

4 TRANSPORTATION

INTRODUCTION



A community's transportation system is comprised of more than just highways. Air transportation, rail facilities, bikeways, and sidewalks are all elements of an efficient transportation network. Together these elements allow for the efficient movement of people and goods. It is essential that communities continually plan for the construction and enhancement of these transportation elements. Doing so allows for the economic viability of communities to be retained and enhanced.

In addition, it is important to remember the strong reciprocal linkage between land use planning and transportation planning. Transportation planning decisions directly affect community growth patterns and may influence the availability and adequacy of public facilities.

Alternative development patterns, particularly those that promote compact development, can directly influence future transportation needs. For example, development density is a factor in determining which transit modes can be supported to potentially reduce vehicular trips in a community. Similarly, diversity of use – having a mix of different land use types in the same area or site – can reduce vehicle trips by increasing opportunities for walking and biking to nearby destinations. Broader elements of site and community design, such as greenways and increased street connections, also contribute to reduced vehicle travel, reduced congestion on main roads, and relate to the environmental and quality of life goals of the comprehensive plan.

This chapter establishes the framework for coordinating transportation with land use, economic development, the environment and other elements essential to developing a sustainable county plan.

BACKGROUND

Botetourt County's transportation infrastructure provides opportunities for future development and to attract and support economic development because it offers multiple options for moving people and goods. However, the County's ability to invest in necessary transportation improvements will continue to be a challenge over the lifetime of this plan. Developments along primary corridors and on the periphery of the County's developed area will strain existing infrastructure; VDOT funding is limited, and many of the roads in the County are not a priority for expansion or repair. Existing corridors, many of which are moderate-to-high traffic roadways with two to four lanes and no shoulders, cannot adequately handle forecasted travel demand at build-out. Botetourt County's traditional, low-density development pattern has resulted in an auto-dependent transportation pattern that if allowed to continue unchecked, will produce an unsustainable growth in travel demand.

Challenges

Road Network

Botetourt County has an efficient road network design. Interstate 81, U.S. Route 11, U.S. Route 220, and U.S. Route 460 provide excellent access and allow for the efficient movement of people and goods within and through the County. Maintaining and improving roads to keep pace with development as well as keeping roads operating at an acceptable level of service will be challenges the County will face during the timeframe of this plan. Map 12 (Botetourt County Transportation Map) shows the major components of the County's highway network within the region. Map 13 (2005 Level of Service), and Map 14 (2035 Level of Service) show the current and projected Levels of Service for the major corridors in Botetourt County. Levels of Services (LOS) are qualitative measures describing operating conditions of roadways and are given designations from A through F, with A representing the best operating conditions and F the worst. Level of Service C is the generally accepted minimum operating standard for rural primary roadways. Under LOS C conditions, a driver is able to maintain the set speed limit, stopping only for stop signs or signals. When proceeding through a stop sign or green light, the driver is able to return to the set speed limit without delay. A driver may occasionally slow down for cars entering the roadway from intersecting streets or driveways. However, the majority of the trip can be completed without impediment. Maintaining and improving roads to keep pace with development while keeping roads operating at an acceptable level of service will be challenges the County will face during the timeframe of this plan.

Primary Highways

The County's major primary highways, U.S. Route 220, Alternate U.S. Route 220/604, U.S. Route 11, and U.S. Route 460 are critical transportation corridors within the County. These corridors allow for the efficient movement of people and goods, and thus are critical to the County's economic health and quality of life.

These corridors are also gateways into Botetourt County and surrounding communities. Visitors' first impressions of the County are developed partly on the basis of how these corridors function, and how they look. Maintaining and enhancing traffic flow within these corridors is of critical importance to the County. Future development along these corridors should be designed to ensure that it does not impede or further restrict traffic flow, and where allowed by law, new development should be responsible for contributing a fair share toward improvement costs required to maintain or enhance the functionality of the corridor. Generally, future development along Botetourt County's primary highways should increasingly be a mixture of land uses conditioned upon the provision or existence of adequate public facilities, the preservation of highway capacity, and improvements to access control. Specific corridors are discussed below. For each, there is a brief description of the corridor, discussion of desired future corridor development patterns, and policy recommendations for future corridor development. The development recommendations contained in this section are more refined than those found on the Future Land Use Map, and can serve as a more specific and refined guide for decision making.

I-81 Interchanges

Five interchanges are located on Interstate 81 (I-81) within Botetourt County. These interchanges provide ease of access to/from I-81 and, to varying degrees, create opportunities for economic and residential development. The future development potential near each of these interchanges is highly dependent upon natural features such as soils and slope and upon other factors such as zoning, availability of water and sewer, and VDOT access policies.

Exit 150

Exit 150 is the primary interchange of concern in the community. This exit is in southern Botetourt County and is located at the convergence of I-81, U.S. Route 220 North, Alternate U.S. Route 220/604 and Route 11. The exit is the location of a considerable portion of the County's commercial economic base. Traffic congestion occurs daily at this interchange. The existing design, very intense commercial development, minimal access control and high volumes of traffic contribute to the congestion.

Planned improvements to I-81 through the Roanoke Valley will result in significant design changes at this interchange. A recently completed study of this interchange has resulted in a recommendation for operations mitigation, new roadway development, and the acquisition of land that presents new opportunities for Botetourt County to change one of its primary gateways and commercial hubs. As one of the main access points to the County, it will be critical to develop a clear vision for the future land development of the area. A new land use vision will minimize the negative traffic and aesthetic impact of inevitable, future land development.

Maintenance of Road Networks

Although Botetourt County has a well-maintained primary roadway network, secondary roadways are often only in fair condition which can put a strain on safety. The maintenance of acceptable levels of service (LOS) on roadways is essential to preserving and enhancing interregional mobility, increasing transportation efficiency, and coordinating transportation and land development.

Based on the most recent counts supplied by the Virginia Department of Transportation (VDOT) and level of service guidelines provided by the Planning District Commission (PDC), the existing roadway network in Botetourt County provides a generally good level of service for motor vehicle transport. There are, however, three roadway segments in the County that are operating at Level of Service D, where LOS C is considered to be the generally accepted minimum operating standard for rural primary roadways. These segments are U.S. Route 220 from north County line to Fincastle, Fincastle to Daleville Town Center, and Daleville Town Center to I-81 Exit 150. Although these segments are not operating at a failing level of service, minor increases in daily traffic would result in failures.

Transportation and Land Use Coordination

Like many growing counties, Botetourt is experiencing extensive low density suburban growth that has had a negative impact on the overall transportation system. Projects exclusively designed to address automobile congestion are not feasible solutions to the County's mounting congestion and long commutes. Roadway investments must be balanced with investments in other transportation modes, such as public transportation and greenways. In addition, within and surrounding small town nodes it is important to link development to sidewalks and greenways, as well as provide adequate connections to transit.

Public Transportation

Botetourt County is predominantly rural with residents living in small communities or isolated rural areas. The rural nature of the County increases the difficulty of providing adequate transportation alternatives for all residents. Because of the auto-dependant nature of the development pattern, there is an unmet need among elderly, disabled, or economically disadvantaged residents without access to personal vehicles for some mode of transport to medical facilities, jobs, shopping, and other locations. Although countywide public transportation services do not currently exist within Botetourt County, a shuttle bus service for some elderly residents and the senior center is in operation.

Access Management

Traffic congestion has steadily increased over the past five years along U.S. Route 220, south of Fincastle. This increase in congestion is directly related to the level of new development that has occurred, generating more and more automobile trips, some of which are considered local with short connections between destinations. The number of commercial entrances and intersections along U.S. Route 220 exacerbates the issue by creating many conflict points, which in turn cause delays in traffic flow. Designed as an arterial road, U.S. Route 220 was meant for mobility – moving people and goods from one destination to another as efficiently as possible – it was never meant to be a commercial corridor. Without improvements such as access management, mobility along the corridor will continue to deteriorate.

Transportation Analysis

Air Transportation

The Roanoke Regional Airport provides passenger and general aviation facilities for Botetourt County residents and businesses. The airport is located within ten minutes of the southern portions of the County. Currently, four major airlines (Allegiant Air, Delta, United Airlines and US Airways) provide passenger services. The airport is a key element of the County's transportation system and an important County economic development tool. The County's proximity to the airport, via I-81 and I-581 allows convenient access for business travel.

Rail Transportation

Portions of Botetourt County and the Town of Buchanan are served by two railroads: Norfolk Southern and CSX. The Norfolk Southern line provides freight service between Hagerstown, Maryland and Winston-Salem, North Carolina, passing through and serving Buchanan and Southeastern Botetourt County. The CSX freight line follows the north bank of the James River through the County. There are no passenger rail services in Botetourt County or the Roanoke Valley. A variety of passenger rail assessments have been undertaken in the past; however, there are no current plans to provide passenger services to the Roanoke Valley. The closest passenger rail terminal for Botetourt residents is located in Clifton Forge in Alleghany County.

Bikeways

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 the southern portion of the county, many areas of Botetourt remain rural in nature with low-density development. 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.

Roadways

Interstate 81

Botetourt County is traversed by Interstate 81 from the Rockbridge County line on the north to the Roanoke County line on the south, a distance of 28 miles of interstate highway. Five interchanges serve Botetourt County, providing a major personal travel route and trucking access to areas outside the region and throughout the nation. The Commonwealth of Virginia is currently evaluating improvement options for Interstate 81. Although preliminary or final designs for I-81 have not been determined, all improvement options will likely involve circulation and land use changes at the interchanges within the County, in particular Exit 150.

Future development potential in proximity to each of these interchanges is highly dependent upon natural features such as soils and slope and upon other factors such as zoning, availability of water and sewer, and VDOT access management policies. A considerable portion of the County's commercial economic base is located around Exit 150, located in southern Botetourt County at the convergence of I-81, U.S. Route 220 North, Alternate U.S. Route 220/604 and U.S. Route 11. Design of the interchange itself, combined with very intense commercial development, minimal access control and high volumes of traffic all contribute to daily congestion around the interchange. A recently completed study of Exit 150 resulted in recommendations for operations mitigation and new construction that will transform the character and use of the area, while still maintaining, and hopefully improving, the economic impact.

Primary and Arterial Routes

Arterial routes or primary roads comprise over 110 miles of Botetourt County's transportation network. U.S. Route 460 provides an important east - west connection from Botetourt County, through the City of Lynchburg, to the Hampton Roads region that is vital to commerce within the County. Other primary routes include U.S. Route 11 (north - south) which runs parallel to I-81, U.S. Route 220 North, which provides access to the Town of Fincastle and links I-81 at Daleville to I-64 at Clifton Forge, and Alternate 220/604 linking U.S. Route 460 to I-81 and U.S. Route 220 North. In addition to moving people and goods, the County's primary highways are also gateways into Botetourt County and surrounding communities; visitors' first impressions of the County are developed partly on the basis of how these corridors function, and how they look. Maintaining and enhancing traffic flow within these corridors is of critical importance to the County's economic health and quality of life.

Route 11

Route 11 between the Roanoke County and Rockbridge County lines has three distinct segments:

1. Roanoke County Line to Exit 150
2. Exit 150 to Town of Troutville, and
3. Town of Troutville to the Rockbridge County line.

Roanoke County Line to Exit 150

This segment of U.S. Route 11 is characterized by a combination of commercial and industrial uses. The road design is currently inadequate and needs to be improved. Some large undeveloped parcels also exist in the corridor. Many of the commercial uses/buildings predate the construction of I-81, and lack access control. Multiple curb cuts are present at these commercial properties, creating opportunities for multiple uncontrolled turning movements.

Exit 150 to Town of Troutville

Land uses along this corridor segment transition from commercial (near Exit 150) to residential (near Town of Troutville). Some of the existing commercial development is interstate oriented, while other commercial development has a more rural character, i.e., antique shops and other small businesses. Future development opportunities exist in the corridor, but are limited on one side of the corridor due to the presence of the railroad.

Town of Troutville North to Buchanan and Beyond

North of Town of Troutville, the corridor segment is characterized by low density residential and agricultural land uses. Commercial and industrial uses are very minimal and found in locations around the Town of Buchanan and the interchanges. North of Exit 168 the landscape is even more rural with no commercial or industrial development present.

Alternate U.S. Route 220 from U.S. Route 460 to Route 11

Alternate U.S. Route 220 is a critical transportation corridor connecting U.S. Route 460 traffic to I-81 and U.S. Route 220 North. Land uses in the corridor are characterized by sporadic commercial and industrial development and low density large lot residential development. Current commercial development in the corridor has generally been designed to minimize strip commercial characteristics. Emphasis has been placed on architectural design, landscaping, and signage control, resulting in a pleasing corridor aesthetic. Traffic within the corridor is free flowing, with minimal flow disruption from traffic signals or turning movements. A median currently restricts left hand turning movements except at controlled intersections.

U.S. Route 220 North

This corridor segment begins at Exit 150, extends northward to Fincastle and beyond to the Alleghany County line. A mixture of industrial, commercial, residential and agricultural land uses are found in the corridor, with the heaviest concentration of commercial development located between Exit 150 north to Glebe Road near Daleville. Multiple curb cuts, uncontrolled turning movements, significant commercial signage and minimal landscaping characterize this older commercial area.

A significant amount of vacant land exists in this corridor north of Route 779. Recent developments in the corridor include the Botetourt Center at Greenfield, Ashley Plantation, and other suburban-style residential developments near Fincastle. Greenfield currently defines the northern limit of more intensive development in the corridor. Most of the vacant land in the corridor is zoned agricultural. North of Fincastle, a rural/agricultural land use pattern dominates the landscape with sporadic rural residential development. Commercial uses are few, and rural in scale.

U.S. Route 460

U.S. Route 460 is a four lane median divided highway that traverses southeast Botetourt County from the Roanoke County line to the Bedford County line. It is a major east to west corridor connecting the Virginia coalfields region to Tidewater. Commercial and industrial developments in the corridor, primarily within Roanoke County and Bedford County, have significantly increased traffic in the corridor in recent years. Traffic has also increased due to suburban residential developments in Botetourt County east of Alternate 220.

In Botetourt County, a mixture of land uses can be found along the Botetourt County segment of the corridor, with industrial uses bracketing both ends, at the Roanoke County and Bedford County lines. Commercial nodes exist in the Rainbow Forest and Blue Ridge areas, and multiple residential subdivisions exist off of the corridor, principally north of U.S. Route 460. As previously discussed, a major entrance to the Blue Ridge Parkway is located in this corridor. Land uses around the Parkway interchange are generally either vacant or currently rural in character.

Secondary and Collector Roads

In addition to the primary route network there are over 530 miles of secondary roads within the County. The purpose of these roads is to provide access to adjoining properties and serve as an internal circulation system for residential, commercial, or industrial areas. These routes also are meant to feed into the primary system to provide access to regional facilities. Collectors carry a variety of traffic volumes, but generally carry less traffic than minor arterial routes. On-street parking may be permitted and usually all abutting properties have access to the road.

Transportation Studies

A number of transportation planning studies have been completed that include information and recommendations pertinent to this plan. They are summarized below.

I-81 Interchange Study

Prepared by Roanoke Valley Alleghany Regional Commission - 2008

This study reviewed traffic capacity factors that will influence future land use at Interstate 81 Exits 156, 162, 167 and 168. The study describes existing conditions at each interchange and recommends future land uses, generally. Based on the information provided in the study, Exits 156 and 162 are projected to experience significant increase in traffic volumes by 2020; Exit 167 is being considered for closure and Exit 168 will experience minor increases. For the purpose of the Comprehensive Plan, this information allows Botetourt County to further consider land use planning around each interchange. Conclusions of the study indicate that as development reduces the amount of land available in southern Botetourt County, growth can be expected to move along Routes 220, 11 and Interstate 81.

Exit 156

- Only a slight decrease in LOS, from A to B is projected at this interchange by 2020.
- The VDOT study is projecting no decrease in LOS for the interchange ramps and State Route 640.
- Route 640 traffic volumes on the south side of the interchange - coming from U.S. Route 11 - is projected to increase 100% while traffic on the north side is projected to increase 75% by 2020.
- Traffic volumes on the northbound entrance ramp and southbound exit ramp are projected to increase by 100% while the northbound exit ramp and southbound entrance ramp are projected to increase 71% by 2020.

Exit 162

- While Interstate 81 Average Annual Daily Traffic (AADT) is projected to increase 93%, the AADT for the ramps at this interchange are projected to increase from 129% to 140% from 1997 to 2020.
- U.S. Route 11 AADT north of the interchange is projected to increase 131% from 1997 to 2020 while still maintaining a LOS of A.
- U.S. Route 11 southbound, south of the interchange has a projected AADT increase of 117% and peak hour increase of 280% from 1997 to 2020.
- U.S. Route 11 northbound, south of the interchange has a projected AADT increase of only 65% and peak hour increase of 58% for the same time period.

Exit 167

- The VDOT Interstate 81 Improvement Study discusses the potential closing of Exit 167.
- This consideration shows that the elimination of Exit 167 ramps improves operation of traffic on this section of Interstate 81 while having no negative impact on traffic flow at Exit 168.
- Traffic on Interstate 81 in this area is expected to increase 25% by 2010 and almost double by 2020 with or without truck lane restrictions.
- The southbound exit ramp peak hour traffic is projected to increase by 400% from 1997 to 2020 and AADT has a projected increase of 117%.

Exit 168

- The Interstate 81 Improvement Study projects a significant decrease in the level of service (LOS) on Interstate 81 for this section.
- The I-81 northbound LOS drops to D south of the interchange and to F north by 2010.
- There is a projected 20% decrease in percentage of truck traffic on northbound entrance ramp. This is the only interchange in the study area with a projected change in truck traffic.
- The southbound entrance ramp has an AADT projected increase of 80%.
- The opposite effect occurs on Route 614 northbound, from a projected decrease of 7% in 2020 without truck lane restrictions to a 78% increase with truck lane restrictions.

U.S. 220 Corridor Review

Prepared by Roanoke Valley Alleghany Regional Commission – June 2008

This study examines the capacity, safety (measured by level of accidents), and infrastructure conditions of U.S. Route 220 within Botetourt County. The information provided examines Level of Service projections to 2035, indicating the furthest southern and northern segments will reach capacity by 2035 (Map 15 - U.S. Route 220 - Traffic Information). VDOT is using this information to prioritize roadway expansion and improvements, but with limited state budgets Botetourt County may need to explore other initiatives to slow the projected LOS declines as growth occurs. For the purpose of the Comprehensive Plan, this information provides an indication that alternative modes of transportation should be considered, as should means of mitigating local travel impacts, such as access management planning. Map 13 and Map 14 also show the Level of Service for all major corridors in Botetourt County. Table 41 provides a snapshot of the roadway characteristics along U.S. Route 220. There are fewer lanes on the northern end of the corridor, which contributes to the lower Level of Service projections. Table 42 indicates the number of accidents at each major intersection along the corridor. There has been a steady increase in accidents at Wesley Road, which can be correlated to the increase in commercial development.

Table 41 – Road Characteristics – U.S. Route 220 Corridor Review

From	To	Lanes	Lane Width (ft.)	Shoulder Surface	Speed Limit (mph)	Median
I-81	RTE 779 North	4 to 6	11 to 12	Gravel	35 to 45	Depressed
RTE 779 North	RTE 1211	4	11 to 12	Gravel	55	Depressed
RTE 1211	RTE 1204	4	12	Curb and Gutter	45	None
RTE 1204	RTE 43Y	4	11 to 12	Gravel	55	Depressed
RTE 43Y	1.14 Mi N RTE 696N	2	10 to 12	Gravel	55	None
1.14 Mi N RTE 696N	Alleghany CL	2	12	Gravel	40	None

Source: Statewide Planning System. Virginia Transportation and Mobility Planning Division. Richmond, 2007.

Table 42 – Accident Data – U.S. Route 220 Corridor Review

Intersection	Accidents			People Injured		
	2004	2005	2006	2004	2005	2006
I-81 SB Exit Ramp		1	1		3	
Tinker Mountain Rd.	2	2	3	2	3	
Stonedale Dr.		1	6			5
Valley Rd.	4	3	3		3	1
Catawba Rd.	1	1	1		4	
Greenfield St.	4	1	2	3		1
Ashley Rd.		1	2			4
Country Club Rd.		1	1			4
Vine St.			2			3
Roanoke St.			1			3
Prices Bluff Rd.	2		1	1		2
10th St.	1		1			3

Source: Statewide Planning System. Virginia Transportation and Mobility Planning Division. Richmond, 2007.

Rural Regional Long-Range Plans

Prepared by Virginia Department of Transportation – On-Going

Improving the transportation system remains vital to improving the quality of life and continued economic growth and prosperity in Virginia. The Virginia Department of Transportation (VDOT) and 20 planning district commissions (PDC) throughout the Commonwealth are partnering to evaluate the state's rural transportation system and to recommend a range of transportation improvements that best satisfy existing and future needs. This partnership will result in a regional plan that identifies needs based upon goals and objectives established by each region. This plan will provide Botetourt County with the opportunity to further identify and assess the community's transportation priorities and needs. Additional benefits may include:

- Identification of transportation deficiencies and recommendations of remedies
- Assistance with comprehensive plan updates and traffic impact studies (per Chapter 527 of the State Code)
- Programming of transportation improvements
- Effects of land use and development

Rural Bikeway Plan

Prepared by Roanoke Valley Alleghany Regional Commission - 2006

The *Rural Bikeway Plan* (2006) 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, including areas outside of the Roanoke Valley Area Metropolitan Planning Organization study area.

The *Rural Bikeway Plan* provides information and guidance on the planning and provision of bike facilities at local and regional levels, to enhance and encourage bicycling in the rural portions of the Regional Commission's service area. The *Rural Bikeway Plan* also briefly considers the relationship between bicycling and tourism and the potential economic benefits of a bicycle-friendly environment. The plan is currently being implemented as roadway improvements are made. Map 16 (Rural Bikeway Plan Study Area) provides the regional context of the bikeway alignment and Map 17 (Botetourt County Rural Bikeway) indicates the alignment within Botetourt County.

GOALS, OBJECTIVES AND POLICIES

The following transportation goals, objectives and policies were developed in conjunction with citizens, the Steering Committee, stakeholders, and elected and appointed officials to guide future decisions about Botetourt County transportation systems.

Transportation Goals

- To provide for an adequate and safe transportation network designed to serve residents, businesses, industry, and the general public.
- To promote safe and efficient accessibility by all modes of transportation including personal automobile, transit, walking, and bicycling by designing a pedestrian-scale, well-connected street network.

Transportation Objectives

- Develop a well coordinated, publicly supported comprehensive transportation system.
- Continue local long range transportation planning efforts for the County's interstate, primary and secondary road system.
- Support alternative modes of transportation for the population such as car-pooling, van pooling, and bicycle routes.
- Monitor state program requirements and seek sources of state funding for specialized road construction needs.
- Ensure that new development proposals do not negatively impact traffic safety, or traffic flow on the County's primary highways.

Transportation Policies

- Continue to participate in the Roanoke Valley Metropolitan Planning Organization (MPO), working closely with MPO partners on local and regional transportation matters affecting the County.
- Clearly define Botetourt County transportation goals within the regional Rural Long Range Transportation Planning process.
- Prepare annual updates to the County's Six Year Secondary Road Construction Plan in conjunction with VDOT.
- Use VDOT's Industrial and Recreational Access Road programs to strengthen the County's economic development and recreational programs, as the need arises.
- Actively support the widening of I-81 and improvements to existing interchanges.
- Work closely with VDOT on the design and implementation of plans for improvements to Exit 150 to ensure that business disruption is minimal, and that the new interchange provides opportunities for business relocations and additional accessible business locations.
- Evaluate current VDOT primary and secondary road access standards and consider adopting more stringent local access standards.
- Support multimodal transportation by developing land use plans and policies that encourage mixed-use land use patterns and pedestrian-oriented site design, and direct higher density development toward designated development areas.
- Continue to identify additional dedicated funding sources to finance the cost of proposed multimodal transportation improvements.
- Include consideration for bicycle and pedestrian accommodations in the planning and design of all major road projects, consistent with VDOT policy.
- Include bicycle and pedestrian accommodations, including ancillary facilities such as bicycle racks, benches, water fountains, rest areas, signage, etc., in conjunction with all new development.

IMPLEMENTATION STRATEGIES

This section identifies more detailed implementation strategies for transportation planning improvements, which include access management, a corridor study, continued bikeway planning, park and ride initiatives, carpooling and transit, continued support of the Blue Ridge parkway, transportation and land use planning for primary highways, considerations for I-81 interchanges, transportation and land use planning and implementation of a Rustic Rural Road Program.

Transportation and Land Use Coordination

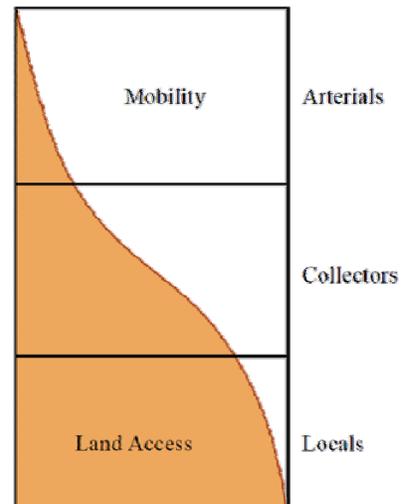
Land use patterns have a significant effect on trip generation and travel behavior. Compact, mixed-use and walkable developments mitigate traffic generation and thoroughfare impacts by shortening trip distances, capturing a greater share of trips internally, and facilitating transit and non-motorized trip-making. Successful mixed-use areas with multi-modal access can thrive with lower parking ratios, freeing up land and capital for open space amenities and productive, revenue-producing uses. Some implementation strategies listed below may be used to develop and maintain a sustainable multi-modal transportation system that supports new and existing residential, commercial and recreational areas, preserves and enhances neighborhood livability and the quality of life for Botetourt County residents, and provides for the safe and efficient movement of people and goods.

- **Coordination with Land Use Map:** Transportation planning, development, expansion, and investment in transportation facilities should be coordinated with the Future Land Use Map.
- **Right-of-Way Reservation:** Support the early identification and acquisition of land for future transportation corridors through land use planning and development permitting.
- **Multi-modal Transportation Design:** Where appropriate, offer residents safe and attractive choices among modes including pedestrian walkways, bikeways, public transportation, roadways, and railways. The street patterns of newly developed areas should provide multi-modal transportation alternatives for access to and circulation between adjacent neighborhoods, parks, shopping centers, and employment areas.
- **Increasing Mobility Choice:** Diversify the mobility choices for work trips by targeting transit support along corridors that connect concentrations of office, retail, and residential uses.
- **Context Sensitive Road Design:** “Context Sensitive” approaches can be used on new roadways or widening of existing roads to minimize impacts to historic areas and neighborhoods, and sensitive natural areas (particularly in watershed protection, conservation management and rural protection areas)
- **Transportation Impacts:** Identify and address transportation impacts before a development is implemented.

Access Management

The primary objective of access management is to improve traffic flow, a concept that may seem at odds with the concept of creating a pedestrian-friendly environment. However, access management is not just about moving traffic as quickly and safely as possible. Access management can be used to create an attractive roadway environment as well; one that is safer for pedestrians who aren't able to avoid driveways and driveway traffic, by using median refuge areas that allow them to cross roadways in increments.

An effective local access management program can play an important role in preserving highway capacity, reducing crashes, and avoiding or minimizing costly remedial roadway improvements. The traveling public would then benefit from faster and safer travel. The great majority of businesses also benefit from increased economic vitality along a well managed corridor. Taxpayers benefit from more efficient use of existing facilities, and public agencies benefit from the relatively low cost of access management, freeing resources for other needs.



This diagram shows the relationship of road design (Access versus Mobility) and road types.

Botetourt County should work with VDOT to develop an access management plan for U.S. Route 220. This plan should be developed in conjunction with a corridor study to determine the potential of future growth along the corridor and the best means of accessing that growth.

Corridor Studies

Corridor planning determines the best way to serve existing and future travel demand, bringing together the goals and expectations of all stakeholders involved in the project. Corridor studies are typically initiated in response to a specific problem (high accident locations and corridors, high levels of existing or future congestion, significant land-use changes, etc.) and often involve more than one mode of transportation. However the benefits of corridor planning reach beyond engineering solutions: resolution of major planning issues prior to the initiation of project development, identification and possibly preservation of transportation right-of-way, protection of transportation investments, and partnerships with diverse public and private agencies and organizations are all positive results of corridor planning efforts. Specific recommendations for corridor studies are identified by route number below.

Botetourt County should develop a corridor study for U.S. Route 220 that examines potential build-out for the corridor, determines travel and traffic implications, and promotes proactive growth management. Additional studies could be conducted for the U.S. Route 460 and U.S. Route 11 corridors. Both the U.S. Route 220 and U.S. Route 11 corridor studies should focus on the I-81 Exit 150 interchange as a gateway into the community. Funding sources for the corridor studies could include grants from VDOT or the local PDC.

Bikeway Planning

Developing safe bikeways is a strategy typically used to diversify modes of transportation and increase the safety and number of bicyclists. Used by both commuters and recreational users, bikeways contribute to a community's quality of life. A common goal of a bikeway plan is to include consideration of the needs of bicyclists in the design and construction of roadways. Typically, road improvements that consider bikeways involve either a wider travel lane, or a wider shoulder. Previous bikeway plans for Botetourt County identified Routes 11, 220, 460, 601, 651, 654, 738, 779 and a portion of the Blue Ridge Parkway as suitable bikeway locations (see Table 43); however, currently there are no bikeways under construction in the County.

Botetourt County should actively pursue implementation of bikeway plans as public roads are improved under VDOT Primary and Secondary funding programs, consistent with VDOT's *Policy for Integrating Bicycle and Pedestrian Accommodations*.

Table 43 – Corridors for Bicycle Accommodations

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

Park and Ride Facilities and/or Locations

Park & Ride transportation facilities facilitate transit and rideshare use by providing parking facilities at transit stations, bus stops and highway entrance ramps, particularly at the urban fringe. By encouraging commuter shifts between single occupancy vehicles, transit and ridesharing, Park & Ride facilities can reduce urban highway traffic congestion and worksite parking demand. There is one facility located on U.S. Route 220 near the I-81 southbound on-ramp. Some additional ad-hoc locations might be used, but sufficient data is not available for an inventory.

Botetourt County should explore working with developers and business owners to create new park and ride lots in appropriate locations that allow users access to park-n-ride facilities and retail services. Such facilities could include minimal efforts such as designation of unused parking spaces during non-peak retail times during the day. Similar approaches can be taken with churches, where parking goes unused during typical work hours. These options could also be pursued in conjunction with a commuter transit service and/or vanpool program.

Rideshare, Commuter Transit, and Car/Van Pooling Options

Public transportation is not just for urban areas. Rural transit services can provide an essential link for Botetourt County residents living in small towns and rural areas with limited access to personal vehicles. Employees, students, the elderly and disabled, and single parents caring for children are all examples of population groups that would benefit from the availability of public transit to commute to work, go shopping, attend school, get to medical appointments and travel to recreational activities.

Botetourt County should work with Roanoke on a continuous basis to reevaluate the potential of a fixed bus route that provides express service to key locations within the county. Eventually, parts of the County may reach transit supportive densities which would trigger the need for services based on location and

commuter demand. On-going conversations will ensure further development and redevelopment meets the operational needs of transit, increasing the efficiency of potential services. Further, Botetourt County should consider the implementation of a Rural Transit Program, which is mostly federally funded for capital and operations assistance. The County currently provides limited elderly and disabled services, which can evolve into a rural transit program. These types of programs are widely used in rural areas like Botetourt County. Proper coordination with human service transportation needs could minimize the County's financial responsibility.

Blue Ridge Parkway Enhancements

Designed as a 469 mile-long national scenic linear park, the Blue Ridge Parkway is a significant recreational resource for over twenty-one million travelers per year. The Parkway is also a significant economic resource for communities located along its length. Conservation of the Parkway's scenic environment benefits from a partnership between the National Park Service (NPS) which manages the park, and localities through which the Parkway passes. The visual impact of new development on the Parkway is an extremely critical issue in the Roanoke Valley and Botetourt County due to the high degree of suburbanization that has occurred in proximity to the Parkway in the past 30 years.

Five miles of the Blue Ridge Parkway are located within the southeast section of Botetourt County, accessible from three interchanges leading to local and regional roads: Route 43 east of Buchanan, U.S. Route 460 in Blue Ridge, and Route 618 near the Peaks of Otter. Although most of the Botetourt segment of the Parkway lies within National Forest Land, including the interchanges that provide access to Route 43 and 618, a highly visible and susceptible portion of the Parkway lies in proximity to the interchange serving U.S. Route 460. Currently, land near this interchange is largely undeveloped; however, future development in this corridor has the potential to be visible from the Parkway. In addition, future development along U.S. Route 460 at or near the Parkway interchange has the potential to be inconsistent with the rural, scenic character of the Parkway.

Botetourt County can assist with the conservation of the Parkway's scenic environment through local action in two areas:

1. Evaluation of the visual impact of new development that is proposed within the Parkway's viewsheds, and
2. Consideration of the scale, character and design of new development proposed to be located in proximity to the Parkway Interchanges.

Primary Highway Strategies

Route 11 Corridor

Future land uses in the U.S. Route 11 corridor should be a combination of commercial and industrial development. Development of these land uses should be limited in scale until road improvements are made. Future road improvements in this corridor should emphasize access management. For example, if a four-lane design is proposed, a median should be considered as a strategy to control turning movements and improve the aesthetics of the corridor.

Access for all new development in the corridor should be controlled, minimizing new curb cuts and emphasizing the shared use of existing curb cuts, and utilizing frontage roads or a reverse frontage access, where feasible. New development should be responsible for installing deceleration/acceleration lanes, as required by VDOT. As redevelopment occurs along the corridor, existing curb cuts should be combined, where appropriate.

Segment 1 – Roanoke County Line to Exit 150

This segment of the U.S. Route 11 Corridor serves as a gateway to both Botetourt County and Roanoke County and would benefit from a corridor planning effort or an urban design strategy to improve the look, feel and mobility through this area. The Botetourt County Planning Commission should initiate discussions with the Roanoke County Planning Commission concerning the development of strategies to improve mutual gateways at this location.

Segment 2 - Exit 150 to Town of Troutville

As indicated on the Future Land Use Map, development along this segment of road should be commercial from Exit 150 North to State Road 653. From State Road 653 North to Town of Troutville a mixture of commercial and office uses are desirable.

Access for all new development in the corridor should be controlled, minimizing new curb cuts and emphasizing the shared use of existing curb cuts, and utilizing frontage roads or a reverse frontage access, where feasible. New development should be responsible for installing deceleration/acceleration lanes, as required by VDOT. As redevelopment occurs along the corridor, existing curb cuts should be combined, where appropriate.

Signage in the corridor should be strictly controlled, extensive landscaping should be provided, and typical “strip commercial” character should be avoided for all new development within this corridor segment (see discussion of *Design Standards* in the *Implementation Section* of the *Land Use Element*, Page 58).

Segment 3 - Town of Troutville North to Buchanan and Beyond

North of Town of Troutville, the corridor segment is characterized by low density residential and agricultural land uses. Commercial and industrial uses are very minimal and found in locations around Buchanan and the interchanges. North of Exit 168 the landscape is even more rural with no commercial or industrial development present.

As indicated on the Future Land Use Map, desired land uses in this corridor segment are primarily agriculture, or very low density residential. Future commercial and industrial development is not appropriate along this corridor, with the exception of commercial and small scale industrial development around the town, commercial development located at I-81 interchanges. Any commercial and/or industrial development proposed near the Town of Buchanan should be evaluated with consideration of the impact of the development on the town, and, to the extent feasible, such development should be encouraged to locate within the Town consistent with the Town’s land use plan and zoning.

Alternate U.S. Route 220 from 460 to Route 11

A corridor access study should be undertaken for this corridor, focusing on the characteristics of vacant land and developed property within the corridor and recommending specific opportunities for future signalization, shared access, median cuts, and frontage roads. Traffic flow is a top priority for this corridor. Strategies for future development include minimizing the number of new traffic signals and discouraging new median cuts, only allowing them for new public roads. Frontage roads and reverse frontage site designs are also a preferred access alternative. For smaller developments, shared access easements should be required to reduce the number of new curb cuts.

Additional commercial uses should be allowed on both the east and west side of this corridor, with a priority for larger scale, planned commercial developments so that access can be controlled through new public roads, or through the use of shared access for multiple properties and uses. New development in the corridor should reflect the highest standards of architectural quality and should incorporate significant landscaping (see discussion of *Design Standards* in the *Implementation Section* of the *Land Use Element*, Page 58). Freestanding signage should be well designed, but limited in height and number. Lighting should be effective for security purposes, but subdued to avoid spillover into the road corridor or adjoining properties.

U.S. Route 220

Botetourt County should develop a corridor study for U.S. Route 220 that examines potential build-out for the corridor, determines travel and traffic implications, and promotes proactive growth management. Funding sources for the corridor study could include grants from VDOT or the local PDC.

U.S. Route 220 North

The key to the appropriate future development of the U.S. Route 220 corridor is development of the frontage parcels with consideration of access control, signage, landscaping, and lighting. Strip commercial development patterns that exist south of Route 779 should not be allowed to extend northward towards Fincastle. Although additional commercial development between Route 779 and Greenfield is appropriate, it should be clustered in nodes at selected intersections, and should not be allowed to develop into a strip commercial pattern of development. Development north of Greenfield should be limited to agricultural and low density residential uses due to lack of public facilities in this area. Higher residential densities may be appropriate for properties near Fincastle if, in the future, the town has the capacity and willingness to extend water and sewer to serve new residential areas. No commercial development should be encouraged north of Greenfield; instead, commercial needs in this area of the County should be met within the Town of Fincastle consistent with the Town's land use plan and zoning.

Access control in this corridor is extremely important to preserve traffic capacity and flow. Left hand turning movements should be limited to existing median cuts, or to new cuts designed to serve new public roads. The number of new traffic signals should be minimized.

U.S. Route 460

Similar to other corridors, access control in the U.S. Route 460 corridor is extremely important to preserve traffic capacity and flow. Left hand turning movements should be limited to existing median cuts, or to new cuts designed to serve new public roads. The number of new traffic signals should be minimized. Shared access between adjoining properties should be required, as should frontage or reverse access roads.

Future commercial development within the corridor should be limited in scale and located within the existing commercial nodes near Laymantown Road and the Blue Ridge community. Future land uses in the corridor should be evaluated with consideration to their impact on the Blue Ridge Parkway viewsheds and interchange character. Parkway staff should be consulted when new developments are proposed. Densities of future residential development in the corridor should be a factor of public utility and facility capacities.

I-81 Interchanges

The character of the I-81 interchanges are discussed elsewhere in the transportation section. The following strategies are recommended:

1. Site specific soil and geologic evaluations should be performed prior to development at I-81 interchanges. If a rezoning is required, the results of these evaluations should be included as one of the factors considered by the Planning Commission and Board of Supervisors as they make their decisions.
2. Exits 156, 162 and 168 are best suited for additional development. However, no new intense residential, commercial, or industrial development should be approved at these intersections unless and until public water and sewer services are available. The previously referenced water and wastewater analysis plan projected a 20-year time frame for County utility improvements. Small scale commercial and low density residential development may be suitable at these interchanges based upon site specific review and analysis.
3. Future interchange development should be required to demonstrate adequate access design to ensure development will not negatively impact traffic flow or impede interchange improvements.
4. The Development Suitability Maps (Map 40, Map 41, and Map 42) for each interchange designate Primary, Secondary, and Restricted development areas. More intensive development should be encouraged/allowed in the Primary areas if public water and sewer are available. Secondary areas do not preclude development, but require more detailed site suitability studies prior to development or zoning approvals. Restricted areas should not be further developed due to their slope, geologic and soil limitations. If proposed for development, extensive site studies should be required within restricted areas.

5. Future development at these interchanges should reflect and respect their predominantly rural setting. Although future commercial development may be oriented to the highway traveler, it should be designed in character with its environs. In evaluating development or rezoning proposals, the Commission and Board of Supervisors should consider design elements such as architectural character and scale, lighting, signage, landscaping and shared access between parcels to reduce curb cuts and provide adequate turning lanes.
6. Commercial development at these interchanges should be restricted to “nodes” around each interchange, and should not be allowed to extend along the U.S. Route 11 corridor to create a strip commercial land use pattern.

Transportation and Land Use Coordination

Land use patterns have a significant effect on trip generation and travel behavior. Compact, mixed-use and walkable developments mitigate traffic generation and thoroughfare impacts by shortening trip distances, capturing a greater share of trips internally, and facilitating transit and non-motorized trip-making. Successful mixed-use areas with multi-modal access can thrive with lower parking ratios, thus freeing up land and capital for open space amenities and productive, revenue-producing uses. The County should evaluate its existing Zoning Ordinance, Subdivision Ordinance and site plan requirements to refine guidelines and regulations to encourage mixed use developments, interconnected streets, sidewalks, streets, adjusted parking standards and other mechanisms that reduce vehicular trips.

Rural Rustic Roads

The Virginia Department of Transportation’s Local Assistance Division established *Guidelines for Rural Rustic Roads*, working with the Rural Rustic Road Policy Committee. This concept, first enacted by the 2002 Session of the General Assembly of Virginia, is a practical approach to paving Virginia's Low Volume Unpaved Roads. A pilot program, implemented in July 2002, demonstrated the success of this program concept. The program ensures that the County will practice environmental and financial stewardship while providing basic paved access to more of its rural countryside. Table 44 provides an overview of the options for the rustic road program.

The following eligibility criteria apply to the Rural Rustic Road Program:

- Must be an unpaved road already within the State Secondary System.
- Must carry no more than 1 500 vehicles per day (VPD).
- Must be a priority (line item) in an approved Secondary Six-Year Plan, even if the funding source is not from normal, secondary construction allocations.
- Must be designated as a Rural Rustic Road by the County Board of Supervisors, in consultation with VDOT’s Residency Administrator or designee.
- Must be a road predominately used for local traffic. The local nature of the road means that most motorists using the road have traveled it before and are familiar with its features.
- Must have minimal anticipated traffic growth. The County Board of Supervisors must attempt to limit growth on roads improved under the Rural Rustic Road program and cooperate with VDOT on the development of adjacent lands consistent with rural rustic road concepts through the comprehensive planning process.
- Must have a special Resolution designating the road as a Rural Rustic Road by the County Board of Supervisors for each individual road.

The maximum speed limit on any highway designated a Rural Rustic Road pursuant to § 33.1-70.1 of the Code of Virginia is 35 miles per hour; however, all speed limits on rural rustic roads in effect on July 1, 2008, may remain in effect unless and until it is changed as a result of a traffic engineering study.

Botetourt County should continue to implement this program on selected, qualified roads. This approach would help minimize the maintenance costs associated with the secondary roads. Because the program limits future improvements, careful consideration should be given to those roads that might have increased development, creating the need for expansion or improvements.

**Table 44 – Rural Rustic Road Program Guidelines
Unpaved Road Improvement Program Options**

	Unpaved Road	Pave-In-Place	Rural Rustic Road
Roadway Status	The road must already be a state maintained road in the secondary system of state highways. These programs do not apply to the addition and improvement of roads that are privately maintained.		
Traffic Volume VPD = vehicles per day Limitations are based on funding (see below).	50 vpd minimum for unpaved road funds, otherwise no minimum for normal secondary construction funding.	less than 750 vpd	less than 1500 vpd
County Government Action and Funding	Project must be in the County's Secondary Six-Year Plan (SSYP) of improvements.	Project must be in the County's Secondary Six-Year Plan (SSYP) of improvements.	Project must be in the County's Secondary Six-Year Plan (SSYP) of improvements. Board must also request the Rural Rustic Road Program be used, by passing a special resolution declaring the road a "Rural Rustic Road."
Land Use Growth Factor	No restrictions.	No restrictions.	The County Board indicates growth and traffic generated by the land are not expected to increase significantly over the next 10 years.
Safety	Safety factors are addressed as part of the project.	Safety factors are addressed as part of the project.	Specific identified safety issues that cannot be addressed through signing should be corrected.
Alignment	Reconstruct as necessary to improve alignment and grade.	Minor changes in alignment may be necessary to address issues.	Ideally, a candidate road can be paved without alignment improvements. For higher traffic volume roads (>400vpd), 18 foot pavement is desirable and some typical section improvements may be necessary.
Drainage	Roadway drainage will be improved, if needed.	Roadway drainage will be improved, if needed.	Existing drainage provisions should be sufficient with minimal improvement. Improvements should be made as necessary to ensure positive drainage.
Right of Way	Abutting property owners will need to provide additional right of way, normally 50 feet in width.	Paving may be done within the existing right of way, but abutting property owners are normally expected to donate additional right-of-way for spot widening, if necessary for safety.	Paving may be done within the existing right of way, which may be a minimum of 30 feet prescriptive R/W.

Source: Virginia Department of Transportation – Rural Rustic Road Program, July 2008