

Rural Bikeway Plan

Alleghany, Craig, and Franklin Counties, the City of Covington, the town of Clifton Forge, and portions of Botetourt and Roanoke Counties (areas outside of the Roanoke Valley Area Metropolitan Planning Organization study area)



Adopted by the Roanoke Valley-Alleghany Regional Commission

September 2006

This report was prepared by the Roanoke Valley Alleghany Regional Commission (RVARC), in cooperation with the U.S. Department of Transportation (USDOT), the Federal Highway Administration (FHWA), and the Virginia Department of Transportation (VDOT). The contents of this report reflect the views of the staff of the RVARC. The RVARC staff is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the FHWA, VDOT, or RVARC. This report does not constitute a standard, specification, or regulation. FHWA or VDOT acceptance of this report as evidence of fulfillment of the objectives of this planning study does not constitute endorsement/approval of the need for any recommended improvements nor does it constitute approval of their location and design or a commitment to fund any such improvements. Additional project level environmental impact assessments and/or studies of alternatives may be necessary.

The Rural Bikeway Plan is available Online at:

www.rvarc.org/bike/rural

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SECTION I: INTRODUCTION

The *Rural Bikeway Plan* (2006) is an update to the *Rural Bikeway Plan for the Fifth Planning District Commission*, completed in 1997. This update is part of the Roanoke Valley – Alleghany Regional Commission’s FY 2006 *Rural Transportation Planning Program* (<http://rvarc.org/work/rural06.pdf>). The *Rural Bikeway Plan* covers the rural portions of the Regional Commission’s service area - Alleghany, Craig, and Franklin Counties, the City of Covington, the town of Clifton Forge, and portions of Botetourt and Roanoke Counties (i.e. areas outside of the Roanoke Valley Area Metropolitan Planning Organization study area). The Regional Commission’s service area and the MPO study area are shown in Figure 1.1.

Plan Purpose

The purpose of the *Rural Bikeway Plan* is to provide information and guidance on the planning and provision of bicycle accommodations (facilities), at the local and regional levels, that enhance and encourage bicycling in the rural portions of the Regional Commission’s service area, thereby better enabling citizens to enjoy the transportation, health, and economic benefits of a bicycle-friendly environment. As such, consideration is given to both utilitarian (i.e., bike commuting, running errands) and recreational uses of the transportation infrastructure.

This plan also considers briefly the relationship between bicycling and tourism and the potential economic benefits of a bicycle-friendly environment. This plan provides an overview of outdoor recreational opportunities in the region and an analysis of the interconnectivity among on-street bicycle accommodations, pedestrian facilities, trails, parks, and other points of interest or tourist destinations.

Plan Development

The *Rural Bikeway Plan* builds on and incorporates information from recent bicycle-related planning studies, reports, and activities and includes and considers a range of demographic, spatial, and related information for use in planning bicycle accommodations. The *Rural Bikeway Plan* and associated work products should be used in concert with local, regional, state, and national plans and policies. The planning process, activities, and methodology used in developing this document are outlined in Section II of this document.

It should be noted that more detailed planning would be required, at the local and regional levels, to develop and implement a bicycling network (and associated accommodations) and realize the benefits of bicycling. To assist in this effort, the Regional Commission’s FY 2007 *Comprehensive Work Program* and the *Rural Transportation Planning Program* include staff time and resources to assist local government with bicycle-related projects and activities.

Rural Bikeway Plan Study Area

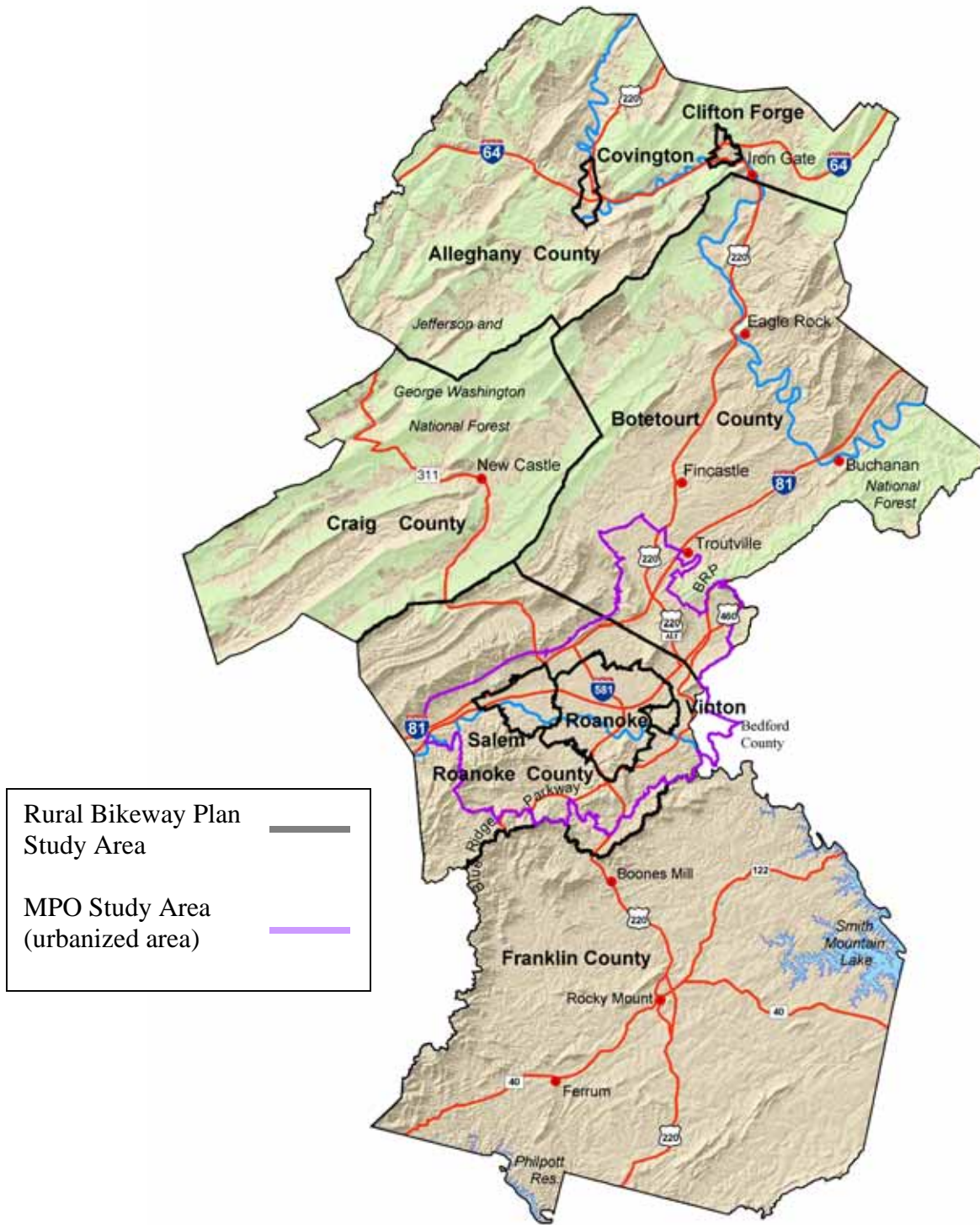


Figure 1.1: Roanoke Valley-Alleghany Regional Commission Service Area

Benefits of Bicycling

There are numerous benefits associated with bicycling - transportation, health, economic, environmental, and quality of life. Moreover, a bicycle and pedestrian-friendly environment and access to outdoor recreational opportunities can provide economic benefits. The cumulative effect of the benefits of increased bicycling can serve to increase the overall quality of life and often far exceed the costs associated with bicycle facility improvements and promotion/advocacy of bicycle use. Additional information on the many benefits associated with bicycling is available from the *Bicycle and Pedestrian Information Center* (www.bicyclinginfo.org/pp/benefits/index.htm).

• Transportation Benefits

Bicycling can provide a range of transportation benefits. Due to a variety of reasons, many Americans either do not or cannot drive. Bicycling can facilitate greater mobility, transportation choice, and provide an alternative option to the automobile. The 1995 *National Personal Transportation Survey* (NPTS) found that approximately 40 percent of all trips are less than 2 miles in length. For many, this is a distance that can be easily traveled on a bicycle. Bicycling can also be incorporated into multimodal travel (travel by more than one mode), further increasing mobility. Bicycling can also reduce roadway congestion and lower emissions. Moreover, according to the *Bicycle and Pedestrian Information Center*, roadway improvements to accommodate pedestrians and bicycles can also enhance safety for motorists. For example, adding paved shoulders on two-lane roads has been shown to reduce the frequency of run-off-road, head-on, and sideswipe motor vehicle crashes.

• Health and Physical Fitness Benefits

According to the Office of the Surgeon General (Office of the Surgeon General, 2003), more Americans than ever before are overweight or obese. [*The Surgeon General's Call To Action To Prevent and Decrease Overweight and Obesity*](#) lists the following facts about overweight and obesity from 1999:

- 61% of adults in the United States were overweight or obese (BMI > 25) in 1999.
- 13% of children aged 6 to 11 years and 14% of adolescents aged 12 to 19 years were overweight in 1999. This prevalence has nearly tripled for adolescents in the past 2 decades.
- The increases in overweight and obesity cut across all ages, racial and ethnic groups, and both genders.
- 300,000 deaths each year in the United States are associated with obesity.
- Overweight and obesity are associated with heart disease, certain types of cancer, type 2 diabetes, stroke, arthritis, breathing problems, and psychological disorders, such as depression.
- The economic cost of obesity in the United States was about \$117 billion in 2000.

The causes of overweight and obesity in Americans are varied and include of a combination of genetic, metabolic, behavioral, environmental, cultural, and socioeconomic factors. Of these factors, behavioral and environmental factors provide

the greatest opportunity for actions and interventions designed for prevention and treatment. Increased physical activity is an effective way to address these factors. The Surgeon General recommends Americans accumulate at least 30 minutes (adults) or 60 minutes (children) of moderate physical activity most days of the week (Office of the Surgeon General, 2003). Incorporating bicycling into everyday life is an easy way to increase physical activity. The Centers for Disease Control states, "the most effective activity regimens may be those that are moderate in intensity, individualized, and incorporated into daily activity" (Centers For Disease Control, 2003). Bicycling to work, school, shopping, or elsewhere as part of one's regular day-to-day routine is a simple, yet effective, way to increase physical activity and maintain physical fitness.

- **Environmental Benefits**

Auto emissions contribute to a range of environmental problems such as poor air quality acid, rain and global warming. Motor vehicles generate three major pollutants-hydrocarbons, nitrogen oxides, and carbon monoxide – all of which negatively impact air quality. According to the [U.S. Environmental Protection Agency \(EPA\)](http://www.epa.gov), driving a car is; the single most polluting thing that most of us do, the single largest contributor to ground-level ozone. Moreover, According the Environmental Literacy Council (<http://www.enviroliteracy.org>) approximately half of all the petroleum refined is used for motor vehicles and their infrastructure. Increased use of alternative modes of transportation, such as bicycling and walking, can reduce emission pollutants released into the atmosphere, leading to improved air quality and a reduction in associated adverse health effects.

- **Economic Benefits**

There are numerous direct and indirect economic benefits associated with bicycling. The cost of owning and operating a bicycle is significantly less than owning an automobile. The cost of operating a car for one year is approximately \$5,170 (AAA Mid-Atlantic), whereas the cost of operating a bicycle for a year is only \$120 (League of American Bicyclists). Moreover, the public costs of building and maintaining facilities for pedestrians and bicyclists are much less than the costs associated with facilities for automobiles.

As previously discussed, physical inactivity is a leading contributor to obesity and overweight. The health care cost associated with physically inactivity and associated health issues - medical care, workers compensation, and lost productivity – can be significant. Active Living Leadership has developed a tool that can provide an estimate of the financial cost of physically inactive people to a particular community, city, state or business. The *Quantifying the Cost of Physical Inactivity Calculator* is available at <http://www.activelivingleadership.org/costcalc.htm>.

For example, the Quantifying the Cost of Physical Inactivity calculator shows that physical activity in the City of Covington costs the community an estimated \$3,459,546 per year or about \$699 per person. These costs are broken down as follows: medical care costs: \$925,568; workers compensation cost: \$16,164; and lost productivity costs:

\$2,517,814. This calculator also indicated that if as little as 5% of inactive people in the community became physically active, it could save an estimated \$172,977 per year. Bicycling to work, school, shopping, or elsewhere as part of one's regular day-to-day routine can increase physical activity and provide significant health and economic benefits to the community.

A recent study by the a study by the Rails to Trails Conservancy, *The Economic Benefits of Trails and Greenways*, noted the positive impact that pedestrian and bicycle facilities can have on property values. Moreover, according to a 2002 survey sponsored by the National Association of Realtors and the National Association of Home Builders, trails ranked as the second most important community amenity out of a list of 18 choices. This study also noted that multi-objective trails, greenways, and related bicycle and pedestrian facilities can also provide significant economic benefits by stimulating tourism and recreation related spending. The complete Rails to Trails Conservancy study is available at http://www.trailsandgreenways.org/resources/benefits/topics/tgc_economic.pdf.

Additional Bicycle and Pedestrian Information

The *Rural Bikeway Plan* and additional information on regional bicycle and pedestrian facilities planning is available at the Regional Commission's Bicycle and Pedestrian Planning web site (<http://www.rvarc.org/bike>). This web site provides a range of bicycle, pedestrian, multimodal, and outdoor recreation and tourism resources including relevant plans and policies, bicycle commuting and public transportation information, as well as links to additional resources.

SECTION II: PLAN DEVELOPMENT AND METHODOLOGY

The spatial extent, varied geography, and the resulting transportation patterns and options of the area encompassed necessitated a range of information, resources, and methodologies be used in developing the Rural Bikeway Plan. As outlined in the introduction, consideration is given to both utilitarian and recreational uses of the transportation infrastructure. Moreover, this plan also considers the relationship between bicycling and tourism and the potential economic benefits of a bicycle-friendly environment. This section provides a brief overview of the planning process and methodologies used in developing this document.

Planning Process and Activities

Data considered and incorporated in this plan were developed using various data sources and planning activities. The major planning activities involved in developing this plan include:

- Review of relevant plans, studies, and policies
- Demographic and spatial overview – local and regional levels
- Mapping
- Fieldwork (i.e., Bicycle Compatibility Index)
- Overview of bicycling, outdoor recreation, and tourism opportunities
- Local staff, citizen, and stakeholder input

Review of Relevant Plans, Studies, and Policies

As previously stated, the *Rural Bikeway Plan* builds on and incorporates findings, work products, and methodologies from recent regional bicycle-related planning efforts. Moreover, the *Rural Bikeway Plan* should be used in concert with local, regional, state, and national plans and policies. A brief overview of plans and related documents used in developing this plan is provided in the Section III of this document.

Demographic and Spatial Analysis of the Study Area

In an effort to better understand and capitalize on the existing resource this plan provides relevant demographic and spatial data at the regional and local and levels. This overview will assist in identifying and prioritizing areas within the region (i.e., population centers) that have demographic and spatial characteristics that could benefit from the provision of bicycle accommodations.

This analysis, in concert with the project mapping, will assist in assessing the interconnectivity between activity centers and tourism destinations. Examples of activity centers include, but are not limited to:

- Downtown areas
- Commercial centers
- Public buildings – schools, libraries
- Employment concentrations

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- Recreational facilities
- Population centers
- Growth areas
- Housing developments
- Urban clusters
- Neighborhoods

Mapping

Maps illustrating a range of demographic and spatial data, at the local and regional levels, are presented throughout the plan. Project mapping includes general background demographic data (i.e., population density), as well as project-specific information (i.e., routes for bicycle accommodations).

Given the large area covered by the Rural Bikeway Plan, maps of individual localities are included in this plan. Information presented on the locality maps (Appendix P) includes but is not limited to:

- Population centers (i.e., places)
- Roadway network
- Recommended corridors for bicycle accommodation
- Public lands – parks, National Forests
- Activity centers, destinations, and points of interest
- Schools and colleges
- Major water features

Maps specific to the *Rural Bikeway Plan* for individual localities are provided in Appendix N of this document. Additional project-related mapping is also provided in this document, where relevant, for informational purposes (i.e., tourism destinations, transit services). All project mapping and additional resources are available on the *Rural Bikeway Plan* update website available at www.rvarc.org/bike/rural.

Fieldwork and Level of Service Modeling

A major component of the *Regional Bicycle Suitability Study* was level of service (LOS) modeling of selected corridors using the Bicycle Compatibility Model (BCI). This methodology will be applied to selected corridors in the study area to assist in developing recommendations for bicycle accommodations on selected corridors, and also illustrate the application of the Bicycle Compatibility Index. Examples of the application of the BCI are provided in Section VII of this document. Additional information regarding the Bicycle Compatibility Index is available at <http://www.hsrb.unc.edu/research/pedbike/98095/index.html>.

The BCI, developed by the FHWA, evaluates the capability of specific roadways to accommodate both motorists and bicyclists. The BCI can assist in:

- Operational Evaluation

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- Design
- Planning
- Route Selection

Local and regional staff can use the BCI in a variety of planning and design applications. Examples of applications of the BCI include:

- Identifying roadway restriping or reconfiguration opportunities to improve bicycling conditions
- Conducting a benefits comparison among proposed bikeway/roadway cross-sections
- Prioritizing and programming roadway corridors for bicycle improvements
- Creating bicycle suitability maps
- Documenting improvements in corridor or system-wide bicycling conditions over time

BCI Inputs:

- Number of travel lanes
- Curb lane travel width
- Bike lane or shoulder width
- Land use - residential/commercial
- Speed limit
- 85th percentile speed
- AADT and HV%
- On-street parking information



Figure 1.2. Fieldwork to collect roadway measurements for LOS modeling

Table 1.1
Bicycle Compatibility Index (BCI) Categories

LOS	BCI Range	Compatibility Level
A	< 1.50	Extremely High
B	1.51 – 2.30	Very High
C	2.31 – 3.40	Moderately High
D	3.41 – 4.40	Moderately Low
E	4.41 – 5.30	Very Low
F	> 5.30	Extremely Low

Examples of application of the BCI for selected corridors in the study area are provided in Section VII of this plan. BCI worksheets for selected corridors are also provided in Appendix M.

Overview of Bicycling, Outdoor Recreation, and Tourism Opportunities

In addition to the transportation aspects of bicycling, Section VI of this plan considers the relationship between bicycling, outdoor recreation, and tourism. This listing of activities and destinations is not intended to be a comprehensive list of all tourism resources in the area, but instead provides general information on bicycling and outdoor recreation opportunities, as well as links to additional information.

SECTION III: REVIEW OF RELEVANT PLANS, STUDIES, AND POLICIES

The *Rural Bikeway Plan* and associated work products should be used in concert with local, regional, state, and national plans and policies. This section provides a brief overview of documents, plans, and policies reviewed and their applicability to development of the Rural Bikeway Plan. These include:

- *VDOT Policy for Integrating Bicycle and Pedestrian Accommodations* (2004)
- *Vtrans 2025*
- *State Bicycle and Pedestrian Plan*
- *SAFETEA-LU*
- *Bikeway Plan for the Roanoke Valley Area* (2005)
- *Regional Bicycle Suitability Study – Phase I* (2003) and *Phase II* (2004)
- *Franklin County Trail System Plan* (2004)
- *West Piedmont Bicycle Plan* (2004)
- *Roanoke Valley Conceptual Greenway Plan* (2006)
- *Central Shenandoah Valley Bicycle Plan* (2005)
- *New River Valley Bikeway-Walkway-Blueway Plan* (2000)
- *Virginia Outdoors Plan* (2002)

VDOT Policy for Integrating Bicycle and Pedestrian Accommodations

The Commonwealth Transportation Board adopted the *Policy for Integrating Bicycle and Pedestrian Accommodations* on March 18, 2004. This policy provides the framework for how VDOT will accommodate bicyclists and pedestrians in the planning, funding, design, construction, operation, and maintenance of Virginia's transportation network.

In the VDOT policy, and in this plan, an accommodation is defined as any facility, design feature, operational change, or maintenance activity that improves the environment in which bicyclists and pedestrians travel.

This policy significantly improved the availability for a county to use its secondary roads allocation to plan, design, and construct bicycle facilities. This policy also eliminates the past VDOT policy requiring that a roadway be included in an approved bikeway plan in order for bicycle accommodations to be considered as part of roadway improvements using Federal and State funding. This policy could assist in facilitating development of a practical, prioritized list of corridors to be considered for bicycle accommodation, instead of an expansive list of corridors developed simply to have them included in an approved bikeway plan.

The VDOT *Policy for Integrating Bicycle and Pedestrian Accommodations* is provided in Appendix A. Additional bicycle-related information is available on VDOT's Bicycling and Walking in Virginia web site at <http://virginiadot.org/info/service/bk-default.asp>.

Vtrans 2025 - Statewide Multi-modal Long-Range Transportation Plan

VTrans2025 is a long-range planning effort to create a more integrated, convenient, and efficient transportation system for all of the Commonwealth of Virginia's travelers. The Secretary of Transportation through four state agencies including the Department of Aviation (DOAV), the Department of Rail and Public Transportation (VDRPT), the Port Authority (VPA), and the Department of Transportation (VDOT) is developing VTrans2025. The final report, completed in 2004, identified 21 policy recommendations in the areas of funding and investment, land use, connectivity, priority setting, and sustaining the VTrans2025 vision. Additional information on Vtrans 2025 is available at <http://www.transportation.virginia.gov/VTrans/home.htm>.

State Bicycle and Pedestrian Plan

The *State Bicycle and Pedestrian Plan* promotes bicycling and walking throughout Virginia. This plan is a component of VTrans2025, Virginia's statewide multimodal long-range transportation plan. This plan seeks to establish a consistent approach to integrating bicycling and walking accommodations into the transportation network. Additional information is available on the VDOT Bicycle and Pedestrian Plan web page at <http://www.virginiadot.org/info/service/bk-swplaninfo.asp>.

SAFETEA-LU

Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU) was signed into law in August, 2005. SAFETEA-LU authorizes the Federal surface transportation programs for highways, highway safety, and transit for the 5-year period 2005-2009. Additional information on SAFETEA-LU is available at <http://www.fhwa.dot.gov/safetealu/>.

Bikeway Plan for the Roanoke Valley Area MPO (2005)

The *Bikeway Plan for the Roanoke Valley Area Metropolitan Planning Organization* represents a coordinated effort by the Roanoke Valley Area MPO and local jurisdictions to facilitate development of a regional transportation network that accommodates and encourages bicycling as an alternative mode of travel and as a popular form of recreation in the MPO study area. The MPO plan includes the cities of Roanoke and Salem, the Town of Vinton and the urbanized portions of Botetourt and Roanoke counties. As outlined in Section IV, much of the development in Botetourt and Roanoke counties is occurring at the urban-rural interface. As such, findings and routes from the *Bikeway Plan for the Roanoke Valley Area MPO* are useful in discussion of corridors for bicycle accommodations in Roanoke and Botetourt counties. The *Bikeway Plan for the Roanoke Valley Area MPO* is available at <http://rvarc.org/bike/bikefinal.pdf>.

Regional Bicycle Suitability Study (2004)

The *Regional Bicycle Suitability Study*, completed by the Roanoke Valley Area MPO in 2004, is intended to serve as a resource to facilitate development of a regionally significant bikeway network in the RVARC service area. The purpose of the Regional

Bicycle Suitability Study was development of planning level data and tools to assess the current level of service (LOS) offered by the existing roadway network in regards to bicycle travel in the region and facilitate the planning and provision of bicycle facilities throughout the region. Work products and information from the Regional Bicycle Suitability Study were used in the update of the *Bikeway Plan for the Roanoke Valley* and the *Rural Bikeway Plan*. The *Regional Bicycle Suitability Study* is available at <http://rvarc.org/bike/suit.htm>.

Franklin County Trail System Plan (2004)

Franklin County currently has an offers broad guidance on potential trail corridors that may be possible in Franklin County. The Franklin County Trail System Plan considered a range of accommodations and facilities, including trails (hiking, mountain biking, and pedestrian), bicycle routes (on-street, off-street, and separate paths), greenways, bicycling routes and other outdoor recreational amenities such as blueways. The Franklin County Trail System Plan serves as the default reference document for the planning and provision of biking, hiking, and paddling trails and related outdoor recreation facilities in Franklin County. The Franklin County Bikeways and Scenic Byways Map is provided in Appendix J. Additional information is available at <http://www.franklincountyva.org/gis.htm>.

West Piedmont Bicycle Plan (2004)

Franklin County was also covered in the *West Piedmont Regional Bicycle Plan*, developed for the West Piedmont Planning District Commission in 2005. *West Piedmont Regional Bicycle Plan* covers Franklin, Henry, Patrick, and Pittsylvania counties, the cities of Danville and Martinsville, and the Town of Rocky Mount. The project placed emphasis on evaluating existing conditions for bicycling in the region today and on identifying bicycling corridors for future planning and development. The Franklin County and Town of Rocky Mount Bicycle Plan Map from the plan is provided in Appendix K. The *West Piedmont Regional Bicycle Plan* is available at http://www.wppdc.org/Web_Data/Transp/wppdc_RBP/WPPD_RBP.htm.

Roanoke Valley Conceptual Greenway Plan (2006)

The *Roanoke Valley Conceptual Greenway Plan*, initially developed in 1995, is currently being updated and is scheduled for completion in the fall of 2006. Roanoke County is part of the Roanoke Valley Greenway Commission and several proposed greenway routes listed in the update of the Greenway Plan are within the *Rural Bikeway Plan* study area. These routes include on-road as well as off-road routes. On-road routes are included in the recommended corridors for bicycle accommodation table for Roanoke County in Section VI of this document. The *Conceptual Greenway Plan* also references conceptual routes in adjacent localities (e.g., Botetourt and Franklin Counties) however, it should be noted that these localities are not currently members of the Roanoke Valley Greenway Commission (member localities include the Roanoke County, the cities of Roanoke and Salem, and the Town of Vinton). Additional information on Roanoke Valley Greenways is available at www.greenways.org.

Central Shenandoah Valley Bicycle Plan (2005)

The *Central Shenandoah Valley Bicycle Plan*, completed in 2005, focuses on connections that link the region's twenty-one (21) jurisdictions together. Localities covered in the plan include the counties of Augusta, Bath, Highland, Rockbridge, and Rockingham; the cities of Buena Vista, Harrisonburg, Lexington, Staunton and Waynesboro, and the eleven towns that lie within the study area. Alleghany and Botetourt counties are adjacent to the localities included in the plan. The *Central Shenandoah Valley Bicycle Plan* is available at <http://www.cspdc.org/documents/BikePlanFinalDraft.pdf>

New River Valley Bikeway-Walkway-Blueway Plan (2000)

New River Valley Planning District Commission list on-road, off-road, and blueways in the NRVPDC service area. A portion of NRVPDC is adjacent to Roanoke and Craig counties. Additional information on the New River Valley Bikeway-Walkway-Blueway Plan is available at <http://www.nrvpdc.org>.

Virginia Outdoors Plan (2002)

The *Virginia Outdoors Plan (VOP)* is the state's official conservation, outdoor recreation and open space plan. The VOP is intended to serve as a guide to all levels of government and the private sector in meeting the conservation, outdoor recreation, and open space needs of Virginia. The VOP includes a Regional Analysis/Recommendation section for each PDC service area that provides a comprehensive listing of recreational facilities, as well as recommendations on a range of outdoor recreation and tourism opportunities in the region. The Department of Conservation and Recreation (DCR) is currently developing the 2007 *Virginia Outdoors Plan*. The 2002 VOP is available Online at <http://www.state.va.us/dcr/prr/vopfiles.htm>.

SECTION IV: OVERVIEW OF THE STUDY AREA

An understanding of local and regional demographics is essential in the transportation planning process. Meeting future transportation demands will require significant understanding of population trends and associated impacts on the transportation system. This section provides an overview of regional and local demographic characteristics and trends to be considered in developing a plan that facilitates the provision of bicycle accommodations and improvement in the bicycling environment at the local and regional levels. By considering and better understanding the demographic and spatial attributes of the region, decision makers will be better able to build on opportunities, overcome constraints, and move toward making bicycling a practical, healthy, and environmentally sensitive form of transportation and recreation.

Study Area

As outlined in Section I, the Rural Bikeway Plan covers the portions of the RVARC service area that are outside of the RVAMPO study area (Figure 1.1) and includes the following localities:

- Alleghany County
- Botetourt County*
- Craig County
- Franklin County
- Roanoke County*
- City of Covington
- Town of Clifton Forge

* The urbanized portions of Botetourt and Roanoke counties are within the RVAMPO study area and were included in the *Bikeway Plan for the Roanoke Valley Area MPO* (www.rvarc.org/bike). The *Rural Bikeway Plan* covers the rural portions of Botetourt and Roanoke Counties (i.e. areas outside of the Roanoke Valley Area Metropolitan Planning Organization study area).

As shown in Figure 1.1, the study area is quite extensive and covers a range of natural and cultural landscapes that directly impact transportation and mobility options. Much of the area is characterized by low-density development patterns typical of rural areas. However, there are areas within the region that have spatial characteristics that are conducive to both utilitarian and recreational bicycling (i.e., higher density population and development). The spatial extent and diverse geography presents special challenges in the planning a provision of bicycle accommodations in the region.

Population

As shown in Table 4.1, population characteristics among the localities are quite varied, with some localities experiencing significant increases in population while others are experiencing much slower population growth, or even decline. Botetourt and Franklin counties are experienced the greatest increases in population, with 22 and 19 percent increases, respectively, between 1990 and 2000. Continuing a general trend in the

Alleghany Highlands, the City of Covington and the Town of Clifton Forge experienced the greatest population declines between 1990 and 2000 at -14.3 and -8.3 percent, respectively.

Population Distribution - Urban and Rural

Increases in the urban population are accompanied by a corresponding decrease in the percent of the population living in “rural” areas. This demographic trend is illustrated in the following tables. Table 4.2 shows the rural population, as a percent of the total population, and the percent change between 1990 and 2000. Although some localities are experiencing population increases, it should be noted that population growth in the region, and individual localities, is not evenly distributed. Instead, population increases are often concentrated around growth centers within a locality (i.e., southern portion of Botetourt County, Rocky Mount and Smith Mountain Lake area of Franklin County). In many portions of the region, increased population and population densities are resulting in an increase in the percentage of the population living in areas defined as “urban” by the US Census Bureau.

Table 4.3 and Table 4.4 present the urban and rural populations, by locality, in 1990 and 2000. The U.S. Census Bureau classifies as urban all territory, population, and housing units located within urbanized areas (UAs) and urban clusters (UCs). It delineates UA and UC boundaries to encompass densely settled territory, which generally consists of:

- A cluster of one or more block groups or census blocks each of which has a population density of at least 1,000 people per square mile at the time, and
- Surrounding block groups and census blocks each of which has a population density of at least 500 people per square mile at the time, and
- Rural consists of all territory, population, and housing units located outside of UAs and UCs.
- Less densely settled blocks that form enclaves or indentations, or are used to connect discontinuous areas with qualifying densities.

The US Census Bureau further defines urbanized areas and urban clusters as follows:

Urbanized area (UA) - an urbanized area (UA) consists of densely settled territory that contains 50,000 or more people.

Urban cluster (UC) - an urban cluster consists of densely settled territory that has at least 2,500 people but fewer than 50,000 people.

Rural consists of all territory, population, and housing units located outside of UAs and UCs.

Table 4.1
Total Population and Percent Change

Locality	Population Estimate 2004	Total Population 2000	Percent Change 2000-2004	Percent Change 1990-2000
Alleghany County*	16,737	12,926	-3.7	0.9
Botetourt County**	31,777	30,496	4.2	22.0
Clifton Forge	NA	4,289	NA	-8.3
Covington City	NA	6,303	NA	-14.3
Craig County	5,139	5,091	0.9	16.4
Franklin County	49,841	47,286	5.4	19.6
Roanoke County**	87,679	85,778	2.3	8.2

* 2004 Population estimate includes Clifton Forge. Clifton Forge gave up its city charter and became a town incorporated within Alleghany County in 2001. US Census population estimates for 2004 are not available at the town level.

** Population total includes all portions of the County, including urbanized areas

Source: US Census Bureau

Table 4.2
Rural Population and Percent Change 1990-2000

Locality	Percent Rural Population 1990	Percent Population 2000	Percent Change in Rural Population 1990-2000
Alleghany County	100	71	- 29
Botetourt County	88	67	- 24
Clifton Forge	0	0	0
Covington City	0	0	0
Craig County	100	100	0
Franklin County	90	91	.01
Roanoke County	27	22	-18.5

Source: US Census Bureau, 1990 and 2000

Table 4.3
Urban and Rural Population
2000

Urban / Rural Population	Alleghany County	Botetourt County	Craig County	Franklin County	Roanoke County	Clifton Forge	Covington City
Total:	12,926	30,496	5,091	47,286	85,778	4,289	6,303
Urban:	3,813	10,214	0	4,398	66,837	4,289	6,303
Inside urbanized areas	0	10,174	0	0	66,837	0	0
Inside urban clusters	3,813	40	0	4,398	0	4,289	6,303
Rural	9,113	20,282	5,091	42,888	18,941	0	0

U.S. Census Bureau, Census 2000

Table 4.4
Urban and Rural Population
1990

Urban / Rural Population	Alleghany County	Botetourt County	Craig County	Franklin County	Roanoke County	Clifton Forge	Covington City
Total:	13,176	24,992	4,372	39,549	79,332	4,679	6,991
Urban:							
Inside urbanized area	0	125	0	0	57,984	0	0
Outside urbanized area	0	2,840	0	4098	0	4,679	6,991
Rural	13,176	22,027	4,372	35,451	21,348	0	0

U.S. Census Bureau, Census 1990

As shown in Tables 3 and 4, the “urban” population increased across the region between 1990 and 2000 (note: some of the population change is due to changes in how the Census Bureau delineates urban/rural areas). With the exception of Roanoke and Botetourt counties, the urban population of the study area was limited to urban clusters as opposed to urbanized areas. However, growth in this urban/rural interface will likely increase in the future, resulting in increased levels of urbanization, increased population density and subsequent improvements to the transportation infrastructure.

This growth may provide opportunities for the provision of bicycle and pedestrian accommodations in conjunction with other improvements to the transportation infrastructure, as outlined in VDOT’s *Policy for Bicycle and Pedestrian Accommodations*. Additionally, numerous housing developments are being constructed in the urban/rural interface across the region. Localities may also encourage developers to incorporate bicycle and pedestrian facilities into new subdivisions designs. As such, these areas are should be considered and prioritized for bicycle accommodations.

Population Density

In addition to total population, population density and distribution are major factors in transportation planning. The US Census Bureau defines population density as the “total population or number of housing units within a geographic entity (for example, United States, state, county, place) divided by the land area of that entity measured in square kilometers or square miles. Density is expressed as both "people (or housing units) per square kilometer" and "people (or housing units) per square mile" of land area.”

As shown in Table 4.5, population density varies considerably between localities. Clifton Forge and Covington have the highest densities with 1,384 and 1,111 people per square mile, respectively. Craig and Alleghany counties are the least densely populated with 15 and 29 people per square mile, respectively.

Table 4.5
Population Density by Locality

Locality	Land Area (square miles)	Population Density (persons per square mile)
Alleghany County*	445	29.1
Botetourt County	543	56
Clifton Forge**	3.1	1,384
Covington City	6	1111
Craig County	331	15
Franklin County	692	70.5
Roanoke County	251	348

*Includes Clifton Forge. Source: US Census, 2000

However, as previously noted, the population is not evenly distributed across the region or individual localities. As such, the population densities provided in Table 4.5 can be misleading. A better understanding of the distribution of the population can be obtained by review of the population density maps provided in Appendix B. These maps show population density (person per square mile) by US Census block groups for each locality.



Figure 4.1: Downtown Clifton Forge

In general, higher population densities are indicative of more compact, higher-density development that is often more conducive to bicycle travel. As illustrated by the population density maps, all localities in the region, with the exception of Craig County, have areas with population densities greater than the locality-wide population density provided in Table 4.5. For example, the population density for Franklin County is 70 people per square mile. However, several census block groups in and around the Town of Rocky Mount have much higher population densities, ranging from 200 to more than 1600 person per square mile. This pattern exists in other areas of the region as well including the block groups in the southern portion of Botetourt County and the Town of Buchanan, areas of Alleghany County proximate to Town of Clifton Forge, the City of Covington. Areas on the population density maps with higher population density generally correlate to previously referenced “urban clusters” in Table 4.3.

Conversely, the population density maps show that large percentages of the populations of Botetourt and Roanoke counties live in urbanized areas (i.e., urbanized areas or urban clusters), thus many areas in the county have population densities that are much lower than the county-wide density provided in Table 4.5.

A thorough understanding of the population distribution within a locality is useful in locating areas the most appropriate locations for the provision of bicycle accommodations within the region and individual localities. In general, more intensive development and higher population densities (i.e., urban clusters) are more conducive and compatible with to bicycle travel.

Journey-to-Work Data and Commuting Patterns

In addition population total and density, the movements and mobility (i.e., commuting patterns) of the population is also important in transportation planning. The U.S. Census compiles “Journey-to-Work” data on where people work, how they get to work, how long it takes to get from their home to their usual workplace, when they leave home to go to their usual workplace, and carpooling. Journey-to-work data for the region are provided in Table 4.6 and Table 4.7.

Table 4.6
Means of Transportation to Work for
Workers 16 Years and Over, 2000

	Alleghany County	Botetourt County	Craig County	Franklin County	Roanoke County	Clifton Forge	Covington City
Total:	5,489	15,519	2,340	22,470	43,419	1,657	2,640
Car, truck, or van:	5,265	14,835	2,226	20,871	41,428	1,504	2,397
Drove alone	4,684	13,471	1,847	18,043	38,072	1,232	2,011
Carpooled	581	1,364	379	2,828	3,356	272	386
Public transportation:	4	71	0	22	94	0	8
Bus or trolley bus	4	71	0	11	54	0	3
Streetcar or trolley car	0	0	0	0	0	0	0
Subway or elevated	0	0	0	11	0	0	0
Railroad	0	0	0	0	8	0	0
Ferryboat	0	0	0	0	0	0	0
Taxicab	0	0	0	0	32	0	5
Motorcycle	0	6	0	26	21	0	7
Bicycle	0	12	2	5	35	0	8
Walked	61	73	38	580	495	103	84
Other means	35	43	19	212	166	7	29
Worked at home	124	479	55	754	1,180	43	107

Source: US Census 2000

Table 4.7
Percent Workers 16 Years and Over Using Bicycle or Walking as Primary
Means of Commuting to Work, 2000

Locality	Percent Bicycle Commuters	Percent Walking Commuters	Percent Bicycle and Walking Commuters
Alleghany County	0	1.1	1.1
Clifton Forge	0	6.4	6.4
Covington City	0.3	3.3	3.6
Botetourt County	0.08	0.5	0.6
Craig County	0.09	1.7	1.8
Franklin County	0.02	2.7	2.7
Roanoke County	0.05	1.2	1.3
Virginia	0.2	2.4	2.6
United States	0.4	3.0	3.4

Source: US Census 2000

As too be expected, these tables show a very low percentage of bicycle commuters in the region. As previously referenced, spatial characteristics and commuting patterns present significant barriers to bicycling and walking as a major means of transportation to work. However, it should be noted that localities with higher population densities, such as Clifton Forge and the City of Covington, more people bicycled or walked to work than in less densely developed areas. Also notable is the significantly greater number of people walking to work than bicycling in all localities. This may indicate that a significant percentage commuters are willing to use alternative transportation (i.e., walking or bicycling) to commute to areas within distances that and may represent potential increased bicycle usage.

Although these data can provide insight into regional commuting patterns, it should be noted that “Journey-to-Work” data only accounts for people (workers 16 years and over) indicating bicycling as their *primary* means of transportation to work. As such, numbers presented may not adequately account for all bicycle trips. Bicycling can often be a *secondary* mode of transit. Moreover, other bicycling trips such as bicycling to school, recreational bicycling, and other utilitarian trips are not counted in this data set.

An overview of commuting data at the city and county level is available in the document titled *Commuting Patterns for the Greater Roanoke Valley-Alleghany Region* (2003) available at <http://rvarc.org/data/commuting.pdf>. As previously discussed, there are several factors that limits the practicality of commuting to work via bicycle, including topography, commuting and employment patterns, and the low density, rural nature of much of the region.

For example, a review of regional commuting data indicates that 35 percent of Botetourt County workers commute to the City of Roanoke to their place of employment. This distance simply is not practical for most bicycle commuters. This pattern is similar in much of the study area. However, it should be noted that bicycling or walking or multi-modal travel to work is much more practical in more densely developed are portions of the study area (see Appendix B for population density maps). These areas included the urban clusters such as the City of Covington and the Town of Clifton Forge, as well as the urban/rural interface in Botetourt and Roanoke Counties.

Employment concentrations (i.e., large employers) are also destinations for many commuters and should possibly be considered in the planning and provision of bicycle accommodations. An example of an employment concentration is MeadWestvaco in the City of Covington, where a large number of employees live within a reasonable bicycle commute to the facility. A listing of the largest employers for each locality is provided in Appendix C.



Figure 4.2: MeadWestvaco in the City of Covington is a major employer in the region.

SECTION V: OVERVIEW OF BICYCLE ACCOMMODATIONS AND EXISTING CONDITIONS

This section provides an overview of existing of bicycle accommodations in the study area, as well as an overview and examples of various bicycle accommodations available for use in creating an environment that is bicycle and pedestrian friendly. In the *VDOT Policy for Integrating Bicycle and Pedestrian Accommodations*, and in this plan, an accommodation is defined as any facility, design feature, operational change, or maintenance activity that improves the environment in which bicyclists and pedestrians travel. The terms bicycle accommodation, facility, and treatment are used synonymously throughout this document.

Existing Bicycle Accommodations and Bicycling Conditions in the Study Area

In Virginia, a bicycle is considered a vehicle with the same rights and responsibilities as motor vehicles. Bicyclists are allowed to operate on all public roads, except where prohibited by law. Due to a variety of factors, bicycle accommodations in the study area are limited.

There are currently no official on-street accommodations, such as bike lanes, in the study area. While limited, various types of bicycle accommodations can be found in the region. Examples include on-street accommodations such as shared roadways, wide travel lanes, and paved shoulders, as well as ancillary facilities such as bicycle related signage. Shared roadways are the most common type of bicycle “accommodation.” These shared roadways generally do not have any type of bicycle accommodations. The region has a large number of scenic, low-traffic volume, low-speed corridors that are popular with recreational cyclist. As previously cited, areas with higher population densities provide environments that are more conducive to bicycling. These areas also tend to have more ancillary facilities that the more rural areas of the study area.

There are also many miles of pedestrian, hiking, mountain biking, and equestrian trails and other outdoor recreation amenities in the area. These trails and other outdoor recreation opportunities are discussed in Section VI of this document.

Bicycle Accommodations – Design Guidelines

Examples of facility designs provided in this section are intended for illustrative purposes and do not constitute recommendation of a specific design standard. The following publications provide guidance and detailed information regarding bicycle facility design guidelines to assist planners, engineers, and bicycle advocates developing and applying design criteria most applicable to local conditions and place-specific considerations.

- *VDOT Road Design Manual, Section A-5-Bicycle Facility Guidelines, 2001*
- *Guide for the Development of Bicycle Facilities, AASHTO, 1999*
- *Selecting Roadway Design Treatments to Accommodate Bicycles, FHWA, 1994*
- *Manual on Uniform Traffic Control Devices, FHWA, 2000*
- *Virginia Bicycle Facility Resource Guide, VDOT, 2001*

- *Bicycle and Pedestrian Facility Guide*, Bicycle Federation of America, 1995

The Pedestrian and Bicycle Information Center (<http://www.bicyclinginfo.org>) also provides a range of design guidelines and related information.

Bicycle accommodations can be broadly grouped into the following categories:

- On-Road Facilities
- Off-Road Facilities
- Ancillary Facilities

On-Road Facilities

The choice of facility type is dependent on an examination of several factors including the environment, the targeted user group, potential utility, corridor conditions, and facility costs. This section provides an overview of the various examples of on-road facilities available to accommodate bicyclists.

• Shared Roadway

Shared roadways are corridors that are used by motorists and bicyclists, without any special bicycle accommodation. Shared roadways that best accommodate motor vehicle and bicycle travel are low-traffic, low-speed corridors such as residential street or rural roads. Bicycle-related signage along these routes is intended to increase motorists' awareness of potential bicycle activity along a particular roadway and heightens the overall presence of bicycling within the corridor. The use of pavement markings can be employed to improve bicycling conditions. Examples include



Figure 5.1: Route 779 - Shared roadway typical of the many rural roads.

“shared lane pavement markings” designed to indicate the shared use nature of a corridor and alert motorists to expect and accept cyclists as users of the roadway.

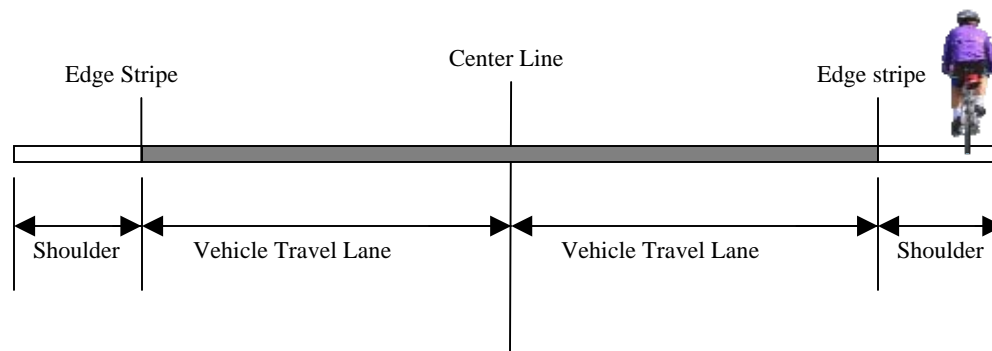
• Paved Shoulder

Shoulder improvements are often effective in accommodating bicycle travel on a shared roadway. Paved shoulders are most effective in accommodating bicyclists when they are uniform, smooth, and well maintained. A shoulder with a minimum width of 4 feet is recommended for bicycle travel. Additional shoulder width may also be appropriate under the following conditions:

- high bicycle usage is expected
- motor vehicle speeds exceed 50 mph

- steep grades are present (bicycles need additional width when traveling uphill)
- the percentage of trucks, buses, and recreational vehicles is high

Although a 4-foot paved shoulder is recommended for bicycle travel, there is no design standard. In general, any additional shoulder width that can be provided, even if less than 4 feet, will provide greater benefit than no shoulder at all. In addition to accommodating bicyclists, paved shoulders also provide additional maintenance and safety benefits such as pull over areas, recovery areas, and increased pavement structure durability. Paved shoulders can often be created through restiping existing pavement.



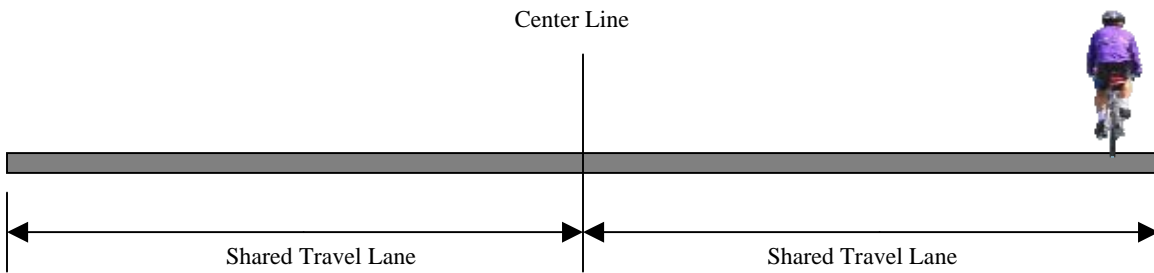
Width may vary depending on a combination of potential widening impacts and traffic flow/cross-section characteristics.

Figure 5.2: Paved Shoulder

- **Wide Travel Lane (Wide Curb Lane)**

Wide outside lanes are outside vehicle travel lanes that provide adequate width for both motor vehicle and bicycle travel. Wide outside lanes have no stripes to delineate a separate lane for bicycles. The minimum recommended standard for wide outside lanes is 14 feet of usable lane width (Figure 5.3). Usable width is defined from edge stripe to lane stripe or from the longitudinal joint of the gutter pan to lane stripe. The gutter pan should not be included as usable width. The *Virginia Bicycle Facilities Resources Guide* suggests that a slightly wider outside lane width (i.e., 15 feet) may be necessary under the following conditions:

- on stretches of roadway with steep grades where bicyclists need more maneuvering space
- adjacent to on-street parking where hazardous conditions for passing bicyclists exist
- where drainage grates and raised reflectors reduce the effective width of the outside lane



Additional width may be needed due to traffic flow/cross-section characteristics

Figure 5.3: Wide Outside Travel (Curb) Lane

Although wide outside travel lanes can increase the ability of a corridor to accommodate both motorists and bicyclists, based on level of service models, the improvement is slightly less than that provided by a striped paved shoulder. Motorists tend to drive to right of the travel lane. As such, a right edge stripe on the lane is beneficial to bicyclists.



Figure 5.4: Paved should on Route 311 in Craig County.



Figure 5.5: Wide travel lane on US 60 Business in Clifton Dale Park, Alleghany

- **Bike Lane**

A bike lane is a portion of a roadway, which has been designated by striping, signing and pavement markings, for the preferential or exclusive use of bicyclists. As previously noted, currently there are no bike lanes in the study area.

The minimum recommended bike lane width is 4 feet (Figure 5.6). The *Virginia Bicycle Facility Resource Guide* recommends the following minimum widths for bicycle lanes:

- 4-foot minimum for bike lanes on roadways with gutter pan and curb
- 5-foot minimum for bike lanes adjacent to barrier curb or other static side obstruction

RURAL BIKEWAY PLAN

- 5-foot minimum for bike lanes with adjacent on-street parking
- 6-foot bike lanes are desirable where substantial truck traffic is present or where motor vehicle speeds exceed 50 mph

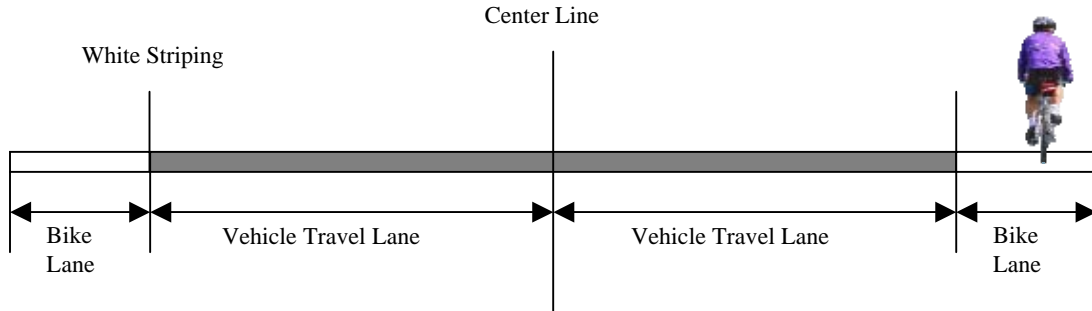


Figure 5.6: Bicycle Lane

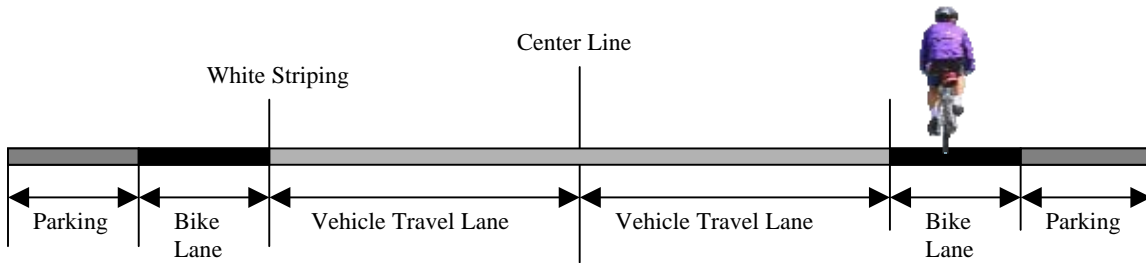


Figure 5.7: Bicycle Lane with Parking

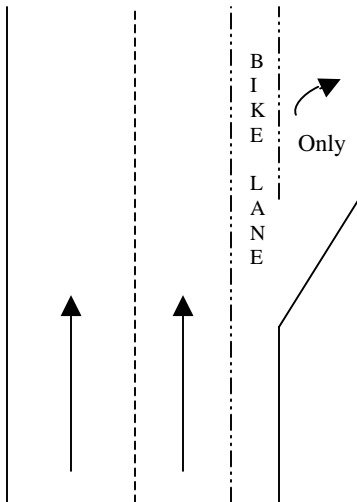


Figure 5.8: Bicycle Lane w/ Right Turn

Off-Road Facilities

- Shared Use Path

A shared use path is a bikeway physically separated from motorized vehicular traffic by an open space or barrier. Typical users include bicyclists, pedestrians, skaters, wheelchair users, joggers, and other non-motorized users in urban, suburban, and rural environments. According to the *Virginia Bicycle Facility Resource Guide*, these facilities have been very successful in reintroducing communities to bicycling as a form of transportation and recreation. Shared use paths are often the catalysts for developing a bicycle network connecting a variety of attractions in the community (i.e., activity centers). These paths may serve as important linkages in the bicycling network providing increased connectivity and mobility. Examples of a shared use path in the study area include the Jackson River Trail, in Alleghany County, which is currently under construction.



Figure 5.9: Shared Use Path

- Other Trails and Greenways

Other trails can be used for recreation and utilitarian bicycling in addition to walking or hiking for exercise. Examples include the Jackson River Trail and the greenway/cross country/house trails at the Botetourt Center at Greenfield. Existing trail and greenways in the study area are outlined in Section V of this document.

A Rails-to-Trails project between Eagle Rock (Botetourt County) and New Castle (Craig County) has been proposed in the past. This proposed trail would potentially provide more than 20 miles of walking and biking trails in the area and has significant potential as a major tourism attraction, thereby benefiting the economic development in the region. However, lack of support for the proposed trail has and continues to preclude discussion and implementation of this project.

Signage and Pavement Markings

Proper signage is an integral part of the transportation system. Signage conveys a variety of messages and instructions to motorists, bicyclists, and other users other the transportation infrastructure. Improving bicycle-related signage can be a cost-effective way to improve safety, increase driver awareness of the presence of bicyclists, and

encourage bicycling as a means of transportation in the region. Examples of bicycle related signage the Manual of Uniform Traffic Control Devices (MUTCD) is provided in Appendix D and include:

- Regulatory signs for bicycle facilities
- Warning signs for bicycle facilities
- Guide signs for bicycle facilities

The complete MUTCD is available at <http://mutcd.fhwa.dot.gov/index.htm>.

Share the Road signs are among the most common bicycle-related signage and are often the placed on shared roadways to indicate to motorist the shared usage of the roadway. Share the Road signs are often used together with a bicycle sign as shown in Figure 5.10. There is a very limited number of Share the Road and other bicycle related signage in the study area. However, signage can be a cost effective method of improving bicycle conditions in the region.



Figure 5.10: Share the Road sign.

Additional bicycle-related signage and pavement markings, not included in the MUTCD, have also been developed and are in use in locations in the United States and abroad. Examples of other bicycle-related signage are presented in Figures 5.11-5.14.



Figure 5.11: “Sharrow” shared lane pavement marking.



Figure 5.12: Bike-and-chevron or “sharrow” shared lane pavement marking.



Figure 5.13: Full lane sign.
Source:<http://www.lagrange.org/memorialride.htm>.



Figure 5.14: Separated bike lane and pedestrian crossing

Bicycle Racks and Other Ancillary Bicycle Accommodations

Ancillary facilities are the supporting facilities located at the bicyclists' destination. In addition to on-street facilities, these treatments are considered integral components of the regional bicycling network contribute directly to the overall success and usefulness of the bicycle system. Ancillary facilities may include:

- Bicycle racks
- Benches
- Bicycle lockers
- Bicycle racks on transit buses
- Shower facilities
- Water fountains
- Rest areas

As previously noted, ancillary facilities in the study area are very limited. Bicycle racks are among the most common type of ancillary bicycle facility. There are several bicycle rack designs in common usage today. The proper type of bicycle rack for a given destination is dependent on a range of factors such as the typical user, number of users, duration, price, and location. The most common type of bicycle racks grid-style racks (Figure 5.15). Grid-style bicycle racks are designed for high volume, low security use. Another common design is the wave-style bicycle rack (Figure 5.16). These types of racks are less desirable to many



Figure 5.15: Grid-style bicycle rack at the Covington Library. This style is generally not preferred.

bicyclists because they provide insufficient support and can potentially cause damage to the bicycle and/or components. However, these types of racks can often be used "broadside" to increase stability and security and are suitable for certain locations and user groups (i.e., libraries, schools or other public building).

The "inverted U" design (Figure 5.17) is the recommended bicycle rack design as it provides sufficient support and security by allowing the frame and one wheel to be secured to the rack with commonly used "U-locks" or cable locks. Other bicycle rack designs are shown in Figures 5.18 5.19.



Figure 5.16: Wave design bike rack.



Figure 5.17. Inverted –U design is the preferred style of bicycle rack.



Figure 5.18. Source:
<http://www.victorstanley.com>.



Figure 5.19: Source:
<http://www.victorstanlev.com>.

In general, bicycle racks should be highly visible, conveniently located near entrances to buildings, minimize conflicts with both pedestrians and motorized traffic, and provide adequate security. Useful locations for bicycle racks include a range of destinations and

activity centers such as libraries and other public buildings, parks, schools and colleges, shopping centers and retail establishments, and places of employment.

Public Transit and Multimodal Travel

Although public transit is not available in all portions of the study area, it is available, on a limited basis, in certain areas. Although bicycle racks are not available, bicycles can be brought onto Valley Metro buses, provided there is sufficient room. This policy offers opportunity for multi-modal travel, combining bicycling and public transit.

- **Mountain Express**

The Mountain Express is a public bus service in and between Covington and Clifton Forge. The Service operates four days a week - Monday, Tuesday, Thursday, and Friday between the hours of 9:00 a.m. and 3:30 p.m. The Mountain Express offers a deviated fixed route service to the citizens of Clifton Forge and Covington. A fare of fifty cents (\$0.50) per trip is charged and must be paid when boarding the van. Exact change is required. Children under the age of six years old ride at no charge. Individuals who are ADA certified may request the van to deviate off its route to make pick-ups and drop offs. This distance may not exceed 3/4 of a mile off the route. For more information regarding this service call (800) 964-5707 Ext. 3 or 4 or visit <http://www.radartransit.org/mountain.htm>.



Figure 5.20: Mountain Express bus in Iron Gate

- **Smart Way Commuter Bus Service**

The Smart Way Commuter Bus Service provides commuter service between the New River and Roanoke Valleys. This service, operated Roanoke's Valley Metro, links the City of Roanoke, Salem, Christiansburg, and Blacksburg. Service is available everyday, with the exception of Sunday. Fare is \$3.00 each way. A Smart Way Commuter Bus route map is included in Appendix E. More information on the Smart Way bus is available at 982-6622 or <http://www.smartwaybus.com/index.htm>.

- **The Ferrum Express**

The Ferrum Express provides connections between Ferrum, Rocky Mount, and Roanoke on Fridays and Saturdays. The Ferrum Express is a free service that is open to the public. The Ferrum Express service map and schedule is included in Appendix F.

Bicycle Facilities Cost Estimates

The costs for various bicycle and pedestrian facilities are dependent on a range of factors. The **Costs-Benefits Analysis of Bicycle Facilities Tool**, available on the Pedestrian and Bicycle Information Center web site provides guidelines for making bicycle facility investment decisions. This analysis tool can be used to estimate costs, the demand in terms of new cyclists, and measured economic benefits (e.g., time savings, increased livability, decreased health costs, a more enjoyable ride). A set of web-based guidelines provide a step-by-step worksheet for estimating costs, demands, and benefits associated with specific facilities under consideration. The **Costs-Benefits Analysis of Bicycle Facilities tool** is available at <http://www.bicyclinginfo.org/bikecost/index.cfm>. The estimates provided by the tools were developed from an 18-month study of the benefits and costs of bicycle facilities, funded by the National Cooperative Highway Research Program and the Minnesota Department of Transportation. This study and Costs-Benefits Analysis of Bicycle Facilities tool is outlined in detail in the TRB's National Cooperative Highway Research Program (NCHRP) *Report 552: Guidelines for Analysis of Investments in Bicycle Facilities* (http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_552.pdf). The report is designed to help transportation planners integrate bicycle facilities into their overall transportation plans and on a project-by-project basis.

SECTION VI: OVERVIEW OF BICYCLING, OUTDOOR RECREATION, AND TOURISM OPPORTUNITIES

As cited in the Introduction, this plan also considers briefly the relationship between bicycling and tourism and the potential economic benefits of a bicycle-friendly environment. Additionally, it considers existing and interconnectivity among existing trails, pedestrian facilities, parks, points of interest, and activity centers.

This section provides an overview of many of the outdoor recreational and tourism opportunities available in the study area, includes hiking, camping, mountain biking, paddling, sight-seeing, shopping. This listing of activities and destinations is not intended to be a comprehensive list of all tourism resources in the area, but instead provides general information on bicycling and outdoor recreation opportunities.

Virginia Interstate Bicycle Route 76

The Interstate Bicycle Route 76 on one of three recognized national bicycle routes that run through Virginia. The Trans-America Bike Trail (a.k.a. BikeCentennial Route 76) runs for 4,250 miles from Williamsburg, Virginia to Astoria, Oregon. The 500-mile Virginia section of the Trans-America Bicycle Route runs from Yorktown to the Kentucky state line near Breaks Interstate Park and generally follows the Trans-America Bike Trail.



Figure 6.1: Interstate Bicycle Route 76 in Botetourt County

The Virginia Interstate Bicycle Route 76 runs through portions of Botetourt and Roanoke counties. Although white and black, “Route 76” signs with a bicycle image demarcate the route (Figure 6.1), it should be noted that roads along the route have not necessarily been improved for bicycle travel. Direction for the Bike Route 76 through Botetourt and Roanoke counties are provide below. The Interstate Bicycle Route is also shown on the Botetourt and Roanoke County maps provided in Appendix N.

Botetourt County

- Enters Botetourt County from the north on Frontage Road 55 (old US 11) coming out of Rockbridge County
- Continues through the Town of Buchanan on US 11
- Turns left onto Route 640 (Lithia Road) just south of the Town of Buchanan
- Continues on Route 640 (Lithia Road) south to Nace Road (also Route 640)
- Follows Nace Road (Route 640) until intersection of US 11
- Turns left onto US 11 for a short distance before turning left onto Route 651 (Stoney Battery Road)
- Continue on Route 651 until it crosses US 11 in Troutville

- Turn right onto Route 779 (Valley Road) to US 220 in Daleville
- Crosses US 220 and follows Route 779 into Catawba Valley and Roanoke County as it continues south

Roanoke County

- Enters Roanoke County on Route 779 (Catawba Creek Road) from Botetourt County
- Continue on Route 779 until the intersection with Route 311 (Catawba Valley Road)
- Turn right (west) onto Route 311 for a short distance
- Turns left onto Route 785 (Blacksburg Road) and continues on Route 785 into Montgomery County

Blue Ridge Parkway

The Blue Ridge Parkway cover is a 469-mile scenic route that runs through 39 counties in North Carolina and Virginia. The Blue Ridge Parkway, is the most visited unit of America's National Park System.

The Blue Ridge Parkway runs through portions of the MPO study area in Botetourt, Franklin, and Roanoke counties and is a popular route for many recreational cyclists (Figure 6.2). Although the Blue Ridge Parkway is under the jurisdiction of the National Park Service, its operation impacts localities in region. The Blue Ridge Parkway is popular among bicyclists because of its limited access and lower traffic levels when compared to most community streets and highways.



Figure 6.2: Bicyclists on the Blue Ridge Parkway. Source: Roanoke Valley CVB

The Blue Ridge Parkway can be accessed in the service area at the following locations:

- US Route 221 (Roanoke County)
- US Route 220 (Roanoke County)
- State Route 24 (Roanoke County)
- US Route 460 (Roanoke County)
- Route 43 (Botetourt County)

Additional information on the Blue Ridge Parkway is available from the National Park Service at <http://www.nps.gov/blri/index.htm>. Blue Ridge Parkway Association provides a range of general, as well as bicycling-specific, information on the Blue Ridge Parkway (<http://www.blueridgeparkway.org/Outdoor%20activities/bicycling.htm>).

Jackson River Scenic Trail

The Jackson River Trail is a 17-mile trail in Alleghany County, Virginia, which runs from Covington, Virginia to the Coles Point Recreation Area at Lake Moomaw. The

Trail, which was developed from an old railroad bed, provides access to many natural, historic and scenic resources. The first seven miles is now complete and open to the public.

Douthat State Park

Douthat is in the Allegheny Mountains in Bath and Alleghany counties. There are more than 40 miles of wooded hiking trails in the park, many of which are open to mountain bikers.

Douthat State Park is approximately 6 miles from Clifton Forge, a distance easily traveled by bicycle. There is interest in the possibility of connecting Douthat State Park with the Town of Clifton Forge. This connectivity could potentially benefit both entities and is discussed in more detail in Section VII of this plan. Additional information on Douthat State Park is available at <http://www.dcr.state.va.us/parks/douthat.htm>.



Figure 6.3: Douthat State Park entrance in Alleghany County

George Washington and Jefferson National Forests

The George Washington and Jefferson National Forests occupy large portions of Alleghany (Figure 6.4), Craig, and Botetourt counties, and a very small portion of northern Roanoke County. The National Forest Service under the United States Department of Agriculture manages Nation forests. The James River, New Castle, and New River Ranger Districts are responsible for management of the George Washington and Jefferson National Forests in the region.

There are hundreds of miles of trails in these National Forests providing a range of recreational activities including hiking and bicycling. Bicycling is permitted on all forest trails except those designated as interpretive trails. Mountain bikers may use the available roads and trails year round. There are no permits, fees, or registration required for individuals or small groups. Additional information on mountain biking in the George Washington and Jefferson National Forests is available at



Figure 6.4: George Washington National Forest in Alleghany County.

http://www.fs.fed.us/r8/gwj/jamesriver/recreation/mountain_biking/index.shtml.

Appalachian National Scenic Trail

The Appalachian National Scenic Trail (AT) is a 2,174-mile footpath along the ridgelines and across the major valleys of the Appalachian Mountains from Katahdin in Maine to Springer Mountain in northern Georgia. The AT runs through portions of the George Washington and Jefferson National Forests in Botetourt and Roanoke, and Craig counties (Figure 6.5) and is accessible at the following locations in the service area:

- Route 311 (Catawba Valley Road) in Roanoke County
- US Route 220 in Daleville (Botetourt County)
- Route 311 at Dragon's Tooth trail (Craig County)



Additional information on the AT is available from the National Park Service at <http://www.nps.gov/appa/>. Note: Bicycling is allowed on the AT.

Carvins Cove Natural Preserve

The Carvins Cove Natural Preserve, operated by the City of Roanoke Parks and Recreation Department, has many miles of mountain biking, hiking, and horse trails within its 12,700 acres of open space. The Carvins Cove reservoir is located in Roanoke and Botetourt counties (Figure) and is the major water supply for much of the Roanoke Valley. The Western Virginia Water Authority owns the reservoir and the land below the 1,200-foot contour. Additional outdoor recreational opportunities available at the Carvins Cove Natural Preserve include hiking, boating, fishing, and horseback riding.

Carvins Cove can be accessed from the following locations:

- Route 311 to (Roanoke County)
- Route 11 to Reservoir Road (Roanoke County)

A trail map of Carvins Cove is provided in Appendix G. Additional information on Carvins Cove is available from the City of Roanoke's Parks and Recreation Department at <http://www.roanokeva.gov/85256A8D0062AF37/vwContentByKey/N26CGQX6774VGREEN>.

Virginia's Explore Park

Explore Park is located at Milepost 115 on the Blue Ridge Parkway near Roanoke, Virginia. The Explore Park trail system, which was professionally built and managed by International Mountain Biking Association (IMBA) volunteers, offers many miles of single track trails. A map of the IMBA trail system at Explore Park is provided in Appendix H. Additional information on the trail system is available at

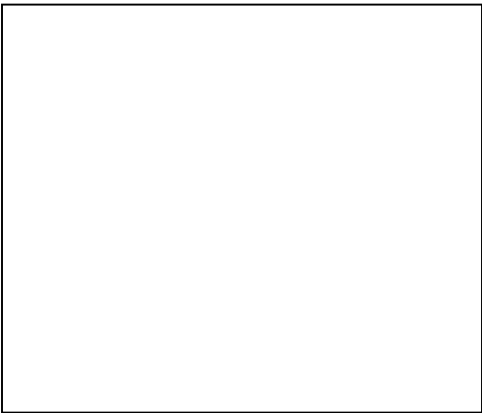
<http://www.exploresingletrack.com>. Explore Park also provide other recreation and tourism opportunities including hiking, canoeing on the Roanoke River, and cultural and interpretive activities. Additional information on Explore Park is available at 540-427-1800 or 800-842-9163 or www.explorepark.org.

Havens Wildlife Management Area

The Havens Wildlife Management Area, covering 7,190 acres, is located about five miles west of the Roanoke-Salem area. In addition to hunting, Havens offers visitors the opportunity to hike, view wildlife and wild flowers, and pursue other outdoor interests. Havens has two primary public access points, the Carroll’s Access Road from Route 619 on the south side of the property and Route 622 where it joins the area’s northwest boundary. Access from I-81 at Salem is via Route 619 or 311 North towards Catawba. Additional information is available at <http://www.dgif.state.va.us/HUNTING/wma/havens.html>.

Botetourt Center at Greenfield

The Botetourt Center at Greenfield is located on Route 220 three miles north of Interstate 81. Botetourt County has established approximately five (5) miles of greenway/cross country/house trails within the Botetourt Center at Greenfield. The Botetourt Center is also park of an interconnected 147-acre recreation park with amenities including an equestrian center and trail, community fitness and sports center, baseball/softball stadium, soccer complex, picnic, fishing and playground areas and trails and walkways.



Waid Recreation Area

The Waid Recreation Area is located off of Six Mile Post Road in Rocky Mount, Virginia offers a variety of walking, hiking, and biking trails as well as other recreational facilities. This Park is located near the Pigg River and is home of the "Mighty Pigg River Ramble" and the "MW Country Mountain Bike Race." Additional information from the Franklin county Parks and Recreation Department is available at http://www.franklincountyva.org/parks/park_info.htm.

James River

The James River forms at the confluence of the Jackson and Cowpasture Rivers in Alleghany County and flows southward through Botetourt County. The Upper James offers a range of recreation opportunities including fishing and canoeing. There are numerous public access points in Botetourt County. Public Boating Access locations and descriptions from the Department of Game and Inland Fisheries (DGIF) for the James River in Botetourt County are provided in Appendix I. Additional information on the James River is available from DGIF at <http://www.dgif.virginia.gov/fishing/waterbodies/display.asp?id=158>.

Jackson River

The Jackson River, downstream of the Gathwright Dam, flows through the Alleghany County, the City of Covington and the towns of Clifton forge and Iron Gate. The Jackson River offer fishing and canoeing opportunities and has several public access points. Public boating access locations and descriptions from the DGIF for the Jackson River in the service area are provided in Appendix I. Additional information on the James River is available at <http://www.dgif.virginia.gov/fishing/waterbodies/display.asp?id=153>.

Lake Moomaw and Gathright Wildlife Management Area

This 2,530 acre lake has a 43 mile shoreline and is a part of the Gathright Wildlife Management Area in Alleghany and Bath Counties. Lake Moomaw provides year round boating, water sports, fishing, hunting, camping, picnicking and hiking. James River Ranger District (540) 962-2214; Warm Springs Ranger District (540) 839-2521. Additional information on Lake Moomaw is available from the DGIF at <http://www.dgif.virginia.gov/fishing/waterbodies/display.asp?id=88>.

Smith Mountain Lake

Smith Mountain Lake is a 20,600-acre impoundment of the Roanoke River located near Roanoke in Bedford, Franklin and Pittsylvania counties. Smith Mountain Lake offers a range of recreational opportunities including fishing, boating, and hiking. There are numerous boat ramps (public and private) and marinas situated around the lake. Additional information on Smith Mountain Lake is available from the DGIF at <http://www.dgif.virginia.gov/fishing/waterbodies/display.asp?id=122>.

Franklin County is currently constructing a Smith Mountain Park Upon Completion this 37 acre park will have picnic shelters, hiking trails, biking trails, beach area and ADA accessible fishing area. Additional information from the Franklin county Parks and Recreation Department is available at http://www.franklincountyva.org/parks/park_info.htm.

Other Rivers and Waterways

There are several other rivers in the service area that also provide outdoor recreation opportunities including the Blackwater and Pigg Rivers in Franklin County, and the Roanoke River in Roanoke and Franklin counties. Franklin County has “blueways” on the Pigg River and the Blackwater River. Additional information the Pigg River and Blackwater River blueways, including maps, is available from the Franklin county Parks and Recreation Department at <http://www.franklincountyva.org/parks/blueways.htm>.

Birding and Wildlife Trail

The Virginia Department of Game and Inland Fisheries has developed a Birding and Wildlife Trail. Several sections of the Birding and Wildlife Trail are in the study area. Virginia Birding and Wildlife Trail Guides are available from the Virginia Tourism Corporation

at 1-866-VABIRDS at 1-866-VABIRDS (1-866-822-4737). Additional information is available at <http://www.dgif.virginia.gov/wildlife/vbwt/index.asp>.

Scenic Byways in the Region

The Virginia Department of Transportation has officially designated selected roads throughout the Commonwealth as Virginia Byways, national scenic parkways, or scenic roads. Designated roads in the service area include:

- **Virginia Byways**

Route 42 (Craig County), Route 43 (Botetourt County), Route 159 (Alleghany County), Route 311 (Alleghany, Craig, and Roanoke counties), Route 602 (Franklin County), Route 615 (Botetourt County), Route 616 (Alleghany County), Route 621 (Alleghany and Botetourt counties), Route 623 (Franklin County) Route 629 (Alleghany County through Douthat State Park), Route 640 (Franklin county), Route 785 (Roanoke County), Route 602 (Franklin County), Route 623 (Franklin County), Route 640 (Franklin County), Route 748 (Franklin County)



Figure 6.6: Virginia Byway sign on Route 311 in Craig County.

- **Scenic Roads**

Interstate 64/US 220/US 60 (Alleghany, Covington, and Clifton Forge), Route 220 (Alleghany County and Covington), Route 220 (Botetourt County), Route 606 (Botetourt and Craig counties)

- **Virginia Scenic Parkway** (national scenic parkways)

Blue Ridge Parkway (Botetourt, Franklin, and Roanoke counties)

Additional information and a map titled *Scenic Roads in Virginia* are available at <http://virginiadot.org/infoservice/prog-byways-sites.asp>.

The Crooked Road: Virginia's Musical Heritage Trail

The Crooked Road is a driving route through the Appalachian Mountains that connects major heritage music venues in the Appalachian region such as the Blue Ridge Music Center, Birthplace of Country Music Alliance, and the Carter Family Fold. A portion of the route runs through Franklin County. The Crooked Road begins in Rocky Mount and follows Route 40 through Ferrum, home of the Blue Ridge Institute and Museum. Additional information on The Crooked Road, including outdoor recreation opportunities and attractions is available at <http://www.thecrookedroad.org>.

Wineries and Vineyards

There are currently several wineries and vineyards in the study area and represent potential tourism destinations. Wineries and vineyards in the study area include Blue Ridge Vineyards, Finacastle Vineyard and Winery, and Virginia Mountain Vineyards in Botetourt County; and AmRhein Wine Cellers and Valhalla Vineyards in Roanoke County. Additional information on wineries and vineyards in the study area is available for the at <http://www.virginia.org/site/content.asp?MGrp=1&MCat=9&Rgn=10000>.

Additional Recreation/Tourism Information and Resources

This section provides links to additional information and resources regarding outdoor recreation and tourism opportunities in the study area.

- **Geotourism MapGuide to Appalachia**

The *Geotourism MapGuide to Appalachia* is a product of the Appalachian Regional Commission (ARC) - National Geographic Geotourism Project. The project was designed to help Appalachian communities stimulate economic development by showcasing its natural, cultural, and heritage assets. The *Geotourism MapGuide to Appalachia* was published in the April 2005 issue of *National Geographic Traveler* magazine. A companion Web feature, Discover Appalachia, is available on the National Geographic Web site at www.nationalgeographic.com/appalachia. Attractions in the service area listed in the guide include:

- Alleghany Highlands Arts and Crafts Center (Clifton Forge)
- Firmstone Manor (Clifton Forge)
- Humpback Bridge (Covington)
- Roaring Run Furnace (New Castle)
- George Washington and Jefferson National Forests
- Paint Bank (Craig County)

- **Outdoor Adventures in Virginia's Blue Ridge Mountains**

This outdoor recreation guide, produced by the Roanoke Valley Convention and Visitors Bureau, provides a comprehensive list and information on outdoor recreation and tourism opportunities in the study area and adjoining regions. This document is available at www.rvarc.org/bike/rural/outdoorguide.pdf.

- **Roanoke.com (Roanoke Times – Outdoors Section)**

The Roanoke.com outdoors sections provides a range of information on various outdoor recreation activities and destinations in the area. Topics include mountain biking, road biking, running, hiking, fishing, and other outdoor recreation. The Roanoke.com outdoors sections <http://www.roanoke.com/outdoors/wb/xp-index>.

- **Useful Recreation and Tourism Web Sites**

Alleghany Highlands Chamber of Commerce - <http://www.ahchamber.com/visitus.htm>

Blue Ridge Bicycle Club - <http://www.blueridgebicycleclub.com>

Botetourt County Department of Parks and Recreation -
<http://co.botetourt.va.us/recreation/index.php>

City of Covington Visitor Information - <http://www.covington.va.us/visitors.htm>

Commonwealth of Virginia – Official Website - <http://www.virginia.gov/cmsportal2/>

Franklin County Parks and Recreation - <http://www.franklincountyva.org/parks>

Roanoke County Department of Parks and Recreation -
<http://www.roanokecountyva.gov/Departments/ParksRecreationAndTourism/Default.htm>

Roanoke Valley Convention and Visitors Bureau -
<http://www.visitroanokeva.com/default.asp#>

VDOT Bicycle and Walking Program - <http://www.virginiadot.org/infoservice/bk-default.asp>

VDOT State Bicycle and Pedestrian Program -<http://www.virginiadot.org/infoservice/bk-proginfo.asp>

Virginia is for Lovers Website - <http://www.virginia.org/>

Virginia Tourism Corporation - <http://www.vatc.org/index.asp>

SECTION VII: SUMMARY AND RECOMMENDATIONS

This section provides some general recommendations to improve bicycling conditions at the local and regional levels. This section also provides tables of recommended roadways for bicycle accommodation within each locality. Moreover, this section provides examples possible inter-jurisdictional connectivity and the application of the Bicycle Compatibility Index (BCI) to assist in operational evaluation and design alternatives for selected corridors.

General Recommendations to Improve Bicycling Conditions in the Study Area

The general recommendations provided in this section involve a range of treatments and considerations that, collectively, may improve bicycling in the region. These recommendations include planning, design, engineering, funding, awareness and education, and political decision-making. Many of these emphasize effectively utilizing the existing (and planned) transportation infrastructure to better accommodate bicyclists, and capitalizing on opportunities to improve bicycling conditions when they arise.

- Apply, by default, the VDOT *Policy for Integrating Bicycle and Pedestrian Accommodations* to all corridors in the transportation network

This policy provides the framework of how VDOT will accommodate bicyclists and pedestrians in the planning, funding, design, construction, operation, and maintenance of Virginia's transportation network. This policy is discussed in more detail in Section III of this document. The VDOT Policy for Integrating Bicycle and Pedestrian Accommodations is provided in Appendix A.

- Utilize cost-effective techniques, where applicable and practicable, to better accommodate bicyclists

A range of cost-effective techniques and treatments are available to better accommodate bicyclists. Consideration and application of various techniques can be coordinated with paving, maintenance, and construction schedules for individual localities and VDOT. Cost-effective techniques to better accommodate bicycles may include, but are not limited to:

- Striping on right edge of lanes to provide paved shoulder for bicyclists
- Changes in roadway design or operation
- Spot improvements
- Roadway and shoulder maintenance
- Improved signage and other pavement markings

The Bicycle Compatibility Index indicates that on many rural roads, with low traffic volumes, the provision of any paved shoulder can raise the LOS or the ability of the corridor to accommodate both motorist and bicyclists. When paving, resurfacing, or restriping a roadway, the existing roadway may be reconfigured, using existing pavement, to provide a paved shoulder improvements to accommodate bicyclists.

However, potential design alternatives or roadway “improvement” should be evaluated to ensure that is not negatively impacted (i.e., speeding up traffic without accommodating bicyclists). Specific examples of possible application of this recommendation are outlined in the *Connectivity and Application of the Bicycle Compatibility Index* portion of this section.

- Improve ancillary bicycle accommodations, signage, and support facilities

Ancillary facilities are the supporting facilities located at the bicyclists’ destination. As discussed in Section V of this document, ancillary facilities in the study area are limited. Potential locations for ancillary bicycle facilities include areas with higher population and development densities (see population density maps in Appendix B), such as downtown areas, as well as destinations/activity centers, such as commercial areas, public buildings, schools, libraries, parks, etc.

Signage conveys a variety of messages and instructions to motorists, bicyclists, and other users other the transportation infrastructure and can be a cost-effective way to improve safety, increase driver awareness of the presence of bicyclists, and encourage bicycling as a means of transportation in the region. Bicycle facilities related signage includes regulatory, warning, and guide signs (Appendix D). Examples and discussion of bicycle-related signage is provided in Section V of this document.

In addition to the utility provided by of ancillary bicycle facilities and bicycle-related signage, their presence in an area may also help create the *perception* of a progressive, bicycle-friendly environment, thereby fostering and encouraging increase bicycle usage.

- Encourage bicycling through education, awareness, and advocacy

Creating an environment that encourages bicycling involves much more than the provision of on-street bicycle accommodations. The behavior of both bicyclists and motorists, in addition to the built environment, can also significantly impact bicycling conditions. Behavior that negatively impacts conditions may be the result of drivers and/or cyclists not understanding or complying with traffic laws. At a minimum, bicyclists and motorists should be familiar with all pertinent traffic laws and basic bicycle safety. To facilitate this understanding, the following documents are presented as appendices.

- Virginia Bicycling Laws (Appendix N)
- Bicycling Safety Tips (Appendix O)

Additional laws, safety tips, and related information are available from VDOT’s *Bicycling and Walking* in Virginia web page at <http://virginiadot.org/info/service/bk-laws.asp>.

Moreover, to help ensure safety and enjoyment, numerous other items should be considered, such as cycling ability, fitness level, where to ride, proper clothing and equipment, and basic bicycle maintenance. These issues can often be effectively

addressed through education, awareness, and advocacy efforts involving a range of stakeholders and programs. Currently, many local police/sheriffs departments hold bicycle safety events (e.g., bicycle rodeos) for children in the study area. Other programs, such as *Safe Routes to School*, a component of SAFETEA-LU, are also available to assist in bicycle education and advocacy. In Virginia, the Safe Routes to School Program is funded by \$13 million in Federal funds through 2009 and is administered by VDOT. Additional information on the Safe Routes to School Program is available at www.saferoutesinfo.org.

- Market the regions outdoor recreation and tourism resources

The region covered by the Rural Bikeway Plan has an abundance of outdoor recreation and other tourism opportunities. However, tourism in the area could benefit from increased and coordinated marketing as well as increased availability of information on outdoor recreation and tourism opportunities in the region. Marketing can include web sites, brochures, maps, special events, etc., and can be conducted by a range of stakeholders (e.g., area chambers of commerce, individual localities, state and regional agencies, economic development organizations). Section VI of this document provides an overview of some of the region's outdoor recreation opportunities and links to additional information.

Recommended Corridors for Bicycle Accommodation

The lists of roadways for bicycle accommodation were developed based on review of demographic and spatial data, fieldwork, and local staff and citizen input. Accessibility and connectivity between activity centers and tourism/outdoor recreation opportunities were also considered in developing these tables. As previously referenced, the 2004 VDOT *Policy for Integrating Bicycle and Pedestrian Accommodations* improved the ability of a county to use its secondary roads allocation to plan, design, and construct bicycle facilities. This policy eliminates the past VDOT policy requiring that a roadway be included in an adopted bikeway plan in order for bicycle accommodations to be considered as part of roadway improvements using Federal and State funding. It should be noted that all VDOT maintained roads in the respective localities, in addition to the recommended corridors, are covered under the auspices of the VDOT *Policy for Integrating Bicycle and Pedestrian Accommodations*. As such, the tables present a practical, yet limited, listing of corridors to be considered for bicycle accommodation. A map for each locality, showing recommended corridors for bicycle accommodation and additional information discussed in this document, is available in Appendix P.

Specific bicycle accommodations are not included for corridors listed on the tables. For the purposes of this plan, all types of bicycle accommodations are considered as possible means to improve bicycling conditions in the region. Any treatment designed to better accommodate bicyclists should be applied based on location-specific analyses of roadway characteristics, geometric and operational design parameters, and other considerations.

Alleghany County

While much of Alleghany County is rural, there are more densely developed areas in the county suitable for bicycle accommodation. The highest population and development densities in Alleghany County are adjacent or in close proximity to the City of Covington and the Town of Clifton Forge and along the US 60 Business and US 220 Business corridors. Alleghany also offers bicycling and other outdoor recreation opportunities and destinations that could be connected via a bicycling network. Several corridors in Alleghany County are discussed in more detail in the Connectivity and Application of the Bicycle Compatibility Index portion of this section.

Table 7.1
Alleghany County
Corridors for Bicycle Accommodation

Roadway	From	To
Route 18 (Potts Creek Road)	Pitzer Ridge Road	Craig County CL
Pitzer Ridge Road	Potts Creek Road	City of Covington SCL
Route 159 (Dunlap Creek Road)	I-64 (Exit)	Route 311
Route 60 (Glafton Road)	I-64 (Exit 27)	Clifton Forge ECL
Route 60	Route 1104 (Valley Ridge Road)	City of Covington ECL
Route 60 (Midland Trail Road)	I-64	City of Covington WCL
Route 60 / 220	Clifton Forge WCL	Dabney Drive (Dabney Lancaster Community College)
Route 220	City of Covington NCL	Route 687
Route 311 (Kanawha Trail Road)	Craig County CL	West Virginia State Line
Route 600	Route 159	641
Route 641	Route 600	Route 687
Route 629 (Douthat Road)	I-64 (Exit 27)	Bath County CL
Route 638	Route 687	Route 666
Route 666	Route 638	Route 600
Route 687 (Hot Springs Road)	Route 220	Route 638
Route 696 (Selma-Low Moor Road)	US 60 / 220	I-64 (Exit 21) / 1104 (Winterberry Road)
Route 1101 (Valley Ridge Road)	City of Covington ECL	1104 (Winterberry Road)
Route 1104 (Winterberry Avenue)	I-64 (Exit 21) / Route 696	Route 1101 (Valley Ridge Road)
Route 1104 (Winterberry Avenue)	I-64 (Exit 21) / Route 696	Road Terminus

Botetourt County

As previously noted, much of the southern portion of Botetourt County is located in the RVAMPO study area (i.e., urbanized area), thus covered in the 2005 *Bikeway Plan for the Roanoke Valley Area MPO*. While much of the growth and development is concentrated in southern portion of the county, many areas of Botetourt remain rural in nature with low-density development. However, growth will likely continue along the rural-urban interface, as the urbanized area expands. However, this growth offers the opportunity to coordinate the provision of bicycle and pedestrian accommodations with development in the area. Botetourt County also has an abundance of outdoor recreation, as well as cultural tourism opportunities. The Appalachian Trail, Blue Ridge Parkway, Bike Route 76, and the James River pass through the county.

Table 7.2
Botetourt County
Corridors for Bicycle Accommodation

Roadway	From	To
US Route 11	Buchanan	Troutville
Frontage Road 55 (Old US 11)*	Rockbridge County CL	US Route 11*
Route 43	Buchanan	Blue Ridge Parkway
Route 43	Eagle Rock	Buchanan
Route 43	Eagle Rock CL	US Route 220
US Route 220	Route 43	Route 615 (Craigs Creek Road)
Route 615 (Craigs Creek Road)	US Route 220	Craig County CL
Route 640 (Lithia Road)*	US Route 11	Nace Road (also Route 640)*
Nace Road (Route 640)*	Route 640 (Lithia Road)	US Route 11
Route 651 (Stoney Battery Road)*	US Route 11	US Route 220
Route 740	Roanoke County CL	Carvins Cove Road
Route 779 (Valley Road)*	US Route 220	Catawba Road (also Route 779)
Route 779 (Catawba Road)*	US Route 220	Roanoke County CL
Blue Ridge Parkway**	Roanoke County CL	Rockbridge County CL

* Part of the Virginia Interstate Bike Route 76 (Note: All portions of Bike Route 76 are included in the Rural Bikeway Plan. Portions of US Route 11, Route 651, Route 779 are within the MPO study area, thus also included in the Bikeway Plan RVAMPO).

** Managed by the United State National Park Service

Town of Clifton Forge

As noted in Section, Clifton Forge has the highest population density of any locality in the study area. In general, high population densities are often associated with a compact, built environment this is more conducive to walking and biking – i.e., short distance and easy access to key destinations, slower traffic speeds, presence of pedestrian or bicycle facilities. While US Census Bureau Journey to Work data for Clifton Forge provided in Section IV show few bicycle commuters, walking commuters represented 6.4 percent of the workforce, considerably higher than the state and national averages. This figure not only reflects the higher population densities and compactness of the town, but also represents the potential for increased bicycle commuters.

Table 7.3
Town of Clifton Forge
Corridors for Bicycle Accommodation

Roadway	From	To
US 60	Alleghany County CL	A Street
US 60 / 220 (Main Street)	A Street	Keswick Street
US 60 / 220 (Keswick Street)	Main Street	Rose Street
US 60 / 220 (Rose Street)	Keswick Street	Roxbury Street
US 60 / 220 (Roxbury Street)	Rose Street	Ridgeway Street
US 60 / 220 (Ridgeway Street)	Main Street	Dabney Drive (Dabney Lancaster Community College)
US 220 (A Street)	Verge Street	Main Street
US 220 (Verge Street)	A Street	Alleghany County CL

Clifton Forge Clifton has much potential to be a bicycle-friendly town, without extensive on-street accommodations. It is compact, with many key destinations are within easy biking/walking distance; traffic pattern and speeds in areas of the town (i.e., central business district) allow for safe bicycling conditions; neighborhood streets provide areas for safe bicycling. The provision of ancillary facilities, such as bike racks, signage and pavements markings could be a cost effective method of improving bicycling conditions and promote bicycling the town. Potential locations for bike racks include town hall, library, commercial destinations, area schools, and locations throughout the downtown and central business district. Several corridors in Alleghany



Figure 7.1: Public bench in downtown Clifton Forge. Possible location for a bike rack.

County are discussed in more detail in the Connectivity and Application of the Bicycle Compatibility Index portion of this section.

City of Covington

As with Clifton Forge, the City of Covington has much higher population densities than much of the study area, creating an environment that facilitates bicycling and walking. This is reflected in Journey-to-Work data that shows the percentage of walking and bicycle commuters in the City of Covington is on par or above state and national averages.

Many areas of the City of Covington have significant potential for cost effective improvements in bicycling conditions through the provision of ancillary facilities, such as bike racks, signage and pavements markings. Potential locations for bike racks include city hall, library, commercial destinations, area schools, and locations throughout the downtown and central business district.

Table 7.4
City of Covington
Corridors for Bicycle Accommodation

Roadway	From	To
Route 18 (Carpenter Drive)	Route 60 / 220 (Madison Street)	Route 18 (West Indian Valley Drive)
Route 18 (West Indian Valley Drive)	Route 18 (Carpenter Drive)	Alleghany County CL
Route 60 / 220 (Madison Street)	I-64 (Exit 16)	Alleghany County CL / Route 1101 (Valley Ridge Road)
Route 60 / 220 (Madison Street)	I-64 (Exit 16)	Route 60 (Monroe Avenue)
Route 60 (Monroe Avenue)	US 60 / 220 (Alleghany Drive)	Alleghany County CL
Route 154 (Craig Street)	Riverside Street	Durant Street
Route 220 (Alleghany Drive)	Route 60 (Monroe Avenue)	Alleghany County CL
Locust Street	Route 60 (Monroe Avenue)	Route 154 (Craig Street)
Durant Street	Craig Street	Jackson Street
Jackson Street	Durant Street	Rayon Drive
Rayon Drive	Jackson Street	Edgemont Drive
Edgemont Street	Rayon Drive	Carpenter Drive

Craig County

As outlined in Section IV, Craig County is the most rural and less-densely populated locality in the study area. The Town of New Castle represents the primary population and commercial center in Craig County. There are numerous roadways in Craig County that are popular with cyclists. Moreover, there are miles of biking and hiking trails in the Jefferson National Forest and other outdoor recreation opportunities throughout the county.

Table 7.5
 Craig County
 Corridors for Bicycle Accommodation

Roadway	From	To
Route 18	Route 311	Alleghany County CL
Route 42	Route 311	Giles County CL
Route 311	Roanoke County CL	West Virginia State Line
Route 615 (Craig Creek Road) / Market Street	Route 311	Botetourt County CL
Route 621 (Craig Creek Road)	Route 311	Montgomery County CL
Route 632	North Route 658	South Route 42
Route 658	Route 311	Route 632
Route 658	Route 632	Route 42

Franklin County

As outlined in Section III of this document, the following documents related to bicycle, pedestrian and outdoor recreation facilities planning have been developed for/by Franklin County.

- Franklin County Trail System Plan (2004)*
- West Piedmont Regional Bicycle Plan (2004)*

These plans and associated maps will serve as the default documents guiding the planning and provision of bicycle-related and outdoor recreation accommodations in Franklin County. The following maps from these documents will serve as the locality maps for the *Rural Bikeway Plan*.

- Franklin County Bikeways and Scenic Byways Map - Appendix J
- Franklin County and Town of Rocky Mount Bicycle Plan Map (West Piedmont Regional Bicycle Plan) – Appendix K

Roanoke County

As with Botetourt County, much of Roanoke County is within is located in the RVAMPO study area, thus is covered in the *2005 Bikeway Plan for the Roanoke Valley Area MPO*. Several corridors in Tables 7.6 are within both the urbanized and rural portions of Roanoke County (e.g., Route 311), thus are included in both the *Rural Bikeway Plan* and the *Bikeway Plan for the RVAMPO*. As noted in Section III of this document, on-road corridors from the *Roanoke Valley Conceptual Plan* are also included in Table 7.6. The urbanized corridors for bicycle accommodation, as well as current and proposed greenways, are included on the Roanoke County Map in Appendix P.

The Appalachian Trail, Blue Ridge Parkway, Bike Route 76, and the Roanoke River pass through the county. Although the Nation Park Service manages the Blue Ridge Parkway, it is a popular bicycling route in Roanoke County. These trails and routes are also included on the Roanoke County Map in Appendix P.

Table 7.6
Roanoke County
Corridors for Bicycle Accommodation

Roadway	From	To
Route 11 / 460	MPO Boundary	Montgomery County CL
Route 311 (Catawba Valley Road)	MPO Boundary	Craig County CL
Route 622 (Bradshaw Road)***	Route 864 (Bradshaw Road)	Montgomery County CL
Route 624 (Newport Road)	Route 311 (Catawba Valley Road)	Montgomery County CL
Route 740 (Carvins Cove Road)***	Route 311 (Catawba Valley Road)	Botetourt County CL
Route 779 (Catawba Creek Road)*	Route 311 (Catawba Valley Road)	Botetourt County CL
Route 785 (Blacksburg Road)***	Route 311 (Catawba Valley Road)	Montgomery County CL
Route 864 (Bradshaw Road)	Route 311 (Catawba Valley Road)	Route 622 (Bradshaw Road)
Route 1404 (Timberview Road)***	Route 863	Road Terminus
Blue Ridge Parkway**	Franklin County CL	Botetourt County CL

*Part of the Virginia Interstate Bike Route 76 (Note: All portions of Bike Route 76 are included in the Rural Bikeway Plan)

** Managed by the United State National Park Service

***On-road greenway corridor from the Roanoke Valley Conceptual Greenway Plan

Implementation and Provision of Bicycle Accommodations

As outlined in the introduction, this plan provides general guidance in the development of transportation infrastructure can accommodate both motorists and bicyclist as well as highlight some of the regions outdoor recreation opportunities. However, it should be noted that implementation of recommendations or activities in this plan ultimately falls to the respective localities and VDOT and will require additional, detailed planning will be required at the local and regional levels. That being noted, the Regional Commission is available to provide assistance to the local governments in the planning of bicycle accommodations in the region.

Funding

Successful planning and implementation of bicycle, pedestrian, and alternative transportation accommodations, as well as developing and marketing the regional outdoor recreation resources will require funding from a variety of sources. When seeking potential funding sources, it should be noted that funding is often available from sources beyond the beyond the transportation field - economic development, health, safety, mobility, etc. in addition to government sources. Funding is also available from private source (foundations, individuals, trusts, etc.).

- **State and Federal Sources**

An overview of state and federal funding sources and programs available for use (as of December 2005), in the planning and provision of bicycle and pedestrian facilities is available in the report from the Virginia Transportation Research Council titled *Alternative Transportation Funding Sources Available to Virginia Localities* (Grimes, Mattingly, and Miller 2006). It should be noted that some of the programs described do not necessarily provide money above the normal annual allocations but rather allows the allocations for the primary, secondary, or urban system to be used for bicycle and pedestrian projects, following the standard VDOT project development process, or road improvement projects that use a simplified design and construction process. The complete report is included in Appendix L. This report is available Online from the Virginia Transportation Research Council at <http://www.virginiadot.org/vtrc/main/online%5Freports/pdf/06-r17.pdf>. The various funding alternatives identified were divided into six categories, according to the agency that administers them:

1. alternative use of highway allocations, administered by VDOT
2. programs administered by VDOT
3. programs administered by localities in Virginia
4. programs administered by the Department of Rail and Public Transportation (DRPT)
5. programs administered by the U.S. Department of Transportation
6. programs administered by the Virginia Department of Conservation and Recreation (VDCR)

- **Private Foundations**

There are several private foundations that provide funding for a range projects that seek to improve the quality of life in the study area.

- **Alleghany Foundation**

The Alleghany Foundation provides funding to projects designed to improve the quality of life for citizens in the Alleghany Highlands. The Foundation awards grants twice annually Grants twice annually for projects related to health, educational, recreational, art and social projects. Additional information is available by calling (540) 962-0970 or via email at allegfnd@aol.com.

- **Carilion Foundation**

The Carilion Foundation dedicates resources to projects that:

- Demonstrate innovative or replicable models for delivery of primary and preventive healthcare services
- Improve access to healthcare services
- Educate and motivate individuals to improve their health
- Champion non-duplicative and collaborative initiatives to reduce health risks
- Enhance overall quality of life

Additional information on the Carilion Foundation is available at www.carilion.com or (540) 581-0175.

Connectivity and Application of the Bicycle Compatibility Index

This section provides examples of the application of the BCI in operational evaluation and reviewing design alternatives for selected corridors that provide some level of connectivity between localities, activity centers and other destinations. In doing so, emphasis is placed on possible design alternatives that use existing pavement, where possible, to improve the ability of a roadway to accommodate bicyclist and motorists. The roadways and design alternatives presented in this section are for illustrative and discussion purposes only and do not necessarily represent design recommendations. BCI worksheets and computation tables for selected corridors are provided in Appendix M.

- **Douthat State Park – Clifton Dale Park – Town of Clifton Forge**

The entrance to Douthat State Park is located on Route 629 (Douthat Road) in Alleghany County, approximately 4 miles north of I-64 and Clifton Dale Park and 6 miles southwest of the Town of Clifton Forge (via US Route 60 Business). Bicycle accommodations along this corridor (Route 629 and US 60 Business) could increase connectivity between Douthat State Park, the Clifton Dale Park area of Alleghany County, commercial areas along the US Route 60 Business corridor, and the Town of Clifton Forge. These areas

also represent some of the highest population densities in Allegheny County (Appendix B).

Route 629 (Figure 7.2) is a two-lane road, with 11-foot travel lanes, no paved shoulder, a posted speed limit of 35 miles per hour, and an AADT of 1400. Based on the BCI, currently this corridor provides a LOS grade of D (moderately low). However, the BCI indicates that a 10-foot travel lane, a 1-foot paved shoulder, and reduction of the 85th percentile traffic speed to 35 mph, would raise the LOS to a grade of C (moderately high). This accommodation would not require additional pavement and could be provided by reconfiguring the travel lane using existing pavement. Other treatments such as improved signage (i.e., Share the Road) and/or pavement markings could be utilized to further improve bicycling conditions along the corridor.



Figure 7.2: Route 629 (Douthat Road) in Allegheny County.



Figure 7.3: Wide travel lanes on US 60 Business in Clifton Dale Park.

This methodology can also be applied to other portions of the Route 60 corridor. Existing pavement on major portions of US 60 between 1-64 (Exit) and Clifton Forge could be reconfigured/restriped to provide a paved shoulder or bike lane to accommodate bicyclists. Portions of US 60 this corridor already have either paved shoulders or wide travel lanes (Figures 7.3-7.5). As shown in Figure 7.6, once US 60 becomes Main Street in Clifton Forge (intersection of A Street), roadway design and traffic speeds provide for a more bicycle-friendly environment.



Figure 7.4: Paved shoulder on US 60 in Allegheny County near Clifton Forge.

As shown in Figure 7.3, US Route 60 (Glafton Road) through Clifton Dale Park has sufficient pavement width (17 feet) to accommodate both motorist and bicyclists.

As such, this roadway section could be reconfigured, using existing pavement width, to increase the current LOS grade of D to a C. Shoulder improvements on US 60 Business, from US 220 to the Clifton Forge corporate limits, could provide a paved shoulder to

accommodate bicyclists and connect with the paved shoulder beginning in Clifton Forge. Moreover, improved signage (i.e., Share the Road) could also be utilized in conjunction with on-road accommodations.



Figure 7.5: Paved shoulder on US 60 Business in Clifton Forge.



Figure 7.6 Route 60 / Main Street in Clifton Forge.

- **Clifton Forge – Selma – Low Moor**

Route 60 / 220 and Route 696 could provide interconnectivity between Clifton Forge, Selma, Low Moor, and Alleghany Regional Hospital. Moreover, Route 60 / 220 (Ridgeway Street) could also provide a connection to the Dabney Lancaster Community College campus (Figure 7.7).

Route 696 (Figure 7.8) has two 11 –foot travel lanes, no paved shoulder, a posted speed limit of 45, and an AADT of 2500. Based on the BCI, Route 696 currently offers a LOS grade of D (moderately low). However, several design alternatives could raise the LOS to a grade of C. One alternative (10- foot travel lanes, 1-foot paved shoulders) increases the LOS to a grade of C, using existing pavement.



Figure 7.7: Paved shoulder on Route 60 / 220 near Dabney Lancaster Community College.



Figure 7.8: Route 696 connects Clifton Forge, Selma, and Low Moor

- **Low Moor – Alleghany County – City of Covington**

Route 1104 (Winterberry Road) and Route 1101 (Valley Ridge Road) provide a connection between Low Moor, Alleghany County, and the City of Covington. This connection begins at Route 1104 near the intersection of I-64 (Exit 21) and Route 696, and continues along Route 1101 and into the City of Covington near the I-64 Exit and Madison Street. As shown in Figure 7.9, there are several activity centers along this route including Alleghany High School, Valley Ridge, Jackson River Technical Center, Mountain View Park. Other activity centers along Route 1104 include Mountain View Elementary School, Clifton Middle School, and the Alleghany County Governmental Complex.

Currently, this corridor has two 11-foot travel lanes, a posted speed limit of 45 mph, and an AADT of 2500. The BCI indicates that the LOS for this corridor is currently a D (moderately low). The BCI also indicates that the LOS could be raised from a D to a C by the addition of a 1-foot paved shoulder, using existing 11 feet of pavement (i.e., 10-foot travel lane and 1-foot paved shoulder).



Figure 7.9: Activity centers along Route 1104 and Route 1101.

Appendix A

Virginia Department of Transportation Policy for Integrating Bicycle and Pedestrian Accommodations

Virginia Department of Transportation Policy for Integrating Bicycle and Pedestrian Accommodations

1. Introduction

Bicycling and walking are fundamental travel modes and integral components of an efficient transportation network. Appropriate bicycle and pedestrian accommodations provide the public, including the disabled community, with access to the transportation network; connectivity with other modes of transportation; and independent mobility regardless of age, physical constraints, or income. Effective bicycle and pedestrian accommodations enhance the quality of life and health, strengthen communities, increase safety for all highway users, reduce congestion, and can benefit the environment. Bicycling and walking are successfully accommodated when travel by these modes is efficient, safe, and comfortable for the public. A strategic approach will consistently incorporate the consideration and provision of bicycling and walking accommodations into the decision-making process for Virginia's transportation network.

2. Purpose

This policy provides the framework through which the Virginia Department of Transportation will accommodate bicyclists and pedestrians, including pedestrians with disabilities, along with motorized transportation modes in the planning, funding, design, construction, operation, and maintenance of Virginia's transportation network to achieve a safe, effective, and balanced multimodal transportation system.

For the purposes of this policy, an accommodation is defined as any facility, design feature, operational change, or maintenance activity that improves the environment in which bicyclists and pedestrians travel. Examples of such accommodations include the provision of bike lanes, sidewalks, and signs; the installation of curb extensions for traffic calming; and the addition of paved shoulders.

3. Project Development

The Virginia Department of Transportation (VDOT) will initiate all highway construction projects with the presumption that the projects shall accommodate bicycling and walking. Factors that support the need to provide bicycle and pedestrian accommodations include, but are not limited to, the following:

- project is identified in an adopted transportation or related plan
- project accommodates existing and future bicycle and pedestrian use
- project improves or maintains safety for all users
- project provides a connection to public transportation services and facilities
- project serves areas or population groups with limited transportation options
- project provides a connection to bicycling and walking trip generators such as employment, education, retail, recreation, and residential centers and public facilities
- project is identified in a Safe Routes to School program or provides a connection to a school
- project provides a regional connection or is of regional or state significance
- project provides a link to other bicycle and pedestrian accommodations
- project provides a connection to traverse natural or man-made barriers

- project provides a tourism or economic development opportunity

Project development for bicycle and pedestrian accommodations will follow VDOT's project programming and scheduling process and concurrent engineering process. VDOT will encourage the participation of localities in concurrent engineering activities that guide the project development.

3.1 Accommodations Built as Independent Construction Projects

Bicycle and pedestrian accommodations can be developed through projects that are independent of highway construction, either within the highway right-of-way or on an independent right-of-way. Independent construction projects can be utilized to retrofit accommodations along existing roadways, improve existing accommodations to better serve users, and install facilities to provide continuity and accessibility within the bicycle and pedestrian network. These projects will follow the same procedures as those for other construction projects for planning, funding, design, and construction. Localities and metropolitan planning organizations will be instrumental in identifying and prioritizing these independent construction projects.

3.2 Access-Controlled Corridors

Access-controlled corridors can create barriers to bicycle and pedestrian travel. Bicycling and walking may be accommodated within or adjacent to access-controlled corridors through the provision of facilities on parallel roadways or physically separated parallel facilities within the right-of-way. Crossings of such corridors must be provided to establish or maintain connectivity of bicycle and pedestrian accommodations.

3.3 Additional Improvement Opportunities

Bicycle and pedestrian accommodations will be considered in other types of projects. Non-construction activities can be used to improve accommodations for bicycling and walking. In addition, any project that affects or could affect the usability of an existing bicycle or pedestrian accommodation within the highway system must be consistent with state and federal laws.

3.3.1 Operation and Maintenance Activities

Bicycling and walking should be considered in operational improvements, including hazard elimination projects and signal installation. Independent operational improvements for bicycling and walking, such as the installation of pedestrian signals, should be coordinated with local transportation and safety offices. The maintenance program will consider bicycling and walking so that completed activities will not hinder the movement of those choosing to use these travel modes. The maintenance program may produce facility changes that will enhance the environment for bicycling and walking, such as the addition of paved shoulders.

3.3.2 Long Distance Bicycle Routes

Long distance bicycle routes facilitate travel for bicyclists through the use of shared lanes, bike lanes, and shared use paths, as well as signage. All projects along a long distance route meeting the criteria for an American Association of State Highway and Transportation Officials (AASHTO) or *Manual on Uniform Traffic Control Devices* (MUTCD) approved numbered bicycle route system should provide the necessary design features to facilitate bicycle travel. Independent construction projects and other activities can be utilized to make improvements for existing numbered bicycle routes. Consideration should be given to facilitating the development of other types of long distance routes.

3.3.3 Tourism and Economic Development

Bicycling and walking accommodations can serve as unique transportation links between historic, cultural, scenic, and recreational sites, providing support to tourism activities and resulting economic development. Projects along existing or planned tourism and recreation corridors should include bicycle and pedestrian accommodations. In addition, the development of independent projects to serve this type of tourism and economic development function should be considered and coordinated with economic development organizations at local, regional, and state levels, as well as with other related agencies. Projects must also address the need to provide safety and connectivity for existing and planned recreational trails, such as the Appalachian Trail, that intersect with the state's highway system.

3.4 Exceptions to the Provision of Accommodations

Bicycle and pedestrian accommodations should be provided except where one or more of the following conditions exist:

- scarcity of population, travel, and attractors, both existing and future, indicate an absence of need for such accommodations
- environmental or social impacts outweigh the need for these accommodations
- safety would be compromised
- total cost of bicycle and pedestrian accommodations to the appropriate system (i.e., interstate, primary, secondary, or urban system) would be excessively disproportionate to the need for the facility
- purpose and scope of the specific project do not facilitate the provision of such accommodations (e.g., projects for the Rural Rustic Road Program)
- bicycle and pedestrian travel is prohibited by state or federal laws

3.5 Decision Process

The project manager and local representatives will, based on the factors listed previously in this section, develop a recommendation on how and whether to accommodate bicyclists and pedestrians in a construction project prior to the public hearing. The district administrator should confirm this recommendation prior to the public hearing. Public involvement comments will be reviewed and incorporated into project development prior to the preparation of the design approval recommendation. When a locality is not in agreement with VDOT's position on how bicyclists and pedestrians will or will not be accommodated in a construction project, the locality can introduce a formal appeal by means of a resolution adopted by the local governing body. The resolution must be

submitted to the district administrator to be reviewed and considered prior to the submission of the design approval recommendation to the chief engineer for program development. Local resolutions must be forwarded to the chief engineer for program development for consideration during the project design approval or to the Commonwealth Transportation Board for consideration during location and design approval, if needed for a project. The resolution and supporting information related to the recommendation must be included in the project documentation.

The decisions made by VDOT and localities for the provision of bicycle and pedestrian travel must be consistent with state and federal laws regarding accommodations and access for bicycling and walking.

4. Discipline Participation in Project Development

VDOT will provide the leadership to implement this policy. Those involved in the planning, funding, design, construction, operation, and maintenance of the state's highways are responsible for effecting the guidance set forth in this policy. VDOT recognizes the need for interdisciplinary coordination to efficiently develop, operate, and maintain bicycle and pedestrian accommodations. Procedures, guidelines, and best practices will be developed or revised to implement the provisions set forth in this policy. For example, objective criteria will be prepared to guide decisions on the restriction of bicycle and pedestrian use of access-controlled facilities. VDOT will work with localities, regional planning agencies, advisory committees, and other stakeholders to facilitate implementation and will offer training or other resource tools on planning, designing, operating, and maintaining bicycle and pedestrian accommodations.

4.1 Planning

VDOT will promote the inclusion of bicycle and pedestrian accommodations in transportation planning activities at local, regional, and statewide levels. These planning activities include, but are not limited to, corridor studies, small urban studies, regional plans, and the statewide multimodal long-range transportation plan. To carry out this task, VDOT will coordinate with local government agencies, regional planning agencies, and community stakeholder groups. In addition, VDOT will coordinate with the Virginia Department of Rail and Public Transportation (VDRPT) and local and regional transit providers to identify needs for bicycle and pedestrian access to public transportation services and facilities.

4.2 Funding

Highway construction funds can be used to build bicycle and pedestrian accommodations either concurrently with highway construction projects or as independent transportation projects. Both types of bicycle and pedestrian accommodation projects will be funded in the same manner as other highway construction projects for each system (i.e., interstate, primary, secondary, or urban). VDOT's participation in the development and construction of an independent project that is not associated with the interstate, primary, secondary, or urban systems will be determined through a negotiated agreement with the locality or localities involved.

Other state and federal funding sources eligible for the development of bicycle and

pedestrian accommodations may be used, following program requirements established for these sources. These sources include, but are not limited to, programs for highway safety, enhancement, air quality, congestion relief, and special access.

VDOT may enter into agreements with localities or other entities in order to pursue alternate funding to develop bicycle and pedestrian accommodations, so long as the agreements are consistent with state and federal laws.

4.3 Design and Construction

VDOT will work with localities to select and design accommodations, taking into consideration community needs, safety, and unique environmental and aesthetic characteristics as they relate to specific projects. The selection of the specific accommodations to be used for a project will be based on the application of appropriate planning, design, and engineering principles. The accommodations will be designed and built, or installed, using guidance from VDOT and AASHTO publications, the MUTCD, and the *Americans with Disabilities Act Accessibility Guidelines (ADAAG)*. Methods for providing flexibility within safe design parameters, such as context sensitive solutions and design, will be considered.

During the preparation of an environmental impact statement (EIS), VDOT will consider the current and anticipated future use of the affected facilities by bicyclists and pedestrians, the potential impacts of the alternatives on bicycle and pedestrian travel, and proposed measures, if any, to avoid or reduce adverse impacts to the use of these facilities by bicyclists and pedestrians.

During project design VDOT will coordinate with VDRPT to address bicyclist and pedestrian access to existing and planned transit connections.

Requests for exceptions to design criteria must be submitted in accordance with VDOT's design exception review process. The approval of exceptions will be decided by the Federal Highway Administration or VDOT's Chief Engineer for Program Development.

VDOT will ensure that accommodations for bicycling and walking are built in accordance with design plans and VDOT's construction standards and specifications.

4.4 Operations

VDOT will consider methods of accommodating bicycling and walking along existing roads through operational changes, such as traffic calming and crosswalk marking, where appropriate and feasible.

VDOT will work with VDRPT and local and regional transit providers to identify the need for ancillary facilities, such as shelters and bike racks on buses, that support bicycling and walking to transit connections.

VDOT will enforce the requirements for the continuance of bicycle and pedestrian traffic in work zones, especially in areas at or leading to transit stops, and in facility replacements in accordance with the MUTCD, *VDOT Work Area Protection Manual*, and *VDOT Land*

Use Permit Manual when construction, utility, or maintenance work, either by VDOT or other entities, affects bicycle and pedestrian accommodations.

VDOT will continue to research and implement technologies that could be used to improve the safety and mobility of bicyclists and pedestrians in Virginia's transportation network, such as signal detection systems for bicycles and in-pavement crosswalk lights.

4.5 Maintenance

VDOT will maintain bicycle and pedestrian accommodations as necessary to keep the accommodations usable and accessible in accordance with state and federal laws and VDOT's asset management policy. Maintenance of bike lanes and paved shoulders will include repair, replacement, and clearance of debris. As these facilities are an integral part of the pavement structure, snow and ice control will be performed on these facilities.

For sidewalks, shared use paths, and bicycle paths built within department right-of-way, built to department standards, and accepted for maintenance, VDOT will maintain these bicycle and pedestrian accommodations through replacement and repair. VDOT will not provide snow or ice removal for sidewalks and shared use paths. The execution of agreements between VDOT and localities for maintenance of such facilities shall not be precluded under this policy.

5. Effective Date

This policy becomes effect upon its adoption by the Commonwealth Transportation Board on March 18, 2004, and will apply to projects that reach the scoping phase after its adoption.

This policy shall supersede all current department policies and procedures related to bicycle and pedestrian accommodations. VDOT will develop or revise procedures, guidelines, and best practices to support and implement the provisions set forth in this policy, and future departmental policies and procedural documents shall comply with the provisions set forth in this policy.

Source: [http://virginiadot.org/infoservice/resources/Policy on Integrating BP Accommodations.pdf](http://virginiadot.org/infoservice/resources/Policy%20on%20Integrating%20BP%20Accommodations.pdf)

Appendix B

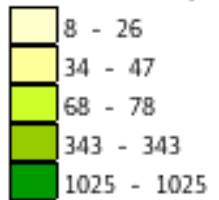
Population Density Maps - Block Group Level, 2000

Allegheny County

Population Density by Block Group 2000

Data Classes

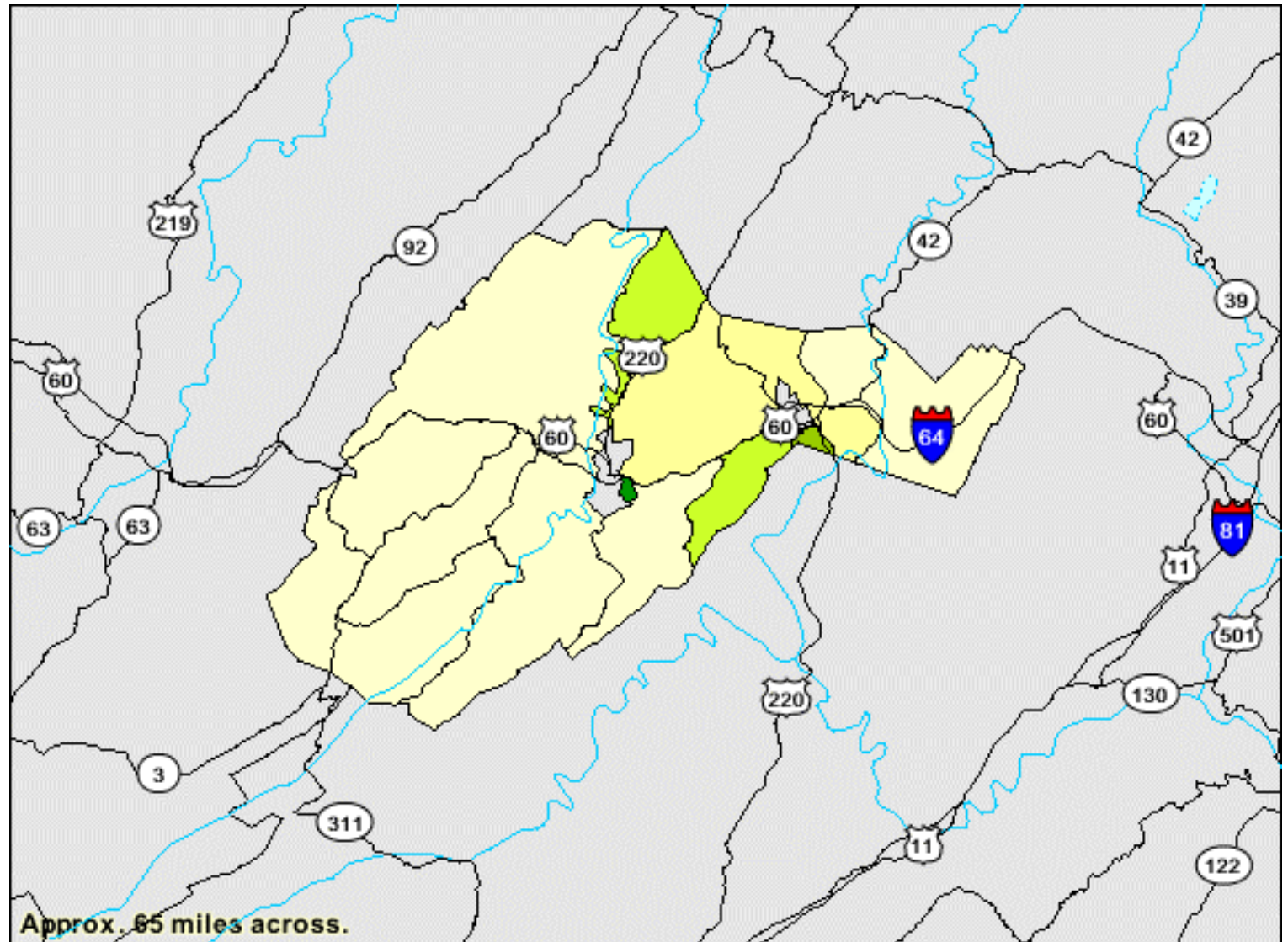
Persons/Sq Mile



Features

- Major Road
- Street
- Stream/Waterbody
- Stream/Waterbody

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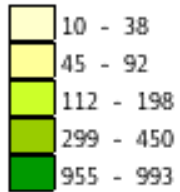


Botetourt
County

Population
Density
by Block Group
2000

Data Classes

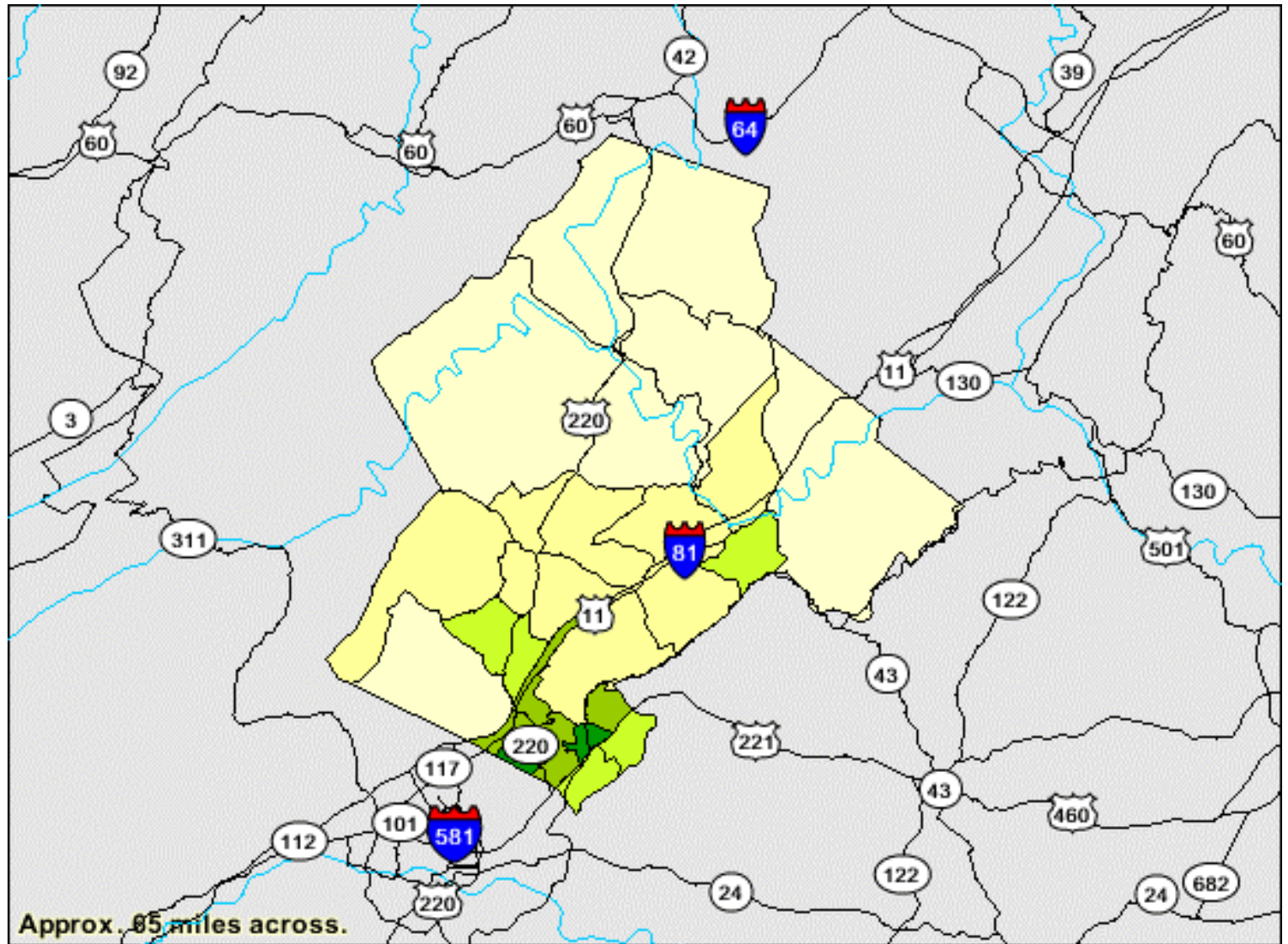
Persons/Sq Mile



Features

- Major Road
- Street
- Stream/Waterbody
- Stream/Waterbody

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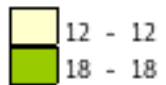


Craig
County

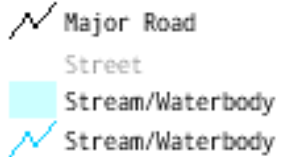
Population
Density
by Block Group

Data Classes

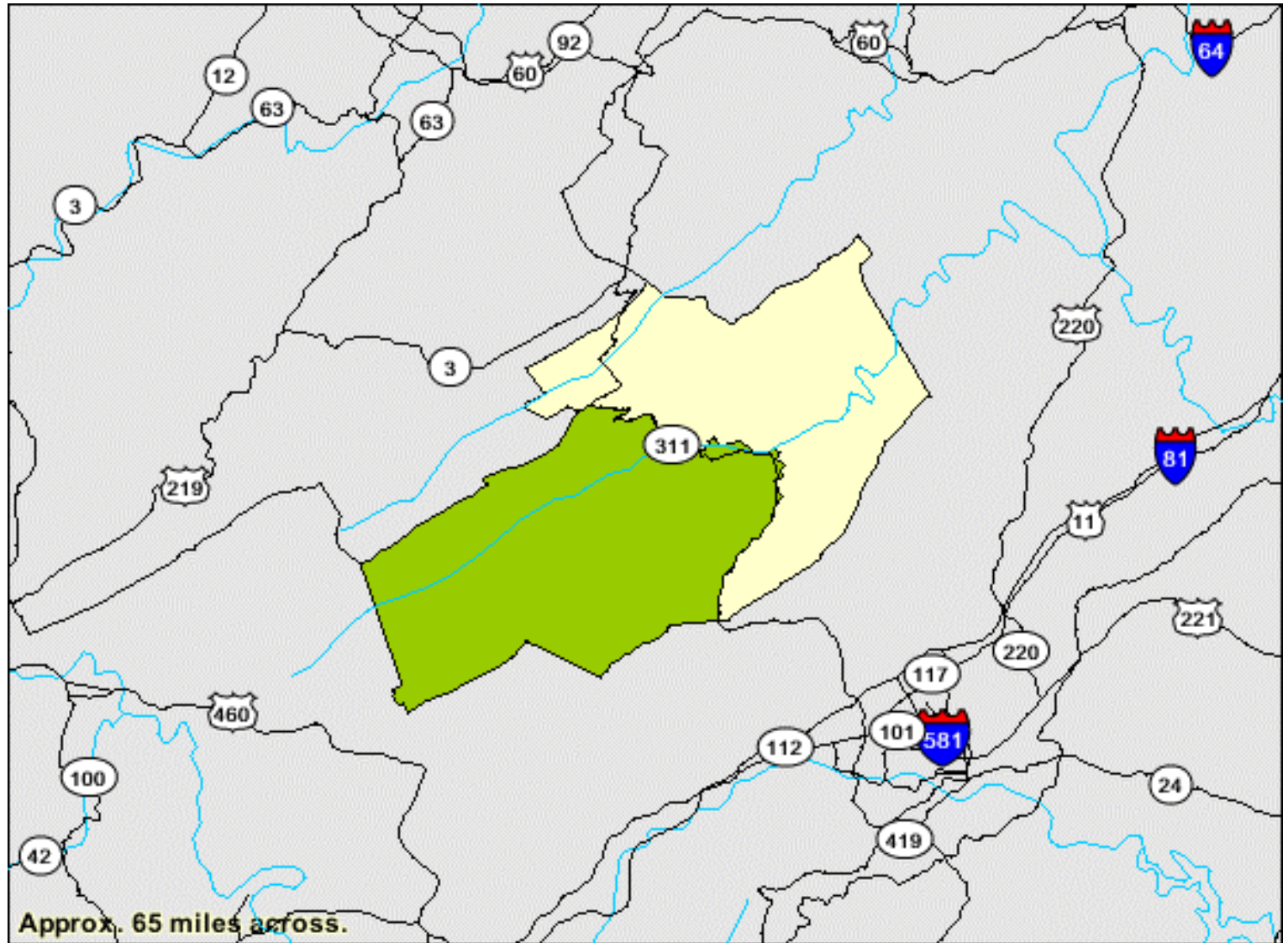
Persons/Sq Mile



Features



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City of Covington

Population Density by Block Group

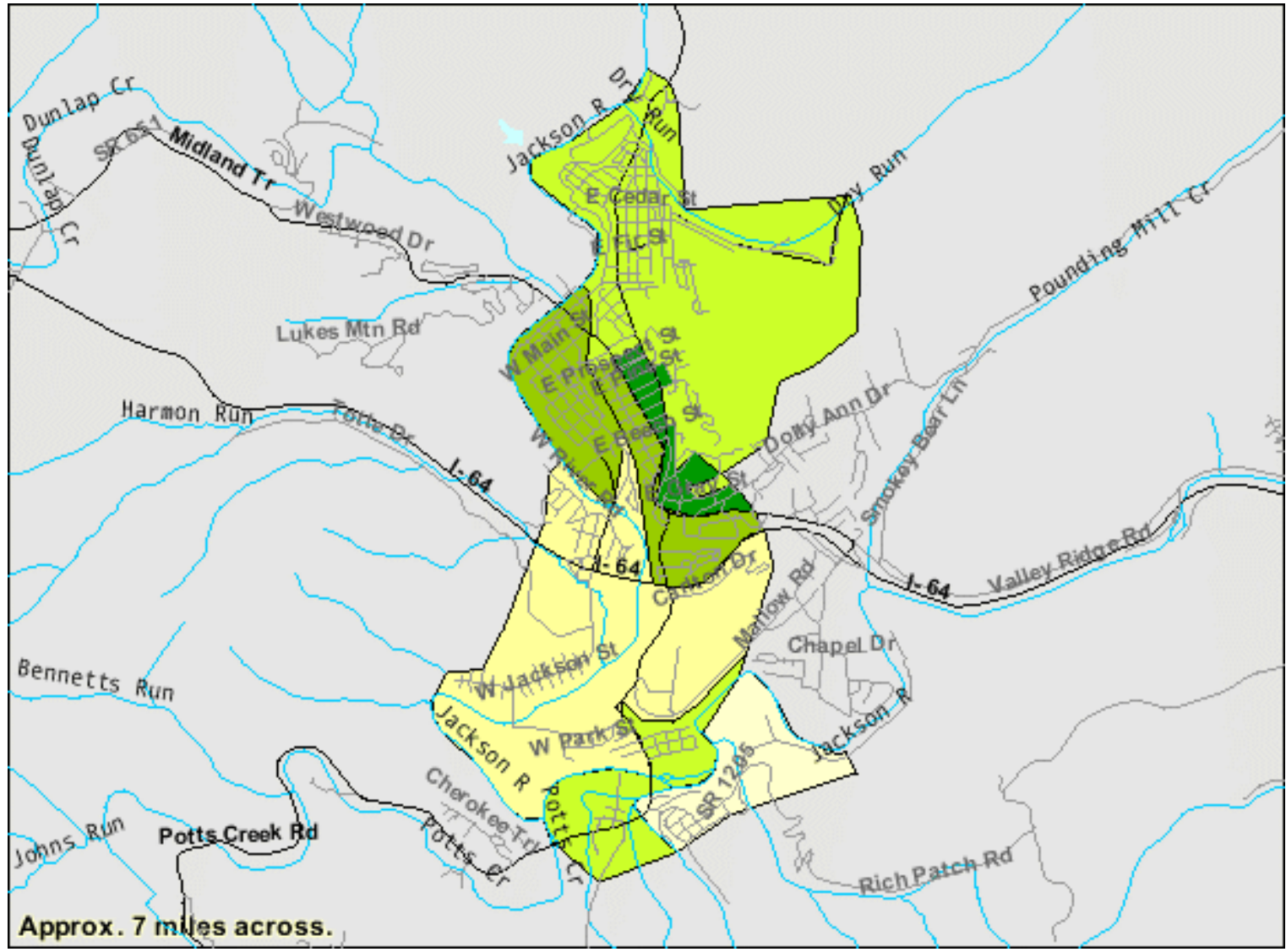
Data Classes

Persons/Sq Mile

655 - 655
800 - 800
1031 - 1129
1708 - 1984
3005 - 3005

Features

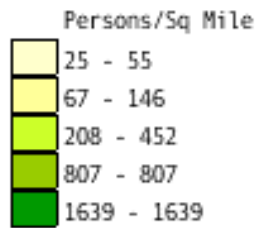
- Major Road
- Street
- Stream/Waterbody
- Stream/Waterbody



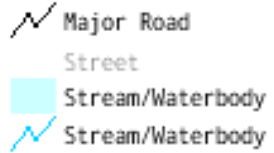
Franklin County

Population Density by Block Group

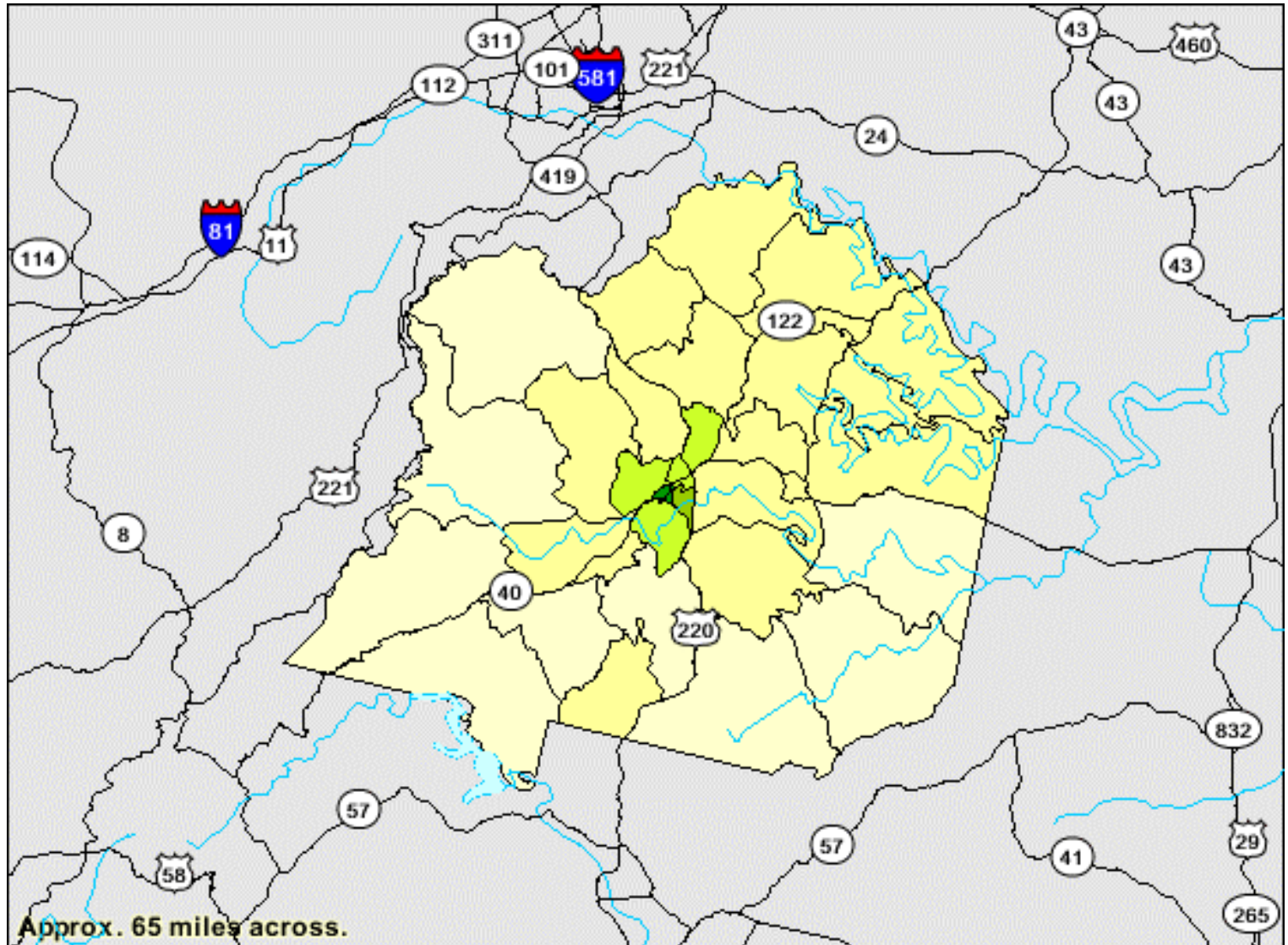
Data Classes



Features



Items in gray text are not visible at this zoom level

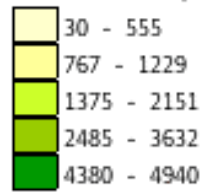


Roanoke
County





Population
Density
by Block Group

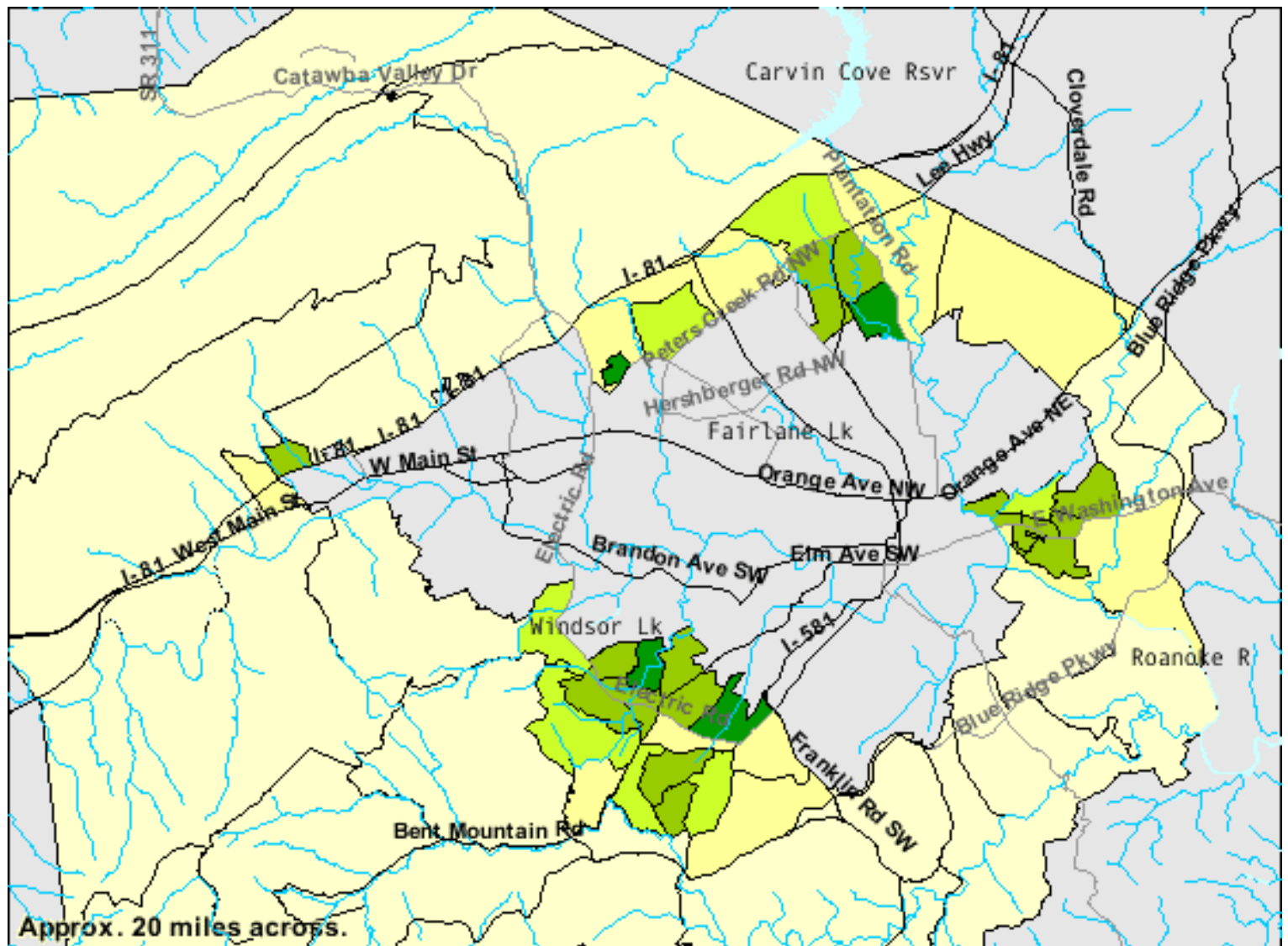
Data Classes

Persons/Sq Mile



Features

-  Major Road
-  Street
-  Stream/Waterbody
-  Stream/Waterbody



Appendix C

Largest Employers by Locality 4th Quarter, 2005

Ownership Code (OC)*	Ownership Type
10	Federal Government
20	State Government
30	Local Government
50	Private

Size Code**	Number of Employees
09	1000 and over employees
08	500 to 999 employees
07	250 to 499 employees
06	100 to 249 employees
05	50 to 99 employees
04	20 to 49 employees
03	10 to 19 employees
02	5 to 9 employees
01	1 to 4 employees

Source: Virginia Employment Commission

Alleghany County (including the Town of Clifton Forge)

RANK	Company Name	OC *	Size Code**
1	Alleghany Highlands Public School Board	30	08
2	Alleghany Regional Hospital	50	07
3	Bacova Guild	50	07
4	County of Alleghany	30	06
5	Parker Hannifin Corp	50	06
6	Westvaco	50	06
7	Dabney S. Lancaster Community College	20	06
8	A.E.T. Packaging Films	50	06
9	Alleghany Highland Mental Health Services	30	05
10	Team Carriers	50	05
11	Miller Electric Company	50	05
12	Hammond Mitchell, Inc.	50	05
13	WVVA Health Care Alliance	50	05
14	Beverly Home Care	50	05
15	Afs of Low Moor Inc	50	05
16	Boys Home	50	05
17	The Woodlands	50	05
18	City of Clifton Forge	30	05
19	Kroger	50	05
20	Mayflower and Highland	50	05

Source: Virginia Employment Commission

Botetourt County

RANK	Company Name	OC *	Size Code**
1	Botetourt County School Board	30	08
2	Dynax America Corporation	50	07
3	Metalsa Roanoke Inc	50	07
4	County of Botetourt	30	06
5	Koyo Steering Systems of Inc	50	06
6	Lawrence Transportation Services	50	06
7	Roanoke Cement Comp LLC	50	06
8	Gala Industries, Inc.	50	06
9	Altec Industries Inc	50	06
10	O'Neal Steel	50	06
11	General Shale Brick Inc	50	06
12	Lanford Brothers Company	50	06
13	Virginia Truck Center, Inc.	50	06
14	Home Instead Senior Care	50	06
15	Arkay Packaging Corporation	50	06
16	Davis H. Elliot Company, Inc.	50	06
17	Howell's Motor Freight Inc.	50	06
18	Cracker Barrel Old Country Store	50	06
19	Kroger	50	06
20	Virginia Department of Corrections, Western VA Field Office	20	06

Source: Virginia Employment Commission

Craig County

RANK	Company Name	OC*	Size Code**
1	Craig County Public School Board	30	06
2	County of Craig	30	05
3	Mick or Mack IGA	50	05
4	Craig Botetourt Electric Co-operative, Inc.	50	04
5	Wilderness Adventure at Eagle Landing	50	04
6	The Virginia Baptist Children's Home	50	04
7	The Farmer's and Merchant's Bank	50	04
8	Castle Sands Company	50	03
9	81 South Corporation	50	03
10	Hanging Rock Grocery	50	03
11	U.S. Department of Agriculture	10	03
12	Paint Bank General Store	50	03
13	Transloading Services	50	03
14	First National Exchange Bank	50	02
15	The Bread Basket	50	02
16	Market Street Pharmacy Inc	50	02
17	New Castle Telephone Company	50	02
18	Pauleys Excavating	50	02
19	Fletcher Plastering Inc	50	02
20	Craig County Automotive	50	02

Source: Virginia Employment Commission

Franklin County

RANK	Company Name	OC*	Size Code**
1	M.W. Manufacturers	50	09
2	Franklin County School Board	30	09
3	Wal Mart	50	07
4	County of Franklin	30	07
5	Ferrum College	50	07
6	Franklin Memorial Hospital	50	07
7	Mills Stop & Go Inc	50	07
8	Ronile	50	07
9	Mod U Kraft Homes	50	06
10	Willard Construction of Roanoke Valley	50	06
11	The Uttermost Company	50	06
12	Ameristaff	50	06
13	Trinity Mission Healthcare & Rehabilitation	50	06
14	Kroger	50	06
15	Fleetwood Homes of Virginia	50	06
16	Dairy Queen	50	06
17	North American Housing	50	06
18	Courtland Health Care Center	50	06
19	Central Virginia MSO	50	06
20	Lowes' Home Centers, Inc.	50	06

Source: Virginia Employment Commission

Roanoke County

RANK	Company Name	OC*	Size Code**
1	Roanoke County School Board	30	09
2	First Union National Bank	50	09
3	Allstate Insurance Company	50	09
4	County of Roanoke	30	09
5	Hanover Direct Inc	50	08
6	Manpower International	50	08
7	Paychecks Plus	50	08
8	Healthmarc	50	08
9	Friendship Manor	50	08
10	Kroger	50	07
11	Wal Mart	50	07
12	Bright Personnel and Business	50	07
13	Precision Fabrics Group	50	07
14	Hollins University	50	07
15	Courtland Health Care Center	50	07
16	Richfield Nursing Center	50	07
17	Catawba Hospital	20	07
18	Medeco Security Locks	50	07
19	John W. Hancock Jr., Inc.	50	07
20	Cardinal Glass Industries Inc	50	07

Source: Virginia Employment Commission

City of Covington

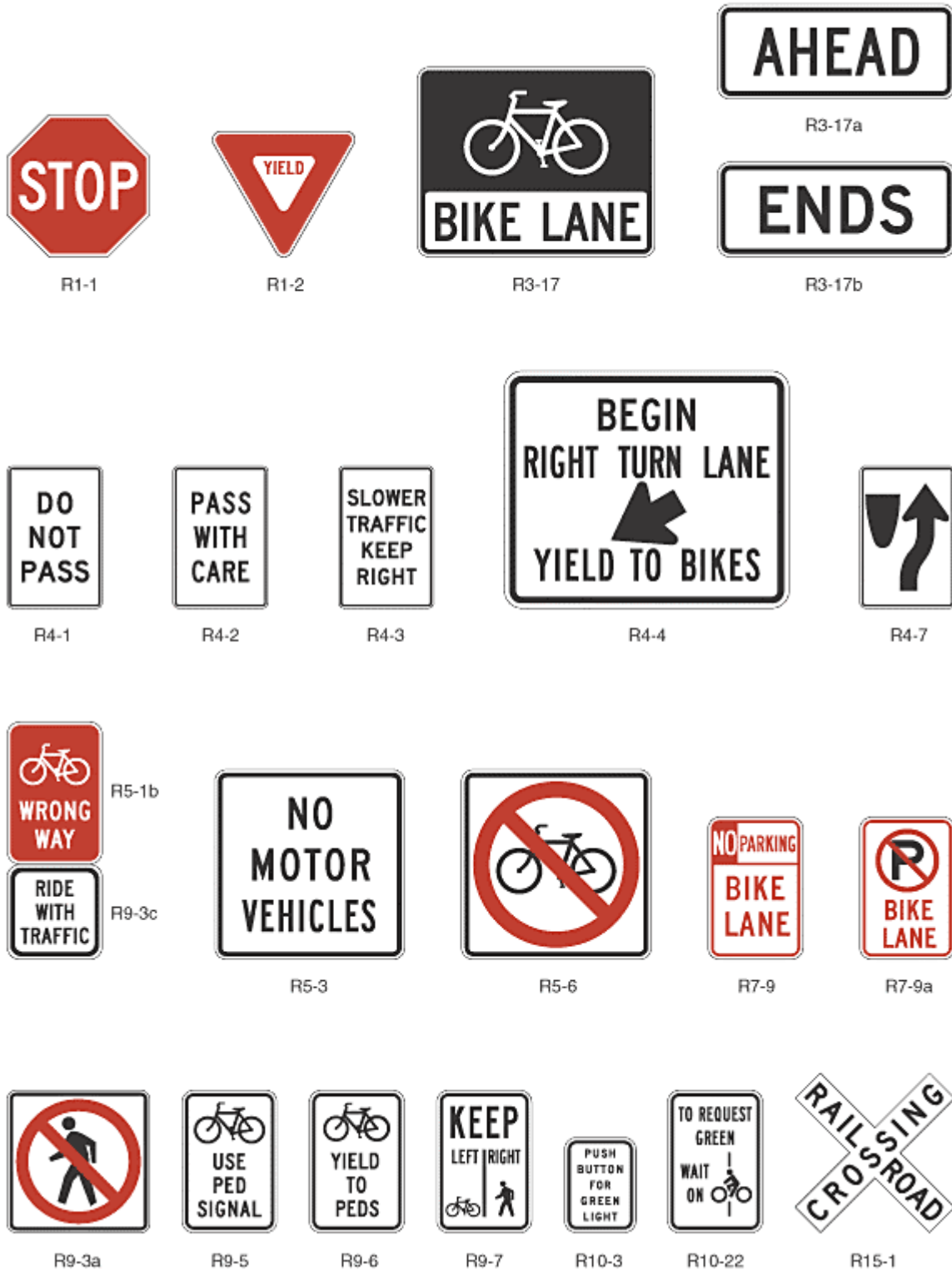
RANK	Company Name	OC*	Size Code**
1	Westvaco	50	09
2	Wal Mart	50	07
3	Lear Operations Corporation	50	06
4	Covington City School Board	30	06
5	Manpower International	50	06
6	City of Covington	30	06
7	Walter N. Yoder and Sons	50	05
8	National Boiler Service	50	05
9	Mead Westvaco	50	05
10	Waco Inc.	50	05
11	Advantage Care	50	05
12	Kmart	50	05
13	Allegany Highland Mental Health Services	30	04
14	Southern Erectors Inc.	50	04
15	Progressive Employment Pa	50	04
16	Cucci Pizzeria	50	04
17	H & M Electric	50	04
18	Kroger	50	04
19	Alleghany Motor Corporation	50	04
20	The Covington Virginian, Inc.	50	04

Source: Virginia Employment Commission

Appendix D

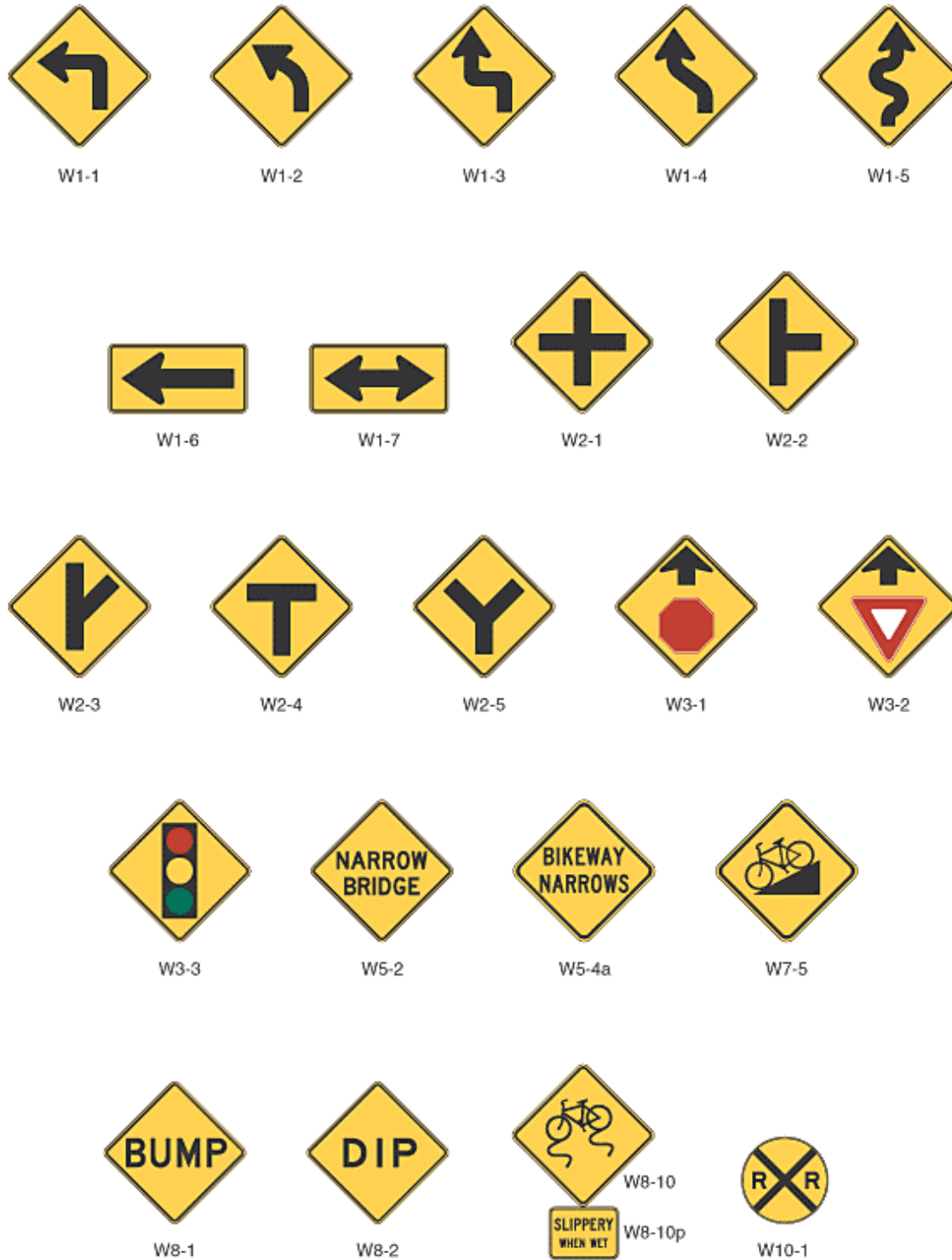
Manual on Uniform Traffic Control Devices – Bicycle Related Signage

Figure 9B-2. Regulatory Signs for Bicycle Facilities



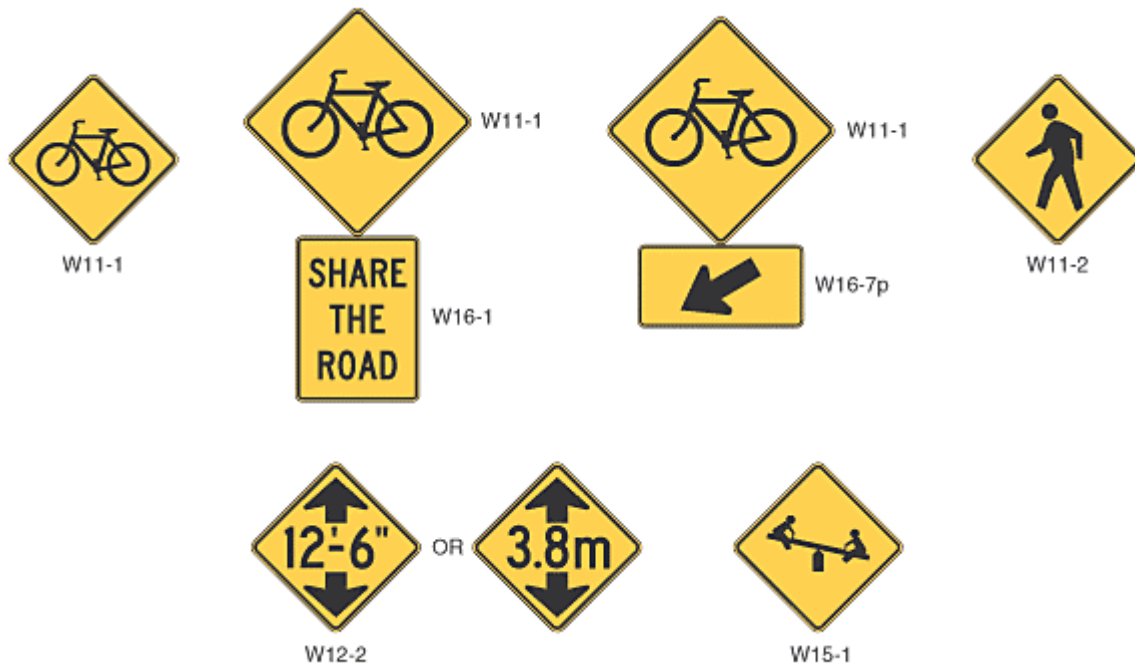
Source: [Manual on Uniform Traffic Control Devices](#) (MUTCD), 2003

Figure 9B-3. Warning Signs for Bicycle Facilities (Sheet 1 of 2)



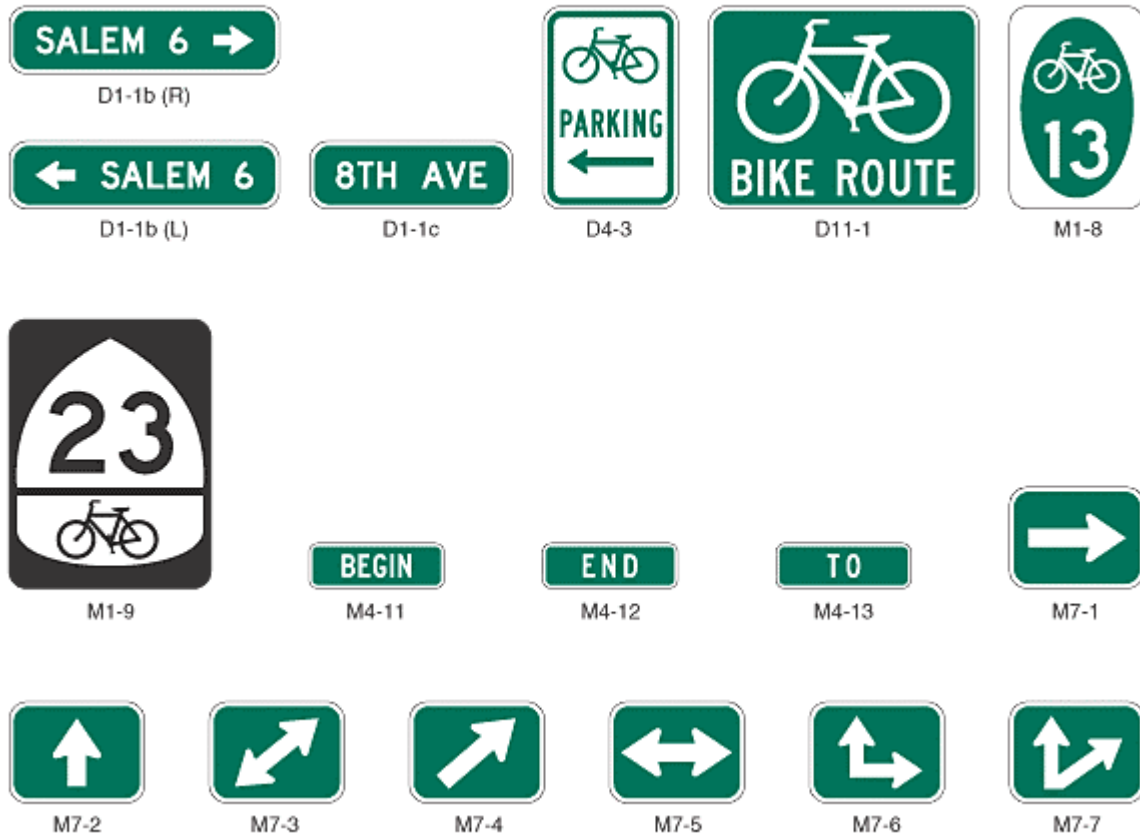
Source: [Manual on Uniform Traffic Control Devices](#) (MUTCD), 2003

Figure 9B-3. Warning Signs for Bicycle Facilities (Sheet 2 of 2)



Source: [Manual on Uniform Traffic Control Devices](#) (MUTCD), 2003

Figure 9B-4. Guide Signs for Bicycle Facilities



Source: [Manual on Uniform Traffic Control Devices \(MUTCD\)](#), 2003

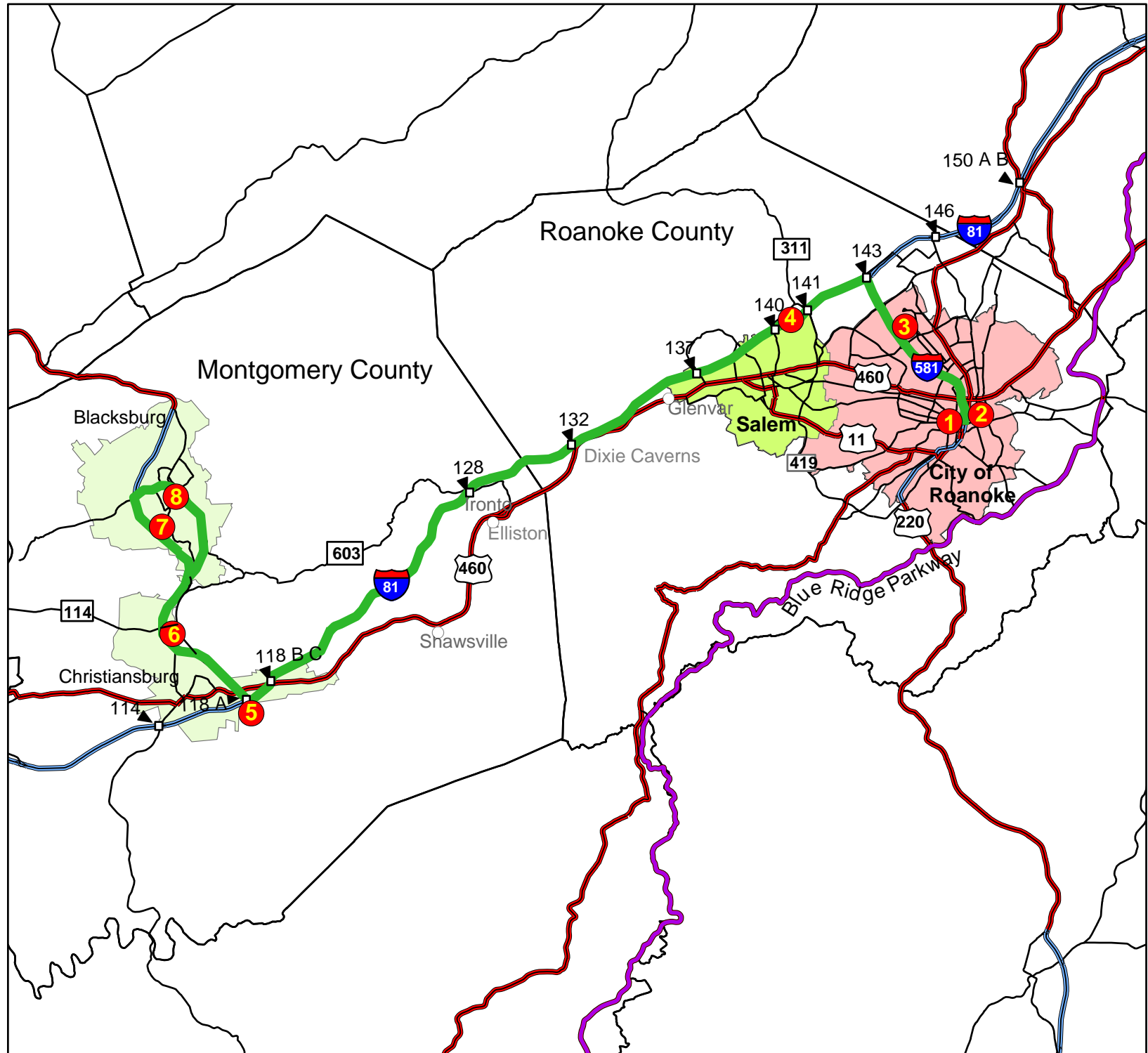
Appendix E
The Smart Way Bus Commuter Bus Service Maps

THE SMART WAY COMMUTER SERVICE MAP

● Bus Stops

- 1: Campbell Court Transportation Center
- 2: Hotel Roanoke and Conference Center/ the Higher Ed. Center
- 3: Roanoke Regional Airport
- 4: Park & Ride Lot - Exit 140
- 5: Park & Ride Lot - Exit 118A
- 6: Christiansburg K-Mart
- 7: Corporate Research Center
- 8: Squires Student Center Virginia Tech Campus

 The Smart Way Service Route



Appendix F

Ferrum Express Service Map

THE FERRUM EXPRESS SERVICE MAP



● Bus Stops

- 1: Ferrum
- 2: Rocky Mount Farmers Market
- 3: Eagle Cinema
- 4: Rocky Mount Wal-Mart
- 5: Bowling Alley
- 6: Campbell Court Transportation Center (Saturday Only)

Schedules

Thursday and Friday Route

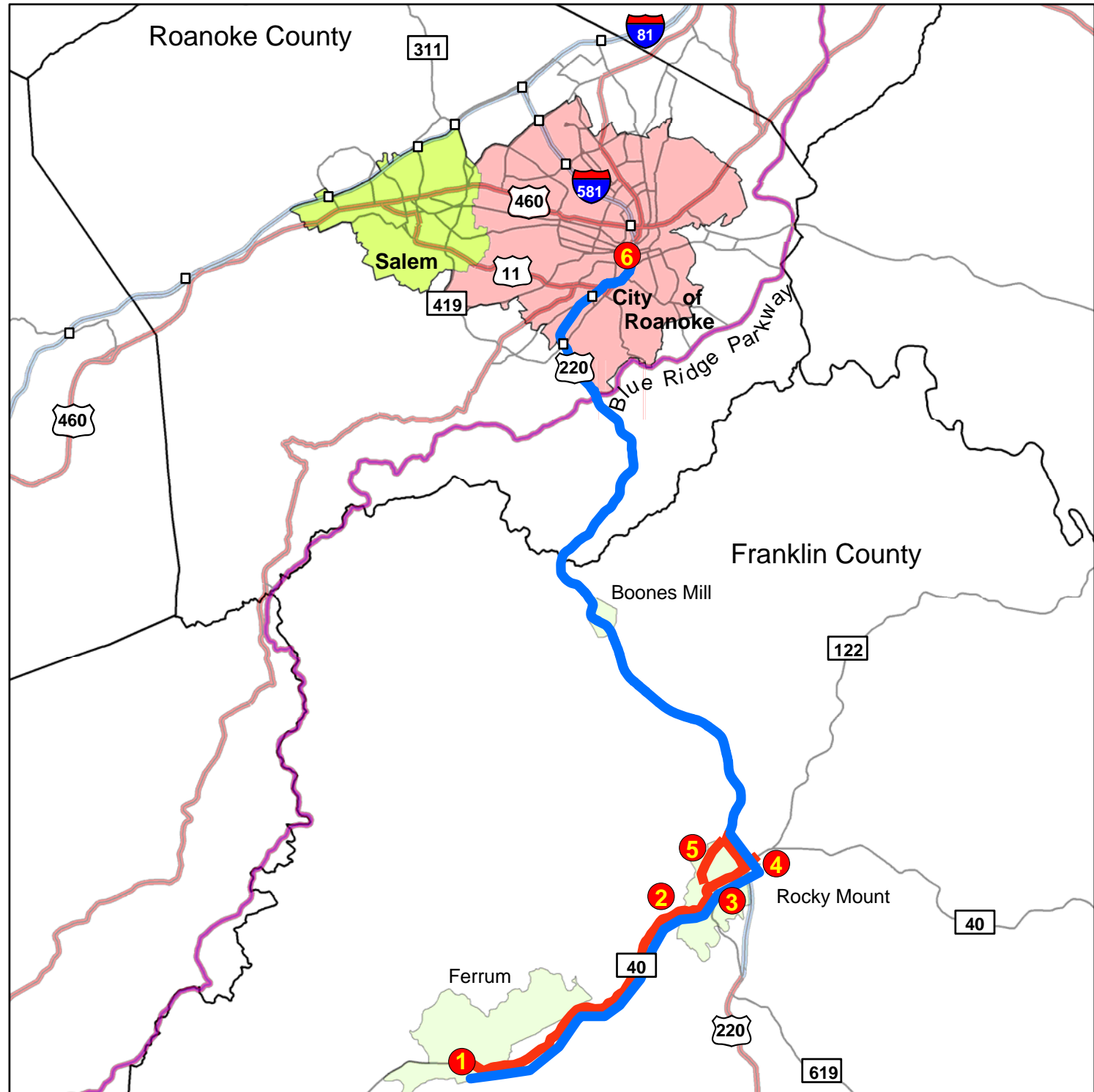
Ferrum	Farmers Mrkt	Eagle Cinema	Wal-Mart
5:00 p.m.	5:15 p.m.	5:20 p.m.	5:25 p.m.
6:00 p.m.	6:15 p.m.	6:20 p.m.	6:25 p.m.
7:00 p.m.	7:15 p.m.	7:20 p.m.	7:25 p.m.
8:00 p.m.	8:15 p.m.	8:20 p.m.	8:25 p.m.
9:00 p.m.	9:15 p.m.	9:20 p.m.	9:25 p.m.
10:00 p.m.	10:15 p.m.	10:20 p.m.	10:25 p.m.

Wal-Mart	Bowling Alley	Farmers Mrkt	Ferrum
5:25 p.m.	5:35 p.m.	5:40 p.m.	6:00 p.m.
6:25 p.m.	6:35 p.m.	6:40 p.m.	7:00 p.m.
7:25 p.m.	7:35 p.m.	7:40 p.m.	8:00 p.m.
8:25 p.m.	8:35 p.m.	8:40 p.m.	9:00 p.m.
9:25 p.m.	9:35 p.m.	9:40 p.m.	10:00 p.m.
10:25 p.m.	10:35 p.m.	10:40 p.m.	11:00 p.m.

Saturday Route

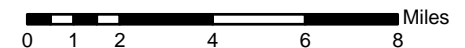
Ferrum	Farmers Mrkt	Eagle Cinema	Wal-Mart	Roanoke
1:00 p.m.	1:15 p.m.	1:20 p.m.	1:25 p.m.	2:00 p.m.
3:00 p.m.	3:15 p.m.	3:20 p.m.	3:25 p.m.	4:00 p.m.
5:00 p.m.	5:15 p.m.	5:20 p.m.	5:25 p.m.	6:00 p.m.
7:00 p.m.	7:15 p.m.	7:20 p.m.	7:25 p.m.	8:00 p.m.
9:00 p.m.	9:15 p.m.	9:20 p.m.	9:25 p.m.	10:00 p.m.
11:00 p.m.	11:15 p.m.	11:20 p.m.	11:25 p.m.	12:00 p.m.

Roanoke	Wal-Mart	Eagle Cinema	Farmers Mrkt	Ferrum
2:00 p.m.	2:35 p.m.	2:40 p.m.	2:45 p.m.	3:00 p.m.
4:00 p.m.	4:35 p.m.	4:40 p.m.	4:45 p.m.	5:00 p.m.
6:00 p.m.	6:35 p.m.	6:40 p.m.	6:45 p.m.	7:00 p.m.
8:00 p.m.	8:35 p.m.	8:40 p.m.	8:45 p.m.	9:00 p.m.
10:00 p.m.	10:35 p.m.	10:40 p.m.	10:45 p.m.	11:00 p.m.



The Ferrum Express is a free service that is open to the public.
 For service changes due to inclement weather please call 540/365-5555 or visit www.ferrum.edu/weather/.
 For connection information to Valley Metro and Smart Way bus services, please contact 800/388-7005.

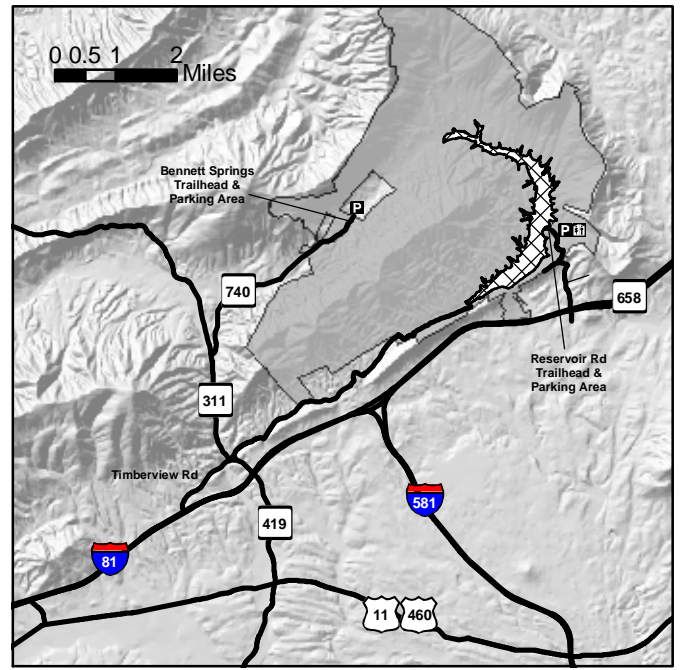
Prepared by the staff of the Roanoke Valley-Alleghany Regional Commission, July 2005



Appendix G

Carvins Cove Trail Maps

Carvins Cove Trail System



Trail Type:

- Fire Road
- Trail

- Streets & Roads
- Appalachian Trail**
- 10 Ft. Contours

- Reservoir
- Cove Boundary
- Parking Area

Trail / Fire Road Key:

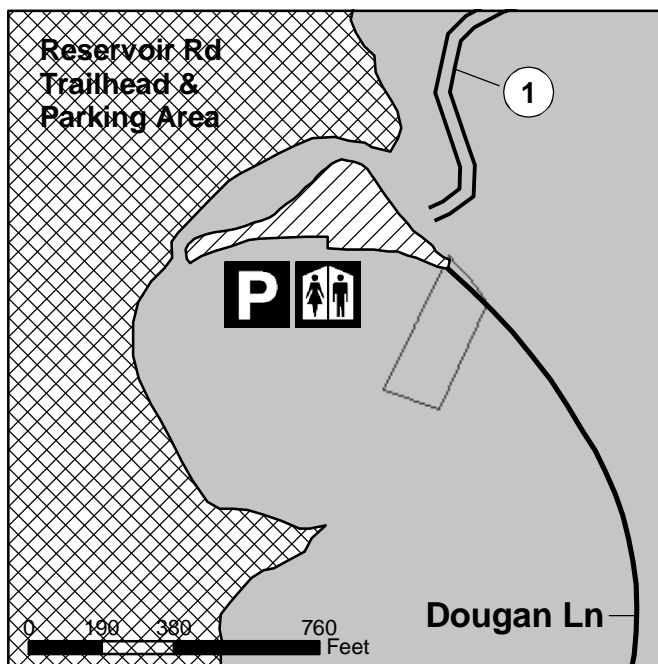
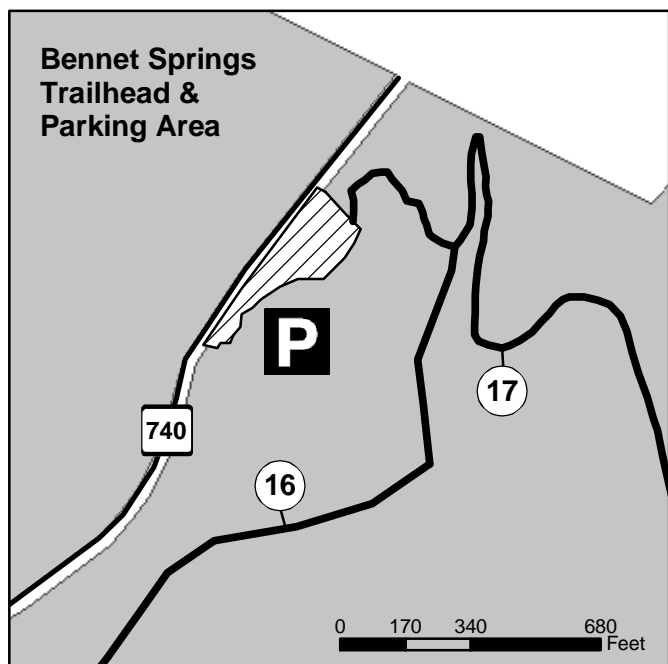
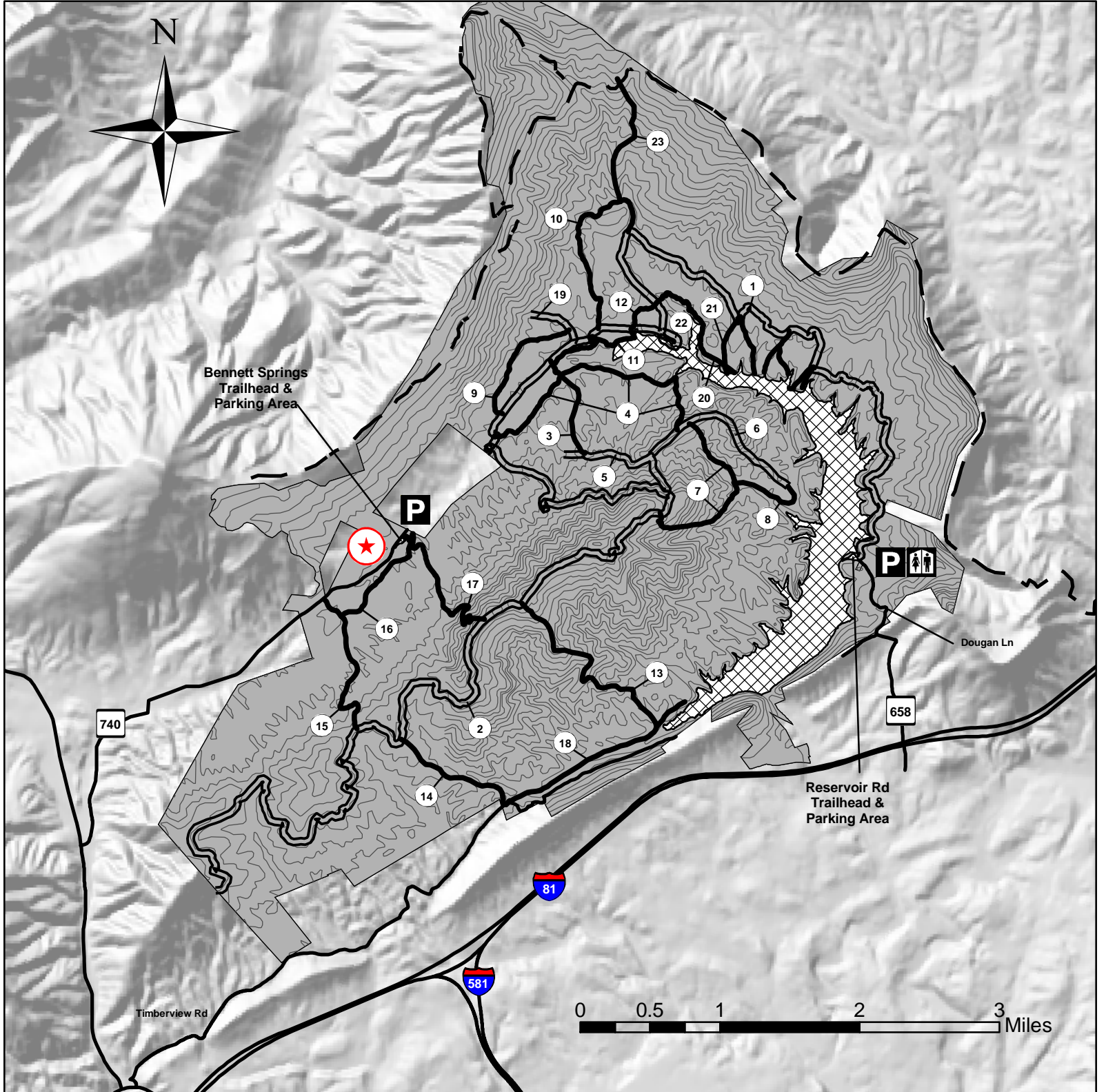
- 1: Happy Valley
- 2: Brushy Mountain*
- 3: Tuck-A-Way
- 4: Comet
- 5: Jacob's Drop*
- 6: Kerncliff*
- 7: Hemlock Tunnel*
- 8: Araminta
- 9: Songbird
- 10: Arrowhead
- 11: Enchanted Forest
- 12: Little Bell
- 13: The Gauntlet*
- 14: The Trough*
- 15: Buck*
- 16: Hotel
- 17: Hi-Dee-Hoe*
- 18: Horse Pen
- 19: Tunnel
- 20: Church Bell
- 21: Schoolhouse
- 22: Riley's Loop
- 23: Sawmill Branch**

* Long climbs, large changes in elevation
 ** Hiking Only

You Are Here

TRAIL USAGE:

- Hike
- Bicycle
- Horseback
- ATV**



Prepared by the City of Roanoke
 Department of Technology, July 2004,
 using reference data prepared by the
 Roanoke Valley Allegheny
 Regional Commission, January 2003

Appendix H

Explore Park International Mountain Biking Association Trail System Map



Subaru Mountain Bike Trail System

VIRGINIA'S EXPLORE PARK

MILEPOST 115, BLUE RIDGE PARKWAY, ROANOKE • 540-427-1800

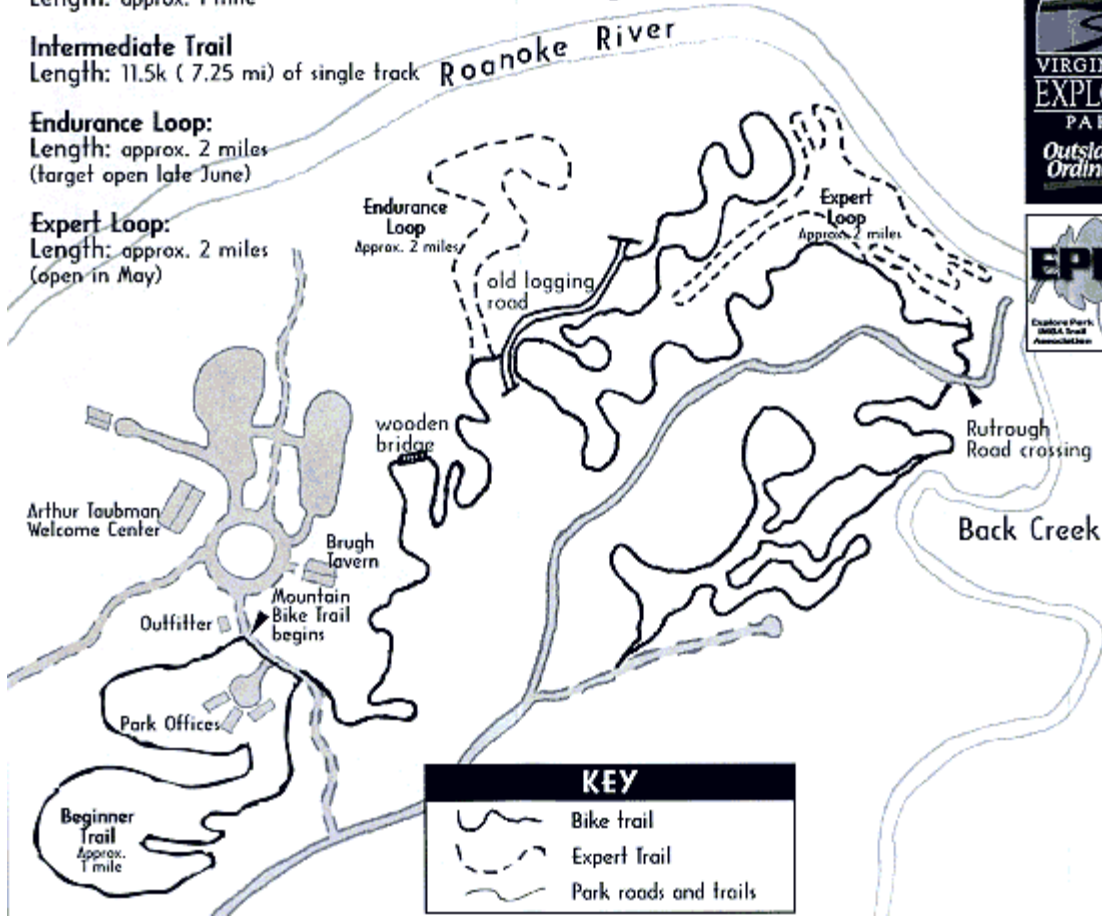
ExploreSingleTrack.com

Beginner Loop:
Length: approx. 1 mile

Intermediate Trail
Length: 11.5k (7.25 mi) of single track

Endurance Loop:
Length: approx. 2 miles
(target open late June)

Expert Loop:
Length: approx. 2 miles
(open in May)



Appendix I

Public Boating Access Department of Game and Inland Fisheries

Alleghany County

Waterbody	Access Area	Barrier Free	Type	Ramps	Latitude	Longitude	Map
<u>Jackson River</u>	Indian Draft	No	Shoreline Access	0	37° 52' 7" N 37.8687031	79° 59' 22" W -79.9893450	<u>Map</u>
Directions: From Covington, N. Rt.220, left Rt. 687 @ Clear.Pk, (3 mi. on E.side)							
<u>Jackson River</u>	Island Ford II	No	Shoreline Access	0	37° 46' 45" N 37.7792338	79° 56' 1" W -79.9334976	<u>Map</u>
Directions: From Covington, E. on Rt. 1104 (2 mi. on right)							
<u>Jackson River</u>	Johnson Spring	No	Shoreline Access	0	37° 54' 54" N 37.9150911	79° 58' 21" W -79.9723798	<u>Map</u>
Directions: From Covington, N Rt 220, left Rt. 687, Clear.Pk, S.Rt 638 Nat.Well 1/2m)							
<u>Jackson River</u>	Low Moor	No	Shoreline Access	0	37° 48' 0" N 37.8000691	79° 52' 17" W -79.8712522	<u>Map</u>
Directions: From Low Moor exit (I64), N. 100 yds, E., on Rt. 1101, Follow Signs to Access							
<u>Jackson River</u>	Petticoat Junction	No	Boat Slide	0	37° 50' 32" N 37.8421107	79° 59' 20" W -79.9888148	<u>Map</u>
Directions: From Covington, N. Rt 220, left Rt. 687 at Clear.Pk -1 mi on left							
<u>Lake Moomaw</u>	Lake Moomaw (Coles Point)	Yes	Concrete Ramp	1	37° 55' 45" N 37.9291811	79° 58' 50" W -79.9806883	<u>Map</u>
Directions: From Covington, Rt 60 West (4); R on Rt 600 (9.5)							

Source: <http://www.dgif.virginia.gov/boating/access/>

Botetourt County

Waterbody	Access Area	Barrier Free	Type	Ramps	Latitude	Longitude	Map
<u>James River</u>	Arcadia	No	Shoreline Access	0	37° 33' 17" N 37.5546289	79° 38' 14" W -79.6371729	<u>Map</u>
Directions: From Buchanan, N. Rt. 11, E. Rt. 614, 1 1/2 mi.							
<u>James River</u>	Buchanan	No	Concrete Ramp, Shallow Water	0	37° 31' 48" N 37.5299870	79° 40' 46" W -79.6794026	<u>Map</u>
Directions: Town of Buchanan							
<u>James River</u>	Craig Creek	No	Shoreline Access	0	37° 38' 45" N 37.6457516	79° 48' 52" W -79.8144734	<u>Map</u>
Directions: Under Rt. 220 Bridge at Rt. 683							
<u>James River</u>	Horseshoe Bend	No	Concrete Ramp	0	37° 35' 21" N 37.5890944	79° 43' 40" W -79.7278398	<u>Map</u>
Directions: From Buchanan. West on Rt. 43 (7mi)							
<u>James River</u>	Irongate	No	Shoreline Access	0	37° 46' 26" N 37.7739067	79° 46' 58" W -79.7826662	<u>Map</u>
Directions: From Irongate, Rt. 220							
<u>James River</u>	Springwood	No	Shoreline Access	0	37° 32' 52" N 37.5476694	79° 44' 33" W -79.7425195	<u>Map</u>
Directions: From Buchanan, Rt 43 North (3.5); L on Rt 630 to (1); to Rt 601							

Source: <http://www.dgif.virginia.gov/boating/access/>

Franklin County

Waterbody	Access Area	Barrier Free	Type	Ramps	Latitude	Longitude	Map
Smith Mountain Lake	Penhook #9	Yes	Concrete Ramp	2	37° 0' 47" N 37.0130298	79° 37' 32" W -79.6255712	Map
Directions: From Penhook, Rt 660 North (.8); R on Rt 966 (1.4)							
Smith Mountain Lake	Scruggs #8	Yes	Concrete Ramp	1	37° 3' 5" N 37.0512595	79° 39' 48" W -79.6633949	Map
Directions: From Moneta southwest on Rt 122 (7); L on Rt 616 (5.7); R on Rt 601 (2)							


















Source: <http://www.dgif.virginia.gov/boating/access/>

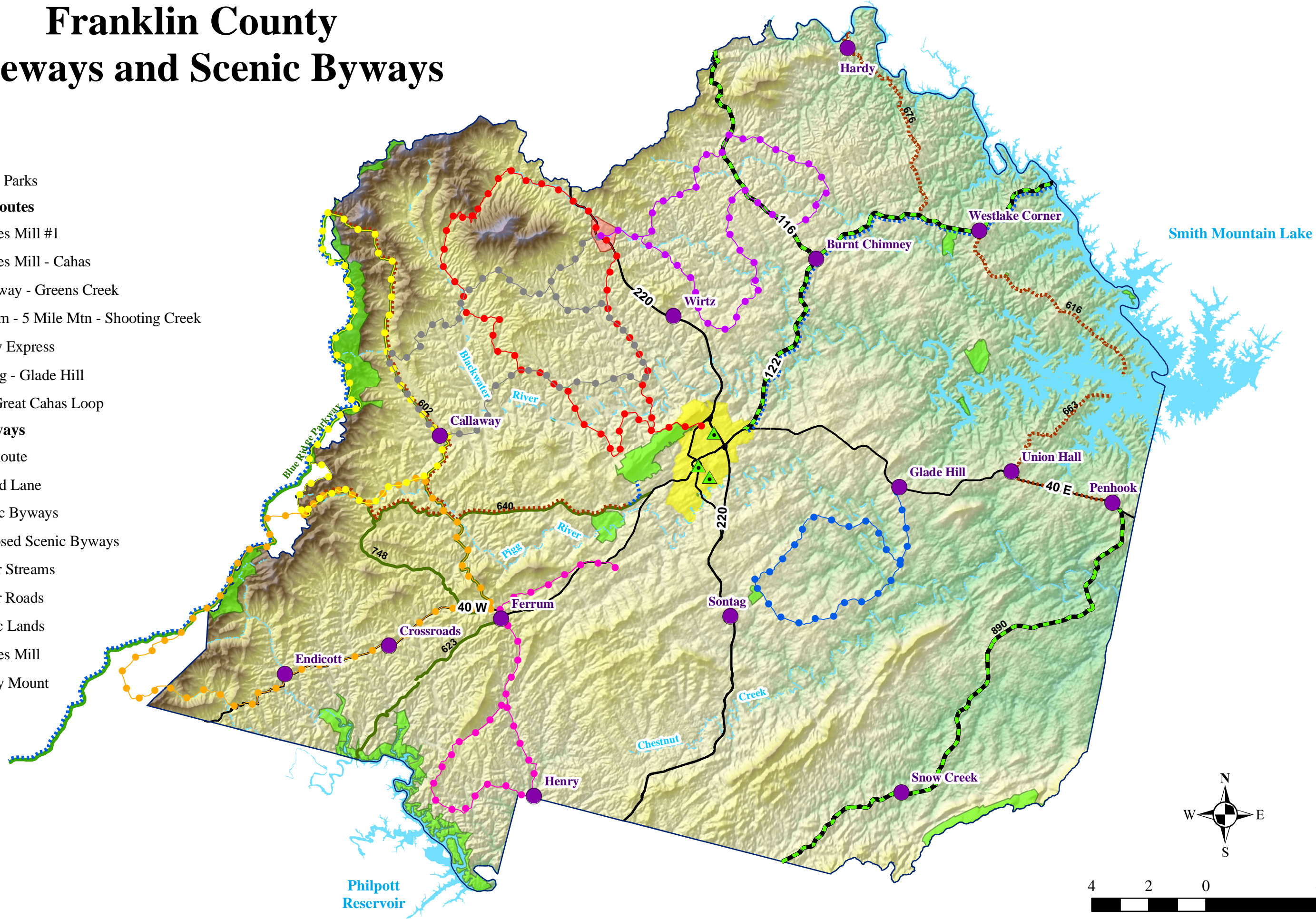
Appendix J

Franklin County Bikeways and Scenic Byways Map (Franklin County Trail System Plan)

Franklin County Bikeways and Scenic Byways

Legend

-  Town Parks
- Existing Bike Routes**
-  Boones Mill #1
-  Boones Mill - Cahas
-  Callaway - Greens Creek
-  Ferrum - 5 Mile Mtn - Shooting Creek
-  Henry Express
-  Sontag - Glade Hill
-  The Great Cahas Loop
- Proposed Bikeways**
-  Off-Route
-  Shared Lane
-  Scenic Byways
-  Proposed Scenic Byways
-  Major Streams
-  Major Roads
-  Public Lands
-  Boones Mill
-  Rocky Mount

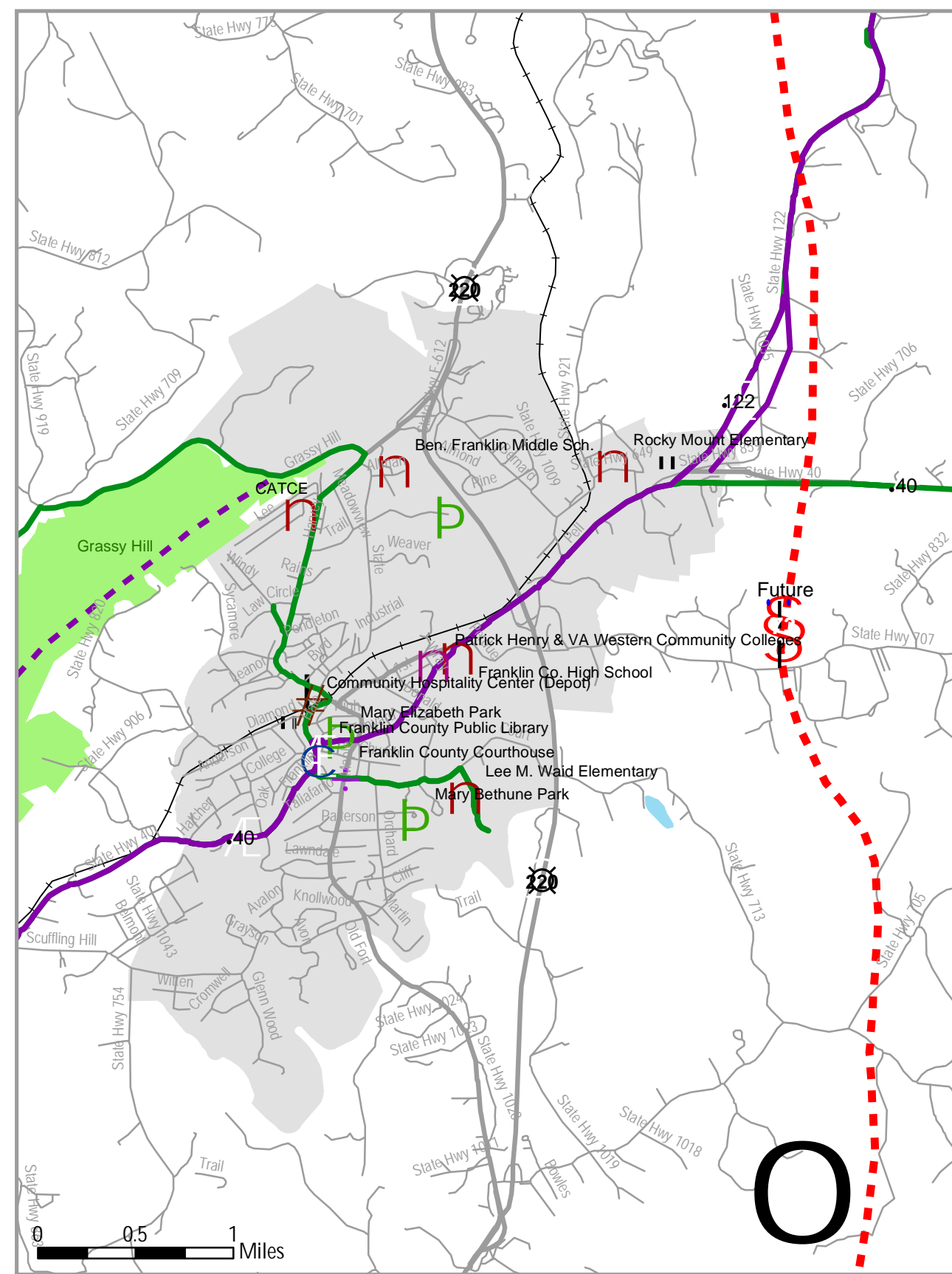
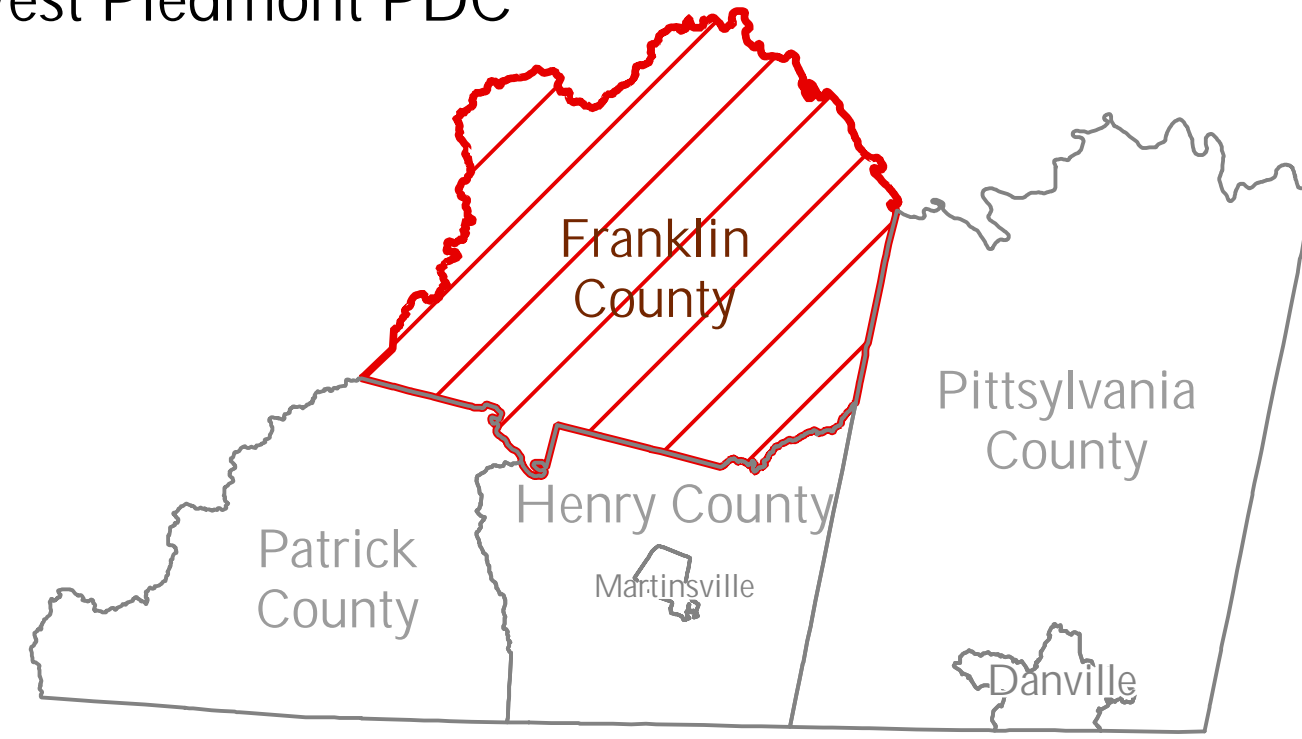


Appendix K

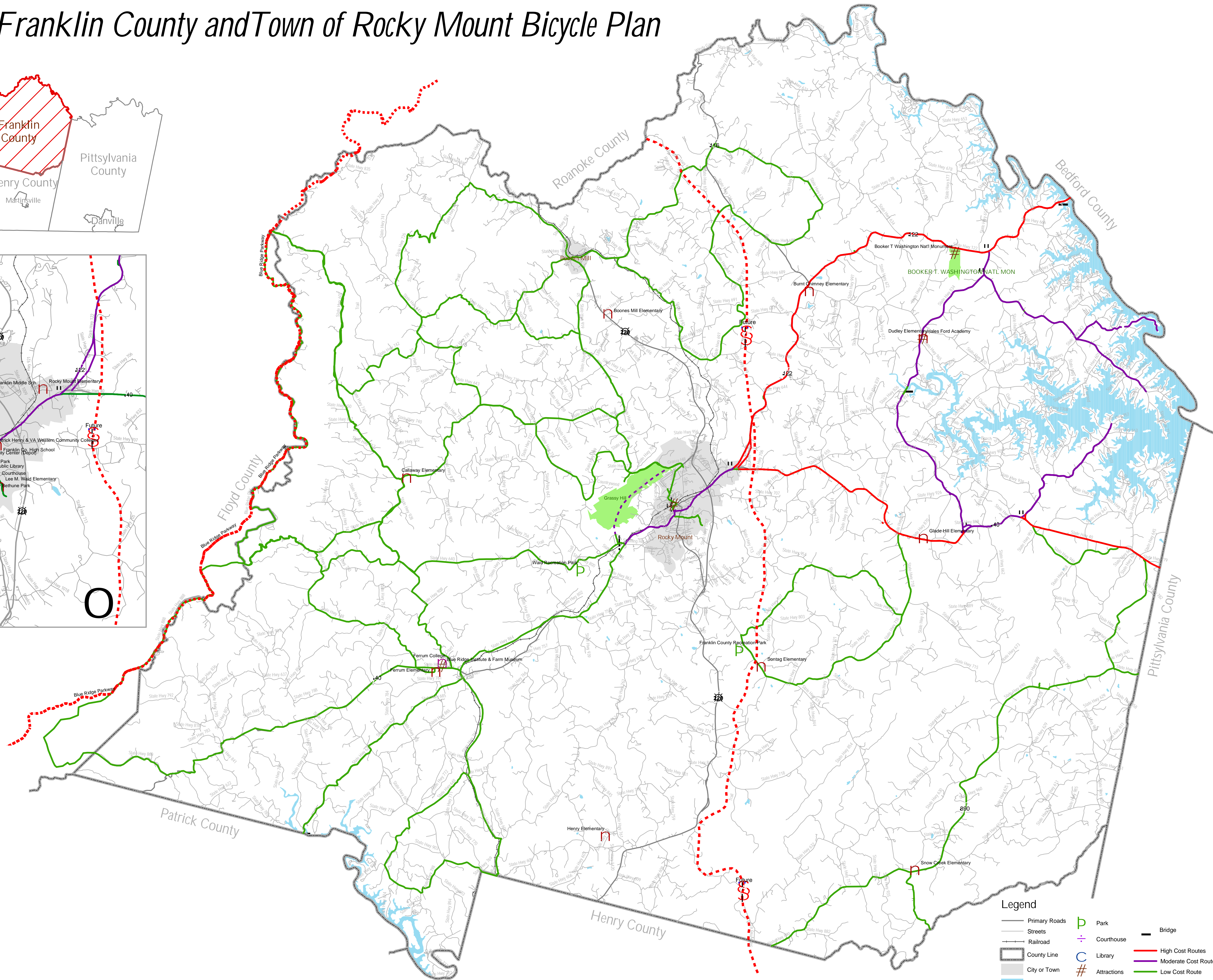
Franklin County and Town of Rocky Mount Bicycle Plan Map (West Piedmont Regional Bicycle Plan)

Figure 4.7 Franklin County and Town of Rocky Mount Bicycle Plan

West Piedmont PDC



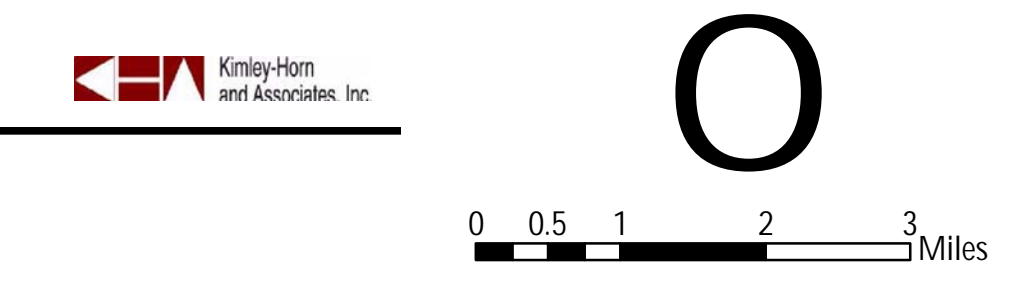
Rocky Mount (inset)



- Legend**
- Primary Roads
 - Streets
 - Railroad
 - County Line
 - City or Town
 - Body of Water
 - College
 - School
 - Park
 - Courthouse
 - Library
 - Attractions
 - RR Crossing
 - Intersection
 - Bridge
 - High Cost Routes
 - Moderate Cost Route
 - Low Cost Route
 - Proposed High Cost Routes
 - Proposed Mountain Bike Trail

West Piedmont Regional Bicycle Plan

Franklin County



Note: For additional information on planning level costs for Low, Moderate, and High Cost Routes see Chapter 4.

Appendix L

Final Report
Alternative Transportation Funding Sources Available to Virginia Localities

Virginia Transportation Research Council
March 2006
VTRC 06-R17

Standard Title Page - Report on Federally Funded Project

1. Report No. FHWA/VTRC 06-R17	2. Government Accession No.	3. Recipient's Catalog No.	
4. Title and Subtitle Alternative Transportation Funding Sources Available to Virginia Localities		5. Report Date March 2006	
		6. Performing Organization Code	
7. Author(s) Matthew C. Grimes, Kimberly M. Mattingly, and John S. Miller		8. Performing Organization Report No. VTRC 06-R17	
9. Performing Organization and Address Virginia Transportation Research Council 530 Edgemont Road Charlottesville, VA 22903		10. Work Unit No. (TRAIS)	
		11. Contract or Grant No. 72989	
12. Sponsoring Agencies' Name and Address Virginia Department of Transportation FHWA 1401 E. Broad Street P.O. Box 10249 Richmond, VA 23219 Richmond, VA 23240		13. Type of Report and Period Covered Final 2004 -2006	
		14. Sponsoring Agency Code	
15. Supplementary Notes			
<p>16. Abstract</p> <p>In 2003, the Virginia Department of Transportation developed a list of alternative transportation funding sources available to localities in Virginia. Alternative funding sources are defined as those that are not included in the annual interstate, primary, secondary, and urban allocations available through VDOT's Six-Year Improvement Program. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, passed by the U.S. Congress in 2005, eliminated some of these programs and created new opportunities. Accordingly, the list of funding sources was updated based on information available as of December 2005.</p> <p>State and federal funding sources and programs, and their potential uses, are detailed in this report. In some cases, the program described does not provide money above the normal annual allocations but rather allows the allocations for the primary, secondary, or urban system to be used for bicycle and pedestrian projects, following the standard VDOT project development process, or road improvement projects that use a simplified design and construction process.</p>			
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FINAL REPORT
**ALTERNATIVE TRANSPORTATION FUNDING SOURCES AVAILABLE
TO VIRGINIA LOCALITIES**

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Virginia Transportation Research Council
(A partnership of the Virginia Department of Transportation
and the University of Virginia since 1948)

In Cooperation with the U.S. Department of Transportation
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ABSTRACT

In 2003, the Virginia Department of Transportation developed a list of alternative transportation funding sources available to localities in Virginia. Alternative funding sources are defined as those that are not included in the annual interstate, primary, secondary, and urban allocations available through VDOT's Six-Year Improvement Program. The Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users, passed by the U.S. Congress in 2005, eliminated some of these programs and created new opportunities. Accordingly, the list of funding sources was updated based on information available as of December 2005.

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INTRODUCTION

The traditional source of funds for transportation improvements in Virginia is the Virginia Six-Year Improvement Program, where projects are allocated by district and roadway system (interstate, primary, secondary, or urban). The *Code of Virginia* (the *Code*) prescribes or implies steps that must be taken by the 16-member Commonwealth Transportation Board (CTB) to ratify the Six-Year Improvement Program when it is submitted to them by the Virginia Department of Transportation (VDOT) (§ 33.1-23.1-3 of the *Code*). These steps include public hearings for projects involving the primary system, coordination with city governments for urban system projects, and approval by county boards of supervisors for secondary system projects. These projects, distributed by district, are generally listed in the first volume of the Six-Year Improvement Program.

Numerous alternative sources of funding are available in Virginia for transportation improvements. These alternatives are usually special programs with a unique emphasis, such as conservation, alternative modes, hazard elimination, and economic development. Generally, these funds are awarded on a competitive basis and have accompanying restrictions on their use.

PURPOSE AND SCOPE

The purpose of this report was to provide Virginia's localities with a convenient reference of the potential funding sources that can be used for transportation-related projects. This document describes state and federal programs and provides detailed information about local programs such as transportation districts and community development authorities. VDOT requires that a local/state project administration agreement be executed for any locally administered project partially or fully funded by programs managed by VDOT. More

information on these agreements, including necessary forms, can be found at <http://www.virginiadot.org/business/local-assistance-programs.asp>.

The information provided in this document was originally published in the report by Miller et al. entitled *Options for Improving the Coordination of Transportation and Land Use Planning in Virginia*.¹ The list was updated after the passage of the 2006 Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), which includes funding programs for local transportation projects. It is expected that some of the programs described herein will change as the Virginia General Assembly makes changes during its 2006 session. However, this document serves as a benchmark for documenting what was known about alternative funding sources as of December 2005.

METHODS

The federal and state funding programs were generally adequately documented on various government websites, which were found in some cases with an Internet search engine. The researchers examined this information and summarized it. In some cases, additional clarification was obtained through personal communication with the federal and state program administrative staff.

The *Code* is also published on the Internet; however, more information about the Virginia statutes, including case law, is available from commercial legal publishers. The information about a Virginia locality's authority to acquire transportation funds or improvement projects was found using the *Westlaw* online legal research tool.

The various funding alternatives identified were divided into six categories, according to the agency that administers them:

1. alternative use of highway allocations, administered by VDOT
2. programs administered by VDOT
3. programs administered by localities in Virginia
4. programs administered by the Department of Rail and Public Transportation (DRPT)
5. programs administered by the U.S. Department of Transportation
6. programs administered by the Virginia Department of Conservation and Recreation (VDCR).

RESULTS AND DISCUSSION

Localities seeking to take advantage of one or more of these sources should carefully consult the pertinent statute or program for detailed implementation procedures and restrictions. More information about many of the funding programs can be obtained by consulting the web links provided at the end of each section and the citations in the Reference section. The amount

of funds available for these programs and the details of the programs themselves may change with each new state legislative session or with each federal reauthorization.

Alternative Use of Highway Allocations, Administered by VDOT

A few transportation improvement opportunities under VDOT's purview are outside the interstate/primary/urban and secondary system projects outlined in the Six-Year Improvement Program, but some of the opportunities allow the alternative use of these allocations, rather than providing a net funding increase. These alternative sources include the following.

VDOT Bicycle and Pedestrian Accommodation Policy, for Using Secondary System Funds for Constructing Bicycle Facilities

In 2004, VDOT adopted a new bicycle policy that dramatically improved the availability for a county to use its secondary roads allocation to plan, design, and construct bicycle facilities. These facilities are no longer restricted to bicycle lanes on roads, and the locality is not required to have an adopted bicycle plan that includes the desired bicycle facility. Bicycle lanes, widened shoulders, or off-road bicycle trails can be constructed, and VDOT will assume some of the maintenance responsibilities. Bicycle and pedestrian facilities are planned, designed, and constructed similarly to roads.² Bicycle and pedestrian facilities may also be constructed with primary and urban system funds, in the same manner that primary highways and urban streets are constructed. More information can be found at <http://www.virginiadot.org/infoservice/bk-default.asp>.

Rural Addition Program for Upgrading Roads Not Maintained by the State for the Purposes of Adding Them to the State Secondary System

Privately maintained streets can be incorporated into the state system provided several eligibility criteria are met, such as being open to the public at all times, serving at least three occupied residences, having been in use prior to 1992, and including sufficient right of way for maintenance and safety purposes. However, in order to upgrade roads with secondary funds, the county subdivision ordinance must be approved by VDOT to ensure that future substandard roads may not be built in that county.³ A county may use up to 5 percent of their secondary road construction funds (termed *rural addition funds*) to upgrade the substandard private road for the purposes of incorporating it into the state system. (Residents may want relief from the expense of maintaining streets, such as some subdivision streets, privately.) More information can be found at <http://virginiadot.org/infoservice/faq-2ndaryroads.asp>.

Rural Rustic Roads Program

Although not a separate source of funds per se, the Rural Rustic Roads Program may be of interest to counties that want particular projects to go into the secondary portion of the Six-Year Improvement Program. The county has the option of designating a particular low-volume unpaved road with low-density development as a "rural rustic road" where the county agrees to limit growth along the road through zoning and planning.⁴ In addition to having between 50 and

500 vehicles per day, the road should be in the VDOT secondary system, be a priority in the Six-Year Improvement Program, and be designated as a Rural Rustic Road by resolution of the local governing body (in coordination with VDOT). In return, VDOT can pave the roadway with minimum additional improvements (thereby requiring only 30 feet of right of way) without adhering to the normal design standards.⁵ In short, the idea behind the program is that for certain low-volume, locally traveled roads, costs and impacts to the environment may be significantly reduced; the tradeoff is that some improvements that would be necessary for higher volume roads (or roads with higher density abutting them) are not made. For example, six pilot sites in Augusta County were paved for 10 percent of the cost that would have been incurred if those sites been constructed and engineered according to conventional standards. The pilot projects were also completed in 4 months rather than the typical 2 to 6 years.⁶ Cost savings are usually significant but vary based on actual road conditions. More information can be found at <http://www.virginiadot.org/business/local-assistance-programs.asp#Rural%20Rustic>.

Public-Private Transportation Act of 1995 (PPTA)

Although administered by VDOT, the PPTA allows private sector organizations to design, construct, build, and maintain transportation systems. Examples of projects being undertaken through the PPTA are construction of Route 28 HOT lanes in Northern Virginia, design work for one of the segments for Route 58, and the maintenance of portions of I-81. PPTA guidelines indicate that the project must be “one or a combination of the following: a road, bridge, tunnel, overpass, ferry, airport, mass transit facility, vehicle parking facility, port facility or similar commercial facility used for the transportation of persons or goods.”⁷ More information can be found at <http://www.virginiadot.org/business/resources/PPTAGuidelines.pdf>.

Funding Source Programs Administered by VDOT

Transportation Enhancement Funds

This program can provide funds for “sidewalks, bike lanes, and the conversion of abandoned railroad corridors into trails” as well as cultural enhancements, such as renovations of historic buildings or the establishment of “transportation museums and visitor centers.”⁸ Although this program has a federal funding source, its administration is the responsibility of VDOT. Grant applications are submitted annually by November 1st and require a 20 percent match from non-federal sources. Projects are initially scored and ranked by a scoring committee composed of staff from VDOT’s districts and central office, the DRPT, and the VDCR. Final selection of projects and funding is the responsibility of the CTB.⁸ Examples of successful projects are the boardwalk trails and pedestrian paths at the Jamestown Settlement; river walk and waterfront improvements in York County; restorations to a 100-year-old train station in Bristol; new sidewalks in Gloucester Courthouse Village; a new visitor center in Bedford; and the Blue Ridge Railway Trail, a rail-trail conversion in Amherst and Nelson counties.⁹ More information can be found at <http://www.virginiadot.org/projects/pr-enhancegrants.asp>.

Recreational Access Program

This program provides funds for recreational access roads or bikeways that make a “publicly developed recreational area or historic site” accessible, provided such a site is not private or federally maintained. The main purpose of the project is to make these recreational or historic sites accessible as opposed solely to creating a new transportation facility. Therefore, a loop trail in a park would not be eligible, but a bikeway funded under this program might connect an area having heavy bicycle traffic to a park that presently is not accessible to cyclists.¹⁰ This program is authorized under Section 33.1-223 of the *Code*. More information can be found at <http://www.virginiadot.org/business/local-assistance-access-programs.asp#Recreational%20Access>.

Industrial, Airport, and Rail Access Fund

Section 33.1-221 of the *Code* authorizes this program, which provides access to employment centers, publicly accessible airports, and rail facilities.¹¹ However, rail funding is administered by the DRPT, although these applications are funded from the same fund as industrial and airport grant applications (B. Dandridge, personal communication, December 19, 2005). This access may entail providing improvements to an existing facility or providing a new facility, although in both cases the emphasis is on providing access to a new or an expanding industrial site. Access funds may be used only for engineering and construction, not for right-of-way acquisition, utility relocation, or environmental permitting. For road access projects, each locality is limited to \$300,000 per year unless the town, city, or county provides matching funds; under that scenario, VDOT can provide up to an additional \$150,000 provided the amount is matched by the city, county, or town. Airport access projects are subject to similar financial limits, with a maximum of \$450,000 (\$300,000 unmatched and \$150,000 matched) awarded to an individual airport per year.¹² More information can be found at <http://www.virginiadot.org/business/local-assistance-access-programs.asp#Industrial%20Access>.

Route 58 Corridor Development Program

This program was established by the Virginia General Assembly in 1989, with the express purpose being to “enhance economic development potential” in southern Virginia.¹³ The projects all involve Route 58, which stretches from Virginia Beach to Lee County. More information can be found at <http://www.virginiadot.org/projects/Rt58-overview.asp>.

Highway Safety Improvement Program (HSIP)

Formerly referred to as the Hazard Elimination and Safety (HES) program, SAFETEA-LU includes funds for projects that eliminate roadside hazards and reduce risk at highway rail grade crossings. VDOT’s Traffic Engineering Division manages the HSIP and accepts applications from localities, rail companies, and VDOT districts and residencies, which are prioritized on a statewide basis. The federal program stipulates a 10 percent funding match from the applicant, be it a state or locality.¹⁴ In addition, the HSIP includes a set-aside for highway-railroad crossing safety projects and high-risk rural roads. An example project is the installation of a new traffic signal in Halifax County, at the intersection of U.S. 501 and Halifax Shopping

Center, where studies had shown such a signal was needed.¹⁵ More information and project applications can be found at <http://www.virginiadot.org/business/trafficeng-default.asp>.

Safe Routes to School

Safe Routes to School is an international movement with the goal of making it safer and easier for children to walk or cycle from home to school, rather than ride in buses or cars.¹⁶ Each state must appoint a safe routes to school coordinator, and 10 to 30 percent of the state's SAFETEA-LU authorization must be spent on the program.¹⁷ Eligible projects include infrastructure improvements such as sidewalks, bike lanes, traffic calming, and public involvement, such as education and outreach. The VDOT safe routes to school coordinator works in the VDOT's Transportation & Mobility Planning Division (TMPD), and the contact information for the district coordinators is posted on <http://www.virginiadot.org/infoservice/bk-directory.asp#VDOT>.

Special Transportation Districts Created by State Law

Virginia allows for the creation of local transportation improvement districts in a single city or county or in two or more contiguous cities or counties (§§ 33.1-409 and 33.1-410 of the *Code*). For example, in 1987, the Virginia General Assembly formed the Route 28 Transportation District 2, in which \$138.5 million was authorized to improve Route 28. Restrictions were that 51 percent of landowners (whose land was zoned commercial or industrial) must support the tax district, with a maximum of \$0.20 per \$100 of assessed value.¹⁸

Revenue Sharing Program

Section 33.1-75.1 of the *Code* authorizes this program, which establishes a 50/50 cost sharing program with counties for the maintenance, improvement, construction, or reconstruction of the primary or secondary road system. The *Code* establishes this as a \$20 million program (\$10 million state funds/\$10 million local funds); however, the annual appropriations act has provided for a \$30 million program since 1999. If requests exceed the amount of funding available, actual allocations are prorated.

Initially, the program was open only to counties, with a maximum allocation of \$500,000 per county; however, the 2005 Appropriations Act provided an expansion for FY 2006 for the program to include cities and towns in the urban system. The funding limit was also increased to \$50 million in state funds (to be matched with \$50 million in local funds), with a maximum allocation of \$1 million of state funds per eligible locality.¹⁹

This program enables localities to contribute matching funds for the following purposes:

1. finance a deficit on a completed project
2. supplement funding on a construction project
3. supplement funding for future projects in the six-year improvement program
4. construct or improve a road not in the six-year improvement program
5. improve subdivision streets to attain state street standards

6. Supplement VDOT maintenance (e.g., guardrail replacement).²⁰

More information can be found at <http://www.virginiadot.org/business/resources/localassistance-revenuesharingguide.pdf>.

Congestion Mitigation and Air Quality (CMAQ) Improvement Program

This program seeks to improve air quality and is restricted to projects that are expected to reduce transportation-related emissions in areas that do not meet National Ambient Air Quality Standards.²¹ As of 2004, these areas formally included Richmond, Northern Virginia, Hampton Roads, Fredericksburg, Roanoke, and Winchester.²² CMAQ projects are diverse and include, but are not limited to, (1) encouraging motorists to use alternative forms of transportation (e.g., transit improvements such as new express bus service or bicycle/pedestrian improvements), (2) encouraging motorists to share existing vehicles (e.g., carsharing programs or guaranteed ride home programs), (3) improving traffic flow for motorists (e.g., traffic operations centers to disseminate information or the synchronization of traffic signals), and (4) encouraging vehicle emissions reduction measures, such as inspection and maintenance programs. Virginia projects funded under CMAQ have included rehabilitation and expansion of bus shelters, bike lanes, turning lanes, guaranteed ride home programs, bicycle racks, employer-sponsored ridesharing, and access improvements to commuter rail.²³ More information can be obtained by contacting the VDOT district planner for the locality and is posted on <http://www.fhwa.dot.gov/environment/cmaqpgs/>.

Transportation Partnership Opportunity Fund

This fund was created by the 2005 General Assembly, which amended the *Code* by adding Section 33.1-221.1:9. Funds are credited to the Transportation Partnership Opportunity Fund by the general appropriations act and revenue from other sources, both public and private. The fund allows the Governor to use these funds to encourage the use of the design-build provisions of Section 33.1-12(2)(b), to encourage the use of the PPTA, and to make transportation improvements that will support economic development. The Governor may award money from the fund as grants, interest-free loans, or other financial arrangements to cities, counties, and the private sector. The funds may be used for roads, rail, and mass transportation and are administered by the CTB after the award.²⁴ More information can be found at <http://www.virginiadot.org/projects/tpof.asp>.

Rural Transportation Planning Assistance Program

In 1993, VDOT initiated the state's first rural transportation planning program through the Transportation Planning Division (now the TMPD). The total amount of SPR funds allocated to the PDCs is \$48,000. When matched with \$12,000 in local funds, this provides a total of \$60,000. Through this program, the TMPD provides funding and guidance to rural planning district commissions (PDCs) in accomplishing rural planning tasks requested by the localities. Annually, the TMPD receives reviews, amends them as needed, and approves the scope of work for each fiscal year. The PDCs perform transportation planning work and submit quarterly billings, quarterly reports, and the end products to the TMPD.²⁵ More information on

these programs can be obtained by contacting the VDOT Regional Planning Manager using the contact information listed at <http://www.virginiadot.org/business/tpd-phone.asp>

Rural Transportation Planning Grant Program

VDOT and the TMPD initiated the Rural Transportation Planning (RTP) Program in 1997 to supplement the RTP Assistance Program. It provides additional funding through a competitive grant program for worthwhile rural transportation planning proposals. VDOT and the TMPD have set aside a minimum of \$200,000 per fiscal year for this competitive program. A minimum of 20 percent of the total grant is to be funded by the PDC through a local match, with administrative charges not exceeding 10 percent of the total cost. Proposals are intended to benefit jurisdictions within a PDC and to develop innovated studies and approaches for use by other jurisdictions in the state.²⁵ More information on these programs can be obtained by contacting the VDOT Regional Planning Manager using the contact information listed at <http://www.virginiadot.org/business/tpd-phone.asp>.

Programs Administered by Localities

As pointed out by the Virginia Chapter of the American Planning Association, a county can acquire funds for transportation improvements through six general mechanisms:

1. local transportation districts
2. pro-rata reimbursement provisions in the subdivision ordinance
3. community development authorities
4. impact fees
5. proffers
6. local bonding authority.²⁶

None of these practices is a panacea, and all have limitations and possibly adverse consequences, but they are options in some situations.

Local Transportation Districts

Creation of Local Transportation Districts

Virginia allows for the creation of local transportation improvement districts in a single city or county or in two or more contiguous cities or counties. To create a district, the owners of at least 51 percent of either the land area or the assessed value of land, in each locality, that (1) is within the boundaries of the proposed district and (2) has been zoned for commercial or industrial use or is used for such purposes must petition the local governing body of each locality in which the proposed district is to be located (qualifying individuals taking part in this process are hereinafter referred to as “petitioners”). Once they have done so, the local governing body of each locality in which the proposed district is to be located may consider a resolution creating the district (§ 33.1-410 of the *Code*).

The District Advisory Board

Within 30 days after the establishment of a district, the local governing body from each locality within which any portion of the district is located must appoint six members to a district advisory board. Three of the six members from each locality must be chosen by the local governing body from nominations submitted to the local governing body by the petitioners. All members must own or represent commercially or industrially zoned land within the district. Each member must be appointed for a term of 4 years, except the initial appointment of board members must provide that the terms of three of the members shall be for 2 years. If a vacancy occurs with respect to a member initially appointed by a local governing body, or any successor of such a member, the local governing body must appoint a new member who is a representative or owner of commercially or industrially zoned property within the local district. If a vacancy occurs with respect to an advisory board member initially nominated by the petitioners, or any successor thereof, the remaining advisory board members initially nominated by the petitioners, or their successors, shall nominate a new member for selection by the local governing body (§ 33.1-413 of the *Code*).

The advisory board must present an annual report to the commission on the transportation needs of the district and on the activities of the board and must present special reports on transportation matters as requested by the commission or the local governing body of the locality concerning taxes to be levied pursuant to the provisions of Title 33.1, Chapter 13, of the *Code*.

Although board members serve without pay, the local governing body must provide the board with facilities for the holding of meetings, and the commission must appropriate funds needed to defray the reasonable expenses and fees of the board (not to exceed \$20,000 annually), including without limitation expenses and fees arising out of the preparation of the annual report. Such appropriations must be based on an annual budget submitted by the board, and approved by the Commission, and be sufficient to carry out its responsibilities. The board is required to elect a chair and a secretary and such other officers as it deems necessary (§ 33.1-413 of the *Code*).

The board is required to fix the time for holding regular meetings and must meet at least once every year. Special meetings of the advisory board must be called by the chair or by two members of the advisory board upon written request to the secretary of the advisory board. A majority of the members constitutes a quorum (§ 33.1-413 of the *Code*).

The Commission

A district, once created, is governed by a commission composed of (1) four members of the governing body of each locality in which the district is located, appointed by their respective local governing bodies, and (2) the chair of the CTB or his or her designee (§ 33.1-411 of the *Code*). The commission is required to elect one of its member's as chair and must, with the advice of the district advisory board, elect a secretary and a treasurer (though it may combine the offices into one position)). The majority of the commission members, not counting vacancies, constitutes a quorum, and a majority vote is necessary for any action taken by the commission).

Powers and Duties of the Commission

The powers and duties of the commission encompass the following (§ 33.1-414 of the *Code*):

1. Construct, reconstruct, alter, improve, expand, make loans, or otherwise provide financial assistance to, and operate transportation improvements in, the district for the use and benefit of the public.
2. Acquire by gift, purchase, lease, in-kind contribution to construction costs, or otherwise any transportation improvements in the district and sell, lease as lessor, transfer, or dispose of any part of any transportation improvements in such manner and upon such terms as the commission may determine to be in the best interests of the district. However, prior to disposing of any such property or interest therein, the commission shall conduct a public hearing with respect to such disposition. At the hearing, the residents and owner of property within the district shall have an opportunity to be heard. At least 10 days' notice of the time and place of such hearing shall be published in a newspaper of general circulation in the district, as prescribed by the commission. Such public hearing may be adjourned from time to time.
3. Negotiate and contract with any person with regard to any matter necessary and proper to provide any transportation improvements, including, but not limited to, the financing, acquisition, construction, reconstruction, alteration, improvement, expansion, or maintenance of any transportation improvements in the district.
4. Enter into a continuing service contract for a purpose authorized by Title 33.1, Chapter 13, of the *Code* and make payments of the proceeds received from the special taxes levied pursuant to the *Code* together with any other revenues, for installments due under that service contract. The district may apply such payments annually during the term of that service contract in an amount sufficient to make the installment payments due under that contract, subject to the limitation imposed by this chapter. However, payments for any such service contract must be conditioned upon the receipt of services pursuant to the contract. Such a contract must not obligate a locality to make payments for services of the district.
5. Accept the allocations, contributions, or funds of, or to reimburse from, any available source, including, but not limited to, any person for either the whole or any part of the costs, expenses, and charges incident to the acquisition, construction, reconstruction, maintenance, alteration, improvement, and expansion of any transportation improvements in the district.
6. Contract for the extension and use of any public mass transit system or highway into territory outside the district on such terms and conditions as the commission determines.

7. Employ and fix the compensation of personnel which may be deemed necessary for the construction, operation, or maintenance of any transportation improvements in the district.
8. Have prepared an annual audit of the district's financial obligations and revenues, and, upon review of such audit, request a tax rate adequate to provide tax revenues which, together with all other revenues, are required by the district to fulfill its annual obligations.

In addition, the district may contract with the CTB for the board to perform any of the purposes of the district, and it may agree by contract to pay all or a portion of the special improvements tax to the CTB (§ 33.1-416 of the *Code*). Prior to executing any such contract, the district must seek the agreement of each local governing body creating the district that the locality's officer charged with the responsibility for preparing the locality's annual budget shall submit in the budget for each fiscal year in which any Commonwealth of Virginia Transportation Contract Revenue Bonds issued for such district are outstanding all amounts to be paid to the CTB under such contract during such fiscal year (§ 33.1-416 of the *Code*).

Annual Special Improvements Tax

Upon the request of the commission and consent of the local governing bodies, each local government body may impose an annual special improvements tax on taxable real estate zoned for commercial or industrial use or used for such purposes and taxable leasehold interests in that portion of the improvement district within its jurisdiction (§ 33.1-415 of the *Code*). Absent the unanimous consent of the owners in the affected district, the annual special improvements tax enacted by the district's commission may not exceed \$0.20 per \$100 of the assessed fair market value of the taxable real property). However, in the case of counties with populations exceeding 500,000, the limit is increased to \$0.40 per \$100, (§ 33.1-435 of the *Code*) and in the special case of the City of Charlottesville and County of Albemarle, it is increased to \$0.25 per \$100 (§ 33.1-453 of the *Code*). Such special improvements taxes must be collected at the same time and in the same manner as the locality's taxes are collected, and the proceeds must be kept in a separate account (§ 33.1-415 of the *Code*). In addition, the effective date of the initial assessment must be January 1 of the year following adoption of the resolution creating the district). All revenues received by each locality pursuant to such taxes must be paid to or at the direction of the commission for its use pursuant to the provisions of Title 33.1, Chapter 13, of the *Code* (§ 33.1-415 of the *Code*).

Pro-Rata Reimbursement Provisions in Subdivision Ordinances

Every locality (through its governing body) is empowered and required to adopt an ordinance governing the subdivision and development of its land (§ 15.2-2240 of the *Code*). In addition, particular localities are empowered to enact provisions in their subdivision ordinances for payment by a subdivider or developer of land of a pro rata share of the cost of reasonable and necessary road improvements, located outside the property limits of the land owned or controlled by him or her but serving an area having related traffic needs to which his or her subdivision or

development will contribute, to reimburse an initial subdivider or developer who has advanced such costs or constructed such road improvements (§ 15.2-2242 of the *Code*).

The following localities are empowered to enact subdivision ordinances with a pro-rata reimbursement provision: a county having the urban county executive form of government, any city located within or adjacent thereto, or any county adjacent thereto or a town located within such county, any county with a population between 57,000 and 57,450, any county with a population between 60,000 and 63,000, and any city with a population between 140,000 and 160,000 (§ 15.2-2242 of the *Code*).

Mandatory Components of Pro-Rata Reimbursement Provisions

Any such provision must provide for the adoption of a pro-rata reimbursement plan to include reasonable standards to identify the area having related traffic needs, to determine the total estimated or actual cost of road improvements required to serve the area adequately when fully developed in accordance with the comprehensive plan or as required by proffered conditions, and to determine the proportionate share of such costs to be reimbursed by each subsequent subdivider or developer within the area, with interest at the legal rate or at an inflation rate prescribed by a generally accepted index of road construction costs, whichever is less (§ 15.2-2242 of the *Code*).

In addition, any such provision must specify that such costs are to be collected at the time of the issuance of a temporary or final certificate of occupancy or functional use and occupancy within the development, whichever comes first (§ 15.2-2242 of the *Code*). .

Optional Components of Pro-Rata Reimbursement Provisions

The subdivision ordinance may provide that no certificate of occupancy may be issued to a subsequent developer or subdivider until (1) the initial developer certifies to the locality that the subsequent developer has made the required reimbursement directly to him as provided above or (2) the subsequent developer has deposited the reimbursement amount with the locality for transfer forthwith to the initial developer (§ 15.2-2242 of the *Code*).

The ordinance may provide that the required reimbursement may be paid (1) in lump sum; (2) by agreement of the parties on installment at a reasonable rate of interest or rate of inflation, whichever is less, for a fixed number of years; or (3) on such terms as otherwise agreed to by the initial and subsequent subdividers and developers (§ 15.2-2242 of the *Code*).

Community Development Authorities

Community development authorities (CDAs), formed under Article 6 of the Virginia Water and Waste Authority Act (§ 15.2-5100 of the *Code*), constitute an additional source of transportation funding mechanism available to localities.

Creation of CDAs

Localities such as cities, towns, and counties may consider petitions for the creation of CDAs, defined as “a public body politic and corporate and political subdivision of the Commonwealth.” (§ 15.2-5152 of the *Code*) Cities have this power automatically under the *Code*, as do counties with a population of at least 75,000 and/or through which an interstate highway passes. Towns (as well as counties that do not meet the criteria just listed) may elect to assume this power by ordinance adopted following a public hearing (§ 15.2-5152 of the *Code*).

Petitions for the creation of a CDA may be submitted to a locality by the owners of at least 51 percent of the land area or assessed value of a given tract. (The criteria under which a given tract of land qualifies are different for cities, towns, and counties and are governed by code (§ 15.2-5153 of the *Code*.) Such petitions must, among other things: (1) set forth the name and describe the boundaries of the proposed district; (2) describe the services and facilities proposed to be undertaken by the CDA within the district; (3) describe a proposed plan for providing and financing such services and facilities within the district; and (4) describe the benefits that can be expected from the provision of such services and facilities by the CDA (§ 15.2-5154 of the *Code*). A resolution creating a CDA cannot be approved until a public hearing (with proper notice) has been held by the local governing body (§ 15.2-5156 of the *Code*).

If the district for which a CDA is proposed overlaps with two or more localities, the CDA may be formed by concurrent ordinances of each locality, and such localities may contract with each other for the administration of the CDA (§ 15.2-5155 of the *Code*).

Powers of CDAs

CDAs have numerous powers (§ 15.2-5110 of the *Code*). Most relevant here are their powers to “finance, fund, plan, establish, acquire, construct or reconstruct, enlarge, extend, equip, operate, and maintain” the infrastructure improvements described in the resolution which established the district, as necessary to meet the increased demands placed upon the locality as a result of development within the district (§ 15.2-5158 of the *Code*). Such infrastructures may include “roads, bridges, parking facilities, curbs, gutters, sidewalks, traffic signals, storm water management and retention systems, gas and electric lines and street lights.”

Funding Available to CDAs

The *Code* outlines three mechanisms available to community development authorities for raising funds to finance its activities (including the infrastructure improvements described above): revenue bonds, special taxes, and special assessments on abutting properties.

1. *Revenue bonds.* A CDA has the power to issue revenue bonds. They are payable solely from the revenues received by the CDA and do not constitute a debt, liability, or obligation of any political subdivision other than the CDA. Consent of the locality is typically not required for the bonds issued by a CDA (unless such consent is specifically required by the authorizing resolution) (§§ 15.2-5158 and 15.2-5125 of the *Code*).

2. *Special taxes.* A CDA can request annually that the locality levy and collect a special tax on taxable real property within the CDA's jurisdiction. Unless requested by every property owner within the proposed district, the rate of the special tax can not exceed \$0.25 per \$100 of the properties' assessed fair market value. The special taxes are collected at the same time and in same manner as are the locality's taxes but are held in a special account and paid over to the CDA subject to annual appropriation. Taxes collected under this provision can be used only for purposes within the enumerated powers of the CDA (§ 15.2-5158 of the *Code*).
3. *Special assessments on abutting properties.* If the CDA provides services and/or facilities to abutting properties, it can finance these by a special assessment on these properties. Such assessments are imposed by the locality at the request of the CDA. All revenues received by the locality pursuant to such special assessments will be paid over to the CDA subject to annual appropriation. Assessments collected under this provision may be used for no other purpose other than to finance the services and/or facilities to abutting properties; moreover, the assessments shall not exceed the full cost of the improvements (which can include the legal, financial, and other directly attributable costs of creating the district, as well as the planning, designing, operating, and financing of the improvements). Such special assessments may be made effective as a lien upon a specified date and can be made subject to installment payments and other provisions allowed for local assessments generally (§§ 15.2-5158 and 15.2-2404 of the *Code*).

Road Impact Fees for New Development

Road impact fees for new development are an option for counties with a population of 500,000 or more and adjacent localities, which in Virginia restricts such practices to Fairfax County and the Northern Virginia jurisdictions. These localities, however, are not using impact fees but instead are using proffers because proffers are easier to administer. (All counties, regardless of population, however, may use connection fees for water and sewer systems.) Impact fees cannot be accepted, however, unless the county has a capital improvement program as specified in Section 15.2-2321 of the *Code*.

Proffers

Proffers are monetary payments from developers to localities and can be delineated into two categories: fees for improvement (or cash proffers) and conditional zoning (or non-cash proffers).²⁶ With the first category, if a county has a population growth of at least 10 percent according to the 2000 census, it can accept fees for road improvements or other public facilities when the developer submits a rezoning request. For example, in 1990, Botetourt County had a population of 24,492 and by 2000 had grown to 30,496; since this figure exceeds 10 percent, the county had a high rate of growth and thus can accept cash proffers.^{27,28} The situation in Caroline County was similar: it grew from 19,217 in 1990 to 22,121 in 2000. Additional restrictions are placed on the cash proffer; e.g., a locality cannot accept such a proffer unless it has a conditional improvement program in place (§ 15.2-2404 of the *Code*). Conditional zoning is appropriate for improvements such as turn lanes, reconstruction or widening turn lanes, etc. (§ 15.2-2297 of the

Code). Localities should consult with VDOT to determine what road improvements will be required as a condition of the entrance permit (e.g., turn lanes, traffic signals, and widening) process. Since these improvements will be required by VDOT, the locality may be able to obtain different or additional improvements with conditional zoning proffers.

General Funds

Sections 33.1-75.1, 75.2, and 75.3 of the *Code* indicate that counties have the ability to use their own general funds to contribute to transportation improvements. Section 75.2 specifically points out that counties may make contributions to facilitate primary and secondary road construction, whereas Section 75.3 notes that counties may use these general funds for other activities related to the primary and secondary system, such as “curbs, gutters, drainage ways, sound barriers, sidewalks, and all other features or appurtenances conducive to the public safety and convenience” (§ 15.2-2404 of the *Code*).

Tax Increment Financing

Tax increment financing is an option for blighted areas. Under this plan, a jurisdiction sells bonds or receives loans and uses the revenue to make public improvements to an area, where such improvements may include “roads, water, sewer, safety services, parks, and schools.”²⁶ To the extent that the improvements increase property values and encourage development in the designated area, the increase in real estate taxes is used to pay back the interest and principal on the loan.²⁶

Local Bonding Authority

Section 33.1-75.3 of the *Code* also provides explicit bonding authority for counties to make such improvements; however, such bonds must be approved by voters (T. Blazer, personal communication, August 20, 2003). The Transportation Coordinating Council points out that the Prince William County Parkway was funded partly from local bond sales.²⁹

Coal and Gas Severance Tax

Section 58.1-3713 of the *Code* authorizes local governments to tax businesses that extract coal or gas from the ground and to use a portion of the revenue from this tax to improve roads. The distribution of this money is controlled by a local Coal and Gas Road Improvement Advisory Committee. This committee is made up of four members: a member from the local governing body (board of supervisors), the VDOT residency administrator, and two citizens of the locality connected with the coal or gas industry. Each locality’s committee prepares an annual plan for use of the fund, a copy of which should be sent to VDOT.

Local Gas Tax

It is highly probable that counties do not have the authority to impose a local gasoline tax without enabling legislation. The phrase “highly probable” is used because Section 15.2-1104 of the *Code* does, in fact, permit municipal corporations to raise funds in manners not prohibited by

law. However, the *Code* also has special legislation pertaining to the Northern Virginia and the Potomac Rappahannock District in Section 58.1-1720. This legislation states that a 2 percent sales tax on fuels for transportation improvements is permissible for areas that meet one of two criteria: (1) an area where “a rapid heavy rail and bus commuter mass transportation system is owned, operated, and or controlled by an agency or commission” where such an entity is a transportation district, or (2) the area is “contiguous to the Northern Virginia Transportation District” (including that district, as denoted in § 15.2-4515) (§ 15.2-2404 of the *Code*).³⁰ The fact that this legislation exists in the *Code* suggests that despite Section 15.2-1104, localities do not have this power to exercise a local gasoline tax unless such a power is explicitly granted by the Virginia General Assembly, as it has been for the Northern Virginia area.

Programs Administered by the Department of Rail and Public Transportation

Industrial Access Railroad Tracks Program

The DRPT administers the Industrial Access Railroad Tracks Program, which “fosters rail development for new or expanding industries.”^{31,32} As is the case with the roadway portion of the Industrial, Airport, and Rail Access Program, the program is authorized by Section 33.1-221 of the *Code*.³² Eligible work under the program includes track construction, reconstruction, improvement, engineering, environmental mitigation, and grading or drainage at the site.³² (Funding limitations are the same as with the Industrial, Airport, and Rail Access Program: each project is limited to \$300,000 unless the town, city, or county provides matching funds; under that scenario, VDOT can provide up to an additional \$150,000 provided the amount is matched by the city, county, or town.³²) Grant application and other additional information can be found at <http://www.drpt.state.va.us/downloads/default.aspx>.

Rail Enhancement Fund

This program is authorized by Section 33.1-221.1:1.1 of the *Code* and can be used by the director of the DRPT for “acquiring, leasing, and/or improving railways or railroad equipment, rolling stock, rights-of-way or facilities, or assisting other appropriate entities to acquire, lease, or improve railways or railroad equipment, rolling stock, rights-of-way or facilities, for freight and/or passenger rail transportation purposes.” The CTB must determine that improvements will result in a public good of higher value than the investment. This program also requires a 30 percent cash or in-kind match from a private source or local government (§ 33.1-221.1:1.1 of the *Code*). More information is available at <http://www.drpt.virginia.gov/news/details.aspx?id=22>.

Programs Administered by the U.S. Department of Transportation

The Federal Highway Administration (FHWA) has several programs available for transportation improvements under federal surface transportation legislation. These programs illustrate some of the different funding mechanisms for transportation improvements eligible for federal funds.³³ The programs differ in eligibility, scope, and funding availability: e.g., for 2003, the scenic byways program was limited to \$25 million for all projects nationally, whereas the

enhancement program had \$18.5 million available for Virginia projects alone⁸ (B. Terrell, personal communication, July 2, 2003). Complete documentation for each program is available from websites maintained by VDOT and/or FHWA.

Transportation and Community System Preservation Program (TCSP)

The TCSP is a “comprehensive program to assist in planning, developing, and implementing strategies to integrate transportation, community, and system preservation plans and practices” available under Section 1117 of SAFETEA-LU. The grants require a 20 percent non-federal match. Planning studies and projects that improve transportation efficiency, environmental impacts, and accessibility are eligible.³⁴ The 2002 Virginia awards show that most projects have a strong environmental component; recipients included implementing a park and ride facility, developing a master plan for Route 17 that included “environmental conservation,” extending a trail system, and purchasing easements for the purposes of watershed preservation.³⁵ Eligibility under this program is not restricted to states; metropolitan planning organizations (MPOs) and local governments are also able to compete for these grants. More information can be found at <http://www.fhwa.dot.gov/tcsp/>.

Scenic Byways Program

This program provides funds for “eligible scenic byway projects along All-American Roads or designated scenic byways and for the planning, design, and development of State scenic byway programs,” where such programs might include scenic roads or bicycle or pedestrian trails.³⁶ SAFETEA-LU authorizes \$175 million, significantly more than the \$25 million in the Transportation Equity Act of the 21st Century (TEA-21). In order for a project to be eligible, it must be an existing byway or scenic road, although passing lanes are no longer acceptable uses.³⁷ Successful Virginia projects have included a scenic overlook in Bath County, constructing the Virginia Capital Trail bikeway between Williamsburg and Richmond, revising current VDOT scenic byways maps, and improvements to the bridge entrance at Montpelier. This program will also fund development of Corridor Management Plans which assist in preserving the scenic, cultural and historical qualities of the byway. More information can be found at <http://www.fhwa.dot.gov/safetealu/factsheets/scenic.htm>.

Public Lands Highways Program

This program consists of two types of funds: (1) public lands discretionary funds and (2) forest highway funds (S. Eagle, personal communication, September 5, 2003). The purpose of the public lands discretionary funds is to “improve access to and within the Federal lands of the nation.”³⁸ Examples of improved access are planning for recreational travel, acquiring easements, and providing physical amenities such as visitor centers, rest areas, vehicle parking, and “interpretative signage.”³⁸ Successful Virginia projects have included intersection improvements at Route 29 and State Route 234 providing safer vehicular and pedestrian access to and within the Manassas National Battlefield Park in Prince William County; the construction of buildings, parking lots, pedestrian and bicycle trails, and access roads to support access to an educational center at the Chincoteague National Wildlife Refuge; and improvements to Route 600 in Smyth County to support the Jefferson National Forest.³⁹

The purpose of the forest highway program is to enhance access to and within national forests by improving forest highways.⁴⁰ Forest highways are public roads owned by state or local agencies that serve the national forest system and are designated as such by FHWA's Federal Lands Highway Division. Successful Virginia projects have included improvements to Route 600 in Smyth County and improvements to Route 614 in Highland County, both to support the Jefferson National Forest (S. Eagle, personal communication, September 5, 2003). More information is available at <http://www.fhwa.dot.gov/flh/>.

Value Pricing

FHWA defines value pricing as “congestion pricing or peak-period pricing [that] entails fees or tolls for road use which vary by level of congestion.”⁴¹ SAFETEA-LU authorizes approximately \$12 million per year until 2009 for peak period pricing and high-occupancy toll (HOT) pilot projects. Up to 15 states may establish pilot programs; and Virginia is currently using the PPTA to implement a 2003 TEA-21 grant. Value pricing projects from other states include feasibility studies and implementation of HOT lanes, variable pricing of heavy vehicles, and parking cash-out practices.⁴¹ More information can be found at <http://www.fhwa.dot.gov/policy/otps/valuepricing.htm>.

Appalachian Regional Commission

The Appalachian Regional Commission (ARC) is a federal and state partnership devoted to economic development, community infrastructure, and a reduction in the region's isolation from the rest of the United States and world. Since 1965, the ARC has been working on the Appalachian Development Highway System, which is intended to provide safe and efficient transportation infrastructure for a region that generally lacks interstate highway corridors. At the time of this writing, approximately 85 percent of the planned highway system had been completed or was under construction.⁴² The following Virginia localities are in the Appalachian region: Alleghany, Bath, Bland, Botetourt, Buchanan, Carroll, Craig, Dickenson, Floyd, Giles, Grayson, Highland, Lee, Montgomery, Pulaski, Rockbridge, Russell, Scott, Smyth, Tazewell, Washington, Wise/Norton, Wythe Bristol, Buena Vista, Covington, Galax, Lexington, Norton, and Radford. More information can be found at <http://www.arc.gov/index.do>.

Other Federal Programs

A variety of additional federal programs are available (not described here because of the highly detailed nature of these programs). For example, the Transportation Infrastructure Finance and Innovation Act allows loans or credit lines for major surface transportation projects (e.g., on the order of \$100 million or greater).⁴³

Program Administered by the Virginia Department of Conservation and Recreation (the Recreational Trails Program)

The Recreational Trails Program provides funds for developing and maintaining trails, which may serve “hiking, bicycling, in-line skating, equestrian use, cross-country skiing,

snowmobiling, off-road motorcycling, all-terrain vehicle riding, four-wheel driving [or] other off-road motorized vehicles”⁴⁴ A wide variety of uses is permitted under the program, such as purchasing easements, constructing new trails, restoring existing trails, and improving signage. FHWA also lists three prohibited uses: property condemnation, the construction of new trails for motorized use on national forest or Bureau of Land Management lands (unless consistent with management plans), and projects that entail permitting motorized use of trails that are currently off limits to motorized vehicles.⁴⁴ Virginia’s contact person for this program notes that successful projects have often involved trails within park systems, such as the W&OD trail in Northern Virginia, the “Creeper” Abingdon-Damascus trail, and the New River State Park Trail in Pulaski and Grayson counties (J. Cassidy, personal communication, July 2, 2003). More information is available at <http://www.dcr.virginia.gov/prr/trailfnd.htm>.

SUMMARY OF PROGRAMS

Table 1 summarizes the funding programs found in this study that are available to Virginia localities, in addition to the VDOT Six-Year Improvement Program and Secondary Six-Year program. Most of the sources are awarded on a competitive basis, and an award may be used for a single project. The table does not provide a complete list of potential funding sources but rather presents a number of sources and program types. Planning, local economic development, recreation, bicycle/pedestrian, and mega-projects all have various alternative funding methods available.

RECOMMENDATIONS

1. *Localities that wish to secure funding through the programs identified in this document should consider the links and reference list for additional information.* While this document may be helpful with brainstorming for both project type and funding source, it does not present all details, restrictions, and administrative difficulties for each funding source or program.
2. *Localities that wish to secure additional funding through these programs should explore opportunities for partnerships with public and private organizations.* Participation in several of the programs identified herein is strengthened by multi-entity involvement. For example, the establishment of a CDA requires coordination between the local government and affected commercial/industrial landowners.
3. *If localities view this document as helpful, then VTRC or VDOT should take steps to update the information it contains periodically.* The funds available for each program or the details of the programs themselves may change with each new state legislative session or each new federal reauthorization.

Table 1. Summary of Funding Sources and Programs

Alternative Use of Highway Allocations, Administered by VDOT	
Bicycle and Pedestrian Accommodation Policy	Allows bike lanes to be built with funds otherwise used for road construction (not additional fund source)
Rural Addition Program	Used to upgrade substandard subdivision streets to state standards (not additional fund source)
Rural Rustic Roads Program	Flexible cost-effective alternative for paving unpaved roads (not additional fund source)
PPTA of 1995	Allows private sector to design, construct, and operate transportation systems, including toll facilities (other than TPOF funds, not additional fund source except what private sector offers)
Funding Source or Program Administered by VDOT	
Transportation Enhancement Funds	Used for bicycle/pedestrian facilities, historic preservation, and aesthetic improvements
Access Programs	Includes recreational, industrial, and airport access road funds to provide access to qualifying facilities
Route 58 Corridor Development Program	Used for enhancing economic development potential of corridor
Highway Safety Improvement Program (HSIP)	Used for improving highway safety
Safe Routes to School	Eligible projects include infrastructure improvements such as sidewalks, bike lanes, and traffic calming, and public involvement, such as education and outreach.
Special Transportation Districts	Regional entities created by state law
Revenue Sharing	Matching funds available to localities
Congestion Mitigation and Air Quality (CMAQ) Program	Used to reduce emissions and promote clean air, available only in MPO areas that do not meet EPA's National Ambient Air Quality Standards
Transportation Partnership Opportunity Fund	Grants that Governor can award to facilitate economic development and use of PPTA (see above)
Rural Transportation Planning Assistance Program	Provides funding and guidance to rural PDCs in accomplishing rural planning tasks requested by localities
Rural Transportation Planning Grants.	Provides funding through competitive grant program for worthwhile rural transportation planning proposals.
Programs Administered by Localities in Virginia	
Local transportation districts	Used for special taxing of land and funding transportation improvements.
Pro-Rata Reimbursement Provisions in Subdivision Ordinance	Provides for reimbursement of road improvement costs between initial and subsequent developer
Community Development Authorities	Additional transportation funding mechanism
Road Impact Fees	Fee that particular localities can charge developers
Proffers	Cash and improvements offered by developers to persuade acceptance of rezoning application
General Funds	Can be used for transportation, including contributions to VDOT for project or improvement
Tax Increment Financing	Used to enhance economic potential of blighted areas
Local Bonding Authority	Bonds have been used by some localities to construct roads
Coal and Gas Severance Tax	Local government taxes on extraction of gas and coal, used for road improvements
Local Gas Tax	Authorized for levy by some localities
Programs Administered by Department of Rail and Public Transportation	
Industrial Access Railroad Tracks	Similar to access programs administered by VDOT
Rail Enhancement Fund	Used for retention, maintenance, improvement, and development of railways
Programs administered by U.S. Department of Transportation	
Transportation and Community System Preservation Program	Used to assist with planning and implementation of transportation improvements with environmental and community benefits
Scenic Byways Program	Used to fund recognition, preservation, and improvement of designated scenic byways
Public Lands Highway Program	Used to provide and improve access to and within federal lands.
Appalachian Regional Commission	Federally funded local and state partnership for economic development and transportation network improvements in Appalachian regions
Programs administered by Virginia Department of Conservation and Recreation	
Recreational Trails Program	Used to develop and maintain trails for motorized and non-motorized recreation

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Appendix M

Bicycle Compatibility Index Worksheets

Route 629 (Douthat Road)

Data Entry											
Location	Geometric & Roadside Data					Traffic Operations Data					
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	No. of Lanes (one direction)	Lane Width (ft)	Lane Width (ft)	Paved Shoulder Width (ft)	Residential Development (y/n)	Speed Limit (mi/h)	85th %tile Speed (mi/h)	AADT	Large Truck % (HV)	Right Turn % (R)	Parking Lane (y/n)
Route 629	1	11	0	0	y	45	45	2500	2.00	0.00	n
Design Alternative A	1	11	0	1	y	45	45	2500	2.00	0.00	n
Design Alternative B	1	10	0	1	y	45	45	2500	2.00	0.00	n
Design Alternative C	1	10	0	2	y	45	45	2500	2.00	0.00	n
Design Alternative D	1	12	0	0	y	45	45	2500	2.00	0.00	n

Bicycle Compatibility Index and Level of Service Computations												
Location	BCI Model Variables										R	
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	BL	BLW	CLW	CLV	OLV	SPD	PKG	AREA	AF	BCI	Level of Service	
Route 629	0	0.0	11.0	138	0	45	0	1	0.5	4.08	D	
Design Alternative A	1	1.0	11.0	138	0	45	0	1	0.5	2.99	C	
Design Alternative B	1	1.0	10.0	138	0	45	0	1	0.5	3.15	C	
Design Alternative C	1	2.0	10.0	138	0	45	0	1	0.5	3.02	C	
Design Alternative D	0	0.0	12.0	138	0	45	0	1	0.5	3.93	D	

Route 60 (Grafton Road)

Data Entry											
Location	Geometric & Roadside Data					Traffic Operations Data					
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	No. of Lanes (one direction)	Lane Width (ft)	Lane Width (ft)	Paved Shoulder Width (ft)	Residential Development (y/n)	Speed Limit (mi/h)	85th %tile Speed (mi/h)	AADT	Large Truck % (HV)	Right Turn % (R)	Parking Lane (y/n)
US 60 (Grafton Road): I-64 to US 220	1	17	0	0	y	35	44	9100	12.00	5.00	n
Design Alternative A	1	13	4	0	y	35	44	9100	12.00	5.00	n
Design Alternative B	1	13	0	3	y	35	44	9100	12.00	5.00	n
Design Alternative C	1	14	0	3	y	35	44	9100	12.00	5.00	n
Design Alternative D	1	12	5	0	y	35	44	9100	12.00	5.00	n
Design Alternative E	1	15	0	2	y	35	44	9100	12.00	5.00	n

Bicycle Compatibility Index and Level of Service Computations											
Location	BCI Model Variables										R
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	BL	BLW	CLW	CLV	OLV	SPD	PKG	AREA	AF	BCI	Level of Service
US 60 (Grafton Road): I-64 to US 220	0	0.0	17.0	501	0	44	0	1	0.6	3.96	D
Design Alternative A	1	4.0	13.0	501	0	44	0	1	0.6	3.11	C
Design Alternative B	1	3.0	13.0	501	0	44	0	1	0.6	3.23	C
Design Alternative C	1	3.0	14.0	501	0	44	0	1	0.6	3.08	C
Design Alternative D	1	5.0	12.0	501	0	44	0	1	0.6	3.13	C
Design Alternative E	1	2.0	15.0	501	0	44	0	1	0.6	3.05	C

Route 1104 and Route 1101 (Winterberry Road)

Data Entry											
Location	Geometric & Roadside Data					Traffic Operations Data					
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	No. of Lanes (one direction)	Lane Width (ft)	Lane Width (ft)	Paved Shoulder Width (ft)	Residential Development (y/n)	Speed Limit (mi/h)	85th %tile Speed (mi/h)	AADT	Large Truck % (HV)	Right Turn % (R)	Parking Lane (y/n)
Route 1104 and Route 1101	1	11	0	0	y	45	45	2500	2.00	10.00	n
Design Alternative A	1	11	0	1	y	45	45	2500	2.00	10.00	n
Design Alternative B	1	10	0	1	y	45	45	2500	2.00	10.00	n
Design Alternative C	1	12	0	0	y	45	45	2500	2.00	10.00	n

Bicycle Compatibility Index and Level of Service Computations											
Location	BCI Model Variables									R	
Midblock Identifier (Route/Intersecting Streets, Segment Number, Link Number, Etc.)	BL	BLW	CLW	CLV	OLV	SPD	PKG	AREA	AF	BCI	Level of Service
Route 1104 and Route 1101	0	0.0	11.0	138	0	45	0	1	0.6	4.18	D
Design Alternative A	1	1.0	11.0	138	0	45	0	1	0.6	3.09	C
Design Alternative B	1	1.0	10.0	138	0	45	0	1	0.6	3.25	C
Design Alternative C	0	0.0	12.0	138	0	45	0	1	0.6	4.03	D

Appendix N

Virginia Bicycle Riding Laws

Virginia Bicycle Riding Laws (From Code of Virginia On-line)

§ 46.2-1015. Lights on bicycles, electric personal assistive mobility devices, electric power assisted bicycles, and mopeds.

Every bicycle, electric personal assistive mobility device, electric power-assisted bicycle, and moped when in use between sunset and sunrise shall be equipped with a white light on the front emitting a white light visible in clear weather from a distance of at least 500 feet to the front and a red reflector visible from a distance of at least 600 feet to the rear when directly in front of lawful lower beams of headlights on a motor vehicle. Such lights and reflector shall be of types approved by the Superintendent. In addition to the foregoing provisions of this section, a bicycle or its rider may be equipped with lights or reflectors. These lights may be steady burning or blinking.

§ 46.2-1066. Brakes.

Every motor vehicle when driven on a highway shall be equipped with brakes adequate to control the movements of and to stop and hold such vehicle. The brakes shall be maintained in good working order and shall conform to the provisions of this article. Every bicycle, electric power-assisted bicycle, and moped, when operated on a highway, shall be equipped with a brake that will enable the operator to make the braked wheels skid on dry, level, clean pavement. Every electric personal assistive mobility device, when operated on a highway, shall be equipped with a system that, when activated or engaged, will enable the operator to bring the device to a controlled stop.

§ 46.2-1078. Unlawful to operate motor vehicle, bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped while using earphones.

It shall be unlawful for any person to operate a motor vehicle, bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped on the highways in the Commonwealth while using earphones on or in both ears.

§ 46.2-1081. Slow-moving vehicle emblems.

The provisions of this section shall not apply to bicycles, electric power-assisted bicycles, or mopeds. Display of a slow-moving vehicle emblem on a bicycle, electric power-assisted bicycle, or moped shall not be deemed a violation of this section.

§ 46.2-800. Riding bicycles, electric personal assistive mobility devices, electric power assisted bicycles, or mopeds; riding or driving animals.

Every person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, moped, or an animal or driving an animal on a highway shall be subject to the provisions of this chapter and shall have all of the rights and duties applicable to the driver of a vehicle, unless the context of the provision clearly indicates otherwise.

§ 46.2-839. Passing bicycle, electric personal assistive mobility device, electric power assisted bicycle, moped, animal, or animal-drawn vehicle.

Any driver of any vehicle overtaking a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, moped, animal, or animal-drawn vehicle proceeding in the same direction shall pass at a reasonable speed at least two feet to the left of the overtaken bicycle, electric personal assistive mobility device, electric power-assisted bicycle, moped, animal, or animal-drawn vehicle and shall not again proceed to the right side of the highway until safely clear of such overtaken bicycle, electric personal assistive mobility device, electric power assisted bicycle, moped, animal, or animal-drawn vehicle.

§ 46.2-847. Left turns by bicycles, electric personal assistive mobility devices, electric power-assisted bicycles, and mopeds.

A person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped and intending to turn left shall either follow a course described in § 46.2-846 or make the turn as provided in this section. A person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped and intending to turn left shall approach the turn as close as practicable to the right curb or edge of the roadway. After proceeding across the intersecting roadway, the rider shall comply with traffic signs or signals and continue his turn as close as practicable to the right curb or edge of the roadway being entered. Notwithstanding the foregoing provisions of this section, the Commonwealth Transportation Board and local authorities, in their respective jurisdictions, may cause official traffic control devices to be placed at intersections to direct that a specific course be traveled by turning bicycles, electric personal assistive mobility devices, electric power-assisted bicycles, and mopeds. When such devices are so placed, no person shall turn a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped other than as directed by such devices.

§ 46.2-849. How signals given.

Signals required by § 46.2-848 shall be given by means of the hand and arm or by some mechanical or electrical device approved by the Superintendent, in the manner specified in this section. Whenever the signal is given by means of the hand and arm, the driver shall indicate his intention to start, stop, turn, or partly turn by extending the hand and arm beyond the left side of the vehicle in the manner following:

1. For left turn or to pull to the left, the arm shall be extended in a horizontal position straight from and level with the shoulder;
2. For right turn or to pull to the right, the arm shall be extended upward;
3. For slowing down or stopping, the arm shall be extended downward.

Wherever the lawful speed is more than 35 miles per hour, such signals shall be given continuously for a distance of at least 100 feet, and in all other cases at least 50 feet, before slowing down, stopping, turning, or partly turning.

A person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped shall signal his intention to stop or turn. Such signals, however, need not be given continuously if both hands are needed in the control or operation of the bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped. Notwithstanding the foregoing provisions of this section, a person operating a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped may signal a right turn or pull to the right by extending the right hand and arm in a horizontal position straight from and level with the shoulder beyond the right side of the bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped, and may signal slowing down or stopping by extending the right arm downward.

§ 46.2-856. Passing two vehicles abreast.

A person shall be guilty of reckless driving who passes or attempts to pass two other vehicles abreast, moving in the same direction, except on highways having separate roadways of three or more lanes for each direction of travel, or on designated one-way streets or highways. This section shall not apply, however, to a motor vehicle passing two other vehicles when one or both of such other vehicles is a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped; nor shall this section apply to a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped passing two other vehicles.

§ 46.2-857. Driving two abreast in a single lane.

A person shall be guilty of reckless driving who drives any motor vehicle, including any motorcycle, so as to be abreast of another vehicle in a lane designed for one vehicle, or drives any motor vehicle, including any motorcycle, so as to travel abreast of any other vehicle traveling in a lane designed for one vehicle. However, this section shall not apply to any validly authorized parade, motorcade, or motorcycle escort, nor shall it apply to a motor vehicle traveling in the same lane of traffic as a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped.

§ 46.2-903. Riding or driving vehicles other than bicycles, electric power-assisted bicycles, or electric personal assistive mobility devices on sidewalks.

No person shall ride or drive any vehicle other than (i) an emergency vehicle, as defined in § 46.2-920, (ii) a vehicle engaged in snow or ice removal and control operations, (iii) a wheel chair or wheel chair conveyance, whether self-propelled or otherwise, (iv) a bicycle, (v) an electric personal assistive mobility device, or (vi) an electric power-assisted bicycle on the sidewalks of any county, city, or town of the Commonwealth.

§ 46.2-904. Use of roller skates and skateboards on sidewalks and shared-use paths; operation of bicycles, electric power-assisted bicycles, and electric personal assistive mobility devices on sidewalks and crosswalks and shared-use paths; local ordinances.

The governing body of any county, city, or town may by ordinance prohibit the use of roller skates and skateboards and/or the riding of bicycles, electric personal assistive mobility devices, or electric power-assisted bicycles on designated sidewalks or crosswalks, including those of any church, school, recreational facility, or any business property open to the public where such activity is prohibited. Signs indicating such prohibition shall be conspicuously posted in general areas where use of roller skates and skateboards, and/or bicycle, electric personal assistive mobility devices or electric power-assisted bicycle riding is prohibited. A person riding a bicycle, electric personal assistive mobility device, or an electric power assisted bicycle on a sidewalk, shared-use path, or across a roadway on a crosswalk, shall yield the right-of-way to any pedestrian and shall give an audible signal before overtaking and passing any pedestrian. No person shall ride a bicycle, electric personal assistive mobility device, or an electric power assisted bicycle on a sidewalk, or across a roadway on a crosswalk, where such use of bicycles, electric personal assistive mobility devices, or electric power-assisted bicycles is prohibited by official traffic control devices. A person riding a bicycle, electric personal assistive mobility device, or an electric power assisted bicycle on a sidewalk, shared-use path, or across a roadway on a crosswalk, shall have all the rights and duties of a pedestrian under the same circumstances. A violation of any ordinance adopted pursuant to this section shall be punishable by a civil penalty of not more than \$50.

§ 46.2-905. Riding bicycles, electric personal assistive mobility devices, electric power assisted bicycles, and mopeds on roadways and bicycle paths.

Any person operating a bicycle, electric personal assistive mobility device, electric power assisted bicycle, or moped on a roadway at less than the normal speed of traffic at the time and place under conditions then existing shall ride as close as safely practicable to the right curb or edge of the roadway, except under any of the following circumstances:

1. When overtaking and passing another vehicle proceeding in the same direction;
2. When preparing for a left turn at an intersection or into a private road or driveway;
3. When reasonably necessary to avoid conditions including, but not limited to, fixed or moving objects, parked or moving vehicles, pedestrians, animals, surface hazards, or substandard width lanes that make it unsafe to continue along the right curb or edge;
4. When avoiding riding in a lane that must turn or diverge to the right; and
5. When riding upon a one-way road or highway, a person may also ride as near the left-hand curb or edge of such roadway as safely practicable.

For purposes of this section, a "substandard width lane" is a lane too narrow for a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped and another vehicle to pass safely side by side within the lane. Persons riding bicycles, electric personal assistive mobility devices, or electric power-assisted bicycles on a highway shall not ride more than two abreast. Persons riding two abreast shall not impede the normal and reasonable movement of traffic, shall move into a single file formation as quickly as is practicable when being overtaken from the rear by a faster moving vehicle, and, on a laned roadway, shall ride in a single lane. Notwithstanding any other provision of law to the contrary, the Department of Conservation and

Recreation shall permit the operation of electric personal assistive mobility devices on any bicycle path or trail designated by the Department for such use.

§ 46.2-906. Carrying articles or passengers on bicycles, electric personal assistive mobility devices, electric power-assisted bicycles, and mopeds.

No person operating a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped on a highway shall carry any package, bundle, or article that prevents the driver from keeping at least one hand on the handlebars. No bicycle shall be used to carry more persons at one time than the number of persons for which it was designed or is equipped, except that an adult rider may carry a child less than six years old if such child is securely attached to the bicycle in a seat or trailer designed for carrying children.

§ 46.2-906.1. Local ordinances may require riders of bicycles, electric personal assistive mobility devices, and electric power-assisted bicycles to wear helmets.

The governing body of any county, city or town may, by ordinance, provide that every person 14 years of age or younger shall wear a protective helmet that at least meets the Consumer Product Safety Commission standard whenever riding or being carried on a bicycle, an electric personal assistive mobility device, or an electric power-assisted bicycle on any highway as defined in § 46.2-100, sidewalk, or public bicycle path. Violation of any such ordinance shall be punishable by a fine of \$25. However, such fine shall be suspended (i) for first-time violators and (ii) for violators who, subsequent to the violation but prior to imposition of the fine, purchase helmets of the type required by the ordinance. Violation of any such ordinance shall not constitute negligence, or assumption of risk, be considered in mitigation of damages of whatever nature, be admissible in evidence, or be the subject of comment by counsel in any action for the recovery of damages arising out of the operation of any bicycle, electric personal assistive mobility device, or electric power-assisted bicycle, nor shall anything in this section change any existing law, rule, or procedure pertaining to any civil action.

§ 46.2-907. Overtaking and passing vehicles.

A person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped may overtake and pass another vehicle on either the left or right side, staying in the same lane as the overtaken vehicle, or changing to a different lane, or riding off the roadway as necessary to pass with safety. A person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped may overtake and pass another vehicle only under conditions that permit the movement to be made with safety. A person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or moped shall not travel between two lanes of traffic moving in the same direction, except where one lane is a separate turn lane or a mandatory turn lane. Except as otherwise provided in this section, a person riding a bicycle, electric personal assistive mobility device, electric power-assisted bicycle, or

moped shall comply with all rules applicable to the driver of a motor vehicle when overtaking and passing.

§ 46.2-908. Registration of bicycle, electric personal assistive mobility device, and electric power-assisted bicycle serial numbers.

Any person who owns a bicycle, electric personal assistive mobility device, or electric power assisted bicycle may register its serial number with the local law-enforcement agency of the political subdivision in which such person resides.

§ 46.2-932. Playing on highways; roller skates, skateboards, toys, or other devices on wheels or runners; persons riding bicycles, electric personal assistive mobility devices, electric power-assisted bicycles, mopeds, etc., not to attach to vehicles; exception.















No person shall play on a highway, other than on the sidewalks thereof, within a city or town or on any part of a highway outside the limits of a city or town designated by the Commonwealth Transportation Commissioner exclusively for vehicular travel. No person shall use roller skates, skateboards, toys, or other devices on wheels or runners, except bicycles, electric personal assistive mobility devices, electric power-assisted bicycles, mopeds, and motorcycles, on highways where play is prohibited. The governing bodies of counties, cities, and towns may designate areas on highways under their control where play is permitted and may impose reasonable restrictions on play on such highways. If the highways have only two traffic lanes, persons using such devices, except bicycles, electric personal assistive mobility devices, electric power-assisted bicycles, mopeds, and motorcycles, shall keep as near as safely practicable to the far right side or edge of the right traffic lane so that they will be proceeding in the same direction as other traffic. No person riding on any bicycle, electric personal assistive mobility device, electric power assisted bicycle, moped, roller skates, skateboards, toys, or other devices on wheels or runners, shall attach the same or himself to any vehicle on a roadway.

Source: BikeWalk Virginia

<http://bikewalkvirginia.org/resources/documents/VirginiaBicycleRules2004.pdf>

Appendix O
Bicycle Safety Tips

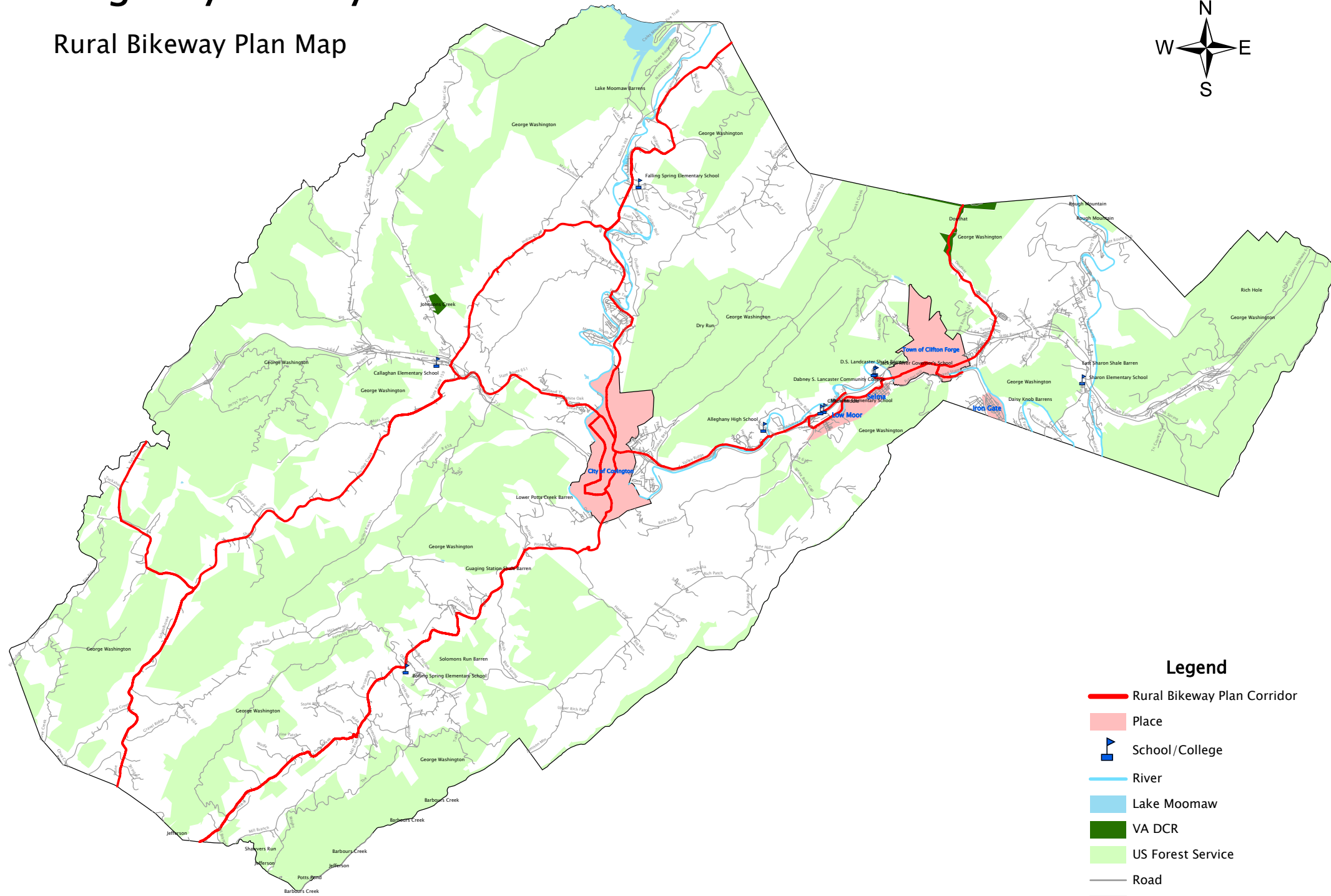
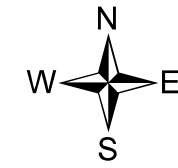
Bicycling Safety Tips

-  Learn and obey traffic laws. Bicycles are considered vehicles and bicyclists are expected to obey the same traffic laws and regulations that apply to motor vehicles operators (e.g., traffic signs, lights, signals, and markings).
-  Always ride with the flow or traffic. Never ride against the flow of traffic.
-  Use hand signals to indicate your intended action (e.g., right/left turn, slowing down or stopping).
-  Use a headlight and rear reflectors. Virginia law requires that a bicycle in use between sunset and sunrise shall be equipped with a white light on the front and a red reflector on the rear of the bicycle.
-  Make sure the bicycle is properly maintained and adjusted. Always check the brakes and other components before riding.
-  Be aware of your surroundings and ride defensively. Watch for road hazards and anticipate the actions of other road users.
-  Be visible. Bicyclist should wear clothing that maximizes visibility (reflective or bright colors) and be aware of motor vehicle blind spots.
-  Wear a properly fitted helmet. The majority of bicycle-related injuries are head injuries.
-  Plan your route prior to leaving home to select the most appropriate route
-  Be predictable. Ride in a straight line, avoid making sudden movements, and indicate your intended action by using hand signals.
-  Do not ride beyond your cycle abilities. Walk your bicycle when you get into traffic situations beyond your cycling abilities.
-  Park your bicycle so you do not block sidewalks, handicap and building accesses or emergency drives.
-  Lock your bicycle. Secure the frame, and both wheels if possible, to a stationary object using a sturdy lock.
-  Do not ride on sidewalks.

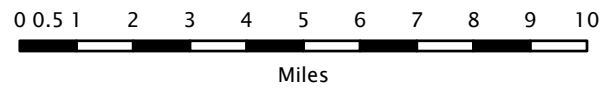
Appendix P
Locality Maps

Allegheny County

Rural Bikeway Plan Map

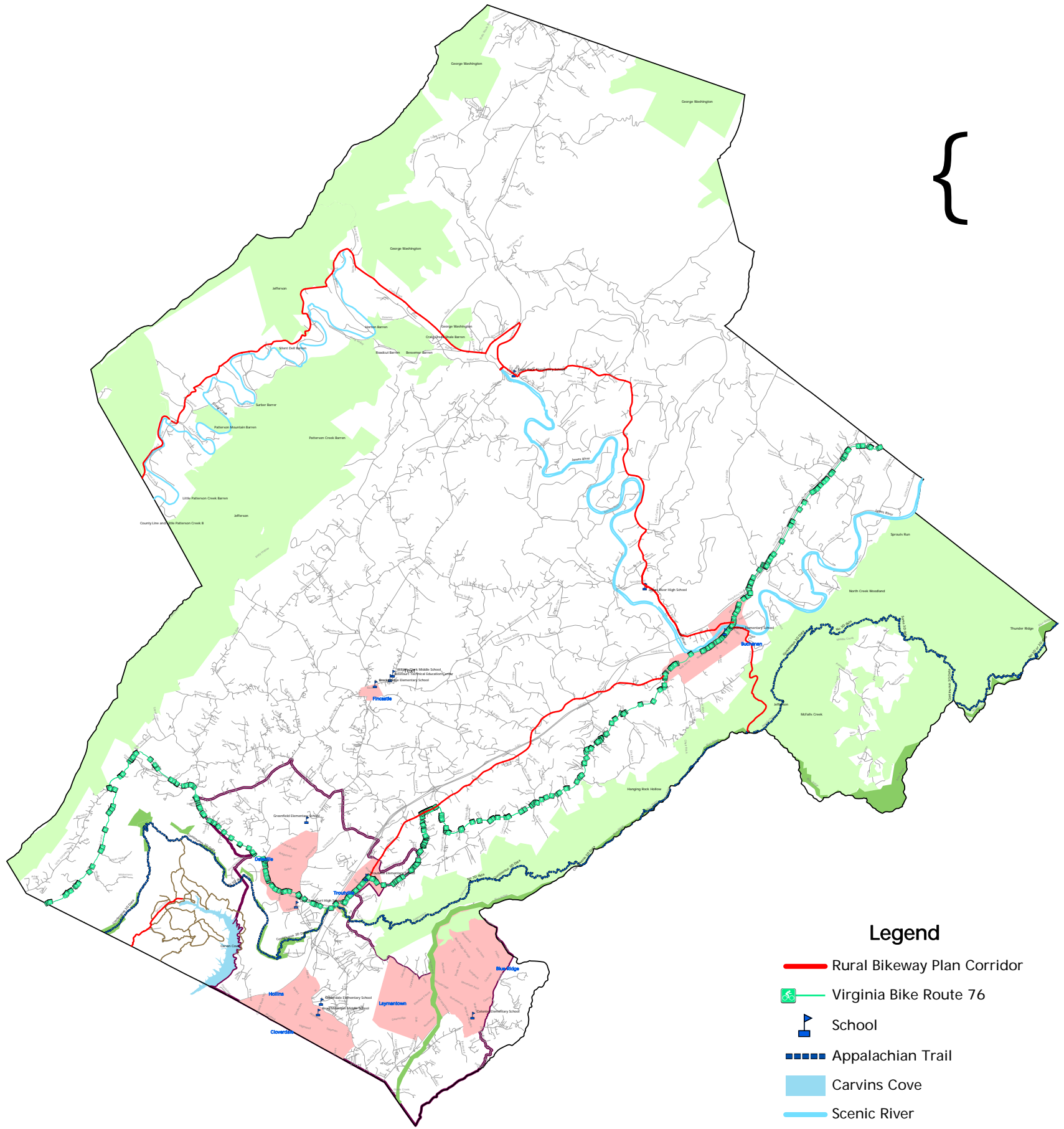


- Legend**
- Rural Bikeway Plan Corridor
 - Place
 - School/College
 - River
 - Lake Moomaw
 - VA DCR
 - US Forest Service
 - Road
 - Jurisdictional Boundary



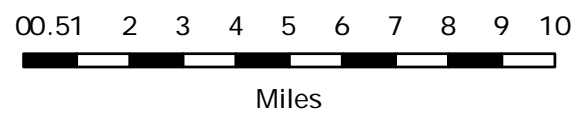
Botetourt County

Rural Bikeway Plan Map



Legend

- Rural Bikeway Plan Corridor
- - - Virginia Bike Route 76
- School
- - - Appalachian Trail
- Carvins Cove
- Scenic River
- National Park Service
- US Forest Service
- MPO Study Area Boundary
- Jurisdictional Boundary
- Place
- Road
- Carvins Cove Trails

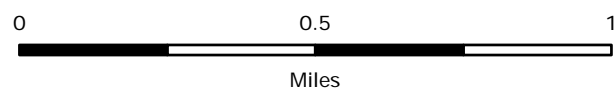
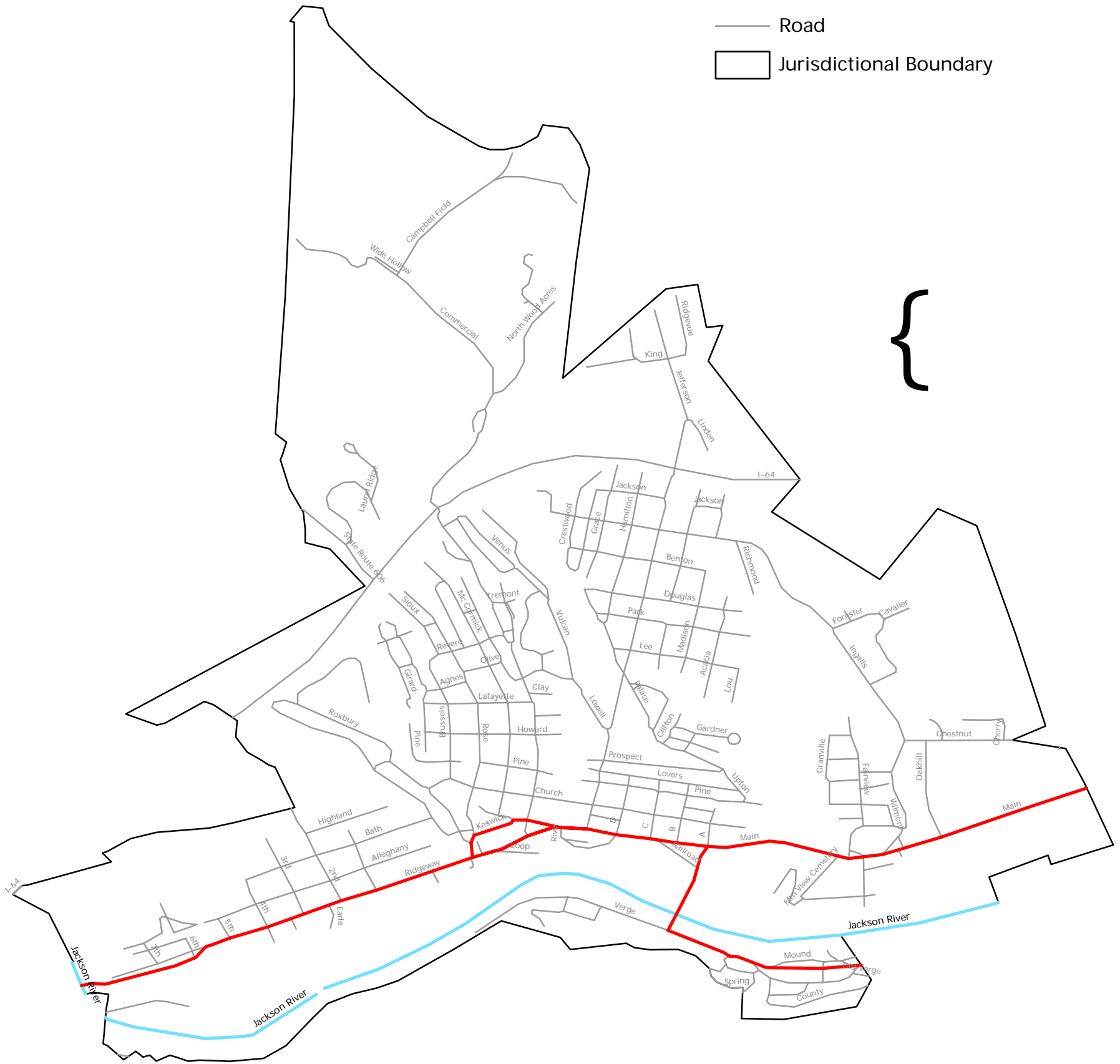


Town of Clifton Forge

Rural Bikeway Plan Map

Legend






- Rural Bikeway Plan Corridor
- Jackson River
- Road
- Jurisdictional Boundary

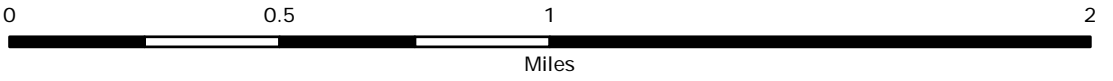
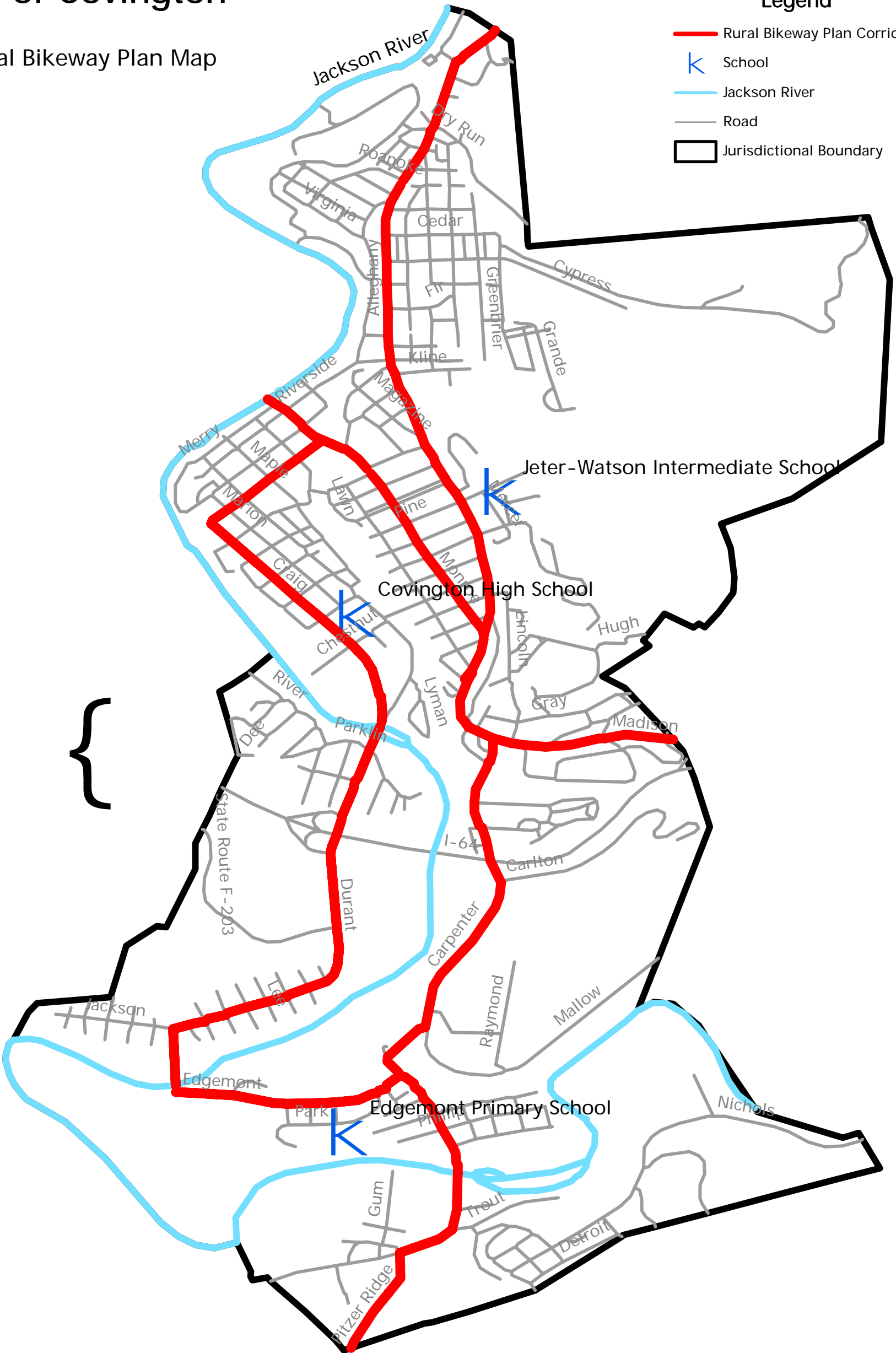


City of Covington

Rural Bikeway Plan Map

Legend









-  Rural Bikeway Plan Corridor
-  School
-  Jackson River
-  Road
-  Jurisdictional Boundary

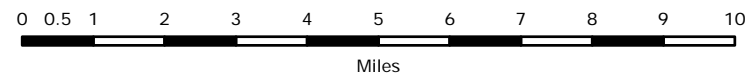
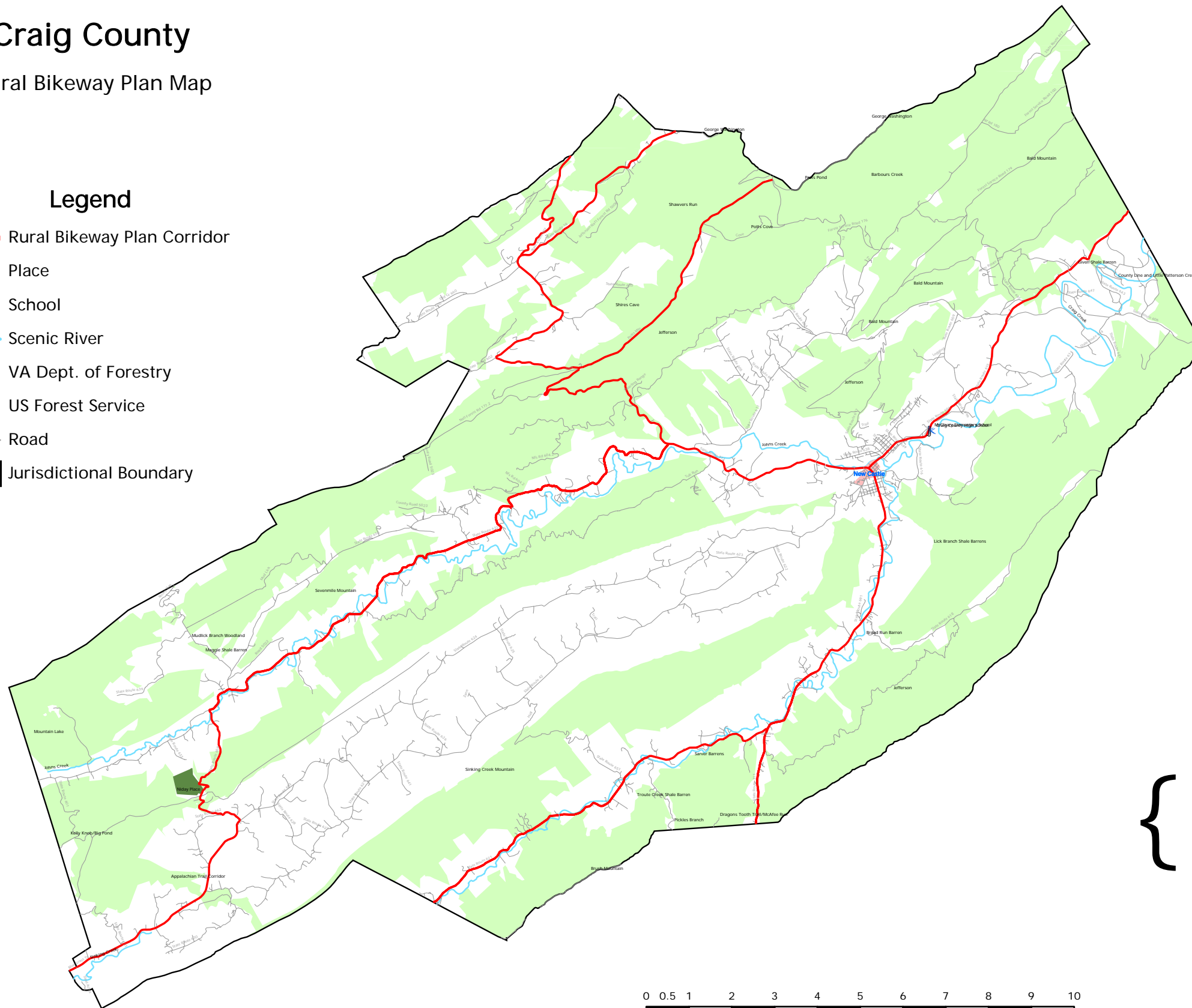


Craig County

Rural Bikeway Plan Map

Legend

-  Rural Bikeway Plan Corridor
-  Place
-  School
-  Scenic River
-  VA Dept. of Forestry
-  US Forest Service
-  Road
-  Jurisdictional Boundary



Roanoke County

Rural Bikeway Plan Map

Legend

- Rural Bikeway Plan Corridor
- Place
- School/College
- VA Bike Route 76
- MPO Bikeway Plan Corridor (Priority)
- MPO Bikeway Plan Corridor (Vision)
- Carvins Cove Trails
- Existing Greenway
- Existing Trail
- Appalachian Trail
- Roanoke River
- Carvins Cove
- Road
- VA DCR
- VA DGIF
- US Forest Service
- National Park Service
- MPO Study Area Boundary
- Jurisdictional Boundary

