

## **IX. Existing Conditions Analysis**

### ***A. Introduction***

#### **1. Purpose**

The Existing Conditions Analysis provides a snapshot of the current conditions of the county from a planning perspective. Demographics, socioeconomics, housing, employment and economy, transportation, community facilities, natural resources, and land use elements have all been analyzed.

Information for the Existing Conditions Analysis was compiled from a variety of sources including the current Plan, studies and reports developed for the county, personal interviews with key county staff, and a public opinion survey.

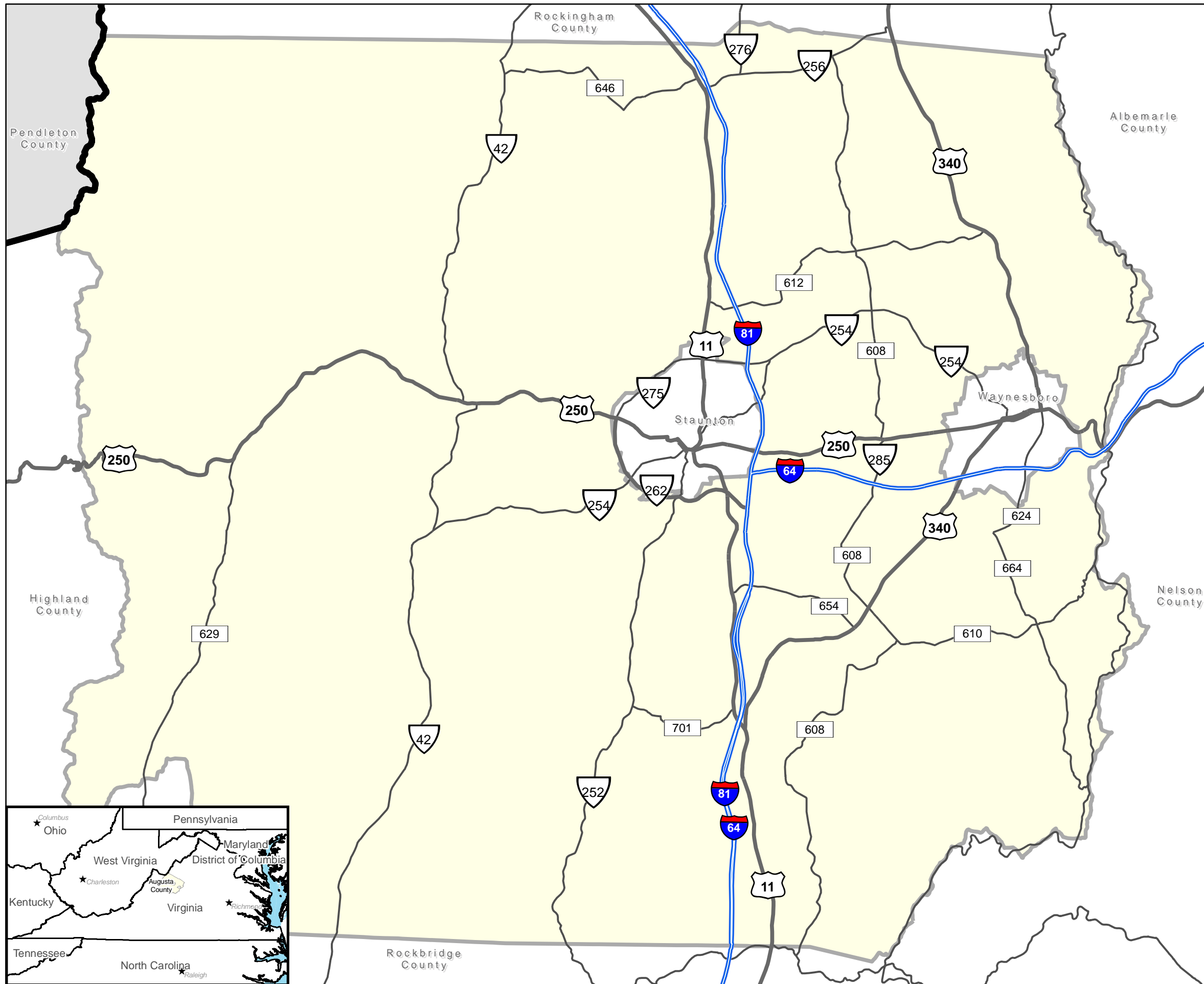
This analysis forms the foundation for the development of the Plan by helping to identify issues and areas of concern that are addressed in the Comprehensive Plan through the development of goals, objectives, and policies. Please note that the majority of the data found in the Existing Conditions Analysis has not been updated since its completion in November 2005. Therefore, some of the information in the Existing Conditions Analysis may be out of date as of the adoption date of this Plan.

### ***B. Description of County and Natural Resources***

#### **1. Location**

Augusta County is located in the Shenandoah Valley of Virginia, a largely rural valley of agricultural and manufacturing communities. The Valley covers an area along the northwestern edge of the state, running southwest to northeast. Augusta County is located approximately midway between the northern and southern ends of the Valley, and essentially covers the width of the Valley, including portions of two mountain ridges. It is bordered by the Virginia Counties of Rockbridge to the south, Albemarle and Nelson to the east, Rockingham to the north, Highland and Bath to the west, and Pendleton County, West Virginia to the west.

Interstate 81 bisects the county in a northeast to southwest direction, while Interstate 64 enters the county from the east, intersecting with I-81 at the edge of the Staunton city limits. Railways also bisect the county in a north to south direction as well as east to southwest. The Shenandoah Valley Regional Airport is located in the northern part of the county, and headwaters of both the James and Shenandoah Rivers, as well as a small portion of the Potomac River, originate in the county. Augusta County is approximately 150 miles southwest of Washington, D.C., 100 miles west of Richmond, 85 miles north of Roanoke and approximately midway between Atlanta and New York. **Map 9** shows the location of the county.



- LEGEND**
- Interstate
  - US Highway
  - State Highway
  - Augusta County
  - West Virginia
  - State Boundaries



**Map 9**  
**Regional Location**  
 Augusta County  
 Comprehensive Plan  
 2007-2027



The county is generally rural in character, with most of the land in agricultural and forest uses, although there are two independent cities and several urbanizing areas in the central portion of the county. The county surrounds the independent cities of Staunton, the county seat, located near the center of the county, and Waynesboro, located at the eastern edge. The cities serve as major cultural and economic focal points for the county, as do several unincorporated developing areas located along the major thoroughfares in the county and the incorporated Town of Craigsville. In addition, a small portion of the Town of Grottoes, a jurisdiction located primarily in Rockingham County, falls within the Augusta County borders.

Of the 95 counties in Virginia, Augusta County is the second largest with 973.9 square miles (623,296 acres) and has a total population of 67,100 based on 2004 estimates. The cities of Staunton and Waynesboro have populations of 23,853 and 19,520 respectively. The county is also made up of seven magisterial or election districts - Riverheads, Wayne, Middle River, South River, Beverley Manor, North River, and Pastures. **Map 10** shows the locations of the districts.

Augusta County is widely known for the scenic beauty of its physical environment. This visual quality is created primarily by the relatively hilly topography that produces dramatic views of the landscape from the public roads, and by the forested mountain ridges which provide a backdrop and sense of visual definition to the valley landscape. The scenic beauty of the county can be considered one of its most important assets. In fact, 62 percent of all respondents in the public opinion survey conducted by the county in June 2005 indicated that scenic beauty was one of the three best things about Augusta County.

## **2. History**

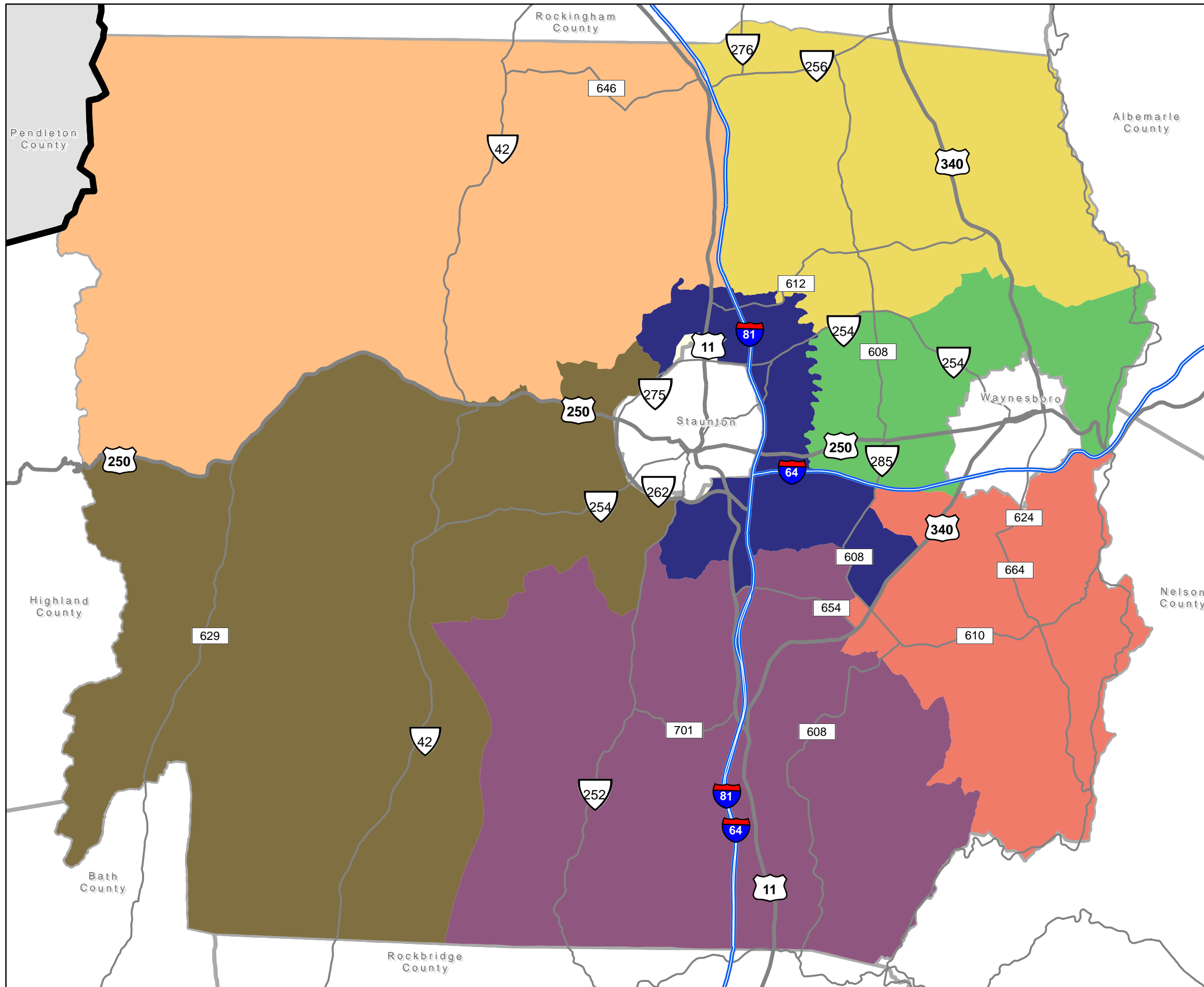
The Shenandoah Valley, including the area that is now Augusta County, was for many centuries a hunting ground for a variety of Native American tribes, including the Shawanese, Tuscaroras, and Senedos.<sup>1</sup> These tribes enhanced the natural productivity of the land by regularly burning the dry grasses of the valley floor in the autumn in order to promote the growth of pasture for the production of wild game. Shenandoah, or Sherando, is a native word meaning “beautiful daughter of the stars.”

The Valley was first visited by non-native settlers in 1716 when Colonel Spotswood’s “Knights of the Golden Horseshoe” discovered it during an expedition. In 1732, 16 families from Pennsylvania crossed the Potomac River and settled in the northern part of the Valley near what is now the City of Winchester.

Settlement continued as word spread about the natural abundance of the Valley and in 1738 the General Assembly found reason to establish Augusta County as a distinct governing entity, separate from Orange County. The county appears to

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<sup>1</sup> History of Augusta County, J. Lewis Peyton, 1953.



**LEGEND**

**Magisterial Districts**

- Beverley Manor
- Middle River
- North River
- Pastures
- Riverheads
- South River
- Wayne

- Interstate
- US Highway
- State Highway
- Augusta County
- West Virginia
- State Boundaries



0 1 2 3 4 5 Miles



Source: Augusta County GIS

**Map 10**

**Magisterial Districts**

Augusta County  
Comprehensive Plan  
2007-2027



Kimley-Horn  
and Associates, Inc.

have been named for Princess Augusta, mother of King George III and wife of Frederick Lewis, then Prince of Wales. Frederick County, Virginia was established at the same time. The original western boundary of the county was the western edge of Virginia, which at the time was the Mississippi River. The boundaries of the county were set at their present location in 1790.

The first settler of Augusta County was John Lewis, who was born in Ireland and educated in Scotland, and who settled in what is now the City of Staunton. Lewis was followed by other Scotch-Irish settlers, and soon thereafter by Germans and those of German lineage from Pennsylvania. In 1745, once the population had grown large enough to support a local government, the county seat was organized at Staunton.

Much of what is Augusta County today was part of the Beverley Manor grant from Governor William Gooch to William Beverley in 1736. The grant consisted of 118,491 acres of land and was followed by a 500,000-acre grant to Benjamin Borden, however most of that grant was for land in present-day Rockbridge County. Beverley and Borden were encouraged by the terms of the grants to bring additional families to settle the land.

The Valley was the site of substantial action during the Civil War, resulting in extensive damage to farms and infrastructure. Battles were fought in and around Augusta County in 1862, 1864, and 1865.

The cities of Staunton and Waynesboro developed in close conjunction with Augusta County. Staunton was established as a town in 1761 and incorporated as a city in 1871. In addition to serving as the county seat and a center of local commerce, Staunton became an educational center as well, with the establishment of the Virginia School for the Deaf and Blind in 1839 and Mary Baldwin College, a private college for women, in 1842. Waynesboro was established in 1801, became a town in 1834, and was incorporated as a city in 1948. With its location at the intersection of two major railroads, Waynesboro became an industrial center by the late 19<sup>th</sup> century.

There were also several major transportation corridors through the county that helped contribute to settlement. Route 11 began as an Indian trail, then changed to the Great Wagon Road, and finally became known as the Valley Pike, which was used to transport settlers and goods out west. The Staunton-Parkersburg Turnpike was also a major route.

Augusta County continued to prosper as an agricultural and manufacturing center into the 20<sup>th</sup> century. During the second half of the 1900s, the two cities continued to develop and mature, two interstate highway links were built through the county, the agricultural base further developed and the area became widely recognized as one of the outstanding natural, historic, and recreational areas in the

nation. The county has established and maintained a high quality of life for its citizens through an extended period of steady growth in both jobs and population.

### **3. Geography**

Augusta County lies within the Valley and Ridge Physiographic Province, which is characterized by gently rolling and hilly valleys, as well as gradual mountain slopes. The extreme eastern edge of the county is within the Blue Ridge Physiographic Province, distinguished by sharp mountain peaks. Elevations range from 1,050 to 1,800 feet above sea level in the Shenandoah Valley. The Blue Ridge Mountains and the Allegheny Mountains have many peaks, which exceed 3,500 feet above sea level. The level areas of the county are located in the vicinity of Fishersville, Middlebrook, Spotswood, Stuarts Draft, Swoope, Waynesboro, and Weyers Cave.

### **4. Climate**

Augusta County is characterized by a modified continental climate with mild winters and warm summers. The average annual temperature is 52.3 degrees Fahrenheit. The average high temperatures are 43.3 degrees Fahrenheit in January and 85.1 degrees in July. The average lows are 21.5 degrees in January and 61.6 degrees in July. Average precipitation is 36 inches per year with 26 inches of snowfall. Prevailing winds are generally out of the southwest. During the colder months, however, the winds often originate from the northwest.

The growing season is 175 days long, from mid April to mid October. This is normally long enough to allow proper maturity for a large variety of crops.

### **5. Geology and Soils**

The geology of the Shenandoah Valley generally consists of three layers of bedrock. The bottom layer is composed of very old Cambrian and Pre-Cambrian rocks such as granite, quartzite, and shale. The middle layer consists of limestones and dolomites of the Ordovician era, and on top of that are sandstones and shales of the Silurian and Devonian eras. These formations were uplifted over a now dormant fault at the eastern edge of the Blue Ridge, and as the rocks weathered over a period of millions of years, limestone rock materials eroded more rapidly than the granite and sandstone, thus forming the large valley.

A number of materials can be produced from the limestone found throughout the valley. Crushed limestone is used for highway bases, building foundations, and other construction uses. Beds, which contain more than 85 percent calcium carbonate, are for agricultural limestone, portland cement, and explosives. There are also some areas containing pockets of high calcium limestone, used for production of lime, glass, paint, dyes, fertilizers, and other chemicals.

Sand and gravel can be recovered from alluvial deposits along river valleys and along the foot of the mountains. These materials are used for construction of roads and buildings, as well as other industrial uses. Also, several pockets of clay

throughout the county have been used for manufacturing brick and other ceramics.

The mineral resources in Augusta County have been mined or quarried over the years with varying degrees of intensity. Currently, the minerals being extracted are limestone for construction and agricultural uses, and sand and gravel for construction. In the past, manganese, iron ore, bauxite, marl, sandstone, coal, and clay have been extracted and sites have been explored for natural gas and oil.

The Crimora Mines were once the largest producer of manganese in the United States, and the areas south of Stuarts Draft once contained a number of smaller iron and manganese mines. However, because of competition from Pennsylvania and overseas, these mines and smelters were closed. Remaining mineral deposits have limited if any future mining potential as they are located in the National Park and National Forest Wilderness areas.

A number of diabase formations occur in isolated locations throughout the county. Diabase is a very hard, igneous rock used in construction where limestone is not strong or stable enough. However, the formations in Augusta County are too scattered and thin to be quarried commercially.

Soils in the Shenandoah Valley range from carbonate and shale soils to alluvial soils along rivers and streams. Colluvial soils derived from the weathering of sandstone and shale are found in the foothills paralleling the valley. The Blue Ridge and Allegheny Mountains are covered with shallow, rocky, excessively drained soils. The predominant geological structure underlying Augusta County is a complex formation of limestone and calcareous shale, with small amounts of sandstone and chert.

Prime agricultural soils are those that are best suited for continuous agricultural use and are designated by the US Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS). These soils account for approximately 11 percent of Augusta County's soils. An additional 25 percent are recognized by the state as locally important for Augusta County farmers. These soils are usually found in areas that are not steep or stony and are well drained and watered. More information on prime agricultural soils can be found in the Land Use section.

### **Hydrogeology**

Bedrock in Augusta County can be divided into three hydrogeologic groups: igneous, clastic, and carbonate. Igneous rocks are found only along the Blue Ridge at the eastern edge of the county. Clastic bedrock covers the George Washington National Forest, the slopes of the Blue Ridge, and a strip along Christians Creek, north of Mint Spring. Carbonates cover the valley floor in all other places. However, a substantial amount of alluvium (200- to 300-foot deep) has accumulated along some foothills and floodplains.

Igneous rocks are hard and dense and have very little soil cover. Groundwater may migrate along faults and fractures, but primary permeability is essentially non-existent. In order to produce any water, a well must intercept a fracture, and therefore, the depth and production of wells will vary. What water is withdrawn is of very good quality, since there is no development along the Blue Ridge and the water does not react with the bedrock. Because of limited soil cover and the likelihood of contamination of wells through bedrock fractures, the use of on-site sewage disposal systems in these areas poses significant risk to long-term groundwater quality.

Siltstone, sandstone, and shale are the predominant clastic rocks. They are somewhat porous but have few fractures and little soil cover. As such, deep wells will usually produce enough water for residential use, but not enough for industrial or municipal uses. Wells in sandstone areas also must be entirely cased, making them cost prohibitive in most cases. Because of variations in mineral composition, water quality varies from clear but hard to turbid but soft. Also, because of shallow, permeable soils, on-site sewage disposal systems can influence surface and groundwater quality.

Limestone and dolomite, the carbonate formations, have little primary permeability but numerous fractures. These fractures are usually exaggerated by the dissolution of carbonates in water. While these solution channels allow for productive wells in some areas, wells drilled outside of fracture areas will produce little water. Water is usually hard, and in some cases may be slightly turbid. Because of the size and interconnection of solution cavities in limestone formations, pollutants can be rapidly transmitted directly into the groundwater reservoir. This makes the combination of on-site sewage disposal systems and limestone bedrock a potentially serious long-term threat to water quality in these areas.

## **6. Groundwater**

The cavernous formations associated with limestone geology provide a good source of groundwater for public and private wells in many areas of the county. However, the supplies of water in these formations are not consistent across the county and therefore some areas do not have access to adequate groundwater. In addition, the formation's interconnectedness also increases the risk of water contamination from nitrates and fecal coliform bacteria that are produced from agricultural waste run-off and on-site sewage disposal systems. Excessive amounts of nitrates in drinking water present health risks to humans, particularly young children.

The portion of Augusta County with the highest potential for groundwater is a narrow belt along the western foot of the Blue Ridge Mountains. Favorable geologic and recharge conditions give this area a relatively high groundwater potential. High-capacity wells yielding 1,000 gallons per minute at depths of 1,000 feet have been developed successfully in this area. Wells in the remainder



of the Augusta County area generally yield less than 20 gallons per minute and are seldom deeper than 300 feet.

## **7. Watersheds**

Augusta County contains 21 hydrologic units as defined by the Virginia Department of Environmental Quality (DEQ). These hydrologic units are commonly referred to as watersheds or subwatersheds, depending on their relative size and drainage area. Each unit centers on a stream which carries the surface water runoff from the land area within the watershed downstream to the next lower watershed.

Because of its relatively high elevation and specific topographic patterns within and adjacent to the county, all of Augusta County's surface water flow originates from watersheds within the county, making it a purely headwaters jurisdiction. This attribute is rare and valuable for a locality because it allows the locality to exercise a relatively large amount of control over the quality and quantity of its surface water resources.

As for surface water, most of Augusta County lies within the James River drainage basin and the Shenandoah River drainage basin, which drains into the Potomac River watershed. The major waterways are South River, which flows through the eastern portion of the county; Middle River, which passes through the north-central portion of the county; and North River, which travels through the northwest section of the county. These three north-flowing rivers meet just north of the county to form the South Fork of the Shenandoah River. Also the Calfpasture watershed, South River, and St. Marys watershed drain into the James River drainage basin.

Several of the county's watersheds are experiencing excessive levels of soil erosion from farmland which can have negative impacts on stream quality as well as long term agricultural productivity. Tributaries to the Middle River, including Christians Creek, are experiencing levels of soil erosion on cropland and pasture land that exceed twice the tolerable levels as defined by the standards of the NRCS. Non-point source pollution is also negatively impacting stream quality in the county. According to DEQ, 30 streams in Augusta County (553.38 miles) have water quality impairments based on total maximum daily loads (TMDLs) for pollutants such as fecal coliform, bacteria, PCBs, pH, and mercury.<sup>2</sup> A stream is considered impaired when it violates state or federal water quality standards for pollutants.

Correspondence from DEQ indicates that Augusta County should specifically consider the mercury fish advisory impairment in the South River when addressing water quality impairments.<sup>3</sup> Mercury that was discharged from

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<sup>2</sup> [www.deq.virginia.gov](http://www.deq.virginia.gov)

<sup>3</sup> Letter from Robert Brent, Regional TMDL Coordinator, DEQ to Augusta County Comprehensive Plan Steering Committee, c/o Nancy Sorrells, dated December 7, 2005.

Dupont in Waynesboro from 1929 to 1950 has caused widespread contamination of the South River and its floodplain. Accumulation of mercury through the aquatic food chain has led to fish advisories on the consumption of fish from the South River. Because significant contamination of floodplain soil also exists, DEQ suggests that planning efforts should consider the impacts of land uses in the floodplain area. Development or other land disturbing practices could spread floodplain contamination or reintroduce contaminated floodplain soils to the river, further exacerbating the problem.

### **8. Wetlands**

Wetland areas are a valuable natural resource, which occupy less than 1 percent of the county's land base. They reduce floodwater peaks by storing the floodwater and reducing velocity, serve as groundwater discharge and recharge areas, and improve water quality. Wetlands are also a source of food and critical habitat for fish and wildlife. Wetlands are defined by the federal Clean Water Act as "areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support the prevalence of vegetation typically adapted for life in saturated soil conditions." Section 404 of the Clean Water Act empowers the U.S. Army Corps of Engineers to regulate the placement of fill or dredged material into the waters of the United States including wetlands. Placement of fill or dredged material into such designated wetland areas may require a permit or authorization by the Corps of Engineers.

Most of the wetlands in Augusta County are located along rivers and within valleys, predominantly in and around the floodplain areas. There are also sinkhole wetlands along the base of the western flank of the Blue Ridge Mountains. **Map 11** shows the location of wetlands in the county.

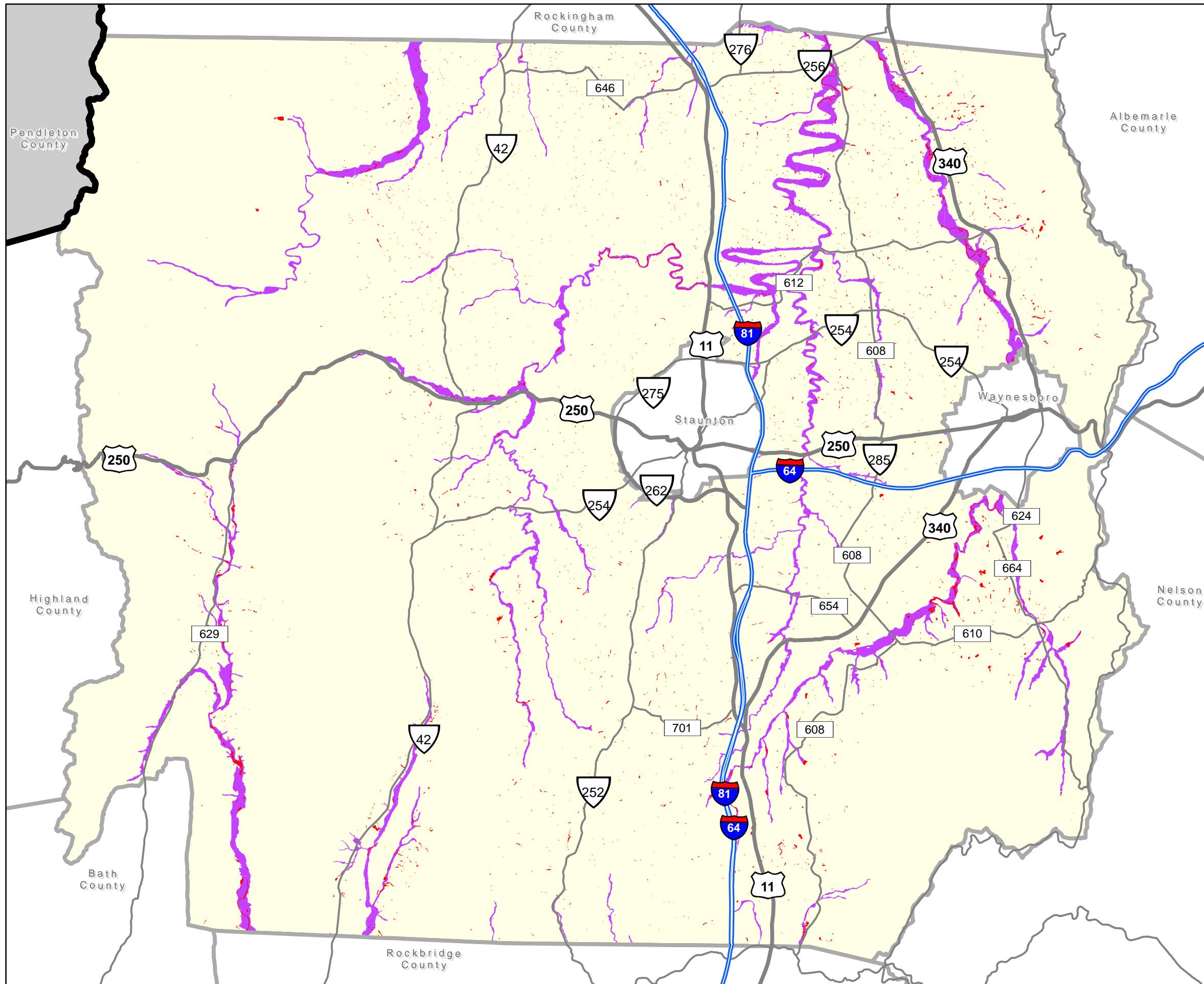
### **9. Steep Slopes**

Because of the rolling nature of the terrain in Augusta County, steep slopes can be found on almost any tract of land. As much as 55 percent of the county contains slopes greater than 15 percent and more than a third has slopes of 25 percent or greater. In some areas the ground lies at or near its natural angle of repose. Cuts into these areas could cause the entire slope to slide, endangering not only the construction site but also neighboring properties located further up the slope.

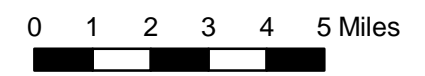
### **10. Floodplains**

Floodplains are those areas along streams and rivers that are prone to periodic flooding. They reduce floodwater peaks by storing the floodwater and reducing velocity, serve as groundwater discharge and recharge areas, and improve water quality. The hazards of floods have prompted federal and state laws requiring management of floodplains where the probability of flooding is greater than one percent (the 100-year floodplain).

The Federal Emergency Management Agency (FEMA) has completed a comprehensive study for all water courses draining more than one square mile



- LEGEND**
- NWI Wetlands
  - Floodplain/ Floodway
  - Interstate
  - US Highway
  - State Highway
  - Augusta County
  - West Virginia
  - State Boundaries



Source: FEMA (Floodplains)  
National Wetlands Inventory (Wetlands)

## Map 11 Wetlands and Floodplains

Augusta County  
Comprehensive Plan  
2007-2027



within Augusta County. Also, the NRCS has prepared Flood Hazard Analyses for some of the water courses in the county. In addition, the Army Corps of Engineers has prepared a study which lists high water marks taken from floods since 1924. **Map 11** shows the location of floodplains in the county.

### **Flood Control Dams**

The county has several dams that are in use to control flooding. Many of these dams are currently not meeting dam design and safety criteria and present a potential hazard to downstream development. Also, the areas that are prone to flooding around these dams (flood inundation zones) are not clearly defined or mapped. This has led to the unintentional allowance of development within flood inundation areas which further escalates the potential hazards. Having dams that do not conform to current design and safety standards and allowing development in the flood inundation areas puts the county at risk for potential loss of life as well as property destruction.

**Table 7** lists the flood control dams currently in operation in the county and any current deficiencies.

**Table 7. Flood Control Dams in Augusta County, 2005**

<b>Dam</b>	<b>Operator</b>	<b>Deficiency</b>
Poor Creek	Department of Corrections	
Lofton Lake	Headwaters	
Stoney Creek	Headwaters	Insufficient spillway
Wilda Lake	Headwaters	Spillway Erodability Study required
Jones Hollow	City of Waynesboro	
Mills Creek	Augusta County	
Canada Run	Headwaters	
Waynesboro Nurseries	Headwaters	Spillway Erodability Study required
Robinson Hollow	Headwaters	Insufficient spillway
Happy Hollow	Headwaters	
Toms Branch	Headwaters	Insufficient spillway
Inch Branch	Headwaters	Insufficient spillway
Upper Sherando	US Forest Service	
Todd Lake	Headwaters	Spillway Erodability Study required
Elkhorn	City of Staunton	
Hearthstone	Headwaters	

Source: Augusta County, 2005.

Note: Headwaters refers to the Headwaters Soil and Water Conservation District.

### **11. Public Lands**

The high quality of natural resources in the Augusta County area is indicated by the large proportion of the county that is held as federal, state, and regional park land. Approximately 33.4 percent of Augusta County is owned by the federal

government. The George Washington-Jefferson National Forest covers approximately 195,758 acres and Shenandoah National Park has 12,272 acres in the county. Within the national forest there are two designated wilderness areas that fall inside the county boundary—Ramseys Draft and Saint Marys. Both wilderness areas were designated in 1984, with the Ramseys Draft area consisting of 6,518 total acres and the Saint Marys area consisting of more than 10,000 acres. Additionally, the Little North Mountain Wildlife Management Area located in the southeastern portion of the county covers approximately 33,697 acres in Augusta and Rockbridge Counties.

### **Forests**

Forests are a primary element in the natural landscape and economy of Augusta County and its neighboring jurisdictions in the Valley and northern mountain area. Forests cover more than half of the county's area and produce multiple environmental, economic, and cultural benefits.

Forests provide habitats for many plant and wildlife species, resources for outdoor recreation, protection from sedimentation and erosion, groundwater recharge areas, and visual buffers between land uses. Forests are an inherently renewable resource and will, with the use of proper timber management practices, continue to provide the county with many benefits.

Forest resources are important in maintaining the local forest industry, watersheds, wildlife habitats, and outdoor recreation in the area. According to the U.S. Forest Service's *Forest Statistics 1992*, 54 percent of the 623,296 acres of land in Augusta County was forested. The majority of the 346,217 forested acres are located in the Shenandoah National Park and the George Washington-Jefferson National Forest.

Of the forested land in Augusta County identified in 1992 as potentially serving as commercial forest, 44.7 percent was private and 55.3 percent was public. The dominant forest type in the area is mixed hardwoods, largely oaks, hickories, and maples. Several major sawmills operate in Augusta County.

The timber industry is an important segment of the state's economy as well as the county's. According to the Virginia Department of Forestry, Augusta County ranks 55 in the state for total harvest value.<sup>4</sup> From 1986 to 2001, Augusta County's average annual harvest value was approximately \$1.2 million. The total economic value of the production of goods and services by forest-related industries in the county was \$2.8 billion in 1999. Total employment in these industries was 2,592. In order to maintain its stock of timberland 2,853 acres were planted between 1994 and 2003.

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<sup>4</sup> Virginia Department of Forestry website – [www.dof.virginia.gov](http://www.dof.virginia.gov)

## **12. Planning Issues**

Based on the available data regarding the natural systems in the county, the following planning issues have been identified:

- The scenic beauty of the county is strongly valued. In order to adequately preserve this, what additional land use protections should be considered for agricultural lands and ridgelines?
- The hydrogeologic characteristics of the county make the successful use of wells in some areas a challenge. The depth of wells also varies greatly and in areas of low depth could create problems with groundwater quality. How should the use of wells be better controlled and balanced with the provision of public services?
- Groundwater as a whole is of good quality in the county; however the nature of the system makes it vulnerable to contamination from agricultural runoff. What groundwater source protection measures should the county consider?
- Soil erosion and non-point source pollution is compromising the water quality in streams throughout the county. How should the county protect the water quality of streams?
- There are many flood control dams in the county that currently are considered to pose risks to property and people. What can the county do to prevent development in flood inundation areas?

### ***C. Supplemental Natural Resources Section***

#### **1. Introduction**

The Natural Resources Report is a supplement to the “Augusta County Comprehensive Plan 2005-2025, Existing Conditions Analysis.” This report contains supplemental data and maps that were not included in the original report.

#### **2. Watersheds**

A watershed refers to an area of land that drains water to a particular point along a stream, river, or other waterbody. Topography and surface runoff are the key elements affecting this area of land. The boundary of a watershed is defined by the highest elevations surrounding the waterbody.

Watershed scale varies depending on the drainage area, ranging from large watersheds (e.g. Chesapeake Bay Basin) to small watersheds (e.g. Walker Creek subwatershed). The Hydrologic Unit Classification (HUC) is a system used to organize watersheds.