

CHAPTER 4

COMMUNITY FACILITIES

1. PARKS AND RECREATION

Introduction

The Roanoke County Parks and Recreation Department offers a vast variety of programs and services. The department oversees large-scale special events, an after school program, development of a residential camp, a ropes course, new park developments and a teen center. The department is motivated to offer the best possible programs and services to the citizens of Roanoke County and the surrounding areas.

The future direction of park facility development includes some exciting projects for Roanoke County. In addition to developing and updating master plans for parks, the Parks and Recreation Department is actively seeking sites and funding to acquire new park land. During school renovation and new school construction, the Parks and Recreation Department and the School Board work to develop joint-use facilities and community centers. The department actively supports the efforts of the Roanoke Valley Greenway Commission. A recent successful fundraising campaign has provided money for significant investment at Camp Roanoke and a master plan for park development around Spring Hollow Reservoir has been completed.

Goal

To protect, conserve and manage designated Roanoke County public parks, assigned public lands and associated environmental, cultural and historic resources consistent with the needs, attitudes and interests of County residents and within available resources.

Issues and Opportunities

- There is growing interest in a Valley-wide greenway system. With the creation of the Roanoke Valley Greenway Commission, opportunities exist to create and expand trail systems throughout the County and across jurisdictional lines. Greenways can serve as a link between destinations such as schools, parks, libraries, and commercial and employment centers. Greenways also can preserve important natural areas, protect water quality, and promote healthy lifestyles and physical fitness. There needs to be continued support for the planning and development of greenways on a County and Valley-wide basis.

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- Roanoke County Parks and Recreation and the Roanoke County School Board have a long history and tradition of the joint use and development of park and athletic facilities. Joint use is a cost-effective way to optimize the use of publicly owned land. As the School system proceeds with the implementation of the Blue Ribbon Committee's School Facilities Plan, efforts should be made to incorporate design strategies that promote and accommodate non-school community programs. Where practical, gyms should be full sized, with convenient and safe access. Outdoor recreation areas should be developed that support both the schools and secondarily, the community recreation mission.
- The requirements associated with the passing of Americans With Disabilities Act has increased both the demand and the expectations for recreation services for our physically and mentally challenged citizens.
- Opportunities exist to partner with private businesses, non-profit community service organizations, and other local governments to develop facilities, programs, and events which will improve the quality of life of all Valley residents. Through increased tourism, these partnerships could also have a positive impact on the business community.
- The development community can provide additional park and recreation facilities. These facilities may include dedication of park land or payment in lieu of dedication, construction of park facilities, dedication and construction of greenways and other forms of public-private partnerships.

Objectives

- A. Continue to develop the County's district parks as a major source of recreational facilities and activities.
- B. Develop a greenway system, and funding mechanism, that provides access to Roanoke County's cultural, historic, and recreational resources for the benefit of all Roanoke Valley citizens.
- C. Encourage the provision of open space and park facilities with new development.
- D. Acquire additional land for new parks, or expansion of existing parks, where facility deficits exist.
- E. Seek alternative funding methods for existing and future recreation facilities and programs.
- F. Provide additional park and recreation facilities during the renovation and/or construction of schools.
- G. Expand the number, size, and type of park facilities in Roanoke County.

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- H. Provide alternative modes of transportation to access recreation facilities.
- I. Provide adequate waterfront access to the Roanoke River.
- J. Develop strategies to preserve the Roanoke River as a recreational resource.
- K. Continue to encourage public input and opinion in planning for parks and recreation.
- L. Attract major athletic events and festivals to park facilities.

Implementation Strategies

1. Continue to use the master planning process to obtain citizen input for park facility's development. (Obj. A, G, K)
2. Use the Capital Improvements Program (CIP) to acquire land and provide improvements to the County's park and recreation facilities. (Obj. D, F, G)
3. Obtain State and Federal funds for park and recreational facility development whenever possible. (Obj. B, E)
4. Revise subdivision and zoning ordinances to require specific amounts of park land to be dedicated or payment in lieu of dedication by developers to the County based upon the population to be served as well as the size of the development. (Obj. C)
5. Coordinate with the Roanoke County School Board on the location, phasing, and design of school and park sites to enhance the potential for development of community recreation facilities. (Obj. F, G)
6. Develop an integrated park and greenway system linking major resource areas, parks and schools. (Obj. B, F, H)
7. Capitalize on the region's tourism through publication of recreational site locations and activities, public waterfront access locations and community programs and events. (Obj. I, J, L)
8. Develop intergovernmental agreements for the provision of recreational programs and facilities. (Obj. B, J, L)
8. Continue to develop park facilities at Camp Roanoke and Spring Hollow Reservoir. (Obj. E, G)
9. Expand Valley Metro and Cortran service to ensure access to County recreation centers and district parks. (Obj. H)
11. Evaluate the development of a County-owned and operated water park. (Obj. D, G)

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12. Implement the Southwest District Park Master Plan. (Obj. A, G, K)
13. Develop a soccer complex in north Roanoke County. (Obj. A, G, K)
14. Encourage neighboring jurisdictions to adopt the Roanoke River Corridor Conservation Overlay District. (Obj. I, J)

2. LIBRARIES

Introduction

In 1996, the Roanoke County Library Board of Trustees revised and approved the *Roanoke County Public Library Five-Year Plan*. The plan provides goals, objectives and strategies for the following components of the library system: resources; operation, organization, and procedures; staff development; collection development; program service and development; technology, capital items and facilities; and interdepartmental and interlibrary cooperation.

The *Roanoke County Public Library Five-Year Plan* has a simple and effective structure of goals, objectives, and implementation strategies. The plan is divided into seven components. Each component of the plan has one general goal, with several underlying objectives. Each objective has strategies to meet the objectives. Each strategy is given a target year for completion. The goals of each component are listed below as objectives. A sample of the objectives of each component goal are listed below as implementation strategies. For complete text of the plan, the reader should refer to the *Roanoke County Public Library Five-Year Plan, April 24, 1996*.

Goal

The Roanoke County Public Library System is a community information and life-long learning center which provides citizens with the resources to help them develop their intellectual, economic, cultural and educational potential.

Issues and Opportunities

- As a world-wide, information-based economy continues to develop, accompanied by vast structural changes in the work force, continual job-related learning, training, and development will become increasingly important to citizens. Career and vocational information, specific skills instruction and access to distant education programs will be vital.
- Demand will grow for electronic, online, audio and video formats and for multimedia information delivery. Libraries will need to have all of these items in their collections and must have the facilities and equipment for their housing and use.
- Extended hours and special reference and research services will be needed as customers want maximum convenience to fit their hectic, demanding lives.
- The way information is gathered, stored, accessed, and disseminated will be subject to continuing technological change as well as changes driven by human behavioral factors and needs. Validation, arrangement and packaging of information may change radically.

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- Automation of routine tasks will help maintain services. Customer self-charging systems, debit cards, security systems, after-hours voice mail and e-mail drops and automated calling systems are all possibilities.
- Contracted cataloging and preliminary processing of up to 70% of all selected titles may eventually be possible, freeing technical services personnel for public services work. Document delivery may be another possible outsourcing option.
- As research strategies and the available search tools become more sophisticated and varied, staff will need to receive constant training to provide effective service. Library work will demand increased knowledge and skills, and, on the average, reference transactions will become more complicated and time-consuming.
- The average age of Roanoke County citizens is increasing. Older library consumers tend to need and demand a higher level of service, including more or improved services in areas such as health and medical information, investment research and non-book formats.
- While children will decrease as a percentage of the County's population their absolute number will remain relatively stable. Continued service improvements will be required for children and students. In an information-economy, the library's role as a doorway to learning and reading for pre-schoolers will be more crucial than ever.
- Assisting students to be competitive with students from around the world will be important. The library can help the information "have nots" of all ages - but especially children - to gain access to technology and information.
- In trying to serve the needs of the oldest and youngest age groups the library will need to improve outreach activities. Beyond these two age groups, the community will also benefit from increased outreach to businesses and educational agencies.
- The library needs to develop more extensive working partnerships with other agencies and private sector organizations.
- The library needs place for active, noisy toddlers as well as quiet space for dedicated researchers. Additional space is needed for community meetings and programs, space supporting the arts and local cultural efforts and instructional space for distant learners.
- The development of the Internet will continue to increase demand on library services.

Objectives

- A. Increase quality of managerial control of resources and seek to improve resource level.
- A. Improve the efficiency and effectiveness of operations and procedures.
- C. Provide opportunities for staff skill development and improvement.

- D. Develop strong, responsive collections, which address well defined, prioritized needs through the systematic use of collection management and developmental techniques and tools.
- E. Expand the customer base for current programs; identify emergent programming needs and develop appropriate support and action plans.

Implementation Strategies

1. Maintain and improve current reporting methodologies. (Obj. A)
2. Adjust and refine formal resource allocation procedures. (Obj. A)
3. Develop a staffing plan to project staffing need based on workload indicators and service plan, and define needed new positions. (Obj. A)
4. Establish and support budget goals for collections. (Obj. A)
5. Diversify team activities through greater use of working teams to address specific, emergent issues. (Obj. B)
6. Complete restructuring process. (Obj. B)
7. Adopt a vision statement to complement the mission statement. (Obj. B)
8. Revise five-year plan. (Obj. B)
9. Promote team concept and support county training. (Obj. C)
10. Improve and expand in-house training. (Obj. C)
11. Support attendance for professional programs, conferences, and workshops. (Obj. C)
12. Retain annual special collection development goal plan. (Obj. D)
13. Begin to build systemized collection development plan. (Obj. D)
14. Maintain expanded staff participation in collection development. (Obj. D)
15. Conduct needs' assessments and fill rate studies. (Obj. D)

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16. Provide strong support for juvenile services programs. (Obj. E)
17. Develop plan for adult programming. (Obj. E)
18. Identify and protect core fundamental services from fee encroachment, but consider fee-based enrichment programs. (Obj. E)
19. Strengthen local history collection and services. (Obj. E)
20. Expand electronic services. (Obj. E)

3. SCHOOLS

Introduction

In April 1996, the Roanoke County School Board began a comprehensive study of their 28 educational facilities. The School Board hired a local consulting firm to coordinate the project. The consulting firm set up local school committees for each of the 28 facilities. The committees consisted of individuals, such as school faculty and staff, PTA members, and parents, who were the most familiar with the physical needs of the schools. The local school committees made lists of major capital investment needs, as well as operation and maintenance needs.

The Roanoke County Board of Supervisors and School Board jointly developed a citizen committee to evaluate and prioritize the results of the facility study. The 22-member group was named the Blue Ribbon Committee. The Blue Ribbon Committee visited each of the school facilities to review the list of needs developed by the local school committees. Following their review and evaluation, the Blue Ribbon Committee identified \$100 million in school capital improvement needs. Three phases of construction were recommended over a 10-year period. The total cost of the recommended improvements, adjusted for inflation, is approximately \$121 million.

On March 17, 1997, the Blue Ribbon Committee presented the school facility's plan to a joint meeting of the Roanoke County Board of Supervisors and the Roanoke County School Board. On March 27, 1997, the School Board accepted and endorsed in concept the report of the Blue Ribbon Committee. On April 22, 1997, the Board of Supervisors passed a resolution endorsing in concept the recommendations presented by the Blue Ribbon Committee.

Goal

Support and implement the School Facilities Plan submitted by the Blue Ribbon Committee and adopted by the School Board.

Issues and Opportunities

The following issues and opportunities were provided by the School Board in 1997. Some of the issues were carried over from the 1985 Comprehensive Plan, Community Facilities Plan.

- The Roanoke County School Board's six-year plan presents goals and strategies intended to enhance the teaching/learning process and to give direction to improvement efforts. The Roanoke County School Board has developed and continues to support a wide range of academic and extracurricular programs. The curriculum and design of each of these Programs are reviewed on a regular schedule to ensure that classroom instruction and other school activities reflect the best practices and recent research.

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- Enrollment is predicted to increase by approximately 3.5% by 2000. The largest increase is anticipated in the West County District (6.1%), followed by Vinton (5.5%), South County (2.9%), and North County (1.3%).
- Roanoke County schools serve as multiple-use facilities. Adult education and continuing education programs use various school facilities. In addition, the School Administration building is used for seminars and workshops. The school system cooperates with the Roanoke County Department of Parks and Recreation in making available gymnasiums and athletic fields for recreation use after school hours. Citizens in many sections of the County sponsor community education programs and/or community meetings in respective elementary schools. County schools are used frequently for community activities and for polling stations. School libraries can also serve as public resources.
- Acquiring school sites over the next 10 years will provide a significant challenge to the County School system, due to an ever tightening real estate market and lack of sites suitable for school facilities.
- The County and the school system cooperate in the areas of central purchasing of paper products, office supplies, food items, office machine maintenance, insurance, data processing services and gasoline facilities.

Objectives

The following objectives for school facilities are excerpts from Section 3A, 3B, and 3C, Statement of Equality Issues in *The 1997 Comprehensive Facilities Study of the Roanoke County School System*. In the Statement of Equality Issues, the Blue Ribbon Committee established guidelines for school population size, school space requirements, safety requirements, and regulatory requirements. The guidelines were developed for elementary, middle/junior high, and high schools.

Statement of Equality Issues, Elementary Schools

Size

Newly constructed elementary schools' student population should be no larger than 600 to 660. However, most of the existing elementary structures were not originally designed for those numbers and their size should not be increased to handle more than a maximum population of 500.

Requirements

Dedicated areas should be established at each school for the resource subjects of art, physical education, music, reading specialist, learning disability specialist, computer lab and other special areas such as guidance and library.

Safety

- All doors unlocked during the school hours should be monitored either through a visual

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means or opening from an office which is constantly manned or by means of electronic equipment.

- All doors should be designed to be operable by all students.
- There should be a 2-way communication intercom in every instructional area for use by the teacher.
- Each school should have a monitored sick child room or clinic.
- Each school should have adequate lighting, indoors and out, to support school functions.
- Dusk-to-dawn lighting should be used at the exterior of each school.
- Each building's electrical system, interior signage, fire alarms, fire doors, emergency exits, etc, should be maintained at current code, not "grandfathered" into acceptance at the expense of safety.
- Procedures for safe arrival and departure of students, whether by bus, auto or on foot, should be implemented and reviewed periodically.
- Adequate space for bus loading and unloading should be provided on school property.
- Adequate parking space should be provided.
- Restroom facilities with adequate ventilation and capacity should be provided.

Regulatory

- "Push and go" doors for handicapped accessibility.
- Access to handicapped bathroom facilities.
- Compliance with ADA through ramps, elevators, etc.
- Compliance with all current local, state and federal codes is required.

Statement of Equality Issues, Middle / Junior High Schools

Size

The optimum size for a middle school is approximately 800 to 850 students, with a core facilities capacity of approximately 1,000.

Requirements

- Requirements under the Americans with Disabilities Act (ADA) must be met.
- Classroom space properly designed and appropriately equipped to meet special education needs must be provided.
- Properly equipped science labs with adequate dedicated space for storage and separate preparation rooms are essential.
- Music and art are not frills. These disciplines are an important part of our culture. Adequate dedicated space must be provided for instruction and storage for these subjects.
- Core areas such as the gymnasium, cafeteria, auditorium, media center/library, and computer labs must be large enough to accommodate the students and faculty in reasonable comfort.
- Sufficient space must be dedicated to essential administrative functions such as administrative offices, guidance offices and conference rooms and storage areas.
- A properly equipped faculty lounge, of a size adequate to accommodate the faculty, is essential. Faculty work areas must be provided so that teachers have a space dedicated to the planning and preparation that are an essential part of proper instruction.
- Storage space is, at best, inadequate and often nonexistent. Storage areas for instructional equipment and materials must be provided.
- Adequate student lockers must be provided. Students should not be required to share lockers. A resolution of the overcrowding problem may alleviate this situation.
- Persistent problems with air conditioning, humidity and heating must be solved.

Safety

- A sick student room with a sink must be provided.
- The administrative offices must be located and configured to provide visual control of all unlocked entrances so as to allow for the observation of strangers entering the building.
- An intercom system must be established to provide two-way communication between the administrative offices and each classroom. Under current conditions, the only way many

teachers have to summon help in an emergency is to send a student to the office.

- Bus and automobile loading and unloading areas must be located and configured to provide safe pick-up and delivery of students.
- Exterior and parking lot lighting must be adequate to provide security.
- Adequate paved parking must be provided.

Statement of Equality Issues, High Schools

Size

The optimum size for a high school is approximately 1,000 to 1,100 students with a core facility for 1,400 students. No high school should exceed 1,400 students. To manage enrollment, the committee recommends an annual review of attendance lines and a willingness to redraw them when necessary. At overcrowded schools, special attention should be given to reducing the number of non-resident students.

Requirements

- Requirements under the Americans with Disabilities Act (ADA) must be met.
- Provide classroom space properly designed and appropriately equipped for all students and programs, including those with special education needs.
- Science labs must be properly equipped with adequate dedicated space for storage and separate preparation rooms.
- Adequate dedicated spaces for music and art are essential including the necessary storage.
- Core areas should include gymnasium, auxiliary gymnasium, cafeteria, auditorium, media center/library and computer labs. These areas must be large enough to accommodate students and faculty in reasonable comfort.
- Until cafeteria space problems can be resolved, short term solutions should be attempted. These include consideration of a 4th lunch period and establishing a lunch program at Arnold R. Burton.
- Outside play fields should be adequate to support the physical education and team sport functions.

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- Dedicated space essential for administrative functions (administrative offices, guidance offices, conference rooms and storage areas) must be provided.
- Faculty should be provided with a lounge of adequate size and work areas with a dedicated space for planning and preparation.
- Students need adequate lockers which do not require sharing.

Safety

- Administrative offices must be located and configured to provide visual control of all unlocked entrances allowing for observation of unauthorized visitors.
- An intercom system should be provided for two-way communication between administrative offices and each classroom.
- Bus and automobile loading and unloading areas must be located and configured to provide safe pick-up and delivery of students/.
- Adequate paved parking must be provided including exterior security lighting.

Implementation Strategies

Strategies to accomplish the objectives take the form of specific proposed facility improvements in the construction phasing schedule. The phasing schedule which is listed below is found in Section 5, Prioritization of Selected Options in *The 1997 Comprehensive Facilities Study of the Roanoke County School System*. For specific project details, the reader should refer to Section 4, Recommendations in *The 1997 Comprehensive Facilities Study of the Roanoke County School System*.

Phase I 1997-2002

New Pyramid V High School and Sports Complex
Glenvar Middle School Separation/High School
Auxiliary Gymnasium and Band Room
Proposed Bonsack Elementary School
Burlington Elementary School
Clearbrook Elementary School

Phase II 2001-2006

Cave Spring Middle School
Roanoke County Career Center
Arnold R. Burton Technology Center
Oak Grove Elementary School
Mount Pleasant Elementary School
Mountain View Elementary School
Northside High School
Glenvar High School
Cave Spring High School

Phase III 2004-2009

Land Acquisition for New South County
 Elementary School
Glenvar Elementary School
Mason's Cove Elementary School
Bent Mountain Elementary School
Penn Forest Elementary School
Glen Cove Elementary School
Herman L. Horn Elementary School
W.E. Cundiff Elementary School
Green Valley Elementary School
Northside Middle School
William Byrd Middle School
Fort Lewis Elementary School
Cave Spring Elementary School
William Byrd High School
Hidden Valley Middle School
Back Creek Elementary School

4. PUBLIC SAFETY

Introduction

Public safety includes the services provided by the County Sheriff's Office and the Fire and Rescue and Police Departments. This element of the Community Plan recognizes that the level of service provided by these departments is a significant factor in the quality of life enjoyed by the County's residents. The strong growth that Roanoke County is experiencing is paralleled by demand for additional services from these departments. Roanoke County must strike a balance between land use decisions and the sustainability of providing appropriate levels of public service.

The primary mechanism for ensuring a well-balanced and adequate public safety system is through the Capital Improvement Program (CIP). The County's Capital Improvement Program guides the development of facilities over a five year period. It shows the arrangement of projects in a sequential order based upon a schedule of priorities and assigns an estimated cost as well as an anticipated method of funding of each project. The Capital Improvement Program provides the financial foundation necessary to implement plans.

The following Goal, Issues and Opportunities and Objectives apply to all three areas of public safety: Sheriff's Office, Fire and Rescue Department and the Police Department. Following the Objectives are specific Implementation Strategies for each of the three public safety areas.

Goal

To provide the highest level of public safety services in the most cost-effective manner.

Issues and Opportunities

- The County strives to provide the efficient delivery of public safety services with minimal response times.
- There are opportunities for increased community involvement and educational programs in the public safety areas.
- There are opportunities for enhanced intergovernmental cooperation in the provision of public safety services.

Objectives

- A. To provide for the safety of all of Roanoke County's citizens, businesses and visitors.
- B. To protect the rights and property of all citizens within the boundaries of Roanoke County.
- C. To cooperate and coordinate with neighboring jurisdictions to provide the most effective and cost-efficient services to County residents.
- D. To inform and educate County citizens about all aspects of public safety.

Police Department

Introduction

Roanoke County Police Department (RCPD) is committed to ensuring that citizens continue to trust the department to provide reliable and effective law enforcement service. The services provided by the RCPD meet or exceed the Commonwealth of Virginia Department of Criminal Justice Services Commission Standards and the stringent standards required for national accreditation. Existing department programs which were enhanced through the accreditation process include: criminal investigations, traffic enforcement, domestic violence, crime prevention, criminal apprehension and community-involved policing. Citizen safety and well-being are of paramount importance to the department.

Implementation Strategies

- 1. Provide the necessary resources to the Roanoke County Police Department to meet the existing and projected needs of County residents. (Obj. A, B, C, D)
- 2. Reduce patrol response times by reevaluating existing patrol districts and maximizing staffing resources. Any modifications to patrol districts should utilize existing community centers and the topographic features of the County. (Obj. A, B, C)
- 2. Continue to expand drug awareness programs by working with the Roanoke County School Board to assist in funding increases in D.A.R.E., the D.A.R.E. Camp and middle school D.A.R.E programs. Utilize the School Resource Officer program to impact drug use in the schools. (Obj. D)

4. Increase community participation in crime control by actively involving the citizens and businesses of Roanoke County in a variety of crime prevention programs. Such programs include: Neighborhood Watch, Business Watch, Citizens Police Academy and other similar programs. (Obj. D)
5. Maintain National Accreditation (CALEA) Status. National Accreditation serves as a management tool to standardize and professionalize the Roanoke County Police Department. (Obj. A, B)

Fire and Rescue Department

Introduction

The Roanoke County Fire and Rescue Department (RCFRD) is committed to providing the most effective and efficient level of fire prevention, suppression and emergency medical services to the residents, business and visitors of Roanoke County. The department is committed to maintaining and enhancing its services while it maximizes the use of taxes and other resources.

Implementation Strategies

1. Examine the existing facilities, equipment and personnel to determine where the demand for services has increased faster than the provision of services. Develop a comprehensive plan to address the deficits in existing services, to minimize response times and project where future improvements will be needed. (Obj. A, B, C)
2. Encourage and provide opportunities for public participation and training in fire prevention and safety as well as first aid and CPR. (Obj. D)
3. Recognize the challenges associated with using a volunteer system. Staff resources are extremely limited during the day when many volunteers are at their day jobs. During the neighborhood planning process the need for new volunteers was identified as a challenge confronting many of the rural fire and rescue stations. Response times for fire and rescue services are constantly monitored and evaluated. (Obj. A, B, D)
4. Take advantage of new technologies to update and improve the County's dispatch and communication systems and establish a regional emergency communications center. (Obj. A, B, C)

Sheriff's Office

Introduction

The primary duties of the Roanoke County Sheriff's Office are to provide a secure and safe environment in the courtrooms for all members of the judiciary and the public. Additionally, the Sheriff's Office is responsible for providing a safe and secure environment for all inmates housed in the Roanoke County-Salem Jail and to serve all civil process orders in a timely manner.

Implementation Strategies

1. Construct a regional juvenile detention center. This facility will eliminate overtime and be a more cost effective and efficient method for the detention of juveniles. (Obj. A, B, C)
2. Continue to learn about and pursue technological innovations in justice administration. The devices and monitoring systems can free up jail space for more serious offenders as well as eliminate the costs of constructing additional space. (Obj. A, B)
3. Explore opportunities for the use of private contracts to provide full detention services and the more basic tasks associated with the administration of courts and detention centers. Exploring these opportunities should be part of an annual review so as to offer the most cost effective system as possible. (Obj. A, B)

5. PUBLIC UTILITIES

Introduction

Public utilities available in Roanoke County include water supply and production, water distribution, sanitary sewer collection, solid waste management, electrical service, telephone service, natural gas distribution and cable television. Public water production and distribution, and sanitary sewer services that are provided by the Western Virginia Water Authority (WVWA). Transfer of solid waste to the regional landfill and the management of that landfill is the responsibility of the Roanoke Valley Resource Authority.

This section of the Community Plan discusses two public utility services - water and sewer, which individually and collectively, greatly influence growth in Roanoke County. The provision of these services to a previously unserved area will encourage growth and development in that community. As we learned over the last 10 years, the lack of water and sewer services to an area does not necessarily mean that community will not experience growth. Past history has shown that growth may still occur, but it will likely be at lower densities. As development pressures increase, the communities may experience the failure of wells and on-site septic tank/drainfield systems.

As a community Roanoke County must recognize the influence that public water and sewer services and internal policies concerning fees, fee rebates and cost sharing have on growth management. The policies of the WVWA must be consistent with County policies concerning issues of land use, economic development, schools and the provision of public services such as police, fire and rescue.

The WVWA is charged with providing public water and sewer service to the citizens of Roanoke County and Roanoke City. This Authority operates as an enterprise fund and receives no direct general fund tax dollars. As a result, the Authority is funded solely from the collection of water and sewer fees from the citizens of Roanoke County and Roanoke City.

The WVWA is responsible for providing and maintaining a safe drinking water supply. The predominant source of this water for Roanoke County is the Spring Hollow Reservoir, which when full, holds 3.2 billion gallons of water. The reservoir can meet Roanoke County's water needs past the year 2040.

Distribution of water from the Spring Hollow Reservoir is provided via two transmission lines. The 30-inch diameter South Transmission Line begins at the Spring Hollow water treatment facility, terminates along U. S. Route 220 in the Clearbrook Community and serves major areas of southwestern Roanoke County between these two points. In addition, portions of southwest Roanoke City are served by the South Transmission Line. The north loop begins at Route 11/460 near Cherokee Hills and proceeds to Route 311, along Loch Haven Road to the Plantation Road area and includes a parallel line from Dixie Caverns to the Fort Lewis area. Major areas served by the North Transmission Line include the I-81 corridor between Dixie Caverns and Plantation Road. Also served are portions of northeast Roanoke City.

The WVWA continues to have limited dependence on ground water wells. Currently, approximately 22 wells located in Roanoke County supply drinking water. More than forty wells have been taken off-line since the construction of the Spring Hollow Reservoir. In

In addition, the WVWA has the capability of purchasing approximately 0.2 million gallons per day from the City of Salem.

The WVWA is responsible for maintaining the wastewater collection system, including sewage pump stations for the wastewater conveyance system located in Roanoke County. Roanoke County participates in the regional wastewater treatment plant that is owned and operated by the WVWA.

Roanoke County, Botetourt County, the Town of Vinton and the Cities of Salem and Roanoke are participating in an upgrade of the regional wastewater treatment plant.

The WVWA has completed a Capital Improvement Plan through the year 2006. This Plan includes the most critical needs in the areas of water and sewer service that can reasonably be funded and constructed within the 2001-2006 timeframe. The WVWA develops a new Capital Improvement Plan every five years.

6. STORMWATER MANAGEMENT

Introduction

Stormwater management is the planned control of surface water runoff that results from rainfall. The goal of stormwater management is to prevent flooding and pollution.

All development creates an impact to the overland flow of rain water. Studies have shown that there is a direct correlation between development and water quality degradation/flood volume. This element of the Community Plan provides direction for ensuring that development impacts are mitigated by stormwater management facilities and water quality best management practices.

A number of regulatory and safety factors influence stormwater management in Roanoke County. These include local, state, and federal regulations such as the Roanoke County Stormwater Ordinance, the Virginia Stormwater Management Handbook, and the County's Virginia Pollutant Discharge Elimination System MS-4 Permit # VAR-040022. Following are the stormwater goals of Roanoke County. (1) Prioritizing drainage basins which need improvement through stream inventories and watershed impact assessment. (2) Addressing pollutant load and flood reduction techniques. (3) Inventorying stormwater management facilities and their condition through the storm sewer system mapping program. (4) Recommending capital improvement projects to improve stormwater quality.

The primary issues of concern for the stormwater management section of the Roanoke County Community Plan are to (1) Minimize the impact of drainage on private property, (2) Alleviate existing stormwater problems, (3) Manage stormwater discharge control, (4) protect water and stream quality, and (5) Research potential stormwater management financing methods. The objectives and implementation strategies of this section direct Roanoke County to monitor maintenance of existing stormwater facilities and will also work towards meeting or exceeding the compliance requirements of the Federal Government's National Pollutant Discharge Elimination System.

Objectives and implementation strategies are presented to address the five primary issues of the Roanoke County Community Plan. Performance standards for stormwater discharge will be applied to new development to prevent downstream degradation. These standards will be imposed through regulations, but alternative methods such as low impact development methods or developer contributions to public facilities may be provided, where feasible. Detailed drainage system studies are proposed to identify feasible off-site discharge control opportunities and to identify other drainage conditions which warrant County action. More general policies for preserving water quality include the protection of natural drainage corridors and the incorporation of water quality consideration into various aspects of stormwater management. Implementing riparian buffer regulations to filter run-off, reducing stream temperatures, providing open space and wildlife habitat and preventing development of parking lots and structures within close proximity of a stream corridors are all means of water protection.

Many drainage issues involve conditions that raise questions concerning the division of public and private responsibility. Policies concerning existing conditions emphasize a thorough study to

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identify conditions which may warrant County action either to correct problems on County property or to assume a new level of responsibility for those that are now considered private property. The creation of a framework for informed decisions concerning the expansion of the County role is proposed.

The County has also determined that regional stormwater management facilities can provide a viable alternative to individual on-site controls and will work to include regional facilities as an important component of the countywide stormwater management program.

Stormwater management regulations should be revised where applicable, so that land development activities can be reviewed and developed from a watershed-wide perspective. Until such time, regional or community facilities should be approved on a case-by-case basis taking into consideration all state and federal stormwater management compliance regulations. .

In summary, the Stormwater Management Policy presented in this section emphasizes prevention of future problems and the development of information and procedures necessary for a proper evaluation of stormwater management practices. Consistent with the nature of the Community Plan, the policy is general and is intended to be a guide for more specific implementation actions.

Issue #1

Drainage on Private Property

Objectives

- Reduce future property damage, nuisance flooding and requests for public assistance.
- Protect water quality and reduce the potential for flooding and erosion damage by preventing encroachment into natural watercourse areas.
- Continue storm sewer drainage system studies to identify existing and future flooding and erosion damage.
- Re-evaluate current County policy for stormwater basin inspections and maintenance acceptance.

Implementation Strategies

- Evaluate the existing floodplain regulations to determine if amendments are needed to reduce the exposure of new structures to flooding.
- Preserve the natural character of drainage ways.
- Apply appropriate standards for the alteration of private drainage facilities.
- Work to upgrade the County's floodplain mapping to provide more accurate data on future flooding evaluations.

Issue #2

Existing Stormwater Problems

Objectives

The current understanding of existing stormwater problems indicates a level of severity which demands substantial immediate action by the County. The current system of responsibility provides remedies either by the affected party or through legal measures to obtain relief from a party causing the problem. Nevertheless additional requests for County assistance can be expected, and will require an expanded County effort. Any actions to expand County responsibilities for the correction of existing stormwater problems should be supported by a thorough analysis of needs, proper solutions, and appropriate levels of public and private responsibility. These conclusions support the following objectives for policies related to existing stormwater problems:

- To provide a high level of performance for drainage facilities on County property and for facilities necessary to manage the off-site effects of drainage from County property.
- To establish the financial capacity, information base and decision criteria necessary for the County to assume responsibility of private drainage problems when conditions warrant such intervention.
- To recognize the validity of private responsibility for a large portion of the drainage system and to maintain a consistent, understandable, and supportive posture regarding private responsibilities.
- To increase coordination with V-DOT in urban Bio-infrastructure installation and maintenance.
- To develop a system for the identification, correction and financing of a comprehensive storm sewer illicit discharge connections program.

Implementation Strategies

The implementation strategies recommended below are intended to retain aspects of current practices which are working well, to adjust certain policies to minimize conflict over responsibilities, and to initiate expansion of County responsibilities for existing drainage systems when such expansion serves the public interest.

- Continue studies necessary to identify deficient drainage structures and conditions on County property, evaluate the effect of these conditions both on and off County property using watershed impact analysis, identify appropriate corrective measures, and establish priorities for implementation. The purpose of this policy may be accomplished as a part of the drainage basin studies recommended in other elements of the overall Stormwater Management Program as outlined in the current stormwater maintenance program and the County's Virginia Pollutant Discharge Elimination System MS-4 Permit # VAR-040022.
- Initiate studies necessary to identify feasible drainage projects on private property, establish the justification for County assumption of responsibility for these projects, and establish priorities for implementation. This policy may also be accomplished as part of a comprehensive drainage basin study.

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- Maintain annual capital budgeting for drainage improvements. Identify feasible projects which require scheduled maintenance and an annual budget. As the results of storm sewer system drainage studies identify additional projects, the budget level may be increased accordingly. Development of a drainage utility approach to funding shall be considered. Any program of sufficient magnitude to justify the creation of a drainage utility may require bond funding to support major capital costs in the early stages.
- Use guidelines which recognize need, equity, and public purpose in determining the appropriateness of the County assuming responsibility for privately owned drainage facilities.
- Develop an information/education program to increase citizen awareness of private drainage responsibilities and potential stormwater effects.
- Develop an ordinance prohibiting illegal discharges into the storm drain system.

Issue #3

Stormwater Discharge Control

Objectives

- Manage the stormwater effects of new development.
- Manage the stormwater effects of re-development.
- Manage stormwater quantity.
- Manage stormwater and stream quality.
- Correct and fund existing drainage deficiencies.
- To prevent significant increases in the potential for property damage, nuisances, or other negative impacts of stormwater.
- To equitably allocate the costs of controlling increases in stormwater discharge to properties which are the sources of the increase.

Implementation Strategies

- Controlling, through regulation or ordinance, stormwater discharge from new development in pre and post construction.
- To apply discharge control methods (stormwater best management practices) which are economically, aesthetically, and environmentally acceptable, as well as effective in stormwater management.
- Develop a system for stormwater discharge control which emphasizes regional/community facilities. In addition, appropriate levels of on-site control for new development should be applied to a particular site where immediate downstream degradation or flooding issues exist.
- Incorporate in site plan review, considerations for potential pre and post construction stormwater impact.
- Develop ordinance and regulation to prohibit illegal and illicit stormwater connections.

This general policy related to discharge is intended to combine the strengths of on-site and off-site approaches, while minimizing the weakness of either approach. Accomplishment may require studies to create a fee in lieu of on-site facilities when plans have been approved for better off-site improvements. These improvements may include strategically located improvements. Design criteria for the discharge control system will be subject to further detailed consideration, but the following are appropriate:

1. Control the peak flow for the two and twenty-five year storm events
2. No increase in peak discharge after development
3. Stormwater Best Management Practices that enhance water quality
4. Provisions for future maintenance
5. Authority and standards for the County to either require on-site performance, to accept alternative methods, or require fees in lieu of performance
6. A fee system based on the average cost of site control

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- Continue storm sewer drainage system studies to identify feasible regional facilities and other facility improvements that may be constructed as alternatives to on-site discharge control. The ongoing program of the storm sewer drainage system study will be necessary to establish the location and feasibility of regional facilities as part of the discharge control system.
- The storm sewer drainage system studies should also identify actions which can be taken to expand the capacity of existing drainage systems to accommodate increased flow. Structural modifications and channel improvements may be the preferred management approach in some situations.
- Continue to prioritize and evaluate watershed and urban bio-infrastructure health through the stream inventory and storm sewer system mapping programs.

Issue #4

Water Quality

Objectives

- To sustain a stormwater and stream water quality program which meets federal stormwater discharge permit requirements, state water quality standards and local needs.
- To preserve the natural character, ecological processing functions and biological integrity of drainage ways.
- To incorporate water quality considerations into County actions related to public facilities and development regulations.

Implementation Strategies

- Evaluate the County's stormwater and stream quality policies to meet federal stormwater discharge permit requirement, state water quality standards and to address local needs. Components of the County's plans should include discharge controls on new development, drainage basin and regional basin studies, illegal discharge identification and control, retrofit projects, water quality monitoring, and public education and participation programs.
- Preserve the natural character of drainage ways by greenway acquisition, flood prone area regulation, drainage corridor protection, public design and construction, and the application of other public resources that may be identified in the future. The intent of this policy is to apply the various powers and resources of the County to the preservation of natural features which prevent pollutants from entering streams and reduce potential economic cost due to flooding, stream erosion and urban Bio-infrastructure degradation.
- Incorporate water quality management practices into discharge control regulations and County design, construction and maintenance practices. Water quality and receiving water impacts will be considered during the design, construction, and maintenance of drainage facilities on County properties. Water quality will be fully considered as one of the factors which may justify assumption by the County of responsibility for the maintenance of drainage systems, including existing facilities on property which is currently privately owned.
- Encourage where applicable, Low Impact Development Standards (LID's) to help alleviate stormwater quality or quantity issues within the county.

Issue #5

Stormwater Management Financing

Objective

- To develop an equitable system of stormwater financing based on relative contributions to the stormwater problem based on impervious surface assessment, water quality impact and watershed impact mitigation.

Implementation Strategies

- Develop a system for financing the public costs of controlling stormwater discharge from new development. A development fee system and/or stormwater utility district confined to basins with regional controls may provide financing for public facilities to be used instead of on-site controls.
- Use general County revenues to finance the correction of drainage deficiencies affecting existing development until annual costs reach a level that justifies a drainage utility approach to financing. The storm sewer drainage system studies may identify additional needs and could lead to a substantially expanded County role in drainage facility construction and maintenance. If such an expansion should occur, the creation of a drainage utility approach to annual financing may be feasible. A drainage utility may be justified if widespread needs and long-term annual funding requirements are identified. Drainage utility fees may be charged to each property in the County based on the amount of uncontrolled runoff from the property as calculated by impervious area.
- Identify target areas for future stormwater management facilities.
- Investigate the feasibility of a regional stormwater management authority.

7. Transportation

Introduction

Roanoke County has become a vital employment, retail, residential, and entertainment center for Southwest Virginia. Along with this growth and expansion, the County is experiencing the consequent transportation dilemmas that much of the nation is undergoing. In order to remedy the problems, one must closely examine travel characteristics, statistics, and trends to gain insight into the quandary. The population of the United States increased 33% from 1970 to 1998, while the workforce increased 66% over that same period. That means that about 55 million more people are commuting daily to work and the majority of those, some 88%, travel in an automobile. That means over 48 million more commuters by automobile on the road every day. The incredible magnitude of the problem becomes clear when one examines the data and realizes that the amount of vehicle miles traveled is almost doubling (increased 72% from 1980 to 1998) while the amount of road mileage/capacity is holding steady as new roads are not being funded and built (total U.S. roadway lane-miles increased by only 3.6% during the same time period) (All statistics from Bureau of Transportation Statistics).

Comprehensive and forward-looking solutions are necessary to address these problems and to meet the transportation needs of Roanoke County residents, visitors, and businesses. The Transportation element of the Community Plan provides a policy and program framework for these solutions. Transportation projects and plans developed and implemented within Roanoke County are guided by this framework. By achieving the goals set forth in this Plan, Roanoke County will provide accessible, attractive, economically viable and environmentally sound transportation options that meet the needs of residents, employers, employees, and visitors for safe, convenient, and efficient travel.

The Virginia Department of Transportation (VDOT) and the Commonwealth of Virginia owns, constructs, and maintains all of the public roads in the County. However, the County does have considerable input and say into what transportation projects are supported and funded within the County; and a close working relationship is and will be maintained with VDOT on County transportation issues. Roanoke County will also continue to participate in the Roanoke Valley Area Metropolitan Planning Organization to continue comprehensive transportation planning and to promote and provide additional opportunities for effective citizen input in concert with neighboring jurisdictions. Utilizing this Transportation element of the Community Plan and working in coordination with adjoining localities and the aforementioned entities will enable the County of Roanoke to achieve the goals laid out herein.

It should be noted that this element of the Community Plan is a policy document rather than a transportation proposal; no specific projects or changes in traffic planning are mandated.

I. Transportation Components of Community Plan

A. Goal: To consider present and future transportation implications when making land use decisions.

i. Objective: To encourage growth where adequate roads and other transportation systems exist; to plan, design, and construct transportation infrastructure in areas where development is desired.

a. Strategy: ***Growth Management Measures*** -- Transportation is one of the keys that unlock the door to irresponsible growth. Without the emergence of transportation, sprawl and suburban development would not exist. Additional transportation infrastructure, if not planned and placed in a reasonable context, leads to a furtherance of ad-hoc sprawl. The question arises, if transportation is a key factor in the creation and growth of sprawl, how is it a growth management tool?

Every metropolitan area in the nation is shaped by the way its public infrastructure is financed and by the timing and geographical sequencing by which that public infrastructure is built. Generally, infrastructure can be financed by developers or by taxpayers; it can be targeted geographically according to a specific desired sequence; or it can be allowed to be constructed anywhere within the area. By design or by accident, these policies help to determine the geographical pattern of growth within a region.

Therefore, a growth management policy is simply an attempt to deliberately use public land acquisitions, land use regulations, and infrastructure investments to contain, influence, or direct growth to specific geographical locations to meet the needs of the locality. While Roanoke County may not be experiencing the population explosion that other areas are, it is imperative that the County encourage development in designated growth areas in order to support efficient expansion of infrastructure and services, including transportation facilities. Similarly, the County should attempt to negate taxing the existing transportation infrastructure with over-development by ensuring that if the existing roadway cannot handle the expected trips generated by a proposed development, then accommodations would be made by the developer or the taxpayers to safely and efficiently carry the expected traffic levels.

As the Roanoke Valley continues to grow, the demands of an increasing population create potential threats to the County's quality of life: threats such as eroding livability, declining mobility, and rising transportation costs. Without careful planning designed to manage this new growth, these threats could become

reality.

b. Strategy: ***Balance Land Use Objectives with Street Functional Capabilities*** -- Transportation road networks provide two divergent objectives (see Figure T-1). One objective is to provide efficient mobility from one location to another, usually accomplished at the sacrifice of limiting access to adjacent land (e.g., limited access highway/freeway). The other objective is to provide access to each parcel of land, usually at the sacrifice of rapid, efficient movement from location to location (e.g., local or subdivision road). In between these two extremes of the transportation network spectrum, you will find many of the roadways that are located in Roanoke County.

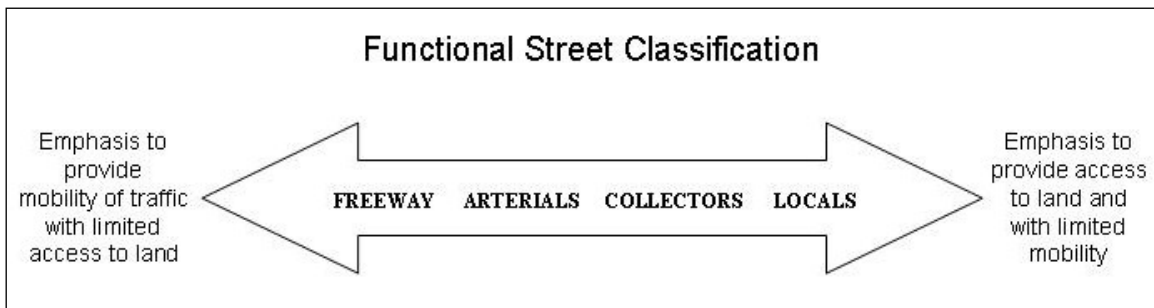


Figure T-1: Objectives/Emphasis of Functional Street Classifications

It is important to first establish and then assign a functional street classification to each roadway within the County; and then to institute a policy framework for balancing our land use objectives with the functional street classifications. The idea behind this practice is to ensure that inadequate roads, or roads that were never intended to handle large traffic volumes, are not overtaxed. It is also the intent of County staff to ensure that the access requirements of each land use designation are properly addressed by the roads in the respective classifications.

Rather than “reinventing the wheel”, the County will utilize the Virginia Department of Transportation (VDOT) functional street classifications. This is done for uniformity and clarity since the County is already using VDOT street classification in its Pavement Management System (mentioned in this element of the Community Plan). VDOT’s functional classifications are based on mobility and accessibility. The streets and highways are grouped into

classes according to the character of service they are intended to provide. The VDOT system parallels the federal classification system except that Federal Major Collectors are designated as Minor Arterials in the State system.

The two major categories of roadways are Rural and Urban Functional Classification Systems. The distinction between Rural and Urban is based on population figures reported by the Bureau of Census. An Urbanized area is defined as one having a population exceeding 50,000 people. A Small Urban area is designated by the Bureau of Census having a population between 5,000 and 50,000. Rural areas are all areas not designated Urbanized or Small Urban (i.e., less than 5,000 people).

Under the heading of Rural Functional Classification System, the classifications and their subsequent criteria and characteristics are as follows:

- **Rural Principal Arterial** (e.g., US 220, between Franklin County line and Blue Ridge Parkway)
 - Serves corridor movements of substantial statewide or interstate travel;
 - serves all urban areas of 50,000 and over population and a majority of those over 25,000 people;
 - provide an integrated network without stub connections;
 - Primary function is the movement of traffic, access for individual properties is a secondary consideration
- **Rural Minor Arterial** (e.g., VA 221, between Floyd County line and Rte. 688 Cotton Hill Rd)
 - Link cities and large towns;
 - Provide service to corridors with trip lengths and travel density greater than those served by rural collectors or local systems;
 - Design should be expected to provide for relatively high overall speeds with minimum interference to through movement;
 - Direct access to individual property owners is discouraged.
- **Rural Major Collector** (e.g., VA 311 Catawba Valley Drive, from ¼ mile North of Rte 419 to Craig County line)
 - Provide service to larger towns not directly served by higher systems;
 - Link the larger towns to nearby larger towns or routes of higher classification;

- Serve the more important intra-county travel corridors;
- Entrance controls (such as turn lanes, signals, signs, combined access points, etc.) should be utilized.
- **Rural Minor Collector** (e.g., VA 711 Tinsley Road, near Bent Mountain Elementary School)
 - Spaced at intervals consistent with population density;
 - To collect traffic from local roads and bring all developed areas within a reasonable distance of a collector road
 - Provide service to the remaining smaller communities.
- **Rural Local** (e.g., VA 617 Pitzer Road, from Blue Ridge Parkway to Franklin County line)
 - Serves primarily to provide direct access to adjacent land;
 - Provide service to travel over relatively short distances as compared to collectors or other higher systems;
 - Includes all facilities not on one of the higher systems.

The Urban Functional Classification System includes the following classes and criteria:

- **Urban Principal Arterial** (e.g., Rte. 11 Williamson Road, between Roanoke City and Botetourt County lines.)
 - Serves the major center of activity of a metropolitan area;
 - Highest traffic volume corridors;
 - Roads serving the longest trip desires;
 - Carry a high proportion of the total urban area travel on a minimum of mileage
 - Limited access highway, direct access to individual properties is controlled.
- **Urban Minor Arterial** (e.g., VA 720 Colonial Avenue, from Roanoke City line to Rte 221 Brambleton Ave.)
 - Should interconnect with and augment the urban principal arterial system and provide service to trip of moderate length at a lower level of travel mobility than principal arterials;
 - Includes all arterials not classified as a principal and contains facilities that place more emphasis on land access and offer a lower level of traffic mobility.
- **Urban Collector** (e.g., VA 630 Kessler Mill Road, from the City of Salem line to Rte 311)

- Provides land access and traffic circulation within residential neighborhoods, commercial, and industrial areas;
 - Distributes trips from the arterials through these areas to their ultimate destination;
 - Collects traffic from local streets and channels it to the arterial system.
- **Urban Local** (e.g., VA 1658 Cresthill Drive, from Rte 682 Garst Mill Rd to Rte 1647 McVitty Rd)
- Serves primarily as direct access to abutting land;
 - Serves as access to the higher order systems;
 - Through traffic movement is deliberately discouraged
 - All facilities not on one of the higher urban systems.

Once the functional street classification system is applied to the County's roads, the next step is to establish the framework for balancing land use objectives with those classifications. The following table, Table T-1, serves to accomplish that goal. In the first column are the County's/VDOT's functional street classifications. The second column contains the County's various land use designations that staff recommends as applicable and pertinent to the street classification. The land use designations are used to identify areas around the County where similar land use activities occur, and are used in conjunction with the Future Land Use Guide and this Community Plan (please refer to *Roanoke County Community Plan Land Use Guide* for further explanation of the designations).

Functional Street Classification	Applicable Land Use Designations
Rural Principal Arterial	Rural Preserve Rural Village Village Center
Rural Minor Arterial	Rural Preserve Rural Village Village Center
Rural Major Collector	Rural Preserve Rural Village
Rural Minor Collector	Rural Preserve Rural Village Conservation
Rural Local	Rural Preserve Rural Village Conservation
Urban Principal Arterial	Transition Core Principal Industrial
Urban Minor Arterial	Transition Core Development
Urban Collector	Neighborhood Conservation Transition Development
Urban Local	Neighborhood Conservation Development

Table T-1: Functional Street Classifications vs. Land Use Designations

For example, consider the land use designation “Core”. As defined by the *Land Use Guide*, Core is a future land use area where high intensity urban development is encouraged. Land uses within core areas may parallel the central business districts of Roanoke, Salem, and Vinton. Core areas may also be appropriate for larger-scale highway-oriented retail uses and regionally-based shopping facilities. Some common Core land use types are: general retail shops and personal services, office and institutional uses, and limited industrial uses. One of Core’s land use determinants is access. Locations that are or can be served by an arterial street system are grouped into the Core category. Therefore, based on these determinants and the criteria outlined in the *Land Use Guide* for the Core designation, it is sensible to recommend Urban Minor Arterial and Urban Principal Arterial as the functional street classifications that could accommodate development that could occur in the Core areas. Urban Local and Urban collector roads would not address the requirements of most Core area

developments, hence they are not recommended.

It is important to point out that the recommendations presented in Table T-1 are not requirements or to be viewed as deterrents to a developer. Rather, they should be seen as a guide for developers and County planners in making land use decisions. A prospective developer or planner could determine what land use designation the prospective site is located in and the functional classification of the road serving the development, refer to Table T-1 in this document, and determine whether the adjacent roadway is capable of meeting the needs of the development. Once again, this policy framework is not intended to be a disincentive or restriction to development, but rather a planning tool to aid in balancing the established land use objectives with the capabilities of the road network that serves them.

Utilizing the information in Table T-1 is but one idea to balance land use objectives with street functional capabilities. County staff is coordinating with VDOT to develop strategies to determine the existing level of service of all roads in the County and then to use that data to better enable planning decisions. Level of service, or LOS, is a quality measure describing operational conditions within a traffic stream, generally in terms of such service measures as speed and travel time, freedom to maneuver, traffic interruptions, and comfort and convenience. Letters designate each level, from "A" to "F", with LOS A representing the best operating conditions and LOS F the worst. Level of Service is defined in the *Highway Capacity Manual*, published by the Transportation Research Board. General definitions of levels of service, as provided in the *Highway Capacity Manual* are as follows:

LOS A describes completely free flow conditions at average travel speeds. Vehicles are almost completely unimpeded in their ability to maneuver within the traffic stream.

Operations are constrained only by the geometric features of the highway and by driver preferences.

LOS B represents reasonably unimpeded operations at average travel speeds. The ability to maneuver within the traffic stream is only slightly restricted and stopped delays are not bothersome. The general level of physical and psychological comfort provided to the drivers is still high.

LOS C represents stable operations. Freedom to maneuver within the traffic stream is noticeably restricted and lane changes require more care and vigilance on the part of the

driver. Minor disruptions can cause serious local deterioration in service, and queues will form behind any significant traffic disruption.

LOS D is the level at which speeds begin to decline slightly with increasing flows and density begins to increase somewhat more quickly. Freedom to maneuver within the traffic stream is more noticeably limited, and the driver experiences reduced physical and psychological comfort levels.

LOS E describes operation at capacity, an unstable level. At capacity, the traffic stream has no ability to dissipate even the most minor disruption, and any incident can be expected to produce a serious breakdown with extensive queuing. Operations at this level are volatile, because there are virtually no usable gaps in the traffic stream. Maneuverability within the traffic stream is extremely limited, and the level of physical and psychological comfort afforded the driver is poor.

LOS F represents breakdowns in vehicular flow. This level characterizes arterial flow at extremely low speeds below one-third to one-quarter of the free flow speed. Intersection congestion is likely at critical signalized locations, with high approach delays resulting.

The *Highway Capacity Manual* contains no recommendations for the applicability of the levels of service in highway design. That is to say there is no “official” standard as to the minimum acceptable level of service. The choice of an appropriate level of service for design is properly left to the highway designer and the local agencies. Representatives from VDOT state that they do not have formal guidelines for this matter, rather they refer to the Green Book, otherwise known as *A Policy on Geometric Design of Highways and Streets*, published by the American Association of State Highway and Transportation Officials (AASHTO). The guidelines set forth in that document are as presented in Table T-2.

Appropriate LOS for specified combinations of area and terrain type				
Functional Class	Rural level	Rural rolling	Rural mountainous	Urban and Suburban
Freeway	B	B	C	C
Arterial	B	B	C	C
Collector	C	C	D	D
Local	D	D	D	D

Table T-2: Guidelines for acceptable minimum LOS standards

Roanoke County will strive to provide the highest level of service practical. County staff will coordinate with VDOT in reviews of traffic impact studies to ensure that these guidelines are met. If the minimum acceptable standards are not met, staff will consult with VDOT as to what mitigation matters, if any, are necessary to meet the standards. County staff should research ordinances that other states/local agencies have implemented that affect development when it is shown that the development project significantly degrades the level of service.

Along the same lines of thought, the County staff, specifically the Traffic Engineering department, desires to reserve the right to request a traffic impact study in situations where staff feels it is necessary. The conditions that could trigger a request for a traffic impact study include: rezoning or special use permit request that is inconsistent with Community Plan; potential impacts upon local and/or regional road networks; the site generates or attracts 100 total trips or more per hour during the adjacent street peak hour; among others. Currently, only the Virginia Department of Transportation or the Director of the Department of Community Development can request a traffic impact study.

c. Strategy: *Long Range Transportation Plan issues* -- Federal regulations, implemented as a result of the Transportation Equity Act for the 21st Century (TEA-21), require urbanized area MPO's (Metropolitan Planning Organization) to develop and approve a financially constrained long range multimodal transportation plan. The Long Range Transportation Plan (LRTP) is intended to guide the region in creating a more efficient, responsive, and environmentally-sensitive transportation system over the next twenty to twenty-five years. The plan examines transportation issues/trends and offers a list of specific projects for addressing the region's mobility needs. The LRTP provides the context from which the region's Transportation Improvement Program (TIP), a capital improvement program for implementing highway, transit, and bikeway projects, is drawn.

VDOT prepares travel demand forecasts using computer simulation models that relate travel demand to socioeconomic factors. Using the computer model, trips forecasted for the horizon year are assigned to the existing plus committed transportation network. The resulting traffic distribution is then analyzed to determine at what Level of Service (LOS) the traffic would operate. Recommendations are then made to eliminate existing and projected deficiencies in the network.

The Roanoke Valley MPO is required to conduct a review of the LRTP on a periodic basis, ideally updating the LRTP every five years. The review takes into account changes in socioeconomic and land use factors and trends. It also includes an evaluation of how well the travel demand forecasting process simulates actual travel. County staff works with the Roanoke Valley MPO and the RVARC to consider VDOT's recommendations and compare those recommendations and projects to the County's future land use, zoning, impacts to the corridor, smart growth factors, etc. The final product, following the County's review and submittal to VDOT, is an updated LRTP. The plan may also be amended as a result of changes in projected Federal, State and local funding, major improvement studies, congestion management system plans, interstate interchange justification studies, and environmental impact studies.

Please refer to Table T-3: *Roanoke Study Area 2025 Recommendations & Priorities* for the routes on the current LRTP and the recommended improvements (as submitted by Roanoke County staff. For the approved 2025 LRTP, see the Roanoke Valley-Alleghany Regional Commission website -- <http://www.rvarc.org/work/lrpfinal.pdf>). This represents a prioritized list of the County staff's recommendations and comments for each road section that VDOT has recommended based on their models. Note that the "U" and "R" designations in the "VDOT/Roanoke Co. Recommends" column represent Urban and Rural, respectively. The number that follows the "U" or "R" is the number of lanes proposed.

It should be pointed out that the County has recommended allocation of funds (relatively more than has been allocated in the past) to be set aside for miscellaneous items such as traffic signals, signal optimization, spot improvements, intersection re-design, transit, bike and pedestrian improvements, and technological solutions to transportation deficiencies.

*Long Range Plan*Roanoke Study Area 2025 Recommendations & Priorities
Jurisdiction -- Roanoke County (Primary Routes)

Priority	Primary Route	Facility	From	To	Length (mi)	Exist. Lanes	VDOT Recommends	Roanoke Co. Recommends	Roanoke Co. Comments
1	11/460	Lee Hwy	Rte 612	WCL Salem	1.91	3L	R4L	R4L	Already being done; could be removed from list
2	221	Bent Mtn.	1.05 mi W 694	.35 mi S Rte 897	3.34	2L	R4L	R4L	4L prior to this section; properties have already been bought through S-turns, some plans have been done
3	11	Williamson	Roanoke CL	Rte 117	1.49	2L	U4L	U4L	Agree, don't want a bottleneck; high priority for County
4	115	Plantation	Roanoke CL	Rte 11	2.19	2L	U4L	U4L	R-O-W has been bought, wide R-O-W; a lot of development in area; widen this takes traffic off Peters Cr.
5	220	Franklin	S Rte 715	Roanoke CL	3.72	4L	R6L	U6L/R6L	Why not continue to Franklin Co. Line? U6L from Roan. City line to Yellow Mtn Rd, R6L from Yellow Mtn Rd to Franklin CL
6	116	Jae Valley	Rte 664	Roanoke CL	1.24	2L	R4L	R2 24'	Downgrade to R2 24'; goes under BR Parkway; keep on the list, very important for Smith Mtn Lake
7	460	Challenger	Roanoke CL	Botetourt CL	1.98	4L	R6L	U6L	Change to U6L; proposed commercial development in this area
8	419	Electric Rd.	Rte 220	Starkey	0.83	4L	U8L	U8L or U6L	For planning purposes keep it 8-lane? 8 lanes probably won't work, would hurt real estate, 8L not the answer; need to focus on 220 interchange; possibly 6L or 4L with frontage roads
9	419	Electric Rd.	Starkey	SCL Salem	4.58	4L	U6L	U6L	Agree, especially if upgrade section prior to this one
10	116	Jae Valley	Franklin CL	Rte 664	1.94	2L	R2 24'	R2 24'	Smith Mtn Lake big attraction; lots of curves and bad terrain; would be major \$ to increase lanes
11	221	Brambleton	Rte 689	Rte 419	0.99	4L	U6L	U4L	4L should accommodate traffic volumes; major impacts if widen; may be removed from list

Table T-3: Roanoke Study Area 2025 Recommendations & Priorities – Primary Routes

Long Range Plan
Roanoke Study Area 2025 Recommendations & Priorities
Jurisdiction -- Roanoke County (Secondary Routes)

Priority	Secondary Route	Facility	From	To	Length (mi)	Exist. Lanes	VDOT Recommends	Roanoke Co. Recommends	Roanoke Co. Comments
1	601	Hollins	Rte 115	083 mi S Rte 627	1.36	2L	R2 24'	R2 24'	On 6-yr plan; R-O-W already acquired
2	720	Colonial	Penn Forest	Electric Rd	0.53	2L	R2 22'	R2 24'	On 6-yr plan; being designed as R2 24'
3	679	Buck Mtn	Starkey	Rte 220	2.25	2L	R2 24'	U2L	Proposed development in area; BR Parkway in area; change to Urban designation on whole section
4	613	Merriman	Starkey	Rte 1640	1.16	2L	R2 24'	U2L	On 6-yr plan; Scoping meeting held; upgrade to U2L
5	634	Hardy	Vinton CL	Bedford CL	0.99	2L	U4L	U4L	Industrial park in the area; some R-O-W being acquired; BR Parkway passes over section; keep U4L
6	904	Starkey	Rte 613	Eden Ave	1.39	2L	U4L	U4L	Lots of industry and residential development in area; U4L
7	625	Hershberger	Roanoke CL	Rte 115	0.60	2L	U4L	U3L (incl. TWTL)	Attempt to match Roanoke City recommendation
8	682	Garst Mill	Brambleton	Grandin	1.44	2L	U4L	U3L (incl. TWTL)	Residential, rough terrain; 4L too much, wouldn't fit in corridor; decrease to 1-through lane in each direction w/ Center Turn Lane
9	687	Penn Forest	Colonial	Starkey	1.25	2L	R2 24'	U2L	Change to U2L
10	720	Colonial	Brambleton	Penn Forest	0.34	2L	U4L	U2L	Change to U2L to match what's being built on Colonial & McVitty

Table T-3 continued: Roanoke Study Area 2025 Recommendations & Priorities – Secondary Routes

B. Goal: To make efficient use of Roanoke County's taxpayers' money allocated for transportation projects.

i. Objective: **To utilize staff expertise, knowledge, and abilities in making road improvement, design, and maintenance funding decisions.**

a. Strategy: ***Pavement Management System for***

Six-Year Secondary System Construction Plan and Revenue Sharing decisions --

The Six-Year Secondary System Construction Plan is VDOT's plan for the allocation of road construction funds for a six year period. The Six-Year Plan provides improvements to all roads with route numbers of 600 and above. It consists of a priority list of projects and a financial implementation plan. The Plan is based on local projects and priorities adopted by the County Board of Supervisors.

Roanoke County and VDOT are continuously reviewing and updating the Six-Year Plan. Staff receives requests throughout the year concerning secondary roads in Roanoke County. In deciding which projects should be included in the Six-Year Plan and/or Revenue Sharing program, staff considers traffic counts, existing and future development, pavement conditions, drainage, safety, and the economic benefit to the County. Staff will make an attempt to incorporate the CIP (Capital Improvement Program) and growth management strategies into their decision making process for the Six-Year Plan; but it must be pointed out again that the Six-Year Plan is only applicable to secondary roads and the budget for this program is currently very limited.

In the latter part of each year (usually November-December), VDOT and the Board of Supervisors hold a joint public hearing about these road improvement projects. After receiving public input, the Board of Supervisors adopts a resolution establishing the top priorities in road improvement projects for the next six years. As is usually the case, the Board of Supervisors approves a priority list of road improvement projects that would cost, in total, in excess of available funds over the six-year planning period. With such a list developed, subsequent VDOT Six-Year Plans can be prepared and revised in response to available annual funds.

The Revenue Sharing program is slightly different. Whereas State money exclusively is used to fund major road improvement/reconstruction projects in the Six-Year Plan, the County must contribute financial resources for Revenue Sharing projects such as routine/preventive maintenance and smaller scale improvement projects. VDOT annually provides counties the

opportunity to receive State matching funds for the construction, maintenance, and improvement to roads in the State's highway system. Roanoke County, a participant in the program, must match dollar for dollar Secondary road improvements within the County. The Commonwealth of Virginia allocates \$15 million for the matching program and limits localities to \$500,000 each (dependent on the number of counties that participate in the program, the value may be increased or decreased proportionately). VDOT and County staff review and evaluate streets and drainage requests throughout the year. There is also contact made with the County's Economic Development Department, Utility Department, and VDOT's area superintendents.

As a result of ever limited State and Federal funding, road construction funds must be carefully expended and road needs carefully identified and programmed. In the past, the County staff has used engineering judgment and opinion to select and prioritize road improvement projects in the County. However, the County is attempting to implement a pavement management system to identify maintenance options, help prioritize competing road sections for immediate attention, and anticipate future deterioration. Under the new system, the County will create and archive an inventory of all the roads in the County (utilizing staff GIS capabilities), assess the current condition of the road, select the appropriate treatment, prioritize the projects, and model its future budget requests. The pavement management system offers a rational, systematic approach, enhances professional judgment, and provides statistical backing for fund-allocations. The desired consequence of utilizing a pavement management system is selecting the *right* treatment, for the *right* road, at the *right* time, ensuring the tax-paying public gets the best value for their dollars. County staff has met with VDOT representatives to discuss their pavement management policy. VDOT uses a pavement management plan for the primary/interstate roads in the Salem District but do not presently have a plan in effect for the secondary/subdivision roads. VDOT has recommended that the County implement a plan for its secondary roads, predominantly for selecting and prioritizing projects in the Revenue Sharing program. VDOT staff has reviewed the software and methodologies that the County plans on using for its pavement management system and had no objections. Both entities have agreed to work in one accord on this undertaking to ensure the best results. At the writing of this element of the Community Plan, the inventory of the County roads is nearly complete and plans are being made to begin the condition assessment and subsequent work. Staff is confident that the implementation of this system is a

step towards providing smooth, safe, and economical road surfaces and achieving the best possible value for the available public funds.

(Note: Interested citizens should consult the most recent “*County of Roanoke Six Year Secondary System Construction Plan and Revenue Sharing*” document for a current, prioritized list of road improvement projects in the County. The document is available for review at the County office and/or on the County website.)

C. Goal: To guide the use of Roanoke County transportation infrastructure system to control air pollution, traffic, and livability problems.

i. Objective: To reduce Roanoke County’s dependence on single-occupant vehicle use as a primary mode of travel.

a. Strategy: *Bicycle Facilities & Greenways* --

Bicycle facilities

There are numerous benefits associated with bicycling. Bicycling offers health and fitness benefits through increased exercise; environmental benefits through reduced vehicular emissions; and transportation benefits by providing an alternative transportation option to the automobile. Bicycles may also serve as an excellent, all-around short-distance transportation alternative to the single-occupant vehicle for trips to work, schools, shopping, recreational facilities, and other intra-neighborhood destinations. The many benefits of bicycle facilities and reasons to invest in such infrastructure have been adequately explained in detail in both the *1997 Bikeway Plan for the Roanoke Valley* and the *Regional Bicycle Suitability Study - Phase I and II* (both documents can be accessed via the Roanoke Valley Allegheny Regional Commission (RVARC) website: <http://www.rvarc.org/bike/home.htm>, or by contacting either the RVARC, at telephone number (540) 343-4417, or the County Traffic Engineer, at telephone number (540) 772-2080, to obtain a hard copy of the documents). For that reason, this element of the Community Plan will not attempt to duplicate the valuable information contained in those documents; rather, explain how the County attempts to implement its bikeway plan.

The following disclaimer is presented in the *2003 Regional Bicycle Suitability Study*:

Note: For bicycle accommodations to be considered as part of roadway improvements using Federal and State funding,

the roadway must be included in an approved bikeway plan. The *1997 Bikeway Plan for the Roanoke Valley Area* (RVAMPO, 1997) is the approved bikeway document for the MPO, thereby fulfilling this requirement. As such, the *1997 Bikeway Plan* should be referenced when specific roadways are cited for bicycle accommodations. *Phase I* of the *Regional Bicycle Suitability Study* is not intended to supercede or replace the *1997 Plan* in this capacity. Instead it should complement the efforts and goals of the *1997 Plan* and facilitate the provision of bicycle accommodation in the MPO.

Due to the Virginia Department of Transportation's requirements and importance of having an adequate and complete list, the County is striving to provide input; not only on amendments to the *1997 Plan*, but in the creation of a region-wide, connected network of bicycle facilities that will hopefully be an end product of the *Regional Bicycle Suitability Study*.

The *Regional Bicycle Suitability Study* will consist of *Phase I* and *Phase II*. Whereas *Phase I* of the *Study* introduces the applicable computer models, provides detailed analysis and summary of survey responses, gives an overview of local, regional, state, and national bicycle facility planning efforts, and lays the groundwork for the project, *Phase II* of the *Study* will consist primarily of the application of work products developed in *Phase I*. A prioritized list of routes, corridors, destinations, and activity centers to be connected via a significant regional bicycling network; maps of existing and proposed bicycle facilities, and other spatial data relevant to the study; and potentially a new, approved, and updated bike plan are end products of *Phase II*.

The primary goal of the *Study* is to provide planners, transportation engineers, citizens, and bicycle coordinators and enthusiasts the tools and data for use in developing facilities and other accommodations to enhance safe bicycle travel within the MPO area. Data and tools developed as part of the *Study* are useful in identifying current and future problems facing the bicycling public, facilitating the planning and design of a bicycle-friendly transportation system, and determining possible options regarding operational and design requirements for new facilities. End products will assist stakeholders in establishing consistency and connectivity along travel corridors, developing crucial linkages with the greenway system and public transit, and developing other components of a regional bicycling network.

Development of a regional bicycling network will require coordination and cooperation among all stakeholders in the study area. As a geographic region composed of several jurisdictions, Roanoke Valley governments should coordinate bicycle facility improvements to ensure that travel corridors are consistent in and between jurisdictions in the study area.

As part of the *Regional Bicycle Suitability Study*, a planning committee, composed of interested stakeholders, was established to assist in various aspects of the study. Representation from a varied cross-section of stakeholders was sought in selecting members. The planning committee was composed of Regional Commission staff, local planning and traffic engineering staff (including Roanoke County staff), Greenway representatives, VDOT representatives, bicycling advocates, and citizens. The committee is assisting in the development of a regionally significant bicycling network by guiding the application of work products in *Phase II* of the *Regional Bicycle Suitability Study*, facilitating continued regional cooperation in bicycle facility planning, and data collection.

The new *Study* will make it easier for the MPO and the localities to develop a new bikeway plan to replace the *1997 Bikeway Plan*, but will not, in itself, be a replacement for the 1997 plan. Until a new plan is developed and adopted by the MPO, the 1997 plan will be the official plan that the County adheres to and thus, it is important to keep the 1997 plan up-to-date. Tools from the *Regional Bicycle Suitability Study* could be used to develop a new bicycle plan for the region in the next few years.

Rather than waiting for the completion of a replacement or update to the *1997 Plan*, the County will strive to utilize the computer models introduced and implemented in the *Regional Bicycle Suitability Study* to get a jump on the planning efforts. Before the design phase of scheduled road projects begins, County staff will attempt to measure the existing bicycle compatibility level and generate proposed options regarding an applicable bicycle facility; all the while consulting the *1997 Bikeway Plan*.

Study findings and work products will be available to localities in the region, and can be easily incorporated in the development of regional and local plans. Once the *Regional Bicycle Suitability Study* is complete and the localities have agreed upon a bicycle-friendly transportation infrastructure that has been developed on a regional basis (not only to meet existing demands, but also to encourage and facilitate bicycling as a viable means of

transportation in the Roanoke Valley), County staff recommends that the County Board of Supervisors adopt the new plan and that it is utilized as the County's approved plan.

In addition, the Virginia Department of Transportation released a memorandum in early 2003 stating their bicycle and pedestrian policies and procedures. In the memo, the Secretary of Transportation stated, among other things: that non-motorized transportation should receive the same consideration as motorized transportation in the planning, design, construction, and operation of Virginia's transportation network; and bicycle and pedestrian accommodations should be included in the design of all new highway facilities and all major highway reconstruction efforts, unless special circumstances exist that prevent their inclusion or a local governing body has formally requested that bicycle or pedestrian accommodations not be included. The Secretary declared that the new policies should be in place by end of the 2003 calendar year. That policy became effective on March 18, 2004 and applies to projects that have not yet reached the scoping phase. The "*Policy for Integrating Bicycle and Pedestrian Accommodations*" can be reviewed on VDOT's website. The County will keep abreast of the developments pertinent to VDOT's bicycle and pedestrian policies and procedures.

Ultimately, the County's objectives pertaining to bicycle facilities can be summed up in the following points:

- To complete a network of bikeways that serves bicyclists' needs, especially for travel to employment centers, commercial districts, transit stations, institutions, and recreational destinations;
- To provide bikeway facilities that are appropriate to the street classifications, traffic volumes, and speed of traffic;
- To develop and implement education and encouragement plans aimed at youth, adult cyclists, and motorists; and to increase public awareness of the benefits of bicycling and of available resources and facilities;
- To encourage bicycle parking and related facilities as part of all new construction or major renovation, including office, retail, industrial, and housing developments;
- To encourage the construction of showers and changing facilities in all new or renovated commercial development;
- To encourage bicycle parking facilities at all park and ride lots, commercial developments, and selected parking lots (such as bicycle parking facilities at public spaces such as County buildings, museums, libraries and civic centers).

A regionally significant bikeway network in the MPO will include the Roanoke Valley Greenway system. The greenway system is an integral component of the recreational and transportation infrastructure in the area, providing open and recreational space for Roanoke Valley residents. Some bicyclists, such as novice users, will not be comfortable with on-road facilities. The Greenway Plan presents an added opportunity to meet this need by providing facilities with little conflict from automobiles and by providing linkages and connectivity. The Roanoke Valley's greenway system is explained in the following section of this element of the Community Plan.

Greenways

A greenway is a corridor of protected open space managed for conservation, recreation and nonmotorized transportation. Greenways often follow natural geographic features such as ridge lines, stream valleys, and rivers, but may also be built along canals, utility corridors, or abandoned rail lines. Most greenways include a trail or bike path, but others may be designed strictly for environmental or scenic protection.

Greenways, as vegetated linear parks, provide tree cover, wildlife habitat, and riparian buffers to protect streams. The environmental benefits include reduced storm water runoff, flood reduction, water quality protection, and preservation of biological diversity. The trails within the greenways provide access between neighborhoods and destination points, opportunity to travel without an automobile, outdoor education classrooms, and close-to-home paths for walking, jogging, bicycling, and roller blading. Tree cover and use of bicycles instead of cars provide for better air quality, fewer hard-surfaced parking lots, and reduced energy costs. Although greenways are a collateral component of a county-wide park system, they do not replace the need for additional park land.

In the spring of 1995, the four local governments (Roanoke County, Roanoke City, City of Salem, and Town of Vinton) appointed representatives to a Greenways Steering Committee, supported by the Fifth Planning District Commission. A consulting firm was hired to develop a *Conceptual Greenway Plan for the Roanoke Valley* with input from elected officials, civic leaders, and the general public. This Plan was adopted by each of the four jurisdictions in 1997.

The Roanoke Valley Greenway Commission, appointed by the four Valley governments, replaced the Steering Committee in

1997. It is an advisory body with the responsibility to facilitate cooperation and coordination among jurisdictions in greenway planning and development; recommend funding sources for greenway construction; develop uniform standards for design and construction; and, pursue public/private partnerships for greenway development.

In August 1997, the first one-half mile of greenway in Roanoke was completed through Garst Mill Park along Mud Lick Creek. This was the first section of greenway in Roanoke County and is being very heavily used. Extensions of this greenway are planned to connect to the Hidden Valley High School and to Murray Run Greenway in the City of Roanoke.

The Hanging Rock Battlefield Trail which travels through portions of Salem and Roanoke County opened in 1999. This Trail is included on the brochure *Shenandoah Valley Civil War Trails* and attracts tourists as well as local residents. The extension of this greenway will follow Masons Creek to the Roanoke River.

In 2001 the Wolf Creek Greenway opened in Roanoke County, extending a section built in the Town of Vinton in 1999. This trail connects the new bicycle lanes built on Hardy Road to Goode and Stonebridge Parks in Roanoke County. The extension of this greenway will connect with the Blue Ridge Parkway to the northeast and with the Roanoke River to the south. A master plan for Tinker Creek Greenway was completed in 2000 in cooperation with Roanoke City, and plans for Glade Creek Greenway are being developed with the Town of Vinton.

The backbone of the Roanoke Valley greenway system will be the Roanoke River Greenway which will run for over 20 miles through Roanoke County, Salem, Roanoke City, and Vinton. Master plans for the Roanoke River Greenway have been completed, and two sections of the greenway have been built - one in Salem and one in Roanoke City. The first section to be built in Roanoke County will be in Green Hill Park.

In 1998, Roanoke County completed a prioritization of greenways within its jurisdiction. The priorities for off-road routes were: Wolf Creek, Roanoke River, Tinker/Carvins Creek, Glade Creek, and Mud Lick Creek Greenways. The priorities developed by staff in 2001 for on-road facilities needing major improvements were: Mountain View Road, Plantation Road, Hardy Road, Loch Haven Drive, and Colonial Avenue. While a significant amount of progress has been made on greenways over the last 7-8 years, there are substantial steps still to be taken.

b. Strategy: ***Traffic Management Strategies*** -- For the most part, the effectiveness of existing roads should be maximized rather than using new road construction as a crutch. It has been proven in the past that we cannot build our way out of congestion; we must begin to be creative about the utilization of the existing infrastructure. Some potential strategies Roanoke County staff can implement include:

- Encouraging motorists to carpool or rideshare;
- Promote employer-supported vanpool programs;
- Persuade the use of park-and-ride facilities;
- Endorse shuttle transit service from fringe parking areas to urban centers or major destinations;
- Encourage enhanced motorists information services and systems (such as presenting the congestion crises on television, radio, or the internet; motorists would be advised to car pool or alter their driving patterns);
- Advocate public transit, working with Valley Metro (Greater Roanoke Transit Company) and RADAR (Roanoke Area Dial-A-Ride);
- Support non-motorized travel, such as bicycle/pedestrian facilities (addressed in other sections of this Plan);
- Teaming up with Roanoke Valley-Allegheny Regional Commission (RVARC) and their regional ridesharing program called “Ride Solutions”. This program is a grant-funded program that provides free carpool and vanpool matching services for citizens of the Roanoke Valley and surrounding areas within southwestern VA. The program also provides directions to area park-and-ride lots, and information about alternative modes of transportation, such as public transit service, walking, and bicycling. Information on Ride Solutions can be obtained from the website www.ridesolutions.org or by calling them at (540) 342-9393.

c. Strategy: ***Education on Transportation Systems & Livability Issues*** -- Americans perceive their car as a provider of the freedom that we have come to cherish so greatly. An aspect of that freedom is enjoying the privacy, convenience, and safety of automobiles. Our love of cars has grown out of necessity. That is to say, as residential developments are built without proximity to employment centers or shopping facilities, residents have no choice but to use personal automobiles. Transportation infrastructure has been designed and built for the personal transport vehicle, rather than designed on a human scale.

The public must be informed of the alternatives to the single-occupant vehicle. One method to consider is informing the younger residents of Roanoke County. Educating the young is highly important if you want to make a new transportation system work or even make an old one work better. Today's children are the potential mass transit users, bikers, and pedestrians of tomorrow, but the potential must be tapped through education. By educating children, not only is the next generation reached, but so are the parents. The children will hopefully influence the parents to consider alternatives to the single-occupant vehicle.

Roanoke County staff will consider working in conjunction with the Roanoke Valley-Alleghany Regional Commission in their educating/advertising endeavors. Staff should also examine informing and promoting the use of mass transit with the aid of Valley Metro (Greater Roanoke Transit Company) and RADAR (Roanoke Area Dial-A-Ride). The County should also enlist the help of the Roanoke Valley Greenway Commission and local bicycling clubs to publicize and market the facilities available to pedestrians and bicyclists. Roanoke County staff could also utilize the County website and the public access cable channel (Roanoke Valley Television, RVTV Channel 3) in its educating efforts.

ii. Objective: **To reduce the negative effects of motor vehicle use, alter driver behavior, and improve conditions for non-motorized street users.**

a. Strategy: **Traffic Calming** -- Traffic calming measures are mainly used to address speeding and high cut-through traffic volumes on neighborhood streets. These issues can create an atmosphere in which non-motorists are intimidated, or even endangered, by motorized traffic. Along with the additional amount of traffic generated within the neighborhood, cut-through motorists are often perceived as driving faster than local motorists. By addressing high speeds and cut-through volumes, traffic calming can increase both the real and perceived safety of pedestrians and bicyclists. Although the social results of traffic calming are slightly more difficult to measure, studies show that traffic calming measures can increase property values, decrease crime and noise levels, promote a sense of community, and improve the quality of life within the neighborhood.

In an effort to induce motorists to slow down and drive responsibly, traffic calming purposely introduces additional self-

enforcing physical features in the design of the roadway, effectively changing the design speed. Traffic calming measures are generally implemented in a retrofit situation and traditional design standards require interpretation and modification. Some of the commonly implemented traffic calming measures includes:

Horizontal Deflection

- curb extension / bulb out;
- chicane;
- choker;
- on-street parking;
- raised median island / pedestrian refuge;
- and traffic circle, etc.

Vertical Deflection

- textured crosswalk;
- speed hump;
- raised intersection;
- and raised crosswalk, etc.

Physical Obstruction

- semi-diverter;
- diagonal diverter;
- raised median through intersection;
- and street closure, etc.

Signs and Pavement Markings

- roadway narrowing with edge lines;
- speed limit signing;
- turn prohibitions;
- one-way streets;
- and commercial vehicle prohibitions, etc.

Any of the above mentioned measures could be individually installed but may be most effective if used in concert with other measures. Tools **not** recommended for traffic calming include: STOP signs, “Children at Play” signs, speed dips, and speed bumps.

Functional classification and land use should be primary criteria in determining whether traffic calming measures are appropriate for a particular roadway. When conditions warrant, traffic calming measures may be appropriate on the following roadway types:

- Local residential streets;
- Collector streets with predominantly residential land uses;
- Arterial roads located within downtown districts or commercial areas (with posted speed limits of 40 mph or less). Traffic calming is not appropriate for use on arterial streets which are intended to accommodate higher speeds and larger traffic volumes. It is important to determine the

intended function of the roadway and remember that efficiently moving large numbers of vehicles is necessary on some roads.

When implementing traffic calming measures, it is best to do so under the direction of an overall traffic calming plan for the area in question. Installing traffic calming devices in the absence of an area-wide plan could simply divert one neighborhood's speed and traffic volume problems to other streets.

One more critical facet of traffic calming is gaining community support. A comprehensive community outreach program is important to ensure that the communities' needs will be met by a proposed project. A task force should be formed at the early stages of planning and concept development. This task force should have representation from the following groups: residents, business and property owners, emergency services, school representatives, transit authorities, local officials, utility departments, RVARC, VDOT, and other interested parties. The idea behind this is to try to get up-front public involvement in order to ensure that the final solution has broad support in the community. It is the citizen's of Roanoke County that must live with the solution and the traffic calming measures will be largely unsuccessful without community support. By making the residents co-authors of the solution it will foster a sense of ownership and pride in the community. The role of Roanoke County staff is one of facilitator rather than director of the solution.

County staff will also work to investigate citizen's traffic calming requests as they are submitted and will examine possibilities to include traffic calming to be included in repair/reconstruction projects on all applicable roads. Staff will determine (based on functional classification, land use, and other factors) whether traffic calming implementation should be pursued and if so, work with VDOT on the project.

iii. Objective: **To provide access to land development, while preserving the safety and capacity of the transportation system.**

a. Strategy: ***Access Management*** -- Access management is a fairly new response to the congestion, the loss of arterial capacity, and the serious access related accidents that are plaguing our roadways. It is defined as the careful control of the location, design, and operation of all driveways and public street connections to a roadway. Access management is intended for use on collectors and arterial roads that have many commercial and

residential driveways/intersections to increase the mobility of the traffic. There are different methods for attaining the goals and those methods are typically designed around the needs and problems of each particular area.

The basic principles of access management include:

Limiting the Number of Conflict Points

A conflict point exists at any place that vehicle paths will cross, merge into, or diverge from one another along roadways, specifically at intersections or driveways. The potential for vehicular crashes increases as the number of conflict points along a roadway go higher. One method for limiting the number of conflict points is to decrease the number of driveways a business or neighborhood can have onto an arterial or collector roadway. Limitation of conflict points can also be accomplished with the use of reverse frontage and access roads. Decreasing the number of conflict points significantly reduce the potential for crashes.

Separating Basic Conflict Areas

Intersections of public streets as well as intersections of driveways and public streets represent basic conflict areas. High levels of activity can occur at these locations and, consequently, the through traffic needs time to react to the decelerations, accelerations, and travel paths of other vehicles at or near the intersections. Adequate spacing between intersections allows drivers to react to one intersection at a time and provides greater opportunities to avoid potential conflicts at each successive downstream intersection. Similarly, setting driveways and connections back from intersections reduces the number of conflicts and provides more time and space for vehicles to turn or merge safely across lanes. One way of accomplishing this goal is to close off or relocate existing entrances or establish a larger minimum lot size for corner lots.

Reducing Interference with Through Traffic

Traffic often needs to slow down for vehicles exiting, entering, or turning across the roadway. Providing turning lanes and restricting turning movements allows turning traffic to get out of the way of the following through traffic. Other measures include increasing the turning radius of a driveway, using a driveway flare, or increased driveway width and length.

Providing Adequate On-Site Circulation and Storage

The design of good internal vehicle circulation in parking areas and on local streets reduces the number of driveways that businesses need for access to the major roadway. Internal

connections between neighboring properties allow vehicles to circulate between businesses without having to re-enter the major roadway. Subdivisions should be designed so that lots fronting the major roadway have internal access from a residential street (reverse frontage).

Implementation of an access management measure is much easier when constructing a new corridor with wide right-of-ways and no existing development. Developers can follow certain guidelines or regulations that have been established. However, as is the case in most of Roanoke County, most of the corridors have already been developed and the right-of-ways are set. The designers and developers must try to “retrofit” access management measures into an already tight right-of-way. More often than not, access management projects will coincide with major road improvements.

Some of the benefits of implementing Access Management are:

- Saves lives and reduces the frequency of fatal, injury, and property damage accidents;
- Maintains the transportation system travel efficiency necessary for economic prosperity;
- Prolongs the functional life of existing highways by maintaining or increasing capacity, thereby reducing the need for new capital construction to meet increasing system demands;
- Is an element of Air Quality Conformance;
- Reduces congestion and delay and provides property owners with safe access to highways;
- Promotes desirable land use patterns, establishes uniform standards, and promotes fair and equal application to the development of the community.

Virginia Department of Transportation has Access Management guidelines that are available for adoption by the County. Roanoke County staff will consider adoption of said standards, coordinating with RVARC and VDOT throughout the process. Until the time that the Board has approved and adopted the standards, staff will consider each major corridor project that is performed in the County as a candidate Access Management project.

iv. Objective: **To reduce noise levels where transportation activities are the predominant noise generating sources.**

a. Strategy: *Noise Abatement Measures* -- To the normal Roanoke County motorist, highway traffic noise is not a

considerable concern. However, to the many County residents and business owners that are adjacent to a busy travel way, it is an unnecessary nuisance.

The level of highway traffic noise depends on three factors: (1) the volume of traffic, (2) the speed of traffic, and (3) the number of trucks in the flow of traffic. With the number of registered vehicles and vehicle miles traveled increasing every year to nearly uncontrollable values, planners/designers must look to strategies other than traffic and/or speed mitigation.

The highway noise dilemma can be solved with a three-part solution: motor vehicle control, land use control, and highway planning and design. *Motor vehicle control:* The Environmental Protection Agency has issued noise limit regulations for new trucks and many local and State governments have passed ordinances requiring existing vehicles to be properly maintained and operated. *Land use control:* Highway traffic noise complaints often come from occupants of new homes built adjacent to an existing highway. The majority of these highways were originally constructed through undeveloped lands. Prudent land use control can help to prevent many future traffic noise problems in these areas. It is important to point out that such controls need not prohibit development, but rather require reasonable distances between buildings and roads as well as “soundproofing” or other noise abatement measures. Another strategy is to promote the development of less noise-sensitive commercial buildings next to a major highway, with residences farther away. *Highway planning and design:* Early in the planning stages of most highway improvement projects, the highway agency will do a noise study. The existing noise levels of a highway are measured or computed by models. Then, the agency predicts what the future noise levels will be once the project is constructed. If the predicted noise levels exceed Federal noise criteria, the agency must consider measures that can be taken to lessen the adverse noise impacts.

Some noise reduction measures that can be implemented on existing roads include creating buffer zones, construction barriers (e.g., earth berms, noise walls, etc.), planting vegetation, installing noise insulation in buildings, and managing traffic.

On a more local level, VDOT established its *Noise Abatement Policy* in 1989 to lessen the impact of highway traffic noise on people in neighborhoods and in other noise-sensitive areas. That policy maintains that VDOT will conduct a highway traffic noise study on proposed federally funded highway improvement projects. These projects must meet one of the following

conditions: a highway is being built on a new location; an existing highway is being redesigned with a significant change in its alignment; or the number of through traffic lanes on an existing highway is being increased. The cost of the noise reduction measures are included with the other costs of the highway improvement and are eligible for Federal funding in the same proportion as other aspects of the project. State highway agencies may also use Federal highway grants for noise reduction project on existing roads on the Federal-aid system. The monies spent on the noise reduction measures are deducted from funds which would otherwise be available for highway construction. On non-federally funded highway improvement projects, the locality can obtain partial funding from VDOT to implement noise abatement measures if the locality meets eligibility requirements outlined in the aforementioned state noise policy. The County will strive to adhere to VDOT's *Noise Abatement Policy* when making decisions pertinent to Roanoke County roads.

If alternative measures will not reduce the noise or are not desirable in a certain location, VDOT engineers will then consider installing noise walls. The noise walls must meet the following conditions: they will not present a safety or engineering problem; they will reduce noise levels by at least five decibels at all impacted locations; and they cost \$30,000 or less per noise-impacted property. If the structure costs more than \$30,000 per affected property, they can still be built if a third party – someone other than VDOT or FHWA, such as a locality or developer – funds the difference. The neighborhood or any other interested party can also participate as the third party and third party payments must be received prior to the start of highway construction.

Noise problems are harder to mitigate after an area is developed. Consequently, local governments are encouraged to evaluate potential noise problems as part of planning and zoning decisions. Development standards can regulate the placement of noise generating activities adjacent to sensitive areas such as residential neighborhoods, schools, hospitals, parks, natural areas, and open spaces. Some of the action measures that the County can consider implementing include:

- Coordinate with area RVARC, MPO, and adjacent state and local agencies to minimize noise impacts of existing and future transportation facilities and other noise-producing land uses;
- Ensure development complies with state noise regulations;

- Adopt development standards which require review of the potential noise impacts of new development, including roads, and the need for appropriate mitigating measures such as:
 - Building setbacks;
 - Berms, noise walls, and extensive landscaping;
 - Site design measures such as using parking, storage areas and buildings which generate little or no noise to separate noise sources from surrounding land uses;
 - Sound insulation and state of the art mechanical and processing equipment which generate little or no noise;
 - Measures recommended by DEQ or a qualified noise consultant and financial agreements to ensure required noise reduction measures are installed;
 - Increased rights-of-way for major arterials and berming, noise walls, sunken roadways, and planting of large shrubs and trees; and
 - Traffic management measures to discourage through traffic from using local residential streets.

v. Objective: **To help reduce and control air pollutants in the Roanoke Valley and surrounding area .**

a. Strategy: *Air Quality/Attainment Status* -- The primary objective of the Federal Clean Air Act, amended by the U.S. Congress in 1990, is to establish standards for various pollutants from both stationary and mobile sources and to provide for the regulation of polluting emissions via state implementation plans. The Clean Air Act authorizes the Environmental Protection Agency (EPA) to establish minimum national standards for air quality, and assigns primary responsibility to the states to assure compliance. Areas not meeting the National Ambient Air Quality Standards (NAAQS), referred to as "non-attainment" areas, are required to implement specified air pollution control measures.

Roanoke County, by its inclusion in the Roanoke Metropolitan Statistical Area (MSA), may possibly be designated as a non-attainment area. The Roanoke MSA has one ozone monitor located in the town of Vinton. Roanoke County and all other communities within the MSA are judged solely on that one monitoring station. To meet the 1-hour ozone standard, the Roanoke MSA must have a monitored hourly peak ozone

concentration below 125 parts per billion (ppb). Since 1990, the Roanoke MSA has exceeded the 1-hour standard on two occasions in 1998. However, due to the guidelines, the MSA remains in compliance for the 1-hour standard.

Similarly, the 8-hour ozone standard, found by averaging three years of the fourth highest 8-hour ozone levels in the area, must be lower than 85 ppb to meet the standard. Currently (as of 2003), the Roanoke MSA design value is 87 ppb. Therefore, it is probable, based on recent monitoring data, that the Roanoke MSA will be designated a non-attainment area when formal designations occur, by the year 2004.

The region is volunteering to put itself into the Ozone Early Action Program (OEAP) process to expedite air cleanup and to avoid being labeled a non-attainment area. The two principal components of the OEAP are the Early Action Compact (EAC) and the Early Action Plan (EAP). The EAC is a memorandum of agreement to prepare and implement the EAP. Specifically, the EAC sets measurable milestones for developing and implementing the EAP. The EAC is between the local governments representing the Cities of Roanoke and Salem, the Counties of Roanoke and Botetourt, the Town of Vinton, the EPA, and VDEQ (Virginia Department of Environmental Quality). It is for the express purpose of developing and implementing a plan that will reduce ground-level ozone concentrations in the Roanoke MSA to comply with the 8-hour ozone standard by December 31, 2007 and maintain that standard until at least 2012. Failure to meet that obligation results in immediate reversion to the traditional non-attainment process and the subsequent negative impacts. A major advantage of the region's participation in the OEAP is the flexibility afforded to the signatories of the Compact in selecting emission reduction measures and programs that are best suited to local needs and circumstances.

The Roanoke MSA's OEAP is designed to enable a local, proactive approach to ensuring attainment of the 8-hour ozone standard and, as a by-product of these actions, protect human health. Using the OEAP approach, the region could begin implementing by 2005 emission-reduction measures directed at attaining the 8-hour standard. This allows for a significantly earlier start than waiting for formal EPA non-attainment designation and it gives more flexibility in choosing which emission reduction strategies to implement.

The Roanoke Valley Alleghany Regional Commission (RVARC), in consultation with the aforementioned local governments, will develop the EAP in coordination with VDEQ, EPA, stakeholders,

and the public. The EAP will serve as Roanoke MSA's official air quality improvement plan, to be adopted and implemented by the local governments.

By signing the EAC, the Roanoke County Board of Supervisors is committed to holding responsibility for the development and implementation of the EAP. Roanoke County Community Development staff has aided the RVARC in the early stages of the EAC and EAP and helped in selecting the consultant that will work on this project. The staff will continue its efforts with the RVARC, adjacent communities, and interested stakeholders throughout this endeavor; ensuring that the emission reduction measures that are selected are best suited to County needs and circumstances. (For more information, please refer to the latest copy of the *Roanoke Valley Area Ozone Early Action Plan* on the internet at <http://www.rvarc.org/work/eap.pdf>)

D. Goal: To play an influential role in shaping and implementing regional transportation decisions.

i. Objective: To continue comprehensive transportation planning and to work in concert with neighboring jurisdictions and public entities.

a. Strategy: ***Active role in Regional Transportation Issues and Funding*** -- In 1973, federal law began requiring the formation of a Metropolitan Planning Organization (MPO) for urbanized areas with populations exceeding 50,000 to ensure that federal expenditures on transportation projects include cooperation at all government levels and provide for citizen input. The regional MPO consists of representatives from area localities, the Virginia Department of Transportation, the Greater Roanoke Transit Company, Roanoke Regional Airport, and the Roanoke Valley-Alleghany Regional Commission (RVARC). The service area of the Roanoke Valley Area MPO includes Roanoke and Salem cities, Vinton, the urbanized portions of Botetourt and Roanoke counties and the extreme western portion of Bedford County.

The MPO functions through regional forums where a series of participants address transportation issues. The Policy Board reviews and approves plans and programs and exercises administrative and fiscal control over MPO duties. It is made up of two representatives (at least one elected official) from each member locality and one member each from other participating agencies. The Transportation Technical Committee (TTC) works

closely with MPO staff in developing plans and programs and advises the Policy Board on technical and administrative issues related to regional transportation planning. It is comprised of planning and engineering staff from participating members of the MPO. An often underutilized component of the decision-making process is citizen participation. The public is invited to help develop, review and comment on proposed regional transportation plans. All MPO meetings are open to the public and serve as a regular forum for community transportation concerns.

The Metropolitan Planning Organization is charged with developing plans and programs to be approved by the Federal Highway Administration (FHWA) in order for federal-aid dollars to reach their regions. Federal regulations (see discussion of TEA-21 in this element of the Community Plan) mandate that each MPO develop a Long Range Transportation Plan and a Transportation Improvement Plan.

The *Long Range Transportation Plan (LRTP)* is an urbanized area's guide to creating a more efficient, responsive and environmentally-sensitive transportation system over a twenty-year horizon. This plan examines transportation issues and trends and offers a list of specific projects for dealing with a region's mobility needs. The LRTP is updated every five years and public input is requested.

The *Transportation Improvement Program (TIP)* is a three-year schedule of all federally funded and regionally significant transportation projects to be constructed in the urbanized area. To receive federal funding, these projects must first be approved by the MPO Policy Board for inclusion in the TIP. The TIP is updated annually and may include proposals originating from the LRTP. The *State Transportation Improvement Program (STIP)* is Virginia's version of the TIP, (earmarking state funds) established after annual TIP approvals.

The *Unified Transportation Work Program (UTWP)* is a one-year schedule of all urban transportation planning activities that will be carried out with federal expenditures. Project suggestions can originate from the public or from any MPO member. The Policy Board and TTC determine the projects to be part of the UTWP which is updated each year.

Roanoke County staff will continue in its efforts to work in concert with the RVARC, collaborating on particular facility, sub-area, corridor, and system-level transportation studies, and representing the County on the associated boards and committees mentioned above.

b. Strategy: *Active role with Virginia Department of Transportation (VDOT)* -- Roanoke County staff seeks to work in a cooperative manner with Virginia Department of Transportation on all projects that occur in the County. This coordination of efforts is done to ensure the project progresses in a timely manner; all the while, looking out for the best interests of the County residents. Our efforts may involve forwarding citizens' comments, questions, and/or recommendations, ensuring compliance with County standards, and sharing data, information, expertise, etc. to assure timely and efficient completion of projects.

Whereas County residents and staff have input on all roads in Roanoke County, the opportunity for citizen input is greater regarding the secondary roads, working within the framework of the annually updated Six-Year Secondary System Construction Plan. The public may advise county staff on needed safety or other improvements to the secondary street system. Staff considers these requests, investigates the matter, and takes the concerns to VDOT, hopefully to gain a spot in the Six-Year improvement program. Staff also gathers insight and input from the Board of Supervisors, VDOT, and the MPO prior to the inclusion of a specific road into the Six-Year improvement program (see Figure T-2 for an explanation of VDOT's Project Development Process). In addition to the Six-Year improvement program, the County also works in conjunction with VDOT on Revenue Sharing (both the Six-Year Secondary System Construction and Revenue Sharing programs are covered in this element of the Community Plan) and the Rural Addition Program.

County staff will attempt to continue to grow and strengthen the working relationship with VDOT, specifically the Salem District of VDOT.

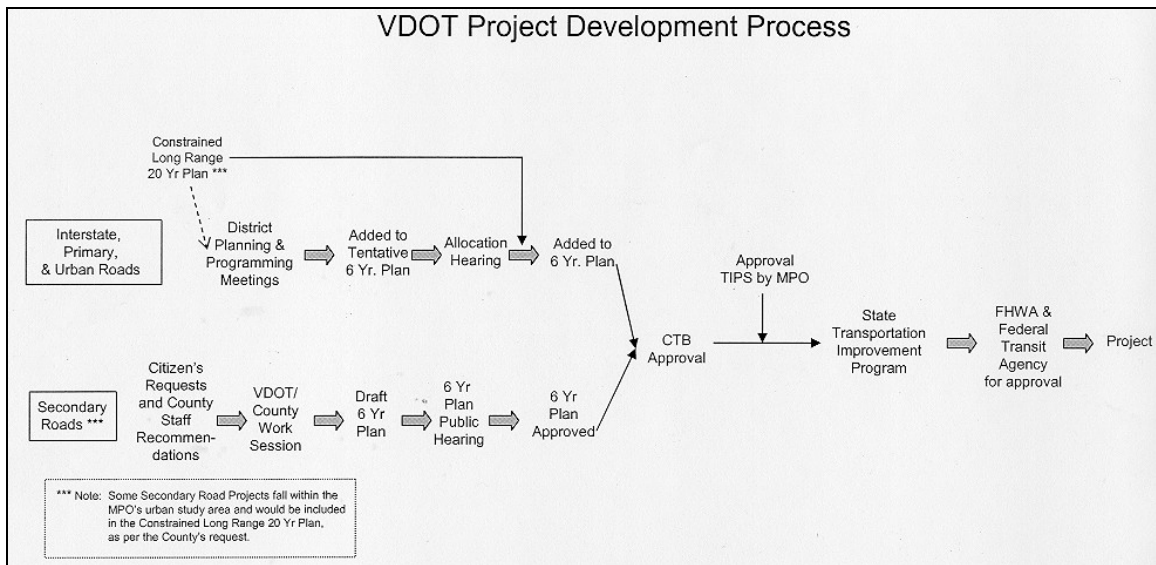


Figure T-2: VDOT Project Development Process

c. Strategy: *Support regional aviation efforts* -- The Virginia Air Transportation Systems Plan classifies the Roanoke Regional Airport as a Commercial Service Airport. The Roanoke Regional Airport accommodates the aviation needs of the scheduled airlines, air freight carriers, general aviation, corporate, air taxi and charter operators, as well as the military, for a region including, but not limited to, the Roanoke Valley. The Roanoke Regional Airport's passenger service area covers an area which includes the Cities of Roanoke and Salem, the Counties of Roanoke, Montgomery, Pulaski, Giles, Craig, Botetourt, Alleghany, Rockbridge, Bedford, Franklin, Floyd, and portions of West Virginia. Public ground transportation service to and from the airport is limited to taxicab and limousine service. There are a few heliports located in and around the area. Although these heliports are important from a service and air traffic standpoint, their impact on overall transportation planning in the Roanoke area is minor.

The need for improvements to the Roanoke Regional Airport spawned an Airport Master Plan Update in 1997 to estimate and accommodate future aviation demand, maintain flexibility for development opportunities and market changes, and to recognize physical constraints. Major long-range anticipated improvements (horizon year 2015) include pavement upgrades to airfield runways, relocation and widening of taxiways, installation of new runway navigational/landing aids, construction of a new air traffic control tower and changes to the passenger terminal and parking lots.

The implementation strategies put forth in the County's 1998 *Community Plan* hold true for this update/revision. The strategies include:

- Supporting improvement to the airport and airport access as a central factor in economic development;
- Locating and operating aviation and related facilities in such a way as to minimize detrimental environmental and community impacts;
- Evaluating land uses around existing aviation facilities during the development review process, to ensure compatibility in terms of height, noise, and the functional classification of the aviation facility;
- Supporting the provision of transit service to the Roanoke Regional Airport, not only for passengers, but in support of the airport's role as a major employment center;
- Encouraging the use and development of the Roanoke Regional Airport and seek international status;
- Encouraging the Airport Commission to procure aviation and related facility easements where appropriate.

d. Strategy: *Collaborate with Virginia Department of Rail and Public Transportation (VDRPT)* -- Rail transport, once a thriving business and transportation choice in the Roanoke Valley, is not presently a popular mode of transportation for County citizens. There is currently no direct inter-city rail service available from the Roanoke valley. There is, however, rail service from Clifton Forge and Lynchburg, surrounding communities within a short driving distance of Roanoke. Roanoke County staff should cooperate with the VDRPT, RVARC, and Roanoke City staff in revitalizing passenger rail service for the Roanoke Valley.

ii. Objective: **To stay abreast of recent legislation that pertains to transportation and investigate its availability for County infrastructure systems.**

a. Strategy: *TEA-3 (An Update / Reauthorization of TEA-21)* -- TEA-3, or Transportation Equity Act- 2003 (third authorization) refers to the nation's surface transportation program previously scheduled for renewal in 2003. The original vision, Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991 introduced a series of reforms to national transportation policy, steering away from the automobile and towards pedestrian, bicycling, passenger rail and transit mobility. In 1998, the Transportation Equity Act for the Twenty- First Century (TEA-21) continued those programs through the expenditure of \$300 billion during the decade.

The renewal of TEA-21 could occur anytime from mid-2004 through late 2005 involving Senate Commerce, Science & Transportation, Finance, Banking, Environment & Public Works,

and Housing & Urban Affairs committees and House of Representatives Transportation & Infrastructure, Science, and Ways & Means committees with the U.S. Department of Transportation as the lead agency. The challenge is to build on ISTEA's provisions for improving transportation through flexibility, local decision-making, long range planning, fiscally constrained budgeting, and environmental stewardship. Sound transportation investments can help communities thrive by providing a safe, healthy, and secure environment, enhancing neighborhood livability, and promoting energy efficiency and conservation.

The most popular and visible use of federal funds has been conducted under the Transportation Enhancements Program (TE). TE was created under ISTEA and fosters local economic development and helps reconnect communities divided or negatively impacted by highway construction. Using only two cents of every federal transportation dollar, TE projects – bicycle and pedestrian facilities, main street revitalization programs, renovation of train stations and other historic sites, scenic easements, and billboard removal along highway corridors – are achieved. For example, the regional greenways program has been awarded nearly \$3.88 million in Transportation Enhancement and other federal funding since 1996.

County staff will continue to monitor the progress of the TEA-3 authorization and investigate ways that County residents can benefit.

iii. Objective: **To remain informed and up-to-date on major road/transportation projects within the County.**

- a. Strategy: ***Interstate 81*** -- Interstate 81 extends for 325 miles throughout Virginia, with a substantial portion of it located in Roanoke County. Cut through rolling and mountainous terrain, I-81 has been recognized as one of the most scenic interstates in the U.S. The highway is essential not only to the economic vitality of Virginia; it also serves as one of the East Coast's most important transportation facilities. The route carries out-of-state tourists, through travelers, a growing number of intra-valley commuters, and more than a third of all college and university students in Virginia. The interstate closely parallels U.S. Route 11 and railroad lines. The nearly 40 year old route is experiencing capacity and safety issues. Traffic through this crucial corridor has tripled in the last 20 years, from around

20,000 vehicles per day to nearly 70,000 vehicles per day in the Roanoke Valley. Though mostly a rural corridor, I-81 is one of the top eight truck routes in the U.S. On some sections of I-81, the number of trucks nearly equals the number of passenger cars. The highway was designed for 15% truck traffic, but trucks now account for 20-40% of the traffic on I-81.

VDOT accepted proposals under the Public-Private Transportation Act of 1995 (PPTA) to design, build, improve, maintain, and/or operate all or parts of I-81 through the Commonwealth. These proposals involved separating passenger vehicles and heavy trucks using physical barriers, adding additional lanes, adding truck climbing lanes, longer on- and off- ramps, tolls on all motor vehicles or tolls only on heavy trucks, utilizing Intelligent Transportation Systems (ITS), and other features. In early-2004, after much review and discussion, the Commonwealth Transportation Commissioner directed VDOT to enter into negotiations with STAR Solutions as the potential operator for improvements to I-81. The STAR proposal would widen I-81 to at least four lanes in each direction, with the separation of truck and car lanes. The project would be partly financed with tolls applied to both cars and trucks.

Plans or proposals to improve I-81 cannot be implemented without the approval and concurrence of the Federal Highway Administration (FHWA). Because the interstate system is federally funded, any proposed changes to the highway must comply with all federal laws, including the National Environmental Policy Act (NEPA). In accordance with NEPA, in the fall of 2003 FHWA and VDOT launched an I-81 Corridor Improvement Study. The study will objectively identify deficiencies along the interstate as well as opportunities for improvements throughout the corridor in Virginia. This study will lead to the completion of an Environmental Impact Statement (EIS) and ultimately a Record of Decision from FHWA.

Roanoke County will be working with neighboring jurisdictions, planning organizations, and VDOT during the completion of the corridor study and environmental review. County staff will continue to work in concert with all interested parties on this endeavor to best address the safety concerns and truck traffic capacity issues. Similarly, we recognize the crucial link between land use and the transportation system.

Staff must consider the impacts to existing right-of-way, be mindful of the project's effect on rezonings, special-use permits, and planning projects, and determine if the corridor will play a role in the growth management measures under consideration.

In addition, it must be stated that the Roanoke County Board of Supervisors has been very supportive of the I-81 improvement project. They have adopted numerous resolutions, some dating back to 1997, corroborating VDOT's attempts to improve the corridor. Subsequently, they have resolved to "express its support for the development and promotion of rail freight and passenger service parallel to I-81, to complement limited highway-widening and to move a large volume of the long-distance freight traffic from trucks on I-81 to freight trains on dual track, high-speed rails parallel to I-81" (Resolution 062403-6.d).

(Note: To review the most current information pertaining to I-81, click on the link on the County's website to access VDOT's I-81 website)

- b. Strategy: ***Proposed Interstate 73*** -- The U.S. Congress designated Interstate 73 (I-73) a National Priority Corridor as part of the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. Congress made I-73 official in 1995 by including it in the National Highway System (NHS). The purpose of the NHS "priority corridor" is to link the nation's regions and support economic growth. Needs were identified to improve goods movements between the port of Charleston, South Carolina and Sault Ste. Marie, Michigan. This would require an effective and efficient roadway that facilitates interstate travel between Michigan, Ohio, West Virginia, Virginia, and North and South Carolina.

I-73 is an identified state and regional priority in Virginia to foster planned economic development between southwestern Virginia and the Piedmont Triad regions in North Carolina. Local manufacturers have business connections with the cities of Greensboro, Winston-Salem, and High Point, NC. Improved access through the Roanoke Valley to I-581 and I-81 will link businesses in the study area with locations in the eastern U.S.

Another regional priority in southwest Virginia is to address safety concerns along U.S. Route 220 resulting from high

percentages of truck traffic, poor sight distances, steep grades, and a large number of accidents. VDOT's consultant maintains that solutions to these concerns could be achieved by developing a safe and direct transportation link for business trucking between NC's Piedmont Triangle and the Roanoke Valley's I-581 and I-81 corridors.

The Virginia Commonwealth Transportation Board (CTB) approved a corridor location for I-73 in May 2001. Starting at the northern end of the corridor, the approved location for I-73 begins at the existing interchange of I-81 and I-581 and continues along I-581 through Roanoke City to the Elm Avenue interchange. At this point in the route, there is a change to be made to the previously approved alignment. In 2004 it was deemed that the Southeast Roanoke neighborhood that would have been impacted by I-73 was eligible for designation as a historic district. Therefore, an approximately 12-mile section of the corridor in southeast Roanoke City, Roanoke County, and northern Franklin County had to be re-routed. The re-routed corridor that is currently being studied at the time of this writing includes the existing alignment of Route 220 from Elm Avenue continuing south into the Clearbrook area of the County and then veering southeast of Buck Mountain Road along Route 657 (Crowell Gap Road) into Franklin County where it would rejoin the original approved corridor in the vicinity of Coopers Cove.

Roanoke County's Board of Supervisors has supported this project and passed several resolutions pertaining to the issue in recent years. VDOT will be finalizing the Environmental Impact Statement (EIS) with specific information about the selected corridor. The Final EIS will then be forwarded to the Federal Highway Administration (FHWA) for consideration and/or approval. Completion of the Final EIS and approval by FHWA may take up to a year. Once the FHWA issues its approval - called a Record of Decision - final design, right of way acquisition and construction can begin. Roanoke County staff will continue to monitor the development of this project and work in concert with all involved. Along those same lines, staff recognizes the crucial link between land use and the transportation system. Staff must consider the impacts to existing right-of-way, be mindful of the project's effect on rezonings, special-use permits, and planning projects, and determine if the corridor will play a role in the growth management measures under consideration.

E. Goal: To provide progressive and forward looking solutions and technology to users of Roanoke County's transportation network.

i. Objective: **To improve the management of the County's resources and data and to utilize computer technology as a decision making tool.**

a. Strategy: ***Geographical Information Systems (GIS)*** --

Roanoke County has attempted to stay on the leading edge of computer technology. This trend maintains as it relates to transportation issues the County encounters. Specifically, GIS will be used to develop and maintain an inventory of the transportation infrastructure. The inventory will include road lengths and widths, traffic counts, and functional classification, to name a few archived items. GIS will also be used in conjunction with a pavement management system to track and display road construction/maintenance. The inventory and pavement management system will be maintained in the ESRI (Environmental Systems Research Institute) environment utilizing up to date versions of ArcGIS. We will incorporate a relational database to enter, store, and analyze the necessary data.

The GIS software will be pivotal in preparing maps and presenting infrastructure inventory and maintenance recommendations to VDOT, the Board of Supervisors, and the public.

ii. Objective: **To improve the livability of Roanoke County residents by ensuring that transportation systems are properly designed and applicable to the community it serves.**

a. Strategy: ***Context Sensitive/Flexible Design*** -- An important, yet often forgotten, concept in highway design is that every project is unique. The setting and character of the area, the values of the community, the needs of the highway users, and the challenges and opportunities are unique factors that designers must consider with each highway project. For each potential project, designers are faced with the task of balancing the need for the highway improvement with the need to safely integrate the design into the surrounding natural and human environments.

Often, over- engineered road design standards limit transportation choices, isolate neighborhoods, create hazardous settings, and otherwise harm the quality of life within a community. Unnecessarily wide neighborhood streets discourage pedestrian and bicycle use and increase car speeds. Flexible road standards

would give designers more opportunities to use varying widths, medians, sidewalks, bike lanes, and landscaping to develop better streetscapes with more opportunities for transportation and recreation, while still providing roads that efficiently carry vehicles. Use of the aforementioned flexible standards is commonly referred to as Context Sensitive Design (CSD). CSD incorporates the streetscape, aesthetics, livability, and the application of devices aimed at changing motorists' behavior. However, in order to succeed, CSD requires neighborhood involvement *before* road design changes are initiated. CSD attempts to balance the level of service of a road with surrounding community values. CSD provides a higher level of safety for pedestrians, cyclists, and motorists than conventional street design which focuses on vehicular movement at high speeds. Typical elements of CSD are somewhat similar to traffic calming measures. Some examples of CSD are:

- Real or perceived lane width reductions or limitations
- Intentional curvature
- Textured pavement and/or markings
- Extensive landscaping
- Right of entry for all travel modes

Context Sensitive Design calls for public involvement when defining the need for a road project. This requires public participation throughout the project, the early and continuous use of a multidisciplinary design team, the use of visualization techniques to aid the public, and the application of flexible design criteria. The reference most often used for project design criteria is the Green Book. Its official title is *A Policy on the Geometric Design of Highways and Streets*. Although often viewed as dictating a set of national standards, this document is actually a *series of guidelines* on geometric design within which the designer has a range of flexibility. As stated in the forward to the Green Book:

The intent of this policy is to provide guidance to the designer by referencing a recommended range of values for critical dimensions. Sufficient flexibility is permitted to encourage independent designs tailored to particular situations.

Context Sensitive Design can provide significant improvements to collector and arterial roads scheduled for widening or reconstruction in Roanoke County. An example of a Virginia Department of Transportation (VDOT) project that has

incorporated CSD is the Colonial Avenue project (a one-half mile portion of Colonial between Penn Forest Boulevard and Route 419). Citizens along Colonial Avenue requested that the County and VDOT implement CSD along that corridor. At the time of this update to the Community Plan, that project is progressing with the input of the citizens along the Colonial Avenue corridor and will hopefully meet the needs of the residents and motorists.

Roanoke County staff will attempt to monitor all VDOT road projects within the County and ensure that the proposed design is applicable to the needs and environment of the community while maintaining the desired function of the roadway.

ii. Objective: **To help take an active role in implementing and incorporating new technologies into the transportation system to increase the safety and efficiency of the system.**

a. Strategy: *Intelligent Transportation Systems (ITS)* -- Intelligent Transportation Systems (ITS) incorporate new technologies in information processing, communications, control, and electronics into the transportation system. When integrated into the transportation infrastructure, and in vehicles themselves, these technologies help monitor and manage traffic flow, reduce congestion, provide alternate routes to travelers, enhance productivity, and save lives, time, and money.

Intelligent transportation systems provide the tools for transportation professionals to collect, analyze, and archive data about the performance of the system. Having this data enhances a traffic operator's ability to respond to incidents, adverse weather, or other capacity constricting events.

Some systems, products, and services are already in place and at work throughout the country (a local example of ITS technology can be found between Blacksburg and I-81 on the Smart Road). Various examples of Intelligent Transportation Systems include:

- On-board navigation systems;
- Crash notification systems;
- Electronic payment systems;
- Roadbed sensors;
- Traffic video/control technologies;
- Weather information services;
- Variable message signs;
- Fleet tracking and weigh-in-motion technologies.

Roanoke County and other member governments of the Roanoke Valley Area Metropolitan Planning Organization (RVAMPO) are seeking to take an active role in the Commonwealth's efforts to develop and implement ITS technologies. County staff will work with the Roanoke Valley-Alleghany Regional Commission (RVARC) in this effort and cooperate with VDOT's Salem District when possible.

F. Goal: To expand and emphasize citizen participation and comments during the early stages of transportation planning.

i. Objective: To ensure that Roanoke County citizens have their voices heard on projects/issues that will affect them.

a. Strategy: ***Comment form on County's website*** -- More and more people are utilizing the internet to gather and transmit information than ever before. The County should provide a platform for those individuals that want to communicate their inquiries, comments, and concerns to County staff, via this format.

An addition will be made to the County's website that allows the citizens to voice their opinions, desires, and questions. The citizen will access the Transportation/Engineering portion of the County's website at:

<http://www.roanokecountyva.gov/Departments/Engineering/Transportation/>. Once here, the citizen will find contact information that will enable them to speak their mind on transportation issues in the County.

b. Strategy: ***Citizen Input on Long Range Transportation Plan*** -- As noted earlier in this element of the Community Plan, the County's input into the Long Range Transportation Plan (LRTP) is vitally important. For that reason, staff is seeking the comments of County residents on the matter. Ultimately, the residents are the one that pay for and use the infrastructure; consequently, their voice should be heard.

Comments received after the release of this updated Community Plan will be taken into consideration for the next update to the LRTP, as the list has already been submitted (submitted in September '03) to VDOT for consideration. However, as stated earlier, the plan may be revised by the Roanoke Valley MPO through amendments. Therefore, County staff is requesting that the residents review the list (Table T-3) and subsequent map

Chapter 4: Community Facilities

attached in this document. Any comments or questions about the LRTP can be directed to the County staff via the website (explained above), email, or telephone.

Chapter 4: Community Facilities

Transportation Element – Implementation Schedule		
STRATEGY	TIME FRAME	COMMENTS
Growth Management Measures	ongoing	Dependent on APFO legislation; work with VDOT on LOS for County roads
Balance Land Use Objectives w/ Street Functional Capabilities	by 2005	Functional Classifications designated by 2004; implementation of guidelines by planning staff will take a little more time.
Long Range Plan Issues	ongoing	Officially updated every 5 yrs.; County will receive comments at any time
Pavement Mgmt. Sys. for Secondary 6-Year Plan & Rev. Sharing	by 2005	6-yr Plan and Revenue Sharing updated annually; hope to implement PMS for Revenue Sharing for 2005 program.
Bicycle Facilities & Greenways	ongoing	Continue working with VDOT & the Roanoke Valley Greenway Commission
Traffic Management Strategies	by 2005	Work with RVARC
Education on Transportation Systems & Livability Issues	by 2005	Work with RVARC, Valley Metro, County website, RVTV, etc.
Traffic Calming	by 2005	Dependent on scheduling of potential projects
Access Management	by 2005	Dependent on scheduling of potential projects
Noise Abatement Measures	by 2005	Project specific; may be an issue that coincides with improvements to I-81
Air Quality/Attainment Status	by 2005	Must be in compliance by 12/31/07; being implementing measures by 2005
Active role in Regional Transportation Issues & Funding	ongoing	Work with RVARC, MPO, and other localities
Active role with VDOT	ongoing	
Support Regional Aviation Efforts	ongoing	Work with Roanoke Regional Airport and Roanoke Co.'s Economic Development department
Collaborate with VDRPT	ongoing	Work with VDRPT, RVARC, and Roanoke City
TEA-3	ongoing	
Interstate 81	ongoing	Roanoke Co. will provide comments; work in conjunction with VDOT & MPO
Proposed Interstate 73	ongoing	Staff monitoring project progress
Geographical Info. Sys (GIS)	ongoing	Used extensively for road inventory and PMS
Context Sensitive/Flexible Design	ongoing	Project specific, time frame dependent on project scheduling
Intelligent Trans. Systems (ITS)	ongoing	Coordinate efforts with RVARC & VDOT
Comment Form on County's Website	by 2005	Citizen can currently access contact info and communicate to the County Traffic Engineer; will attempt to get more structured comment form in 2005
Citizen Input on Long Range Plan	ongoing	Will receive comments at any time for potential amendments and/or the scheduled updates