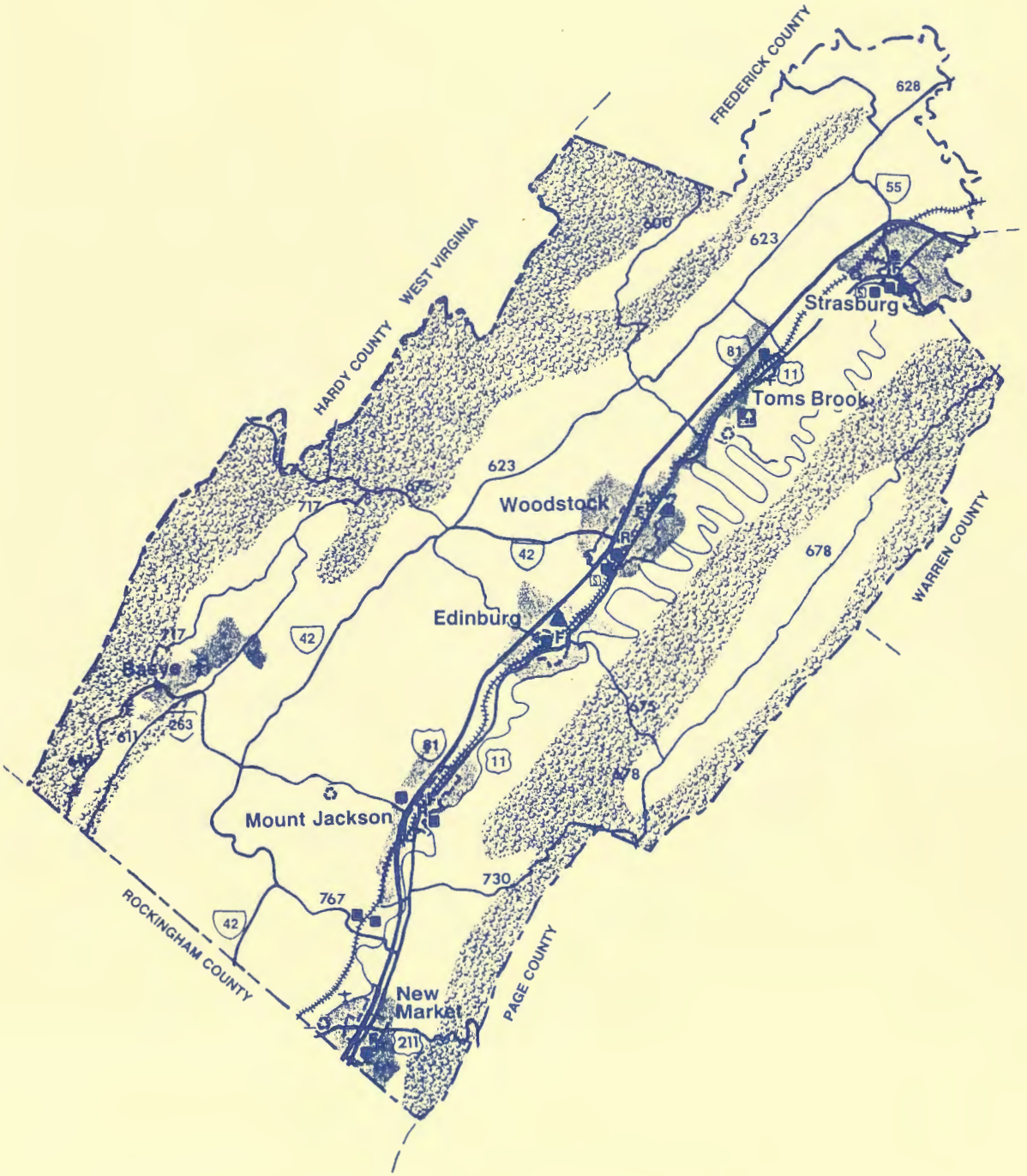
SHENANDOAH COUNTY
COMPREHENSIVE PLAN: 2010



DECEMBER 1991

SHENANDOAH COUNTY COMPREHENSIVE PLAN: 2010

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ACKNOWLEDGEMENTS

This plan was prepared with the assistance of numerous individuals and organizations, as explained in the Introduction. The County would like to express its deep appreciation to all the citizens and community officials of Shenandoah County and its towns who contributed their time and knowledge to the development of the plan.

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

INTRODUCTION

LEGAL BASIS FOR COMPREHENSIVE PLANNING

Authority for local government planning in the Commonwealth of Virginia is contained in the Code of Virginia, 1950, as amended, Title 15.1 Counties, Cities and Towns, Chapter 11. As a Dillion Rule state, local government authority is limited to that provided for in the Code. Therefore the tools available to local governments to carry out planning vary from those in other states and can vary within the Commonwealth. Some of the major points are presented here, but the reader may wish to review the complete code. Section 15.1-427 begins with the General Assembly's declaration of legislative intent relative to establishing laws for planning, subdivision of land and zoning:

This chapter is intended to encourage local governments to improve public health, safety, convenience and welfare of its citizens and to plan for the future development of communities 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 healthy surrounding for family life; that agricultural and forestal land be preserved; and that the growth of the community be consonant with the efficient and economical use of public funds.

Local planning commissions were required for every county and municipality as of July 1, 1976. Section 15.1-446.1 states: "The local commission shall prepare and recommend a comprehensive plan for the physical development of the territory within its jurisdiction." As of July 1, 1980, every governing body in the Commonwealth was required to adopt a comprehensive plan.

The purpose of the comprehensive plan, as set forth in Section 15.1-446.1, is to "guide and accomplish a coordinated, adjusted and harmonious development of the territory which will, in accordance with present and probable future needs and resources best promote the health, safety, morals, order, convenience, prosperity and general welfare of the inhabitants."

The format of a comprehensive plan is not specified in the Code, that is left up to the localities.

The Plan, "...with the accompanying maps, plats, charts, and descriptive matter, shows the commission's long-range recommendations for the general development of the territory covered by the plan, including the location of proposed recycling centers." In accordance with the Code, it may include, but need not be limited to:

1. The designation of areas for various types of public and private development and use, such as different kinds of residential, business, industrial, agricultural, conservation, recreation, public service, flood plain and drainage, and other areas;

2. The designation of a system of transportation facilities such as streets, roads, highways, parkways, railways, bridges, viaducts, waterways, airports, terminals, and other like facilities;

3. The designation of a system of community service facilities such as parks, forests, schools, playgrounds, public buildings and institutions, hospitals, community centers, waterworks, sewage disposal or waste disposal areas and the like;

4. The designation of historical areas and areas for urban renewal or other treatment;

5. The designation of areas for the implementation of reasonable groundwater protection measures;

6. An official map, a capital improvements program, a subdivision ordinance, and a zoning ordinance and zoning district maps; and

7. The designation of areas for the implementation of measures to promote construction and maintenance of affordable housing.

Once adopted, the comprehensive plan is to be reviewed by the planning commission at least once every five years to determine whether is is advisable to amend the plan.

The legal status of a plan, once approved and adopted by the governing body, is that "...it shall control the general or approximate location, character and extent of each feature shown on the plan." Section 15.1-456

BACKGROUND

The Shenandoah County Comprehensive Plan 1990 was prepared in the early 1970's by staff of the then Division of State Planning and Community Affairs for the recently formed County Planning Commission. It was adopted November 13, 1973 with little public input or comment. Growth and development was relatively new for the County. From 1950 to 1965, less than 100 lots per year were added in the rural county, but between 1966 and 1970 4,280 lots were created on 3,344 acres. Another 1,505 lots were added between 1970 and 1975. Development of the interstate highway system opened the County to retirement and second home development from Washington, D.C. and other metropolitan areas of Virginia. The comprehensive planning process and implementing ordinances offered the County a way to deal with growth.

Although a subdivision ordinance was passed in 1972 prior to adoption of the plan, a zoning ordinance, as recommended by the plan, failed in its first attempt. In 1977, due to faster population growth than anticipated, a plan review was prepared by the staff of the Lord Fairfax Planning District Commission and published as a supplement to the plan. Although additional growth of 5,300 population by 1990 was projected, it was concluded that "Even with greater land needs based on the expected increased population, the areas shown on the land use plan map ... still exceed the newest estimates of need in each land use category." Commission staff also began working with the Planning Commission on a zoning ordinance.

In 1978, the County Zoning Ordinance was adopted, implementing with the designation of the zoning districts, areas of the future land use map. Because a conservative approach was taken in the designation of land, the County did not create a legacy of vested rights as many counties did in their initial zoning. Wide areas of other counties were put in three-acre residential zoning because of optimistic growth projections in the 1960's and 1970's. The technology of package treatment plants and the cost of private water supplies were relatively low, giving the impression housing development could go anywhere. Groundwater protection and soil limitations for septic systems were not issues at that time. The 1990 plan included 12 rural development centers outside the towns, each having 500 to 1000 residents on package treatment plants.

During the next ten years County planning focused on economic issues and administration of existing ordinances. The Towns, with the exception of Toms Brook, developed their own plans and implementing ordinances. Due to increasing environmental regulations and the limitations of County soils for septic systems, the importance of the Towns as suppliers of central services increased. The multi-center concept of growth proposed in the 1973 plan was proving valid for the towns, but rural development did not concentrate around rural centers because there were no public facilities.

COMPREHENSIVE PLAN UPDATE PROCESS

In this environment, the work of updating the information base for the comprehensive plan was undertaken by the Lord Fairfax Planning District Commission staff. An analysis was made of the six existing comprehensive plans (county and towns) and available data sources.

The 1990 Plan consisted of two parts with five sections each. The content easily converted to a ten section format compatible with the town and regional plans. Natural Resources, Housing and Implementation were kept as individual sections. Alternative Development Concepts was added to Land Use. Sections "1. Population and Economy" and "2. Community Facilities and Transportation Facilities" were divided into four separate sections. A "Growth Management Policies" sections combined the "Goals and Objectives" and "The Plan" sections. The "Estimation of Future Space Needs" was not updated, since the original methodology was not effective in actually projecting what might happen.

A major problem with local government comprehensive plans is that they are bound documents which can not easily be updated section by section as data becomes available. A looseleaf format, such as developed for the County marketing book, was chosen. Using individually numbered sections allows topics to be expanded upon and be inserted as updates, without affecting the structure of any other plan sections. By extension and reference, the plan can utilize other supporting documents. To extend the plan, a second 20 year horizon was picked, the year 2010. To the extent possible, information and mapping developed for the Virginia Community Certification Program was used in preparation of the plan analyses.

The Shenandoah County Comprehensive Plan Committee was organized from members of the Planning Commission, Economic Development Council, and Board of Supervisors as an ad hoc group. They reviewed the plan sections: Regional Setting & History; Natural Resources; Land Use; Economy; Population; Housing; Community Facilities; and Transportation. The goals of the 1973 plan were reviewed along with examples from Clarke County and Front Royal. It was recognized that the key to a successful community planning effort is agreement on the long-term goals which represent the vision for the future of the County. Proposed goal statements were developed for the Planning Commission and the Board of Supervisors to apply for guidance in decisions affecting the County's growth through the year 2010.

The Shenandoah County Comprehensive Plan Committee used the data and projections of plan sections 1 through 8 to identify issues and draft recommended growth management policy options as a means of achieving the goals. A citizen participation process was developed and implemented. Beginning in December, 1989, meetings were held with representatives from each incorporated town in the County. The Extension Service was asked to summarize the elements of the draft comprehensive plan for a series of six advertised public meetings. These were held throughout the County in February and March, 1990. The presentations were made to explain the planning process to date; to present the proposed growth management policies prepared by the Committee; and to stimulate public comment on the issues. After this process was completed, Section 10, Implementation was prepared as part of the May, 1990 draft.

An advertised Public Hearing was held on the draft plan on June 19, 1990. The Comprehensive Plan Committee, having completed the task of proposing the 2010 Plan was ended and the Planning Commission took responsibility for completing the plan. A citizens review committee process was developed and comments about the May, 1990 draft were incorporated into a November 1990 draft as proposed amendments to amend the 1990 Plan to become the 2010 Plan.

The Citizens Review Committee consisted of persons appointed from each district by the Planning Commissioners, the Planning Commission, and three members of the Board of Supervisors. An organizational meeting of the committee was held and complete copies of the draft plan distributed. The committee was divided into three groups so that each group could concentrate its review on specific plan sections. Three additional meetings were held, and all of the comments and questions of the committee were incorporated into the draft plan sections. Individual meetings were then held with each group to review those specific sections and to be sure that all comments and concerns were addressed.

As a part of the committee's work, a subsection to the draft plan was developed which describes Shenandoah County twenty years from now, based on a concensus of aspirations and projection of trends.

SHENANDOAH COUNTY 2010 - "THE VISION"

Shenandoah County, Virginia lies at the heart of the I-81 growth corridor between Hagerstown, Maryland and Staunton, Virginia. It offers a unique alternative life style to the megalopolis that characterizes much of the Mid-Atlantic section of the United States today. Over the last twenty-five years it has experienced steady, moderate population growth, yet has generally maintained its traditional rural landscape. At least 85 percent of the County is forested or in agricultural usages. Seven compact towns and villages lie along the historic Valley Turnpike (U.S. Route 11). A diverse and thriving economic base and predominantly middle class population have ameliorated many of the socio-economic ills that plague several other parts of the Mid-Atlantic. Shenandoah County residents and visitors alike have always appreciated their quality of life. Today, it is obvious that this quality of life is better than ever.

The landscape of Shenandoah County is highly influenced by Mother Nature, traditional Germanic settlement patterns and historical transportation routes. The mountain ridges and primary roads all run in a northeast-southwest direction. Two sparsely populated valleys--Cedar Creek and Fort--define the western and eastern flanks of the County, respectively. The Little North and Massanutten mountain ranges are almost entirely forested. The central Shenandoah River Valley (North Fork) has a relatively high rural population density for Virginia because of the Germanic origins of its settlers, but still has a very open, agricultural feeling.

The towns and villages are compact and focus on historic districts which contain two hundred year old plus architecture. Seven of these towns and villages cluster in a line along U.S. Route 11 and Interstate 81. Much of the northern top of the County is within the Shenandoah County National Battlefield Park, but is protected by an overlay zone, not public ownership. The New Market Battlefield, in the southern tip of the County, is owned by the Virginia Military Institute. A water conservation-open space system created by an overlay zone over the County's river, streams, and wetlands ties the north-south axis of the Shenandoah River with the east-west axis of its tributary streams.

Over the last twenty years, the citizens have utilized the capital and energy created by steady population and economic growth to improve on their heritage. Agriculture--in particular capital-intensive specialized agriculture--was encouraged and actively promoted by government and the general public. Shenandoah County is now a nationally recognized location for farmstead gourmet food/beverage production. Poultry and fish farming are extremely important economic activities. New residents who were not interested in agricultural life styles have tended to locate in urbanized areas, either in restored historic buildings or in compact developments which have urban utilities and services. Only non-polluting industries are recruited into the County. Strict water and air pollution regulations have been enforced with

new and old industry alike. Several community facilities such as libraries, schools, and teen centers have been constructed to correct past deficiencies. All of these are networked with activities at the Shenandoah Armory, which functions as a county-wide civic center. The "good life" enjoyed by Shenandoah Valley residents for two hundred and fifty years continues on into the Twenty-first Century.

The general goals were re-worded in accordance with committee recommendations, and follow below. The entire draft plan was then re-printed so that the committee could review it in its entirety.

GENERAL DEVELOPMENT GOALS

GOAL 1 - Retain the rural and open-space character of the unincorporated area of the County.

GOAL 2 - Preserve and enhance the environmental quality and historic features of the County and its quality of life.

GOAL 3 - Guide, and direct growth into and around the towns and areas served by the road network and other public facilities, while preserving the rural and open space character of those areas outside of public service areas.

GOAL 4 - Encourage the concentration of economic development within the public service areas.

GOAL 5 - Promote affordable housing for all segments of the population, particularly for semi-skilled and unskilled workers.

GOAL 6 - Provide for the improvement of the road network and other public facilities and for the delivery of necessary public services consistent with these goals.

GOAL 7 - Integrate transportation planning with land use planning.

Following the citizens review committee meeting, another advertised public hearing was held on November 25th. Several suggestions were made in the format and contents of Sections 9 and 10, and they were incorporated.

After the Planning Commission recommended approval of the Plan at its meeting of December 5, 1991, it was adopted by the Board of Supervisors on December 10, 1991.

REGIONAL SETTING & HISTORY

INTRODUCTION

This section describes Shenandoah County's regional setting and provides a brief history of the County. Included is a listing of properties included in the Historic Landmarks Survey done in the County and on file with the Department of Historic Resources in Richmond, and a map showing sites that are within areas that are likely to develop.

The Shenandoah County Comprehensive Plan - 1990, adopted November 13, 1973, henceforth referred to as the "1973 Plan," covered County history in four paragraphs of the plan preface.

REGIONAL SETTING

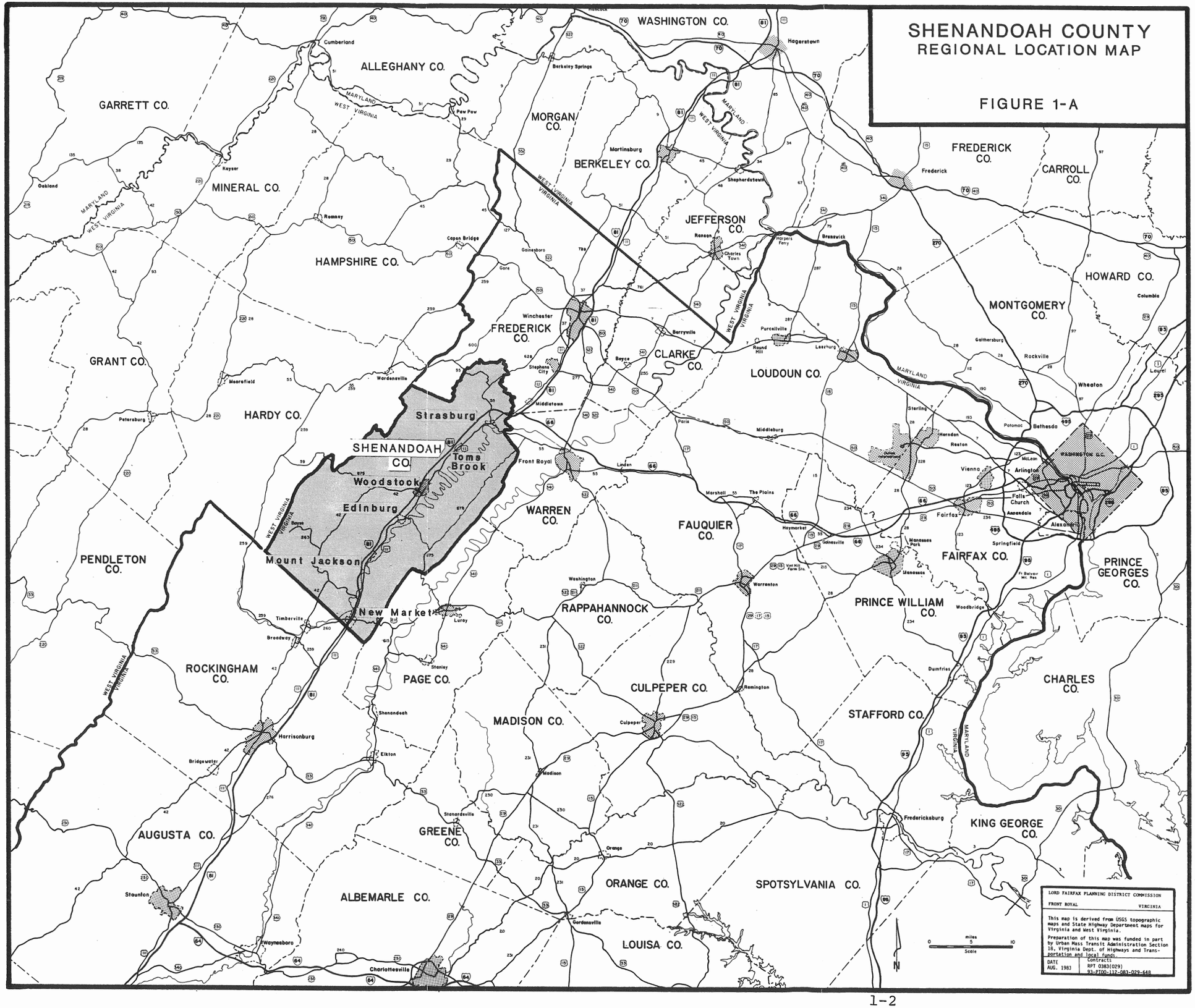
Shenandoah County is located in the scenic northern Shenandoah Valley of Virginia. The County is 34 miles long, running in a northeast-southwest direction, an average of 16 miles wide, and contains a land area of 507 square miles. It is bounded by Frederick County on the north; by Rockingham and Page counties on the south; by Page and Warren counties on the east; and by Hardy County, West Virginia on the west. Major cities lying within a 150 mile radius of the County include Washington, D.C.; Richmond, Virginia; Baltimore, Maryland; and Harrisburg and Pittsburgh, Pennsylvania. See Figure 1-A Regional Location Map on the following page.

Part of the Ridge and Valley geologic province, the County contains elevations ranging from 537 feet above mean sea level (msl) at the Shenandoah River to over 3,000 feet msl in the Great North Mountain range which forms its western boundary. This province is characterized by steep slopes and wide river valleys.

Shenandoah County is served by Interstate I-81 which runs its length, and the intersection with I-66 is just a short distance north of the County line.

SHENANDOAH COUNTY
REGIONAL LOCATION MAP

FIGURE 1-A



HISTORY

Shenandoah County was formed in 1772 from Frederick County, and was originally named Dunmore County in honor of Governor Dunmore. In 1778 the name was changed to Shenandoah after the Shenandoah River, an Indian name meaning "Daughter of the Stars."

Many of the earliest settlers were Scotch, Irish, and German, who moved to the County from Pennsylvania. The Town of Woodstock, formed in 1752, was selected as the County Seat in 1772 upon the formation of Shenandoah County.

The County provided men and supplies during three periods of conflict: the French and Indian War, the Revolutionary War, and the Civil War.

The earliest economic activity in Shenandoah County by settlers, beginning about 1670, revolved around fur trapping and trading. With permanent settlement, soon after 1726, came the introduction of flax, tobacco and new varieties of grain, livestock, vegetables, and fruit.

Gradually, towns developed along the Valley Turnpike (now U.S. Route 11), which was the most important transportation route in and through the Shenandoah Valley for over 200 years until Interstate 81 was completed.

As communities grew at intersections of travel routes through the County, manufacturing was soon started to meet local demand, using products of nearby farms, forests, and mines. Small industries, tanneries, lumber mills, and primitive iron smelting furnaces were established by the middle of the 18th century.

A vigorous pattern of trade soon evolved in Shenandoah County. Supplies came from and Valley produce went to such market centers and port towns as Baltimore, Georgetown, Alexandria, and Richmond. Until after the Revolutionary War, hemp was a major cash crop. Tobacco was packed in wooden barrels built in the area and then exported. Cattle were driven to Baltimore and Alexandria. Turkeys were also raised. Other surpluses from farms went to market by wagon and river barge.

Many of the local manufacturing activities, which once met only the needs of nearby settlers, expanded, supplying items for sale outside the County. Industries commercially processing farm produce and other raw materials were developed. Flour and cornmeal were ground at many stream-side mills. Hams and bacon were cured in large quantity in area smokehouses. Sawmills became more productive. Plentiful iron ore, limestone, and timber led to the establishment of iron mining, milling, and smelting operations, which continued between 1742 and 1907. The furnaces soon became a major source of pig iron for forges in Maryland and Pennsylvania. Maganese and zinc ores were also mined intermittently between 1834 and 1962. Limestone has been quarried on a large scale since 1868.

Other industries were started because of the special skills of Shenandoah County residents. The Henkel Press, in New Market, was established in 1806. During the 1800's, Strasburg was noted for its pottery made by the Town's German settlers and their descendants.

The limestone soils of the Shenandoah Valley are excellent for agriculture. The great volume of grains which were produced here caused this region to be called the "Granary of the Confederacy" during the Civil War.

Shenandoah County was the scene of much fighting between 1861 and 1865. There were troop movements and skirmishes over most of the land area of the County, and there are four major battle sites: New Market, Toms Brook, Fishers Hill, and Cedar Creek. All of these actions took place in 1864.

The Battle of New Market is one of the most famous battles of the war. It took place on May 15, 1864. In it, the cadets of Virginia Military Institute made a heroic charge against the Union forces advancing down the Valley. The Battle of Cedar Creek ended the fight for control of the Shenandoah Valley.

By the late 1870's, tourism was becoming an important industry in the County. Born of increased prosperity, improved transportation, and the local climate and scenic beauty, the tourism industry began slowly when wealthy persons built dwellings for seasonal homes. Summer hotels and resort spas appeared, as at Orkney Springs and Seven Fountains. Then came a number of summer visitors, seeking fresh air and outdoor recreation. Tourism began to flourish with the opening of the Shenandoah National Park and the Skyline Drive. Tourists are also attracted to the County's mineral springs and limestone caverns.

The County is noted for its many historic sites and structures, including the New Market Battlefield Park, the Henkel Press Publishing House, and the Confederate Hospital of Mount Jackson. The preservation and enhancement of these resources must be kept in mind while reviewing development proposals.

Table 1-A on the following pages provides a listing of the Historic Landmarks Survey done in Shenandoah County. Figure 1-B maps out many of the surveyed sites within areas that may be subject to development, and is shown on page 1-10.

TABLE 1-A

VIRGINIA DEPARTMENT OF HISTORIC RESOURCES SURVEY
SHENANDOAH COUNTY, VIRGINIA

V - Virginia Landmarks Register
N - National Register of Historic Places
(As of May, 1991)

Name	Survey No.
Antioch Regular Baptist Church	85-108
Baker, Philip, Stone House (Windle Place)	85-77
Bank Barn (Stoddart Barn)	85-126
Barb Farm	85-87
Barb Water Mill	85-2
Belleview Farm	85-65
Beydler Place (Valhalla)	85-96
Boehm Place (Mowery Place)	85-62
Boyer Iron Furnance	85-45
Brill Place	85-53
Brubeck Place	85-88
Burnshire Dam	85-28
Bushong House	85-40
Byrd, Moance, House (C. S. Beaver Home)	85-3
Campbell Farm	85-127
Campbell House	85-19
Cedar Creek Battlefield	
Cedar Creek Bridge	85-24
Chapman Dam	85-43
Claylick Farm Settlers Cabin	85-50
Clover Dale	85-43
Coffelt Place	85-63
Conicville School House	85-106
Copenhaver, John, House	85-114
Covered Bridge	85-28
Crables Tavern	85-97
Edinburg Dam	85-109
Edinburg Truss Bridge	85-107
Edinburg Mill *(V/N)	85-110
Fisher's Hill Battlefield	85-1
Flynn, Thomas, House	85-95
Fort Bowman or Harmony Hall *(V/N)	85-4
Fort Painter (site)	85-25
Fry's Fort	85-58
Funkhouser Stone House	85-69

Glaiz Farm Spring-house	85-61
Glendale Farm	85-66
Green Spring	85-21
Halfway House	85-82
Hammond Place	85-78
Harrisonburg (McGaheysville) Dam	85-128
Henrietta Furnance	85-44
Hockman, Dr. Christian, House (Checquers) *(V/N)	85-76
Hockman House	85-124
Hockman House and Bank Barn	85-109
Hockman, Jennie, Place	85-93
Hockman, John, House	85-117
Hockman Place	85-85
Huddle, George, House	85-5
Hudson, Tommy, House	85-20
Hupp Distillery	85-6
Hupp House (Hupp Homestead)	85-7
Hupp Mansion	85-8
Inn at Narrow Passage	306-17
Keller House	85-120
Keller Place	85-71
Keller, John, Place (Abe Stoner Place)	85-84
Kiln	85-36
Lebanon Church (Village)	85-118
Log Barn	85-42
Manor's Hill	85-12
McClanahan-Green, House	85-22
Meems Bottom covered Bridge * (V/N)	85-103
Miley Site * (V)	85-101
Miller Ruins	85-67
Moore Estate	85-34
Moore House	85-10
Moore's Inn (Kunz Place)	85-32
Moore's Store (Kunz) Blacksmith Shop	85-33
Moore's Store (and Post Office)	85-11
Moore's Store Office	85-13
Moore's Store Village, General	85-37
Mount Airy	85-18
Mount Pleasant	85-72
Old Mill (Spengler Mill)	85-17
Old Miller Home	85-91
Old Mountz Place	85-60
Nesselrodt House	85-112
New Market Battlefield Park * (V/N) - Bushong House	85-27
Newman Farm	85-99

One Acre	85-41
Orkney Springs, General	85-121
Orkney Springs Hotel * (V/N)	85-39
Orndoff, Harry, Place (Eli Peer Place)	85-57
Orndorff, J. H., Cabin	85-55
Orndorff, Perry, Farm	85-56
Pifer Place (Sheltered Spring Farm) (Funkhouser Homestead)	85-92
Pleasant Green School	85-115
Quicksburg Site * (V/N)	85-102
Rhodes Farm	85-79
River Bend Farm Outbuildings	85-94
Rogers Place (Cedar Bluff)	85-75
Rosenburger Place	85-81
Rude House	85-128
Rudolph, Adam, Farm (Craigmillar)	85-49
Sandy Hook Settlement	85-16
Schmucker Farm (Little River Farm)	85-98
Shell, Samuel, Place	85-52
Shenandoah County Farm (Glebe Farm)(Alms House)	85-86
Shrine of the Transfiguration	85-38
Sibert, Joe, Place (Spiker Place)	85-89
Snapp House (Charles House)	85-123
Snapp House (Wildflower Farm) * (V/N)	85-29
Snarr, Henry, House	85-119
Snarr's, A.B., Broom Shop	85-74
Soloman's Luthern Church	85-113
Sonner, Levi, Store	85-116
Spengler Hall (Matin Hall)	85-9
Spring House	85-125
St. James Lutheran Church	85-48
Stickley, Abraham, Place	85-68
Stickley House	85-13
Stickley Mill (Bowman Mill)	85-14
Stickley, Sam, Place (Green Mountain Farm)	85-70
Stone Schoolhouse	85-59
Stoner Mill & House (Keller Mill)	85-83
Strathmore	85-104
Swartz Mill	85-80
Swartz Place	85-90
Sydnor, Dr., Place (Old Lindamood Place)	85-64
Tanyard (Walton's Mill)	85-26
Tavern, Old #1	85-30
Tavern, Old #2	85-31
Thundershower Mill (Armentrout Mill)	85-35
Van Burean Furnace	85-51

Vance, Richard, Farm	85-105
Vesper Hall	85-73
Vesper Hall Tenant House	85-106
Whittington Cabin	85-54
Willow Grove Tavern	85-15
Wunder Farm	85-100
Zepp Post Office (Lockstampfer Store)	85-47
Zepp Tannery Ruins	85-46
Zirkle Mill * (V/N)	85-122

Mount Jackson, Virginia

Mill Creek	265-3
Town House	265-1
Union Church	265-2

Mount Jackson Historic District * (V/N) (Listed 6/24/93)

New Market, Virginia

Calvert House (Main St. Apts #4, NMHDS #42)	269-12
Deary's Tavern (Main St. Apts #2, NMHDS #40)	269-10
Henkle, Abbie, House (Stone Corner, NMHDS #23)	269-3
Henkel Press Building (NMHDS #84)	269-6
Henkel Press Building & Apartments (NMHDS #32)	269-7
Main St. Apartments #3 (NMHDS #96)	269-11
Main St. Apartments #5 (NMHDS #93)	269-13
Main St. Apartments #7	269-14
Main St. Apartments #11 (NMHDS #87)	269-16
Main St. Apartments #13 (NMHDS #86)	269-17
Main St. Apartments #15 (NMHDS #82)	269-18
Main St. Office Building #1 (NMHDS #79)	269-19
Myers, Guy, House	269-21
New Market Historic District * (V/N)	269-5
Provost Marshall House (Main St. Apartments #14) 269-14	
Stone Corner (Abbie Henkel House)	269-3
Strayer, John, House (Lee-Jackson Hotel)	269-1
Town Pump	269-4
Trading Post (James Wick House)	269-2
Wicks, R. L., House NMHDS #101)	269-9
Weisenborn Law Office (New Market Bus Station)	269-22

Strasburg, Virginia

Academy Hall	306-4
Alton House	306-1
Bell Pottery Shop	306-14
Copp House (108 High Street)	306-7

Crawford House (121 King Street)	306-10
Eberly, George, House (222 West King Street)	306-12
Grove House (215 Holliday Street)	306-8
Houck Property (Pifer House, 110 W. Queen St.)	306-13
Dosh Log House (Washington Street)	306-11
Mill Restaurant (Route 11)	306-2
Post Office	306-18
Presbyterian Church (South Holliday Street)	306-3
Sonner House (200 West Queen Street)	306-15
Spangler Hotel (Womack Apts, 227 E. King St.)	306-6
Strasburg Historic District *(V/N)	306-16
Strasburg Stone and Earthenware Mfg. Co. *(V/N) (Old Railroad Station; Strasburg Museum, King St.)	306-9

Woodstock, Virginia

Clower House (Nance Clower's Home)	330-1
Riddleberger Hall (Massanutten Military Academy)	330-3
Post Office	330-4
Shenandoah County Court House * (V/N)	330-2

SHENANDOAH COUNTY
VIRGINIA

HISTORIC SITES WITHIN
LIKELY DEVELOPMENT AREAS

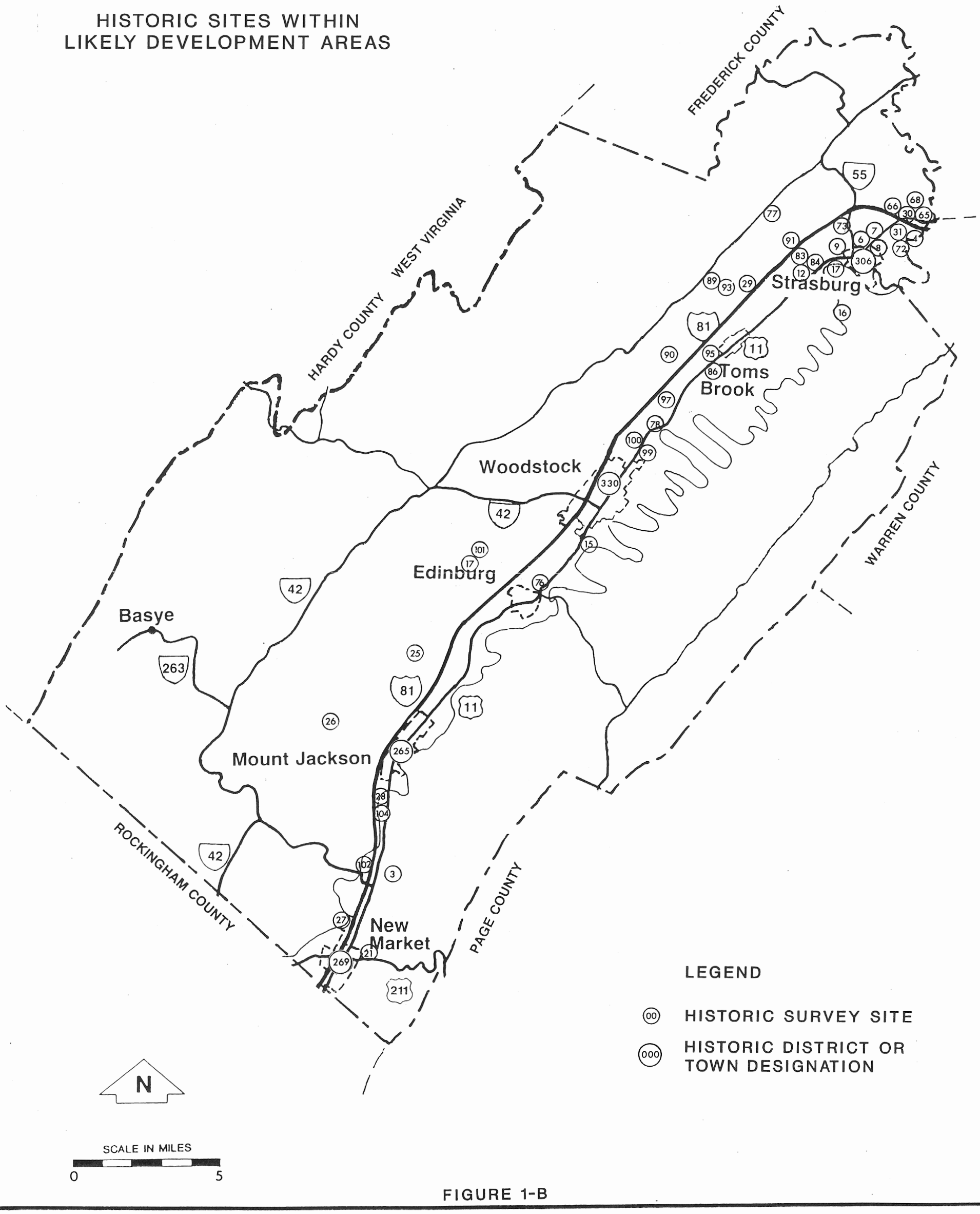


FIGURE 1-B

SUMMARY AND RECOMMENDATIONS

Shenandoah County's location in the Northern Shenandoah Valley and its underlying geology and soils have played a key part in its history and development in the past and continues to do so today.

There were over 150 historic sites identified by a previous historic landmarks survey of the County, ranging from individual homes, farms, taverns, bridges and other structures to complete historic districts which are found in the towns of New Market and Strasburg. Another survey is now in progress in the Town of Woodstock, which may lead to the designation of an historic district there.

Several additional historic properties outside of the towns were brought up by the review group. There is a need for further surveying and documentation of other historic and architectually significant properties that were not included in earlier surveys and summarized in Table 1-A.

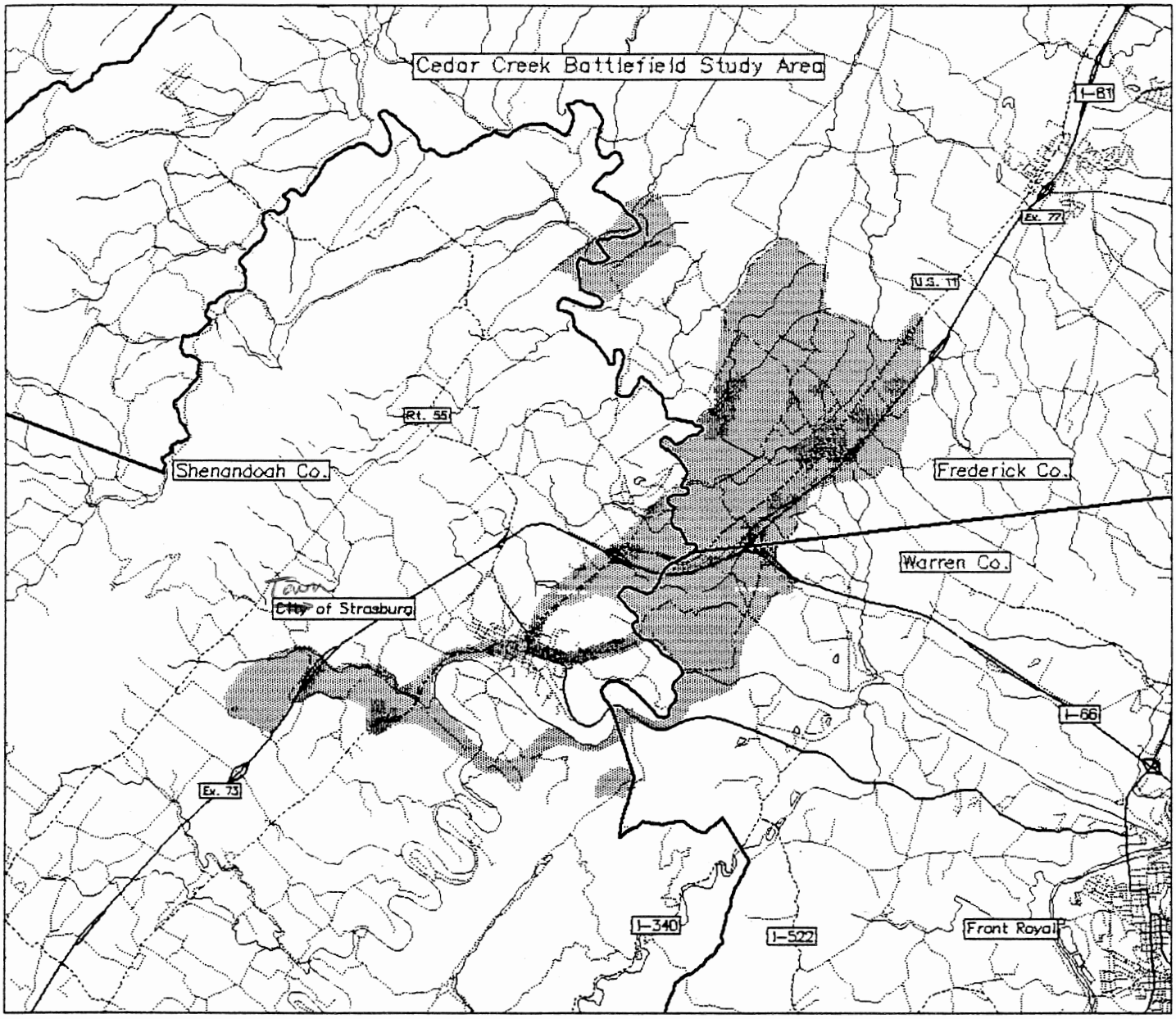
The preservation and enhancement of the County's historic assets is one of the major goals of this plan. One action which is recommended to implement this goal is the completion of additional historic and archaeological surveys and the designation of additional qualifying structures and districts in the rural areas as well as the balance of the towns. Partial funding may be available through the Department of Historic Resources on a matching basis. Further research is encouraged for towns and citizens groups with matching funds.

In addition, there are several battlefield sites in Shenandoah County which should be preserved and enhanced. Such actions will boost the County's attraction for tourism, as well as help to preserve additional open space lands. Congress commisioned the National Park Service to do a study of Civil War sites in the Shenandoah Valley. Four sites were identified in Shenandoah County, and they are shown on figures 1-C through 1-F on the following pages.

Any development proposals submitted should identify historic features found on the site. This will aid in the preservation of additional structures and features which are significant from an historic or archaeological viewpoint.

The overall goal of these recommendations is to preserve the quality of life in the County for today's citizens as well as for those who will follow.

TITLE: Integrity of Cedar Creek Area
LOCATION: Shenandoah Valley Study, American Battlefield Protection Program



SCALE: 1 : 134184

WINDOW: 716738.28 4333520.23 743948.28 4310240.23

valley.counties (jjk)

roads.primary (jjk)

roads.secondary (grass)

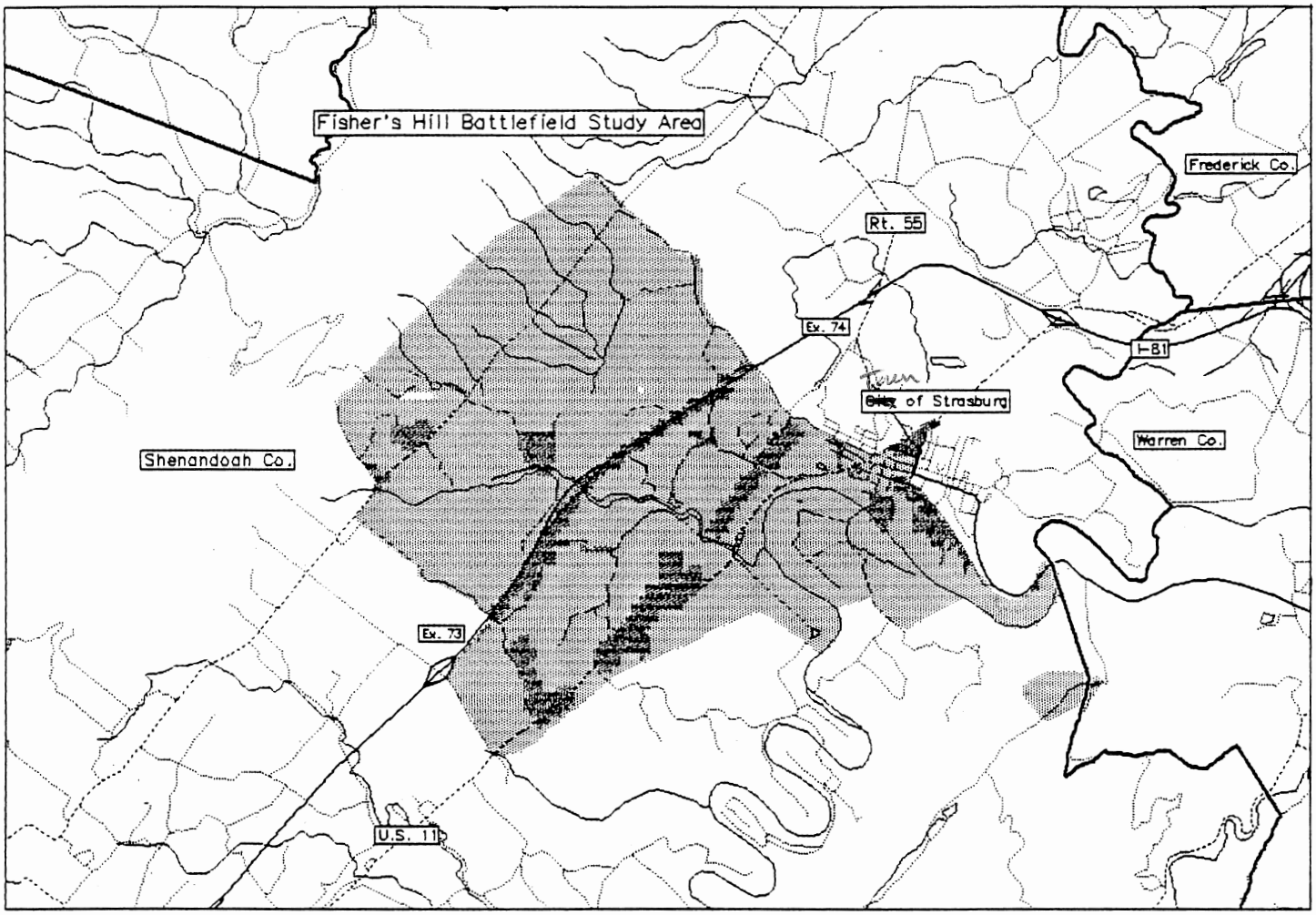
roads.connector (grass)

tributaries (grass)

water.bodies (grass)

FIGURE 1-C

TITLE: Integrity of Cedar Creek Area
LOCATION: Shenandoah Valley Study, American Battlefield Protection Program



SCALE: 1 : 90837

WINDOW: 715988.28 4325180.23 734408.28 4312436.23

valley.counties (jjk)

roads.primary (jjk)

roads.secondary (grass)

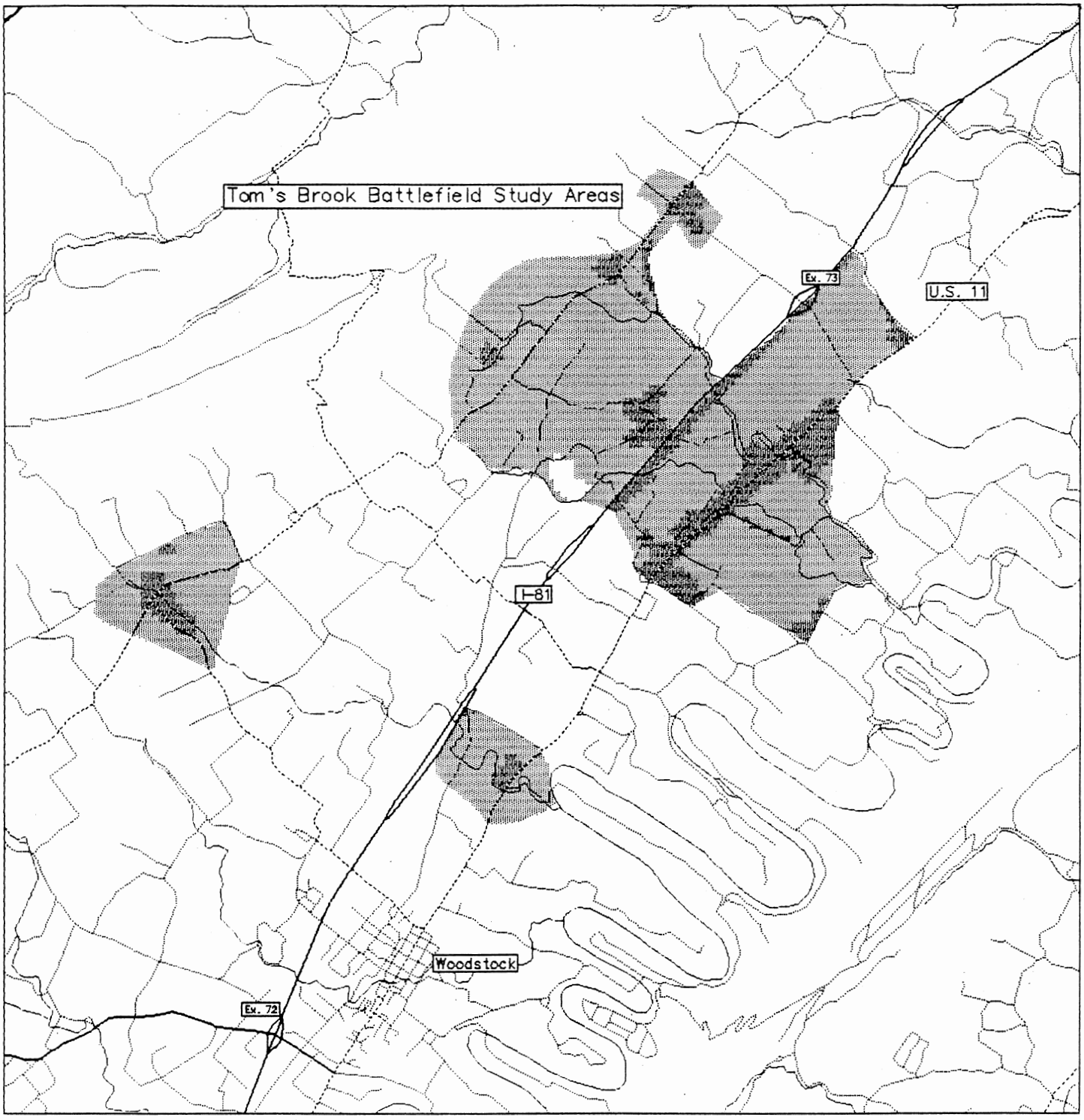
roads.connector (grass)

tributaries (grass)

water.bodies (grass)

FIGURE 1-D

TITLE: Integrity of Cedar Creek Area
LOCATION: Shenandoah Valley Study, American Battlefield Protection Program



SCALE: 1 : 76161

WINDOW: 710624.28 4320050.23 726068.28 4304126.23

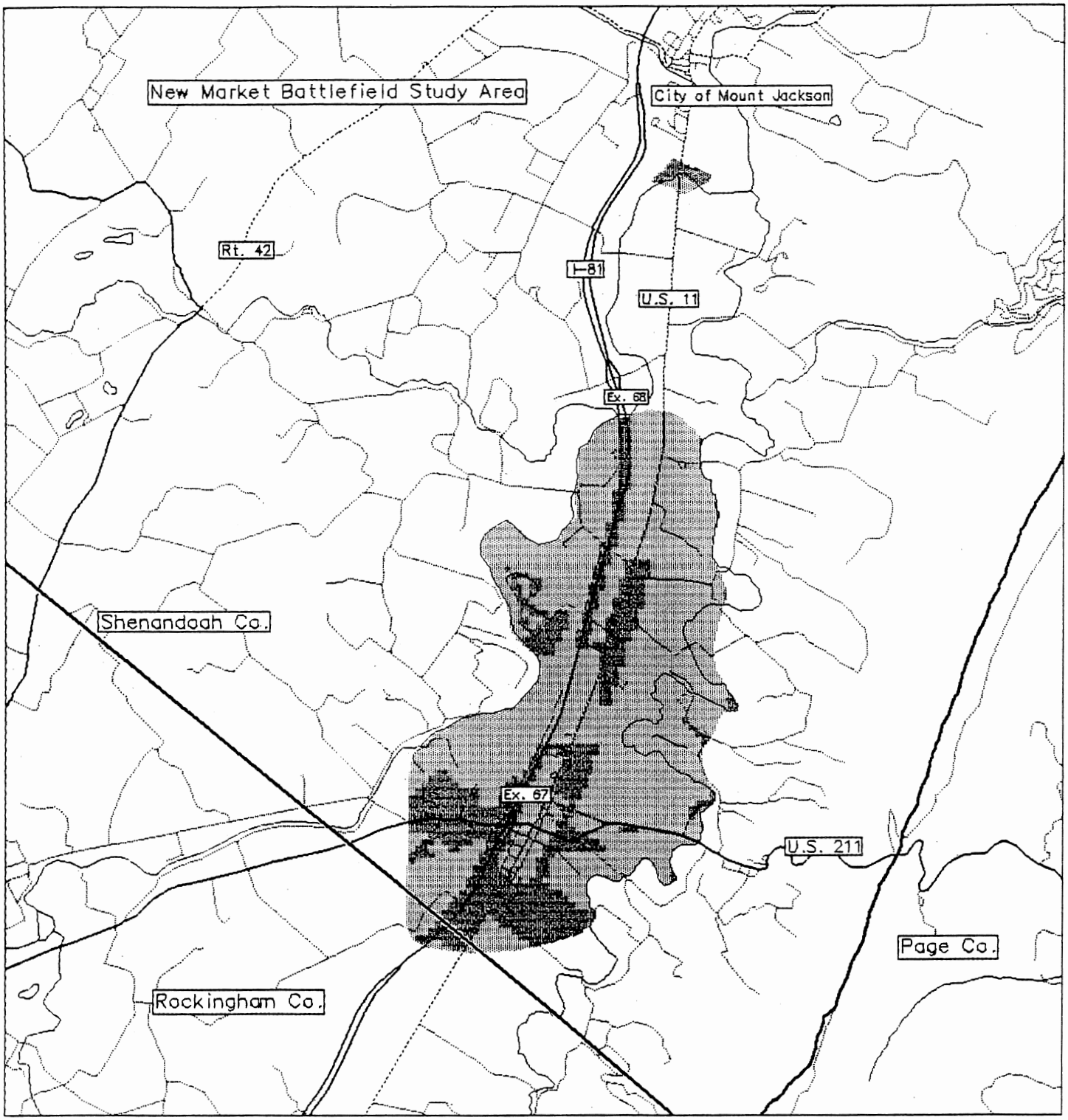
valley.counties (jjk)

roads.primary (jjk)

roads.secondary (grass)

FIGURE 1-E

TITLE: Integrity of Cedar Creek Area
LOCATION: Shenandoah Valley Study, American Battlefield Protection Program



SCALE: 1 : 73676

WINDOW: 695198.28 4291640.23 710138.28 4275956.23

valley.counties (jjk)

roads.primary (jjk)

roads.secondary (grass)

FIGURE 1-F

9/22/93

FOR FUTURE INPUT TO SHEN. CO COMP PLAN.

Winter Hill, Frederick County (DHR № 34-87), was rated at
architecture. It was found to be eligible with a score of 37.

Woodburn, Frederick County (DHR № 34-102), was rated at
architecture. It was found to be eligible with a score of 35.

Wright-Barton House, Frederick County (DHR № 34-633),
area of architecture. It was found to be eligible with a score of

Zig-zag Trenches, Frederick County (DHR № 34-314), were
the area of military history. They were found to be eligible wit

SHENANDOAH COUNTY SURVEY EVALUATIONS

Barb Farm, Shenandoah County (DHR № 85-87), was rated at the local level for significance in the area of architecture. It was found to be eligible with a score of 31.

Mount Airy, Shenandoah County (DHR № 85-18), was rated at the local level for significance in the area of architecture and agriculture. It was found to be eligible with a score of 43.

Mount Pleasant, Shenandoah County (DHR № 85-72), was rated at the local level for significance in the area of architecture. It was found to be eligible with a score of 35.

Spengler Hall, Shenandoah County (DHR № 85-09), was rated at the local level for significance in the area of architecture. It was found to be eligible with a score of 35.

Stickley House and Mill, Shenandoah County (DHR № 85-13 and 85-14), were rated at the local level for significance in the area of architecture and archæology. They were found to be eligible with a score of 38.

Valhalla, Shenandoah County (DHR № 85-96), was rated at the local level for significance in the area of architecture. It was found to be eligible with a score of 33.

Vesper Hall, Shenandoah County (DHR № 85-73), was rated at the regional level for significance in the area of architecture and art. It was found to be eligible with a score of 34.

DISTRICTS:

Columbia Furnace Historic District, Shenandoah County (DHR № 85-400), was rated at the regional level for significance in the area of industry and architecture. It was found to be eligible with a score of 38.

Conicville Historic District, Shenandoah County (DHR № 85-402), was rated at the local level for significance in the area of transportation, commerce, and architecture. It was found to be not eligible with a score of 29. The team will re-evaluate this district after the next phase of the survey has been completed.

Forestville Historic District, Shenandoah County (DHR № 85-405), was rated at the local level for significance in the area of industry and commerce. It was found to be eligible with a score of 35.

Hudson Crossroads Historic District, Shenandoah County (DHR № 85-410), was rated at the local level for significance in the area of commerce. It was found to be eligible with a score of 34.

Moore's Store Historic District, Shenandoah County (DHR № 85-37), was rated at the local level for significance in the area of industry, architecture, and commerce. It was found to be eligible with a score of 38.

Mount Clifton Historic District, Shenandoah County (DHR № 85-409), was rated at the local level for significance in the area of architecture, industry, and commerce. It was found to be eligible with a score of 35.

Mount Olive Historic District, Shenandoah County (DHR № 85-504), was rated at the local level for significance in the area of architecture and commerce. It was found to be eligible with a score of 34.

Oranda Historic District, Shenandoah County (DHR № 85-505), was rated at the local level for significance in the area of industry and commerce. It was found to be eligible with a score of 35.

NATURAL RESOURCES

INTRODUCTION

This section describes both the land and water resources of Shenandoah County. It presents information on the County's topography, geology, soils, and water resources. These resources provide many opportunities, but also pose some severe environmental problems. Development should be guided away from areas with serious limitations, such as steep slopes, shallow depth to bedrock, flood plains, prime agricultural lands, wetlands, and sinkholes. Maps showing general geology, general soils, the hydrogeologic survey of Shenandoah County, and generalized development limitations are included.

Natural resources were briefly addressed in individual paragraphs about topography, climatology, minerals, soils, hydrology, and forests in the 1973 Plan, along with a general soils map. Soils data has since been updated with the Shenandoah County Soils Survey.

LAND RESOURCES

Topography

Shenandoah County lies within the Ridge and Valley physiographic province of Virginia. This province is known for its steep slopes in the mountainous areas with wide valleys lying between.

The County's topography is steep to gently rolling, and well drained. Elevations vary from 537 feet above mean sea level in the valley to approximately 2500 feet msl along the Massanutten Mountains on the east and over 3,300 feet msl along the North Mountains on the west. Intersected by narrow valleys in a northeast to southwest direction, these mountains comprise approximately one-half of the County's total land area.

The central portion of the County is the valley proper which is relatively level. Meandering through this area is the North Fork of the Shenandoah River, a major tributary of the Potomac River. Other major watersheds include Cedar Creek, Passage Creek, Stony Creek, and Smith Creek.

Approximately 45 percent of the County contains steep slopes ranging from 15 to 25 percent and, along the eastern and western borders, lands containing slopes of from 25 to 45 percent. The land along the eastern and western sides has severe slope limitations for both farm and non-farm uses.

Geology

Shenandoah County is underlain by bedrock which geologists have assigned to many different formations and groups which are shown on Figure 2-A on the following page.

The formation and group classifications are combined into major geologic belts, and the County lies within three of them. Both the eastern and western sections are made up of Appalachian Sandstones and Shales. The eastern-central part of the County is underlain by the Valley Shale belt and the west-central area is part of the Valley Carbonate belt.

Appalachian Sandstones and Shales are made up of several rock types. The major geologic units found in the belt are the Hampshire, Brallier, Chemung, Tuscarora Formations and the Clinton and Cayuga Groups. Where the bedrock is exposed at the earth's surface, sandstone forms the many high, narrow, linear, northeast-trending ridges characteristic of the area.

The Valley Shale belt is made up of a single rock unit, called the Martinsburg Formation. Shale and easily erodable sandstone are the major rock type of this belt.

Valley Carbonates are made up of six major formations or groups. The most common rock types are limestones and dolomites of sedimentary origin. The major geologic units included are the Edinburg Formation, Lincolnshire and New Market Limestones, the Beekmantown Formation, and Conococheaque Limestone.

The bedrock underlying the County influences almost every other feature of the environment and directly or indirectly affects many of man's land use decisions. Each of the major belts shows up in distinct land forms, and each also has an influence on water and its movement above or below the surface.

Carbonate rocks (limestone and dolomite) commonly show considerable solution activity and surface collapse features consisting of sinkholes and caves. Such features are direct conduits into the County's groundwater.

SHENANDOAH COUNTY

VIRGINIA

GENERAL GEOLOGY

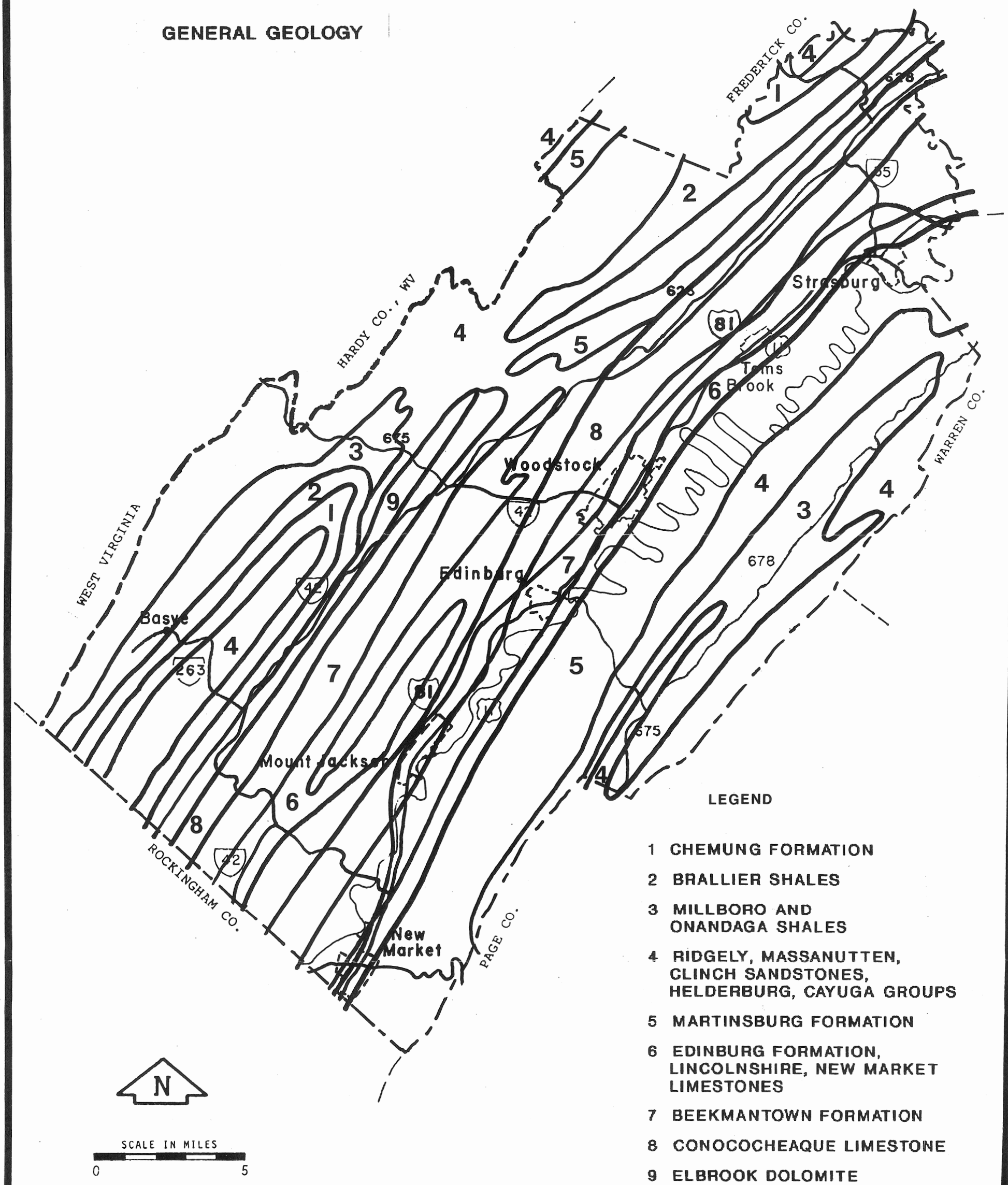


FIGURE 2-A

One of the direct effects of geology on the use of land is the presence or possibility of rocks and minerals having commercial value. High-calcium limestone is quarried northeast of Strasburg to produce lime. Limestone for roads, concrete and other uses is quarried near Forestville.

In the past, limestone and dolomite have been quarried at many other sites. Clay materials near Strasburg and Woodstock were used in the manufacture of brick. Clay near Strasburg was also used to make pottery products and drain tile.

Sand and gravel were produced near Edinburg and Maurertown. Manganese minerals have been mined in the Cedar Creek Valley-Capola Mountain and Massanutten Mountain areas. Iron minerals have been mined in the western part of the County and in the Massanutten Mountain area. A small quantity of zinc ore was mined near Forestville.

Samples of shale from selected localities in the County have been tested and found potentially suitable for use in the manufacture of brick, tile, and lightweight aggregate.

Sandstone and quartzite at some localities may have potential as sources of high-silica raw materials.

Soils

The information in this sub-section was provided by the Soil Conservation Service from the preliminary draft of the Shenandoah County Soil Survey. Seven major soil associations are found within the County. They are listed below in Table 2-A, and shown in Figure 2-B, "Soils", on page 2-5.

TABLE 2-A
MAJOR SOIL ASSOCIATIONS

1. Frederick-Poplimento-Endcav
2. Chilhowie-Carbo-Endcav
3. Weikert-Berks-Laidig
4. Lehew-Gainesboro
5. Wallen-Laidig
6. Wallen-Rock outcrop-Drall
7. Unison-Monongahela-Braddock

Source: Draft Soil Survey of Shenandoah County, Virginia

The soil associations in the survey were grouped into four general kind of landscapes for broad interpretive purposes. Each of the broad groups and the soil associations in each group are described below.

SOILS IN THE SHENANDOAH VALLEY FORMED IN RESIDUUM OF LIMESTONE AND INTERBEDDED LIMESTONE AND CALCAREOUS SHALE; ON UPLANDS:

1. Frederick-Poplimento-Endcav

This association is composed of very deep, well drained soils that have clayey subsoils.

Areas of these soils are located on broad uplands whose slope varies from gently sloping to steep; they generally have long smooth slopes.

This map unit makes up about 23 percent of the County. It is about 35 percent Frederick soils, 24 percent Poplimento soils, 15 percent Endcav soils and 26 percent soils of minor extent.

The Frederick and Poplimento soils are dominantly gently sloping and sloping. Both soils have a surface texture of silt loam and are gravelly or rocky in some areas. The Endcav soils are dominantly gently sloping and sloping and have silt loam surface textures. Some areas are rocky.

Of minor extent in this map unit are well drained Carbo and Timberville soils. Also of minor extent are somewhat poorly drained Toms soils and poorly drained Maurertown soils along small streams and drainageways and areas of rock outcrop.

The soils in this map unit are used mainly for crops and pastures. The non-rocky soils are used mostly as cultivated cropland and are well suited to this use. The steeper soils and the rocky soils are suited to grasses and trees. The hazard of erosion, rockiness, and steep slopes are the main limitations for farming. The clayey subsoil, rockiness, and steep slopes are the main limitations for community development and most other uses.

2. Chilhowie-Carbo-Endcav

This association is composed of moderately deep to very deep, well drained soils that have clayey subsoils.

Areas of these soils are mainly on gently sloping to moderately steep slopes and broad ridge tops. Rock outcrops and sinkholes are numerous throughout the unit.

This map unit makes up about 10 percent of the County. It is about 30 percent Chilhowie soils, 15 percent Carbo soils, 12 percent Endcav soils and 43 percent soils of minor extent.

Carbo and Endcav soils are dominantly gently sloping to strongly sloping and have silty clay loam surface textures. The Carbo soils are moderately deep and the Endcav soils are very deep. The Chilhowie soils are on ridge tops and short, steep side slopes. Chilhowie soils are moderately deep and have a surface texture of silty clay loam. Rock outcrops and sinkholes are numerous throughout this map unit.

Of minor extent in this unit are shallow, well drained Opequon soils, deep well drained Edom and Timberville soils and pits and dumps.

This unit is mainly used for crops and pasture. Most of the steep and rocky areas are in pasture and woodland.

The hazards of erosion, rockiness and slope are the main limitations for farming. The clayey subsoil, depth to bedrock, and steep slopes are the main limitations for community development and most other uses.

SOILS FORMED IN RESIDUAL OR COLLUVIAL MATERIAL FROM SHALE AND SANDSTONE ON UPLANDS AND MOUNTAIN FOOTSLOPES:

3. Weikert-Berks-Laidig

This association comprises shallow to very deep, well drained soils that have loamy subsoils.

Areas of these soils are on hills and ridges, lower side slopes and foothills, and are generally gently sloping to very steep.

This map unit makes up about 38 percent of the county. It is about 21 percent Weikert soils, 20 percent Berks soils, 12 percent Laidig soils and 47 percent soils of minor extent.

The Weikert and Berks soils are predominantly in moderately steep to very steep areas. Both have silt loam surfaces and are closely intermingled on the landscape. Weikert soils are shallow and Berks soils are moderately deep. They are on hills and ridges in the Valley and lower mountains side slopes. Some areas are very stony.

The Laidig soils are very deep and well drained. Most areas are stony or very stony. It is on lower side slopes and narrow ridge tops and side slopes of the foothills.

Of minor extent in this map unit are well drained, Gilpin, Sequoia and Wheeling soils, somewhat poorly drained Toms and Guyan soils, and poorly drained Maurertown and Purdy soils.

This unit is mostly in woodland. A few areas are in cultivated crops and pasture. These areas are mostly along small streams and the North Fork of the Shenandoah River. Slope and depth to bedrock are the main limitations for community development and most other uses.

4. Lehew-Gainesboro

This association has moderately deep, well drained soils that have loamy subsoils.

Areas of these soils are on hills and ridges. They generally have short smooth slopes and are highly dissected.

They map unit makes up about 30 percent of the county. It is about 40 percent Lehew soils, 20 percent Gainesboro soils and 40 percent soils of minor extent.

The Lehew and Gainesboro soils are dominantly on steep side slopes. They are moderately deep and well drained.

Of minor extent in this unit are the moderately deep, well drained Berks, Gilpin and Wallen soils and shallow, well drained Weikert soils.

This unit is mostly wooded. A few small areas along the ridge tops are in pasture. Slope and depth to bedrock are the main limitations for community development and most other uses.

SOILS IN THE APPALACHIAN MOUNTAINS, MASSANUTTEN MOUNTAINS AND MOUNTAIN FOOT SLOPES THAT FORMED IN RESIDUAL OR COLLUVIAL MATERIAL WEATHERED FROM SANDSTONE:

5. Wallen-Laidig

Soils in this association are moderately deep and very deep, somewhat excessively drained and well drained and have loamy subsoils.

Areas of these soils are gently sloping to very steep, on the tops and side slopes of the Appalachian Mountains. Most of this unit is in the George Washington National Forest. This unit makes up about 11 percent of the county. It is 38 percent Wallen soils, 35 percent Laidig soils and 27 percent soils of minor extent.

The Wallen soils are somewhat excessively drained and have very stony and extremely stony surfaces. They are on side slopes and tops of the mountains and are droughty in the summer. The Laidig soils are well drained and have very stony surfaces. They are on the lower side slopes and foot slopes.

Of minor extent in the map units are well drained Zepp, Lehew and Gilpin soils, excessively drained Drall soils and Rock outcrops.

All areas in this map unit are wooded. Slope and stones on the surface are the main limitations of this unit for community development and most other uses.

6. Wallen-Rock outcrop-Drall

This association contains moderately deep and very deep, somewhat excessively and excessively drained soils that have a loamy or sandy subsoil and areas of Rock outcrop.

Areas of these soils are gently sloping to very steep, on the tops and upper side slopes of the Massanutten Mountains. Most of this unit is in the George Washington National Forest. This unit makes up about 9 percent of the county. It is 40 percent Wallen soils, 18 percent Rock outcrop, 8 percent Drall soils, and 34 percent soils of minor extent.

The Wallen soils are somewhat excessively drained and have very stony and extremely stony surfaces. They are on upper side slopes and tops of the mountains. The Rock outcrops which consist of sandstone are mainly 30 feet apart and are on the upper side slopes and tops of the mountains. The Drall soils are excessively drained and have extremely stony surfaces. They are on tops and upper side slopes of the mountains.

Of minor extent in this map unit are well drained Massanutten and Laidig and Weikert soils.

All areas of this map unit are wooded. Slope, rock outcrops and surface stones are the main limitations of this map unit for community development and most other uses.

SOILS ON RIVER TERRACES THAT FORMED IN ALLUVIAL MATERIALS:

7. Unison-Monongahela-Braddock

These soils are very deep, well drained soils that have a loamy or clayey subsoil.

They are located in areas that are nearly level to moderately steep, on terraces along the North Fork of the Shenandoah River and Stony Creek.

This map unit makes up 6 percent of the county. It is 26 percent Unison soils, 15 percent Monongahela soils, 11 percent Braddock soils and 48 percent soils of minor extent.

The Unison and Braddock soils are well drained and are at slightly higher elevations that the Monongahela soils. In some areas these soils are gravelly or cobbly.

The Monongahela soils are moderately well drained and are usually adjacent to the flood plain. This soil has a seasonal high water table. Some areas of this soil are cobbly.

Of minor extent in this map unit are well drained Allegheny, Chavies and Nolin soils, and moderately well drained Cotaco soils.

This unit is used mostly for crops and pastures. A small acreage is wooded. The seasonal high water table in the Monongahela soils and the permeability of the Unison and Braddock soils are the main limitations of this unit for community development and most other uses. Flooding is a hazard on some of the minor soils.

Upon publication of the Soils Survey, more informaton will be available such as better interpretation of the soil data, and detailed mapping of soil types overlaid on aerial photography. In addition, through the use of the geographic information system now in development at the Soil Conservation Service's Culpeper office, generalized maps of soil limitations for various uses and maps of prime agricultural soils will be available. These resources should be incorporated as appropriate into proposed development plans.

Forests and Agriculture

The forests in Shenandoah County are a very important natural resource. Fifty-two percent of the County is forested; the most common forest type is the oak-hickory category, and pole-sized stands are the most numerous.

Forests and forest products have greatly influenced the economic activities in the County. Both the hardwood and pine forests of the County form an excellent source of raw material for a range of industries and domestic uses.

As can be seen in Table 2-B below, the growth in cords of wood and board feet of lumber is substantially greater than the "drain" on these resources. This means that, with proper management, the forest areas can supply needed resources in perpetuity, as well as provide all the benefits of cleansing the air, producing oxygen, and acting as a substantial ground cover.

TABLE 2-B
FORESTRY IN SHENANDOAH COUNTY - 1986

				Growth		Drain	
All Forest	Private Forest	Million Cords	1,000 Bd. Ft.	1,000 Bd. Ft.	1,000 Bd. Ft.	1,000 Bd. Ft.	1,000 Bd Ft
185,674	115,820	3.99	844,144	104.5	29760	1.5	518

Source: Virginia Department of Forestry

Approximately 39.4 percent of the land in Shenandoah County (127,782 acres) is classified as agriculture according to the 1988 existing land use map. Agricultural land includes crop land and pasture land, orchards, and confined feeding operations.

There were 830 farms in Shenandoah County as of the 1987 Census of Agriculture. While this represented a drop of ten percent in the number of farms since 1982, the average size of a farm rose by about ten percent from 151 acres to 167 acres due to consolidations--some of the current farms have absorbed the operations of former farms.

The recent trend in farming in Shenandoah County is toward less land-intensive uses, including the development of additional confined feeding operations (predominantly poultry).

Almost one-third (30 percent, or 98,506 acres) of the County is regarded as having prime agricultural soils. This is the highest percent and acreage of all the counties in the Lord Fairfax Planning District. The largest area of prime farm land is in the central part of the County. Every effort should be made to reserve prime agricultural land for agricultural uses.

WATER RESOURCES

This subsection is an inventory and description of the water resources, uses of water, and water-related problems which have been identified in the County. It was abstracted from the complete Shenandoah County Water Resources Assessment, which was prepared under a U. S. Environmental Protection Agency 205-J grant administered by the Virginia Water Control Board, and supplemented by county funds.

The assessment considered both surface and groundwater resources, and began the process of integrating management of those resources into the traditional county government function of land use regulation. Information was gathered from three types of sources: 1) analysis of U.S. Geological Survey 7.5 minute topographic maps; 2) communication with state and local agencies; 3) published papers and documents.

The report entitled Mapping Groundwater Pollution Potential for Shenandoah County, Virginia was prepared by the Virginia Water Project using the DRASTIC methodology, with funding by The Public Welfare Foundation and the Virginia Environmental Endowment.

The DRASTIC methodology was developed to show local officials and residents information necessary for making wise decisions regarding groundwater protection policies, in an easily understandable form. It assesses a combination of factors and results in an index showing the overall pollution potential. The resulting map shows the general groundwater pollution potential of the various areas in the County. However, DRASTIC results are very generalized, with a resolution of no less than a hundred acres. Detailed studies are needed to evaluate individual sites.

SUMMARY OF RESOURCES AND USES

Water Sources

On average, 34 inches of precipitation per year fall onto Shenandoah County land. Approximately 72% of this water returns to the atmosphere through evapotranspiration, leaving 28%, or 230 million gallons per day (MGD), over the whole county, which either runs off the land directly to become stream flow, or first infiltrates the soil to become part of groundwater.

Surface runoff (water which does not infiltrate) becomes part of approximately 1150 miles of permanent and intermittent county streams. The flows in five major streams begin in other counties: the North Fork Shenandoah River, Mill Creek, Smith Creek, and Holmans Creek have their headwaters in Rockingham County; Passage Creek has its headwaters in Page County. Within the county, other major streams - Cedar Creek, Stony Creek, Narrow Passage Creek, Toms Brook, Pughs Run, and Tumbling Run - arise from small tributaries in the eastern and western highlands. Nine dams temporarily impound the flows of seven county streams, resulting in a potential maximum storage of approximately 1800 MG (million gallons). All surface water in the county eventually enters the North Fork, which has averaged (over the period 1925-1988) 379 MGD as it passes the USGS gage at Strasburg (U.S. Route 55 bridge). Approximately two river miles farther downstream, the North Fork leaves the county, eventually entering, in order, the Shenandoah River, the Potomac River, and the Chesapeake Bay. Shenandoah County land represents 49% of the total North Fork watershed, and 7% of the total Potomac River watershed.

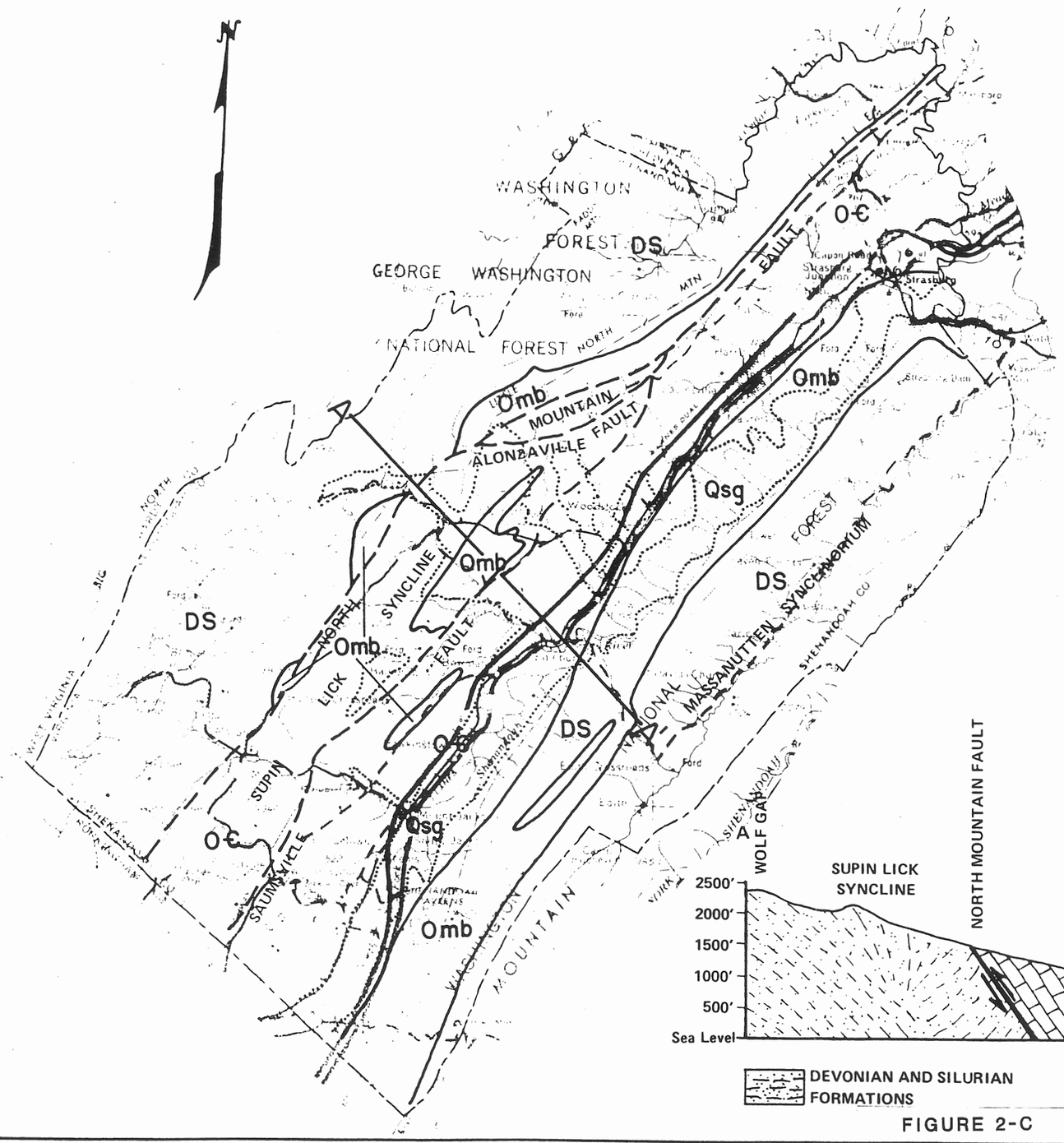
Water that infiltrates and percolates below the water table enters one of four hydrogeologic regions, representing the four primary aquifers in the county (Figure 2-C, page 2-13). Water may remain here, depending on local hydrogeologic conditions, for days, years, decades, or longer. At some point, however, much of this water returns to the surface, by one of three routes: 1) through one of 40 or more springs in the county; 2) through one of the many wells; or 3) through subsurface connections between groundwater and stream channels. During periods of base flow, when no surface runoff is occurring, all of a stream's flow comes from groundwater inputs.

Surface water may also enter (or re-enter) the groundwater system. This may occur through subsurface connections, or by way of surface depressions, also known as sinkholes, which occur especially in the areas underlain by carbonates.

These connections between surface water and groundwater are a part of the natural hydrologic cycle, whereby water (in solid, liquid, or gaseous states) circulates among the atmosphere, continents, and oceans. Movement both between the land surface and the subsurface system, and within this subsurface (groundwater) system, can be especially direct and rapid in the Valley and Ridge physiographic province of Virginia, where Shenandoah County lies, because of the presence of carbonate bedrock. In this type of bedrock, water moves from groundwater to the surface through springs, from the surface to groundwater through sinkholes, and within the groundwater system through subsurface solution channels. Approximately 30% of county land, in the central valley, overlies carbonate-bearing bedrock (solution limestone).

HYDROGEOLOGIC SURVEY OF SHENANDOAH COUNTY

FIGURE 2-C



LEGEND

Qsg — ALLUVIAL, TERRACE AND FLOOD PLAIN DEPOSITS
Chiefly gravel, some sand and clay. Good to excellent water-bearing properties depending upon thickness and lateral extent.

DS — DEVONIAN AND SILURIAN FORMATIONS
Predominantly shale and sandstone. Poor to fair water producer for domestic supplies.

Omb — MARTINSBURG FORMATION
Predominantly shale. Fair to good well yields, good to excellent when overlain by alluvial deposits.

0-€ — ORDOVICIAN AND CAMBRIAN CARBONATE FORMATIONS
Predominantly limestone and dolomite. Fair to good well yields for all supplies, good to excellent when overlain by alluvial deposits.

——— FAULT

SCALE 1:250,000

5 0 5 MILES

5 0 5 KILOMETERS

SCHEMATIC CROSS SECTION

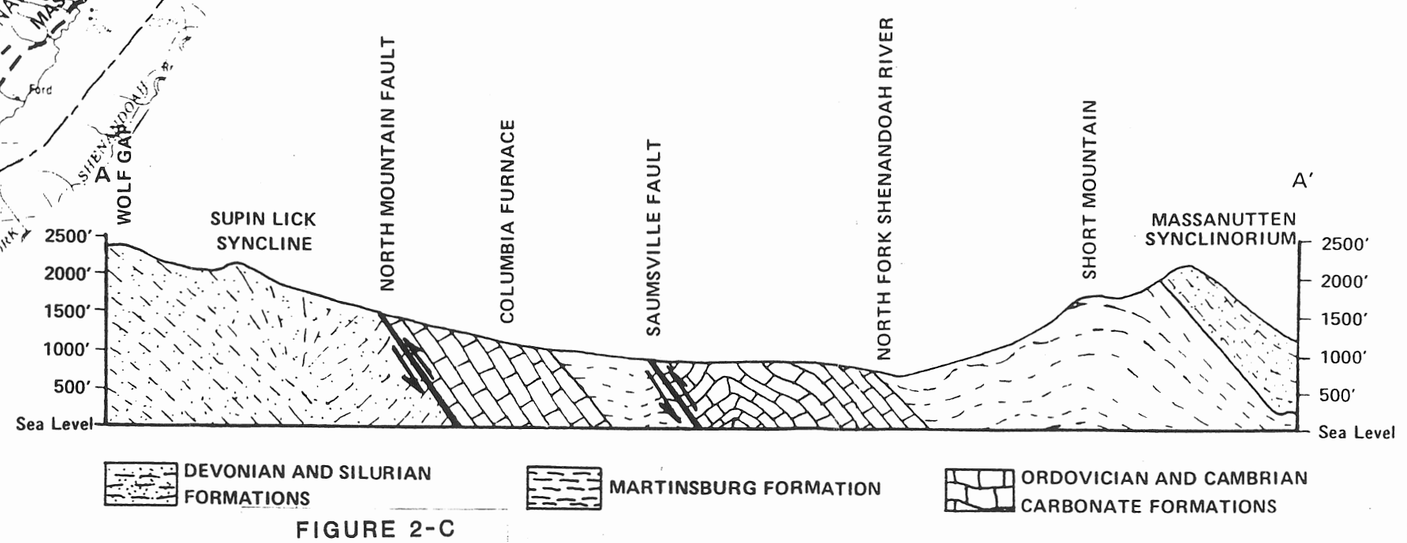


FIGURE 2-C

Source: Virginia State Water Control Board — VRO; Virginia Division of Mineral Resources

Water Quality

Water quality in general refers to the suitability of water for its intended or desired uses. Both aesthetic characteristics and safety influence water's suitability for a particular use. Water suitable for one use may not be suitable for another. For example the water in a high quality trout stream is still not safe to drink without treatment. Conversely, water that has been treated for human consumption may not, before further treatment, support aquatic ecosystems.

Surface water quality in Virginia is evaluated by the Water Control Board as to its suitability, not only for fishing and swimming but also for the maintenance of aquatic life and in-stream usage. Four parameters - dissolved oxygen (DO), temperature, pH, and coliform bacteria - are used in the evaluation. In its biennial report, covering 1985-1987, the Water Control Board rated the quality of the North Fork and Passage Creek as generally good, but identified problems of high bacteria in Smith Creek and Stony Creek. Results from monitoring during 1987-89 indicated fewer bacterial standard violations in Smith and Stony Creeks. Certain mountain streams that provide high quality habitat for wild and stocked trout show evidence of acidification from acid precipitation.

The North Fork and Smith Creek are the main streams used in the county as drinking water sources. High quality drinking water contains no potentially harmful substances in concentrations above acceptable levels (according to standards set by regulation), and has no problems of taste, odor, or appearance. Water from these streams, after treatment, is generally of good quality for drinking, but some taste and odor problems have occurred at Woodstock (North Fork). There have also been some cases of relatively high nitrate-N levels in the county, although the concentrations are still below the standard for public intakes.

Groundwater quality is primarily evaluated on the basis of its suitability for drinking, although characteristics such as hardness may also affect its suitability for other domestic uses or for industry. Available data on the quality of groundwater in the county shows two general patterns. First, water hardness is relatively high in the carbonate region of the central valley and in the Martinsburg Formation area, but low in the western and eastern highlands. Second, high iron and manganese levels are found in the highlands and the Martinsburg Formation, but levels are low in the central valley. Sulfate levels are relatively high in some parts of the central valley (e.g., the Toms Brook and Tumbling Run surface watersheds). Nitrate-N levels are high in several central valley watersheds, as well as in three surface watersheds in the western highlands: Stony Creek main stem; Falls Creek; and Foltz Creek.

Water Uses and Importance

Shenandoah County's water resources and their water quality are important to both the people of the county and the other organisms which inhabit or depend on aquatic systems.

County residents and industries withdrew approximately 4.7 MGD (excluding irrigation water) in 1980 from surface and groundwater sources. Projected use in 1990 is 5.3 MGD (also excluding irrigation). Irrigation for 1990 was projected to be 0.6 MGD based on voluntary

reporting to the County Extension Agent. These figures include groundwater and offstream use of surface water by households, businesses, industries, and farms. Surface water is also used instream for recreation, aesthetic enjoyment, receipt of treated wastewater, and aquatic habitat.

Water is supplied by public waterworks in seven population centers: Bryce Resort (Stoney Creek Sanitary District); Edinburg; Mt. Jackson; New Market; Strasburg; Toms Brook/ Maurertown; and Woodstock. In 1980, 43% of households were supplied by these waterworks. The remainder of households were on individual wells or had some other water source.

Protection of groundwater is extremely important to the county, because approximately 45% of public, commercial, and industrial water used in 1980 was groundwater, and at least 36% of households that year used wells for domestic water. This reliance on groundwater takes on added significance because of the susceptibility of groundwater to contamination, especially in the carbonate bedrock area of the central valley. Location of septic systems or other wastewater treatment systems near wells poses a significant risk of groundwater contamination, in areas where no other economical water source exists.

Besides water for human uses, habitat for many aquatic species is provided by county streams and riparian areas. This and other instream uses received recognition as beneficial uses, worthy of legal protection, by the 1989 Virginia General Assembly. The North Fork, Passage Creek, Cedar Creek, and Little Stony Creek are examples of many streams in the county with valuable ecological features to accompany their value for traditional offstream uses.

PROBLEM IDENTIFICATION

Surface Water Protection

1. Nonpoint source (NPS) pollution from agricultural practices affects county streams and eventually the Chesapeake Bay. Sediment and plant nutrients affect the quality of habitat for fish and other aquatic organisms. Bacteria, as well as excess enrichment from nitrogen and phosphorus, can affect the suitability of water for swimming or drinking. The North Fork, Stony Creek, and Smith Creek have been identified as Priority Water Bodies by the Water Control Board because of NPS pollution impacts: taste and odor problems in drinking water have occurred at Woodstock (North Fork water); Smith and Stony Creeks have occasional high fecal coliform bacteria levels. The fishability and swimmability of Cedar Creek and Passage Creek are threatened if NPS pollution continues at present levels.

2. Coldwater (trout) streams have been affected by acid precipitation, and are vulnerable to further acidification.

3. Riparian areas are very important to the ecological health of stream systems. Protection of riparian areas is needed to help maintain the ecological, aesthetic, and recreational qualities of streams, especially the coldwater streams.

4. More detailed information is needed on wetlands within the county.

5. The number of alternative wastewater treatment systems designed for surface discharge has increased substantially. Improperly constructed or maintained systems potentially threaten stream water quality. The number and location of these systems need to be monitored to ensure that they do not adversely affect streams.

6. Instream flow requirements are not well-defined for county streams, and conflicts with offstream uses may develop. The Water Control Board is in the process of designating minimum flow standards for streams.

Groundwater Protection

1. Recharge areas for aquifers have not been delineated, so the existence of threats to groundwater quality are difficult to assess.

2. Improperly-constructed wells threaten both the owner's domestic supply and the groundwater source. Abandoned wells, if not properly sealed, are a conduit for groundwater contamination. The number and location of improperly-constructed or improperly-sealed wells in the county are not known.

3. Groundwater can be contaminated by substances from a variety of sources and activities. Aquifers in the central valley of the county are especially vulnerable. Sources of potential contamination include: 1) location of septic systems near wells; 2) underground storage tanks; 3) improper management of animal waste; 4) excessive use of fertilizers and pesticides.

4. A limited program of locating and mapping existing occurrences of bacterial and nitrate contamination of wells has been started, and should be expanded throughout the County.

5. Sinkholes provide rapid entry of surface contaminants into groundwater. The location of sinkholes has not been adequately mapped, and it is not known whether or where sinkhole dumps exist.

6. At least 10 wells have been contaminated by petroleum products, suspected to be from underground storage tanks (UST's). Thirteen cases of leaking UST's in the county had been reported to the Water Control Board as of February 1, 1990.

Water Supply

1. There are a substantial number of households with water supplies of questionable safety.

2. Toms Brook/Maurertown is currently having trouble meeting demand. Service lines are too small for fire protection, according to Virginia Department of Health guidelines. (VWCB, 1988b)

3. Two public systems - Stoney Creek Sanitary District (SCSD) and Toms Brook/Maurertown - are projected by the Virginia Water Control Board to have source deficits by the year 2030, based on average use. Five systems, however - Edinburg, Mt. Jackson, SCSD, Strasburg, and Toms Brook/Maurertown - are projected to have deficits based on peak use. (VWCB, 1988b)

4. SCSD is projected to have a treatment deficit by 2030. Projected withdrawals are likely to exceed flows needed for waste assimilation, even without taking any instream flow requirement into account. (VWCB, 1988b)

5. Serious instream/offstream conflicts are projected to occur by the year 2030 for SCSD and New Market (VWCB, 1988b, Appendices p.160).

6. A substantial percentage of water used by some public waterworks is unaccounted for. The percentages are as follows (VWCB, 1988): Edinburg - 57%; Mt. Jackson - 38%; New Market - 21%; Strasburg - 12%; SCSD - No data available; Toms Brook/ Maurertown - 31%; Woodstock - 25%.

WATER RESOURCES RECOMMENDATIONS

Five general objectives of good water resource management are proposed to achieve the major goals of this plan relating to preserving and enhancing the environmental quality of the County and providing for the economical delivery of necessary public services. These objectives are:

A. Efficiency in the use of existing water supplies and wastewater facilities;

B. Appropriate development of needed new water supplies, water facilities, and wastewater facilities;

C. Protection of surface and groundwater resources from depletion, pollution, and ecological degradation;

D. Acquisition and maintenance of necessary data and information.

E. Involvement of local officials and citizens in water resource decisions.

Recommendations to help accomplish these objectives are presented below.

A. Efficiency in use of existing supplies and facilities

1. Develop a county-wide water conservation plan. The VWCB can assist this effort.

2. Reduce the percentages of unaccounted-for water from municipal systems.

3. Develop a plan for emergency water conservation or allocation in case of severe drought, or in case of contamination of a public water supply.

B. Appropriate development of new supplies or facilities

1. Maintain and improve as necessary existing public water supplies and wastewater facilities.

2. Guide growth into areas with existing water and sewer service.

3. Consider in-stream or off-stream water impoundments.

C. Protection of water resources

1. Use the watershed delineations done for this project to identify priority watersheds, based both on the value of the water resources and the potential risks within the watersheds, and concentrate available resources on these watersheds first.

2. Address nonpoint source pollution by: promotion of agricultural, urban, forestry, and other best management practices (BMP's); cooperation with the Division of Soil and Water Conservation and the Soil Conservation Service's programs to implement BMP's; promotion of techniques to reduce agricultural and household chemical use; and appropriate enforcement of the Erosion and Sediment Control Law.

3. Delineate wellhead protection areas for public water supplies, and incorporate wellhead protection into the development of new public supplies.

4. Use available local tools to protect groundwater from contamination by septic systems, underground storage tanks, animal wastes, excessive agricultural chemical use, or other threats as identified.

5. Locate sinkholes and sinkhole dumps, and implement sinkhole protection (sinkhole ordinance).

6. Continue improvement to municipal sewer facilities as needed. Encourage cooperation among towns and other water and sewer service providers and outlying areas to provide services where needed.

7. Monitor all discharge from alternative systems.

8. Support the efforts of the U. S. Forest Service and the Virginia Department of Game and Inland Fisheries to mitigate the effects of acidification in coldwater streams.

9. Follow the progress of VWCB instream flow regulations, and gather information of instream uses and flow requirements for county streams.

10. Encourage riparian landowners to maintain streambank vegetation and minimize disturbances in riparian areas, in order to protect stream habitat and water quality. Landowners can apply to the Agricultural Stabilization and Conservation Service (ASCS) to have riparian land (if it qualifies) placed in the Conservation Reserve Program.

11. Consider the development of site plan review criteria for the definition and protection of wetlands.

12. Stress the role individual land owners must play in the protection of groundwater by proper on-site wastewater system maintenance, and proper use and disposal of household chemicals and waste oil.

D. Acquire and maintain data

1. Consult with the Virginia Groundwater Protection Steering Committee on data needs of the county, and how the state can help.

2. Identify aquifer recharge areas.

3. Locate any existing contamination of groundwater by nitrates and bacteria.

4. Locate the significant threats to groundwater.

5. Work with the Water Control Board, other agencies, and private citizens to devise and implement a system for monitoring surface water flows and the quality of surface and groundwater.

6. Work with state agencies to determine instream flow requirements for county streams.

7. Identify existing wetland areas within the county. The National Wetlands Inventory can be reviewed, and soil survey data can be used to identify hydric soils.

8. Track the permitting and installation of alternative wastewater treatment systems designed for surface discharge.

E. Local involvement

To assist in implementing the recommendations listed above, the county Board of Supervisors should create a Water Resources Steering Committee. This committee would help provide both the leadership and the public participation needed to continue the process of water resource management and protection. The committee could investigate the funding sources available for implementation of this plan's recommendations, and advise the county on specific needs for regulation, education, or other water management tools.

NATURAL RESOURCE LIMITATIONS

Approximately 56 percent of the County's total land area has severe limitations for on-site septic systems and almost 40 percent has severe excavation limitations. These limitations include slow permeability, a seasonally high water table, flooding, rock fragments, shallow depth to bedrock, steep slopes, danger of well contamination, a high shrink-swell potential, surface rock outcroppings, and other factors.

Land with severe limitations for on-lot sewerage systems is located along the eastern and western portions of the County and in the extreme center. Generally this area corresponds to the Appalachian Mountain section (including the Massanuttens) and the land underlain by the Martinsburg Formation.

The best general areas for constructing septic tank and tile field systems are those underlain by limestone and terrace gravel, which generally occupy the valley lowlands in the center of the County. However, these areas also have the greatest potential for ground water pollution and the danger of well contamination from septic tanks because of the underground stream network and solution channels associated with the limestone formations.

Many of the County's soils are also rated poorly for building excavations, foundations, basements, and water and sewer lines. Excavation limitations arise because of the shallow depth of some soils to bedrock, a high percentage of rock fragments in the soil, frequent rock outcroppings, and other similar factors.

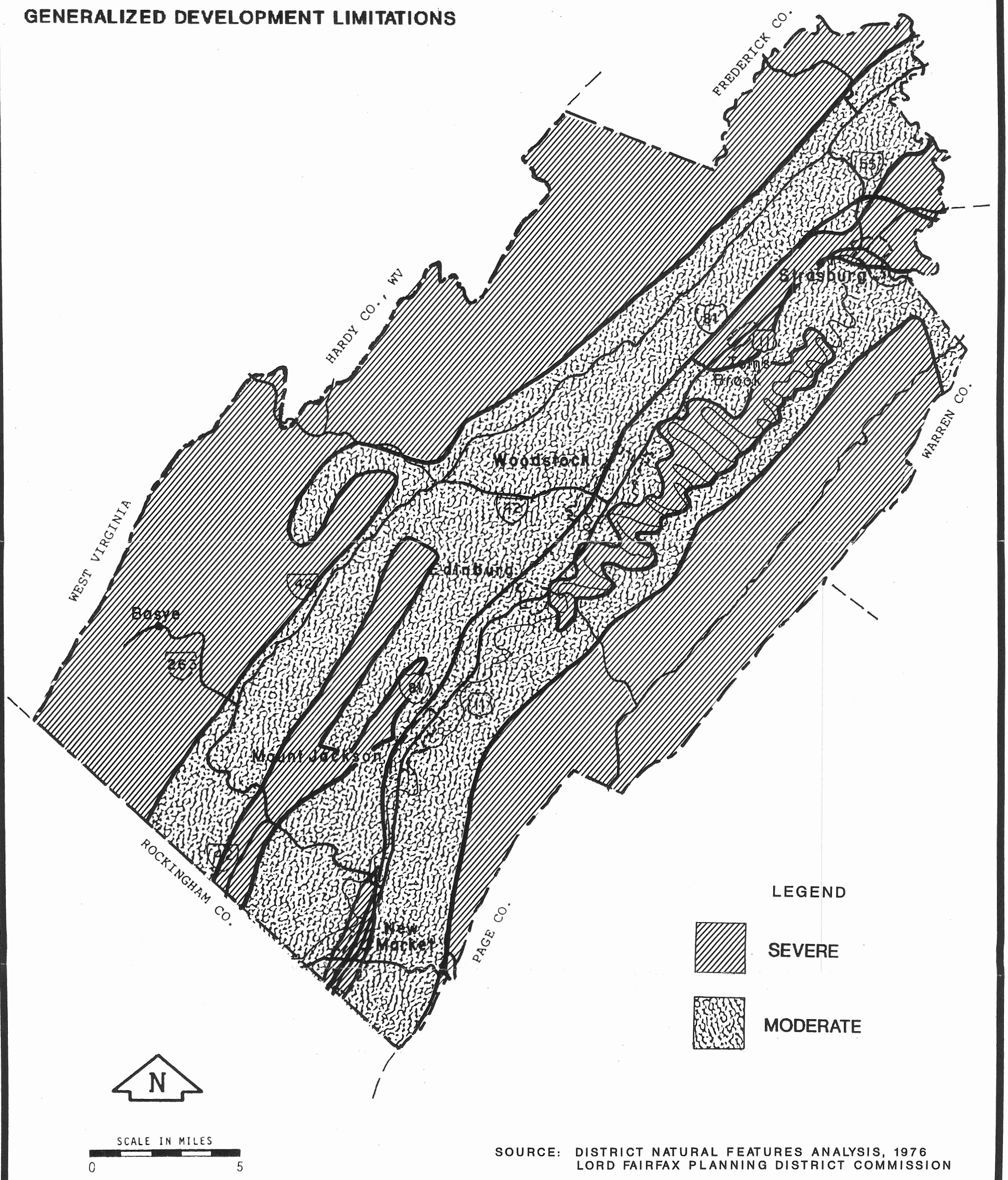
Approximately 40 percent of the land area in Shenandoah County has severe limitations for excavation, and about another 37 percent has moderate to moderate-severe limitations. Most of the land in these categories also occurs in the western and eastern parts of the County.

In summary, the major areas of severe natural restrictions-- land poorly suited for both septic systems and excavations--are located along the County's eastern and western flanks; this is shown on Figure 2-D on the next page. This is the same area as the Appalachian Mountain Belt of geography, including the Massanutten Mountain. Public policy should discourage non-farm or non-woodland uses of land in these areas. A second area, having severe limitations for septic systems is located on the east-central lowland, and is underlain by the Martinsburg (shale) Formation.

SHENANDOAH COUNTY

VIRGINIA

GENERALIZED DEVELOPMENT LIMITATIONS



SOURCE: DISTRICT NATURAL FEATURES ANALYSIS, 1976
LORD FAIRFAX PLANNING DISTRICT COMMISSION

FIGURE 2-D

SUMMARY

The natural resources of Shenandoah County provide many opportunities, but also pose some severe environmental problems. Development should be guided away from areas with serious limitations, such as steep slopes, shallow depth to bedrock, flood plains, prime agricultural lands, wetlands, and sinkholes.

Forest areas and agriculture should be preserved as major natural and economic assets. Floodplains along the North Fork of the Shenandoah River and its tributaries must be protected, and riparian lands kept in their natural state.

The water resources of the County must be protected, both surface water and groundwater. Because of the rock and soil conditions and the hydrogeologic cycle, the water resources are directly inter-connected.

A first step was the development of the Shenandoah County Water Resources Assessment as part of this plan. Now the recommendations of that assessment need to be carried out by the Planning Commission and Board of Supervisors. Specific recommendations for water resource protection are included on pages 2-18 through 2-20 of this section. The following points summarize the major efforts that are needed to implement those recommendations and to mount a comprehensive water resources management effort:

- Develop a comprehensive Shenandoah County Water Resources Plan which deals with both surface and ground water issues, and delineates and protects wells, wetlands, and sinkholes.

- Work with the other counties in the North Fork drainage basin and the State Water Control Board for a regional surface water management strategy.

- Look for long-term solutions for storm water management and non-point source pollution abatement.

- Monitor the progress of the Health Department and Water Control Board in their permitting and monitoring of individual alternative treatment systems.

- Consider special County ordinances which may require higher standards than the State for wells and septic systems.

- Explore a county-wide mechanism for the monitoring and maintenance of alternative and septic treatment systems.

LAND USE

INTRODUCTION

This section describes the history of land use regulation in Shenandoah County, shows how the land area of the County is utilized, and presents recommended policies to guide further land use activities.

Local government management of land use through subdivision and zoning ordinances has been an option in Virginia since the 1940's. In the 1950's, the Division of State Planning and Community Affairs began providing technical assistance to encourage local governments to establish planning commissions, develop local plans, and implement them through land use ordinances. Towns are responsible for land use within their corporate limits with counties responsible for the unincorporated areas.

Shenandoah County first established a planning commission in 1971, adopting its first subdivision ordinance in 1972. The Shenandoah County Comprehensive Plan 1990 was prepared with the Planning Commission by planners from the Division of State Planning and Community Affairs and adopted in 1973. This included a future land use map and recommendation for a zoning ordinance to implement it. The basic premise of zoning is that incompatible land uses should be separated. Generally, the citizens of rural counties have been opposed to such "regulations" since they are of the opinion they will not do anything to harm their land or their neighbors. Writing down the rules for land use is however, a necessary fact of modern life as new residents move to the county with essentially suburban values for the protection of housing values.

After the plan adoption, a zoning ordinance was developed by the same state planners and presented for local adoption in 1975. A large crowd in a meeting at Woodstock's Central High School convinced the then Board of Supervisors that the citizens were not ready for a zoning ordinance to implement the County Plan. In 1976, the Planning Commission began working with staff from the Lord Fairfax Planning District Commission to develop a more appropriate zoning ordinance. This led to adoption of the current ordinance in 1978.

Actions of the General Assembly in the early 1970's contributed to an increase in the level of planning by localities. The problems encountered by Northern Virginia and Tidewater, plus recreational home development in the Valley and other rural areas, indicated the need for local regulation. Requirements for establishing local planning commissions by 1976, subdivision ordinances by 1977, and comprehensive plans by 1980 were included in the Code of Virginia. Zoning, however, is still an option. Since the adoption of the 1973 plan by the county, all towns except Toms Brook have adopted their own plans and zoning ordinances to implement them. All towns have subdivision ordinances. The majority of that work was done with the staff assistance of the PDC.

In order to achieve the goals of this plan, County and Town plans must be coordinated. Since they did not exist at the time of the 1973 plan, an administrative goal of this plan is to establish an umbrella plan that will address the land use concerns in the rural county in a way that supports the maintenance of viable towns as the primary locations for growth. Throughout this land use section of the Plan, data will be discussed in terms of the unincorporated rural area, the incorporated towns, and the County as a whole.

General land use is discussed first, followed by a discussion of the development that took place between 1970 and 1990. Current zoning and the development within the individual zoning districts is described next. An analysis of these land use trends is followed by recommended land use policies which will advance and further define fulfillment of the County's goals of preserving an open rural atmosphere and protecting the environment as first set out in the 1973 Plan.

LAND USE PATTERNS

Since first being surveyed in the 1970's, the general land use patterns of the County have not changed greatly; it is still largely rural, with the predominant land use being agriculture. However, the major types of developed uses--residential, commercial, and industrial--increased considerably during the last couple of decades.

Using figures contained in the 1973 Shenandoah County Comprehensive Plan as a base, the residential acreage has increased by 634 percent, from an estimated 2,330 acres to approximately 14,772 acres by 1988. Commercial acreage increased from about 85 acres to approximately 415, for a 488 percentage increase. Industrial land increased from 120 acres to about 1,420 acres for a 1188 percent increase.

The changes described above are shown in Table 3-A on the next page.

TABLE 3-A
DEVELOPED LAND USE CATEGORIES - 1973 AND 1988
UNINCORPORATED AREA OF SHENANDOAH COUNTY

Land Use Category	1973 Acres*	1988 Acres**	Percent Increase
Residential	2,330	14,772	634%
Commercial	85	415	488%
Industrial	120	1,420	1188%
Public/Semi-Public and Institutional	165	118 ***	- 28%
Transportation/Utilities	N/A	4,738	----
TOTAL "DEVELOPED" LAND	2,700	21,463	795%

Notes:

* All acreages from the 1973 Comprehensive Plan were estimated by assigning an arbitrary land area of 0.5 acre to residential and commercial land uses, and 1 acre for industrial and public and semi-public land uses.

** Acreages calculated from planimeter measurements of the 1986 land use map as updated through local review in 1988 (for the unincorporated area), and from town plans.

*** Mount Jackson airport (87.14 acres) closed. Land became part of the Shenandoah County Industrial Park.

N/A Not available - Transportation uses not estimated in 1973 Plan, utility sites included in Industrial.

Agricultural land includes crop and pasture land, orchards, confined feeding operations, and small tracts of timber. As of 1988, these uses account for 127,782 acres, or just over 39% of the County's total land area.

The George Washington National Forest, containing approximately 77,681 acres of land is located along both the western and eastern boundaries of Shenandoah County in the two mountain ranges. It represents almost 24 percent of the entire land area of the County that will

basically be preserved in its natural state and as managed timber land, thereby contributing to the County's air and water quality.

Land committed to residential development accounts for an estimated 16,503 acres, or about 5% of the County, based on subdivision records. This represents a marked increase from the 1973 figure of 2,330 acres (less than 1%) and indicates the shift to larger lot sizes as a result of residential lots being created bypassing the subdivision ordinance.

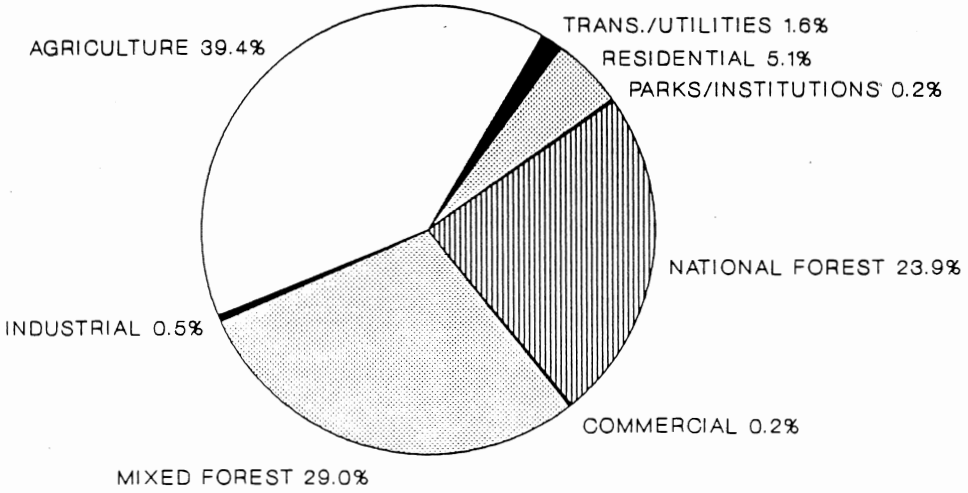
Transportation and utility uses take up approximately 5,334 acres in existing rights-of-way or easements. This includes the interstate and primary highways, the secondary road system, and electric and gas transmission lines. These uses were not estimated in the 1973 plan.

Industrial activities currently occupy about 1,672 acres, or 0.5 percent of Shenandoah's land area. This was a large amount of additional acreage devoted to this use (from 120 in 1973), but still involves a very small percentage of land area.

Commercial and institutional uses are also located on very small amounts of land at 641 and 353 acres respectively, while local parks and recreational uses occupy another 340 acres.

The remainder of the County, approximately 94,174 acres, or 29 percent of the land area, is classified as "conservation". Low density development may occur in some of these areas, but many of them are constrained by natural features such as steep slopes, flood plains, or soil conditions which have severe limitations for development. See Figure 3-A, below, and Table 3-B on the next page.

FIGURE 3-A
EXISTING LAND USE - 1988



TOTAL = 324,480 ACRES

TABLE 3-B
EXISTING LAND USES - 1988 (Acres)

Land Use	Unincorporated County	(%)	Towns	(%)	Total County	(%)
Agriculture	127,722	40.0%	60	1.1%	127,782	39.4%
Conservation	92,286	28.9%	1,888	35.6%	94,174	29.0%
National Forest	77,681	24.3%	--	--	77,681	23.9%
Residential	14,738	4.6%	1,731	32.5%	16,503	5.1%
Trans./Utilities	4,738	1.5%	596	11.2%	5,334	1.6%
Industrial	1,420	0.4%	252	4.7%	1,672	0.5%
Commercial	415	0.1%	226	4.2%	641	0.2%
Institutional	85	0.1%	268	5.0%	353	0.1%
Parks/Rec.	33	0.0%	307	5.7%	340	0.1%
TOTAL	319,152	100.0%	5,328	100.0%	324,480	100.0%

Source: Planimeter measurements from 1986 land use map updated through local review in 1988 (unincorporated areas) and Town Comprehensive Plans.

The general land use patterns are shown on Figure 3-B "Generalized Existing Land Use" on the following page.

Growth and development has taken place in two distinctive patterns over the past 16 years. There has been concentrated growth in and around the towns and the Bryce Mountain service area where public facilities are available and it was possible to construct several types of housing, including townhouses and apartments, as well as commercial and industrial uses.

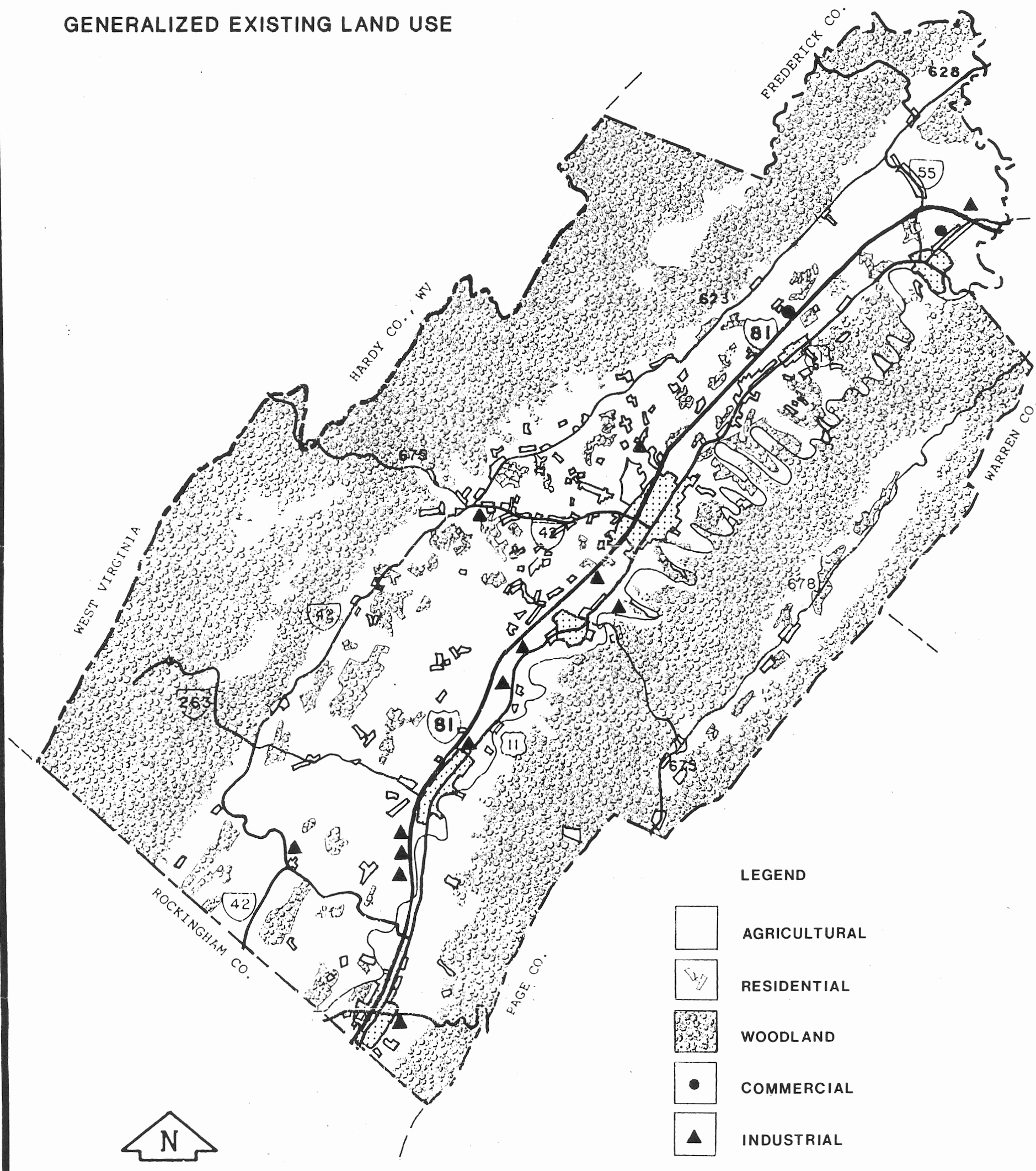
Outside of those areas, the growth has been primarily residential on large lots with individual on-site water and septic systems, and has been scattered throughout the County along rural secondary roads. Many of the homes--both in the Basye/Bryce Mountain area and in the rural countryside--are second homes that are used as weekend retreats or are being held for retirement.

This scattered development, combined with topographic characteristics that isolate certain areas like Fort Valley and Cedar Creek, makes much of the County impractical to economically serve with public water and sewer facilities, and it also impacts the County's natural resources and road network.

SHENANDOAH COUNTY

VIRGINIA

GENERALIZED EXISTING LAND USE



SOURCE: AERIAL PHOTOGRAPHY FLOWN 1985
LOCALLY UPDATED AS OF 1988

FIGURE 3-B

The six incorporated towns in the County are located in a linear pattern running northeast and southwest along U. S. Route 11 from south of Cedar Creek (the Frederick County line) to the Rockingham County line at the southern end of New Market.

The population of the towns is approximately 10,851 according to the preliminary 1990 Census data. Together with an additional 300 persons in the Basye/Bryce Mountain area, a total year-round population of about 11,200 is served by public water and sewer facilities, which represented approximately 36 percent of the County's population. Sixty-four percent is therefore served by individual on-site wells and sewage disposal systems, which depend upon good ground water and proper soil conditions.

Table 3-C, below, shows the population figures and approximate land areas for each of the towns and the Basye area.

TABLE 3-C
POPULATION & LAND AREAS - 1990

Location	1990 Population	Land Area (Sq. Miles)	Population Per Sq. Mi.
Basye/Bryce Mtn.	300 *	2.16	139
Edinburg	860	0.73	1,178
Mt. Jackson	1,583	1.21	1,308
New Market	1,435	1.46	983
Strasburg	3,762	1.60	2,351
Toms Brook	227	0.14	1,621
Woodstock	3,182	3.21	991
SUBTOTAL	11,349	10.51	1,080
Rural County	20,287	496.49	41
TOTAL COUNTY	31,636	507.00	62

* (Estimated year-round population)

Sources: U.S. Census of Population & Housing, 1990
Lord Fairfax Planning District Commission

The population in the Basye area, a resort community, fluctuates seasonally; at times it is several times the permanent year-round population and may approach 3,000. Public facilities such as water, sewer, and roads must have the capacity to serve the maximum number of residents and commercial establishments, even though this capacity may only be needed for one period in the year.

DEVELOPMENT TRENDS

Population and Housing Units

Table 3-D, below, examines the growth which took place in Shenandoah County between 1970 and 1990. Overall, 66 percent of the population growth and 69 percent of the increase in housing units took place outside of the towns in the rural portions of the County during this time period.

The trends were distinctly different, however, during the two decades. Between 1970 and 1980, 92 percent of the population growth and 79 percent of the housing growth were in the rural portions of the County. Between 1980 and 1990, 64 percent of the population increase was in the towns, while about 59 percent of the housing increase was in the rural area. This is due in part to the second home/retirement home market in Shenandoah County. Of all the vacant units in 1990, 68 percent were being held for seasonal, recreational, or occasional use. There are more homes being constructed in the County than are needed for the population. In addition, the growth rates for both population and housing were greater in the towns than the rural area between 1980 and 1990.

TABLE 3-D
POPULATION AND HOUSING GROWTH 1970-1990

	1970	1980	1990	Increase '70-'90	% Rural '70-'90
Population:					
Total County	22,852	27,559	31,636	8,784	
Rural Area	14,765	19,106	20,587	5,822	66%
Towns	8,087	8,453	11,049	2,962	
Housing:					
Total County	8,773	12,000	15,160	6,387	
Rural Area	5,750	8,315	10,184	4,434	69%
Towns	3,023	3,685	4,976	1,953	

Sources: U.S. Census of Population & Housing, 1970, 1980, 1990

Subdivisions

Information was compiled on the subdivisions that were recorded in Shenandoah County from June 1978 through December 1988. These subdivisions involved 6,470 acres of land. According to a preliminary analysis of the subdivision data, there were a total of 1,494 individual parcels created for development during that time period, with an average lot size of 4.3 acres. Most occurred in agriculturally-zoned areas.

Residential Building Permits

Figure 3-C, on the next page, shows the distribution of residential building permits issued from 1980 through 1988. The towns of Strasburg and Woodstock, the Basye area, plus the Census Tracts around the towns of New Market and Toms Brook each gained more than 250 dwelling units during the period. The Town of New Market and the Census tracts around the towns of Strasburg, Woodstock, Edinburg, and Mount Jackson, plus the Block Groups east of Basye and Bryce Mountain all gained between 150 and 250 dwelling units. The remainder of the County experienced relatively low levels of building (less than 150 dwelling units).

Recent Development

Two of the towns have enlarged their boundaries in the 1980s. Strasburg completed a major annexation as of December 31, 1984 which incorporated 528 acres and provided land for residential, commercial, and industrial growth. A shopping center was constructed in the annexed area in 1988, and a large apartment complex since then. Several additional developments have been proposed in that area. Under the terms of the Annexation Agreement between the Town and the County, as additional parcels are served by Town utilities they will be annexed by Resolution of the Town.

Woodstock has been enlarged by approximately 237 acres through a series of boundary adjustment agreements with the County as owners of undeveloped parcels next to the corporate limits requested that their properties be brought into the Town and have utility services extended to them.

As indicated in Table 3-C, Strasburg remains the most densely-populated town, even after its annexation. Basye is second only to Strasburg during the active resort season with a density of approximately 1388 persons per square mile, but its permanent population density is quite low. If most of these homes were to be occupied year-round, many additional public services would be required in that area.

Another important development that has taken place over the last few years has been the creation of the industrial park located just south of Mt. Jackson. The park is served by public utilities extended from the Town of Mt. Jackson. Two major industries have built on sites in the industrial park, employing a total of approximately 400 persons. The County has had several other serious inquiries from additional companies interested in locating somewhere in this region, and will continue to market the remaining sites to selected industries.

SHENANDOAH COUNTY
VIRGINIA

1980-1989 BUILDING PERMITS

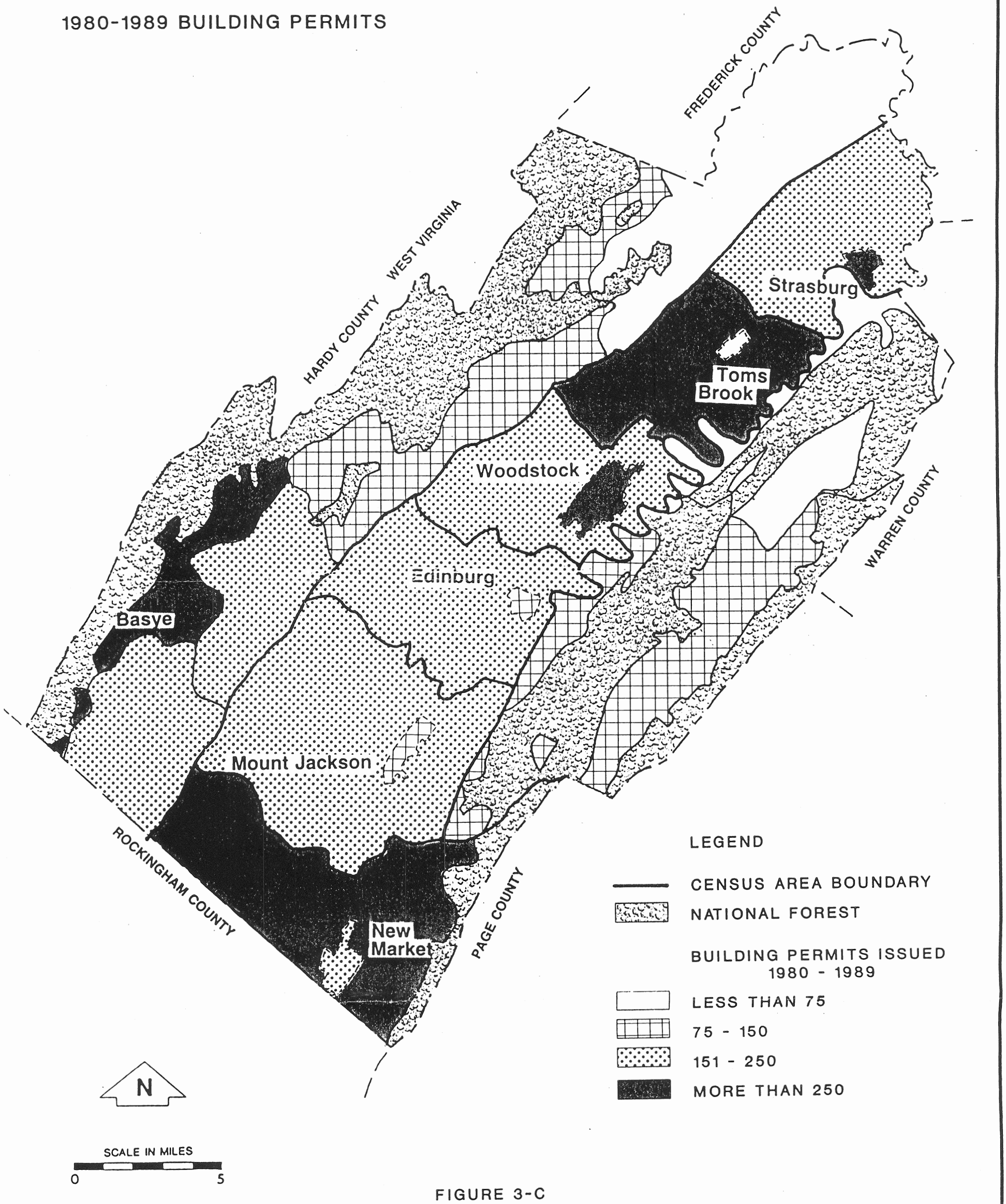


FIGURE 3-C

Development Constraints

Due to soil and rock conditions, not all of the previously subdivided lots in the County will be buildable. In some cases they may have to be combined to obtain sufficient land for a well and a septic system; in other cases, the ground may be too poor for septic systems to be approved at all.

The topography of the land is another limiting factor. Where steep slopes exist, construction will be limited or not acceptable. The same is true in flood plains, where uses such as parks and recreational areas could be developed, but no permanent buildings should be allowed.

Access by the primary highway and secondary road systems can be another development constraint. There are many locations in the County that do not now have good roads, and some where the potential for creating them is very limited due to excessive grades, limited areas for rights-of-way or poor soils.

There are many other constraints imposed upon the County due to its topography, geology, soils, and water resources. These were discussed in detail in Section 2 "Natural Resources".

LAND USE ANALYSIS BY WATERSHED

A water resources assessment was recently prepared for the County under a U.S. Environmental Protection Agency water quality planning grant administered by the Virginia Water Control Board. The Shenandoah County Water Resources Assessment is summarized in the Water Resources portion of Section 2. As part of this study, the various watersheds within the County were identified, measured, and their general types of land uses examined.

Twenty-six individual watersheds were identified within the County, from the North Fork of the Shenandoah River to small tributary streams. As can be expected from the previous portions of this section, there is a significant amount of agricultural and forestal land in all of them. Eleven out of the 26 watersheds are at least 50% agricultural, and 14 are at least 50% forested. All together, the land area within 24 of the watersheds contains 80 percent or more agricultural and forestal uses combined, none comprise less than 60 percent of these uses, and six contain only agriculture and forestry as of 1989.

Because of the amounts of land involved, non-point source pollution potential from agricultural and forestal uses is one major concern for the quality of water in Shenandoah County. This could take the form of erosion and sedimentation, plant nutrients from animal waste and fertilization, and toxic substances such as herbicides and pesticides. To avoid these problems, it is important that Best Management Practices (BMP's) be utilized for agricultural and forestal activities.

BMP's are practices or combinations of practices which will prevent or reduce the amount of pollution from non-point sources. BMP Handbooks were prepared by the Virginia Water Control Board in conjunction with other agencies such as the Soil & Water Conservation Commission, the Department of Agriculture & Consumer Services, and the Division of Forestry. There are individual handbooks for Agriculture, Forestry, Sources Affecting Groundwater, Urban, and others.

Urbanized land uses include mixed built-up areas (such as the towns), and residential, industrial, and commercial uses. There were only a few watersheds with a significant portion of their land areas devoted to such uses. Ten had less than one percent, four had between one and two percent, six had between two and five percent, and four had from 5 to 10 percent. Of the remaining two, the Narrow Passage Creek watershed had 23.4 percent of these uses and the Spring Hollow Run watershed had the most urbanized uses, occupying approximately 39.3 percent of its area. The six most urbanized watersheds are shown below in Table 3-E below and mapped on Figure 3-D on the next page.

The County as a whole, which is a part of the North Fork Shenandoah River watershed, has 6.3 percent of its land area in urbanized uses.

TABLE 3-E
PERCENT OF URBANIZED LAND USES
SHENANDOAH COUNTY - 1989

Watershed Name	Watershed Number	Total Acres	Percent Urbanized
Spring Hollow	06-08	6,104	39.3%
Narrow Passage Creek	06-07	13,045	23.4%
North Fork Shenandoah (Main Stem Only)	02070006	59,854	6.8%
Toms Brook	06-10	10,479	6.6%
Smith Creek	06-05	13,744	6.0%
Stoney Creek	06-03	39,530	5.0%
County Total	02070006	324,480	6.3%

Source: Shenandoah County Water Resources Assessment

SHENANDOAH COUNTY
VIRGINIA

URBANIZED LAND USES
BY WATERSHED

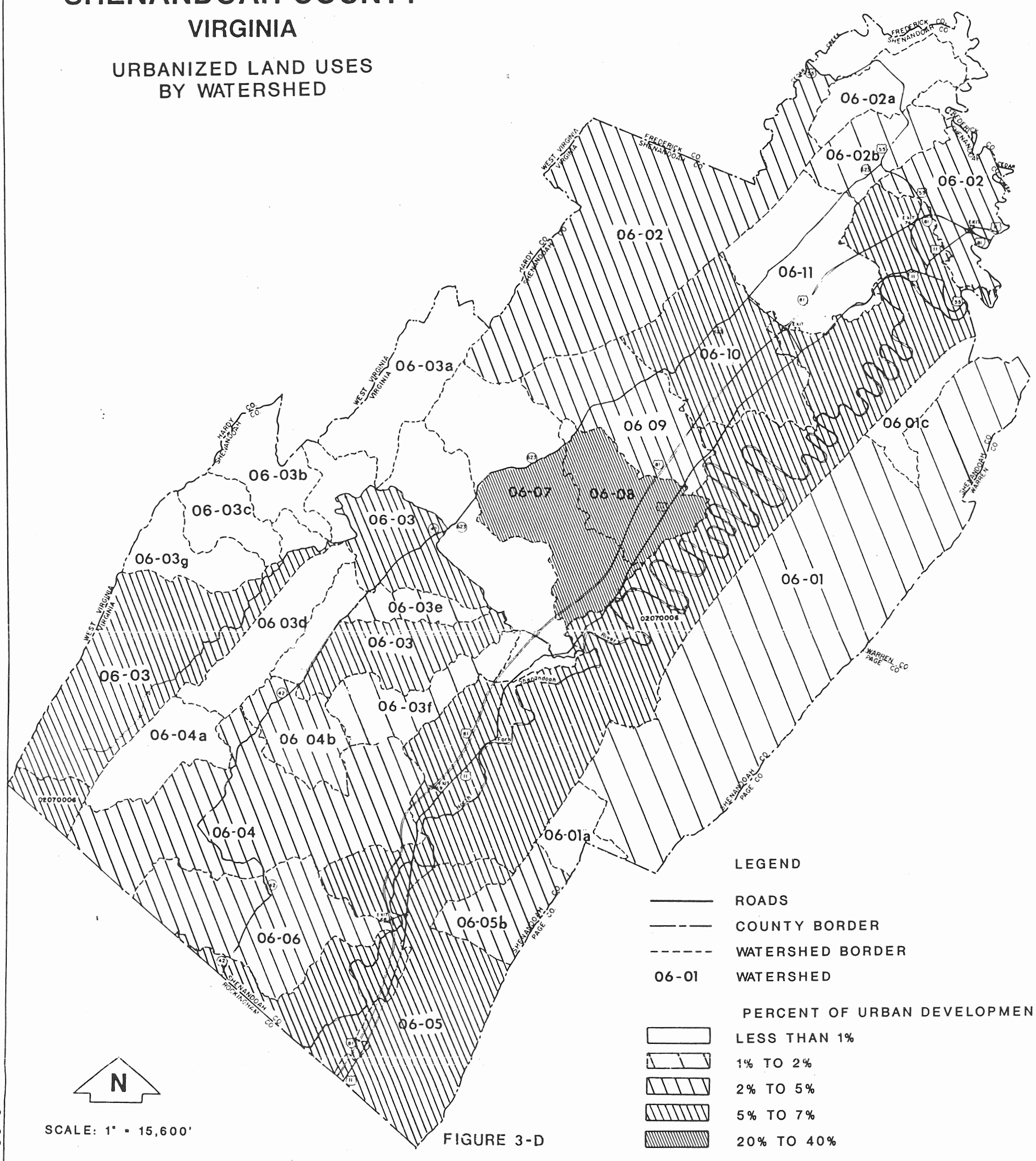


FIGURE 3-D

Potential non-point pollution from urban and urbanizing areas include bacteria, fertilizers and pesticides, traffic- generated pollutants, chlorides from roadway deicing, and erosion and sedimentation from construction projects. Again, BMP's for urban areas should be followed. Other specifications, such as curbing and guttering, drainage systems, and retention ponds will assist in reducing some of these pollutants.

Both Smith Creek and Stony Creek were identified as having relatively high bacteria counts in the Water Control Board's biennial report covering 1985-1987.

Because of its underlying geology and many surface waters, it is of the utmost importance to follow good practices in all development activities to prevent any degradation of the county's water supply.

ZONING

The County and all of the incorporated towns except for Toms Brook have enacted zoning ordinances to implement their land use plans. These ordinances control the types of uses permitted on the land, the density of development, and contain requirements for minimum lot sizes, lot widths, and building set-backs. In Toms Brook, such dimensional requirements are included within the subdivision ordinance.

Each zoning ordinance within the County has districts designated for residential, commercial, and industrial uses. Other districts which are found in some ordinances are agricultural and conservation. In addition, there are "overlay" districts or additional regulations that govern such things as uses in flood plains.

In the unincorporated areas of the County which are subject to the Shenandoah County Zoning Ordinance, there are eight different zoning districts; three are for residential uses, two are for commercial uses, and one is for industrial uses. The other two districts are a conservation district and the agricultural district. The zoning districts and the acreages which are covered by each are shown in Table 3-F on page 3-16.

The residential districts range from low-density areas which require a 30,000 square foot lot size for a single-family house (R-1) to an area which will allow a density of 10,000 square foot lots if public water and services are provided (R-3). The lower density residential areas are located near several towns, in some rural "villages", and in several recreational subdivisions. Moderate-density districts are located near towns and in the Basye/Bryce Mountain area. In the unincorporated portion of the County, most of the "high-density" designation is also located in the Basye/Bryce Mountain area.

The two business districts are designed to provide for convenience type shopping and services (B-1), and more general business operations and services which require frequent access from a major roadway (B-2). Local Business B-1 districts are located in the rural village areas, while General Business B-2 districts are located primarily at interchanges of I-81 and along U.S. Route 11.

The Industrial District (M-1) is designed to permit limited industrial uses in order to encourage the development of the local economy. This classification is found in several areas of the County, with large parcels located in the County industrial park and in the Strasburg area.

The Conservation district covers parts of the County which contain various open uses such as forests, recreation areas, the George Washington National Forest, and farms. It is designed to promote the protection of such open lands and to protect the natural resources.

The Agricultural district is designed to preserve the character of those areas where the major uses are agriculture and related uses, and is located primarily in a wide belt running northeast-southwest through the center of the County. Residential uses are allowed in the conservation and agricultural districts as well as the residential districts. Required minimum lot sizes vary from 125,000 square feet to 30,000 square feet in all areas that are not served by public water and sewer. In residential areas, Lot size requirements are reduced in those areas with either or both utilities. Individual manufactured homes and manufactured home parks (as authorized by the Shenandoah County Manufactured Home Park Ordinance) are also allowed.

TABLE 3-F
Land Use by Zoning Classification
Unincorporated County

	Land Use (Acres)									
Zone	Total	Ag.	Open/ Mixed Forest	Nat'l Forest	Res.	Trans/ Util.	Ind.	Comm.	Inst.	Park/ Rec.
LDR	4,620 Ac.	2,311	485		1,754	39	31			
MDR	4,616 Ac.	1,571	735	---	2,258	39	13	---	---	---
HDR	292 Ac.	10	252	---	30	---	---	---	---	---
L. Bus.	83 Ac.	32	30	---	---	---	---	21	---	---
G. Bus.	933 Ac.	604	71	---	---	10	71	177	---	---
Ind.	2,526 Ac.	1,020	269	---	---	50	1,147	40	---	---
Cons.	140,384 Ac.	2,690	55,521	77,681	3,992	500	---	---	---	---
Ag.	165,698 Ac.	119,484	34,923	---	6,738	4,100	189	146	85	33
TOTAL	319,152 Ac.	127,722	92,286	77,681	14,772	4,738	1,420	415	85	33

Notes: Land Use figures measured with planimeter by LFPDC from the 1986 land use map based on 1985 aerial photography, and updated through local review in 1988.

Zoning figures measured with planimeter by LFPDC from the composite zoning map updated through local review in 1989.

All figures are approximate.

LDR = Low Density Residential MDR = Medium Density Res'l HDR = High Density Res'l.
L. Bus = Local Business G. Bus = General Business
Ind. = Industrial Cons. = Conservation Ag. = Agricultural

LAND USE CONCERNS

Despite the low-density designations of conservation and agricultural zoning districts in the unincorporated areas, a large portion of development still took place in the rural areas of the County between the time the 1973 plan was adopted and 1990. This ran counter to the goal of preserving the open rural atmosphere of Shenandoah County by having most development located within the six towns and in the areas that are served by public utilities.

While the 1973 Plan identified a need for only approximately 700 additional acres of residential land by 1990 (page 26), a total of 13,209 acres were designated "Residential (Low and Medium)" and an additional 197,726 acres were designated "Agricultural/Residential" on the Future Land Use Map on page 35 of that Plan. (Note: acreage calculations were made using the ASCS digital planimeter and all acreages are approximate.) In addition, twelve "Rural Development Centers" were proposed, each to contain a population of 500 to 1,000, and dependent upon the establishment of "package" treatment plants. With these designations, the 1973 Future Land Use map supported residential growth for two thirds of the rural county.

Projecting build-out at one and two acres per dwelling unit for the Residential designation and five and ten acres per dwelling unit for the Agricultural/Residential designation, that future land use pattern could produce 26,000 to 52,000 dwelling units in the rural county or between 68,000 to 136,000 people. (Based on the 1990 average household size of 2.59, which is lower than the average size of 3.0 projected in the 1973 Plan.)

The concept of rural development centers has not worked. This may be primarily because package sewage treatment plants serving small clusters of development generally have not worked efficiently nor economically, and were not established in those designated centers. Consequently, growth in the rural area has been scattered out over the countryside, and needs to be re-directed to the areas served by public facilities.

One way of measuring how well future growth is being directed is by tracking density in the various areas of the County. Higher rural densities are found adjacent to the towns. To meet the goal of keeping the unincorporated area of the County rural in character, the densities outside of the proposed public service areas should not increase significantly.

Density in the Unincorporated Area

A density scale that is appropriate to a rural county has been defined. (See Table 3-G, on next page). Unlike urban areas where densities are expressed in terms of so many units per acre, the rural densities have been expressed as how many acres there are for each dwelling unit.

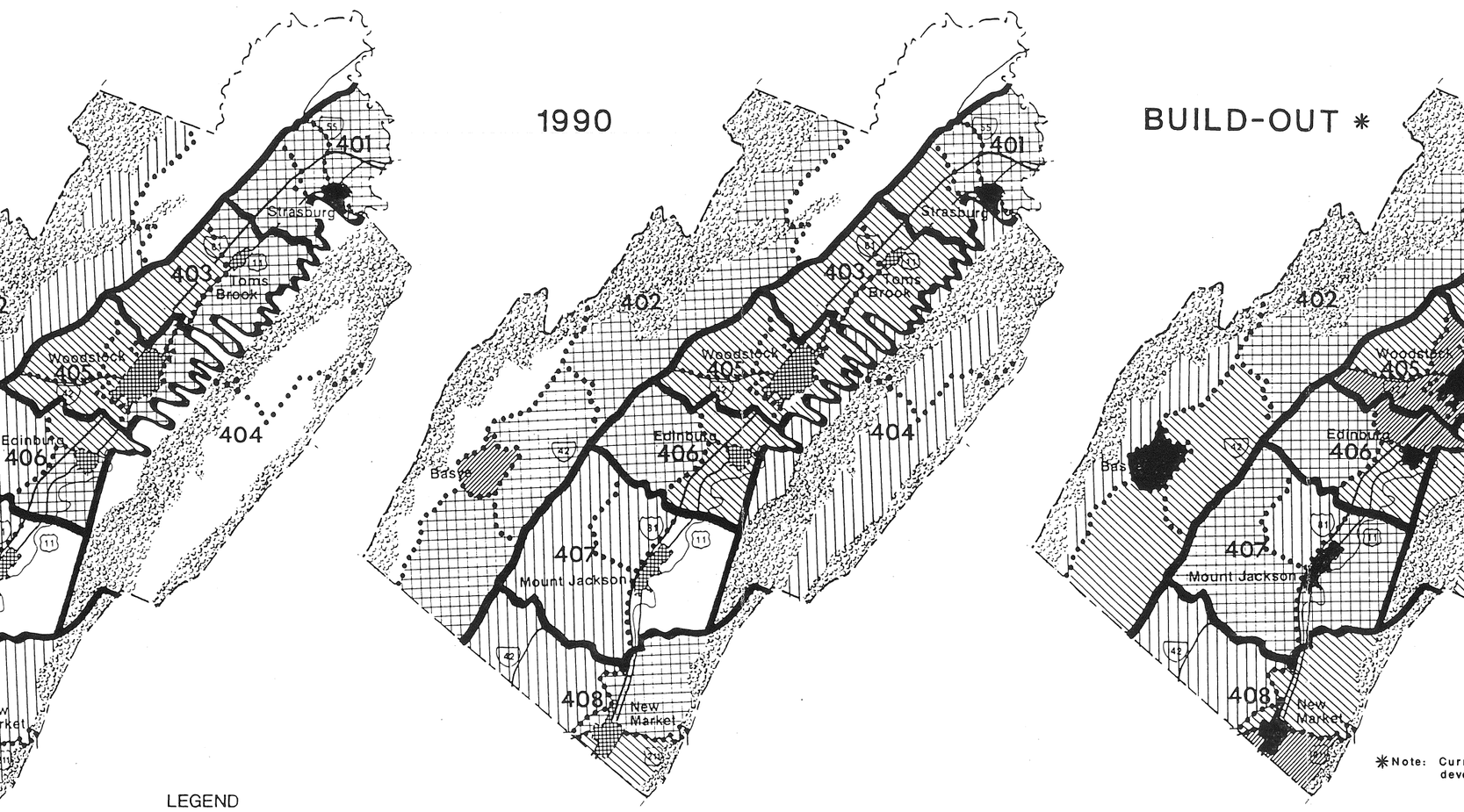
TABLE 3-G
RURAL DENSITY SCALE

Acres Per Dwelling Unit	Density Range
Less than 1	A
1.00 to 2.49	B
2.50 to 9.99	C
10.00 to 19.99	D
20.00 to 29.99	E
30.00 to 39.99	F
40.00 to 49.99	G

Figure 3-E on the following page provides a summary and visual picture of how the density has been changing in Shenandoah County, and what is projected based on existing subdivisions. In 1980, eight block groups (as defined by the Census Bureau) had an average density of 40 or more acres for every dwelling unit. By 1990, there were only three block groups in the entire county with that average density. If the existing subdivisions build-out, or if additional lots are created and housing units constructed on them, there will not be anywhere in the County with such a low average density.

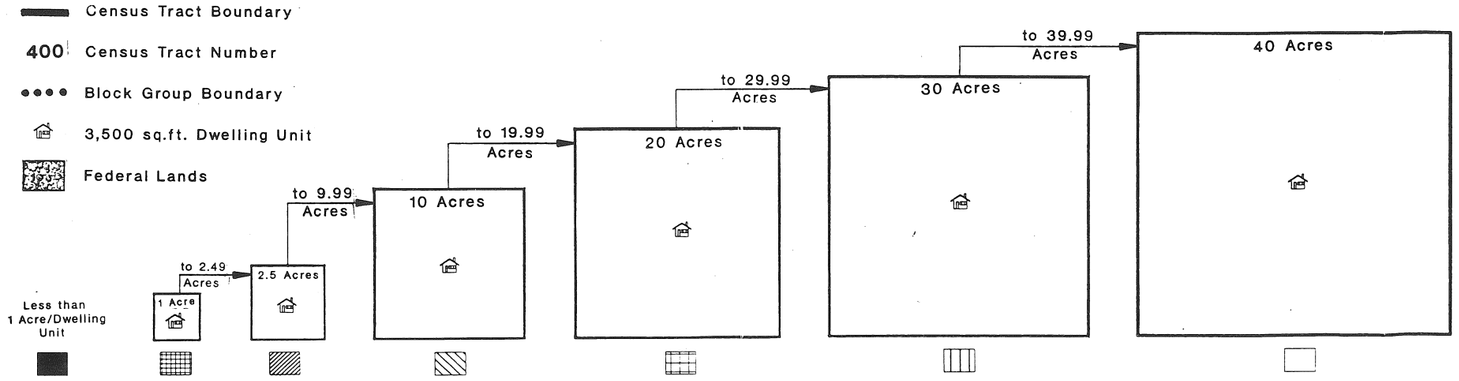
In addition, the average density in many of the other block groups shown on Figure 3-E is continuing to increase. Channeling growth towards the towns and public service areas will help to prevent the suburbanizing of the unincorporated area.

1980, 1990 AND BUILD-OUT
DWELLING UNIT DENSITY CHANGE



LEGEND

- Census Tract Boundary
- 400 Census Tract Number
- Block Group Boundary
- 3,500 sq.ft. Dwelling Unit
- Federal Lands



SHENANDOAH COUNTY ACREAGE PER DWELLING UNIT - DENSITY RANGES

FIGURE 3-E

The coordination of zoning and subdivision regulations in areas just outside of the corporate limits of some of the towns has been a concern. There are places where the County allows higher density and requires less improvements to the road system than the town that is immediately adjacent to a proposed subdivision.

Commercial and industrial uses should also be concentrated in areas where public services are available, and need to be adequately buffered from adjacent uses.

There is no zoning in the Town of Toms Brook. Dimensional requirements had to be incorporated into the Town's Subdivision Ordinance, and there are very few restrictions on allowed uses.

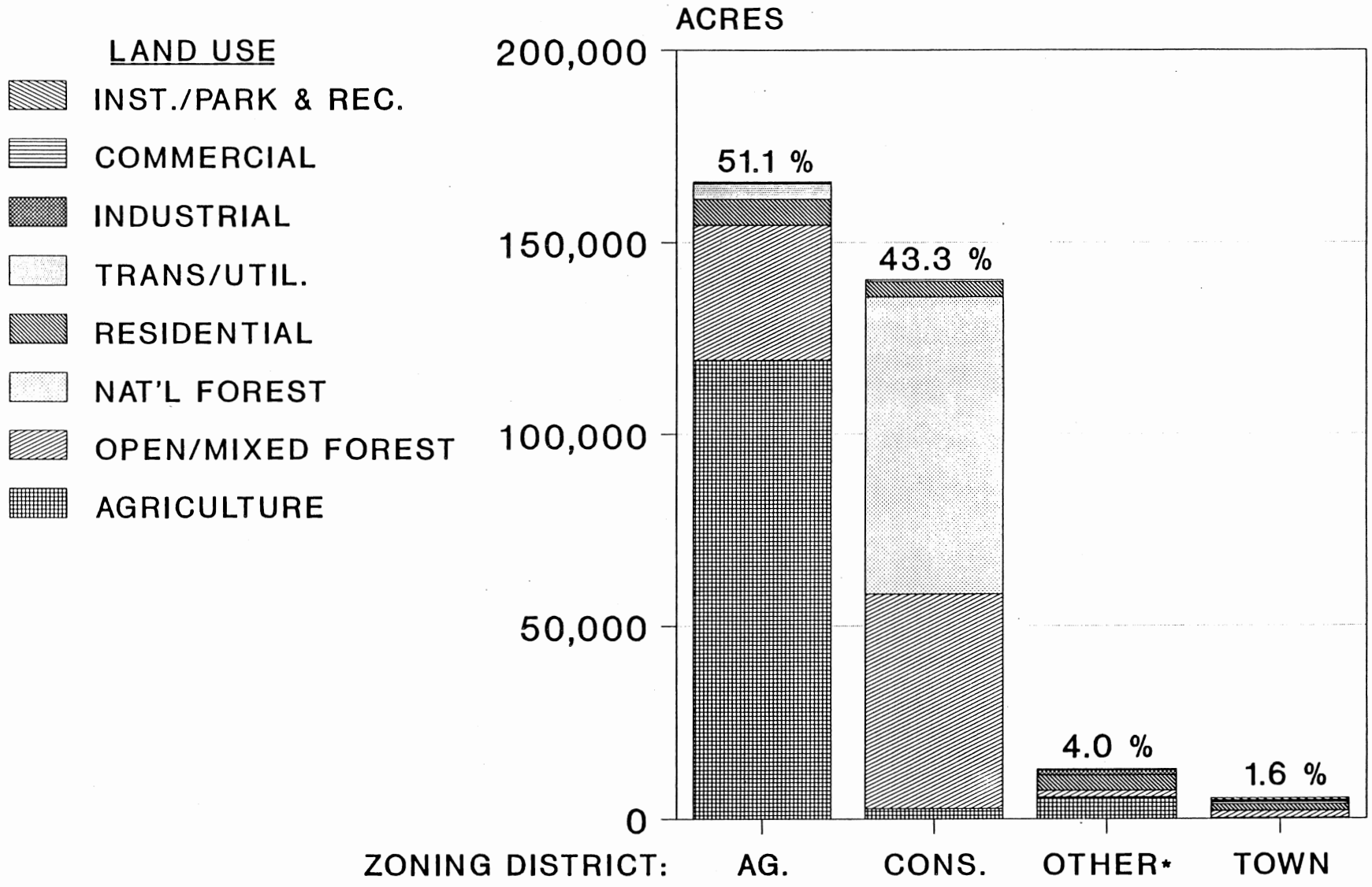
There is a need to track the status of agricultural and forestal districts, and of land that is placed in use-value taxation. With some districts due for renewal, there is also a need to review the requirements for such districts and how they affect land use decisions in the County.

Access to parts of Shenandoah County is not easy, and there are many roads throughout the County which need to be upgraded. Alignments for future expansions and upgrades need to be protected.

The first comprehensive examinations of water resources show that they must be protected by taking active measures; density of development, the amount and types of wastewater treatment systems, and the control of non-point pollution must be considered carefully in all areas.

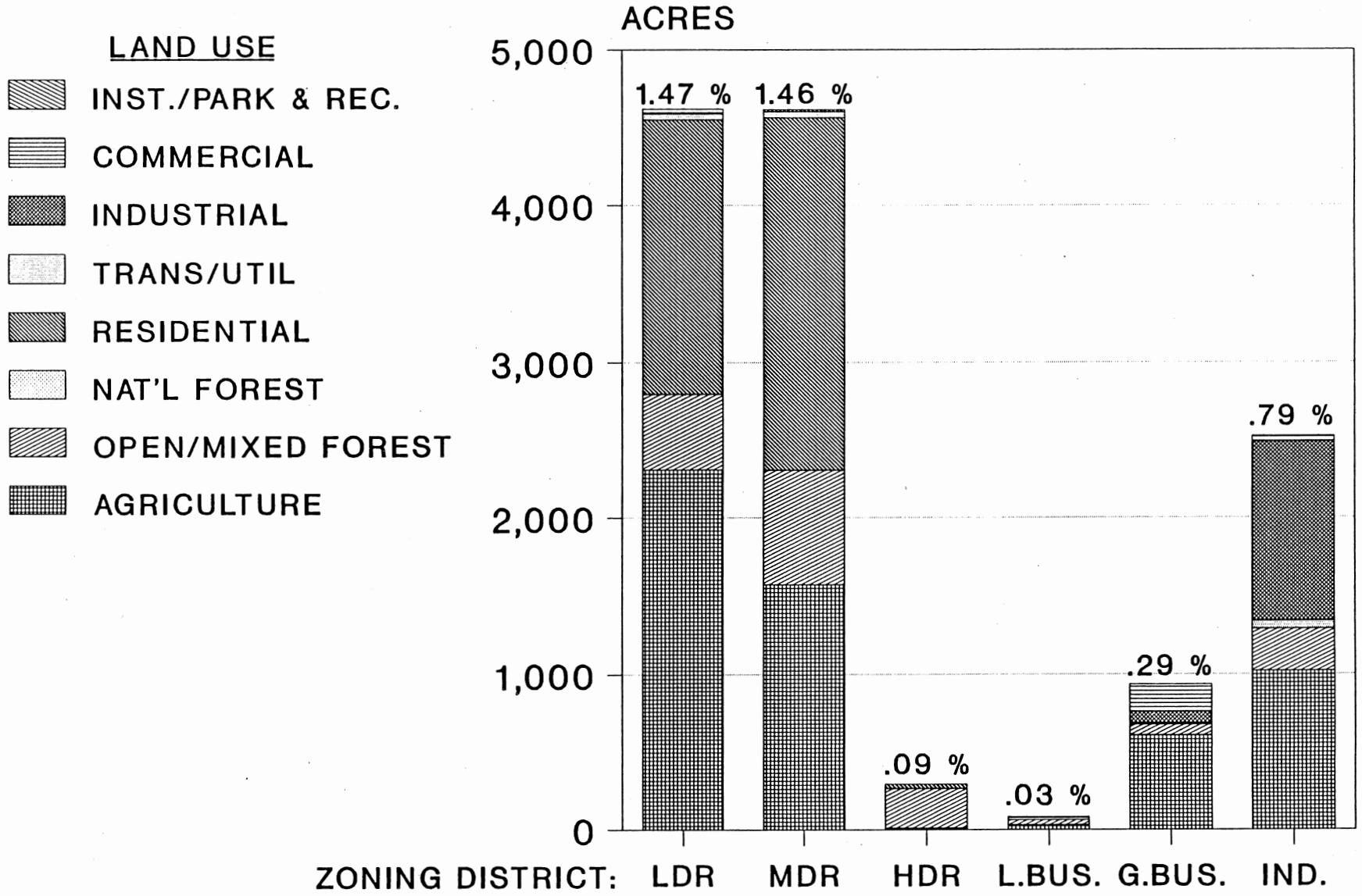
Figures 3-F and 3-G on the next two pages show graphically the acreages of land in the zoning districts and the types of land uses that occupied their areas as of 1988. In each case, there is land available of a less dense designation than the zoning category that could be used for additional growth as zoned. Therefore, there is no need to expand any of the zoning districts at this time; however a new district which would have development requirements that match those of the towns is needed.

FIGURE 3-F
COUNTY LAND USE BY RURAL ZONING DISTRICT AND INCORPORATED TOWNS



* Other - see figure 3-G for detail of small area zoning districts

FIGURE 3-G
SMALL AREA RURAL
ZONING DISTRICT LAND USES



LAND USE POLICY RECOMMENDATIONS

The purpose of this plan is to provide guidance for the continued orderly growth of the County while maintaining the quality of its environment.

In order to preserve agricultural land and to prevent hazards to the ground and surface waters in the County, the County's future growth should be tied to the availability of public facilities, with moderate density allowed where utilities and services are available. Where individual water and sewage disposal systems must be used and rural secondary roads exist only very low density can be permitted. In order for the goals of the plan to be met, the average densities in the rural areas should not increase significantly during its time frame.

Places where public utilities can be extended economically should be identified primarily in and around each town, in conjunction with the town governments, to determine their ultimate service areas. Such areas are referred to as "public service areas" in this plan. Preliminary designations of these areas are shown in Section 7, Figure 7-C Potential Water and Sewer Service Areas. Within those areas, the development ordinances of the County should be amended to match the towns' urban type of regulations. This would include the subdivision, zoning, and site plan regulations that specify requirements for such things as lot sizes, roadways, and drainage facilities.

On the other hand, certain areas of the County have already been identified as having great potential for ground water contamination and/or having severe limitations for septic systems. Such locations should be designated for conservation, agriculture, and limited to very low density development.

Additional provisions that allow for flexible development and encourage the developer to provide needed facilities should be explored and incorporated into the zoning and subdivision ordinances within the County where feasible in order to channel growth to the public service areas.

Zoning techniques can also be tied into a land evaluation and site assessment (LESA) system which rates the land according to its value for agriculture, and encourages the use of only non-prime lands for uses other than agriculture.

Perhaps even more effective than conventional land use regulations and ordinances in a rural county like Shenandoah are standards for the placement, construction, and maintenance of well, septic, and alternative waste treatment systems, and the use of private easements and restrictions. Together with capital improvements that are placed to guide growth to specific areas, these can form a firm foundation for the future development of the County. Specific policy recommendations are shown in Section 9.

Alternative Development Concepts

The 1973 plan selected the multi-center concept of the three options that were presented. Based on development from 1973 to the present, that concept has not worked and is not recommended. The rural centers were to depend upon some form of small community sewer treatment plant ("package" treatment plant) that has not materialized. In addition, the majority of the unincorporated rural area of the County was designated as "Agricultural/ Residential". Consequently, instead of being concentrated in the proposed rural centers, most rural development has been scattered throughout the countryside along existing roadways.

This plan recommends the following revisions to that concept: 1) removing the rural centers based on package treatment plants; 2) defining the areas of the towns and the areas surrounding them where public services can be extended logically and economically as combined "public service areas"; 3) coordinating land use planning with transportation planning; and 4) designating the rural portion of the County as "Agricultural". This recommended plan concept is shown in Figure 3-H Alternative Development Concepts on the following page.

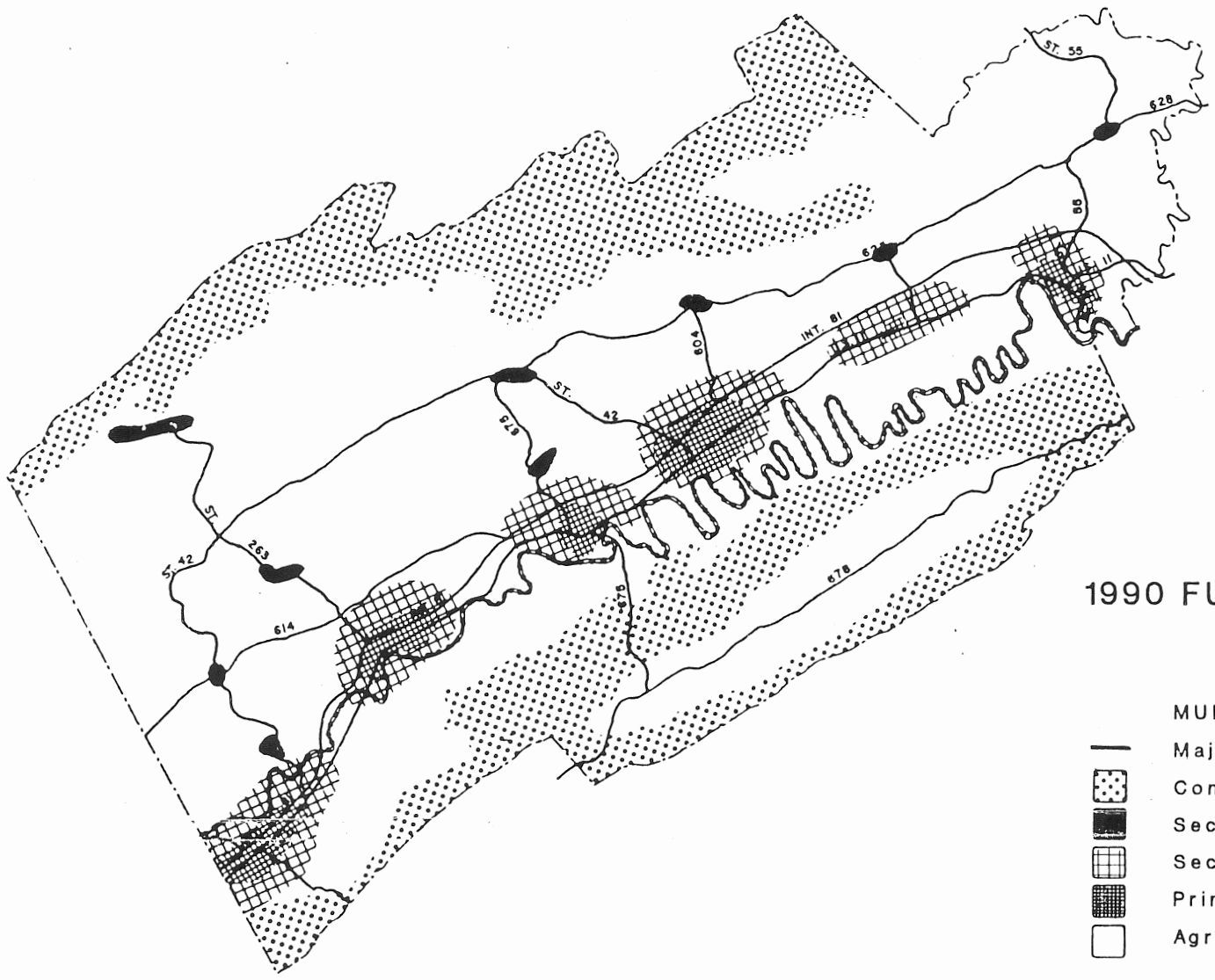
The revised public service areas concept is also incorporated into the Generalized Future Land Use map, which is included in Section 9 - Growth Management Policies as Figure 9-A.

In order to implement this concept, planning must be coordinated with the towns and public service providers. The proposed public service areas need to be well-defined, and any environmentally sensitive or historically important areas within them protected.

SHENANDOAH COUNTY

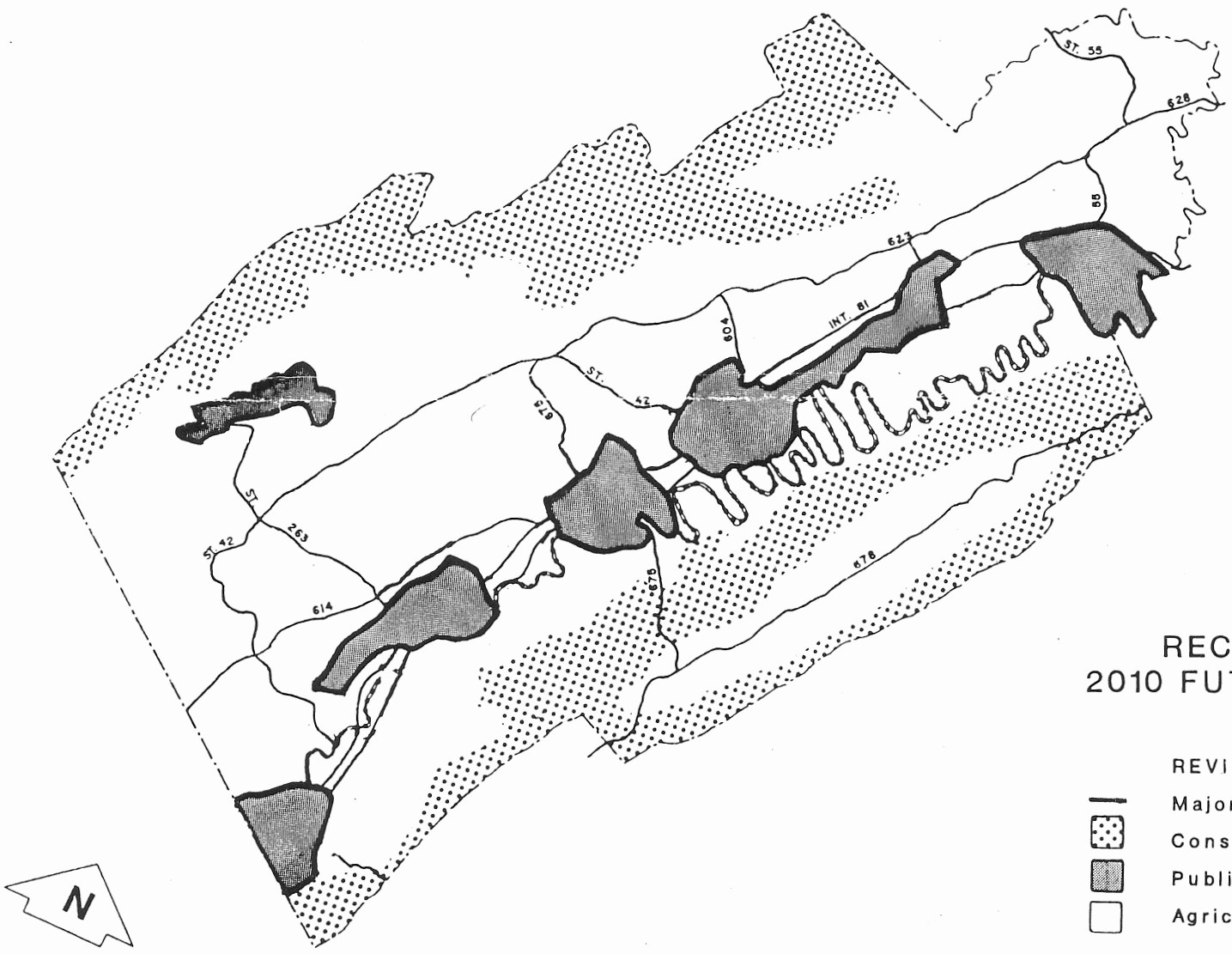
VIRGINIA

ALTERNATIVE DEVELOPMENT CONCEPTS



1990 FUTURE LAND USE

MULTI-CENTER CONCEPT
- Major Highways
- Conservation & Open Space
- Secondary Growth Center
- Secondary Growth Area
- Primary Growth Center
- Agricultural/Residential



RECOMMENDED
2010 FUTURE LAND USE

REVISED MULTI-CENTER CONCEPT
- Major Highways
- Conservation & Open Space
- Public Services Areas
- Agricultural

FIGURE 3-H

ECONOMY

INTRODUCTION

The purpose of this section is to study the County's economy and identify important changes and trends which are occurring locally. The County economy was addressed in the 1973 Plan using data from the 1960s. Both the character of the local economy and the data sources for measuring it have changed since that time.

Because of high unemployment in the 1970s, the County was eligible for Federal designation as an Economic Redevelopment Area. An Overall Economic Development Program was established and designation received in 1977, but no project funding was received. The process encouraged proactive planning as a means of improving the local economy. The 1983 Virginia Department of Economic Development's Community Certification program took this concept further. To meet Virginia requirements, the Shenandoah County Economic Development Council was formed. The County achieved Virginia Community Certification in 1986, only the 15th locality to do so, and recertification has just been received.

The primary economic indicators are employment and income. Five specific analyses are included. First is a labor market analysis which shows in which ways residents are employed, as well as the labor drawing area for local industries. Second, the number and kind of local jobs available are considered in a work source analysis. Third, the economic base of the County is considered, identifying those jobs producing goods and services for sale outside the area. The fourth analysis concerns the County's agricultural economy and its relationship to the total local economy. A study of income is the fifth analysis.

The best available data has been used from a variety of State and Federal agencies. Due to statistical methods and source data, some variation will be evident, however, this has little effect on the larger economic picture.

LABOR ANALYSIS

Labor Force

Labor force refers to the number of persons living in the County who are 16 years of age or older and who are employed or seeking work. Of the two basic labor force components - armed forces and civilian - the military portion consisted of only a small number of persons in 1980. Accordingly, only the civilian labor force is considered in this study. Comparative census figures for 1970 and 1980, as well as the 1988 Virginia Employment Commission (VEC) estimate follow in Table 4-A.

TABLE 4-A
LABOR FORCE DATA

	1970	1980	1990
Total, 16 years and over	16,449	21,418	----
Civilian Labor Force	9,602	13,120	17,334
Employment	9,469	12,575	16,471
Unemployment	133	545	863
Unemployment Rate	1.3%	4.2%	5.0%
Not in labor force	6,847	8,289	----

Sources: Census of Population 1970 and 1980, General Social and Economic Characteristics
Labor Force Estimates, January-December 1990, Virginia Employment Commission

The County civilian labor force was 13,120 in 1980, which represented 61 percent of all citizens 16 years and over. In 1970, the labor force was 9,602, which represented 58 percent of all persons age 16 and over. The civilian labor force estimates for 1990 show a increase of 4,214 persons since 1980. This is a growth rate of 32 percent. The labor force increased both in total and in percentage of the population between 1970 and 1990.

The County fell below Virginia's participation rate of 64 percent in 1980, this may reflect an overall elderly population. Of those persons over 16 and not in the labor force, 3,498 were 65 or older and 1,426 were between the ages of 55 and 64. Those persons 55 and older account for 59 percent of all persons not in the labor force.

The female participation rate of 48 percent in 1980 was higher than the state average of 44 percent. This was also an increase from the 1970 participation rate of 41 percent in Shenandoah County. During this ten year period 1,769 females joined the workforce.

Labor Characteristics

Resident labor characteristics will be presented in the next section. The resident labor force is classified in two different ways by the Bureau of Census. The first is by the industry in which they are employed, such as agriculture, manufacturing, services, etc. The second is by occupation. Managers or clerical workers, for example, are employed in a number of industries.

The data used in this section is from the 1980 Census, later, more recent data from the Bureau of Economic Analysis (BEA) will also be used. The Census material was chosen for this section because it contained greater in-depth data than was available from the BEA. Also, these figures differ somewhat and it was felt that using the Census data would provide a historical perspective along with a needed foundation from which more recent figures can be looked at.

Industry of Employed Residents

Table 4-B shows the growth and change in employment by industry for 1970 and 1980.

TABLE 4-B
INDUSTRY OF EMPLOYED RESIDENTS

	1970		1980		% Change
	Total	Distr.	Total	Distr.	1970-1980
Total Employment	9,469	100.0%	12,526	100.0%	+ 32.3
Agricultural, Forestry, & Fisheries	812	8.6	814	6.4	+ 0.2
Mining	38	0.4	0	0.0	-100.0
Manufacturing	3,696	39.0	4,440	35.4	+ 20.1
Construction	942	9.9	1,209	9.7	+ 28.3
Transportation, Communication, and other utilities	456	4.8	800	6.4	+ 75.4
Wholesale-Retail Trade	1,580	16.7	1,980	15.8	+ 25.3
Finance, Insurance, Real Estate	235	2.5	387	3.1	+ 64.7
Services	1,515	16.0	2,551	20.4	+ 68.4
Government	195	2.1	345	2.8	+ 76.9

Source: Census of Population 1980, General Social and Economic Characteristics
Census of Population 1970, Economic Characteristics

Between 1980 and 1970, total employment rose 32 percent, but the distribution by industry of employed residents remained essentially the same. Over one-third of those employed worked in the manufacturing sector of the economy. The service sector accounted for 20 percent of those employed, followed by the wholesale and retail industry with almost 16 percent. Of these three industries, only the service industry increased its share from 1970 to 1980. The Government, Transportation, Communication, & Utilities, and Finance, Insurance, & Real Estate sectors also made slight gains during the 70's. Every sector of the economy had a net increase in employment except for Mining which lost all of those employed in the field. Agriculture, Forestry, and Fisheries, while making a slight gain in total employment, decreased in the distribution of employed residents from 8.6 in 1970 to 6.4 percent in 1980.

Of the females working in Shenandoah County 70 percent were employed by either service or manufacturing industries. The manufacturing industry employed 2,035 (39.2%) females and the service industry employed 1,584 (30.5%) females. An additional 893 (17.2%) females were employed in the wholesale and retail sector. Only 2.7 percent (141) worked in agriculture in 1980. This is higher than the State's 0.9 percent for females working in agriculture.

Employment of the County's males was more diverse. The two largest employment sectors were manufacturing 2,405 (32.6%) and wholesale and retail trade with 1,386 (18.8%). These two industries account for 51.4 percent of Shenandoah County males. The construction trade represented 15.7 percent (1,156) of the working males. The service, transportation, communication, & utilities, and agriculture were 13.1%, 8.5%, and 8.4% respectfully. These numbers differ from those for all of Virginia. Only 3.2 percent of the entire State's male workers were engaged in agriculture.

Occupation of Employed Residents

The two leading occupation groups for County residents in 1980 were "operatives and kindred" and "craftsmen, foremen and kindred" at 25.3 and 18.4 percent respectively as shown in Table 4-C on the next page. The "professional, technical and kindred" made the greatest increase in distributional share, increasing by 1.7% between 1970 and 1980. "Service workers" and "craftsmen, foremen and kindred" along with "laborers, except farm workers" increased their share by 1.6, 1.5, and 1.5 percent respectively.

All occupations had net increases, with the exception of "farm laborers and foremen" which had a net decrease of 12.9 percent.

TABLE 4-C
OCCUPATION OF EMPLOYED RESIDENTS

Occupation	1970 Total	1970 Distr.	1980 Total	1980 Distr.	% Change 1970-1980
Total employed, 16 years and over	9,469	100.0%	12,575	100.0%	+ 32.8
Professional, technical and kindred	671	7.1	1,103	8.8	+ 64.4
Managers and administrators, non-farm	663	7.0	925	7.4	+ 39.5
Sales workers	415	4.4	596	4.7	+ 43.6
Clerical and kindred	955	10.1	1,390	11.1	+ 44.2
Craftsmen, foremen and kindred workers	1,602	16.9	2,310	18.4	+ 44.2
Operatives and kindred	2,952	31.1	3,186	25.3	+ 7.9
Laborers, except farm	526	5.6	905	7.1	+ 72.1
Farmers and farm managers	332	3.5	350	2.8	+ 5.4
Farm laborers and foremen	396	4.2	345	2.7	- 12.9
Service workers	957	10.1	1,465	11.7	+ 53.0

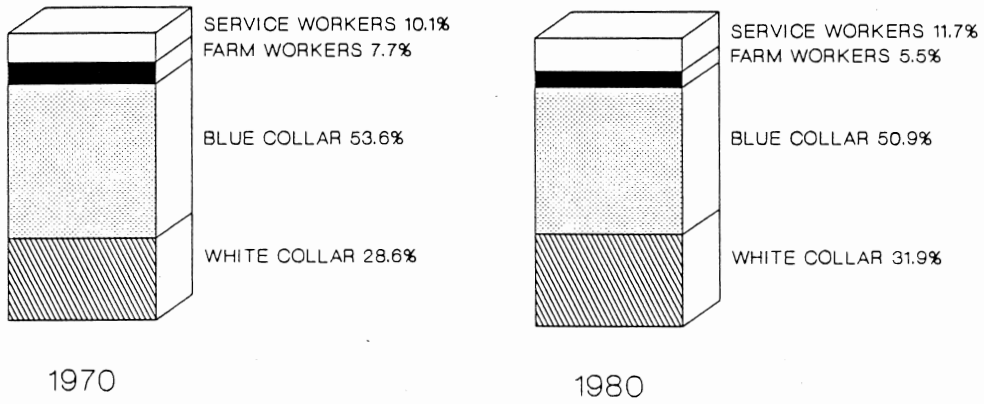
Source: Census of Population 1970 and 1980, General Social and Economic Characteristics

Among Shenandoah County's working males, the largest occupation group in 1980 included craftsmen, foremen, and kindred workers. There were 2,007 such male workers, accounting for 27.2 percent of the male workforce.

Of the County's female workers 27 percent were employed in operatives and kindred. This category included 1,382 female workers in 1980 and was the largest occupation group among females.

In Figure 4-A, next page, these occupations are broken into four basic groups. This figure shows how the occupational groups have shifted in the ten years between the censuses. While there has been net growth in all occupational groups, employment has drifted away from agriculture blue collar and moved toward the service and white collar fields.

FIGURE 4-A
GROUPED RESIDENT EMPLOYMENT



SOURCE: General Social and Economic Characteristics
U.S. Census Bureau, 1970 & 1980

White collar occupations include managerial and professional specialty, plus technical, sales, and administrative support. Blue collar occupations include precision production, craft, and repair, plus operations, fabrications, and laborers. Farming also includes forestry and fishing. Service covers all service jobs. White collar jobs increased by 3.3 percent over 1970, but the 1980 average of 31.9 percent is well below the state average of 54.8. Shenandoah County was 22.9 percentage points below the State average in 1980 but was only 20.3 percentage points below the State's 1970 average of 48.9 percent.

Neither the industry distribution or the occupational distribution changed significantly between 1970 and 1980. There was a shift from blue collar and agriculture sectors to white collar and service sectors of the economy. This could be a result of job movement by residents or by the recent immigrants to the County.

Unemployment

During the early 1980's Shenandoah County's unemployment rates were above the state's average. In 1980 Virginia's unemployment rate was 5.0 and Shenandoah County's was 6.3 percent. By 1987 the County's unemployment rate had decreased to 3.0 percent while the State posted 4.4 percent that same year. In 1987 and 1989 the County's average was below that for Virginia, but in 1990 the County's average was above Virginia. In Table 4-D, the years 1987 to 1991 are shown giving the monthly unemployment rate along with the yearly averages for the planning district and the state.

Shenandoah County's unemployment rate, like other areas, varies with the seasons of the year. The County's unemployment is highest in the winter months (January-March) and lowest in the late summer and early autumn. It is particularly low in August, September, and October, when agricultural crops are being harvested and processed.

TABLE 4-D
UNEMPLOYMENT RATES

	1987	1988	1989	1990	1991
January	5.2%	3.2%	3.6%	7.8%	7.1%
February	3.7	3.0	4.5	4.1	7.7
March	3.6	3.6	3.7	5.0	7.7
April	3.7	2.8	2.3	3.8	5.9
May	2.3	3.5	3.3	5.3	5.2
June	2.4	2.8	2.5	6.0	---
July	3.7	3.2	3.3	4.2	---
August	2.3	3.5	1.9	4.5	---
September	1.3	2.8	3.4	4.7	---
October	2.4	3.3	3.0	2.9	---
November	2.5	4.6	5.2	4.7	---
December	2.6	4.6	6.6	6.6	---
Average for Year:					
Shenandoah Co.	3.0	3.4	3.6	5.0	---
Planning District	4.3	4.3	4.5	6.0	---
Virginia	4.4	3.8	3.8	4.2	---

Sources: Labor Force Estimates, January 1984 - May 1991, Virginia Employment Commission

Regional Labor Pool

In 1990, there was an estimated population of 163,470 people living within a 30-mile radius of Woodstock, which includes parts of Clarke, Fauquier, Warren, Rappahannock, Page, Rockingham, Hardy, Hampshire, and Frederick counties, the City of Winchester, as well as a substantial portion of Shenandoah County.

It is estimated that a work force of 128,499 persons 16 years or older lived within the 30-mile radius in 1990, including 63,024 males and 65,475 females. Of those, it is projected that 48,150 males and 37,583 females participated in the labor force, using the 1989 national participation rate. The "Estimated Labor Pool", shown in Table 4-E on the next page, refers

to those persons between the ages of 16 and 55. People over 55 quite possibly may not be a likely source of labor for a new industry, since they would be close to retirement and may not be interested in a new employer.

For 1990, the average labor pool of unemployed seeking work for Shenandoah and surrounding counties was 7,135 or 5.4 percent of the 131,510 total civilian labor force. One important source of potential labor is females, age 25 to 54, who are not currently in the labor force, but who may be encouraged to join it should the right job opportunity come along. Within a 30-mile radius of Woodstock, there were approximately 36,044 females ages 25 to 54, of which 9,840 (27.3%) were not be part of the labor force.

TABLE 4-E
1990 REGIONAL LABOR POOL

Population of Labor Drawing Area (within a 30-mile radius):

Shenandoah County	=	31,636	
Surrounding Areas	=	131,834	
Total = 163,470	Males	=	80,194
	Females	=	83,276

Labor Force Participation:	Persons 16 and Over	In Labor Force	1989 National Participation Rate
Males	63,024	48,150	76.4%
Females	65,475	38,583	57.4%

Estimated Labor Pool, Ages 16 to 55:	Males	Females	Total
1990 Estimated	44,505	46,188	90,693

Females, Age 25 to 54:			
	Total	=	36,044
	Not in Labor Force	=	9,840 (27.3%)

Source: Lord Fairfax Planning District Commission

WORK SOURCE ANALYSIS

Jobs in Shenandoah County

As reported by the Bureau of Economic Analysis (BEA), in 1989 Shenandoah County had 16,783 jobs, up from 12,843 jobs in 1980 for an increase of 30.7 percent since 1980. (See Table 4-F, next page.) Wage and salary employment grew at a faster rate (28.5%) during this nine year period than the total number of proprietors (18.3%). While the number of farm proprietors fell by 5.4 percent, non-farm proprietors posted a 31.8 percent increase, representing 556 new proprietors.

One-third of the wage and salary employment in Shenandoah County in 1989 was in the manufacturing sector with 5,584 jobs. The service sector provided 3,072 jobs, and wholesale and retail trade had 2,780. These three industries account for 68% of all the jobs in Shenandoah County in 1989. Of these three industries the service sector had a 57.0 percent increase over 1980. The manufacturing sector posted a 37.8 percent increase and the wholesale and retail industries increased 25.3 since 1980.

Several manufacturing employers in Shenandoah County employ over 500 persons; including Aileen, Inc., producing women and misses clothing; Judds, Inc., doing commercial printing, Automotive Industries making fabricated textile products; and Rocco Farm Foods, a poultry processor.

With 18 percent of the County's jobs, the service industry is both the second largest employer and the second fastest growing sector of the economy. Examples of employment in this sector include hospitals and physicians' practices, nursing homes, motels, beauty salons, auto repair shops, and amusement facilities. Most of the employment is provided in the medical field. Shenandoah County Memorial Hospital employs 700 to 800 persons and Skyline Terrace Nursing Home employs between 50 to 100 persons. Bryce Resort also supplies between 50 and 100 jobs.

Figures 4-B and 4-C give graphic comparison of Shenandoah County's employment and income changes by industry for the years 1980 and 1989 on pages 4-11 and 4-12.

TABLE 4-F
SHENANDOAH COUNTY EMPLOYMENT AND INCOME BY INDUSTRY: 1980 & 1989

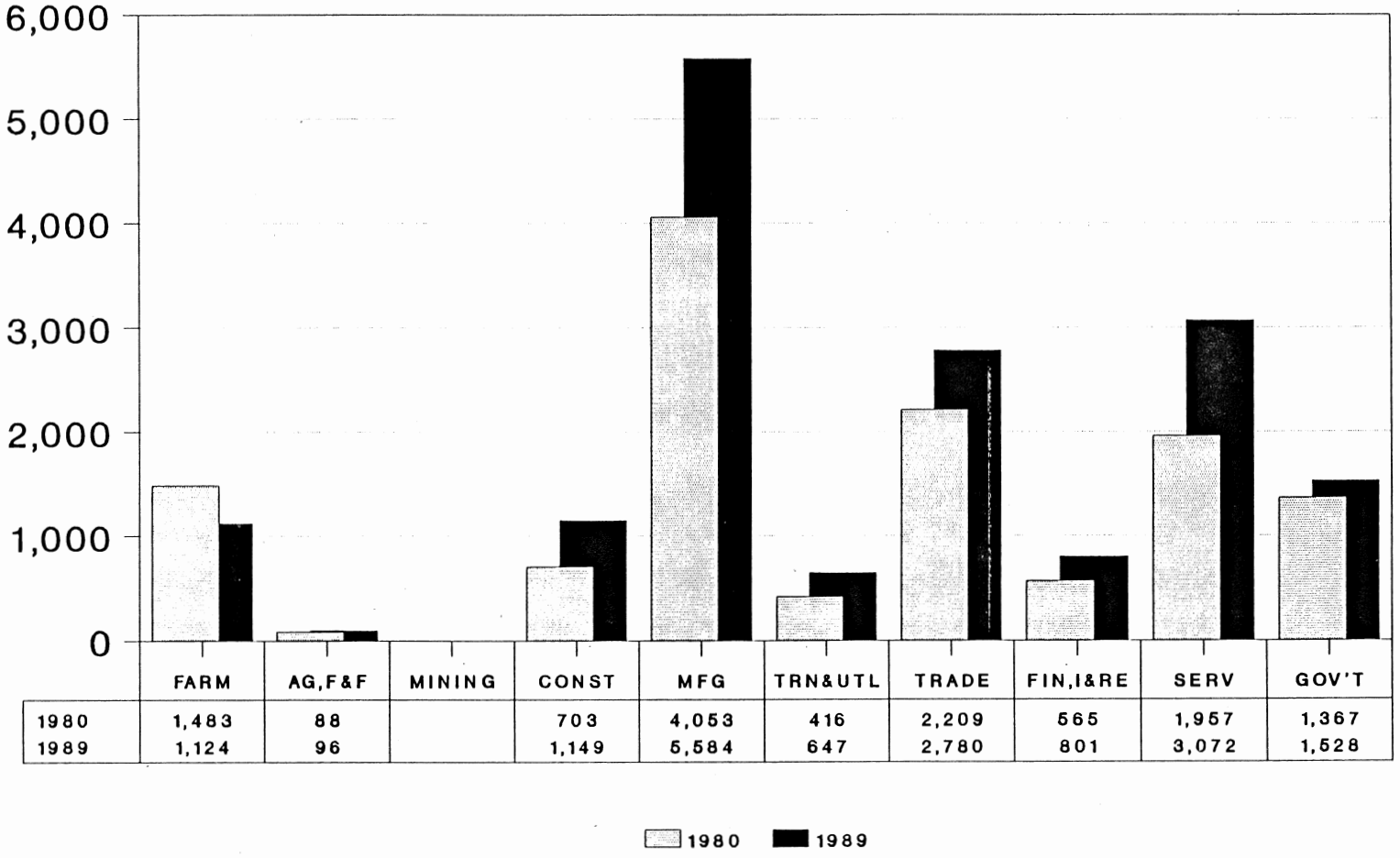
Industry Classification	No. of Employees 1980	No. of Employees 1989	Percent Change	Personal Earnings by Major Industry Classification ($1,000) 1980	Personal Earnings by Major Industry Classification ($1,000) 1989	Percent Change
Total - Farm and Non-Farm	12,843	16,783	30.7%	$ 125,805	274,392	126.1%
Farm - total	1,483	1,124	-24.2%	4,135	8,904	115.3%
Non-farm - total	11,360	15,659	37.8%	121,670	275,488	126.4%
Private - subtotal	9,993	14,131	41.4%	107,782	246,995	129.2%
Agriculture, Forestry and Fisheries	88	96	9.1%	605	1,233	103.8%
Mining	---	---	n/a	353	260	-26.3%
Contract Construction	703	1,149	63.4%	8,392	22,515	168.3%
Manufacturing	4,053	5,584	37.8%	51,446	120,245	133.7%
Transportation & Public Utilities	416	647	55.5%	6,701	16,450	145.5%
Wholesale and Retail Trade	2,209	2,780	25.8%	19,439	36,931	90.0%
Finance, Insurance and Real Estate	565	801	41.8%	4,198	8,015	90.9%
Services	1,957	3,072	57.0%	16,648	41,346	148.4%
Government - subtotal	1,367	1,528	11.8%	13,888	28,493	105.2%
Federal	163	146	-10.4%	2,400	3,649	52.0%
Military	116	177	52.6%	378	1,122	196.8%
State & Local	1,088	1,205	10.8%	11,110	23,722	113.5%

--- Date Suppressed

Source: Bureau of Economic Analysis, Personal Income by Major Source and Earnings by Major Industry for 1980, 1989. April 1991

FIGURE 4-B

EMPLOYMENT BY INDUSTRY
SHENANDOAH COUNTY: 1980 & 1989

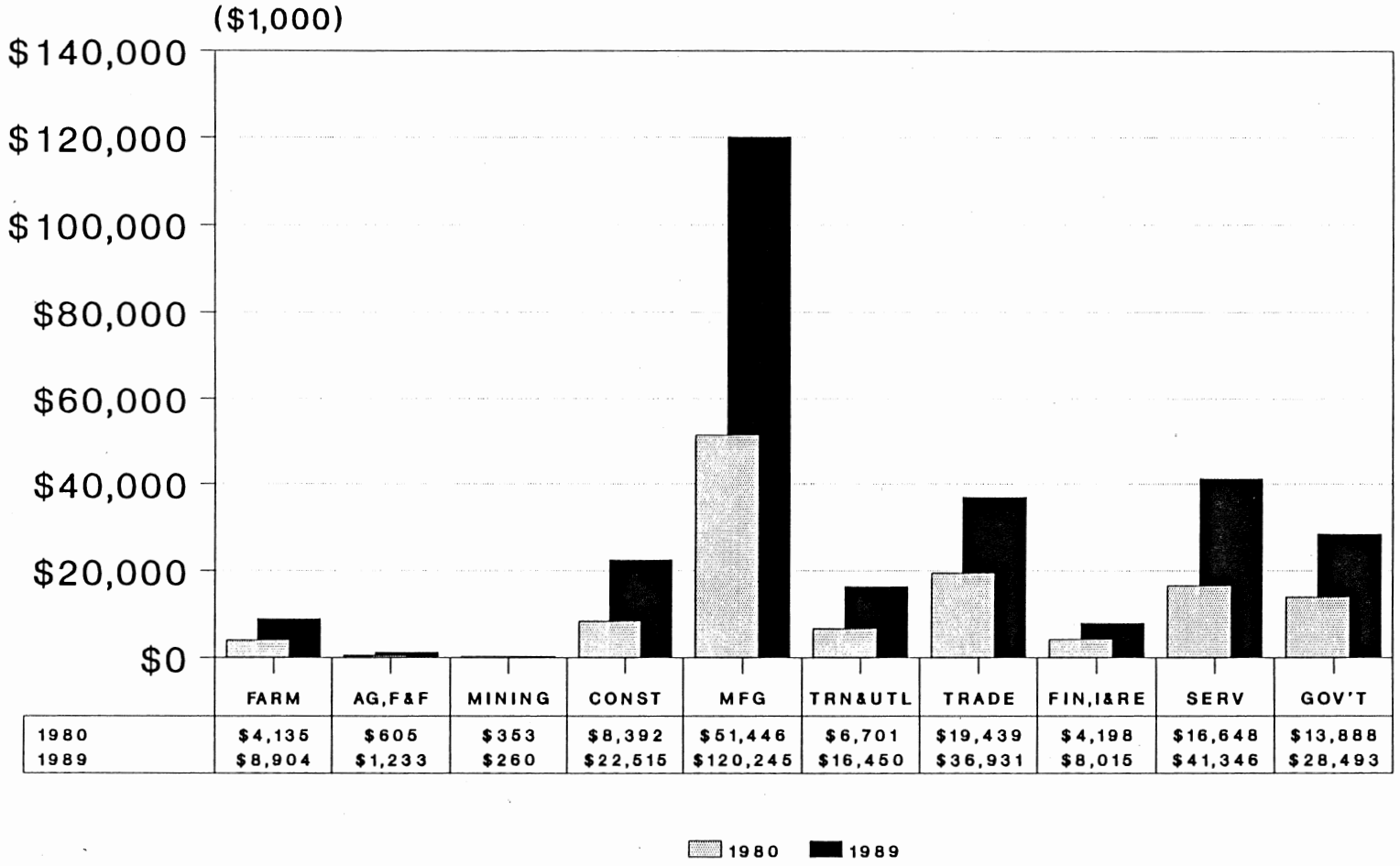


	FARM	AG,F&F	MINING	CONST	MFG	TRN&UTL	TRADE	FIN,I&RE	SERV	GOV'T
1980	1,483	88		703	4,053	416	2,209	565	1,957	1,367
1989	1,124	96		1,149	5,584	647	2,780	801	3,072	1,528

Source: Bureau of Economic Analysis,
April, 1991

FIGURE 4-C

INCOME BY INDUSTRY
SHENANDOAH COUNTY: 1980 & 1989



	FARM	AG,F&F	MINING	CONST	MFG	TRN&UTL	TRADE	FIN,I&RE	SERV	GOV'T
1980	$4,135	$605	$353	$8,392	$51,446	$6,701	$19,439	$4,198	$16,648	$13,888
1989	$8,904	$1,233	$260	$22,515	$120,245	$16,450	$36,931	$8,015	$41,346	$28,493

Source: Bureau of Economic Analysis,
April, 1991

Wholesale and Retail Trade provide 16.6 percent of all jobs in the County. Government accounts for 9.1 percent (1,528) jobs, most of which (1,205) are in state and local governments. Farm employment fell by 359 jobs (24.2 percent) from 1980 to 1989. Employment is shifting away from farm and related industries to the service and manufacturing sectors of the economy.

All industries posted increases in personal earnings except for Mining which decreased by 26.3 percent. Overall, incomes rose by 126.1 percent while employment rose by 30.7 percent between 1980 and 1989.

The Non-Farm sector rose by 126.4 percent and the Private sector posted a 129.2 percent increase. Farm income showed a 115.3 percent increase although employment decreased by 24.2 percent.

The industries with the largest increase in income are construction (168.3%), service (148.4%), transportation (145.5%), and manufacturing (133.7%). Government incomes overall rose by 105.2 percent. The small number of persons employed in the Military saw an increase of 196.8 percent, while State and Local government incomes rose by 113.5 percent.

Incomes by industry have followed the same trend that employment has over this nine year period. Incomes are rising faster in the construction, service and manufacturing industries than in the farm and agriculture-related industries. This will likely be a continuing trend in the future.

Commuting Patterns

Commuting data is not yet available from the 1990 Census, and is not expected until 1993 or 1994. As of 1980, approximately 75.2 percent of the 11,814 workers who reported their place of work indicated that they lived and worked within Shenandoah County.

There were 1,324 commuters coming into Shenandoah County in 1980. Almost half of these commuters were from Rockingham County (641). The Counties of Page (126) and Warren (196) accounted for 24% of all in-commuters. The City of Winchester (22) and Frederick County (118) represented just over 10% of the commuters to Shenandoah County. See Table 4-G on the next page for a summary of 1980 commuting data.

Only 24.8 percent (2,926) of Shenandoah County's employed residents worked outside the County in 1980. Thirty-four percent (1,003) of those out-commuters went to the Winchester-Frederick County area. Another 21 percent (635) of the out-commuters went to Harrisonburg-Rockingham County area.

Since there were 1,324 in-commuters and 2,926 out-commuters, Shenandoah County experienced a net loss of 1,602 workers in 1980. A major portion of them went to the City of Winchester (-528), and Warren County (-374). Net gains came from Rockingham County (+192) and from West Virginia (+41).

TABLE 4-G
1980 COMMUTING PATTERNS

	In-commuters From	Out-commuters To	Net
Clarke County	0	-10	-10
Frederick County	+118	-453	-335
Page County	+126	-90	+36
Warren County	+196	-570	-374
Winchester City	+22	-550	-528
Outside LFPD-within Va.	+771	-1,054	-283
Alexandria	0	-44	-44
Fairfax City	0	-33	-33
Fairfax County	+42	-181	-139
Falls Church	0	-36	-36
Harrisonburg	0	-186	-186
Prince William County	+11	-8	+3
Rockingham County	+641	-449	+192
Other in Virginia	+77	-117	-40
Washington D.C.	0	-88	-88
Maryland	+19	-39	-20
West Virginia	+72	-31	+41
Other States, Countries	0	-41	-41
TOTAL	+1,324	-2,926	-1,602

Source: U.S. Bureau of the Census, unpublished data, 1980

From the commuter data, it can be seen that many of Shenandoah County's workers are employed in the Winchester-Frederick County Area and the Harrisonburg-Rockingham Area. Warren County employed 19 percent of Shenandoah County's residents and 13 percent commuted to the Washington D.C. Area. These areas offer higher paying jobs, for skilled workers. These commuters might choose to work locally if they could find comparable jobs and wages. This commuting pattern is helped by the existence of interstate 81 running north and south and interstate 66 running directly into the Washington D.C. Metro area.

ECONOMIC BASE ANALYSIS

Basic and Supporting Employment

The County's employment is divided into basic and non-basic or supporting employment. Basic employment industries are selling most of their goods and services outside the County. Industries such as manufacturing, farming and the Federal government, along with the military, are considered basic industries. All of these industries are subject to national and regional demands. The supporting sector markets their goods and services locally. These industries are wholesale and retail trade, construction, finance, insurance, real estate, and most services along with local and routine state governments functions. Most supporting industries rely upon the basic industries and local economy rather than regional and national markets.

About 43.5 percent of Shenandoah County's employment in 1989 is in basic industries. The manufacturing sector accounts for almost 77 percent of the County's basic employment. Table 4-H on the next page, shows that supporting industries provided employment for 56.5 percent of the County in 1989. In 1980, the supporting industries supplied 53.6 percent. Since 1980, 2,600 jobs have been added to the supporting industries which is an increase of almost 38 percent. The basic industry on the other hand added 1,340 new jobs or a 22.5 percent increase in the nine years.

The ratio of basic employment to supporting employment increased from 1:1.15 in 1980 to 1:1.30 in 1989. This may reflect an underlying demand for more support services as a result of basic employment growth.

Preparatory schools such as Massanutten Military Academy and Shenandoah Valley Academy are basic industry for the County, since the students are primarily from outside the area.

A percentage of Shenandoah County's retail, motel, and tourist attractions are also considered basic. The local population alone would not support the level of such facilities. According to 1988 Travel in Virginia, the attractions of Bryce Mountain Ski Resort, Endless Caverns, Shenandoah Caverns, New Market Battlefield Park, George Washington National Forest and the Shenandoah River are responsible for $46,894,000 in revenues. This emphasizes the importance tourism plays in Shenandoah County's economy. A total of 162 travel and tourism employees are considered as basic employment in 1989.

TABLE 4-H
BASIC VS. SUPPORTING EMPLOYMENT

	1980		1989	
	Number	%	Number	%
Employment in County	12,843	100.0	16,783	100.0
Basic	5,958	46.4	7,298	43.5
Manufacturing	4,053	31.6	5,584	33.3
Farming	1,571	12.2	1,220	7.3
Preparatory Schools	97	0.8	97	0.6
Travel/Tourism Trade	110	0.9	162	1.0
Nursing Homes	127	1.0	235	1.4
Supporting	6,885	53.6	9,485	56.5

Sources: Employment by Type and Broad Industrial Sources, Bureau of Economic Analysis
Covered Employment and Wages, Virginia Employment Commission
General Social and Economic Characteristics, U.S. Bureau of the Census 1980.

There are several nursing and rest homes in the County. These are Susan B. Miller Nursing Home, Skyline Terrace Nursing Home, Shenandoah Valley Village and Life Care Center of New Market. Since most of the residents of these homes are from outside the area, a share of their employment is considered basic.

Trends in the County's Economic Base

In the past, agriculture has provided much of the County's economic base, but in recent years, while the rest of the County's economic base has diversified and expanded, farming as a percentage of the economic base has declined. In 1980, 6.4 percent of the workforce worked in the agricultural sector of the economy. This was a decrease from 8.4 percent in 1970 and recent trends show that is continuing to decline. Despite this, Shenandoah County remains one of Virginia's top agricultural Counties.

The tourism industry plays a major role in the economy. In 1980, the county had revenues of just over ten million dollars. Revenues have increased to over 46 million dollars in 1988. Tourism should continue to increase in the future.

Manufacturing showed significant growth among the County's basic industries during the 1970's and 80's. It has continued to increase in both percentage share and in net employees. Manufacturing and agriculture are becoming more integrated. The majority of the agricultural sector produces poultry which is processed by food companies located in Shenandoah County.

AGRICULTURAL ECONOMY

Since Shenandoah County is a rural area as opposed to a urbanized area, an analysis of the agricultural economy is vital to understand how it relates to Shenandoah County's economy as a whole. This section will attempt to show the relationship between the agricultural sector and the rest of the County's economy.

Market Value of Crops

Shenandoah County is one of the top ten agricultural counties in Virginia. The backbone of Shenandoah County's agricultural economy is poultry and poultry products. This industry is integrated with local growers operating small farms. The revenues of poultry and poultry products ($24,468,000) represent 54 percent of the total revenues from agricultural products in 1987. Together with cattle and calves, dairy products, and other livestock, poultry and related products accounted for over 92 percent of total agricultural revenues. (See Table 4-I on the following page.)

The total market value of all agricultural products sold equaled $44,963,000 by 1987. This was an increase of $2,483,000 (5.8 percent) from 1982 and a total increase of $15,079,000 (50.5 percent) since 1978. While these figures indicate a substantial rise, most of it can be attributed to the inflation of food prices rather than an increase in farm production. In table 4-I on the next page net dollar values are given for comparison.

TABLE 4-I
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD

(in $1,000)	1978	1982	1987
Total Market Value of All Products Sold	$29,884	$42,480	$44,963
Livestock, Poultry, and Their Products	$26,665	$38,381	$41,439
Poultry and Poultry Products	15,450	22,345	24,468
Dairy Products	4,278	5,678	5,663
Cattle Caves	5,505	7,981	9,326
Hogs & Pigs	915	1,521	888
Sheep, Lambs, and wool	402	661	861
Other Livestock and Poultry	115	195	233
Crops	$3,219	$4,099	$3,524
Grains	784	1,098	455
Hay, Silage, and Field Seeds	483	437	660
Nursery/Greenhouse Products	---	28	71
Fruits, Nuts, and Berries	1,930	2,510	2,294
Other Crops	---	26	44

Note: "---" = "Not Available" or "Withheld to avoid disclosure of information about individual farms". Data included in "Other" category.

Source: Census of Agriculture, 1978, 1982, 1987

With 62,000 acres of pasture, raising livestock is also particularly well-suited to the County. "Cattle and Calf" production is its second leading agricultural industry. The revenues from the sale of "Cattle and Calves" in 1987 was $9,326,000. "Dairy Products" with $5,663,000 in revenues ranks third of Shenandoah County's agricultural products, and ninth of all Virginia counties.

The raising of hogs & pigs and sheep, lambs, and wool is increasing in Shenandoah County. The market values of hogs and pigs in 1987 was $888,000, while the market value of sheep, lamb and wool was $861,000.

While not responsible for a large percentage of the total agricultural sales, the growing of crops is also important in Shenandoah County. The largest section of "Crops" was "fruits, nuts and berries". In 1987 "Crops" were responsible for $3.5 million with "fruit, nuts and berries" accounting for $2.3 million.

Farm Income

In Table 4-J, shows the relationship of farm income to total personal income in Shenandoah County. The percentage over a ten year span have fluctuated between 2.83 to a negative .17. Generally the ratio have been between one and two percent. In 1979, the percentage was 2.83, but in during the 1980's the percentages have become more variable.

TABLE 4-J
FARM INCOME IN SHENANDOAH COUNTY

	Farm Income	Total Personal Income	Farm/Total
1979	$6,104,000	$215,320,000	2.83%
1980	4,135,000	236,503,000	1.75%
1981	3,156,000	257,200,000	1.23%
1982	3,450,000	273,969,000	1.26%
1983	- 515,000	302,797,000	-0.17%
1984	5,802,000	337,970,000	1.72%
1985	3,456,000	359,603,000	0.96%
1986	9,277,000	421,354,000	2.20%
1987	7,967,000	460,530,000	1.73%
1988	8,164,000	494,134,000	1.65%
1989	8,904,000	528,248,000	1.69%

Source: Personal Income by Major Sources, Bureau of Economic Analysis, April 1991

Even though the County's farm income percentages have fluctuated, they have usually been twice as high as the States percentage (Table 4-K). It can be seen that both the State and Shenandoah County's percentages have declined in recent years, but the relationship in Shenandoah County is diminishing at a slower pace.

TABLE 4-K
FARM INCOME VS. TOTAL PERSONAL INCOME
BY PLACE OF RESIDENCE

Farm Income/Total Personal Income

	Shenandoah	Virginia	Shenandoah/Virginia
1979	2.83%	0.95%	2.98
1980	1.75%	0.53%	3.30
1981	1.23%	0.87%	1.41
1982	1.26%	0.51%	2.47
1983	-0.17%	0.18%	N/A
1984	1.72%	0.66%	2.61
1985	0.96%	0.39%	2.46
1986	2.20%	0.46%	4.78
1987	1.73%	0.54%	3.20
1988	1.65%	0.60%	2.75
1989	1.69%	0.57%	2.97

Source: Personal Income by Major Sources, Bureau of Economic Analysis, April 1991

Farm Employment

In Shenandoah County farm employment is almost 4 times greater than the State as a whole. Farm as well as total employment include both laborers and proprietors. In 1989 the farm employment was 14.0 percent (Table 4-L, next page) of Shenandoah County's total employment. This is well above the State's 3.0 percent for the same year.

TABLE 4-L
FARM EMPLOYMENT VS. TOTAL EMPLOYMENT BY PLACE OF WORK

	Farm Employment/Total Employment		
	Shenandoah	Virginia	Shenandoah/Virginia
1984	18.49%	4.76%	3.88
1985	17.40%	4.36%	3.99
1986	14.85%	3.76%	3.95
1987	13.77%	3.38%	4.07
1988	14.27	3.26%	4.38
1989	14.02%	3.01%	4.66

Source: "Employment by type and Broad Industrial Sources", Bureau of Economic Analysis, April 1991

Farm employment in Shenandoah County has declined since the early 1980's (See Table 4-M). In 1989, there were 2,353 persons employed in the farming industry. Of these 870 were farm proprietors and 1,124 were laborers. Only a small percentage are covered by unemployment insurance, thus the industry total is relatively small. In the early 1980's about 20 percent of all employment in the County was in farming compared to 14.0 percent in 1989. The 1989 figure is slightly above the 1987 figure which was the lowest in the ten year span shown.

TABLE 4-M
FARM EMPLOYMENT IN SHENANDOAH COUNTY

	Farm Proprietors	Farm Laborers	All Farm Employment	Total Employment	Farm/Total
1979	1,037	1,423	2,460	13,081	18.81%
1980	1,016	1,483	2,490	12,843	19.46%
1981	1,063	1,515	2,578	12,900	19.98%
1982	1,118	1,571	2,089	12,815	16.30%
1983	1,147	1,593	2,740	13,094	20.93%
1984	1,093	1,524	2,617	14,151	18.49%
1985	1,052	1,466	2,518	14,469	17.40%
1986	961	1,297	2,258	15,204	14.85%
1987	908	1,209	2,223	16,147	13.77%
1988	889	1,212	2,348	16,456	14.27%
1989	870	1,124	2,353	16,783	14.02%

Source: Employment by Type and Broad Industrial Sources, Bureau of Economic Analysis, April 1991

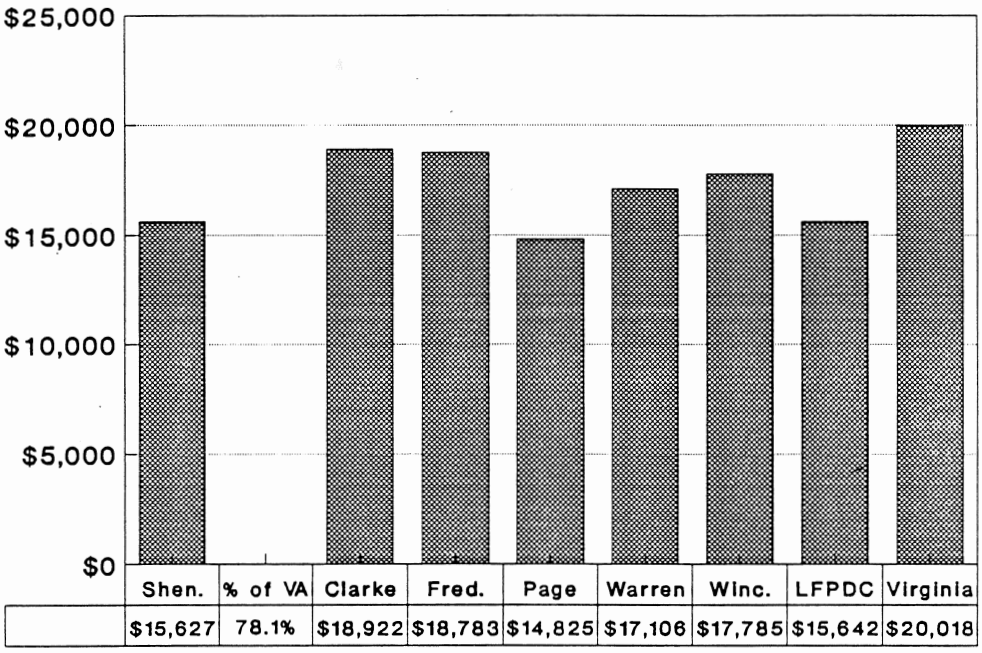
INCOME ANALYSIS

Income and Wages

Income information is not yet available from the 1990 Census. Data in this section is obtained from the 1980 Census, and from adjusted incomes from Virginia tax returns.

The 1980 Census calculated the median family income for Shenandoah County residents in 1979 to be $15,627 (Figure 4-D). This was comparable to the median for the Lord Fairfax Planning District, which was $15,642, while the State's median was higher at $20,018.

FIGURE 4-D
MEDIAN FAMILY INCOME IN 1979



	Shen.	% of VA	Clarke	Fred.	Page	Warren	Winc.	LFPDC	Virginia
	$15,627	78.1%	$18,922	$18,783	$14,825	$17,106	$17,785	$15,642	$20,018

SOURCE: Census of Population & Housing 1980, Summary Tape STF3A

Table 4-N, on the next page, shows the median adjusted gross income of Shenandoah County residents as indicated on married couples' returns for 1980, 1985, and 1989.

For this nine year span, Shenandoah County's median adjusted gross income is lower than the LFPDC median, and below the State average. However, during this time period, the County has gained as a percentage of the State, rising from 75.3 percent in 1980 to 78.4 percent by 1989.

TABLE 4-N
MEDIAN ADJUSTED GROSS INCOME ON MARRIED COUPLE RETURNS

	1980	% of State	1985	% of State	1989	% of State
Shenandoah County	$16,375	75.3	$22,141	74.8	$28,719	78.4
Clarke County	$19,632	90.3	$27,045	91.3	$36,117	98.6
Frederick County	$18,815	86.6	$26,046	88.0	$33,971	92.7
Page County	$15,344	70.5	$20,592	69.5	$26,089	71.2
Warren County	$18,212	83.8	$24,793	83.7	$32,301	88.2
Winchester	$19,559	90.0	$25,088	84.7	$32,151	87.8
Planning District	$17,787	81.8	$24,018	81.1	$31,324	85.5
NOVA PDC	$32,517	149.6	$45,128	152.4	$56,765	155.0
Virginia	$21,735	100.0	$29,610	100.0	$36,630	100.0

Source: Distribution of Virginia Adjusted Gross Income by Income Class, 1980, 1985, 1989, Center for Public Service

In Table 4-O next page, 10.8 percent of Shenandoah County's married returns had adjusted gross incomes below $10,000 while the State was 9.9 percent. In Shenandoah County, 13.5 percent of the married returns had incomes of $50,000 or more. The State's percentage of families with incomes greater than 50,000 was 31.7 in 1989.

During this six year period, the percent of change has shifted from the low income brackets to higher income brackets in both the married returns and all returns. Overall, the increase in married returns was 48.4 percent and 40.4 percent for all returns.

As reported by the Bureau of Economic Analysis, per capita personal income in Shenandoah County in 1989 was $17,568 (see Figure 4-E, page 4-25) which is 92.6 percent of the State's 1989 per capita income of $18,979.

In 1985, the County had a per capita income of $12,786 and the State had a per capita income of $14,477. The County's per capita income increased 37.4 percent between 1985 and 1989, well above the State's increase of 31.1 percent.

The 1960, 1970 and 1980 census per capita personal incomes are also provided on Figure 4-E showing the base from which there has been a rapid increase.

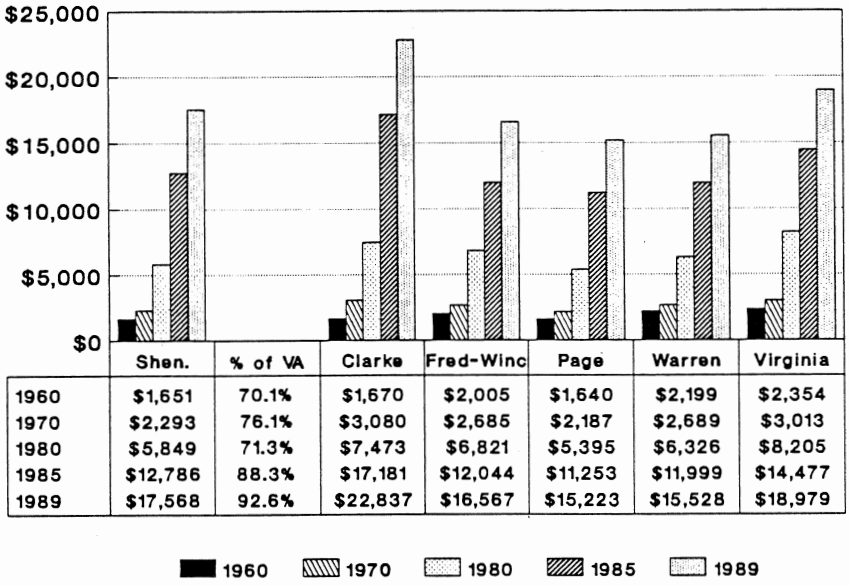
TABLE 4-O
ADJUSTED GROSS INCOME
SHENANDOAH COUNTY, VIRGINIA

	Estimated Population	Number of Returns	AGI ($) Total (000)	AGI ($) Median Per Return	PERCENTAGE DISTRIBUTION OF RETURNS BY AGI CLASS ($000) Less Than 5.0	5.0 To 9.9	10.0 To 14.9	15.0 To 19.9	20.0 To 24.9	25.0 To 29.9	30.0 To 39.9	40.0 To 49.9	50.0 To 74.9	75.0 Or More
ALL RETURNS														
1983	27,800	11,287	183,156	13,165	17.2	21.9	17.3	13.2	10.8	8.0	7.2	2.5	1.4	0.5
1984	27,900	11,714	200,722	13,963	16.2	20.3	17.0	13.6	10.6	8.5	8.4	2.8	1.8	0.7
1985	28,100	12,123	220,676	14,316	16.2	18.6	17.6	12.2	10.5	8.5	9.6	3.5	2.4	0.9
1986	28,500	12,292	244,167	15,422	14.7	17.5	16.8	12.3	10.5	8.7	10.6	4.7	3.0	1.2
1987	29,100	12,938	282,218	16,783	13.9	15.5	16.3	12.3	10.2	8.7	11.8	5.7	3.9	1.6
1988	29,600	12,788	301,802	17,733	12.1	15.1	15.8	13.2	9.7	8.8	12.4	6.6	4.9	2.0
1989	N/A	12,613	311,326	18,479	12.0	14.2	15.0	13.1	9.6	8.6	13.0	7.2	5.6	2.2
% Change 83-89		11.7	70.0	40.4	-30.2	-35.2	-13.3	-0.8	-11.1	7.5	80.6	188.0	300.0	340.0
MARRIED RETURNS														
1983	27,800	6,263	134,396	19,354	7.0	13.4	15.2	16.4	16.0	12.7	11.7	4.2	2.5	0.9
1984	27,900	6,377	146,163	20,776	6.4	11.5	13.5	16.2	15.7	13.7	14.1	4.7	3.1	1.1
1985	28,100	6,501	160,323	22,141	5.6	10.5	13.6	13.9	15.1	13.4	16.3	6.2	4.1	1.4
1986	28,500	6,579	177,295	23,778	5.3	9.8	11.3	13.0	14.1	13.3	17.8	8.2	5.3	1.9
1987	29,100	6,832	206,141	25,986	4.2	7.6	11.0	11.4	13.1	13.4	19.7	10.1	6.8	2.7
1988	29,600	6,647	221,532	27,756	2.7	6.9	9.9	12.0	11.6	13.0	20.7	11.6	8.7	3.4
1989	N/A	6,645	228,742	28,719	4.1	6.7	8.9	10.6	11.2	12.0	21.0	12.7	9.9	3.6
% Change 83-89		6.1	70.2	48.4	-41.4	-50.0	-41.4	-35.4	-30.0	-5.5	79.5	202.4	296.0	300.0

Sources: Distribution of Virginia Adjusted Gross Income Class and Locality, 1983-89
John L. Knapp and Robert W. Cox, Center for Public Service, Charlottesville, Virginia. July, 1991

/3/4/1/agi

FIGURE 4-E
PER CAPITA PERSONAL INCOME



	Shen.	% of VA	Clarke	Fred-Winc	Page	Warren	Virginia
1960	$1,651	70.1%	$1,670	$2,005	$1,640	$2,199	$2,354
1970	$2,293	76.1%	$3,080	$2,685	$2,187	$2,689	$3,013
1980	$5,849	71.3%	$7,473	$6,821	$5,395	$6,326	$8,205
1985	$12,786	88.3%	$17,181	$12,044	$11,253	$11,999	$14,477
1989	$17,568	92.6%	$22,837	$16,567	$15,223	$15,528	$18,979

SOURCE: Census of Population 1960, 1970 & 1980, General Social & Economic Characteristics
Personal Income by Major Source and Earnings by Major Industry, BEA, April 1991

The average weekly wage paid to workers by industries in Shenandoah County during the first quarter of 1990 was $313 (Table 4-P), according to the Virginia Employment Commission. That represents a 71.0 percent increase over the first quarter of 1980. The industrial group paying the highest wages included transportation, communication, and utility firms, which paid a weekly average of $430. Manufacturing and finance, insurance, and real estate were the next highest paying $366 and $313 per week respectively.

TABLE 4-P
AVERAGE WEEKLY WAGES PAID IN SHENANDOAH COUNTY
COVERED EMPLOYMENT FOR 1ST QUARTER 1970, 1980, 1985, 1990

	1970	1980	1985	1990
Agricultural, Forestry, Fisheries	$---	$145	$167	$227
Construction	$70	$152	$187	$310
Manufacturing	$91	$205	$253	$366
Transportation, Communication Utilities	$139	$240	$329	$430
Wholesale & Retail Trade	$86	$156	$174	$236
Finance, Insurance, Real Estate	$85	$177	$218	$313
Services	$73	$142	$160	$210
Average	$90	$183	$219	$313

Source: Covered Employment and Wages, First Quarter, 1970, 1980, 1985, 1990, Virginia Employment Commission

During the third quarter of 1990, the average weekly wage per worker in Shenandoah County was $313. The Lord Fairfax Planning District had an average weekly wage of $350 and the State average was $428. Table 4-Q also compares wages paid in Shenandoah County to those paid in Arlington and Fairfax Counties, illustrating the reason why some workers commute to the Northern Virginia metropolitan area:

TABLE 4-Q
AVERAGE WEEKLY WAGES: 3RD QUARTER, 1990

Shenandoah County	$313
Lord Fairfax PDC	$350
Arlington County	$606
Fairfax County	$543
Virginia	$428

Source: Employment and Wages, 3rd Quarter, 1990, Virginia Employment Commission

Components of Income

The income of Shenandoah's residents has been increasing rapidly in recent years. Between 1980 and 1989, total personal income in the County increased by 123.4 percent, and per capita income increased by 105 percent (See Table 4-R on the next page). This increase is slightly above that of average for the Planning District, and nearly 12 percent higher than the State's average increase.

The increase in Shenandoah County has been due primarily to an increase in net labor and proprietors' income by place of residence, which includes total earnings by place of work, less personal contributions for social security, and an adjustment for place of residence to account for commuting wage earners. This category grew by 121.7 percent between 1980 and 1989, accounting for 67 percent of the increase in total personal income.

Two factors significantly affect the local economy in terms of personal income. One is income from dividends, interest, and rent, and the other is transfer payments. Both categories grew substantially in the County; transfer payments decreased as percentage of the total personal income.

Transfer payments include retirement and disability benefits; unemployment insurance benefits; and medical, educational, and public assistance benefits. Retirement benefits are the biggest source of transfer payments.

In 1989, 13.5 percent of the total personal income of Shenandoah's residents was from transfer payments. This percentage has decreased from 16.1 percent in 1980, but has remained above the State's and the Planning District's percentage share.

TABLE 4-R
COMPONENTS OF PERSONAL INCOME

	1980		1989		% Increase
	1,000	Distr.	1,000	Distr.	1980-1989
Shenandoah County					
Net Labor and Propr. Income	160,915	68.0%	356,798	67.5%	121.7
Dividends, Interest & Rent	37,410	15.8%	100,241	19.0%	168.0
Transfer Payments	38,178	16.1%	71,209	13.5%	86.5
Total Personal Income	236,503	100.0%	528,248	100.0%	123.4
Per Capita Income ($1)	8,568	---	17,568	---	105.0
Planning District					
Net Labor and Propr. Income	772,784	69.6%	1,741,470	68.4%	125.4
Dividends, Interest & Rent	165,067	14.9%	460,525	18.1%	179.0
Transfer Payments	172,546	15.5%	342,457	13.5%	98.5
Total Personal Income	1,110,397	100.0%	2,544,452	100.0%	129.1
Per Capita Income ($1)	8,361	---	16,884	---	101.9
Virginia					
Net Labor and Propr. Income	38,288,138	72.6%	82,050,173	71.1%	114.3
Dividends, Interest & Rent	7,083,659	13.4%	19,155,297	15.8%	170.4
Transfer Payments	7,381,938	14.0%	14,556,743	13.1%	197.2
Total Personal Income	52,753,735	100.0%	115,762,213	100.0%	119.4
Per Capita Income ($1)	9,827	---	18,979	---	93.1

Source: Personal Income by Major Sources, Bureau of Economic Analysis, April 1989

SUMMARY

Approximately 44 percent of the jobs in the County are in the industries which provide the County's economic base. Those "basic" industries are industries which sell the majority of their goods and services outside the County, thus bringing to the County money from other areas. Much of the County's basic employment is in manufacturing.

The manufacturing sector of the economy has increased in employment but it's distribution to total employment has remained the same. The real change is in the service sector. Significant increases in employment and in total distribution have occurred in recent years. One area this can be seen in is the tourism trade that has developed in Shenandoah County.

Changes in the occupational distribution of the County's residents indicate a shift from blue collar to white collar. This trend may be due somewhat to recent in-migrants to the County, particularly those who have moved into the County from the Washington, D.C. Metro Area but still commute back to high-skill, high-pay jobs.

The economy of Shenandoah County is becoming less dependent on farming as a primary source of income and employment for residents. However, agriculture is still more important in Shenandoah County than in most of the rest of Virginia.

Historically, Shenandoah's unemployment rate has primarily been higher than the State and the Planning District. From early 1987 to 1990, Shenandoah's yearly average unemployment rate has been lower than both the State's and the Lord Fairfax Planning District's. This reflects the success of the County's decade of economic development work.

The income of Shenandoah's residents has historically been lower than the average of the Planning District, and of the State average. It is considerably lower than in the Northern Virginia/D.C. metropolitan area, providing an incentive to some workers to commute. However, in recent years income in Shenandoah County has risen faster than the State average.

The County's relationship to the regional, state, national and global economy has become increasingly important since 1973. Economic analysts agree that a locality's economic viability in the 1990's and into the 21st century depends upon a quality work force in terms of basic education, continuing education to upgrade skills and a positive work ethic. The Shenandoah County Economic Development Council's activities have benefited the local economy, and its efforts--in concert with other local, regional and State programs--should be continued with the goal of improving the quality of the County's economy.

This section of the plan should be maintained on a more regular basis as economic data becomes available. Workforce and income data from the 1990 census is expected by 1992. Achieving the goal of a "diverse and viable local economy" will produce a growing tax base which is important to the implementation of the comprehensive plan strategies.

POPULATION

INTRODUCTION

This section presents trends of the County's population, including its size, characteristics, and geographic distribution, discusses the components of change in the population, and presents projections of population growth. Detailed characteristics derived from sample data gathered by the 1990 census are not expected until 1993 or later, so some of the tables in this section contain data from the 1980 Census or 1988 estimates.

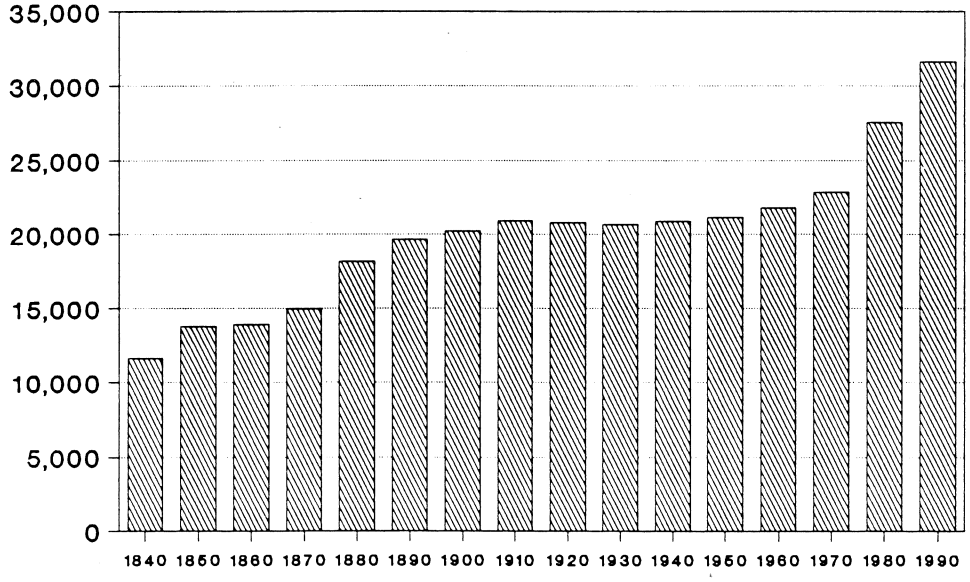
In the 1973 Plan, the 1990 projection for total population was 25,400. This was based on the 1960-70 trend. Higher growth in the early 1970's led to revised State population projections which were used in the June 1977 plan supplement, and the 1990 projection was increased to 30,700. The 1990 Census final population count for Shenandoah County is 31,636.

POPULATION GROWTH

Table 5-A presents the County's population counts from 1840 through 1990.

TABLE 5-A
DECENNIAL CENSUS POPULATION

Year	Population
1840	11,618
1850	13,768
1860	13,896
1870	14,936
1880	18,204
1890	19,671
1900	20,253
1910	20,942
1920	20,808
1930	20,655
1940	20,898
1950	21,169
1960	21,825
1970	22,852
1980	27,559
1990	31,636



Sources: Intercensal Estimates and Decennial Census Counts for Virginia Localities, 1790-1980, TMI, February 1983.
Summary Tape File STF-1A, Bureau of the Census, 1991.

From 1840 to 1900, the County grew at an average annual increase of 0.9%, reaching 20,253 persons. From 1900 to 1970, the average annual increase was only 0.2%. Between 1970 and 1980 the average annual rate of change for the County was 1.9% and from 1980 to 1990 it was approximately 1.4%.

Shenandoah County's average annual increase was less than that of Virginia as a whole from 1840 to 1970, but its 1.9% average annual increase between 1970 and 1980 outpaced the state's 1.4% rate during that period and between 1980 and 1990 it was equal to the state's 1.4% rate.

CHARACTERISTICS OF THE POPULATION

Characteristics such as age, education, income and geographic distribution of the population all influence the kinds of services the County may need to provide. This section presents an overview of such characteristics.

Table 5-B presents a summary of Shenandoah County's major demographic characteristics now available from the 1990 census, with comparative figures for Virginia and the U.S.

TABLE 5-B
SUMMARY DEMOGRAPHIC CHARACTERISTICS FOR 1990

	Shenandoah County	Virginia	United States
Total Population	31,636	6,187,358	248,709,873
Percent Male	48.3%	49.0%	48.7%
Percent Female	51.7%	51.0%	51.3%
Median Age	37.4	32.6	32.9
Percent Minorities	1.8%	22.6	19.8%

Source: Summary Tape File STF-1A, U.S. Bureau of the Census, 1991.

Age Distribution

Table 5-C shows the age distribution for Shenandoah County based on Census data from 1960 through 1990. The distribution is generally well-balanced, but the trend towards an older population is apparent as the median age has increased each decade. Persons under 20 years old decreased from 34.5 percent of the total population in 1970 to 29.1 percent in 1980, and has further decreased to 24.7% by 1990.

TABLE 5-C
AGE DISTRIBUTION: 1960, 1970, 1980, AND 1990

	1960		1970		1980		1990	
	Pop.	%	Pop.	%	Pop.	%	Pop.	%
Under 5	2,059	9.4	1,713	7.5	1,639	5.9	1,932	6.1
5 - 19	5,939	27.2	6,182	27.0	6,398	23.2	5,876	18.6
20 - 64	11,251	51.6	11,896	52.1	15,435	56.0	18,548	58.6
Over 64	2,576	11.8	3,061	13.4	4,087	14.8	5,280	16.7
Totals	21,826	100.0	22,852	100.0	27,559	100.0	31,636	100.0

Sources: U. S. Census of Population, 1960, 1970 and 1980.
Summary Tape File STF-1A, Bureau of the Census 1991

Educational Attainment

Details of educational attainment are not yet available from the 1990 Census since they are obtained from sample data. The information presented below is from 1980.

In 1980, approximately half of Shenandoah County's adults 25 years and over had earned a high school diploma. The County's employment emphasis in the past had been blue-collar-oriented in which twelve years of schooling was not always necessary. On the other hand, approximately 18 percent of County residents had completed at least one year of college education, with about 9 percent having completed four or more years. Table 5-D, on the next page, presents the 1980 data on educational attainment.

TABLE 5-D
EDUCATIONAL ATTAINMENT - 1980

Years of School Completed Number of persons 25 yrs. old & over with Elementary:	Male	Female	Total
0 - 4 yrs.	446	310	756
5 to 7 yrs.	1,797	1,628	3,425
8 yrs.	724	605	1,329
High School:			
1 to 3 yrs.	1,378	1,865	3,243
4 yrs.	2,461	3,188	5,649
College:			
1 to 3 yrs.	672	841	1,513
4 yrs.	381	542	923
5+ yrs.	426	213	639
Total Persons, 25+ yrs.	8,285	9,192	17,477
Percent High School Grads	47.6%	52.0%	49.9%

Source: Census of Population, General Social and Economic Characteristics, Table 175, 1980. U.S. Bureau of the Census

Density & Urban/Rural Distribution

The total land area of Shenandoah County is 507 square miles. There were 62.4 people per square mile in the county and the State's population density was 155.8 per square mile in 1990. Table 5-E, on the next page, shows comparative densities for other jurisdictions in the region as of 1990.

The U.S. Bureau of the Census defines an urban area as any incorporated area having at least 2,500 people. In Shenandoah County, only the Town of Woodstock fit that definition in 1980 with a population of 2,627. By 1990, both the towns of Strasburg (which had an annexation in 1984) and Woodstock met the Census Bureau's criteria for urban places: Strasburg's population was 3,762 and Woodstock's was 3,182. Strasburg was the fourth largest urban area within the Lord Fairfax Planning District in 1990, behind Winchester (21,947), Front Royal (11,880), and Luray (4,587).

TABLE 5-E
LAND AREA AND POPULATION DENSITY

Jurisdiction	Square Miles	1990 Population	1990 Density per sq. mile
Shenandoah	507.0	31,636	62.4
Clarke	174.0	12,101	69.5
Frederick	426.8	45,723	107.1
Page	316.0	21,690	68.6
Warren	219.0	26,142	119.4
Winchester City	9.2	21,947	2,385.5
Virginia	39,703	6,187,358	155.8

Sources: Areas of Virginia Localities, Bureau of the Census, 1986
Summary Tape File STF-1A, Bureau of the Census, 1991

Table 5-F, below, shows the growth rates and percentage of total population occurring in the towns and the unincorporated area of Shenandoah County from 1970 to 1990. After adjusting the town population counts to include areas annexed between 1970 and 1990, the percentage of County population in towns decreased from 37.6% in 1970 to 34.9% in 1990. Growth in towns for the period ranges from -12.0% in Toms Brook to 36.1% in Woodstock, while the unincorporated areas of the County grew by 44.3% during the same period.

TABLE 5-F
TOWN POPULATIONS

	1970	1980	1990	% Change 1970-1990
Edinburg	766	752	860	12.3%
Mount Jackson	1,320	1,419	1,583	19.9%
New Market	1,128	1,118	1,435	27.2%
Strasburg	2,775	2,826	3,762	35.6%
Toms Brook	258	226	227	-12.0%
Woodstock	2,338	2,627	3,182	36.1%
Rural Areas	14,267	18,591	20,587	44.3%
County Total	22,852	27,559	31,636	36.8%
Town % of Total	37.6	32.5	34.9	

* adjusted to reflect annexation area estimated population

Sources: Census of Population, 1970, 1980, Bureau of the Census
Summary Tape File STF-1A, Bureau of the Census, 1991

If Table 5-F is examined by decades, two very different patterns are seen. Between 1970 and 1980, the vast majority of the population growth was in the unincorporated area of the County. The towns grew only 4.4 percent during this period (adjusting for boundary changes from annexations), while the area outside of the towns grew by 30.3 percent. However, between 1980 and 1990, the population of the incorporated towns grew at a rate of 23.2 percent while the population of the unincorporated area of the County grew by only 10.7 percent.

Several factors contributed to this shift in patterns. Most notably, there was an increase in the amount and types of housing available in the towns to serve more segments of the population (apartments and townhouses), and many of the older residents moving into the County chose to live where services were more readily available.

COMPONENTS OF CHANGE

The overall trend for the County is that of a larger and older population, with an increasing number of newer residents moving in. This section discusses these and other changes in the characteristics of the population and identifies some reasons for those changes. This analysis will provide a basis for formulating expectations of development and county services demands.

Natural Increase and Net Migration

Table 5-G, on page 5-7, illustrates Shenandoah's population changes in relation to other Counties within the Lord Fairfax Planning District (LFPD), the City of Winchester, the Planning District as a whole, neighboring Harrisonburg and Rockingham County, and Virginia as a whole. The LFPD experienced a fairly rapid pace of growth between 1980 and 1990, adding 26,747 new residents to its total population. Shenandoah County ranked third in the Planning District in terms of net population growth. Shenandoah (14.8% growth) rated higher than neighboring Page County (11.8%) and the City of Harrisonburg and Rockingham County (8.0%), and was slightly lower than the statewide population increase of 15.7%.

TABLE 5-G
COMPARATIVE NATURAL INCREASE AND NET MIGRATION, 1980 - 1990

	Net Increase	Percent Change 1980 - 1990	Natural Increase	Net Migration
Shenandoah	4,077	14.8	270	3,807
Clarke	2,136	21.4	231	1,905
Frederick	11,573	33.9	2,779	8,794
Page	2,289	11.8	543	1,746
Warren	4,942	23.3	1,171	3,771
Winchester	1,730	8.6	390	1,340
LFPD	26,747	20.2	5,384	21,636
Harrisonburg/ Rockingham	6,496	8.0	3,893	2,603
Virginia	840,540	15.7	407,458	433,082

Source: Virginia Vital Statistics, Virginia Department of Health 1980 - 1989
Summary Tape File STF-1A, Bureau of the Census 1991.
U.S. Census of Population, 1980.

Historical figures show that between 1950 and 1970, almost all population increase could be attributed to natural increase. In other words, there were more births than deaths, and few people migrated into the area. Between 1970 and 1990, however, migration served as the primary cause of population increase in Shenandoah County. In fact, between 1970 and 1990, 94.5% of the County's new residents had migrated into Shenandoah County.

Two chief causes for Shenandoah's recent in-migration have been identified. The County's expanding economy has added job opportunities, enticing more people to live and work in Shenandoah. A second reason for the tremendous in-migration is the increasing number of retirees choosing to settle within the County. Its beauty and rural character, with a favorable location near major cultural and economic centers makes Shenandoah County an excellent retirement community. The result is a diversified population quite different from that of 1970.

Table 5-H, on page 5-8, helps explain the declining role of natural increase in population changes. The figures show that both birth and death rates declined from 1960 to 1989 in Shenandoah County and the State as a whole. However, longer life spans did not compensate for the fewer number of births in terms of increasing total population. Statistically, the death rate declined 9.9%, but the birth rate decreased by 37.4%. The State figures followed the same trend, with a drop of 34.4% in the birth rate. Table 5-I, also on page 5-8, carries this analysis even further, providing the numerical results of these trends between 1980 and 1990.

TABLE 5-H
BIRTH AND DEATH RATES PER THOUSAND POPULATION: 1960 - 1989

	Shenandoah County	State of Virginia
1960 - Birth Rate	19.5	24.4
Death Rate	12.1	9.2
1970 - Birth Rate	16.5	18.6
Death Rate	12.3	8.4
1980 - Birth Rate	13.4	14.7
Death Rate	11.4	7.9
1990 - Birth Rate	12.2	16.0
Death Rate	10.9	7.8

Sources: County and City Data Book, Bureau of the Census for 1967, 1977, 1983, 1989 Virginia Vital Statistics, Virginia Department of Health. December 1990.

TABLE 5-I
POPULATION CHANGE FACTORS, SHENANDOAH COUNTY AND VIRGINIA
1980 - 1990

	Shenandoah County	Virginia
Population		
April 1, 1990	31,636	6,187,358
April 1, 1980	27,559	5,346,818
Net Change	4,077	840,540
Total percentage change	14.8%	15.7%
Average annual rate	1.4%	1.5%
Components of change		
Births	3,541	855,017
Deaths	3,271	447,559
Natural increase	270	407,458
Total percentage change	1.0%	7.6%
Average annual rate	0.1%	0.7%
Estimated net migration	3,807	433,082
Total percentage change	13.8%	8.1%
Average annual rate	1.3%	0.8%

Sources: Census of Population, 1980, U.S.Bureau of the Census.
1980-1989 Vital Statistics Annual Reports, Table 1, Virginia Department of Health, Center for Health Statistics

Shenandoah County exhibited moderate population growth between 1980 and 1990, recording a 14.8% increase for the period. This was a little behind the State growth rate of 15.7%. However, the composition of the County's population growth is quite different from that of the statewide growth. While natural increase accounted for over half the population gain statewide from 1980 to 1990, it represented only 7% of Shenandoah County's population gain for the period. This means that the trend of the 1970s has slowed, but 93% of the County's population growth is due to in-migration. Many of these in-migrants are retirees, which causes the natural increase figures to remain lower.

As shown below in Table 5-J, 57.1% of residents new to the County since 1975 had moved to Shenandoah from other areas of Virginia, and 42.9% arrived from a different state. Over half (54.6%) of those coming from other states came from the South, with another 21.5% moving to Shenandoah from the West.

TABLE 5-J
1975 RESIDENCE OF 1980 POPULATION

	Total		Percent		
Persons 5 years or over	26,236	100.0			
Same House	16,539	63.0			
Different House in U.S.	9,606	36.6	100.0		
Same County	5,634		58.7		
Different County	3,792		41.3	100.0	
Same State	2,269			57.1	
Different State	1,703			42.6	100.0
Northeast	246				14.4
North Central	162				9.5
South	929				54.6
West	366				21.5
Abroad	91	0.4			

Source: Geographical Mobility and Commuting for Counties: 1980, Table 174, General Social and Economic Characteristics, 1980, U.S. Bureau of the Census

The native Shenandoah County population, as well as the Virginia, different state, and foreign-born distribution of population for the County are shown in Table 5-K on the next page.

TABLE 5-K
SHENANDOAH COUNTY RESIDENTS
PLACE OF BIRTH, 1970 AND 1980

	1970		1980	
Total Persons	22,852		27,559	
Native of U.S.	22,731	(99.5%)	27,346	(99.2%)
Born in State of residence	19,524	(85.4%)	21,735	(78.9%)
Born in different State	2,593		5,511	
Northeast	506		1,105	
North Central	346		729	
South	1,655		3,389	
West	86		288	
Born Abroad, at sea, etc.	39		100	
Foreign Born	121		213	

Sources: Social Characteristics for Counties and Independent Cities: 1970, U.S. Bureau of the Census
Geographical Mobility and Commuting for Counties: 1980, Table 174, General Social and Economic Characteristics, 1980, U.S. Bureau of the Census

Migration obviously plays a major role in population changes in Shenandoah County. It has had an important impact on the County's population in the past decade, and must be carefully considered in the formulation of population projections.

Aside from the growth resulting primarily from in-migration, other characteristics of the population have been changing, which is likely to affect the kinds of services the County may be expected to deliver. These changes are discussed below.

Population Distribution by Sex

As shown in Table 5-L, on page 5-11, Shenandoah County's male-female ratio indicates that the County has a slightly higher ratio of females to males than does the State as a whole. This relationship has not changed much between 1980 and 1990, with the percentage of females increasing by one-tenth of a percent.

TABLE 5-L
MALE/FEMALE DISTRIBUTION: 1980, 1990

		1980	1990
Shenandoah Co.	Male	13,341 (48.4%)	15,280 (48.3%)
	Female	14,218 (51.6%)	16,356 (51.7%)
	Total	27,559	31,636
Virginia	Male	2,617,729 (49.0%)	3,033,974 (49.0%)
	Female	2,729,089 (51.0%)	3,153,384 (51.0%)
	Total	5,346,818	6,187,358

Sources: Census of Population, General Social and Economic Characteristics, part 48, Virginia, Bureau of the Census, 1980
Summary Tape File STF-1A, Bureau of the Census, 1991.

Median Age

Table 5-M compares median ages of Shenandoah County with the region and the state. From 1960 to 1990 the state experienced increases in median age. Shenandoah County maintained an older population at each decennial determination, and the thirty year net increase was higher for the County than the region or the State.

TABLE 5-M
MEDIAN AGE: 1960-1990

	1960	1970	1980	1990
Shenandoah County	31.9	32.8	33.9	37.4
Lord Fairfax Planning District	30.0	30.7	32.7	34.6
State of Virginia	27.1	26.8	30.0	32.6

Sources: Virginia General Population Characteristics, Bureau of the Census, 1960, 1970, and 1980,
Summary Tape File STF-1A, Bureau of the Census, 1991.

The expanding Washington, D.C. metropolitan area to the east offers amenities for which many wish to have easy access without being caught in the middle of tremendous development. Thus, many are choosing to retire in (or commute from) Shenandoah County in a rural or small town setting with considerably lower costs of living. The Shenandoah Valley is a beautiful area and many people approaching retirement age are buying second homes in the County with plans to eventually make them their retirement homes. The increasing median age reflects these occurrences.

Racial Composition

According to 1990 census data, over 98 percent of Shenandoah County's population is white. There were less than 400 blacks in the county in 1990. Although the white population increased 3,966 from 1980 to 1990, the number of blacks decreased by 15, dropping to merely 1.1% of total population. Other minorities increased to 0.7 percent. This differs greatly from the State population, which consists of 22.6 percent minorities. Data on racial composition are presented in Table 5-N.

TABLE 5-N
RACIAL COMPOSITION: 1980, 1990

	1980 Persons	Percent of Population	1990 Persons	Percent of Population
White	27,103	98.3%	31,069	98.2%
Black	374	1.4%	359	1.1%
Other	82	0.3%	208	0.7%

Sources: General Population Characteristics, U.S. Bureau of the Census, 1980.
Summary Tape File STF-1A, Bureau of the Census, 1991.

FUTURE POPULATION GROWTH

The population count for Shenandoah County in 1990 was 31,636, a 14.8% net increase over the 1980 population of 27,559.

Since the County has a low natural increase rate, an excess of births over deaths, the primary factor for growth since 1960 has been in-migration. At all times the County has had some in-migration, but in earlier periods the residents were leaving faster than new people moved in.

New residents are likely to move to the County for retirement, for local employment or as a commuter looking for lower cost housing or a lifestyle not available in the jurisdiction of employment. The distribution of new residents from among these groups may be determined in part in 1993 or 1994, after release of complete census data.

Population projections are necessary for planning. Projections extend mathematically historical trend numbers, many of which are estimates. For the purpose of this plan, projections prepared by the Virginia Employment Commission are used. They should not be mistaken as population targets.

Table 5-O shows recent growth and projections for Shenandoah County, the Planning District, and Virginia:

TABLE 5-O
POPULATION COUNTS AND PROJECTIONS

Year	Shenandoah County	Planning District	State of Virginia
Census Counts			
1950	21,169	89,568	3,319,000
1960	21,825	97,045	3,954,000
1970	22,852	106,372	4,651,448
1980	27,559	132,492	5,346,818
1990	31,636	159,239	6,187,358
Population Projections			
2000	33,700	176,600	7,023,300
2010	36,500	97,200	7,827,900

Sources: Intercensal Estimates and Decennial Census Counts for Virginia Localities, 1790-1980, Tayloe Murphy Institute, February 1983
Virginia Population Projections 2000, Virginia Employment Commission, January 1990
Population Projections 2000-2030, Richmond Regional Planning District Commission, January 1990
Summary Tape File STF-1A, Bureau of the Census, 1991

The projected population growth for the year 2010 is 36,500, a 15.4 percent increase from 1990. For the same period, the State population is expected to increase 26.5 percent and the Planning District population is to increase 23.8 percent. Once the 1990 detailed census data is available, the Virginia Employment Commission will develop population projections based on the age distribution of the 1990 county population, historical shifts between age groups, and birth and death rates. These are likely to be available by 1993 or 1994.

The prospect of population growth concerns many residents of Shenandoah County. Some fear the loss of the County's rural nature with too rapid growth, while others remember when there was little growth and consequently limited economic opportunities. Though a majority favor some growth for Shenandoah County, opinions conflict over what rate of growth is manageable.

Another way to consider population growth is using average annual increase. Due to the national recession, very little growth took pace in the early 1980's. The 1990's could start out in the same mode. Average annual increase reflects the long term trend. A classification of population growth rates was published by the Virginia Housing Development Authority in its Statewide Housing Needs Analysis, 1975. There are:

* less than 1% average annual increase - slow growth
* between 1% and 5% average annual increase - moderate growth
* greater than 5% average annual increase - fast growth

Shenandoah County's historical and projected growth, in terms of an average annual increase follows in Table 5-P.

TABLE 5-P
AVERAGE ANNUAL INCREASE AND NET POPULATION INCREASE
SHENANDOAH COUNTY

Time Period	Net Increase	Percentage Increase	Percent Average Annual Increase
1990-1950	916	4.5	less than 0.1
1950-1960	656	3.0	0.3
1960-1970	1,027	4.7	0.5
1970-1980	4,707	20.6	1.9
1980-1990	3,711	13.4	1.3
1990-2000	2,430	7.8	0.8
2000-2010	2,800	8.3	0.8

While growth between 1970 and 1990 is moderate by the average annual rate definition, the more visible growth has been in housing units. Dwelling units in the County increased from 8,773 in 1970 to 15,115 in 1990, an average annual rate of 2.8% over the twenty year period. This is both a function of second home development and the demographic factor of a declining average household size.

Households

The number of persons per household, as defined by the Census Bureau, includes all persons living in a single dwelling unit. Table 5-Q shows historical, current estimates, and projections of average household size for the County, the Lord Fairfax Planning District (LFPD), the State, and the U.S. In all cases, the household size exhibits a steady decline

which is projected to continue. This trend will significantly affect the need for housing in the County since more housing would be required just to maintain a constant population. This is addressed further in the Housing chapter of this Plan.

TABLE 5-Q
AVERAGE HOUSEHOLD SIZE

Historical	Shen. Co.	LFPD	VA	U.S.
1970	3.02	3.11	3.13	3.14
1980	2.72	2.74	2.77	2.75
1990	2.50	2.60	2.61	2.63
Projections				
2000	2.36	2.45	2.46	2.48

Sources: National Average Household Size Estimates, U.S. Bureau of the Census, March 1989
Household Projections, Lord Fairfax Planning District Commission, 1991
Summary Tape File STF-1A, U.S. Bureau of the Census, 1991

Table 5-R, below, shows the projections of the total number of households in Shenandoah County based on the persons per household shown above. The projected 7.8% increase in population between 1990 and 2000 combined with a decline in the average household size will generate a 10.2% increase in the number of households. The projected 8% increase in population between 2000 and 2010 will generate a 14% increase in the number of households.

TABLE 5-R
PROJECTIONS OF HOUSEHOLDS

	Actual		Projections	
	1980	1990	2000	2010
Population	27,559	31,636	33,700	36,500
Persons not in Households	261	530	566	613
Person per Household	2.72	2.50	2.36	2.23
Number of Households	10,035	12,452	14,040	16,093

Source: Household Projections, Lord Fairfax Planning District Commission, 1991

SUMMARY

Shenandoah County's population has been growing at a rate above or near the State average since 1970 and is attributable mostly to in-migration. Over half of the in-migrants from 1975 to 1980 came from other areas in Virginia. Over half of the in-migrants coming from other states came from the South. Many of the new residents live outside of the incorporated towns.

The median age of County residents is increasing faster than the State average, with the percentage of persons under 20 decreasing each of the last three decades.

Population growth is projected to continue, along with the trend to smaller households. The impact of this will be considered in the section on housing. Because they will be smaller and older, many of the new households might be accommodated in apartments or townhouses within the incorporated towns and areas where public services are available.

When there is a complete release of the detailed (sample) 1990 census data, the affected portions of this section should be updated. Since both State population projections and current population estimates are based on statistical models or administrative records, the County should consider development of a management information system to track local data such as building permits, occupancy permits, school enrollments, etc. which reflect growth and change. This could be part of a geographic information system.

HOUSING

INTRODUCTION

Since the housing needs of the County's residents can be expected to change and because the provision of housing is affected by the actions of the County and Town governments, it is necessary to plan to meet both present and future housing needs. This section considers the housing market in Shenandoah County, the need for housing, and the projected changes in the total housing stock through 2010. When detailed data is available from the 1990 Census, this section should be up-dated.

In the 1973 Plan housing was briefly addressed in Part One, Section Five, and in Part Two, Section Four. There was no examination of the housing market or the needs for various types of housing.

HOUSING MARKET

Shenandoah County is defined as a basic housing market. As of 1980, 75% of its citizens lived and worked in the County. The County is also part of the regional housing market, offering relatively lower-cost housing than Clarke County, Frederick County-Winchester, Rockingham County-Harrisonburg, or Warren County. Further, the County is a sub-market of the Washington, D.C. Metropolitan Area housing market. Because of the access to the metropolitan area afforded by I-81 and I-66, families with their primary income from that area now consider Shenandoah County as a place to live.

This market was studied in the publication Housing Market Analysis: Shenandoah County, developed by the Lord Fairfax Planning District Commission. Much of the information for this section is drawn from that report and the housing element of the District Comprehensive Plan of the Lord Fairfax Planning District Commission. These documents, along with subsequent updates, may be consulted for further information.

Demand For Housing

A major concern for the County is the demand for housing. Based on the Federal Housing Administration market analysis criteria, the major determinants of demand are: 1) the rate of growth in the number of households; 2) income and employment patterns; 3) liquid asset holdings, down payment and mortgage term requirements; and, 4) space, convenience and style requirements.

The household is the basic unit of demand. Each household requires a dwelling unit, or housing. The terms "dwelling unit" and "housing" are used interchangeably. The following definitions apply:

Dwelling unit - A house, manufactured home, apartment, group of rooms, or single room occupied or intended for occupancy as separate living quarters.

Household - All of the persons who occupy a dwelling unit. They may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated persons who share living arrangements, except those in group quarters.

Growth in Households

In 1970, Shenandoah County's average household size was 3.02 compared to 3.14 for the United States. In 1980, the national average was 2.75 persons per household which was again higher than the 2.72 persons per household in the County at that time. The 1990 national average declined to 2.63 persons per household and the County's average declined to 2.50 persons or 95 percent of the national average.

A continued decline in the size of households is predicted through the year 2010. Table 6-A shows the projections of the persons per household and total number of households in Shenandoah County.

The declining household size means that housing units will be required at a higher rate than the population growth. A projected 6.5% increase in population between 1990 and 2000 (to 33,700 persons), combined with a decline in the average household size will generate a 12.8% increase in the number of households. Beyond the year 2000, a projected 8.3% increase in population between 2000 and 2010 (to 36,500 persons) will generate a 14.6% increase in the number of households.

TABLE 6-A
PROJECTIONS OF HOUSEHOLDS

	Actual		Projections	
	1980	1990	2000	2010
Population	27,559	31,636	33,700	36,500
Persons not in Households	261	530	566	613
Person per Household	2.72	2.50	2.36	2.23
Number of Households	10,035	12,452	14,040	16,093

Sources: Projections of Number of Households - Shenandoah County, 1-33-hhproj, Lord Fairfax Planning District Commission, 1990. Summary Tape File 1A, U.S. Bureau of the Census, June 1991.

Income and Employment Patterns

The economic characteristics of the County are discussed in Section 4. This section will consider the distribution of income as it affects the housing market.

The most recent data available is 1989 income tax returns for the State of Virginia. Of major concern to a builder is the price range affordable to new householders. To determine what ranges might exist in the County, the 1989 distribution of married couple Adjusted Gross Income (AGI) was used to project the income of new households. This assumes that married households will represent the majority of new households and that the income distribution among these households will be approximately the same for the near future as that in 1989. The nine income ranges are also divided into three relative levels -- low, moderate, and high income. For the projection period nearing the year 2000, these general categories may be more useful, since the actual income figures are difficult to predict.

Table 6-B on the next page uses this information as follows: Column 1 shows the nine income ranges in three general levels. Column 2 computes the affordable range of housing costs for a household in each income range. Column 3 then computes the affordable total monthly housing cost at 28 percent of the gross monthly income. This figure is an estimate of one week's take-home pay which is an accepted guide for total monthly housing cost. This figure is then multiplied by 75 percent to determine an affordable mortgage or rental payment, shown in Column 4. The remaining 25 percent is to cover utilities, maintenance, taxes, insurance, and other incidental housing costs. Depending upon which costs are included in the rental payment, the rent figure may equal Column 3, total monthly housing costs.

Column 5 shows the 1989 distribution of income for Shenandoah County married households. Column 6 and 7 is the distribution of total anticipated households between 1990 - 2000 and 2000 - 2010, based on the 1989 distribution. Total new households are the same as shown in Table 6-A.

Based on affordable housing costs, most of the lower income households will be unable to find homes that can be purchased on their incomes and will, therefore, probably seek rental units. In order to get adequate housing, these households may have to spend more than 25 percent of their income. Households in all income ranges may be willing to spend more than 25 percent of their incomes for housing. In part, for these projections to occur, the local economy must continue to expand.

TABLE 6-B
SHENANDOAH COUNTY
DISTRIBUTION OF NEW HOUSEHOLDS BY AFFORDABLE HOUSING COSTS

Income $	Affordable Housing Range at 2 and 2-1/2 Times Gross Annual Income ($)	Affordable Total Monthlly Housing at 28% Gross Monthly Income ($)	Affordable Mortgage or Rental Payment at 75% Total Monthly Housing Cost	1989 Distribution of Income for Married Households %	Distribution of New Households 1990-2000*	Distribution of New Households 2000-2010	General Income Level
Less than $ 9,999	to $20,000	$ 233 maximum	$ 175 maximum	10.8%	170	220	Low
$10,000 to $14,999	$ 20,000 to $ 37,000	$ 233 to $ 350	$ 175 to $ 263	8.9%	140	181	
$15,000 to $19,999	$ 30,000 to $ 50,000	$ 350 to $ 467	$ 263 to $ 350	10.6%	167	216	
$20,000 to $24,999	$ 40,000 to $ 62,500	$ 467 to $ 583	$ 350 to $ 437	11.2%	177	228	Moderate
$25,000 to $29,999	$ 50,000 to $ 75,000	$ 583 to $ 700	$ 437 to $ 525	12.0%	189	245	
$30,000 to $39,999	$ 60,000 to $100,000	$ 700 to $ 933	$ 525 to $ 700	21.0%	332	430	
$40,000 to $39,999	$ 80,000 to $125,000	$ 933 to $1,167	$ 700 to $ 875	12.7%	201	259	High
$50,000 to $74,999	$100,000 to $187,500	$1,167 to $1,750	$ 875 to $1,313	9.9%	156	202	
$75,000 or more	$150,000 or more	$1,750 or more	$1,313 or more	3.6%	56	72	
			TOTAL	100.0%	1,588	2,053	

NOTE: Totals have been corrected to account for rounding.

SOURCES: Lord Fairfax Planning District Commission, Data sheet 1-33-hhproj.
Distribution of Virginia Adjusted Gross Income by Income Class and Locality, 1989.

Liquid Asset Holdings and Financing

This category of determinants is difficult to predict. Mortgage interest rates and down payment requirements may become more favorable in the future; however, a sharp drop in interest rates is not anticipated. Down payment requirements for banks are held to a 20 percent minimum by law. Savings and loan associations may go to five percent. Lower down payment loans are offered through the Virginia Housing Development Authority or Farmers Home Administration for low and moderate income households who are first time buyers. The most important figure for the home buyer is the monthly housing payment. Those households with little or no liquid assets will need State and Federal programs to make home ownership within their reach.

Those new households which consist of retirees or out-commuters are likely to have higher assets with which to purchase housing in the local market. Both of these groups either come primarily from or travel to the Washington Metropolitan Area. They may have equity from the sale of property or be earning higher wages relative to the area, and thus be able to afford more costly housing than the typical Shenandoah County family. This may also be true with respect to households in higher income jurisdictions within the Planning District.

Space, Convenience, and Style

As profiled in Table 6-C on page 6-7, the County's housing is primarily single-family, detached, owner-occupied homes. Although most households would prefer such a home, many may not have the resources to buy such a home in the future. There will also be a demand for more rental units to serve the increased number of small households and those families which cannot afford or may not wish to buy a home. These demands are now being met by the sale or rent of townhouse units and by apartments. More apartment construction may be anticipated in the future, along with efforts to convert large single-family homes into apartment units.

HOUSING NEED

If all existing housing units met minimum standards, the housing market would only require the addition of enough units to meet the growth in households with enough surplus to provide an adequate vacancy rate. However, not all housing units meet standards for adequacy, so substandard units must be brought up to standards or new units provided to replace substandard units.

Adequacy of the housing stock was measured only indirectly in the 1980 Census. The two most common indicators of substandard units are overcrowding -- defined as 1.01 or more persons per room -- and a lack of complete plumbing facilities for exclusive use of the household. Since an overcrowded unit may be otherwise adequate, the best available indicator of structural inadequacy is lack of complete plumbing.

In 1980, 951 (9.5 percent) of the occupied housing units lacked one or more plumbing facilities for the exclusive use of the occupants. Plumbing facilities were hot and cold piped water, a flush toilet, and a bath tub or shower. In total, 975 (8.2 percent) of the year-round housing units were considered substandard by this criterion.

Another measure of adequacy has to do with the cost of a unit compared to household income. If the household is paying more than 25 to 30 percent of its gross income for housing, including utilities, then the unit (whether structurally standard or not) may be considered too costly relative to the household income. In some respects this is a measure of the adequacy of the income; however, it also indicates to what degree the market does not provide adequate housing at certain price levels.

The housing conditions of the County's black population were worse than for other County residents in 1980. For blacks, 11.6 percent of their dwelling units lacked complete plumbing compared to 9.5 percent of white-occupied housing units. The average household size in 1980 was 3.23 for blacks, compared to 2.71 for whites. Black ownership of homes was 66.1%, compared to 76.1% for whites in 1980.

Additional data on the 1960, 1970, and 1980 year-round housing stock are shown in Table 6-C. Due to the existence of a second home housing market in the County, there is also a large stock of homes held for occasional use. They are suitable for year round occupancy and therefore, if so utilized, on a wide scale, could result in a rapid increase in population without the construction of more new units.

The housing market is the system which currently allocates housing resources within the County. In simple terms, people buy or rent the kind of housing they can afford on their income. The Virginia Housing Development Authority and Farmers' Home Administration expand the range of choice for low and moderate income households through their loan programs. U.S. Department of Housing and Urban Development Section 236 and Section 8 rental housing program units provide some assistance to renters as does the Farmers Home Administration Section 515 Rural Rental Housing Program.

The County recognizes the need for additional affordable housing, and would support small developments of it dispersed in and around the towns and public service areas. In addition, the existing housing stock should be preserved, and upgraded where necessary. Substandard housing should be brought up to code wherever possible.

TABLE 6-C
SHENANDOAH COUNTY HOUSING STOCK
HISTORICAL, CURRENT ESTIMATE

	1960	% of Total	1970	% of Total	1980	% of Total	1990	% of Total
Total Year-round	7,208	100.0	8,707	100.0	11,861	100.0	15,160	100.0
Vacant - For Sale/Rent	221	3.1	147	1.7	423	3.6	352	2.3
- Not for Sale/Rent	480	6.7	1,034	11.9	371	3.1	507	3.3
- Held for Occasional Use	---	---	---	---	1,032	8.7	1,849	12.2
Total Occupied	6,507	90.2	7,526	86.4	10,035	84.6	12,452	82.1
Owner	4,608	70.8a	5,467a	72.6a	7,622a	76.0a	8,903a	71.5a
Renter	1,899	29.2a	2,059a	27.4a	2,413a	24.0a	3,549a	28.5a
More Than 1.01 Persons per Room	485	7.5a	424a	5.6a	257a	2.6a	210a	1.7a
Lacking Complete Plumbing for Exclusive Use	3,392	47.1b	2,531b	29.1b	975b	8.2b		
Units at Address								
Single Units (incl. Townhouses)	6,590	91.4	7,603	87.3	10,081	85.0	12,088	79.7
2+ Units (Multi-Family)	541	7.5	828	9.5	1,164	9.8	1,881	12.4
Mobile Homes	77	1.1	276	3.2	616	5.2	1,191	7.9
In-Town	---	---	2,722	31.3	3,877	32.7	4,976	32.8
Out-of-Town	---	---	5,985	68.7	7,984	67.3	10,184	67.2

Sources: Census of Housing, 1960, 1970, 1980, U.S. Bureau of the Census
Summary Tape 1A, U.S. Bureau of the Census, June 1991

Notes:
a. As percentage of total occupied.
b. As percentage of total year-round.

Housing Stock Improvement

Substandard housing units should either be brought up to standard by rehabilitation or removed from the housing stock. Due to the high costs of new construction, it is expected that most such units would be rehabilitated. Many homeowners cannot afford to move, and therefore choose to improve their current homes. Some families purchase older but larger and perhaps substandard structures and gradually improve them, which gives them more square footage of living space than they could purchase outright in perfect condition. Other substandard units may have to be replaced.

An objective for the County is for all year-round housing units to meet the standards by the year 2010. This could be achieved by encouraging the elimination of half of the substandard housing units in each of the next two decades. Using lack of complete plumbing as the best available indicator of adequacy, the 1980 substandard housing stock was 975 units, or 8.2% of year-round units. It is possible for the 1990 stock to have been reduced to 487 as a result of homeowner improvements. The balance would be reduced to zero by 2010.

Replacement of Losses

In addition to planned replacement of substandard units, other losses can be expected to occur in the housing stock. Units are lost due to: deterioration to a point where they are unfit for habitation; natural disasters such as fire and flood; man-made changes such as conversion to non-residential uses, or to group quarters, or removal from the site. Based on previous changes, documented by the U. S. Bureau of Census Components of Inventory Change, approximately 6.4 percent of each decade's beginning housing stock is lost. This percentage is applied to the projections in Table 6-E on page 6-11.

Vacancy

The number of vacant units for 1980 and 1990, and the 1990 vacancy rate are shown for each rural Census Tract and for the six incorporated towns in Table 6-D on the following page.

In the some areas of the County there is a very high vacancy rate; the Census Tract which contains the Basye/Bryce Mountain area has a vacancy rate of 47.0 percent, and the Fort Valley area has a vacancy rate of 32.8 percent. Much of this vacant housing stock represents second homes or retirement homes that are held for occasional use. The northern-most section of the County, west of routes 623 and 628, has the lowest vacancy rate of the unincorporated area.

The towns have considerable more moderate vacancy rates, ranging from 3.5 percent in the Town of Toms Brook to 8.5 percent in the Town of Woodstock.

TABLE 6-D
VACANT DWELLING UNITS 1980-1990

	Vacant 1980	Vacant 1990	'80-'90 Change	Tl. DU's 1990	1990 Vacancy Rate
Rural Portion of Census Tract					
401	85	33	-61.2%	819	4.0%
402	778	1456	87.2%	3101	47.0%
403	114	112	-1.8%	1125	10.0%
404	203	331	63.1%	1008	32.8%
405	83	82	-1.2%	1240	6.6%
406	78	76	-2.6%	884	8.6%
407	117	130	11.1%	970	13.4%
408	81	191	135.8%	1037	18.4%
Incorporated Towns:					
Edinburg	32	32	0.0%	427	7.5%
Mount Jackson	47	29	-38.3%	687	4.2%
New Market	41	51	24.4%	694	7.4%
Strasburg	78	57	-26.9%	1604	3.6%
Toms Brook	9	3	-66.7%	87	3.5%
Woodstock	80	125	56.3%	1477	8.5%

Sources: Summary Tape 1A, U.S. Bureau of Censu, June 1991
U.S. Census of Population & Housing, 1980

An adequate vacancy rate should be maintained in the housing market to provide for movement of households and the creation of new households. The Virginia Housing Development Authority in its Statewide Housing Needs Analysis, 1975 identified three recommended levels of vacancy rates based on population growth rates (derived from annual percentage increases.) They are:

A. Areas of slow growth - less than 1% average annual increase
owner vacancies = 1.0%
renter vacancies = 4.0%

B. Areas of moderate growth - between 1% and 5% average annual increase
owner vacancies = 1.25%
renter vacancies = 5.0%

C. Areas of fast growth - greater than 5% average annual increase
owner vacancies = 1.75%
renter vacancies = 7.0%

In 1990, there was a 71.5% - 28.5% split between owner and renter-occupied units. The vacancy rates shown in Table 6-E are based on the assumption that the 1990 percentage of owner-occupied units would be maintained and are applied to the average annual rate of growth on a decade-by-decade basis.

Projections

Table 6-E on the following page shows Shenandoah County's projected Dwelling Unit needs to the year 2010, based on the projected number of households, the projected number of units that must be replaced, and the expected vacancy rate needed for the housing market.

Between 1990 and 2010 an additional 5,623 housing units will be required to meet the County's projected needs. This translates into an annual average of about 281 new units. As with all projections, these projections are based on assumptions about the continuation of recent growth trends into the future, making periodic re-evaluation of the trends and projections necessary for proper planning.

Sorting the 1990 through 2010 projected new and replacement units in terms of the income categories -- low, moderate, and high -- based on 1989 income distribution, results in the following distribution of the total (2,466 + 3,157 = 5,623):

Income Level	Percent of Households	1990-2010
Low	19.6	1,102
Moderate	33.6	1,889
High	46.8	2,632
TOTAL	100.0	5,623

Table 6-E
Dwelling Unit Projections By Decade
Shenandoah County

	1980-1990	1990-2000	2000-2010
Average Annual Growth	1.40%	0.60%	0.80%
Vacancy Rate considered appropriate			
Owner	1.25%	1.0%	1.0%
Renter	5.00%	4.0%	4.0%
Occupied Units, End of Decade	12,452	14,040	16,093
Owner Units (71.5%)	8,903	10,039	11,506
Rental Units (28.5%)	3,549	4,001	4,587
Vacant Units, End of Decade	2,708	2,616	2,654
Owner Units	185	100	115
Renter Units	167	160	183
Other* - Not for sale/rent and/or held for occasional use	2,356	2,356	2,356
Total Units, End of Decade	15,160	16,656	18,747
Total Units, Beginning of Decade	11,861	15,160	16,656
Loss for Decade (6.4%)	-759	-970	-1,066
Net Dwelling Unit Base	11,102	14,190	15,590
New Units in decade	4,058	2,466	3,157
Annual Average	406	247	316

* The 1990 other vacancies is the balance of units after vacant for sale & rent is subtracted from the 1990 vacant unit counts. The total of other vacants is held constant for 2000 and 2010. This other vacant figure is added to the vacant for sale & rent to determine the total vacant units for 2000 and 2010. These other vacant figures could be smaller if the household size declines faster than projected or the County population has been under estimated. Regardless, there has been a large increase in the amount of the housing stock held as second homes.

SUMMARY

Shenandoah County's housing stock is a reflection of the market demand for housing. In addition to serving the needs of natives, it also is a desirable location for other housing buyers within the Lord Fairfax Planning District and the Northern Virginia/Washington, D.C. metropolitan area.

Based on projections of population growth and declining household size, a 13% increase in households can be expected between 1990 and 2000, and an additional 15% increase between 2000 and 2010. The types of housing that are affordable will be dictated by the household income. If current trends continue, low, moderate and high income households will split out at 19.6%, 33.6%, and 46.8% respectively.

The housing stock is primarily single-family, detached, owner-occupied homes. In 1990, the County had a vacancy rate of 18 percent. The County has a large share of second homes which accounted for 68.3 percent of all the vacant units or 12 percent of the 1990 year-round housing stock. As for quality, as of 1980 only 28 percent of those lacking complete plumbing in 1960 remained so, but there were still 975 units so classified. Some improvement is expected to be found when the detailed 1990 data becomes available.

As the County grows, the housing stock will change. Losses will need to be replaced. The vacancy rate will fluctuate with the market demand. Taking into account such dynamic factors, it is projected that 2,466 units may be added from 1990 to 2000 and 3,157 from 2000 to 2010.

A basic objective of the local governments should be to provide for a wide variety of housing opportunities within the County. This is important for the maintenance of a healthy economy. Quality, however, should be a major criteria, both in the maintenance of the existing housing stock and for additions. Additional affordable housing for workers is needed; small developments should be dispersed in and around the towns and public service areas. Substandard housing should be brought up to code wherever possible.

Federal and State programs are available to provide some assistance in the area of affordable housing. Detailed analyses of the housing stock and targeted planning is required to access funds. When complete 1990 census data is available, the County should consider a housing needs analysis.

COMMUNITY FACILITIES

INTRODUCTION

Community facilities and services in Shenandoah County are provided by the County, by other governmental agencies, and by private companies and organizations. County facilities and services include the administration building, court house and jail complex, the school system, the solid waste management system, the County Recreation Park, the Sheriff's Department, the VPI & SU Extension Service, and the Department of Social Services. Some of these services are provided in conjunction with the Commonwealth.

Public facilities were addressed in Part Four, pages 14 through 22 of the 1973 Shenandoah County Comprehensive Plan.

The towns provide general local government services and, in all but Toms Brook, their own police protection. In addition, they supply water and sewer facilities and services to most of the residents and businesses in the county that have public service. The Stoney Creek Sanitary District likewise provides water and sewer service to the Basye/Bryce Resort area, and the Toms Brook-Maurertown Service Authority provides service covering an area from Toms Brook to just north of Woodstock.

These systems are described in great detail as to their capacities, sources (for water), methods of treatment, and discharge points (for sewer) in the Shenandoah County Marketing Book, and are summarized in this section. The major effect of these facilities on the County's planning efforts lies in the location of the current and future service areas, and their ultimate capacities.

Private companies or organizations provide the other utilities (electricity, gas, telephone), own and operate the Shenandoah Memorial Hospital in Woodstock, and provide volunteer fire and rescue services, a sheltered workshop for the handicapped, and several recreational facilities.

Virginia Power serves five of the six incorporated towns and almost half of the County. The Potomac Edison Company serves the northern part of the County including the Town of Strasburg. The Shenandoah Valley Electric Cooperative--which receives power from Virginia Power's transmission system--serves the remaining portion of the County.

The Shenandoah Telephone Company provides the vast majority of the County with telephone service. Some customers on the edges of the County are also served by Centel or Contel.

Natural gas, LP gas, fuel oil and coal are all available in Shenandoah County through a variety of distributors.

SCHOOLS

There were 5 elementary schools, 5 intermediate schools, and 3 high schools in Shenandoah County for the 1990-91 school year. They had a combined enrollment of almost 5,000 students in April 1991, with approximately 420 teachers.

Located in the Northern portion of the County are Sandy Hook Elementary, Strasburg Intermediate, and Strasburg High School in Strasburg. Toms Brook Elementary is in Toms Brook, and closed at the end of the school year. The Fort Valley Elementary School is located at Detrick, and may also be subject to closing in the future.

In the Central region of the County are the towns of Woodstock and Edinburg. W. W. Robinson Elementary, Woodstock Intermediate and Central High School are all located in Woodstock. Edinburg Intermediate is in Edinburg.

The towns of Mt. Jackson and New Market are in the Southern portion of the County. There are two schools in Mt. Jackson, Triplett Intermediate School and Triplett Business and Technical Institute. The Stonewall Jackson High School and Ashby Lee Elementary School are located off of the Shenandoah Caverns exit of I-81, between the towns. New Market Intermediate closed at the end of the 1990-91 school year.

Figure 7-A, on the following page, shows the location of the public schools in Shenandoah County. All of the schools except Fort Valley Elementary School are located in or near the six towns, along the I-81/Route 11 corridor.

A State population projection for Shenandoah County estimates enrollment could be 6,310 by 2000. To address this, the Shenandoah County School Board has presented a proposal to build three new intermediate schools, expand the Sandy Hook, W. W. Robinson, and Ashby Lee Elementary Schools and update and expand the three existing high schools. This proposal also standardizes the grades taught among the three school levels.

Table 7-A, page 7-4, shows the grade levels at each school, April 1991 enrollment, and projected enrollment as compiled by the School Board Staff. The projected enrollment figures are expected at the completion date of each new/upgraded facility.

SHENANDOAH COUNTY

VIRGINIA

PUBLIC SCHOOL SYSTEM

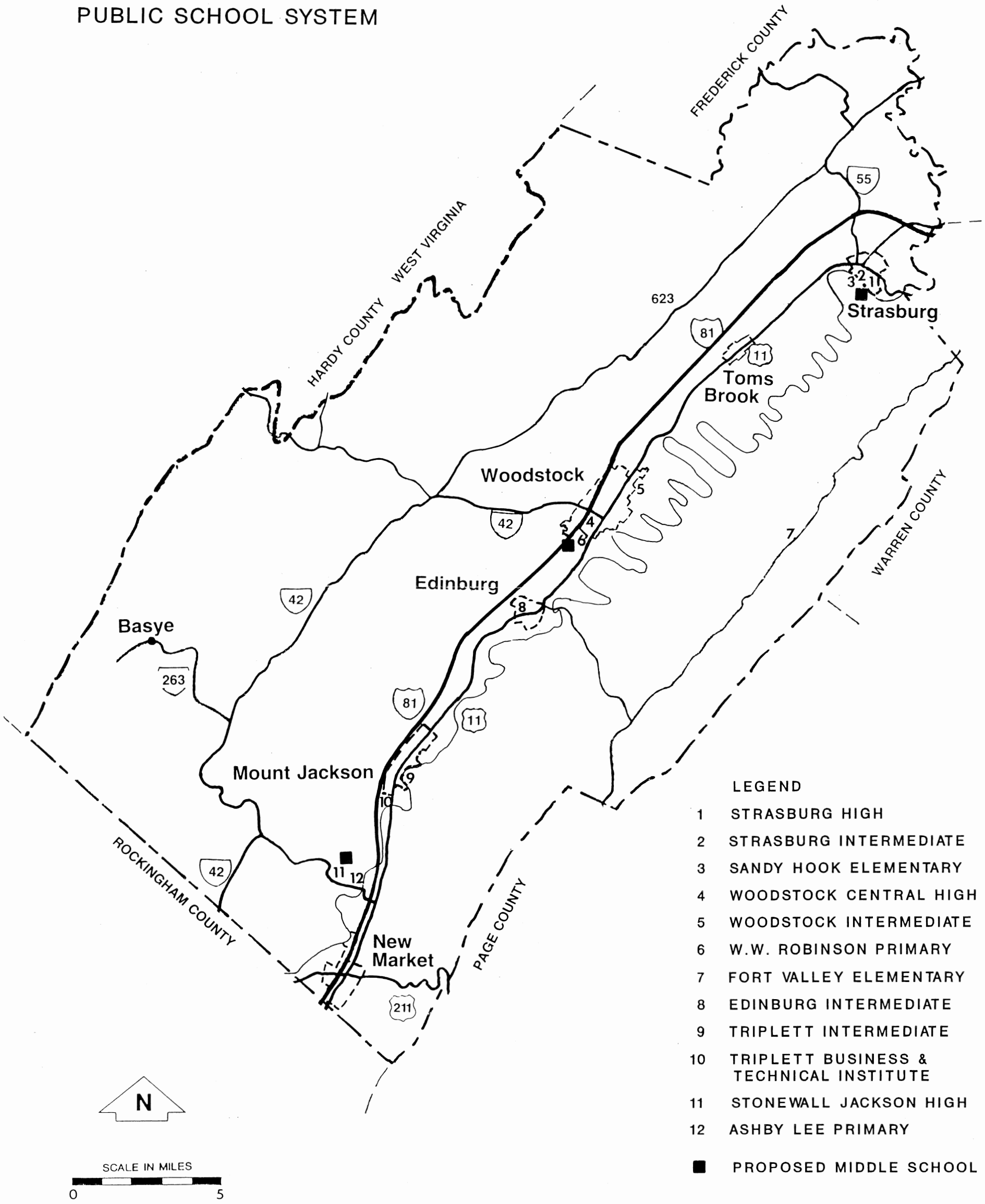


FIGURE 7-A

TABLE 7-A
SHENANDOAH COUNTY SCHOOLS
AS OF APRIL 30, 1991

Name	Current Grades	Enrollment Current	Enrollment Proj.	Proj. Grades	Complete Date
Elemetary:					
Fort Valley	1-6	31	n/a	---	
Toms Brook *	K-4, S.E.	114	n/a	---	
Ashby-Lee	K-4, S.E.	576	550	K-4, S.E.	4/91
W.W. Robinson	K-4, S.E.	867	875	K-4, S.E.	4/91
Sandy Hook	K-4, S.E.	560	625	K-4, S.E.	4/91
Elemetary Total		2,148	2,050		
Middle:					
Edinburg	5-6, S.E	333	n/a	---	
New Market	5-7, S.E.	144	n/a	---	
Strasburg	5-7	338	500	5-8, S.E.	4/92
Triplett	5-7, S.E.	200	n/a		
Woodstock	7-8, S.E.	328	710	5-8, S.E.	4/93
Southern	n/a	n/a	460	5-8, S.E.	4/93
Middle Total		1,343	1,670		
High School:					
Central	9-12, S.E.	568	710	9-12, S.E.	4/93
Stonewall Jackson	8-12, S.E.	469	460	9-12, S.E.	4/93
Strasburg	8-12, S.E.	466	500	9-12, S.E.	4/92
High School Total		1,503	1,670		
		4,994	5,390		

Notes: n/a = Information Not Available * = Closing at end of 90-91 school year

Source: Shenandoah County School Board.

Two sites have been purchased for new intermediate schools; 17 acres in Strasburg and 15 acres in Woodstock. A site for the southern intermediate school has been selected but a purchase has not yet been completed as of this writing.

In addition to the public schools, there are three private schools in the County. In New Market, the Shenandoah Valley Academy offers enrollment for kindergarten through grade 12. Valley Baptist Christian School near Edinburg also offers kindergarten through grade 12 and Massanutten Military Academy in Woodstock offers grades 6 to 12 for males and 9 to 12 for females.

Vocational Education is offered through Triplett Business and Technical Institute in Mt. Jackson.

A college education is available at many locations close to Shenandoah County. A partial listing of nearby colleges and universities and others which serve the entire state follows:

Bridgewater College	Bridgewater, VA 22812
Christendom College	Front Royal, VA 22630
Eastern Mennonite College	Harrisonburg, VA 22801
George Mason University	Fairfax, VA 22030
James Madison University	Harrisonburg, VA 22807
Lord Fairfax Community College	Middletown, VA 22645
Mary Washington College	Fredericksburg, VA 22401
Shenandoah University	Winchester, VA 22601
University of Virginia	Charlottesville, VA 22903
Virginia Military Institute	Lexington, VA 24450
Virginia Tech	Blacksburg, VA 24061

Source: Shenandoah County Marketing Book

LIBRARIES

There are six libraries serving Shenandoah County, they are shown on Figure 7-B, Community Facilities, on the following page. Each town except for Toms Brook has a small community library, and a larger Shenandoah County Library is located in Edinburg. Combined, these libraries contain an estimated 64,000 volumes. The County Library also contains nearly 1,000 videos as well as numerous magazine and newspapers.

There are four paid staff persons working in the Shenandoah County Library, plus some volunteers. The community libraries are staffed solely by volunteers. A group called Friends of the Library helps to support the community libraries with volunteers and an annual fund drive. One project they are working on is to obtain a computer and create a database of the volumes that are available throughout the community library system.

SHENANDOAH COUNTY

VIRGINIA

COMMUNITY FACILITIES

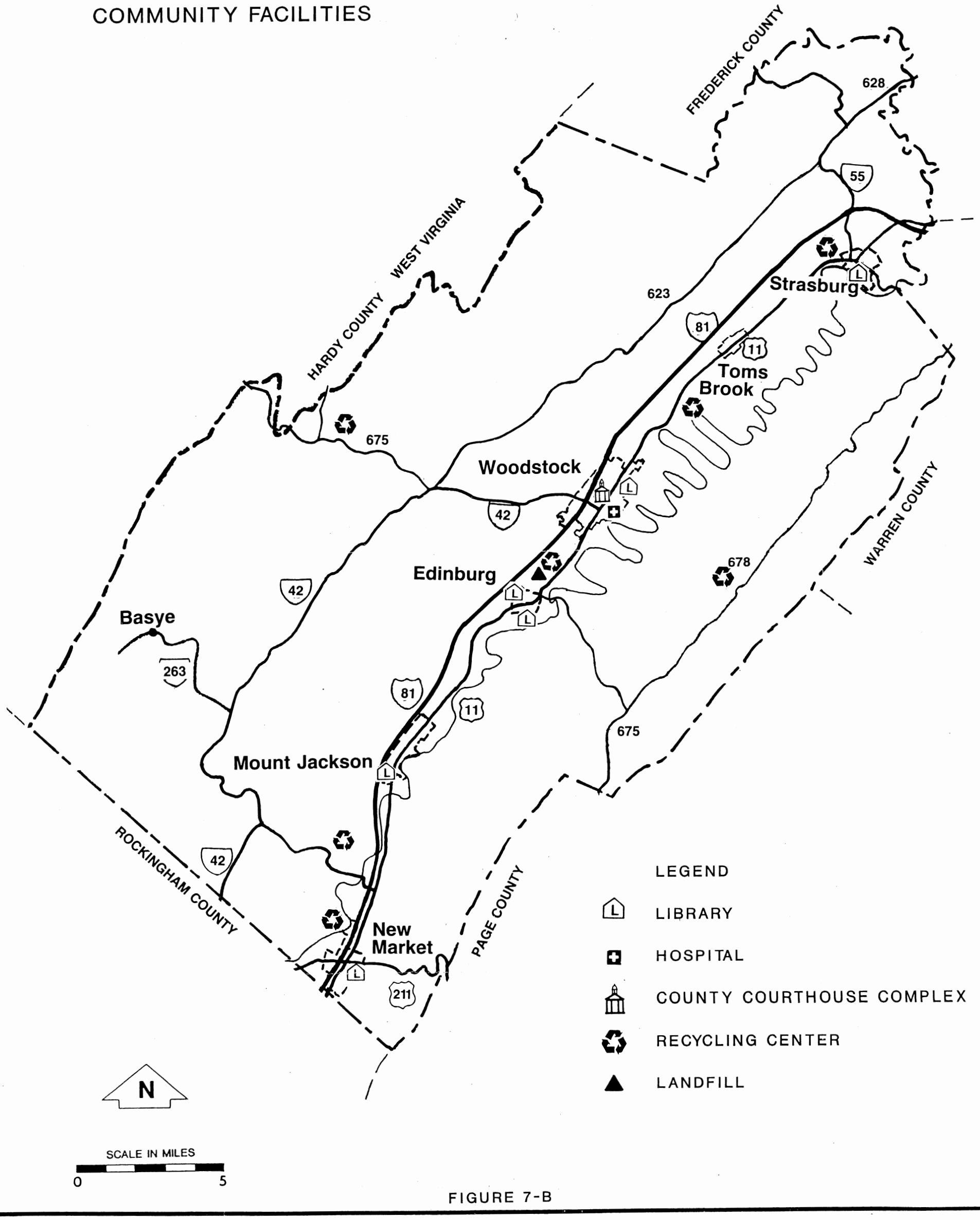


FIGURE 7-B

JULY, 1990

LORD FAIRFAX PLANNING DISTRICT COMMISSION

The State Library Board recommends 2 to 4 books per capita for libraries. Shenandoah County had a population of 31,270 according to preliminary 1990 Census figures. To meet the minimum recommended level the County would need 62,500 to 125,000 volumes. Together the County's libraries meet the minimum level recommended, but by spreading the books over different libraries the choices offered at any one library are diminished. The Shenandoah County Library contains 18,500 volumes or about 29 percent of all the books in the County.

PARKS AND RECREATION

Shenandoah County has numerous parks and recreation facilities which offer a wide range of activities for people of all ages. These facilities are owned and operated by a range of agencies and organizations including Shenandoah County, several towns, recreational associations, and private companies. Figure 7-C on the next page shows parks and recreation facilities

The Shenandoah County Recreation Park is located between Toms Brook and Maurertown. It contains picnic shelters, ball fields (two softball and one baseball), a playground, volleyball court, tennis courts, basketball court, horse shoe area, and a concession stand with rest rooms.

Mt. Jackson, New Market Strasburg, and Woodstock each have town parks. Mt. Jackson's park contains a swimming pool, tennis courts, a baseball field, basketball courts, a playground, and a picnic shelter.

New Market's park has a swimming pool, baseball diamond, volleyball courts, tennis courts, a band stand, fitness trail, picnic shelters and a barbecue pit.

Strasburg recently acquired its park, which had been owned and operated by a recreation association. The Town is now in the process of renovating and expanding its facilities, including the old pool which needs major renovations, and is not currently in use. A new playground was just designed and constructed by the community. Plans call for picnic shelters, basketball courts, and tennis courts.

Woodstock's park has a pool, playground, volleyball courts, tennis courts, basketball courts, picnic shelters, a baseball diamond, and an all-purpose field.

A few recreational facilities are owned and operated by clubs or associations, such as the Lions Club playground in Strasburg and the Madison District Park near Edinburg. Additional recreation areas are located at the County's schools. A total of 340 acres of local public and privately owned recreational land is located in the County.

The North Fork of the Shenandoah River and the County's other waterways provide residents and tourists with many opportunities for boating, canoeing, swimming, and fishing.

Along with public recreational facilities, several private companies offer recreational activities such as skiing, golfing, horseback riding, swimming, and admission to museums or caverns for a fee.

In addition to local facilities, the George Washington National Forest, which contains 77,681 acres of forest in the County, offers hiking trails, campgrounds, and picnic areas, along with hunting and fishing for both residents and tourists.

LAW ENFORCEMENT

Four categories of law enforcement agencies serve Shenandoah County citizens. The towns of Edinburg, Mt. Jackson, New Market, Strasburg, and Woodstock all have their own Police Departments.

The Shenandoah County Sheriff's Department, headquartered in Woodstock, has jurisdiction in the Towns as well as the County, but concentrates on providing protection in the rural areas and also court-related services. Central dispatch is also handled by the Sheriff's Department.

The Virginia State Police has State-wide law enforcement powers. Shenandoah County is covered by troopers working out of the Page County office in Luray.

The fourth category consists of those officers who enforce the laws and regulations pertaining to natural resource areas such as game wardens and forestry officials.

All of these groups can call on one another for assistance when needed.

EMERGENCY SERVICES

Shenandoah County has nine volunteer fire departments with a total of about 341 volunteers. These companies cover most of Shenandoah County and a portion of Rockingham County. One company from Frederick County, (Company 17 in Star Tannery), covers the Northwest portion of Shenandoah County.

The fire companies are listed on the following page in Table 7-B. The approximate number of volunteers each company has and the equipment available are also listed.

Table 7-B
Shenandoah County Fire Departments

Number	Name	Location	Active Volunteers
Co. 9	Toms Brook Volunteer	Toms Brook	47
	Equipment: 2 Pumpers, Tanker & Salvage Truck		
Co. 12	Woodstock Volunteer	Woodstock	30
	Equipment: 3 Pumpers, Tanker, Brush Truck & Ladder Truck		
Co. 13	Conicville	Conicville	20
	Equipment: 2 Pumpers & Brush Truck		
Co. 14	Fort Valley	Detrick	43
	Equipment: 2 Pumpers, Tanker & Brush Truck		
Co. 15	Edinburg Volunteer	Edinburg	45
	Equipment: 3 Pumpers & Brush Truck		
Co. 18	Orkney Springs	Orkney Springs	23
	Equipment: 2 Pumpers, 2 Tankers & Brush Truck		
Co. 20	Mt. Jackson Volunteer	Mt. Jackson	33
	Equipment: 2 Pumpers, Tanker & Brush Truck		
Co. 23	New Market Volunteer	New Market	40
	Equipment: 2 Pumpers, Tanker, Brush Truck & Ladder Truck		
Co. 51	Strasburg Volunteer	Strasburg	60
	Equipment: 3 Pumpers, Tanker, Salvage Truck & Ladder Truck		

Source: Shenandoah County Sheriff Department, 1991.

Four Rescue Squads are currently operating in Shenandoah County. One squad is located in the each of the towns of Mt. Jackson, New Market, Strasburg and Woodstock. The Mt. Jackson and Woodstock Rescue Squad operate substations. Mt. Jackson's substation is at Orkney Springs and Woodstock's substation is in Fort Valley. One Rescue squad from Rockingham County (Broadway Rescue Squad) provides emergency services to the Southwestern portion of the County.

The four Rescue Squads with the number of active volunteers and the equipment in each squad are listed in Table 7-C, on the following page.

Table 7-C
Shenandoah County Rescue Squads

Number	Name	Location	Active Volunteers
Co. 5	Woodstock Rescue Squad	Woodstock	39
	Equipment: 3 Modular Ambulances, Ambulance, Crash Truck, Utility Truck & Boat		
Co. 5	Fort Valley - Substation	Detrick	16
	Equipment: Modular Ambulance, Ambulance & Boat		
Co. 19	New Market Rescue Squad	New Market	25
	Equipment: 2 Modular Ambulances, 2 Ambulances & Carry All		
Co. 21	Mt. Jackson Rescue Squad	Mt. Jackson	30
	Equipment: 2 Modular Ambulances, Utility Truck, Crash Truck & Boat		
Co. 21	Orkney Springs - Substation	Orkney Springs	30
	Equipment: 2 Ambulances, Utility Truck & Boat		
Co. 25	Strasburg Rescue Squad	Strasburg	44
	Equipment: 4 Modular Ambulances, Crash Truck Mass Casualty Unit, 4-Wheel Drive Vehicle & Boat		

Source: Shenandoah County Sheriff Department, 1991.

Figure 7-D on the following page shows the location and service areas covered by the Fire and Rescue Departments. While all of the County has fire and rescue service, it is apparent that the remote areas of the County will be harder to serve. This factor should be considered for future residential development decisions.

The Board of Supervisors has adopted an ordinance which places a small surcharge on phone lines within the County in order to develop an enhanced 911 emergency service dispatching system. The upgraded system will provide additional capabilities for the dispatchers, and provide location information for the source of emergency calls. As part of the process of upgrading the system, all of the streets and roads must be named, and the house numbering system expanded throughout the balance of the County.

WATER AND SEWER FACILITIES

The Towns of Edinburg, Mt. Jackson, New Market, Strasburg, and Woodstock have public systems; the Toms Brook-Maurertown area is served through a public authority, and the Bryce Mountain resort and specific properties in the Basye area which contract for service are served by the Stony Creek Sanitation District. Each system is described below:

Edinburg - The Town primarily serves the area within its corporate boundaries, although a few small lines run a short distance outside them. The water system is currently utilizing one-third of the available capacity. An upgrade to the wastewater treatment plant was recently completed, which increased both the treatment level and its capacity. Rated capacity is currently 175,000 gallons per day (gpd), and the amount being pumped is approximately 89,000 to 95,000 gpd. The Town continues to work on infiltration and in-flow problems. In the future, services can be extended to the study area which was identified in the Town's Comprehensive Plan.

Mt. Jackson - A water and sewer study is currently being conducted by the Town's consultants. In the past, there haven't been coordinated policies regarding the extension of utilities outside of the corporate limits. However, there are now some guidelines which include a one-third premium on the rates, and a required analysis of the sizing of service pipes and possible requirements to contribute to their upgrading. In addition to serving the current corporate limits, the Mt. Jackson system also serves the County's industrial park located west of I-81 near the Shenandoah Caverns exit. In the future, service may be extended further in this area and then northward to serve the western side of the interstate up past the Mt. Jackson interchange. The current capacity of the wastewater treatment plant is 200,000 gpd with an average flow of 150,000 gpd.

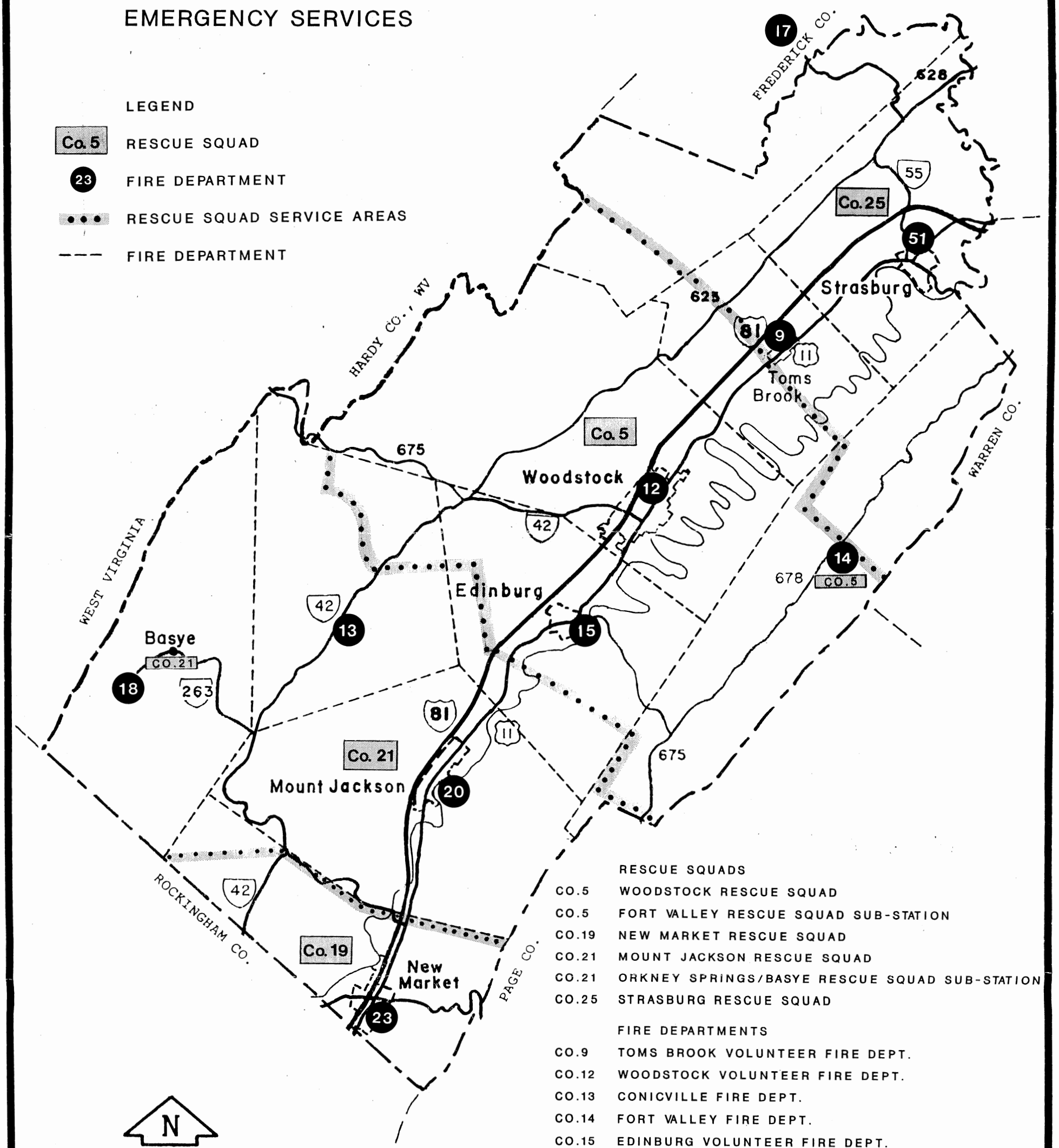
New Market - The Town has had strict policies on new connections to its systems for years. All water or sewer hookups outside of the corporate limits must have Council's approval. In addition, the connection fees are double for out of town service. No industrial hookups are allowed. The town does not feel it is in a position to finance the extension of its lines; any businesses or persons wanting service would have to pay the cost of any necessary extensions. New Market has recently completed the construction of a 500,000 gpd secondary wastewater treatment plant. The current average flow is approximately 300,000. The Town's water system has a 1.73 mgd maximum capacity, including a 500,000 storage capacity. The current average use is 534,000 gpd.

Strasburg - An upgrade of the water treatment plant was recently completed by the Town, which expanded its capacity from 670,000 gpd to 1,000,000 gpd. An upgrade project is now under way to the sewer treatment plant which has a permitted capacity of 975,000 gpd. Current averages flows at the plants are 454,000 gpd (water) and 500,000 gpd (sewer). The future service area is the area identified as Annexation Area B in the Town's annexation study.

SHENANDOAH COUNTY

VIRGINIA

EMERGENCY SERVICES



RESCUE SQUADS

CO.5	WOODSTOCK RESCUE SQUAD
CO.5	FORT VALLEY RESCUE SQUAD SUB-STATION
CO.19	NEW MARKET RESCUE SQUAD
CO.21	MOUNT JACKSON RESCUE SQUAD
CO.21	ORKNEY SPRINGS/BASYE RESCUE SQUAD SUB-STATION
CO.25	STRASBURG RESCUE SQUAD

FIRE DEPARTMENTS

CO.9	TOMS BROOK VOLUNTEER FIRE DEPT.
CO.12	WOODSTOCK VOLUNTEER FIRE DEPT.
CO.13	CONICVILLE FIRE DEPT.
CO.14	FORT VALLEY FIRE DEPT.
CO.15	EDINBURG VOLUNTEER FIRE DEPT.
CO.17	STAR TANNERY FIRE DEPT.
CO.18	ORKNEY SPRINGS FIRE DEPT.
CO.20	MT. JACKSON VOLUNTEER FIRE DEPT.
CO.23	NEW MARKET VOLUNTEER FIRE DEPT.
CO.51	STRASBURG VOLUNTEER FIRE DEPT.

FIGURE 7-D

Woodstock - The town has defined a future service area for its water and sewer facilities which will extend west to Route 763, south to Route 605, east to a proposed new road along the seven bends of the river, and north to the proposed new interchange with I-81. Current policy is to extend utilities only to those property owners who are willing to become a part of the Town through a boundary adjustment agreement with the County. Permitted capacities is 1.8 million gpd for the water system with an average flow of 600,000 gpd, and 1 million gpd for the sewage system with an average daily flow of 500,000.

Toms Brook-Maurertown Service Authority - This system provides water and sewer services to the Town of Toms Brook, the unincorporated community of Maurertown, and the surrounding area from the Toms Brook interchange at I-81 south to the Town of Woodstock. Total permitted capacity is 77,600 for the water system which pumps an average of 65,000 gpd, and 180,000 gpd for the sewage system which has an average flow of 90,000 gpd. A proposal has been made to create a sanitary district to replace the authority.

Stony Creek Sanitary District - Water and sewer service is provided primarily to the Bryce Mountain resort area and a few additional properties which contract for service by this utility system. There are no plans to provide additional service outside of the designated service area. The District relies solely on ground water for its source. Currently, the permitted capacity of the water system is 210,000 gpd, and approximately 110,000 gpd are pumped. The sewer system's permitted capacity is 600,000 gpd (at secondary treatment), with an average flow of 350,000. The wastewater treatment plant is capable of providing tertiary treatment if necessary, but this reduces its capacity.

Based on the above information, current and potential future public water and sewer service areas are illustrated in Figure 7-E, page 7-15. The Town of Strasburg service area is covered by an annexation agreement and therefore accurately represents potential future growth for the Town. This is not the case with the other towns. Individual annexation agreements may be developed between the County and the Towns of Edinburg, Mt. Jackson, New Market and Woodstock to define specific future growth areas for each.

SOLID WASTE FACILITIES

The town of Woodstock provides collection services on a once-a-week basis to its residents, using municipal crews and equipment. No separate collection fee is charged. Commercial and industrial establishments must contract separately with a private collection service.

The five other towns in Shenandoah County have municipal contracts with private disposal companies for weekly collection service. A portion of the County outside of the towns is also served by private collection services on an individual contract basis.

In the past, the County has provided bulk container service at 23 sites, using its own equipment. These 23 sites are gradually being phased out of operation and ten compactor sites which will include recycling centers will be opened. In addition, a county-wide recycling program involving all the towns is currently being developed. The majority of the towns are in favor of siting drop-off recycling containers in key locations which will allow residents to drop off their recyclables while on their way to and from other facilities or activities.

Approximately 140 tons of solid waste are disposed of daily at the County's sanitary landfill, located between Woodstock and Edinburg off of Route 11. The landfill was first established on a 43 acre site in 1973, and additional adjacent land has been purchased since to expand the site currently to 187 acres total. Scales were installed in August 1988 to provide a more accurate measurement of the waste entering the site. The projected life of the landfill is estimated to be approximately 20 years.

The County is participating in the regional solid waste planning effort, and should continue to support this cost-effective way to meet the State mandated planning and reporting requirements. In addition, an implementation plan is being developed for the Shenandoah County landfill service area, which will detail how the State goals for recycling and reduction of the waste stream will be met. The County's landfill and existing recycling centers are shown on the Community Facilities Map (Figure 7-B), page 7-6.

SHENANDOAH COUNTY

VIRGINIA

POTENTIAL WATER & SEWER
SERVICE AREAS

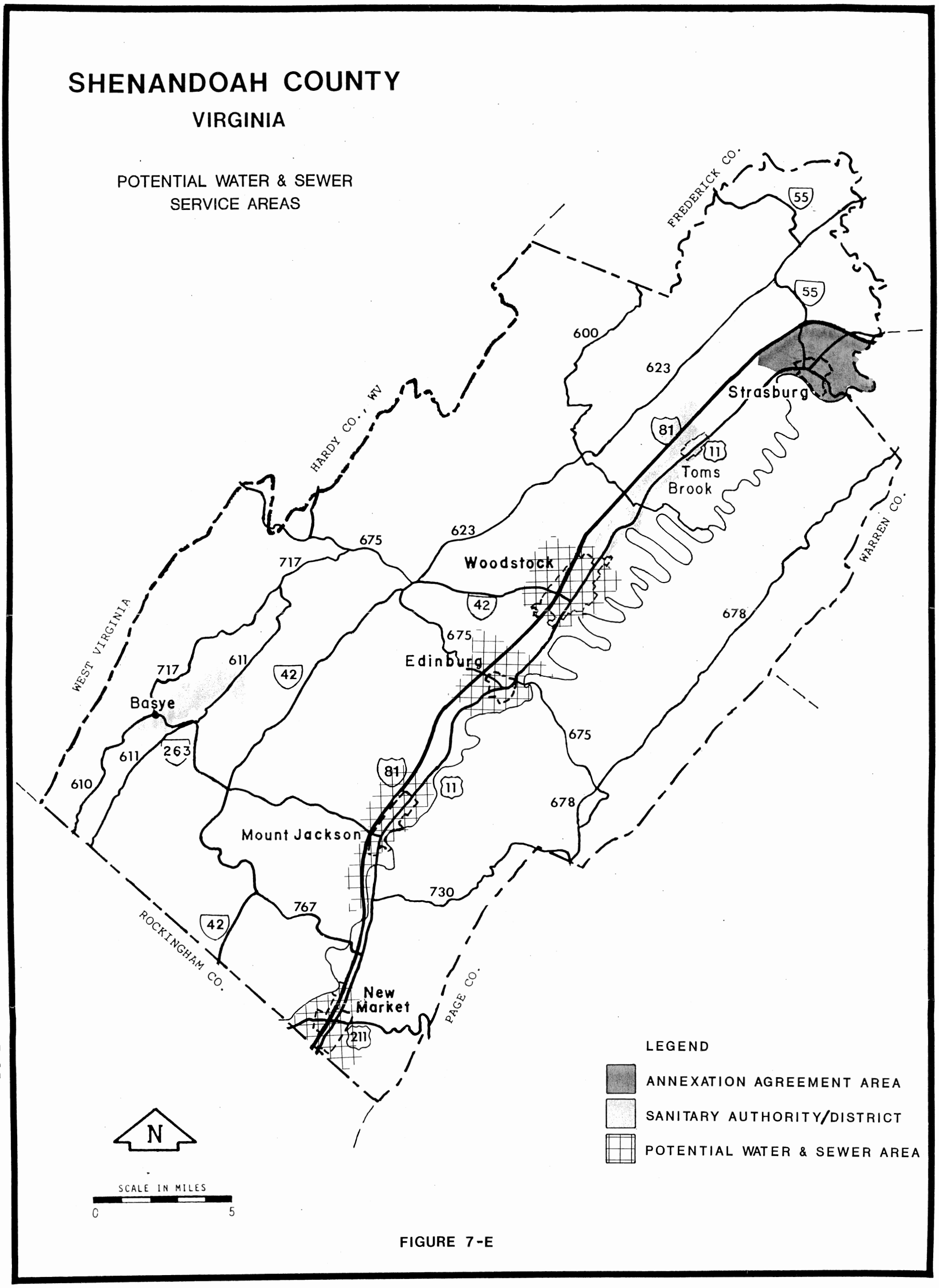


FIGURE 7-E

RECOMMENDATIONS

Adequate public services and facilities are required to serve community needs. Public service areas should be delineated around the towns to serve the needs in an efficient manner. Preliminary designations of proposed areas are shown on Figure 7-E.

Facilities that are needed to support development will also require participation by the developer(s) in their financing. This may include the extension of services to the development and the expansion of the system's capacity if required.

It is a County objective to improve the County's school facilities and curriculum. A facilities plan has been prepared and is now being implemented. The County should also promote adequate recreational facilities for citizens of all ages.

The need to improve the capability for fire and rescue service dispatching and response will be met by the enhanced 911 emergency dispatch system that has been approved by the Board of Supervisors. This will include the implementation of a county-wide road naming and house numbering system.

The County will comply with state and federal requirements for the disposal of solid waste. It is actively promoting recycling and waste-minimization efforts, and is developing a county-wide recycling program in cooperation with the Town. It will also promote regional cooperation on solid waste disposal issues by participating in regional solid waste planning, and encouraging the towns to do the same.

The County implements capital projects through a Capital Improvements Program (CIP). A fiscal analysis of recent trends in County revenues and expenditures should be conducted to determine relative fiscal capacity for expanded services and capital projects. The CIP should be maintained as part of the County budget process, and all towns and other county service agencies should be encouraged to have capital improvement programs

The provision of adequate public facilities requires foresight, planning, and coordination. It is essential that the several communities within Shenandoah County and all of the agencies, authorities, public service districts and other organizations providing services work with the County to provide facilities where needed, to guide development to desired locations, and to protect natural areas from encroachment.

TRANSPORTATION

INTRODUCTION

Transportation in and through Shenandoah County consists of five components: roads and highways, railroads, airports, bus service and taxi service, and transportation provided by local human service agencies and organizations. (See Figure 8-A, Transportation Map on the following page.)

The 1973 plan contained five paragraphs which gave general descriptions of the major transportation components (highways, bus and trucking, railroads, and airports) in Part One, Section Four, and presented major highway proposals in Part Two, Section Four.

ROAD NETWORK

The most visible mode of transportation is the road network and the vehicles which travel on it. As of December 31, 1988 (latest figures available) Shenandoah County contained 772.53 miles of roads, as follow:

TABLE 8-A
SHENANDOAH COUNTY ROAD MILEAGES, 1988

Interstate Highway	34.68 Miles
Primary Highways	94.01
Secondary Roads:	
Hard Surface	371.50
All-Weather Surface	259.48
Light Surface*	12.86
Unsurfaced	0.00
Total Secondary	643.84
TOTAL ROAD MILEAGE	772.53

*(Light surface is at least graded and drained)
Source: VDOT; General Highway Map - Shenandoah County

SHENANDOAH COUNTY

VIRGINIA

TRANSPORTATION

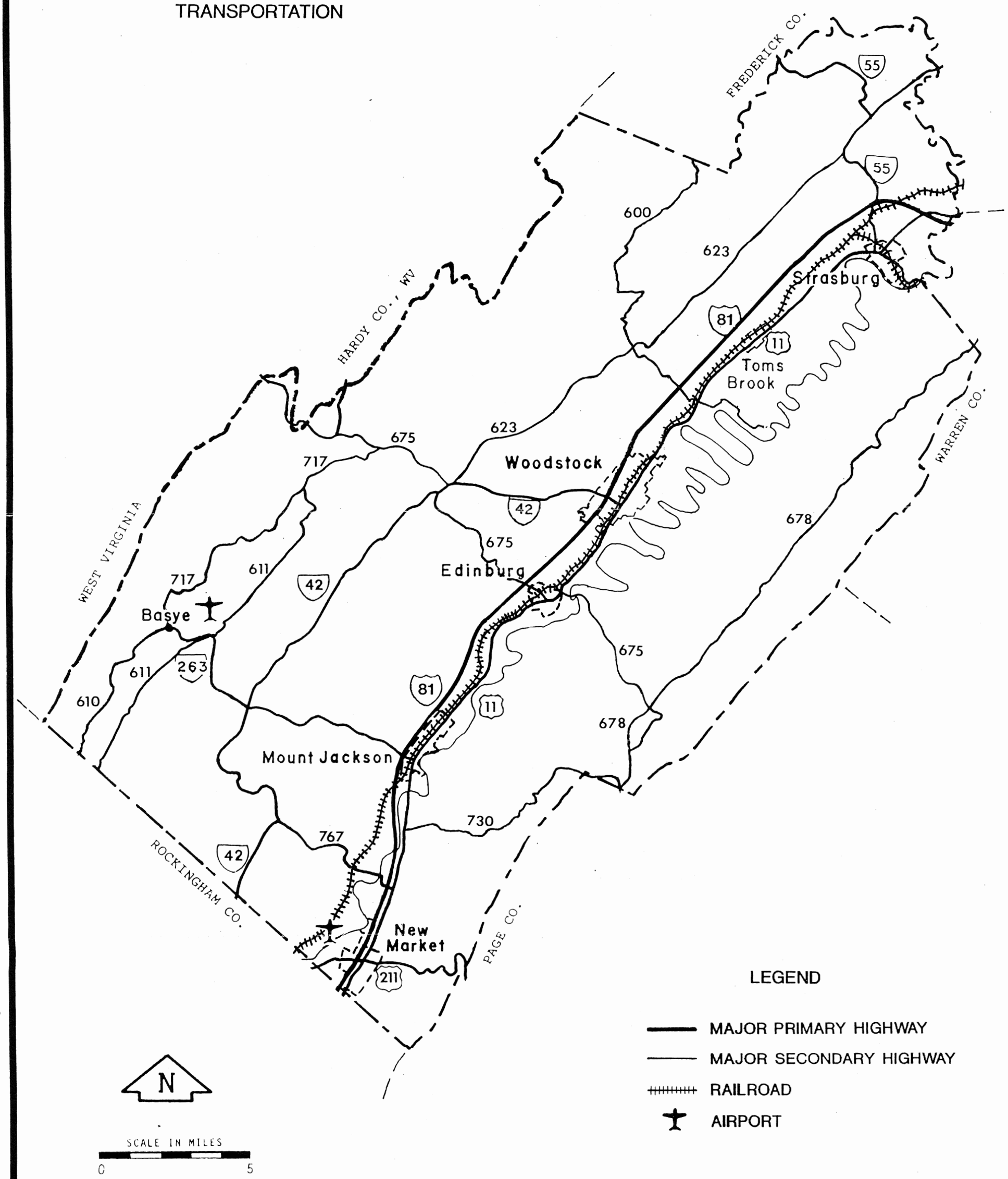


FIGURE 8-A

The total mileage of secondary roads in the County has not grown substantially in the last forty years, from 621.35 miles in 1950 to the current 643.84 miles. However, there has been a gradual upgrading of the surfaces throughout the secondary road network. As of December 1950, only 180.67 miles of secondary roads were hard-surfaced, or 29 percent. This increased to over 240 miles in 1960, over 300 miles in 1970, and over 350 miles by 1980, to the 1988 figure of 371.50, which represents approximately 58 percent of the secondary road mileage.

The extensive system of bridges that are included in the County's road system pose a significant problem in maintaining and upgrading it. Bridges are far costlier to construct than a regular road segment; therefore a far greater proportion of the County's highway allocations goes to bridge maintenance and replacement than in the average county in Virginia and, consequently, less money remains for normal road maintenance.

In addition, while gradual progress has been made over the years to upgrade unsurfaced or gravel roads to hard surfaced roads, there are still a great many existing roads that need to be upgraded. As of December 1988, 272 miles (42.3 percent of the secondary road system) were not hard surfaced.

Under present funding formulas and the statewide secondary road allocation process, there is never enough money for current road needs in Shenandoah County.

Traffic Volumes

Traffic volumes for the County's interstate and primary highways increased significantly during the period of 1980-1988, with traffic on I-81 averaging a 52.6 percent increase. Other segments of primary highways increased from a low of 3.5 percent to a high of 81.7 percent.

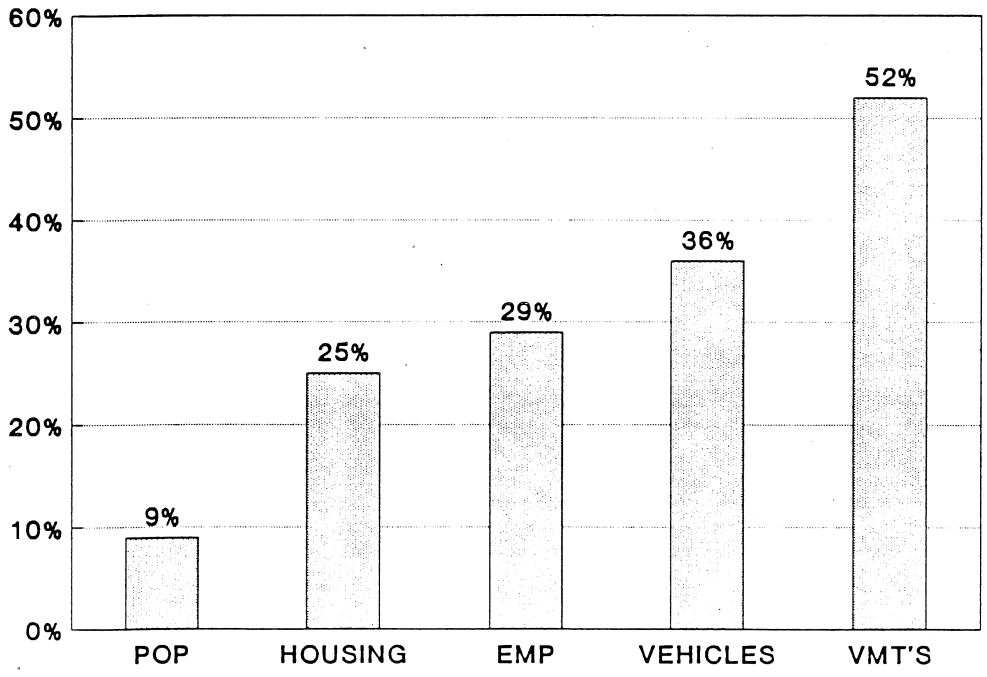
As in many other communities, traffic volumes are increasing in Shenandoah County at a much more rapid pace than are the increases in population, jobs, housing units, or the total number of passenger vehicles. See Table 8-B, Major Change Indicators 1980-1988, and Figure 8-B on page 8-4.

TABLE 8-B
MAJOR CHANGE INDICATORS 1980-1988

Category	1980	1988	Percent Change	Annual Rate
Population	27,559	30,000	9%	1.1%
Total Housing Units	11,770	14,734	25%	2.8%
Employment	12,575	16,209	29%	3.2%
Tl. Passenger Vehicles Registered	18,966	25,857	36%	3.9%
Total Vehicle Miles Traveled (VMT's) on Interstate, Arterial, & Primary Highways	649,159	988,688	52%	4.3%

Source: Lord Fairfax Planning District Commission, 1990

FIGURE 8-B
MAJOR CHANGE INDICATORS 1980-1988



Another factor that is important in the road system in addition to the total volume of traffic is its composition: whether the traffic is mostly passenger cars, the number and size of trucks, amount of buses, and so forth.

In 1980 there were an average of 1,626 single-unit trucks and 3,144 trailer trucks on the segments of I-81 that run through Shenandoah County, with no twin trailer trucks. By 1988, these figures were 881 single-unit trucks, 5,943 trailer trucks, and 507 twin trailer trucks. Both the number of trucks and their size has increased substantially on I-81 during this time period.

The total number of trucks decreased on Route 11, from an average of 1,286 in 1980 to 386 in 1988. This indicates that the growth seen in truck traffic is primarily for through traffic, not that destined for the County.

Traffic volumes on the primary and interstate highway systems in Shenandoah County are shown in Table 8-C on the next two pages.

TABLE 8-C
PRIMARY & INTERSTATE TRAFFIC VOLUMES
1980 AND 1988

Route	From:	To:	1980	1988	% Chg.
11	Rte. 81 N. of Strasburg	Strasburg	4,720	6,600	39.8%
11	Strasburg	Woodstock	5,650	6,390	13.1%
11	Woodstock	Mount Jackson	4,595	5,225	13.7%
11	Mount Jackson	Rte. 767 N. of New Market	2,575	3,335	29.5%
11	Rte. 767 N. of New Market	Rte. 211 N. New Market	2,780	3,515	26.4%
11	Rte. 211 N. New Market	Rte. 211 S. New Market	6,150	6,580	7.0%
42	Rte. 11 Woodstock	Rte. I-81	6,620	8,940	35.0%
42	Rte. I-81	Rte. 605 Calvary	4,230	5,015	18.6%
42	Rte. 605 Calvary	Rte. 675 Columbia Furnace	3,600	4,425	22.9%
42	Rte. 675 Columbia Furnace	Rte. 263 Mill	300	450	50.0%
42	Rte. 263 Mill	Rte. 767 Forestville	405	580	43.2%
42	Rte. 767 Forestville	Timberville	975	1,185	21.5%
55	NWCL Front Royal	Strasburg	2,755	3,150	14.3%
55	Strasburg	Rte. I-81	2,075	3,180	53.3%
55	Rte. I-81	Rte. 628 Lebanon Church	1,410	1,950	38.3%
55	Rte. 628 Lebanon Church	Rte. 600 near Star Tannery	960	1,485	54.7%
55	Rte. 600 near Star Tannery	West Virginia State Line	765	1,390	81.7%
211	Bus. 211 West of Luray	Rte. 11 New Market N. Int.	3,825	5,055	32.2%
211	Rte. 11 New Market N. Int.	Rte. 11 New Market S. Int.	6,550	6,580	0.5%
211	Rte. 11 New Market S. Int.	Rte. I-81 W. of New Market	7,335	7,590	3.5%
211	Rte. I-81 W. of New Market	Rte. 42 S. of Timberville	4,430	5,300	19.6%

TABLE 8-C (Continued)
PRIMARY & INTERSTATE TRAFFIC VOLUMES
1980 AND 1988

Route	From:	To:	1980	1988	% Chg.
I-81	Rte. Mauzy	Rte. 211 New Market	11,655	18,265	56.7%
I-81	Rte. 211 New Market	Rte. 703 N. of Mt. Jackson	11,340	16,985	49.8%
I-81	Rte. 703 N. of Mt. Jackson	Rte. 185 Edinburg	11,640	18,125	55.7%
I-81	Rte. 185 Edinburg	Rte. 42 Woodstock	11,950	18,300	53.1%
I-81	Rte. 42 Woodstock	Rte. 55 W. of Strasburg	12,220	19,065	56.0
I-81	Rte. 55 W. of Strasburg	Rte. 11 N. of Strasburg	12,390	18,145	46.4%
I-81	Rte. 11 N. of Strasburg	Rte. I-66 N. of Strasburg	12,365	18,630	50.7%
I-81	(Average of I-81 through Shenandoah County)		(11,937)	(18,216)	(52.6%)

Traffic counts for secondary roads are only made every other year, and the locations of the counts along a particular route may vary, so it is hard to compare figures from year to year for any particular road segment. The traffic volumes were therefore examined only for certain selected secondary roadways in the County, and were matched as closely as possible for the same road segment.

The latest detailed information available is for the counts which were taken from August through November, 1987. These volumes are compared with the volumes from the period of September through November, 1981 in Table 8-D on the following two pages.

Volumes on the secondary roads are much smaller than those of the primary and interstate roads, so a small change in the amount of traffic can yield a large percentage for a particular route. The percentage changes from 1981 to 1987 range from a 16 percent reduction to a 312 percent increase in traffic (from 8 to 25 vehicles).

The five most heavily-traveled secondary roads (outside of incorporated towns) as of 1987 were Route 604 near Woodstock (1,414 vehicles), Route 614 at Bowman's Crossing (1,087 vehicles), Route 675 at its intersection with Route 678 (1,010 vehicles), Route 623 in the Mt. Olive area (875 vehicles), and Route 678 up and down Fort Valley (704 vehicles) with the heaviest traffic at the northern end. Along with the primary highways, these roads serve as the major travel routes throughout the County.

TABLE 8-D
SELECTED SECONDARY TRAFFIC VOLUMES
1981 AND 1987

Route	From:	To:	1981	1987	% Chg.
600	G. W. National Forest	Rte. 746, S. Intersection	108	122	13%
600	Rte. 623	Rte. 652, N. Intersection	206	193	-6%
600	Rte. 11ck	Rte. 661	181	205	13%
600	Rte. 654	Dead End	8	25	312%
604	Rte. 676, S. Intersection	Rte. 676, N. Intersection	1,295	1,414	9%
604	Rte. 652	Rte. 623, W. Intersection	619	718	16%
611	Rte. 726	Rte. 263, W. Intersection	65	110	69%
611	.75 Mi. N. of Rte. 263	Rte. 720	71	208	192%
611	Rte. 835	Rte. 711	43	55	28%
611	Rte. 703	Rte. 701	26	50	92%
611	Rte. 701	Rte. 717	51	74	45%
614	Rte. 738	Rte. 728, N. Intersection	102	156	53%
614	Rte. 42, N. Intersection	Rte. 627	558	624	12%
614	Rte. 263	Rte. 703, S. Intersection	702	935	33%
614	Rte. 708, N. Intersection	Rte. 693	709	753	6%
614	Rte. 1604	Rte. 11	978	1,087	11%

TABLE 8-D (Continued)
SELECTED SECONDARY TRAFFIC VOLUMES
1981 AND 1987

Route	From:	To:	1981	1987	% Chg.
623	Rte. 681, S. Intersection	Rte. 680	801	704	-12%
623	Rte. 605	Rte. 679	499	473	-5%
623	Rte. 676, N. Intersection	Rte. 604, S. Intersection	389	463	19%
623	Rte. 600	Rte. 658, S. Intersection	603	623	3%
623	Rte. 651	Rte. 646	601	875	46%
623	Rte. 757	Rte. 55, S. Intersection	559	468	-16%
623	Rte. 714	Rte. 606, S. Intersection	289	325	12%
675	Rte. 608	Rte. 623	899	956	6%
675	Rte. 682	Rte. 808	834	969	16%
675	Rte. 1432	Rte. 678	757	1,010	33%
675	Rte. 730	Page County Line	190	207	9%
678	Rte. 675, W. Intersection	Rte. 776	484	651	35%
678	Rte. 812	Rte. 758, S. Intersection	492	600	22%
678	Rte. 772	Warren County Line	523	704	35%
717	Rte. 702	Rte. 703	203	173	-15%
717	Rte. 691	Rte. 690	376	415	10%
758	Rte. 665	Rte. 845	346	498	44%

Functional Classification

Based on the National Highway Functional Classification Study, the Virginia Department of Transportation (VDOT), in cooperation with the Federal Highway Administration, has classified all of the public roads and highways in Shenandoah County into six categories: interstate, principal arterial, minor arterial, major collector, minor collector, and local access road. They are shown on Figure 8-C on the following page and discussed below:

Interstate highways are designed to carry a large volume of through traffic between large cities. They form a national network of multi-lane, limited-access highways which carry traffic at relatively high speeds. I-81 runs through the entire length of the County and links it to the Middle Atlantic states.

Principal arterials serve substantial traffic of moderate trip length. These routes are generally four lanes in width. Route 211 is the only principal arterial in Shenandoah County.

Minor arterials form a highway network that forms links between towns and other traffic generators. They also connect to principal arterials and/or the interstate system. Route 11 from I-81 to Strasburg, and Route 55 from Strasburg west to the West Virginia line are the only minor arterials in the County.

Major collectors provide service to towns not directly linked to an arterial or interstate highway, to other traffic generators, and serve the important intra-county travel corridors. Several major collectors are shown on the Functional Classification Map.

Minor collectors collect traffic from local access roads, rural villages, and locally important traffic generators, and bring all developed areas within a short distance of a major collector.

Local access roads provide direct access to adjacent land uses, and facilitate short distance travel.

VDOT provides design standards which must be met when developing any public roadway, depending upon the proposed road's classification and use.

SHENANDOAH COUNTY
VIRGINIA

FUNCTIONAL CLASSIFICATION

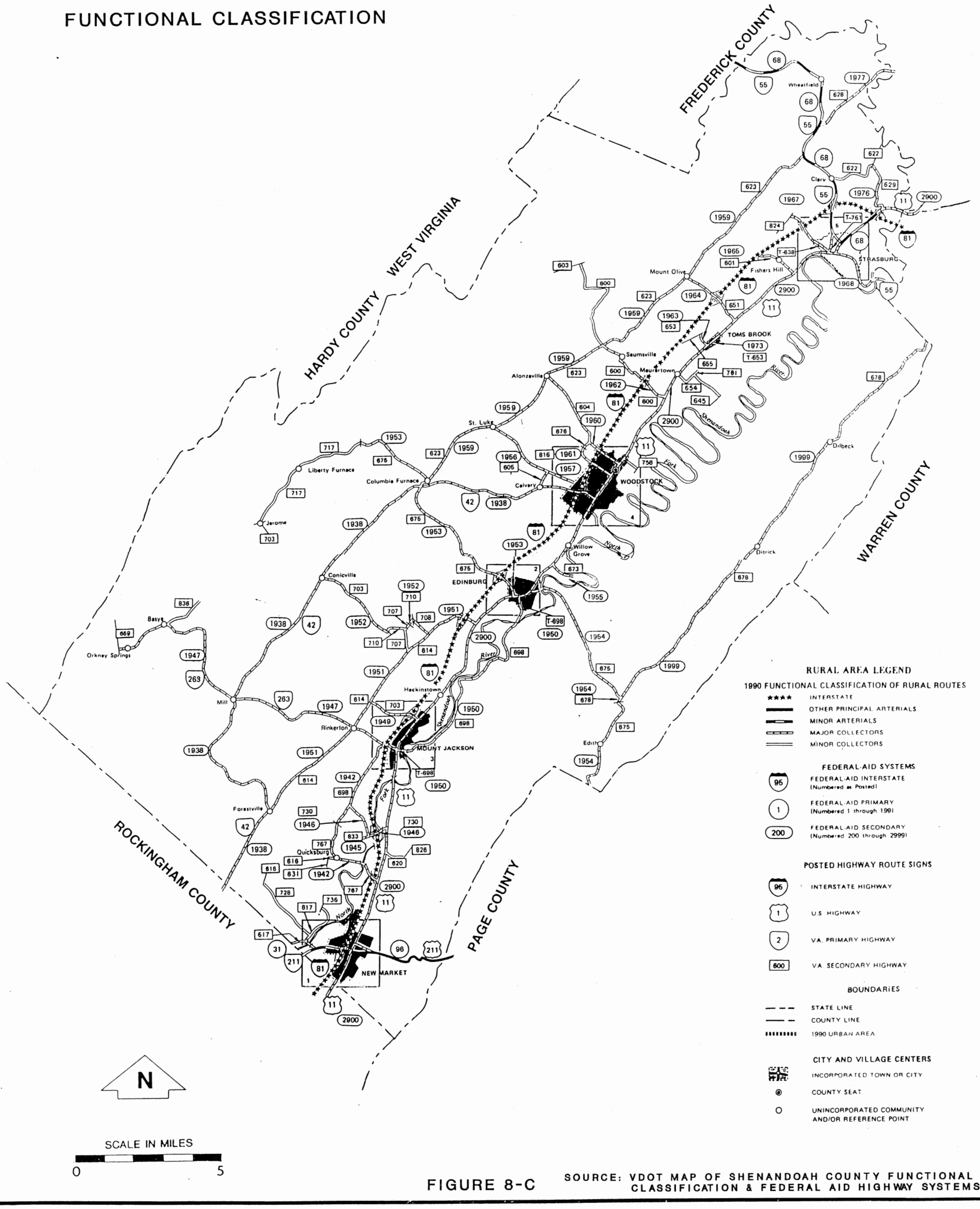


FIGURE 8-C

SOURCE: VDOT MAP OF SHENANDOAH COUNTY FUNCTIONAL CLASSIFICATION & FEDERAL AID HIGHWAY SYSTEMS

Private Roads

In addition to the public road system, there are many private roads in Shenandoah County. Usually the biggest problems associated with them is that they were not constructed to recommended geometric standards (widths, grades, curvatures, roadbeds and paving, etc.), and the lack of provision for their long-term maintenance.

The County has recently changed its development regulations regarding roads to prevent the problems mentioned above, and now no additional private roads are allowed constructed.

Road Improvement Needs

As in most Virginia counties today, there are a great many highway and secondary road improvement needs in Shenandoah County. Some of these have been identified locally as a result of the comprehensive planning process, while others have been included in the Virginia Department of Transportation's Statewide Highway Plan that is updated periodically. The major needs that have been so identified are shown on Figure 8-D on the following page.

With the increases in traffic along the length of I-81, it is felt that this facility will have to be widened to three lanes. This will be a long-term project that will have to be planned and coordinated by VDOT.

A new interchange at the north end of Woodstock is included in the Town's plan update. The detailed planning, engineering and construction process should be initiated by VDOT. A determination should also be made as to whether the partial interchange at Bowmans Crossing will need to be upgraded.

In the primary highway system, several up-grading needs have been identified. These include construction, reconstruction, or widening projects included in the Statewide Highway Plan for routes 11, 42, 55, 211 and 263. In addition, County officials recommend that the entire Route 42 and Route 263 corridors be planned for major improvements to handle the existing and future traffic flows.

In the areas around Strasburg and Woodstock, new roads are included in local plans which will connect major existing roads to allow for better local access, and also to provide bypasses around the congested central areas of those towns. The County and VDOT need to cooperate closely with the town governments in coordinating improvements in the local road systems.

SHENANDOAH COUNTY
VIRGINIA

IMPROVEMENT NEEDS ON
PRIMARY & MAJOR SECONDARY ROADS

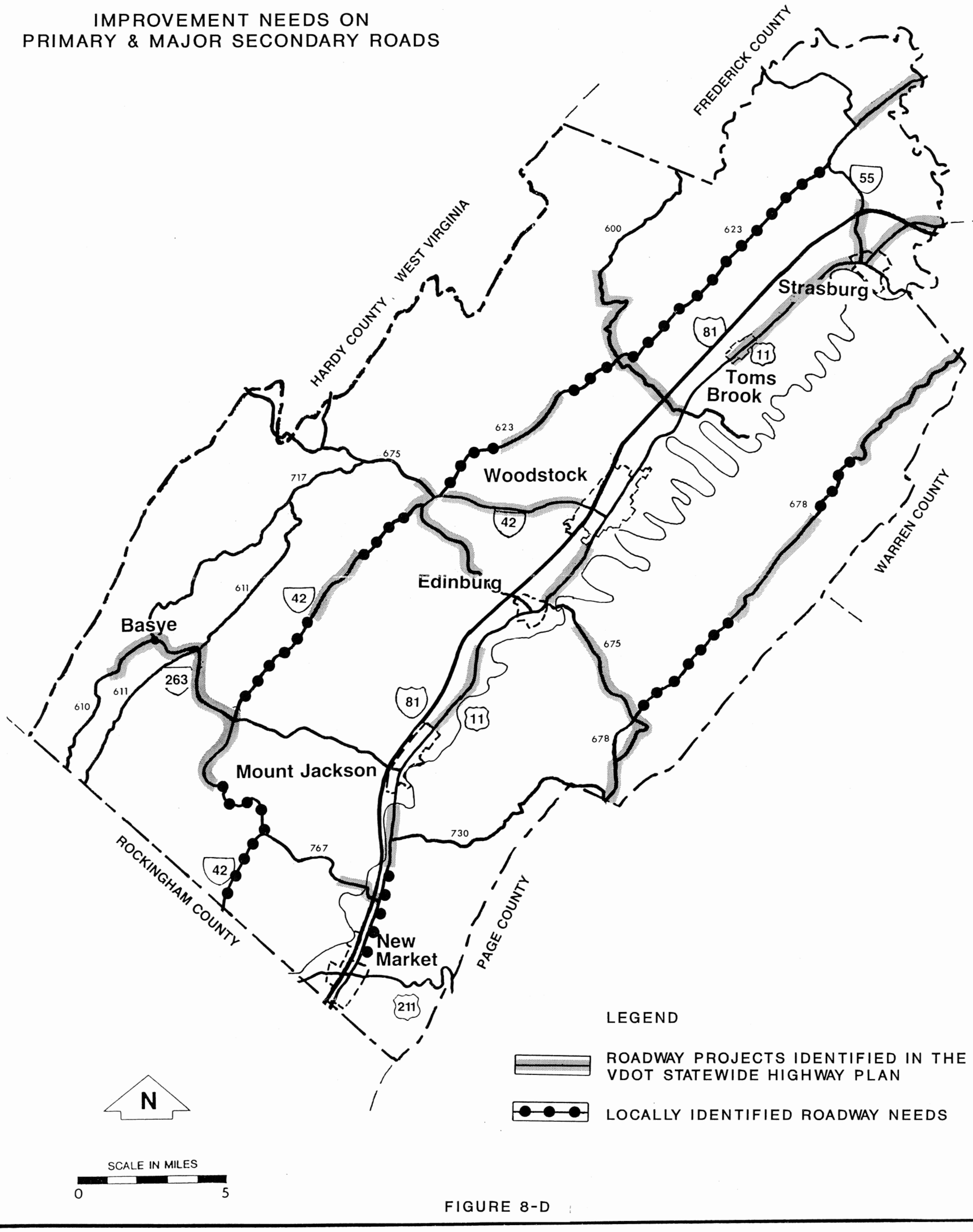


FIGURE 8-D

Rights-of-way need to be preserved to allow for future improvements to the major secondary roads. Standards for the set-backs for development along such roads need to be reviewed, with the objective of allowing for sufficient room to make improvements in the road alignments as well as their surfaces.

LOCAL PUBLIC TRANSPORTATION

If a citizen of Shenandoah County does not own or have access to a car, there are few options for getting from one place to another.

There is only one taxicab company currently active in Shenandoah County, in the town of New Market. It serves a limited area in and around the Town. Previously, there had been cabs in Strasburg and Woodstock, but they no longer exist.

The Shenandoah Area Agency on Aging (SAAA) sponsors a van which operates in the County on Tuesdays. Driven by a Retired Senior Volunteer, the van will pick up persons who are age 60 or older and have a transportation need, and take them to such destinations as shopping areas, health care facilities, or other business places.

The Senior Center in Edinburg (another SAAA program) also provides transportation to and from the center with its van. It picks up people traveling to the center in the morning and returns them home in late afternoon. The area served is north to Woodstock, and south to New Market, and the countryside in between. Trips with hot meals are also made during the middle of the day to home-bound seniors.

Additional special-purpose transportation is arranged by health associations or societies, such as the Red Cross and the American Lung Association of Virginia.

A committee was established to study the transportation needs of the elderly and handicapped, and to recommend any steps that can be taken to fill the needs. Preliminary findings indicate that no public transportation service is economically feasible at this time. The County supports private solutions to these local transportation needs.

BUS SERVICE

There is no longer any inter-city bus service in Shenandoah County. Greyhound Bus Lines previously had several stops along Route 11 in the County, but now all buses travel on I-81. The closest bus terminals are located in Winchester and Harrisonburg.

Charter bus service is available through Richards Bus Lines in Luray, Quick-Livick, Inc. based in Staunton, and Schrock Sightseeing Service in Winchester.

AIR TRANSPORTATION

There are two general aviation airports located in the County which can serve most small aircraft, one in New Market and one at the Bryce Mountain Resort.

The New Market Airport is a privately-owned public use facility. The runway is 3,000 feet long and 60 feet wide, and has low-intensity lighting that is operated from dusk until 10:00 p.m. (11:00 p.m. summers). Aviation fuel (100 LL) is also available.

Sky Bryce Airport is also a privately-owned public use facility with a 2,240 by 50 foot runway, which is open from sunrise to sunset.

A portion of the County's industrial park is located on the site of the former Mt. Jackson airport (grass landing strip) and adjacent lands. To offset the effects of this loss of an aviation facility, a preliminary site study and environmental assessment for a possible future County airport has been prepared. Although it appears that a new airport could be feasible from an economic viewpoint, there does not seem to be sufficient public support for pursuing the development of one at this time.

The County is a member of the Winchester Regional Airport Authority which operates the Winchester Regional Airport, located 31 miles from Woodstock. The 4,500 foot runway is now being expanded to 5,500 feet, and new runway and taxiway lighting is being installed. Upon completion of the runway improvements, a full instrument landing system (ILS) is scheduled to be installed. Other major improvements have recently been completed, including a new terminal building, additional hangers, and new fueling facilities. Air charter service and flight instruction services are currently available, and it is hoped that the runway extension and ILS system will lead to the establishment of commuter airline service.

The Shenandoah Valley Airport is located between the cities of Harrisonburg and Staunton at Weyers Cave. This regional airport has a 6,000 foot runway, a full instrument landing system, and is served by two commuter airlines providing scheduled flights to BWI and Dulles International airports.

RAIL TRANSPORTATION

The Norfolk Southern Railway System and the CSX Corporation both serve the County, and the two railroads connect at Strasburg. All rail services are freight-only; there is no passenger service available. Both of these lines have been identified as being low-volume lines and are subject to threats of abandonment, but they play important roles for economic development in Shenandoah County. Plans for rail transportation in the Commonwealth need to be monitored, and any attempts at abandonment of the lines in the County should be actively opposed.

A new service is available at the Virginia Inland Port, located north of Front Royal approximately 15 miles from Shenandoah County. This facility provides daily service direct to the international shipping port of Hampton Roads, Virginia. This is a deepwater port with a 45 foot channel. Containers can be transported to the Inland Port where they are loaded onto a special Port Authority train which travels to Hampton Roads daily. The Inland Port offers excellent service to any businesses that wish to import or export materials and products.

SUMMARY AND RECOMMENDATIONS

The activity seen in the Shenandoah County transportation system is directly related to the adjoining region, the state, and the eastern United States. Both internal factors (the multitude of bridges, increasing traffic) and external factors (interstate travel and truck traffic, commuting patterns) have large influences on the County's transportation needs.

The facts and needs outlined above form the basis of a general transportation policy for the County. However, an expanded and improved transportation system will be needed over the 20 year time frame of this Comprehensive Plan. To accomplish this, an in-depth transportation planning effort should be made which will include the identification of key existing roadways, an analysis of highway capacities, the projection of demands, and recommendations for transportation improvements needed to safely accommodate the projected needs.

Certain steps should be undertaken now to ensure an adequate transportation system in the future: the County should support improvements to the interstate and primary highways and access to I-81; the County must work closely with the local town governments in planning for new and improved roads as well as land uses within the urbanized areas; coordination with VDOT is essential in forming the priorities for roadway improvements; development standards for all types of development need to be reviewed to ensure adequate provision of needed transportation facilities.

GROWTH MANAGEMENT POLICIES

INTRODUCTION

Communities and their rural environs evolve...they do not leap in finished form from the plans of planners, the programs of environmentalists or the plats of developers. The landscape of Shenandoah County twenty years from now will be the result of the collective group of interested residents, the elected representatives, and outside factors which influence the County. To formulate a meaningful set of goals and policies, we must have a clear vision of where we want to go. As a starting point, the next sub-section describes Shenandoah County twenty years from now based on a consensus of popular aspirations and a realistic projection of current socio-economic trends.

SHENANDOAH COUNTY 2010 - "THE VISION"

Shenandoah County, Virginia lies at the heart of the I-81 growth corridor between Hagerstown, Maryland and Staunton, Virginia. It offers a unique alternative life style to the megalopolis that characterizes much of the Mid-Atlantic section of the United States today. Over the last twenty-five years it has experienced steady, moderate population growth, yet has generally maintained its traditional rural landscape. At least 85 percent of the County is forested or in agricultural usages. Seven compact towns and villages lie along the historic Valley Turnpike (U.S. Route 11). A diverse and thriving economic base and predominantly middle class population have ameliorated many of the socio-economic ills that plague several other parts of the Mid-Atlantic. Shenandoah County residents and visitors alike have always appreciated their quality of life. Today, it is obvious that this quality of life is better than ever.

The landscape of Shenandoah County is highly influenced by Mother Nature, traditional Germanic settlement patterns and historical transportation routes. The mountain ridges and primary roads all run in a northeast-southwest direction. Two sparsely populated valleys--Cedar Creek and Fort--define the western and eastern flanks of the County, respectively. The Little North and Massanutten mountain ranges are almost entirely forested. The central Shenandoah River Valley (North Fork) has a relatively high rural population density for Virginia because of the Germanic origins of its settlers, but still has a very open, agricultural feeling.

The towns and villages are compact and focus on historic districts which contain two hundred year old plus architecture. Seven of these towns and villages cluster in a line along U.S. Route 11 and Interstate 81. Much of the northern top of the County is within the Shenandoah County National Battlefield Park, but is protected by an overlay zone, not public ownership. The New Market Battlefield, in the southern tip of the County, is owned by the

Virginia Military Institute. A water conservation-open space system created by an overlay zone over the County's river, streams, and wetlands ties the north-south axis of the Shenandoah River with the east-west axis of its tributary streams.

Over the last twenty years, the citizens have utilized the capital and energy created by steady population and economic growth to improve on their heritage. Agriculture--in particular capital-intensive specialized agriculture--was encouraged and actively promoted by government and the general public. Shenandoah County is now a nationally recognized location for farmstead gourmet food/beverage production. Poultry and fish farming are extremely important economic activities. New residents who were not interested in agricultural life styles have tended to locate in urbanized areas, either in restored historic buildings or in compact developments which have urban utilities and services. Only non-polluting industries are recruited into the County. Strict water and air pollution regulations have been enforced with new and old industry alike. Several community facilities such as libraries, schools, and teen centers have been constructed to correct past deficiencies. All of these are networked with activities at the Shenandoah Armory, which functions as a county-wide civic center. The "good life" enjoyed by Shenandoah Valley residents for two hundred and fifty years continues on into the Twenty-first Century.

PLANNING POLICIES

A policy is a written statement intended to guide decisions and activities. Policy statements are expressed at different levels of detail: 1) general overall goals, 2) objectives or principles that further define those goals within various categories, and 3) strategies which set forth specific activities for implementation.

A goal is a broad statement of a future ideal considered desirable for the County. It is a clear and concise statement of the vision of the future of Shenandoah County.

Objectives or principles describe ideas or concepts which can be used to accomplish a goal. They are more specific in terms of the types of activities needed to achieve a particular category of goals (e.g. environmental objectives, economic principles).

Strategies are specific activities to be accomplished which will implement the goals and objectives of the plan. They are based on the facts and evidence generated throughout the planning process and used in establishing the principles or objectives.

The comprehensive planning process is dynamic. As new data is generated and trends are established, changes need to be made to the plan. While the strategies may change often (as they are accomplished or conditions change), the principles or objectives will change less often, and the general goals will not change until they have been met.

The adopted goals and objectives for Shenandoah County follow. A Generalized Future Land Use map appears at the end of this section as Figure 9-A. Section 10 of the plan focuses on implementation recommendations for the period of 1990 to 1995.

GENERAL DEVELOPMENT GOALS

The following goals are broad policies that the Planning Commission and the Board of Supervisors will apply in making decisions affecting the County's growth through the year 2010. The specific objectives and strategies were drawn from the general goals, and from the information contained in Sections 1 through 8 of this plan:

GOAL 1 - Retain the rural and open-space character of the unincorporated area of the County.

GOAL 2 - Preserve and enhance the environmental quality and historic features of the County and its quality of life.

GOAL 3 - Guide, and direct growth into and around the towns and areas served by the road network and other public facilities, while preserving the rural and open space character of those areas outside of public service areas.

GOAL 4 - Encourage the concentration of economic development within the public service areas.

GOAL 5 - Promote affordable housing for all segments of the population, particularly for semi-skilled and unskilled workers.

GOAL 6 - Provide for the improvement of the road network and other public facilities and for the delivery of necessary public services consistent with these goals.

GOAL 7 - Integrate transportation planning with land use planning.

GENERAL DEVELOPMENT OBJECTIVES

OBJECTIVE A - Provide a framework for the orderly growth of the County, within which the demands for residential, commercial, public and other land uses can be accommodated in a harmonious manner.

OBJECTIVE B - Provide a basis for designing and programming new public facilities

OBJECTIVE C - Encourage environmentally sound economic development in agriculture, industry, public facilities, and services.

OBJECTIVE D - Provide for a continuing planning process through which the needs and desires of the citizenry will be constantly reflected and realized.

OBJECTIVE E - Coordinate planning with the Lord Fairfax Planning District Commission and citizen advisory groups to insure that the County plan is consistent with stated goals.

GOALS, OBJECTIVES AND STRATEGIES FOR INDIVIDUAL PLAN CATEGORIES

1. REGIONAL SETTING & HISTORY

GOAL 8 - Protect the historic resources in Shenandoah County.

OBJECTIVE A - Preserve individual properties and sites throughout the county.

STRATEGY 1) - Encourage completion of historic surveys and nomination of eligible properties to the Virginia and National registers.

STRATEGY 2) - Require all development proposals to identify historic and prehistoric features.

STRATEGY 3) - Seek funding for rural historical preservation.

STRATEGY 4) - Encourage the use of donated easements to permanently protect buildings and sites.

OBJECTIVE B - Protect and enhance battlefield sites throughout the County.

STRATEGY 1) - Support the goals of the National Park Service study which identified four Civil War battlefield sites in the County.

STRATEGY 2) - Encourage the use of donated easements and other voluntary measures to permanently protect these sites.

2. NATURAL RESOURCES

GOAL 9 - Preserve and enhance the natural environment of Shenandoah County.

OBJECTIVE A - Protect the natural environment from damage due to development activity.

STRATEGY 1) - Protect the natural resources and respect development limitations of slope, soils, geology, and water availability.

STRATEGY 2) - Maintain agricultural and forestal lands for their contribution to the economic base and environmental quality.

OBJECTIVE B - Provide for development according to the carrying capacity of the environment.

STRATEGY 1) - Limit development in areas identified as having high potential for groundwater pollution; protect sinkholes

STRATEGY 2) - Limit density in areas which are identified as critical areas for septic systems.

OBJECTIVE C - Preserve and protect the Shenandoah River, other streams, and the County's ground water

STRATEGY 1) - Regulate development in flood plains.

STRATEGY 2) - Develop a groundwater protection strategy for the County.

STRATEGY 3) - Identify priority watersheds; identify and protect high quality streams and wetland areas.

STRATEGY 4) - Assist towns and other public water suppliers in protecting public water supplies, including wellheads and aquifer recharge areas.

STRATEGY 5) - Protect wetlands and sinkholes.

OBJECTIVE D - Require industrial compliance with environmental standards.

STRATEGY 1) - Support State agency implementation of environmental standards.

STRATEGY 2) - Provide for review of industrial proposals by State environmental agencies.

STRATEGY 3) - Include performance requirements in zoning and site plan regulations for industry.

3. LAND USE

GOAL 10 - Guide and direct growth into and around the towns and public service areas, while preserving the rural and open space character of the balance of the County.

OBJECTIVE A - Guide major development to locate in and around the towns and utility service areas.

STRATEGY 1) - Coordinate County zoning in adjacent areas around towns with zoning in the towns.

STRATEGY 2) - Identify potential public service areas and seek annexation agreements with towns to define those areas.

STRATEGY 3) - Encourage uniform town subdivision regulations.

OBJECTIVE B - Maintain the rural character of areas outside of the public service areas.

STRATEGY 1) - Confine urban forms of land development to the public service areas.

STRATEGY 2) - Encourage the use of Best Management Practices in agricultural and forestal areas.

STRATEGY 3) - Protect existing farming operations from premature or speculative development.

STRATEGY 4) - Provide for the orderly expansion of urban development into territory surrounding incorporated areas within the County while discouraging the scattering of residential, commercial, and industrial uses into the agricultural areas.

STRATEGY 5) - Maintain a low average density of dwelling units and businesses in agricultural and conservation areas.

STRATEGY 6) - Assure adequate protection for farming in zoning ordinances.

STRATEGY 7) - Encourage agricultural districts in order to utilize Use Value Taxation.

STRATEGY 8) - Consider the implementation of a land evaluation and site assessment (LESA) system for agricultural lands.

STRATEGY 9) - Use zoning to avoid the encroachment of residential use on agricultural uses.

STRATEGY 10) - Consider the implementation of sliding scale zoning where it fosters achievement of overall plan goals and objectives.

STRATEGY 11) - Encourage the use of agricultural, scenic, historic and other voluntary easements to permanently preserve land.

OBJECTIVE C - Guide future commercial land uses to locate where there is access to major transportation corridors and public utility services are or can be made available.

STRATEGY 1) - Consider locations carefully when evaluating rezoning requests.

STRATEGY 2) - Provide for adequate access and for avoiding congestion along roadways.

STRATEGY 3) - Coordinate placement of utilities with developers and the towns/service authorities.

STRATEGY 4) - Establish adequate buffer zones between residential and commercial and industrial areas to maintain property values and physical attractiveness.

OBJECTIVE D - Guide future limited industrial land uses to locate near the interstate corridor and interchanges where public utility services are or can be made available and adequate transportation facilities exist:

STRATEGY 1) - Provide a limited industrial classification in the zoning ordinance

STRATEGY 2) - Provide for adequate access and for avoiding congestion along roadways, accommodating safe and efficient movement of people and goods.

STRATEGY 3) - Coordinate placement of utilities with developers and the towns/service authorities.

STRATEGY 4) - Utilize interstate frontage for maximum value uses at interchanges where services can be provided; keep open space uses along interstate and other frontages to promote tourism and preserve historic areas.

STRATEGY 5) - Encourage light, high-tech, non-polluting industry that will benefit the economy and ecology of the County.

STRATEGY 6) - Promote industrial uses in "park" settings with adequate distance and aesthetic qualities in relation to neighboring uses and roadways.

STRATEGY 7) - Prohibit obnoxious, nuisance-type industries from all areas of the County.

4. ECONOMY

GOAL 11 - Support a business climate conducive to economic activity and encourage a diversity of business and industry in the County.

OBJECTIVE A - Encourage the development of existing and new commercial and industrial activities.

STRATEGY 1) - Continue in the Virginia Certification Program; meet re-certification requirements.

STRATEGY 2) - Emphasize the recruitment of higher wage industries and high capital investment.

OBJECTIVE B - Support travel and tourist related activities.

STRATEGY 1) - Promote tourism; encourage the protection of historic sites and recreational facilities.

OBJECTIVE C - Carefully locate business and industrial areas.

STRATEGY 1) - Encourage the concentration of economic development within the public service areas.

STRATEGY 2) - Group highway commercial/industrial services in selected locations.

OBJECTIVE D - Maintain and expand the role of agriculture as part of the basic economy of the County:

STRATEGY 1) - Provide the means to preserve agricultural land through tax policies, regulations, and support for private actions.

STRATEGY 2) - Encourage diversity in agricultural production.

STRATEGY 3) - Encourage better marketing of agricultural products.

5. POPULATION

GOAL 12 - The County's population will grow at a low to moderate rate, and this growth will not be scattered throughout the countryside.

OBJECTIVE A - Monitor growth trends.

STRATEGY 1) - analyze detailed 1990 Census data when available and incorporate it into the Plan.

OBJECTIVE B - Guide the majority of growth to the public service areas.

STRATEGY 1) - Strive for a balanced distribution of population by age group.

STRATEGY 2) - Maintain a low to moderate rate of population growth.
STRATEGY 3) - Concentrate population growth in areas served by central facilities.

6. HOUSING

GOAL 13 - Provide for a wide variety of housing opportunities and types within the County

OBJECTIVE A - Provide for a variety of housing types and locations.

STRATEGY 1) - Promote equal housing opportunity for all.

STRATEGY 2) - Encourage the creation of quality housing through land use ordinances.

OBJECTIVE B - Reduce the cost of providing housing and public facilities.

STRATEGY 1) - Provide for a range of housing types and styles consistent with a town/rural environment and local incomes.

STRATEGY 2) - Encourage maintenance of the existing housing stock with rehabilitation and historic preservation activities as appropriate.

OBJECTIVE C - Encourage energy efficient housing types and patterns.

STRATEGY 1) - Guide residential development to locate in proximity to good transportation access; near the major retail shopping areas and major employment centers; and in areas with public services such as water and sewer, fire, and police protection.

7. COMMUNITY FACILITIES

GOAL 14 - Provide a basis for designing and programming new public facilities.

OBJECTIVE A - Provide adequate services and facilities to serve planned land uses and development.

STRATEGY 1) - Delineate service areas around towns and phase development within those service areas consistent with the availability of services.

STRATEGY 2) - Infrastructure that is required for developments requires financial participation by the developers.

STRATEGY 3) - Improve the County's school facilities and curriculum.

OBJECTIVE B - Contribute to the needs of the community with parks and recreation facilities for citizens of all ages.

STRATEGY 1) - Continue to develop the County's regional and town parks.

STRATEGY 2) - Insure that all appropriate recreational facilities are provided.

STRATEGY 3) - Provide recreational programs and activities.

OBJECTIVE C - Improve the capability for fire and rescue service dispatching and response.

STRATEGY 1) - Complete the implementation of county-wide road naming and house numbering.

STRATEGY 2) - Install enhanced 911 service.

OBJECTIVE D - - Comply with state and federal requirements for the disposal of solid waste:

STRATEGY 1) - Promote recycling and waste-minimization efforts; develop and implement a county-wide recycling program.

STRATEGY 2) - Promote regional cooperation on solid waste disposal issues.

STRATEGY 3) - Participate in regional solid waste planning and encourage towns to do the same.

OBJECTIVE E - Implement capital projects through Capital Improvements Programs (CIPs):

STRATEGY 1) - Conduct a fiscal analysis of trends in County revenues and expenditures to determine relative fiscal capacity for expanded services and capital projects.

STRATEGY 2) - Maintain a County CIP as part of the budget process.

STRATEGY 3) - Encourage all towns and other county service agencies to have capital improvement programs.

8. TRANSPORTATION

GOAL 15 - Provide a safe and efficient transportation system throughout the County.

OBJECTIVE A - Integrate transportation planning with land use planning.

STRATEGY 1) - Coordinate land use planning and decisions with transportation planning.

OBJECTIVE B - Improve the secondary road system in the County by encouraging the Department of Transportation to adopt the following strategies:

STRATEGY 1) - Widen rights-of-way and roadways where necessary.

STRATEGY 2) - Improve roadway surfaces.

STRATEGY 3) - Develop better drainage along roads.

STRATEGY 4) - Upgrade subdivision road standards.

OBJECTIVE C - Improve access to I-81 and the primary highway system.

STRATEGY 1) - Reduce congestion and increase capacity at interstate interchanges through reconstruction and transportation system management measures.

STRATEGY 2) - Prevent capacity from deteriorating as additional commercial development proceeds; provide for a rigorous review of proposed projects and determination of traffic measures needed.

STRATEGY 3) - Require traffic impact analyses for larger developments.

STRATEGY 4) - Support improvements to the Interstate highway system in Shenandoah County.

OBJECTIVE D - Encourage the provision of a full range of transportation options.

STRATEGY 1) - Provide for adequate and safe pedestrian and bicycle travel.

STRATEGY 2) - Encourage public transportation initiatives by the private sector.

STRATEGY 2) - Support regional airport service.

9. GROWTH MANAGEMENT POLICIES

GOAL 16 - Provide for a continuous comprehensive process which results in policies to manage the County's growth and development.

OBJECTIVE A - Maintain the Comprehensive Plan process to implement the Generalized Future Land Use map - Figure 9-A - which presents a composite of recommended plan amendments:

STRATEGY 1) - Conduct a complete plan review in 1995, 2000, and 2005.

STRATEGY 2) - Prepare updates to individual sections, if required, on a more frequent basis.

STRATEGY 3) - Conduct special planning studies as conditions warrant.

STRATEGY 4) - Review and update the Implementation section annually as part of the County budget process.

OBJECTIVE B - Provide for adequate personnel and financial resources to manage future growth.

STRATEGY 1) - Provide staffing as required to assure effective plan analysis and implementation.

STRATEGY 2) - Update fees charged for development reviews to fully cover costs.

SHENANDOAH COUNTY
VIRGINIA

GENERALIZED FUTURE LAND USE

FIGURE 9-A

IMPLEMENTATION

INTRODUCTION

The purpose of this section is to identify specific actions that can be taken to implement the goals and objectives of the plan over the first five year segment of the planning period. The plan proposes controlled and managed growth tied to the availability and sufficiency of public facilities and services.

As the needs of an increasingly older population shift towards reliance upon proximity to community facilities, and the demands of new residents shift towards additional services, the efficiency of providing these services becomes more important.

All of these factors contribute to the importance of directing growth to where it can be most efficiently served, which supports the policy of concentrating new development mainly in and around the Towns and the unincorporated places that are served by public facilities.

To fully implement this plan will require political resolve and the committment of personnel and financial resources far above what has traditionally been the case. It will also require much greater cooperation among the County, the towns, and the service districts/authorities.

This section should be reviewed annually as part of the County's budget process.

SPECIFIC IMPLEMENTATION ACTIONS

Natural Resource Management

1) Appoint a Water Resources Steering Committee.

2) Establish a Shenandoah River Basin Surface Water Management Area in conjunction with other counties and the State Water Control Board.

3) Develop comprehensive watershed management plans for the urban development areas to address existing drainage problems and to develop sufficient stormwater management standards for new development.

4) Use all available sources of natural resource information to identify and protect aquifers, wells, wetlands, sinkholes, and critical habitats.

5) Identify prime agricultural lands, forest lands, and areas having severe limitations for septic systems and/or excavation, and work to preserve them.

6) Work with State agencies to insure that appropriate methods are in effect for rural sewage disposal along with standards and procedures for approving and monitoring those systems. Investigate the use of small community systems and sanitary districts.

Land Use Controls and Residential Development

7) Undertake an effort to establish appropriate rural and urban residential densities based on the carrying capacity of the environment, roads, and facilities. Develop information to estimate carrying capacity. Establish density standards which provide a balanced distribution of population growth.

8) Review all zoning regulations related to rural development and address efficient use of land and transportation standards.

9) Develop appropriate special ordinances or overlay districts where necessary to protect land and water resources from potential pollution.

10) Require master plans for all multi-phased developments.

11) Establish a system promoting a reasonable basis for rezoning proffers inside and outside the public service areas.

12) Provide incentives to encourage the inclusion of affordable housing in development planning.

Economic Development and Tourism

13) Undertake a complete inventory, investigation, and documentation of historic sites and develop methods to protect those sites. Recognize sites with plaques and signs.

14) Develop a comprehensive system for preserving battlefields, including the donation of historic easements.

15) Identify scenic vistas in the County and identify methods to protect those vistas.

16) Develop standards to evaluate proposals for new exactive manufacturing areas.

17) Work with local farmers, agricultural organizations, and agriculturally related businesses to develop economic development strategies in relation to agriculture.

18) Review and improve economic development policies.

Transportation

19) Develop a general road plan for the public service areas. Use the plan to identify and designate important existing and planned travel routes. Develop a process for reserving rights-of-way for planned routes and for making needed improvements.

20) Develop an interchange area/corridor plan for U.S. Route 11 and the I-81 interchanges.

21) Review and develop procedures and criteria for secondary and primary road plans.

22) Review the subdivision ordinance to provide appropriate design for streets and facilities and to insure an orderly development process. Use a road classification system to determine necessary road improvements.

23) Review development ordinances to insure that provisions for pedestrian and bicycle travel are made in developments.

Community Facilities and Services

24) Develop a general sewer and water service plan in order to establish logical limits for service.

25) Establish agreements with the utility ownership to allow for orderly expansion in accord with the land use plan.

26) Prepare a county-wide recreation plan identifying parks and recreation needs and addressing the following:
    a) Park, open space and facility needs in the urban development area.
    b) Open space and facility standards for new development.
    c) Rural and rural community center recreation needs.
    d) Recreational program needs.

27) Provide for support of the fire and rescue resources needed within the public service areas and rural areas.

28) Provide for expanded landfill operations and encourage resource recovery.

29) Support regional airport service.

Administration

30) Review the land development ordinances and administrative procedures to insure that adequate provision is made for administration and enforcement.

31) Develop a geographic database for the County which is continuously updated and which can be used to monitor development.

32) Consider planning staff additions appropriate to the expanded needs.