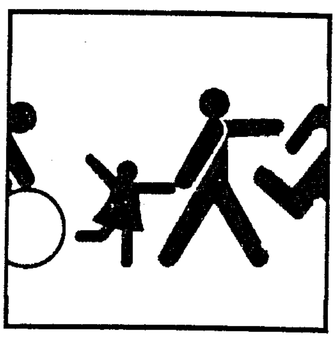
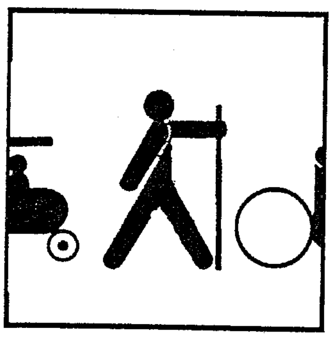
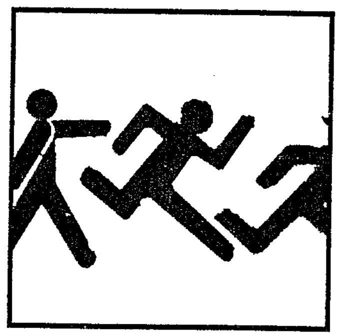
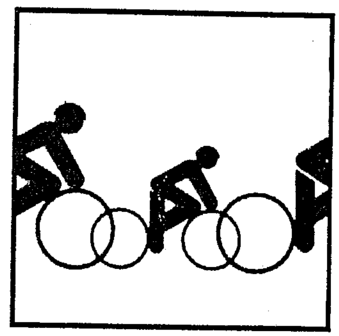
Conceptual Greenway Plan

Roanoke Valley Virginia

Prepared For:
the Roanoke Valley Greenways/Open Space Steering Committee,
the Fifth Planning District Commission
the City of Roanoke, the County of Roanoke,
the City of Salem, and the Town of Vinton

Prepared By:
Greenways Incorporated
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Contents

Acknowledgements

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Document Summary

The regional greenways planning effort began in earnest in December 1994 when the elected officials of the valley's four governments appointed representatives to serve on the RoanokeValley Greenways/Open Space Steering Committee; the group is staffed by the Fifth Planning District. Local governments also provided funding, on a per-capita basis, to hire a greenways specialist to assist the steering committee with a citizen-based greenways planning effort.

The steering committee's activities have included: visiting greenway systems in Raleigh/Durham, North Carolina, and Knoxville, Tennessee; hiring Chuck Flink and his firm,Greenways Incorporated, as the consultant for the planning effort; conducting a series of three public workshops across the valley to obtain citizen input; working with the consultant to develop the Roanoke Valley Conceptual Plan; and selecting, from among several regional alternatives, the first greenway corridor for which ISTEA funds will be sought. (For a detailed chronology of the planning process, see Appendix A.)

Section 2: Top Ten Strategies for Success

Based on its experience working in communities across the United States, Greenways Incorporated, the consulting firm which helped the regional steering committee prepare the conceptual plan, sets forth 10 strategies as essential to the successful development of the Roanoke Valley greenway system. The strategies are:

1. Establish a formal framework for on-going inter-governmental cooperation.
2. Promote and ensure private-sector involvement.
3. Create a non-governmental, citizen-based greenway advocacy organization.
4. Develop a Valley-wide network of on and off-road corridors linking major facilities and points of interest.
5. Incorporate bicycle (and, where feasible, pedestrian) accommodations when upgrading existing roads and building new roads.
6. Develop a highly visible, multi-jurisdictional pilot project.
7. Establish an on-going, regional program to preserve or acquire the use of property for greenways.
8. Institutionalize the greenway system by way of annual funding allocations by local governments for greenway development and maintenance.
9. Implement a regional greenway management and maintenance program.
10. Develop an on-going information and marketing program for the regional greenway system to ensure maximum usage and support by citizens as well as the realization of economic benefits.

Section 3: Benefits of Greenways

Investments in greenway systems pay off, directly and indirectly, through a variety of benefits realized by communities.

Transportation benefits: Greenways can link common destinations such as schools, commercial and employment centers, parks and libraries. Therefore, they can provide alternative transportation routes which reduce or prevent congestion on highways and streets and the associated costs of expanding or developing infrastructure for motor vehicles.

Economic benefits: In exchange for the costs of development and maintenance, greenway systems frequently produce a diversity of economic benefits including: increased tourism and recreation-related revenues; increased property values for homes and businesses located adjacent to greenways; and avoided costs for highway expansion. Greenway systems also are a quality-of-life amenity considered important by many corporations seeking to expand or relocate.

Health and recreation benefits: Greenway systems often link existing parks and playgrounds and provide a variety of opportunities for recreation and exercise to many, regardless of age and ability. Typically, they are used by walkers, joggers and bicyclists and, based on terrain and trail design, the intensity of exercise can range from mild to strenuous. Excepting extremely rough terrain, greenway corridors can, and should, be designed to be accessible to those with physical limitations.

Cultural and historic benefits: Greenways can provide opportunities for the enhancement of a region's culture (they are becoming the new "Main Street" in many communities) and the protection of its historic resources. Many of the Roanoke Valley's historic resources, in particular those related to its early settlement, are found along the Roanoke River and tributaries such as Tinker Creek.

Water-quality and quantity benefits: Greenways can protect water quality by preserving natural buffer areas beside streams and rivers which filter pollutants. They also can be used in stormwater management programs to prevent or minimize flooding and reduce property damage by serving as storage areas for water during periods of heavy rain.

Air-quality benefits: Greenways promote walking and bicycling and often link shopping and employment districts, schools, parks and libraries. Therefore, they provide alternatives to motor vehicle transportation which can figure significantly in controlling or reducing air-polluting emissions.

Plant and animal-habitat benefits: All types of wildlife benefit from greenways, especially in urban and suburban areas, because they provide corridors for access to food sources, water and habitat. In much the same way, greenways provide "gene-ways" for plant life.

Section 4: Goals and Objectives/Strategies

This section describes the citizen-based planning process used to develop the conceptual greenway plan and contains the goals and objectives/strategies in their entirety. The goals and objectives/strategies for the Roanoke Valley Conceptual Greenway Plan are based on citizen input obtained at the series of three public workshops; these statements were reviewed and refined by the regional steering committee to ensure that the plan being presented to local officials is complete and comprehensive.

The transportation goal states that greenways should be viewed as an alternative to motor vehicles as a means to access shopping areas, schools, work sites, parks and other important places in the Valley. Objectives/strategies focus on integrating greenways into the community by connecting them with mass transit sites, widening or modifying roads to accommodate bicycles and ensuring access to greenways for those with physical challenges.

The safety goal focuses on designing greenway corridors and programs to ensure the safety of users and those living and working nearby. Supporting objectives/strategies address the establishment of effective law enforcement and emergency response programs, the prevention of problems, minimizing user conflicts and improving bicycle safety.

The recreational/fitness goal states that the greenway system should be designed to serve both as a recreational/fitness resource and as a means of access to parks and other recreational opportunities. Objectives/strategies cite the need for a range of fitness activities, encourage the integration of greenways into area businesses' fitness programs and promote the use of fitness education to help Valley citizens emphasize wellness.

The education goal focuses on providing the public with information about the benefits and uses of greenways and the area's natural and cultural history. Objectives/strategies address a variety of education initiatives dealing with the environment, economic benefits, proper greenway use and conduct, historic resources and the use of greenways as learning laboratories for school and community groups.

The economic development goal states that both costs and benefits should be considered as the greenway system is being developed. Objectives/strategies deal with promoting tourism; maintaining greenways; utilizing easements, incentives, public rights-of-way and other approaches to promote and enable greenway development; documenting greenway benefits; and cultivating multiple sources of financial support for greenways.

The environment goal identifies environmental benefits as a major focus of the greenway system and establishes as supporting objectives/strategies: stormwater management and flood reduction; protection of stream corridors, vegetation and wildlife habitats; and reduction of non-point-source water pollution.

The organization and operation goal addresses the implementation of the regional conceptual greenway plan and the greenway system. Objectives/strategies include: obtaining local government and citizen support; being responsive to citizen concerns; establishing standards for the design, operation and maintenance of the system; ensuring the existence of an organizational structure to carry out regional planning, implementation and operation of the greenway system; establishing a non-profit organization to promote public support, raise funds and operate volunteer programs; and selecting a pilot greenway corridor project and implementing it.

Section 5: Inventory and Analysis

This section has two components. The first catalogs earlier plans and studies directly or indirectly involving greenways and recreational trails. It also discusses existing trails and bicycle facilities in the Valley. In the second component, types of corridors are described; these include railroad corridors and utility rights-of-way.

Section 6: Conceptual Greenway Route Plan

This section, along with Section 4 which contains goals and objectives/strategies, forms the backbone of the conceptual greenway plan. The public-input process used to identify greenway linkages and rank corridors is described. Detailed information is provided about each of the 51 greenway corridors set out in the conceptual plan and map and several routes within the City of Roanoke which could not be shown on the map due to its scale are explained.

The section concludes with a listing of the greenway corridors recommended by the Roanoke Valley Greenways/Open Space Steering Committee as starting points for greenway implementation. In determining which corridors to recommend, the steering committee considered public input and preferences, information provided by the consultant, the insights they gained through greenway site visits and similar experiences and the perspectives and knowledge they brought with them to the committee (as bicyclists, teachers and hikers, for instance).

The listing of recommended greenway corridors is (in no priority order):

- The Roanoke River;
- Mudlick Creek/Garst Mill;
- The Blue Ridge Parkway (on-road and off-road facilities);
- The Salem Rail Trail (Hanging Rock);
- Tinker Creek;
- Downtown Roanoke to Explore Park (via Mill Mountain);
- A connection to the Appalachian Trail (via Carvins Cove);
- Electric Road/Route 419 (on-road and off-road facilities);
- Wolf Creek;
- Stewartsville Road (Rt. 24) to the Blue Ridge Parkway; and
- Connections to existing horse trails.

Section 7: Getting the Greenway Built

Implementing a greenway system is a long-term process during which the system is pieced together, literally, as each corridor is developed. This section proposes an implementation schedule for the Roanoke Valley's regional greenway system and explains in detail the components and sub-parts of the implementation process.

Several sub-parts comprise the first implementation component, greenway planning and design: feasibility studies, master planning and construction documentation. Finding land for greenway development is the second component; easements, regulations and impact fees are among the approaches used and within each of those categories there are a variety of mechanisms. For instance, conservation easements, preservation easements and public-access easements offer landowners a range of options and incentives to provide land for greenway development.

The third implementation component, sources of funding for greenway projects, is examined in some depth. Local funds for greenway systems can be provided by way of bond referenda, General Fund appropriations and Capital Improvement Programs, greenway trust funds, private-sector funds and other initiatives such as volunteer-assistance and small-scale donation programs which give citizens opportunities to actually buy-in to greenway systems. Federal funding sources include the Intermodal Surface Transportation Efficiency Act (ISTEA) monies which are passed through and administered by the Virginia Department of Transportation, the Symms National Recreation Trails Fund Act, the National Scenic Byways Program, various programs charged with protecting public land and conserving natural resources and public works/community development programs. Some of the more prominent grant programs funded by private foundations are also identified.

Section 8: Greenway Maintenance and Management

A greenway maintenance and management plan is critical to the long-term success and viability of any greenway system and should be developed *early* in the greenway development process. A regional approach, to the extent it is feasible, is proposed for the Roanoke Valley greenway system.

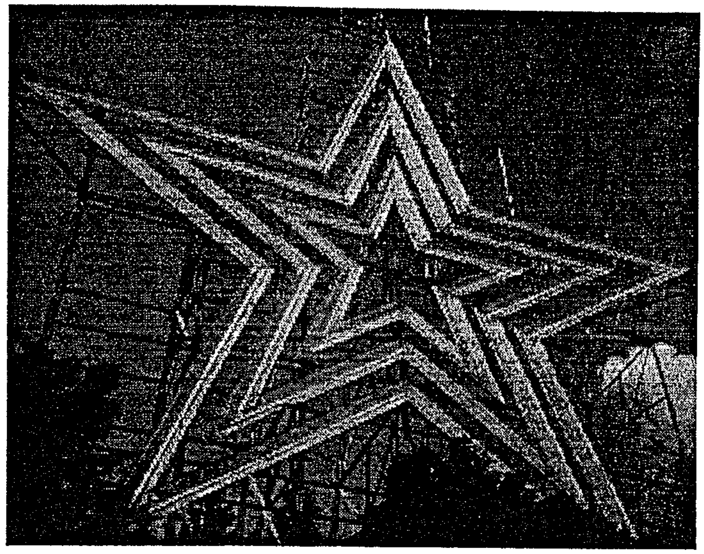
Techniques for addressing liability and risk management issues are discussed, as are safety and security considerations and routine maintenance.

Section 9: Greenway Trail Design

The final section of the plan provides technical information about a range of trail types, widths and surfaces; special structures, such as bridges and boardwalks; signage; and furnishings.

Section 1: Introduction

The Roanoke Valley Conceptual Greenway Plan's study area includes the Cities of Roanoke & Salem, the Town of Vinton, and Roanoke County. This plan delineates proposed conceptual routes for a network of greenways throughout the four jurisdictions. It also addresses necessary policies, programs, and physical improvements needed to develop this network of greenways throughout the Valley. This plan addresses both off-road and on-road corridors, and makes recommendations for a trail system that would serve the needs of bicyclists, walkers, joggers, rollerbladers, horseback riders and hikers.



This plan reflects the strong desire of local residents to ensure greater mobility and improve the quality of life in the region. The Roanoke Valley Conceptual Greenway Plan is the result of growing grassroots support for greenway development among local citizens. Hundreds of Roanoke Valley residents demonstrated their support during a series of three public workshops conducted during July and August of 1995. These residents, along with the Greenways/Open Space Steering Committee, provided detailed input that became the foundation for this Conceptual Plan. It is their collective vision that made this plan possible, and that vision will carry its implementation into the 21st century.

Section 2: Top Ten Strategies for Success

A tremendous amount of work will be needed to achieve the greenway route network envisioned by the Conceptual Greenway Route Map. In order to fully implement the plan, success must occur both "on the ground" — as indicated by miles constructed — as well as at a programmatic level. Greenway programs such as on-going planning, education, marketing, maintenance and advocacy are *essential* components of a successful program. It is important to consider these elements during the early years of greenway development to ensure continued public interest and safe and secure trails.

The ten action statements below represent the most critical items that must be accomplished in order to successfully develop the Roanoke Valley greenway system. These recommendations are based on successful techniques that other communities have used to get greenway systems on the ground. Some will be easier to accomplish than others - but all are necessary.

- **Establish a framework for on-going inter-governmental cooperation to develop a regional greenway system through a permanent committee of interjurisdictional local staff.**

  A successful greenway program in the Roanoke Valley will be more likely if local staff are able to devote time for planning and coordination. In some communities, intergovernmental Greenway Commissions can provide not only a forum for staff involvement, but also a planning entity that can be charged with reviewing local greenway plans and on-going regional greenway planning.

- **Promote and ensure private sector involvement from all localities by means of organized partnerships.**

  As fundraising efforts begin in earnest for greenways in the Roanoke Valley, it will be essential to identify private sector corporations and businesses that are willing to contribute land, funds, materials, or services for greenway development. By formally organizing public/private partnerships to develop greenways, local businesses will be assured that their contributions are recognized

- **Create a non-governmental greenway advocacy organization that would include citizens from all communities.**

  Grass-roots support will be essential in order to keep the greenway movement going strong in the Roanoke Valley. A Citizen's Greenway Advocacy Group can provide local support that is critical during the early years of implementation. Local planners will need community support for ordinance revisions, local Capital Improvements Program funding, and specific greenway projects. In other communities, greenway advocacy groups have formed to promote a particular project, and then have graduated to new projects as greenways are built.

- **Develop an on-road and off-road network of trails through the Valley linking diverse land uses such as communities, parks, commercial areas, and natural resources.**

  The Roanoke Valley Conceptual Greenway Map shows a network of facilities proposed throughout the Valley. These trails should be built to serve diverse users such as equestrians, walkers, bicyclists, rollerbladers, cross-country skiers, joggers and mountain bicyclists.

- **Incorporate bicycle and pedestrian accomodations on newly built and improved urban roads. Incorporate bicycle accomodations on other newly built and improved roads.**

  Many opportunities exist to include bicycle and pedestrian facilities on roads that are already planned for widening, and on new roads that are planned in the Valley. It is far less expensive to include bicycle and pedestrian facilities as part of the construction process, rather than retrofitting these roads after construction is complete.

- **Develop a highly visible multi-jurisdictional pilot project.**

  A successful, well-used, and popular pilot project can be used to introduce the greenway concept to the general public in a positive way, and to garner general public support for continued greenway development. A multi-jurisdictional pilot project in the Valley would also help the region develop cooperative working relationships, as well as provide a guide to dealing with critical management issues for trails that cross jurisdictional boundaries.

- **Establish a regional program of on-going greenway land acquisition through donations, easements combined with new sewer interceptors, and land purchase where necessary.**

  Immediate action to preserve and acquire greenway land will be necessary in the Roanoke Valley, due to diminishing land resources in urban and suburban areas. Governmental agencies should be made aware of the opportunities to include greenway easements along with new sewer interceptors and rail corridors that are announced for abandonment. Interagency assistance should be provided to ensure these opportunities aren't missed.

- **Establish an annual allocation of local government funds for trail construction and maintenance.**

  While federal funding for bicycle and pedestrian facilities has provided a boost to greenway construction throughout the United States, these funds cannot be accessed without local matching funds. Greenway funding should be a standard part of local fiscal budgets. In general, a diverse funding base should be pursued, in the event that federal funding is discontinued.

- Implement a multi-jurisdictional greenway maintenance and management program to promote a safe and clean trail system.

  Maintenance and management issues should be resolved *before* greenways are built.

- **Develop a regional marketing program for the greenway system that includes promotional literature, maps, and tourist information.**

  As the Roanoke Valley's greenway system begins to take shape, local governments, and community organizations should join together to market this system. Maps and brochures can be used not only to educate local citizens, but also to increase tourism revenues.

Section 3: Benefits of Greenways

Greenways are not a new land use concept, having existed in the United States for more than 100 years. Greenways are generally regarded as systems or networks of connected lands that are protected, managed or developed to provide environmental protection, alternative transportation, flood plain management, economic revitalization, and a recreation amenity. In the urban areas of the Roanoke Valley, greenways will be established along the last vestiges of undeveloped land, which include abandoned railroad corridors, streams, utility rights-of-way, and park lands.

Many greenways are implemented by local communities to control flooding, improve water quality, protect wetlands, conserve habitat for wildlife, and buffer adjacent land uses. Greenways typically incorporate varying types and intensity of human use, including trails for passive recreation and alternative transportation, and low intensity park facilities, such as open play fields. They have also been shown to increase the value of adjacent private properties as an amenity to traditional forms of land development. These and other benefits of a Roanoke Valley greenway network are described below.

3.1 Transportation Benefits

Greenway corridors throughout the Roanoke Valley can serve as extensions of the road network, offering realistic and viable connections between origins and popular destinations such as work, schools, libraries, parks, shopping areas, tourist attractions, and others. Congested streets and highways are a familiar sight throughout the Roanoke Valley, despite a program of new roadway construction and roadway improvements. The Valley's roads are becoming more congested, and the congestion often makes public roads unsafe for alternate means of transportation. Greenways offer us the option to bicycle or walk, when few options otherwise exist.

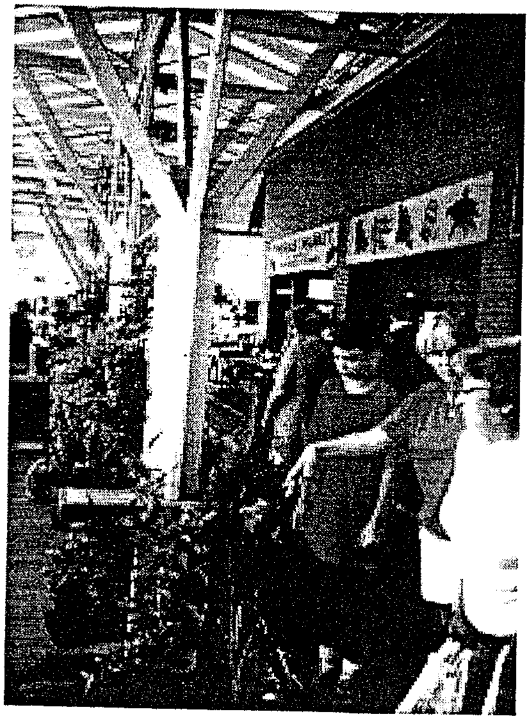
In past years, our communities have grown in a sprawling, suburban manner fueled by the capability of the automobile. Our nation has abandoned some traditional forms of transportation (such as passenger train service), and has been slow to improve other forms of mass transportation (bicycle networks, bus systems, local train service). In order to provide relief from congested streets and highways in the Roanoke Valley, we should concentrate future transportation planning and development on providing a choice in mode of travel to local residents. These mode choices should offer the same benefits and appeal currently offered by the automobile: efficiency, safety, comfort, reliability and flexibility.

Greenway corridors, if viewed as extensions of the roadway network, can serve as viable commuting and travel routes throughout the Roanoke Valley. Greenway based bikeways and walkways are most effective for certain travel distances. National surveys by the Federal Highway Administration have shown that Americans are willing to walk as far as 2 miles to a destination, and bike as far as 5 miles. It is easily conceivable that destinations can be linked to multiple origins with a combination of off-road trails and on-road bicycle and pedestrian facilities.

3.2 Economic Benefits

Greenways offer numerous economic benefits to the Roanoke Valley including higher real property values, increased tourism and recreation related revenues, and cost savings for public services. Greenways have been proven to raise the value of immediately adjacent properties by 5 to 20%. In a new development in Raleigh, North Carolina, new lots situated on greenways were priced $5000 higher than comparable lots off the greenway. Many home buyers and corporations are looking for real estate that provides direct access to public and private greenway systems. In many communities, homes situated adjacent to greenways sell for thousands of dollars more than similarly sized and priced lots across the street. Greenways are viewed as amenities by many residential, commercial and office park developers who, in turn, are realizing higher rental values and profits. Additionally, greenways in the Roanoke Valley can also save local taxpayers significant public money by utilizing resource based strategies for managing community stormwater and hazard mitigation, thus placing into productive use landscapes that would not normally be developable in a conventional manner.

City of Roanoke's downtown Market



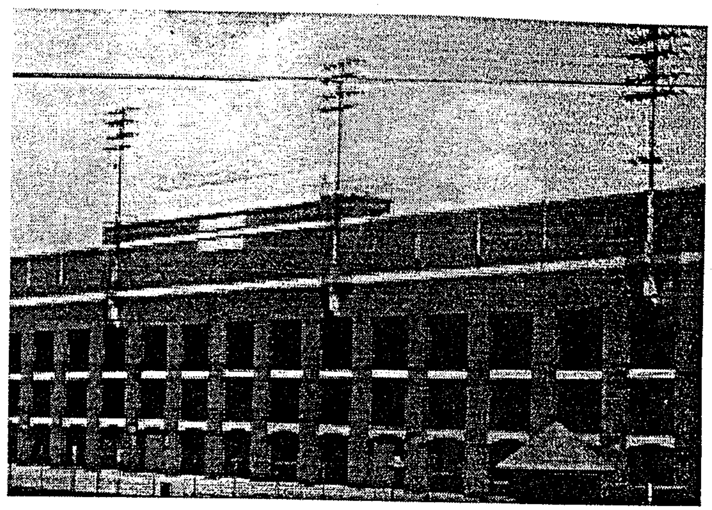
Tourism plays an important part in the economy of the Roanoke Valley and the development of greenways can work to enhance this industry. Tourism is currently ranked as the number one economic force in the world. In several states, regional areas, and localities throughout the nation, greenways have been specifically created to capture the tourism potential of a regional landscape or cultural destination. The State of Missouri, for example, spent $6 million to create the 200-mile KATY Trail, which, in its first full year of operation, generated travel and tourism expenditures of more than $6 million. Orange County, Florida spent $2 million to create the 16-mile West Orange Greenway, and expects to realize a complete return on its investment in the first year of operation through the economic revitalization of the small rural towns that lie along the trail's route.

3.3 Health and Recreation Benefits

If greenways can encourage more people to walk or bike to short distance destinations, Valley residents will likely be more fit and healthy. The modern American life-style is becoming increasingly fast paced. Leisure time for the average citizen has actually decreased from the 1960's by almost 4 hours per week. We are working longer hours, and engage in activities that are less physical. As a society, we are also spending more of our time indoors.

In 1987, the President's Commission on Americans Outdoors released a report that profiled the modern pursuit of leisure and defined the current quality of life for many Americans. Limited access to outdoor resources was cited as a growing problem throughout the nation. The Commission recommended to President Reagan that a national system of greenways could provide all Americans with access to linear open space resources close to where they live and work.

The proposed greenway system for the Roanoke Valley would be developed to complement the community's existing parks and open space system. Trail systems could be developed not only for alternative transportation, but also to serve as primary recreation and fitness resources. Many older Americans are asked by their doctors to walk at least two miles a day to maintain a healthy life-style. Greenways can offer safe off-road facilities for this prescriptive therapy.



Victory Stadium

3.4 Cultural Benefits

Greenways can enhance the culture and protect many historic resources of the Roanoke Valley. Successful greenway projects across the United States have served as America's new "main street," where neighbors meet, children play, and community groups gather to celebrate. For cities and towns large and small, greenways have become a cultural asset and focal point for community activities. Some communities sponsor "Greenway Day" to celebrate the outdoors and local traditions. Various walking and running events are also held on greenways to support charity or extend traditional sporting events. Many environmental groups adopt segments of greenways to sponsor Earth Day activities and Clean Sweep programs. Some greenways, like San Antonio's Riverwalk, are the focal point not only for community activities, but also for economic growth and prosperity.

The richness and diversity of the Roanoke Valley's historic resources are represented by numerous local National Register of Historic Places properties and historic districts. Many of these properties are found along the Roanoke River and within some of the stream corridors throughout the valley. Streams played a critical role in the early settlement and development of the Valley and greenways are a land use tool that can be utilized to further protect and enhance these historic resources. Greenways can also be a vehicle to provide controlled public access to important historic properties in a manner that allows preservation to continue.

Historic Home in Salem

3.5 Water Quality and Water Quantity Benefits

Greenways often preserve wooded open spaces along creeks and streams which absorb flood waters and filter pollutants from stormwater. Flooding is a significant problem throughout the Roanoke Valley. A problem that continues to occur in the Valley is the encroachment of buildings and other

The Roanoke River

land use development into flood prone areas. By designating flood plains as greenways, the encroachments can be better managed, and can be replaced with linear open space that serves as an amenity to local residents and businesses whose property lies adjacent to the greenway.

As a flood control measure, greenway corridors serve as a primary storage zone during periods of heavy rainfall. The protected flood plain can also be used during non-flood periods for other activities, including recreation and transportation. In conjunction with existing stormwater management policies and programs implemented in the Valley, greenway lands can be established by development as it occurs.

The expense associated with the establishment of the greenway system will be offset by the savings realized by every resident in reduced flood damage claims. Additionally, for those residents who are required to purchase flood insurance, implementation of a community-wide greenway system in the Roanoke Valley is likely to result in reduced rates.

Greenway corridors also serve to improve the surface water quality of local streams, many of which, including sections of the Roanoke River, fall below acceptable standards for recreational water contact. Currently, stormwater in the urban area is collected in pipes and eventually discharged into local streams and rivers. If more stormwater were allowed to flow overland though flood plain forests and wetlands, more pollutants would be removed. Cleaning the surface water in streams would benefit not only local residents, but also the numerous forms of wildlife that depend on streams for their habitat.

3.6 Air Quality Benefits

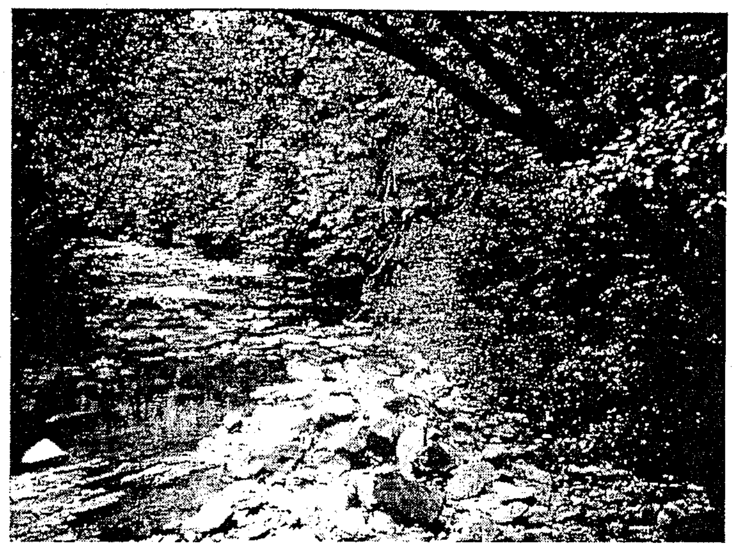
Greenways as transportation corridors could serve to reduce traffic congestion and therefore improve the air we breath. The most prevalent source of air pollution in the Valley is automobile emissions. The highest concentrations of emissions are typically located in and around suburban shopping centers, and highway interchanges. Offering a viable transportation choice will encourage people to bicycle and walk more often, especially on short trips, thereby reducing congestion and auto emissions.

The Roanoke Valley is able to meet air quality standards at present and has not been designated as a "non-attainment" area. However, because of the area's topography, weather inversions can trap man-made pollutants in the Valley, causing pollution concerns at times.

3.7 Plant and Animal Habitat Benefits

Humans are not the only beneficiaries of greenway corridors. Many species of urban and rural wildlife also benefit from greenways. Most of the wildlife that we are familiar with today in our urban communities are known as "edge species." These mammals, birds, amphibians and insects have adapted to urbanizing landscapes and are developing a harmonious relationship with urban residents.

Greenway corridors can serve as a suitable habitat for many edge species wildlife. These corridors offer the necessary food source and, most importantly, access to water that is required by all wildlife. Additionally, greenway corridors in the Roanoke Valley could become the primary migratory corridor for terrestrial wildlife, serving to keep gene pools well integrated. Some wildlife biologists have extolled greenways as future "gene-ways" and determined that north-south migration routes are essential to maintaining healthy wildlife populations.



Tinker Creek near Hollins College

Greenways can also serve as gene-ways for plant life. Plants migrate with changes in climate and habitat. Recently, several scientific studies have described the demise of the eastern North American forest; one of the culprits has been 200 years of intensive land use that fragmented important gene-ways. These gene-ways are often the rivers and stream corridors that have long served as transportation routes for animals and humans. Greenways in the Roanoke Valley can be targeted as a primary habitat for many species of plants and animals. Programs can be established to not only protect the valuable existing forested areas of the Valley, but also to reclaim and revegetate channelized streams in order to support better habitat.

Section 4: Goals and Objectives

Public interest in a greenway system for the Roanoke Valley has been growing for some time. The concept of greenway development has been supported by many local planning projects. This plan, however, represents the first effort to address a greenway system comprehensively. All localities within the Roanoke Valley have become cooperatively involved in developing a greenway system that will work to link these jurisdictions. The development of goals, objectives and strategies to guide this cooperative effort has been a major part of this plan's preparation.

The process of developing goals and objectives for the greenway system has allowed citizens and the Steering Committee to examine how they want the system to function and what they want it to provide for the community. The setting of goals and objectives involved three steps.

At the first community workshop, citizens divided into small groups and "brainstormed" sets of goals and objectives. These were compiled and displayed on the wall. Citizens then voted for the goals and objectives considered to be the most important. After the meeting, the consultant further compiled the citizen responses (avoiding duplication, clarifying wording, etc.). They provided the results at the remaining community meetings and in the first draft of the plan. This draft was presented to the Steering Committee which closely examined citizen input and further refined goals and objectives.

4.1 Summary of Citizen Input

The citizens attending the first community meeting were divided into groups and asked to "brainstorm" goals and objectives for each of six topics - transportation, safety, recreation/fitness, education, economics, and environment. After compilation of the small group results, the large group refined a set of goals and objectives. At subsequent workshops, a summary of these results was distributed and further citizen input was collected and incorporated. That is also reflected in the following to the extent possible.

The community workshops were held on July 14, 1995 in Roanoke City, August 17, 1995 in Vinton, and August 30, 1995 in Salem. They utilized an interactive group process. Although input collected from citizens cannot represent an exhaustive listing of all potential greenway planning factors and concerns, it provides many examples of the types of things that Roanoke Valley residents consider important. For example, citizens noted the importance of including a variety of users on the greenways. They mentioned bicyclists, walkers, joggers, parents with baby carriages, rollerbladers, and horseback riders. They wanted the physically challenged to have access to at least part of the system also, although they noted that some trails would be of the "rougher" type that could not accommodate wheelchairs. They wanted greenway surfaces to vary - being paved in some places and unpaved elsewhere.

Citizens stated that it may be difficult to decide exactly how each trail should be used. They wondered if horses would get along with bicyclists, noting that some trails (like the New River State Park Trail) allow horses and bicyclists on the same path. In other localities, these uses are separated. Similar questions arose on whether or not rollerblades would interfere with walkers. Ideas were offered on how all types of users could or should be accommodated on the greenway system.

They stressed that greenways should be used both as recreational destinations and as ways to get to other recreation areas (both proposed and existing) in the community. They also listed the types of places that should be linked together by greenways - schools, libraries, parks, shopping areas, and work sites. They wanted people to be able to use greenways as alternatives to motor vehicle traffic. They wanted people to be able to use greenways to get to Valley Metro's Campbell Court (main bus station) and to bus stops.

Citizens felt that both on-road and off-road trails are needed. For the on-road network, they wanted existing roads to be modified to allow for bicyclists and pedestrians. Many wanted new road construction to consider the needs of these users. They wanted the greenway network to stretch throughout the Roanoke Valley, into the downtown sections, through the suburbs, and into the rural areas. For example, people noted the desire to hike from the Blue Ridge Parkway to the downtown farmers markets in Salem, Roanoke, and Vinton.

Many citizen were aware of the economic benefits of greenways. Greenways could become new tourist attractions for the Valley, as well as connect the Valley's tourist attractions. Many people urged greenway linkages with the Appalachian Trail, Blue Ridge Parkway, and Explore Park.

Citizens described health benefits of greenways, both in the way increased open space contributes to improved air quality, and in the use of greenways for exercise and recreation. Many voiced an opinion that new businesses would come to the Roanoke Valley because of the increased quality of life that greenways can bring. These new businesses would become partners in the greenways program, using it with their corporate wellness programs.

Citizens wanted greenways to be safe for both users and nearby residents. They suggested that police patrol greenways by horseback or bicycle. They noted that planners would need to make decisions about signs, lighting, hours of operation, and other security concerns. This will be especially needed for sections of greenways that pass through residential neighborhoods.

They stressed the need for greenway planners to work closely with property owners during the design phase to ensure that adjacent property owners' concerns are considered.

Citizens wanted to make sure that the environment is not degraded in any way by the development of greenways. They stressed the point that trails along the Roanoke River should result in less, rather than more, runoff and pollutants in the water. They noted the need for strict guidelines for environmentally sensitive trail development. Many suggested taking advantage of the opportunity to make new greenway trails whenever the ground is restabilized after routine replacements of sewer or other utility lines. Tinker Creek and the Garst Mill areas were given as examples of such opportunities.

Many citizens proposed that greenways be used as outdoor learning laboratories for school students. Adults also could use greenways for various learning experiences. Along the greenways, displays can provide specific cultural and historical information. Citizens noted that greenways would provide ideal opportunities for teaching bicycle safety.

4.2 Goals, Objectives, and Strategies

This section of the plan combines input of citizens, the consultant (Greenways Incorporated), and members of Roanoke Valley Greenways/Open Space Steering Committee. Steering Committee members attended citizen workshops in order to hear citizens' concerns in person. The Committee then reviewed the consultant's analysis of the citizen input as compiled in the first draft of the plan. Steering Committee members provided comments on the draft goals and objectives, which were then sent to a Technical Sub-Committee comprised of local staff planners and a Steering Committee representative. That sub-committee further refined the draft and returned it to the Steering Committee for final comment. The Technical Sub-Committee also drafted Organizational and Operational goals for review by the Steering Committee. Because some of the objectives that came out of the planning process also could be described as strategies, they are called Objectives/Strategies in the following statements.

The following is a listing of goals, objectives, and strategies for greenway planning in the Roanoke Valley over the next decade. It is not in priority order.

4.21 Transportation Goal

Provide corridors that bicyclists, pedestrians, and others can use to get from one place to another as an alternative to motor vehicle use.

Objectives/Strategies:

- Provide greenways that connect schools, libraries, shopping centers, work sites, parks and other places in the community.
- Provide connections between mass transit sites and make arrangements for safe storage of greenway system users' bicycles (or other belongings) while they are using the transit system.
- Identify and make plans for existing roads that should be widened or otherwise modified to accommodate bicycles and pedestrians.
- Initiate Valley-wide design and installation standards to incorporate bicycle and pedestrian facilities on new roads and road improvement plans.
- Initiate design standards that are sensitive to the disabled in order to ensure opportunities for a variety of users.

4.22 Safety Goal

Design a greenway system that maximizes the safety of greenway system users and nearby property owners and neighborhoodsObjectives/Strategies:

- Establish integrated law enforcement and emergency response programs that service the needs of greenway system users and landowners.
- Incorporate into the greenway management system appropriate safety and security strategies.
- Design the greenway system to accommodate different activities (such as horseback riding and bicycling) with a minimum of user-conflict.
- Improve bicycle safety by implementing safety education programs in local schools and the community.

4.23 Recreational/Fitness Goals

Design the greenway system as both a recreational resource and as public access to other recreational resources, offering a full spectrum of recreation and exercise opportunities.

Objectives/Strategies:

- Provide a greenway system that accommodates a variety of recreational activities.
- Encourage businesses to establish and integrate use of greenways into corporate health and wellness programs.
- Promote programs and facilities that provide opportunities for individual health related activities.
- Make each greenway a stand-alone destination (as well as a link to other resources) by providing amenities such as benches, picnic areas, and workout stations.
- Provide access to the Valley's existing and proposed recreation areas, such as local parks, the Blue Ridge Parkway, and the Appalachian Trail.
- Inform the public on how using the greenways can help citizens increase personal fitness and maintain healthy lifestyles.

4.24 Education Goal

Educate the public about the need for and benefits of greenways, and educate the greenway system user about the area's natural and cultural history.

Objectives/Strategies:

- Educate the community on the importance of environmental conservation and restoration ecology.
- Develop a program of continuing education for elected officials, agency staff, developers, and engineers to define the latest technologies, design methodologies, and land use practices for managing the environment.
- Increase public awareness of the importance of the Roanoke River and its watershed lands to the future of the Roanoke Valley.
- Educate the public on the benefits and uses of greenways. Develop an out-reach education program to attract new users.
- Educate property owners of the economic advantages of having a greenway on or near their property.
- Educate greenway system users on proper greenway system etiquette that respects the rights of adjacent property owners and other greenway system users.
- Use the greenway system as an outdoor Environmental Learning Lab for school and community use.

- Provide historic information using trail markers along historically significant trail corridors.
- Provide maps and literature on trail length, difficulty, restrictions, and amenities.

4.25 Economic Development Goal
Address both the appropriate costs of implementing the greenway system (including land acquisition and capital improvements) and the benefits that will result from its creation.

Objectives/Strategies:
- Utilize the greenway system as an economic development marketing tool for the Roanoke Valley.
- Use greenway linkages to complement and enhance tourist attractions.
- Document economic benefits of greenways, such as increasing the value of land that lies contiguous to a greenway and the benefits to a new business locating in the Roanoke Valley.
- Establish a mechanism to ensure continuing maintenance of the greenways, such as using volunteers to keep maintenance costs low and starting an Adopt-A-Greenway program.
- Utilize tax incentives, easements and other approaches to encourage individuals and businesses to donate land, funding, or materials.
- Establish procedures for subdivision developers to provide donations of land or rights-of-way for greenway systems.
- Utilize existing rights-of-way, utility corridors, and other features to lower installation costs.
- Explore and obtain mutiple sources of funding for the greenways.

4.26 Environmental Goal
Design a plan that preserves, promotes and enhances the Valley's environmental assets.

Objectives/Strategies:
- Encourage localities to include greenways as a flood reduction strategy in the Roanoke Regional Stormwater Management Plan.
- Develop a valley-wide strategy for protecting natural stream corridors and other open space, plus a mitigation program for addressing resources that have been adversely altered by land development.
- Promote greenways as an alternative transportation mode that can help reduce air pollution.
- Utilize areas adjacent to greenways as natural areas that protect, maintain, or restore natural vegetation and aquatic and wildlife habitats.
- Design greenways to reduce non-point source pollution in stormwater runoff.
- Utilize greenways as buffer zones between developed areas and open spaces.

4.27 Organizational and Operational Goals
Implement the Roanoke Valley Conceptual Greenway Plan on a regional level and proceed with future greenway system planning and implementation.

Objectives/Strategies:

- Obtain local government and citizen support for the Roanoke Valley Conceptual Greenway Plan.
- Respond to citizen concerns such as safety issues and user conflicts in the establishment and operation of the greenway system.
- Establish standards for the design, operation, and maintenance of the greenway system.
- Ensure that an organizational structure exists for regional planning, implementation, and operation of greenways in the Roanoke Valley.
- Establish a non-profit organization to launch a public awareness campaign, volunteer programs and fundraising efforts.
- Select a pilot greenway project and implement it.
- Pursue implementation of other elements of the Roanoke Valley Conceptual Greenway Plan.

Section 5: Inventory

As is common for growing urban areas throughout the country, the Roanoke Valley is experiencing the problems that often accompany this growth: increased traffic congestion, diminishing air quality, and flooding in urbanized stream and river corridors.

Poorly designed urban roadways and traffic congestion have made it difficult for local residents and visitors to bicycle and walk for fitness, recreation or transportation. On the main roadways that traverse the Roanoke Valley metropolitan area, bicyclists and pedestrians face a transportation system that is oriented almost completely to motor vehicle travel. There are many places where neighborhoods are not connected to nearby destinations with sidewalks. Residents are isolated in these neighborhoods. Many schools are also isolated because they are surrounded by high-speed 4-lane roadways, which have minimal provisions for pedestrian crossings, and no travel lanes for bicycles.

5.1: Historical Context of The Roanoke Valley

The Roanoke Valley is known and loved for its rich history. Residents and visitors enjoy the cultural richness of the region on vacations as well as in everyday life. The region's natural resources and man-made historic features are important components of the Valley and should be protected and preserved whenever possible. During future design of Roanoke Valley trails, it will be important to identify and enhance these historical resources.

5.2: Previous Support for Greenway Planning

Greenways are not a new concept for the Roanoke Valley. John Nolen in his Roanoke City Plans of 1907 and 1928 originated the idea. He called attention to the aesthetic and recreational possibilities along Tinker Creek and sounded an early call for its preservation and incorporation into an open space plan for the city. Greenway development has been supported by other planning efforts in the Valley for quite some time. This Roanoke Valley Conceptual Greenway Plan, however, represents the first comprehensive approach to greenway planning in the Valley. Support for this effort has been provided by several previous planning reports, which are outlined in the following section. These descriptions are brief; should any additional information be needed from these documents, they can be located in the reference library at the Fifth Planning District Commission.

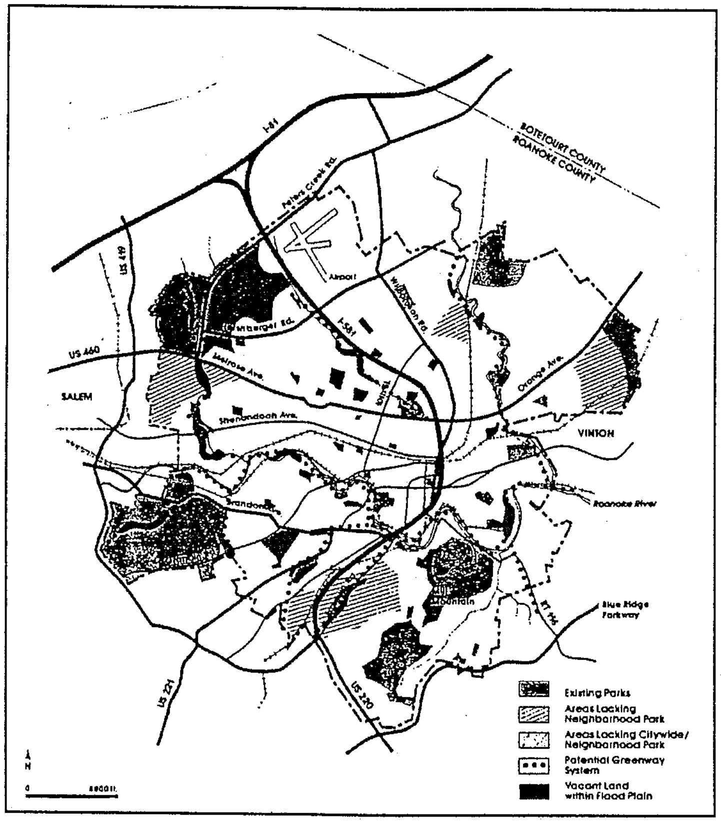
DRAFT Virginia Outdoors Plan

The draft version of the *Virginia Outdoors Plan of 1994* by the VA Department of Conservation and Recreation supports the development of greenways throughout the Commonwealth. This plan is currently being prepared by the Virginia Department of Conservation and Recreation. It describes the benefits greenways provide, including economic, environmental, transportation, fitness and others. This plan outlines methods of organizing and planning greenway systems, and raising funds to build the trail systems.

The *Virginia Outdoors Plan* proposes several specific trail projects in the Roanoke Valley. The Appalachian National Scenic Trail is identified as being in need of improvement or protection in several locations. The plan also proposes a loop trail (called the "Roanoke Area Trail") which would link the Appalachian Trail to the urban area. A greenway system linking the Roanoke and Salem metro area is supported by this plan, although the plan does not identify potential routes.

Roanoke Valley Bikeway Plan

The *Roanoke Valley Bikeway Plan* was prepared in 1991 by the Fifth Planning District Commission. This plan was written to assess the existing conditions for bicycling in the Roanoke Valley as well as to make plans to improve these conditions in the future. It makes recommendations for future roadway improvements to both new and realigned bike routes. The Bikeway Plan incorporates the concept of greenways as one element in a network of bicycle facilities throughout the Valley. The plan supports greenway development because of environmental factors such as flood water control, and recognizes the economic advantages of greenways and rail-trails.



Plan for open space and greenways from the City of Roanoke's Comprehensive Vision Plan

Roanoke Vision

Roanoke Vision is the comprehensive plan for the City of Roanoke, spanning the years between 1985 and 2005. This plan recommends greenway development in the chapter devoted to parks planning. The plan supports the development of a greenway along the Roanoke River, and encourages connections to existing trails and parks. Included on the strategy map are potential greenway routes.

Tinker Creek Conservation/Development Plan

The *Tinker Creek Conservation/Development Plan*, prepared in June 1992, is a comprehensive study on the history and future of Tinker Creek. The study outlines all past research as well as actions plans that have been developed for this region. It cites the various historical features of the stream corridor, such as Masons Mill and Billy's Cabin, and stresses the importance of preserving them. It also outlines many important topics, including the environmental, ecological, and recreational features of the creek. The plan specifically encourages the development of a recreational greenway trail that would also function to control stormwater runoff and preserve forested areas.

Reconnaissance Survey of the Roanoke River Parkway Corridor

The *Reconnaissance Survey of the Roanoke River Parkway Corridor* was prepared for the River Foundation by the National Parks Service. The purpose of this study was to evaluate the conditions and resources of the Roanoke River and its surroundings. The study's recommendations included the development of a greenway along the Roanoke River and led to the development of the Roanoke River Greenway Master Plan, described below.

The Roanoke River Greenway Master Plan

The *Roanoke River Greenway Master Plan* was prepared in 1988 for the River Foundation by Jones & Jones, and was the result of the assessments and suggestion included in the *Reconnaissance Survey of the Roanoke River Parkway Corridor.* This plan gives a detailed account of the existing conditions of the Roanoke River Corridor. In this plan the river corridor is broken down into sections which are then examined on an individual basis. Each section outlines a different set of objectives tailored to that portion of the river.

The *Roanoke River Greenway Master Plan* outlines many options for the development of a greenway along the river. These options range from a parkway system which would allow vehicular traffic along the river corridor to a pathway system that would prohibit motor vehicle traffic.

Roanoke River Corridor Plan

The *Roanoke River Corridor Plan* was prepared in 1990 by Lardner/Klein Landscape Architects. This study is composed of two parts, the first of which dealt with flood reduction measures in the Roanoke River Valley, while the second part proposed a trail system within that corridor. The plan includes strategies to be implemented in the community that would enhance the environment, aesthetics of the region, and the local economy.

5.3: Existing Trails and Bicycle Facilities in the Valley

The Roanoke Valley includes many hiking and equestrian trails, as well as several paved asphalt trails within local parks. The hiking trails are located primarily in the hills that surround the Valley, and therefore they command outstanding views of the metro area. The following is a brief overview of the locations of several popular hiking trails in the region:

The Appalachian Trail

A section of the Appalachian National Scenic Trail passes through the northern portion of the County, and has three different road way access points in that area. One can be found on Hwy 311 just east of Catawba Mt., and provides adequate parking. Two more access points exist on Hwy. 785 and Hwy. 624, but the only parking provided is room to pull off the road. Through-hikers on the Appalachian Trail are unlikely to journey into town on foot, since all three highways carry fast traffic and have no place for safe walking.

Trail Head near the Niagara Dam

Blue Ridge Parkway

Several loop-style hiking and horse trails are located along the Blue Ridge Parkway as it passes through Roanoke County. Some of these trails originate at scenic overlook parking areas, such as the network of trails that extends from the Parkway down to the Roanoke River near the bridge at Niagara Dam. The Chestnut Ridge overlook also connects to a series of hiking and equestrian loop trails.

Access to the trails located along the Parkway is primarily by automobile. The majority of people who use these trails park their automobiles or bicycles at the overlook parking lots, and take day-hikes along the trails. Bicycle access on the Parkway is generally limited to the bravest of cyclists, since there are no paved shoulders, many hills, and numerous curves with limited sight distance. There is no bicycle parking at overlooks.

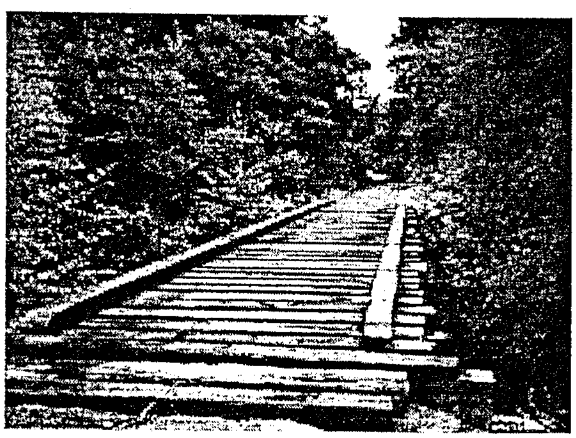
Equestrian Trails

There has been extensive support and interest in incorporating an equestrian trail system with this greenway system. Members of the Green Hill Equestrian Center, which is located in the western portion of Roanoke County, have expressed their desire to somehow link the Center with the Carvins Cove area horse trails. This is described further in the next section of this document.

On-Road Bicycle Routes

There are two bicycle routes in the study area. One extends through the City of Salem and is 11.2 miles long. The other, a shorter route in Roanoke, is a loop that is approximately three miles long. There are no special improvements along these roads to accommodate cyclists - i.e. no paved shoulders or wider travel lanes. The bicycle route signage is minimal, and does not include information such as nearby destination points and mileage. These bicycle routes are primarily for recreational riding, since they do not connect to likely destination points for commuters.

Hanging Rock Trail during construction



Multi-Use Trails and Greenways

The Roanoke Valley's first rail-trail is currently under construction in Salem. This trail extends along Kessler Mill Road from Hanging Rock to Branch Street in Salem (approximately 2 miles in length). This trail will likely serve both recreational and transportation use, as it connects to several neighborhoods. The trail was funded through the Intermodal Surface Transportation Efficiency Act of 1991, Transportation Enhancements Program of the Surface Transportation Program. Another trail is planned along a sewer easement near Garst Mill Park in Roanoke. This recreational trail was planned after sewer system improvements were installed. Except for these two trails in the planning and construction phases, there are no other paved greenway trails known to exist in the urban area of the Valley, except for several loop trails within local parks.

5.4: Potential Greenway Corridors

There are numerous corridors of land within the Roanoke Valley that offer the potential to serve as trail corridors. These linear corridors will require much future research to determine their viability for trail uses. The predominant corridor types include abandoned railroad corridors, power line easements, roadway rights-of-way, abandoned roadway corridors and river and stream corridors.

In addition, there are many publicly and privately owned open space lands within the urban area that could be used for greenway development. As specific route planning occurs, it will be important to consider these public and private lands for greenway linkages.

Railroad Corridors

The Roanoke Valley has an active past in the railroad industry, and is still criss-crossed by many active rail lines. Norfolk Southern Railroad lines stretch across the Valley linking Roanoke County, Salem, Roanoke, and Vinton. It is likely that some rail lines in the Valley will be abandoned in the future. Because these corridors are often the last remaining traffic-free linear corridors in urban areas, abandoned rail lines present exciting opportunities for multi-use trails.

Railroad Corridor

It has become a national goal to protect these vital corridors from loss by using a provision and procedure administered by the Interstate Commerce Commission to "railbank" these vital corridors. A legitimate and congressionally supported interim use for railbanking is the development of recreational trails.

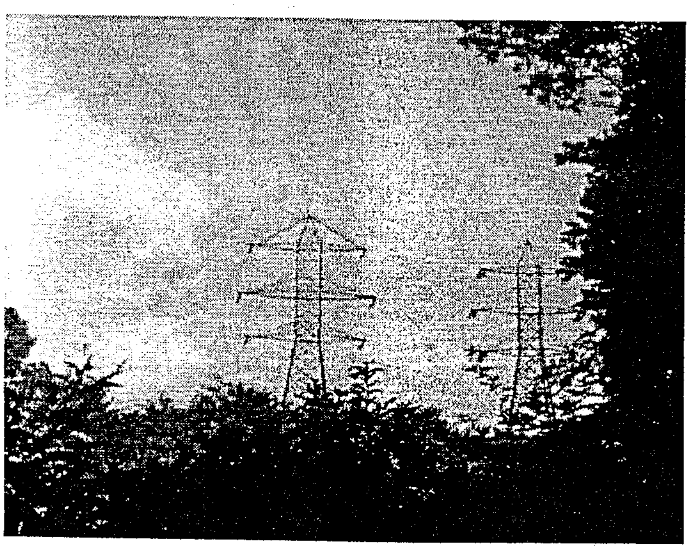
Former rail corridors, the rail bed and bridges associated within these corridors are well suited to trail development. The grades are normally flat to slightly sloped, and the bridges, trestles and other support structures that lie within the corridor were developed to support heavy and frequent rail-car use. It should be noted that existing railroad corridors also make ideal trail settings because impact to native vegetation and soil has already taken place, and cross drainage of storm waters has also been successfully resolved.

Some of the problems typically encountered with rail corridors include: title issues related to the possible use of the corridor (some titles may include rail use only); opposition from landowners to conversion to trail use; presence of toxic chemicals in the ballast, soil and surrounding vegetation; missing bridges, ballast and other facilities - removed as part of the rail operators salvage of the abandoned corridor. Each project must be evaluated on an individual basis to determine its feasibility as a viable rail-trail conversion.

Monitoring railroad activity in the Roanoke Valley will be vitally important in the future. Low freight lines need to be identified and watched so that action may be taken quickly should they become abandoned. Virginia's State Rail Plan is a source of information on abandoned rail lines and low-use freight lines. Currently, according to the State Rail Plan, there are no lines considered abandoned or low freight in the Roanoke Valley area. However, the status of local lines could change in the future, depending on freight demand, and short-line railroads could also become abandoned with only a brief public notice to indicate their intent. Therefore, all railroad lines in the Valley should be periodically monitored to determine their current status.

Utility Easements/Rights-of-Way

Utility easements in the Roanoke Valley include powerlines, which usually follow straight paths, and sewer and waterline easements, which are usually found along streams and rivers. In many cities across the country, utility easements and rights-of-way serve a dual use as trail corridors. In utility corridors where the land is owned by the utility company (termed a "right-of-way"), an agreement must be sought with that utility company. If the utility corridor exists as an easement, the land is owned by individual property owners who must each be contacted for permission to develop a greenway. Greenways are more difficult to establish in utility easements, particularly where these easements extend through residential areas, due to property owners' concerns about loss of privacy and crime. This method of greenway development in residential areas is often far easier to implement in later years of greenway development when greenways have already been established and are widely popular among residents.



Powerline Corridor

Corridors of this type require careful coordination with utility companies and adjacent land owners. Landowner and utility company liability and risk management should also be thoroughly resolved before this type of corridor is accepted for trail development. Additionally, the issue of electromagnetic fields and their effects on trail users should be considered for each corridor of this type. An excellent reference publication on this subject is "Trails on Electric Utility Lands: A Model of Public-Private Partnership," which was produced jointly by American Trails and the Edison Electric Institute. A copy of this publication is available from American Trails (see appendix for address).

Road Rights-of-Way

In urban areas, greenway systems inevitably connect to the existing street system. In many cases, local streets are the only linear corridors available for bicycle and pedestrian use. Therefore, the most successful greenway systems across the country combine off-road trails with an extensive on-road system of bicycle facilities and sidewalks.

This type of network best suits the needs of people who bicycle and walk for transportation reasons, since all major destination points connect directly to the street system.

Some advantages of this approach include availability of publicly owned land, presence of graded shoulder, ease of access and use, especially by cyclists, and familiarity with the street system. Disadvantages include proximity to automobile traffic, lack of pedestrian scale, and high volume intersections. The use of public roadways for trails must be coordinated with the appropriate local and state departments of transportation.

River and Stream Corridors

Early settlers chose to live in the Valley for reasons such as its proximity to streams and rivers. Perennial and intermittent streams flow through numerous subdivisions and neighborhoods on their way to the Roanoke River. There are several major tributaries of the Roanoke River within the study area, including Mason Creek, Tinker Creek, and Back Creek. Mason Creek flows south along Highway 311 in Roanoke County and through the City of Salem to the Roanoke River. Tinker Creek also flows south towards the Roanoke River from the Hollins area through Roanoke, just west of the Vinton town limits. Back Creek parallels Route 221 and runs east towards the river in the southern part of Roanoke County. Along with these major tributaries, numerous streams, such as Murray Run, Peters Creek, and Glade Creek all have potential as possible greenway corridors.

Every natural water feature and flood plain in the urban area has experienced urban encroachment to some extent. The increasing amounts of impervious surfaces within these flood plains are taxing both the health and basic function of these stream and river corridors, resulting in poor water quality and flooding during peak storms.

The Roanoke River near Downtown Roanoke

Comparatively speaking, the larger stream corridors are less urbanized than the smaller ones such as Murray Run. There are several stretches of Tinker Creek, for example, that are presently undeveloped and that should be preserved with greenways. The threat of flooding has been somewhat of a deterrent to development in several of these corridors, except for those who could afford to channelize the stream (which has occurred in several areas). It will be critical in the future to preserve these corridors with greenways, not only to provide trail resources, but to also protect flood plains from further degradation. Many communities are also working to restore channelized streams to their original meandering and forested condition, so that they can again serve the function of filtering and slowing stormwater.

"Paper" Streets

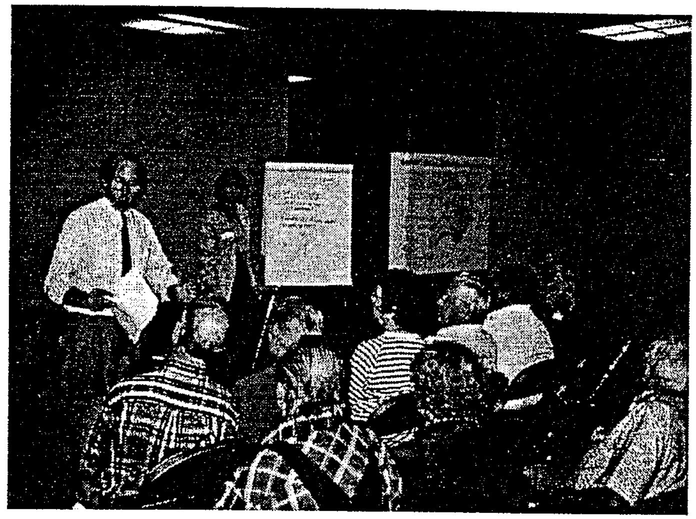
Some roadways have been abandoned from future use, or may have never been built by the municipalities. These rights-of-way are often called "paper streets". While paper streets hold potential as publicly-owned, linear spaces, they are often short and discontinuous. In some cases, plans for building these streets may have been abandoned because of environmental limitations that might also affect trail development. These corridors should not be ruled out as potential trail connections, particularly for short segments of a larger system of off-road trails. The use of dedicated, but unopened, streets must be analyzed on a case-by-case basis as the public may have only limited rights for certain purposes.

Section 6: Conceptual Greenway Route Plan

A main objective of this plan is to produce a conceptual greenway route plan for discussion, study and implementation throughout the Roanoke Valley and as the basis for further action by governing bodies. Several preparatory steps have taken place so that this can happen. The following section explains the process of identifying potential routes.

6.1 Route Planning

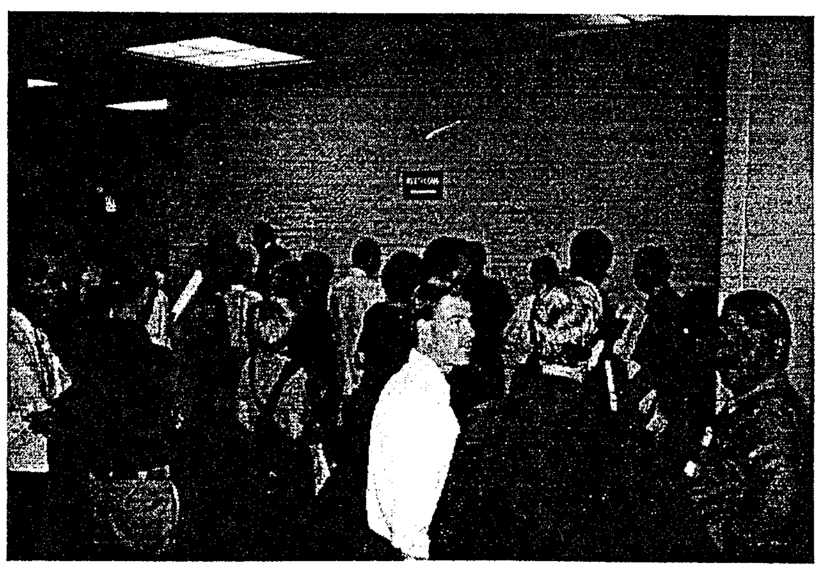
Route planning decisions made as part of this study were primarily a function of public input combined with input from the Greenways/Open Space Steering Committee and direction from the consultant. Excellent turnout at public workshops enabled project planners to identify specific corridors in high demand for improvements. Over 140 citizens attended the first public workshop, held on July 24, 1995. Following keynote presentation on greenways throughout the U.S., participants broke into five groups to "brainstorm" on potential goals and objectives for the greenway system, as well as the destinations their ideal greenway system would link. All participants were given the opportunity to share their suggestions during the break-out session. By this process, a set of goals was established. The goals were divided into six categories and are discussed in detail in the Goals and Objectives section found earlier in this report.



Citizen Involvement at a Public Workshop

The linkages recorded during the break-out session of the first workshop formed the basis of the route plan. Additional routes were added following the second and third public workshops based on participants' input. Potential greenway routes were established by directly applying the desired linkages to the existing features map. Where potentially viable off-road corridors were known to exist, a route was included on the plan. Where no known viable off-road corridor existed, on-road corridors were identified.

The Roanoke Valley Conceptual Greenway Plan recommends many on-road bicycle and pedestrian facilities throughout the metropolitan area. In general, this system of on-road bicycle and pedestrian facilities is designed to capitalize on already-planned road improvement projects. These are termed



Local Citizens vote on their priorities for the Roanoke Valley Greenway System

"incidental" improvements, and are far less expensive than "independent" improvements that are not combined with a regular roadway widening project.

Roadways scheduled for widening in the 20-Year Transportation Improvement Program were evaluated for potential bicycle and pedestrian demand - as gauged by the linkages requested by local citizens who participated in Workshop #1. Where these streets satisfied public demand, they were identified on the Conceptual Greenway Route Map.

6.2 Greenway Route Descriptions

Listed below are the numbered routes identified on the Roanoke Valley Greenway Route Plan. This listing has been compiled in order to suggest potential routes for use by local communities and the steering committee in future trail development. These routes range in type and length, depending on their location, which include both on-road and off-road corridors. When reading these descriptions, it is important to remember the following:

1) This is a conceptual plan, and further detailed design and feasibility studies are needed for each route.
2) Through further study, some may be deemed feasible, while others will be eliminated from consideration due to factors that are unknown at this time.
3) Other routes may be added as opportunities arise.
4) The Roanoke River (route 32) is the "spine" of the system.

It will be important to update and modify this plan often as the design process becomes more detailed. Included in these descriptions is an explanation of historical resources.

Route 1: Highway 785/Blacksburg Road

This stretch of highway in the northern portion of Roanoke County runs east/west and has been designated a bicentennial bikeway. It traverses the Catawba Valley. Named for early Native American inhabitants, this valley qualifies for the National Register designation of "Rural Historic District" due to the retention of cultural resources, some of which date back to the 1760's. In this region is an outstanding collection of 19th century architecture including farms, schools, churches and agricultural buildings.

Route 2: Highway 622/Bradshaw Road

This route, running almost parallel to and south of Hwy 785, is another popular on-road link to Blacksburg and Virginia Tech.

Route 3: The Appalachian Trail

This existing popular hiking trail runs from Craig County east through northern Roanoke County into Botetourt County. The Appalachian Trail was designed in 1937, and has long been considered the premiere multi-state scenic hiking trail, stretching from Georgia to Maine.

Route 4: Mason Creek
Mason Creek runs south from the northern part of Roanoke County to the Roanoke River. The stream, which parallels Hwy 311 for much of its distance, would make an excellent off-road route linking Roanoke and Salem with the Appalachian Trail and the northern on-road routes. Near the intersection of Routes 311 and 419 is the site of the Battle of Hanging Rock, fought on June 21, 1864. Mason Creek also played a role in the settlement of the Valley. One of the earliest families in the region, the Garsts, built Kessler Mill here. The mill went out of business in the 1920's.

Route 5: Timberview Road
Timberview Road links Mason Creek and Carvins Cove. It runs east/west just north of I-81.

Route 6: Wood Haven Road
This on-road route is in the northern portion of the County of Roanoke. It serves as a linkage from schools and suburban neighborhoods to both Mason Creek and Peters Creek Road. Kingstown Community was once located in this area. This community was established in the 1870's by freed slaves. A number of 19th century buildings and descendants of the original inhabitants still remain in this area.

Route 7: Horse Pen Branch
This off-road route links with Timberview Road to complete the east/west corridor to Carvins Cove. This links neighborhoods along Mason Creek in northern Salem and Roanoke County with the outlying area of Carvins Cove.

Route 8: Link to Appalachian Trail
This route in the northeastern portion of Roanoke County serves the need for a future linkage that could connect to the Appalachian Trail in Botetourt County.

Route 9: Carvin Creek
Carvin Creek runs south from Carvins Cove toward Roanoke City. It would provide an ideal off-road linkage for neighborhoods and schools in the Hollins area.

Route 10: Paint Bank Branch
This small tributary of the Roanoke River runs north to south through the western portion of Salem. This route would link neighborhoods in this area to Main Street and the proposed Roanoke River Greenway.

Route 11: Horner's Branch
This tributary of the Roanoke River could serve as an off-road route for suburban Salem neighborhoods linking to the Roanoke River Greenway.

Route 12: Roanoke River Tributary
The headwaters of this unnamed stream begin in the Havens Wildlife Management Area.

This stream runs through downtown Salem and could serve as an off-road corridor to link Salem neighborhoods with both the wildlife area and the Roanoke River Greenway.

Route 13: Red Lane
Red Lane could serve as an on-road corridor linking Salem neighborhoods with Havens Wildlife Management Area, north of Salem.

Route 14: Gish Branch
Gish Branch feeds into Mason Creek which eventually connects to the Roanoke River. This stream could link neighborhoods in the northern area of Salem with the Hanging Rock Trail (see Salem Rail Trail, Route 15).

Route 15: Salem Rail Trail
The Salem Rail Trail is the Roanoke Valley's first rail-to-trail conversion. This former rail corridor runs north/south along Kessler Mill Road in Salem. It will link Hanging Rock to Salem with an off-road trail that ends near Branch Street. There are several neighborhoods nearby that will have access to the trail. The route ends near the site of the Battle of Hanging Rock, fought in 1864. Also located near this route (on Mason Creek) is the former site of Kessler's Mill. At one time, this was one of the area's largest operating mills.

Route 16: Peters Creek Road/Green Ridge Road
This on-road corridor would link the northern part of the City of Roanoke with other corridors that extend directly into downtown Salem and Roanoke. It would connect schools and neighborhoods, such as Glen Cove Elementary and Meadow Wood Estates, with other important transportation routes.

Route 17: Hershberger Road
Hershberger Road is an important east/west transportation route through the northern part of the City of Roanoke. Parts of this busy road are slated for improvement in the 20 Year Transportation Improvement Plan(TIP). This creates an opportunity to implement provisions for bicycle and pedestrian traffic.

Route 18: Plantation Road
This on-road corridor would run north/south through the northern portions of Roanoke City and County. It would link neighborhoods and schools in the Hollins area with downtown Roanoke. Tombstone Cemetery is located along this corridor. This cemetery contains the Denton Monument, "Old Tombstone", which is listed on the National Register.

Route 19: Hollins Road
Hollins Road parallels Plantation Road on the east. It would provide another linkage between neighborhoods in this area, such as Meadewood and Bryant Heights. This road served as a pioneer road in the 18th century.

Route 20: Main Street, Salem
This east/west on-road route runs directly through downtown Salem linking many important destinations. Shopping centers, schools and neighborhoods would be accessible from this route. Downtown Salem is rich with both commercial and residential historic architecture.

Route 21: Lick Run
Lick Run is a small stream that would provide an off-road corridor linking neighborhoods, such as Fairland, with parks and schools, such as Washington Park and Lincoln Terrace Elementary School.

Route 22: 10th Street
This corridor would provide an important on-road route into downtown Roanoke from the north. This portion of 10th Street is already slated for some improvements in the 20 Year TIP and should include provisions for pedestrian and bicycle traffic.

Route 23: Williamson Road
This on-road corridor would link the northern section of the City of Roanoke (Hollins area) with downtown Roanoke.

Route 24: Tinker Creek
Tinker Creek is a major tributary of the Roanoke River. With its head waters near Hollins, Tinker Creek runs north to south. This off-road greenway route would create an ideal link from Hollins area neighborhoods and schools to Roanoke and Vinton. Tinker Creek is the Roanoke Valley's largest tributary to the Roanoke River. Settlement along Tinker Creek dates back to the 1740's and 1750's and included farms, mills, churches, and schools. (See "Routes Not Shown On Map" for more information on Tinker Creek Routes.)

Route 25: Highway 460/Challenger Rd.
This on-road route would link outlying Roanoke County neighborhoods with Roanoke City.

Route 26: Glade Creek
Glade Creek runs in a southwest direction from Roanoke County into Vinton. This stream would serve as an off-road route, linking schools and neighborhoods with each other and downtown Vinton.

Route 27: Glenwood Horse Trail Link
This route would provide a connection with existing horse trails in Botetourt County, to the northeast of Roanoke County.

Route 28: River Tributary
This unnamed tributary from Twelve O'Clock Knob connects to the Roanoke River in southern Salem. It would serve to link neighborhoods in this area with the proposed Roanoke River Greenway.

Route 29: Proposed Peters Creek Road Extension
Once built, this new section of roadway, extending south from the existing Peters Creek Road, would link area neighborhoods with the proposed Roanoke River Greenway, and complete a portion of a bicycle transportation route toward downtown Salem and Roanoke.

Route 30: Lynchburg/Salem Turnpike
This roadway, when modified, could serve as a primary transportation route between Salem and Roanoke.

Route 31: Dale Avenue/Virginia Avenue
Dale Avenue would serve as an on-road connection between downtown Roanoke and Downtown Vinton (where it is called Virginia Avenue). This congested urban route would primarily serve commuters.

Route 32: The Roanoke River
The Roanoke River stretches through the middle of the Roanoke Valley. It crosses all four jurisictions and would serve as the backbone for the greenway system. It links numerous parks, schools, neighborhoods and shopping areas. Many historic features can be found along the Roanoke River Corridor. "Nature's Own Swimming Hole" was a popular recreation spot on the river located between the two historic communities of Wabun and Glenvar. On the southeastern side of the county, the Niagara Dam, built in 1906, is still in operation. In the City of Roanoke, Memorial Bridge, built as a memorial to Roanoke soldiers who died in World War I, crosses the river to the west of Wasena Park.

Route 33: Stewartsville Road (State Route 24)
This on-road route would leave Vinton to the east and connect neighborhoods with the Blue Ridge Parkway.

Route 34: Dry Hollow
This route would use a stream corridor to link a former YMCA camp (now owned by Roanoke County) as well as a future reservoir recreation area to the proposed Roanoke River Greenway.

Route 35: Highway 639/Harbourwood Road
This on-road route would serve as a connection to the Green Hill Park Equestrian Center which is located in this part of Roanoke County.

Route 36: Barnhardt Creek
This creek could serve as a linkage to the Roanoke River for several suburban neighborhoods in southwest Roanoke, including Farmingdale, Medmont Lake, and Crestwood.

Route 37: Mudlick Creek
Mudlick Creek would be a valuable off-road corridor, providing linkages for many suburban neighborhoods, schools, and libraries in the Cave Spring area of Roanoke County and Southwest Roanoke City. This route passes by Cave Spring Corners Shopping Center, Melody Acres and Lee Hy Gardens.

Route 38: Brandon Road
This short on-road corridor would link to Grandin Road, providing cyclists with a direct route into downtown Roanoke from the southwest.

Route 39: Grandin Road
Grandin Road would provide a direct on-road route into downtown Roanoke from the southwest. This route would link a densely populated suburban area with the Roanoke River and other amenities such as schools and shopping centers.

Route 40: Colonial Avenue
Colonial Avenue is slated for improvements in the 20 Year TIP which would provide an opportunity to include provisions for bicycles and pedestrians. This is an important corridor for commuter traffic in southwestern Roanoke City and County, and would serve alternate transportation needs.

Route 41: Garnand Branch
Garnand Branch is a small stream located in southeast Roanoke City that could connect neighborhoods, schools and parks in this area with the Roanoke River and downtown Roanoke.

Route 42: Rutrough Road
This on-road corridor would link the Blue Ridge Parkway with the entrance to Explore Park in southeast Roanoke County. This would provide on-road access to Explore Park for pedestrians and bicyclists.

Route 43: Murray Run
This stream meanders through neighborhoods and parks in and around the Cave Spring section of the Valley. This linkage would provide an important connection with the Roanoke River.

Route 44: Routes to Mill Mountain
There are two routes that lead to Mill Mountain. The route on the north side of Mill Mountain would utilize Prospect Road and connect the park at the summit with down-

town Roanoke. (This route is not shown on the map, due to scale) The other route would link the south side of Mill Mountain with the Blue Ridge Parkway. Both would serve as ideal on-road routes, providing scenic and functional ways to the park on top of Mill Mountain. Mill Mountain is a popular tourist site and includes a zoo as well as spectacular views of the Roanoke Valley. Mill Mountain was named for Evans Mill, which was located at the base of the mountain. It is the original site of the "incline" rail system that took visitors to Rockledge Inn which was established in 1890's.

Route 45: Back Creek
Back Creek is a major tributary to the Roanoke River. It runs across much of the south Roanoke County, paralleling Highway 221 and crossing the Blue Ridge Parkway. This off-road route would provide scenic access to this relatively lightly populated but developing area. Elijah Poage built a sawmill and grist mill in the vicinity of Back Creek in 1848.

Route 46: Route to Smith Mountain Lake
Smith Mountain Lake is located southeast of Roanoke County and is fed by the Roanoke River. The Roanoke River corridor could serve as a viable link to the Smith Mountain Lake recreation area.

Route 47: Hwy 221/Brambleton Avenue
Parts of this on-road corridor are scheduled for improvement making this route a candidate for bicycle and pedestrian improvements. This could provide an important alternative transportation route in southwest Roanoke City and County.

Route 48: Highway 419
This route links parts of southwest Roanoke City, Roanoke County, and Salem with Tanglewood Mall, which is an important shopping destination for area residents.

Route 49: Blue Ridge Parkway
The Blue Ridge Parkway already serves as a highly popular on-road scenic route and draws tourists from all over the eastern U.S. It passes through the southeastern portion of Roanoke County, offering some of the most scenic views of the Roanoke Valley. The Parkway has been established as a greenway system for close to sixty years. The portion of the Parkway that travels through Roanoke County was completed in the 1960's, and incorporates many scenic views of the Roanoke Valley.

Route 50: Highway 220
This portion of 220 leaves Roanoke going south. As an on-road corridor it would link communities in southern Roanoke with the Blue Ridge Parkway.

Route 51: Wolf Creek
This small tributary of the Roanoke River at the boundary of Vinton and Roanoke County would link schools and neighborhoods with the Roanoke River corridor.

6.3 Routes Not Shown On Map

The following is a list of routes, which due to size and scale could not be included on the Greenway Route Plan but should be officially recognized as recommendations of this document.

Route to Explore Park

A new road, providing direct access to Explore Park from the Blue Ridge Parkway, will be constructed. It will be important to include on-road facilities to accommodate bicycles and pedestrians.

Roanoke City

Within the City of Roanoke there are many possibilities for greenway corridors utilizing a combination of City streets, sidewalks, alleys and open space. Three categories of corridors merit special attention:

- Linkages among and between neighborhoods, shopping areas, schools, and parks;
- Rail trails located on abandoned railway beds; and
- Corridors located on or near sewer interceptor lines or other utility rights-of-way.

Six corridors within the City of Roanoke have been identified for inclusion in this conceptual plan.

- **Mill Mountain to Downtown Roanoke:** Mill Mountain is a resource to the entire Roanoke Valley as are the City Market and the Central Business District. A corridor linking the park at the summit of Mill Mountain with the downtown, by way of Prospect Road and including Riverview Park, would connect these two important tourist attractions. This linkage could incorporate Elmwood Park and the City Market and could be extended to the Hotel Roanoke and beyond, through the Gainsboro neighborhood and Washington Park, to the Roanoke Civic Center.

- **The Roanoke Center for Industry and Technology (RCIT) to Tinker Creek:** The newest of the City's industrial centers, the RCIT features clean and progressive industries and corporations in a park-like setting. Tinker Creek was important to the early development of the Roanoke Valley and contains valuable historic and cultural resources. Preliminary designs for a Tinker Creek greenway have already been developed.

- **Mudlick Creek to Patrick Henry High School Complex:** This corridor would utilize City streets, sidewalks and alleys to connect Mudlick Creek and its tributaries-- and the adjacent Greater Deyerle and Raleigh Court neighborhoods -- with the high school complex and surrounding community.

- **Tanglewood Mall to Virginia Western Community College:** This segment of the greenway system could extend from the Tanglewood Mall through the old Jefferson Hills Golf Course to Virginia Western Community College and Madison Junior High School and Fishburn Elementary schools. Extending this corridor to the Patrick Henry High School complex by way of Shrine Hill Park would enable it to connect to the corridor linking the high school complex with Mudlick Creek.

- **Fleming Ruffner Schools Complex to Lick Run**: A corridor linking the Ruffner Middle School/ William Fleming High School complex to Lick Run would provide educational resources as well as opportunities to expand in several directions, possibly incorporating the Marriott Hotel and the Sheraton Inn, Countryside Golf Course and several multi-family housing developments in the area.

- **Valley View Mall to Lick Run**: This segment would offer the opportunity to link nearby neighborhoods with Lick Run by way of Valley View Mall, thus encouraging pedestrian access and providing a means to reduce motor vehicle traffic to the mall.

Downtown Salem and Downtown Vinton

While no walking tours currently exist in these downtowns, many routes on the Greenway Route Plan lead into these town centers. Here as greenway planning continues, it will be important to design safe access for bicycles and pedestrians to these downtown areas.

Equestrian Trails

Members of the Green Hill Park Equestrian Center have produced a map showing proposed dedicated bridle paths throughout the Roanoke Valley. This trail map also shows linkages with equestrian trails in Botetourt County. During planning for greenways throughout the Roanoke Valley, it will be important to include the proposed equestrian trails. They utilize existing utility corridors for the most part and extend throughout the Valley. From the south they follow the Blue Ridge Parkway east toward the Glenwood Horse trails, and to the west they criss-cross over Bent Mountain toward Green Hill Park Equestrian Center. From the equestrian center they extend northeast towards the Carvins Cove Reservoir.

6.4 Priorities for Route Development

Priorities for route development was a topic of discussion throughout the planning process for the Roanoke Valley Conceptual Greenway Plan. During the first community workshop, local citizens were asked what linkages they felt were most important. During the third community workshop, participants voted on their top priority routes. This process confirmed that Valley residents feel the top priority should be a greenway along the Roanoke River, and that residents also want other trails located close to home and linking nearby destinations. Creeks and streams scored high among local citizens as potential greenway routes.

The Roanoke Valley Greenways/Open Space Steering Committee examined the public input, along with the consultant's review, and developed the priority list below (list does not imply any priority order):

- Roanoke River
- Mudlick Creek/Garst Mill
- Blue Ridge Parkway (on-road and off-road facilities)
- Salem Rail Trail (Hanging Rock)
- Tinker Creek
- Downtown Roanoke to Explore Park (via Mill Mountain)
- Connection to Appalachian Trail via Carvins Cove
- Electric Road/Rt. 419 (on-road and off-road facilities)
- Wolf Creek
- Stewartsville Road/ Rt. 24 to the Blue Ridge Parkway
- Connection to existing horse trails

The routes on the list above should be considered as "starting points" for greenway implementation. While the list indicates the routes that are *most desired* for greenway development, the actual feasibility of such routes is yet unknown. The availability of land in these areas has not been determined, nor have potential trail alignments been explored. These and related issues will be resolved during the next phase of greenway planning and design.

Section 7: Getting the Greenway System Built

Development of this Roanoke Valley Conceptual Greenway Plan is the initial step in a process that will require more planning, on a trail-by-trail basis. This plan does not address the specifics of trail development along each corridor, such as land ownership, trail installation, and environmental constraints.

An implementation schedule for the Roanoke Valley Greenway System is found in this section of the report. This schedule addresses the practical aspects of greenway planning and design (below), as well as the programmatic activities that should occur in the years to come (reference "Strategies for Success", Section 2).

7.1 Greenway Planning and Design

Step 1: Greenway Feasibility Studies
The first step in determining the viability of a priority route in the Roanoke Valley is a feasibility study. This step is especially important in cases where corridor ownership is in question or land acquisition will be necessary. The feasibility study also allows for public input in the early stages of project planning and it allows municipalities to determine citizen support for specific routes and political feasibility prior to making firm commitments to develop particular trails. It also provides additional time to disseminate information about the benefits of greenways to trail opponents, and to plan for security issues.

A typical trail feasibility study would examine the following aspects of trail development:

- What are the options for trail routing and what are the pros and cons of each?
- For corridors that are not presently owned by the local government: what is the feasibility of either obtaining the land or getting a public-access easement to use the land?
- Are there special areas that would represent design challenges that may be impossible or cost-prohibitive to resolve? If such challenges exist, it may be helpful to enlist the help of a trail designer to provide possible solutions and their costs.
- What are the estimated costs of each trail routing option?
- Based on information obtained, which is the preferred routing alternative?
- What agencies need to be involved to make this facility a reality? What permits will be necessary?
- What is the targeted funding source of this facility, and is funding sufficient for detailed trail design, surveying, land acquisition and construction? Does this funding source have particular requirements that must be considered early in the trail planning process? (If the source of funds is the Transportation Enhancements Program, there are strict requirements for land acquisition and trail design).

Step 2: Greenway Master Planning

Once a corridor has been selected for greenway development, and the corridor has been acquired or leased for use, (see land acquisition techniques in this section) a master plan should be developed. A master plan specifies the series of actions that must be carried out by the agency that is responsible for greenway development. The master plan examines all issues relevant to the construction, maintenance and operation of the greenway. The plan must also be defensible and should be prepared through a participatory process that involves local residents in key design decisions, such as the location of access points to the corridor, the treatment of the interface between public and private properties, the type of facilities to be located in the corridor and maintenance and management of the facilities. The level of detail in a master plan for a particular corridor will vary from project to project, however, enough information should be provided, both graphically and in written form so that local residents, government staff, private-sector advocates and elected officials can understand the vision for the corridor and the series of steps required to implement the project.

The involvement of the public is a key component of developing a master plan. It is suggested that a small working group, made up of local residents, greenway advocates, government officials and other interested citizens, be established to work on the preparation of the master plan. As the work of this group progresses, interim public information meetings should be held to discuss the objectives of the master plan and to receive input from other residents. When a final master plan has been completed, it will need to be reviewed for compliance with local, state and federal laws. If the local governments are asked to sponsor development of the greenway, the plan will need to be reviewed and approved by the local officials.

Addressing Crime and Privacy Concerns of Local Landowners

Greenways in the Roanoke Valley can provide safe recreational environments. Some of the most effective deterrents to crime have involved local citizens' becoming more aware of their neighborhoods and participating in community watch programs. Greenways have proven to be an effective program for encouraging local residents to participate in neighborhood outdoor programs.

In other communities, law enforcement officials have found that parks and greenways are land uses that typically have the lowest incident of reported criminal activity. By providing entrance bollards or other such devices that restrict motor vehicles on the greenway system, crime and vandalism is less likely to be a problem.

Loss of privacy for adjacent land owners can also be avoided through sensitive trail development. Vegetation should be preserved where it provides a natural screen. Where needed, additional vegetative screens and fences can be constructed to provide visual screens and barriers.

Roanoke Valley Greenway Proposed Implementation Schedule

Implementation Activity	1996	1997	1998	1999	2000	2005	2010
Form intergovernmental organizational structure	●						
Establish Citizens Greenway Advocacy Group	●						
Planning, design, and construction for pilot Project	━	━					
Develop ordinances that support greenway development	━	━	━	━	━		
Establish on-going local funding mechanisms	━	━					
Prepare feasibility studies for priority projects, create Phases 1 and 2	━	━					
Conduct land acquisition and fundraising for Phase 1 Greenways		━	━				
Develop management program for regional greenway system			●				
Prepare master plans for Phase 1 Greenways			●				
Prepare design documents and construct Phase 1 Greenways			━	━			
Develop marketing literature and maps for greenway system				●			
Conduct land acquisition and fundraising for Phase 2 Greenways			━	━	━		
Prepare master plans for Phase 2 Greenways					●		
Prepare design documents and construct Phase 2 Greenways					━		
Re-evaluate regional greenway plan and establish new priorities						●	
Plan, design and construct Phase 3 Greenways						━	━

Step 3: Construction Documentation
Construction documents are drawings and specifications that describe the materials, workmanship and finished form of all facilities to be built within the corridor. The level of complexity of these drawings depends to a great extent upon the type of greenway: a five foot wide hiking trail does not require the same construction documentation as a ten foot paved multi-use greenway.

Construction documents must be prepared to meet minimum public-use standards established by federal, state and local governments. These will vary depending on the type of users served by the greenway, and the type of landscape being traversed by the corridor. National standards have been established for all paved trails designed for bicycle transportation and can be referenced in the AASHTO publication, *Guidelines to the Development of Bicycle Facilities.*

Construction drawings and specifications should describe materials, style and form for all proposed facilities; they will be used to build the greenway. Documents can be prepared in-house by local staff or by a consulting landscape architect and/or engineer. They are typically produced at either 20 scale or 50 scale (1" = 50'), and should include cross sections at 100' intervals. Trail details should include trail clearing and grading, trail tread design, cross slope drainage, storm drainage design, erosion control measures, signage placement and design, and any other design elements. Trail layout plans should include stationing and curve data.

7.2 Finding Land for Greenway Development

Some of the off-road greenway corridors identified by the conceptual plan extend across privately owned lands. This section of the report identifies mechanisms for obtaining public access to these areas.

Greenway lands can be preserved and protected through a variety of mechanisms. The amount of greenway land to be preserved in any given situation is based on two factors - the size of a parcel of land and an evaluation of the parcel's greenway value. The most successful greenway programs encourage voluntary involvement among landowners, rather than relying on the power of eminent domain. Landowners should be given the option of deciding what land they would view as being included in the greenway system. Landowners should also be eligible to benefit from economic incentives for voluntary participation in the program.

Landowners may have the following options in participating in a greenway program:

- Landowners can donate all or a portion of their land for greenway purposes, thereby becoming eligible for Federal tax deductions. Property proposed for donation, whether in fee-simple, conservation easement or other manner, must meet certain eligibility requirements set forth by federal and state agencies to qualify for tax benefits. In addition, only approved governmental and private agencies may be the receiving organizations. The property owner may choose to dedicate greenway lands in fee-simple title, or the owner may choose to convey a conservation easement in which issues such as maintenance and public access are negotiated with the receiving organization.

- Landowners can lease greenway lands to the responsible jurisdiction for long-term public access and/or conservation.

- Landowners can offer the jurisdiction first right of refusal in purchasing the land. Purchase would be made using money from an established greenway trust fund or another source of greenway funds.

7.21 Greenway Easements

The purpose of greenway easements is to establish legally binding contracts based on a mutual understanding of the specific use, treatment and protection that greenway lands will receive. Property owners who grant easements retain all rights to the property except those which have been granted by the easement. The property owner is responsible for all taxes associated with the property, less the value of the easement granted. Easements are generally restricted to certain portions of property, although in some cases an easement can be applied to an entire parcel. Easements are usually transferable through title transactions, thus the easement can remain in effect in perpetuity. Three types of greenway easements which may be appropriate for use in the Roanoke Valley are:

Conservation Easements

This type of easement generally establishes permanent limits on the use and development of land in order to protect the natural resources of that land. Dedicated conservation easements usually qualify for both federal income tax deductions and state tax credits.

Preservation Easements

This type of easement is intended to protect the historical integrity of a structure or important elements of the landscape by sound management practices. Preservation easements may qualify for the same federal tax deductions and state tax credits as conservation easements.

Public-Access Easements

Right-of-public-access easements provide the general public with the right to use a specific parcel of property. Both conservation easements and preservation easements may contain clauses for the right of public access and still be eligible for tax incentives.

7.22 Greenway Development through Regulation

The following are regulatory tools that can meet the challenges of projected urban and suburban growth and development and, at the same time, conserve and protect greenway resources. While many of the methods below can be used in Virginia others require changes in state law. Some of the methods require zoning ordinances that do not currently exist in the Valley, or do not exist for all local jurisdictions. Therefore, the use of some of the methods would require ordinance revisions and staff resources to implement the new requirements.

Reservation of Land
A reservation of land does not involve any transfer of property rights but simply constitutes an obligation to keep property free from development for a stated period of time. Reservations are normally subject to a specified period of time, such as 6 or 12 months. At the end of this period, if an agreement has not been reached to transfer certain property rights, the reservation expires.

Conditional Zoning
Also known as conditional rezoning, this mechanism can be used to create public and private greenways through special conditions voluntarily offered by the property owner requesting a rezoning. Conditional rezoning allows the owner to perform some act or make site improvements to make the proposed rezoning more compatible with the surrounding area. This mechanism allows planning officials to accommodate property owners, to not conflict with the Land Use Plan, and to protect greenways within the jurisdiction.

Buffer/Transition Zones
This mechanism recognizes the problem of reconciling different, potentially incompatible, land uses by preserving greenways that function as buffers or transition zones between uses. Care must be taken to ensure that use of this mechanism is reasonable, is narrowly and directly focused, and will not destroy the value of a property.

Density Bonuses
One regulatory method currently used in James City County, Virginia, is incentive zoning - also termed density bonuses. Under this mechanism, developers are encouraged to provide amenities within the community (such as trails, buffers, or scenic views) by allowing greater densities than normally allowed by the zoning ordinance.

Conservation Overlay Zones
This mechanism could allow local jurisdictions to place a conservation development zone in a location identified for greenway development. Conservation development zones allow for a closer grouping of buildings on one part of a property so that the remaining open land can be conserved and/or used for recreation (this is also called "cluster zoning"). This would require a conservation-development-zoning ordinance.

Resource Overlay Zones
By establishing resource overlay zones through local zoning ordinances, Valley area governments can protect undeveloped land along streams and rivers. This method places restrictions on development activity in and around important historic sites, or near sensitive natural resources such as streams and rivers. While this method would not require greenway development, it could preserve critical greenway lands from further urban encroachment.

Planned-Unit Development Ordinances
A PUD ordinance can enable a jurisdiction to require a certain percentage of land area to be set aside for recreation or for common open space. This zoning ordinance, combined with a greenway plan that identifies a proposed route within the property, can be used to secure additional greenway lands.

Subdivision Exactions

A subdivision exaction is a condition of subdivision approval which requires the subdivider/developer to provide for certain public improvements at its own expense. Section 15.1-466 (A) (5) authorizes the exaction of certain improvements ("any right-of-way located within any subdivision, ... any street, curb, gutter, sidewalk, bicycle trail, drainage or sewer system, water line as part of a public system or other improvement dedicated for public use"). If authorized by local ordinance, this authorizes requiring the developer to dedicate parts of its land for public use or to construct at its expense, and in accordance with defined standards, needed facilities serving the subdivision. The courts permit the needed facilites serving the subdivision. The courts permit the use of on-site mandatory dedication and exactions when the need for particular facilities can be closely related to the development.

Section 15.1-466 (A) (10) authorizes developers to pay for certain off-site improvments for sewage, water and drainage facilities. There are statutory limitations and guidelines for calculating the amount of the developer's pro-rata share of these improvements. Section 15.1-466 (E) authorizes localities to include in local subdivision ordinances reasonable provisions for voluntary funding of off-site road improvements.

Agricultural and Forestal Districts (AFDs)

AFD's are a land conservation and preservation effort that can only be enacted by a landowner. Through this special district, the landowner agrees to limit development on the property for the life of the agreement, which is usually 4-10 years. This method can be used to preserve future greenway lands in developing areas, particularly where the landowner desires to keep the property intact in the years prior to greenway development. In return, the property owner is taxed on the use of the land, rather than its fair market value.

7.23 Greenways Land Acquisition

The third method of developing greenways in the Roanoke Valley is through the acquisition of property. A variety of methods can be used to acquire property for greenway purposes, including: Donation/Tax Incentives, Fee-Simple Purchase, Easement Purchase, Purchase/Lease Back, Bargain Sale, Option/First Right Of Refusal, Condemnation, and Impact fees. Each of these is described in Appendix B.

7.3 Sources of Funding for Greenway Projects

The most common method for funding greenways is to combine local, public-sector and private-sector funds with funds from state, federal and additional private-sector sources. Many communities involved with greenway implementation are choosing to leverage local money as a match for outside funding sources, in essence multiplying their resources.

During future greenway development in the Roanoke Valley, local advocates and government staff should pursue a variety of funding sources for land acquisition and greenway construction. A greenway program that relies on limited funding sources may one day come to a grinding halt should these funding sources dry up.

The funding sources cited below represent a few of the greenway funding opportunities that have been pursued by other communities. This list provides a place to "get started". (Addresses and phone numbers of national organizations which provide technical assistance for greenway projects can be found in Appendix C of this report.)

7.31 Local Funding Sources

Bond Referendums for Greenways
Communities across the nation have successfully placed on local ballots propositions to support greenway development. The Charlotte-Mecklenburg County, NC, area passed four consecutive referendums that generated more than $3 million for greenways. Guilford County, NC, passed a referendum in 1986 that appropriated $1.6 million for development of a specific greenway corridor. In Cheyenne, Wyoming, a greenway bond referendum was used to fund the first three miles of local greenways.

Residents throughout the United States have consistently placed a high value on local greenway development and voted to raise their own taxes in support of greenway implementation. Considering the popularity of greenways in the Roanoke Valley, bond referendums may be successful.

Greenway Funding through Local CIP's
Perhaps the true measure of local government commitment to greenways is a yearly appropriation for trail development in the Capital Improvements Program. In Raleigh, NC, greenways continue to be built and maintained, year after year, due to a dedicated source of annual funding (administered through the Parks and Recreation Department). In addition, the City of Raleigh's Real Estate Department has its own line item budget for greenway land acquisition.

Roanoke Valley Greenway Trust Fund
Another strategy used by several communities is the creation of a trust fund for land acquisition and facility development that is administered by a private greenway advocacy group, or by a local greenway commission . A trust fund can aid in the acquisition of large parcels of high priority properties that may be lost if not acquired by private sector initiative. Money may be contributed to the trust fund from a variety of sources, including the municipal and county general funds, private grants, and gifts.

Local Private-Sector Funding
Local industries and private businesses may agree to provide support for greenway development in the Valley through:

- donations of cash to a specific greenway segment;
- donations of services by large corporations to reduce the cost of greenway implementation, including equipment and labor to construct and install elements of a specific greenway;
- reductions in the cost of materials purchased from local businesses which support greenway implementation and can supply essential products for facility development.

One example of a successful endeavor of this type is the Swift Creek Recycled Greenway in Cary, NC. A total of $40,000 in donated construction materials and labor made this trail an award-winning demonstration project. This method of raising funds requires a great deal of staff coordination. (Note: Some materials used in the "recycled trail" were considered waste materials by local industries!)

7.32 Volunteer Assistance and Small-Scale Donation Programs

Greenway Sponsors

A sponsorship program for greenway amenities allows for smaller donations to be received both from individuals and businesses. The program must be well planned and organized, with design standards and associated costs established for each amenity. Project elements which may be funded can include mile markers, call boxes, benches, trash receptacles, entry signage and bollards, and picnic areas.

Volunteer Work

Community volunteers may help with greenway construction, as well as conduct fundraisers. Organizations in the Roanoke Valley could include the Boy Scouts, the Blue Ridge Bicycle Club, the Sierra Club and local civic clubs such as the Kiwanis, Rotary and Lions Clubs.

A point in case is Cheyenne, Wyoming's volunteer greenway program. The Greater Cheyenne Greenway has motivated an impressive amount of community support and volunteer work. The program has the unusual problem of having to insist that volunteers wait to begin landscaping the trail until construction is completed. A manual for greenway volunteers was developed in 1994 to guide and regulate volunteer work. The manual includes a description of appropriate volunteer efforts, request forms, waiver and release forms, and a completion form (volunteers are asked to summarize their accomplishments). Written guidelines are also provided for volunteer work in 100-year floodplains.

To better organize volunteer activity, Cheyenne developed an "Adopt-a-Spot" program. Participants who adopt a segment of trail are responsible for periodic trash pick-up, but can also install landscaping, prune trail-side vegetation, develop wildlife enhancement projects, and install site amenities. All improvements must be consistent with the Greenway Development Plan and must be approved by the local Greenway Coordinator. Adopt-a-Spot volunteers are allowed to display their names on a small sign along the adopted section of greenway.

Volunteers have included the Boy Scouts, the Southeastern Wyoming Mental Health Center, and F. E. Warren Air Force Base. Cheyenne's Job Training Partnership Program has become involved in building trail-side benches and picnic tables. School groups have also raised funds to build trail amenities. Other volunteers have participated in a stream bank improvement project, donating labor and materials.

Estate Donations

Wills, estates and trusts may be also dedicated to the appropriate agency for use in developing and/or operating the greenway system.

"Buy-a-Foot" Programs

"Buy-a-Foot" programs have been successful in raising funds and awareness for trail and greenway projects within North Carolina. Under local initiatives, citizens are encouraged to purchase one linear foot of the greenway by donating the cost of construction. An excellent example of a successful endeavor is the High Point Greenway "Buy-a-Foot" campaign, in which linear greenway "feet" were sold at a cost of $25/ foot. Those who donated were given a greenway T-shirt and a certificate. This project provided over $5,000 in funds.

7.33 State Government Funding Sources

Virginia Department of Transportation (VDOT)

VDOT is the state agency that administers federal funding from the Intermodal Surface Transportation Effciency Act (ISTEA) of 1991. Along with the federal requirements for this money, VDOT has application policies and procedures. The following list provides key policies that apply to this source. (Excerpts below were taken from VDOT's *Enhancement Procedure Checklist* and the *Enhancement Program Reimbursement Procedures and Match Requirements.*)

- This is a reimbursment program, so costs are reimbursed only if they were incurred *after* authorization. Approved costs include land acquisition and design services.
- Greenway lands must be owned as rights-of-way, rather than exist as easements across private property. Furthermore, strict federal guidelines apply to land acquisition for trail use (per the Uniform Relocation Assistance and Real Property Acquisition Policies Act).
- An environmental document is required during the Preliminary Engineering Phase.
- Consultant selection for design-development services must conform to certain state and federal procedures.
- Funding is contingent on a minimum 20 percent local match.
- Private contributions of donated right-of-way can be used to make the local match.

7.34 Federal Government Funding Sources

Some Federal programs offer financial aid for projects that aim to improve community infrastructure, transportation, housing and recreation programs. Some of the Federal programs that can be used to support the development of greenway systems include:

The Intermodal Surface Transportation Efficiency Act (ISTEA)

The primary source of federal funding for greenways is through the Intermodal Surface Transportation Efficiency Act of 1991 (ISTEA), which is authorized through fiscal year 1997. There are many sections of the Act that support the development of bicycle and pedestrian transportation corridors. Those sections that apply to the creation of greenway systems include:

- **Section 1302: Symms National Recreational Trails Fund Act (NRTFA)**
  A component of ISTEA, the NRTFA is a funding source to assist with the development of non-motorized and motorized trails. In fiscal year 1994, Congress did not fund this national program, and it has become apparent that this funding

source is not as stable as it was once envisioned by the national trail community. In 1993, Congress appropriated only $7.5 million of a $30 million apportionment. The Act uses funds paid into the Highway Trust Fund from fees on non-highway recreation fuel used by off-road vehicles and camping equipment.

Motorized and non-motorized trail projects receive a 30 percent share of annual appropriations. Forty percent of the appropriation must be spent on projects that accommodate both user groups. States can grant funds to private and public sector organizations. NRTFA projects are 100 percent federally funded during the first three years of the program. Beginning in 1995, grant recipients must provide a 20 percent match. Projects funded must be consistent with the Statewide Comprehensive Outdoor Recreation Plan.

- **Section 1047: National Scenic Byways Program**
  This component of ISTEA is designed to protect and enhance America's designated scenic roads. Money is available for planning, safety and facility improvements, cultural and historic resource protection, and tourism information signage. Bicycle and pedestrian facilities can be developed in conjunction with scenic roadway projects. Some states with Scenic Byway Programs have developed greenways in conjunction with this initiative.

- **Section 1008: Congestion Mitigation and Air Quality Improvement (CMAQ) Program**
  The CMAQ program was created to reduce congestion on local streets and improve air quality. Funds are available to urban communities designated as "non-attainment" areas for air quality, meaning the air is more polluted than federal standards allow. Since the Roanoke Valley is not currently classified as a non-attainment area for air quality, it is not eligible for this funding. However, this funding source should be considered in the event that the air quality in the Valley deteriorates.

  The program is administered by the Virginia Department of Transportation, Federal Highway Administration and Environmental Protection Agency. A grant recipient must demonstrate that its project will improve air quality throughout the community. Funding requires a 20 percent local match.

Community Development Block Grant Program
The U.S. Department of Housing and Urban Development (HUD) offers financial grants to communities for neighborhood revitalization, economic development, and improvements to community facilities and services, especially in low and moderate-income areas. Several communities have used HUD funds to develop greenways, including the Boscobel Heights' "Safe Walk" Greenway in Nashville, TN.

Land and Water Conservation Fund (LWCF) Grants
This Federal funding source was established in 1965 to provide "close-to-home" park and recreation opportunities to residents throughout the United States. Money for the fund comes from the sale or lease of nonrenewable resources, primarily federal offshore

oil and gas leases and surplus federal land sales. LWCF grants can be used by communities to build a variety of park and recreation facilities, including trails and greenways.

LWCF funds are distributed by the National Park Service to the states annually. Communities must match LWCF grants with 50 percent of the local project costs through in-kind services or cash. All projects funded by LWCF grants must be used exclusively for recreation purposes, in perpetuity.

Conservation Reserve Program
The U. S. Department of Agriculture (USDA), through its Agricultural Stabilization and Conservation Service, provides payments to farm owners and operators to place highly erodible or environmentally sensitive landscapes into a 10-15 year conservation contract. The participant, in return for annual payments during this period, agrees to implement a conservation plan approved by the local conservation district for converting sensitive lands to less intensive uses. Individuals, associations, corporations, estates, trusts, cities, counties and other entities are eligible for this program. Funds from this program can be used to fund the maintenance of open space and non-public-use greenways, along bodies of water and ridge lines.

Wetlands Reserve Program
The U.S. Department of Agriculture provides direct payments to private landowners who agree to place sensitive wetlands under permanent easements. This program can be used to fund the protection of open space and greenways within riparian corridors.

Watershed Protection and Flood Prevention (Small Watersheds) Grants
The USDA Natural Resource Conservation Service (NRCS) provides funding to state and local agencies or nonprofit organizations authorized to carry out, maintain and operate watershed improvements involving less than 250,000 acres. The NRCS provides financial and technical assistance to eligible projects to improve watershed protection, flood prevention, sedimentation control, public water-based fish and wildlife enhancements, and recreation planning. The NRCS requires a 50 percent local match for public recreation, and fish and wildlife projects.

Urban and Community Forestry Assistance Program
The USDA provides small grants of up to $10,000 to communities for the purchase of trees to plant along city streets and for greenways and parks. To qualify for this program, a community must pledge to develop a street-tree inventory; a municipal tree ordinance; a tree commission, committee or department; and an urban forestry-management plan.

Small Business Tree Planting Program
The Small Business Administration provides small grants of up to $10,000 to purchase trees for planting along streets and within parks or greenways. Grants are used to develop contracts with local businesses for the plantings.

Economic Development Grants for Public Works and Development of Facilities
The U. S. Department of Commerce, Economic Development Administration(EDA),

provides grants to states, counties and cities designated as redevelopment areas by EDA for public works projects that can include developing trails and greenway facilities. There is a 30 percent local match required, except in severely distressed areas where federal contribution can reach 80 percent.

Design Arts Program

The National Endowment for the Arts provides grants to states and local agencies, individuals and nonprofit organizations for projects that incorporate urban design, historic preservation, planning, architecture, landscape architecture and other community improvement activities, including greenway development. Grants to organizations and agencies must be matched by a 50 percent local contribution. Agencies can receive up to $50,000.

7.35 Grants through Private Foundations and Corporations

Many communities have solicited greenway funding from a variety of private foundations and other conservation-minded benefactors.

American Greenways DuPont Awards

The Conservation Fund's American Greenways Program has teamed with the DuPont Corporation and the National Geographic Society to award small grants ($250 to $2000) to stimulate the planning, design and development of greenways. The awards are intended to:

1. Develop action-oriented greenway projects;
2. Assist grassroots greenway organizations;
3. Leverage other money for greenway development; and
4. Recognize and encourage greenway organizations.

Grant recipients are selected according to the following criteria:

1. The importance of the project to local greenway development efforts;
2. The extent to which the grant will result in matching funds or other support for public or private sources;
3. Demonstrated community support for the project;
4. Likelihood of tangible results;
5. Capacity of the organization to complete the project; and
6. The degree to which the project serves as a model for planning and developing greenways.

These grants can be used for activities such as mapping, conducting ecological assessments, surveying land, holding conferences, developing brochures, producing interpretive displays and audio-visual materials, incorporating land trusts, building trails and greenway facilities, and other creative projects. Grants cannot be used for academic research, institutional support, lobbying or political activities.

REI Environmental Grants

REI (Recreational Equipment Incorporated) awards grants to organizations interested in protecting and enhancing natural resources for outdoor recreation. Grants of up to $500 are available through this program and can be used for:

1. Preservation of wildlands and open space;
2. Advocacy-oriented education for the general public on conservation issues;
3. Building the membership base of a conservation organization;
4. Direct citizen action (lobbying) campaigns for public land and water recreation issues; and
5. Projects that serve to organize a trails constituency or enhance the effectiveness of a trail organization's work as an advocate.

Walking Magazine Trail Restoration Fund
Walking Magazine, hoping to encourage more volunteer efforts among trail users, established this fund for the restoration of urban, suburban or rural walking trails. The magazine provides small grants, generally from $200 to $500, to help walking clubs and other groups purchase trail maintenance equipment or supplies.

Coors Pure Water 2000 Grants
Coors Brewing Company and its affiliated distributors provide funding and in-kind services to grassroots organizations that are working to solve local, regional and national water-related problems. Coors provides grants, ranging from a few hundred dollars to $50,000, for projects such as river cleanups, aquatic habitat improvements, water quality monitoring, wetlands protection, pollution prevention, water education efforts, groundwater protection, water conservation and fisheries.

World Wildlife Fund Innovative Grants Program
This organization awards small grants to local, regional and statewide non-profit organizations to help implement innovative strategies for the conservation of natural resources. Grants are offered to support projects which:

1. Conserve wetlands;
2. Protect endangered species;
3. Preserve migratory birds;
4. Conserve coastal resources; and
5. Establish and sustain protected natural areas, such as greenways.

Innovation grants can help pay for the administrative costs for projects including planning, technical assistance, legal and other costs to facilitate the acquisition of critical lands; retaining consultants and other experts; and preparing visual presentations and brochures or other conservation activities. The maximum award for a single grant is $10,000.

Section 8: Greenway Maintenance and Management

A maintenance and management program is critical to the long-term success of greenways in the Roanoke Valley. Several issues should be addressed prior to the project being approved for funding and implementation including: liability and risk management, safety and security, and routine maintenance.

8.1 Liability/Risk Management

The design, development and management of each greenway project must be carefully and competently planned and executed in order to provide a resource that protects the health and welfare of the public.

Liability most often occurs when a greenway has been inadequately designed to handle the volume of use; when management of the facility is poor; or when unexpected accidents occur because potentially hazardous areas haven't been effectively dealt with. The following measures should be taken to reduce liability:

- Develop a thorough maintenance program that defines appropriate duties and designates a greenway management organization or agency.
- Prepare a risk management plan that describes potential liability and government insurance issues for the greenway system. This should be reviewed by each jurisdiction's legal department.
- Complete a safety and security plan for the greenway system that addresses law enforcement (cooperatively with multiple jurisdictions if the project crosses municipal boundaries), and establishes appropriate emergency-response mechanisms.

Public use of greenways should be covered under existing municipal policies for the use of parkland, public spaces and city property. Jurisdictions should exercise care in the construction of greenway facilities to minimize hazardous and public nuisance situations. Additionally, by setting specific hours of operation, any individual found using greenways outside the permitted hours of operation would not be covered by the insurance policies for public use.

8.2 Safety and Security Considerations

In order to provide a standard of care that offers reasonable safety measures, greenway management agencies should prepare and implement a safety and security plan. This plan should address the following:

- law enforcement procedures;
- emergency and fire-response guidelines;
- user rules and regulations; and
- a system for accident reporting and analysis.

Plans should identify all points of access to trails in the Roanoke Valley and should provide details for making these access-points safe and secure, as well as accessible to law enforcement officials. The plans should also specify if and where a system of cellular-type emergency phones should be located along greenways.

Procedures for emergency response should be developed in conjunction with local fire and rescue stations. An emergency response system should specify which agencies will respond to 911 calls, and should provide easy-to-understand routing plans and access points for emergency vehicles.

Greenway managers should discourage the general public from using any segment of a greenway that is under construction. Such segments should not be considered officially open for public use until a formal dedication ceremony and opening has occurred.

8.3 Routine Maintenance

Regular greenway maintenance is important to protecting the public health, safety and welfare. Normal maintenance includes the removal of debris, trash, litter, and other foreign matter.

Removal of vegetation should be done with discretion. The objective in controlling the growth of existing vegetation should be to maintain clear and open lines of sight along the edge of greenways, and to eliminate potential hazards that could occur due to natural growth, severe weather and other unacceptable conditions. The following are typical guidelines for vegetation removal:

- All vegetation should be clear cut a minimum distance of three (3) feet from each edge of the greenway trail. Selective clearing of vegetation should be conducted within a zone that is defined as being between three (3) to ten (10) feet from each edge. At any point along the greenway, a user should have a clear, unobstructed view along the centerline of the trail, 300 feet ahead and behind his/her position. The only exception to this policy would be where terrain or curves in the trail serve as the limiting factor. Removal of vegetation by individuals other than local government employees or approved volunteers should be unlawful and subject to fines and/or prosecution.

- All greenway trail surfaces should be maintained in a safe and usable manner. Rough edges, severe bumps or depressions and cracked/uneven pavement should be repaired so that the surface is maintained as a continuous, even surface. The greenway manager should minimize the number of areas where ponding water occurs.

Section 9: Trail Design

Trail design is a broad topic that covers many issues. For the purposes of the Roanoke Valley Conceptual Greenway Plan, the consultant has provided a general design overview. Below are references with other appropriate design standards that provide more in-depth information.

- Greenways - A Guide to Planning, Design and Development
  Published by Island Press, 1993
  Authors: Chuck Flink and Robert Searns

- Trails for the 21st Century
  Edited by Karen Lee Ryan, Rails-to-Trails Conservancy

- Guide to the Development of Bicycle Facilities*
  Updated in 1991 by the American Association of State and Highway Transportation Officials

- Manual on Uniform Traffic Control Devices
  Published by the US Department of Transportation

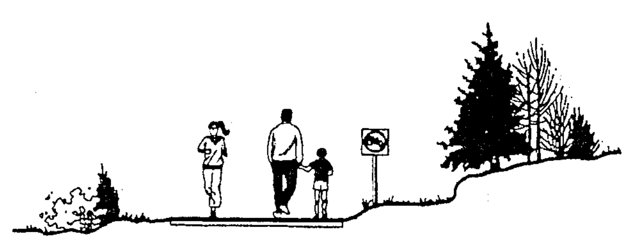
- Mountain Bike Trails: Techniques for Design, Construction and Maintenance, Published by BikeCentennial

- Construction and Maintenance of Horse Trails
  Published by Arkansas State Parks

*If the trail is intended for bicycle transportation or will be funded by Virginia Department of Transportation, these minimum national standards must be followed.

9.1 Trail Tread Design

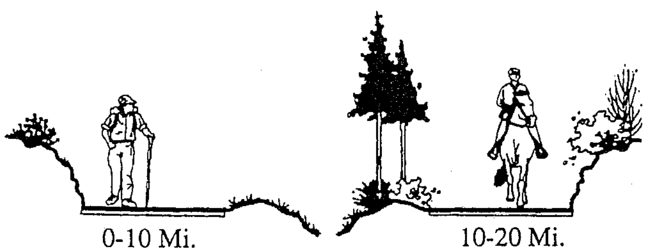
Trail design on a conceptual level typically occurs during the master planning process. After the general route of the trail has been established and the intended user groups identified, trail planners should determine the most appropriate design for the trail tread. The trail tread consists of the actual materials and design specifics of the trail surface. Provided below are several types of trail treads:



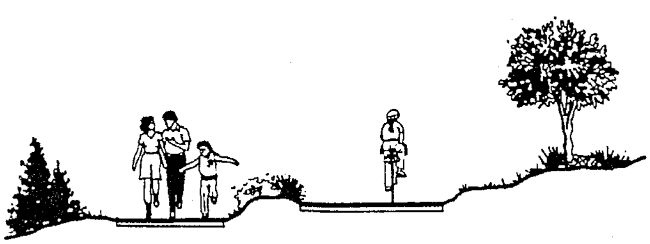
Single Tread/Single Use

1) Single Tread/Single Use:
This tread is designed for single trail user groups, such as walkers or bicyclists. These can include trails within street/road/highway rights-of-way, off-road trails and sidewalks outside of rights-of-ways, and other pedestrian ways and trails that meander through a variety of urban, suburban, rural or wilderness landscapes. These trails may have different uses depending upon the sea-

Single Tread/Multiple Use



Single Tread/Multiple Use Zones



Multiple Tread/Multiple Use

son, such as a hiking trail that doubles as a cross-country ski trail in the winter.

2) *Single Tread/Multiple Use:* These trails are designed to accommodate multiple trail users on a single tread or pathway, and are most common. Facilities vary in width, from 5 feet to more than 20 feet. Some facilities will have striping, signage or other usage control features to separate users.

3) *Single Tread/Multiple Use Zones:* A relatively new concept in the United States, trail zoning provides areas or segments of a trail for different users, physically separating conflicting uses by limiting them to a specific distance they can travel. For example, if a trail is 30 miles long, walkers could use a segment between milepost zero and 10, bicyclists could ride between milepost 10 and 20, and horseback riders could ride between mileposts 20 and 30. Zones can be rotated so that all users can eventually experience all segments of a particular trail.

4) *Multiple Tread/Multiple Use:* This approach allows for multiple use within the same right-of-way, but on separate treads. This tread type generally requires a wider right-of-way in order to accommodate the diversity of users. For example, a hard surfaced trail would be developed for bicycle use and a walking path would utilize an unsurfaced earthen trail. Treads could be developed parallel along an entire corridor, or a portion of it.

9.2 Trail Tread Width

Typically, tread width depends on the amount of usable land within the corridor, the uses of the trail, volume of use, potential for conflict among users, desire for one-way or two-way travel, environmental sensitivity, and the cost of constructing various tread types. Individual treads can range from a 20-inch wide track for hikers in remote wilderness terrain to more than 20 feet wide for multiple users in heavily congested urban areas. Speed of travel is also an important consideration in determining trail width. For example, the accommodation of bicyclists and rollerbladers on the same trail tread would necessitate a wider trail. The following chart provides standards that meet or exceed existing AASHTO standards for trail tread development in the Roanoke Valley, based on the targeted user groups:

Recommended Trail Widths for Single-Use and Multi-Use Trails

Trail Users	Recommended Tread Width
Bicyclists only	10 foot minimum (2-way travel)
Pedestrians, bicyclists and rollerbladers	12 foot urban, 10 foot rural
Hikers/Cross-Country Skiers	5 foot urban; 4 foot rural
Pedestrians only (wheelchair accessible)	8 foot urban, 6 foot rural
Equestrians only	5 foot urban and rural (8 foot cleared width)
Hikers and Equestrians	6 foot urban, 5 foot rural (8 foot cleared width)
Equestrians and Mountain Bicyclists	(not recommended as dual use)

9.3 Design of the Trail Cross Section

Trail surfaces must be carefully designed and constructed to support long term use. It is important to determine the design load for the tread cross section, and to determine if the surface must withstand the weight of emergency and/or maintenance vehicles. Once these issues are resolved, the component parts of the trail tread: sub-grade, sub-base and surface course can be designed.

Advantages and Disadvantage of Trail Surface Materials

Surface Material	Advantages	Disadvantages
Native soil	Natural material; lowest cost; low maintenance; can be altered for future improvements	Dusty, ruts under heavy use; not an all-weather surface;uneven surface; limited uses.
Soil Cement	Uses natural materials; supports more usage than native soils; smoother surface; low cost	Surface wears unevenly; not an all weather surface; erodes; difficult to achieve correct mix
Graded Aggregate Stone	Hard surface supports heavy use; moderate costs; natural material; accommodates multiple uses.	Angular stones can require continuous maintenance; uneven surface; erosion, ruts.
Granular stone (limestone, cinders)	Soft but firm surface; natural material; moderate costs; smooth surface; accommodates variety of modes.	Surface can wash away; ruts; erosion; constant maintenance to keep smooth surface.
Shredded wood fiber	Soft, spongy surface; good for walking; moderate cost; natural material.	Decomposes under high temperature, moisture and sunlight;

		requires replenishment; long term expense
Wood (boardwalks, bridge decking)	Pliable surface; excellent for multi-use; natural material blends with native landscape; spans streams, ecologically sensitive areas, and soft soils; only surface that places trail user above surrounding grade.	High installation cost, easy to vandalize; expensive to maintain; deteriorates with exposure to sun, wind and water; susceptible to fire damage; can be slippery when wet.
Asphalt Concrete	Hard surface; supports most types of use; all weather; does not erode; accommodates most users simultaneously; low maintenance.	High installation cost; costly to repair; not a natural surface; leaches toxic chemicals, freeze/ thaw can crack surface; difficult access for construction vehicles.
Concrete surface	Hardest surface; easy to form to site conditions; supports multiple use; low maintenance; resists freeze/thaw; can be colored; all weather.	Joints result in bumps, high installation cost; costly to repair; not a natural looking surface; access for construction vehicles difficult.

Source: *Greenways, A Practical Guide to Planning, Design and Management,* Island Press 1993

9.4 Bridges and Boardwalks

Many trails require the construction and installation of special structures. Structures such as bridges, boardwalks, and ramped walkways are normally the most expensive items of trail development. It is usually advisable to use natural materials in construction, so as to blend with the surrounding landscape. However, recycled materials and some metals, such as cor-ten steel, can be suitable for use in trail projects.

Design and construction specifications for bridges vary greatly from project to project and must be based on site specific criteria. Regardless of the type of bridge selected, it is absolutely necessary to have them designed and/or checked for capability by a structural engineer.

9.5 Trail Intersections

Since trail user safety is of prime importance, safe intersections with roadways is crucial. A evaluation of potential conflict at all intersections should be performed for each project. This would include examining: pedestrian/vehicle conflict potential; geometric conditions of the intersection; speed of vehicles through intersection (not posted speed); distance to alternative crossing points; traffic volume; and time of crossing based on the most physically disadvantaged user. Treatments of intersections can range from striping new crosswalks, installing flashing amber lights to warn motorists of the intersection, and installing special signalization at the intersection to constructing overpasses (bridges) or underpasses (tunnels).

9.6 Trail Signage

For each Roanoke Valley corridor project, signage should be carefully designed and appropriately installed to provide all users with essential information, guidance and supplemental data that will serve to enhance the greenway experience. Avoid over-signing a trail facility — it can create visual and physical clutter, confusing messages, and information overload.

Signage is the primary source of direct communication with each user, therefore, it must be clear, concise, and legible to a wide variety of people. Pictographs, sometimes referred to as "symbol signs", are the best way to communicate information to a wide range of user groups.

There are several types of signs for trails:

1) *Informational:* Orients users to their position within the trail system: "You are here"; provides an overview of the types of facilities, programs and activities available; and describe routes or modes of travel required to reach these facilities.

2) *Directional:* Provides users with instructions regarding their bearing and route of travel. Most directional signage is in the form of graphic symbols and brief descriptions or listings. For example, directional signage would include arrows that indicate a heading (direction of travel), and descriptive text such as "this way," "keep to the right," or "south, one-mile."

3) *Regulatory*:* Describes the governing laws and regulations that apply within the trail, such as permitted uses, hours of operation/accessibility, speed limit, allowable activities, and legal requirements for use. Regulatory signs must be uniform and standard in terms of size, location and information. All regulatory signs should have black lettering on white reflective background. Regulatory information should not conflict in any way with other components of the signage program, or vice-versa.

4) *Warning*:* Used to caution trail users of various hazardous conditions, such as sharp curves in the trail, slippery bridges, roadway crossings, steep downhill or uphill conditions, blind intersections, changes in trail surface condition, and related messages about environmental conditions of the greenway. All warning signs should be of uniform size and shape, located a minimum of 50 feet in advance of the condition the user is approaching, and labeled with black lettering on a reflective yellow background.

5) *Educational:* Also called interpretive signage, it is used to describe the unique qualities or significance of natural or cultural features along the greenway. Educational signage provides the user with specific information about the features, such as age, habitat, and historical relevance.

*Regulatory and warning sign standards for bicycle transportation facilities are contained in the *Manual on Uniform Traffic Control Devices* (U.S. Department of Transportation).

9.7 Site Furnishings

There are a wide range of trail and site furnishings that can enhance the experience or improve the safety and function of a trail system. These include benches and seating areas, trash cans and waste disposal areas, water fountains, shelters, restrooms, decorative landscaping, fencing, safety railing, and others. Each trail in the Roanoke Valley System will have unique needs and a different "personality." The greenway designer will need to develop site furnishings for each trail that best suit its opportunities and constraints.

9.8 Typical Trail Cost Estimates

The greenway designer/developer should thoroughly research funding sources and determine costs for each and every greenway project within the Roanoke Valley. The following provides typical development costs for recreational trails based on national industry standards. The Virginia Department of Transportation should be able to assist in the verifying these cost estimates.

<u>Trail Development Costs for Greenways</u>

Trail development costs can vary from project to project depending on the existing conditions at each individual site, and depending on the particular type of trail that is to be developed. For instance, a 6 foot wide bare earth hiking path costs approximately $5.00 per linear foot to construct, while a 12 foot wide asphalt multi-purpose trail costs approximately $25.00 per linear foot to construct. These estimates are based on national industry averages, and they account for the installation of only basic facilities. They do not include costs for design, permitting, conformance with environmental protection, contingencies, or other local regulatory considerations. Other aspects of trail development not included in this cost estimate are signage, site furniture, parking lots and general maintenance expenses.

Appendix

Appendix A:

Overview and chronology: the Roanoke Valley conceptual greenway planning process

Two recent initiatives culminated in the publication of the Roanoke Valley Conceptual Greenway Plan: interest and action on the part of Roanoke Valley citizens and grassroots organizations which have resulted in increased awareness of greenway opportunities, and months of hard work by members of the regional Greenways/Open Space Steering Committee and staffs of the Fifth Planning District Commission and the four Valley governments. The following chronology traces these initiatives, and subsequent planning activities, from late 1993 to November 1995.

October - December 1993:

Sponsored by the Valley Beautiful, **Edward McMahon, director of the American Greenways Program**, visits the Roanoke Valley.

An **open-space study** is requested by the City of Roanoke through the Fifth Planning District Commission.

October - December 1994:

A citizens group supporting greenways sponsors a presentation by **Sam Rogers, one of the founders of the Tennessee greenway system**. Enthusiastic response results in a standing-room-only crowd.

Valley Beautiful President Lucy Ellett and area builder Bob Fetzer make **presentations on greenways to elected officials** of Valley governments and request the appointment of a greenway commission in each jurisdiction.

January -March 1995:

Elected officials of **the four Valley governments appoint representatives** to serve on the Roanoke Valley Greenways/Open Space Steering Committee. Staff support for the steering committee is to be provided by the Fifth Planning District Commission. The regional steering committee is comprised of: Barbara Duerk, Lucy Ellett (Chairperson) and John Marlles, representing Roanoke City; Charles Blankenship, Butch Kelly and Donald Witt, representing Roanoke County; Ed Riley and Joe Yates, representing Salem; Bradley Grose, Anita McMillan and John Sell, representing Vinton; and Lee Eddy, representing the Fifth Planning District Commission.

Planning staff in each of the four Valley jurisdictions develop a map showing all public and semi-public land.

Short-term objectives for the greenway planning effort are developed by the steering committee.

Lucy Ellett is elected chairperson of the steering committee.

April - June 1995:

Steering Committee members view videos of Nashville, Tennessee's, greenway symposium which featured nationally known greenway experts Randall Arendt, Ron Flanagan, Charles Flink and Anne Lusk.

Based on a request from the Roanoke Valley Greenways/Open Space Steering Committee, **local governments provide funding on a pro-rata basis** to support a greenway conceptual planning effort and to hire a greenway expert to work with the steering committee. Funding is provided, as follows: City of Roanoke - $14,400; Roanoke County - $10,800; City of Salem - $3,600; and Town of Vinton - $1,200. Steering committee chairperson Lucy Ellett appears before each jurisdiction's elected officials to explain the planning process and present the funding request.

The **steering committee develops and approves a schedule of activities** and target completion dates for the conceptual planning process. Key components of the planning process are: visits by the steering committee to see greenway systems in North Carolina and Tennessee and to talk with greenway staff; selection of a greenways expert to work with the steering committee to prepare the conceptual plan; a series of three public workshops in the Valley to obtain input from residents on how and where greenways should be developed; and the submittal of an application in January 1996 for ISTEA funds to help in the construction of the first official corridor of the greenway system.

To assist the steering committee and provide continuity, **a technical sub-committee is formed** which consists of staff planners for the four Valley governments and the Fifth PDC.

To learn more directly about greenway systems, **steering committee members and planning staff make site visits** to Kingsport and Knoxville, Tennessee, or Raleigh and Durham, North Carolina. The greenway manager in each city conducts the tour and provides information about the planning, development and implementation of the corridors. Photos, slides and video footage of the site visits are taken for use later.

A **selection subcommittee is formed** to oversee the hiring process for the greenway expert. Subcommittee responsibilities include:
- developing a scope of work for the greenways expert;
- developing the Request for Proposal; (It was advertised in *The Roanoke Times*

and *Virginia Business Opportunities* and sent to a listing of experts compiled by the greenways steering committee and staff.)

- developing the criteria to use in ranking the proposals and the qualifications of responding consulting firms;
- ranking consultants' proposals and firms and informing the steering committee of which candidates are to be interviewed; and
- interviewing candidates and negotiating contract terms with the top-ranked candidate; (selection and terms are subject to final approval by the steering committee).

July - September 1995:

Greenways Incorporated and President, Chuck Flink, are hired by the steering committee to provide technical expertise and work with the group in preparing the regional greenways conceptual plan.

The **steering committee requests the help of the National Park Service's** Rivers, Trails and Conservation Assistance Division.

The **first newsletter is published** by the Roanoke Valley Greenways/Open Space Steering Committee. Its purpose is to inform citizens about the regional greenway planning effort and to promote attendance at the series of three public workshops, scheduled for July 24 at the Roanoke Civic Center, August 17 at William Byrd High School in Vinton and August 30 at Salem High School.

On July 24, the **first public workshop signals the official beginning** of the regional greenway planning effort. It is preceded by an extensive public information campaign which includes the appearance of steering committee members and affiliated staff on area public interest programs, in-depth coverage of the greenway issue by *The Roanoke Times,* the distribution of public service announcements to the Valley's news media and the issuing of invitations to over 500 interest groups and individuals.

A **luncheon for about 100 elected officials and community leaders** at the Vinton War Memorial precedes the first workshop. The event is underwritten by *The Roanoke Times* and features as speaker Chuck Flink of Greenways Incorporated, the newly hired greenways expert. His address and slide show focus on the benefits of greenways, including their positive impact on economic development and quality of life.

The **first workshop**--at the Roanoke Civic Center Exhibition Hall--draws approximately 130 citizens from across the Roanoke Valley. Chuck Flink and Greenways Incorporated staff present a general information session on greenways and discuss greenway opportunities in the Roanoke Valley. In breakout sessions, citizens brainstorm goals for the regional greenway system and each participant votes for his or her top-rated goals. Citizens also identify greenway corridors they believe should be included in the regional conceptual greenway plan. Each of the believe should be included in the regional conceptual greenway plan. Each of the three workshops is preceded by a "drop-in session" for citizens at which they can see the maps and plans for greenway systems in other communities as well as videos on greenways by organizations such as the Rails-to-Trails Conservancy.

In order to update citizens on the goals they established and other input received at the first public workshop, a **second newsletter** is published and distributed early in August by the regional greenways steering committee.

The **second workshop** is conducted August 17 at William Byrd High School in Vinton. At this workshop, attended by approximately 60 people, the top ten goals from the first workshop are presented, as are proposed greenway routes. In breakout sessions, citizens discuss route and facility issues.

At the **third workshop** on August 30 at Salem High School, 54 area residents review the proposed greenway route plan which was prepared by Greenways Incorporated based on input provided at the earlier workshops; they also learn about historic and cultural resources and linkages from a representative of the West Main Design Collaborative of Charlottesville and vote for the greenway corridors in each locality they consider the most important.

The greenways **steering committee receives a $4,000 grant** from Valley Beautiful, the Urban Forestry Council and the Virginia Department of Forestry to develop a slide show to inform Roanoke Valley citizens about greenways and to promote their support of a regional system. Greenways Incorporated is selected to produce the show and the contract with the firm is amended to reflect the project.

Technical staff initiate preparations for an ISTEA application for regional greenway funds and develop a timetable for the application process for steering committee review and action.

October - December 1995:

The **first complete draft of the Roanoke Valley Conceptual Greenway Plan** is received by the regional steering committee. A review process begins, involving the steering committee and technical staff in frequent, often weekly, meetings. The steering committee focuses special attention on the plan's goals and objectives/strategies and the proposed greenway corridors, all of which were developed using the input provided by citizens at the three public workshops. The steering committee reviews the plan--refining it, rounding out information and ranking issues where required--with the purpose of ensuring that when it is presented to local elected officials for review later in the fall, it will be a comprehensive, accurate and usable document.

Simultaneously, work leading to the preparation of an application for ISTEA funds continues. If received, ISTEA funding would be used to implement the first official corridor of the regional greenway system. The steering committee directs the technical subcommittee to develop criteria for screening potential greenway corridors and ranking and selecting a final corridor. The criteria are presented and approved and the steering committee narrows approximately 10 proposed corridors to four.

Additional research and analysis for each of the **four possible ISTEA application sites** is conducted by local governments' planning staffs. The steering committee ranks the sites and selects the corridor extending from Downtown Roanoke/City Market to Explore Park in Roanoke County by way of Mill Mountain.

Next steps:

As the conceptual planning process and the initial work of the Roanoke Valley Greenways/Open Space Steering Committee draw to a close, preparations are being made to:

(1) develop and submit an ISTEA application for funding the first phase of the Downtown Roanoke to Explore Park corridor; and

(2) present the proposed regional conceptual greenway plan to the elected officials of each Roanoke Valley government.

Appendix B:

Following are descriptions of greenway land aquisition methods referenced in Section 7.23;

Donation/Tax Incentives
A local government agency agrees to receive full title to a parcel of land at virtually no cost. In most cases, the donor is eligible to receive federal and state deductions on personal income, as previously described under conservation easements. In addition, property owners may be able to avoid inheritance taxes, capital gains taxes and recurring property taxes.

Fee-Simple Purchase
This is a common method of acquisition where a local government agency or private greenway manager purchases property outright. Fee simple ownership conveys full title to the land and the entire "bundle" of property rights including the right to possess land, to exclude others, to use land, and to alienate or sell land.

Easement Purchase
This mechanism is the fee simple purchase of an easement. Full title to the land is not purchased, only those rights granted in the easement agreement. Therefore the easement purchase price is less than full title value.

Purchase/Lease Back
A local government agency or private greenway organization can purchase a piece of land and then lease it back to the seller for a specified period of time. The lease may contain restrictions regarding the use and development of the property.

Bargain Sale
A property owner can sell property at a price less than the appraised fair market value of the land. Sometimes the seller can derive the same benefits as if the property were donated. Bargain Sale is attractive to sellers when the seller wants cash for the property, the seller paid a low cash price and thus is not liable for high capital gains tax, and/or the seller has a fairly high current income and could benefit from a donation of the property as an income tax deduction.

Option/First Right of Refusal
A local government agency or private organization establishes an agreement with a public agency or private property owner to provide the right of first refusal on a parcel of land that is scheduled to be sold. This form of agreement can be used in conjunction with other techniques, such as an easement, to protect the land in the short term. An option would provide the agency with sufficient time to obtain capital to purchase the property or successfully negotiate some other means of conserving the greenway resource.

Condemnation
The practice of condemning private land for use as greenways is viewed as a last resort policy. Using condemnation to acquire property or property rights can be avoided if private and public support for the Greenway Program is present. Other successful

"greenway communities" have seldom used condemnation for the purpose of dealing with an unwilling property owner. In most cases, condemnation for greenway purposes has been exercised when there has been absentee property ownership, when title to the property is not clear, or when it becomes apparent that obtaining the consent for purchase will be difficult because there are numerous heirs located in other parts of the United States, or in different countries. The community must exercise caution in using Eminent Domain.

It is recommended that the right of eminent domain for a specific property be exercised by the community **only** if all of the following conditions exist:

a) the property is valued by the community as an environmentally sensitive parcel of land, significant natural resource, or critical parcel of land, and as such has been defined by the community as an irreplaceable property;
b) written scientific justification for the community's claim that the property possesses such value is prepared and offered to the property owner;
c) all efforts to negotiate with the property owner for the management, regulation and acquisition of the property have been exhausted and that the property owner has been given reasonable and fair offers for compensation and has rejected all offers;
d) due to the ownership of the property, the time frame for negotiating the acquisition of the property will be unreasonable, and in the interest of pursuing a cost effective method for acquiring the property, the community has deemed it necessary to exercise the right of eminent domain.

Impact Fees

Impact fees are monetary one-time charges levied by a local government on new development to offset some of the cost of providing public facilities for new development. Unlike subdivision exactions, impact fees can be applied to finance facilities located outside a specific land use development and can account for the impact of a development on facilities beyond the boundary of the development. The purpose of impact fees is not to raise revenue, but to ensure that adequate capital facilities will be provided to serve and protect the public. They can be levied through the subdivision or building permit process.

The Virginia General Assembly has granted certain local governments (any county over 500,000 population, cities and counties adjacent thereto, cities contiguous to such adjacent counties and cities, and towns therein) limited authority to assess impact fees for "road improvements", defined to include construction of new roads or improvements or expansion of existing roads to meet increased demand attributable to new development. This legislation is quite specific as to the manner in which the impact fees are assessed and used. Current State law would have to be amended to authorize the use of impact fees for greenway purposes in the Roanoke Valley.

The Dolan vs. Tigard Supreme Court Case and it's Effect on Greenways in the Roanoke Valley

In July 1994, the United States Supreme Court in the case of *Dolan v Tigard* examined the circumstances under which a property owner could be required to transfer land to a local government, with no monetary compensation, for a bicycle-pedestrian trail, as a condition of receiving a permit for enlarging an existing store. The Dolan family, owners of a local plumbing supply store in Tigard, Oregon, were required by the City to dedicate for public use a fifteen foot strip of land for a segment of the City's planned greenway and bicycle/pedestrian corridor as a condition of receiving a permit to enlarge the store. Conditions such as these are commonly called "development exactions" or "dedications" and are used extensively by local governments throughout the nation as a mechanism for keeping pace with rapid population growth and land use development. Local governments are burdened with the responsibility of providing services, facilities and infrastructure to new developments and in the last ten years have begun to rely on exactions as a method for "pay-as-you-go" community growth.

In 1987 the Supreme Court decided Nollan vs. California Coastal Commission, holding that an exaction must be directly related, both in nature and extent, the impact of the proposed development. The Commission granted a permit to the Nollans to replace a small bungalow on their beach front lot with a larger house upon the condition that they allow the public an easement to pass along their beach, which was located between two public beaches. The Nollans challenged the condition to the permit as an unconstitutional taking. The Court agreed, holding that the imposition of the beach access easement condition could not be treated as a reasonable exercise of its land use regulatory power since the condition did not directly serve the public purposes related to the building permit requirement. The court likened the requirement for this condition to "an out-and-out plan of extortion". There must be a direct relationship between the reason for the condition and what is being exacted.

Nollan cited Board of Supervisors vs. Rowe, a Virginia exaction case in support of its decision. In Rowe the local zoning ordinance required landowners, as a condition to the right to develop their land, to dedicate a portion of their property for the purpose of providing a service road (including curbs, sidewalk, and landscaped median strip) which was substantially generated by public traffic demands, rather than by the proposed development. The Virginia Supreme Court found that the local ordinance constituted an unconstitutional "taking" since the enabling legislation did not authorize this "taking" and that it violated Article I, Section 11 of the Constitution of Virginia. This "taking" was not so much for the benefit of the properties from which the land was to be acquired as it was for a more general public good.

After this decision the Attorney General for the Commonwealth of Virginia opined that subdividers may not be required to dedicate land for public park, school, or recreation purposes or to make cash payments in lieu thereof, as a precondition for subdivision plat approval, since these facilities are not specifically authorized by section 15.1-466.

Dolan added another requirement: that the exaction must be "roughly proportional" to the impact of the new development. In applying this test, the Supreme Court first recognized that a pedestrian/bicycle trail provides a useful alternative means of transportation for workers and shoppers that could serve to reduce automobile congestion and improve traffic flow. Nonetheless, the Court held that the dedication was a taking, in the case of *Dolan*, because Tigard had failed to make an "individualized determination" that the trail would or was likely to offset some of the additional traffic generated by the expanded store. Thus, where the transfer of land is required as a condition of receiving development approval, *Dolan* makes clear that local governments, and not the property owner, are burdened with demonstrating that the condition of approval bears the required relationship to the impacts of the proposed development documented at the time of imposing the conditions.

Critical to the outcome of *Dolan* was Tigard's failure to include individualized findings at the development site review stage, quantifying both the impacts of Dolan's development and the extent to which the bicycle/pedestrian trail would respond to those impacts. While the Court did not require mathematical precision in determining the relationship of approval conditions to development impact, it does require that assumptions must be justified by "rough proportionality."

Dolan v. Tigard served to clarify the rules under which local governments can conditionally require the dedication of land for public-use facilities, such as greenways. While some hail the Court's action as a "victory for private property owners," the more accurate assessment of the decision is that it provides clearer definition for both landowners and local governments engaged in land development review and approval. For the Roanoke Valley, the decision clarifies the need for new programs, such as the proposed Roanoke Valley Greenway Plan, to establish fair, equitable and justifiable objectives for protecting the Valley's stream corridors and floodplains. The first step in achieving these objectives is the adoption of this plan.

Appendix C:

Contacts for Technical Assistance

Federal Agencies

US Department of Transportation
Federal Highway Administration
Bicycle and Pedestrian Program - HEP 23
400 Seventh Street, SW
Washington, DC 20590
(202) 366-5007
(Intermodal Surface Transportation Efficiency Act Funds)

US Department of the Interior
National Park Service
Rivers and Trails Technical
Assistance Program
Post Office Box 37127
Washington, DC 20013-7127
(202) 343-9578
(Planning and Design Assistance only)

US Department of Housing and Urban
Development
Office for Community Planning
and Development
Main Street Program
Washington, DC 20410-7000
(CBDG project development only)

US Forest Service
Woodcrest Office Park
3205 John Knox Road, Suite F-100
Tallahassee, Florida 32303
(904) 422-1404
(Technical Assistance Forest Service related projects)

National Recreation and Parks Association
3101 Park Center Drive
Alexandria, VA 22302
(703) 820-4940
(Planning and Technical Assistance)

National Organizations

Rails-to-Trails Conservancy
1400 Sixteenth Street, NW
Suite 300

Washington, DC 20036
(202) 797-5400

National Trust for Historic Preservation
1785 Massachusetts Avenue, NW
Washington, DC 20036
(202) 673-4000
(Cultural resource protection identification)

American Greenways Program
The Conservation Fund
1800 North Kent Street
Suite 1120
Arlington, Virginia 22209
(703) 525-6300
(Small Grants/Greenway Projects)

Land Trust Alliance
900 17th Street, NW
Suite 410
Washington, DC 20006
(Technical Assistance)

Bicycle Federation of America
1818 R Street, NW
Washington, DC 20009
(202) 332-6986
(Technical Assistance)

American Trails
1400 Sixteenth Street, NW
Suite 300
Washington, DC 20036
(Technical Assistance)