

employ to help address increases in volumes on adjacent roadways due to diverted traffic from incidents on I-81 and I-64? Should the county's fire and rescue resources be changed in order to address the growing number of incidents on the interstates that the county responds to annually?

- Augusta County has a growing rural elderly population. As these people age and have less personal mobility, reliance on available public transportation will increase. How should the Coordinated Area Transportation System (CATS) be changed to address the future transportation needs of the projected elderly population? How can the transportation needs of the elderly and disabled populations in the county be better served?
- VDOT is required (by state law) to reserve an adequate level of funding to maintain and operate its existing system of roads prior to allocating funds for road improvements. With the current rate of growth of the state road system and only minimal growth in transportation funds, VDOT will have a decreasing allocation for new construction. How should the county plan financially to provide funding for future road improvements?

## ***H. Supplemental Transportation Section***

### **1. Introduction**

This section 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. Overview**

A three step process for analyzing existing and projecting future transportation conditions was introduced, and endorsed, by participants at the Augusta County Workshop on September 28, 2006. These three steps were.

Step 1: Analyze existing transportation network.

- Existing Conditions Results
- Road Segment Classification and Capacity Analysis
- Preparing GIS Road Network Data for Analysis

Step 2: Develop traffic growth projections.

- 2025 AADT projection
- Projecting 2025 Population by Policy Area
- Calculating 2005 Population by Policy Area
- Road Segment Classification by Policy Areas

Step 3: Identify future network constraints.

- Identify Network Constraints
- Level of Service Analysis

More information on the methodology and the results for the three steps follows.

### **3. Step 1: Analyze Existing Transportation Network**

#### **Preparing GIS Road Network Data for Analysis**

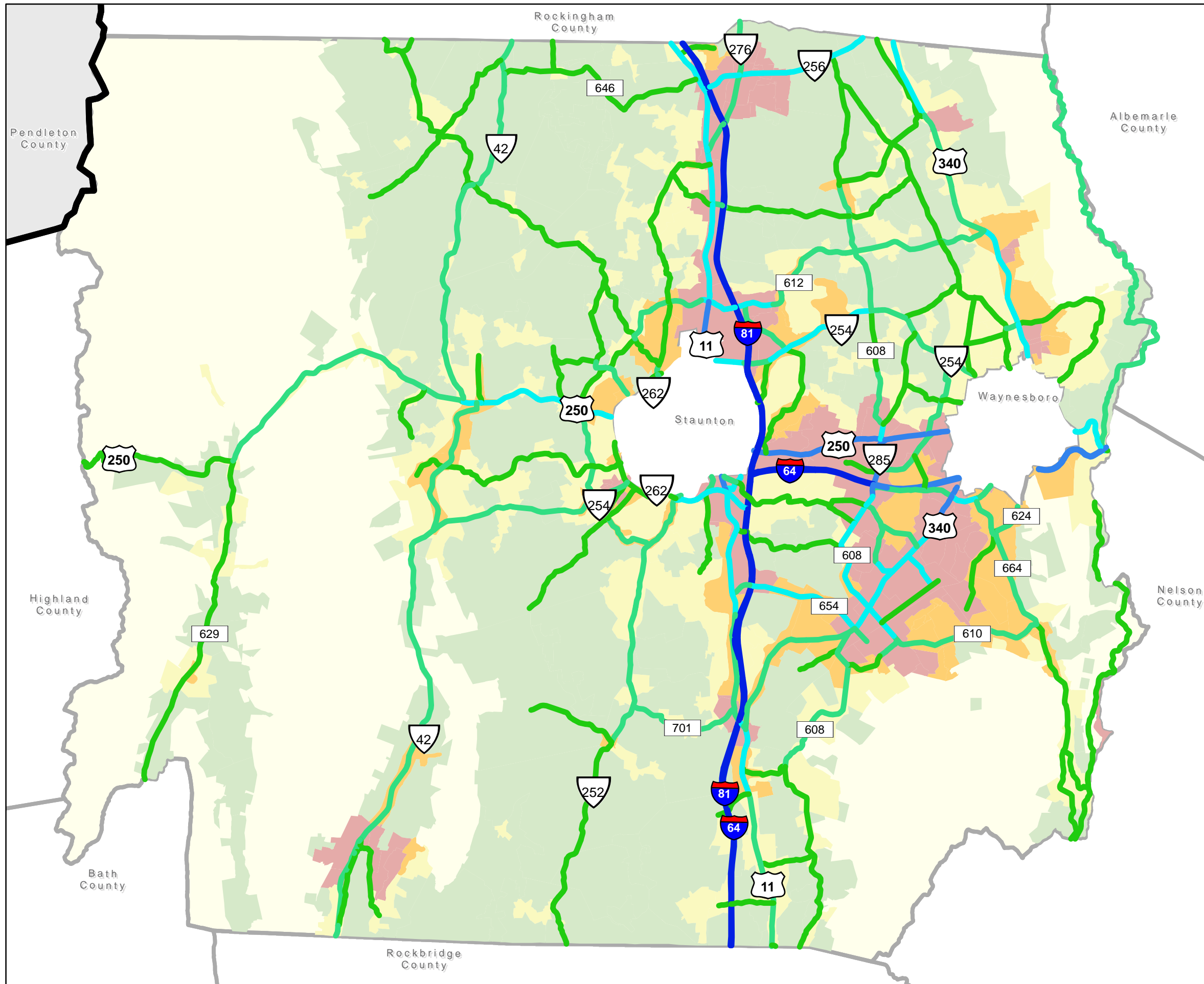
Average Annual Daily Traffic (AADT) data for Augusta County were extracted from the VDOT Regional Long-Range Transportation Plan (LRTP) for the Central Shenandoah Region (August 2006). This ArcGIS Shapefile contained the most recent AADT, with most road segments containing data from 2005 and a few that have not been updated since 2004. **Map 29** displays the existing AADT data for Augusta County. Roadway segments for Staunton and Waynesboro were removed from the dataset.

#### **Road Segment Classification and Capacity Analysis**

The VDOT LRTP data also contains classifications for road function, number of lanes, signal locations, and other descriptive data. The Augusta County thoroughfare network includes the following road classifications, displayed in **Map 30**:

1. Rural Interstate
6. Rural Minor Arterial
7. Rural Major Collector
8. Rural Minor Collector
11. Urban Interstate
14. Urban Other Principal Arterial
16. Urban Minor Arterial
17. Urban Collector

To determine the capacity and level of service for each segment, the VDOT road classifications were converted to Florida Department of Transportation (FDOT) road classifications. Both VDOT and FDOT capacities and levels of service are based on procedures in the Transportation Research Board's *Highway Capacity Manual*. Due to the large number of roadway segments and the data and time required to calculate individual capacities for every roadway segment, the FDOT classifications are used in Augusta County to provide a generic calculation of capacities and levels of service using "Generalized Level of Service Tables." These tables provide default capacity values for numerous road types based on the intensity of development surrounding the road segment, the type of road (i.e., interstate, arterial, collector, etc.), the number of lanes, and the presence of traffic signals. The eight VDOT classifications were converted to 19 FDOT classifications to allow a finer-grained level of detail for the level of service analysis.



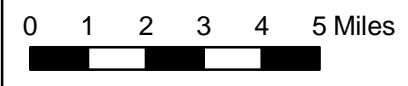
### Legend

- AADT 2005**
- 0 - 1500
  - 1501 - 5000
  - 5001 - 15000
  - 15001 - 35000
  - 35001 - 54208

- Policy Areas**
- Urban Service Area
  - Community Development Area
  - Rural Conservation Area
  - Agricultural Conservation Area

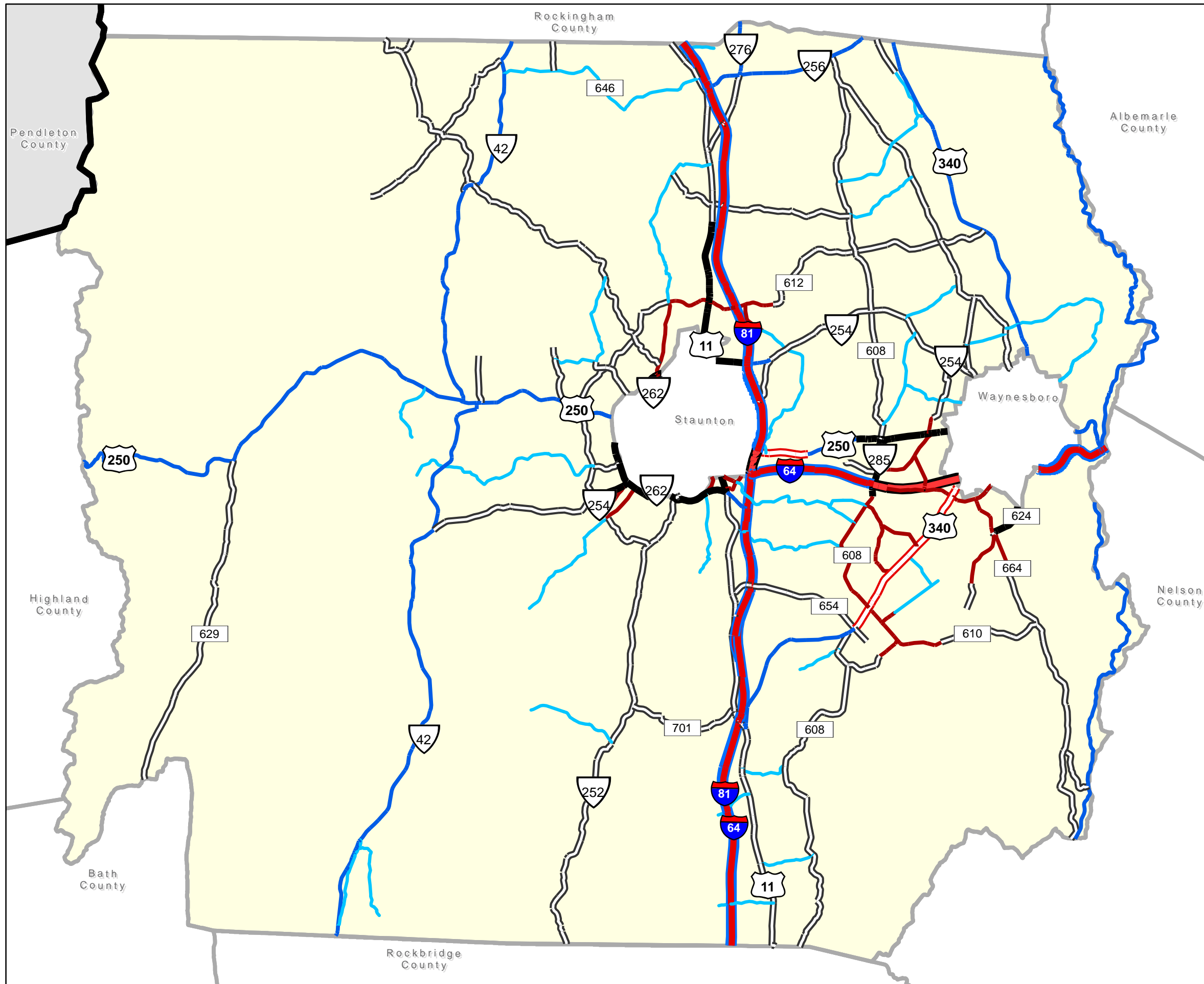
- Boundaries**
- Augusta County
  - West Virginia

[Average annual daily traffic counts are shown by road segment in preparation for capacity analysis.]



**Supplemental  
 Transportation Section  
 Map 29**  
 Average Annual Daily Traffic  
 Counts - 2005 (some 2004)  
 Augusta County  
 Comprehensive Plan  
 2007-2027





## Legend

### Roadway Segments by Function Type

- Urban Interstate
- Urban Other Principal Arterial
- Urban Minor Arterial
- Urban Collector
- Rural Interstate
- Rural Minor Arterial
- Rural Major Collector
- Rural Collector

### Boundaries

- Augusta County
- West Virginia

[VDOT's existing road type function classifications are factors of the network's traffic capacity analysis.]

0 1 2 3 4 5 Miles



## Supplemental Transportation Section Map 30

Road Segments by  
Function Type

Augusta County  
Comprehensive Plan  
2007-2027



**Table 33. VDOT Road Classifications**

VDOT classification		Number of lanes	Signal/spacing	Divided/undivided	FDOT capacity at LOS C
1	Rural Interstate	4	n/a	divided	47,900
6	Rural Minor Arterial	2	signalized	undivided	11,000
6	Rural Minor Arterial	4	signalized	divided	25,500
6	Rural Minor Arterial	2	unsignalized	undivided	12,700
6	Rural Minor Arterial	4	unsignalized	divided	41,800
7	Rural Major Collector	2	signalized	undivided	7,000
7	Rural Major Collector	4	signalized	divided	16,400
8	Rural Minor Collector	2	unsignalized	undivided	8,000
11	Urban Interstate	4	n/a	divided	52,500
14	Urban Other Principal Arterial	2	<2 signals/mile	undivided	13,100
14	Urban Other Principal Arterial	4	<2 signals/mile	divided	32,800
14	Urban Other Principal Arterial	2	>2 signals/mile	undivided	10,500
14	Urban Other Principal Arterial	4	>2 signals/mile	divided	24,400
16	Urban Minor Arterial	2	signalized	undivided	11,000
16	Urban Minor Arterial	4	signalized	divided	25,500
16	Urban Minor Arterial	2	unsignalized	undivided	12,700
16	Urban Minor Arterial	4	unsignalized	divided	41,800
17	Urban Collector	2	signalized	undivided	7,000
17	Urban Collector	4	signalized	divided	16,400

The capacity for each road type was derived from the “Generalized Level of Service Table” corresponding to the capacity at level of service “C.” A road can still function with moderate congestion at a level of service “D” or significant congestion at levels of service “E” or “F” but many localities choose to adopt a level of service “C” as the roadway capacity by policy, i.e., a level of service “D,” “E,” or “F” is not considered an acceptable roadway condition. A small number of 3-lane road segments are found in Augusta County. However, the tables do not provide capacities for 3-lane segments. The tables do instruct the user to increase the capacity for a 2-lane segment by 25 percent where 3-lane segments exist, so that methodology was replicated in the analysis.

**Existing Conditions Results**

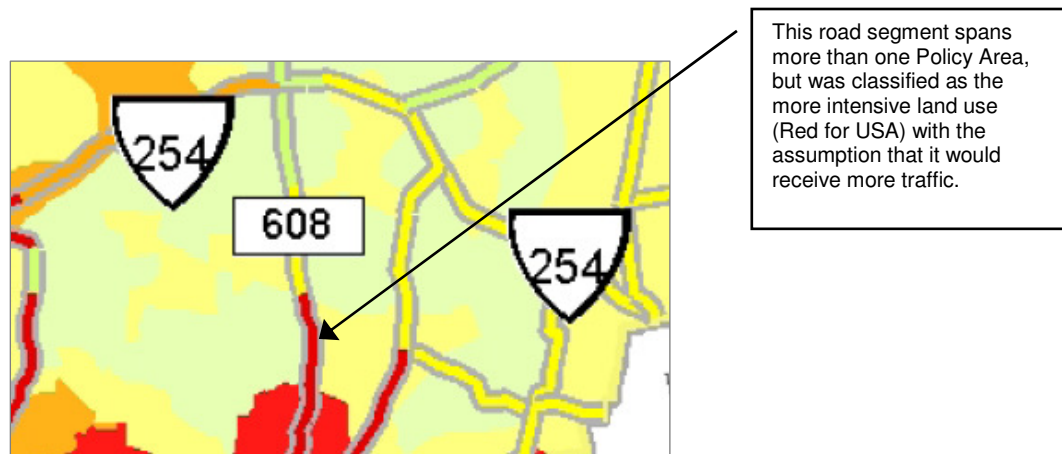
Based on the existing traffic conditions and the FDOT “Generalized Level of Service Tables,” a level of service was assigned to each roadway. The level of service ranges from an “A” under the best conditions, where travel is free-flow, to an “F” under the worst conditions, where travel is highly congested. The volume-to-capacity ratio was also calculated for existing and 2025 AADT data, which is a measure of the amount of traffic volume as related to the capacity of the roadway segment at a level of service of “C.” A segment with a volume-to-capacity ratio over 1.0 indicates that the segment is failing the adopted level of service.

**Map 31** displays the existing roadway levels of service for Augusta County. The majority of the network operates at a passing level of service of “C” or better. Most of the segments operating at LOS “D” are on Interstate 81, which is currently being analyzed by VDOT to determine a statewide improvement strategy. A few segments along Route 11, which runs parallel to Interstate 81 and relieves congested conditions during incidents on the interstate, also operate at LOS “D.” Route 608 through downtown Stuarts Draft is at LOS “D,” likely resulting from the limited number of railroad and river crossings in this area. Route 285 between Route 250 and Interstate 64 is at LOS “E,” where Route 285 serves as the only significant north-south connection between the Interstate, Fishersville, and other Route 250 destinations.

**4. Step 2: Develop Traffic Growth Projections**

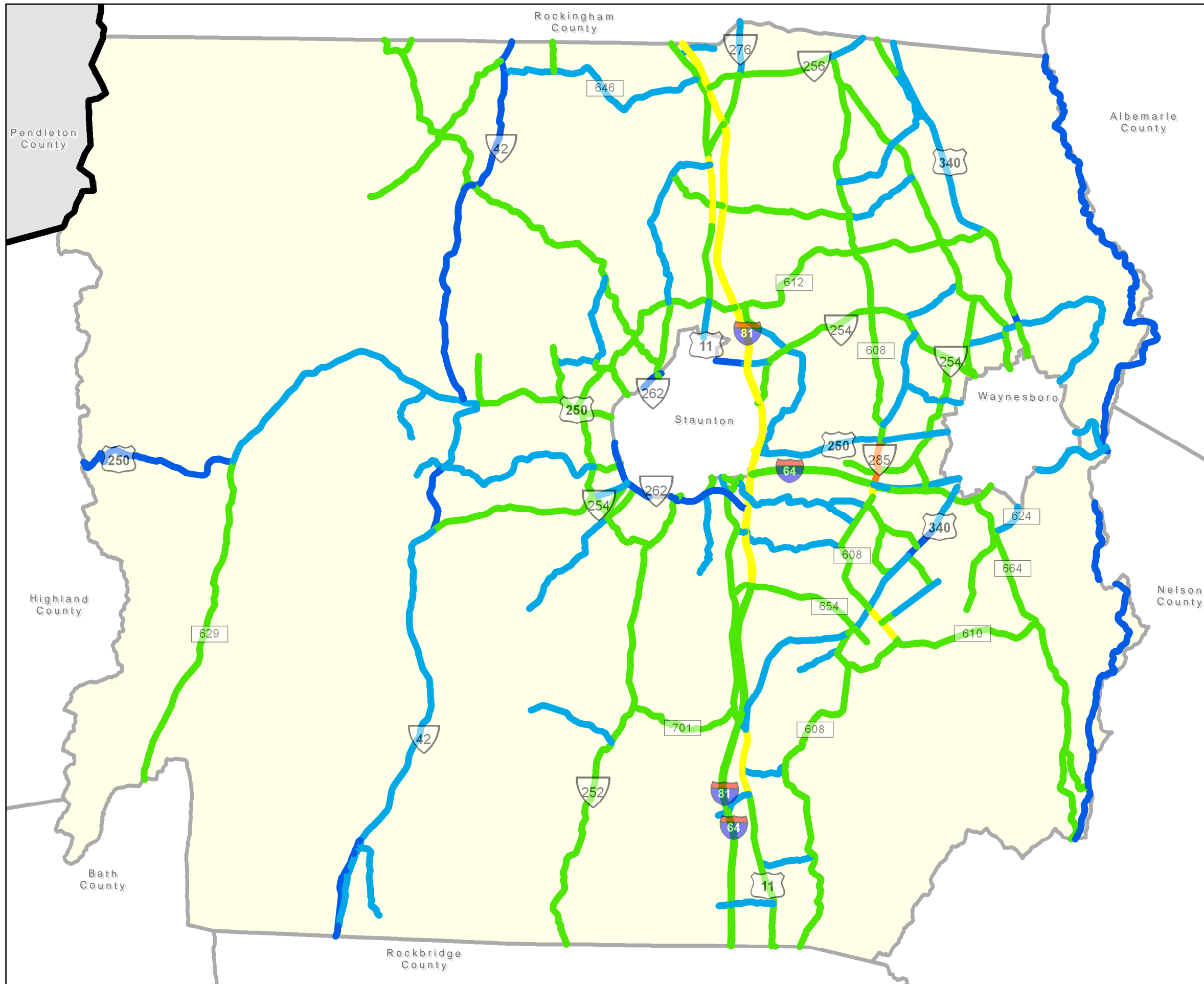
**Road Segment Classification by Policy Areas**

To project traffic growth by roadway segment, population growth was projected in the area of each segment based on the county’s policies for growth by planning policy area. Each segment was classified by its location in one of the four policy areas – Urban Service Area (USA), Community Development Area (CDA), Rural Conservation Area (RCA), and Agricultural Conservation Area (ACA). To forecast worst-case conditions, if a road segment crossed two Policy Areas, it was assigned the attributes of the more intensive area, as shown below. **Map 32** displays the classifications of roadways by Policy Area.



**Calculating 2005 Population by Policy Area**

An estimate of existing population by Policy Area was needed as a starting point for this analysis. Using the county’s data on the number of dwelling units per Policy Area, a multiplier of 2.56 persons per house was used (based on the assumptions used in the Existing Conditions Analysis) to estimate the population by Policy Area. The following table shows how percentages of the 2005 population were reached for each Policy Area.



## Legend

### Road Level of Service 2005

- A (Passing)
- B (Passing)
- C (Passing)
- D (Failing)
- E (Failing)
- F (Failing)

### Boundaries

- Augusta County
- West Virginia

[Road segment levels of service for 2005 are calculated based on average daily traffic volumes and VDOT's road function classification (see Supplemental Transportation Map 30). Levels D through F are considered failing.]

0 1 2 3 4 5 Miles

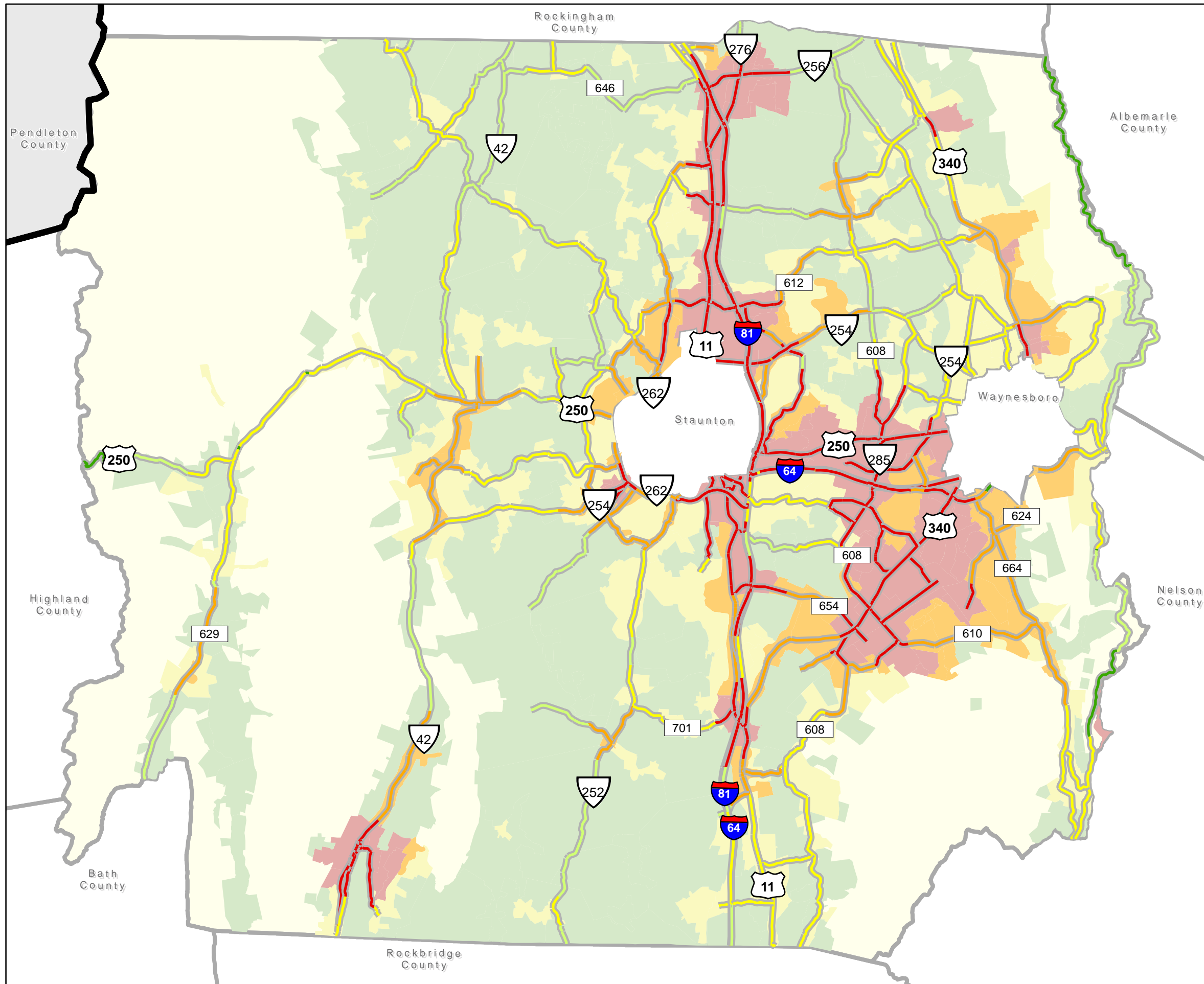


## Supplemental Transportation Section Map 31

Road Segment  
Level of Service - 2005

Augusta County  
Comprehensive Plan  
2007-2027





## Legend

### Roadway Segments by Policy Area

- USA
- CDA
- RCA
- ACA
- PUBLIC

### Planning Policy Areas

- Urban Service Area
- Community Development Area
- Rural Conservation Area
- Agricultural Conservation Area

### Boundaries

- Augusta County
- West Virginia

[Road segments are assigned a 'policy area' classification in preparation for calculating future road capacities.]

0 1 2 3 4 5 Miles



## Supplemental Transportation Section Map 32

Road Segment  
Classified by Policy Area

Augusta County  
Comprehensive Plan  
2007-2027





**Table 34. Estimated Percentage of 2005 Population by Policy Area**

	USA	CDA	RCA	ACA
Number of Residential Units Per Policy Area (2005)	9,825	5,343	7,714	4,468
Population (based on 2.56 people per unit)	25,152	13,678	19,748	11,438
Total Estimated 2005 Population	<b>70,016</b>			
Actual 2005 Population (US Census estimate)	<b>68,370</b>			
Controlled 2005 Population Estimate	24,561	13,357	19,284	11,169
Estimated 2005 Percent of Population by Policy Area	36%	20%	28%	16%

**Projecting 2025 Population by Policy Area**

Population projections based on a linear extrapolation of Weldon Cooper Center data were approved for use in this Plan update. The projected population growth between 2005 and 2025 was distributed by policy area based on the approved growth targets by Policy Area. The tables below reflect the growth projections and calculations used in this analysis.

**Table 35. Population Estimates 2000-2030**

Year	Population	Source
2000	65,615	US Census
2005	68,370	US Census (estimate)
2010	74,000	Cooper Center based projections
2015	78,500	Cooper Center based projections
2020	82,900	Cooper Center based projections
2025	87,300	Cooper Center based projections
2030	91,700	Cooper Center based projections

**Table 36. Estimated Annual Population Growth Rate by Policy Area**

	2005 Pop.	Distribution	Growth	2025 Pop.	Total Growth	Annual Growth Rate
USA	24,561	80%	15,144	39,705	62%	2.4%
CDA	13,356	10%	1,893	15,249	14%	0.7%
RCA	19,284	5%	947	20,230	5%	0.2%
ACA	11,169	5%	947	12,116	8%	0.4%
	<b>68,370</b>	<b>0%</b>	<b>18,930</b>	<b>87,300</b>		<b>1.2%</b>

**2025 AADT projection**

The analysis assumes that traffic volume will increase at the same rate as the population increases. Each road segment was classified based on the Planning Policy Area that it falls within and assigned the corresponding annual rate of growth from the table above. Where overlaps occur, such as when a segment falls

partially within a Community Development Area and partially within an Urban Service Area, a conservative approach was taken that assigned the more intense use, in this case the Urban Service Area, to the segment. The existing AADT data was then factored by the annual traffic growth rate to arrive at the projected AADT for 2025.

### **5. Step 3: Identify future network constraints**

#### **Level of Service Analysis**

Based on the 2025 traffic projections and the FDOT “Generalized Level of Service Tables,” a level of service was assigned to each roadway. The level of service ranges from an “A” under the best conditions, where travel is free-flow, to an “F” under the worst conditions, where travel is highly congested. The volume-to-capacity ratio was also calculated for existing and 2025 AADT data, which is a measure of the amount of traffic volume as related to the capacity of the roadway segment at a level of service of “D.” A segment with a volume-to-capacity ratio over 1.0 indicates that the segment is failing the adopted level of service. The 2025 roadway levels of service are shown in **Map 33**.

#### **Identify Network Constraints**

**Map 34** isolates the failing roadway segments where the LOS is “D” or worse. Traffic conditions on the segments failing based on 2005 conditions are projected to further deteriorate by 2025, with most segments of Interstate 81 reaching an LOS of “F.” Additional segments in the Route 11 corridor and in the Urban Service and Community Development Areas around Fishersville and Stuarts Draft are projected to fail. Other segments at LOS “D” include Route 340 just north of Waynesboro, and segments perpendicular to the Interstate 81/Route 11 corridor around Weyers Cave, Verona, and Staunton. The Thoroughfare Plan will provide recommendations for mitigating the projected failing segments.

### ***I. Community Facilities, Services, and Utilities***

#### **1. Administrative Facilities**

The county administrative offices are located in the Augusta County Government Center on Route 11 in Verona. The Government Center consists of several refurbished buildings on a seven-acre campus formerly owned by a trucking company. Rehabilitated in 1990, these buildings provide approximately 175,000 square feet of office space to various county departments and other state and federal agencies. The county also owns several other major properties throughout the county, including a 385-acre regional landfill, 520 acres of undeveloped land west of Verona (Berry Farm), 285 acres of vacant business and industrial land adjacent to the Government Center, as well as numerous rights-of-way, community center properties, and container sites generally leased to civic organizations.