

*Page County, Virginia*

# COMPREHENSIVE PLAN

## VOLUME II: COMMUNITY CHARACTER

(PREPARED BY PAGE COUNTY)



Adopted by the Page County Board of Supervisors  
April 21, 2009

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## **ACKNOWLEDGEMENTS**

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## **PART III – COMMUNITY ASSESSMENT**

### **Chapter 1: Overview**

This plan is an edited revision and update of the work begun with the 1974, 1980, 1992, 2001 and 2007 updated comprehensive plans. Page County is an attractive rural county with varied terrain, abundant open space, scenic characteristics, small communities, and unique environmental features. The major goal of this plan is to retain these characteristics while accommodating a reasonable share of the region's growth.

There is a need to coordinate planning with the three incorporated towns in Page County to establish public service areas around them to which utilities and other facilities may be extended in the future. There is also a need to control development beyond those boundaries to discourage encroachment into agricultural, forestal and conservation areas of the County.

This plan provides a far-ranging policy designed to guide future growth and development. It is intended to provide the decision-makers of Page County with a balanced framework to guide future growth and change while preserving existing assets and amenities.

#### **1.1 Role of the Planning Process in Local Government**

Authority for local government planning in the Commonwealth of Virginia is contained in the Code of Virginia, 1950, as amended, Title 15.2-2223 through 15.2-2232. As a “Dillon Rule” state, local government authority is limited to that provided for in the Code. Therefore the tools available to local governments to carry out planning vary from those in other states and can vary within the Commonwealth. Title 15.2 - 2200 begins with the General Assembly's declaration of legislative intent relative to establishing laws for planning, subdivision of land and zoning.

Page County uses the traditional County Board of Supervisors form of government. One Supervisor is elected from each of the five voting districts. A sixth Supervisor is elected from the whole county to chair the board. The Supervisors are elected to staggered four-year terms. Supervisors are responsible for the legislative, administrative, and financial management of the county government. The Supervisors appoint the County Planning Commissioners.

Accordingly, the Page County Planning Commission shall establish guidelines and make recommendations for the preparation and maintenance of a Comprehensive Plan for the development of the county. Such plan, with the accompanying maps, plats, charts, and descriptive matter, shall show the Commission's long-range recommendations for the general development of the territory covered by the plan. In accordance with the Code, it may include, but need not be limited to:

1. The designation of areas for a variety of public and private development categories such as different kinds of residential, business, industrial, agricultural, forestal, conservation, recreation, public service, flood plain and drainage, and other areas;
2. The designation of a system of transportation facilities such as streets, roads, highways, parkways, railways, bridges, viaducts, waterways, airports, terminals, and other like facilities;
3. The designation of a system of community service facilities such as parks, forests, schools, playgrounds, public buildings and institutions, hospitals, community centers, waterworks, sewage disposal or waste disposal areas, and the like;
4. The designation of historical areas and areas for urban renewal or other treatment;
5. The designation of areas for the implementation of reasonable groundwater protection measures;
6. An official map, a capital improvements program, a subdivision ordinance, and a zoning ordinance and zoning district maps; and,
7. The designation of areas for the implementation of measures to promote construction and maintenance of affordable housing.

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

Once approved and adopted by the governing body the legal status of a plan is that "...it shall control the general or approximate location, character and extent of each feature shown on the plan." (Code of Virginia, Section 15.2 – 2232)

The Comprehensive Plan shall be general in nature. It shall designate the approximate location, character, and extent of each feature shown and may indicate where existing lands or facilities are proposed to be extended, widened, removed, relocated, vacated, narrowed, abandoned, or changed in use.

## **1.2 Relationship of the General Plan to District Plan**

The purpose of this plan is to help guide both public and private land use decisions as they relate to the specific goals of the county within the context of the Northern Shenandoah Valley Regional Partnership Strategic Plan 1997-2002.

## **1.3 History and Background of Planning and Development in Page County**

Page County first established a Planning Commission in 1964, and adopted its first subdivision ordinance in 1972. Prepared by the Planning Commission with assistance by planners from the Lord Fairfax Planning District Commission, the Page County Comprehensive Plan was adopted in 1974. That plan was reviewed in 1979, and updated plans were prepared and adopted in 1980, 1992, 2001 and 2007. These plans included a future land use map and a recommendation for a zoning ordinance to implement them. The basic premise of zoning is that incompatible land uses should be separated. By restricting unhealthy, dangerous or other unwise use of land, such an ordinance acts as a major protector of property values for all landowners. It also forms the basis for controlling the density in each area so that property can be adequately served by such facilities as roads, schools, and utility systems.

In 1988, the Planning Commission began working with the County Attorney and the staff of the Lord Fairfax Planning District Commission to develop an appropriate zoning ordinance. This led to adoption of the current ordinance in 1989. Subsequently, all towns in Page County have adopted their own plans, subdivision ordinances, and zoning ordinances.

Since first being surveyed in the 1970's, the county's general land use pattern has not changed greatly. As the 1980 Plan stated, the land use pattern is "the result of many pressures acting over time. Highway access, natural features, historical development, industrial and commercial expansion, and other market factors act upon a given land area to alter value and its potential for development."

Page County is still largely rural, with the predominant land use being agriculture. However, major types of developed uses - residential, commercial, and industrial - have increased during the last couple of decades. Most major growth is located in and around the three towns, but there is also much scattered growth throughout the rural portions of the county.

## **1.4 Current Conditions and Trends**

### **1.4.1 *The Built Environment***

Most development in the county has occurred in the central valley, where the best roads and other facilities are located and where the land is most suited for development.

Growth and development over the past decade has taken place in two distinct patterns. The first pattern is seen in and around the towns where public facilities have enabled the construction of several types of housing, including townhouses and apartments, as well as commercial and industrial uses.

The second pattern has been the growth outside of the towns. This growth has been primarily residential on large lots with individual on-site water and septic systems, and has been scattered throughout the county on rural secondary roads.

Page County has two primary routes, U.S. 340 and U.S. 211. Luray, the county seat and largest town, is located at the intersection of these two primary routes. The county's two other towns, Shenandoah, and Stanley, and most of the other smaller population centers, are also located along Route 340 and Business Route 340 corridors.

### **1.4.2 *The Natural Environment***

Page County has a spectacular natural environment. The Blue Ridge Mountains lie to the east, the Massanutten Mountains lie to the west and the South Fork of the Shenandoah

River travels from south to north through its central valley. The Blue Ridge Mountains and foothills comprise 40 percent of the county and about half of this portion is owned by Shenandoah National Park (38,614 acres). The Massanutten Range and its foothills comprise about 22 percent of the county. George Washington-Thomas Jefferson National Forest owns approximately 26,000 acres, or over 52 percent of this area. The Federal Government, therefore, owns approximately 65,000 acres, or 32 percent of the county's land.

The county's natural features present economic opportunities. The National Park, National Forest, Luray Caverns, Shenandoah River, and historical areas within its boundaries offer a wealth of recreational opportunities, beauty and history. These features attract tourists. Undulating hills and valleys sustain a strong agricultural economy.

The natural features and resources of Page County have decisively determined past settlements and will continue to influence future development throughout the county. The topographic features of any area ultimately affect the cost and type of development, soil erosion, the direction and rate of storm water runoff, the variety and visual quality of the landscape, the climate, vegetation and wildlife. The problems presented by the topography are as numerous as its pleasing aspects and present both opportunities and problems for development.

### **1.4.3 *The Economic Environment***

As a rural county in close proximity to Washington D.C. and other cities such as Harrisonburg, Charlottesville, and Winchester, Page County's economic environment is comprised of a variety of elements including agricultural, industrial, retail/commercial and tourism. The agricultural economy experienced a marked decline in smaller farming operations, especially in the dairy sector, which by 1998 had been reduced from more numerous small and mid-sized producers to only two larger operations. Mixed farming in general declined, as did the number of full-time farmers. Presently, a viable poultry industry exists in the county.

In the late 1990s and during the first three years of the current century the industrial sector has experienced some decline due to downsizing and closings. Numerous small businesses exist throughout the county.

The development and expansion of large shopping centers and huge malls housing large national chains in adjacent communities siphoned off a large percentage of Page County's consumer purchasing power. A greater variety of goods and services at lower prices resulted in the closure of many locally owned and operated businesses-notably clothing, hardware, electronics, general merchandise, and builders' supplies. Many businesses along the once bustling main streets of Luray, Stanley, and Shenandoah closed. More recently, mixes of old and new businesses have opened in small shopping centers in all three towns. These centers are home mainly to supermarkets, gas stations, fast food catering, branch banks and service related businesses. The most recent addition is Wal-Mart, which opened in January 2000.

Revitalization efforts have begun on Front Street in Shenandoah. The Luray Downtown Initiative (LDI) has brought revitalization efforts to Luray. In the spring of 2005, Luray was designated a Virginia Main Street Community. The numbers of restaurants and specialty shops are increasing.

Tourism plays a large role in the economy. For many years, the county has been a popular destination for travelers.

#### **1.4.4 The Public Service Environment**

The county provides basic, essential services to its citizens. These services include education, police and fire protection, and solid waste collection (compactors and recycling centers) and disposal.

Additional services provided in the county include General Administration, Economic Development, the Sheriff's Department, Emergency 911 Services, Environmental Services, Health Department, Educational Services, the Extension Service, Social Services, recreation services, Shenpaco, Northwestern Community Services, community centers, and libraries. Page County provides general public facilities such as office buildings, courthouse, jail, and school system facilities.

The public school system is a primary component of our community. Schools are an area of community focus and a gathering place for community and youth activities. The elected Page County School Board administers the public school system. There are five elementary schools (grades K-7) and two high schools (grades 8-12). In addition to the

general educational programs offered, technical and vocational training are available for students and adults at the Page County Technical Center. In 2006, the county and the Town of Luray supported the opening of a Lord Fairfax Community College satellite campus in Luray. In addition to the public schools, several private schools operate in Page County and the surrounding area.

## **1.5 Emerging Issues and Future Needs**

### **1.5.1 Land Use**

Housing and commercial development that conflict with the county's vision statement. To ensure orderly growth the county needs to:

- Create a land use plan for the county; and
- Ensure that Zoning Ordinances and the Comprehensive Plan are compatible

### **1.5.2 Education**

Pressures to prepare the county's students for the 21<sup>st</sup> century economy which require:

- Facilities consistent with meeting the county's educational goals;
- Renovations to facilities as needed;
- Technology capable of supporting the curriculum; and,
- Broadened curriculum opportunities such as Community College programs, expanded science and technical school programs, cultural activities and public arts.

### **1.5.3 Technology**

Rapid changes in technology pressuring the county to:

- Provide county residents and businesses with access to up to date technology;
- Make technology available in all schools with adequate computer hardware and appropriate teacher training; and,
- Provide telecommuting-information technology that will enable people to relocate from metropolitan areas such as Washington D.C. to scenic, quality of life areas such as Page County.

### **1.5.4 Transportation**

Commercial and residential development and the desire to attract more tourists highlighting the need for road improvements and the development of alternative modes of public transportation. To these ends the county needs to promote:

- Road improvements and development in the county that will maintain consistency with the community vision statement and employ Context Sensitive Solutions (CSS)<sup>1</sup>, adhere to safety standards and zoning ordinances and, where possible, include the development of bike-walkways; and,
- Public transportation including ride sharing, rail, bus and taxi services, and the further development of Luray Caverns Airport.

### **1.5.5 Landfill**

Fiscal pressures and environmental concerns requiring the county to develop a sound management plan to address these issues.

### **1.5.6 Ground and Surface Water**

Increasing needs for good water quantity and purity throughout the community requiring the county to adopt a comprehensive policy to meet these demands.

### **1.5.7 Tourism**

The need to support the local economy by developing programs to attract more tourists and encourage them to stay longer such as the greenway, a performing arts theater, the Luray train depot, Steven's cottage, etc.

### **1.5.8 Public Services**

Growing population, housing developments and education demands that increase the need for increased public expenditures to fund:

- New and renovated schools;

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<sup>1</sup> CSS: Context sensitive solutions (CSS) is a policy sponsored by the Federal Highway Administration (FHWA) which defines a collaborative, interdisciplinary approach in which citizens and other stakeholders are part the design team and involved in all phases of any contemplated road project from conception through completion. Context sensitive solutions and design principles asks questions first about the real need and purpose of the transportation project and then equally addresses safety, mobility, and the preservation of scenic, aesthetic, historic, environmental and other community values. CSS encourages flexibility in design standards in order to address areas of a project that would be adversely affected by applying the usual design standards.

- New traffic patterns, stoplights, and improved roads to manage increased traffic; and,
- Renovation or replacement of the county office building to accommodate new technologies, provide citizens with better meeting facilities that incorporate these technologies (i.e. audio/visual technology and computers), and public art.

### **1.5.9 Social Services**

Pressures to address the needs of the county’s youth and its increasingly large retirement-aged population by:

- Providing evening and weekend activities for the sixteen to twenty age group and developing comprehensive Parks and Recreation programs;
- Providing appropriate senior services; and,
- Supporting new programs and facilities such as a performing arts theater, art galleries, Luray train depot, Steven’s cottage, etc.

### **1.5.10 Economy**

The continuing need for residents to commute out of the county for employment compelling the county to attract new industries and businesses while encouraging aesthetic integration of the new businesses with the natural environment.

### **1.5.11 Governance**

County officials must find ways to meet the county’s financial obligations without overburdening citizens with tax increases and assure fair voter representation. To this end the county should:

- Seek both State and Federal matches to local dollars;
- Redistrict as needed based on census data; and,
- Work with state legislators to increase funding for local programs, state and federal mandates.

## **1.6 Local Policies, Values and Actions Affecting Future Development**

Budgeting for projects proposed in the plan is the first and most important step in carrying out plan objectives because no plan can be implemented without allocation of funds for its

accomplishment. A number of projects (new schools) will require large amounts of funding. While alternatives to public funding are available for a number of needs, others will depend on county or other governmental sources. A number of grant assistance programs for specified types of projects are available. These funding sources should be actively pursued. If obtained, these grants could speed up implementation substantially.

In addition, citizen participation in county planning and decision-making activities will be essential to carrying out plan objectives.

### **1.7 Regional Issues; Regional Goals**

The prominence of regional planning and inter-jurisdictional cooperation in the Northern Shenandoah Valley will be a significant feature affecting county land use in the 21st Century. There is a growing understanding that to thrive in the future, the world outside the county must be considered. The Northern Shenandoah Valley Regional Partnership Strategic Plan 1997-2002 addresses these.

### **1.8 Regional and Local Growth Forecast**

The aforementioned Northern Shenandoah Valley Regional Partnership Strategic Plan 1997-2002 addresses this.

## Chapter 2: Regional Setting and History

### 2.1 Regional Setting

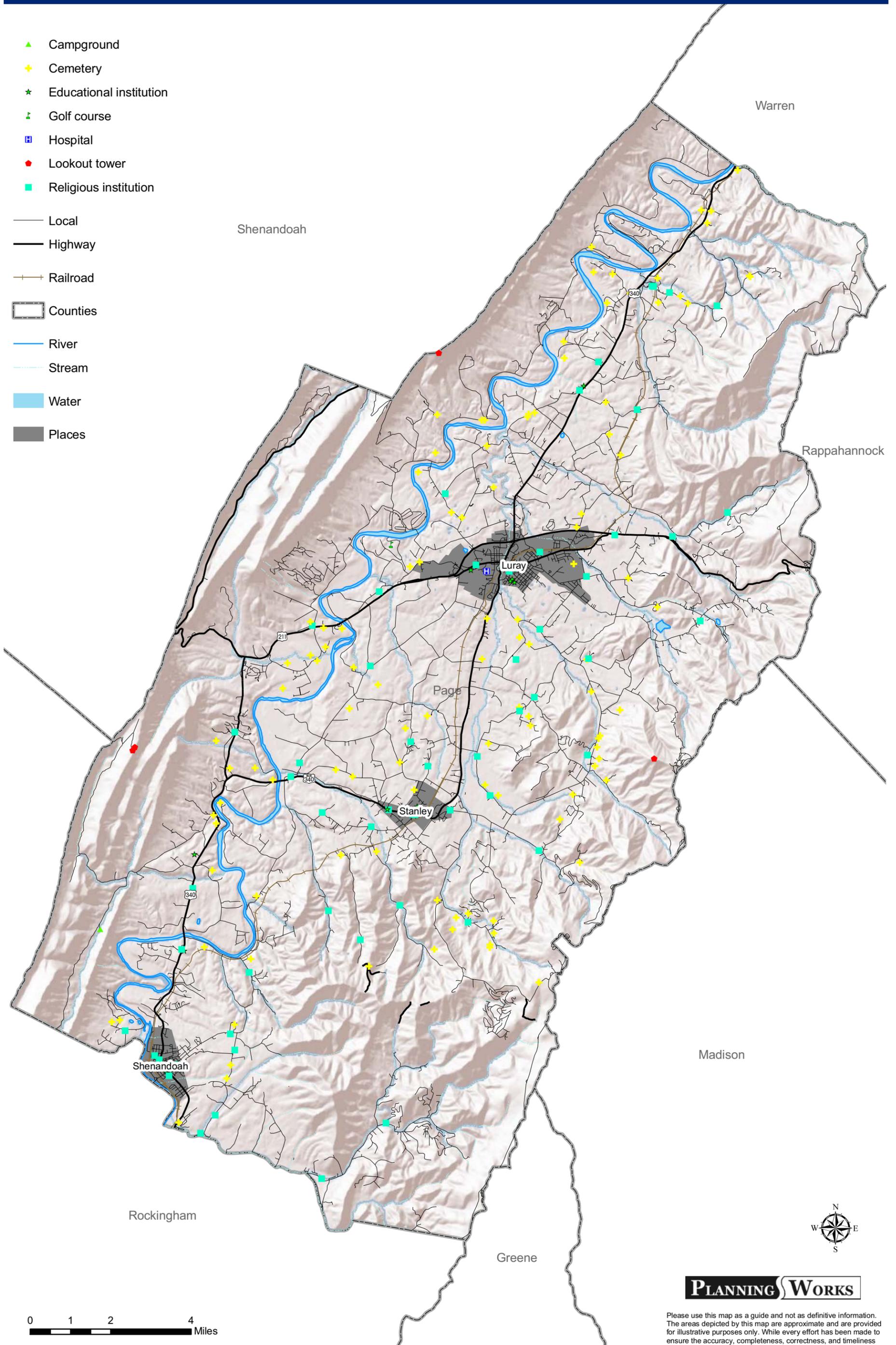
Page County contains 316 square miles of land and comprises a distinct area between the Blue Ridge Mountains on the east and the Massanutten Mountains on the west. The South Fork of the Shenandoah River flows north through the length of the county and has historically served as its main focus and avenue of commerce. Page County is bordered on the north by Warren County, on the west by Shenandoah and Rockingham counties, on the south by Rockingham County, and on the east by Rappahannock, Madison, and Greene counties.

Although high mountains flank Page County, it has always been tied to the larger region of which it is a part. Mobility has increased as transportation improvements have been made over the last few decades.

The proximity of Page County to major metropolitan areas such as Washington, D.C., Northern Virginia, Richmond, Virginia, and Baltimore, Maryland has had a major influence in terms of tourism and second homes, as well as providing an incentive for many residents to commute to jobs. The county's available labor supply, relatively low land costs and low taxes, as well as its nationally known attractions, all serve as incentives for continued tourism, business and industrial development.

The above factors present many challenges and opportunities for the county to accommodate appropriate growth and maintain a balanced and diversified economy without spoiling the natural beauty and rural atmosphere.

# Exhibit 1: Base Map



## **2.2 History**

### **2.2.1 Indian Origins**

The earliest inhabitants of that part of the Shenandoah Valley region known as Page County were Native Americans or Indians. Many Indian peoples favored the valley between the Massanutten Range and the Blue Ridge Mountains for several thousand years. There was abundant wildlife, berries, nuts, and roots throughout the valley and abundant food in the Shenandoah River. In the seventeenth and eighteenth centuries such tribes as the Senedos, Tuscarawas and, in greater numbers, the Shawnees migrated in and out of this area. Some used the land for temporary hunting and gathering while others created more permanent villages. More than a dozen Indian grave mounds have been discovered in Page County - three times the number in surrounding counties. On many local farms arrowheads, burned stones, and other indications of former village sites have been found. From such villages the valley's first inhabitants used the lands for hunting, some subsistence farming and as a path for trade, migration and war.

### **2.2.2 The Colonial Era**

By the second half of the seventeenth century white explorers and trappers breached the "gaps" of the Blue Ridge Mountain barrier. Native Americans in the Shenandoah Valley Region west of the Blue Ridge Mountains found themselves on the fringes of an expanding British Empire. John Lederer's three expeditions through Virginia and Carolina in 1669 and 1670 furnished the first maps and writings about the valley. In 1716, Britain's Royal Governor of Virginia, Sir Alexander Spotswood, pushed over the Blue Ridge at Swift Run Gap. This famous expedition, or reconnaissance mission, went as far as the South Fork of the Shenandoah in the vicinity of Elkton. Spotswood's much-publicized journey strengthened Britain's claim to lands west of the Appalachians and opened the door to white settlement.

The first European settlers migrated south into the valley from Pennsylvania in the 1720s and 1730s. Most were of German and Swiss descent. Seeking freedom from religious persecution, Mennonites and Lutherans first settled Page County. Later settlers were drawn primarily by the county's rich farmland. Very few tenant farms or plantations were established as most of the settlers raised a variety of crops on small and middle-sized independent holdings. These pioneers were proficient in the mechanical arts as well. Waterpower was harnessed to run sawmills, flourmills, tanneries, forges and foundries.

By 1732, the first settlement in the Shenandoah Valley was established in Page County at "Massanutten Old Fields". A 5000-acre patent was granted to Jacob Stover who shortly thereafter divided it among a dozen settlers. Adam Miller [Muller], the first settler, took occupation of his tract of land near Elkton as early as 1722. By the 1750s, he and his counterparts took over abandoned Indian fields and carved out productive farms in the rich bottomlands along the Shenandoah River and in the Hawksbill flood plain.

### **2.2.3 *The French and Indian War 1755-1763***

Until 1754 whites and Indians lived peaceably together. Such amiable relations resulted from the fairness of the Quakers to the Shawnees. The Shawnees were one of the contracting parties at William Penn's peace treaty, which applied to the Pennsylvanian settlers in the valley as well. In 1755 the outbreak of the Great War of Empire between Britain and France, or the French and Indian War as it was known in the American colonies, caused the French to incite Shawnees and other western tribes to attack encroaching settlers. The French armed their Indian allies with firearms in a bloody effort to forcibly push white settlers from the British colonies back across the Appalachians. Throughout eight long years of war sporadic massacres of families in Page Valley caused many settlers to temporarily abandon their homesteads and endure much hardship. Often the Indian raids were retaliation for massacres against their own people.

After Britain's victory over France and her Indian allies in 1763, Indian influence in the area diminished rapidly. Much is owed to these early Indian inhabitants as their trails, clearings, and intimate knowledge of the ecology and natural environment contributed to the survival of the early white settlers.

### **2.2.4 *The Revolutionary War***

During the Revolutionary War, the settlers of that section of Shenandoah County that now comprises Page County favored independence from Britain. Many settlers left the valley to fight throughout the colonies. During this time, the Reverend Peter Muhlenberg organized the Eighth Virginia Regiment; also know as the "German" Regiment. He was later made commander of all Virginia troops. These troops were judged by one of General Washington's chief aides "to be the best armed, best clothed, best equipped of all the Virginia regiments." They were thought to be "alert, zealous and spirited." Page

Valley farmers contributed considerable quantities of wheat and livestock to the war effort.

### **2.2.5 The Antebellum Period**

After Independence, settlers continued to pour into the area, and, by 1790, approximately 10,000 persons had settled on the land that presently comprises Shenandoah and Page Counties. Because of the difficulty of traveling 40 miles over mountains to the Shenandoah County seat at Woodstock, the people of the Massanutten Valley established the Town of Luray in 1812.

Isaac Ruffner, his brother, Jonas, and his brother-in-law, William Marye, founded the town on the lands of Isaac Ruffner. The town was named after Luray in France. The surveyor, James Modisett, platted an east-west street (now Main Street), and three blocks of three lots each on either side of the street. Each of these lots measured one-half acre.

Even before the Town of Luray was surveyed, a settlement known as Mundellsville had emerged about a mile south of Luray by the 1790s. Mundellsville boasted a mill, tannery, distillery, blacksmith shop, carding mill, and a sawmill.

As early as 1752, citizens petitioned the Virginia colonial legislature for a new county to extend from the top of the Alleghenies to the top of the Blue Ridge. Establishment of the Town of Luray added focus to this desire. By 1860, Luray had about 600 inhabitants.

John Overall settled at Milford in the 1780s. In the early 1800s, his son, Isaac, owned over 40,000 acres. His holdings stretched from Stanley to Sperryville to Bentonville.

In the decades preceding the Civil War, Page County made notable strides in both agricultural and industrial development. In spite of the fact that a good portion of its land was mountainous and could not be farmed, Page County achieved the second greatest crop production for a county of its size in the entire state.

This achievement was complemented by the development of an iron industry made possible by an abundance of high-grade ore, waterpower, timber for making charcoal, and limestone for flux. The first iron maker to exploit these resources was Nicholas

Yager who built the Isabella cold-blast furnace in 1760 on Hawksbill Creek one mile north of present day Luray. Yager's furnace was one of the first iron works established in the central Shenandoah Valley. In 1781, Dyrek Pannebecker succeeded Yager in the enterprise and built a new furnace christened "Redwell". Pannebecker operated a foundry and forge "fashioning ... stoves, kettles and all kinds of iron utensils." The partnership of Blackford and Arthur succeeded the Pannebecker family and built the Speedwell chafery that turned out ironware for several decades. Speedwell Forge Number One was abandoned in 1841.

Pennsylvania iron master Samuel Forrer, Sr., who had settled at Mundellsville in the early 1800, located another prime location for iron making in southern Page County. His sons, Daniel and Henry, pursued this opportunity by going into partnership with Samuel Gibbons, the owner of the bulk of these desirable lands. The Shenandoah Iron Works (SIW) was founded on February 13, 1836 under the business name-and-style of Forrer, Gibbons and Forrer. In November 1837, Gibbons sold his interests in the iron works to the Forrers for the then sizable sum of \$25,000 payable over an eight-year period.

Forrer Capital and Enterprise established an iron plantation and, in the process, created the nucleus of the town of Shenandoah. The Forrers were largely responsible for a gradual shift of economic gravity from the northern to the southern end of Page County. The SIW attracted scores of permanent and transient, black and white, slave and free, skilled and unskilled workers to labor at the mines, at the furnaces and in the fields and woodlands.

The distinctive geographical features of Page County presented both obstacles and opportunities for Page County's ante-bellum economy. The Blue Ridge and Massanutten Mountain ranges to the east and west respectively and the generally poor state of roads throughout the Shenandoah Valley made the South Fork of the Shenandoah River the transportation lifeblood for Page County's iron makers, lumbermen and farmers. Transporting heavy, bulky commodities, such as pig iron, lumber and grain by wagon, was not economically feasible. The South Fork of the Shenandoah became a transportation gateway to the markets in the lower Shenandoah and Potomac River Valleys throughout most of the nineteenth century. Also, The South Fork was used to send pig iron and flour down-river to White Post, Harper's Ferry and Alexandria from the 1830s until around 1880. These products were carried on long, relatively narrow boats of shallow draft dubbed "gondolas".

By mid-century the poor state of roads leading in and out of Page County prompted the building of several significant toll roads. Between 1848 and 1850 the New Market and Sperryville Turnpike Company constructed a sturdy wagon road over the Massanutten and Blue Ridge Ranges and linked Page County with these two towns. In 1848 the Blue Ridge Turnpike section of the New Market – Gordonsville Turnpike became a major route for wagons and stagecoaches traversing the Blue Ridge Mountains at Fisher's and Milam's Gaps. By 1860 the thriving village of Marksville had been founded on the Blue Ridge Turnpike, laying the foundation for the later development of the Town of Stanley.

### **2.2.6 The Civil War in Page County**

The outbreak of the Civil War saw the vast majority of Page County's seven thousand or so white residents professing their loyalty to the Confederacy. Although most county residents did not possess slaves, some of Page County's wealthiest and most prominent community leaders were slaveholders. In 1850 there were 957 slaves and 229 owners, or an average of four slaves for each owner. Slaves comprised fifteen percent of the county's population. The Shenandoah Iron Works was largely dependent on the labor of nearly eighty slaves. Some mill operators and large grain farmers also needed slave labor. Page County's slaveholders were in the forefront of driving public opinion toward the Confederate cause. Thus, while slavery was not considered a paramount issue in Page County, the "peculiar institution" did contribute to Anti-Union sentiment and on May 27, 1861, a committee of wealthy and politically powerful secessionists, all of whom were slave holders, issued an order – "\$ 600 appropriated for the uniforms and equipping any volunteer companies which may be hereafter formed in Page County."

The one thousand or so Page County men who served in the gray ranks were an indication of widespread support for the Confederates. Most of the officers for Page County's four volunteer companies were from slaveholding families. Page County's Shenandoah Iron Works made another important contribution to the Confederacy by supplying all-crucial iron to the South's armaments makers. Yet, most citizens who served and supported the Confederate cause were motivated by their loyalty to Virginia and the physical threat of a Federal invasion that would bring a harsh military occupation of home and hearth.

During the course of the war (1861-1865) no major battles were fought on Page County soil. In September and October of 1864, the most significant engagements fought in Page County were at Milford, now Overall, on the Page-Warren County boundary. The most

important battle was a cavalry skirmish in September involving approximately 5500 to 6000 men. General Early sent a force under General Wickham to block a Union attack on Early's advancing army. The Federals were repulsed.

Page County, however, did not escape unscathed. General Stonewall Jackson's triumphant Valley Campaign of 1862 was achieved using Page County's strategic geographical features and position to out-maneuver larger Federal forces. In November 1862, Jackson marched 25,000 troops along the Blue Ridge Turnpike and over the Blue Ridge Mountains at Fisher's Gap. His final exit from the Shenandoah Valley to his final destiny at Chancellorsville led through Page County.

In addition, the county's agricultural productivity made it one of General Sheridan's primary targets in his campaign to cut off supplies to confederate armies. The damages that Page County suffered were among the worst in the valley. Three hundred barns were burned and over \$1,000,000 in property was destroyed. The October 1864 "Burning" of Page Valley was the most traumatic calamity endured by its inhabitants during the entire war.

### ***2.2.7 Reconstruction and Recovery***

In spite of much destruction, the county's lesser dependence on slaves made reconstruction easier than in most of the South. Barns and mills were rebuilt. By 1870, when Virginia was re-admitted into the Union, much of the former prosperity had returned, despite the great flood of that same year. This rapid reconstruction encouraged the building of the Shenandoah Valley Railroad from Hagerstown, Maryland to Roanoke, Virginia. The Norfolk and Western later absorbed this railroad. The Shenandoah line was completed near Luray in April 1881. Economically, this was one of the most significant events in the county's history. Mineral tonnage over the new Shenandoah Valley Railroad jumped from 46,328 in 1882 to 231,537 in 1883 and furthered expansion because coke could be brought faster and cheaper from the North. The initial effect of the railroad on the county's iron industry was positive. The optimism of the Eighties was so great that many housing lots were laid out east of Luray on land that is presently being used for farms. This area is still referred to as the "Boomfields."

### **2.2.8 Shenandoah Founded**

The former Shenandoah Iron Works was incorporated as a town on February 12, 1884. It was named Milnes for William Milnes, Jr., President of the Shenandoah Valley Railroad and owner of the Iron Works. The town was renamed Shenandoah in 1890.

The railroad, and the expansion in the iron industry it encouraged, gave the town its main impetus for growth. In 1882, Big Gem Furnace was built near Shenandoah. It had a daily capacity of 75 tons of pig iron and employed 400 men. Around 1900, when production was at its peak, this furnace produced 135 tons per day. Even by Pittsburgh standards, it was a modern furnace for its time. The ore of the area was of such high quality that it remained profitable a decade after other furnaces declined. This demise was caused by the same railroad that fueled the earlier boom. It became cheaper to ship finished steel from Pittsburgh, rather than to forge the pig iron in Page County and send it North.

Although the “boom” ended when the furnace closed down, Shenandoah continued to be the largest town in the county. The railroad shops and other industries that sprang up employed many workers. As in Luray though, there were sections where lots were sold and never developed. After 1892, a general depression settled over the county. Farm prices fell and the Luray Inn, the most elegant hotel in the county, was destroyed by fire on November 5, 1891.

### **2.2.9 Stanley Founded**

The coming of the Shenandoah Valley Railroad to Marksville triggered vigorous business expansion on its western edge. Eventually Marksville became a suburb of Page County’s youngest municipality. The Town of Stanley was incorporated on February 14, 1900. It was named for Stanley McNider, whose father, James, was President of the Stanley Furnace and Land Improvement Company. The settlement was known also as Sands. In 1885, the Oxford Ochre Company situated an ochre bank and a mill about a mile southwest of Stanley, at the junction of Stony Run and the Norfolk and Western Railroad. Ochre is a type of impure iron ore used as a pigment. The Town was platted in two sections, one on each side of the railroad.

### **2.2.10 Shenandoah National Park**

Along with the growth and diversification of manufacturing, another major impact on Page County has been the growth of tourism. Since the last century, the area's mountain beauty and rich valley scenery have attracted visitors.

Before 1920, a general movement was underway to establish a national park in the southern Appalachians. In 1924, a committee was formed to find a site for such a park. After much study and local "politicking", the site for Shenandoah National Park was selected. In 1926, the U.S. Congress authorized Shenandoah National Park to be acquired by donation, without the expenditure of any federal funds. Over the next 10 years, a campaign to raise donations to buy the land for Shenandoah National Park was waged. Largely because of an appropriation by the Commonwealth of Virginia, the needed acreage was acquired.

George Freeman Pollock, who owned and operated Skyland Resort, and L. Ferdinand Zerkel of Luray provided active local support for the Park in the face of widespread local opposition to the proposed land acquisition program. On September 23, 1930, 37,445 acres in Page County were condemned by the Commonwealth of Virginia for its later donation to the Federal Government to establish Shenandoah National Park. Scores of Blue Ridge Mountain inhabitants were compelled to leave their homes. A few resisted and were forcibly removed. The Commonwealth paid out the landowners, and some were resettled on homesteads offered by the Federal Government in the Ida section of the county. Land titles were given to the Federal Government.

Shenandoah National Park was officially established on December 26, 1935. In a ceremony at Big Meadows on July 3, 1936, President Franklin D. Roosevelt dedicated Shenandoah National Park "... to this and to succeeding generations of Americans for ... recreation, and ... re-creation ...". The entire Park comprises 193,000 acres of mountain land and extends from Front Royal southwestward to Waynesboro along the Blue Ridge Mountains. Thirty-eight thousand, six hundred and fourteen (38,614) acres, approximately one-fifth of the park, are in Page County.

The park contains the 105-mile long Skyline Drive located along the ridge top. Approximately one-third of the Skyline Drive is located within Page County or near the county's border. The Page County section of Skyline Drive was completed during the summer of 1934, and opened to a long line of eager visitors on September 15, 1934. This

drive is Page County's most famous mountain road. The Skyline Drive Historic District, including the portion in Page County, was placed on the Virginia Historic Landmarks Register in December of 1996 and on the National Register of Historic Places in April of 1997 and has been designated a "Scenic By-Way".

Shenandoah National Park has a substantial economic impact on the eight surrounding counties (Page, Albemarle and Rockingham, Green, Augusta, Rappahannock, Warren and Madison). According to the 2005 National Park Service Money Generation Model, the park received 1,141,102 recreation visits in 2005. Two factors contribute to spending in the surrounding area; employee salaries and benefits and visitor spending outside the park on lodging, food, transportation, souvenirs, etc. In 2005 this spending amounted to approximately \$52,643,000. The Money Generation Model indicates that the park supports 1309 jobs in the surrounding counties.

### **2.2.11 Luray Caverns**

At the time of the first settlement in Page County, Indians and settlers alike knew about a cave near the present Luray Caverns. Yet, Luray Caverns was not discovered until August 13, 1878. These caverns, with over forty rooms, are the largest on the east coast, fourth largest in the nation, and seventh largest in the world. Presently, over one-half million tourists visit the Caverns each year.

In 1937, the Belle Brown Northcott Memorial was dedicated on a site near the caverns. The Memorial contains a carillon of 47 bells, and is played without pneumatic or electric assistance from a clavier of oak levers and pedals.

## **2.3 Historic Landmarks**

The rich heritage of Page County has left a legacy of many structures and sites of historical and architectural significance. Sixteen structures located in Page County are listed on the Virginia Landmarks Register. Fifteen structures and places are on the National Register of Historic Places. The county should identify and preserve for future generations those structures and sites that reflect its history of settlement and development.

The Virginia Department of Historic Resources (VDHR) completed an architectural and historic resources survey in 1998 and documented a total of 266 significant sites. The 1998 survey also resulted in the location and mapping of all accessible rural and urban properties that appeared to

be over fifty years in age. The Virginia Historical Landmarks Commission had previously surveyed some of these properties in 1972 and identified 242 structures throughout the county. The relatively poor quality of information included in the earlier survey led the VDHR staff to request the re-survey of many of the items as a component of the 1998 project.

In November 1998, as a follow up to the survey effort, the VDHR Evaluation Team considered the eligibility of 57 individual properties for recognition as Virginia Landmarks and listing on the National Register of Historic Places. In addition to these individual properties, the VDHR Evaluation Team considered 2 districts, the communities of Hamburg (Hamburg Quadrangle) and Mundellsville (Luray Quadrangle), and found them to have potential as National Register Historic Districts. Although The Evaluation Team also considered the Isabella furnace area, the historic complex at Luray Caverns and the Inn Lawn neighborhood in Luray, it did not officially review these sites.

Many structures stand in potential historic districts. Although its boundaries have not been defined, in 1998 the VDHR Staff proposed a “Luray Historic District” encompassing properties on Water Lane and North Broad Street. In Stanley the East Main Street residential neighborhood may also qualify. Likewise, certain collections of properties in villages and rural areas may comprise historic districts. Survey work in the communities of Ida, Leaksville, Marksville, Newport and Rileyville suggested the possibility of historic districts in those communities. A relatively large area between Luray and Stanley, roughly bounded by the Norfolk Southern Line and the Blue Ridge, may qualify as a rural historic district for the building diversity, architectural character, and high degree of historic integrity of its farms and a corresponding lack of modern development. Similarly rich, but smaller, areas exist along Mill Creek south of Hamburg and in the heart of the Massanutten settlement along the Shenandoah River. Most of the county’s listed Germanic houses are located in these areas. Pending further investigation, these areas may be eligible for listing as rural historic districts.

The fifteen structures and districts listed on the National Register of Historic Places are described below.

- **Aventine Hall (1852).** This house is one of the purest architectural examples of Greek revival in Virginia as well as on the eastern seaboard. Peter Beck Borst, Commonwealth’s Attorney and one of the organizers of the Shenandoah Valley Railroad, built it. The house was moved to its present site on South Court Street in Luray from its original location on the grounds of the Mimslyn in West Luray.

- **Catherine Furnace (1836).** This is an excellent example of industrial architecture in Virginia. The furnace is pyramidal in shape, constructed on hand laid stone without the use of mortar. It was designed to be loaded from the top with iron ore, limestone and charcoal. It is located in the George Washington National Forest, about five miles north of the Town of Shenandoah. The Furnace’s peak production was achieved in 1856 when between 40 and 50 men were employed extracting 526 tons of iron during a 22-week period. It continued production until 1888.
  
- **Fort Egypt (1755).** Constructed by Jacob Strickler, this imposing fortified house is located west of Luray near the west bank of the South Fork of the Shenandoah River. The framed loopholes, wattle and daub chinking, immense chimney and original hardware all contribute to make Fort Egypt an important local landmark.
  
- **Fort Phillip Long (1750).** The Fort represents a significant group of structures originally developed to repulse Indian attacks, which seriously threatened continued settlement in the area. It subsequently developed into a plantation during the nineteenth century. It is located near Alma.
  
- **Fort Stover (Circa 1760).** Although not on the original Massanutten patent, this Fort is nonetheless historically and architecturally tied to the other fortified farmhouses of the patent. Located northwest of Springfield near the east bank of the South Fork of the Shenandoah River, it is of limestone construction.
  
- **Heiston-Strickler House (late 18<sup>th</sup> century).** This historic building is located approximately two miles northwest of Luray overlooking the Shenandoah River bottomlands. It is a fine example of a handsome and well-preserved Germanic house.
  
- **The Isaac Spitler Home Place (1826).** This historic farmstead located on Mill Creek near Leakesville. Isaac Spitler, grandson of the original settlers John and Elizabeth Spitler, German immigrants who came from Pennsylvania in 1738 or 1739, constructed this house. The architecture, association and feeling of the surviving cluster of buildings reflect the eighteenth century settlement and early nineteenth century development of the self-sustaining German immigrant farms of the lower Shenandoah Valley. The dominant feature of the four-acre remnant of the original homestead is a simple Federal style red brick farmhouse, which was expanded in 1857.

- **John Beaver House.** This historic home is located in the western portion of Page County. This house typifies many standard features of the early nineteenth century architecture in Western Virginia. John Beaver was a prominent original settler of the valley.
- **Kanawha (early 1920s).** This historic home, also known as Tuckahoe, is a two-and-one half story classical revival residence located on Jamison Road in Luray. The house and its spacious grounds occupy an elevated terrace overlooking Hawksbill Creek. The home was a creation of Luray businessman and mayor, Vernon H. Ford. Mr. Ford was a prominent community leader and president of the land company that developed Luray’s Inn Lawn subdivision. The property is significant as an architectural statement commensurate with Mr. Ford’s standing in the community and as a promotional feature of his Inn Lawn venture.
- **Massanutten Heights.** This site represents an essentially undisturbed example of a prosperous early nineteenth century Shenandoah Valley farmstead. The house, which overlooks Massanutten Old Fields, is noted for its painted wall decorations and provincial woodwork. It provides a vivid picture of the material culture of the early German-American settlers in Page County.
- **Page County Court House (1833).** This arcade type structure traces its origins back to the English Renaissance town hall concept. It has been expanded with three additions that architecturally conform to the original structure.
- **Stevens Cottage (1890).** This historic building is located in the Town of Shenandoah on Maryland Avenue. It was built by the Shenandoah Land and Improvement Company for \$2,800 and was used as its initial office. Later Misses Edna and Mary “Mamie” Stevens occupied it as a residence. In 1974, the Shenandoah Heritage Center, Inc. made arrangements to purchase the cottage from the owner Mr. Charles Stevens, brother of the above-mentioned sisters. The Shenandoah Heritage Center sponsors many community activities and holds its meetings at the cottage. A restored 1917 Norfolk and Western railroad caboose is located on the cottage property.
- **The White House (second half of the 18<sup>th</sup> century).** This structure is one of an important group of Rhenish log and stone houses situated in Page Valley in the shadow

of the Massanutten Mountains. The house possesses many Germanic features including a two-room, central chimney plan, over a vaulted cooling cellar, and a large storage loft. It was remodeled in the early nineteenth century and from that alteration retains very fine Federal woodwork with its original paint. The structure is located approximately two miles southwest of Hamburg just north of Highway 211 where it crosses the South Fork of the Shenandoah. The White House has been registered as a Virginia Historic Landmark and is pending listing on the National Register of Historic Places.

- **The Welfley-Shuler House (1875).** This historic building is located in Shenandoah at 449 Shipwreck Road, off of Route 601. Thirty-two year old John Welfley founded a gun powder operation at this site as early as 1857. During the war seven local men were detailed from the Confederate army to assist with the operation. In addition to the gunpowder operation, Welfley may have operated a limekiln operation, a distillery, a gristmill and a water-powered sawmill. Welfley ran into money troubles and lost his house in 1878. The house has been restored and currently is privately owned.
- **The Milford Civil War Battlefield.** This site is located off of Route 340 in Overall near the Page County-Warren County Line. Two Civil War Battles were fought there in 1864.

Three districts are currently eligible for listing as historic districts.

- Page Valley Rural Historic District extending from the Shenandoah National Park to the Shenandoah River from Route 211 north of Luray into Warren County.
- Rileyville Historic District
- Compton Historic District

## Chapter 3: Natural Resources

The natural features and resources of Page County have determined past settlements and will continue to influence future development throughout the county—Topography, soils, water, air, and vegetation cover must be considered when planning future land uses. General land use suitability and potential development problems related to the existing physical environment must be identified to assure harmony between the county’s future development and the capabilities of the land.

This section of the plan deals with the major land, air and water resources of the county. The natural features examined include:

- Geography
- Geology
- Soils
- Woodland Resources
- Water Resources
- Air Quality
- Climate
- Critical Environmental Areas

The natural features examined on the following pages are outlined, discussed, and mapped as general background for land use planning. This material is not specific enough for local site planning.

### 3.1 Geography

Page County is part of two geographic regions, the Blue Ridge Province and the Ridge and Valley Province. Locally, the Blue Ridge Province is a long, narrow spine of mountains extending along the eastern border of the county. The Blue Ridge reaches its highest elevation on Hawksbill Mountain at 4,055 feet. Several other peaks rise a little over 4,000 feet, notably Stony Man at 4010 feet. The Blue Ridge Mountains extend six to eight miles westward from the Page-Greene-Madison boundary almost to the South Fork of the Shenandoah River at Ingham.

The Ridge and Valley geographic province extends along the central and western sections of the county. This province is divided into two distinct areas; the central section, or lowland, is known

as the Shenandoah Valley, and the western section characterized by high ridges and intervening valleys, known as the Appalachian Mountains. The easternmost extension of the Ridge and Valley province, the Massanutten Mountains, splits the Shenandoah Valley and forms the western border of Page County. The Massanutten Mountains are particularly prominent and occupy a width of slightly over two miles along the county's western boundary. The Shenandoah Valley is a part of a larger valley known as the "Great Valley" running from New England southward.

The central part of the county is a valley floor drained by the South Fork of the Shenandoah River. The valley widens to seven miles just north of Stanley and narrows to one mile near Overall. The valley floor, generally 100 to 125 feet above the river elevation, is primarily covered with a gravel veneer.

Topographic features of any area ultimately affect the cost and type of development, soil erosion, direction and rate of storm water runoff, landscape variety and visual quality, climate, and the types of vegetation and wildlife. Steep-walled valleys and heavily wooded slopes characterize the topography of the extreme eastern and western parts of the county.

### **3.1.1 *Limiting Effects of Slope on Development***

The amount of slope associated with the mountains that surround Page County has direct ramifications on land use planning. The spectacular scenery of the steep mountainous terrain, with mixed hardwood and pine forests, encourages the development of cottages and second home subdivisions. However, the same areas that provide desirable second home development are vulnerable to erosion, difficult to access by road and are unsuitable for septic tank installation.

Based on slope only, approximately 45 percent of the county has severe limitations for general residential, industrial, and commercial development. Agricultural uses in much of this land are also restricted. These areas include the Blue Ridge and Massanutten Mountains and immediately adjacent lands.

Only 32 percent of the total county land area is well suited (slight limitations) for non-farm uses, and 34 percent is well suited for farm use. These areas of undulating land (2 to 7 percent slope) are found in the county's central valley area.

Most of the moderately sloping land is found in belts along the eastern and western portions of the county. The upper ranges of this category approach the maximum slope for normal wheeled traffic. A smaller amount is level (less than 2 percent slope) and is located along the South Fork of the Shenandoah River in northern Page County.

The following list defines four slope categories and characterizes the development potential of each:

- **Flat Terrain:** Land with no slope or minimal slope (0- 3%). Development in these areas should be prohibited in most cases because of drainage problems and vulnerability to flooding.
- **Gentle Slopes:** Land with slopes ranging from three to eight percent (3-8%). Such land is suited for all forms of development. The gentle slopes provide good drainage without posing construction problems. This slope predominates in the central, most developed, part of the county. Most of the land within this slope range is limited to areas east of the Shenandoah River and west of the Blue Ridge.
- **Moderate Slopes:** Land with slopes ranging from eight to sixteen percent (8-16%). These areas are ideally suited for single-family, detached residential development. However, in areas with steeper slopes (especially over 12 percent), greater problems will be encountered during construction and site development. The amount of land in the county within this slope range is limited mostly to areas west of the Shenandoah River and east of the Massanutten Mountains.
- **Steep and Excessive Slopes:** Land with slopes greater than sixteen percent (16%). This category comprises a large portion of the county's land where plats for summer homes and vacation home subdivisions have been approved. Provision of public services such as roads, water and sewer is prohibitively expensive in these areas. These lands should be developed only at very low density under strict regulations that include erosion control, ground water protection, minimal lot size and a complete site plan. On-site sewer systems must be strictly regulated regarding slope, soil percolation rate, and the shallow depth to bedrock. Intensive residential development in these areas must be discouraged in order to better protect precious water resources from further deterioration. No

residential structures should be built on slopes greater than 25% without meeting special standards and fully considering environmental problems that may arise.

Much as the county's hillsides may be admired, they are becoming progressively more threatened. Construction in areas with lesser slope is easier, less expensive and more secure from the threat of landslides and severe drainage and erosion problems. However, as valley and upland sites available for development become scarcer and more people are able to afford "view" properties, pressure will increase to allow development on the steeper slopes and hillcrests. The county needs to develop measures to avoid the environmental problems and the degradation of the dramatic visual character of the wooded hillsides that such development will cause.

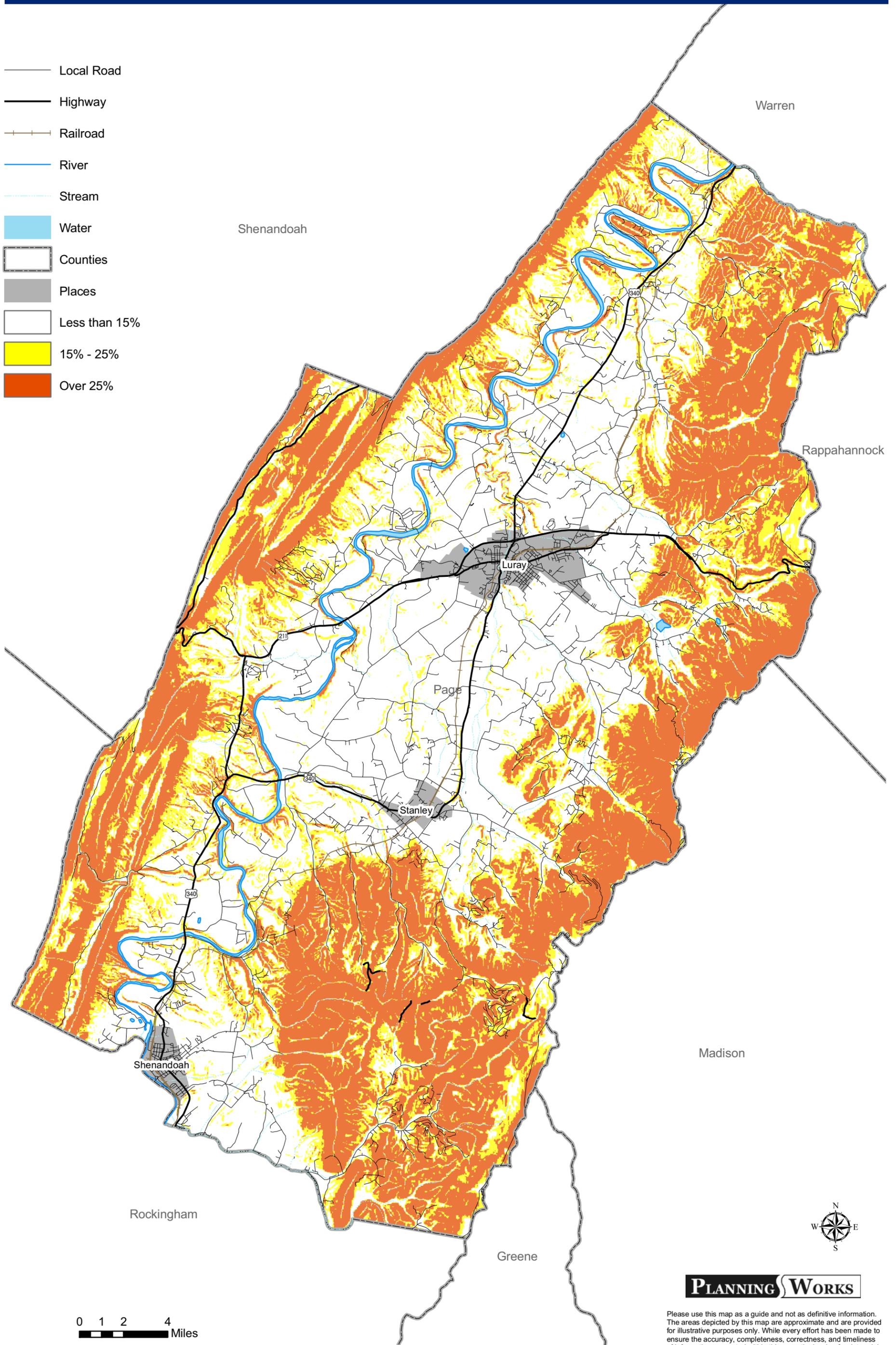
### 3.2 Geology

Page County is divided into four belts of similar geology underlain with bedrock. The bedrock generally becomes younger going from east to west across the county. The oldest rocks, dating from about 1,150 million years ago, occur in a 30-mile area in the southeastern part of the county. Page County contains eight primary rock types that make up its four geologic belts. These belts are known as follows:

- **The Appalachian Sandstone/Shale Belt:** This belt is located in two general areas in the western side of the county and makes up the Massanutten Mountains. Sandstone and shale are the major rock types in the division that is made up of eight separate geologic groups and formations.
- **The Valley Carbonates:** This group is found in the middle of the county. This belt is composed of 11 different rock formations and groups, the most common of which are limestone and dolomite. In areas of carbonate rocks, the construction of buildings requiring high load-bearing bedrock strength is severely limited.
- **Central Valley Shale:** This section is a wide belt running through the center of the county. It is made up of a single rock unit, the Martinsburg Formation. Shale is the major rock type in this belt.
- **The Blue Ridge Complex:** This section extends along the county's eastern boundary. The most common of the many rock types found are granite, gneiss (altered granite), and greenstone (metamorphosed lava).

# Exhibit 2: Topographic & Hillside Considerations

- Local Road
- Highway
- +— Railroad
- River
- Stream
- Water
- Counties
- Places
- Less than 15%
- 15% - 25%
- Over 25%



0 1 2 4 Miles

**PLANNING WORKS**

Please use this map as a guide and not as definitive information. The areas depicted by this map are approximate and are provided for illustrative purposes only. While every effort has been made to ensure the accuracy, completeness, correctness, and timeliness of information presented within this map, the burden for determining appropriateness for use rests solely with the user. This map is provided "as is" with no warranties, express or implied.

### **3.2.1 Commercial Value of Rocks and Minerals**

One effect of the geology on man's use of the land is the presence or possibility of commercially valuable rocks and minerals. Mineral resources consist of a wide variety of materials.

In the past, limestone and dolomite were quarried at varied sites for crushed stone, dimension stone, lime manufacturing, and for flux used in early iron furnaces. Iron and manganese ores were mined at numerous sites. A small quantity of copper also was mined. Today, only deposits of sand, gravel and stone are being quarried at various sites within the county, chiefly for construction and paving.

### **3.2.2 Limiting Effects of Karst Topography on Development**

A key factor of Page County's geology is its Karst topography. Karst is defined as a landscape with sinkholes, springs and streams that sink into subsurface caverns and conduits. The word "Karst" was developed in Europe, where early geologists first studied the nature of groundwater flowing through limestone hills and valleys. In Karst areas, the fractured limestone rock formations have been dissolved by groundwater to form cavities, pipes and conduits that make up the underground drainage systems in Karstlands.

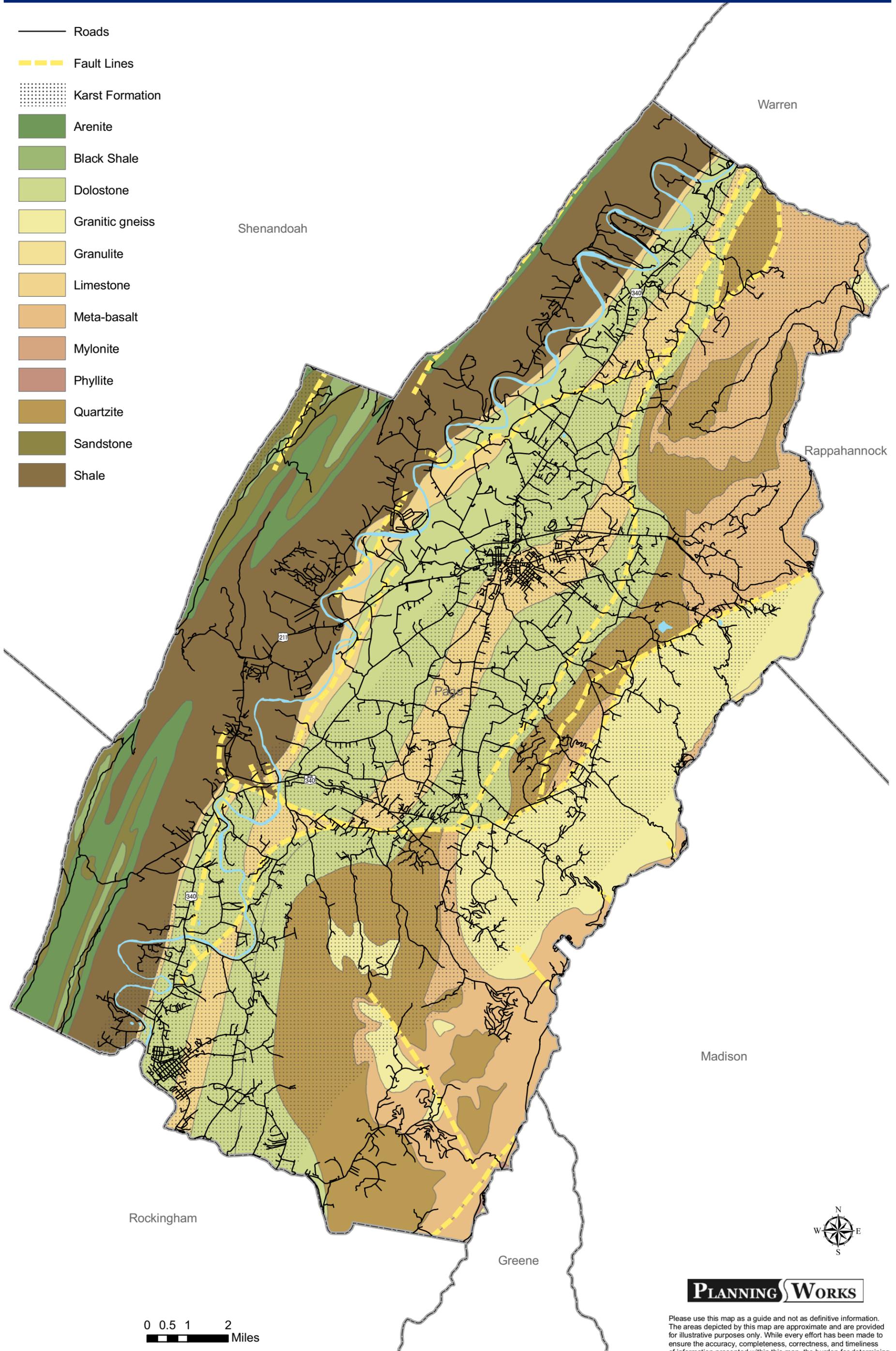
Approximately 10% of the earth's surface and 20% of the United States is composed of Karst. However, approximately 25% of the world's population lives on these areas. As noted above, the center of Page County is made up of carbonate rocks, principally limestone and dolomite, in which Karst topography predominates. The abundance of caverns in the area enclosed by Leaksville, Hamburg, and Luray are characteristic of Karst topography. Large areas of Page County's land surface and a significant portion of the population rests on Karst topography.

Karst topography is inherently unstable and susceptible to settlement and surface collapse. The placement of impervious coverage, grade changes or increased loads from site improvements can lead to the alteration of drainage patterns, which, in turn, can lead to settlement and sinkholes. Fractures, fissures and openings in the bedrock makes water sources in Karst areas especially susceptible to groundwater contamination from solid and liquid wastes, sediment, contaminated surface water, septic tank effluent or other

hazardous substances moving through fractures, fissures and solution openings within the bedrock.

Because the hollow nature of Karst terrain results in a very high pollution potential, watersheds in Karst areas must be protected. Because streams and surface runoff enter sinkholes and caves directly and bypass natural filtration through soil and sediment, the direct connections between the surface and the subsurface must be monitored to avoid threatening the quality of drinking water. Because groundwater can travel quite rapidly through these underground networks transmitting contaminants to wells and springs across large areas, septic tank construction in karst areas should be carefully regulated.

# Exhibit 3 : Geologic Formations Map



**PLANNING WORKS**

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The safest watersheds are those in which all residents understand the Karst landscape and work together to reduce soil erosion, high-density development, agricultural and storm water runoff, improper waste disposal, and other sources of pollution. In order to prevent further exposure of the county's sources of clean water to high risks of pollution, measures should be adopted to stop current trends of building, digging, earth removal and well-drilling in areas of the county where Karst topography is the dominant geological feature.

The effects of Karst topography must be considered in the placement of on-site sewage disposal facilities and in the management of groundwater resources.

### **3.3 Soils**

The General Soil Map (**Exhibit 4**) shows broad areas that have distinctive patterns of soils, relief and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. Each map unit is named for one of the eleven major soils which are described below.

The components of one map unit can occur in another but in different patterns. The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field, for selecting a road-building site, or for building structures. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

### 3.3.1 Major Soil Types

- **LODI-CARBO-OAKLET**

Moderately deep and very deep, gently sloping to steep, well drained soils that have a clayey subsoil.

#### **Setting**

*Topography:* Broad, moderately dissected uplands

*Location:* Limestone valleys

*Vegetation:* Cultivated crops, pasture, and woodland

*Slope range:* 2 to 35 percent

*Elevation:* 800 to 1,000 feet

*Flooding:* None

*Drainage pattern:* Dendritic

#### **Composition**

Percent of survey area: 10

Lodi soils—64 percent

Carbo soils—15 percent

Oaklet soils—12 percent

Minor soils—9 percent

#### **Soil Properties and Qualities**

##### Lodi

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from limestone

*Permeability:* Moderate

*Texture class:* Clayey

##### Carbo

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from limestone

*Permeability:* Slow

*Texture class:* Clayey

#### Oaklet

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from limestone

*Permeability:* Slow

*Texture class:* Clayey

#### Minor soils

Limestone rock outcrops

Well drained Timberville soils

Pits, bedrock

- **DEKALB-MASSANUTTEN-ROCK OUTCROP**

Rock outcrop and moderately deep, strongly sloping to very steep, well drained soils that have a loamy subsoil.

#### **Setting**

*Topography:* Ridge summits and side slopes

*Location:* Massanutten Mountains

*Vegetation:* Mixed hardwoods and pines

*Slope range:* 2 to 70 percent

*Elevation:* 1,400 to 2,500 feet

*Flooding:* None

*Drainage pattern:* Dendritic

#### **Composition**

Percent of the survey area: 8

Dekalb soils—27 percent

Massanutten soils—27 percent

Rock outcrop—17 percent

Minor soils—29 percent

### **Soil Properties and Qualities**

#### **Dekalb**

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from sandstone

*Permeability:* Rapid

*Texture class:* Loamy-skeletal

#### **Massanutten**

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from sandstone

*Permeability:* Rapid

*Texture class:* Sandy-skeletal

#### **Minor soils**

Excessively drained Drall soils

Well drained Jefferson and Zepp soils

- **L Aidig-Weikert-Berks**

Shallow to very deep, gently sloping to very steep, well drained soils that have a loamy subsoil.

#### **Setting**

*Topography:* Side slopes and foot slopes

*Location:* Side slopes and foot slopes of the Massanutten Mountains

*Vegetation:* Mixed hardwoods and pines

*Slope range:* 2 to 55 percent

*Elevation:* 600 to 1,400

*Flooding:* None

*Drainage pattern:* Dendritic

### **Composition**

Percent of survey area: 14

Laidig soils—35 percent

Weikert soils—31 percent

Berks soils—25 percent

Minor soils—9 percent

### **Soil Properties and Qualities**

#### Laidig

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Colluvium derived from shale and sandstone

*Permeability:* Moderate or moderately rapid above the pan; slow or moderately slow in the pan

*Texture class:* Fine-loamy

#### Weikert

*Depth:* Shallow

*Drainage class:* Well drained

*Parent material:* Residuum derived from shale and sandstone

*Permeability:* Moderately rapid

*Texture class:* Loamy-skeletal

#### Berks

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from shale and sandstone

*Permeability:* Moderately rapid

*Texture class:* Loamy-skeletal

#### Minor Soils

Well drained Gilpin, Chilhowie, and Edom soil

- **THURMONT**

Very deep, gently sloping to moderately steep soils that have a loamy subsoil.

#### **Setting**

*Topography:* Alluvial and colluvial fans, benches, and side slopes

*Location:* Terraces and foot slopes of the Blue Ridge Mountains

*Vegetation:* Mixed hardwoods and pines

*Slope range:* 2 to 25 percent

*Elevation:* 900 to 1,200 feet

*Flooding:* None

*Drainage pattern:* Dendritic

#### **Composition**

Percent of survey area: 6

Thurmont soils—100 percent

#### **Soil Properties and Qualities**

##### Thurmont

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite and granite

*Permeability:* Moderate

*Texture class:* Fine-loamy

- **EDGEMONT-DEKALB**

Moderately deep and deep, strongly sloping to very steep, well drained soils that have a loamy subsoil.

**Setting**

*Topography:* Side slopes and foot slopes

*Location:* Quartzite ridges of the Blue Ridge Mountains

*Vegetation:* Mixed hardwoods and pines

*Slope range:* 2 to 55 percent

*Elevation:* 1,400 to 2,600 feet

*Flooding:* None

*Drainage pattern:* Dendritic

**Composition**

Percent of survey area: 7

Edgemont soils—54 percent

Dekalb—42 percent

Minor soils—4 percent

**Soil Properties and Qualities****Edgemont**

*Depth:* Deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from quartzite

*Permeability:* Moderate

*Texture class:* Fine-loamy

**Dekalb**

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from quartzite and sandstone

*Permeability:* Rapid

*Texture class:* Loamy-skeletal

#### Minor Soils

Rock outcrops

- **SYLVATUS-SYLCO**

Shallow and moderately deep, moderately steep to very steep, well drained soils that have a loamy subsoil.

#### **Setting**

*Topography:* Side slopes

*Location:* Quartzite ridges of the Blue Ridge Mountains

*Vegetation:* Mixed hardwoods and pines

*Slope range:* 2 to 55 percent

*Elevation:* 1,400 to 2,600 feet

*Flooding:* None

*Drainage pattern:* Dendritic

#### **Composition**

Percent of survey area: 7

Sylvatus soils—60 percent

Sylco soils—40 percent

#### **Soil Properties and Qualities**

##### Sylvatus

*Depth:* Shallow

*Drainage class:* Well drained

*Parent material:* Residuum derived from metasedimentary rock

*Permeability:* Moderate

*Texture class:* Loamy-skeletal

### Sylco

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from metasedimentary rock

*Permeability:* Moderate

*Texture class:* Loamy-skeletal

- **EDNEYTOWN-PEAKS**

Very deep and moderately deep, gently sloping to very steep, well drained soils that have a loamy subsoil.

### Setting

*Topography:* Ridge summits and side slopes

*Location:* Blue Ridge Mountains

*Vegetation:* Mixed hardwoods and pines

*Slope range:* 2 to 70 percent

*Elevation:* 1,250 to 2,800 feet

*Flooding:* None

### Composition

Percent of survey area: 8

Edneytown soils—71 percent

Peaks—29 percent

### Soil Properties and Qualities

#### Edneytown

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from granite

*Permeability:* Moderate

*Texture class:* Fine-loamy

**Peaks**

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from granite

*Permeability:* Moderate

*Texture class:* Loamy-skeletal

- **SHERANDO**

Very deep, gently sloping and strongly sloping soils that have a loamy subsoil.

**Setting**

*Topography:* Alluvial and colluvial fans, and benches and side slopes

*Location:* Terraces and foot slopes of the Blue Ridge Mountains

*Vegetation:* Mixed hardwoods and pines; pasture

*Slope range:* 2 to 15 percent

*Elevation:* 700 to 1,100 feet

*Flooding:* None

*Drainage pattern:* Dendritic

**Composition**

Percent of survey area: 2

Sherando soils—100 percent

**Soil Characteristics****Sherando**

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Colluvium derived from quartzite and granite

*Permeability:* Rapid

*Texture class:* Loamy-skeletal

- **CATOCTIN-FAUQUIER-MYERSVILLE**

Moderately deep to very deep, gently sloping to steep, well drained soils that have a clayey and loamy subsoil.

**Setting**

*Topography:* Ridge summits and side slopes

*Location:* Blue Ridge Mountains

*Vegetation:* Mixed hardwoods and pines

*Slope range:* 2 to 70 percent

*Elevation:* 1,500 to 2,600 feet

*Flooding:* None

*Drainage pattern:* Dendritic

**Composition**

Percent of the survey area: 12

Catoctin soils—39 percent

Fauquier soils—31 percent

Myersville soils—30 percent

**Soil Properties and Qualities****Catoctin**

*Depth:* Moderately deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from greenstone

*Permeability:* Moderately rapid

*Texture class:* Loamy-skeletal

**Fauquier**

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Residuum derived from greenstone

*Permeability:* Moderate

*Texture class:* Clayey

#### Myersville

*Depth:* Deep

*Drainage:* Well drained

*Parent material:* Residuum derived from greenstone

*Permeability:* Moderate

*Texture class:* Fine-loamy

- **BRADDOCK-MONONGAHELA-UNISON**

Very deep, gently sloping to moderately steep, well drained soils that have a clayey and loamy subsoil.

#### **Setting**

*Topography:* Broad terraces and alluvial and colluvial fans and benches

*Location:* Terraces along the South Fork of the Shenandoah River and Hawksbill Creek

*Vegetation:* Cultivated crops and pastures

*Slope range:* 2 to 25 percent

*Elevation:* 600 to 1,000 feet

*Flooding:* None

*Drainage pattern:* Dendritic

#### **Composition**

Percent of survey area: 20

Braddock soils—56 percent

Monongahela soils—15 percent

Unison soils—13 percent

Minor soils—16 percent

#### **Soil Properties and Qualities**

Braddock

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Alluvium and colluvium derived from crystalline rock

*Permeability:* Moderate

*Texture class:* Clayey

#### Monongahela

*Depth:* Very deep

*Drainage class:* Moderately well drained

*Parent material:* Alluvium derived from acid sandstone and shale

*Permeability:* Moderate above the fragipan, moderately slow in the fragipan

*Texture class:* Fine-loamy

#### Unison

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Alluvium and colluvium derived from acid, crystalline rock

*Permeability:* Moderate

*Texture class:* Clayey

#### Minor Soils

Well drained Dyke soils

Moderately well drained Cotaco and Zoar soils

Somewhat poorly drained Tygart soils

Poorly drained Maurertown and Purdy soils

Urban land

- **CRAIGSVILLE-HUNTINGTON**

Very deep, nearly level, well-drained soils that have a loamy subsoil.

#### Setting

*Topography:* Meandering flood plains and stream channels

*Location:* Flood plains along streams in the Valley and Ridge province

*Vegetation:* Mixed hardwoods or cultivated crops

*Slope range:* 0 to 4 percent

*Elevation:* 400 to 600 feet

*Flooding:* Occasional

*Drainage pattern:* Open ditches

### **Composition**

Percent of survey area: 6

Craigsville soils—35 percent

Huntington soils—20 percent

Minor soils—45 percent

### **Soil Properties and Qualities**

#### Craigsville

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Alluvium derived from soils that formed in limestone, shale, and sandstone

*Permeability:* Moderately rapid

*Texture class:* Coarse-loamy

#### Huntington

*Depth:* Very deep

*Drainage class:* Well drained

*Parent material:* Alluvium derived from soils that formed in limestone, sandstone, and shale

*Permeability:* Moderate

*Texture class:* Fine-silty

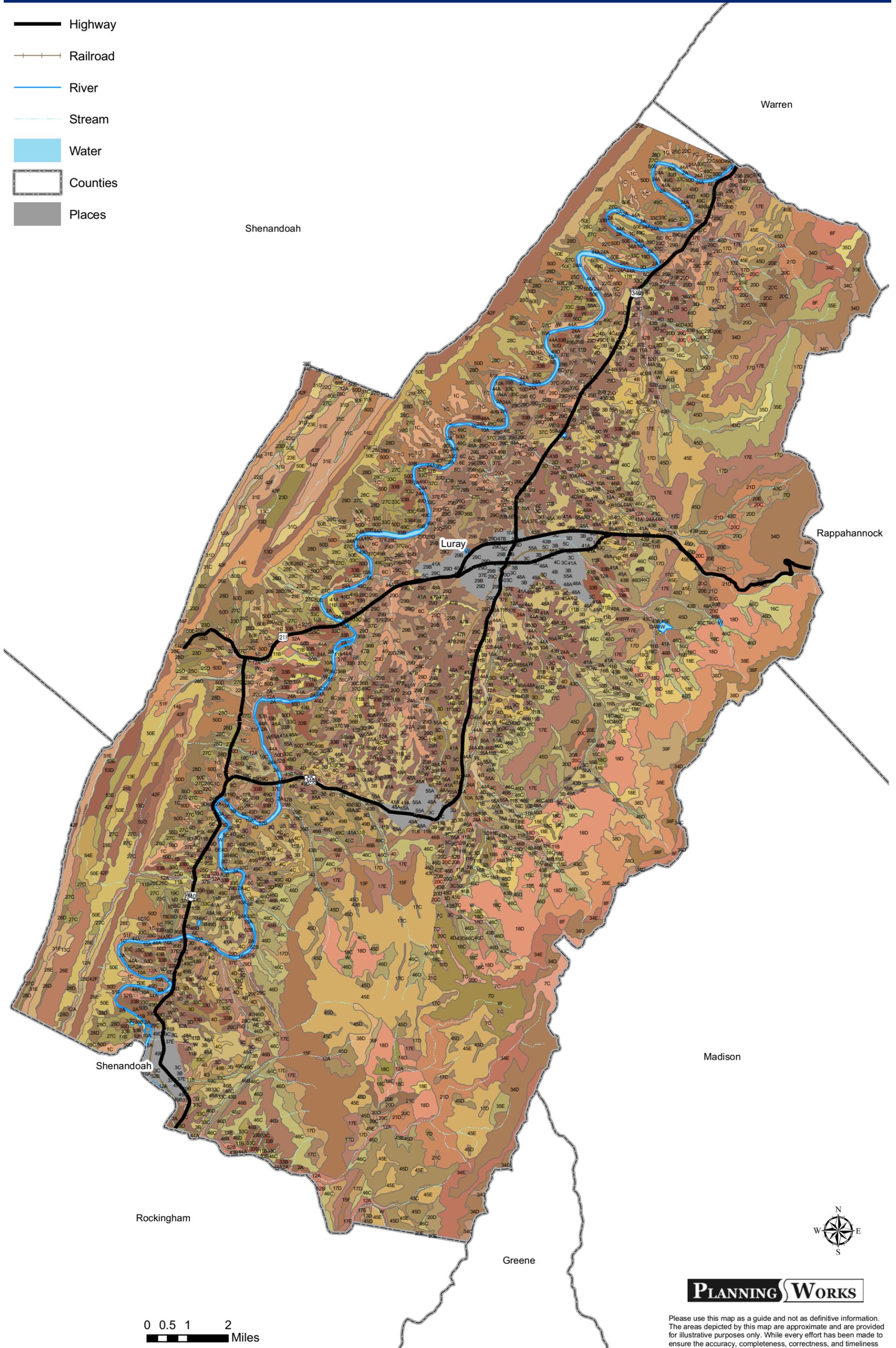
#### Minor Soils

Well drained Biltmore, Combs, and Wheeling soils

Moderately well drained Sindion soils

# Exhibit 4 : General Soils Map

-  Highway
-  Railroad
-  River
-  Stream
-  Water
-  Counties
-  Places



### **3.3.2 Prime Agricultural Soils**

Approximately 21.9 percent, or 44,290 acres, may be classified as prime agricultural soils defined as U.S. Department of Agriculture (USDA) Soil Classes I and II. The majority of prime agricultural soils are located within the general soil associations shown as having slight limitations for farming. The best agricultural soils are those largely derived from limestone and dolomite bedrock or from terrace gravel or other water-carried deposits.

The best agricultural land in the county is located in the central parts of the county. These deep, well-drained soils are suited to a wide variety of agricultural uses but presently most are intensively used for livestock production. Much of the land could be irrigated from the South Fork of the Shenandoah River to produce a high volume of corn or truck crops.

Very little good cropland is found in the Blue Ridge Mountain foothills of the eastern part of the county and most of that area's potential cropland would require intensive treatment for profitable use. Hay and grazing are the most suitable agricultural uses for the area. Its present use is mostly woodland.

There is only limited crop production on the gentle slopes and flat areas along the river. Grazing is the most suitable use of the area.

### **3.3.3 Development Constraints Related to Soils**

Several soil conditions lead to development constraints. These constraints are outlined as follows:

1. **Excavation Limitations - Shallow Depth to Bedrock:** Many of the county's soils are poorly suited for building excavations, foundations, basements, and water and sewer lines. Excavation limitations arise because of the shallow depth to bedrock, a high percentage of large rock fragments in the soil, frequent rock surface outcrops, and so forth. Shallow soils, which lie close to bedrock, make excavations of all kinds difficult and expensive, depending on the bedrock's depth and hardness. Excavating for basements and underground utilities, including sewers, is difficult. Water and drainage systems cannot be built. Since these soils tend to occur on moderate to steeply sloping lands, erosion problems are likely to be severe. This feature usually occurs in conjunction with a seasonal high water table.

Such development constraints exist in most places in the western portion of the county, from one-half to two miles east of the George Washington National Forest. In the east, the constraints are located in the Shenandoah National Park and in the Tanner's Ridge area south of Stanley.

About 21 percent of the county has severe to moderate limitations for excavation. Only 8.8 percent has slight limitations for excavations.

2. **Costly Basement Construction, Road Building and Drainage Systems Seasonal High Water Table:** A high water table is defined as land areas where the water supply lies less than three feet from the surface. Its existence makes the construction of basements more difficult and costly. Unless a drainage system is provided to dry out the soils, yards may also flood at certain times during the year. Road building, earth moving and other construction may be hampered, raising costs that are passed on to the homebuyers. It is a common problem in the eastern and western parts of the county.
3. **Limited Suitability for On-site Sewage Disposal – Multiple Soil Conditions and Other Factors:** The following eight major conditions limit on-site sewage disposal:
  - Too shallow a depth to the water table
  - Frequency of flooding
  - Excessive slope
  - Too shallow a depth to bedrock
  - Excessive stoniness of the soil
  - Coarse fragments in the soil
  - Poor percolation rate because of slow permeability of the soil
  - Karst

According to available local soil studies, approximately 47 percent of the total land area in Page County, or about 95,000 acres, has severe limitations for on-site septic systems.

These severe limitations arise because of slow permeability (liquid absorbing rate), seasonally high water table, flooding, rock fragments, and shallow depth to bedrock, steep slopes, a high shrink-swell potential, danger of well contamination, rock surface outcrops, danger of seepage from surrounding areas, potential of soil creep or landslides and karst. Land with severe limitations for on-lot sewage is located along the eastern and western flanks of the county. Generally, this area corresponds to the Blue Ridge and Massanutten Mountain sections of the county. Approximately 53 percent of the land area, or about 107,000 acres, has moderate limitations for on-site sewage systems.

The best areas for constructing septic tank systems are those underlain by limestone and terrace gravel. These areas generally occur in the eastern and western sides of the county's valley lowlands. However, as noted in some of the individual soil and geological reports, the karst topography throughout these areas greatly increases the potential for ground water pollution and the danger of well contamination from septic tanks.

### **3.3.4 Policy Implications of Development Constraints**

Public policy should not encourage non-farm development in areas of severe limitations for excavations and on-site sewage. If permitted, building should be at a low density.

Soils with a seasonal high water table and shallow depth to bedrock should be left in their natural state. Even low-density residential uses are unsuitable for these soils. Because on-site sewer systems will not function when bedrock is near or at the surface, any development would require sewer lines. Since the existing sewer systems in the county are not located near these areas, installation of such a system would be costly.

The steep and moderate slopes usually associated with shallow depth to bedrock and seasonal high water tables preclude industrial and commercial development as well. As a general development policy, these soils should be preserved as open space and parks, or used for grazing or forest culture.

Based on soil limitations for excavation, the best land for future development is in central Page County. This area overlies predominantly limestone and dolomite bedrock formations. The limiting factor in these areas is the Karst topography.

**Exhibit 5: Page County Soil Limitations**

<b>Building Construction</b>	<b>Percent of Total Average</b>
Septic Systems	
Severe	47
Moderate –Severe	0
Moderate	53
Slight	0
Excavations (Foundations or Basements)	
Severe	0
Moderate-Severe	21.4
Moderate	0
Slight-Moderate	21.8
Slight	8.8
Woodland	
Severe	23
Moderate	12.5
Slight	64.5
Agriculture*	
Severe	20.6
Moderate	39.1
Slight	40.3
U.S.D.A. Soil Classes	
I, II Prime Cropland	21.9
III, IV Marginal	24.5
VI, VII Non-Cropland	53.6

Source: Page County Comprehensive Plan 1980. \* Measured by general soil associations.

### 3.4 Woodland Resources

The forests of Page County are one of its most precious resources. These woodlands add to the economic vitality of the county, its natural beauty, and to the resident's quality of life. The county's woodlands are used for recreation, watershed and wildlife management, and for a variety of wood products.

There are 106,674 acres of forestland in Page County. These acres are distributed as follows:

Private Ownership	41,996 acres (39.4%)
County/Towns	246 acres (0.2%)
State	90 acres (<0.2%)
Federal	60,342 acres (60.3%)

**Exhibit 6** provides information on the characteristics of Page County's forest resources. The Upland Hardwood – Southern Pine forest type dominates the woodlands. The most common species in this forest type include white oak, black oak, chestnut oak scarlet oak, northern red oak, pignut hickory, butternut hickory, mockernut hickory, red ask, white ash, tulip tree, Virginia pine, shortleaf pine, pitch pine, tablemountain pine, white pine and black gum.

The commercial quality of these trees varies greatly depending upon the soil types that underlay the woodland. Many acres of forest grow on shale-derived soils that are of very low quality and value. Conversely, trees growing on limestone soils, or on river bottom alluvial soils, are of very high quality. It is these better quality soils that make the county a leader in the world market of fine hardwood products.

**Exhibit 6: Page County Forest Characteristics**

Forest Type	Acres	Stand Size Class	Acres
Pine Hardwoods	8,534	Saw Timber	65,711
Oak-Hickory	74,672	Pole Timber	40,536
Mixed Hardwoods	23,468	Saplings	427
Total	106,674	Total	106,674

Source: Source, Joe Lehner, Area Forester, Woodstock, VA

The County's forest resources are a valuable economic resource. At least 343 workers depend upon the forest products industry. Because the forest resources are not being utilized to their fullest extent and because the land management objectives in the federally held lands preclude timber harvesting, Page County's forest products economy ranks only 90<sup>th</sup> in the state. The total annual forest economic impact is \$27,163,177 broken down as follows:

Direct Economic Impact (Primary and secondary Industries)	\$20,430,308
Indirect Impact (Service industry: trucking, supplies, etc.)	\$ 2,879,529
Induced Impact (employee spending)	\$ 3,853,341

From 1986 through 1992, cumulative harvest revenues for county landowners averaged about 140,000 per year. However, beginning in 1993, and through the end of 2001, annual harvest revenues increased to \$326,666. This increase is attributable to an improved global hardwood market, an increased demand for hardwood products, a decrease in lumber harvested from the National Forests and the recognition of the superior quality of Shenandoah Valley hardwoods. Trends in the county have been increasing fragmentation and parcelization of forest acreage. This loss of productive forestland equates to a decline in the county's economic viability due to decreased revenues generated by traditional forest products and eco-tourism (hiking, fishing, hunting, bird watching, and nature study).

The county should seek a balance between managed growth and the protection of productive forestland. A serious concern is the loss of prime forestland to development. Many of the most productive sites, which grow some of the world market's finest hardwoods are presently being subdivided for development, rendering the remaining included wooded areas "unmanageable". The remaining woodland parcels are too small to practice good management techniques and economic harvesting. The public needs to understand the value of well-managed forests.

### **3.5 Water Resources**

Page County is located in the Shenandoah River Basin. The county is drained by the South Fork of the Shenandoah River and its major tributaries; Naked Creek, Cub Run, Stony Run, Mill Creek, Passage Creek, Hawksbill Creek, East Hawksbill Creek, Jeremiah's Run, Dry Run and Pass Run.

Six major watersheds are located in Page County:

South Fork, Shenandoah River/Gooney Run	37,550 acres
South Fork, Shenandoah River/Mill Creek	36,056 acres
Passage Creek	6,083 acres
Hawksbill Creek	56,833 acres
South Fork, Shenandoah River/Cub Run	40,896 acres
Naked Creek	23,558 acres

### **3.5.1 Drainage and Flood Plains**

The major surface water body is the South Fork of the Shenandoah River. The volume of the South Fork at Luray averages 1,264 cubic feet per second (CFS). The minimum flow is 70 CFS and the maximum is 100,000 CFS. The headwaters of Passage Creek, a tributary of the North Fork, provide drainage for the western area of the county.

The waters of the Shenandoah River reach 20 feet over normal levels every five years and over this amount about every 16 years. Management of development within the 100-year flood line would be appropriate.

Development in the flood plain hinders the already poor drainage in such areas, increases the chance of flooding downstream and results in extensive property damage. By allowing these areas to remain in their natural state, stream valleys will absorb a large portion of the rainfall, replenish the ground water supply and release the storm water into the streams at a more gradual rate.

### **3.5.2 Surface Water Resources**

Approximately 4,600 residents use public water systems with a surface water supply.

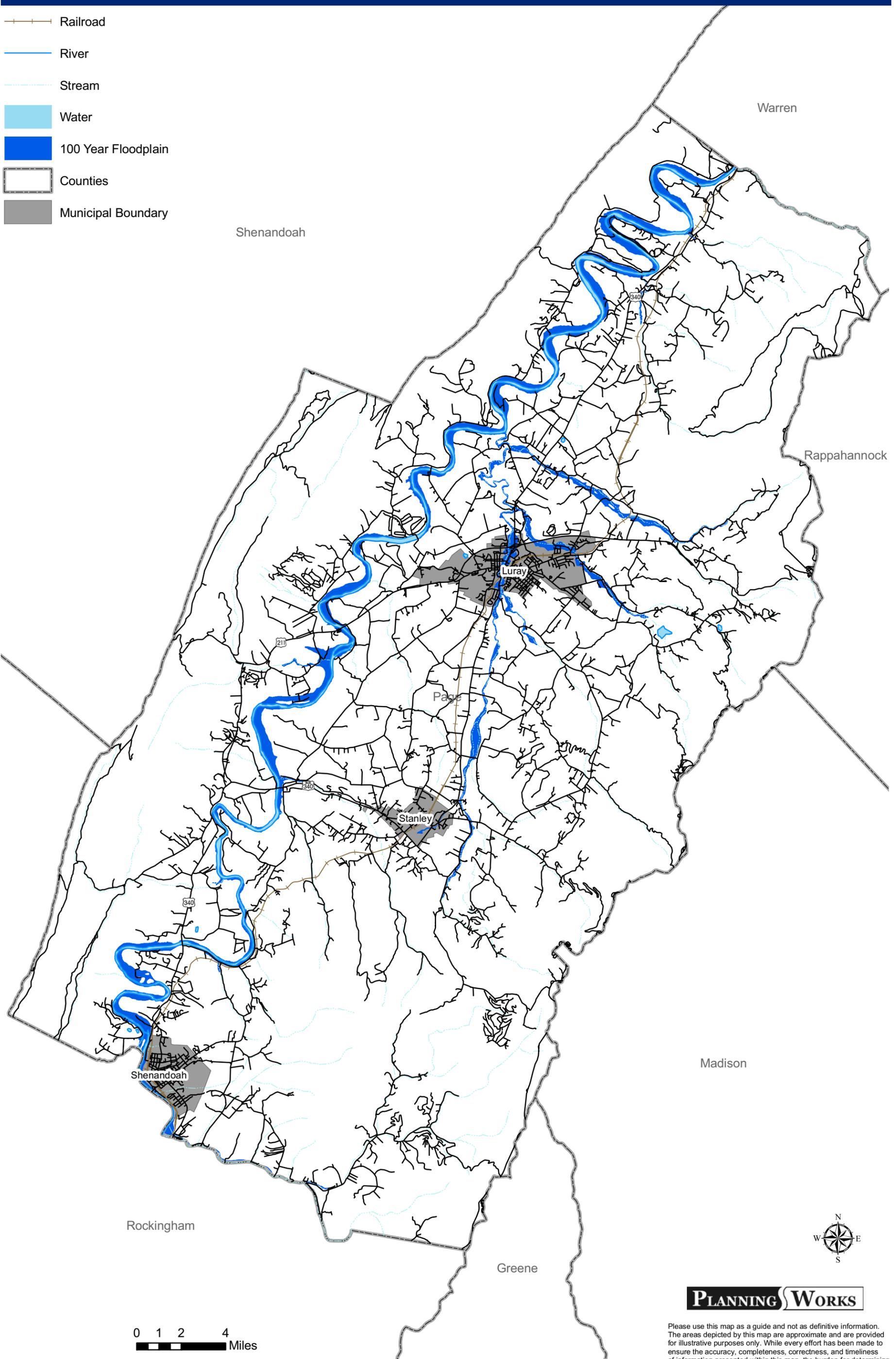
According to reports in the mid-seventies, noticeable traces of deadly mercury (released decades ago upriver by the Dupont Plant at Waynesboro) raised concerns over the South Fork's water quality. Today, the amount of mercury in the water and sediments results in health advisories against eating fish from the river. Although reports from the State Water Control Board since 1992 consider the quality of the South Fork's water good, they also cite alkalinity and high levels of phosphate. In 1998-99, DEQ reported increases in fecal coliform bacteria levels and the levels of these bacteria remain a problem.

There is no current scarcity of usable surface water in the South Fork of the Shenandoah River. However, as the water demand approaches the volume of total flow available, increasing difficulty with water quality and quantity can be expected. Three additional impoundments created for power generation are located on the South Fork near Luray, Newport and Shenandoah.

Lake Arrowhead is the only water supply reservoir in the county. It is located near and serves Luray.

# Exhibit 7 : 100-Year Floodplain

-  Roads
-  Railroad
-  River
-  Stream
-  Water
-  100 Year Floodplain
-  Counties
-  Municipal Boundary



0 1 2 4 Miles



**PLANNING WORKS**

Please use this map as a guide and not as definitive information. The areas depicted by this map are approximate and are provided for illustrative purposes only. While every effort has been made to ensure the accuracy, completeness, correctness, and timeliness of information presented within this map, the burden for determining appropriateness for use rests solely with the user. This map is provided "as is" with no warranties, express or implied.

### **3.5.3 Ground Water Resources**

About 5,500 other residents use municipal water supplies with ground water sources. The remaining residents draw ground water from individual wells. Ground water quality is commonly hard to very hard (a measure of calcium and magnesium) and has a high concentration of iron and nitrate.

Many of the geologic formations with the highest potential ground water yields underlie the center of the county. The quality of this water varies greatly, but is commonly hard to very hard. Public officials and citizens should be aware of the great pollution hazard to ground water in the Karst topography of the limestone and dolomite formations undergirding the center of the county.

The volume of water stored in the ground is many times greater than in the surface bodies. Only two geologic formations, the Beekmantown and the Shady, can be considered as important sources of ground water.

Three sections of Page County are described below in relation to ground water characteristics:

1. Eastern Section

Because the igneous and metamorphic rocks along the crest and west slope of the Blue Ridge are fairly impermeable, wells drilled there generally have low yields. Most of the wells along the west slope of the Blue Ridge are from 50 to 300 feet deep. About half of the wells in this area have yields ranging from 0 to 10 gallons per minute (gpm), and about one-third yield 10 to 35 gpm. These wells produce sufficient water for domestic use. In the Skyland area, wells that penetrate the Swift Run formation between Little Stony Man and Bushytop generally have good yields.

2. Central Valley

The wells in this area tend to be deeper than those in the eastern section, ranging from 60 to 600 feet. Of the 76-recorded wells in this area, most yield less than 10 to 20 gpm. Five have yields greater than 100 gpm. The water from most of these wells is hard due to the limestone geology.

### 3. Western Section

The wells in much of this area are fairly shallow (75 to 100 feet deep) and generally yield less than 10 gallons per minute. However, along the eastern front of the Massanutten Mountain, wells in deep gravel yield from 10 to 20 gallons per minute. The water is generally soft. Wells in the sandstone and shale of Massanutten Mountain are generally less than 75 feet deep and furnish enough water (3 to 5 gpm) for domestic use.

#### **3.5.4 Policy Implications of Ground Water Characteristics**

Two major factors influence the use of ground water in the county. The first is the absence of major water-bearing rock formations over much of the land area. The few good aquifers present significant limitations to a future land use pattern of scattered development.

The second factor is the presence of Karst topography in the areas of the greatest ground water yields. As noted on pages 32 and 33, carbonate rocks have numerous open channels from the surface (sinkholes) that connect to an underground stream network. Sinkholes are the primary access for the recharge of ground water into the network. The presence of septic tank systems draining directly into the bedrock and the sub-surface streams, or any activity that pollutes this recharge, could affect a large land area.

Industry, scattered developments (through ground water pollution), and dense development (through runoff) will increase the future potential for ground water deterioration. Increased development throughout the county will increase the problems of storm water management and non-point source pollution. Agriculture, forestry, recreation, and low-density development pose minimal danger to the groundwater resources in areas of limestone and dolomites. Industry and urbanization pose high risks of ground water contamination.

Policies should be developed for storm water management, flood and erosion control, riparian buffer zones and on-going surface and groundwater management.

Preservation of the county's water quality is recommended through local adoption and use of the State's 208 Water Quality Best Management Practices Handbooks, and compliance with the State Water Control Board's standards and regulations, and the Page County Sedimentation and Erosion Controls.

In addition, all prospective land uses should be examined and evaluated against the degree to which they pollute groundwater resources. Those that do should be prohibited or carefully regulated. It is wiser to guard against contamination of the ground water resource in the first instance than have to engage in long, expensive rehabilitation measures after the damage has been done.

### **3.6 Climate and Air Quality**

Climate and air quality have influenced land use in the county in several different ways. The length of the growing season, the normal temperatures and precipitation conditions encourage the growth of a wide variety of crops. The county's cooler annual average temperatures (54.8 degrees versus 57.5 degrees in the Washington Metropolitan area)<sup>2</sup>, natural beauty of the mountains and vast wooded areas attract tourists and second-home residents. Future industrial development and greater traffic will increase the potential for air quality deterioration.

#### **3.6.1 Climate**

Page County has a modified continental (four seasons) climate. The Blue Ridge and other Appalachian Mountain ridges modify the effects of storms and air movements and lower temperatures in their vicinity. Average weather factors in the county include an annual precipitation of over 41 inches<sup>2</sup> an average seasonal temperature variation of between 34 degrees in January and 74 degrees in July<sup>2</sup> and prevailing winds from the south to southwest at 8 miles per hour. About 30 inches of snow fall annually. Based on average dates of the last freeze in the spring and the first freeze in the fall, the growing season is about 185 days.

Floods, drought, and damaging storms occur periodically. Flooding can occur in any month, but happens most frequently in early fall from tropical storms and during late winter from a combination of precipitation and snow melt. Thunderstorms and low-pressure movements not associated with hurricanes or tropical depressions are the most common types of damaging storms. However, they may not be the most severe or costly storms.

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<sup>2</sup> Golden Gate Weather Services, © 2001, Climate Normals 1971-2000

### **3.6.2 Air Quality**

Concerns over threats to air quality in Page County have surfaced in recent years. Air-born contaminants are believed to be partly responsible for the pollution of some surface and ground water sources in the county. Major emissions sources impacting the park are found in the Ohio River Valley, northeastern West Virginia, southwestern Pennsylvania and central and eastern Virginia.<sup>3</sup> Emission sources within 125 miles cause greater visibility and acidic deposition impacts at the park on a per ton basis than the more distant sources.<sup>3</sup> Since the Shenandoah National Park began monitoring the Park's air quality in the 1980s their findings point to some harmful effects generated by deteriorating air quality:

#### **Increased Ozone Levels**

Exposure to unhealthy ground-level levels of ozone reduces lung function, aggravates asthma, increases the severity and incidence of respiratory infections, and decreases exercise capacity.<sup>4</sup> Levels of ozone in Virginia's mountains are higher than in many cities.<sup>5</sup>

Between 1990 and 2000 ozone continued to be higher than 80 parts per billion (ppb) per hour on many summer days. The Park's Air Quality from 1997 – 2001 did not meet the 8-hour ground-level ozone standard set in 1997 by the U.S Environmental Protection agency to protect public health and welfare. The portions of the Park that are in Page and Madison Counties were designated as non-attainment zones under the 8-hour ozone standard in 2004. Under the 1977 amendments to the Clean Air Act, Shenandoah National Park is designated as a Class I area and as such it is afforded the greatest degree of air quality protection.

The Virginia Department of Environmental Quality (VA-DEQ) has responsibilities to regulate air emissions and achieve compliance with the Clean Air Act in Virginia. The Class I designation and the non-attainment area status can influence the allowable quantity and type of air emissions from any new air emissions sources that would significantly influence air quality in the park.

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<sup>3</sup> Assessment of Air Quality and Related Values in Shenandoah National Park, May 2003

<sup>4</sup> "Health Effects of Outdoor Air Pollution", Am. J. Respir. Crit. Care Med. Vol. 153, pp.3-50, 1996

<sup>5</sup> Power That Pollutes, Southern Environmental Law Center, April 2000

Although daily maximum 8-hour average ozone levels at the Luray Caverns Airport Ozone Monitoring Station did not exceed 80 ppb in 2004 (highest value 79 ppb), ozone 8-hour average levels did exceed 80 ppb in 1999, 2001 and 2003.<sup>6</sup> On two occasions in 2004, May 9th and on July 3<sup>rd</sup>, one-hour values exceeded 80 ppb.<sup>6</sup> The mountain ridges on the east and west sides of Page County can hold dirty air instead of allowing it to mix and move on. Because of these local conditions and the Park's Class I designation and non-attainment area status, air quality impacts should be considered when planning development and recruiting industries to Page County. In addition, the county should work cooperatively on a regional basis to improve air quality through involvement with such groups as Shenair and other similar efforts.

### **Reduced Visibility**

The view shed from the park has declined 80% over the past 75 years from about 115 miles to 23 miles.<sup>6</sup> Under natural conditions, atmospheric water vapor scatters light and reduces visibility. This water vapor induced natural haze gives the Blue Ridge Mountains their name. The increased haze developed over the past three-quarters of a century stems from sulfates and nitrates attaching to the water molecules that then become more effective in scattering the light.

Variations in the concentration of atmospheric ammonium sulfate causes the seasonal variations in visibility and the poorest visibility occurs in the summer.<sup>3</sup> Between March 1998 and February 2000 the haziest 20% of days showed a moderately improving trend. Coal burning power plants are the most significant source of the pollution causing this problem.<sup>5</sup>

### **Stream Acidification**

When sulfate and nitrate particles from old coal burning power plants and other sources combine with water molecules, the result is acid rain. As of 1997, the rate of acid deposition in Virginia's mountain streams was among the highest in the country.<sup>7</sup> Because of the underlying bedrock with low acid buffering capacity, many streams in Shenandoah National Park are moderately to extremely sensitive to acidifying effects of

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<sup>6</sup> Ambient Air Monitoring Report, DEQ, August 2005

<sup>7</sup> U.S. EPA, National Air Quality and Emissions Trends Report, 1997

acidic deposition.<sup>8</sup> DEQ has listed two Page County streams, Rocky Branch and Jeremy's Run, as impaired due to excessive acidity.

By 1993, 50 percent of Virginia's native brook trout streams had reduced capacity to host trout populations due to acid rain, and 6 percent were incapable of supporting trout or other fish populations because of their chronic acid state.<sup>9</sup> Severe reductions in acid deposition will be required to preserve Virginia's native brook trout streams.<sup>10</sup> Concentrations of Sulfur have decreased at Big Meadows over the past 15 to 20 years and currently are about 13 kg/2 acres/year.<sup>3</sup> Concentrations of Nitrogen have not declined at Big Meadows and currently are 8 kg/2 acres/year.<sup>3</sup>

### **Vegetation Damage**

Ozone's interference with photosynthesis reduces the growth rates of plants and weakens the ability of plants to withstand pests and disease.<sup>5</sup> Ground level ozone has been determined to slow the growth of several species of trees<sup>3</sup> and to reduce crop yields.<sup>5</sup>

## **3.7 Critical Environmental Areas**

In 1972, the Virginia General Assembly directed the Division of State Planning and Community Affairs to define and locate those land areas that – because of location, physical features, historical character, natural production, scenic significance, or unique animal or floral life – contribute to the well-being of society and that, because of their particular qualities, are in limited supply.

Two general locations in Page County were noted and should be protected as critical environmental areas by criteria noted in the study.

The first area designated was the South Fork of the Shenandoah River in Page and Warren Counties. This scenic and natural area contains pastoral scenery, forests and cliffs. It has extraordinary potential for recreation and wildlife habitats. The second critical area designated

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<sup>8</sup> Fact Sheet: Air Quality & Pollution Impacts in Shennandoah national Park, National Park service, Department of Interior, 3/19/01

<sup>9</sup> A.T. Hurley, et al, *The Effects of Acidic Deposition on Streams in the Appalachian Mountain and Piedmont Region of the Mid-Atlantic Region of the United States*, Water Resources Research. August 1993

<sup>10</sup> Art Bulger, et al, *Acid Rain: Current and Projected Status of Coldwater Fish Communities in Southeastern U.S. in the Context of Continues Acid Deposition*, Trout Unlimited, July 1998

was The Massanutten Mountain Range in Page, Shenandoah and Warren Counties. This mountain range is a unique geologic formation under intense pressure for development. It is partially government-owned.

Designation of criteria for and the selection of critical environmental areas does not complete the task. Standards should be developed for controlling development in these designated areas and buffer zones established to protect these areas.

### **3.8 Policy Implications of Natural Resources on Economic and Development Potential**

The county's, natural resources provide scenic beauty in abundance. Page County attracts many tourists interested in seeing the scenic beauty and many historic and natural attractions located in this area. These tourists provide economic benefits to the county. Shenandoah National Park policy supports the retention of Page County's rural character as an essential component of the scenic Page Valley view shed enjoyed by the 1.6 million tourists who visit the Park annually.

Some of the county's many tourist attractions include Shenandoah National Park, The George Washington National Forest, Luray Caverns, the Shenandoah River, historic sites, and the towns of Luray (The Luray-Hawksbill Greenway), Stanley (the Hawksbill Recreation Park) and Shenandoah (Big Gem Park). Activities available in the county include canoeing, hiking, horse back riding, biking, hunting and fishing. Bed and Breakfasts, motels and local restaurants provide accommodations for visitors. Lists of available activities and accommodations are available through the Luray-Page County Chamber of Commerce (540-743-3915). The scenic beauty and accessibility of these areas, however, also attract recreational home development. Greater access and better roads to major metropolitan centers to the east are combining to exert strong pressure to develop scenic parts of the county.

As discussed above under specific natural resource components, natural resources also bring development constraints. In the east and west much of the land adjacent to the Blue Ridge and Massanutten Mountains has considerable development constraints. These constraints include excessive slopes, unsuitability for on-site sewage disposal, shallow depth to bedrock, seasonal high water tables, inadequate ground water resources, and flood-prone areas. In the center of the county, areas of severe development restriction are found along sections of the Shenandoah River and throughout the valley lowlands where Karst topography predominates and flood-prone areas are numerous. Because of these constraints, approximately 57 percent of the land in Page County is not suitable for development.

## Chapter 4: Population

Changes in the size, location and make-up of the population have definite implications for planning. Such changes may impact community facilities and services, educational systems, public utilities, health facilities and transportation systems. Other factors in the community may also be affected, such as land use and housing demand.

### 4.1 Ethnic Trends

German and Swiss were the earliest settlers of European origin to inhabit Page Valley. Before 1800, their cultural and social presence was apparent in the widespread use of the German language and customs. When the Commonwealth of Virginia took the first population census in the Page Valley section of Shenandoah County in the 1780s, the population, numbering less than 1,200, was largely ethnic German or Swiss. Many Germanic surnames found in early twenty first century Page County date back nearly three centuries.

By the 1750s, English and Scots-Irish had migrated into the county from eastern Virginia over the Blue Ridge. The Blue Ridge foothills and hollows were home to large family clans, particularly in the eastern upland areas between Stanley and Shenandoah.

In the nineteenth century, Page County's population reached 7,600. The number of English speaking settlers had increased and English replaced German as the population's legal and common language. Settlers of German descent remained the majority but were not nearly as dominant as they had been half a century earlier.

In 1850, African Americans made up fifteen percent of the population. African Americans came to Page County with some of the earliest white settlers. By the 1840s, they worked on the farms or at the iron furnaces throughout Page County from Rileyville in the north to Shenandoah in the south. Most were slaves.

A modest trend toward increasing ethnic and cultural diversity in Page County's population occurred during the twentieth century. In the 1990s, county surnames reflect the influx of new residents representing a wider cross-section of the American population. Ethnic Chinese, Asian Indians and Hispanics make up a small but growing minority of the county's residents. Conversely, the African American population has declined steadily since 1850 and accounted for

only two percent by 2000. This decline is part of the larger national trend of African Americans migrating to large urban centers from southern states' rural and small town communities.

The trend toward a more ethnically and culturally diverse population is likely to continue into the foreseeable future.

## 4.2 Growth Trends

Since the county's formation in 1831, the total population has risen gradually over the years as shown in **Exhibit 8** and **Exhibit 9**.

**Exhibit 8: Decennial Census Population**

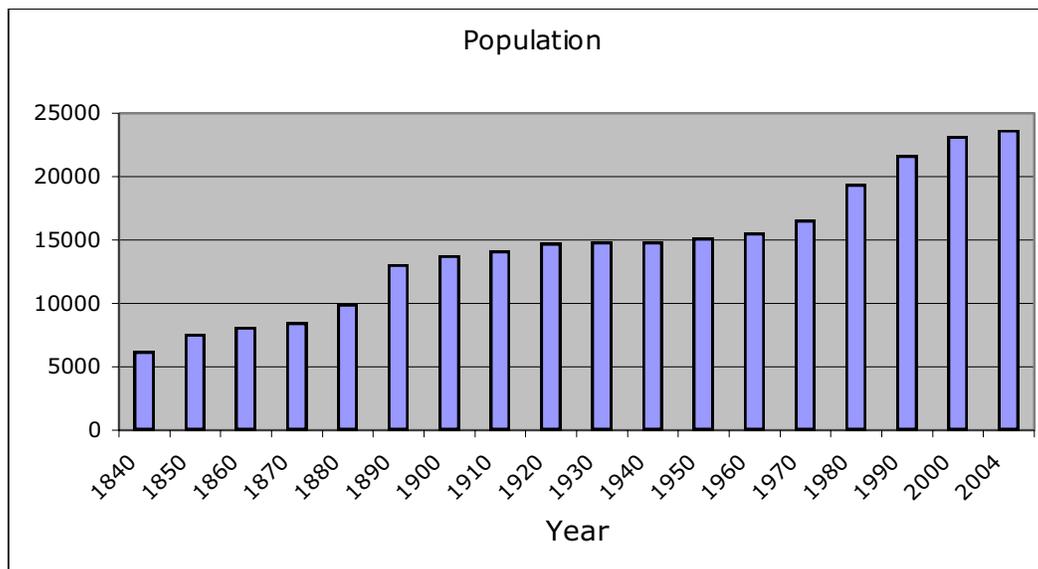
Year	Population	Year	Population
1840	6,194	1930	14,852
1850	7,600	1940	14,863
1860	8,109	1950	15,152
1870	8,462	1960	15,572
1880	9,965	1970	16,581
1890	13,092	1980	19,401
1900	13,794	1990	21,690
1910	14,147	2000	23,177
1920	14,770	2004	23,700*

*Sources: Intercensal Estimates and Decennial Counts for Virginia Locations*

*1790-1980: Taylor Murphy Institute, 1983*

*2000 Census of Population, Decennial Census*

*\* US Census Bureau, Population Estimates Program 2004*

**Exhibit 9: Population 1840-2004**

Between 1840 and 1900, the county underwent rapid population growth (122.7 %). However, 41 percent of this growth occurred in the decade 1880 to 1890 when Page County's population grew 31.4 percent, from 9,965 to 13,092. The building of the Shenandoah Valley Railroad was responsible for an economic boom that brought rapid growth to all three towns, especially to what became Stanley and Shenandoah. For a time, Shenandoah, home to the new railroad industry, became Page County's largest municipality with a population of 1,300.

During the twentieth century the population grew from 13,794 inhabitants in 1900 to 23,177 in 2000, a 68 percent increase. The rate of growth during the second half of the century was much greater than during the first half; 9.8 percent from 1900 to 1950 compared to 53 percent from 1950 to 2000. In addition, 82.2 percent of the growth since 1950 occurred after 1970. In the each of last two decades, 1980-1990 and 1990-2000, the population increased 11.8 and 6.9 percent respectively.

As Page County enters the twenty first century its population is likely to grow, perhaps faster than in the twentieth century. The rate of growth will depend upon land use and zoning decisions.

### 4.3 Factors Contributing to Growth

Two basic factors account for population change: natural increase and migration.

## Natural Increase

Natural increase is the difference between the total births and deaths that occur during the base period. As shown in **Exhibit 10**, the birth rate for the county in 1990 and 2000 was 11.4 births per 1,000 persons. This figure is lower than the statewide rate of 16 and 14 births per 1,000 for the same periods. Conversely, for the past twenty years, 1980 to 2000, the death rate in Page County has been consistently higher than the statewide rate.

These data may reflect the fact that on average Page County's population is older than in Virginia as a whole.

**Exhibit 10: Birth and Death Rates 1980-2000**

Year	Birth Rate*		Death Rate*	
	Page County	Virginia	Page County	Virginia
1980	15.2	14.7	11.6	7.9
1990	11.4	16	10	7.7
2000	11.5	14	10.1	7.9

*Source: Virginia Center for Health Statistics, Vital Statistics Annual Report for 1980, 1990 and 2000. \*Rates given per thousand*

## Migration

For decades rural counties have had net out-migration as young people seek job opportunities elsewhere. In the counties with low-birth rates, in-migration is the only factor allowing them just to maintain the population level. The several indicators of in-migration are shown in **Exhibits 11, 12, and 13**.

**Exhibit 11** shows natural and migration population increases for Page County, its neighboring counties, the Northern Shenandoah Valley Regional Commission (NSVRC) and the state.

**Exhibit 11: Natural and Migration Population Increases 1980-2000**

Jurisdictions	Population Increases				Population Increase			
	1980-1990				1990-2000			
	Total	Natural	Migration	Percent Migration	Total	Natural	Migration	Percent Migration
Greene	2,672	832	1,840	68.9%	4,947	1,178	3,769	76.2%
Madison	1717	438	1,279	74.5%	571	162	409	71.6%
Page	2,289	533	1,756	76.7%	1,487	234	1,253	84.3%
Rappahannock	529	187	342	64.7%	361	158	203	56.2%
Rockingham	5,428	3,208	2,220	40.9%	10,232	3,147	7,086	69.3%
Shenandoah	4,044	277	3,767	93.2%	3,439	252	3,187	92.7%
Warren	4,942	1,189	3,753	75.9%	5,442	1,557	3,886	71.4%
NSVRC*	26,747	5,416	21,331	79.8%	33,618	6,364	27,254	81.1%
Virginia	840,540	410,975	429,565	51.1%	889,713	425,859	463,854	52.1%

Source: *Components of Change 1990-2000*; Center for Public Service

\* Northern Shenandoah Valley Regional Commission. Page, Warren and Shenandoah Counties are among those belonging to the Commission.

For Virginia as a whole, the population growth due to natural increase and migration has been nearly equal over the past 20 years. Conversely, in the northwestern part of the state, including the counties in the NSVRC, migration is a greater cause of population growth. Among these counties, Page has one of the highest rates of population increase due to in-migration, 76.7 percent from 1980 to 1990 and 84.3 percent from 1990 to 2000. Only Shenandoah's net population increase due to migration exceeds that of Page.

**Exhibit 12** presents another indicator of in-migration, the individual's place of residence five years earlier. The decennial census asks the individual's place of residence five years earlier.

**Exhibit 12: Page County 2000 Census – Respondent’s Place of Residence in 1995**

Persons 5 Years and Older	Number	Percent
Same House in Page County 1995	14,059	64.2%
Different House in Page County in 1995	4,931	22.5%
Different House in U.S. in 1995	2,825	12.9%
Virginia	1,791	8.2%
Different State	1,934	8.8%
Northeast	266	1.2%
Midwest	123	0.6%
South	541	2.5%
West	104	0.5%
Different House Abroad in 1995	84	0.4%
Total	21,899	100.0%

Source: US Census Bureau, Census 2000

Although it is not possible to determine the native Page County population directly from these census figures, this data suggests that 13.3 percent of the county’s 2000 population did not live in Page County five years earlier.

Birthplace is yet another indication of in-migration. **Exhibit 13** shows the birthplace of Page County residents in 1990 and 2000 and distinguishes between those born in Virginia, and those born in a different state or in another country. It does not distinguish between those born in Page County and elsewhere in Virginia. Between 1990 and 2000, the number of county residents born outside Virginia, in another state or in another country, increased from 17.4 percent to 20.4 percent.

**Exhibit 13: Place of Birth for County Residents**

Place of Birth	1990		2000	
	Number	Percent	Number	Percent
Native Born in Virginia	17,906	82.6%	18,445	79.6%
Native Born in a Different State, Abroad or at Sea	3,560	16.4%	4,380	18.9%
Foreign Born	224	1.0%	352	1.5%
Total	21,690	100.0%	23,177	100.0%

*Source: US Census Bureau, 1990, 2000*

#### 4.4 Characteristics of the Population

The following section presents data concerning the age and sex distribution, and racial composition of the Page County residents. The population make-up of Page County is compared to the population make-up of the State.

##### Age Distribution

**Exhibit 14** shows the county's population by age group for 1980, 1990 and 2000. Changes by decade will be discussed on the following page.

**Exhibit 14: Population Change by Age Group**

Age	Population			Percent Change		Percent Distribution 2000
	1980	1990	2000	1980-1990	1990-2000	
Under 5	1,324	1,373	1,286	3.7	-6.3	5.5
5 to 9	1,374	1,470	1,515	7.0	3.1	6.5
10 to 14	1,565	1,393	1,563	-11.0	12.2	6.7
15 to 19	1,744	1,478	1,520	-15.3	2.8	6.6
20 to 24	1,410	1,366	1,229	-3.1	-10.0	5.3
25 to 29	1,482	1,681	1,407	13.4	-16.3	6.1
30 to 34	1,439	1,688	1,584	17.3	-6.2	6.8
35 to 39	1,322	1,617	1,830	22.3	13.2	7.9
40 to 44	1,023	1,548	1,743	51.3	12.6	7.5
45 to 49	1,020	1,388	1,664	36.1	19.9	7.2
50 to 54	1,085	1,128	1,587	4.0	40.7	6.8
55 to 59	1,114	1,111	1,441	-0.3	29.7	6.2
60 to 64	982	1,178	1,164	20.0	-1.2	5.0
65 to 69	878	1,084	1,057	23.5	-2.5	4.6
70 to 74	680	876	960	28.8	9.6	4.1
75 to 84	752	1,021	1,236	35.8	21.1	5.3
85 and over	207	290	391	40.1	34.8	1.7
<b>Total</b>	<b>19,401</b>	<b>21,690</b>	<b>23,177</b>	<b>11.8</b>	<b>6.9</b>	<b>100</b>
19 & under	6,007	5,714	5,884	-4.9	3.0	25.4
20 to 39	5,653	6,352	6,050	12.4	-4.8	26.1
40 to 59	4,242	5,175	6,435	22.0	24.3	27.8
60 & over	3,499	4,449	4,808	27.2	8.1	20.7
	Median Age			Percent Change		
	1980	1990	2000	1980-1990	1990-2000	
Page County	32.7	32.2	39.0	-1.5	21.1	
Virginia	29.8	32.6	35.7	9.4	9.5	

Source: US Census Bureau, 1980, 1990, 2000

Major changes in age distribution by decade are highlighted below.

### **1980 to 1990**

Numbers declined in four age groups; children aged 10 to 14, 15 to 19, 20 to 24 and 55 to 59. All age groups 60 years and older showed a steady increase (20 to 40 percent). The largest increase occurred in the age group “85 and over”.

### **1990 to 2000**

Between 1990 and 2000, numbers declined in several age groups; children under 5 years, and adults aged 20 to 34, and 60 to 69. The decrease in the groups 20 to 34 may reflect the earlier decade’s decline in the age group 10 to 24. Similarly, the decline in the age group 60 to 69 may reflect the decline in the 50 to 59 age group of the previous decade. In this decade, the largest increase took place among adults aged 50 to 54.

### **Trends 1980 to 2000**

The data shows two distinct trends in population’s age distribution. The population under 39 years has declined over the past 20 years, from 60 percent in 1980 to 51 percent in 2000. This may reflect the lack of employment opportunities in or near the county and the declining birth rate. Conversely, the proportion of the population 60 years and older has increased slowly over the past 20 years from 18 percent in 1980 to 20.7 percent in 2000. The steady increase in this population group reflects the choice of Page County by many as a retirement area. It also reflects the increased longevity of this group.

The upward shift in median age over the past 20 years reflects these trends. Although the Virginia median has also increased consistently from 29.8 years in 1980 to 35.7 years in 2000, Page County’s median age jumped 21 percent between 1990 and 2000. Page County’s median age was 3.3 years higher than the State’s in 2000.

### **Sex Distribution**

As shown in **Exhibit 15**, Page County’s the population 1990 and 2000 was composed of 51.0 percent females and 49.0 percent males, or 1.04 females to every 1 male. This is the same proportion as for the state as a whole and it has remained relatively constant over the past 30 years.

**Exhibit 15: Sex Distribution by Percentage**

Jurisdiction	Year	Female (Percent)	Male (Percent)	Ratio: Females to Males
Page County	1970	51.3	48.7	1.05
	1980	51.3	48.7	1.05
	1990	51.0	49.0	1.04
	2000	51.0	49.0	1.04
Virginia	1970	50.6	49.4	1.02
	1980	51.1	48.9	1.04
	1990	51.0	49.0	1.04
	2000	51.0	49.0	1.04

Sources: US Census Bureau 1970, 1980, 1990, and 2000

### Racial Composition

As indicated in **Exhibit 16**, data on Hispanics, Asians and American Indians was not collected in Page County until 2000. In 2000 these groups plus “other” made up 1.5 percent of the county’s population. Since 1980, the Black population has remained relatively constant, between 2.0 and 2.6 percent.

**Exhibit 16: Page County Racial Composition**

Race	1980		1990		2000	
	Number	Percent	Number	Percent	Number	Percent
White	18,833	97.1%	21,141	97.5%	22,311	96.3%
Black	499	2.6%	442	2.0%	501	2.2%
Hispanic	*	*	*	*	251	1.1%
American Indian	*	*	*	*	34	0.1%
Asian	*	*	*	*	55	0.2%
Other	69	0.3%	107	0.5%	25	0.1%
Total	19,401	100.0%	21,690	100.0%	23,177	100.0%

Source: US Census Bureau, 1980, 1990, and 2000

\*Information is unavailable

## 4.5 Population Distribution

As shown in **Exhibits 17, 54 and 55** the county's population growth between 1990 and 2000 occurred in the rural areas. **Exhibit 17** provides population change by geographic boundaries. Between 1980 and 1990, the towns' population increased 20.1 percent while the rural areas increased only 7.5 percent. However, between 1990 and 2000 this was reversed; the rural areas population increased 10.2 percent while the population in the towns increased by only 1.1 percent. **Exhibit 55** shows that between 1990 and 2000, 94 percent of the population growth occurred in the rural areas. **Exhibit 54** shows that consistent with this rural area population growth, the population density in the rural areas during this period increased 11.4 percent as compared to only 1.1 percent in the towns.

**Exhibit 17: Population Change by Geographic Boundaries 1980-2000**

Geographic Area	1980	1990	2000	Percent Increase	
				1980-1990	1990-2000
Towns					
Luray*	3,584	4,587	4,871	28.0%	6.2%
Shenandoah	1,861	2,213	1,878	18.9%	-15.1%
Stanley	1,204	1,186	1,326	-1.5%	11.8%
Subtotal Towns	6,649	7,986	8,075	20.1%	1.1%
Rural	12,752	13,704	15,102	7.5%	10.2%
Total	19,401	21,690	23,177	11.8%	6.9%

Sources: US Census Bureau, 1980, 1990, and 2000

\*Luray annexed approximately 687 persons in 1985

### Urban / Rural Distribution

The U.S. Bureau of the Census defines an urban area as any incorporated area having at least 2,500 people. According to this definition, Luray, with 4871 residents, continues to be the county's only urban area.

In 2000, only five other areas within the NSVRC met these criteria:

Berryville at 2,963

Front Royal at 13,589

Strasburg at 4,017

Woodstock at 3,952

Winchester City at 23,585

The U.S. Bureau of the Census defines a rural area as any area not meeting the criteria for classification as urban. In 1980, 71.7 percent of the NSVRC was classified as rural. In 2000, the figure dropped to 67.2 percent. The District includes Clarke, Frederick, Page, Shenandoah and Warren Counties but excludes the urban area populations mentioned above.

## Density

**Exhibit 18** compares population and density data for Page County, neighboring jurisdictions, and the state. Page County’s land area is 316 square miles. The density has increased steadily since 1980. In 2000 it reached 73.3 persons per square mile, which is greater than the densities of Madison, Shenandoah and Rappahannock Counties.

**Exhibit 18: Land Area and Population**

	Square Miles	Population			Population Change		Density		
		1980	1990	2000	1980-1990	1990-2000	1980	1990	2000
Virginia	39,703	5,346,818	6,187,358	7,078,515	15.7%	14.4%	135	156	178.3
Greene	157	7,625	10,297	15,244	35.0%	48.0%	48.6	65.6	97.1
Madison	322	10,232	11,949	12,520	16.8%	4.8%	31.8	37.1	38.9
Page	316	19,401	21,690	23,177	11.8%	6.9%	61.4	68.6	73.3
Rappahannock	267	6,093	6,622	6,983	8.7%	5.5%	22.8	24.8	26.2
Rockingham	854	*52,068	57,482	67,725	10.4%	17.8%	66.8	67.3	79.3
Shenandoah	512	27,559	31,636	35,075	14.8%	10.9%	53.8	61.8	68.5
Warren	217	21,200	26,142	31,584	23.3%	20.8%	97.7	121	145.5

Sources: US Census Bureau: 1980, 1990, and 2000

\*1980 population adjusted for annexation that took place in 1983.

## 4.6 Summary

Between 1980 and 2000, Page County’s population increased 19.5 percent, 11.8 between 1980 and 1990 and 6.9 percent between 1990 and 2000. The rural areas have grown significantly more rapidly than the three towns. Between 1980 and 2000 over three-quarters of the population increase was due to migration into the county.

The County’s population aged over the past 20 years and the median age of its residents is over three years higher than in the state as a whole. This reflects both a high growth rate in number of residents over 60 (37.4 percent since 1980) and a low growth rate in the number of residents under 39 years (2.3 percent since 1980).

Migration is an important factor in the county's population growth. If currently (2005) planned development in and around the three towns is realized, in-migration will increase significantly. Clearly, migration must be considered when making population projections for Page County.

## **4.7 Future Population**

Because numerous variables are involved, accurate population projections are difficult to make. In particular, projections will be affected by zoning, future interest rates, the emergence of new industries or the expansion or loss of existing industry. U.S. Census Bureau—population projections for Page County, as shown below in **Exhibit 34**, are 25,400 in 2010, 27,500 in 2020, and 30,200 in 2030.

## Chapter 5: Economy

Over the past five decades Page County’s economy has gone through a number of significant changes.

### **The 1950s and 1960s**

Through the decades of the 1950s and 1960s farming remained the county’s leading source of income. During this period farming was characterized by a wide range of activities on numerous small and mid-sized farms, ranging in size from less than 100 acres up to 200 acres. There were several dozen dairy operations with herd-sizes from less than forty head to over three hundred head. Numerous small poultry, beef and hog operations were spread throughout the county. Most farmers grew corn, hay and grains to feed their livestock. Wheat, barley, oats and corn were sold at local grain markets and harvested for ensilage. Several hundred acres of orchards in the Blue Ridge foothills yielded mainly peaches and some apples, cherries and damson plums. Several canneries employed seasonal laborers to process peaches and vegetable crops such as tomatoes, green beans and dry-land cress.

During the 1950s and 1960s retail and commercial activities were concentrated in the county’s three towns; Luray, Stanley and Shenandoah. All three towns had small locally owned department and hardware stores, gas stations, theaters, restaurants, banks, and grocery stores. Most residents bought what they needed in these modestly prosperous towns. Therefore, during this period, most Page County residents spent their money in the county.

During this period nearly 1500 people were employed in textile production in Luray and in smaller “sewing factories” in Stanley and Shenandoah. The Virginia Oak Tannery in Luray employed around 400 workers.

The rapidly growing tourist industry created many seasonal jobs. Luray Caverns attracted about a half million visitors and about one million visitors traveled on Skyline Drive in the Shenandoah National Park. A number of small and mid-sized motels sprang up to serve the increasing tourist traffic in Luray. The seasonal employment of hundreds of county residents in tourism became a well-established trend by the 1960s. Luray, with a number of motels, shops and eating establishments, was, and still is, the heart of the county’s tourist trade.

Since World War II, much of Page County's labor force commuted to Washington D.C. and the rapidly expanding suburbs of northern Virginia and Maryland for higher paying jobs in the

construction industry. Several hundred Page County textile workers also traveled to the American Viscose Plant, (later Avtex) in Front Royal to work for considerably higher, union-negotiated, wages. The migration of workers out of the county indicates that Page County's economy has not grown rapidly enough to provide sufficient higher paying jobs for its labor force.

### **Post 1970 Changes**

Since 1970, trends in farming have been dominated by two factors; increased specialization, and farmland consolidation. In the late 1970s and 1980s Page County farmers responded enthusiastically to the opportunities provided by large poultry processors, or integrators, to grow chickens and turkeys using extremely efficient and scientifically advanced methods. This led to a variable flood in poultry production and ushered in a new wave of relative prosperity for large and small farmers. By the mid-1990s nearly five hundred poultry houses-some the length of a football field-dotted the county's landscape. Beef cattle and corn production increased with the widespread application of cheap, nutrient rich, poultry manure to pastures and cropland. By the mid-1990s, Page County ranked third among Virginia counties in poultry production, and twenty-eighth (28th) in beef cattle production.

Since 1970 and in line with national trends, the county's industrial sector has lost a number of industries. Foreign competition forced the Virginia Oak Tannery nearly out of business. Subsequently it was sold and the facility was closed. By the mid-1980s the textile factory in Luray and the small "sewing factories" in Stanley and Shenandoah ceased operations. In the 1980s, Wallace, Lear and Wrangler, employed about 2000 workers. However, by 2001, all three industries had shut down their Page County manufacturing operations. At Alma, near Stanley, a Wampler-Longacre poultry processing plant, in existence for over fifty years, closed its doors. Over 400 people lost their jobs.

Several new industries have located in the County. Although the Town of Shenandoah lost its major employer, the Norfolk and Western Railroad Shops by the mid 1960's, by 1997 two new and smaller industries, the Genie Company, with approximately 250 employees, and KVK Specialties Inc., with approximately 135 employees, had opened their doors. Also in Shenandoah, the Shenandoah Machine Shop employs approximately 10 workers. In Stanley, Crown Door opened in the 1960s. Masonite bought out the company in the late 1990s and currently has around 300 employees. In Luray, EMCO opened its doors in 2000 and currently employs 290 workers. Also in Luray, Kiari's Coffee recently opened with 20 employees.

One of the most noticeable economic trends over the last thirty years has been the decline of certain types of retail and commercial businesses in the older “Main Street”, or downtown sections, of Page County’s three towns. Since the late 1960’s larger towns and cities - such as Harrisonburg, Front Royal, Charlottesville, Winchester, Washington D.C., and the suburbs of northern Virginia - developed large regional commercial centers attracting residents from smaller counties such as Page. By the late 1990s most county residents purchased many unobtainable items and services outside of the county. The opening of a super Wal-Mart in January 2000 in the emerging commercial center west of Luray reversed this trend. Shenandoah has undertaken restoration activities in its commercial district. Luray has engaged in extensive revitalization and is now home to several restaurants, inns and antique shops.

### **Current Trends**

This section will explore Page County’s economy and identify important changes and trends by examining the following:

- The county’s economic base - jobs producing goods and services
- The Labor Market
- Employment by industry, occupation and location
- Income

## 5.1 The County's Economic Base

The county's employment is divided into basic and non-basic, or supporting, employment. Basic employment industries sell most of their goods and services outside the county. Industries such as manufacturing, farming, and the federal government are considered basic industries. All of these industries are subject to national and regional demands.

The supporting sector markets goods and services locally. These industries are wholesale and retail trade, construction, finance, insurance, real estate, services, and local and state government functions. Most supporting industries rely upon the basic industries and local economy rather than on regional and national markets.

**Exhibit 19** displays the change in personal income from all industries during the 1990-2000 decade. Personal income from all industries grew during this period. Farming grew the least. Although small, the agricultural, forestry, and fishery industries grew the most. Manufacturing also grew considerably. Personal income from finance, insurance and real estate more than doubled.

**Exhibit 19: Page County: Personal Earnings by Industry – 1990-2000**

Industry Classification	Personal Earnings by Major Industry Classification (\$1,000)			Percent Change 1990-2000
	1990	1995	2000	
Total – Farm and Non-Farm	146,052	196,160	227,987	56.1%
Farm – Total	14,257	17,701	15,111	6.0%
Non-Farm – Total	131,795	178,459	212,876	61.5%
Private – Subtotal	105,985	146,775	171,627	61.9%
Government - Subtotal	25,810	31,684	41,249	59.8%
Federal	5,155	6,681	8,938	73.8%
Military	1,137	1,092	1,289	13.4%
State and Local	19,518	23,911	31,022	59.8%
<b>By Individual Private Industry</b>				
Agriculture, Forestry and Fisheries and mining	2,723	3,170	7,359	170.3%

Industry Classification	Personal Earnings by Major Industry Classification (\$1,000)			Percent Change 1990-2000
	1990	1995	2000	
Contract Construction	16,067	18,541	16,272	1.3%
Manufacturing	35,007	68,977	71,773	105.0%
Transportation and Public Utilities	6,297	6,122	10,273	63.1%
Wholesale and Retail Trade	14,999	17,298	21,979	46.5%
Finance, Insurance and Real Estate	3,303	4,532	5,568	68.6%
Services	27,589	28,135	38,403	39.2%
Total Private Industry	105,985	146,775	171,627	61.9%

Source: U.S. Bureau of Economic Analysis

**Exhibit 20** displays personal income from industries listed according to whether they are basic or support industries. Since 1990 earnings from basic industry have grown from 39.9 percent of the total in 1990 to 45.8 percent in 2000. Peak earning from basic industry occurred in 1995 at 49.9 percent of the total. Among the basic industries, manufacturing yielded the largest percent of personal income, 60 percent and higher. Income from farming dropped from 24.5 percent in 1990 to 14.5 percent of the income from basic industries in 2000.

Personal income from support industries has been consistently higher than from basic industries. However, as employment in basic industries has grown, income from support industries has decreased from 60 percent of the total in 1990 to 54.2 percent in 2000. The highest percent of income from support industries came from the service industry (28.6 to 31.4 percent).

**Exhibit 20: Page County Personal Incomes – Basic and Support Industries**

Industry	1990		1995		2000	
	\$	%	\$	%	\$	%
<b>Basic</b>						
Farming	14,257	24.5	17,701	18.1	15,111	14.5
Federal	5,155	8.8	6,681	6.8	8,938	8.6
Military	1,137	2.0	1,092	1.1	1,289	1.2
Ag., Forestry, Fisheries	2,723	4.7	3,170	3.2	7,359	7.0
Manufacturing	35,007	60.1	68,977	70.7	71,773	68.7
<b>Sub-Total Basic</b>	<b>58,279</b>		<b>97,621</b>		<b>104,470</b>	
<b>Supporting</b>						
State/Local Government	19,518	22.2	23,911	24.3	31,022	25.1
Construction	16,067	18.3	18,541	18.8	16,272	13.2
Wholesale/Retail	14,999	17.1	17,298	17.6	21,979	17.8
Finance/Ins/Real est.	3,303	3.8	4,532	4.6	5,568	4.5
Services	27,589	31.4	28,135	28.6	38,403	31.1
Trans/Pup. Utilities	6,297	7.2	6,122	6.2	10,273	8.3
<b>Sub-total Supporting</b>	<b>87,773</b>		<b>98,539</b>		<b>123,517</b>	
<b>Basic plus Supporting</b>	<b>146,052</b>		<b>196,160</b>		<b>227,987</b>	
% Basic	39.9%		49.8%		45.8%	
% Supporting	60.1%		50.2%		54.2%	

Source: U.S. Bureau of Economic Analysis

As shown on **Exhibit 21**, tourism plays a large role in Page County's economy and in the economies of the surrounding area. The two industries most affected by tourism are services and wholesale and retail trade. Restaurants and lodging income from tourism accounted for nearly one third of the personal income from services in 2000. Restaurants and lodging plus wholesale and retail trade accounted for 28% of personal income from support industries in 2000. Given the county's abundance of attractions, Page County's low dollar and payroll figures relative to most of the other NSVRC jurisdictions indicate a potential for significant growth in the tourism industry.

**Exhibit 21: Travel and Tourism – Expenditures and Employment, 1995 and 2000**

	1995			2000			Percent Change 1995-2000		
	Total \$ Spent (1000)	Payroll \$	Number Employed	Total \$ Spent (1000)	Payroll \$	Number Employed	Total \$ Spent	Payroll \$	Number Employed
Virginia	9,981,800	2,712,760	166,440	13,172,500	4,038,900	208,200	32.0%	48.9%	25.1%
NSVRC	210,180	40,940	3,180	342,783	68,875	4,649	63.1%	68.2%	46.2%
Winchester City	38,660	8,880	720	53,682	12,559	829	38.9%	41.4%	15.1%
Clarke	6,010	850	70	9,798	1,873	131	63.0%	120.4%	87.1%
Frederick	34,400	6,890	540	50,324	10,459	728	46.3%	51.8%	34.8%
Page	25,800	5,540	430	37,387	8,018	549	44.9%	44.7%	27.7%
Shenandoah	68,790	11,890	920	114,088	22,655	1,524	65.8%	90.5%	65.7%
Warren	36,520	6,890	500	77,504	13,311	888	112.2%	93.2%	77.6%

Source: Virginia Tourism Corporation

## 5.2 The Labor Market

Labor force refers to the number of persons 16 or over who are employed or seeking employment.

### Participation in the Civilian Labor Force

**Exhibit 22** displays Page County's labor force participation since 1970. The percent of the population 16 years and older participating in the civilian labor force has grown slowly, but steadily, from 54.5 percent in 1970 to 62.2 percent in 2000.

**Exhibit 22: Page County Labor Force Participation – 1970-2000**

	1970	1980	1990	2000
Total Population, 16 years and over	11,838	14,730	17,152	18,497
Not in Labor Force	5,376	6,177	6,746	6,981
Civilian Labor Force	6,450	8,542	10,400	11,511
Employed	6,188	7,726	9,590	11,061
Unemployed	262	816	810	450
Unemployment Rate	4.1%	9.6%	7.8%	3.9%

Source: US Bureau of Census

In 2000, the labor force participation of the county's males was 69.2 percent (6279 out of 9079). Labor force participation by males in the surrounding area was 71.7 percent (see **Exhibit 23**). For members of the NSVRC the male participation rate was 74.9 percent and for the state it was 73.4 percent. The labor force participation rate for the county's females was 55.6 percent (5232 out of 9418). The rate for the surrounding area was 58.4 percent (see **Exhibit 23**), for the NSVCR it was 59.4 percent and for the state it was 60.6 percent. In 2000 the employment gap between males and females in Page County was 13.6 percentage points, considerably less than in 1990 when 72.2 percent of males were employed compared to only 49.9 percent of females.

### **Proportion of the Labor Force Actually Employed**

**Exhibit 23** presents employment information on Page County and the regional labor pool. Regional is defined as the area within a 30-mile radius of Luray. As shown on this Exhibit, the percent of Page County's population aged 16 and over actually employed in 2000 was 59.8 percent, a figure moderately below rates in all the other communities except the City of Harrisonburg (53.7%).

**Exhibit 23: Page County and the Regional Labor Pool - 2000**

Jurisdiction	Total Population 16 and Older	In Civilian Labor Force		Number Employed in Civilian Labor Force	Percent of Population 16 & Older Employed
		Number	Percent of Total		
Page County	18,497	11,511	62.2%	11,061	59.8%
Culpeper County	26,543	16,825	63.4%	16,285	61.4%
Greene County	11,493	8,309	72.3%	8,085	70.3%
Harrisonburg	35,052	20,763	59.2%	18,834	53.7%
Madison County	9,875	6,373	64.5%	6,170	62.5%
Rappahannock County	5,569	3,672	65.9%	3,591	64.5%
Rockingham County	52,819	35,853	67.9%	34,650	65.6%
Shenandoah County	28,092	18,204	64.8%	17,710	63.0%
Warren County	24,361	16,245	66.7%	15,687	64.4%
Totals for Area	212,301	137,755	64.9%	132,073	62.2%
<b>Participation by Sex</b>					
Males	103,213	74,027	71.7%	71,084	68.87%
Females	109,088	63,728	58.4%	60,989	55.91%

Source: U.S. Census, 2000

## Educational Attainment of the Adult Population

Recent high school graduates are a major source of labor. According to the U.S. Census Bureau, in 1990, 35% of the residents 25 years and older were high school graduates and 10.6 percent held post high school degrees (Associates Degree, BA, MA or PhD). In 2000, 39.7 percent were high school graduates and 12 percent held post high school degrees.

## Unemployment

**Exhibit 24** provides unemployment rates from 1995 through 2005. It should be noted that while the trends match those in **Exhibit 22**, the figures do not. This is because the sources, Bureau of Labor Statistics and Bureau of the Census, use different inputs. Throughout the second half of the 1990s, unemployment declined steadily. In 2000, the county unemployment rate hit 2.6 percent, the lowest rate in the past ten years. During the early part of this decade, unemployment increased. However, since 2003 the unemployment rate has been declining (from 7 percent in 2003 to 4.9 percent in 2005).

Page County's unemployment rate, like other rural areas, varies with the seasons of the year. The county's unemployment is highest in the winter months (November to February) and lowest in the summer and early autumn (July through September) when the tourism, agricultural and construction industries are the busiest.

**Exhibit 24: Unemployment Rates – 1995-2005**

Month	Subjects	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
January	Labor Force	13,096	13,127	11,763	11,773	12,250	11,676	11,806	12,645	11,961	11,782	11,372
	Unemployed	1,839	1,680	1,374	1,170	1,038	566	513	1,019	951	967	730
	% Rate	14.0%	12.8%	11.7%	9.9%	8.5%	4.9%	4.4%	8.1%	8.0%	8.2%	6.4%
February	Labor Force	12,942	12,547	11,712	11,656	11,998	11,533	11,801	12,244	11,892	11,640	11,393
	Unemployed	1,586	1,404	1,249	1,009	893	498	458	939	1,181	837	750
	% Rate	12.3%	11.2%	10.7%	8.7%	7.4%	4.3%	3.9%	7.7%	9.9%	7.2%	6.6%
March	Labor Force	12,911	12,269	11,351	11,494	11,891	11,572	11,950	12,205	11,923	11,758	11,528
	Unemployed	1,319	1,015	803	773	730	371	421	876	1,069	754	661
	% Rate	10.2%	8.3%	7.1%	6.7%	6.1%	3.2%	3.5%	7.2%	9.0%	6.4%	5.7%
April	Labor Force	12,448	12,096	11,129	11,227	11,551	11,620	11,824	12,383	11,758	11,577	11,577
	Unemployed	789	620	436	323	323	244	330	766	864	552	548
	% Rate	6.3%	5.1%	3.9%	2.9%	2.8%	2.1%	2.8%	6.2%	7.4%	4.8%	4.7%

Month	Subjects	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
May	Labor Force	12,458	12,276	11,160	11,240	11,411	11,816	12,022	12,418	11,922	11,698	11,543
	Unemployed	702	632	319	331	299	262	340	662	941	550	503
	% Rate	5.6%	5.2%	2.9%	2.9%	2.6%	2.2%	2.8%	5.3%	7.9%	4.7%	4.4%
June	Labor Force	12,653	12,166	11,462	11,507	11,640	11,990	12,254	12,401	12,060	11,844	11,686
	Unemployed	756	519	415	350	251	272	355	658	808	565	517
	% Rate	6.0%	4.3%	3.6%	3.0%	2.2%	2.3%	2.9%	5.3%	6.7%	4.8%	4.4%
July	Labor Force	12,708	12,521	11,834	11,565	11,645	11,859	12,250	12,378	12,270	12,024	11,891
	Unemployed	833	825	770	305	217	257	328	600	752	535	456
	% Rate	6.6%	6.6%	6.5%	2.6%	1.9%	2.2%	2.7%	4.9%	6.1%	4.5%	3.8%
August	Labor Force	12,444	12,107	11,352	11,514	11,581	11,793	12,236	12,155	12,036	11,807	11,768
	Unemployed	616	362	313	350	230	250	374	598	682	492	441
	% Rate	5.0%	3.0%	2.8%	3.0%	2.0%	2.1%	3.1%	4.9%	5.7%	4.2%	3.7%
September	Labor Force	11,797	12,230	11,346	11,661	11,649	11,777	12,355	12,299	11,823	11,695	11,633
	Unemployed	449	753	340	531	344	219	362	591	653	454	546
	% Rate	3.8%	6.2%	3.0%	4.6%	3.0%	1.9%	2.9%	4.8%	5.5%	3.9%	4.7%
October	Labor Force	11,840	11,761	11,505	11,159	11,576	11,651	12,315	12,173	11,829	11,771	11,652
	Unemployed	520	373	394	432	290	190	338	563	598	446	540
	% Rate	4.4%	3.2%	3.4%	3.9%	2.5%	1.6%	2.7%	4.6%	5.1%	3.8%	4.6%
November	Labor Force	12,337	12,016	11,780	11,729	11,680	11,515	12,225	12,030	11,709	11,769	11,643
	Unemployed	954	517	593	515	397	209	430	807	640	462	533
	% Rate	7.7%	4.3%	5.0%	4.4%	3.4%	1.8%	3.5%	6.7%	5.5%	3.9%	4.6%
December	Labor Force	12,578	12,226	12,205	11,977	11,868	11,510	12,285	12,006	11,851	11,963	11,742
	Unemployed	1,136	936	962	790	691	306	576	890	803	633	655
	% Rate	9.0%	7.7%	7.9%	6.6%	5.8%	2.7%	4.7%	7.4%	6.8%	5.3%	5.9%
Year Average	Labor Force	12,518	12,279	11,550	11,542	11,728	11,693	12,110	12,278	11,920	11,777	11,619
	Unemployed	958	803	664	573	475	304	402	747	829	604	573
	% Rate	7.7%	6.5%	5.8%	5.0%	4.1%	2.6%	3.3%	6.1%	7.0%	5.1%	4.9%

Source: Bureau of Labor Statistics

### 5.3 Employment by Industry, Occupation and Location

The Bureau of Census classifies employment of the resident labor force in two different ways. The first is by the industry in which employees work, such as agriculture, manufacturing, services, etc. The second is by the employee's occupation within industries. Managers or clerical workers, for example, are employed in a number of industries.

## Employment by Industry

**Exhibit 25** provides data on employment according to the industries in which Page County residents work. It does not give the location where they are employed. A Page County resident could be employed in the manufacturing sector but working in Fairfax County. This data is important because existing industries or new industries moving into Page County are concerned about the available workforce. New industries in Page County could attract county workers commuting elsewhere.

**Exhibit 25: Employment by Industry**

Industry	1980		1990		2000		Percent Change 1980-	Percent Change 1990-
	Number	Percent	Number	Percent	Number	Percent		
Agricultural Services, Forestry, Fisheries & Mining	616	8.0%	651	6.8%	440	4.0%	5.7%	-32.4%
Construction	1,142	14.8%	1,648	17.2%	1480	13.4%	44.3%	-10.2%
Manufacturing	2,601	33.7%	2,482	25.9%	2,979	26.9%	-4.6%	20.0%
Transportation, Warehousing & Other Utilities	383	5.0%	464	4.8%	370	3.3%	21.1%	-20.3%
Wholesale and Retail Trade	1,149	14.9%	1,675	17.5%	1,430	12.9%	45.8%	-14.6%
Finance, Insurance & Real Estate	187	2.4%	311	3.2%	330	3.0%	0.9%	6.1%
Services*	1,379	17.8%	2,070	21.6%	3,690	33.4%	50.1%	78.3%
Government**	269	3.5%	289	3.0%	342	3.1%	7.4%	18.3%
Civilian Labor Force	7,726	100%	9,590	100%	11,061	100%	24.1%	15.3%

Source: U.S. Census Bureau, 1980, 1990, 2000

\*Professional, Scientific, Management, Administrative, Waste Management, Arts, Entertainment, Recreation, Accommodation, Food Services and 'other'.

\*\* Local and State Government

The greatest growth in employees took place in the service industry and by 2000 it employed the largest number of Page County workers. It is important to note that this category includes numerous different sectors in addition to those related to tourism. Manufacturing remains the second largest employer. In 2000, over half of Page County's working residents were employed in either the manufacturing or service industries. Three industries - construction, transportation, warehousing & other utilities and wholesale & retail trade - lost employees relative to other industries in the last decade.

### **Employment by Occupation**

**Exhibit 26** shows the types of work Page County residents perform within the various industries.

Throughout the past two decades the largest group of workers have been those involved in the production (manufacture) and transportation of goods and materials. Twenty six (26) to 33 percent of the labor force has been involved in this type of work and, in 2000, 3025 people participated in these occupations.

The numbers of employees who identify themselves as sales persons or clerical workers continue to increase. By 2000 there were 2201 people working in these occupations. Between 1980 and 2000 the numbers of workers in these occupations increased 58 percent.

Construction, extraction and maintenance, which includes trade workers, craftsmen, repair occupations and the operation of heavy equipment, accounted for 17 to 20 percent of the work force. The numbers involved in these occupations declined between 1990 and 2000.

The largest increase (61 to 66 percent) over the past two decades occurred among workers who identified themselves as professionals or managers. This includes people involved in business and financial operations, math, engineering, teaching, legal services, farmers and farm management. In 2000, they made up almost 19 percent of the work force.

The people who identify themselves as service workers account for only 16 percent of the work force and include fire, police, building and grounds maintenance as well as food preparation and serving. The numbers of these workers has increased steadily over the past two decades, 34.5 percent between 1980 and 1990, and 45.5 percent between 1990 and 2000.

**Exhibit 26: Employment by Occupation**

Occupation	1980		1990		2000		Percent Change	
	Total	Percent	Total	Percent	Total	Percent	1980-1990	1990-2000
Employed Civilian Labor Force 16 years and over	7,726	100%	9,590	100%	11,061	100%	24.1%	15.3%
Managerial & Professional Specialties	772	10.0%	1242	13.0%	2064	18.7%	60.9%	66.2%
Sales, Clerical & Office Workers	1393	18.0%	2031	21.2%	2201	19.9%	45.8%	8.4%
Construction, Extraction & Maintenance	1581	20.5%	2,063	21.5%	1899	17.2%	30.5%	-7.9%
Production, Transportation, material moving	2,558	33.1%	2,462	25.7%	3025	27.3%	-3.8%	22.9%
Farming, Fishing & Forestry	529	6.8%	591	6.2%	125	1.1%	11.7%	-78.8%
Service Workers	893	11.6%	1,201	12.5%	1747	15.8%	34.5%	45.5%

Source: Summary Tape 3A, U.S. Bureau of the Census, 1980, 1990, and 2000

### Commuting Patterns

In addition to which industries employ Page County workers and what kinds of jobs workers have within those industries, it is important to know where workers go to find employment. **Exhibit 27** displays the commuting patterns of the Page County workforce.

In 1980, 30.1 percent (2,327) of 7726 Page County workers indicated that they commuted out of the county for jobs. In 1990, 35.1 percent (3364) of the 9,590 employed Page County residents were commuting out of the county for jobs. By 2000 workers commuting out of the county for jobs had dropped to 24.6 percent. Approximately 17 percent were going south either to Harrisonburg or to Rockingham County. Another 6 percent commuted west and north to areas within the NSVRC Planning District and 1.5 percent traveled to jobs elsewhere in Virginia.

From 1980 to 2000, between 632 and 713 people commuted into Page County for jobs. A substantial majority (69 to 92%) of them came from Harrisonburg and Rockingham County. Clearly, a significant portion of Page County’s employed workforce is commuting to jobs outside the county.

**Exhibit 27: Commuting Patterns**

	1980			1990			2000		
	Into Page	Out of Page	Net In	Into Page	Out of Page	Net In	Into Page	Out of Page	Net In
<b>NSVRC*</b>									
Clark County	0	0	0	7	53	-46	3	20	-17
Frederick County	20	4	16	17	6	11	8	86	-78
Shenandoah County	90	126	-36	103	225	-122	119	230	-111
Warren County	59	508	-449	30	317	-287	41	302	-261
Winchester City	15	10	5	3	0	3	-	42	-42
<b>Sub-total</b>	184	648	-464	160	601	-441	171	680	-509
<b>Other Virginia Communities</b>									
Alexandria		40	-40		21	-21	-	-	-
Fairfax City & County		317	-317		386	-386	-	-	-
Harrisonburg and Rockingham County	306	766	-460	358	1519	-1161	424	1874	-1450
Manasses City	0	52	-52	-	-	-	-	-	-
Prince William County	12	24	-12	0	187	-187	-	-	-
Other areas in VA	125	330	-205	32	0	32	58	171	-113
<b>Sub-total VA</b>	443	1529	-1086	390	2113	-1723	482	2045	-1563
<b>Outside Virginia</b>									
Washington DC	0	51	-51	0	305	-305	-	-	-
Maryland	0	66	-66	27	253	-226	9	-	-9
West VA	5	20	-15	93	31	62	-	-	-
Other States, Countries	0	13	-13	43	61	-18	11	-	11
<b>Sub-Total</b>	5	150	-145	163	650	-487	20		2
<b>TOTALS</b>	632	2327	-1695	713	3364	-2651	673	2725	-2052

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

\* NSVRC, Northern Shenandoah Valley Regional Commission

## 5.4 Income

Income can be looked at in several ways:

- Median income
- Income distribution
- Per capita personal income
- Weekly income
- Poverty rate
- Components of personal income

### Median Income

Page County's median household income was \$25,831 in 1990 and \$33,359 in 2000. In both 1990 and 2000 the median household income in Page County was less than in the other five members of the NSVRC. As shown on **Exhibit 28**, Page County's median household income in 2000 was lower than that of Virginia (\$43,982) and the United States (\$41,994).

**Exhibit 28: Median Household Incomes – 1990 and 2000**

	1990	2000	Percent Change
Clarke County	\$36,240	\$51,601	42.4%
Frederick County*	\$35,306	\$46,941	33.0%
Winchester City	\$30,360	\$34,335	13.1%
Page County	\$25,831	\$33,359	29.1%
Shenandoah County	\$29,193	\$39,173	34.2%
Warren County	\$32,904	\$42,422	28.9%
NSVRC	\$31,896	\$41,508	30.1%

Source: U.S. Census Bureau, 1990 and 2000

\*The figures for Frederick County exclude Winchester, which, as a NSVRC member, is listed separately

## Income Distribution

In 1990, 17.4 percent of Page County's households had incomes below \$10,000. By 2000 this figure had dropped to about 12 percent. In 1990 13.7 percent of the households had incomes of \$50,000 or more. By 2000, the percent of families in this category increased to 26.5 percent. However, in 2000, 73.5 percent of households in Page County earned less than \$50,000 and nearly half (47.8%) earned less than \$35,000.

**Exhibit 29: Page County Household Income Distribution – 1990, 2000**

Income Range	1990		2000		Percent Change
	Number	Percent	Number	Percent	
Less than \$ 10,000	1391	17.4%	1112	11.9%	-20.06%
\$10,000 to \$14,999	851	10.6%	714	7.7%	-16.10%
\$15,000 to \$24,999	1,769	22.1%	1,687	18.1%	-4.64%
\$25,000 to \$34,999	1,490	22.1%	1,349	14.5%	-9.46%
\$35,000 to \$49,999	1,413	17.6%	1,982	21.3%	40.27%
\$50,000 to \$74,999	761	9.5%	1531	16.4%	101.18%
\$75,000 to \$99,999	202	2.5%	528	5.7%	161.39%
\$100,000 to \$149,000	97	1.2%	290	3.1%	198.97%
\$150,000 or more	38	0.5%	120	1.3%	215.79%
Total	8,012	100.0%	9,313	100.0%	16.24%

Source: Summary Tape 3A, U.S. Bureau of Census, 1990 and 2000

## Per Capita Personal Income

As shown in **Exhibit 30**, Page County's 1990 per capita income was \$11,304. The per capita personal income in the county was 28.1 percent lower than the state's figure, of \$15,713. By 2000, Page's per capita income had increased to \$16,321, a figure 32 percent below the state's figure. Although Page's per capita income has increased steadily, its rate of increase consistently has been lower than that of the state. Between 1990 and 2000 Page County's per capita income increased 44.4 percent. Over the same period, the state's per capita income increased over 52 percent.

Page County’s per capita income remains significantly lower than that of all the other NSVRC members. It is 17.4 percent lower than that in Shenandoah County, the community with the next lowest per capita income in the NSVRC.

**Exhibit 30: Per Capita Personal Income – 1970-2000**

	1970	1980	1990	2000
Clark	3,080	7,473	15,657	24,844
Frederick	2,548	6503	13,671	21,080
Winchester City	2,954	7,358	14,214	20,500
Page	2,187	5,395	11,304	16,321
Shenandoah	2,293	5,849	12,686	19,755
Warren	2,689	6,326	13,580	19,841
VIRGINIA	3,013	7,478	15,713	23,975

*Source: Summary Tape 3A, U.S. Bureau of the Census 1970, 1980, 1990 and 2000*

### **Average Weekly Wage**

In Page County the average weekly wage paid to workers during the first quarter of 1990 was \$259. By 2005 this figure had increased almost 72 percent to \$442. In 2005, the sectors paying the highest average weekly wages were transportation, communication, and utility firms (\$620), wholesale trade (\$610), finance, insurance, & real estate (\$520). Except in 1990, the lowest paying sector is retail sales (annual salary \$17,316). The next lowest-paying sector is services (annual salary \$20,228). The numbers of Page County workers employed in these sectors have increased more rapidly than in most other sectors and in 2000 these sectors accounted for nearly 36 percent of the county’s employed workforce.

**Exhibit 31: Page County Average Weekly Wages by Industry – 1990, 1995, 2000 and 2005**

	1990	1995	2000	2005
Agricultural, Forestry, Fisheries*	-	\$292	\$404	\$541
Construction	\$286	\$338	\$392	\$491
Manufacturing	\$297	\$375	\$430	\$513
Transportation, Communication, Utilities*	-	-	\$672	\$620
Retail Trade	\$225	\$238	\$278	\$333
Wholesale Trade*	\$230	-	\$446	\$610
Finance, Insurance, Real Estate	\$286	\$358	\$357	\$520
Services**	\$216	\$258	\$309	\$389
Average	\$259	\$326	\$373	\$442

Source: Virginia Employment Commission, Annual Quarterly Census of Wages, 1990, 1995, 2000 and 2005.

\* No comparable figures given for the years indicated (-)

\*\* Health care, food services, social assistance and "other".

**Poverty Rate**

As shown in **Exhibit 32**, except for Winchester, Page County has the highest number of individuals (12.3%) living below the poverty level of all NSVRC members. While lower than the U.S. rate (12.4%), it is higher than the Virginia rate (9.3%). Except for Virginia, Page County also has the highest percent (11.3%) of children between 5 and 15 below the poverty level. In addition, as mentioned earlier, Page County has the lowest household median income of the NSVRC communities. It is also lower than the household median incomes of both the U.S. and Virginia.

**Exhibit 32: Estimates of Poverty and Household Income 2000**  
**(Page County, NSVRC, Virginia, U.S.)**

Locality	Individuals below the Poverty Level		Children A below the Poverty Level Aged 5-17		Median Household Income (Dollars)
	Number	Percent	Number	Percent	
U.S.	33,899,812	12.4%	8,334,833	15.7	41,994
Virginia	656,641	9.3%	149,749	11.7%	34,982
NSVRC	15,842	7.9%	3,243	7.2%	41,508
Clarke County	811	6.4%	145	4.9%	51,601
Frederick County	3,727	6.3%	825	5.3%	46,941
Winchester	2,991	12.7%	455	8.9%	34,335
Page County	2,845	12.3%	603	11.3%	33,359
Shenandoah County	2,837	8.1%	712	9.1%	39,173
Warren County	2,631	8.3%	503	6.2%	42,422

*Source: U.S. Census Bureau, Profiles of General Demographic Characteristics*

### Components of Income

The Bureau of Economic Analysis breaks personal income into three sources. The first is the “Net Earnings from Work” which are the individual’s gross work earnings less Medicare and social security deductions, the cost of commuting to work, etc. The second is “Dividends, Interest, and Rent Receipts” which are self-explanatory. The last source is “Transfer Payments” defined as retirement and disability payments, unemployment insurance, medical, educational and public assistance benefits, etc, **Exhibit 33** presents Personal Income Components for Page County residents, residents of NSVRC communities and Virginia residents.

**Exhibit 33: Components of Personal Income**

	1990		2000		2004		Percent Increase 1900-2000
	\$(1000)	Percent	\$(1000)	Percent	\$(1000)	Percent	
<b>Page County</b>							
Net Earnings from Work	188,872	66.9%	307,389	64.1%	333,866	62.4%	62.7%
Dividends, Interest, and Rent	56,062	15.0%	85,324	17.8%	87,963	16.4%	52.2%
Transfer Payments	46,734	18.1%	86,912	18.1%	113,634	21.2%	86.0%
<b>Total Personal Income</b>	<b>291,668</b>		<b>479,624</b>		<b>535,463</b>		<b>64.4%</b>
<b>NSVRC*</b>							
Net Earnings from Work	1,811,100	68.4%	3,315,261	69.0%	4,069,075	69.7%	83.1%
Dividends, Interest, and Rent	544,456	17.9%	904,447	18.8%	976,360	16.7%	66.1%
Transfer Payments	293,351	13.7%	582,656	12.1%	788,780	13.5%	98.6%
<b>Total Personal Income</b>	<b>2,648,907</b>		<b>4,802,364</b>		<b>5,834,215</b>		<b>81.3%</b>
<b>Virginia</b>							
Net Earnings from Work	91,909,406	70.6%	160,213,993	70.6%	198,916,444	73.5%	74.3%
Dividends, Interest, and Rent	23,996,637	16.5%	39,100,257	16.5%	43,425,459	16.0%	62.9%
Transfer Payments	11,223,277	12.9%	21,531,255	12.9%	28,379,794	10.5%	91.8%
<b>Total Personal Income</b>	<b>127,129,320</b>		<b>220,845,445</b>		<b>270,721,697</b>		<b>73.7%</b>

Source: Personal Income by Major Sources, Bureau of Economic Analysis (BEA), July 2006

\* NSVRC is the Northern Shenandoah Valley Regional Commission that is made up of Page, Warren, Clarke, Shenandoah and Frederick Counties and the City of Winchester.

As shown elsewhere, personal income has increased in recent years. According to the BEA analysis, between 1990 and 2000 total personal income in the county 64.4 percent. “Net earnings from work” is the largest component of personal income and increases in this component is the primary driver of the total personal income increase. However, because net earnings from work in the NSVRC and state increased significantly more than they did in Page County, total personal income in Page County did not increase as much as it did in the NSVRC or in the State.

Dividends, interest and rent receipts make up only 16-17 percent of total personal income in Page County, the NSVRC and the state. It should be noted that the rate of increase in this sector was somewhat lower in Page County than in the NSVRC and the state.

As with dividends, interest and rent, transfer payments constitute only a modest portion of total personal income, 10.5 to 21.2 percent. However, transfer payments make up a larger share of personal income in Page County than in either the NSVRC or the state. At the same time the increase in these payments was lower in Page County than in the NSVRC or the state.

In summary, total personal earnings in Page County did not increase as much as they did in the NSVRC and in the state because none of the components of personal income increased in Page County as much as they did in the NSVRC and the State. The most significant factor was the lower rate of increase in net wages from work.

## **5.5 Summary**

In 2000, approximately 45 percent of labor force earnings in the county were in industries that provide the county's economic base, and this represents a decrease from the 49.9 percent in 1995. Those "basic" industries are industries that sell the majority of their goods and services outside the county, thus bringing money into the county from other areas. As noted below, however, a significant number of Page County workers commute to "basic" industry jobs located outside the county.

Much of the county's basic employment is in manufacturing. From 1990 to 2000, income from employees in manufacturing made up between just over 60 to just over 70 percent of the total earned in basic industries. Personal income from farming has remained relatively constant over the same period and, in 2000, it accounted for about 14 percent of "basic" industry personal income.

Page County's economic base has diversified in recent years. Tourism, wholesale and retail sales and services are significant factors in the county's economy. In addition, employment has increased in various professions such as technology, teaching, engineering, financial operations and business.

Roughly 25 percent of Page County's workforce commutes outside the county for work, primarily to Rockingham County to the south and to areas within the NSVRC to the north and

west. Existing industries or new industries moving into Page County could attract county workers commuting elsewhere.

Income analysis reveals that in 2000 household median income was \$33,359, lower than that of surrounding NSVRC communities, the state and the U.S. In 2000, 73.5 percent of Page County households had incomes of less than \$50,000 and 47.8 percent had incomes less than \$35,000. The Page County per capita income of \$16,841 is lower than that of the NSVRC and the state. The percent of individuals living below the poverty level (12.3%) is greater than in other NSVRC communities as well as the state. The percent of children ages 5 to 17 living in poverty (11.3%) is greater than any of the NSVRC communities, the state or the U.S.

The fastest growing sectors of Page County's economy are retail sales and the service industry. In 2005 the annual salaries in these two sectors were \$17,316 and \$20,228 respectively.

## Chapter 6: Housing

Actions of the county and town governments affect the provision of housing, and it is necessary that these government bodies plan to meet both present and future housing needs. This section considers the housing market in Page County, housing need, and projected changes in the total housing stock through 2020.

### 6.1 Housing Market

Page County is defined as a basic housing market. The county is also part of the regional housing market. Further, because of access to the metropolitan area via Routes I-81 and I-66, the county is a sub-market of the Washington, D.C. Metropolitan Area housing market. Families earning their primary income in the metropolitan area now consider Page County as a place to live. Currently, it offers relatively lower-cost housing than Rockingham County-Harrisonburg, Shenandoah or Warren Counties.

### 6.2 Demand for New Housing

Based on the Federal Housing Administration market analysis criteria, the major determinants of housing demand are:

- The rate of growth in the number of households
- Affordability
- Liquid asset holdings, down payment and mortgage term requirements
- Space, convenience and style requirements

#### Households

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

Dwelling unit - A house, mobile 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 living in group quarters.

As shown in **Exhibit 34**, the size of households in Page County has declined steadily and is projected to continue to decline through 2030. In 1980, Page County’s average household size had dropped to 2.78 while the national average had dropped to 2.75. By 1990, the county’s average was 2.67 and the national average was 2.63.

In 2000 Page County’s average had fallen to 2.46. Until 2000, Page County’s household size was greater than the national average. In 2000 it fell below the national average.

**Exhibit 34: Households and Housing Units**

	Actual			Projections		
	1980	1990	2000	2010	2020	2030
Population	19,401	21,690	23,177	25,400	27,500	30,200
Persons not in households	139	214	260	260	260	260
Persons per household	2.78	2.67	2.46	2.42	2.38	2.34
Number of households	6,929	8,043	9,316	10,388	11,445	12,795
Number of Housing Units	8,329	8,948	10,557	11,614	12,796	14,305

*Sources: Summary Tape 1A, U.S. Bureau of Census, 1990 and 2000*

- *Projected of Number of Households - Page County: Northern Shenandoah Valley Regional Commission 2006. Projected Household sizes are calculated from the National Projections based on the ratio of Page County’s household size (2.46) to the National household size (2.59) in 2000, which was 94.98 percent.*
- *Projected Number of Housing Units: Based upon the 2000 vacancy rate of 11.8% remaining constant.*

The declining household size means that the rate of housing unit growth will have to exceed the rate of population growth in order to meet the housing demand. Although the U.S Census Bureau population projections for Page County presented in **Exhibit 34** are only estimates, they can be used to provide an indication of the number of housing units that may be needed in the next few decades. The projected 9.6 percent increase in population between 2000 and 2010 (to 25,400 persons) combined with a decline in the average household size would generate an 11.5 percent increase in the number of households. The projected 8.3 percent population increase between 2010 and 2020 (to 27,500 persons) would generate a 10.2 percent increase in the

number of households. The projected 9.8 percent increase in population between 2020 and 2030 would lead to an 11.8 percent increase in the number of households.

### Affordability

A major concern to builders is the housing price range new householders can afford. As shown in **Exhibits 28 and 30**, Page County household and per capita income levels for 2000 are the lowest among all the members of the NSVRC. As shown in **Exhibit 32**, Page County is second only to the City of Winchester in both the number of individuals and the number of children living below the poverty level.

**Exhibit 35** displays Page County 1999 household income levels and the housing costs affordable for home-buying households at each income level. It should be noted that 37.7 percent of Page County households fall into the “Low Income” category for whom the maximum affordable housing is \$62,498. An additional 52.2 percent fall under “moderate Income” for whom the maximum affordable housing is \$187,498. Housing prices below \$187,498 would meet the needs of 89.9 percent of Page County households.

According to the US Bureau of the Census, the 2003 median income of Page County households was \$34,429, a figure that falls within the moderate-income category and supports housing needs in the \$50,000 to \$187,498 price range.

**Exhibit 35: Page County Household Incomes and Affordable Housing**

Household Incomes in 1999	General Income Level	Percent of Total Households in 1999	Projected Distribution of New Households		Affordable Housing Range at 2 and 2.5 Times Gross Annual Income	Affordable Total Monthly Housing at 28% Gross Monthly Income	Affordable Mortgage or Rental Payment at 75% Total Monthly Housing Cost
			2000-2010	2010-2020			
\$					\$	\$	\$
Less than 10,000	Low	11.9%	126	141	To \$ 20,000	\$ 233 maximum	\$175 maximum
10,000 to 14,999		7.7%	81	91	20,000 to 37,500	233 to 350	175 to 262
15,000 to 24,999		18.1%	191	214	30,000 to 62,498	350 to 583	263 to 437
25,000-34,999	Moderate	14.5%	153	171	50,000 to 87,498	583 to 817	\$438 to 612
35,000-49,999		21.3%	225	252	70,000 to 124,998	817 to 1167	613 to 875

Household Incomes in 1999	General Income Level	Percent of Total Households in 1999	Projected Distribution of New Households		Affordable Housing Range at 2 and 2.5 Times Gross Annual Income	Affordable Total Monthly Housing at 28% Gross Monthly Income	Affordable Mortgage or Rental Payment at 75% Total Monthly Housing Cost
			2000-2010	2010-2020			
\$					\$	\$	\$
50,000-74,999		16.4%	173	194	100,000 to 187,498	1167 to 1750	875 to 1312
75,000-99,999	High	5.7%	60	67	150,000 to 249,998	1750 to 2333	1313 to 1750
100,000-149,999		3.1%	33	37	200,000 to 374,998	2333 to 3500	1750 to 2625
150,000 or more		1.3%	14	15	300,000 or more	3500 or more	2625 or more
Total		100%	1,057	1,182			

Sources: Northern Shenandoah Valley Regional Commission, Table DP-3, Profiles of Selected Economic Characteristics, 2000 and U.S. Bureau of the Census, Summary Tape 3A, 2000.

### Explanation of the terms used in Exhibit 35.

*The projected distribution of anticipated new households at each income range for the years 2010 and 2020 is based on the 1999 income distribution. This assumes that the income distribution among these households will be approximately the same for the near future as it was in 1999. It also depends upon continued expansion of the local economy. The total number of anticipated new households in **Exhibit 35** is the same as that used in **Exhibit 34** to calculate the number of households projected for 2010 and 2020.*

*The affordable total monthly housing cost at 28 percent of the household's gross monthly income is an estimate of one week's take-home pay and is an accepted guide for total monthly housing cost.*

*The affordable mortgage or rental payment is obtained by multiplying the total monthly housing cost by 75%. The remaining 25 percent is to cover utilities, maintenance, taxes, insurance, and other incidental housing costs. Depending upon which costs are included in the rent or mortgage payment, the affordable rent or mortgage figure may equal total monthly housing costs.*

### **Liquid Assets, Down Payment and Mortgage Terms**

The most important figure for the homebuyer is the monthly housing payment. This category of determinants is difficult to predict because mortgage interest rates and down payment requirements fluctuate. Households with little or no liquid assets need State and Federal programs to put home ownership within their reach. Down payment requirements for banks and savings and loan associations are sometimes beyond the reach of first-time homebuyers. For low and moderate-income households, who are first time buyers, lower down payment loans are offered through the Virginia Housing Development Authority or Farmers Home Administration.

Retiree or out-commuter new households are likely to have higher assets with which to purchase housing in the local market. Both of these groups come primarily from, or travel to, the Washington Metropolitan Area. Because they may have liquid assets from the sale of property or from higher wages relative to the area, they are able to afford more costly housing than the typical Page County family. This may also be true with respect to households in higher income jurisdictions within the NSVCR.

### **Space, Convenience and Style Requirements**

Page County's housing is primarily single-family, detached, owner-occupied homes. Because the price of such houses has increased significantly, demand will rise for more rental units to serve the increased number of small households and those families that 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.

A significant feature of Page County's housing development is the growing popularity of manufactured homes. The cost per square foot of living space is noticeably lower than in individually contracted units. Low and middle-income households, retired residents and second-home buyers have a wide variety of manufactured home styles and sizes from which to choose.

## **6.3 Adequacy of Current Housing Stock**

The several measures of the adequacy of the current housing stock include the number of housing units failing to meet minimum standards, vacancy rate, the rate of housing loss, and the adequacy of affordable housing.

### Housing Stock That Fails to Meet Minimum Standards

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

**Exhibit 36: Page County Housing Stock**

	1980	Percent of Total	1990	Percent of Total	2000	Percent of Total
<b>TOTAL UNITS</b>	<b>8,063</b>	<b>100%</b>	<b>8,948</b>	<b>100</b>	<b>10,557</b>	<b>100</b>
<b>Vacant Units</b>	<b>640</b>	7.9%	<b>447</b>	5.0%	<b>1252</b>	<b>11.9%</b>
For Sale	255	3.1%	175	2.0%	-	-
Not for Sale or Rent	385	4.8%	272	3.0%	-	-
<b>Units For Seasonal Recreational, or Occasional Use</b>	<b>499</b>	<b>6.2%</b>	<b>446</b>	<b>5.0%</b>	<b>651</b>	<b>6.2%</b>
<b>Occupied Units</b>	<b>6,924</b>	<b>85.9%</b>	<b>8,055</b>	<b>90.0%</b>	<b>9,305</b>	<b>88.1%</b>
Owner*	5,358	77.4%	6,191	76.9%	6,872	73.9%
Renter*	1,566	22.6%	1,864	23.1%	2,433	26.1%
More than 1.01 Persons per Room*	247	3.6%	235	2.9%	-	-
<b>Lack Complete Plumbing</b>	<b>1,243</b>	<b>15.4%</b>	<b>382</b>	<b>4.3%</b>	<b>154</b>	<b>1.5%</b>
<b>Units at Address</b>						
Single Units Including Townhouses	6,875	85.3%	7,072	79.0%	8,434	79.9%
2+ Units (Multi-Family)	557	6.9%	621	6.9%	767	7.3%
Mobile Homes	631	7.8%	1,255	14.0%	1,296	12.3%
<b>Location</b>						
In-Town	3,006	37.3%	3,263	36.5%	3,565	33.8%
Out-of-Town	5,057	62.7%	5,685	63.5%	6,992	66.2%

Source: US Census Bureau, 1980, 1990, and 2000

\* Percent of Occupied Units

As shown on **Exhibit 36**, the 2000 census indirectly measures the adequacy of Page County's housing stock. 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 the household's exclusive use. Since an overcrowded unit may be otherwise adequate, the best available indicator of structural inadequacy is the lack of complete plumbing. Complete plumbing facilities are defined as hot and cold piped water, a flush toilet, and a bathtub or shower. Using lack of complete plumbing as the indicator of adequacy, substandard housing stock has declined steadily.

An objective for the county is for all year round housing units to meet minimum standards by the year 2010. Substandard housing units should be brought up to standard by rehabilitation. 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, larger, and perhaps substandard structures and gradually improve them. This gives them more square footage of living space than they could purchase outright in perfect condition. Substandard units that fail to meet minimum standards may have to be removed from the housing stock.

### **Vacancy Rate**

As shown on **Exhibit 36**, 11.9 percent of the county's housing stock is vacant. In addition to this 11.9 percent of vacant housing, another five to six percent of homes are held for occasional because of the second home housing market in the county and because owners hold them as vacation rental properties. These homes are not counted as "vacant" in **Exhibits 35 or 36**. Generally these structures are suitable for year round occupancy. If so utilized on a wide scale, the population could increase without the construction of new units. In the future, the county may need to examine possible adverse impacts from the development of areas with high-density vacation rental homes.

**Exhibit 37** provides a breakdown of vacant units for each census tract and for the three incorporated towns for 1990 and 2000. These units can be for sale or for rent or, in fact, just held unoccupied by the owners. The county's total vacancy rate was 11.9 percent in 2000. The Northwest section of the county (Tract 302) had the highest vacancy rate, 21.4 percent. The Southeastern section (Tract 304) had the second highest vacancy rate (11.1%). The towns have more moderate vacancy rates, ranging from 5.9 percent in the Town of Shenandoah to 7 percent in the Town of Luray.

**Exhibit 37: Vacant Dwelling Units – 1990, 2000**

Area	Total Dwelling Units 1990	Vacant 1990	Vacancy Rate 1990	Total Dwelling Units 2000	Vacant 2000	Vacancy Rate 2000
By Census Tract						
301	1,037	89	8.6%	1,151	100	8.7%
302	1,579	222	14.1%	2,027	433	21.4%
303	1,945	190	9.8%	2,223	186	8.4%
304	2,221	184	8.3%	2,644	294	11.1%
305	2,166	208	9.6%	2,512	239	9.6%
Totals	8,948	893	10.0%	10,557	1,252	11.9%
By Town						
Luray	2,013	167	8.3%	2,191	154	7.0%
Shenandoah	752	13	1.7%	812	48	5.9%
Stanley	498	25	5.0%	562	36	6.4%

Source: U.S. Census, 1990, 2000

Note: The census tracts listed above include the towns, therefore dwelling units within the towns should be treated as a subset of the five census tracts, not in addition to the census tracts.

In its Statewide Housing Needs Analysis, 1975, The Virginia Housing Development Authority identified recommended levels of vacancy rates based on population growth rates (derived from annual percentage increases.) Since Page County's population growth has been slow to moderate (1.2 percent annually from 1980 to 1990 and 0.7 percent annually from 1990 to 2000), vacancy rates should be:

- Areas of slow population growth - less than 1% average annual increase
  - owner vacancies = 1.0%
  - renter vacancies = 4.0%
  
- Areas of moderate population growth - between 1% and 5% average annual increase
  - owner vacancies = 1.25%
  - renter vacancies = 5.0%

An adequate vacancy rate should be maintained in the housing market to provide for the movement of households and the creation of new households. However, for the past ten years Page County’s vacancy rates have exceeded the recommended levels significantly.

### Housing Stock Losses

In addition to substandard units that have not been rehabilitated, 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 housing available at the beginning of each decade is lost. This percentage is applied to actual and projected housing inventories in **Exhibits 34 and 36**. The need to replace lost housing units each decade plus the need to accommodate the projected numbers of households means that 3658 new housing units will be needed between 2000 and 2020. This translates into an average of about 183 new units annually. Between 1990 and 2000, 218 new units were added annually resulting in an 18 percent growth in housing stock. Proper planning requires examination of the sudden growth between 1990 and 2000 in order to determine its relationship to vacancy rates, population growth and the need, type and location of future housing units.

**Exhibit 38: Dwelling Unit Projections by Decade**

	Actual		Projected	
	1980-1990	1990-2000	2000-2010	2010-2020
<b>Average Annual Growth of Units</b>	11.0%	18.0%	10.0%	10.2%
Total Units, End of Decade	8,948	10,557	11,614	12,796
Total Units, Beginning of Decade	8,063	8,948	10,557	11,614
Loss for Decade (6.4 %)	-516	-573	-676	-743
Net Dwelling Unit Base	7,547	8,375	9,881	10,871
New Units in Decade	1,401	2,182	1,733	1,925
Annual Average	140	218	173	193

*Sources: U.S. Bureau the Census, Summary Tape 1A, 1980, 1990, 2000 and Components of Inventor Change.*

### Adequacy of Affordable Housing

Another measure of adequacy is the cost of housing units in relation to household incomes. 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. This is one measure of the degree to which the market does not provide adequate housing at certain price levels.

As shown in **Exhibit 39**, in 2000, 562 units (24%) of the rented housing stock units had gross rents exceeding 35 percent of the tenant’s monthly income and 673 units (28.9%) exceeded 30 percent of the tenant’s income. Although owners fare better, 15.3 percent of owners (793) spend more than 35 percent or more of their household income on housing costs and 20.1 percent (941) pay more than 30 percent. Surprisingly, 44.7 percent of owners spend less than 15 percent of their household incomes on housing costs. Given the low median income of Page County households, this may be because many owners live in housing that has been in the family for one or more generations.

**Exhibit 39: Housing Costs in Relation to Household Incomes - 2000**

Costs as a Percent of Household Income	Renter Households		Owner Households	
	Number	Percent	Number	Percent
Less than 15%	496	21.3%	2,309	44.7%
15-19.9%	352	15.1%	728	14.1%
20-24.99%	286	12.3%	588	11.4%
25-29.9%	237	10.2%	422	8.2%
30-34.99%	111	4.8%	248	4.8%
35% or more	562	24.1%	793	15.3%
Not computed	290	12.4%	82	1.6%

*Source: NSVRC, Profiles of Selected Economic Characteristics 2000, Data Profile Section DP-3*

The housing market is the system that allocates housing resources within the county. In simple terms, people buy or rent the kind of housing they can afford. 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’s Section 236 and Section 8 rental housing program units provide some

assistance to renters, as does the Farmers Home Administration’s Section 515 Rural Rental Housing Program.

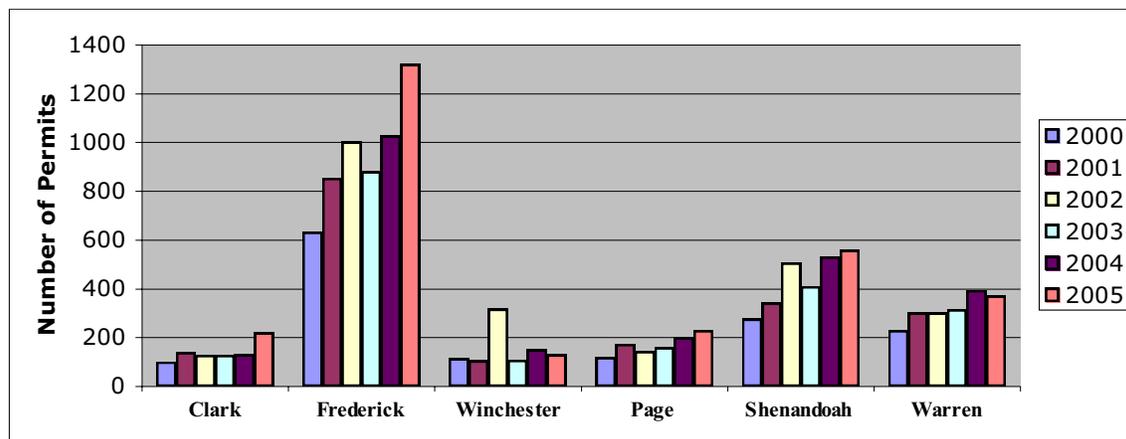
Based on housing costs, most of the county’s low- and moderate-income households will be unable to rent or buy homes for prices they can afford. The county needs to develop a policy wherein “affordable housing” is defined as what is determined to be affordable to the county’s low-, moderate-, and high-income residents as shown in **Exhibit 35**. Further, the county needs to ensure that the emphasis of new residential development is to provide housing affordable for citizens who live and work in the county. Housing needs for those with income levels not necessarily representative of the county should be addressed only when the above needs are met.

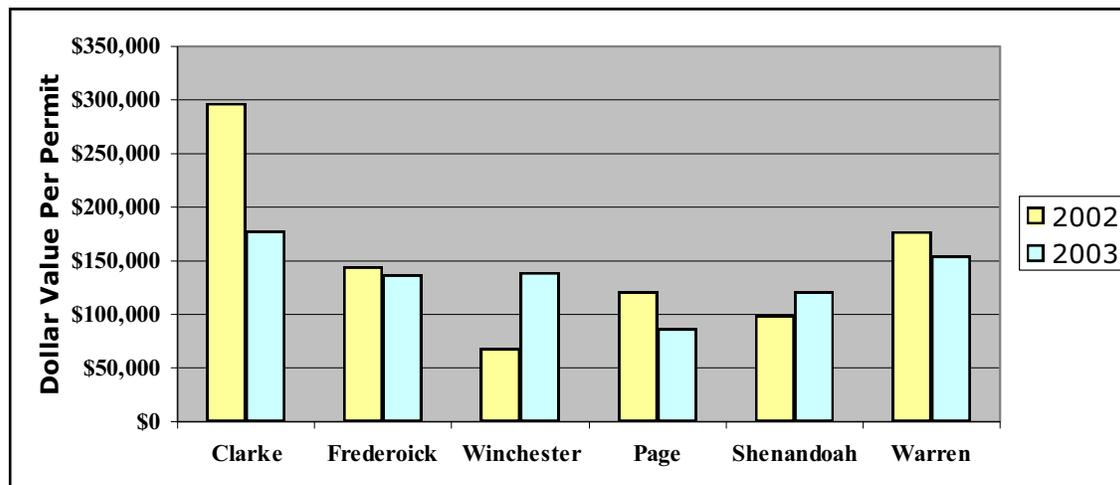
## 6.4 New Housing in Page County

The number of building permits issued by each community in the NSVRC and their corresponding monetary value is an indication of Page County's share of the new housing market in the NSVRC. **Exhibit 40** illustrates the fact that the number of building permits issued per year has risen constantly from 120 per year in 2000 to 231 per year in 2005. However, only Clarke County (848) and the City of Winchester (925) issued fewer total permits than Page (1028) over the six-year period.

**Exhibit 41** illustrates the fact that the value of the permits issued between 2002 and 2003 in Page County, Shenandoah County and the City of Winchester were the lowest in the NSVRC. Conversely, the value of the permits issued in Clarke County was the highest during this period. Although the number of permits issued in Page County went up in 2003, the value of the permits declined in 2003.

**Exhibit 40: Building Permits Issued, 2000-2005 – NSVRC**



**Exhibit 41: Dollar Value of Building Permits Issued, 2002-2003 - NSVRC**

## 6.5 Summary

Page County's housing stock is a reflection of the market demand for housing. In addition to serving the needs of those born in the county, it is also a desirable location for other housing buyers within the NSVRC and the Northern Virginia/Washington, D.C. metropolitan area.

Based on population growth projections and declining household size, an 11.5 percent increase in households can be expected between 2000 and 2010 and an additional 10.2 percent increase between 2010 and 2020.

The types of housing that are affordable will be dictated by household income. If current trends continue, the percentage of new housing units needed for low-, moderate- and high-income Page County households will be 37.7%, 52.2% and 10.1%. As shown on **Exhibit 35**, the maximum cost of housing affordable for low, medium and high-income households is \$62,498, \$187,498 and \$300,000 (or more) respectively.

The housing stock is primarily single-family, detached, owner-occupied homes. In 2000, just under 12 percent of the year-round housing stock was vacant. Eight-one percent (81%) of the vacant housing was in the rural areas. In addition to the nearly 12 percent of vacant housing, 6.2 percent of the housing is reserved for “seasonal” or “recreational” use. In 2000 only 1.5% of the year-round dwellings were substandard, as measured by the lack of complete plumbing. That is a decrease from 1980 when over 15 percent of the year-round dwelling units fell into this category.

Over the next two decades the housing stock will change. The population will grow, losses will need to be replaced, and household size will change. The vacancy rate will fluctuate with market demand. Taking into account such dynamic factors, it is projected that 1,057 units may be added between 2000 and 2010 and 1,182 units between 2010 and 2020.

## Chapter 7: Community Facilities

The county, the three incorporated towns, and private companies and organizations, provide community facilities and services.

In addition to general local government services and police protection, the towns supply water and sewer facilities and services to the residents and businesses located in areas served these utilities. The Page County Marketing Book describes in detail these systems' capacities, water sources, methods of treatment, and sewage discharge points.

The major effect of these public facilities on the county's planning efforts lies in the ultimate capabilities and location of the current and future service areas.

Private companies or organizations provide the other utilities (electricity, natural gas, and LP gas), own and operate the Page Memorial Hospital in Luray, and provide volunteer fire and rescue services, and a sheltered workshop for the handicapped. The Allegheny Power Company provides electricity. A variety of distributors supply natural gas, LP gas, fuel oil and coal to Page County residents.

### 7.1 Schools

#### Public Schools

There are 5 elementary schools, 2 high schools and one technical school in Page County. The k-12 enrollment was 3,690 students in June 2005. There were approximately 285 teachers. Two new high schools are scheduled for completion in 2010. The existing Luray and Page County high schools will then be converted to middle schools.

The County's public school facilities include:

- **Grove Hill Elementary School**, located north of Shenandoah, was constructed in 1940. It employs 18 teachers, and houses 12 regular classrooms and a cafeteria. Part-time remedial reading is also offered at the school. In 2004-05 it had an enrollment of 212 and was recently renovated with new classrooms, cafeteria, and gymnasium.

- **Luray Elementary School** was constructed in 1961 and enrolled around 753 students in 2004-05. Besides 29 regular classrooms, the school has a special education program, as well as a remedial reading class and a library. It employs 52 teachers. Renovations currently underway include a new science room, gymnasium and classrooms.
- **Shenandoah Elementary School** was constructed in 1928 and enrolls 381 students in 2004-05. It houses 19 standard classrooms, an auditorium, a gymnasium, and a cafeteria, as well as special education, remedial, and library facilities. It had 29 teachers and was last renovated in 1988-89.
- **Springfield Elementary School** was constructed in 1939. It has 16 classrooms. In 2004-05 it employed 26 teachers, and enrolled 278 students. Special services include band and remedial reading programs. It was recently renovated with a new cafeteria, gymnasium, classrooms, and parking area.
- **Stanley Elementary School** was constructed in 1933 and remodeled in 1950 and in 1982. In 2004-05, it employed 48 teachers and enrolled 579 students in 18 regular classrooms. Special educational, remedial, and library facilities are also available.
- **Luray High School** was constructed in 1930 and remodeled for the fifth time in 1982. In 2004-05, it enrolled 641 students in 17 regular classrooms and in 10 other classroom units and it had 50 teachers.
- **Page County High School** was constructed in 1961. Enrollment in 2004-05 was 671 students. The building contains 13 regular classrooms plus 8 special classrooms for science, home economics, and art. It employed 52 teachers.
- **Page County Technical Center** opened in 1993-94 and has a capacity for 300 students. In 2004-05 there were 150 students enrolled and 10 teachers employed. Programs offered are Office Management, Cosmetology, Auto Technology, Electricity, Practical Nursing and Health Assistance, Adult Education and G.E.D. Courses. Many of the students come from the elementary and high Schools. Some are post-graduate adults enrolled in the G.E.D. program

**Exhibit 42: Page County Public School Enrollment**

School	Grade	Location	Enrollment		Operating
			1999-00	2004-05	Capacity
Grove Hill Elementary	K-7	Shenandoah	211	219	300
Luray Elementary	K-7	Luray	750	773	850
Shenandoah Elementary	K-7	Shenandoah	407	400	585
Springfield Elementary	K-7	Rileyville	332	286	326
Stanley Elementary	K-7	Stanley	604	613	595
Luray High School	8-12	Luray	672	682	680
Page County High School	8-12	Newport	782	717	700
<b>Total Enrollment</b>	<b>K-12</b>	<b>Page County</b>	<b>3,758</b>	<b>3,690</b>	<b>4,036</b>

Source: Page County School Board, June 2000 and 2005.

**Exhibit 43: General Public School Data, Page County, Virginia**

School	Location	Grades	Enrollment		Teachers	
			1999-00	2004-05	1999-00	2004-05
<b>Elementary Schools</b>						
Grove Hill	Shenandoah	K-7	211	219	17	18
Luray	Luray	K-7	750	773	52	52
Shenandoah	Shenandoah	K-7	407	400	30	29
Springfield	Rileyville	K-7	332	286	26	26
Stanley	Stanley	K-7	604	613	46	48
<b>K-7 Totals</b>			<b>2304</b>	<b>2291</b>	<b>171</b>	<b>173</b>
<b>High Schools</b>						
Luray	Luray	8-12	672	682	48	50
Page County	Newport	8-12	782	717	56	52
<b>8-12 Totals</b>			<b>1454</b>	<b>1399</b>	<b>104</b>	<b>102</b>
<b>K-12 Totals</b>			<b>3,758</b>	<b>3,690</b>	<b>296</b>	<b>285</b>

Source: Page County School Board, June 2000 and 2005.

**Exhibit 44: Ratio of Pupils to Classroom Teaching Positions**

	Elementary K-7		Secondary 8-12	
	1999-00	2004-05	1999-00	2004-05
Teaching Positions	171	173	104	102
Pupil Membership	2304	2291	1454	1399
Pupil-Teacher Ratio	13.5	13.2	14.0	13.7

Source: Page County Public Schools, June 2005

### Private Schools

In addition to the public schools, there are two private schools within the county; Mount Carmel Christian Academy and Stanley Seventh Day Adventist. Several other private schools are located in adjacent counties. Randolph-Macon Academy, a military boarding school, and Wakefield School are located in Front Royal (Warren County), Massanutten Military Academy is located in Woodstock (Shenandoah County). There are also a number of pre-school facilities throughout the county.

### Colleges

Lord Fairfax Community College is within commuting distance of Page County and it opened a satellite campus in Luray in 2005. Other colleges and universities located nearby are James Madison University and Eastern Mennonite University (in Harrisonburg), Bridgewater College (near Harrisonburg, in the Town of Bridgewater), Blue Ridge Community College (in Weyers Cave), and the University of Virginia (located in Charlottesville).

## 7.2 Libraries

There are three library facilities serving Page County; The Page Public Library in Luray, The Shenandoah Library in Shenandoah, and the William Kibler Community Library in Stanley. These libraries are part of the Massanutten Regional Library System, which also includes Rockingham County and the City of Harrisonburg. Because the county is part of this system, residents have over 290 items for loan; books, videos, DVDs and CDs.

The Page Public Library houses approximately 19,855 units, the Shenandoah Library houses 14,906 units and The William Kibler Community Library houses 2,000 units. The Page Public

Library also has over 500 items in its Genealogy Department and four, three-drawer, legal-size file cabinets of documents. Thirty-five (35) mm microfilm of the *Page News and Courier* from 1869 through 2004 (1911 missing) is also available. A microfilm reader-printer and a copy machine are also available.

The Page Library has seven computers for public use. The Shenandoah library has six computers for public use and the Stanley Library has two computers for public use.

Throughout the year a display cabinet features educational displays of interest to Page County citizens. Story hours are held weekly and all of the libraries have a Summer Book Reading Program.

Because Page County is a part of the Massanutten Regional Library System, it has countywide Bookmobile services on a monthly basis.

### **7.3 Parks and Recreation**

Many parks and recreation areas are located in Page County and offer a wide range of facilities and activities. Several of the recreational areas are located near schools.

The Page County Recreation Department offers many programs and recreational activities to residents, including such activities as volleyball, basketball, soccer and softball tournaments, fitness awareness programs, dance classes, and community theater presentations. These programs operate in conjunction with each town's programs to ensure that all segments of the population are served. Some of the programs are held at county's schools that have athletic facilities, including playgrounds and athletic fields. There are also Little League baseball programs, Midget League football, and Big League softball and basketball programs in the county.

- **Luray**

The Town of Luray provides parks and recreation facilities for its residents and their guests. Luray's many parks and recreation areas offer a wide range of activities.

The largest of the town's parks is Lake Arrowhead. The land was purchased in 1970 and is located two and one-half miles southeast of Luray on 132 acres. The park features a 34-acre lake with a beach, swimming facilities, and picnic pavilions. Visitors to Lake Arrowhead also may enjoy boating and fishing.

Luray has a number of smaller parks. Inn Lawn Park, located near downtown Luray, provides for leisurely sitting. It is adjacent to the Page County Library and One-room School House. This park provides a picturesque backdrop with play areas for children, a gazebo, picnic tables and one tennis court. The park also hosts a summer concert series. Eugene Park is located in the northern part of Luray in a residential area. It has a sheltered picnic area and a play area for children. Carillon Park is located in the western part of Luray adjacent to the Luray Caverns. The park features the Luray Singing Tower, a 47-bell carillon. The park also includes picnic areas and a pond equipped with a fountain.

Luray Recreation Park/Imagination Station, located near Sixth Street in the southern section of Luray, is situated on approximately 55 acres. The park offers a playground, picnic shelter, and athletic fields used for football, baseball and soccer. A hiking path around the park offers workout areas along the way.

The Luray-Hawksbill Greenway is a footpath/bike path along the Hawksbill Creek with 1.75 miles of paved pathways. Numerous benches and picnic tables are available along the entire length of the Greenway. The third phase of the Greenway is nearing completion.

For five consecutive years since 2001 the National Arbor Day Foundation has recognized Luray as a “Tree City USA”. In addition, the town has received the “Growth Award” from the Foundation for three consecutive years beginning in 2003. Luray was just one of eight locations in Virginia to receive this prestigious award.

- **Stanley**

The 28-acre Hawksbill Recreation Park is located near Stanley. Facilities include three picnic shelters, volleyball courts, horseshoe pits, a children’s playground, informal ball field, a quarter-mile hiking trail, community center, and a swimming pool. The 18 acre wooded portion of the park is used by the local scout troops for camping and other projects. The Tree Board and ecology club are actively involved with ongoing projects. Stanley has purchased 10 acres adjacent to the park and is proceeding with plans to construct two ball fields on this property. Both will be regulation fields, one for football and one for senior little league. Parking areas, concession stands, dugouts and lights are included.

The town has also donated a small piece of property for a future skate park. The Hawksbill Skate Park Committee is actively fundraising for this project and construction is scheduled to begin in the spring of 2006.

The Town of Stanley also owns the Franklin Aleshire Memorial Park located off of Painter Drive. The Stanley Little League operates this park. Facilities include a major league field with lights, minor league field, concession stand, bathrooms and batting cages.

The town also operates a large softball field off of park road. This facility is used by midget league football and the recreation league for softball games.

- **Shenandoah**

The Town of Shenandoah provides park and recreation facilities with a wide range of activities. These include the Shenandoah Memorial Ball Park, Big Gem Park, a small playing field, Shenandoah River Park and the Community Center.

Shenandoah Memorial Park, located at the intersection of Varina Street and Junior Avenue, includes two ball fields that are leased and maintained by the Shenandoah Recreation League. Plans are underway to add lights, seating and multi-use fields. The League organizes baseball, softball, and football programs and plans to add a soccer program in the future.

The 68-acre Big Gem Park is the town's largest recreational property. The park is currently under development with many hours of volunteer help and funding from the town, the Virginia Department of Forestry, and private donations. The park includes a gazebo, picnic tables, a pond and floating dock for fishing, and trails for hiking, bird watching, biking and horseback riding. Future plans include an arboretum, ball fields, more hiking and biking trails, an outdoor amphitheater, restrooms and parking areas. A V-DOT grant will fund a new access road. Big Gem is a multi-use facility and has hosted weddings, family gatherings, musical events and festivals. The park's gazebo and picnic areas may be rented or reserved by contacting Shenandoah Town Hall.

Shenandoah River Park has a boat launch, dock, picnic tables and public restroom. It is used by canoers, boaters, and jet skiers and for fishing. Future plans include building a trail to link

this park to Big Gem and to have a walking trail along the river properties from the Park to the town line.

The Shenandoah Community Center contains a spacious hall, stage and kitchen facilities. Two tennis courts and the town's Wig-Wam playground and picnic area are adjacent to the Center. The Center may be reserved by contacting the Shenandoah Women's Club.

- **Rileyville**

Located on approximately 7 acres of land, The Rileyville Recreation Center has a ball field, playground, barbecue pit and picnic shelter. There are plans for future development.

- **Additional Facilities**

In addition to local facilities, approximately 37,335 acres of the Shenandoah National Park and 23,004 acres of the George Washington National Forest are situated in Page County. The Park facilities include the Skyline Drive, hiking trails, campgrounds, horse trails, and picnic areas. George Washington Forest provides opportunities for camping, fishing, hunting, and other pursuits. The South Fork of the Shenandoah River provides residents and tourists with opportunities for boating, canoeing, swimming, and fishing.

Along with these public recreational facilities, there are also 10 private campgrounds, 6 landings or dams that feature boating and fishing, and several swimming pools in the county. The Luray Caverns, among the most famous in the country, is one of the largest caves in the nation with over 40 rooms. It is a United States Registered Natural Landmark.

## **7.4 Law Enforcement**

Four categories of law enforcement agencies serve Page County citizens; town, countywide, state and federal. The towns each have their own Police Departments. The Town of Luray has twenty-four hour police services.. The Department has 12 sworn officers. Stanley has four police officers. Shenandoah has 4.5 police officers and a K-9 unit.

The Page County Sheriff's Department, headquartered in Luray, has jurisdiction throughout the county, but concentrates on providing protection in the rural areas. It also provides court-related services. The department has a K-9 unit, a mobile command trailer, a crime prevention trailer, a water rescue and recovery unit and an investigation department. The department also operates the county jail.

The Virginia State Police has statewide law enforcement powers, as do the enforcement officers of the Virginia Commission of Game and Inland Fisheries. Finally, there are the rangers of the Shenandoah National Park. All these agencies can call on one another for assistance when needed.

## 7.5 Emergency Services

The Page County Memorial Hospital provides 24-hour emergency room service and has a full range of medical and surgical staff, as well as consulting neurologists, pathologists, and radiologists. When necessary, the hospital can call on the University of Virginia Hospital's Pegasus Emergency Medical Transport Service and INOVA in Fairfax.

Three volunteer rescue squads currently operate in Page County, one located in each of the towns. **Exhibit 45** lists the rescue squads with the number of active volunteers and the equipment in each squad. There is also a private, for-profit, ambulance service operating in the county.

Page County has three volunteer fire departments with a total of about 112 volunteers. **Exhibit 46** lists the locations, available equipment, and approximate number of volunteers in each company.

**Exhibit 45: Page County Rescue Squads**

Number	Name	Location	Active Volunteers	Equipment
Rescue 1	Shenandoah Volunteer Rescue Squad	Shenandoah	9	1 First Response Unit 4 Rescue Vans 1 First Response
Rescue 3	Luray Volunteer Rescue Squad	Luray	26	Unit 3 Rescue Vans 2 Boats 1 ALS Unit 1 First Response

Rescue 4	Stanley Volunteer Rescue Squad	Stanley	12	Unit 2 Box Units 1 Rescue Van 1 Boat
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Source: Page County Emergency Services Coordinator

#### Exhibit 46: Page County Fire Departments

Number	Name	Location	Active Volunteers	Equipment
Co. 1	Luray Volunteer Fire Department	Luray	45	4 Pumpers 2 Tankers 2 Brush Units 1 Ladder Truck 1 Chief's SUV 1 Pick-up
Co.24	Stanley Volunteer Fire Department	Stanley	42	3 Pumpers 1 Tanker 1 Brush Unit 1 Squad Truck 1 Utility Vehicle 1 Chief's Car
Co. 70	Shenandoah Volunteer Fire Department	Shenandoah	25	3 Pumpers 1 Tanker 1 Brush Unit 1 Salvage Unit 2 Utility Trucks 1 Tactical Unit 1 Boat Ford Trailer

Source: Page County Emergency Services Coordinator

The Virginia Department of Forestry (VDF) coordinates activities between the National Park, the National Forest and the local fire companies. It has one full-time forest warden living in the county. The VDF provides forest and open land fire protection on all private land holdings in

Page County and assists the U.S. Forest Service and U.S. Park Service with fires occurring on national forests and park lands. It assists the county volunteer fire departments with suppressing fires in forests and fields. A dozer-fire plow unit is stationed within the county. VDF Forest wardens are responsible for investigating all forest and land open fires, and for pursuing legal action towards responsible parties as warranted.

In 1990, the Page County fire departments formed a level-2 hazardous materials team. All personnel involved complete the necessary training, and a trailer has been purchased to carry the necessary equipment. The unit is housed in the Stanley Fire Station. In addition, the county has a mutual aid agreement with Rockingham County for the use of that county's hazardous materials team. All emergency calls are received at the Page County Sheriff Department and dispatched to the different departments. The Emergency 911 telephone system operates with enhanced 911 mapping and computer aided dispatch.

While the entire county has fire and rescue service, it is apparent that in the near future paid personnel will be needed to answer the increasing demand of calls especially with Emergency Medical Services (EMS). The county established an EMS Department in 2003 consisting of one emergency services technician (EMT) at each Volunteer Rescue Squad from 8 am-3 pm Monday to Friday. An additional EMT, to be used as a floater, was added in 2005. With the decline in available volunteers, additional EMS personnel and equipment should be considered. Also, as remote areas of the county become developed, there will be a greater demand for service to these areas. This factor should be considered for future residential development decisions.

## **7.6 Water and Sewer Facilities**

### **Municipal Water Systems**

The water system in Luray is supplied by two springs with a safe yield capacity of 1.296 million gallons per day (MGD). At both springs, water is treated with chlorine and fluoride. Engineering plans are being developed to add a filtration plant to the system. Average consumption varies. It peaks during the tourist season with an average consumption of 0.95 MGD. In 1996, the average withdrawal was 1.3 MGD. Luray's reservoir allows for six million gallons of storage capacity. The number of water hook-ups includes approximately 1,800 residential and 230 non-residential customers.

The Town of Shenandoah's water supply is provided by three drilled wells and has a capacity of 610,000 gallons daily. In 2004 the average withdrawal was 290,000 gallons per day. Hook-ups

presently number around 787 residential and 96 commercial establishments. The two storage tanks have a total capacity of 976,000 gallons.

The Town of Stanley has an excellent ground water source. The water system is made up of two separate systems that include six wells and two storage tanks. One system includes one well and pressure tank and serves only the Page County Technical Center. The other system includes five wells, two storage tanks, and 1450 hook ups. The system's safe yield is approximately 475,000 gallons with a storage capacity of 560,000 gallons. In 2005 the average withdrawal was 300,000 gallons per day. The Virginia Department of Health has estimated the service population of the town's water system is 3,550. Currently, the town is working with the county to drill a seventh well off Goodrich Road. The town has plans to connect the well at the Technical Center and the new well on Goodrich Road into the main system. At that time the town will shut off wells number 3 and 2 that are located near the old Stanley Landfill. When all of this is accomplished the expected flow will reach 675,000 gallons daily.

### **Private Water Systems**

There are a number of private community water systems in Page County. These serve major subdivisions, including Egypt Bend Estates, Page Valley Estates, and the Old Farms subdivision.

### **Sewer Systems**

The Luray sewer system has a permitted capacity of 1.6 million gallons per day (MGD) with an average flow of 1.2 MGD. Completed in 1990, the wastewater treatment plant upgrade provided the ability for an in-house upgrade to 2.0 MGD. The plant is an activated sludge, oxidation ditch type best suited for industrial waste treatment. The plant process includes advanced influent screening and sludge dewatering equipment for land application. Prior to entering the Hawksbill Creek, effluent is disinfected by ultraviolet light, designed to disinfect 4.0 MGD and undergoes step aeration.

The Town of Shenandoah's sewer system has a capacity of 400,000 gallons daily. The average use is 150,000 gallons per day. Hook-ups number around 730 residential and commercial establishments. The discharge point is the South Fork of the Shenandoah River.

The Town of Stanley has a primary treatment sewer system. It has a capacity of 300,000 gallons daily. Average consumption is 150,000 gallons daily. The discharge point is the South Fork of the Shenandoah River. The Stanley wastewater plant is an activated sludge plant with two

oxidation ditches. It also has a modern ultra violet system for disinfection. Construction is underway for a new fan press that will compact dry solids for disposal at the local landfill.

No other areas in the county have sewer system coverage.

## **7.7 Solid Waste Disposal**

The Town of Luray contracts with Waste Management, Inc. for waste collection services. Collection is provided to residences and businesses once a week. Luray also holds a clean up each spring where crews with appropriate equipment collect bulk items.

The Town of Stanley contracts with Waste Management, Inc. for collection services for residents and businesses located within the Stanley service area. Service is provided once a week to residences. Businesses are served from one to three times each week. In the spring and fall, special clean-up week collections are made for bulk items, brush, etc.

The Town of Shenandoah has a municipal contract with Waste Management, Inc. to provide weekly collection services within town jurisdiction. The town also sponsors a spring clean up, using town personnel and equipment.

Outside of the towns, individuals, commercial businesses, and industries can contract with private collection services in most areas.

Page County has three recycling collection centers with 40 cubic yard containers for magazines, newspaper, cardboard, glass, of all colors and two types of plastic. Aluminum cans are accepted also. The sites are located at The Battle Creek Landfill, and at the Springfield, Stanley and Shenandoah compactor sites. In addition to the recycling facilities, the Springfield, Stanley and Shenandoah sites have trash compacting units, a small building for a site attendant, chain link fencing, toilet facilities, paved parking lots and concrete retaining walls.

The Page County Battle Creek Landfill opened in January 1999. It is a 160-acre site located along state Route 340 near the intersection with Route 211. The landfill was closed in March 2004 but re-opened in September 2005 under county management. The landfill is permitted as a regional landfill able to accept 350 tons of trash per day.

## Chapter 8: Transportation

Transportation in and through Page County consists of four components:

- Roads and highways
- Public transportation
- Air
- Rail

In a rural area, such as Page County, where home, job, shopping, and recreational opportunities are often scattered, the transportation system serving the area must have adequate range to provide access to all parts of the county. Additionally, it must provide for adequate incoming and outgoing commuter traffic. The transportation system should offer both private and public modes of transportation.

### 8.1 Existing Road Network

The most visible mode of transportation in Page County is the road network and the vehicles that travel on it. In 2006 VDOT reports 361 miles of publicly maintained roads in the county. Primary routes U.S. 340 and U.S. 211 comprise the north-south and east-west axis of development respectively and total 56 miles in length. Luray, the county seat and largest town, is located at the intersection of these two primary routes. The county's two other towns, Shenandoah, and Stanley, and most of the other smaller population centers, are located along Route 340 and Business Route 340.

**Exhibit 47: Primary and Secondary Road Mileages – 2006**

Road Type	Miles
<b>Primary Highways</b>	<b>56.19</b>
<b>Secondary Roads:</b>	<b>305.05</b>
Hard Surface	241.07
All Weather Surface	40.56
Light Surface	23.21
Unsurfaced	0.21
<b>Total Road Mileage</b>	<b>361.24</b>

*Source: Virginia Department of Transportation.*

The largest portion (79 percent) of the county’s public road network is made up of hard surface secondary roads, comprising about 241 miles. All-weather surface roads (high-grade gravel) make up an additional 41 miles of the system. Light surface roads (at least graded and drained) comprise about 23 miles of the public system. The lesser quality roads serve a feeder function to the higher-grade roads. The primary routes provide access beyond the county.

In the mountainous and isolated parts of the county, private roads are significant. They often provide access to residences and subdivisions in these areas. Many of these roads, developed prior to the adoption of the County Subdivision Ordinance, were poorly designed and constructed and are often impassable in bad weather. The roads were cut into steep hillsides and natural contours were often disregarded. Frequently this causes these roads to serve as water channels. In addition, the extreme curves and grades make it very difficult for emergency vehicles to service these subdivisions.

### **Functional Classification**

The roads in the county perform different functions according to their size and location. The Virginia Department of Transportation (VDOT) classifies roads in the following manner.

#### **1. Principal Arterials**

Roads serving as high speed connecting links in interstate travel between the county’s major population centers and for statewide travel between the larger cities and towns in the Commonwealth. The two categories of principal arterials are:

##### *Interstate, Freeways, and Expressways*

These routes have the very highest design standards possible, including control of access. Full control of access is required on interstate routes and freeways, but expressways may be constructed with partial control.

##### *Other Principal Arterials*

These routes have lower design standards than interstate or freeways. Except for unusual circumstances, access control will be limited to bypasses and major relocations. U.S. Route 211 is the only principal arterial in the county.

## 2. Minor Arterials

The function of these roads is to link urban areas with towns not situated on principal arterial routes and to form a network providing interstate and inter-county service. This system is designed to provide relatively high-speed travel, even though in many cases multi-lane facilities will not be required. Minor arterials include U.S. Route 340 and Route 602 in Shenandoah.

## 3. Collectors

This system consists of those routes that, regardless of traffic volume, primarily are of intra-county rather than statewide importance. Since trip lengths will be much shorter than on arterial routes, design standards provide for moderate travel speeds. Although some collector corridors may run through several counties, trip lengths within the corridor are usually relatively short. Collectors are also subdivided into two categories:

### *Major Collectors*

These routes have three main functions; to connect the locally important travel generators, to link travel generators to nearby towns on higher-class roads, and to serve the more important intra-county travel corridors. Major collectors are Route 616 from Luray to Alma, Route 689 from Stanley to Luray, Route 675 from the George Washington National Forest to Luray, and Main Street and Reservoir Road in Luray.

### *Minor Collectors*

These routes form a network bringing all remaining developed areas within reasonable distance from a major collecting route. There are a number of minor collectors in the county.

### *Local Roads*

The local road system serves primarily to provide direct access to adjacent land parcels. These roads are designed for low travel speeds.

## Traffic Volumes

As in many other communities, traffic volumes are increasing in Page County. As shown in **Exhibit 48**, the number of passenger vehicles increased at a much more rapid pace than the

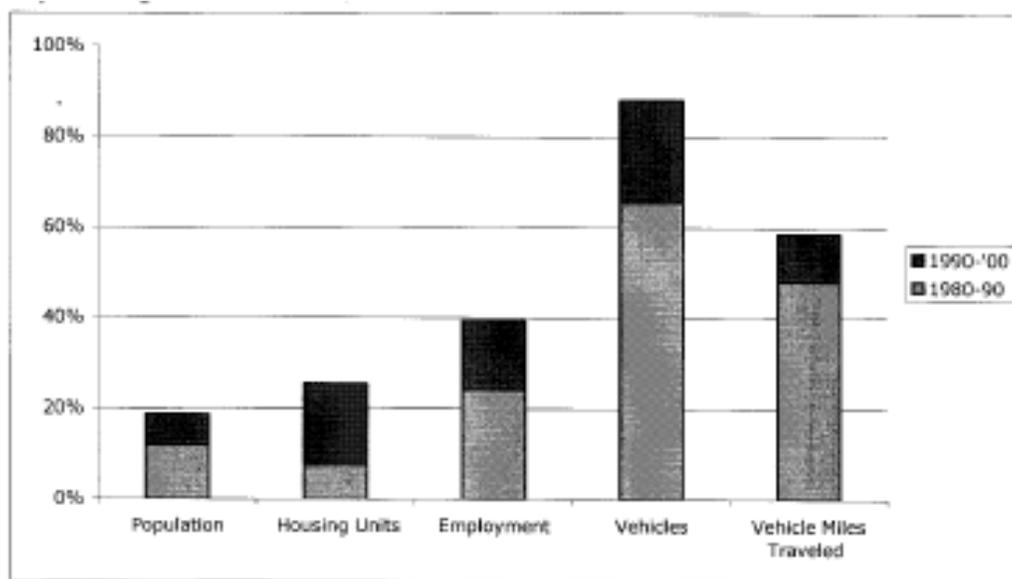
population, jobs, or housing units between 1980 and 1990 and between 1990 and 2000. Accordingly, the total vehicle miles traveled on arterial and primary highways increased as well. It should be noted that, with the exception of housing units, the increases in all categories in the second decade were less than in the first decade.

**Exhibit 48: Major Change Indicators – 1980, 1990, 2000**

Category	Year			Percent Change	
	1980	1990	2000	1980-90	1990-'00
Population	19,401	21,690	23,177	11.80%	6.86%
Total Housing Units	8,329	8,948	10,557	7.43%	17.98%
Employment	7,726	9,590	11,061	24.13%	15.34%
T1 Passenger Vehicles Registered	12,221	20,214	24,804	65.40%	22.71%
Total Vehicle Miles Traveled (VMT's) on Arterial and Primary Highways	161,352	238,933	264,263	48.08%	10.60%

Sources: Bureau of the Census and the Virginia Department of Transportation

**Exhibit 49: Major Change Indicators – 1980, 1990, 2000**



### Traffic Volumes on Routes 211 and 340

Traffic volumes, counted annually for all segments of primary routes 211 and 340, are shown for the years 2001 and 2004 in **Exhibit 50**.

**Exhibit 50: Average Daily Traffic Volumes on Routes 211 and 340 – 2001, 2004**

Route	From	To	2001	2004	Change
211 West to East	Shenandoah County Line	Route 340 Exit to South off of 211	4,800	5,900	22.9%
	Route 340 Exit to South off 211	West Corporate Line, Luray	6,400	13,000	103.1%
	Luray West Corporate Line	West Intersection Bus. 211	10,000	13,000	30.0%
	West Intersection Bus 211	Luray East Corporate Line	5,000	5,700	14.0%
	Luray East Corporate Line	East Intersection Bus.211	3,700	3,900	5.4%
	East Intersection Bus.211	Rappahannock Line/Skyline Drive	2,900	3,200	10.3%

Route	From	To	2001	2004	Change
340 North to South	Warren County Line	North Corporate Line, Luray	4,625	5,200	12.4%
	North Corporate Line, Luray	Route 211 (West)	6,100	6,300	3.3%
	Route 211 (West)	West Intersection Bus.211	5,000	5,700	14.0%
	West Intersection Bus.211	West Corporate Line, Luray	10,000	13,000	30.0%
	West Corporate Line, Luray	Route 340 Exit to South off 211	6,400	13,000	103.1%
	Route 340 Exit to South off 211	Intersection Bus. 340 South of Stanley	3,700	4,300	16.2%
	Intersection Bus. 340 South of Stanley	North Corporate line Shenandoah	5,280	6,000	13.6%
	North Corporate line Shenandoah	South Corporate Line Shenandoah	6,000	6,300	5.0%
	South Corporate Line Shenandoah	Rockingham County Line	6,500	6,000	-7.7%

Source: Virginia Department of Transportation, Average Daily Traffic Volumes on Interstate, Arterial and Primary Routes; 1980, 1990, 1995.

The highest volume of traffic occurred along Route 211/340 between the Business 211 intersection west of Luray and the 340 intersection at the base of the Massanutten Mountains. The volume of traffic on this stretch of 211/340 increased 103 percent between 2001 and 2004, especially to the west of the shopping center.

Between 2001 and 2004, the smallest volume increase (3.3%) occurred on Route 340, between the northern boundary of Luray and the Route 340 intersection with Route 211. One segment of Route 340, between Shenandoah and the Rockingham County line, showed a 7 percent decline in traffic during this period.

### Traffic Volumes on Selected Secondary Roads

**Exhibit 51** shows Annual Average Daily Traffic on selected secondary roads in Page County. In 2000 and 2004, the secondary road that had the highest traffic counts was Route 602 between the Rockingham County line and US 340 in Shenandoah. Route 639 between Business 340 south of Luray and Route 616 (which runs from Business 211 in Luray to Alma) showed the greatest increase in traffic.

Traffic on the county's roads will continue to grow with a continuing steady growth in permanent population, increasing travel to second homes in the county, and an increasing amount of commuting.

**Exhibit 51: Traffic Counts on Selected Secondary Roads – 2001, 2004**

Route	From	To	AADT		Percent Change
			2001	2004	
602	Rockingham Co. Line	Route US 340	4600	4500	-2.2%
	Route US 340	Shenandoah Corp. Limit	2900	2900	0.0%
	Shenandoah Corp. Limit	Route 711	2900	2900	0.0%
	Route 711	Route 603 South	1200	1400	16.7%
	Route 603 South	Route 603 North	1100	1100	0.0%
616	US 340 Bus	Route 646 North	1100	1100	0.0%
621	Route 619	Route 638	1100	1300	18.2%
622	Route 624	Route 340 Business	1700	1600	-5.9%
623	Route 622	Route 340 Business	1700	1800	5.9%
624	Route 340 Business	Route 689	1100	1200	9.1%
	Route 689	Route 622	1500	1500	0.0%
638	Route 621	Stanley S. Corp. Limit	2100	2600	23.8%
	Stanley S. Corp. Limit	Route 622	2400	2800	16.7%
	Route 622	US 340 Bus.	1700	1900	11.8%
	Route US 340 Bus.	Stanley N. Corp. Limit	1100	960	-12.7%
	Stanley N. Corp Limit	Route 633	-	-	-
	Route 633	Route 629	1000	930	-7.0%
639	Route 629	Luray S. Corp. Limit	1000	900	-10.0%
	Route US 340 Bus.	Route 638	640	1000	56.3%
639	Route 638	Route 616	870	1400	60.9%
	Route 638	Route US 340 Bus.	1900	1700	-10.5%
650	Route 638	Route US 340 Bus.	1900	1700	-10.5%
656	Route 211	Route 709	1500	1500	0.0%

Route	From	To	AADT		Percent
675	Luray N. Cop. Limit	Route 684	1700	1600	-5.9%
	Route 684	Route 615	1100	980	-10.9%
678*	Route US 340 Bus.	Route 724	1300	1300	0.0%
689	Route US 340 Bus	Corp. Limit Stanley	2200	2400	9.1%
	Corp. Limit Stanley	Route 624	2200	2400	9.1%
	Route 624	Route 611	2100	2600	23.8%
	Route 611	Route 668	810	1000	23.5%
	Route 668	Route 642	860	920	7.0%
	Route 642	Luray S. Corp Limit	1200	1200	0.0%
731	Luray N. Corp. Limit	Route US 340	3600	2200	-38.9%

Source: Virginia Department of Transportation, 2006.

\* Route 678 is entirely within Stanley.

## Road Improvements

In December 2004, The Virginia Department of Transportation (VDOT) released a long-term planning document known as *VTRANS 2025*. The 20-year plan for Page County’s primary roads includes the reconstruction of Route 340 from a 2-lane road into a 4-lane highway with a median strip from Rockingham County to US Route 211. In addition, *VTRANS 2025* recommends widening Business 340 from Luray 10 miles south into a 24-foot wide, 2 lane rural highway.

The next step to making the long-term plan a reality is the six-year plan that VDOT revises annually. The six-year plan projects can be designated “Preliminary Engineering Only”, “Preliminary Engineering and Right of Way” or Preliminary Engineering and Right of Way and Consideration”. The current six-year plan for Page County lists five projects along Route 340 including the bridges at Jeremiahs Run, Compton Creek, and Overall Creek and their approaches totaling four miles of reconstruction. VDOT revises the six-year plan for the secondary road system projects after a public hearing held in conjunction with the Page County Board of Supervisors. In addition, VDOT appropriates funds annually for improvements within each town’s boundaries. Details of these plans may be found at VDOT’s Luray Office.

For the foreseeable future VDOT is not considering 4-laning Route 340 from Luray to the Warren County line. However, the Page County Board of Supervisors continues to work for

safety and efficiency improvements on the existing 2-lane road consistent with maintaining the historical, cultural, environmental and rural characteristics called for elsewhere in this Comprehensive Plan.

With these values in mind, the Page County Board of Supervisors supports a new dialogue in Virginia regarding the adoption and full implementation of “Context Sensitive Solutions” (CSS)<sup>1</sup> in current and future road improvement planning. Many of Virginia’s neighboring states have adopted CSS. In 2004 the Page County Board of Supervisors adopted a resolution supporting the use of CSS in all road development and improvement projects within the county.

## **8.2 Public Transportation**

Page County Transit, social service agencies and organizations and limited taxi service provide public transportation in Page County. Page County Transit is a bus service running north and south on Route 340 from Shenandoah to Front Royal. It is operated by the Virginia Regional Transportation Association and charges only a co-pay nominal flat fee per trip. Because there is no commercial bus or train service, such low fee services should continue to be supported and expanded in order to assist residents without access to personal transportation. The service also reduces traffic on the county’s principal roads.

Transportation in the county is a problem for those with no access to an automobile. Car and vanpooling has some success in Page County because a large proportion of residents live along Route 340, allowing for the convenient pickup and discharge of passengers. Many of those who participate in car or vanpools commute long distances for employment.

## **8.3 Air Transportation**

Air travel is assuming increasing importance in the overall transportation system. The Luray-Page County Airport is publicly owned and leased to Luray Caverns Corporation. It is one of five public-use airports in the NSVRA.

Luray’s facilities include a 3125’ by 75’ paved and lighted runway, a storage / operations building, and 100LL aviation fuel. The airport is used primarily by visitors to the Caverns or for business purposes, including some businesses located in Shenandoah County. An Airport Master Plan has been completed for the Luray-Page County Airport that examines options for the future. State and federal funds have been requested to make significant improvements. These include runway reconstruction and lengthening. An apron area has been developed to accommodate the

parking of aircraft. When the runway project is completed, Luray and Page County will have a considerably up-graded airport with a runway and facilities to accommodate corporate jet aircraft and a wider range of public services and facilities.

The county will continue to work with the Luray-Page County Airport Commission to develop an Airport Overlay District. This overlay district would create a specific buffer extending for a specified number of feet from the centerline of the runway. No development of any type could occur within this buffer area. Additionally, the overlay district would designate a specific radius around the airport beyond the “no-development buffer” within which only compatible land uses would be allowed.

Currently, the closest passenger services available to Page County residents are located at Dulles International Airport, at the Charlottesville Airport, and at the Shenandoah Valley Airport in Weyers Cave. For more information contact the airport manager or a representative of Luray-Page County Airport Commission.

## **8.4 Rail Transportation**

Rail passenger service is not available within the county. Passenger service is available in Culpepper, Charlottesville, Fredericksburg and Washington, D.C. Freight service for Luray, Stanley and Shenandoah is provided by the Norfolk and Southern Shenandoah Division, which runs through the county from Hagerstown, Maryland to Winston-Salem, North Carolina.

The Virginia Inland Port, located north of Front Royal in Warren County, provides direct service to the international shipping port of Hampton Roads, Virginia, 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 that travels daily to Hampton Roads. The Inland Port offers excellent service to any businesses in the area that wish to import or export materials and products.

Within Page County existing commercial rail siding capacity is underutilized and capacity for additional sidings remains for future development. Because all rail siding capacity has been absorbed in counties to the north of Page County, this excess siding capacity should be used to entice businesses needing rail service into the county.

## Chapter 9: Land Use

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

By the early 1970's, problems encountered by Northern Virginia and Tidewater and recreational home development in the Shenandoah Valley and other rural areas indicated the need for local regulation. The Code of Virginia included requirements for establishing local planning commissions by 1976, subdivision ordinances by 1977, and comprehensive plans by 1980.

All towns in Page County Luray, Stanley and Shenandoah have adopted their own comprehensive plans, subdivision ordinances, and zoning ordinances. The majority of that work was done with staff assistance from the NSVRC. In order to achieve the goals of this Comprehensive Plan, county and town plans must be coordinated. The Page County Comprehensive Plan establishes an umbrella plan that addresses land use concerns in the rural county areas in a way that supports the maintenance of viable towns as the primary locations for growth.

### 9.1 Land Use Patterns to Date

The figures in **Exhibit 52** provide estimates of the acres in each zoning category between 1980 and 1999. At this time exact figures are unavailable. No figures are available for 2005.

Between 1980 and 1999 the county lost open space. Taken together, the acreage designated as Agricultural and Woodland Conservation decreased while that designated Residential increased. The gain in acreage designated Residential was more pronounced between 1991 and 1999. The acres designated Industrial and Commercial also increased between 1980 and 1999 with the greatest increase occurring between 1991 and 1999.

**Exhibit 52: Acreage Distribution Among Various Land Use Categories**

Land Use Category	1980 Acres	1991 Acres*	Percent Increase	1999 Acres	Percent Increase	Percent of Total
Residential	4,890	5,550	13.5%	14,155	155.0%	7.1%
Commercial	63	217	244.4%	1,070	393.1%	0.5%
Industrial	53	54	1.9%	1,024	1796.3%	0.5%
Agriculture	61,698	62,404	1.1%	79,107	26.8%	39.4%
Open Space /Woodland, Conservation	65,665	61,460	-6.4%	41,232	-32.9%	20.5%
Other Park / Recreation	150	292	94.7%	290	-0.7%	0.1%
National Park and Forest	63,165	64,342	1.9%	63,989	-0.5%	31.9%
Public, Semi-public and Institutional	139	157	12.9%			
Transportation/Utilities	3,127	3,252	4.0%			
Total	198,950	197,728	-0.6%	200,867		100%

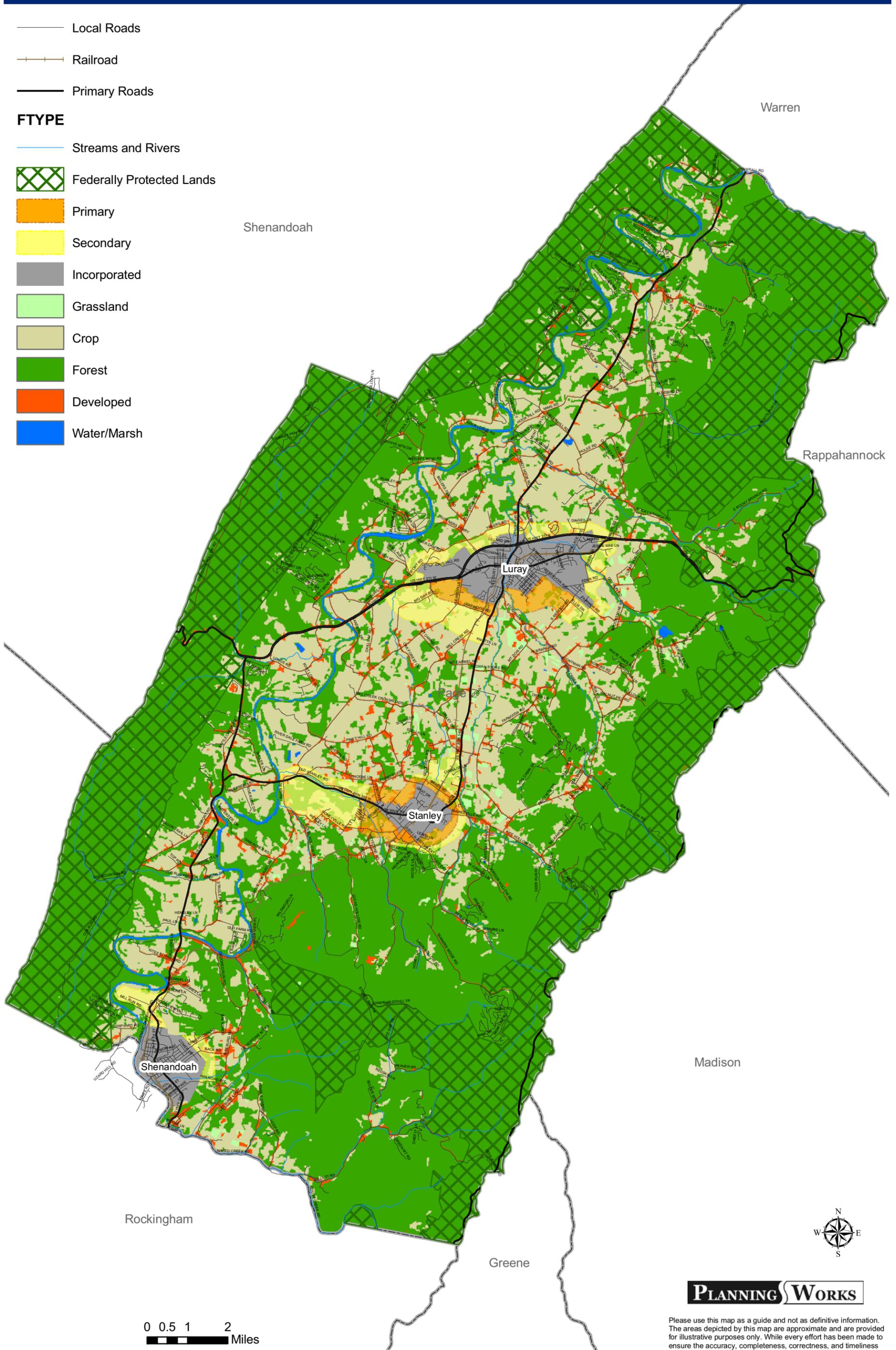
*Source: Land uses for 1991 are measured from the Page County Generalized Existing Land Use Map using digital plan meter equipment at the Agricultural Stabilization and Conservation Office. The Commissioner of Revenue provided figures for 1999. All figures are approximate.*

Agricultural land includes crop and pastureland, orchards, confined feeding operations, and small tracts of timber. Woodland Conservation lands tend to be forested and are located primarily throughout the foothills of the Blue Ridge and the Massanutten Mountains. Although many of these areas are constrained by natural features, such as steep slopes or soil conditions that severely limit development, significant low-density development has occurred.

The Shenandoah National Park (38,614 acres) and the George Washington-Thomas Jefferson National Forest (approximately 26,000 acres), located on the county's eastern and western flanks

respectively represent about 32 percent of the county's land area. The lands of the national park and national forest protect the headwaters of most of the county's watersheds. Because the federal government owns it, this land will be preserved in its natural state and continue to help protect the county's air and water quality and contribute to the tourist economy.

# Exhibit 53 : Existing Land Use



Please use this map as a guide and not as definitive information. The areas depicted by this map are approximate and are provided for illustrative purposes only. While every effort has been made to ensure the accuracy, completeness, correctness, and timeliness of information presented within this map, the burden for determining appropriateness for use rests solely with the user. This map is provided "as is" with no warranties, express or implied.

## 9.2 Development Trends

### Increasing Population and Housing in the Rural Areas

Luray, Stanley, and Shenandoah are located along U.S. 340 or Business 340 that runs through Page County from north to south. As shown on **Exhibit 54**, in 2000 the total population of these towns was 8075, or 35 percent of the county's total population. Although the density of the towns increased significantly from 1980 to 1990, it increased only slightly between 1990 and 2000.

The rate of increase in the density of the rural areas nearly doubled between 1990 and 2000. By 2000, about 65 percent of the county's population lived outside the towns in the county's unincorporated areas. Since there is no public water and sewer outside the towns, this population is served by individual, on-site wells and sewage disposal systems. These facilities depend upon good ground water and proper soil conditions to operate efficiently.

**Exhibit 54: Population and Land Areas – 1980-2000**

Location	Square Miles	Population			Population Per Square Mile			% increase in Density	
		1980	1990	2000	1980	1990	2000	1980-1990	1990-2000
Luray	4.7	3,584	4,587	4,871	763	876	1,036	14.9%	18.3%
Shenandoah	1.3	1,861	2,213	1,878	1,432	1,702	1,445	18.9%	-15.1%
Stanley	1.1	1,204	1,186	1,326	1,095	1,078	1,205	-1.5%	11.8%
<b>Subtotal Towns</b>	<b>7.1</b>	<b>6,649</b>	<b>7,986</b>	<b>8,075</b>	<b>936</b>	<b>1,125</b>	<b>1,137</b>	<b>20.1%</b>	<b>1.1%</b>
Rural County	308.9	12,752	13,704	15,102	41	44	49	6.6%	11.4%
<b>Total</b>	<b>316</b>	<b>19,401</b>	<b>21,690</b>	<b>23,177</b>	<b>61</b>	<b>69</b>	<b>73</b>	<b>12.4%</b>	<b>6.3%</b>

Source: U.S. Census of Population and Housing 1980, 1990 and 2000.

As shown of **Exhibit 55**, 94 percent of the county's population growth and 79 percent of the county's housing growth occurred in the rural areas during the decade 1990 to 2000. This rural population and housing growth reversed the growth trend of the previous decade. The growth of population and housing stock in rural areas is consistent with the combined loss of Woodland Conservation and Agricultural Lands shown in **Exhibit 52**. It is also consistent with the increased population density in the rural areas as compared to the towns during the 1990-2000 decade as shown in **Exhibit 54**.

**Exhibit 55: Page County Population and Housing Growth – 1980-2000**

				Percent Increase	Percent Increase	Town & Rural Growth as a Percent of Total Growth	
Population	1980	1990	2000	1980-1990	1990-2000	1980-1990	1990-2000
Total County	19,401	21,690	23,177	11.8%	6.9%		
Rural Area	12,752	13,704	15,102	7.5%	10.2%	41.6%	94.0%
Towns	6,649	7,986	8,075	20.1%	1.1%	58.4%	6.0%
Housing							
Total	8,329	8,948	10,557	7.4%	17.9%		
Rural Area	5,553	5,685	6,956	2.4%	22.4%	21.3%	79.0%
Towns	2,776	3,263	3,601	17.5%	10.4%	78.7%	21.0%

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

Census Bureau data reveal that in 1980 only one area had an average density of 40 or more acres for every dwelling unit and that by 1990 the least dense category was from 30 to 39.99 acres per dwelling unit. By 1999 the least dense areas had 20 to 29.99 acres per dwelling unit. If the current development trends continue in the county's unincorporated areas, only one area will remain with 20 to 29.99 acres per dwelling unit and the major portion of the unincorporated county will have a density of between 10 and 10.99 acres per dwelling unit (twice as dense as in 1980). Also large areas of the county surrounding the towns will have a density of 2.5 to 9.99 acres per dwelling unit.

### Rural Subdivisions

Records from the Commissioner of Revenue's Office indicate that there are 108 residential subdivisions in Page County. All but three of these subdivisions contain four or more platted lots. Several contain hundreds. Between 1991 and 2006, the greatest growth occurred in subdivisions with 50 to 99 lots. The decrease in subdivisions with 300 to over 400 lots may have occurred because the lots in these subdivisions were between one-third to one-half acre and buyers purchased multiple lots and combined them.

**Exhibit 56: Subdivisions by Number of Lots – 1991, 2006**

Number of Lots in the Subdivision	No. of Subdivisions		Percent Change in Number of Subdivisions
	1991	2006	
400+	3	2	-33.3%
300 to 399	2	1	-50.0%
200 to 299	5	6	20.0%
100 to 199	7	9	28.6%
50 to 99	15	23	53.3%
26 to 49	16	19	18.8%
10 to 25	24	32	33.3%
2 to 9	13	16	23.1%
Total	85	108	27.1%

Source: Commissioner of Revenue, 1992 and 2006

As is shown in **Exhibit 57**, subdivisions with over 50 lots contain almost 82 percent of all the lots. Twenty-five percent of all lots are in subdivisions containing 50 to 99 lots. Only 18 percent of the lots are in smaller subdivisions.

**Exhibit 57: Distribution of Lots within Subdivisions - 2006**

Subdivisions by Number of Lots	Totals		Percent of Lots
	Numbers of Subdivisions	Number of Lots	
400+	2	980	13.5%
300 to 399	1	315	4.3%
200 to 299	6	1414	19.4%
100 to 199	9	1423	19.6%
50 to 99	23	1809	24.9%
26 to 49	19	730	10.0%
10 to 25	32	515	7.1%
2 to 9	16	89	1.2%
Total	108	7275	100%

Source: Commissioner of Revenue Office, 2006

As shown on **Exhibit 58**, in 2006 the greatest number of subdivisions and lots are located in the Marksville District. Between 1991 and 2006 the greatest increase in the number of subdivisions and lots occurred in the Luray District.

**Exhibit 58: Number of Subdivisions and Lots by Magisterial Districts – 1991, 2006**

Magisterial District	Subdivisions		Lots		Percent Change	
	1991	2006	1991	2006	Subdivisions	Lots
Luray*	17	31	1420	1933	82.4%	36.1%
Marksville**	24	32	2208	2391	33.3%	8.3%
Shenandoah Iron	16	19	858	1248	18.8%	45.5%
Springfield	28	26	1873	1703	-7.1%	-9.1%
County Total	85	108	6359	7275	27.1%	14.4%

Source: Commissioner of Revenue, 1992 and 2006

\*Includes Town of Luray

\*\* Includes Town of Stanley

\*\*\* Includes Town of Shenandoah

As shown in **Exhibit 59**, 73.1 percent of all subdivisions and 88.6 percent of all lots are in the unincorporated (rural) areas of the county. Of the three towns Luray has the greatest number of subdivisions and lots within its boundaries. In the unincorporated areas, the Springfield District has the greatest number of subdivisions while the Marksville District, which has five subdivisions each with over 200 lots, has the greatest number of lots.

**Exhibit 59: Location of Subdivisions: Unincorporated Areas vs. Towns - 2006**

Unincorporated Area	Subdivisions	Lots	Town*	Subdivisions	Lots
Springfield	26	1703	-	-	
Luray	14	1242	Luray	17	691
Marksville	22	2309	Stanley	10	82
Shenandoah	17	1192	Shenandoah	2	56
Totals	79	6446	Totals	29	829

Source: Commissioner of Revenue, 2006

\* As of December 2005 the town acreages were:

Luray 2995 Acres

Stanley 597 Acres

Shenandoah 818 Acres

**Exhibit 60** shows that the real boom in subdivisions took place from the mid-fifties through the mid-seventies. Between 1956 and 1975, 5,950 lots were established in 72 subdivisions. Conversely, only 46 lots were created in three subdivisions between 1930 and 1956 and only 363 lots were created in 10 subdivisions between 1976 and 1991. However, between 1991 and 2006, 916 lots were created in 23 subdivisions and the number of lots created per year more than doubled over the previous decade. Several subdivisions proposed during 2005 and 2006 in Luray, Stanley and Shenandoah are not included in **Exhibit 60** because plats have not been submitted.

**Exhibit 60: Subdivision Formation in Page County**

Dates	Number of Subdivisions	Number of Lots	Average New Lots per Year
Pre 1930	1	4	-
1930 -1939	1	7	0.8
1940 - 1949	1	35	4
1950 - 1955	-	-	-
1956 - 1960	4	467	93
1961 - 1965	5	742	148
1966 - 1970	41	3,052	610
1971 - 1975	22	1,689	338
1976 -1977	2	21	11
1977 - 1991	8	342	23
1991 - 2006	23	916	57
Totals	108	7275	

Sources: Page County Subdivision Directory, 1978; Commissioner of Revenue, 1992 and 2006

There are many constraints on the use of some of the existing subdivision lots for residential development including:

- Size (many are too small to meet current setback requirements)
- Location in hilly topography
- Availability of a dependable and safe water supply
- Ability to be approved for individual septic systems and cost of their maintenance

- Costs of alternative means of sewage disposal (and restrictions on the use of such systems)
- Inadequate road access.

As a result of these problems many of the lots in the larger subdivisions platted in the fifties through the seventies have never been “developed” and are listed as “vacant” on the assessment records. As shown in **Exhibit 61** the vacant subdivision lots plus other vacant parcels of land throughout the unincorporated areas of the county add up to 9166 vacant parcels.

In addition to vacant lots in the unincorporated areas of the county, there are a significant number of privately owned vacant parcels of land in the three towns that are not in subdivisions. Within the town of Luray there are 678 acres of land in 58 lots of 5 or more acres. In Stanley there are 9 lots of five or more acres adding to a total of 166 acres of vacant land. Information is unavailable for the town of Shenandoah.

**Exhibit 61: Vacant Land Parcels**

Magisterial District	Number of Vacant Parcels	
	1999	2006
Springfield	729	2192
Luray	2,100	1910
Marksville	1,160	3049
Shenandoah Iron Works	1,301	2015
Total	5,614	9166

*Source: Page County Commissioner of Revenue, 2000 and 2006*

If all the existing vacant parcels could obtain approved wells and individual sewage disposal systems, an additional 9166 dwelling units could be constructed within Page County’s unincorporated areas without any more subdivisions being approved by the Planning Commission and the Board of Supervisors. Using the average number of persons per dwelling unit in Page County in 2000 (2.46), those dwelling units could house approximately 22,548 additional persons. .

Even if many of the existing lots in the larger subdivisions are never developed because of their small acreage, inadequate roads, water supplies, or sewage disposal systems, the potential exists for significant growth in the rural areas. The existing potential for build-out within existing subdivisions presents policy questions for the Planning Commission and the Board of Supervisors to consider, such as whether:

- The minimum lot sizes are appropriate
- The standards for roads are adequate
- Existing construction standards for wells and septic systems are sufficient to protect both the individual homeowner and the environment.

### 9.3 Zoning

Statewide zoning ordinances designate several zoning categories; Residential, Commercial, Industrial, Woodland Conservation and Agricultural. In addition, zoning ordinances can provide for "overlay" districts, or additional regulations, that govern such things as permitted uses in flood plains, historic and conservation districts.

Page County, Luray, Stanley and Shenandoah have enacted zoning ordinances to implement land use plans and to provide for the citizen's public health, safety, and welfare. These ordinances control the types of uses permitted, the density of development, minimum lot sizes, lot widths, and building setbacks and other provisions.

The Page County Zoning Ordinance contains six zoning districts, described as follows:

- **Park-Recreation** encompasses those lands owned by the federal government in Page County and includes the Shenandoah National Park and the George Washington-Thomas Jefferson National Forest. Any land zoned Park-Recreation and not owned by the United States or Virginia is subject to all requirements of the Woodland-Conservation district.
- **Woodland-Conservation** is intended to perpetuate the "rural atmosphere, open space, and scenic landscape" of that area of the county. This district is established for the specific purpose of conserving natural resources, protecting fragile environmental areas, reducing soil erosion, protecting watersheds, reducing hazards from flooding and protecting existing farmland. It covers mountain and heavily forested areas, and other areas of open space uses such as recreation, flood plains, and farms.

- **Agriculture** zoning was enacted to preserve agriculture and other low intensity uses of the county. It is located generally where the soils are well suited for such purposes. The restrictions for this district are intended to ensure a relatively low density of development and to preserve agriculture. The permitted uses should include mainly agriculture and related uses.
- **Residential** district is intended to encourage residential development, which will blend with existing development, create an appropriate living environment and a harmonious residential community and promote a suitable environment for family life. This district includes residential subdivisions and other areas where major residential development has occurred.
- **Commercial** zoning covers the areas of the county intended for general business uses to which the public requires direct and frequent access but which is not characterized either by constant heavy trucking or undesirable impact. It is also intended to include areas that provide services for visitors and tourists.
- **Industrial** is intended to provide areas where certain industries can locate close to the labor supply. It is also intended to ensure that those industries protect the environment and do not detract in any way from the overall desirability of the area. The areas included in this district are concentrated near suitable public facilities.

## 9.4 Summary

Several factors indicate increasing development of rural land between 1990 and 2000. These include the loss of open space to residential use and increased population and housing densities in the rural areas. Ninety-four percent (94%) of the county's population growth and 79 percent of its housing growth took place in the unincorporated areas of the county during this period.

The county has 108 platted subdivisions. Many subdivisions were platted between 1956 and 1975. However, between 1991 and 2006, 957 lots were created in 22 subdivisions and these figures do not include several large subdivisions approved in the towns of Luray, Stanley and Shenandoah in 2005-2006. The unincorporated (rural) area of the county has 79 platted subdivisions containing 6446 lots. The potential for build-out in the rural areas of the county is significant.

The lack of complete records reflecting changes in the acreage listed under the various zoning categories over time makes it impossible to accurately track trends in zoning changes as well as changes in land use.

## **9.5 Land Use Concerns**

### **Water Pollution Dangers**

Steep slopes, flooding, soil limitations, and the potential for surface and ground water pollution present serious hazards for development in many portions of the county. It is economically impractical to provide public water and sewer facilities to rural areas. The cumulative effect of excavation and development in rural areas that lack municipal water systems poses a threat to the county's water quality, water supply and demand especially for the 65 percent of the population living in the county's rural areas. Continued building in these areas also damages the rural, scenic quality of the county.

### **High Costs**

Widely scattered development in the rural or “unincorporated” areas of the county is expensive to maintain for the property owners and for the county. Private costs include the installation of wells and (in many cases) water treatment, the installation and maintenance of septic systems, or other alternate wastewater treatment systems, the construction of generally long driveways, and the necessity of driving into one of the towns for most goods and services.

Public costs of widely scattered development include the need to upgrade miles of secondary roads and bridges, a large number of school buses and extensive bus routes, increased teachers, and the provision of police protection, emergency services and other public services over a large area.

### **The Potential for Build-out In Existing Subdivisions**

The thousands of vacant residentially zoned parcels in the unincorporated area present many challenges. Many of them cannot be built upon because of soil and septic limitations. Although alternate methods of wastewater disposal are being developed, they are presently costly to install and difficult to maintain. Although community facilities are expanding in and adjacent to existing local population centers, there is currently a low level of these facilities in the rural areas. Finally, if the population of the rural subdivisions grows to its potential, the public costs to extend facilities and services to these rural subdivisions would be significant.

### **Density Increases in the Unincorporated Areas**

The citizens of Page County want to protect the rural character of the countryside; “Preserve and protect the natural, rural and open space character of the county” has been a major goal of the county’s Comprehensive Plans since 1980.

The county has no direct control over approximately one-third (32%) of its land because the federal government owns and controls land use in Shenandoah National Park and George Washington National Forest. As a result, past growth has been concentrated on only two-thirds of the county's land area, thus raising the population density level. As shown on **Exhibit 18**, in 2000, Page County had a higher population density in the land area controlled by the county than Madison, Shenandoah, Greene or Rappahannock Counties. As discussed above, housing density in the unincorporated rural areas of the county has continued to increase.

Clearly, increasing housing and population densities in the county’s rural areas indicate that existing zoning and subdivision ordinances have not supported a major desire of Page County citizens and a primary goal of the county’s Comprehensive Plans.