

Shenandoah County Comprehensive Plan - 2025



Adopted June 2005; Revised as of September 2014

ACKNOWLEDGMENTS

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

COMPREHENSIVE PLAN CITIZENS ADVISORY COMMITTEE

George Sylvester, Chairman
Russell Adams
Barbara Adamson
John Adamson
Steven Baker
Vito Gentile
Jimmy Hockman
Carolyn Long
John Mcalpine
Jane Rea
Hilda Vann
Allen White

SHENANDOAH COUNTY PLANNING COMMISSION

Jeffrey C. Aimonetti, Chairman
Mike Davis, Vice Chairman
Abbe Kennedy
John Jordan
Regan Loughlin
Dick Neese
Hilda Vann

Robert E. Kinsley, Jr. AICP, Director of Planning and Code Enforcement

SHENANDOAH COUNTY BOARD OF SUPERVISORS

Barry D. Murphy, Chairman
Dennis Morris, Vice Chairman
David E. Ferguson
Conrad A. Helsley
Dick Neese
James Patrick

Vincent E. Poling, County Administrator

Cover Photograph by Rich Cooley

CONTENTS

Acknowledgments	i
Contents	ii
Introduction & Executive Summary	vii
1. Regional Setting & History	
Introduction	1-1
Regional Setting	1-1
History	1-3
Summary & Recommendations	1-8
2. Natural Resources	
Introduction	2-1
Land Resources	2-1
Topography	2-1
Geology	2-2
Soils	2-4
Forests and Agriculture	2-10
Water Resources	2-12
Summary of Resources and Issues	2-13
Water Resources Recommendations	2-21
Natural Resource Limitations	2-24
Summary	2-25
3. Land Use	
Introduction	3-1
History of Land Use	3-1
Land Use Patterns	3-3
Development Trends	3-9
Impacts of Land Use Practices on Water Resources	3-11
Zoning	3-12
The Future of Land Use	3-15
4. Economy	
Introduction	4-1
Labor Analysis	4-2
Work Source Analysis	4-7
Economic Base Analysis	4-13
Agricultural Economy	4-16
Income Analysis	4-20
Summary	4-26

5. Population	
Introduction	5-1
Population Growth	5-1
Characteristics of the Population	5-2
Components of Change	5-7
Future Population Growth	5-15
Summary	5-19
6. Housing	
Introduction	6-1
Housing Market	6-1
Housing Needs	6-5
Summary	6-14
7. Community Facilities	
Introduction	7-1
Schools	7-2
Libraries	7-6
Recreational Facilities	7-6
Visual and Performing Arts	7-9
Law Enforcement	7-10
Emergency Services	7-10
Water and Sewer Facilities	7-12
Solid Waste Facilities	7-15
Summary	7-17
8. Transportation	
Introduction	8-1
Road Network	8-1
Local Public Transportation	8-17
Bus Service	8-18
Air Transportation	8-18
Rail Transportation	8-19
Summary	8-19
9. Growth Management	
Introduction	9-1
Planning Policies	9-2
General Development Goals	9-2
Goals, Objectives and Strategies for Individual Plan Categories	9-3
10. Implementation	
Introduction	10-1
Specific Implementation Actions	10-1

LIST OF TABLES

1-A	Virginia Landmarks Register	1-5
2-A	Major Soil Associations	2-4
3-A	Population and Land Area 1980-2010	3-8
3-B	Population and Housing Growth 1980-2010	3-9
3-C	Acreages in All County Zoning Districts	3-12
4-A	Labor Force Data	4-2
4-B	Industry of Employed Residents	4-3
4-C	Occupation of Employed Residents	4-5
4-D	Average Annual Unemployment Rates	4-6
4-E	2003 Regional Labor Pool	4-6
4-F	Employment and Income by Industry: 1980, 1990 & 2000	4-8
4-G	Commuting Patterns - 2000	4-12
4-H	Basic vs. Supporting Employment	4-14
4-I	Market Value of Agricultural Products Sold	4-17
4-J	Farm Income in Shenandoah County	4-18
4-K	Farm Income vs. Total Personal Income	4-18
4-L	Farm Employment vs. Total Employment by Place of Work	4-19
4-M	Farm Employment in Shenandoah County	4-19
4-N	Median Family Income	4-20
4-O	Per-Capita Personal Income - 1999	4-22
4-P	Average Weekly Wages Paid in Shenandoah County Covered Employment for 1980, 1990, 2000	4-23
4-Q	Average Weekly Wages - 2000	4-23
4-R	Components of Personal Income	4-25
5-A	Population Growth 1840-2000	5-1
5-B	Summary Demographic Characteristics for 2000	5-2
5-C	Age Distribution: 1970, 1980, 1990, and 2000	5-3
5-D	Educational Attainment - 2000	5-4
5-E	Land Area and Population Density	5-5
5-F	Town Populations	5-6
5-G	Comparative Natural Increases and Net Migration 1990-2000	5-8
5-H	Birth and Death Rates per Thousand Population: 1970-2000	5-9
5-I	Population Change Factors, Shenandoah County and Virginia 1990-2000	5-10
5-J	Place of Residence in 1985 of 1990 Population and in 1995 of 2000 Population	5-11
5-K	Shenandoah County Residents Place of Birth 1980, 1990 & 2000	5-12
5-L	Male/Female Distribution: 1990, 2000	5-12
5-M	Median Age: 1970-2000	5-13
5-N	Racial Composition and Hispanic Origin: 1990 & 2000	5-14
5-O	Population Counts and Projections	5-15

5-P	Population Projections - 2010 through 2050	5-16
5-Q	Average Annual Increase and Net Population Increase	5-17
5-R	Average Household Size	5-18
5-S	Projection of Households	5-18
6-A	Projections of Households	6-2
6-B	Distribution of New Households by Affordable Housing Costs	6-4
6-C	Shenandoah County Housing Stock - 1980-2000	6-6
6-D	Vacant Dwelling Units 1990-2000	6-11
6-E	Dwelling Unit Projections by Decade	6-13
7-A	Shenandoah County Schools as of March 2012	7-3
7-B	Comparison of Shenandoah County High Schools with State of Virginia Averages	7-4
7-C	Shenandoah County Fire Departments	7-11
7-D	Shenandoah County Rescue Squads	7-12
8-A	Shenandoah County Road Mileages, 2001	8-1
8-B	Major Change Indicators 1980-2000	8-4
8-C	Primary & Interstate Traffic Volumes 1990 and 2002	8-6
8-C	Primary & Interstate Traffic Volumes 1980, 1990 and 2000 (Continued)	8-7
8-D	Selected Secondary Traffic Volumes 1991 and 2002	8-9
8-D	Selected Secondary Traffic Volumes 1991 and 2002 (Continued)	8-10

LIST OF FIGURES

1-A	Regional Location Map	1-2
1-B	Historical Resources	1-7
2-A	General Geology	2-3
2-B	General Soil Map	2-5
2-C	Hydrogeologic Survey of Shenandoah County	2-14
3-A	Proportion of All County Land Uses	3-4
3-B	Generalized Existing Land Use Map	3-5
3-C	Agricultural & Forestal Districts Map	3-6
3-D	Changes in Developed Land Use 1988-2012	3-7
3-E	Population Growth 1980-2010	3-10
3-F	Housing Growth 1980-2010	3-10
3-G	Percentage of Housing Growth in Rural Areas vs. Towns	3-10
3-H	Generalized Zoning	3-13
3-I	Acreage by Zoning District	3-14
3-J	Future Growth Areas	3-18
3-K	New Market Growth Area	3-19
4-A	Employment by Industry	4-9
4-B	Income by Industry	4-10
4-C	Median Family Income - 1999	4-21
4-D	Per-Capita Personal Income - 1999	4-22
6-A	Housing Data Report 2003	6-8
6-B	Shenandoah County Housing Analysis Areas	6-9
6-C	Shenandoah County Housing Density	6-10
7-A	Community Facilities	7-5
7-B	Parks and Recreation	7-8
7-C	Emergency Services	7-13
7-D	Public Service Areas	7-16
8-A	Transportation	8-2
8-B	Major Change Indicators 1980-2000	8-4
8-C	Functional Classification	8-12
8-D	Road Improvement Needs	8-16

INTRODUCTION & EXECUTIVE SUMMARY

The purpose of this comprehensive plan, as set forth in the Code of Virginia, 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.”

Shenandoah County’s first comprehensive plan was prepared in the early 1970’s by the 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. It covered the period 1973-1990. At the time, growth and development were new for the County. Its population had remained almost constant at approximately 20,000 for the preceding century. Development of the interstate highway system, however, opened the County to north-south interstate commerce and to retirement and second home development from Washington, DC and other metropolitan areas of Virginia and Maryland. The comprehensive planning process and implementing ordinances offered the County a way to deal with impending growth.

A second County comprehensive plan, covering the period 1991-2010, was adopted by the Board of Supervisors on December 10, 1991. Unlike the first plan, this plan had the benefit of extensive involvement by County officials, a review by an appointed citizens review committee, and a series of public meetings and hearings. Much of the Vision statement and the General Development Goals espoused in the 1991-2010 Plan remains valid to this day.

In the fall of 2002, the County sponsored a series of three public meetings distributed throughout the County for the purpose of soliciting citizen inputs for an update to the comprehensive plan, such plan to cover the period to 2025. As a direct product of those public meetings, a Citizens Advisory Committee was appointed by the Board of Supervisors. The mission of the Citizens Advisory Committee was to update the 1991-2010 Plan, chapter by chapter, under the guidance and direction of the Director of Planning and Code Enforcement. Meeting on a monthly basis, the Committee completed a draft of the new comprehensive plan in October 2004. At that time the Committee hosted a series of six public meetings, one in each electoral district. Public response was spirited and constructive. Comments from the six public meetings were then assessed by the Committee and, where appropriate, became revisions to the draft. The Committee then proceeded to prepare the Implementation chapter. Following completion of the draft plan update, a joint workshop was held on April 7, 2005 between the Board of Supervisors, the Planning Commission and the Citizens Advisory Committee where consensus on the Plan’s goals, objectives and strategies was obtained.

SHENANDOAH COUNTY 2025 – “THE VISION”

The following Vision Statement describes in a broad sense what we as a county want to be twenty years from now. It is based on a consensus of popular aspirations and a realistic projection of current socio-economic trends. The Vision Statement provides the framework for formulating a meaningful set of goals and policies for Shenandoah County over the next 20 years.

In the year 2025, Shenandoah County will still be a primarily rural community that:

- Protects its natural resources
- Directs its growth to the towns ensuring its open, agricultural character
- Provides a variety of jobs in business, light industry, tourism, and sustainable agriculture
- Maintains moderate growth of a demographically varied population
- Supports safe and efficient interstate transportation and maintains the rural character of its primary and secondary roads
- Affords its students excellent and appropriate education
- Serves its citizens with public facilities and services that enhance their quality of life
- Ensures preservation of its natural beauty and unique, historical character by strictly adhering to the goals and objectives of the Comprehensive Plan.

MAJOR ISSUES

During the series of public meetings held in October-November 2004, the Citizens Advisory Committee identified the following seven major Comprehensive Plan-related issues that the County leadership will need to deal with over the course of the Plan years 2005-2025:

1. Protecting the quality of our wells and streams. The limestone geology of the Valley, and particularly the fractionated limestone (karst) that characterizes much of Shenandoah County, puts the quality of our groundwater at substantial risk. The fractured bedrock, sinkholes, caverns and caves of karst terrain mean that surface contamination is easily transferred to underground water supplies. Several tributary streams and portions of the North Fork are “impaired,” meaning that they are sufficiently polluted that swimming in them or eating fish caught in them is unsafe. This condition results from such causes as failed septic systems, improper manure management, runoff from farms and urban areas, and even wildlife. Surface water and groundwater are interconnected throughout much of the region. Sample testing indicates that a significant percentage of septic systems are failing (21%) and that many private wells do not meet safe standards for bacteria and nitrates (38%). The Implementation chapter contains a number of recommendations, some voluntary and some regulatory, for ensuring that the quality of the water supply is adequate for the foreseeable future.

2. Attracting quality business and industry. The median family income in Shenandoah County of \$45,000 is \$3,500 below that of the Northern Shenandoah Valley Regional Planning District (of which Shenandoah County is a part) and \$9,000 below that of the Commonwealth of Virginia. This relatively low figure is due largely to the predominance of manufacturing in the County. These industries require mostly semi-skilled labor and pay relatively low wages. Daily some 6000 residents of the County commute elsewhere to jobs that pay more than they could earn here. During the past decade there have been few new jobs created in the County that pay more than the average. If the County is to break out of the current cycle of low-paying jobs, it will need to attract a different kind of business and industry – ones that require a better educated workforce, a more highly skilled workforce, a more technically oriented workforce, a more knowledge-based workforce. Such companies hire mostly college graduates, and they pay substantially higher wages and salaries. Recruiting such companies requires a collective community effort to create a business-friendly climate and a targeted effort to recruit the right kind of companies to build or relocate here. With a more highly educated workforce, new companies will look closely at the quality of the public schools in the county. Shenandoah County schools currently spend over \$1000 less per student than the state average, have a significantly higher student/teaching position ratio in grades 8-12 than the state, show lower average SAT scores than the state average, and otherwise show indications that the quality of instruction offered to high school students who aspire to four-year college degrees needs improvement. See the Implementation chapter for specific recommendations related to attracting quality business and industry to the County.

3. Promoting and protecting farming as an occupation. Farming is the traditional economic lifeblood of the Shenandoah Valley and also the foundation of much of its culture. The County ranks 5th in the state in agriculture. However, there are many current trends that are slowly but surely eroding the agricultural orientation of the County. Since 1980 there has been a 20.7% reduction in farm employment. In just the last five years some 52 new housing subdivisions (565 lots) have been created in rural areas. The farm acreage lost during that period is the most in the Valley over the same time period. Younger generations are reluctant to continue in farming; the average age of farmers is approaching 60. Preserving farmland and farming as an occupation is becoming a challenge of major proportions. The County has several tools at its disposal to promote farm preservation, such as conservation easements and purchase of development rights. The former has been sparsely used; the latter has yet to be used in this County. As for promoting farming as an occupation, there is no easy solution. Maintaining agricultural programs in the schools, promoting an emphasis on agriculture in the media, promoting new markets, exploring further agricultural tax relief, and promoting the health and growth of agriculture as an industry---all of these and more will be required.

4. Balancing residential growth in rural areas of the county. While a stated Goal of this Plan and its predecessor is to guide and direct future growth in and around the towns and other areas served by public utilities (primarily water and sewer), there is no legal

mechanism to preclude development in the rural areas of the County. The challenge is to control growth so that it does not lead to endless sprawl and so that it preserves as much open space and rural ambiance as possible. To that end, and as a first step, in 2003 the County increased the minimum lot size in Agricultural districts (A-1) to 3.5 acres and to 10 acres in Conservation districts (C-1). In 2004 the County created two new rural residential zones (RR-A in Agricultural districts and RR-C in Conservation Districts). Developers wishing to convert a parcel of land to a subdivision will be required to go through the rezoning process with the County. Subdividing is thus no longer a “by right” action. A distinctive feature of this Comprehensive Plan is the re-introduction of Open Space or Cluster Development. Under this provision, a rezoning to RR-A or RR-C would require that the homes be clustered and that a majority of the acreage of the parcel be preserved as open space in perpetuity. Minimum lot sizes would be reduced so as to preserve the same density as at present. The Implementation chapter provides further details.

5. Community facilities to meet growing needs. Shenandoah County’s population has nearly doubled since 1970 –from 20,000 then to over 37,000 in 2004. It is forecast to increase by another 12,000 by 2025. Growth since the 2000 census, however, suggests that the forecast for 2025 may be too conservative. In the 20-year period between the 1980 Census and the 2000 Census, the median age increased from 33.9 to 40.9, reflecting the large influx of older families and retirees. School-age children increased only 3% during that entire period while the overall population increased 27%. However, since the 2000 census, school enrollment has increased **by 2% per year**, so the demographics are changing. As the population continues to grow there will be increased demands for services and facilities. Some of these demands can be met from the private sector, some from tax-supported public sources, and some through a partnership of private and public entities. In the last decade the County has added \$40 million in school capital improvements, and has added a new government center, a new county library, a new landfill cell, and the North Fork Wastewater Treatment Plant. Nevertheless, outstanding facility requirements remain, including over time new school construction, upgrading the county jail, public safety, and court facilities, creating a cultural arts center at the former Edinburg school, implementing the County’s Master Indoor/Outdoor Recreation Plan, and as part of the latter, opening a county-wide wellness center. More details on these and other initiatives are covered in the Implementation chapter. As the County moves further into the 21st century, balancing the cost of increased facilities and services with tax revenue policy will be a major challenge for the County’s leadership.

6. Transportation for the Future. Shenandoah County is in need of a county-wide transportation plan. I-81 is far and away the major transportation artery through the county, with truck traffic alone accounting for 14,000 vehicles per day. Issues such as widening the interstate and/or providing a rail solution to reduce I-81 traffic can only be addressed on a regional multi-state basis, but Shenandoah County needs to have a voice in this process. Locally, vehicle traffic has increased dramatically. Between 1980 and 2000, the population increased 27% but vehicle miles traveled increased by 190%. With

the exception of I-81, all of the primary and secondary roads in the county are basically two-lane roads and are destined to remain so for the foreseeable future. Many of them need safety improvements, such as straightening out dangerous curves, installing larger culverts, and providing shoulders where none currently exist. These and other considerations need to be addressed by a professional transportation study. Any county-wide transportation study and plan should be coordinated with the towns. See the Implementation chapter for additional details.

7. Accountability. A comprehensive plan should be a “living” document in the sense that it needs to guide the decisions of the county leadership on a regular basis and it needs to be updated to reflect the inevitable changes that occur in the physical, economic, social and cultural fabric of our society. To that end, this Plan recommends that the Board of Supervisors establish a permanent Citizens Advisory Committee to support the Board and the Planning Commission and to function under the direction of the Director of Planning and Code Enforcement. The committee would propose updates and revisions to the Plan as they are needed and, on an annual basis, review the actions of the previous 12 months and report its findings to the Planning Commission and the Board of Supervisors.

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 512 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 the parallel routes of the Old Valley Pike (U.S. Route 11) and Interstate I-81 which run its length, and the I-81 intersection with I-66 which runs east to Washington, D.C. is just a short distance north of the County line.

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 English colonial government encouraged the creation of a frontier buffer between the settled tidewater and French and Indian influences to the northwest. The early settlers brought their German language, religion, culture, crafts, folk art and architecture. For the most part, they did not own or believe in the ownership of slaves. Their family farms were much smaller than the plantation system of the English settlers to the east of the mountains. Gradually these distinctions faded and blended into a new American culture. But to the discerning eye, the influence of these early Germans can still be noticed – as can their family names.

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. Manganese 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. To assist in that effort, the historic sites that have been inventoried in Shenandoah County are now included in the GIS system.

Table 1-A, below, is a listing of those sites and districts in the County that are included in the Virginia Landmarks Register and/or the National Register of Historic Places.

TABLE 1-A

VIRGINIA LANDMARKS REGISTER
 NATIONAL REGISTER OF HISTORIC PLACES
Updated Through NPS June 15, 2001 Announcement

<u>PROPERTY</u>	<u>USGS Quad Map</u>	<u>VLR</u>	<u>NRHP</u>	<u>FILE #</u>
Beydler, Abraham House	Toms Brook	06-13-01	02-07-02	85-096
Campbell Farm	Middletown	04-17-90	08-15-90	85-127
Edinburg Historic District	Edinburg	12-03-97	07-22-98	215-001
Edinburg Mill	Edinburg	06-19-79	09-07-79	85-110
Elizabeth Furnace	Strasburg	03-17-99		85-940
Fort Bowman or Harmony Hall	Middletown	11-05-68	11-25-69	85-04
Hockman, Dr. Christian, House	Edinburg	01-17-84	02-23-84	85-76
Hupp House	Strasburg	12-04-96	02-21-97	85-7
Lantz Hall,				
Massanutten Military Academy	Woodstock	10-21-92	12-30-92	330-05
Meems Bottom Covered Bridge	New Market	04-15-75	06-10-75	85-103
Miley Site (44SH2)	Toms Brook	04-16-74	-----	85-101
Mount Jackson Historic District	New Market	04-21-93	06-17-93	265-04
Munch, Daniel House	Rileyville	12-05-01	03-13-02	85-363
New Market Battlefield Park	New Market	06-02-70	09-15-70	85-27
New Market Historic District	New Market	05-16-72	09-22-72	269-05
Orkney Springs Hotel	Orkney Springs	03-18-75	04-22-76	85-39
Quicksburg Site (44SH3)	New Market	04-16-74	-----	85-102
Shenandoah County Courthouse	Toms Brook	06-19-73	06-19-73	330-02
Shenandoah County Farm	Toms Brook	08-18-93	10-29-93	85-86
Snapp House	Toms Brook	11-21-78	05-07-79	85-29
Strasburg Historic District	Strasburg	05-15-84	08-16-84	306-16
Strasburg Stone and Earthenware				
Manufacturing Company	Strasburg	04-17-79	06-19-79	306-09
Van Buren Furnace	Woodstock	03-17-99		85-051
Woodstock Historic District	Woodstock	06-27-95	10-25-95	330-15
Zirkle Mill	New Market	12-14-82	02-10-83	85-122

There have been two major surveys of historic structures, places, and potential historic districts completed in Shenandoah County. The first one was completed in 1985 and contained information on approximately 180 listings. At that time, there were only two historic districts listed on the Virginia Landmarks Register and the National Register of Historic Places, the New Market Historic District and the Strasburg Historic District.

One objective of the Comprehensive Plan that was adopted in 1991 was to have further surveys done to document additional properties, and also to obtain information on other potential historic districts, including those in the rural part of the County. Since then, two phases of an additional survey have taken place in cooperation with the County and the Virginia Department of Historic Resources (VDHR); one was completed in 1993 and the second in 1995.

The Historic Landmarks Survey Report that was published in 1993 provided documentation on 326 sites at the “reconnaissance level” and 38 sites at the “intensive level” for a total of 364 sites that were located outside of the corporate limits of the six towns and also outside the boundaries of the George Washington National Forest. Fourteen of the sites were rural communities, villages or crossroads; they include Calvary, Columbia Furnace, Conicville, Forestville, Hudson Crossroads, Lebanon Church, Moores Store, Mount Clifton, Mount Olive, Oranda, Quicksburg, Saumsville, Wheatfield and Williamsville.

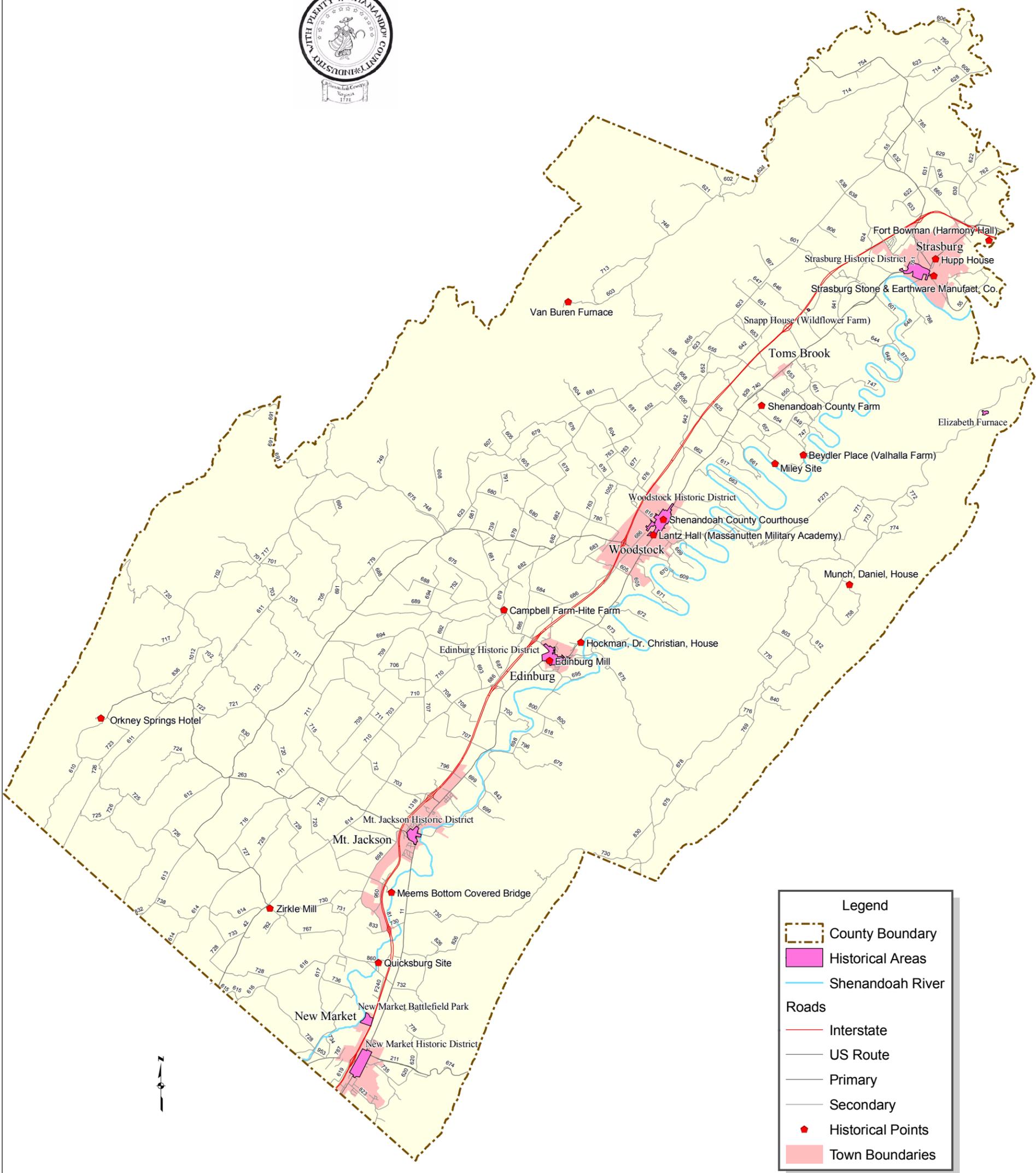
All of the information that was gathered was entered into the Integrated Preservation Software (IPS) that is utilized by the Department of Historic Resources. In addition, Preliminary Information Forms were prepared for the rural communities that can be used as a first step in the nominating process of making determinations of eligibility for the Virginia Landmarks Register and/or the National Register of Historic Places.

This report, titled Shenandoah County Historic Landmarks Survey - Survey Report can be reviewed in the Archives section in the Shenandoah Room of the Shenandoah County Library, located at 514 Stoney Creek Boulevard in Edinburg.

The second phase of the Shenandoah County Historic Resources Survey was undertaken in 1994 and 1995, and was also funded jointly by the County, the Department of Historic Resources and the Shenandoah County Historical Society. The 1995 report includes documentation of 359 individual sites at the “reconnaissance level” and 32 at the “intensive level” and also included documentation on 10 communities that were evaluated for their potential as rural historic districts. Recommendations for further research and for ten properties to be considered for listing in the Virginia Landmarks Register and the National Register of Historic Places are also included. This report is also available for reference at the County Library, and at the Planning and Zoning office.

Shenandoah County, Virginia

Figure 1-B Historical Resources

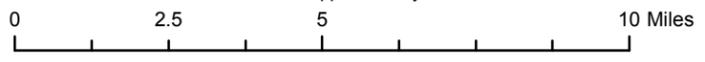


Legend

- County Boundary
- Historical Areas
- Shenandoah River
- Roads**
- Interstate
- US Route
- Primary
- Secondary
- Historical Points
- Town Boundaries



1 inch = approximately 3 miles



SUMMARY

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.

Over 750 historic sites have been identified by the historic landmarks surveys that have been accomplished in the County, ranging from individual homes, farms, taverns, bridges and other structures to complete historic districts.

The towns of Edinburg, Mount Jackson, New Market, Strasburg and Woodstock now have historic districts that are listed on the State and National Registers of Historic Places.

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 the nomination process for the individual sites and potential rural historic districts that have been identified in the latest Historic Resources Survey. Partial funding for such efforts may be available through the Department of Historic Resources on a matching basis.

In addition, there are several battlefield sites in Shenandoah County which should be preserved and enhanced. The County supports the efforts of the Shenandoah Valley Battlefields Foundation, and will participate in detailed preservation studies for some of the identified battlefields.

The Historic Resources Survey reports for the County and the Management Plan for the Shenandoah Valley Battlefields National Historic District are available for public reference at the County Library and the Planning and Zoning Office in the County Government Center.

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.

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.

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.

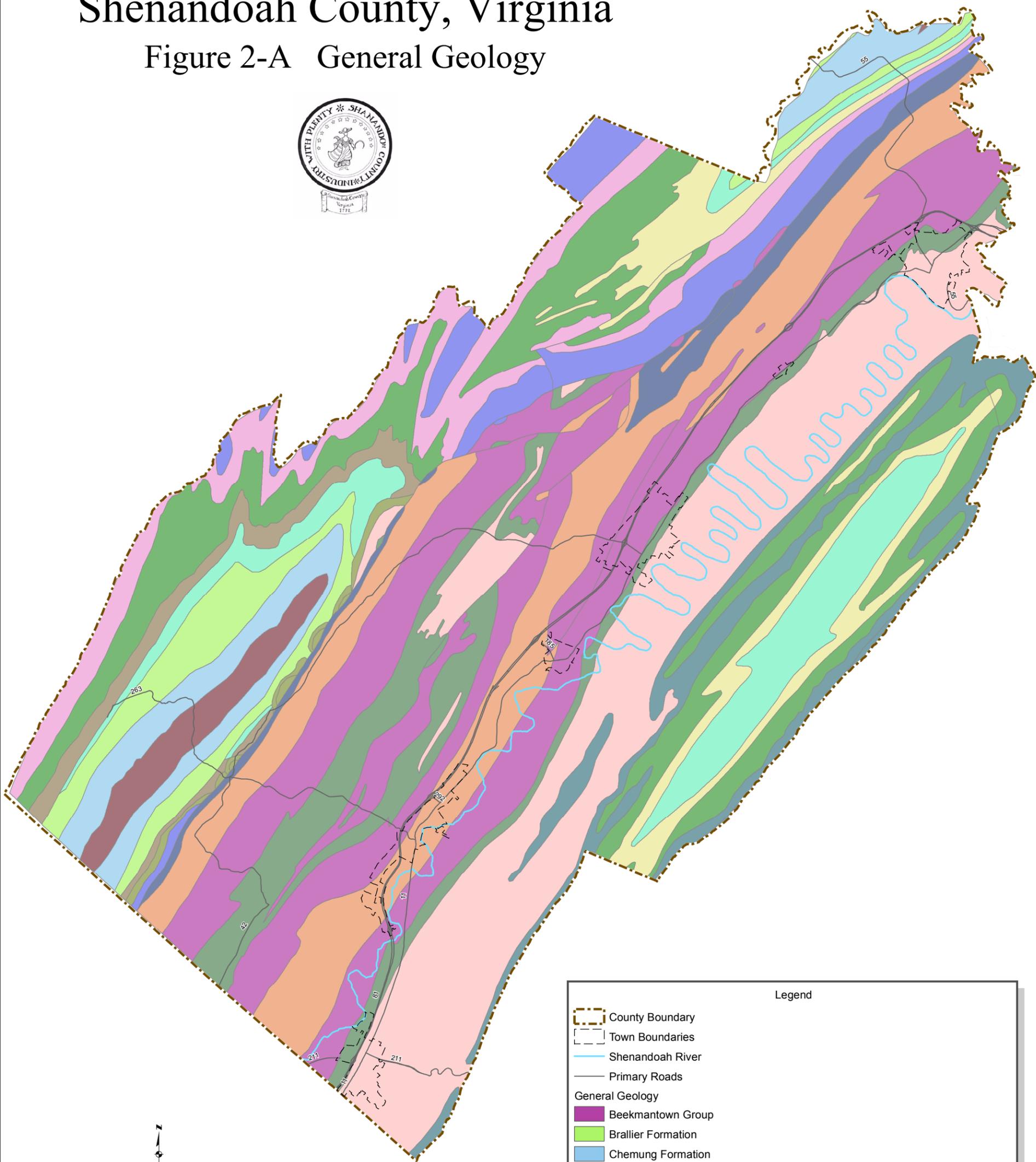
Valley Carbonates are made up of six major formations or groups. The most common rock types are limestones and dolomites of sedimentary origin. The major geologic units included are the Edinburg Formation, Lincolnshire and New Market Limestones, the Beekmantown Formation, and Conococheaque Limestone.

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.

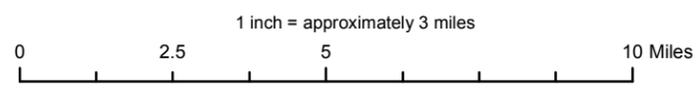
Shenandoah County, Virginia

Figure 2-A General Geology



Legend

- County Boundary
- Town Boundaries
- Shenandoah River
- Primary Roads
- General Geology**
- Beekmantown Group
- Brallier Formation
- Chemung Formation
- Conococheague Formation
- Edinburg Formation, Lincolshire and New Market Limestones
- Elbrook Formation
- Hampshire Formation
- Juniata, Oswego, Martinsburg (Reedsville and Dolly Ridge), Eggleston Formation
- Keefer Sandstone, Rose Hill and Tuscarora Formations
- Mahantango Formation
- Marcellus Shale and Needmore Formation
- Martinsburg and Orando Formations
- Massanutten Sandstone
- Millboro Shale and Needmore Formation
- Ridgeley Sandstone, Helderber and Cayuga Groups
- landslides with intact stratigraphic units - undivided



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.

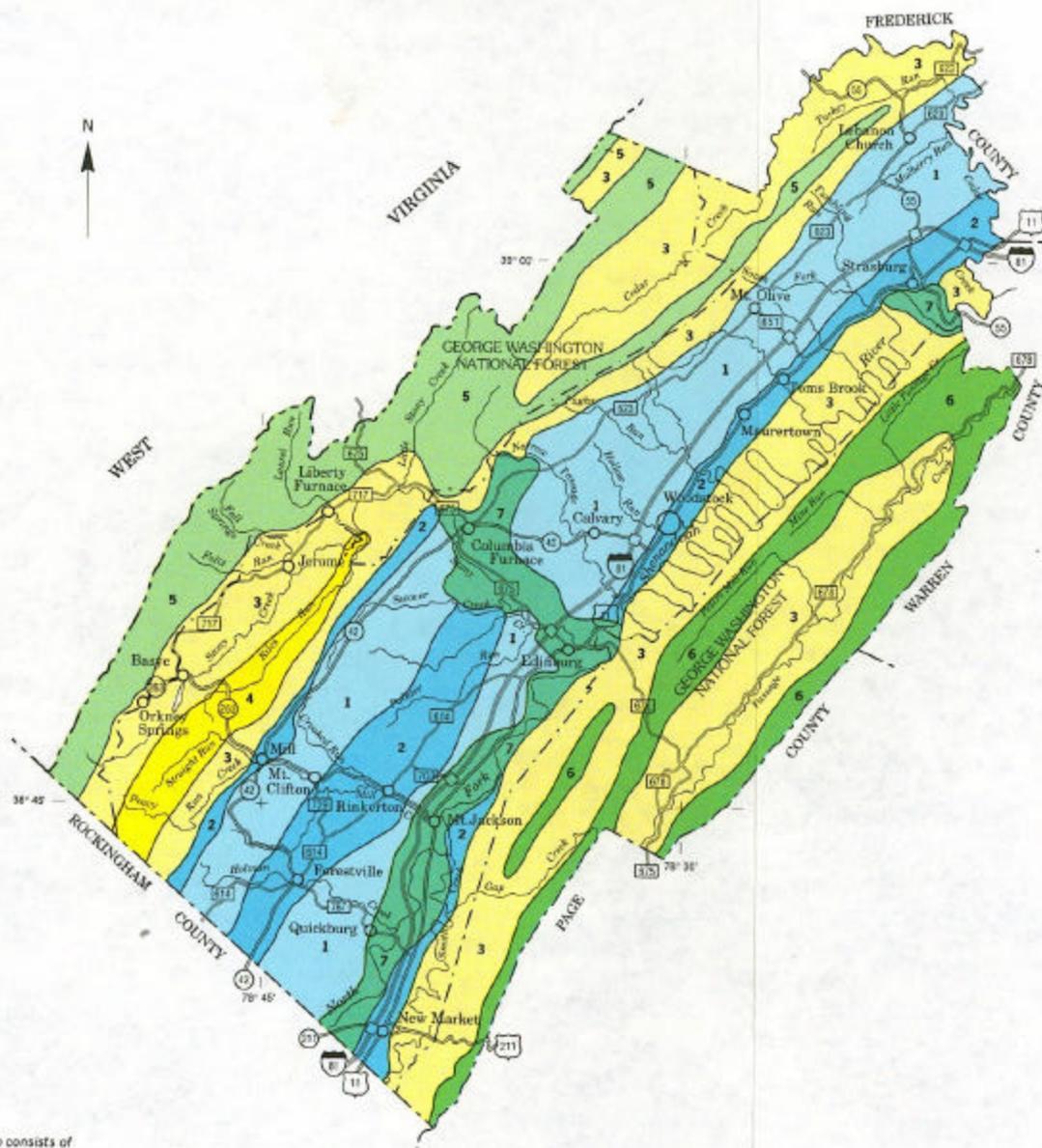
Soils

The information in this sub-section was provided by the Soil Conservation Service from the Soil Survey of Shenandoah County. 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



Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

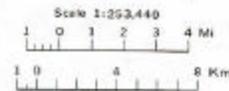
LEGEND

- SOILS FORMED IN RESIDUUM OF LIMESTONE AND INTERBEDDED LIMESTONE AND CALCAREOUS SHALE; ON UPLANDS IN THE SHENANDOAH VALLEY
- 1 FREDERICK-POPLIMENTO-ENDCAV: Deep and very deep, gently sloping to moderately steep, well drained soils that have a clayey subsoil
 - 2 CHILHOWIE-CARBO-ENDCAV: Moderately deep and deep, gently sloping to steep, well drained soils that have a clayey subsoil
- SOILS FORMED IN RESIDUAL OR COLLUVIAL MATERIAL DERIVED FROM SHALE AND SANDSTONE; ON UPLANDS AND MOUNTAIN SIDE SLOPES
- 3 WEIKERT-BERKS-LAIDIG: Shallow to very deep, gently sloping to very steep, well drained to somewhat excessively drained soils that have a loamy subsoil
 - 4 LEHEW-GAINESBORO: Moderately deep, gently sloping to very steep, well drained and somewhat excessively drained soils that have a loamy subsoil
- ROCK OUTCROP AND SOILS FORMED IN RESIDUAL OR COLLUVIAL MATERIAL WEATHERED FROM SANDSTONE, IN THE APPALACHIAN AND MASSANUTTEN MOUNTAINS
- 5 WALLEN-LAIDIG: Moderately deep and very deep, gently sloping to very steep, somewhat excessively drained and well drained soils that have a loamy subsoil
 - 6 WALLEN-ROCK OUTCROP-DRALL: Rock outcrop and moderately deep and deep, gently sloping to very steep, somewhat excessively drained and excessively drained soils that have a loamy or sandy subsoil
- SOILS FORMED IN ALLUVIAL MATERIAL; ON RIVER TERRACES
- 7 UNISON-MOOMAW-BRADDOCK: Very deep, gently sloping to moderately steep, well drained and moderately well drained soils that have a loamy or clayey subsoil

Compiled 1990

U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
FOREST SERVICE
VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

GENERAL SOIL MAP 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.

This 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 than 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.

The Soil Survey of Shenandoah County includes an 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 that was developed at the Natural Resource Conservation Service's Culpeper office, generalized maps of soil limitations for various uses and maps of prime agricultural soils are available. These resources should be incorporated as appropriate into proposed development plans.

Forests and Agriculture

The forests of Shenandoah County are one of its most precious resources. These woodlands add to the economic vitality of the County, its natural beauty, and to the quality of life for its residents. The County’s woodlands are used for recreation, watershed and wildlife management, and for a variety of forest products.

Shenandoah County’s woodlands are dominated by the Upland Hardwood – Southern Pine forest type. The most common tree species in this forest type include: white oak, black oak, chestnut oak, scarlet oak, northern red oak, pignut hickory, bitternut hickory, mockernut hickory, red maple, white ash, tulip tree, Virginia pine, shortleaf pine, pitch pine, table mountain pine, white pine, eastern hemlock and black gum. The forests are dominated by sawtimber-size trees which are 16 inches in diameter or greater in size. Major forest pests affecting the health of these trees include the gypsy moth, southern pine bark beetle and hemlock wooly adelgid.

There are 184, 400 acres of forest land in Shenandoah County. The majority of these acres belong to private landowners, both residents of the County and also absentee owners. There are also federal landholdings (George Washington – Jefferson National Forest), state lands (Devil’s Backbone State Forest) and county lands (County parks) located within the boundaries of Shenandoah County. Following is a table displaying the data for each of these ownership classes:

FOREST OWNERSHIP IN SHENANDOAH COUNTY

<u>Ownership</u>	<u>Acres</u>	<u>Percent of Total Forest Land</u>
Private	116,500	63%
County & Local Gov.	300	.2%
State	400	.2%
Federal	67,200	36%

Source: Virginia Department of Forestry.

Shenandoah County’s economy is very dependent upon its forest resources. At least 1,031 workers are dependent upon the forest products industry. Shenandoah County’s forest products economy ranks 61st in the state, but is the leader among all of the counties in the Lord Fairfax Planning District. Following is a table showing the forest economic information for the county:

SHENANDOAH COUNTY FOREST ECONOMIC INFORMATION

Direct Economic Impact.....	\$54,493,794
(primary and secondary industries)	
Indirect Economic Impact.....	\$ 8,652,295
(services to industry: trucking, supplies maintenance, etc.)	
Induced Economic Impact.....	\$18 ,678,811
(employee spending)	
TOTAL ANNUAL FOREST ECONOMIC IMPACT...	\$81, 824,900

The commercial quality and value of these trees vary greatly depending upon the soil types which underlay these woodlands. There are many acres of forests growing upon shale-derived soils that are of very low quality and value. Conversely, trees growing on limestone soils, or river bottom alluvial soils, are of very high quality and value. It is these better quality soils that make Shenandoah County a leader in the world market of fine hardwood products.

From 1986 through 1992, cumulative harvest revenues for Shenandoah County landowner averaged approximately \$380,000. Beginning in 1993, and through the end of 2001, these same annual harvest revenues have significantly increased to \$1,380,000. The reasons for this one million dollar increase in annual revenues can be attributed to an improved global hardwood market, an increased demand for hardwood products, a decrease in timber harvested from National Forests and the recognition of the superior quality of Shenandoah Valley hardwoods. For every \$1.00 landowners receive for their timber, an additional \$35.39 of “value added dollars” is generated for Virginia’s economy.

Shenandoah County relies upon its rural landscapes to support its population and, in part, its economy. Yet trends for the county show increasing fragmentation and parcelization of once manageable forested acreage. The loss of productive forest land equates to a possible decline in the economic viability of the county due in part from the decreased revenues generated by traditional forest products. The county should seek a balance between managed growth and the retention of productive forest land.

Approximately 41 percent of the land in Shenandoah County (133,032 acres) is classified as “land in farms” according to the 2002 Census of Agriculture. Agricultural land includes crop land and pasture land, orchards, and confined feeding operations.

There were 989 farms in Shenandoah County as of 2002, which represented an increase of about 19 percent in the number of farms since 1987. During that period, the average size of a farm also decreased by about 19 percent from 167 acres to 135 acres.

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 Northern Shenandoah Valley Region. 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

Water Sources

On average, approximately 36 inches of precipitation per year fall onto Shenandoah County land. Approximately 26” of this water returns to the atmosphere through evapotranspiration, 6” enters the county’s streams as surface runoff, and 4” infiltrates the soil and eventually recharges the groundwater supply.

Surface runoff (water which does not infiltrate the soil) becomes part of approximately 1150 miles of permanent and intermittent county streams. All of these streams or tributaries, whether or not they originate in Shenandoah County, eventually enter the North Fork of the Shenandoah River, which has averaged over the period 1925-2000 some 375 million gallons per day as it passes the USGS gage at Strasburg. Approximately two miles further downstream the North Fork leaves the county, 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 into bedrock (the earth’s crust below the soil) enters one of four hydrogeological regions (Figure 2-C, page 2-14). 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 the numerous springs in the county; 2) through one of the thousands of wells, both private and public; 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 the groundwater system. This may occur through subsurface connections, or by way of surface depressions or sinkholes which occur especially in areas underlain by carbonates (limestone and dolomite). Groundwater Under the Influence of Surface Water (GWUISW) is the term applied to this phenomenon.

Approximately 30% of county land, concentrated in the central valley area, overlies carbonate rock, primarily limestone. This bedrock material is characterized by numerous caves and caverns, sinkholes, underground solution channels, and fractionated layers. When these conditions are present the term karst is applied. Groundwater in karst terrain is noted for easy entry from surface water sources, quite rapid lateral movement, and hence susceptibility to contamination which can spread rapidly over large underground areas.

HYDROGEOLOGIC SURVEY OF SHENANDOAH COUNTY

FIGURE 2-C

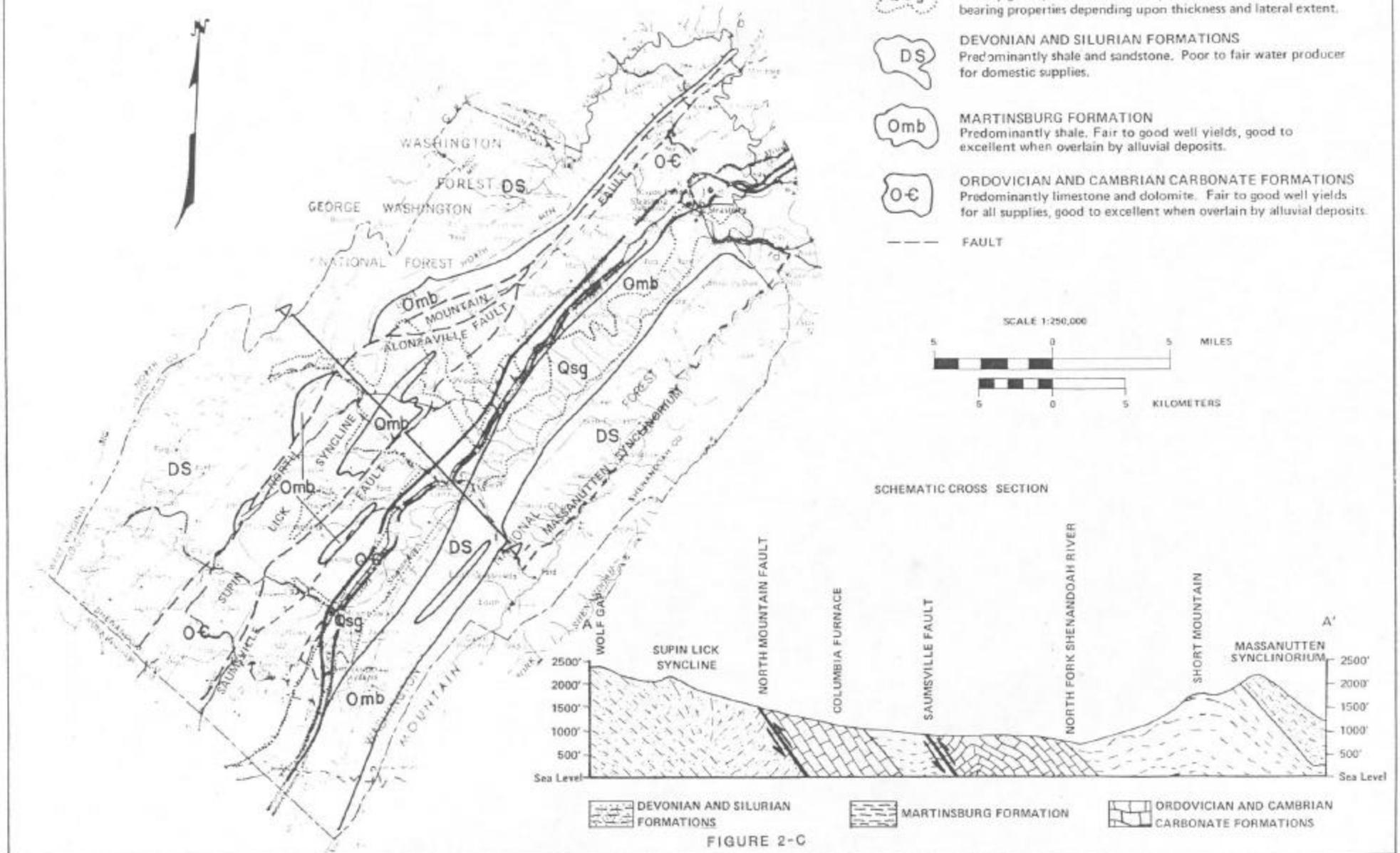


FIGURE 2-C

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.

Drinking water supplies for the people who live and work in Shenandoah County come from the following sources: 1) water for the towns of Strasburg and Woodstock is drawn from the North Fork and is treated at treatment plants for the two towns respectively; 2) water for the towns of New Market, Mt. Jackson, Edinburg, and the county's two sanitary districts (Stoney Creek Sanitary District, serving the Bryce Mountain area, and Toms Brook/Maurertown Sanitary District) is drawn from drilled wells and treated in treatment plants before reaching the consumer; 3) approximately 60 other public water systems (serving 25 or more people on a year-round basis) obtain their drinking water from drilled wells and treat it as necessary; 4) the rest of the rural population of the county (the majority of county residents) obtains drinking water from private wells, with only rare treatment of the water before it reaches the tap; and 5) a relatively few rural residents who obtain their drinking water from cisterns or from water haulers.

Surface water quality in Virginia is evaluated by the Virginia Department of Environmental Quality (DEQ) as to its suitability, not only for fishing and swimming, but also for the maintenance of aquatic life and in-stream usage. In its most recent report, DEQ listed segments of the following streams in Shenandoah County as "impaired" meaning unfit for swimming or fishing: Holmans Creek, Smith Creek, Mill Creek, Toms Brook, and portions of the North Fork. Fecal coliform and high nitrate levels are the most common sources of impairment. It should be evident that the quality of river water at the intakes for the public water systems of Woodstock and Strasburg, and hence the amount of treatment necessary to make the water potable, is directly affected by the impaired nature of the upstream tributaries.

Besides water for human uses, habitat for many aquatic species is provided by county streams and riparian areas. The North Fork, Passage Creek, Cedar Creek, and Little Stony Creek are examples of many of the streams in the county with valuable ecological features to accompany their value for traditional offstream uses.

Water Quantity

In 2001 a Regional Water Supply Committee study (Northern Shenandoah Valley Regional Partnership) forecast that by 2025 the maximum daily demand for water from the North Fork would exceed the low mean flow of record supply of water. In the absence of augmentation, i.e., impoundment of water upstream in the watershed, or reduced demand (for example, rerouting Frederick County and Winchester water supply to the main stem of the Shenandoah River), the demand for water from the North Fork will continue to outpace the low mean flow of record by an ever widening margin. Nine dams temporarily impound the flows of seven county

streams resulting in a potential maximum storage of approximately 1800 million gallons. These dams, however, were constructed for other purposes such as flood control, hydroelectricity, and recreation, and none are connected with existing treatment plants or distribution systems. Looking to the long term, therefore, the availability of water from the North Fork for human consumption is clearly in jeopardy during periods of drought conditions. The issue of adequate flow in the North Fork was addressed by a Minimum Instream Flow (MIF) study conducted jointly by the United States Geological Survey (USGS) and Virginia Tech and completed in 2004. This study established the minimum instream flow requirements to support drinking water supplies, aquatic habitats and recreational uses of the river.

As for groundwater supplies, the very complex nature of the bedrock geology underlying Shenandoah County makes it virtually impossible to know with any degree of certainty how much groundwater is stored beneath the county. Individual wells vary greatly as to depth and yield, suggesting that there are an infinite number of small aquifers of varying capacity but no main aquifer or underground river. During periods of drought such as the summer of 1999 there were reports of a number of springs and wells which ceased to function, indicating that the water table in those areas had receded significantly. It is clear that the county does not have an unlimited supply of groundwater. Over time the demand for groundwater has increased and will continue to do so as the population grows and as per capita consumption rates remain much higher than they were 50 or 100 years ago. Groundwater is also the main source of water for much of the county's livestock as well as for a number of industries located here. For example, the poultry processing plant at Columbia Furnace consumes over one million gallons of water per day, drawn from company wells.

Water and Land Use

Water quality and quantity on the one hand and land use activity on the other are inextricably intertwined. As growth development continues to expand westward from the greater Washington area, counties located in the path are faced with the challenge of preserving their agricultural heritage, their rural culture, and open spaces. Shenandoah County is no exception. One of the major goals stated in the 1991 Comprehensive Plan was "to guide, and direct growth into and around the towns served by the road network and other public facilities [meaning water and sewer primarily], while preserving the rural and open space character of those areas outside the public service areas."

Unfortunately there is a disconnect between that stated goal and reality. Between 1990 and 2000 there was an increase of 1,549 total dwelling units, and 795 of them (51.3%) were located in the towns; 754 (48.7%) were located in the rural areas of the County. Each new home in rural areas requires its own well and septic system, both of which put added strain on the fragile groundwater environment.

Surface Water Pollution and Protection

Under the federal Clean Water Act (1972), point source discharges (sewage treatment plants, industrial facilities, etc.) are regulated through the National Pollutant Discharge Elimination System, a nationwide permitting program. In Virginia this permitting authority is under the State Water Control Board which issues and renews hundreds of Virginia Pollutant Discharge Elimination System (VPDES) permits annually through the DEQ. These permits authorize individuals, municipalities, and industrial facilities to discharge directly to surface waters provided they meet certain specified discharge requirements

Nonpoint source (NPS) pollution is a very complex issue. Unlike pollution from a discharge pipe, which is point source and readily identified, NPS pollution comes from many diffuse sources and is not always easy to identify. NPS pollution can come from agricultural land, parking lots, construction sites, lawns, driveways, etc. As rainwater or snowmelt moves over these areas it picks up numerous contaminants and carries them to nearby streams and rivers. NPS pollution also can affect groundwater, especially in the Shenandoah Valley with its karst geology where surface water and groundwater are so easily interchanged. The contaminants commonly found may include the following:

- Oil, grease, and toxic chemicals from urban runoff
- Excess fertilizers or pesticides from agricultural and residential areas
- Sediment from improperly managed construction sites or cropland
- Bacteria and nutrients from livestock and faulty septic systems

Best Management Practices (BMPs) are among the best means of controlling agricultural NPS pollution. The Virginia Water Quality Improvement Act provides financial incentives to landowners for the installation of BMPs which minimize the movement of agricultural pollutants such as sediment, nutrients, and pesticides to water resources. Riparian fencing, vegetative filter strips, controlled manure storage, and alternative watering systems are a few examples of BMPs.

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 coldwater streams. Some coldwater (trout) streams have been affected by acid precipitation and are vulnerable to further acidification.

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.

Under the Clean Water Act there is provision for addressing and restoring those streams that have been designated as “impaired” by DEQ and EPA (see section above on Water Quality). The terminology used is Total Maximum Daily Load (TMDL) which is the pollution threshold below which a stream must be restored to make it safe for swimming and fishing. The program is complex, controversial, and costly, and will take at least a decade to complete. It requires establishing for each impaired stream, based on modeling of that stream’s watershed, the TMDL of specific pollutants such as fecal coliform, sediments, nutrients, aquatic or benthic, metals, organics, pH, etc.. It also requires identifying point and non-point sources of these pollutants as well as remedial action to bring them into compliance. Public participation by interested property owners is both encouraged and essential.

Groundwater Pollution and Protection

Groundwater located in karst terrain, which is the case for much of Shenandoah County, is particularly vulnerable to pollution from surface sources. Among the main threats are underground storage tanks, sinkholes, uncapped abandoned wells, improperly managed animal waste, excessive use of fertilizers and pesticides, and poorly maintained septic systems.

In 2000-2001 the county sponsored a Source Water Assessment and Protection Plan (SWAPP) study for the five major public water systems that obtain their drinking water from groundwater sources: New Market, Mt. Jackson, Edinburg, and the Stoney Creek and Toms Brook/Maurertown Sanitary Districts. Using the science of hydrogeology the recharge areas for all of the wells in these five systems were delineated for the first time, and potential sources of contamination within each recharge area were identified and characterized as to risk. It was discovered that the recharge areas are quite large (on the order of four square miles per well) and quite irregular in shape. It should be noted that each of these five systems treats the groundwater before it passes on to the consumer. This is also true of the approximately 60 smaller “public systems” in the county that are regulated by the health department.

The number of individual property owners who treat their drinking water or have it tested on a regular basis is unknown, but is believed to be very small. Since 1994 there has been a county-wide long-term Citizen Groundwater Monitoring Program under the auspices of the Friends of the North Fork with funding support from the county. Currently 36 wells are tested on a semi-annual basis for fecal coliform, nitrates, metals, chemicals, herbicides, and the like. During the mid-90s there were frequent positive samples of fecal coliform, nitrates, manganese, lead, and the herbicides atrazine, and metholachlor.

With the exception of those who live in the towns and sanitary districts where sewer service is provided, the majority (approximately 60%) of the county's residents rely on septic systems. The fact that most of these are located in karst terrain poses an exceptionally serious potential threat to groundwater quality. Aside from meeting the initial installation requirements set by the health department, there is no regulation of a septic system thereafter. In the absence of any required inspections or pump-outs it is a virtual certainty that many septic systems in the county are failing to perform their intended function. The Virginia Cooperative Extension Service reports that: "Malfunctioning septic systems are currently the leading cause of groundwater pollution in Virginia." To the extent that this occurs in karst terrain the problem can be particularly pervasive.

Conservation

The fragile nature of the quantitative water supply in Shenandoah County is addressed in the earlier section on Water Quantity. The situation with respect to groundwater is of particular interest because the quantity of groundwater available is essentially unknown and unknowable and because upwards of 80% of the population obtains its drinking water and household water from wells or springs and both the agricultural and industrial sectors are similarly dependent on groundwater.

During the droughts of the summer of 1999 and again in 2002, the county issued a drought advisory with guidelines for voluntary water conservation. The guidelines included such measures as: discontinuing watering of lawns, washing cars only at commercial car washes, discontinuing irrigation of crops during daily periods of high evaporation, use of soaker hoses to water trees, shrubs, and vegetable gardens, and a host of steps to reduce water consumption in individual households.

As population increases and periodic droughts occur, developing an ethic of water conservation as a permanent way of life in the Valley should be a serious consideration. In the event of extreme drought conditions, some form of mandatory conservation measures may be necessary, although action by the Governor would be required to put such measures in effect.

Public education is the key to creating an ethic of water conservation. Citizens and businesses need to understand that water quantity is critical in the Valley and they need to learn what they can do to reduce their own water demands. Simple things like low volume flush toilets and shower heads can in the aggregate cut a household's water demands by a substantial percentage.

Drought Management

During the drought of 1999 the county formed an emergency committee to deal with drought issues, particularly the plight of farmers with dwindling supplies of water for livestock and poultry. Out of this effort grew some very positive measures, both short and long term, for drought management. Among the short-term measures were development of a list of commercial

water haulers, a list of locations where individual farmers with portable water storage capability could load them, advice regarding procurement of suitable water bladders for hauling and/or storing water, advice on proper well management, conservation techniques, and in the extreme, delivery of water by volunteer fire departments. Long-term measures focused on monitoring the status of streams and individual wells and springs; permanent on-farm water storage, including ponds; water metering systems for livestock; and financial incentives for farmers through agencies such as FSA, NRCS, and the Soil and Water Conservation District. The Virginia Cooperative Extension Service agent took the responsibility of disseminating all of this information to the farm community.

Stormwater Management

Inadequate management of accelerated runoff of stormwater resulting from development throughout the North Fork watershed increases flood flows and velocities, contributes to erosion and sedimentation, overtaxes the carrying capacity of streams and storm sewers, infiltrates municipal sewer systems, increases the cost of public facilities to carry and control stormwater, undermines flood plain management and flood control efforts in downstream communities, reduces groundwater recharge, and threatens public health by way of pollutants washed from the surface into drinking water supplies (automobile oil and grease, sediment from construction sites, bacteria from animal waste, excess lawn care and farm fertilizers and pesticides, as well as deposits of airborne pollutants).

Historically, managing storm flows focused on simple routing of stormwater through gutters and storm sewers with the objective of removing the stormwater as quickly as possible. A more effective approach to stormwater management is to maintain as nearly as possible the natural runoff flow characteristics. This can be accomplished either by augmenting the infiltration process or by temporarily storing stormwater for release at controlled rates of discharge. Actual stormwater management techniques can be structural (detention ponds, pipes, etc.) or non-structural (land use planning to effectively preserve existing vegetation, drainage swales, perviousness, etc.). Both techniques should be used as complementary elements of a management plan. The effectiveness of a stormwater management program is a function of comprehensive planning and sound engineering design.

A comprehensive program of stormwater management, including reasonable regulation of development and activities causing accelerated runoff, is fundamental to the county's and the towns' health, safety, and welfare, their resources, and the environment. The Virginia Stormwater Management Program (1990) gives the counties and the towns the option of establishing local stormwater management programs to regulate activities on private property within their jurisdictions.

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 with emphasis on public education and the nurturing of an ethic which promotes the voluntary conservation of water resources as a way of life in Shenandoah County.
 - 2. Reduce the percentages of unaccounted-for water from municipal systems.
 - 3. Follow the Drought Management Plan for the county when appropriate, and ensure that it is updated annually. The plan should provide for both voluntary and mandatory (in the case of extreme drought) water conservation and allocation.
- B. Appropriate development of new supplies or facilities
 - 1. Maintain and improve as necessary existing public water supplies and wastewater facilities
 - 2. Develop a plan for utilizing the assets of the North Fork Wastewater Treatment Plant to best advantage. Process all septage at this plant in place of the current Toms Brook facility.
 - 3. Reexamine existing land use codes with a view toward guiding future growth into areas with existing water and sewer and minimizing new development requiring individual wells and septic systems
 - 4. As a member of the Regional Water Resources Policy Committee, support planning for augmenting the flow of the North Fork by 2015. Impoundment of a significant amount of water for release as needed during periods of extreme drought is indicated.

5. Along the Route 11 corridor, extend the water line north from Woodstock to join the Toms Brook/Maurertown system at its southern terminus. This stretch currently has sewer service but no water service.

C. Protection of Water Resources

1. Address nonpoint source pollution by promotion of agricultural, urban, forestry, and other BMPs; cooperation with the Natural Resources Conservation Service and Cooperative Extension Service to implement BMPs; promotion of techniques to reduce agricultural and household chemical use; and appropriate enforcement of the Erosion and Sediment Control Law.
2. Adopt, as appropriate, the recommendations of the SWAPP project pertaining to the five major public water systems that depend on groundwater supplies.
3. Additions to the Code of Virginia in 1998 and 1990 gave local governments the authority to “protect surface and groundwater.” The County Code should be amended to specifically provide for this protection in all planning and zoning land use actions.
4. Use available local tools to protect groundwater from contamination by underground storage tanks, animal wastes, biosolids, excessive fertilizer and pesticide use (both agricultural and residential), or other threats as identified.
5. Institute a program for periodic inspections of septic systems and, if warranted, pump-outs. Encourage citizens to have their septic tanks pumped out every five years.
6. Locate sinkholes and sinkhole dumps, and implement sinkhole protection with a sinkhole ordinance
7. Continue improvement to municipal sewer facilities, particularly with respect to stormwater infiltration. Encourage cooperation among towns and other water and sewer service providers and outlying areas to provide services as needed.
8. Monitor all discharge from alternative systems.
9. Support the efforts of the U.S. Forest Service and the Virginia Department of Game and Inland Fisheries to mitigate the acidification of coldwater streams.
10. Support implementation of the Minimum Instream Flow Study for the North Fork recommendations.
11. Encourage riparian landowners to maintain streambank vegetation and minimize disturbances in riparian areas in order to protect stream habitat and water quality. Encourage landowners to apply to have riparian land placed in the Conservation Reserve Program or conservation easements.
12. Develop site plan review criteria for the definition and protection of wetlands.
13. Stress the role that individual landowners must play in the protection of groundwater by proper on-site wastewater system maintenance (items 5 and 8 above), limited use of fertilizers and pesticides, control of animal wastes, wellhead maintenance, proper use and disposal of household chemicals and waste oil, and the like.
14. In coordination with the towns, develop a county-wide stormwater management plan (Virginia Stormwater Management Program, 1990)

D. Acquire and maintain data

1. The county's Geographical Information System (GIS) is the central repository for water and other geographical data for the county. The GIS Coordinator is responsible for entering appropriate and accurate data into the system and for ensuring that it is kept up-to-date. The GIS should continue to be supported as a matter of priority.
2. The SWAPP project provides a specific database on potential sources of contamination located within the groundwater recharge areas of five major public water systems. Changes will inevitably occur within these recharge areas so this data base needs to be kept current
3. Numerous federal and state agencies maintain extensive data bases that are accessible through the internet. USGS, EPA, DCR, DEQ, and the Virginia Department of Health are especially pertinent. County and town planners should access these as a matter of course.
4. The Friends of the North Fork and the Friends of the Shenandoah have each engaged in monitoring and recording surface water quality on selected streams in the county. The Friends of the North Fork in cooperation with the Board of Supervisors have sponsored the Citizen Groundwater Monitoring (testing of 36 individual wells) program. These efforts should continue to be supported, and expanded. Furthermore, systematic trend analysis should be performed so as to better exploit the value of the data being compiled.
5. In the event that a Groundwater Monitoring Network is established by the State Water Commission, the county should be prepared to participate in a major way. Few if any counties stand to benefit more from filling in the unknowns about our groundwater supply.

E. Local Involvement

1. In June 1999 the county Board of Supervisors created the Water Resources Advisory Committee (WRAC) to advise the Board on matters of water quality and quantity and to help provide both the leadership and the public participation needed to continue the process of water resource management. The SWAPP project, which was funded by the county, is an example of how this committee can contribute to public awareness of the importance of protecting the sources of groundwater to the major public water systems in the county. The WRAC should continue to be supported by the county.
2. Public education is an essential factor. The county and town governments, the schools, the libraries, the media, and local service groups are all conduits for public awareness and education. In 2000 the WRAC published and distributed a 16-page "Primer on Water in Shenandoah County," written in layman's language for all citizens of the county. It is important that this document be kept current and reprinted at yearly intervals.

NATURAL RESOURCE LIMITATIONS

Approximately 56% of the county's total land area has severe limitations for on-site septic systems and almost 40% 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, 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 Massanutts) and the land underlain by the Martinsburg Formation.

The best general areas for constructing septic tank and drain 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 groundwater pollution and the danger of well contamination from septic systems because of the underground stream network and solution channels associated with the limestone formations.

In summary, the land area of Shenandoah County is not well suited for excavations and conventional septic tanks and drain fields. Public policy should be toward limiting growth in those areas where public sewer systems are not available now nor economically feasible in the future.

AIR QUALITY

As development continues and perhaps accelerates, as traffic on I-81 continues to grow, and as federal and state air quality standards become more stringent, the subject of air quality in the Shenandoah Valley will likely become a hot environmental issue. As of 2004, several locales in the region, and the Shenandoah National Park, were in non-compliance with the EPA air quality standards for ozone.

Early that year the Shenandoah Valley Air Quality Project (SHENAIR) was initiated under the auspices of the Northern Shenandoah Valley Regional Commission. The mission of SHENAIR, which was spawned in the Frederick County/Winchester area, is to study and improve air quality in the northern Valley. In order to gather data throughout the region, additional air quality monitoring stations will be required. Currently monitoring stations are located in Frederick County, Winchester, Front Royal, Luray, Harrisonburg, and the Shenandoah National Park.

Federal legislation in the form of the Clean Air Act requires EPA to establish National Ambient Air Quality Standards (NAAQS) and reevaluate those standards every five years. Virginia has an Air Pollution Control Law and supporting regulations to supplement the federal statute. In addition to ozone, other pollutants such as particulate matter, carbon

monoxide, lead, nitrogen dioxide, and sulfur dioxide are governed by these statutes. Emission sources include power generating stations and large industrial facilities (some of which are located hundreds of miles upwind in Ohio, West Virginia, and western Pennsylvania), gasoline marketing and distribution centers, solvent-based paint processes, on-road vehicles, and off-road mobile sources such as farm and construction equipment and lawn and garden equipment.

One tool in the process of coping with air quality threats and maintaining ambient air quality within the prescribed standards is air quality modeling. Modeling can be used to simulate air quality events and concentrations, recreate air pollution episodes, determine causes and contributing factors, predict future conditions, test control strategies, and demonstrate success.

At this point in time, the subject of protecting air quality in the northern Shenandoah Valley is still in its infancy. While there is little that any one county can do on its own to stop pollution, a regional approach, such as the SHENAIR initiative, offers substantial promise of success. As a member of the Northern Shenandoah Valley Regional Commission, Shenandoah County should support the SHENAIR project.

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 the 1991 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 2-20 through 2-23 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 region to develop a Shenandoah Valley Regional Water Supply Plan.
- Look for long-term solutions for storm water management and non-point source pollution abatement.
- Monitor the progress of the Health Department and Department of Environmental Quality 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.
- Participate in a regional approach to improving air quality by supporting the SHENAIR project.

Chapter 3. Land Use

INTRODUCTION

This chapter describes the history of land use regulation in Shenandoah County, depicts ways the land area of the County is utilized, and presents forward-looking policies to guide future land use activities within the unincorporated County boundary.

HISTORY OF LAND USE IN SHENANDOAH COUNTY

From its earliest settlement by European settlers during the 1730s, Shenandoah County has been an extremely productive agricultural area. The strong tradition of agriculture is a key element of the Shenandoah County economy, landscape and culture and has always been widely and enthusiastically embraced by past and present generations of citizens. The Vision statement in the Comprehensive Plan, confirmed many times in recent years, states that “In the year 2025 Shenandoah County will still be a primarily rural community.”

Before the 20th Century, landowners outside the towns of the county had few choices other than agriculture for productive use of their property. As a result, there was little need for local government to intervene to ensure the continued survival of the rural character of the county. During the 20th Century, as transportation systems improved and employment opportunities became more diverse, changes in land use patterns shifted away from open space. Subdivision of large, rural parcels for homes and other non-farm purposes became feasible and the rural character of the county was jeopardized. During the last several decades, a proliferation of small lots in the rural districts has occurred. Increasing numbers of residential units in the agricultural area and the creation of many parcels too small for agriculture prompted local government action to preserve Shenandoah County’s rural character.

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 the plans through land use ordinances. Towns are responsible for land use within their corporate limits, and counties are responsible for the unincorporated areas.

Forward-looking policies to guide future land use activities within the County

Since being settled, Shenandoah County has been an extremely productive agricultural area

***Vision Statement:
“In the year 2025, Shenandoah County will still be a primarily rural community...”***

Actions of the General Assembly in the early 1970's contributed to increases in the level of planning by localities. The problems encountered in Northern Virginia and the Tidewater area, plus the spread of vacation 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 a local option. The basic premise of zoning is to avoid land use patterns that cause activities on one property to inherently and negatively affect neighboring properties. Writing down the rules for land use is a necessary fact of modern life. Since the adoption of the 1973 Comprehensive Plan by the county, each of the county's six towns have adopted their own plans, and corresponding zoning ordinances to implement them. All towns also have subdivision ordinances.

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 Virginia 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.

After the first 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. In 1978, after much discussion and debate, Shenandoah County enacted its first set of land use (zoning) regulations. These regulations provided for basic zoning district types and created some restrictions on residential development in rural areas. In 2005, the frequency of allowable subdivision of parcels in A-1 (agriculture) and C-1 (conservation) zoning districts was set at one subdivision per three year period.

During the period from 2000 to about 2006, unprecedented residential growth occurred throughout the County, including development in the A-1 and C-1 zoning districts. Investigation of the impact of this residential development revealed that the existing land use and subdivision ordinances of Shenandoah County did not

The creation of many parcels too small for agriculture prompted local government action to preserve Shenandoah County's rural character

From 2000-2006, unprecedented residential growth occurred throughout the County, including development in the A-1 and C-1 zoning districts

County ordinances did not support the Vision statement in the Comprehensive Plan

support the Vision statement in the Comprehensive Plan. In particular, over time, those regulations would facilitate the breaking up of large, rural parcels into thousands of small parcels which would not support sustained agriculture. The projected result of such partitioning would be the decline of agriculture and loss of the rural character of Shenandoah County in violation of the Vision expressed in the Comprehensive Plan. A further concern that developed during this period of rapid residential development was the cost of providing residential services (e.g. education and emergency services) in rural portions of the county.

The Community Planning Project

In 2008, Shenandoah County convened an effort, known as the Community Planning Project (CPP), to assess what policy changes, if any, were needed to achieve the long term goals reflected in the Vision statement of the Comprehensive Plan. The first step in

the CPP process was to verify, through public participation, the Vision expressed in the Comprehensive Plan approved in 2005. Those guiding principles (shown at left) were overwhelmingly supported and confirmed by the many residents that participated.

In 2010, the CPP Steering Committee issued its final report with recommendations to achieve the Comprehensive Plan goals. Shenandoah County then passed a series of modifications to zoning and subdivision regulations (see top right, next page) to encourage the retention of large agricultural lots and discourage the creation of numerous small parcels in the A-1 and C-1 zoning districts.

CPP Confirms Principles from Comprehensive Plan:

- ◆ Shenandoah County should remain a primarily rural county with a successful agricultural base.
- ◆ Most new residential growth should occur in areas with public water and sewer.
- ◆ Allowable residential density in rural areas should be reduced.
- ◆ Additional goals were identified by the CPP process:
 - Support and enhance agriculture;
 - Conduct joint planning for growth areas between the County and the Towns;
 - Strengthen tools to assure conservation of rural areas;
 - Help maintain the character of the county's towns; and
 - Provide flexibility for rural land owners to develop rural parcels.

LAND USE PATTERNS

The general land use pattern of the County has not changed greatly over the past 40 years; Shenandoah is still largely rural, with the predominant land uses being farm and woodland. (See Figure 3-A for percentages of each type of land use, and see Figure 3-B for a map of land use distribution throughout the County.) Farm land includes crop and pasture land, orchards, animal feeding operations, and small tracts of timber. According to the 2012 Census of Agriculture, there

were 980 farms in Shenandoah County comprising 133,519 acres.

Agricultural & Forestal Districts

Shenandoah County has 21 Agricultural and Forestal Districts (AFDs) encompassing over 46,000 acres (see Figure 3-C). These districts are rural zones dedicated to the production of agricultural products and timber and the maintenance of open space land as an important economic and environmental resource. The AFDs were established according to state guidelines with the approval of the Board of Supervisors. AFDs constitute a voluntary agreement between landowners and the county that no new, non-agricultural uses will take place in the district for a period of ten years. Districts provide much stronger protection for farmers and farmland than does traditional zoning.

Agricultural and Forestal Districts provide the following benefits for landowners:

- eligibility for land use taxation;
- certainty that agriculture will be maintained in the area;
- protection from nuisance ordinances that would limit customary farming practices such as manure spreading;
- assurance that the district will be taken into account in local planning decisions such as rezonings; and
- protection, in many cases, from government acquisition of land.

From the county’s perspective, AFDs serve the public good by maintaining the rural character of the community and protecting productive agricultural and forest lands.

Forested Lands

Roughly 23% of the unincorporated County can be classified Woodland. The George Washington – Jefferson National Forest contains approximately 78,250 acres of land in Shenandoah County, located along both the western and

2010 Changes to Zoning Ordinances

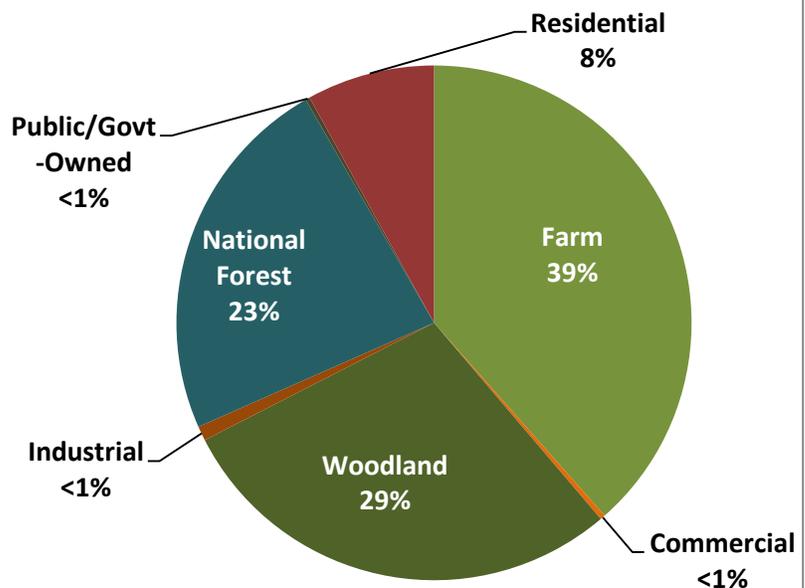
Reduced by-right residential density for A-1 and C-1 districts:

- A-1 subdivisions density decreased from 1 per 3.5 acres to 1 per 10 acres
- C-1 subdivisions density decreased from 1 per 10 acres to 1 per 15 acres

Reduced the minimum lot size in A-1 and C-1 districts:

- A-1 decreased from 3.5 acres to 1.5 acres
- C-1 decreased from 10 acres to 1.5 acres

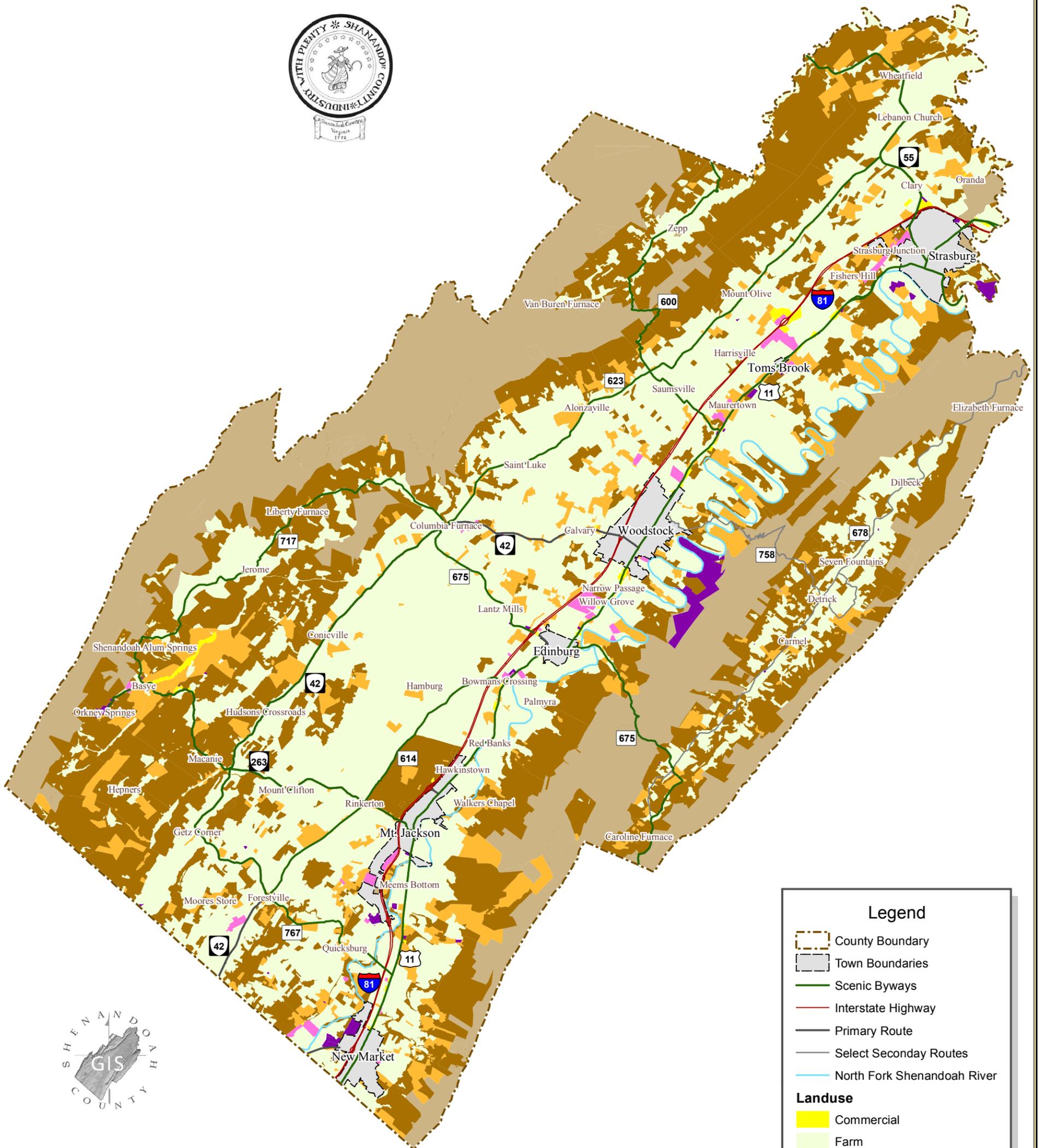
FIGURE 3-A. PROPORTION OF ALL COUNTY LAND USES



Estimated from 2011 aerial photography.

Shenandoah County, Virginia

Figure 3-B Generalized Existing Land Use



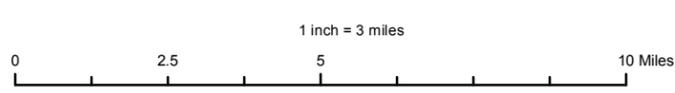
Legend

- County Boundary
- Town Boundaries
- Scenic Byways
- Interstate Highway
- Primary Route
- Select Secondary Routes
- North Fork Shenandoah River

Landuse

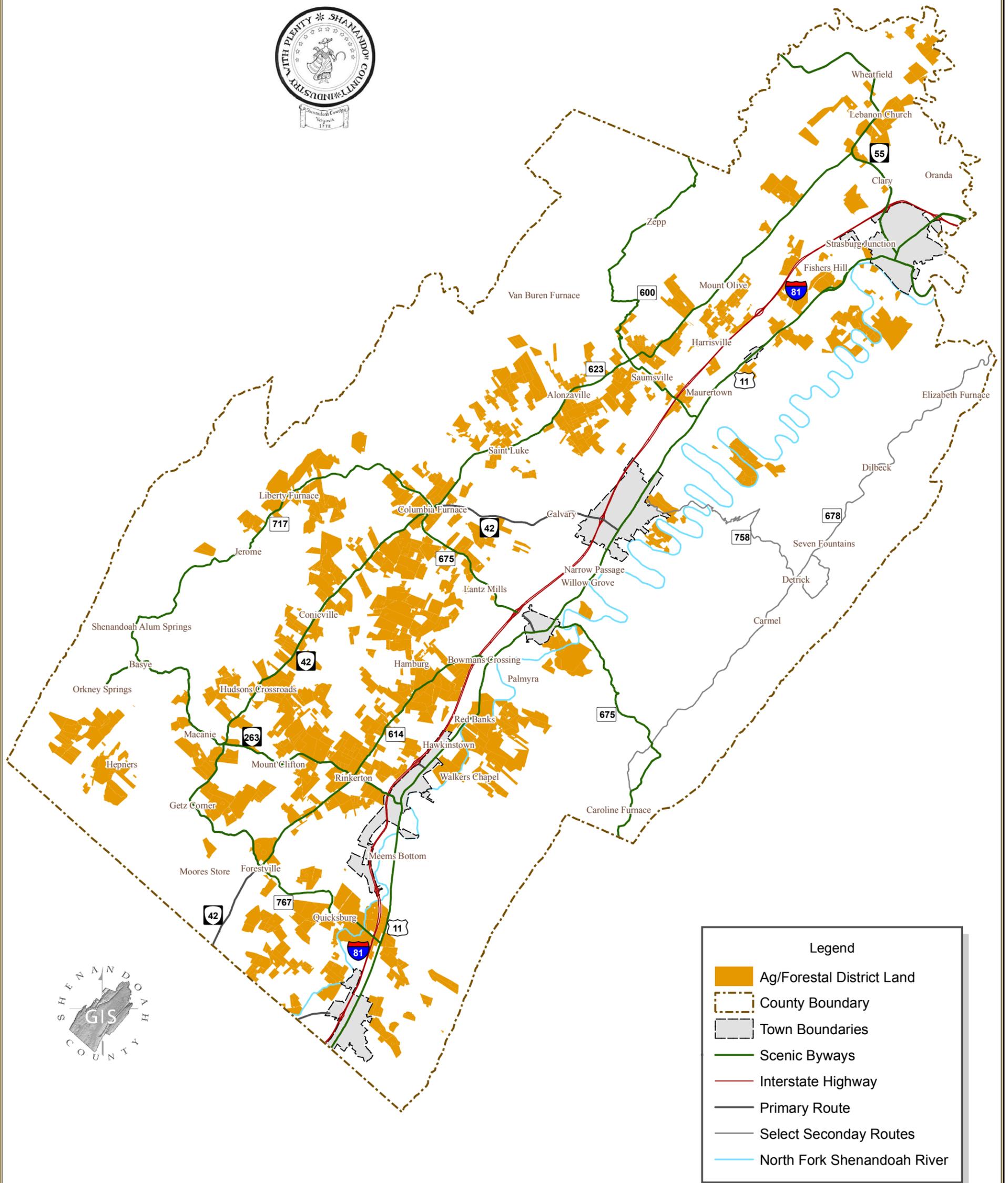
- Commercial
- Farm
- Industrial
- National Forest
- Public/Government-Owned
- Residential
- Woodland

Note: This land use map is an estimation of how land was used based on a review of 2011 aerial photography. Land use does not reflect county zoning.



Shenandoah County, Virginia

Figure 3-C Agricultural and Forestal Districts



1 inch = 3 miles



Over half of the forested land in Shenandoah County is privately owned

Developed land uses—residential, commercial and industrial—have increased considerably over the past several decades

eastern edges of the County. It represents almost one-fourth 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.

Over half of the forested land in Shenandoah County is privately owned. These woodlands add to the economic vitality of the County, its natural beauty, and to the quality of life for its residents. The County's woodlands are used for recreation, watershed protection, wildlife management and for a variety of forest products. Over the past several decades a number of these privately held forest tracts have been subdivided for development, thereby creating a very fragmented forest resource. Having ownership of this forest land divided among multiple owners creates many challenges for resource managers as they attempt to assist landowners with managing the land for the more traditional uses such as forest harvesting and wildlife management.

Developed Land Uses

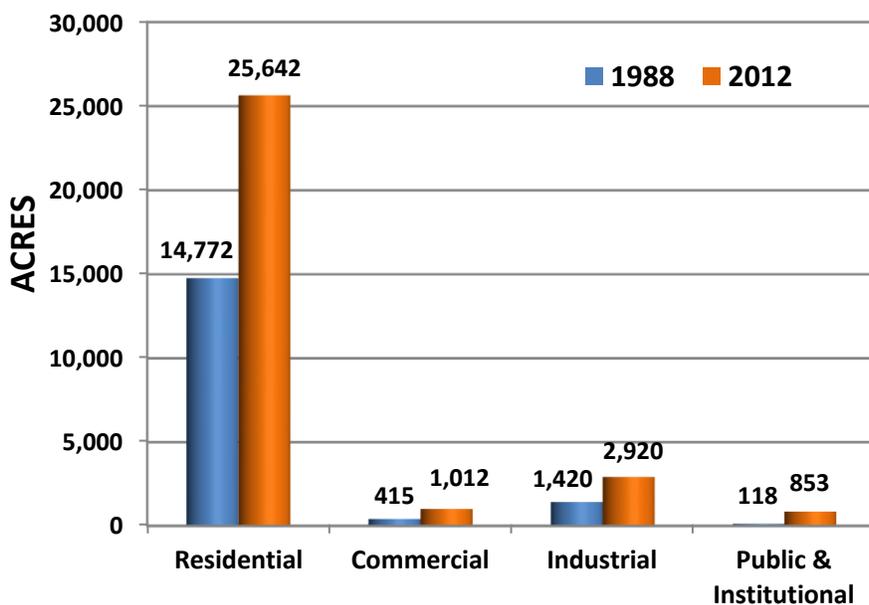
While the majority of land in the county is open space, the major types of developed uses—residential, commercial, and industrial—have increased considerably over the last several decades (see Figure 3-D). Land committed to residential development accounts for an estimated eight percent of the unincorporated area of the County. This represents a marked increase from the 1988 figure of

less than five percent, and indicates a shift to larger lot sizes and increased interest in subdividing rural land for residential use.

Industrial and commercial land uses in the unincorporated areas more than doubled from 1988 to 2012, despite annexations of developed land by the towns over that period.

Growth and development has taken place in two distinctive patterns over the 14 year period. Where public facilities were available, there was concentrated growth in and

Figure 3-D. Changes in Developed Land Use 1988-2012



Source: Shenandoah County Office of Community Development

around the towns and the Bryce Mountain service area. Due to the availability of water and sewer, it was possible to construct several types of housing, including townhouses and apartments, as well as commercial and industrial facilities.

Outside of those areas, the growth has been primarily residential on spacious residential lots with individual on-site water and septic systems, and that growth was scattered throughout the County along rural secondary roads. This dispersed development, combined with topographic characteristics that isolate certain areas like Fort Valley and Cedar Creek, makes it impractical to economically serve remote neighborhoods with public water and sewer facilities, and it also impacts the County's natural resources, the secondary road network, and the ability to provide other community services.

The six incorporated towns in the County are located in a linear pattern running northeast and southwest along Old Valley Pike (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.

Table 3-A shows the population trends and approximate land areas for each of the towns and the Basye area. 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

Scattered development makes it impractical for the County to provide public water and sewer, and impacts the County's natural resources

Table 3-A. Population and Land Area 1980-2010

Location	1990 Pop.	2000 Pop.	2010 Pop.	% Change 1990-2010	Land Area (Sq. Miles)
Rural County	20,287	21,751	23,806	17%	492.89
Basye/Bryce Mtn.*	300	986	1,253	318%	2.16
Edinburg	860	813	1,041	21%	0.76
Mt. Jackson	1,583	1,664	1,994	26%	2.77
New Market	1,435	1,637	2146	50%	2.03
Strasburg	3,762	4,017	6398	70%	3.57
Toms Brook	227	255	258	14%	0.13
Woodstock	3182	3,952	5,097	60%	3.81

*1990 Basye numbers are estimated year-round population.
Source: U.S. Census of Population and Housing

The trend since 2000 shows greater population and housing growth in the towns

Proximity to northern Virginia has contributed to recent growth

and commercial establishments, even though this capacity may only be needed for one or two periods in the year.

DEVELOPMENT TRENDS

Population and Housing Units

Table 3-B examines the growth which took place in Shenandoah County between 1980 and 2010. Overall, a third of the population growth and just over half of the increase in housing units took place outside of the towns in the rural portions of the County during this time period. As of 2010, 57% of the county population and 62% of housing units were in the rural areas. However, the trend since 2000 shows greater population and housing growth in the towns.

Several factors have affected the type and amount of growth that has occurred in the county. Historically, there has been a strong second home/retirement home market in Shenandoah County over the last several decades. Also, the proximity to rapid growth and housing markets of Northern Virginia has contributed to recent growth in the northern part of the County in and near Strasburg, and to some extent in Woodstock.

The rate of housing growth increased rapidly from 2000 to 2006, but has since fallen dramatically. While the number of housing units constructed between 1980 and 2010 was slightly higher in the rural areas, the population growth was greater in the towns over the same period. Figures 3-E to 3-G display these growth trends.

Table 3-B. Population and Housing Growth 1980-2010

	1980	1990	2000	2010	Increase 1980- 2010
Population:					
Rural Area	19,106	20,587	22,737	23,806	4,700
Towns	8,453	11,049	12,338	18,187	9,734
Total County	27,559	31,636	35,075	41,993	14,434
Housing Units:					
Rural Area	8,315	10,184	10,938	12,960	4,645
Towns	3,685	4,976	5,771	7,916	4,231
Total County	12,000	15,160	16,709	20,876	8,876

Source: U.S. Census of Population and Housing

Recent Development

In accordance with the Annexation Agreement between the County and the Town of Strasburg that was adopted in 1984, the town has been able to annex, by ordinance, developing areas that it serves with public utilities. Strasburg has annexed land along the Route 11 corridor between the downtown area and the I-81 interchange (including the industrial park, a shopping center, apartment and

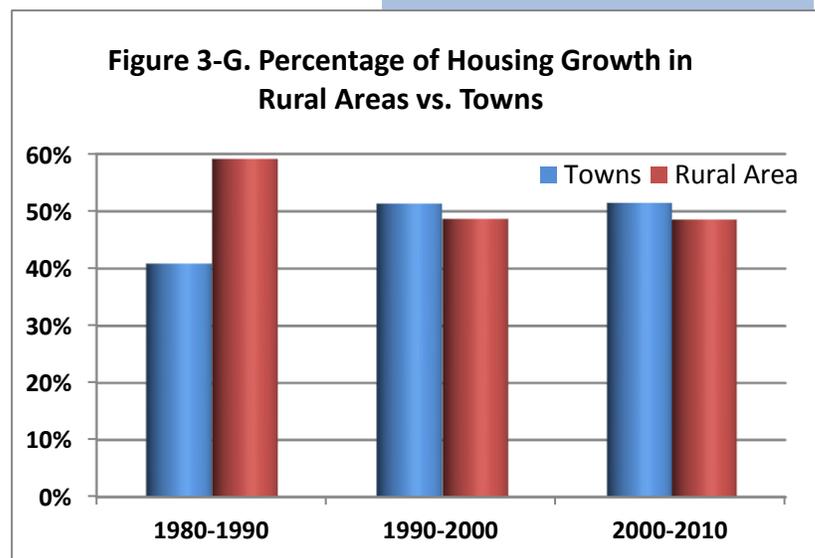
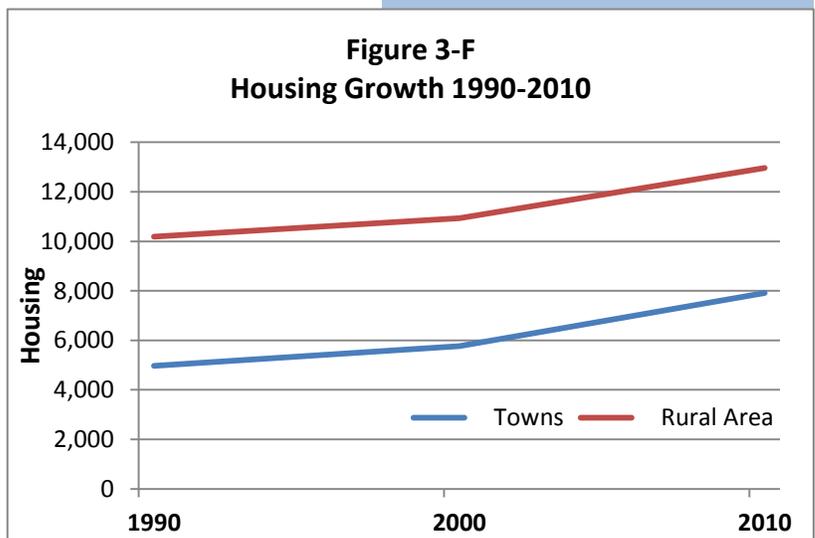
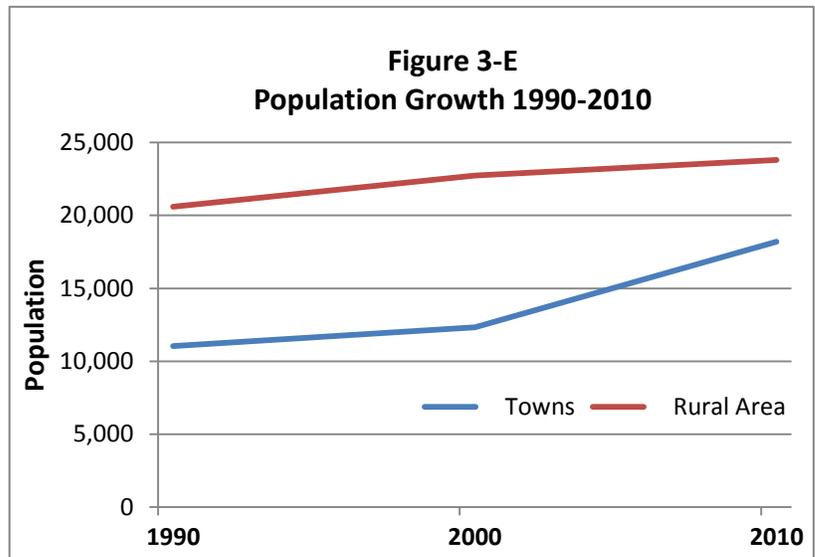
condominium complexes, planned residential development areas and many commercial areas).

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

In 2001, Mount Jackson also completed an Annexation Agreement with the County and proceeded to annex a 2.47 square mile area into the Town. There have been additional small annexations between 2002 and 2005 under the same agreement.

The industrial park in Mount Jackson continues to be developed with light industrial users. A second major industrial park, the Northern Shenandoah Industrial Park (NSIP), was developed in the northern end of the County. The NSIP provides easy access to I-81, and is served by rail and all utilities (including water, sewer, electricity, natural gas and broadband internet). It contains several major industries and plans are proceeding to create additional road access to and within the park to stimulate further growth. An agreement between the County and Strasburg allowed the Town to annex the NSIP as of January 2014.

New Market has a Voluntary Settlement Agreement with the County, last amended in 2012, that outlines future growth of the Town.



Source: U.S. Census of Population and Housing

***In flood plains,
no permanent buildings
are allowed***

***Limited access by the
primary highway and
secondary road systems
can be a development
constraint***

***Because of the amounts
of land involved, the
potential for polluted
runoff is a major
concern for the quality
of water in Shenandoah
County***

Development Constraints

Due to soil and rock conditions, not all of the previously subdivided lots in the County will be buildable. In some cases multiple lots may have to be combined to obtain sufficient land for a well and a septic system. Where the ground is unsuitable for the approval of a conventional septic system, an alternative on-site wastewater disposal system may be required.

The topography of the land is another limiting factor. Although no current ordinance restricts development on steep slopes, construction on such slopes is limited by natural topography. In flood plains, no permanent buildings are allowed by ordinance, although uses such as parks and other recreational areas may be developed. A similar ordinance governing the development of steep slopes and ridgelines should be considered.

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 adequate 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.

Constraints imposed due to topography, geology, soils and water resources are discussed in further detail in Chapter 2, Natural Resources.

IMPACT OF LAND USE PRACTICES ON WATER RESOURCES

As stated above, most County land is used in agriculture or is woodland. Because of the amounts of land involved, the potential for polluted runoff 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, excess bacteria and nutrients from failed septic systems, animal waste and fertilization, and toxic substances such as herbicides, and pathogens. 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 polluted runoff. Extensive catalogues of effective BMPs are available from the local Soil & Water Conservation District and several state environmental agencies. There are individual handbooks for Agriculture, Forestry, Sources Affecting Groundwater, Urbanized land uses, and others.

Urbanized land uses include built-up areas (such as the towns), and residential, industrial, and commercial uses. Potential stormwater runoff from urban and urbanizing areas include bacteria, fertilizers and pesticides, traffic-generated pollutants, chlorides from roadway deicing, and erosion and sedimentation from construction projects. As with agricultural and forestal lands, BMP's for urban areas should be followed.

Because of the prevalence of karst in the underlying local geology and to the presence of many surface waters, it is of the utmost importance that good practices are followed in all development activities to prevent any degradation of the County's water supply.

ZONING

The County and all of the incorporated towns 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.

The County's zoning ordinance has districts designated for agriculture, conservation, residential, commercial, and industrial uses. In addition, there are "overlay" districts or additional regulations that govern such things as uses in flood plains.

The unincorporated areas of the County are subject to the Shenandoah County zoning ordinance.

The zoning districts and the acreages which are covered by each are shown in Table 3-C. Figure 3-H (Shenandoah County generalized Zoning Map) shows the location and distribution of zoning districts, while Figure 3-I displays the proportions of each zoning type. It is important to note that zoning and land use are not always the same (for example, it is common to have residential subdivisions as a use of land in areas zoned for agriculture).

The residential districts range from low-density areas which require a 30,000 square foot lot for a single family house (R-1) to an area which

The prevalence of karst in the underlying local geology requires good practices that prevent degradation of the County's water supply

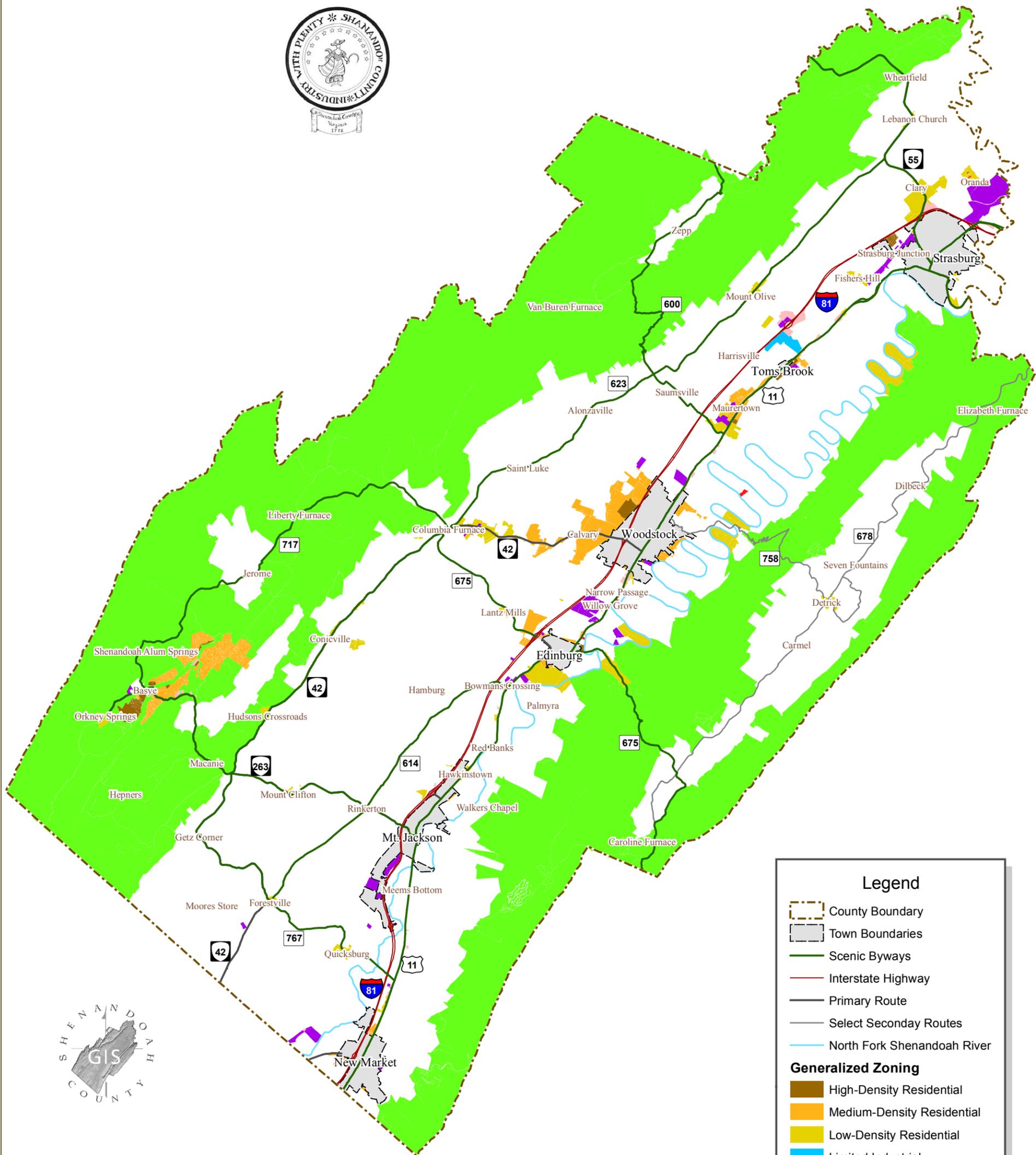
Table 3-C. Acreage in All County Zoning Districts

Zoning District	Acreage	Percent
Conservation (C-1)	69,229	28.85%
Agriculture (A-1)	159,160	66.32%
Rural Residential – Conservation (RR-C)	0	0.00%
Rural Residential – Agriculture (RR-A)	0	0.00%
Low-Density Residential (R-1)	3,600	1.50%
Medium-Density Residential (R-2)	4,112	1.71%
High-Density Residential (R-3)	606	0.25%
Local Business (B-1)	77	0.03%
General Business (B-2)	654	0.27%
General Industrial (M-1)	2,348	0.98%
Limited Industrial (M-2)	202	0.08%

Total only includes land zoned by the County (e.g. towns not included).
Source: Analysis of County GIS data.

Shenandoah County, Virginia

Figure 3-H Generalized Zoning

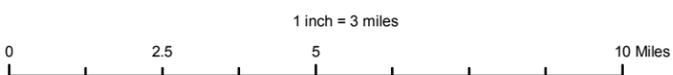


Legend

- County Boundary
- Town Boundaries
- Scenic Byways
- Interstate Highway
- Primary Route
- Select Secondary Routes
- North Fork Shenandoah River

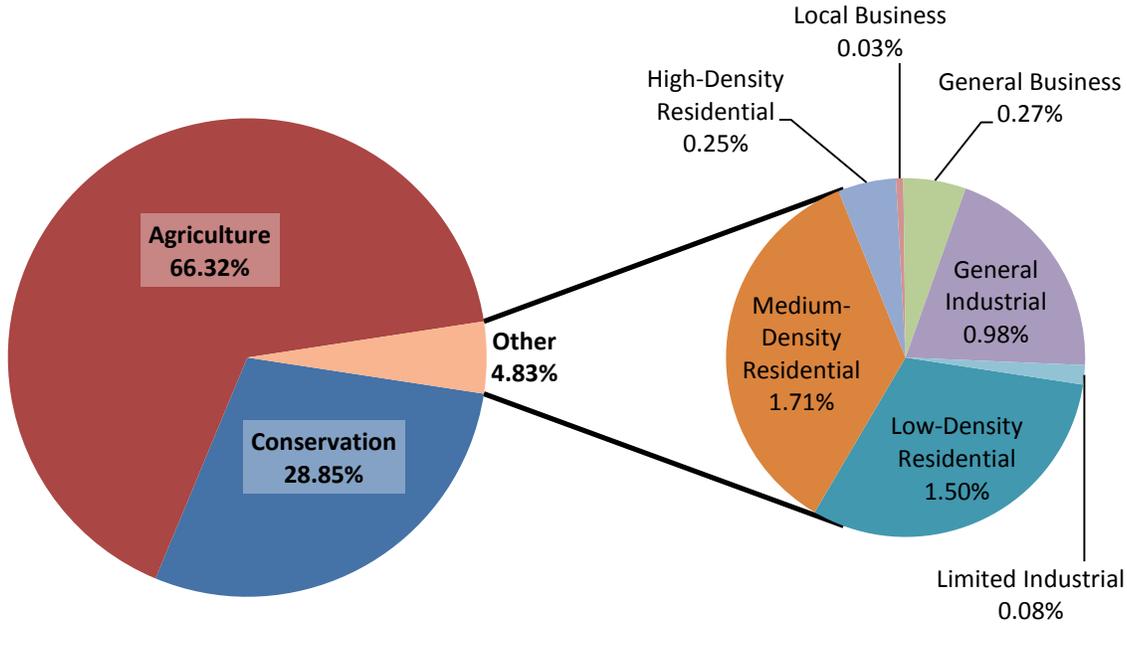
Generalized Zoning

- High-Density Residential
- Medium-Density Residential
- Low-Density Residential
- Limited Industrial
- General Industrial
- Conservation
- General Business
- Local Business
- Agriculture



Note: Zoning does not always reflect actual land use.

Figure 3-I. Acreage by Zoning District



Source: Shenandoah County GIS

will allow a density of 20,000 square foot lots that could contain duplex units if public water and services are provided (R-3).

Lower-density residential areas are located near several towns, in some rural "villages", and in several

recreational subdivisions.

Medium-density districts are located near towns and in the Basye/Bryce Mountain area. New subdivisions being created in all of the residential districts require urban type services such as water, sewer, roads, curbs, gutters, sidewalks, underground utilities and street lights. The "high-density" designations are located within the Toms Brook-Maurertown Sanitary District and the Stoney Creek Sanitary District.

The two business districts are designed to provide for neighborhood 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 the Old Valley Pike (U.S. Route 11).

The General 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.

New residential subdivisions require government services like water, sewer, roads, curbs, gutters, sidewalks, underground utilities and street lights.

A Limited Industrial District (M-2) is designed to permit “high tech” research and development type industries and other light industrial uses that generally assemble or process goods from parts that have previously been manufactured.

The Conservation District (C-1) covers parts of the County which contain various open uses such as forests, recreation areas, and farms. It is designed to promote the protection of such open lands and to protect the natural resources.

The Agriculture District (A-1) 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. Some residential uses are allowed in the conservation and agricultural districts. The required minimum lot size was raised to 3.5 acres in 2003 to reduce the number of lots that could be developed on agricultural land. In 2010, density and lot size requirements were separated. Overall subdivision density was decreased from one lot per 3.5 acres to one lot per 10 acres, and minimum lot size was decreased from 3.5 acres to 1.5 acres.

Two new districts were enacted in 2004: the Rural Residential - Conservation District (RR-C) and the Rural Residential - Agriculture District (RR-A). The purpose of these districts is to provide opportunities for low-density residential lots in areas of the county where there are primarily open uses, such as forests, recreation areas, lakes or streams, agricultural and other low-intensity uses predominate. Uses not consistent with the existing character of the districts are not permitted. As of this writing, no land had been rezoned into either Rural Residential category.

THE FUTURE OF LAND USE

One purpose of the Comprehensive Plan and its supporting ordinances is to provide guidance for the continued orderly growth of the County while maintaining its rural character and the quality of its environment. Efforts to manage the proliferation of small lots in traditional agricultural areas began with the establishment of zoning districts during the 1970s. Early efforts to preserve the rural and agricultural nature of the County concentrated on ordinances related

Conservation zoning is designed to promote the preservation of those open lands and protect natural resources

The Comprehensive Plan provides guidance for the growth of the County while maintaining its rural character

Future growth should be tied to the availability of public service areas

County ordinances should encourage most new residential, commercial and industrial development to occur in and around the towns.

Zoning and subdivision ordinances should be made consistent with the Comprehensive Plan

to lot sizes and limitations on the allowed frequency of subdivision of individual parcels. Despite these ordinances, there was a significant growth in the number of small parcels in the A-1 and C-1 districts with a resultant threat to the rural character of the County and its water resources.

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 water and sewer facilities ("public service areas", or PSAs), with higher density allowed where utilities and services are available or planned to be available. Where individual water and sewage disposal systems must be used and rural secondary roads exist, only low density should be permitted. In order for the goals of the Comprehensive Plan to be met, the average density in the rural (A-1 and C-1) areas should not increase significantly during the period of the Comprehensive Plan.

Future growth areas have been proposed by each of the towns (see Figures 3-J and 3-K). The County has annexation agreements with Mt. Jackson, New Market and Strasburg. (Figure 3-K provides a detailed concept plan for the New Market Growth Area, as agreed to in the voluntary settlement agreement negotiated between the Town and the County.) These agreements specifically delineate the areas jointly targeted for future growth. Edinburg, Toms Brook and Woodstock have each published their intent to expand town boundaries into existing or planned PSAs. Those proposed growth areas are also displayed in Figure 3-J for reference purposes, but those three growth areas have not received County review and concurrence. The Toms Brook-Maurertown and Stoney Creek Sanitary Districts are also shown on the growth areas map. County ordinances and policies should encourage most new development (residential, commercial and industrial) to occur in and around the towns.

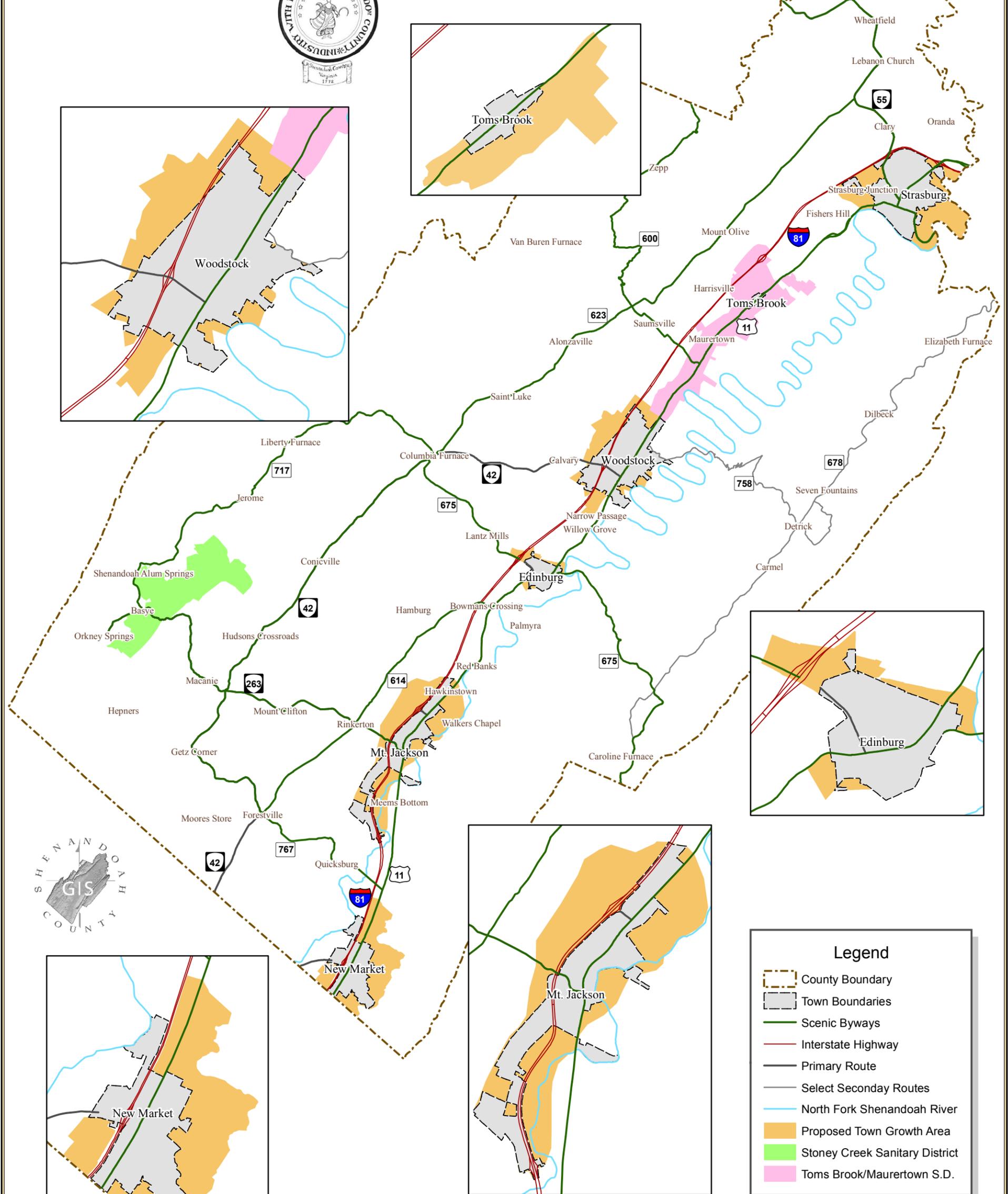
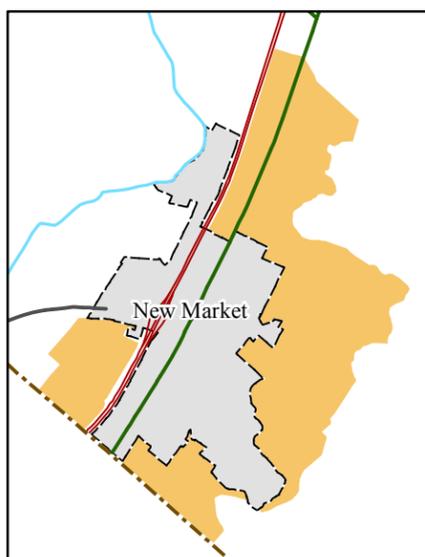
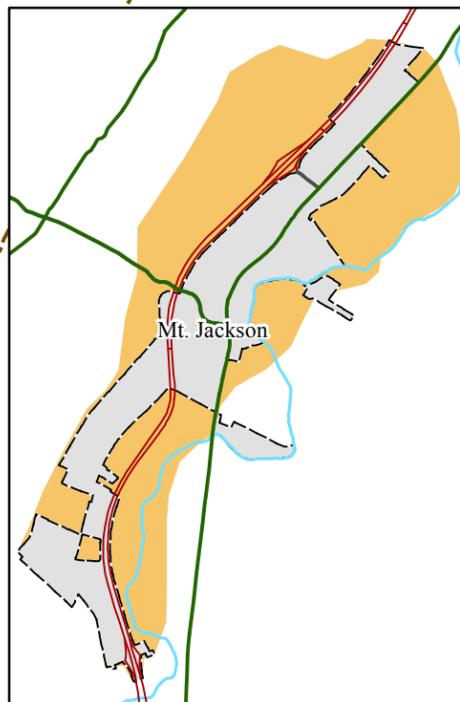
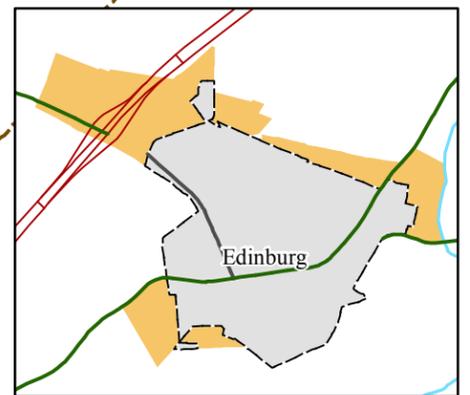
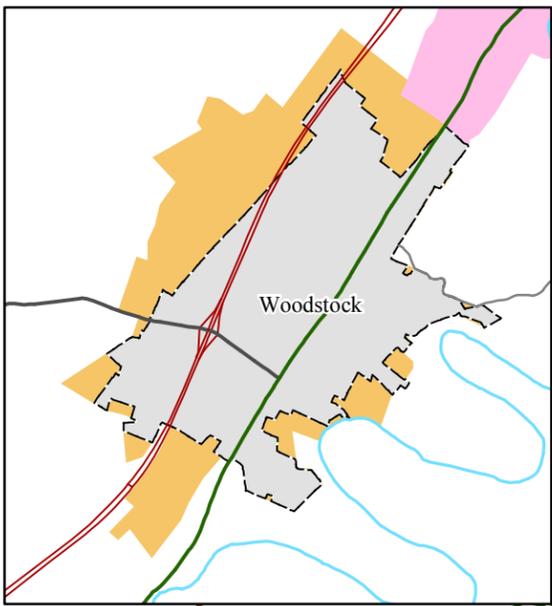
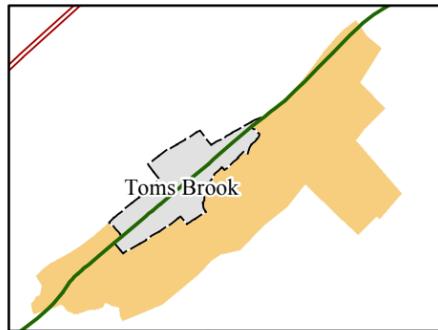
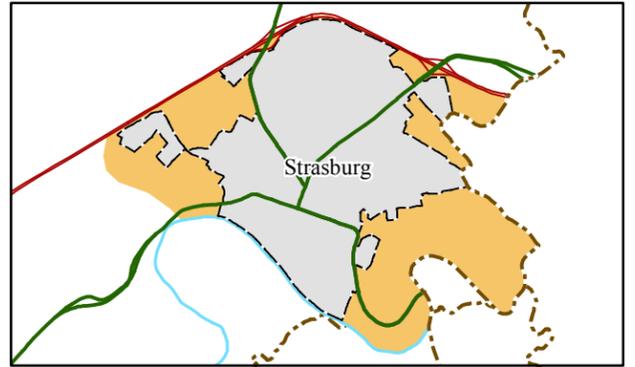
Changes in development techniques and technology will continue to occur and it is necessary to constantly examine the provisions of the approved plan to see if they conform to the stated Vision of the plan while meeting the needs of the County's citizens. Additional provisions that allow for flexible development and encourage developers to provide needed facilities should be explored and incorporated into the zoning and subdivision ordinances of the County consistent with channeling growth to the public service areas.

Finally, until the Vision of the Comprehensive Plan is modified, Shenandoah County's zoning and subdivision ordinances should be consistent with the following principles and procedures which were confirmed during the recently completed Community Planning Project:

- Creation of policies and ordinances that direct most residential growth to Towns and growth areas around the Towns and other public service areas
- Promote business and economic development in appropriately zoned areas
- Support for agriculture
- Management of rural residential development through overall density
- Provide for landowner flexibility in subdivision of existing parcels
- Allow for smaller, but fewer lots for development
- Preservation of large lots
- Encouragement and means for conservation of rural parcels
- Joint land use planning with Towns
- Consideration of ridgeline and steep slope ordinances
- Land use policies and ordinances should be protective of the quality and quantity of groundwater and surface water resources.
- Periodically evaluate and adjust policies and regulations to implement the Vision stated in the Comprehensive Plan.

Shenandoah County, Virginia

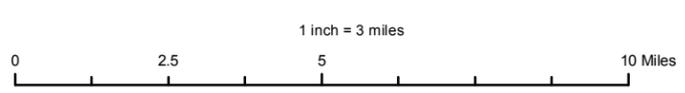
Figure 3-J Proposed Future Growth Areas



Legend

- County Boundary
- Town Boundaries
- Scenic Byways
- Interstate Highway
- Primary Route
- Select Secondary Routes
- North Fork Shenandoah River
- Proposed Town Growth Area
- Stoney Creek Sanitary District
- Toms Brook/Maurertown S.D.

Note: Growth areas for Edinburg, Toms Brook and Woodstock have not received County review and concurrence.



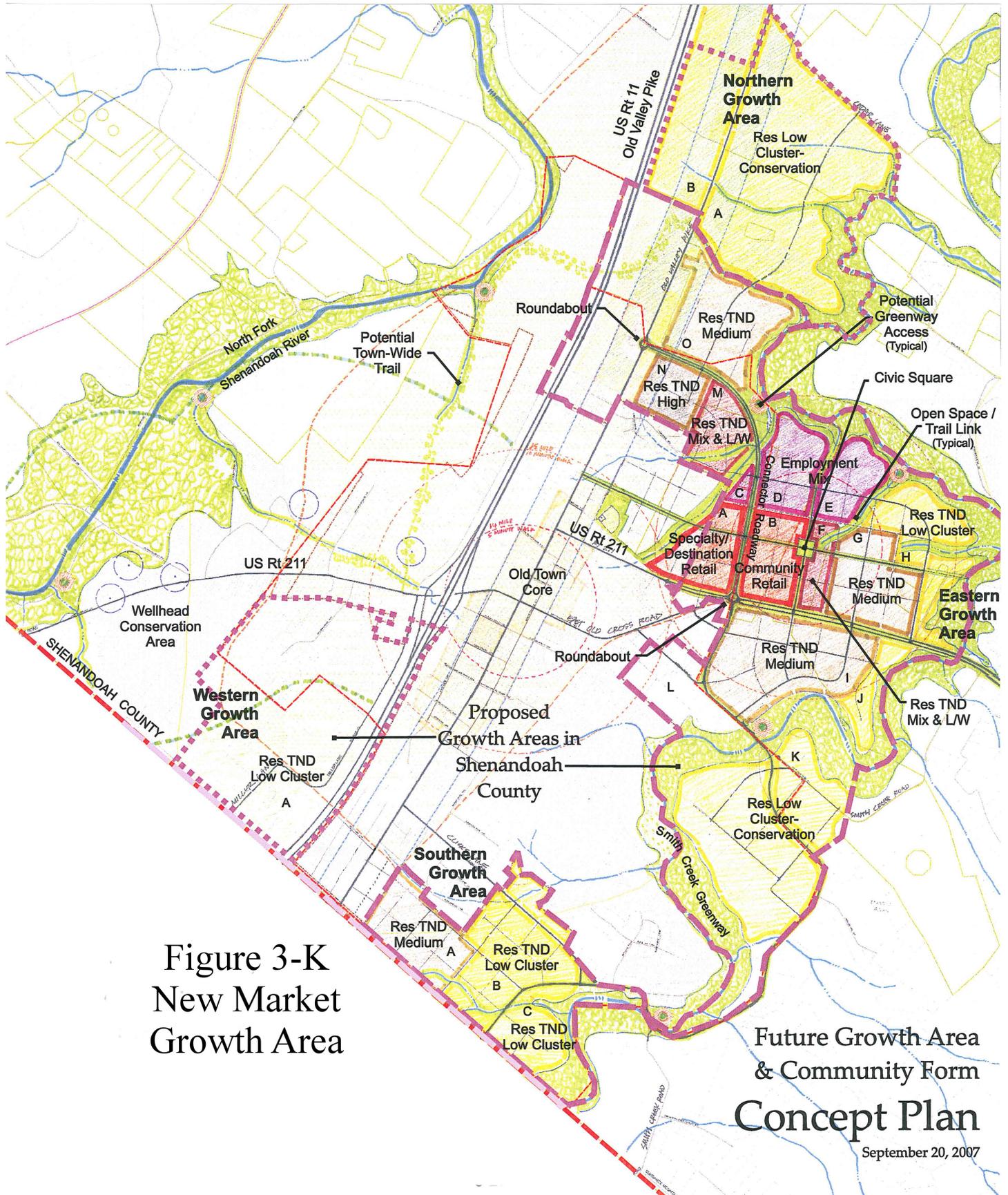


Figure 3-K
New Market
Growth Area

Future Growth Area
& Community Form
Concept Plan

September 20, 2007

ECONOMY

INTRODUCTION

The purpose of this section is to study Shenandoah County's economy and identify important trends and changes that are occurring. The County economy has been examined in a major way several times before for the comprehensive planning process, during the development of an Overall Economic Development Program in the late 1970s, and as part of meeting the initial and then re-certification requirements of the Virginia Department of Economic Development's Community Certification program.

This chapter incorporates data from several sources. The best available recent data has been used for each specific topic, from a variety of State and Federal agencies including: the Virginia Employment Commission, the U.S. Bureau of the Census and the Bureau of Economic Analysis. Due to multiple statistical methods and source data, some variation may be evident throughout the chapter; however, this does not affect the larger economic picture.

The economic base of the County has slowly changed over the past several decades. Textiles were the dominant manufacturing industry for many decades, with plants in several of the towns as well as in the unincorporated area. Now there are no longer any active textile plants.

Manufacturing is still the classification that has the highest percentage of local jobs (although that percentage is falling), followed by Services and then Wholesale and Retail Trade. Agriculture is also an important part of the County's economy, and while the direct employment numbers are not high compared to other classifications, several of the manufacturing enterprises and service industries that are located here are dependent upon the agricultural base for their existence.

The primary economic indicators are employment and income. These indicators are analyzed in two ways in this chapter: by the types of employment and incomes of the County's residents, no matter where they are employed, and by the types of jobs that are located here in Shenandoah County and the incomes generated by those jobs.

In addition, there is a specific analysis of the County's agricultural economy and its relationship to the total local economy.

LABOR ANALYSIS

Labor Force

Labor force refers to the number of persons living in Shenandoah County who are 16 years of age or older and who are employed or seeking work, either within the County or elsewhere. Of the two basic labor force components-- armed forces and civilian--the military portion consisted of only a small number of persons. Accordingly, only the civilian labor force is considered in this study. Comparative figures for 1980 and 1990, and 2000 are shown in Table 4-A.

TABLE 4-A
LABOR FORCE DATA

	<u>1980</u>	<u>1990</u>	<u>2000</u>
Total, 16 years and over	21,418	25,373	28,092
Civilian Labor Force	13,120	16,233	18,204
Employment	12,575	15,622	17,710
Unemployment	545	611	494
Unemployment Rate	4.2%	3.0%	2.7%
Not in labor force	8,289	9,129	9,840

Sources: Census of Population 1980 and 1990, General Social and Economic Characteristics
Census of Population 2000, Summary File 3 (STF3) - Sample Data

In 1980, the County's civilian labor force was 13,120, which represented 61.3 percent of all persons age 16 and over. By 1990, the labor force had increased to 16,233, which represented 64.0 percent of all citizens 16 years and over. The 2000 Census shows an increase to 18,204 persons in the labor force, or 64.8 percent of the total population of 16 years and older. This is a growth rate in the labor force of 38.8 percent for the 20-year period. The rate of growth in the first decade (23.7%) was much greater than the rate of growth in the second decade (12.1%). The County was about equal with Virginia's labor force participation rate of 64.4 percent in 2000. There were a total of 9,840 persons aged 16 and over who were not in the labor force.

The female participation rate in Shenandoah County increased from 48 percent in 1980 to 54.5 percent in 1990 and to 57.4 percent in 2000. That figure was lower than the state average of 59.9 percent in 2000.

Labor Characteristics

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. Table 4-B shows the growth and change in employment by industry between 1980 and 2000.

TABLE 4-B
INDUSTRY OF EMPLOYED RESIDENTS

	1980 <u>Total</u>	1990 <u>Total</u>	2000 <u>Total</u>	% Change <u>1980-2000</u>
Total Employment*	12,575	15,622	17,710	+ 40.8
Agricultural, Forestry, fishing, hunting, and mining	863	866	684	- 20.7
Construction	1,209	1,922	1,782	+ 47.4
Manufacturing	4,440	4,266	3,870	- 12.8
Transportation, Communication, and other utilities	800	862	798	- 0.0
Wholesale-Retail Trade	1,980	2,841	2,825	+ 42.6
Information	---	---	541	---
Finance, Insurance, Real Estate	387	635	751	+ 94.1
Services	2,551	3,782	5,617	+ 120.2
Government/Public Admin.	345	448	842	+ 144.1

Sources: Census of Population 1980, General Social and Economic Characteristics
Census of Population 1990, General Social and Economic Characteristics
Census of Population 2000, Profile of Selected Economic Characteristics

* (Note: Includes employment both within and outside of Shenandoah County.)

Between 1980 and 2000, total employment rose 40.8 percent, and the distribution by industry of employed residents changed. In 1980, over one-third of those employed worked in the manufacturing sector of the economy and the service sector accounted for approximately 20 percent, followed by the wholesale and retail industry with about 16 percent.

By 2000, the top two shares were reversed, with services employing 31.7 percent of the residents while manufacturing employed 21.9 percent. Wholesale and retail trade continued to employ about 16 percent of the County's work force.

Every sector of the economy had a net increase in employment for the 20-year time period except for Agriculture, Forestry, Fisheries and Mining – which decreased from 6.9 percent to 3.9 percent of the work force – and Manufacturing which decreased from 35.3 percent to 21.9 percent. In the short span of 20 years, these are significant changes in the mix of the labor force.

Occupation of Employed Residents

The two leading occupation groups for County residents in 2000 were "Sales and office" and "Production, transportation and material moving" at 24.9 and 23.8 percent of the total respectively as shown in Table 4-C on the next page. In addition, "Management, professional and related" was the classification for 22.5 percent of the residents.

As far as changes are concerned, the "Construction extraction and maintenance" category had the greatest percentage growth between 1980 and 2000, increasing by 157.9 percent. "Sales and office" was the next fastest-growing category with a 122.3 percent increase. "Management, professional and related" workers grew by 96.6 percent while those working in "Services" increased their share by 70.8 percent. Examples of employment in this sector include hospitals and physicians' practices, nursing homes, motels, beauty salons, auto repair shops, and amusement facilities. Most tourism-related businesses are included in this category. In addition, educational services (both public and private) are also classified in this industry.

All occupations had net increases, with the exception of "Farming, forestry and fishing" which had a net decrease of 62.7 percent and "Production, transportation & material moving" which decreased by 23.3 percent. This reflects a continuing trend of growth in the white collar and service industries and away from the manufacturing type industries.

TABLE 4-C
OCCUPATION OF EMPLOYED RESIDENTS

<u>Occupation</u>	<u>1980 Total</u>	<u>1990 Total</u>	<u>2000 Total</u>	<u>% Change 1980-2000</u>
Total employed, 16 years and over	12,575	15,622	17,710	+ 40.8
Management, professional and related	2,028	2,914	3,987	+ 96.6
Services	1,465	1,858	2,502	+ 70.8
Sales and office	1,986	3,323	4,414	+122.3
Farming, forestry and fishing	695	774	259	- 62.7
Construction, extraction and maintenance	905	997	2,334	+157.9
Production, transportation, & material moving	5,496	5,756	4,214	- 23.3

Sources: Census of Population 1980, General Social and Economic Characteristics
Census of Population 1990, General Social and Economic Characteristics
Census of Population 2000, Profile of Selected Economic Characteristics

Unemployment

During the early 1980's Shenandoah County's unemployment rates were above the state's average. By 1990, the County's average annual unemployment rate had decreased to 3.6 percent while the State posted 3.8 percent that same year. In 1995 the County's average of 5.8 percent was again above the average of 4.5 percent for the state, but by 2000 the County's average of 1.2 percent was below Virginia's average of 2.2 percent. Table 4-D, on the next page, shows the unemployment rates for Shenandoah County, the Northern Shenandoah Valley region and Virginia.

TABLE 4-D

AVERAGE ANNUAL UNEMPLOYMENT RATES

	<u>1990</u>	<u>1995</u>	<u>2000</u>
Shenandoah Co.	3.6	5.8	1.2
NSV Region	4.5	5.2	1.7
Virginia	3.8	4.5	2.2

Source: Labor Force Estimates, Virginia Employment Commission

Regional Labor Pool

In 2000, there were 258,417 people living in the counties adjoining Shenandoah County, and the cities that two of those counties surround. This includes Frederick County and the City of Winchester, Warren County, Page County, Rockingham County and the City of Harrisonburg, and Hardy County, WV.

It is estimated that 113,437 persons comprised the civilian labor force within Shenandoah County and the surrounding communities as of July, 2003. Of those persons, 108,769 were employed and 4,668 or 4.1 percent of the labor force were seeking employment, according to monthly unemployment estimates from Virginia and West Virginia.

TABLE 4-E
2003 REGIONAL LABOR POOL

Population of Labor Drawing Area (2000):

Shenandoah County	=	35,075
Surrounding Areas	=	258,417
Total	=	293,492

Persons in Labor Force (July 2003): 113,437

Estimated Unemployed (July 2003): 4,668

Source: Labor Force Estimates, Virginia and West Virginia.

WORK SOURCE ANALYSIS

Jobs in Shenandoah County

As reported by the Bureau of Economic Analysis (BEA), in 2000 Shenandoah County had 19,766 jobs, up from 13,067 jobs in 1980 for an increase of 51.3 percent. (See Table 4-F, next page.) Non-farm jobs grew at a faster rate (59.4%).

About 28.4 percent of the wage and salary employment in Shenandoah County in 2000 was in the manufacturing sector with 5,253 jobs, down from 35 percent of total non-farm jobs in 1980. The service sector provided 4,207 jobs, and wholesale and retail trade had 3,819. Together these three industries accounted for 71.9 percent of all the jobs in Shenandoah County in 2000. The service sector had a 108.4 percent increase over 1980, wholesale and retail industries increased 72.2 since 1980, and manufacturing posted a 29.4 percent increase.

Several major employers in Shenandoah County employ over 250 persons; including:

<u>Name</u>	<u># of Employees*</u>
Shenandoah County Schools	1000 +
George's Chicken, LLC	500 - 999
Lear Corporation	500 - 999
Perry Judd's Inc.	500 - 999
Merillat Corporation	250 - 499
Shenandoah Memorial Hospital	250 - 499
Howell Metal Company	250 - 499
Wal-Mart Associates	250 - 499

*(As of the 1st Quarter, 2003)

With 22.8 percent of the County's jobs, the service industry is both the second largest employer and the fastest growing sector of the economy.

Figures 4-B and 4-C give graphic comparison of Shenandoah County's employment and income changes by industry for the years 1980, 1990 and 2000 on pages 4-9 and 4-10.

TABLE 4-F
SHENANDOAH COUNTY EMPLOYMENT AND INCOME BY INDUSTRY: 1980, 1990 & 2000

Industry Classification	No. of Employees				Personal Income by Major Industry Classification			
	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>% Change 1980-2000</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>% Change 1980-2000</u>
Total - Farm and Non-Farm	13,065	17,372	19,766	51.3%	\$124,429	\$310,002	\$447,430	260.0%
Farm - total	1,470	1,207	1,287	-8.5%	\$1,708	\$13,924	\$12,041	605.0%
Non-Farm - total	11,595	16,165	18,479	59.4%	\$122,721	\$296,078	\$435,389	254.8%
Private - subtotal	10,234	14,596	16,579	70.0%	\$107,464	\$260,915	\$377,273	251.1%
Agriculture, Forestry & Fisheries	88	136	(D)	---	\$504	\$3,340	(D)	---
Mining	(D)	34	(D)	---	\$583	\$1,058	(D)	---
Contract Construction	703	1,217	1,241	76.5%	\$7,490	\$23,307	\$29,985	300.0%
Manufacturing	4,059	5,522	5,253	29.4%	\$51,837	\$127,604	\$161,987	212.5%
Transportation & Public Utilities	420	625	741	76.4%	\$6,446	\$16,062	\$29,023	350.2%
Wholesale Trade	405	482	424	4.7%	\$4,939	\$9,558	\$11,798	138.9%
Retail Trade	1,813	2,431	3,395	87.3%	\$14,684	\$27,889	\$46,022	213.4%
Finance, Insurance & Real Estate	725	756	1,010	39.3%	\$4,178	\$7,375	\$13,448	221.9%
Services	2,019	3,393	4,207	108.4%	\$16,803	\$44,722	\$73,749	338.9%
Government - subtotal	1,361	1,569	1,900	39.6%	\$15,257	\$35,163	\$58,116	280.9%
Federal, Civilian	161	148	170	5.6%	\$2,981	\$4,969	\$8,090	171.4%
Military	115	168	131	13.9%	\$512	\$1,587	\$1,840	259.4%
State & Local	1,085	1,253	1,599	47.4%	\$11,764	\$28,607	\$48,186	309.6%

(D) = Not shown to avoid disclosure of confidential information, but the estimates for this item are included in the totals.

Source: Bureau of Economic Analysis, Regional Economic Information System, Tables CA05 and CA25.

(Inflation was 70.75% between 1980 and 1990, and a total of 128% between 1980 and 2000.)

Figure 4-A
Employment By Industry
Shenandoah County: 1980-2000

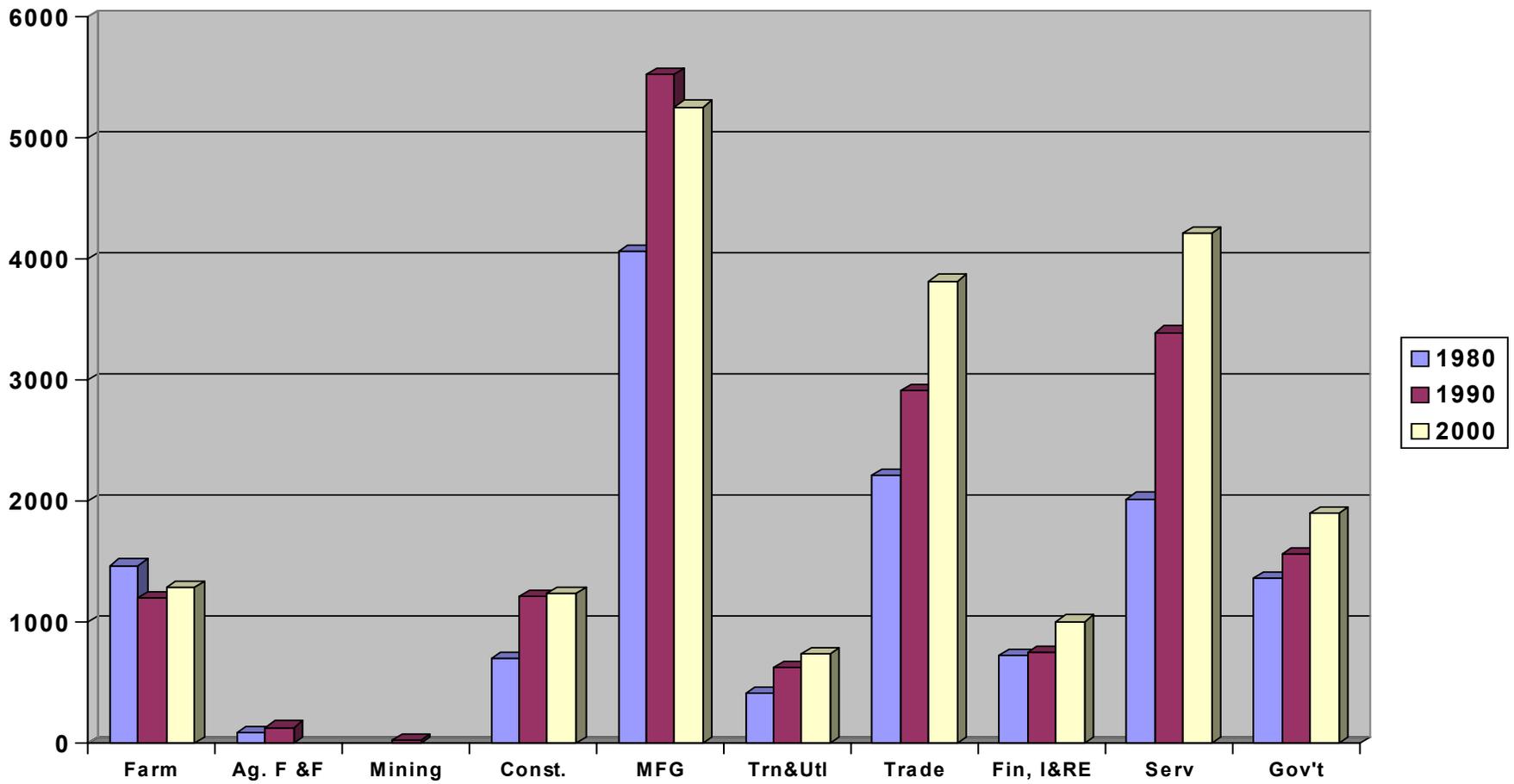
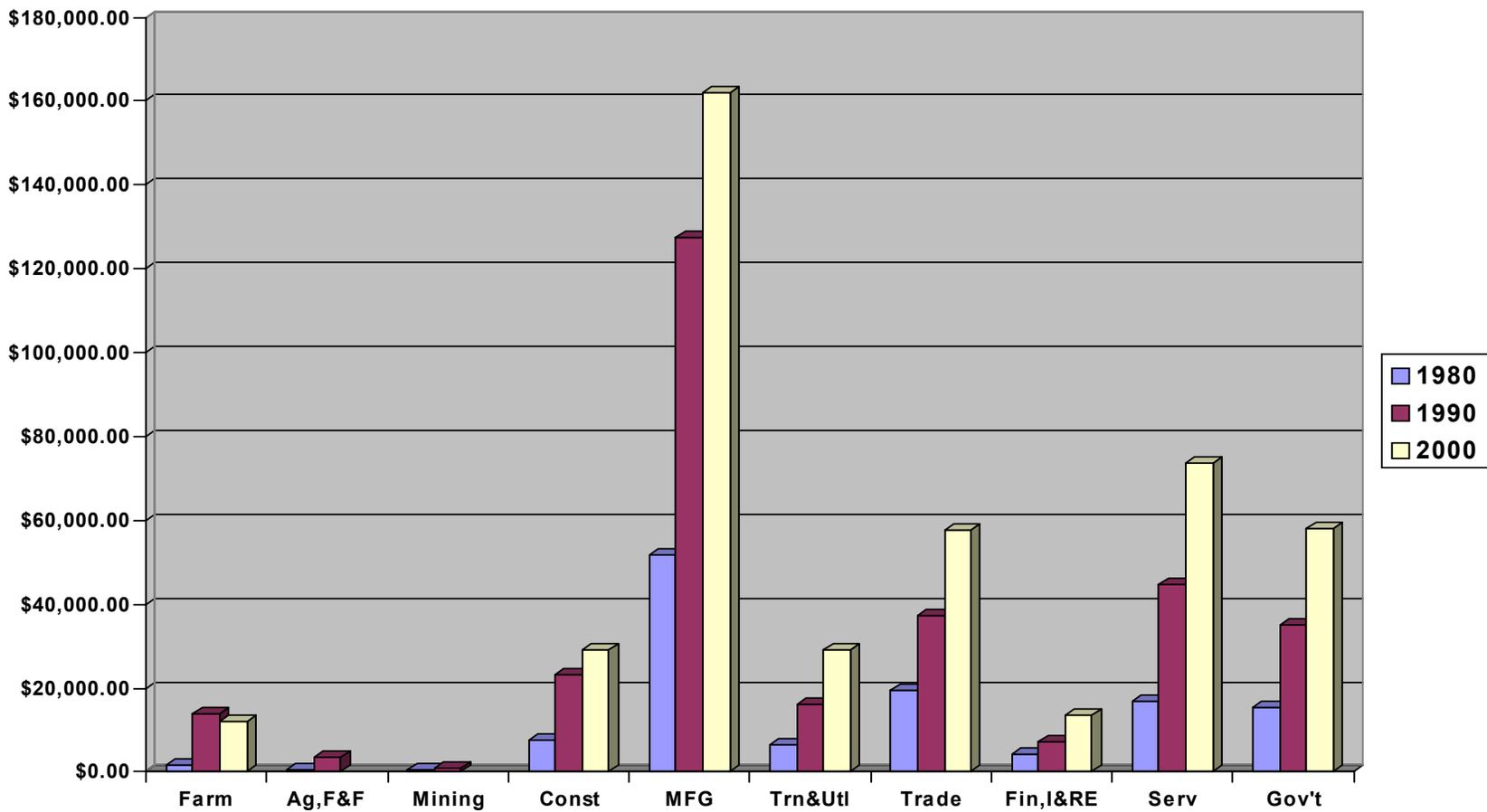


Figure 4-B
Income By Industry
Shenandoah County: 1980-2000



Wholesale and Retail Trade provide 20.7 percent of all jobs in the County. Government accounts for 10.3 percent or 1,900 jobs, most of which (1,599) are in state and local governments. Farm employment fell by 183 jobs (12.5 percent) from 1980 to 2000. Employment is shifting away from farm and manufacturing industries to the service and trade sectors of the economy.

All industries posted increases in personal earnings. Overall, incomes rose by 260 percent, while employment rose by 51.3 percent between 1980 and 2000.

The Non-Farm sector rose by 254.8 percent and the Private sector posted a 251.1 percent increase. Farm income showed a 605.0 percent increase although employment decreased by 8.5 percent.

The other industries with the largest increases in income are Transportation & Public Utilities (350.2%), Services (338.9%), Contract Construction (300.0%), and Government (280.9%). Finance, Insurance & Real Estate incomes rose by 221.9% percent, Manufacturing by 212.5% and combined Wholesale and Retail Trade by 194.7 percent.

Commuting Patterns

As of 2000, approximately 65.2 percent of the 18,252 workers who reported their place of work indicated that they both lived and worked within Shenandoah County, down from 75.2 percent in 1980. Roughly twice as many workers commuted out of Shenandoah County (6,085) compared to those who commuted into the County (3,066) for work. See Table 4-G on the next page for a summary of 2000 commuting data.

There were 3,066 commuters coming into Shenandoah County in 2000. Approximately one-third (33.6%) of those commuters were from Rockingham County (826) or Harrisonburg (637). The Counties of Page (230) and Warren (550) accounted for 25.4 percent of all in-commuters. The City of Winchester (172) and Frederick County (530) represented 22.9 percent of the commuters to Shenandoah County.

A total of 6,085 workers commuted to locations outside the County in 2000. This included 2,098 (34.5%) to the Winchester-Frederick County area and another 1,463 (24.0%) to the Harrisonburg-Rockingham County area. In addition, 1,043 (17.1%) commuted east to the Northern Virginia/D.C. area, and 680 (11.2%) commuted to Warren County.

TABLE 4-G
SHENANDOAH COUNTY COMMUTING PATTERNS - 2000

	In-commuters	Out-commuters	Net
	From	To	
NSV Region:			
Clarke County	28	97	-69
Frederick County	530	1,232	-702
Page County	230	119	+111
Warren County	550	680	-130
Winchester City	<u>172</u>	<u>866</u>	<u>-694</u>
Sub-total	1,510	2,994	-1,484
Outside NSV-within Va.:			
Alexandria	0	29	-29
Arlington County	0	71	-71
Fairfax City	0	31	-31
Fairfax County	7	452	-445
Harrisonburg	164	637	-473
Loudoun County	5	193	-188
Manassas	0	59	- 59
Prince William County	25	92	-67
Rockingham County	867	826	+41
Other in Virginia	<u>77</u>	<u>311</u>	<u>-234</u>
Sub-total	1,145	2,701	-1,556
Washington D.C.	15	116	-101
Maryland	0	127	-127
West Virginia	372	73	+299
Other States, Countries	<u>24</u>	<u>74</u>	<u>-50</u>
Sub-total	411	390	+21
Totals	3,066	6,085	-3,019

Source: U.S. Bureau of the Census, unpublished data, 2000. Northern Shenandoah Valley Regional Commission.

From the commuter data, it can be seen that out-commuting has more than doubled over the past 20 years (6,085 workers in 2000 compared to 2,926 in 1980), while the percentage of those who lived and worked in the County declined from 75.2 percent to 62.3 percent.

Many of Shenandoah County's workers are employed in the Winchester-Frederick County Area and the Harrisonburg-Rockingham Area. Warren County employed 11.2 percent of the County's residents and another 17.1 percent commuted to the Washington D.C./Northern Virginia area. Those areas offer higher paying jobs, for skilled workers. These commuters might choose to work locally if they could find more 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. metropolitan area.

ECONOMIC BASE ANALYSIS

Basic and Supporting Employment

The County's employment is divided into basic and supporting employment. Basic employment industries sell 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 include wholesale and retail trade, construction, finance, insurance, real estate, and most services along with local and routine state government functions. Most supporting industries rely upon the basic industries and local economy rather than regional and national markets.

About 42.2 percent of Shenandoah County's employment in 2000 was in basic industries, down from 44.6 percent in 1990. The manufacturing sector accounts for almost 63 percent of the County's basic employment. Table 4-H on the next page, shows that supporting industries provided employment for 57.8 percent of the County in 2000, up from 55.4 percent in 1990. Since 1990, 1,800 jobs have been added to the supporting industries which is an increase of about 19 percent. The basic industry on the other hand added 583 new jobs or a 7.5 percent increase in the ten year period.

The ratio of supporting employment to basic employment to increased from 1.24:1 in 1990 to 1.37:1 in 2000. This shows an overall increasing demand for more support services as basic employment grows incrementally. 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 earning of those facilities. According to 2000 Virginia Tourism statistics, Shenandoah County had \$114,087,885 in revenues from tourism related attractions. The Bryce Resort, Shenvallee Golf Resort, Shenandoah Caverns, the American Celebration on Parade, the Civil War Battlefields, and an increased interest in Agri-tourism (wineries, deer farms), as well as having 35 miles of interstate running through the County, have all contributed to these revenues.

TABLE 4-H
BASIC VS. SUPPORTING EMPLOYMENT

	<u>1990</u> <u>Number</u>	<u>%</u>	<u>2000</u> <u>Number</u>	<u>%</u>
Employment in County	17,372	100.0	19,766	100.0%
Basic	7,753	44.6	8,336	42.2
Manufacturing	5,522	31.8	5,253	26.6
Farming	1,343	7.7	1,423	7.2
Travel/Tourism Trade	740	4.3	1,490	7.5
Federal Government	148	0.9	170	0.9
Supporting	9,619	55.4	11,430	57.8

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

Other basic employment not shown in the table above comes from preparatory schools (Massanutten Military Academy, Shenandoah Valley Academy), as well as several nursing homes and assisted living facilities. There is no state-wide data in these categories, but we are aware that this employment adds to the overall basic employment data for the County.

Trends in the County's Economic Base

Total employment has steadily grown in the County, both in the basic and supporting industry sectors. Shenandoah County historically has had a sound and stable economy even when some of its neighbors have not enjoyed similar stability; this is because the economic base is diversified. Currently the County reports one of the lowest unemployment rates state-wide. It is also well-positioned to attract new industries that depend on information technology as their basis with the wide-band telecommunications capabilities that are currently in place, and further improvements that are planned for the future.

The percentage of manufacturing jobs has decreased slightly. The year 2000 reported 269 fewer manufacturing jobs than were available in 1990. "Farming" jobs reflect a 6.0 percent increase in the last decade, and Shenandoah County remains one of Virginia's top agricultural Counties. The majority of the agricultural sector produces poultry which is processed by food companies located in Shenandoah County.

Tourism/travel plays a major role in the economy, and tourism-related jobs have increased by 101.4 percent between 1990 and 2000. Tourism should continue to increase in the future.

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 Agricultural Products

Shenandoah County is one of the top five agricultural counties in Virginia in terms of farm income. The backbone of Shenandoah County's agricultural economy is poultry and poultry products.(See Table 4-I on the following page.) This industry is integrated with local growers operating small farms. The revenues of poultry and poultry products (\$45,708,000) represent 66 percent of the total revenues from agricultural products in 2002, up from 63 percent in 1992. Poultry is clearly the dominant agricultural activity in the County today and for the foreseeable future.

With approximately 55,100 acres of pasture land, 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 2002 was \$11,295,000, or 16.2 percent of the total market value of all products sold. Dairy products, sheep, lambs and other livestock have declined over the same period, from a total of 11.7 percent of all livestock sales in 1992 to 9.1 percent of all livestock sales in 2002.

Meanwhile, crops such as grains, nursery/greenhouse products, and fruits, nuts, and berries have improved market value, with a 24 percent increase over the decade. Altogether though, crops represent only 9.2 percent of the total of agricultural products sold. This figure may be distorted somewhat by the practice of growing hay and silage for consumption on the same farm (rather than for sale).

"Crops" with \$6,401,000 in revenues ranks third of Shenandoah County's agricultural products in 2002. 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 1992 "Crops" were responsible for \$5.1 million with "fruit, nuts and berries" accounting for \$2.8 million.

The total market value of all agricultural products sold equaled \$69,658,000 in 2002. This was an decrease of \$3,386,000 (4.6 percent) from 1997, but a total increase of \$13,703,000 (24.5 percent) since 1992. While these figures indicate a substantial rise, most of it can be attributed to inflation rather than an increase in farm production. In Table 4-I, below, net dollar values are given for comparison.

TABLE 4-I
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD

(in \$1,000)	<u>1992</u>	<u>1992</u>	<u>1997</u>
Total Market Value of All Products Sold	\$55,955	\$73,044	\$69,658
Livestock, Poultry, and Their Products	\$50,798	\$65,604	\$63,257
Poultry and Poultry Products	\$35,159	\$50,633	\$45,708
Dairy Products	\$5,234	\$5,473	\$5,570
Cattle, Calves	\$9,288	\$8,583	\$11,295
Sheep, Lambs, and Wool	\$535	\$365	\$174
Other Livestock and Poultry	\$198	\$201	—
Crops	\$5,157	\$7,440	\$6,401
Grains	\$1,416	\$2,489	\$1,271
Hay, Silage, and Field Seeds	\$591	\$916	\$1,057
Nursery/ Greenhouse Products	\$29	\$491	\$847
Fruits, Nuts, and Berries	\$2,802	\$3,467	\$3,063
Other Crops (Vegs., Sweet Corn, & Melons)	\$34	\$63	\$163

Source: Census of Agriculture, 1992, 1997, 2002.

Farm Income

Table 4-J shows the relationship of farm income to total personal income in Shenandoah County. The percentages over a twenty year span have fluctuated between 0.73% to 2.76%. The large increase in the percent of farm income seems to coincide with an increase in the number of farmers who are growing poultry under contract.

TABLE 4-J
FARM INCOME IN SHENANDOAH COUNTY

	<u>Farm Income</u>	<u>Total Personal Income</u>	<u>Farm/Total</u>
1980	\$4,135,000	\$236,503,000	1.75%
1990	\$13,924,000	\$503,869,000	2.76%
2000	\$15,367,000	\$812,878,000	1.89%

Sources: Personal Income by Major Sources, Bureau of Economic Analysis, April 1991.
Table CA30, Regional Economic Information System, Bureau of Economic Analysis,
May 2002.

Even though the County's farm income percentages have fluctuated, they have usually been several times as high as the State's percentage (see Table 4-K, next page). It can be seen that both the State and Shenandoah County's percentages have declined in the most recent decade, but Shenandoah County's proportion to the State figures is increasing.

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

Farm Income/Total Personal Income

	<u>Shenandoah</u>	<u>Virginia</u>	<u>Shenandoah/Virginia</u>
1980	0.73%	0.16%	4.56
1990	2.76%	0.50%	5.52
2000	1.89%	0.26%	7.27

Source: Regional Economic Information System, Bureau of Economic Analysis, May 2002.

Farm Employment

In Shenandoah County farm employment is now almost five times greater than the State as a whole. Farm as well as total employment include both laborers and proprietors. In 2000 the farm employment was 11.8 percent of Shenandoah County's total employment. This is well above the State's 3.0 percent for the same year. (See Table 4-L, below.) Note that for 2000 11.8% of the total employment is in farming, but only 1.89% of total personal income (Table 4-J) is from farming.

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

	Farm Employment/Total Employment		
	<u>Shenandoah</u>	<u>Virginia</u>	<u>Shenandoah/Virginia</u>
1980	11.25%	3.03%	3.71
1990	12.30%	2.98%	4.13
2000	11.80%	2.49%	4.74

Source: Table CA25, Regional Economic Information System, Bureau of Economic Analysis, May 2002.

Farm employment in Shenandoah County has remained fairly steady between 1980 and 2000 (See Table 4-M). In 2000, there were 2,337 persons employed in the farming industry. Of these, 1,050 were farm proprietors and 1,287 were laborers. In the 1980's about 19 percent of all employment in the County was in farming compared to approximately 12 percent in 2000. So while farm employment has been level, its portion of total employment has steadily decreased.

TABLE 4-M
FARM EMPLOYMENT IN SHENANDOAH COUNTY

	<u>Farm Proprietors</u>	<u>Farm Laborers</u>	<u>All Farm Employment</u>	<u>Total Employment</u>	<u>Farm/Total</u>
1980	1,016	1,470	2,486	13,065	19.03%
1990	930	1,207	2,137	17,372	12.30%
2000	1,050	1,287	2,337	19,766	11.82%

Source: Table CA25, Regional Economic Information System, Bureau of Economic Analysis, May 2002.

INCOME ANALYSIS

Income and Wages

Table 4-N, below, shows the median family incomes as indicated by Census figures for Shenandoah County and the surrounding counties for 1980, 1990, and 2000. They are also shown graphically for comparison in Figure 4-D on the next page.

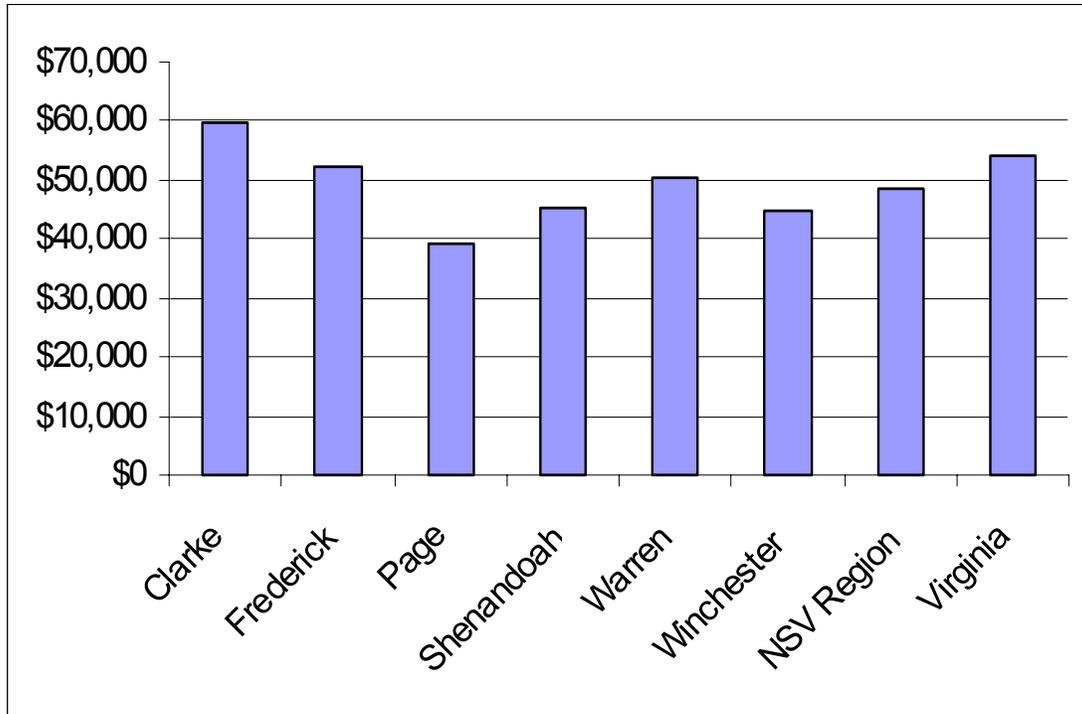
For this twenty year period, the County's median adjusted gross income is slightly lower than the average of NSVRC medians, and well below the State average. However, during this time period, the County has gained as a percentage of the State, rising from 78.1 percent in 1980 to 83.2 percent by 2000.

TABLE 4-N
MEDIAN FAMILY INCOME

	<u>1980</u>	<u>% of State</u>	<u>1990</u>	<u>% of State</u>	<u>2000</u>	<u>% of State</u>
Shenandoah County	\$16,375	75.3	\$31,273	81.8	\$45,080	83.2
Clarke County	\$19,632	90.3	\$38,096	99.7	\$59,750	110.3
Frederick County	\$18,815	86.6	\$35,958	94.1	\$52,281	96.5
Page County	\$15,344	70.5	\$28,251	73.9	\$39,005	72.0
Warren County	\$18,212	83.8	\$35,130	91.9	\$50,487	93.2
Winchester	\$19,559	90.0	\$31,974	83.7	\$44,675	82.5
Planning District	\$17,787	81.8	\$33,457	87.5	\$48,546	89.6
NOVA PDC	\$32,517	149.6	\$48,274	126.3	\$56,765	104.8
Virginia	\$21,735	100.0	\$38,213	100.0	\$54,169	100.0

Source: Summary Social, Economic and Housing Characteristics, 1980, and Summary Tape File STF-3, 1990 and 2000, U.S. Bureau of the Census.

FIGURE 4-C
 MEDIAN FAMILY INCOME - 1999



Per-Capita Personal Incomes for 1980, 1990 and 2000 are shown in Table 4-O on the next page for all the counties in the Northern Shenandoah Valley Region, the City of Winchester, and for the Commonwealth.

As reported by the Census Bureau, per capita personal income in Shenandoah County in 2000 was \$19,755 which is 82.4 percent of the State's 2000 per capita income of \$23,975.

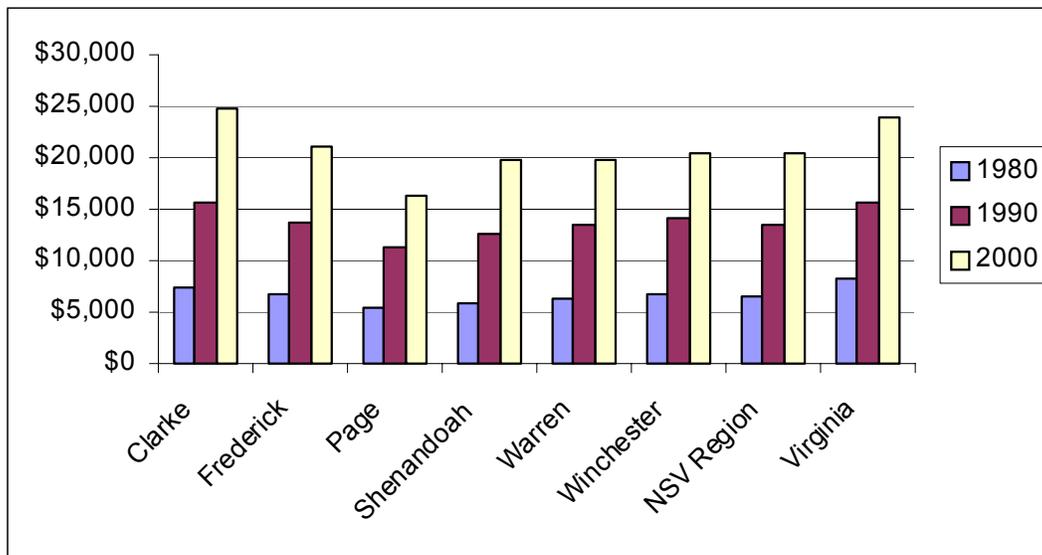
In 1980, the County had a per capita income of \$5,849 and the State had a per capita income of \$8,205. The County's per capita income increased 237.8 percent between 1980 and 2000, well above the State's increase of 192.2 percent.

The 1980, 1990 and 2000 Census per capita personal incomes are also provided on Figure 4-E, below, graphically showing the increases by county over the 20-year period..

TABLE 4-0
PER-CAPITA PERSONAL INCOME - 1999

	1980	1990	2000
Clarke	\$7,473	\$15,657	\$24,844
Frederick	\$6,821	\$13,671	\$21,080
Page	\$5,395	\$11,304	\$16,321
Shenandoah	\$5,849	\$12,686	\$19,755
Warren	\$6,326	\$13,580	\$19,841
Winchester	\$6,821	\$14,214	\$20,500
NSV Region	\$6,448	\$13,519	\$20,390
Virginia	\$8,205	\$15,713	\$23,975

FIGURE 4-D
PER-CAPITA PERSONAL INCOME - 1999



In 2000, some 2873 individuals (8.2% of the population) of Shenandoah County were classified as living below the poverty level. This compares with a state-wide average of 9.6%.

The average weekly wage paid to workers by industries in Shenandoah County during 2000 was \$444 (Table 4-P), according to the Virginia Employment Commission. That represents a 194.5 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 \$707. Manufacturing and Construction were the next highest categories, paying \$545 and \$435 per week respectively.

TABLE 4-P
AVERAGE WEEKLY WAGES PAID IN SHENANDOAH COUNTY
COVERED EMPLOYMENT FOR 1980, 1990, 2000

	<u>1980</u>	<u>1990</u>	<u>2000</u>
Agricultural, Forestry, Fisheries	\$145	\$227	\$427
Construction	\$152	\$310	\$435
Manufacturing	\$205	\$366	\$545
Transportation, Communication			
Utilities	\$240	\$430	\$707
Wholesale & Retail Trade	\$156	\$236	\$381
Finance, Insurance, Real Estate	\$177	\$313	\$414
Services	\$142	\$210	\$351
Average	\$183	\$313	\$444

Sources: Covered Employment and Wages, First Quarter, 1980, 1990, Virginia Employment Commission.
ES-202 Annual Average Weekly Wage, 2000, Virginia Employment Commission.

During 2000, the average weekly wage per worker in Shenandoah County was \$444. The Lord Fairfax Planning District had an average weekly wage of \$525 and the State average was \$706. 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: 2000

Shenandoah County	\$444
Lord Fairfax PDC	\$525
Arlington County	\$1,065
Fairfax County	\$1,013
Virginia	\$706

Source: Employment and Wages, 2000, Virginia Employment Commission

Components of Income

The income of Shenandoah's residents has been increasing steadily in recent years. Between 1980 and 2000, total personal income in the County increased by 243.7 percent, and per capita income has increased by 169.4 percent (these figures are derived from Table 4-R on the next page). This increase is lower than the average of those for the Planning District and the State.

The increase in Shenandoah County has been due to all categories of income, but the most rapid rate of increase is seen in "Dividends, Interest & Rent" This category grew by 335.6 percent and between 1980 and 2000, while all other categories grew between 217 and 243 percent.

Two factors continue to significantly affect the local economy in terms of personal income. One is income from dividends, interest, and rent, and the other is transfer payments. Together they comprise almost 35 percent of all income for County residents.

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 2000, 14.9 percent of the total personal income of Shenandoah's residents was from transfer payments, up from 12.9 percent in 1990. This percentage remains well above the State's and the Planning District's percentage share, and is consistent with the high median age of county residents. (See Chapter 5 - Population.)

TABLE 4-R
COMPONENTS OF PERSONAL INCOME

	1980		1990		2000	
	<u>1,000</u>	<u>Distr.</u>	<u>1,000</u>	<u>Distr.</u>	<u>1,000</u>	<u>Distr.</u>
<u>Shenandoah County</u>						
Net Labor and Propr.						
Income	160,915	68.0%	328,021	65.1%	528,873	65.1%
Dividends, Interest & Rent	37,410	15.8%	110,683	22.0%	162,943	20.0%
Transfer Payments	38,178	16.1%	65,165	12.9%	121,062	14.9%
Total Personal Income	236,503	100.0%	503,869	100.0%	812,878	100.0%
Per Capita Income (\$1)	8,568	—	17,568	---	23,079	—
<u>Planning District</u>						
Net Labor and Propr.						
Income	772,784	69.6%	1,817,950	68.7%	3,375,804	70.1%
Dividends, Interest & Rent	165,067	14.9%	541,018	20.4%	874,405	18.2%
Transfer Payments	172,546	15.5%	286,625	10.9%	563,276	11.7%
Total Personal Income	1,110,397	100.0%	2,645,593	100.0%	4,813,485	100.0%
Per Capita Income (\$1)	8,361	—	16,359	---	26,199	—
<u>Virginia</u>						
Net Labor and Propr.						
Income	38,288,138	72.6%	92,493,148	72.5%	160,824,350	72.7%
Divs, Interest & Rent	7,083,659	13.4%	24,146,954	18.9%	39,493,025	17.9%
Transfer Payments	7,381,938	14.0%	10,974,042	8.6%	20,760,391	9.4%
Total Personal Income	52,753,735	100.0%	127,614,144	100.0%	221,077,766	100.0%
Per Capita Income (\$1)	9,827	—	18,979	—	31,120	—

Source: Personal Income by Major Sources, 1980, 1990, 2000, Bureau of Economic Analysis.

SUMMARY

Approximately 42 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 decreased both in the number of employees and percentage of total employment between 1990 and 2000. The most rapid increases are seen in the services and retail trade sectors. Significant increases in employment and in total distribution have occurred in recent years in tourism in Shenandoah County.

Changes in the occupational distribution of the County's residents indicate a continued shift from blue collar to white collar type jobs. This trend may be due somewhat to those who have recently moved into the County but still retained their jobs in other areas, and now commute out to maintain their higher-skill and higher-pay employment.

The economy of Shenandoah County is becoming less dependent on farming as a primary source of income and employment for residents. However, the agricultural economy is still much more important in Shenandoah County than in most of the rest of Virginia. Poultry and poultry products account for 69% of the market value of all agricultural products sold.

Historically, Shenandoah's unemployment rate had been higher than the State and the Planning District. Beginning with the late 1980s, the County's yearly average unemployment rate has been lower than both the State's and the Northern Shenandoah Valley Region.

The income of Shenandoah's residents has historically been lower than the average of the region and of the State, and it remains so as of the year 2000. It is also considerably lower than that of those living in the Northern Virginia/D.C. metropolitan area, providing an incentive for some workers to commute. In fact, twice as many workers commute to jobs outside the County as commute into the County from elsewhere.

If the County is to break out of the current cycle of low-paying jobs, it will need to attract a different kind of business and industry – ones that require a better educated workforce, a more highly skilled workforce, a more technically oriented workforce, a more knowledge-based workforce. Such companies hire mostly college graduates, and they pay substantially higher wages and salaries. Recruiting such companies requires a collective community effort to create a business-friendly climate and a targeted effort, perhaps on a regional basis, to recruit the right kind of companies to build or relocate here.

With a more highly educated workforce, new companies will look closely at the quality of the public schools in the county. Shenandoah County schools currently spend over \$1000 less per student than the state average, have a higher student/teaching position ratio in grades 8-12 than the state, show lower average SAT scores than the state average, and otherwise show indications that the quality of instruction offered to high school students who aspire to four-year college degrees needs improvement. See the Implementation chapter for specific recommendations related to attracting quality business and industry to the County.

The County's relationship to the regional, state, national and global economies has continued to become increasingly important. Economic analysts agree that a locality's economic viability in the 21st century depends upon a quality work force in terms of basic education, continuing education to upgrade skills and a positive work ethic.

POPULATION

INTRODUCTION

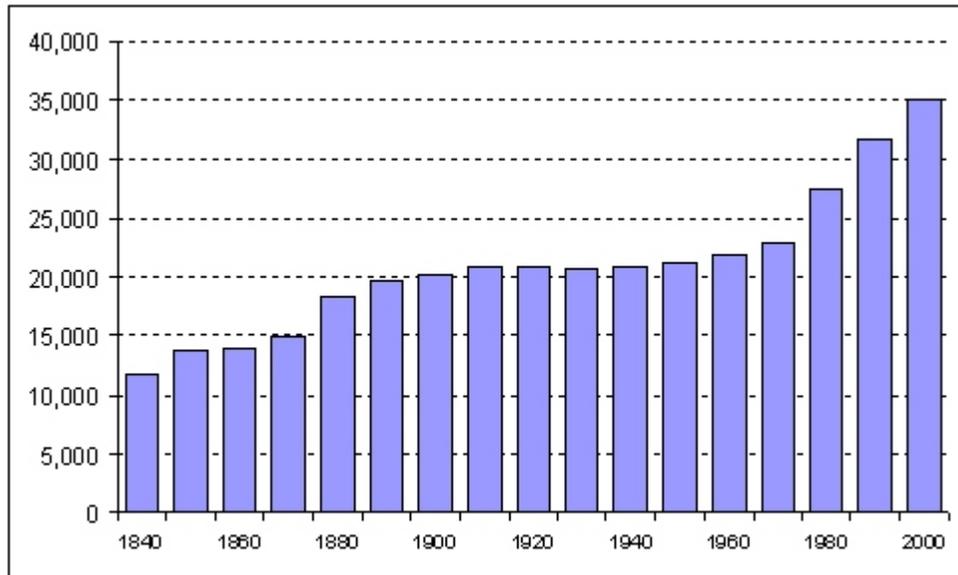
This section presents trends of the County's population, including its size, characteristics, and geographic distribution, discusses the components of change in the population, and presents projections of population growth. Detailed characteristics are derived from sample data gathered by the Census Bureau. The 2000 final population count for Shenandoah County was 35,075.

POPULATION GROWTH

Table 5-A presents the County's population counts from the U.S. Census of Population for the years 1840 through 2000.

TABLE 5-A
POPULATION GROWTH 1840-2000

<u>Year</u>	<u>Population</u>
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
2000	35,075



Sources: Intercensal Estimates and Decennial Census Counts for Virginia Localities, 1790-1980, Tayloe Murphy Institute, February 1983.
Census of Population, U.S. Bureau of the Census, 1990, 2000.

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%. This growth rate declined to approximately 1.03% annually throughout the 1990s, with the latest available population count of 35,075 for 2000.

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 was equal to the state's 1.4% rate between 1980 and 1990. This past decade the County's rate declined to just over 1.0% while the State's rate again remained at 1.4%.

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 available from the 2000 census, with comparative figures for Virginia and the U.S.

TABLE 5-B
SUMMARY DEMOGRAPHIC CHARACTERISTICS FOR 2000

	<u>Shenandoah County</u>	<u>Virginia</u>	<u>United States</u>
Total Population	35,075	7,078,515	281,421,906
Percent Male	48.7%	49.0%	49.1%
Percent Female	51.3%	51.0%	50.9%
Median Age	40.9	35.7	35.3
Percent Minorities	4.4%	27.7%	24.9%

Source: Profile of General Demographic Characteristics, U.S. Bureau of the Census, 2001.

Age Distribution

Table 5-C shows the age distribution for Shenandoah County based on Census data from 1970 through 2000. 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, to 24.7% by 1990, and then to 24.5% by 2000.

TABLE 5-C
AGE DISTRIBUTION: 1970, 1980, 1990, AND 2000

	1970		1980		1990		2000	
	<u>Pop.</u>	<u>%</u>	<u>Pop.</u>	<u>%</u>	<u>Pop.</u>	<u>%</u>	<u>Pop.</u>	<u>%</u>
Under 5	1,713	7.5	1,639	5.9	1,932	6.1	1,948	5.6
5 - 19	6,182	27.0	6,398	23.2	5,876	18.6	6,625	18.9
20 - 44	6,706	29.3	9,352	33.9	11,495	36.3	11,229	32.0
45 - 64	5,190	22.7	6,083	22.1	7,053	22.3	9,190	26.2
Over 64	<u>3,061</u>	<u>13.4</u>	<u>4,087</u>	<u>14.8</u>	<u>5,280</u>	<u>16.7</u>	<u>6,083</u>	<u>17.3</u>
Totals	22,852	100.0	27,559	100.0	31,636	100.0	35,075	100.0
Median Age:	31.4		33.9		37.4		40.9	

Sources: U. S. Census of Population, 1970, 1980, 1990 and 2000.

Educational Attainment

In 1980, only 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. By 1990, over 65 percent of County adults had earned at least a high school diploma, and by 2000 this has further increased to over 75 percent.

Those who had earned a college degree or higher (including graduate school or a professional degree) rose from 8.9 percent in 1980 to 11.2 percent as of 1990 and to 14.7 percent as of 2000. Table 5-D presents the 1980, 1990 and 2000 data on educational attainment.

TABLE 5-D
EDUCATIONAL ATTAINMENT - 2000
PERSONS AGE 25 YEARS OR OVER

	<u>1980</u>	<u>1990</u>	<u>2000</u>
Not High School Graduate	8,753	7,590	6,162
High School Graduate	5,649	7,991	9,572
Some College/Associate Degree	1,513	3,789	5,531
Bachelor Degree	923	1,635	2,461
Graduate or Professional Degree	639	798	1,200
Total Persons, 25 yrs.+	17,477	21,803	24,926
Percent High School Grads	49.9%	65.2%	75.3%

Source: Census of Population, General Social and Economic Characteristics, U.S. Bureau of the Census, 1980, 1990, 2000.

Density & Urban/Rural Distribution

The total land area of Shenandoah County is 512 square miles. There were 68.5 people per square mile in the county and the State's population density was 178.3 per square mile in 2000. Table 5-E shows comparative densities for other jurisdictions in the region as of 2000, as well as their rate of increase in density.

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. As of 2000, Strasburg's population was 4,017 and Woodstock's was 3,952. Strasburg is the fourth largest urban area within the region (Lord Fairfax Planning District) in 2000, behind Winchester (23,585), Front Royal (13,589), and Luray (4,871).

TABLE 5-E
LAND AREA AND POPULATION DENSITY

Jurisdiction	Square Miles	1990 Population	2000 Population	2000 Density per sq. mi.	% Increase in Density 1990 - 2000
Shenandoah	512.0	31,636	35,075	68.5	10.9
Clarke	174.0	12,101	12,652	72.7	4.6
Frederick	426.8	45,723	59,209	138.7	29.5
Page	316.0	21,690	23,177	73.3	6.9
Warren	219.0	26,142	31,584	144.2	20.8
Winchester City	9.2	21,947	23,585	2,563.6	7.5
Virginia	39,703	6,189,307	7,078,515	178.3	14.4

Sources: Census of Population, 1980, 1990, Bureau of the Census
Profile of General Demographic Characteristics, Bureau of the Census, 2001

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 1980 to 2000. The percentage of County population in towns increased from 32.5% in 1980 to 35.2% in 2000. Growth in towns for the period ranges from 8.1% in Edinburg to 50.4% in Woodstock, for an average of 37.6% for all towns, while the unincorporated areas of the County grew at a rate of 22.3% during the same period.

TABLE 5-F
TOWN POPULATIONS

	<u>1980</u>	<u>1990</u>	% Change	
			<u>2000</u>	<u>1980-2000</u>
Edinburg	752	860	813	8.1%
Mount Jackson	1,419	1,583	1,664	17.3%
New Market	1,118	1,435	1,637	46.4%
Strasburg	2,826	3,762	4,017	42.1%
Toms Brook	226	227	255	12.8%
<u>Woodstock</u>	<u>2,627</u>	<u>3,182</u>	<u>3,952</u>	<u>50.4%</u>
Total - Towns	8,968	11,049	12,338	37.6%
Rural Areas	18,591	20,587	22,737	22.3%
County Total	27,559	31,636	35,075	27.3%
Town % of Total	32.5%	34.9%	35.2%	

Sources: Census of Population, 1980, 1990, U.S. Bureau of the Census
Profile of General Demographic Characteristics, Bureau of the Census, 2001

In the 1970's the vast majority of the population growth in Shenandoah County was in the unincorporated area. 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, as shown in Table 5-F, between 1980 and 2000, the population of the incorporated towns grew at a rate of 37.6 percent while the population of the unincorporated area of the County grew by only 22.3 percent.

While the **rate** of growth was faster in the towns, the absolute **number** of persons added was still greater in the unincorporated area (1,289 persons in towns; 2,150 persons in the rural area).

Several factors contributed to the shift in growth 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. The analysis will provide a basis for formulating expectations of development and county services demands.

Natural Increase and Net Migration

Table 5-G, on page 5-8, illustrates Shenandoah's population changes in relation to other Counties within the Northern Shenandoah Valley Region, the City of Winchester, the region as a whole, neighboring Harrisonburg and Rockingham County, and the Commonwealth of Virginia. The region experienced a moderate pace of growth between 1990 and 2000, adding 26,043 new residents to its total population. Shenandoah County ranked third in the region in terms of net population growth. Shenandoah (10.9% growth) rated higher than neighboring Page County (6.9%) and Clarke County (4.6%) but was considerably lower than Frederick County (29.5%), Warren County (20.8%), the Northern Shenandoah Valley Region (16.4%) and was also lower than Harrisonburg and Rockingham County (22.7%) and the statewide population increase of 15.7%.

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 moved into Shenandoah County. This pattern continued between 1990 and 2000, when 92.7 percent of the 3,439 increase was due to net in-migration.

Two chief causes for Shenandoah County's recent in-migration have been identified. The County's economy 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-G
COMPARATIVE NATURAL INCREASE AND NET MIGRATION, 1990 - 2000

	<u>Net Increase</u>	<u>Percent Change 1990 - 2000</u>	<u>Natural Increase</u>	<u>Net Migration</u>
Shenandoah	3,439	10.9%	285	3,154
Clarke	551	4.6%	167	384
Frederick	13,486	29.5%	3,579	9,907
Page	1,487	6.9%	270	1,217
Warren	5,442	20.8%	1,552	3,890
Winchester	<u>1,638</u>	<u>7.5%</u>	<u>673</u>	<u>965</u>
NSV Region	26,043	16.4%	6,526	19,517
Harrisonburg/ Rockingham	20,004	22.7%	4,352	15,652
Virginia	889,318	14.4%	428,377	460,941

Source: Weldon Cooper Center for Public Service Tabulations, 2001

Table 5-H, on page 5-9, helps explain the declining role of natural increase in population changes. The figures show that both birth and death rates declined from 1990 to 1999 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 16.3%, but the birth rate decreased by 30.9%. The State figures followed the same trend, with a drop of 24.7% in the birth rate. Table 5-I, shown on page 5-10, carries this analysis even further, providing the numerical results of these trends between 1990 and 2000.

TABLE 5-H
 BIRTH AND DEATH RATES PER THOUSAND POPULATION: 1970 - 2000

	Shenandoah <u>County</u>	State of <u>Virginia</u>
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
2000 - Birth Rate	11.4	14.0
Death Rate	10.3	7.9

Sources: County and City Data Book, Bureau of the Census for 1977, 1983;
 Virginia Department of Health Web Site Statistics, 2002.

Shenandoah County exhibited moderate population growth between 1990 and 2000, recording a 10.9% increase for the period. This was lower than the State growth rate of 14.4%. However, the composition of the County's population growth is quite different from that of the statewide growth. While natural increase accounted for over 48% of the population gain statewide from 1990 to 2000, it represented only 8.3% of Shenandoah County's population gain for the period. This means that 91.7% of the County's population growth is due to in-migration. In addition, since many of these in-migrants are retirees, that causes the natural increase figures to remain lower.

TABLE 5-I
POPULATION CHANGE FACTORS, SHENANDOAH COUNTY AND VIRGINIA
1990 - 2000

	Shenandoah <u>County</u>	<u>Virginia</u>
Population		
April 1, 2000	35,075	7,078,515
April 1, 1990	31,636	6,189,197
Net Change	3,439	889,318
Total percentage change	10.9%	14.4%
Average annual rate	1.0%	1.4%
Components of change		
Births	3,928	944,366
Deaths	3,643	515,989
Natural increase	285	428,377
Total percentage change	0.9%	6.9%
Average annual rate	<0.1%	0.6%
Estimated net migration	3,154	460,941
Total percentage change	10.0%	7.4%
Average annual rate	1.0%	0.7%

Source: Demographic Profiles, Weldon Cooper Center for Public Service,
VaStat Web Site, 2002.

As shown below in Table 5-J, 54.8% of residents new to the County since 1995 had moved to Shenandoah from other areas of Virginia, and 40.7% arrived from a different state. Approximately 4.5% of those new residents came here from somewhere outside of the United States.

TABLE 5-J
PLACE OF RESIDENCE IN 1985 OF 1990 POPULATION
AND IN 1995 OF 2000 POPULATION

	<u>1990</u>	<u>2000</u>
Persons 5 years or over	29,706	33,059
Same House	17,313	19,508
Same County, Different House	6,166	7,316
Elsewhere in Virginia	3,333	3,416
Different State	2,838	2,539
Elsewhere - outside of U.S.	56	280

Sources: General Social and Economic Characteristics, U.S. Bureau of the Census, 1990; Profile of Selected Social Characteristics:2000, Weldon Cooper Center for Public Service Web Site, 2002.

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.

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 decades, and must be carefully considered in the formulation of population projections.

TABLE 5-K
SHENANDOAH COUNTY RESIDENTS
PLACE OF BIRTH 1980, 1990 AND 2000

	<u>1980</u>	<u>1990</u>	<u>2000</u>
Total Persons	27,559	31,636	35,075
Native of U.S.	27,346	31,282	33,995
Percent Born in State of residence	78.9%	73.2%	96.1%
Foreign-Born Population	213	354	275

Sources: Social Characteristics for Counties and Independent Cities, U.S. Bureau of the Census, 1980, 1990. Profile of Selected Social Characteristics: 2000, U.S. Bureau of the Census, 2002.

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, below, 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 1990 and 2000, with the percentage of females decreasing by four-tenths of a percent.

TABLE 5-L
MALE/FEMALE DISTRIBUTION: 1990, 2000

		<u>1990</u>	<u>2000</u>
Shenandoah Co.	Male	15,280 (48.3%)	17,075 (48.7%)
	Female	<u>16,356</u> (51.7%)	<u>18,000</u> (51.3%)
	Total	31,636	35,075
Virginia	Male	3,033,974 (49.0%)	3,471,895 (49.0%)
	Female	<u>3,153,384</u> (51.0%)	<u>3,606,620</u> (51.0%)
	Total	6,187,358	7,078,515

Sources: General Social and Economic Characteristics, U.S. Census of Population, 1980, 1990. Profile of General Demographic Characteristics: 2000, U.S. Bureau of the Census, 2002.

Median Age

Table 5-M compares median ages of Shenandoah County with the Northern Shenandoah Valley Region (formerly the Lord Fairfax Planning District) and the Commonwealth. From 1970 to 2000, all three experienced increases in median age. Shenandoah County maintained an older population at each decennial determination, although the median age for the Commonwealth is now increasing at a faster rate than either the region or the County.

TABLE 5-M
MEDIAN AGE: 1970-2000

	<u>1970</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>
Shenandoah County	32.8	33.9	37.4	40.9
Northern Shenandoah Valley	30.7	32.7	34.6	38.3
Commonwealth of Virginia	26.8	30.0	32.6	35.7

Sources: Virginia General Population Characteristics, Bureau of the Census, 1970 and 1980; Summary Tape File STF-1A, Bureau of the Census, 1991; Profile of General Demographic Characteristics: 2000, U.S. Bureau of the Census, 2002.

The expanding Washington, D.C. metropolitan area to the east offers a range of 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 ages reflect these occurrences.

Racial Composition

According to 2000 census data, over 95.6% of Shenandoah County's population is white. For the first time ever, the Census forms allowed those responding to indicate that their racial background was from two or more races; however, less than one percent indicated that. There were just over 400 blacks in the county in 2000, which comprised 1.2% of the population.

Whites increased by 2,464 (7.9%) between 1990 and 2000, while Blacks or African-Americans increased by 53 (14.8%). Other minorities increased rapidly in the past decade, from 208 to 1,130 (a 443.3% increase). Persons of Hispanic Origin (of any race) increased by 902, from 292 in 1990 to 1,194 in 2000 (a 300.1% increase). The increase in persons of Hispanic origin is particularly noteworthy. Integration of Hispanics into the overall community, encouraging and assisting adults to learn English, and teaching English as a second language to school age children are among the challenges which this rapid growth presents to the County and to the community.

The County's racial composition differs greatly from the State population, which consists of 26.1% minorities. Minorities have always been a very low percentage of the County's total population, but they are now increasing at a faster pace than Whites. Data on racial composition and Hispanic origin for Shenandoah County are presented in Table 5-N, below.

TABLE 5-N
RACIAL COMPOSITION AND
HISPANIC ORIGIN: 1990 AND 2000

	1990 <u>Persons</u>	Percent of <u>Population</u>	2000 <u>Persons</u>	Percent of <u>Population</u>
White	31,069	98.2%	33,533	95.6%
Black	359	1.1%	412	1.2%
Other*	208	0.7%	1,130	3.2%
Hispanic Origin	292	0.9%	1,194	3.4%

*(Including mixed races)

Sources: General Population Characteristics, U.S. Bureau of the Census, 1980; Summary Tape File STF-1A, Bureau of the Census, 1991; Profile of General Demographic Characteristics: 2000, U.S. Bureau of the Census, 2002.

FUTURE POPULATION GROWTH

Shenandoah County's population in 2000 was 35,075, a 10.9% net increase over the 1990 population of 31,636. The primary factor for growth ever since 1960 has continued to be net in-migration.

New residents are likely to move to the County for several reasons: a quality retirement location, local employment opportunities, or as a commuter looking for lower cost housing or a lifestyle that is not available in the jurisdiction of employment. These can all be summarized as "quality of life" issues.

Population projections are necessary for planning future public improvements and programs. Most projections mathematically extend historical trends. For the purpose of this plan, projections prepared from several sources are used. However, none of these projections should be mistaken as a population target.

Table 5-O, below, is based on Census counts and the population projections from the Labor Market & Demographic Analysis section of the Virginia Employment Commission (VEC), which were prepared prior to the 2000 Census. It shows recent growth and projections for Shenandoah County, the Planning District, and Virginia:

TABLE 5-O
POPULATION COUNTS AND PROJECTIONS

<u>Year</u>	<u>Shenandoah County</u>	<u>Planning District</u>	<u>State of Virginia</u>
<u>Census Counts</u>			
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
2000	35,075	185,282	7,078,515
<u>Population Projections</u>			
2010	42,597	213,984	7,737,597
2020	47,594	240,869	8,034,150
2030	52,591	267,754	8,617,142
2040	57,588	294,639	--
2050	62,585	321,524	--

The projected population for the County by the year 2010 was 42,597, which would be a 21.4 percent increase from 2000. For the same period the State population is expected to increase by only 9.3 percent, while the Planning District is expected to grow more rapidly with a projected increase of 15.5 percent. Given the recent growth of Shenandoah County, at 10.9 percent from 1990 to 2000, the projection for the year 2010 seems rather high.

VEC has now prepared new population projections, based on the actual 2000 Census counts and on their cohort survival model which projects population based on age, sex and race through the year 2030. Since the 2000 Census count was lower than the previous projection (of 37,600) the revised projections for the County are somewhat lower than the previous numbers at 39,100 by 2010; 43,000 by 2020; and 47,100 by the year 2030.

The latest population estimates prepared by the Weldon Cooper Center for Public Service at UVA reflect a faster-growing population since 2000. Those estimates are 36,100 as of July 2001, 36,700 as of July 2002, 37,600 by July 2003 and a provisional estimate of 38,300 as of July 2004. Overall, the rate of growth reflected by those estimates is a total of 9.2 percent, for an annual average growth rate of 2.1 percent – well above the annual rate of 1.0 percent between 1990 and 2000.

Other ways to project population include a straight-line projection based on the same numerical growth as the last period studied; a projection based on the percentage growth, and a statistical approach that looks at the growth in several past periods and projects it forward called linear regression (a form of regression analysis). Table 5-P, below, shows the results for Shenandoah County based on these three methods, and a resulting “educated guess” projection.

TABLE 5-P
POPULATION PROJECTIONS - 2010 THROUGH 2050
SHENANDOAH COUNTY

	<u>2000</u>	<u>2010</u>	<u>2020</u>	<u>2030</u>	<u>2040</u>	<u>2050</u>
Straight-Line Numeric:	35,075	38,514	41,953	45,392	48,831	52,270
Straight-Line Percent:	35,075	38,888	43,115	47,802	52,998	58,759
Linear Regression:	35,075	39,967	44,342	48,716	53,091	57,465
Rounded Projections:		39,400	43,700	48,300	53,000	58,000

Another way to consider population growth is using annual average increase, which can reflect the long term trends. Shenandoah County’s growth over the last several decades peaked between 1970 and 1980 with an annual average increase of about 1.9 percent. Due to the national recession, very little growth took place in Shenandoah County in the early 1980's, and for the period 1980 to 1990 the annual average increase dropped to approximately 1.4 percent. Between 1990 and 2000 we have seen a moderate growth rate of just under one percent annually.

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

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

<u>Time Period</u>	<u>Net Increase</u>	<u>Percentage Increase</u>	<u>Percent Average Annual Increase</u>
1940-1950	271	1.3	less than 0.1
1950-1960	656	3.1	0.3
1960-1970	1,027	4.7	0.5
1970-1980	4,707	20.6	1.9
1980-1990	4,077	14.8	1.4
1990-2000	3,439	10.9	1.0
2000-2010	4,325	12.3	1.2
2010-2020	4,300	10.9	1.0
2020-2030	4,600	10.5	0.9
2030-2040	4,700	9.7	0.9
2040-2050	5,000	9.4	0.9

While population growth between 1980 and 2000 was moderate by an annual average rate definition, the more visible growth has been in housing units. Dwelling units in the County increased from 11,861 in 1980 to 16,709 in 2000, an average annual rate of over 2% 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-R shows historical, current estimates, and projections of average household size for the County, the Northern Shenandoah Valley Region, 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-R
AVERAGE HOUSEHOLD SIZE

Historical	<u>Shen. Co.</u>	<u>NSV</u>	<u>VA</u>	<u>U.S.</u>
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
2000	2.42	2.50	2.54	2.59
Projections				
2010	2.38	2.46	2.50	2.55

Sources: National Average Household Size Estimates, U.S. Bureau of the Census, March 1989
Household Projections, Northern Shenandoah Valley Regional Commission, 2002

Table 5-S, below, shows the projections of the total number of households in Shenandoah County based on the persons per household shown above. The projected 12.3% increase in population between 2000 and 2010 combined with a decline in the average household size will generate a 14.1% increase in the number of households.

TABLE 5-S
PROJECTION OF HOUSEHOLDS

	<u>1980</u>	Actual <u>1990</u>	<u>2000</u>	Projection <u>2010</u>
Population	27,559	31,636	35,075	39,400
Persons not in Households	261	530	513	576
Persons per Household	2.72	2.50	2.42	2.38
Number of Households	10,035	12,452	14,296	16,313

Source: Household Projections, Northern Shenandoah Valley Regional Commission, 2002 and population projections by Shenandoah County Planning Department, 2002

SUMMARY

From 1890 until 1970 the population of Shenandoah County remained almost constant at about 20,000. Between 1970 and 2000 it grew to 35,000. Projections indicate a significant but somewhat slower growth rate over the next 30 years (to approximately 48,000 by 2030).

The median age of 40.9 years is significantly above the state (35.7) and the U.S. (35.3). There are important implications stemming from this wide disparity in median age in terms of higher death rates from leading diseases and the need for senior care in all of its dimensions.

There has been a 10% decrease in the percentage of the population under 20 years old over the last 30 years. This also has important implications for the present and the future.

There has been a significant increase in the percent of adults with a high school education – from 50% in 1980 to 75% in 2000.

Although the percentage of growth in the towns has been greater than in the rural areas since 1980, the absolute number of persons added has been greater in the rural areas (2150 versus 1289).

In terms of growth, the ratio of in-migration to natural growth, 1990-2000, is overwhelmingly in favor of in-migration (11:1) and is far greater than any of the neighboring jurisdictions or the state as a whole.

On a daily basis, over twice as many members of the workforce commute to jobs outside the county than commute into the county from elsewhere.

Shenandoah County has a very small minority population. African Americans represent 1.2% of the population; Hispanics represent 3.4% and have been growing, especially in the last decade.

Nation-wide there has been a steady decline in household size over the past 30 years. At 2.42 persons per household, Shenandoah County has a lower rate than the planning district, the state, or the U.S.

On the whole, these statistics indicate that over the past 30 years Shenandoah County has become the residence of choice for a significant number of older and often retired individuals who have moved here from other locales.

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 2020.

HOUSING MARKET

Shenandoah County is defined as a basic housing market. As of 2000, 65.2% of its workers 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 consider Shenandoah County as a place to live.

The current housing market in the County is very active. According to 2000 Census data, 40 percent of the population aged 5 years and older were located in a different housing unit in 1995. There is now interest in building relatively larger housing developments by nationally-known construction firms, something that had not been seen before this decade.

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 1990, Shenandoah County's average household size was 2.50 compared to 2.63 for the United States. In 2000, the national average was 2.59 persons per household which was again higher than the 2.42 persons per household in the County at that time.

A continued decline in the size of households is predicted through the year 2030. Table 6-A, below, 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 an even higher rate than the population growth. A 10.9% increase in population between 1990 and 2000, combined with a decline in the average household size, generated a 14.8% increase in the number of households. Between 2000 and 2010, a projected 11.5% population increase would yield a 13.4% increase in households. In total, for the projection period between 2000 and 2020, a 22.6% increase in population is expected to generate a 26.4% increase in the number of households.

TABLE 6-A
PROJECTIONS OF HOUSEHOLDS

	Actual		Projections	
	<u>1990</u>	<u>2000</u>	<u>2010</u>	<u>2020</u>
Population	31,636	35,075	39,400	43,000
Persons not in Households	530	513	520	520
Person per Household	2.50	2.42	2.38	2.35
Number of Households	12,452	14,296	16,336	18,077

Sources: U.S. Bureau of the Census, Census of Population & Housing, 1990 & 2000. Virginia Employment Commission, Population Projections Northern Shenandoah Valley Regional Commission, Projections of Households, 2004.

Income and Employment Patterns

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

The most recent data available is 2002 income tax returns for the State of Virginia, and it is presented in nine income ranges with the highest being \$75,000 and above. Of major concern to a builder is the price range affordable to new householders. To determine what ranges might exist in the County, the 2002 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 2002.

Table 6-B on the next page uses this information as follows: Column 1 shows the nine income ranges. 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 30 percent of the gross monthly income. This figure is a currently-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 2002 distribution of income for Shenandoah County married households. Column 6 and 7 is the distribution of total anticipated households between 2000 - 2010 and 2010 - 2020, based on the 2002 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 Monthly Housing at 30% Gross Monthly Income (\$)	Affordable Mortgage or Rental Payment at 75% Total Monthly Housing Cost	2002 Distribution of Income for Married Households %	Distribution of New Households	
					2000-2010*	2010-2020
Less than \$ 9,999	to \$20,000	\$ 250 maximum	\$ 188 maximum	13.0%	249	243
\$10,000 to \$14,999	\$ 20,000 to \$ 37,000	\$ 250 to \$ 375	\$ 188 to \$ 281	4.0%	77	75
\$15,000 to \$19,999	\$ 30,000 to \$ 50,000	\$ 375 to \$ 500	\$ 281 to \$ 375	4.6%	88	86
\$20,000 to \$24,999	\$ 40,000 to \$ 62,500	\$ 500 to \$ 625	\$ 375 to \$ 469	5.6%	107	105
\$25,000 to \$29,999	\$ 50,000 to \$ 75,000	\$ 625 to \$ 750	\$ 469 to \$ 563	5.7%	109	106
\$30,000 to \$39,999	\$ 60,000 to \$100,000	\$ 750 to \$1,000	\$ 563 to \$ 750	12.1%	232	226
\$40,000 to \$49,999	\$ 80,000 to \$125,000	\$1,000 to \$1,250	\$ 750 to \$ 938	13.1%	251	245
\$50,000 to \$74,999	\$100,000 to \$187,500	\$1,250 to \$1,875	\$ 938 to \$1,406	24.8%	474	462
\$75,000 or more	\$150,000 or more	\$1,875 or more	\$1,406 or more	17.1%	327	319
TOTAL				100.0%	1,914	1,867

NOTE: Totals have been corrected to account for rounding.

SOURCE: Weldon Cooper Center for Public Service, University of Virginia, Virginia Adjusted Gross Income by Income Class and Locality, 2002.

Liquid Asset Holdings and Financing

This category of determinants is difficult to predict. Mortgage interest rates and down payment requirements may be variable over time. Down payment requirements for banks are generally held to a 20 percent minimum; to finance greater than 80 percent of the value, banks will require private mortgage insurance (PMI). Credit unions may allow a lower down payment. Lower down payment loans are also 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

The County's housing consists primarily of single-family, detached, owner-occupied homes; 13,208 out of a total 16,709 houses (79%) were included in that category in 2000. Although most households would prefer that type of home, many may not have the resources to buy such a home in the future. Over the last two decades, there has been 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 2000 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 2000, 290 (2.0 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.

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.

Additional data on the 1980, 1990, and 2000 housing stock are shown in Table 6-C, below. 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 generally 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.

TABLE 6-C
SHENANDOAH COUNTY HOUSING STOCK
1980-2000

	<u>1980</u>	<u>% of Total</u>	<u>1990</u>	<u>% of Total</u>	<u>2000</u>	<u>% of Total</u>
Total Year-round	11,861	100	15,160	100	16,709	100
Vacant-For Sale/Rent	423	3.6	352	2.3	372	2.2
Not for Sale/Rent	371	3.1	507	3.3	579	3.5
Held for Occasional Use	1,032	8.7	1,849	12.2	1,462	8.7
Total Occupied	10,035	84.6	12,452	82.1	14,296	85.6
Owner	7,622	76.0*	8,903	71.5*	10,462	73.2*
Renter	2,413	24.0*	3,549	28.5*	3,834	26.8*
In-Town	3,877	32.7	4,976	32.8	5,771	34.5
Out-of-Town	7,984	67.3	10,184	67.2	10,938	65.5

Sources: Census of Housing, 1980, 1990, 2000, U.S. Bureau of the Census

Notes: *(As percentage of total occupied.)

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, either through direct subsidies or interest rate subsidies for construction of units, as does the Farmers Home Administration Section 515 Rural Rental Housing Program. There are over 800 subsidized units in Shenandoah County as of 2004.

The County recognizes the need for additional affordable housing, and encourages 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.

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 2020. 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. By the year 2000, this was reduced to 290, and a goal is to reduce the balance to zero by 2020.

Replacement of Losses

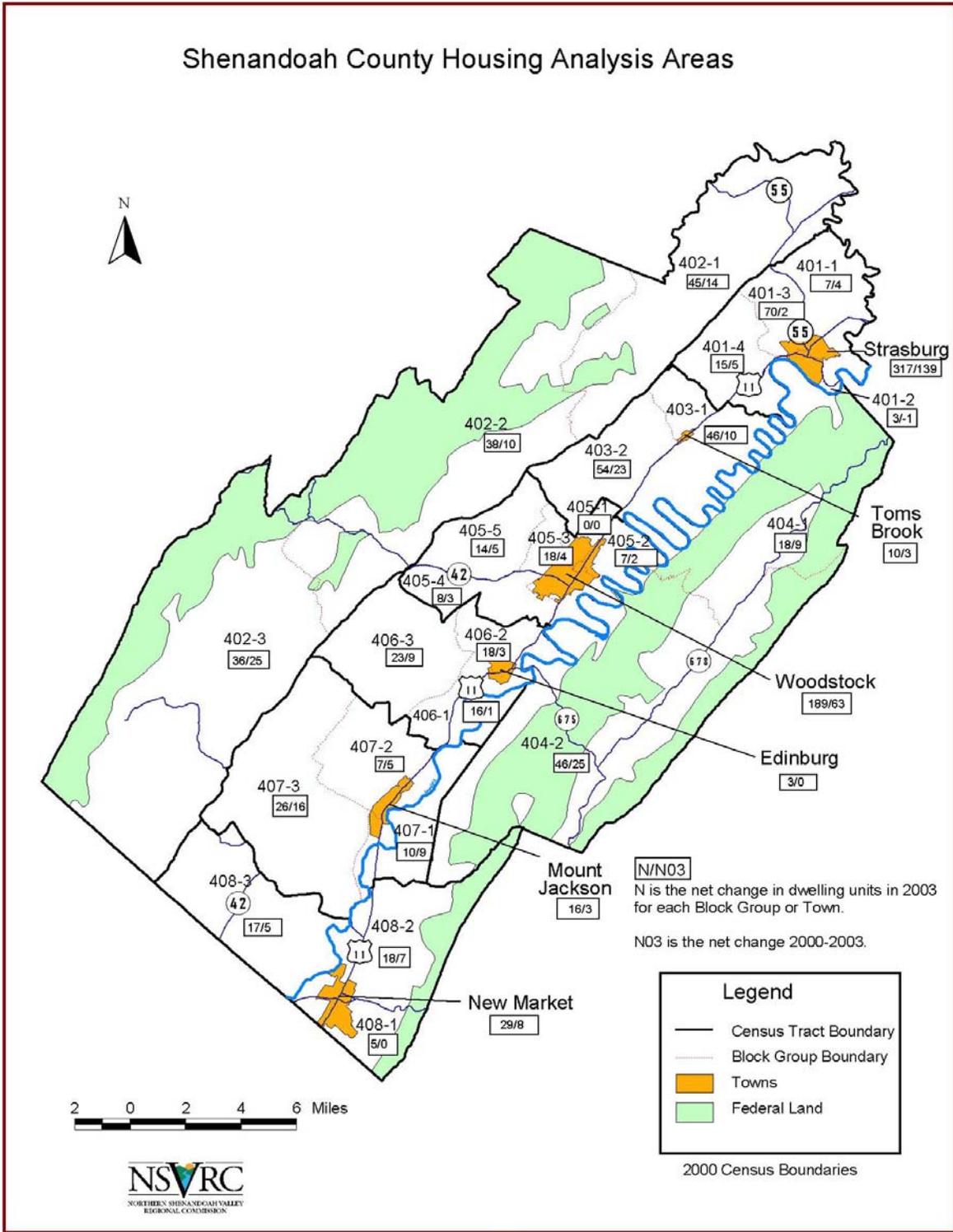
In addition to planned replacement of substandard units, other losses can be expected to occur in the housing stock. Units are lost due to: deterioration to a point where they are unfit for habitation; natural disasters such as fire and flood; man-made changes such as conversion to non-residential uses, 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 6-13.

Current Estimates

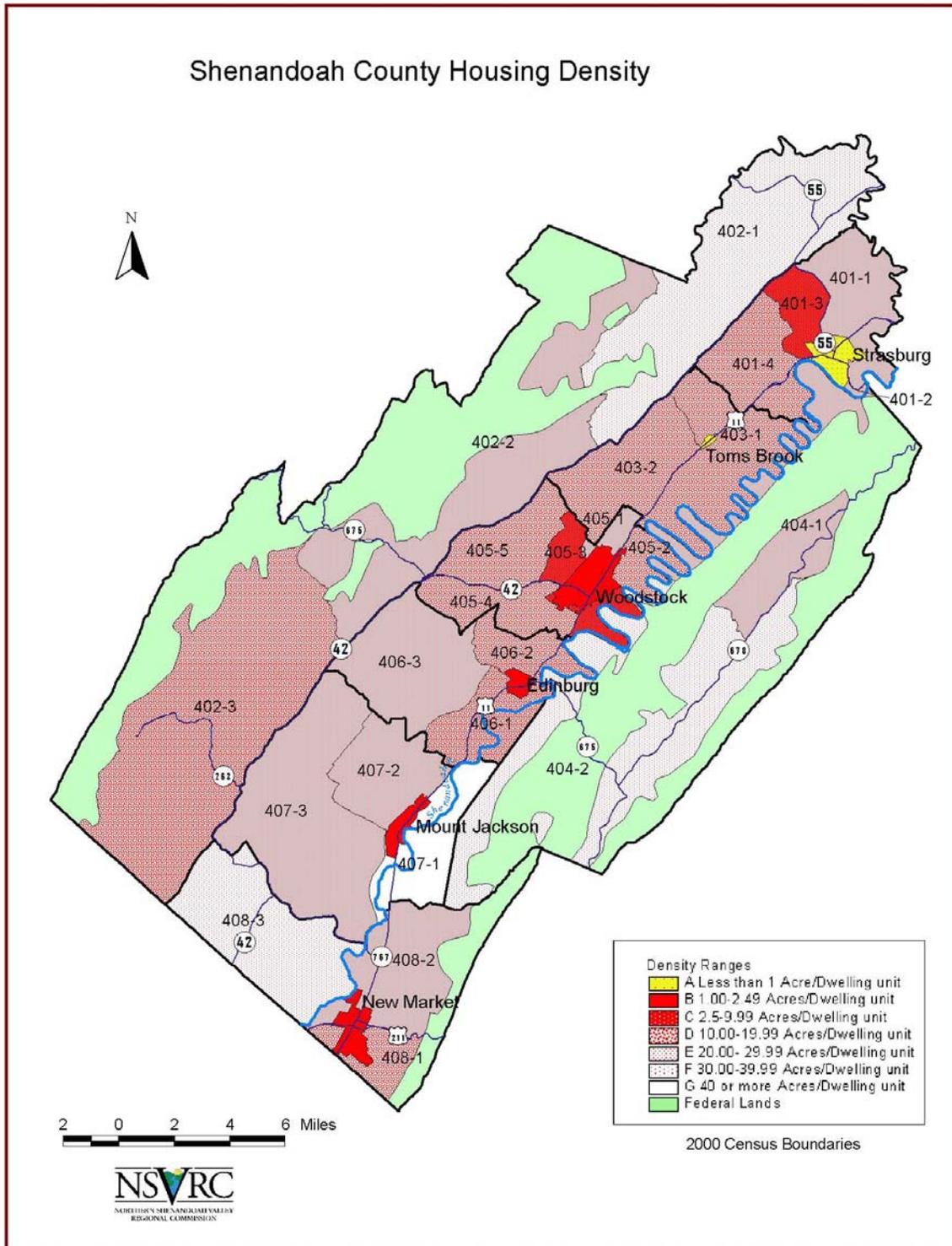
The most current estimates through 2003, based on building permit data are shown in the Housing Data Report table on the next page. The 2000-2003 growth figures and resulting densities are also shown on the following two maps. These three pages were extracted from the Annual Housing Report prepared by the Northern Shenandoah Valley Regional Commission, and show that the housing growth rate has increased (9.2% for 2000-2003 compared to 10.2 for the last decade).

[Insert NSVRC 2003 Housing Table here – it is in M.S. Word Format – print separately!]

Shenandoah County Housing Analysis Areas



Shenandoah County Housing Density



Vacancy

The number of vacant units for 1990 and 2000, and the 2000 vacancy rate are shown for each rural Census Tract and for the six incorporated towns in Table 6-D. In 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 35.2 percent, and the Fort Valley area has a vacancy rate of 25.5 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 considerably more moderate vacancy rates, ranging from 2.9 percent in the Town of Toms Brook to 9.4 percent in the Town of Edinburg.

TABLE 6-D
VACANT DWELLING UNITS 1990-2000

	<u>Vacant 1990</u>	<u>Vacant 2000</u>	<u>'90 - '00 Change</u>	<u>Tl. DU's 2000</u>	<u>2000 Vacancy Rate</u>
Rural Portion of Census Tract:					
402	1,456	1,131	-22.3%	3,208	35.2%
403	112	99	-11.6%	1,268	7.8%
401	33	50	51.5%	920	5.4%
404	331	288	-13.0%	1,131	25.5%
405	82	76	-7.3%	1,325	5.7%
406	76	71	-6.6%	973	7.3%
407	130	117	-10.0%	1,030	11.4%
408	191	157	-17.8%	1,083	14.5%
Incorporated Towns:					
Edinburg	32	40	25.0%	425	9.4%
Mount Jackson	29	51	75.9%	718	7.1%
New Market	51	71	39.2%	808	8.8%
Strasburg	57	104	82.5%	1,877	5.5%
Toms Brook	3	3	0.0%	103	2.9%
Woodstock	125	155	24.0%	1,840	8.4%

Source: U.S. Census of Population & Housing, 1990, 2000.

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 identifies 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 2000, there was a 73.2% - 26.8% split between owner and renter-occupied units. The vacancy rates shown in Table 6-E are based on the assumption that the 2000 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 2020, 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 2000 and 2020 an additional 6,075 housing units will be required to house the projected growth. This translates into an annual average of about 304 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.

Table 6-E
 Dwelling Unit Projections By Decade
 Shenandoah County

	1990-2000	2000-2010	2000-2020
Average Annual Growth	1.20%	1.30%	1.00%
Vacancy Rate considered appropriate			
Owner	1.25%	1.25%	1.25%
Renter	5.00%	5.00%	5.00%
Occupied Units, End of Decade	14,296	16,210	18,076
Owner Units (71.5%)	10,462	11,865	13,231
Rental Units (28.5%)	3,834	4,345	4,845
Vacant Units, End of Decade	2,413	2,406	2,448
Owner Units	202	148	165
Renter Units	170	217	242
Other* - Not for sale/rent and/or held for occasional use	2,041	2,041	2,041
Total Units, End of Decade	16,709	18,616	20,524
Total Units, Beginning of Decade	15,160	16,709	18,616
Loss for Decade (6.4%)	<u>-970</u>	<u>-1,069</u>	<u>-1,191</u>
Net Dwelling Unit Base	14,190	15,640	17,425
New Units in Decade	2,519	2,976	3,099
Annual Average	252	298	310

* The 2000 other vacancies is the balance of units after vacant for sale & rent is subtracted from the 1990 vacant unit counts. The total of other vacancies is held constant for 2010 and 2020. This other vacant figure is added to the vacant for sale & rent to determine the total vacant units for 2010 and 2020. These other vacant figures could be smaller if the household size declines faster than projected or the County population has been under-estimated.

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 Northern Shenandoah Valley Region 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 2000 and 2010, and an additional 12% increase between 2010 and 2020. The types of housing that are affordable will be dictated by the household income.

The housing stock is primarily single-family, detached, owner-occupied homes. In 2000, the County had a vacancy rate of 14.4 percent. The County has a large share of second homes which accounted for 60.6 percent of all the vacant units or 8.7 percent of the 1990 total housing stock. As for quality, as of 2000 only 290 (1.7 percent) of total dwelling units lacked complete plumbing facilities.

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 2,976 units may be added from 2000 to 2010 and 3,099 from 2010 to 2020.

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 also be a major criteria, both in the maintenance of the existing housing stock and for additions. Additional affordable housing is needed; small developments should be encouraged 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.

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 County Government Center, the Court Houses and jail complex including the Sheriff's Department, the school system, the County Park, Shenandoah County Library, solid waste management facilities, the animal shelter, the Department of Social Services, the Health Department, and the Virginia Cooperative Extension Service. Some of these services are provided in conjunction with the Commonwealth of Virginia, but housed in County offices.

Consideration of facilities construction by the county is part of a Capital Improvements Program (CIP). Currently, County Administration provides recommendations to the Board of Supervisors regarding the CIP. In the future, the Planning Commission should play an expanded role in the consideration and recommendation of facilities projects included in the CIP.

The six incorporated 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 provides water and sewer service to the Basye/Bryce Mountain area and the Toms Brook-Maurertown Sanitary District provides service covering an area from Toms Brook to just north of Woodstock.

These systems are described in detail as to their capacities, sources (for water), methods of treatment, and discharge points (for sewer) in the Economic Development Profile, 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 and cable), own and operate the Shenandoah Memorial Hospital in Woodstock and other health clinics and services, provide volunteer fire and rescue services, a sheltered workshop for the handicapped, and various recreational facilities.

Dominion Virginia Power serves five of the six incorporated towns and almost half of the County. The Shenandoah Valley Electric Cooperative--which receives power from Virginia Power's transmission system--serves the remaining portion of the County.

Shenandoah Telecommunications Company (Shentel) is headquartered in Edinburg, Virginia. Founded as a rural telephone cooperative in 1902, Shentel now has more than 700 employees serving customers in Virginia, West Virginia, Maryland and Pennsylvania. In Shenandoah County, Shentel provides a broad range of telecommunications services including local and long distance telephone, Internet and data services and cable TV. As a Sprint PCS Affiliate of Sprint/Nextel, Shentel offers mobile telephone service from a network of towers.

Since 2005, high-speed Internet (DSL) has been available to 100% of Shentel local exchange subscribers--an important option for the increasing number of residents who work from home. Living in a beautiful rural area does not mean surrendering technology in Shenandoah County. Current DSL service provides data speeds from 384 kilobits per second to 10 megabits per second for residential customers.

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

SCHOOLS

Since the fall of 1994, the Shenandoah County Public Schools system has been divided into three distinct campuses located in the north, center, and south of the County. Each campus is comprised of one elementary school, one middle school, and one high school. In March 2012, the combined enrollment of the school system was 6,003, with 523 teachers.

Located in the Strasburg area, the Northern Campus consists of Sandy Hook Elementary, Signal Knob Middle, and Strasburg High School. The Central Campus contains W. W. Robinson Elementary, Peter Muhlenberg Middle and Central High School and is located in Woodstock. The Southern Campus lies halfway between Mt. Jackson and New Market, off the Shenandoah Caverns exit of I-81. It is the home of Ashby-Lee Elementary, North Fork Middle and Stonewall Jackson High School.

Triplett Tech, located in the Town of Mt. Jackson, is the career and technical center serving secondary school students from the three high schools in Shenandoah County. Occupation specific programs are offered that are taught by industry-experienced professionals using current equipment. Business and industry representatives serve on the advisory board, and assist yearly in keeping programs current with industry standards.

Programs offered include career and technical instruction in Automotive Technology and Collision Repair, Carpentry, Masonry, Electricity and Professional Cosmetology. Expanded instructional opportunities now include Animation, Culinary Arts, CISCO Systems Networking, Criminal Justice, Industrial Co-Operative Training (ICT), and Health Care Science. Many students completing career training at Triplett Tech successfully complete requirements for a variety of industry certifications. Dual enrollment opportunities with Lord Fairfax Community College are available for students enrolled in Health Care Science, Criminal Justice, and Electricity.

Triplett Tech is also the site of the regional Massanutten Governor’s School for Integrated Environmental Science and Technology for gifted and highly motivated high school juniors and seniors who have demonstrated an advanced mastery of the traditional high school curriculum. Approximately 75 pupils attend the program from the school divisions of Harrisonburg City Public Schools, Page County Public Schools, Rockingham County Public Schools and Shenandoah County Public Schools. The Governor’s School curriculum provides students a rigorous academic program that demands the integration of academic disciplines with technology. It integrates the study of environmental science, mathematics, technology, computer science, information systems, society and business. Using principles of problem-based learning, scientific theory will combine with hands-on experience to encourage further interest in environmental science and technology and its impact on society.

Table 7-A, on the next page, shows the grade levels, capacity, and March 2012 enrollment at each school. Enrollment versus capacity is highest at the elementary schools, with the highest at Sandy Hook Elementary School which is located where the greatest growth in the County has occurred. Sandy Hook’s enrollment exceeds its capacity. In due course, an additional school will be needed. Figure 7-A Community Facilities, on page 7-5, shows the location of the public schools in Shenandoah County.

School capacity figures found in Table 7-A were taken from the November 2006 report “Population Planning and Facilities Review” prepared for Shenandoah County Public Schools by the Commonwealth Educational Policy Institute (CEPI) of the Virginia Commonwealth University. As explained in Part II, School Capacities and Facility Utilization, these capacity figures are “an estimate of the capability of the facility to offer its program.” The capacity of individual school buildings has been reduced over time with such variables as increased federal and state program requirements that result in lowered capacity for individual instruction spaces or changes in local community expectations related to class size. Having first determined a “standard operating capacity” for each facility, the 2006 CEPI review made a final adjustment or reduction (using standards or principles explained in the

COMMUNITY FACILITIES

review) to the “standard operating capacity”, which resulted in the “adjusted operating capacity” for each facility. A full description of how the “adjusted operating capacity” is determined can be found in the 2006 CEPI review. Table 7-A reflects the “adjusted operating capacity” for each school facility as found in the 2006 CEPI review.

TABLE 7-A
SHENANDOAH COUNTY SCHOOLS
AS OF MARCH 31, 2012

<u>School</u>	<u>Grades</u>	<u>Enrollment</u>	<u>Capacity</u>
Northern Campus:			
Sandy Hook	K – 5	1,010	953*
Signal Knob	6 – 8	478	713
Strasburg	9 – 12	<u>683</u>	<u>810</u>
	<i>Campus Total:</i>	2,171	2,476
Central Campus:			
W. W. Robinson	K – 5	1,126	1,192*
Muhlenberg	6 – 8	552	893
Central	9 – 12	<u>758</u>	<u>1,002</u>
	<i>Campus Total:</i>	2,436	3,087
Southern Campus:			
Ashby – Lee	K – 5	634	796*
North Fork	6 – 8	331	685
Stonewall	9 – 12	<u>506</u>	<u>808</u>
	<i>Campus Total:</i>	1,471	2,289
	TOTAL	6,078	7,852

* Based on a K-3 ratio of 21:1 for elementary schools.
Source: Shenandoah County School Board, April 2012.

The U.S. Census indicated a population of 41,993 citizens in the county in 2010 with a public school enrollment of approximately 6,100 students. The State population projections prepared by the Virginia Employment Commission show that there will be a total of 49,427 county residents by the year 2020 and 56,927 county residents by 2030. Assuming the April 2010 ratio of student enrollment to total county population it is estimated that the student enrollment will be 7,187 students by 2020 and 8,277 students by year 2030.

All of the public schools in the County are fully accredited by the State of Virginia, and the pass/fail rates on the Standards of Learning examinations are competitive with the state averages. As the County shifts toward newer businesses which require a more highly educated workforce, more emphasis will be focused on the preparation of high school students to advance to four year college programs. Table 7-B compares the County’s schools with the state average for three relevant parameters: pupil/teaching position ratios, SAT scores, and advanced studies diplomas.

In addition to the public schools, there are currently four private schools in the County. (A fifth private school, the Community Christian School, located north of Woodstock, which offered enrollment for pre-kindergarten through grade 8, closed following the 2011-2012 academic year.) In New Market, the Shenandoah Valley Adventist Elementary School offers enrollment for pre-kindergarten through grade 8, and the Shenandoah Valley Academy offers enrollment for grades 9 through grade 12. The Valley Baptist School near Edinburg offers kindergarten through grade 12. The Massanutten Military Academy in Woodstock offers grades 7 to 12. In April

COMMUNITY FACILITIES

2011, private schools in the county served 658 students, with 248 being from Shenandoah County.

Some families home-school their children. As of the 2009 -2010 school year, there were 162 children being educated at home. There were also approximately 132 school aged children who had obtained a “Religious Exemption” from attending public schools.

TABLE 7-B.
COMPARISON OF SHENANDOAH COUNTY SCHOOLS WITH STATE OF VIRGINIA AVERAGES

	<u>Shenandoah County</u>	<u>Virginia</u>
Pupil/Teaching Position Ratio (K-7)*	10:1	12:1
Pupil/Teaching Position Ratio (8-12)*	15:1	11:1
SAT Scores (Class of 2011) ***		
SAT Reading (2011)	510	512
SAT Math (2011)	516	509
SAT Writing (2011)	498	495
Advanced Studies Diplomas (2009) **	44.36%	41.33%

*Source of data: Table 2, 2009-2010 Superintendent’s Annual Report

**Source of data: Table 5, 2009-2010 Superintendent’s Annual Report

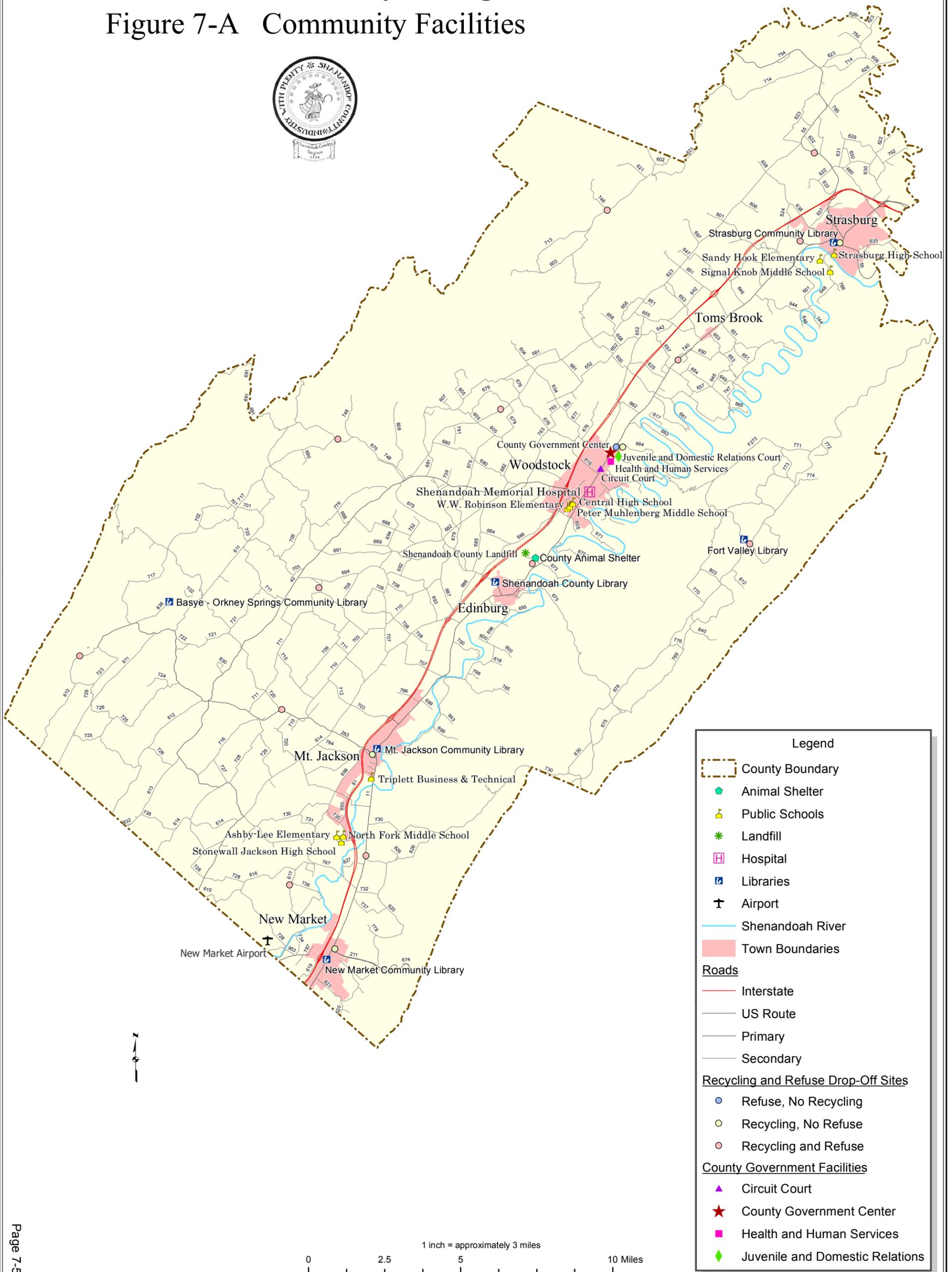
***Source of data: Shenandoah County School Board (April 2012)

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:

Blue Ridge Community College	Weyers Cave, VA 24486
Bridgewater College	Bridgewater, VA 22812
Christendom College	Front Royal, VA 22630
Eastern Mennonite University	Harrisonburg, VA 22801
George Mason University	Fairfax, VA 22030
James Madison University	Harrisonburg, VA 22807
Lord Fairfax Community College	Middletown, VA 22645
University of Mary Washington	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
Old Dominion University	Middletown, VA 22645*
	*satellite campus at LFCC

Shenandoah County, Virginia

Figure 7-A Community Facilities



COMMUNITY FACILITIES

LIBRARIES

There are seven libraries serving Shenandoah County. The Shenandoah County Library System consists of the County Library in Edinburg, the Basye/Orkney Springs station, and community libraries in Strasburg, Fort Valley, Mount Jackson and New Market. The County Library opened in 1985 and formed the library system in 1997. The County Library features an archive and a local history and genealogy collection. An independent library is located in Woodstock.

The County Library system has collections with over 155,000 cataloged items, including e-books, DVDs, audios and periodicals in several formats. The system has a fully integrated automation system and provides access to an array of electronic resources through its website. Internet access is available at all locations in the system, whether by Wi-Fi or by use of one of the more than 40 public access workstations.

In 2011 there were over 150,000 visitors to the County Library System. They checked out over 235,000 items, with 35,000 registering to use a computer.

The County Library has six full time and seven part time staff members. Volunteers staff the other libraries. The Shenandoah County Library Foundation supports the County Library system with a Book Endowment Fund, a Technology Endowment, annual fund drives, and capital drives. In 2012-2013 the County Library will receive \$146,000 in State Aid for the system's materials budget.

The County owns the two plus acre lot immediately west of the County Library. It is used for parking and offers space for expansion of the County Library. The Stone House on the property houses the Richard A. "Dick" Golden Meeting Room and the library's technical services offices.

All of the libraries are shown on Figure 7-A Community Facilities on the previous page.

RECREATION FACILITIES

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-B, page 7-8 shows the location of the parks and recreation facilities.

The Shenandoah County Park is located between Toms Brook and Maurertown. It contains two large picnic shelters with double-sided grills, one lighted softball field, one non-lighted softball field, and one non-lighted baseball field, a playground, sand volleyball court, two tennis courts, a basketball court, four horseshoe pits, two rest room facilities, three gazebos, and a newly-renovated one-mile walking trail.

Edinburg, Mt. Jackson, New Market, Strasburg, and Woodstock each have town parks. The old Madison District Park was deeded to the Town of Edinburg by the County in 2003. It has a pool and bath house, playground, two tennis courts with lights and three picnic shelters. A walking trail has been started within the wooded area of the park; it is approximately 1,000 ft. The Town is planning to continue improving the existing facilities.

Behind the Edinburg School and adjacent to the Edinburg Madison District Park, Shenandoah County Parks & Recreation also maintains the Woodstock-Edinburg Little League baseball field and one basketball court.

The Shenandoah County Soccer League opened its soccerplex south of Mt. Jackson in September 2009 with three of the planned five full size fields in operation. The non-profit SCSL provides soccer for over 500 children ages 4-15 every fall and spring season.

COMMUNITY FACILITIES

Mt. Jackson's Town Park contains a swimming pool with a new bathhouse (2009), tennis court, a baseball field, a tee ball field, basketball courts, a playground, and a picnic shelter. The Town also has a fishing area along Mill Creek and a downtown festival park in conjunction with its new Visitors Center/Town Hall project, and a new Veteran's Park.

New Market's Town Park has a swimming pool, a bath house with showers, two basketball courts, five lighted tennis courts, a softball field, a little league baseball field, playground equipment, a fitness/walking trail, a gazebo, six picnic shelters, a soccer field, one large barbeque pit, two horseshoe courts, four parking lots and public restrooms. New Market has Rebel Park which is home to the New Market Rebels of the Valley Baseball League and the New Market Shockers of the Rockingham County Baseball League.

Strasburg's Town Park includes a swimming pool with bath house, the new Riverside Park walking trail that connects to Strasburg High School, newly-renovated playground, picnic shelters, two tennis courts, basketball courts, soccer fields, and a boat ramp access to the Shenandoah River.

The Parks and Recreation System for the Town of Woodstock has a significant effect on the quality of life enjoyed by town and county residents. Recreation facilities available to residents are located in Woodstock at the W.O. Riley, Riverview, Fairview and Main Street Parks; the elementary, middle, and high schools; and the Shenandoah County Fairgrounds. Additionally, a new state park, the Seven Bends State Park, has been approved east of town with access to the park being provided along E. Reservoir Road.

W.O. Riley Park has a swimming pool, playground, volleyball courts, tennis courts, basketball court, picnic shelters, an all-purpose field and arboretum. Riverview Park consists of two Little League fields with one field equipped for night games, and a nature walking trail.

Fairview Park (Future) consists of a 73 acre parcel on the northwest corner of the town limits. The master plan for Fairview Park displays elements that include: an historical event center, two field sports complex, tennis complex, central park, small amphitheater, arboretum, picnic areas, playground areas, public restrooms, park-wide trails, college level baseball/multi-use complex and a recreation/wellness/community center. The town anticipates this project to develop over a twenty year time period.

A total of 241 acres of local public park land is located throughout the County. In 2002, the County acquired the 151 acre Keister tract of land, east of Strasburg, to be developed as an additional park facility. Recreation areas are also located at each of the County's schools.

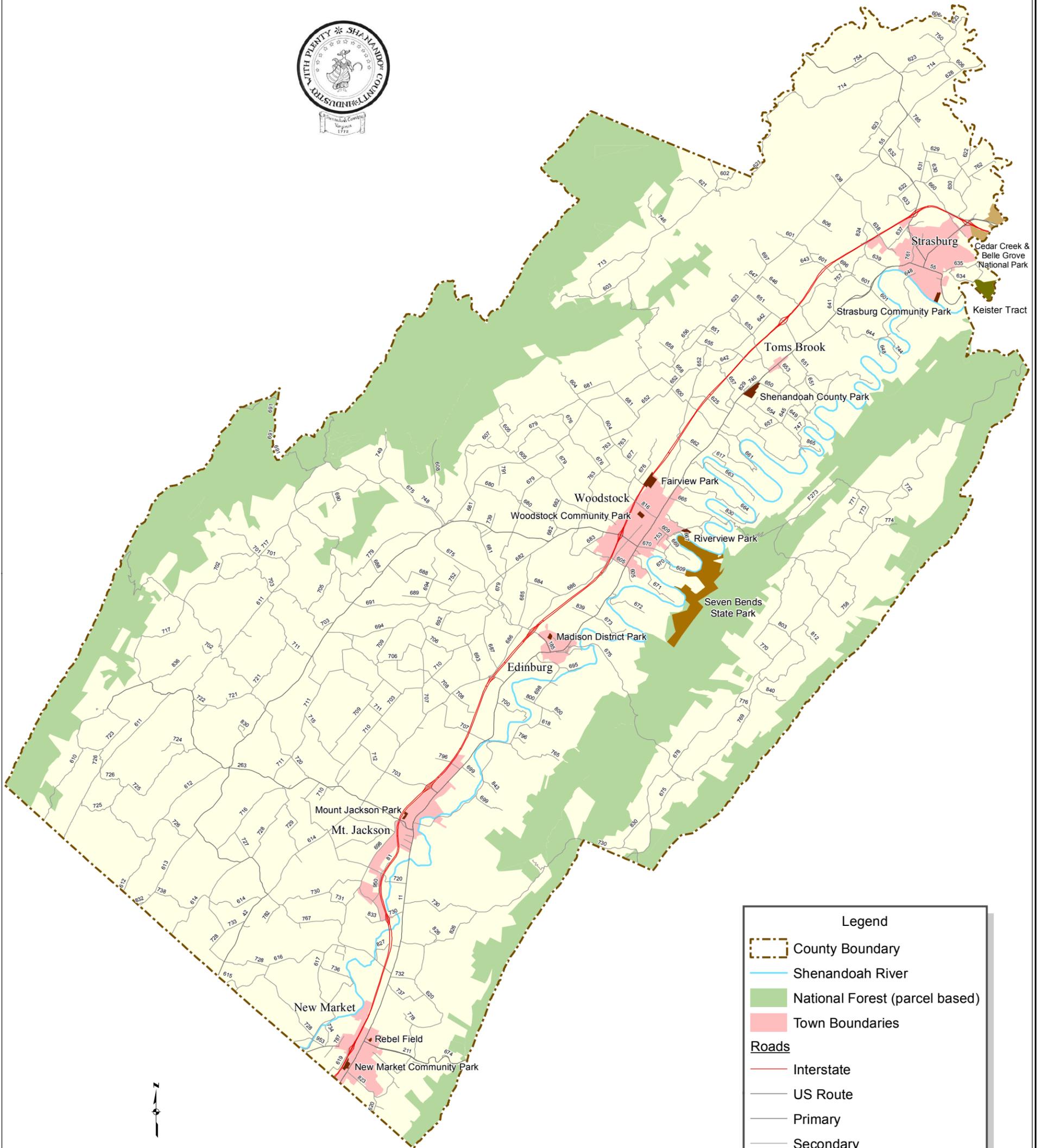
Seven Bends State Park is named for a series of oxbow curves in the river. The 1,066 acre site has almost four miles of river frontage. The state park master planning process is complete with the development of a park mission statement and goals and objectives. The Commonwealth of Virginia Department of Conservation and Recreation is now in the process of implementing the plan as funding becomes available.

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

Currently, there are three public access landing sites on the North Fork in Shenandoah County: Meems Bottom near the Route 730 bridge, Chapman's Landing south of Woodstock, and at the Strasburg Town Park. Additionally, a fourth public access landing site may be added in the future at the Deer Rapids Bridge. In addition to public recreational facilities, Shenandoah County has a number of privately owned and operated recreational activities that are open to the public. These include two golf courses, driving ranges, miniature golf, skiing and snow tubing, horseback riding, bowling alleys, swimming, lake sports, museums and caverns.

Shenandoah County, Virginia

Figure 7-B Parks and Recreation



Legend

- County Boundary
- Shenandoah River
- National Forest (parcel based)
- Town Boundaries

Roads

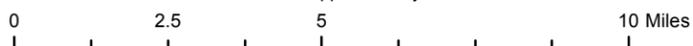
- Interstate
- US Route
- Primary
- Secondary

Parks

- Local Park
- Local/National Park
- National Park
- State Park



1 inch = approximately 3 miles



COMMUNITY FACILITIES

The George Washington National Forest, contains 77,681 acres of forest in the County, offers hiking trails, ATV trails, campgrounds, and picnic areas, along with hunting and fishing, for both residents and tourists. There is also a newly created Cedar Creek and Belle Grove National Historic Park located at the northern edge of the County and extending into Warren and Frederick counties. The county-owned Keister tract and future park is within the national park boundary.

Creation of a series of trails on land owned by the National Park Service (NPS) and key partners such as the Cedar Creek Battlefield Foundation, The National Trust for Historic Preservation and Belle Grove Inc., and the Shenandoah Valley Battlefields Foundation (SVBF), along with local and community partners, is included in the Cedar Creek and Belle Grove National Historic Park final general management plan. The SVBF is managing the creation of a trail system to link Fishers Hill Battlefield properties with the new Cedar Creek and Belle Grove National Historic Park in the northern portion of the county. SVBF has engaged a professional planning and design firm to accomplish this work. Initial trail development will be within the Fishers Hill parcels currently owned by SVBF. It is expected that completion of the entire project, including new trails located on privately owned property, will take several years.

The Virginia Department of Forestry is still in the process of receiving final land donations for the Devil's Backbone State Forest (DBSF). Located in the northwestern portion of the county in the Cedar Creek Valley, it is presently 715 acres in size. The future estimated size of the DBSF will be approximately 900 acres. The main goals for this State Forest are conservation education, forest research concentrating mainly on the reestablishment of the American Chestnut in Shenandoah County, and passive outdoor recreation such as hiking, bird watching and nature study.

The Shenandoah County Parks & Recreation Department's Master Indoor/Outdoor Recreation Plan for the County was adopted in 2000. Its overall goal is to "Provide a range of high quality indoor and outdoor recreational facilities and activities that meet the expressed needs of all County citizens." Major recommendations include: work with the School Board to develop and manage joint-use facilities; rehabilitation and expansion of the County Park at Maurertown; addition of walking/biking trails to all parks; additional boat access sites along the North Fork; acquisition and development of a new park with river access; meet the needs for indoor wellness and fitness activities and sports; and meet the needs for arts performance and instruction.

VISUAL AND PERFORMING ARTS

Whether as student, artist or member of an audience, Shenandoah County provides the opportunity for community participation in the visual and performing arts. The Shenandoah County Department of Parks & Recreation and private art organizations such as VECCA and The Art Group Gallery at the Bowman-Shannon Cultural Arts Center in Mt. Jackson offer classes and mentorships in the visual and performing arts. The Shenandoah Valley Music Festival, Masterworks Chorus and Theater Shenandoah offer performances throughout the year. Masterworks Chorus and Theater Shenandoah are composed of local musicians and actors while the Shenandoah Valley Music Festival brings nationally known musicians to the county.

A facility to support the activities of these groups is needed. The Master Indoor/Outdoor Recreation Plan for the County, referenced above, specifically addresses the need for arts performance and instruction in the community. Shenandoah County, at present, does not have an adequate performing arts space. A theater with raised seating for the audience and appropriate sound and lighting systems is needed. Practice spaces, classroom space and a gallery for the display of artwork are additional needs.

From the mid 1990's to late 2011, the old Edinburg School building had housed the offices of the Shenandoah County Parks & Recreation Department and several county non-profit agencies, including space provided to the Shenandoah Area Agency on Aging for a senior center and the meals on wheels program. The Edinburg School building was built in the 1930's and a cafeteria addition was added in the 1950's. A plan was

COMMUNITY FACILITIES

presented in February 2011 by the School Superintendent and County Administration to renovate the Edinburg School. In May 2011 the county received an unsolicited Public Private Education Act (PPEA) proposal to convert the existing building interior spaces into an education facility for alternative education as well as continued use for a senior center and parks and recreation programs. After advertising for additional proposals the county entered into an interim agreement in September 2011 for a 35 percent partial site and design plan which was received in April 2012. The building was fully vacated in December 2011 with all former occupants moved to permanent or temporary locations pending final decisions and actions on the project design proposal.

LAW ENFORCEMENT

Four categories of law enforcement agencies serve Shenandoah County citizens. Central dispatch for the County is located in the County Government Center.

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. It also provides court-related services at the Court House and staffs the county jail in Woodstock.

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 Virginia Department of Forestry has three, full-time forest wardens living within the County. This State agency provides forest and open land fire protection on all private land holdings within Shenandoah County. The VDF also assists the U.S. Forest Service with fires occurring on national forest lands. The VDF responds to all forest and field fires and assists the county volunteer fire departments with the suppression of these fires. A dozer-fireplow unit and a forest fire engine are stationed at the VDF office in Woodstock. VDF forest wardens are responsible for the investigation of all forest and open land fires, and the pursuit of legal action towards the responsible parties as is warranted.

The Virginia Department of Game and Inland Fisheries has one, full-time Conservation Police Officer living within the County. This State agency is responsible for enforcing all portions of the Code of Virginia relating to boating and wildlife regulations. Conservation Police Officers enforce these code sections on private, state and federal lands and also assist local law enforcement agencies with other criminal and investigative matters as requested.

The decision to construct a new Shenandoah County District Courts Building to address courthouse overcrowding and habitability issues was made in 2008 with construction completed and occupancy in June 2011. The Historic Court House Task Force, for the continued use and rehabilitation of the Historic Old Court House in downtown Woodstock, presented its recommendations to the County in December 2010. A partial site and design plan was submitted to the County in early 2012 for the renovation and rehabilitation of the historic courthouse. To address overcrowding issues at the County Jail, a decision to participate with Warren County and Rappahannock County in a Regional Jail Facility was made in 2009. Land was purchased in Warren County for this regional facility. It is anticipated that construction and occupancy of the Rappahannock Shenandoah Warren Regional Adult Detention Center will be completed in 2014.

EMERGENCY SERVICES

Shenandoah County has ten volunteer fire departments with a total of about 350 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.

COMMUNITY FACILITIES

The Shenandoah County Department of Fire and Rescue was formed in 1999. In April 2012, the department had a full-time staff of 33, including the Fire & Rescue Chief, the Fire Marshal, Operations Chief, Training Officer, Service Assistant, EMS Billing Technician, and additional members are Firefighters/EMTs ranging from basic to paramedic. In addition there are six part-time Firefighters/EMT employees. Funding for an additional eight Firefighters/EMT positions has been included in the County's 2012 - 2013 budget.

Currently, the Department's vehicles include: two ALS (Advanced Life Support) vehicles, four staff vehicles, a Hazmat Trailer, an ATV and a "Serv" vehicle (a utility vehicle that can haul personnel or equipment).

The County's volunteer fire companies and their major equipment are listed below in Table 7-C.

TABLE 7-C
SHENANDOAH COUNTY FIRE DEPARTMENTS

<u>Number</u>	<u>Name</u>
Co. 9	Toms Brook
Equipment: 2 Serv, 1 Wagon, 1 Rescue Engine, 1 Tanker	
Co. 12	Woodstock
Equipment: 1 Engine, 1 Truck, 1 Wagon, 1 Brush, 1 Rescue Engine-Command Unit	
Co. 13	Conicville (Fire & Rescue Combined)
Equipment: 1 Brush, 1 Tanker, 3 Engines, Ambulance	
Co. 14	Fort Valley (Fire & Rescue Combined)
Equipment: 1 Mobile, 1 Mini, 1 Pumper, 1 Tanker, 1 Engine, Ambulance, 2 ATV's	
Co. 15	Edinburg
Equipment: 1 Brush, 1 Engine, 1 Pumper, 1 Wagon	
Co. 17	Star Tannery (Fire & Rescue Combined)
Equipment: 1 Brush, 1 Tanker, 1 Wagon, 1 Ambulance	
Co. 18	Orkney Springs (Fire & Rescue Combined)
Equipment: 1 Brush, 1 Mobile, 1 Tanker, 3 Wagons, 2 Ambulances, Squad Boat, 1 Engine	
Co. 21	Mt. Jackson (Fire & Rescue Combined)
Equipment: Engine, Squad, Pumper, 2 Ambulances, Serv	
Co. 23	New Market (Fire & Rescue Combined)
Equipment: Brush, 3 Engines, Truck, Serv	
Co. 51	Strasburg
Equipment: Brush, 1 Boat, Engine, Pumper, Squad, Serv, Truck, Wagon	
Co. 10	Shenandoah County Fire & Rescue
Equipment: 2 Ambulances, 2 Engines, 1 Squad, 1 ATV, 2 Chase Units, 1 Hazmat Trailer, 1 EVOC Supply Trailer, 4 Staff Vehicles	

Source: Shenandoah County Department of Fire & Rescue, 2012.

Three volunteer rescue squads and three combination departments currently operate in Shenandoah County. One squad is located in the town of Strasburg and Woodstock. In addition, one Rescue squad from Rockingham County (Broadway Rescue Squad) provides emergency services to the Southwestern portion of the County.

The three Rescue Squads and their major equipment are listed below in Table 7-D.

TABLE 7-D
SHENANDOAH COUNTY RESCUE SQUADS

<u>Number</u>	<u>Name</u>
Co. 5	Woodstock Rescue Squad
	Equipment: 4Ambulances, Mobile, Squad
Co. 25	Strasburg Rescue Squad
	Equipment: 3Ambulances, Mass Casualty Unit, Squad, Mobile
Co. 10	Shenandoah County Fire & Rescue
	Equipment: 2 Ambulances, 1 Engine

Source: Shenandoah County Department of Fire & Rescue, 2012.

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

The County is served by an Enhanced 911 emergency service dispatching system that is funded by a small surcharge on phone lines. This system provides location information for the source of emergency calls, and additional capabilities for the dispatchers handling those calls. A computer-aided dispatch system has been implemented to further enhance the system.

In April 2012, Shenandoah County Fire & Rescue implemented the Delta Alert program, which communicates emergency situations to citizens of Shenandoah County. This automated system will notify citizens of a missing person search, evacuations and severe weather.

WATER AND SEWER FACILITIES

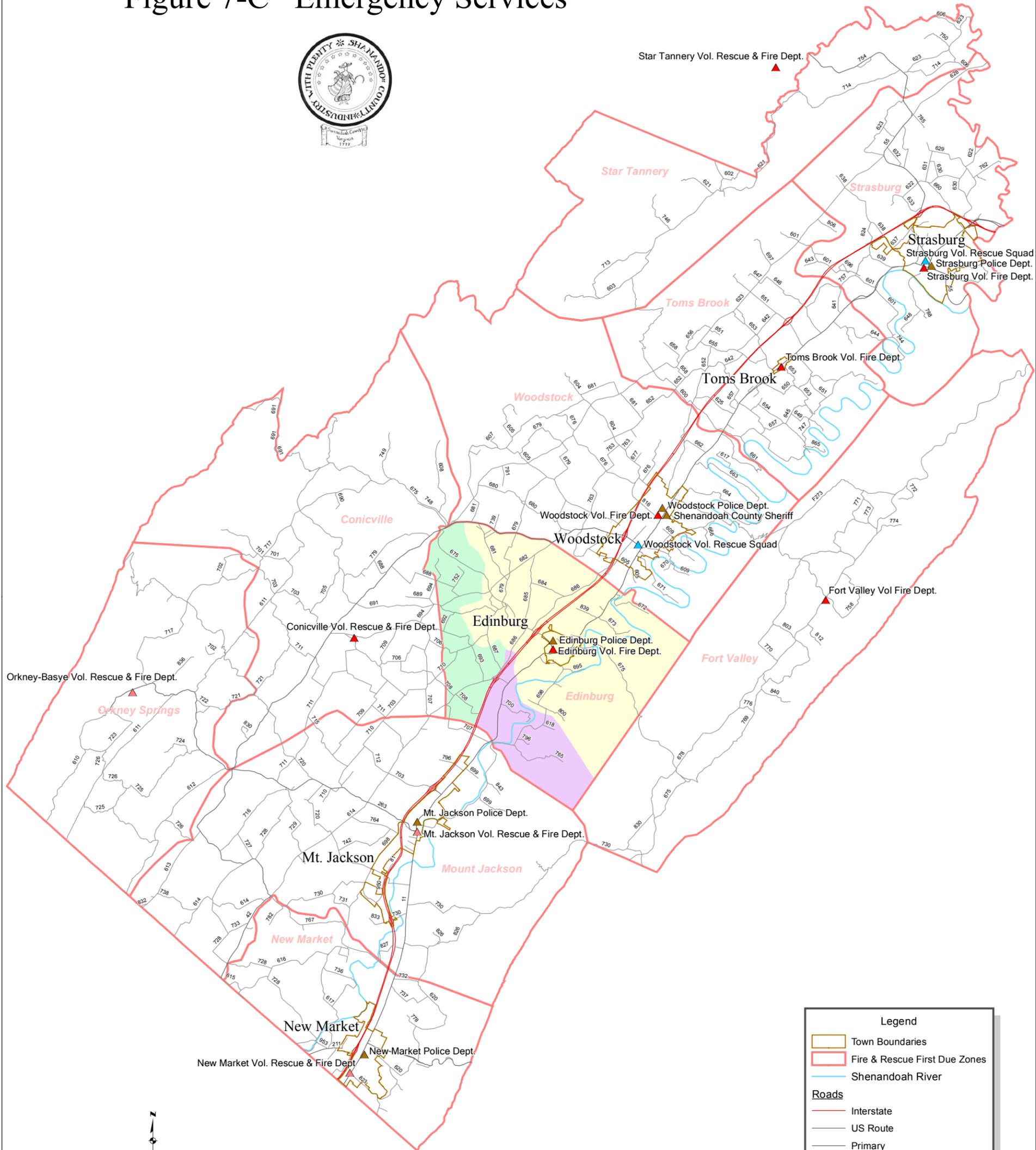
The Towns of Edinburg, Mt. Jackson, New Market, Strasburg, and Woodstock all have their own public systems; the Toms Brook-Maurertown area and the Basye/Bryce Mountain area are served by the Toms Brook-Maurertown Sanitary District and the Stony Creek Sanitary District respectively. Each system is described below; gallons per day are expressed as “gpd.”

Edinburg - The Town primarily serves the area within its corporate boundaries. Water is also provided to the Cave Springs Subdivision, located in the County off State Route 698, and water and sewer service is provided to the Edinburg Manor Subdivision off Route 675. Construction was completed in 2005 to allow sewer service to the Massanutten View Subdivision, located in the County on the west side of Interstate 81 and serves approximately 30 homes in the subdivision.

Water is provided by two wells with a Memcor Microfiltration Treatment Plant that was put on line in 1998. Plant capacity is 225,000 gpd, with average usage of 140,000 gpd. The Town has water storage capacity of 800,000 gallons. The Town’s wastewater treatment plant was upgraded in 1988 and has a rated capacity of 175,000 gpd with average flows of 95,000 gpd. The Town has corrected a number of infiltration and inflow problems in recent years and continues to locate and correct these problems. There is very little undeveloped industrial zoned land within the Town. What there is belongs to Shentel, who is not historically a large water user. The Town feels that future growth will be residential and light commercial within the Town’s boundaries. All out of Town water and sewer hookups require the Town Council’s approval and will be studied thoroughly as to their impact on the available capacities.

Shenandoah County, Virginia

Figure 7-C Emergency Services



Legend

- Town Boundaries
- Fire & Rescue First Due Zones
- Shenandoah River

Roads

- Interstate
- US Route
- Primary
- Secondary

Emergency Services Locations

Type of Facility

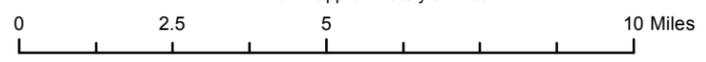
- Fire Station
- Fire & Rescue Dept
- Law Enforcement
- Rescue Squad

Area Covered by Another Rescue

- Conicville Rescue
- Mount Jackson Rescue
- Woodstock Rescue



1 inch = approximately 3 miles



COMMUNITY FACILITIES

Mt. Jackson – In 2001, the town completed nearly \$3 million in improvements made to the water system.

The town now has 5 wells, any one of which can carry the town's daily (2010) needs, and a total pumping capacity in excess of 900,000 gallons per day. There are more than 24 miles of pipes ranging in size from 2 inches to 12 inches. The larger pipes form an interconnection between the town's three 500,000 gallon water tanks (Caverns, Mountain near Fleming Park, and elevated on Dutch Lane). Pressures are uniform at approximately 80 PSI, and fire flow in all areas is excellent. The system is also interconnected with the additional storage and high production wells at Bowman Andros Apple Products to provide mutual backup in the event of emergency. Two additional wells were drilled in 2009 and will be connected to the system in the future, as funding is identified to complete the project.

The town closed its old 200,000 gallons/day sewer plant and replaced it with a new 700,000 gallons/day plant capable of handling the sewage loads from both the town's residential and business uses and the industrial park. The plant is considered "limits of technology" (state of the art) and meets all the most stringent modern treatment standards.

New Market - The Town's water filtration plant has an 850,000 gpd continuous capacity and water tank with a storage capacity of 500,000 gallons. In 2010 the average daily consumption of water was 447,667 gallons. Six wells serve as New Market's source of water.

New Market has contracted the treatment of its wastewater with the Town of Broadway. In 2011 the Town started sending its wastewater to Broadway's regional treatment facility by way of a 4.3 mile force main. New Market received \$3,656,513 in Federal Stimulus for the project. The Town's capacity was also increased from 500,000 gpd to 1,000,000 gpd. The average flows for wastewater are 484,000 gpd. New Market is also actively working to reduce inflow and infiltration through the replacement or relining of sewer mains.

The Town has had strict policies on new connections to its system. All water and sewer connections outside of the corporate limits must be approved by the Town Council. In addition, the connection fees are double for out-of-town service. New Market also does not feel it is in a position to finance the extension of its lines; any business or person wanting service would have to pay the cost of any necessary extensions.

Strasburg - Construction is currently underway on the Town's new water treatment plant that will increase capacity from 1,000,000 to 3,000,000 gpd. The Town is finalizing engineering plans and financing details for an upgrade to its current 975,000 gpd wastewater treatment plant. The upgrade will increase treatment capacity to 2,000,000 gpd. Current average flows at the plants are 890,000 gpd (water) and 950,000 gpd (sewer). Future service areas include the Northern Shenandoah Industrial and Business Park and area identified as Annexation Area B in the Town's annexation study. There is a 40 percent premium on water and sewer utility rates outside of Town limits.

Woodstock –Wastewater Treatment: The town owns and operates a 1,000,000 gallon per day wastewater treatment facility located east of town in Shenandoah County. At present the plant treats an average of 480,000 gallons per day of wastewater with more than 2,548 households being provided with sewer service.

Water Treatment: The town's water supply quality is good and the treated water meets or exceeds state and federal drinking water quality standards. Drinking water for the Town of Woodstock comes from the North Fork of the Shenandoah River. The Virginia Department of Health has permitted the town's water treatment plant at 1.8 million gallons per day. Treatment at the Woodstock Water Treatment Plant is achieved by rapid mix, flocculation, sedimentation, and filtration for turbidity removal; chlorination for disinfection; and fluorination to aid in reducing tooth decay. Water is pumped from the water treatment plant to the storage and distribution system which consists of two elevated water storage tanks; the first, located on Ox Road has a capacity of 400,000 gallons, and the second, located on West North Street has a capacity of 2,000,000 gallons.

COMMUNITY FACILITIES

Toms Brook-Maurertown Sanitary District - 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 240,000 gpd for the water system which pumps an average of 95,000 gpd, and 189,000 gpd for the sewage system which has an average flow of 110,000 gpd. The District is governed by the Shenandoah County Board of Supervisors.

Stoney Creek Sanitary District - Water and sewer service is provided primarily to the Bryce Mountain -Basye area and several adjacent properties which have been added to the District's service area. Construction commenced in April 2012 to connect Shrine Mont and Orkney Springs into the districts sewer system and is expected to be completed by December 2012. There are no current 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 392,800 gpd, and approximately 150,000 gpd are pumped. The sewer system's permitted capacity is 600,000 gpd (at secondary treatment), with an average flow of 300,000. The District is governed by the Shenandoah County Board of Supervisors.

North Fork Regional Wastewater Treatment Plant- The North Fork Regional Wastewater Treatment Plant (NFRWWTP) is located at 850 Aileen Road, between Woodstock and Edinburg. The activated sludge treatment facility was acquired by the County in 1998. The current operating permit has treatment capacity of 100,000 gpd, and future potential capacity of up to 750,000 gpd. The plant currently provides treatment for leachate from the County landfill and biosolids from local municipal facilities. Biosolids are eventually dewatered by means of a filter press prior to disposal. All County septage wastes are treated at the NFRWWTP. Sanitary sewer is also treated from the surrounding areas in the vicinity of the plant.

Based on the above information, current and potential future public water and sewer service areas are illustrated in Figure 7-D, Public Service Areas on page 7-16. The service areas for the Town of Strasburg and for the Town of Mt. Jackson are covered by annexation agreements, and therefore accurately represents potential future growth areas for these towns. The Town of New Market and the Town of Edinburg have jointly adopted a future growth area with the County (see Chapter 3 for future growth area maps). Individual annexation agreements and corresponding Growth Area Plans should be developed between the County and the Towns of Toms Brook and Woodstock to define specific future growth areas for each.

SOLID WASTE FACILITIES

The six incorporated towns within Shenandoah County provide refuse collection services to their residents. All the towns contract for these services with private firms via periodic bids.

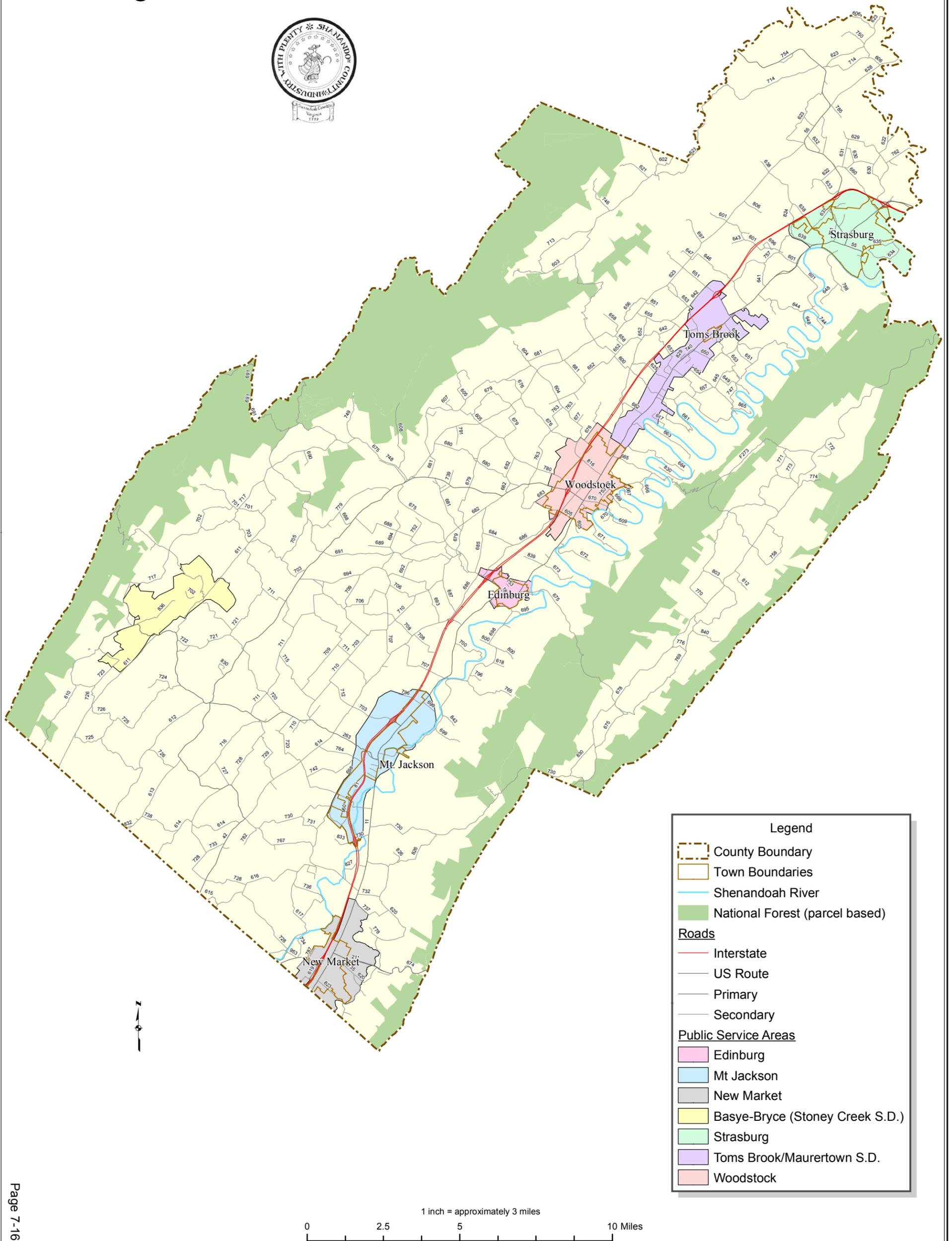
The County provides thirteen convenience center drop-off sites for its residents to deposit their trash. The sites are located so as to provide minimal travel distances to all citizens. The County services these sites utilizing its own employees and equipment. These sites are open Monday – Saturday (closed on Thursday) from 7:00a.m. until 7:00p.m. and Sunday from 1:00p.m. until 5:00p.m. Several of the drop-off sites do not have compactor capability and need to be upgraded to this configuration. All thirteen sites also have specialized containers in place for the collection of recyclables. In addition, recycling-only containers are located in four of the towns.

The County operates a permitted, modern lined landfill on a 214 acre site off US 11 between Woodstock and Edinburg. Recently, the first portion of an expansion section was opened which, with growth allowances, is projected to provide thirty three years of capacity from its opening in mid-2003. This newest landfill section is the third portion of the property to be used for refuse burial; the initial section was opened in 1972, and a second section was started in 1988. These first two disposal areas are now closed.

Environmental monitoring has been conducted on the property since 1994. Currently the County is burning off methane gas onsite until the completion of the landfill gas system, which will enable the County to collect

Shenandoah County, Virginia

Figure 7-D Public Service Areas



Legend

- County Boundary
- Town Boundaries
- Shenandoah River
- National Forest (parcel based)

Roads

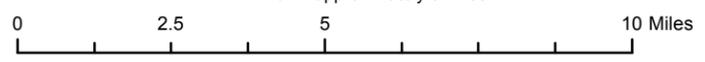
- Interstate
- US Route
- Primary
- Secondary

Public Service Areas

- Edinburg
- Mt Jackson
- New Market
- Basye-Bryce (Stoney Creek S.D.)
- Strasburg
- Toms Brook/Maurertown S.D.
- Woodstock



1 inch = approximately 3 miles



COMMUNITY FACILITIES

methane gas from the “old landfill” as well as current and future landfill cells. At this time, it is understood that the carbon credits may be available for the current and future cells but not from the old landfill cells. Further, it is understood that a “beneficial use” project will be actively pursued, whereby the County would be able to sell methane gas and/or electricity generated from that gas.

An underground pipeline from the county landfill to the North Fork Regional Wastewater Treatment Plant was completed and placed in service in April 2012 providing underground transfer of leachate, as well as all septage from local commercial septage haulers from the newly completed Septage Receiving Station located at the county landfill.

Recycling forms a substantial part in the County’s solid waste program, which was begun in 1992 and received added focus in 1994 when a sizeable barn on the landfill property was converted by County employees into a Materials Recovery Facility (MRF) for sorting and packaging of recycled materials. The volume of items processed has grown from 3,811,854 lbs in 2007, 4,351,300 lbs in 2008, 4,629,524 lbs in 2009, 3,226,000 lbs. in 2010 and 4,368,220 lbs. in 2011. Initially the program included plastics, glass, metals, wood wastes, and paper. Over time, scrap tires, computers and

electronics, waste oils and antifreeze, household hazardous wastes (chemicals), and vehicle batteries have been included in the program. The Town of Strasburg started curbside recycling in March 2009. Woodstock began curbside recycling in July 2011.

Shenandoah County is also very active in regional solid waste cooperative programs, plus planning and reporting activities are done as a regional group. Most recently, money has been allocated via local contributions and grant funds for the purchase of a glass pulverizer which will be shared regionally.

The County's landfill and existing recycling centers are shown on the Community Facilities Map (Figure 7-A), page 7-9.

SUMMARY

Adequate public services and facilities are required to serve community needs. Public service areas have been delineated around the towns to serve the major development needs in an efficient manner.

It is a County objective to improve the County's school facilities and curriculum. In recent years major improvements and additions have been made to all elementary, middle and high schools. With the County’s increased school-age population, particularly in the northern portion of the County, new school construction may be -considered.

The capability for fire and rescue service dispatching and response was met by the enhanced 911 emergency dispatch system that has been implemented, and also by the growth of the Department of Fire and Rescue, which coordinates emergency response throughout the County.

The County complies with all state and federal requirements for the disposal of solid waste. It also actively promotes recycling and waste-minimization efforts, and has a county-wide recycling program in cooperation with the towns. It also promotes regional cooperation on solid waste disposal issues by participating in regional solid waste planning, tire recycling, and is investigating other cooperative measures to reduce the waste flow to landfills.

Capital projects are implemented through a Capital Improvements Program (CIP) for expanded services and physical facilities that is reviewed and updated annually as part of the budget process. All other county service agencies and towns are also encouraged to have capital improvement programs.

COMMUNITY FACILITIES

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: 1) roads and highways, 2) taxi service and bus service, and 3) transportation provided by local human service agencies and organizations, 4) airports, and 5) rail transportation. (See Figure 8-A, Transportation Map, on the following page.)

ROAD NETWORK

The most visible mode of transportation is the road network and the vehicles which travel on it. As of December 31, 2001 (latest figures available) Shenandoah County contained 767.99 miles of roads, as follow:

TABLE 8-A
SHENANDOAH COUNTY ROAD MILEAGES, 2001

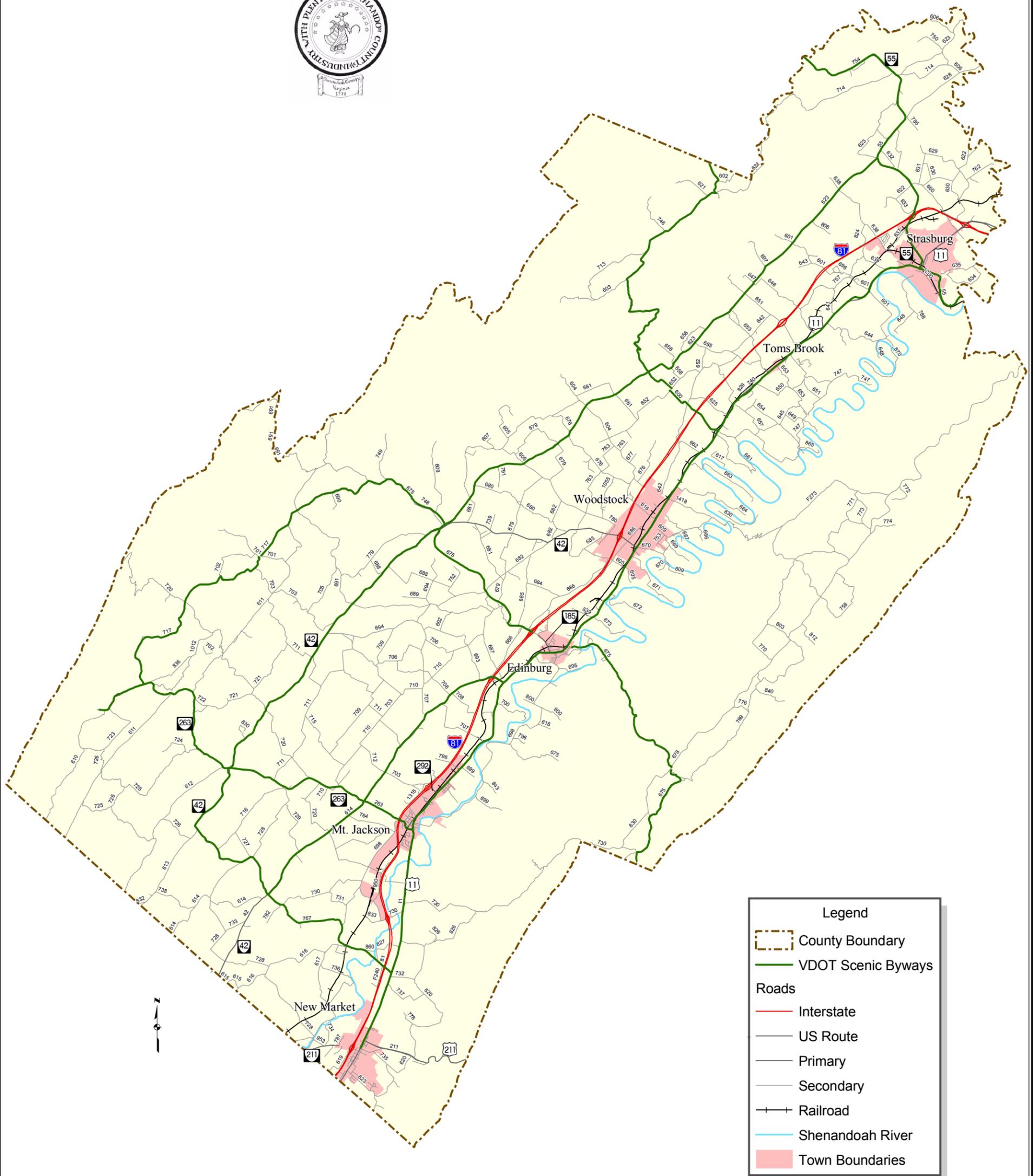
Interstate Highway	34.68
Primary Highways	94.04
Secondary Roads:	
Hard Surface	384.26
All-Weather Surface	242.54
Light Surface*	12.47
Unsurfaced	<u>0.00</u>
Total Secondary	639.27
TOTAL ROAD MILEAGE	767.99

*(Light surface is at least graded and drained)

Source: Virginia Department of Transportation: Milage Tables, 2001

Shenandoah County, Virginia

Figure 8-A Transportation



Legend	
	County Boundary
	VDOT Scenic Byways
Roads	
	Interstate
	US Route
	Primary
	Secondary
	Railroad
	Shenandoah River
	Town Boundaries



1 inch = approximately 3 miles



The total mileage of secondary roads in the County has grown by about 23 percent in the last fifty plus years, from 621.35 miles in 1950 to the current 763.62 miles, and there has been a gradual and steady 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 1995 figure of 374.23, which represents approximately 59 percent of the secondary road mileage.

There are over 350 bridge structures in Shenandoah County. This extensive system of bridges included in the County's road system pose a significant problem in maintaining and upgrading it. Bridges are far costlier to construct and maintain 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 un-surfaced or gravel roads to hard surfaced roads, there are still a great many existing roads that need to be upgraded. As of December 2001, 255 miles (40 percent of the secondary road system) were not hard surfaced. There is a new "Rural Rustic Road" program that may help get more roads paved for the money allocated. Under that program there would be no additional right-of-way obtained or road widening; just paving the roadway in place.

Scenic Byways

In April 2000, Shenandoah County proposed several roadways that travel through scenic, historic and tourism-related areas in the County to be designated as Scenic Byways by the Commonwealth Transportation Board. After review by both VDOT and the Department of Conservation and Recreation, who jointly administer this program, 10 roads were designated Scenic Byways.

The roads include four primary routes: Route 11, from Route 55 in Strasburg through the County to New Market; a portion of Route 42 between Routes 675 and 767; Route 55 through the County; and Route 263 from Mt. Jackson to Orkney Springs. In addition, six secondary roads (or portions of these roads) were so designated: Routes 600 from Route 11 north through the County; Route 614 from Route 11 to Forestville; Route 623 from Route 55 to Route 675; Route 675 from Route 42 south through the County to Page County; Route 717 from Route 675 to Basye; and Route 767 from Forestville east to Route 11.

Together, these routes form a couple of scenic parallel routes to I-81, and also several loop routes so that someone could get off the main highways and see one or more scenic and historic areas of the County easily. All the Scenic Byways are shown on Figure 8-A on the previous page.

Traffic Volumes

Traffic volumes for the County's interstate and primary highways increased significantly during the period of 1980-2000, with traffic on I-81 averaging a 215 percent increase. Other segments of primary highways increased from a low of 17 percent to a high of 333 percent.

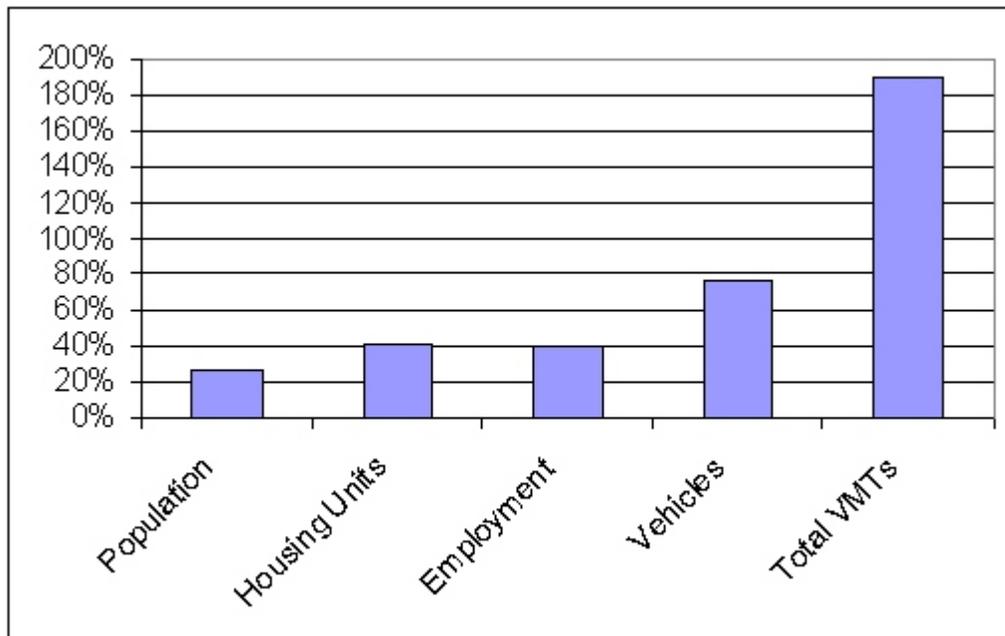
As in many other communities, traffic volumes and total vehicle miles traveled are increasing at a much more rapid pace than are the increases in population, jobs, housing units, or the total number of passenger vehicles registered. See Table 8-B, Major Change Indicators 1980-2000, and Figure 8-B on page 8-4.

TABLE 8-B
MAJOR CHANGE INDICATORS 1980-2000

Category	1980	1990	2000	Percent Change '80-'00
Population	27,559	31,636	35,075	27.3%
Total Housing Units	11,770	15,160	16,709	42.0%
Employment	12,575	15,633	17,710	40.8%
Tl. Passenger Vehicles Registered	18,966	27,600	33,545	76.9%
Total Vehicle Miles Traveled (VMT's) on Interstate, Arterial, & Primary Highways	649,159	988,688	1,875,284	188.9%

Sources: U.S. Bureau of the Census, Virginia Employment Commission, Virginia Department of Motor Vehicles, Virginia Department of Transportation.

FIGURE 8-B
MAJOR CHANGE INDICATORS 1980-2000



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 a daily 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 1990, these figures were 918 single-unit trucks, 5,673 trailer trucks, and 527 twin trailer trucks.

Between 1990 and 2000 VDOT installed automatic traffic counting devices on I-81, and the counts for 2000 estimated trucks to be: 1,127 single-unit trucks, 10,144 trailer trucks, and 751 dual trailer trucks. Both the total number of trucks and their size has increased substantially on I-81 during these time periods.

The total number of trucks decreased on Route 11, from an average of 1,286 in 1980 to 390 in 1990 and an average of 500 in 2000. This indicates that the growth seen in overall truck traffic is primarily for through traffic, not that destined for the County.

Average Annual Daily Traffic (AADT) 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
1990 AND 2002

Route	From:	To:	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>% Chg.</u>
11	Rte. 81 N. of Strasburg	Strasburg	4,720	7,165	10,000	111.9%
11	Strasburg	Woodstock	5,650	6,970	7,600	34.5%
11	Woodstock	Mount Jackson	4,595	5,670	7,300	58.9%
11	Mount Jackson	Rte. 767 N. of New Market	2,575	3,590	5,300	105.8%
11	Rte. 767 N. of New Market	Rte. 211 N. New Market	2,780	3,740	4,600	65.5%
11	Rte. 211 N. New Market	Rte. 211 S. New Market	6,150	7,115	7,900	28.5%
42	Rte. 11 Woodstock	Rte. I-81	6,620	9,565	14,000	111.5%
42	Rte. I-81	Rte. 605 Calvary	4,230	5,390	8,100	91.5%
42	Rte. 605 Calvary	Rte. 675 Columbia Furnace	3,600	4,800	4,700	30.6%
42	Rte. 675 Columbia Furnace	Rte. 263	300	475	1,300	333.3%
42	Rte. 263	Rte. 767 Forestville	405	620	600	48.1%
42	Rte. 767 Forestville	Rockingham County Line	975	1,280	1,300	33.3%
55	NWCL Front Royal	Strasburg	2,755	3,390	3,500	27.0%
55	Strasburg	Rte. I-81	2,075	3,410	4,300	107.2%
55	Rte. I-81	Rte. 628 Lebanon Church	1,410	2,095	3,600	155.3%
55	Rte. 628 Lebanon Church	Frederick County Line	960	1,605	3,300	105.6%
211	Page County Line	Rte. 11 New Market N. Int.	3,825	5,370	6,000	56.8%
211	Rte. 11 New Market N. Int.	Rte. 11 New Market S. Int.	6,550	7,115	7,900	20.6%
211	Rte. 11 New Market S. Int.	Rte. I-81 W. of New Market	7,335	8,190	12,000	63.6%
211	Rte. I-81 W. of New Market	Rte. 42 S. of Timberville	4,430	5,650	5,200	17.4%

TABLE 8-C (Continued)
PRIMARY & INTERSTATE TRAFFIC VOLUMES
1980, 1990 AND 2000

<u>Route</u>	<u>From:</u>	<u>To:</u>	<u>1980</u>	<u>1990</u>	<u>2000</u>	<u>% Chg.</u>
263	Route 11, Mt. Jackson	Route 42	1,305	1,820	4,000	206.5%
263	Route 42	Route 717, Basye	1,160	1,675	1,800	55.2%
263	Route 717	Orkney Springs	805	1,285	640	-20.5%
I-81	Rte. Mauzy	Rte. 211 New Market	11,655	20,465	38,000	226.0%
I-81	Rte. 211 New Market	Rte. 703 N. of Mt. Jackson	11,340	19,145	35,000	208.6%
I-81	Rte. 703 N. of Mt. Jackson	Rte. 185 Edinburg	11,640	20,275	36,000	209.3%
I-81	Rte. 185 Edinburg	Rte. 42 Woodstock	11,950	20,620	36,000	201.3%
I-81	Rte. 42 Woodstock	Rte. 55 W. of Strasburg	12,220	21,520	38,000	211.0%
I-81	Rte. 55 W. of Strasburg	Rte. 11 N. of Strasburg	12,390	20,400	39,000	214.8%
I-81	Rte. 11 N. of Strasburg	Rte. I-66 N. of Strasburg	12,365	20,900	41,000	231.6%
I-81	[Average of I-81 through Shenandoah County]		[11,937]	[20,475]	[37,571]	[214.7%]

Traffic counts for secondary roads are now only made infrequently under a “ reduced count program,” and the locations of the

Traffic counts for secondary roads are now only made infrequently under a “ reduced count program,” 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 1999 through 2002. These volumes are compared with the volumes from counts taken in 1991 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 1991 to 2002 range from a 36 percent reduction to a 206 percent increase in traffic (from 85 to 206 vehicles).

The five most heavily-traveled secondary roads (outside of incorporated towns) as of 2002 were Route 614 between 263 and Route 703 (1,900 vehicles), Route 604 near Woodstock (1,400 vehicles), Route 675 between Route 608 and Route 42 (1,100 vehicles), Route 623 between Route 604 and Route 600 (1,000 vehicles), and Route 678 in Fort Valley between Route 675 and Route 775 (740 vehicles). Along with the primary highways, these roads serve as the major travel routes throughout the County.

TABLE 8-D
SELECTED SECONDARY TRAFFIC VOLUMES
1991 AND 2002

Route	From:	To:	1991 *	2002 **	% Chg.
600	G. W. National Forest	Rte. 746, S. Intersection	124	180	45%
600	Rte. 623	Rte. 652, N. Intersection	231	230	0%
600	Rte. 11ck	Rte. 661	212	240	13%
600	Rte. 654	Dead End	14	30	114%
604	Rte. 676, S. Intersection	Rte. 676, N. Intersection	1,552	1,400	-10%
604	Rte. 652	Rte. 623, W. Intersection	1,336	850	-36%
611	Rte. 726	Rte. 263, W. Intersection	110	180	64%
611	.75 Mi. N. of Rte. 263	Rte. 720	186	520	180%
611	Rte. 835	Rte. 711	85	260	206%
611	Rte. 703	Rte. 701	38	50	32%
614	Rte. 738	Rte. 728, N. Intersection	100	170	70%
614	Rte. 42, N. Intersection	Rte. 627	862	1,000	16%
614	Rte. 263	Rte. 703, S. Intersection	1,298	1,900	46%
614	Rte. 708, N. Intersection	Rte. 693	914	940	3%
614	Rte. 1604	Rte. 11	857	1,300	52%
623	Rte. 675	Rte. 768	1,015	1,000	-2%
623	Rte. 681	Rte. 605	567	670	18%
623	Rte. 605	Rte. 604	618	750	21%
623	Rte. 604	Rte. 600	784	1,000	28%
623	Rte. 600	Rte. 653	647	840	30%
623	Rte. 653	Rte. 806	598	620	4%
623	Rte. 806	Rte. 55, S. Intersection	279	600	115%
623	Rte. 741	Rte. 55, Mid. Intersection	33	45	36%
623	Rte. 55, N. Intersection	Frederick County Line	289	325	12%
648	SCL Strasburg	Rte. 9090	1,907	2,300	21%
648	Rte. 9090	Rte. 788	262	1,200	358%

TABLE 8-D (Continued)
 SELECTED SECONDARY TRAFFIC VOLUME ESTIMATES
 1991 AND 2002

Route	From:	To:	1991 *	2002 **	% Chg.
675	WV State Line	Rte. 789	116	190	64%
675	Rte. 789	Rte. 717	142	220	55%
675	Rte. 717	Rte. 749	714	830	16%
675	Rte. 749	Rte. 608	891	970	9%
675	Rte. 608	Rte. 42	1,048	1,100	5%
675	Rte. 42	Rte. 682	595	570	-4%
675	Rte. 682	Rte. 185	899	956	6%
675	Rte. ECL Edinburg	Rte. 1430	834	969	16%
675	Rte. 1430	Rte. 678	757	1,010	33%
675	Rte. 730	Page County Line	190	207	9%
678	Rte 675 South	Rte. 830	53	50	-6%
678	Rte. 830	Rte. 675 E. Intersection	157	200	27%
678	Rte. 675, W. Intersection	Rte. 775	842	740	-12%
678	Rte. 775	Rte. 758, N. Intersection	585	640	9%
678	Rte. 758, N. Intersection	Rte. 774	585	660	13%
678	Rte. 774	Rte. 772	556	580	4%
678	Rte. 772	Warren County Line	625	720	15%
717	Rte. 263	Rte. 703	220	460	109%
717	Rte. 703	Rte. 691	289	350	21%
717	Rte. 691	Rte. 675	548	460	-16%
730	I-81	Rte. 833 - school complex	2,375	3,000	26%
758	Rte. 665	Rte. 845	577	700	21%

Notes: * Traffic volume counts taken between 1985 and 1991.
 ** Presented as "Traffic Volume Estimates" with counts taken between 1999 and 2002.

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.

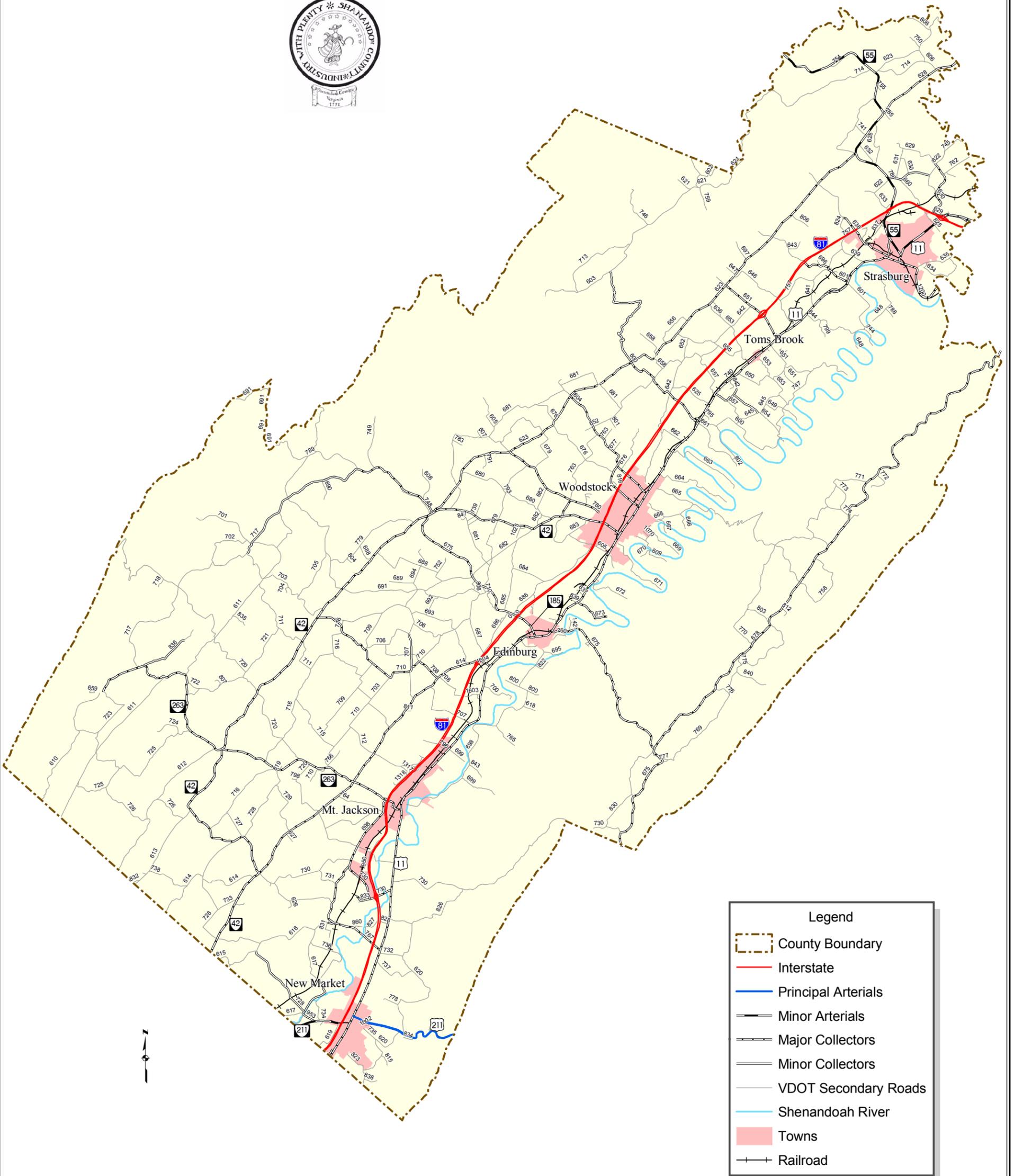
Minor collectors collect traffic from local access roads, rural villages, and locally important traffic generators, and bring all developed areas within a short distance of a major collector.

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

Figure 8-C Functional Classification



Legend

- County Boundary
- Interstate
- Principal Arterials
- Minor Arterials
- Major Collectors
- Minor Collectors
- VDOT Secondary Roads
- Shenandoah River
- Towns
- Railroad

1 inch = approximately 3 miles



Private Roads

In addition to the public road system, there are many private roads serving subdivisions 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 provisions for their long-term maintenance. A few subdivisions did make adequate provisions for the long term, and their roads are maintained at no cost to the public.

The County changed its development regulations regarding roads in the late 1990s to prevent the problems mentioned above, and now private rights-of-way are only allowed to serve two subdivision lots. If a parcel is located on a private right-of-way that already serves two or more lots, no more lots can generally be subdivided from it.

Old Valley Pike (U.S. Route 11) Corridor

Shenandoah County had concerns about the operation and appearance of the Old Valley Pike (US Route 11) Corridor through the County. These concerns involve traffic issues as well as land use development issues. The County and town comprehensive plans did not discuss a vision of how the corridor should look in the future, and that was felt to be detrimental to the future traffic operation, economic development, and tourism.

Through a Rural Transportation Planning Grant from VDOT, administered by the Northern Shenandoah Valley Regional Commission (NSVRC), a consultant was hired to assist the County and localities in examining the current situation along the Old Valley Pike corridor, and proposing coordinated guidelines for both the County and the towns on a future vision of the corridor, which would insure adequate traffic operation, protect the scenic and rural character, and promote tourism and economic development.

The plan studied the 34-mile segment of Old Valley Pike within Shenandoah County. The plan objectives were:

- To determine current and future traffic volumes and capacities, roadway conditions, safety improvement needs, and potential Intelligent Transportation System (ITS) applications;
- To establish a Corridor Overlay District, which would provide guidance for future land development and road improvement projects to minimize impacts on the scenic and rural character of the corridor;
- To examine access management needs as future development occurs;
- To plan for bicycle facilities and land uses along the corridor, as they relate to its gateway function for all the historic districts in the County; and
- To promote quality Economic Development in the Corridor consistent with the scenic and rural character of the Corridor and the economic needs of Shenandoah County.

The Old Valley Pike Corridor Plan, which provides a concept plan for maintaining the traffic capacity of this highway as future growth occurs, and for planning land uses and facilities along the corridor while protecting the historic and scenic assets located there, was adopted by the Board of Supervisors on February 25, 2003, and is hereby incorporated in the Comprehensive Plan by reference. The entire plan can be viewed on the County's web site located at www.co.shenandoah.va.us.

The policies incorporated in the plan seek to achieve a consistent vision of the Old Valley Pike Corridor within Shenandoah County. The major recommendation is to create a Corridor Overlay District, including requirements for safe and efficient traffic operations, and at the same time providing guidelines for future economic development opportunities along the corridor. The intent is to preserve the historic and scenic nature of the corridor by providing a policy framework that will promote economic development, while controlling sprawl.

District boundaries would encompass the land area along the Old Valley Pike frontage and extend approximately 500 feet on each side of the centerline of Old Valley Pike. In addition, access management policies will be applied to all parcels that would have direct access to Old Valley Pike.

To manage the future conditions of the Corridor, the Corridor Overlay District establishes guidelines directed towards development design and access, as well as Corridor transportation improvements. Each development application will be subject to the policies and guidelines to ensure compatibility with the surrounding area,

It is recognized that the agricultural industry that exists along the Corridor is important in preserving the County's rural and open-space character. Major residential and commercial development should be focused primarily within the Public Service Areas (PSA) along the Corridor. However, if development does occur along the Corridor outside of the PSA in the agriculture area, the development will reflect the policies contained in this plan.

Major policies of the Old Valley Pike Corridor Plan include:

- Bicycle and Pedestrian Facilities - Creation of a multi-use trail system along the length of the corridor to provide non-motorized links between towns and tourist sites. Such trails would take various forms depending on location in a rural or urban area.
- Land Use and Development - Make sure the pattern and design of development contribute to achieving the goals of preserving the rural character of the County, providing safe and efficient travel, and promote economic development.
- Transportation Improvements - Future transportation improvements should improve the safety and operation the Old Valley Pike corridor, promote pedestrian and bicycle circulation, as well as minimize the impact of any traffic diverted from I-81. The County will also consult with the towns to ensure that planning for distinct "gateways" into each is coordinated and the towns historic and archaeological resources are protected.
- Access Management - Coordinate land use and transportation planning to ensure that capacity and efficiency of the roadway are maintained as future development occurs. Utilize available controls such as medians, shared entrance ways, and service roads where needed. Cluster multi-use activities whenever possible to create fewer, more carefully designed access points and foster pedestrian and other non-vehicular trips.
- Use of Intelligent Transportation Systems (ITS) Technology - Communications infrastructure and closed circuit cameras can be used to collect, analyze and disseminate roadway information to manage traffic flow. In case of major traffic diversions, signalization can be controlled and coordinated at a remote "smart center." Provide traveler information via signs, an interactive web site and phone access.

A Corridor Overlay District still needs to be developed and adopted to put the concepts and design guidelines included in the plan into fruition.

I-81

Shenandoah County is extremely concerned at this point with the effects of implementing the public-private partnership proposal that provides for a total of eight lanes, including separate truck lanes and many new structures needed to provide separate truck interchanges. Such a project would have drastic effects on the scenic, environmental and historical resources along the corridor. In particular, this would include effects on parks (including the new Belle Grove - Cedar Creek National Park); effects on battlefields and the Shenandoah Valley Battlefield Historic District; effects on agricultural operations and the six Agricultural & Forestal Districts located along I-81. This project will have to be carefully planned and coordinated to have as minimal an impact as possible on the scenic, environmental, historic and agricultural resources of the County.

There are other strategic alternatives to widening I-81, such as a regional rail alternative and extensive safety improvements and speed limit enforcement on the existing interstate. The County should petition the Governor and General Assembly to explore all strategic alternatives to widening I-81 and it should encourage other jurisdictions along the I-81 corridor to do likewise.

A new interchange at the north end of Woodstock is needed now and is included in the Town's Comprehensive Plan, and is included as a "locally-desirable" project in the Woodstock Area Plan recently prepared by VDOT. The County concurs with this proposal, and feels that the planning and engineering process should be initiated by VDOT immediately so that construction can subsequently be scheduled. This project should be coordinated with the I-81 upgrade planning process that is now taking place at the State and Federal levels.

Other 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.

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.

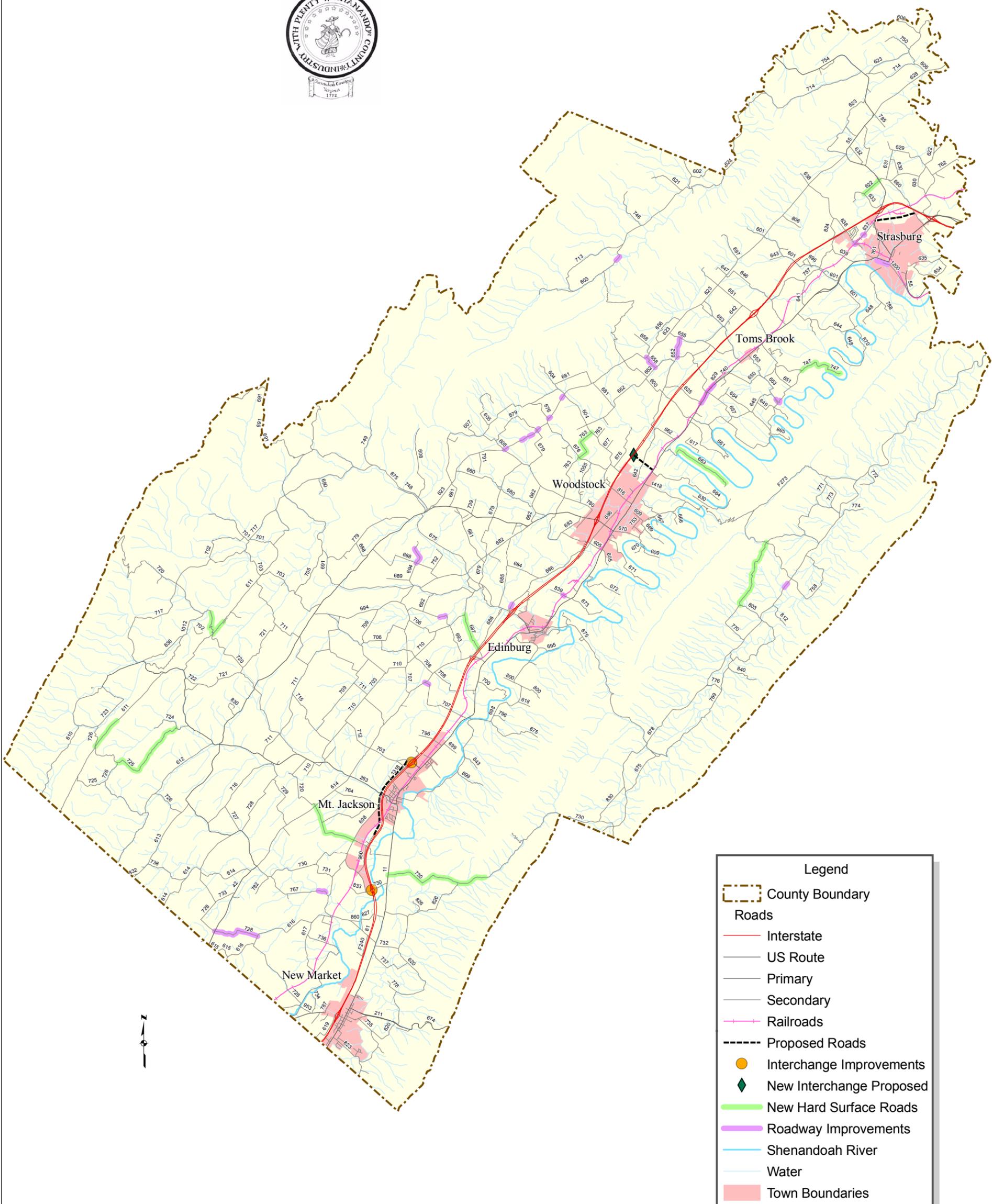
In the areas around Strasburg and Mt. Jackson, new secondary roadways are included in local plans which will connect major existing roads to allow for better access, and also to provide bypasses around the congested central areas. The County and VDOT need to cooperate closely with the town governments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

Improvements identified in the VDOT Secondary System Improvement Plan are also shown on Figure 8-D. These consist of a range of projects from major improvements along existing routes; to spot improvements, new bridges or culverts, roadway re-alignments for better sight distance; and rail crossing improvements and signals. Under present funding formulas and the statewide secondary road allocation process, there is never enough money for current road needs in Shenandoah County.

Rights-of-way need to be preserved to allow for future improvements to the major secondary roads throughout the County. The Subdivision Ordinance contains provisions for the dedication of additional right-of-way along secondary roads that do not currently have a 50 foot right-of-way. Additional rights-of-way may also be needed to make improvements in road alignments as well as their surfaces.

Shenandoah County, Virginia

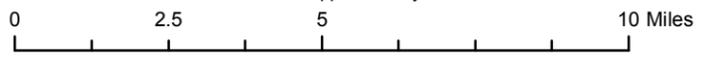
Figure 8-D Road Improvement Needs



Legend	
	County Boundary
Roads	
	Interstate
	US Route
	Primary
	Secondary
	Railroads
	Proposed Roads
	Interchange Improvements
	New Interchange Proposed
	New Hard Surface Roads
	Roadway Improvements
	Shenandoah River
	Water
	Town Boundaries



1 inch = approximately 3 miles



Other Transportation Planning Efforts

The NSVRC, in partnership with the Shenandoah Valley Battlefields Foundation (SVBF), received VDOT Rural Transportation Planning Grant funds to prepare a Shenandoah Valley Battlefields and Greenways Bicycle and Pedestrian Plan for the region to link existing and planned bicycle and pedestrian routes, identify new route options based on needed links with Civil War heritage sites, historic properties, town tours, natural land forms and key tourist attractions and destinations.

Local member jurisdictions of the NSVRC, community organizations and interest groups were involved in the on-going planning process. A consultant with expertise in the design and construction of greenways, trails and pathways was hired to assist with this project. The draft plan is now completed, and it will be published on the Internet for easy access and reference. Subsequent to that publication, the adoption process will take place.

LOCAL PUBLIC TRANSPORTATION

There is no local transit system in Shenandoah County. If a citizen does not own or have access to a car, there are a few options for getting from one place to another.

There are three taxicab companies currently listed in the Shenandoah County phone book; two in the Woodstock area and one in Strasburg.

Several of the social service agencies and non-profits incorporate transportation into their programs. The Shenandoah Area Agency on Aging (SAAA) sponsors a van that operates in the County four days a week (excluding Mondays). 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 delivering hot meals to home-bound seniors are also made during the middle of the day.

Additional special-purpose transportation is arranged by health associations or societies, such as the Red Cross, the American Lung Association of Virginia, and a Veterans Association, and private companies that provide medical transport (wheelchair or stretcher), and volunteer drivers for churches and other organizations.

A regional Public Mobility program is being established to serve the Northern Shenandoah Valley Region, including Shenandoah County. The Northern Shenandoah Valley Public Mobility Program is an effort by a group of human service and non-profit organizations to provide improved transportation service to their clients. These clients include people who are mentally and/or physically disabled, elderly, and people who are involved in welfare-to-work programs. Each organization's transportation program is almost completely independent of the other organizations.

Currently, there are 14 agencies participating in the program; six of those agencies own vehicles and the remainder are purely consumers of transportation service. Most of the vehicles are used to pick up clients in the morning, take them to some activity, and then return them to their homes in the afternoon

Dispatching is usually handled informally by a single person within each organization via telephone. Each organization's routes typically follow certain consistent patterns with minor daily deviations from the pattern. In addition, there are frequent special requests for transportation for medical appointments and other similar reasons. The goal of the program is for the agencies to reach more people in need by working together in a cooperative manner to better utilize their transportation resources and utilize a joint dispatching system.

An assessment needs to be made as to the overall transportation needs and the adequacy of existing resources.

BUS SERVICE

There is no longer any inter-city bus service in Shenandoah County. Greyhound Bus Lines previously had several stops along Route 11 within the County, but now all buses travel on I-81. The closest bus terminals for local service 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 Resort near Basye.

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 located between mountain ridges. The airport is open from sunrise to sunset. No fuel is available.

The County is a member of the Winchester Regional Airport Authority which operates the Winchester Regional Airport, located 31 miles from Woodstock. The runway is now 5,500 feet long, and can serve business jets. A full instrument landing system (ILS) and high intensity lighting is available to assist pilots during low-visibility operations. Other major improvements were completed in the 1990s that included 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 longer runway and ILS system will lead to the establishment of commuter airline service.

The Shenandoah Valley Regional 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 a commuter airline providing scheduled flights to one or more hub cities.

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.

Although it is an unlikely possibility, a two-track railroad through the Valley would help alleviate some of the heavy truck traffic on I-81. Norfolk Southern has shown little interest in making the improvements and additions necessary to provide such a service however, and it is unclear how much truck traffic it would displace.

The Virginia Inland Port is located north of Front Royal approximately 15 miles from Shenandoah County. This facility provides daily rail 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

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. To this end, the County should commission an outside planning consulting agency to conduct the study as a matter of priority.

Certain steps should be undertaken now to ensure an adequate transportation system in the future: the County should support appropriate 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; adoption of a Corridor Overlay District for the Route 11 Corridor is imperative; 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 while protecting the environmental, scenic and historic resources of the County.

GROWTH MANAGEMENT

INTRODUCTION

Communities and their rural environs evolve over time and are affected by the actions of local landowners, the plans of planners, programs of environmentalists and the plans 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.

The following Vision Statement describes in a broad sense what we as a county want to be twenty years from now. It is based on a consensus of popular aspirations and a realistic projection of current socio-economic trends. The Vision Statement provides the framework for formulating a meaningful set of goals and policies for Shenandoah County over the next 20 years.

In the year 2025, Shenandoah County will be a primarily rural community that

- protects its natural resources;
- directs its growth to the towns ensuring its open, agricultural character;
- provides a variety of jobs in business, light industry, tourism and sustainable agriculture;
- maintains moderate growth of a demographically varied population;
- supports safe and efficient interstate transportation and maintains the rural character of its primary and secondary roads;
- affords its students an excellent and appropriate education;
- serves its citizens with public facilities and services that enhance their quality of life;
- and ensures preservation of its natural beauty and unique, historic character by strictly adhering to the goals and objectives of its Comprehensive Plan.

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 are 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 2005 to 2010.

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 2025. 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 - Preserve and enhance the natural environment of the County.
- GOAL 2 - Protect and promote the historic resources of the County.
- GOAL 3 - Guide and direct growth into and around the towns and other areas served by public utilities, while preserving the rural and open space character of the balance of the County.
- GOAL 4 - Create a business climate conducive to economic activity and encourage a diversity of business & industrial activity.
- GOAL 5 - Promote affordable housing for all segments of the population.
- GOAL 6 - Provide for the improvement of public facilities and for the delivery of necessary public services.
- GOAL 7 - Provide a safe and efficient transportation system throughout the County.
- GOAL 8 - Provide for a continuing planning process which results in policies to manage the County's growth and development.

GOALS, OBJECTIVES AND STRATEGIES
FOR INDIVIDUAL PLAN CATEGORIES

1. NATURAL RESOURCES

GOAL - Preserve and enhance the natural environment of the 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 resources.

STRATEGY 2) - Expand acreage in agricultural and forestal districts for their contributions to the economic base and environmental quality.

OBJECTIVE B - Provide for development according to the carrying capacity of the environment.

STRATEGY 1) - Through the use of overlay zones, limit development in areas identified as having high potential for groundwater pollution; protect sinkholes.

STRATEGY 2) - Through the use of overlay zones, limit density in areas which are identified as critical areas for septic systems.

OBJECTIVE C - Preserve and adopt specific measures to protect the Shenandoah River, other streams, and the County's ground water.

STRATEGY 1) - Regulate development in flood plains and promote landowners' participation in hazard mitigation programs that will reduce future dangers of flooding.

STRATEGY 2) - Develop/implement a groundwater protection plan for the County.

STRATEGY 3) - Identify priority watersheds; identify and adopt specific measures to protect sinkholes, streams and wetland areas.

STRATEGY 4) - Assist towns and other public water suppliers in protecting public water supplies, including wellheads and aquifer recharge areas.

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.

2. REGIONAL SETTING & HISTORY

GOAL - Protect and promote the historic resources in Shenandoah County.

OBJECTIVE A - Preserve individual properties and sites throughout the county.

STRATEGY 1) - Complete additional surveys and nomination of eligible properties and rural historic districts to the Virginia and National registers. In addition to many individual historic homes and buildings, Shenandoah County contains several unincorporated villages that may be eligible for historic designation.

STRATEGY 2) - Require all development proposals to identify historic and prehistoric features. Require development proposals to include specific plans for all historic and prehistoric features within the development area.

STRATEGY 3) - Publicize historic features of Shenandoah County and tax incentives and other preservation programs available to assist property owners with preservation initiatives. Encourage private preservation of historic resources.

STRATEGY 4) - Provide resource information to assist private citizens and developers in the following preservation activities:

- identification of historic buildings and features
- nomination of properties for inclusion in historic registers
- application for tax credits for historic restoration and tax deductions for donated easements.
- identification of funding opportunities and application for grants associated with historic preservation.

OBJECTIVE B - Protect and enhance battlefield sites throughout the County.

STRATEGY 1) - Support the implementation of Shenandoah Valley Civil War Battlefields National Historic District preservation plans in the County:

- continue to show rural areas of the battlefields as agricultural or forest uses.
- limit the extension of water and sewer service into these areas.
- prevent road construction or improvements to existing roads that would cause adverse impact with particular attention to Battlefield Rd. at Fisher's Hill.
- refrain from approving infrastructure or capital projects such as solid waste disposal facilities, schools or communications towers.

STRATEGY 2) Consider conveying conservation easements on county-owned land at Fisher's Hill and Tom's Brook Battlefields to the Virginia Outdoors Foundation.

STRATEGY 3) Explore implementation methods that the County can commit toward battlefield preservation such as PDR, agricultural and forestal districts, agricultural support programs and a battlefield preservation zoning district.

STRATEGY 4) Encourage the use of donated easements and other voluntary measures to permanently protect Civil War sites.

3. LAND USE

GOAL - 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 so as to ensure compatible zoning.

STRATEGY 2) - Identify potential public service areas and seek annexation agreements or urban growth area plans with towns to define those areas.

STRATEGY 3) - Encourage uniform town subdivision regulations.

STRATEGY 4) - Create incentives for development where public services are available.

OBJECTIVE B - Maintain the rural and open space character of areas outside of the public service areas.

STRATEGY 1) - Confine urban forms of land development to the public service areas.

STRATEGY 2) - Maintain a low average density of dwelling units in agricultural and conservation areas by establishing a maximum number of dwelling units per 100 acres or fraction thereof.

STRATEGY 3) - Adapt the cluster housing concept for subdivisions and set the open space requirement to 70%.

STRATEGY 4) - Encourage rural property owners to place their land in agricultural or forestal districts.

STRATEGY 5) - Encourage the use of conservation, scenic, historic and other voluntary easements to permanently preserve land.

STRATEGY 6) - Consider the purchase of development rights of strategically located high quality rural property.

OBJECTIVE C - Guide future commercial land uses to locate where there is access to major transportation corridors and where public utility services are 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 industrial land uses to locate near the interstate corridor and interchanges where public utility services are available and adequate transportation facilities exist:

STRATEGY 1) - Promote new industry to locate in the existing industrial parks whenever feasible.

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) - Along I-81, locate businesses that need maximum access by the public at the interchanges. Retain open spaces along the interstate between the interchanges and other frontages to preserve the natural beauty of the Valley and to preserve historic areas.

STRATEGY 5) - Encourage light non-polluting industry and business 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) - Ensure there is adequate ground or surface water to support any new industry.

4. ECONOMY

GOAL - Create 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 the activities that were required for the Virginia Certification Program; establish and maintain an adequate database of information to support economic development activities.

STRATEGY 2) - Encourage light, non-polluting industries and businesses that will benefit the economy and ecology of the County.

STRATEGY 3) - Emphasize the recruitment of higher wage companies; those that require a better educated work force, a more highly-skilled work force, a more technically-oriented work force, and a more knowledge-based work force.

OBJECTIVE B - Support travel and tourist related activities.

STRATEGY 1) - Promote tourism and destination marketing.

STRATEGY 2) - Encourage the protection of scenic beauty and historic sites.

STRATEGY 3) - Enhance recreational facilities.

STRATEGY 4) - Support the implementation of the Shenandoah Valley Battlefields National Historic District, the interpretation of Civil War sites and related tourism and travel activities.

OBJECTIVE C - Maintain and promote the role of agriculture as part of the basic economy of the County:

STRATEGY 1) - Provide the means to preserve agricultural land through such measures as Agricultural & Forestal Districts, conservation easements, purchase of development rights, zoning laws and tax incentives.

STRATEGY 2) - Promote the health and growth of agriculture as an industry.

STRATEGY 3) - Encourage diversity in agricultural production.

STRATEGY 4) - Encourage better marketing of agricultural products.

STRATEGY 5) - Provide agricultural educational opportunities for our youth.

5. HOUSING

GOAL 5 - Promote affordable housing for all segments of the population.

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 and building codes.

OBJECTIVE B - Reduce the cost of housing.

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.

6. PUBLIC FACILITIES

GOAL - Provide for the improvement of public facilities and for the delivery of necessary public services.

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 to meet valid needs, including rapidly expanding enrollment.

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.

STRATEGY 4) - Provide a County-sponsored facility for the performing arts.

OBJECTIVE C - Improve the capability for fire and rescue service dispatching and response.

STRATEGY 1) - Continue to develop a parcel-based geographic information system (GIS) for the County and tie the computer mapping into emergency dispatching operations.

OBJECTIVE D - Comply with state and federal requirements for the disposal of solid waste:

STRATEGY 1) - Promote recycling and waste-minimization efforts through public education; develop and implement a county-wide recycling program.

STRATEGY 2) - Continue to promote regional cooperation on solid waste disposal issues.

STRATEGY 3) - Continue to participate in regional solid waste planning and encourage towns to do the same.

OBJECTIVE E - As part of the annual budget process 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.

7. TRANSPORTATION

GOAL - 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.

STRATEGY 2) - Require that adequate access roadways are provided for before rezoning or subdivisions are approved.

STRATEGY 3) - Coordinate transportation planning with the approved Old Valley Pike Corridor Plan.

OBJECTIVE B - Improve the secondary road system in the County while maintaining the rural character of the County:

STRATEGY 1) - Widen rights-of-way and roadways only where necessary for safety.

STRATEGY 2) - Improve existing roadway surfaces with pave-in-place.

STRATEGY 3) - Develop better drainage along roads where flooding occurs.

STRATEGY 4) - Require subdivision roads in public service areas to meet urban standards.

OBJECTIVE C - Encourage VDOT to 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 but insure that they are done with adequate design to preserve the County's scenic, natural, historic and rural areas.

OBJECTIVE D - Encourage the provision of a full range of transportation options.

STRATEGY 1) - Support exploration of a rail solution to Interstate congestion.

STRATEGY 2) - Provide for adequate and safe pedestrian and bicycle travel.

STRATEGY 3) - Encourage public transportation initiatives by the private sector.

STRATEGY 4) - Support regional airport service.

8. GROWTH MANAGEMENT POLICIES

GOAL - Provide for a continuous planning 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 which presents a composite of recommended plan amendments:

STRATEGY 1) - Conduct a plan review annually.

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 plan review 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.

OBJECTIVE C - Provide a mechanism for continuity between the Comprehensive Plan and the actions of the Planning Commission and the Board of Supervisors.

STRATEGY 1) - Indicate for each action whether or not it conforms with the Comprehensive Plan.

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 a 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 in the unincorporated places that are served by public facilities.

To fully implement this plan will continue to require political resolve and a substantial commitment of personnel and financial resources. In addition, it will require close coordination and cooperation among personnel at the State, County, Town, and Sanitary District levels.

Progress made toward implementing the actions proposed in this section will be reviewed annually by a review committee formally constituted by the Board of Supervisors.

SPECIFIC IMPLEMENTATION ACTIONS

Natural Resources

1. Develop a county-wide stormwater management plan, coordinate with towns' stormwater management plans, and prepare a budget to implement the plan.

Director of Planning & Code Enforcement '05-'06

2. Develop an ordinance requiring pump outs of septic systems at intervals determined by the County.

Director of Planning & Code Enforcement '06
Health Department

3. Develop a sinkhole ordinance to identify and protect sinkholes from accumulating groundwater contaminants.

Director of Planning & Code Enforcement '07

4. Aggressively pursue expansion of Best Management Practices in riparian areas.

Increase number of miles of stream bank protection by 10% per year, '06-'10.

Natural Resources Conservation Service

Lord Fairfax Soil & Water Conservation District

County Administrator

5. Support the Regional Water Resources Policy Committee by participating in funding the committee's work. This committee is in the process of preparing a Water Resources Strategic Plan for the Shenandoah River watershed.

Board of Supervisors '05

6. Participate in the clean air initiative (SHENAIR) which has been added as a new committee within the Northern Shenandoah Valley Regional Commission.

Board of Supervisors '05

Land Use Controls and Residential Development

1. Develop an Open Space Development ordinance to replace the existing subdivision ordinance. Open Space Development would apply to any parcel rezoned RR-A or RR-C. A minimum of 70% of the subdivision acreage would be open space in perpetual easement. Minimum lot size, taking into account road requirements, would be .75 acres for RR-A and 2.75 acres for RR-C.

Director of Planning & Code Enforcement '05

Zoning Administrator

2. Establish a system promoting a reasonable basis for rezoning proffers inside and outside the public service areas.

County Administrator '05

3. Develop a specific package of incentives to encourage the inclusion of affordable housing in new development planning.

Director of Planning & Code Enforcement '05

Zoning Administrator

4. Develop special ordinances/overlay districts to protect sensitive land and water resources from potential pollution and to preserve battlefields and other historic, scenic, and cultural resources.

Director of Planning & Code Enforcement '06
Zoning Administrator

5. Convene an ad hoc advisory committee to study the merits of the purchase of development rights (PDR) as a means of permanently preserving agricultural land in the county. PDR is a recognized tool for protecting rural areas but has been little used in the Commonwealth. Determining what parcels of land are worthy of this designation and how such purchases would be paid for are key issues to be addressed.

Board of Supervisors '05

6. On a detailed map of the county, identify those areas such as wetlands, sinkholes, etc. which are unsuitable for future development. Post to the Geographical Information System (GIS).

Director of Planning & Code Enforcement '05

Economic Development and Tourism

1. Working with local farmers, agricultural organizations, and agriculturally related businesses, develop a set of economic development strategies in relation to agriculture.

Director of Economic Development '05-'06

2. Working with local chambers of commerce, electric power companies, telecommunications companies, health service providers, the Superintendent of Schools, VDOT, the taxing authority, the Director of plans, and others as appropriate, develop a strategy for maximizing the "climate" for attracting new businesses and industries of the type described in the next paragraph.

Director of Economic Development '05-'06

3. Hire a consulting firm of national stature to assist the county in finding and recruiting companies that pay significantly higher wages/salaries, are environmentally clean, and have a research, engineering, technology, or knowledge base component.

Director of Economic Development '05-'06

4. In keeping with the view that such companies value academic excellence in their employees and future employees, commit to enhancing the academic excellence in the county's high schools, particularly with respect to those students who aspire to a four year college education. Specifically, appropriate from local resources 5% more per year, over and above other increases, for each of the next 5 years for school operating expenses. This 5% per year increase should be earmarked for improvements in education quality.

School Board '06
Board of Supervisors

5. Utilize the additional operating funds to achieve the following goals by 2010:
Pupil/teaching position ratios, grades 8-12: reduce from 14.4 to 11
Percent of students taking SATs: increase from 46 to 65
Average SAT scores: increase from 983 to 1040 (adjusted to new SAT scoring)
Percent of students going on to 4 year colleges: increase from 34 to 50
Percent of teachers with relevant masters degrees: increase to 50

School Board &
Superintendent of Schools

6. To enhance the role of tourism as an engine for economic prosperity:

a. Form a county-wide Chamber of Commerce.

County Administrator; Town Chambers '06

b. Develop plans for a full-service County Tourism and Information Center, to become operational by 2012. Plans to be ready by '09.

Dir. of Tourism

c. Identify specific scenic vistas throughout the county, erect appropriate roadside markers, and promote procedures for protecting, insofar as possible, those vistas from encroachment.

Dir. of Tourism '07

Director of Planning & Code Enforcement

7. Explore with the Virginia Employment Commission the possibility of establishing a satellite office in Shenandoah County similar to that of the Social Security Administration. Such an office should list local job opportunities, not just regional ones.

Dir. of Economic Development '05

Community Facilities

1. Explore ways of making full utilization of classroom space before embarking on a new school building program.
School Board '05 and following
2. Upgrade the county jail, public safety, and court facilities.
Board of Supervisors & Sheriff's Department '05-'06
3. Act on one of the 3 options for renovating the Edinburg School as a cultural arts center, the cost of renovation to be borne primarily by private funding.
Board of Supervisors '05
4. Update and then fund and implement the Master Indoor/Outdoor Recreation Plan
Department of parks and Recreation '05
Board of Supervisors '06-'10
5. Promote the concept of a privately funded or private sector/Shenandoah Memorial Hospital partnership to create a county-wide wellness center by 2010.
Department of Parks & Recreation Starting in '06
6. Commission a study to determine the optimum use of the North Fork Wastewater Treatment Facility.
North Fork Wastewater Treatment Authority '05

Transportation

1. Implement the recommendations of the Old Valley Pike Corridor Plan; create a corridor overlay district; encourage VDOT to implement safety improvements at dangerous locations; and apply access management criteria along the corridor.
Dir. of Planning & Code Enforcement '05
2. Review and revise as necessary the subdivision ordinance to provide appropriate design for streets and facilities and provision for pedestrian and bicycle travel in new developments.
Dir. of Planning & Code Enforcement '05

3. Commission a professional study to develop a transportation plan through 2025, to include:

- Safety and volume improvements in the primary & secondary road network
- An I-81 interchange north of Woodstock
- Future needs for public transportation, e.g., bus service
- Protection of scenic, battlefield, and historic resources
- Provisions for pedestrian and bicycle travel

Director of Planning & Code Enforcement '06

4. The proposed widening of I-81 (to at least 4 lanes in each direction) could have severe adverse economic, environmental, historical, and quality of life consequences for the Valley. The County, through the Northern Shenandoah Valley Regional Commission, should work to have all jurisdictions along the I-81 Corridor petition the Governor and the General Assembly to explore all strategic alternatives to widening I-81 in this fashion. Other alternatives should include a regional high speed rail line, and safety improvements to the existing interstate. The County should remain engaged on this subject until it is resolved.

Board of Supervisors '05 and following
County Administrator

Administration

1. Establish a permanent Citizens Advisory Committee on the Comprehensive Plan. The committee will support the Board of Supervisors and the Planning Commission and will function under the direction of the Director of Planning and Code Enforcement. It will propose updates and revisions to the Plan as they are needed. On an annual basis the committee will review the actions of the previous 12 months and report its findings to the Planning Commission and the Board of Supervisors

Board of Supervisors '05

2. In the staff reports accompanying relevant Planning Commission and Board of Supervisors agenda items, indicate whether or not the proposed action conforms to the Comprehensive Plan.

Director of Planning and Code Enforcement '05 and following

3. Form a permanent joint council composed of town managers and the county administrator, such council to meet on a regularly scheduled basis and with a jointly agreed upon agenda.

Board of Supervisors '05

4. Make planning staff additions appropriate to the expanding planning needs of the county.

Board of Supervisors '05