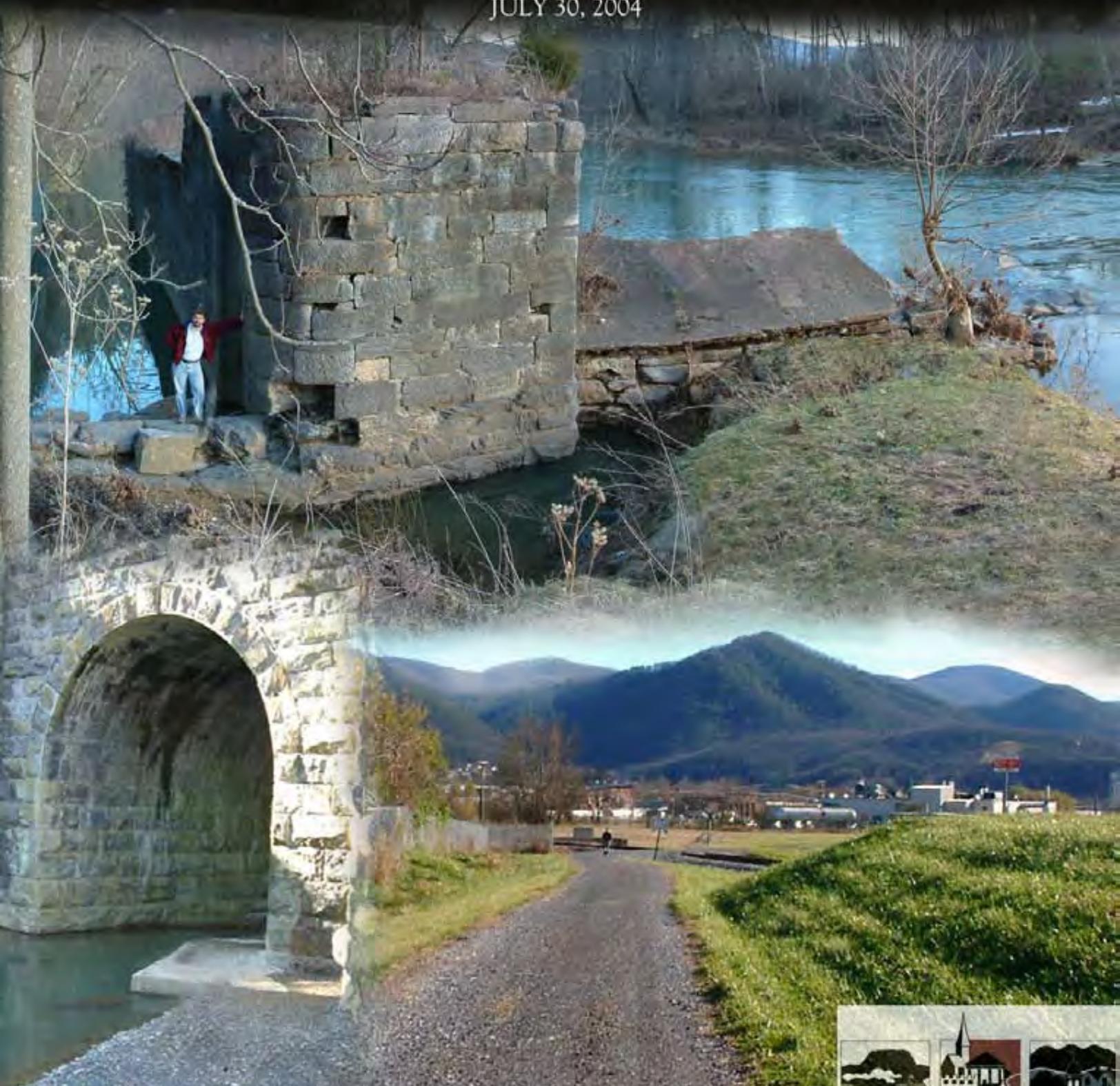


BRUSHY BLUE GREENWAY MASTER PLAN

JULY 30, 2004



BRUSHY BLUE GREENWAY MASTER PLAN

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Executive Summary

The Brushy Blue Greenway has been discussed for some time; the concept of connecting the City of Buena Vista, the City of Lexington and Rockbridge County with a walking and biking trail. Currently walking trails exist and are used on a regular basis in each jurisdiction. These include:

- The Brushy Hills Preserve walking trails, a network of hiking trails through the Preserve, located west of Lexington.
- The Woods Creek Trail in Lexington, a walking trail along Woods Creek, from Waddell School, through Washington & Lee and VMI, to Jordan's Point Park.
- The Chessie Trail in Rockbridge County, the abandoned C&O railroad corridor along the Maury River converted into a walking trail.
- The Levee Walk in Buena Vista, a walking trail along the Levee at the Maury River.

The gaps or new connections for the Brushy Blue Greenway include:

- A trail connecting Woods Creek Trail to the existing foot trails within Brushy Hills Preserve.
- A trail connecting Chessie Trail near Stewardsburg Road to the Levee Trail and Downtown Buena Vista.
- An urban trail through Downtown Buena Vista connecting to George Washington National Forest.
- A trail within George Washington Nation Forest connecting to the Blue Ridge Parkway.

The Brushy Blue Greenway will include interconnecting the four existing trails and upgrading these trails to a multi-use greenway trail, and the creation of new greenway connections. The complete

Brushy Blue Greenway corridor is approximately seventeen miles in overall length.

Public involvement has been a critical part of the project development. A working group was organized with regular meetings. Two public meetings were held, the first at Rockbridge County High School in Lexington and the second at Parry McClure High School in Buena Vista. A final public presentations/meeting was held in Lexington and meetings are planned for Buena Vista and Rockbridge County.

The master plan for the Brushy Blue Greenway depicts the main greenway corridor alignment, alternate alignments and proposed features. The master plan illustrates the design alternatives the relationship of each greenway trail alignment to existing conditions and resources. Also included are trailheads, river edge improvements, waysides and other trail features. The master plan and the associated cost estimate are intended to be used as a planning tool to guide further planning and greenway decision-making efforts.

Introduction

Greenways Vision

The Brushy Blue Greenway will be a ribbon connecting cities to the country. A ribbon connecting streams to rivers. A community space that must care for private properties such as businesses, farms and neighborhoods.

The Greenway should enhance the life for the region in many ways, providing:

A recreational outlet for hiking, walking, jogging, and biking.

A safe, “off the road” means for children and pedestrians to travel between neighborhoods, downtown areas, recreational areas and educational sites.

Improved access to downtown businesses creating an enhanced tourist profile.

Educational opportunities to learn about cultural and natural heritage.

A continued safeguard for our watershed and wildlife, enhancing the education and protection of local streams and rivers.

The opportunity to exercise civic pride by creating a showcase multi jurisdictional greenway to leave for our children and to improve our quality of life.

Greenways Definition

To understand the Brushy Blue Greenway we must first understand what a greenway means. Greenway is often used to describe a linear corridor of open space that is used or designated for recreational use

and transportation. They typically include some form of developed trail or path. Greenways are often located within existing man made or natural linear corridors, or greenbelts, such as rivers, streams, lake edges, canals, valleys, ridges, utility easements, rail lines, roads and the like.

Greenways accommodate non-vehicular modes of transportation in a community setting and provide an alternate mode of transportation to traveling by traditional methods. Greenways may accommodate a variety of non-vehicular modes of transportation such as walking, bicycle, equestrian, skiing and roller-blades.

A greenway system may include a mix of uses. Some portions of the greenway may be used for pedestrians only while others may make provision for pedestrians and bicyclists. The appropriate mix of users will be important to the success of a greenway. As user ship increases it is generally desirable to separate distinct groups such as bicycles and pedestrians by means of pavement markings or separate systems all together.

Greenways can accomplish many goals for a community including: economic development, transportation, education, conservation and recreation.

Plan Development

Plan Purpose

The purpose of the Brushy Blue Greenway Master Plan is to provide a framework for development of a greenway within the Cities of Buena Vista, Lexington and Rockbridge County. The master plan outlines specific recommendations for trail improvements to existing trails, new trail routes and trail amenities, and provides justification for their locations. The master plan is a guide for future detailed design and implementation of specific portions of the greenway corridor and has been prepared with direct input from the municipalities, property owners and the general public.

Coordination

This master plan is the result of public and private partnership and is funded in part with a grant from the Virginia Department of Transportation, through their Rural Transportation Planning Grant Program and the Virginia Department of Forestry, through their Urban and Community Forestry Grant. Contributing funding was provided by Buena Vista, Lexington and Rockbridge County, as well as the Central Shenandoah Planning District Commission (CSPDC) .

The completion of this master plan has been a cooperative effort between the City of Buena Vista, the City of Lexington, Rockbridge County, the Central Shenandoah Planning District Commission (CSPDC), the Rockbridge Area Recreation Organization, the Lexington~Rockbridge Chamber of Commerce, the Visitor Center, the VMI Foundation, Washington and Lee University, property owners, planning consultants, and the general public.

The CSPDC and each jurisdiction has provided labor, materials and enthusiastic and much appreciated support in this master planning effort. Property owners and the general public have provided support and enthusiasm for the master plan and the ideas contained within.

The Brushy Blue Greenway Master Plan is a community project and has involved municipalities, citizens and greenway supporters and

has resulted in a rewarding process with a sense of ownership and pride.

Plan Development Process

The planning process for this master plan was developed to allow input and involvement from municipalities, organizations, property owners and the general public. The process involved three phases of Analysis, Programming and Design.

A core group of individuals were organized to serve as the representation for the community at large. This group also provided in-kind labor and material required to complete this document and was called the working group. The working group consisted of members of City of Buena Vista, the City of Lexington, Rockbridge County, the Central Shenandoah Planning District Commission (CSPDC), the Rockbridge Area Recreation Organization, the Lexington~Rockbridge Chamber of Commerce, the Visitor Center and the VMI Foundation. A series of meetings, including a site reconnaissance tour, were held to gather input from the working group.



Site Reconnaissance Tour

Two public meetings and one presentation meeting/review were held in order to involve property owners and the general public in the planning process and to collect comments and concerns. Both public meetings were held to introduce the project and the concept of a greenway and to present potential trail improvements to existing trails, new greenway routes and potential improvements along the length of the greenway. The first meeting was held in the Lexington area and the second was held the Buena Vista area. The presentation meeting was provided for the Inter-Governmental Dinner held at VMI. The presentation meeting including draft master plan strategies for the greenway with information and feedback taken from the two public meetings. Formal presentations of the final master plan will also be made to each municipality and will be open to the public.

Goals and Objectives

Ownership

Goal:

To develop a greenway ownership structure that is comprehensive.

Objectives:

To explore, together with the City of Buena Vista, the City of Lexington, Rockbridge County and the VMI Foundation, the primary ownership of the Brushy Blue Greenway, including the holding of easements and liability.

To encourage adoption of the Brushy Blue Greenway Master Plan as part of each jurisdiction's Comprehensive Plan.

Management and Maintenance



Chessie Trail at Jordan's Point

Goal:

To develop policies for centralized and shared Greenway management and maintenance that ensures safety on the trail and extends the life of the trail.

Objectives:

To discuss with each municipality the option of providing regular greenway trail maintenance and upkeep.

To discuss with each municipality the option of including volunteer involvement in greenway maintenance and improvement such as trash pickup and tree planting with venues such as the annual Brushy Blue Greenway Community Cleanup Days and Adopt-A-Stream or Adopt-A-Trail programs.

To coordinate city-provided, county-provided and volunteer-provided management and maintenance services.

Easements



Chessie Trail along the Maury River

Goal:

To work with private and public property owners along the Greenway corridor to gain voluntary, legal access for the Greenway.

Objectives:

To use a combination of voluntary easements and access and use agreements with property owners to gain access to parcels or portions of parcels that are included within the Greenway.

To explore the appropriateness of acquiring land for the Greenway through voluntary donation of land by property owners.

To always respect the interests and wishes of property owners.

Funding

Goal:

To fund Greenway design and construction through a public/private partnership model.

Objectives:

To identify and acquire primary funding for the Greenway through federal, state and private sector grants.

To negotiate with the each municipality to provide funding for local match requirements for Greenway construction grants (a typical

match requirement ranges from 20% to 50% of the grant award amount).

To use in-kind contributions, such as volunteer labor, staff time, and donated planting and construction materials, wherever possible for local match requirements for Greenway design and construction grants.

To encourage private donations through fundraising efforts.

Users and Needs Assessment

Understanding the needs of trail users is an important step to accomplish before trail master planning begins. These needs will help determine the criteria and parameters to consider during the planning and design of the greenway trail.

Most of the users of the Brushy Blue Greenway are expected to be recreational with the potential for commuting pedestrians. Current users of the Woods Creek, Chessie and Levee Trails give an indication of trail usership, however currently all of these trails are pedestrian only (walking).

Walking/Hiking

Potential trail user groups for this category include walking, strolling, jogging/running and hikers. Considerations for each group in this category are listed below.



Pedestrian use today on the Levee Trail

Pedestrians: Generally, the largest user group of trails. Pedestrians walk the trails in pairs in most instances, therefore, the width should accommodate a pair.

Pedestrians With Strollers: Typically the slowest moving user on a trail. A smooth, hard, and clean surface works best with strollers. Occasional rest areas and wider paths also accommodate this group.

Pedestrians With Leashed Dogs: When designing for this group, the following rules should be followed:

- All dogs should be on a leash that is short enough so that the dog does not block more than one-half of the trail with the leash at its longest length.
- All dogs should walk on the edge of the trail.
- Owners should clean up after their dogs.
- Owners should know how their dogs interact with livestock considering portions of the Chessie Trail contain livestock.

Hikers: Hikers tend to like a more challenging trail than standard pedestrians use. They prefer trails with soft, informal surfaces,

locations to view wildlife and more secluded locations. Brushy Blue Greenway should expect hikers in portions of the Greenway that provide this environment. These areas include the Brushy Hills Preserve Area and the proposed eastern leg of the Brushy Blue Greenway from Buena Vista to the Blue Ridge Parkway.

Handicapped Users: This group consists of people with many forms of handicaps (i.e. persons bound to wheelchairs, vision and hearing impaired individuals, elderly people, etc.). When designing a trail, Federal Law for the Americans with Disabilities Act should be respected. The 1991 edition of the ADA Handbook states “all new design, construction and renovation projects will be readily accessible to users with disabilities, except where an entity can demonstrate that it is structurally impractical, excessively difficult or expensive to meet the requirements”. By designing your trail to meet or exceed the ADA standards, you will directly benefit more than half of the users (handicapped and non). Portions of the Brushy Blue Greenway may not be accessible for all handicapped users, but all who wish to partake in trail activities should be accommodated whenever possible.

Bicycling

It is anticipated that bicyclists will be the second major user of the Brushy Blue Greenway system, given the increased popularity of recreational bicycling and commuting by bicycle. The following are sub-groups of this category and require an understanding of different needs when planning for this greenway:

Experienced Recreational Cyclists: Prefers roads to off-street trails. Should not be discouraged from using roads rather than trails. They are usually interested in off-street trails if they are designed for higher speeds.

Commuter Cyclists: Prefers to use their bicycle in place of their automobile for daily travel and will use the fastest route whether on or off the road.

Amateur Cyclists: Will travel at a leisure but steady pace with the other groups on trails to avoid vehicular traffic and conflict.

Family Cyclists: Prefers “off the road trails” easy to negotiate, slower paced and completely separate from vehicles.

Children Cyclists: This group is under the age of 13. This group is preferred to use off the road trails for safety. The groups benefits from greenway trails that are routed under and over busy roads, avoiding vehicle conflicts, and also providing direct connections to parks and schools.

Equestrian

There is potential that portions of the Brushy Blue Greenway could accommodate equestrian use. Equestrians are more likely to use rural greenways with parking that accommodates trailer parking. Potential trail sections suitable for equestrian use include the Brushy Hills Preserve Area, portions of the Chessie Trail and the proposed eastern leg of the Brushy Blue Greenway, from Buena Vista to the Blue Ridge Parkway, through George Washington Nation Forest. Mounted police officers may also benefit from the use of sections of the Greenway.

Equestrian users prefer a separate, soft-surfaced trail. Features necessary for equestrians include:

- Horse trailer parking and access.
- Higher railings on bridges.
- Tie-ups and water troughs at the rest areas.
- Signs and trail markings specifically to alert the equestrian users at crossings.

Skaters

Skaters: Includes skateboarders, skaters, in-line roller-blades and non-motorized scooters, due to continued popularity in skateboarding and small wheeled non-motorized travel. They require a smooth, durable trail surface and prefer a generous width with varied topography. Many portions of the Brushy Blue Greenway could accommodate this group if a smooth trail surface is installed and maintained.

Existing Conditions

Planning Efforts

The Brushy Blue Greenway Master Plan uses the resources of previous planning efforts in the region. These include:

- RARO - Comprehensive Parks, Recreation & Open Space Masterplan
- Jordan's Point Park Project Plan
- Jordan's Point Low Water Bridge Design
- Field Guide to the Chessie Nature Trail
- The Maury River Atlas
- Hill Top – Glen Maury Park Master Plan
- CSPDC – Draft Greenway Master Plan

Existing Trails and Greenways

There are several active pedestrian trail systems within the region that would be linked within the framework of the Brushy Blue Greenway. Bicycle lanes and roads improvements also exist in certain locations nearby that could benefit this Greenway.



Woods Creek Trail at VMI

The Brushy Hills Preserve Trails is a hiking trail system within the Brushy Hills Preserve. The trails are used on a regular basis and maintained by the Friends of Brushy Hills. These trails are back - country style earth trails.

The Woods Creek Trail, a varied surface, pedestrian only trail approximately 5 feet in width, runs from tributary of Woods Creek at Waddell School, along Woods Creek into VMI land, then running along an old railroad bed and ending at Jordan's Point Park. The surface includes asphalt, prime and seal, sand and crushed aggregate.

The Jordan's Point trail is a pedestrian hard surface loop trail system within Jordan's Point Park.

The Chessie Nature Trail begins at Jordan's Point Park and follows the abandoned C&O Railroad bed along the Maury River,

terminating at Stewardsburg Road in Rockbridge County. The Chessie Trail continues in a deteriorated state along Stewardsburg Road to the parking area under the Route 60 bridge but due to repeated damage from flooding and off road vehicle use, the usable portion of Chessie Trail ends as it meets Stewardsburg Road. The trail is primarily crushed aggregate. The original Chessie Nature Trail spanned the Maury River at Jordan's Point via a pedestrian bridge. Repeated flooding has washed several pedestrian bridges away with only the concrete piers remaining, resulting in the current condition of no pedestrian connection across the Maury River into Jordan's Point Park. A new low water pedestrian bridge has been designed but until final design and construction occurs, the alternate strategy of using the sidewalk on the Route 11 Bridge will have to be identified. The existing trestle bridge on the Chessie Trail over the South River was washed off of its abutments during hurricane Isabelle. Efforts were discussed at salvaging the bridge and replacing the abutments. However the bridge was recently removed as scrap. A completely new bridge will have to be installed. In the interim, faithful walkers and runners may be crossing the South River via the active VDOT bridge and return to the Chessie Trail farther downstream.



Chessie Nature Trail

The Levee Walk or Buena Vista River Walk is a hard surface pedestrian only trail located along the top of the ACOE levee within the City of Buena Vista approximately 6 feet in width. The surface is crushed aggregate.

Virginia Outdoors Plan

The Virginia Outdoors Plan 2002 outlines recreation demand for each Planning District in Virginia and makes recommendations for improvements in these regions. It is prepared by the Virginia Department of Conservation and Recreation. The publication is updated every few years.

The Brushy Blue Greenway Master Plan lies within the Central Shenandoah Planning District 6. The Plan recommends that “each locality develop a trail and greenway plan as part of its comprehensive plan. This plan should make an effort to link existing and proposed trails and greenways into a regional greenways network connecting existing and proposed recreational, cultural, water, business and other resources the community deems desirable.” It also recommends that localities determine appropriate roads for

bicycle routes. The Brushy Blue Greenway Master Plan addresses these issues. Furthermore the Central Shenandoah Planning District Commission (CSPDC) has prepared a Greenway Master Plan. This Greenway Plan identifies general needs for greenways within the planning district.

The Virginia Outdoors Plan makes specific recommendations for considering Route 60, from Rockbridge County to Buena Vista, as a Virginia Byway. The Brushy Blue Greenway would pass under Route 60 at the Maury River with a potential alternate trail located on the Route 60 bridge.

Parks & Recreation and Public Lands

The Brushy Blue Trail Master Plan corridor, which includes the City of Buena Vista, the City of Lexington and Rockbridge County, is blessed with a diversity of parks and public lands. Facilities include parks, schools and land preserves. Each institution, jurisdiction manages their facilities. Existing facilities include:

Brushy Hills Preserve
Waddell School
Washington & Lee University
VMI - Virginia Military Institute
Jordan's Point Park
Glen Maury Park
Laurel Park Youth Complex.

Federal lands are also within the Greenway and make up the eastern portion of the study area. These include George Washington National Forest and the Blue Ridge Parkway.

Passive and active recreational uses are available along the length of the greenway corridor. These include a new a 18-hole golf course (Vista Links) at Glen Maury Park, recreation fields at Laurel Park, pavilion and interpretive information at Jordan's Point Park, and a generous variety of open space along its length.

The mission statement of Parks and Recreation is to enhance the quality of life and meet the needs of every citizen by providing comprehensive leisure service opportunities. The mission also includes developing and maintaining a safe system of open spaces and public facilities for the use and enjoyment by the community.

The Brushy Blue Greenway corridor would take advantage of the existing recreation facilities and would allow for trail users to extend their journeys to create a series of interconnected open spaces. In addition, these facilities can serve as trail head locations for vehicular, bicycle and pedestrian traffic. These include Waddell School, Jordan's Point Park, Glen Maury Park and Laurel Park.

Scenic Areas

The Brushy Blue Greenway offers a variety of scenic opportunities along its length. The portion of Greenway along Woods Creek will provide instances of "wild nature" within the City limits of Lexington, as well as attractive scenic views along the stream in a variety of contexts. The Maury River, with the potential of designation as a scenic river, provides a variety of scenic river vistas. The Levee Walk in Buena Vista offers commanding views of the surrounding mountains range.

Notable views along the Greenway include:

- Brushy Hills Preserve- Select views from vistas within the trail system.
- Washington & Lee University - Views of the stone arch bridge and woodland setting along Woods Creek.
- VMI - Commanding views from the North Post Area of the Historic Barracks.
- Jordan's Point Park - Picturesque views of the old waterfront.
- Chessie Trail at Old Buena Vista Road - Views of the rocky, wooded slopes on the far side of the Maury River.
- The Chessie Trail at the South River – Views of the confluence of the South River into the Maury River within a pastoral setting.
- The Chessie Trail at Zimmerman Lock - Views of the historic stonework of the lock and dam in an agricultural setting.
- The Route 60 Bridge – Views of rocky, wooded slopes on the far side of the Maury River, along the edge of Glen Maury Park in Buena Vista.
- Levee Walk in Buena Vista – Commanding views of the city and mountain range to the east.

Historic Resources

History within the Brushy Blue Greenway includes some of the most notable historic places and features this country has to offer. A list of historic resources has been compiled that include four historic districts. These include historic sites directly adjacent or near to the Greenway and historic resources within view of the Greenway. For more information about historic resources for the Brushy Blue Greenway, see the included archeological report.

1. Historic Sites



Buena Vista From Levee

Buena Vista - Situated along the banks of the Maury River with a long history of industry, prosperous settlement and commerce. Mining of iron ore at the foothills of the City occurred for a period of time as well as an ongoing diversified industrial economy. Historic rail activity was also an integral component of the city. While blessed with access to trade by the river, Buena Vista also fell victim to periodic flooding.

Historic sites within Buena Vista along or near the Greenway Include:

- Southern Virginia College for Women or Southern Virginia College, visible from the Levee.
- Old Buena Vista Courthouse, visible from the Levee.
- Old Railroad trestles, adjacent to the Levee.



Southern Virginia College

Lexington - Located in the historic Shenandoah Valley, an historic site in its own right, with taproots extending directly from events of the founding fathers of our nation to the struggles of the Civil War. These roots include a context that represents many cultural and geographic features with vital roles in the development of our national identity. The Brushy Blue Greenway will travel past much of Lexington's history and within four distinct historic districts.

Historic sites within Lexington along or near the Greenway Include:

- VMI Barracks and VMI Historic District, visible from Woods Creek.
- Washington & Lee Historic District, visible from Woods Creek Trail.
- Stone Arched Bridge at Washington & Lee, visible from Woods Creek Trail.



Stone Arched Bridge

- Lexington Historic District, visible from Woods Creek Trail.
- East Lexington Historic District, visible from the Chessie Trail.
- Miller House at Jordan's Point, along the trail within Jordan's Point Park.
- Covered Bridge Abutments and old waterfront at Jordan's Point, visible from Chessie Trail.
- Trestle Rail Bridge remains at Jordan's Point, visible from the Trail.

Rockbridge County - Surrounding Lexington and Buena Vista, Rockbridge County offers a rich history and variety of historic sites. The Brushy Blue Greenway will travel past much of Rockbridge Counties maritime history..



Zimmerman Lock and Dam

Historic sites within Rockbridge County along or near the Greenway Include:

- Remains of stone abutment of bridge / canal culvert, visible along the Chessie Trail. Potential remains of R&A railroad.
- Remains of Reid's (Ross's / Emore's) Lock and Dam complex at Alexander's Landing, visible along Chessie Trail.
- Remains of South River Lock and Dam complex, visible from Chessie Trail.
- Remains of Ben Salem (Dunlap's) Lock and Dam complex, visible across Maury River from Chessie Trail.
- Remains of Zimmerman (Stratton's) Lock and Dam complex, visible from Chessie Trail.

Downtown Attractions

Buena Vista and Lexington's downtowns have continued to maintain strong roles in education, tourism and retail services within the Shenandoah Valley. Although the Brushy Blue Greenway will not intersect Lexington's downtown, it provides the opportunity for pedestrian connections. The Greenway will intersect the Buena Vista downtown area by providing a link between the Levee Walk and Laurel Park and providing a connection to the National Forest and Blue Ridge Parkway.



21st Street Downtown Buena Vista

Inventory and Analysis

Introduction

The Brushy Blue Greenway Inventory and Analysis included two specific tasks; first the examination of current condition of the existing trail systems within the Greenway corridor and their potential for enhancement, modification and improvement. These existing trail systems include the Brushy Hills Preserve Trails, Woods Creek Trail, Chessie Trail and the Levee Walk. The second task is to identify properties and land uses along the Greenway corridor in locations that do not currently offer a trail system and determine if these locations support or discourage trail development.

The compiled analysis will include specific opportunities and constraints and determine and action plan.

For locations with existing trail systems, specific actions may include realignment, widening, resurfacing and other strategies necessary for multi use trail systems. For locations that do not currently contain trail systems, specific actions may include

acquiring property, negotiating permanent easements, use of existing easements or avoid properties or areas all together. The analysis maps in this report identify many of the trail issues.

The analysis information has been compiled to aide in the decision making process regarding general locations for greenway development. The analysis is general and does not consider exact dimensional information and exact locations of easements or



property lines. As each portion of the Brushy Blue Greenway is planned for construction, a detailed survey will be necessary.

To aid the understanding of the analysis, the Brushy Blue Greenway Corridor is divided into five distinct sections:

- **Section one, Potential Western Connector-** Proposed Greenway north and west of Waddell School in Lexington to the western limits of the Greenway at Brushy Hills Preserve.
- **Section two, Woods Creek-** The Woods Creek Trail corridor from Waddell School to Jordan's Point.
- **Section three, Chessie Trail-** The Chessie Nature Trail Corridor, from Jordan's Point to the Route 60 Bridge over the Maury River.
- **Section four, Proposed Greenway East Connector A-** Proposed Greenway east from the Route 60 Bridge to the existing Levee Walk and through downtown Buena Vista to Laurel Park.
- **Section five, or proposed Greenway East Connector B-** Proposed Greenway east from Laurel Park, through George Washington National Forest, to the Blue Ridge Parkway.



Considering Brushy Blue

Larry and Ellen Martin of Lexington peer at aerial photographs of the Brushy Hills area west of Lexington in the Rockbridge County High School cafeteria, Thursday. Approximately two dozen people went to a community meeting at RCHS to learn about plans to connect Brushy Hills to the Blue Ridge Parkway by a multi-use trail through Rockbridge County, Lexington and Buena Vista. The proposed Brushy Blue Greenway will zig-zag 10.4 miles along Woods Creek and the Maury River connecting existing trails at Brushy Hills, the Chessie Trail and the Buena Vista River Walk. The project is being administered by the Central Shenandoah Planning District Commission. The aerial photographs are part of a master plan being developed by the Land Planning and Design Associates. LPDA will present the finished plan to the three jurisdictions in June. (B. Lynn DiBlase photo)

Public Meeting #1

Methodology

The analysis was accomplished using a combination of map overlays, site reconnaissance and discussions with property owners, trail users, and working group committee members. Working group committee members included; staff from Central Shenandoah Planning District Commission, Buena Vista, Lexington and Rockbridge County, the Rockbridge Area Recreational Organization, the Regional Chamber of Commerce and the VMI Foundation. Mapping overlays utilized several sources of information including high resolution 2000 aerial photography and GIS data layers. Data Layers include tax parcels, land use, roads, waterways, and topography. Mapping was provided by the Cities of Buena Vista and Lexington, Rockbridge County and the CSPDC.

Work sessions were held with the Working Group, including a site reconnaissance field trip. The focus of the work sessions was to identify potential new routes, effects on properties, potential improvements for existing trails and current development that would affect development of the greenway. Several critical issues identified included steep topography in the western and eastern portions, non-

compatible land uses, restrictive ownership issues and potential railroad and vehicle conflict points.

Two public meetings were held, the first at Rockbridge County High School in Lexington and the second at Parry McClure High School in Buena Vista. The meetings provided the opportunity for the general public to solicit comments and provide feedback. Corridor maps were made available for review and comments were documented.

Many issues were discussed at the public meetings including property ownership and land use issues, safety, access, specifics about trail users and greenway design.

A final public presentations/meeting was held in Lexington, with meetings planned for Buena Vista and Rockbridge County.

Land Ownership and Use

Land Uses within the City and County

There are many land uses along the greenway corridor within a city or county. These include: Single Family and Multi-Family Housing, Education, Neighborhood Commercial, Mixed-Use / Commercial, Industrial, Parking, Office, Government, Institutional, Cultural, Recreation, Agricultural, Open Space and Vacant. Each land use differs in compatibility with mixed-use trails.

There are pros and cons associated with locating trails through or along certain properties, for both the property owner and the trail user. For example, residential property owners may enjoy access to the trail from their home but often express concern over proximity of trails for safety reasons. Ideally the property should be large enough to allow for a planted buffer between a yard and trail, or in some cases fencing. But if the property is small, the trail may pass close to a house or building.

Commercial land can also have compatibility issues as well. Some commercial businesses welcome a trail and the benefits to their customers. But if commercial land is fully developed, it may be

difficult to provide space for a trail that is separate from the business and customer parking.

When proposing trails through industrial property, adequate space for a trail may be available but conditions may not be ideal for trail use. Some industrial areas are unsightly or offensive to the senses. Additionally, some industrial uses create potentially hazardous conditions for trail users and require specific security measures. In the case of the Chessie Trail, the VMI Foundation has negotiated with industrial property owners along Old Buena Vista road access for pedestrian only trail use. If the Chessie Trail is modified to a multi use trail, this arrangement would have to be readdressed including providing a safer separation of industrial uses from trail uses. Another industrial property issue is the Bontex plant in Buena Vista. This industrial use allows for little space to “fit” the trail within the industrial property.

Educational facilities may also have concerns about additional traffic and security.

Recreational uses are usually a compatible land use with trail systems. These include parks, ball fields, and golf courses and they often offer support services for trail users such as public restrooms, water fountains, telephones, and parking. Hazards do exist that should be addressed in detailed trail design, such as the danger of stray baseballs or golf balls.

Agricultural land uses are also encountered along the Greenway. Most of this land is in the form of pasture for grazing of cattle but small areas of crop land does exist. Several agricultural land owners attended the community meetings. Comments from property owners included support of the trail, concerns for improving the Chessie Trail for multi use, to no support for future trails through their agricultural land. One property owner noted that along Chessie Trail it is often “only 10% of the trail users improperly using the trail and effecting it for everyone”. Another property owner noted that a proposed trail could divide their current operation. Important concerns to be addressed in agricultural uses included gate access control with self closing gates, overall trail control to separate trail users from cattle, signage, enforcement, vehicle parking and access points in relation to tractor access.

Vacant properties and open spaces have potential to contribute to the entirety of a trail system project. These areas could be considered for additional park space, tot lots, trailheads and parking areas.

Various land uses should be assessed when planning the route of a trail. The nature of property ownership and the desires of the landowner should both be considered when addressing the usage of property for trail implementation.

Environmental

Geology

The geology in this area is dominated by the underlying sedimentary shale, limestone and dolomite. Soil types vary along the length of the Brushy Blue Greenway Corridor. The western and eastern portions of the Greenway are mountainous and have significant amounts of exposed limestone bedrock.

In the lower portions of the corridor along Woods Creek and the Maury River, the presence of shallow and exposed bedrock remains. Runoff remains rapid, and the potential for erosion is high due to the alluvial nature of the soils coupled with the presence of rock in the actual flow channel. Along the Maury River in certain locations, soils level out and deepen along the floodplain. Erosion potential remains high.

Trail location along Woods Creek and Maury River should consider future problems with channel incision from erosion, particularly along the outside of turns where erosive energy is greatest. Where space is limited, bank stabilization may be necessary to protect the trail.

Floodplain

The entire length of the Greenway along Woods Creek and the Maury River is within the 100-year floodplain, as identified in the Flood Insurance Rate Maps (FIRM) issued by FEMA. Floodplain areas are regulated under the Floodplain Ordinances, which is based on Federal Ordinances. Development in the floodplain is controlled to prevent and reduce the potential increase in flood elevations and

the introduction of new, flood-prone structures. Greenway development will be subject to the same requirements.

The floodplain is divided into two main components; the floodway and floodplain. Development in the flood plain can proceed provided that new structures are elevated (or flood proofed) above the established flood elevations. Development in the floodway, considered the primary flow area, is severely restricted. Essentially no work can occur in the floodway that has the potential to increase flood elevations. Development in the floodway usually requires associated work to offset the effect of the project on flood depths.

In the case of the Greenway, flood regulations may require that excavation occurs with minimal to no filling. Use of retaining walls may become necessary. Greenway design should avoid flood impacts. It is particularly important to avoid impacts that require revisions to the recorded flood maps.

Wetlands

The U.S. Army Corps of Engineers (USCOE) is responsible for determining if jurisdictional areas actually existing within the project area and issuing permits if impacts to these areas are unavoidable. Isolated wetlands do not fall under the USCOE's jurisdiction; however, isolated wetlands were not observed during site reconnaissance (see the attached environmental report for this project prepared by Draper Aden). If impacts for certain projects are less than 0.5 acres, then the USCOE usually defers all wetland permitting to the State agency. The National Wetland Inventory (NWI) map for this area shows Woods Creek and Maury River themselves as wetlands, although it is only within the limits of its banks. Stream relocation, if necessary, would become a wetland and permitting issue. Stream bank stabilization would also be a permitting issue.

Detailed planning along any stretch of the Greenway should not overlook the possibility of wetland areas. Suspect areas should be evaluated by an experienced biologist or soil scientist. Impacts on wetlands should be avoided if at all possible. Significant impacts could require costly mitigation work.

Wildlife

Threatened and Endangered Species

There are 50 animals and 13 plants on the Threatened and Endangered Species list for the State of Virginia. Research has revealed that there are thirteen species listed as either federally or state threatened and endangered in Rockbridge County, Virginia. (see the attached environmental report for this project prepared by Draper Aden).

Physical Attributes



Existing Brushy Hills Preserve Trailhead



Kendall at Lexington



*Properties on the west side
E of Ross Road.*

The sections below document existing conditions along the length of Brushy Blue Greenway. See the included analysis maps for a visual interpretation of the existing conditions and the potential effects on the Greenway Corridor.

Section One – Proposed Greenway West

A mixture of steep, wooded, upland, rolling agricultural land interspersed with residential properties.

This section begins within Brushy Blue Preserve, a mixed hardwood forest typical for the Shenandoah Valley. Due to topography, the Preserve area is more suitable for pedestrian only foot trails. The Preserve currently includes a network of pedestrian trails that would provide a suitable connection opportunity.

At the foot of the Preserve are primarily agricultural land tracts. The largest tract being a farm along Enfield Road known as Sunnyside Farm. The topography within this agricultural area is more supportive for a multi use trail if property ownership supports a trail route. The transition from steep wooded area to agricultural property also provides the opportunity for a trailhead or trail transition location.

Along the eastern edge of the agricultural area is Kendal at Lexington, a seniors community. This community also adjoins Woods Creek along its eastern boundary by Ross Road and Rebel Ridge Road. If the residents allow, a trail connection could be made along the edges of this community without negatively impacted the privacy of its residents and also accommodating future expansion to the facility.



Woods Creek Trail at Waddell School

From the east edge of Kendal at Lexington, the Greenway would follow Woods Creek to the Waddell School Property, as you enter the City of Lexington. Although this is only a small portion of Greenway, it is complicated by residential parcels that front along the Creek at Ross Road.

Section Two – Woods Creek Trail



Jordan's Street Crossing

This section follows Woods Creek, along the existing Woods Creek pedestrian trail, to Jordan's Point on the Maury River, within the City of Lexington.

Beginning at Waddell School, the trail follows the east side of Woods Creek, crossing Jordan's Street, and continues to the city playground at Lime Kiln Road. At this location the trail crosses over Woods Creek via the Lime Kiln Road bridge. The topography is generally favorable in this area to allow for trail improvements. Road crossings will have to be addressed as well as the potential of a new creek crossing or improved crossing.



Jordan's Point Park

From Lime Kiln Road the trail follows the west side of the creek and gradually ascends a steep grade dropping down to the creek, crossing to the east side over a low water bridge crossing before passing under the West Nelson Road/Route 60 Bridge. The steep area would require grading for trail improvements and the creek crossing would also have to be improved.

Continuing under the West Nelson Road/Route 60 Bridge, the trail crosses the creek again via a low water bridge crossing and follows the west side through Washington & Lee University Property, adjacent to the sororities. The trail squeezes under an existing stone bridge and then crosses over a university access road. Improvements will be necessary for both crossings.



Chessie Nature Trail at Old Buena Vista Road

The trail then crosses an access road for Washington & Lee facilities and begins to ascend a steep grade before turning left onto an old railroad bed. This steep grade will require grading adjustments as well as improvements at the top of the hill as it turns onto the railroad bed.

The trail now enters VMI property and follows the old railroad bed down a gradual slope through the North Post Area of VMI to Jordan's Point, crossing a VMI access road along the way. Future planning in this section will have to respond to long term planning goals for the VMI North Post area.



Chessie Nature Trail

At Jordan's Point Park the trail would leave the old railroad bed and turn and follow the park access road, crossing the old millrace and then connecting to the location of the future pedestrian bridge over the Maury River. An alternate road through the Park would be to cross the access road, cross over Woods Creek and then provide access of the vehicular Route 11 bridge and connect to the Chessie Trail on the opposite site of the Maury River.

Improvements through Jordan's park would include water crossings as well as trail improvements and new installations. Improvements in the Park should be coordinated with the Jordan's Point Park Master Plan.

Section Three – Chessie Nature Trail



Zimmerman Lock and Dam

This section follows existing Chessie Trail, along the Maury River in Rockbridge County, from Jordan's Point in the City of Lexington, to the Route 60 bridge, near the City of Buena Vista. The Chessie Trail is located on an old railroad bed, providing a solid surface with a gentle slope.

Beginning at Jordan's Point at the Route 11 bridge, the trail follows the northeast side of the Maury River. The trail is along the edge of a small industrial area, adjacent to Old Buena Vista Road, and continues downstream.

Below the industrial area the trail crosses two small creeks, one is Mill Creek, near the VDOT service yard, before entering a access gate for the trail. Improvements to the creeks crossings will be necessary. A potential trailhead is also located at this area.



Route 60 Bridge Area

The Chessie Trail runs along a mixture of river-edge wooded areas and pasture areas, from the gate downstream to the confluence of the South River into the Maury River. Just down from the gate is a steep, rocky area with cliffs along the trail. Several small streams with culverts are also encountered including Reid's Lock.

At the South River the Chessie Trail previously crossed using the existing railroad trestle bridge. A hurricane has washed the bridge into the river. A new pedestrian bridge will have to be installed in this position. There is also the potential for a trailhead area at this

location. Currently trail users wanting to continue along the trail must leave the trail at the South River, follow Route 703 over the South River down to a small farm access road, and connect back to the Chessie Trail approximately 1000 feet from the South River.

From the farm access road, the Chessie Trail continues downstream through a mixture of river-edge wooded areas and pasture areas, passing by the Zimmerman Lock and ending at Stewardsburg Road. It appears that in the past the Chessie Trail continued from this point paralleling Stewardsburg Road down to the Route 60 Bridge, but erosion and uncontrolled four wheel drive activity has all but eliminated this section of trail. Stream bank stabilization and river edge modifications, as well as vehicle controls will be necessary to revive and improve this section of the Chessie Trail.

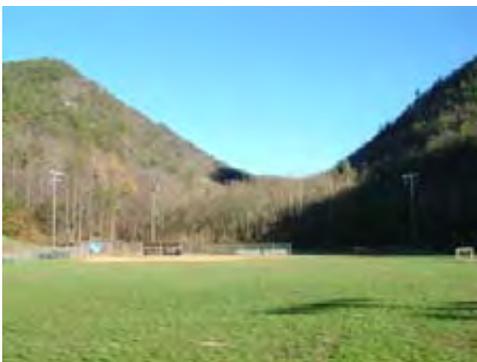
Section Four – Proposed Greenway East A

Beginning at the Route 60 Bridge and generally following the Maury River into the City of Buena Vista, then turning through downtown and connecting to Laurel Park. This section of trail is a mixture of land uses and site conditions, including industrial, commercial, residential and openspace.



Bontex Plant Area

From the Route 60 bridge the future greenway corridor is problematic. The Bontex industry in utilizing most of their property along the banks of the Maury River. The potential greenway will have to navigate through or along the edge of Bontex, and the active rail spur that serves them, and connect to the open area inside the levee wall. A trail connection over the Route 60 bridge to the new Vista Links Golf Course in Glen Maury Park is also being considered.



Laurel Park in Buena Vista

From the entry into the levee wall, the future greenway could follow the existing levee trail as an alternate, or follow a more direct route along the edge of the rail spur to the vicinity of 21st Street. At 21st Street an existing parking area serves the levee trail. This parking area could be upgraded to serve the new trail connection while also serve the existing levee trail.

From the levee area at 21st Street, the greenway has the potential of connecting to Laurel Park via two different routes. One route could run directly up 21st Street with modifications to the existing street. This would be considered an urban and suburban greenway, with vehicle conflicts and heavy pedestrian activity from businesses. The other route would use the existing levee trail and connect to Indian

Gap Run, locating the greenway along Indian Gap Run to Laurel Park. This option is more rural in character with less vehicle conflicts.

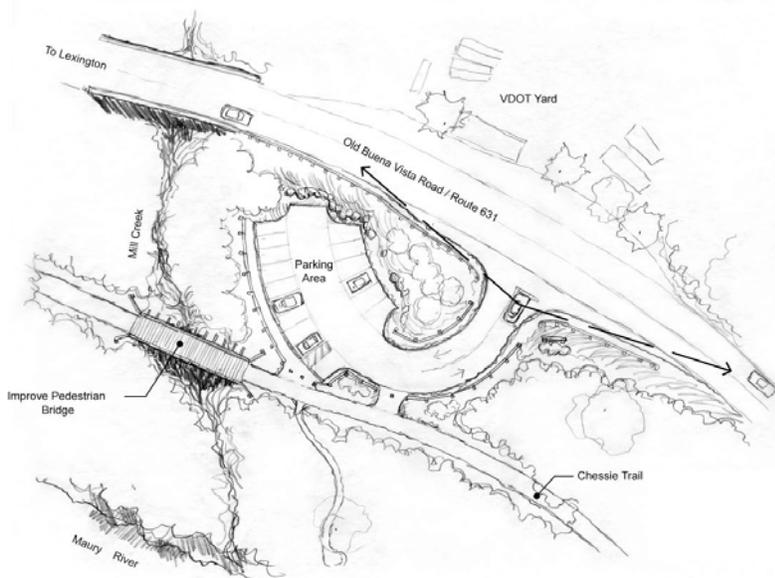
Section Five – Proposed Greenway East B

This section is primarily steep, wooded, upland, a mixed hardwood forest typical for the Shenandoah Valley. The greenway would begin at Laurel Park in the City of Buena Vista running through Rockbridge County and George Washington National Forest, and connecting to the Blue Ridge Parkway property. Due to the steep topography and rough terrain, a pedestrian only foot trails is more suitable from Laurel Park to the eastern terminus at the Blue Ridge Parkway.

Access and Transportation

Trailheads

Vehicular access to the greenway will require developed parking areas in conjunction with trailheads. Access to parking areas should be well defined and easy to locate. Access should occur on secondary road systems where traffic is calmer. Major, heavily traveled roads, should be avoided due to conflicts of turning movements and the potential need for turning lanes. Quiet residential streets should also be avoided where possible. The following streets offer good vehicular access to land potentially appropriate for vehicular trailhead development: Enfield Road/ Route 672 in Rockbridge County, Old Buena Vista Road/ Route 631 in Rockbridge County, Highland Farm Road at Route 703 in Rockbridge County, Stewardsburg Road in Rockbridge County and the end of 21st Street in Buena Vista.



Typical intermediate trailhead, at Old Buena Vista Road.

Existing community facilities also offer opportunities to develop trailheads. Schools and parks that offer existing parking and the

opportunity to develop new parking are good candidates for trailhead locations. When primary trailheads are not located at these facilities, secondary access is typically desired. Public properties appropriate for primary trailhead development include: Waddell School in the City of Lexington, Jordan's Point Park in the City of Lexington.

Secondary public access points might include: Washington & Lee University and VMI in the City of Lexington and Glen Maury Park in the City of Buena Vista.

Many tertiary opportunities exist for pedestrian access to the Greenway system. Typically these include use of existing sidewalks and paths along City streets. There are also many secondary pedestrian access point opportunities. These include pedestrian paths and proximity points that intersect the greenway such as: Brushy Hills Preserve Trails and Jordan's Point Park Trails. The residential neighborhoods around the corridor also offer pedestrian access opportunities. The more prominent of these should be marked with appropriate signage.

Public and Private Infrastructure

Utilities

Several different agencies are responsible for utilities in the Region. Much of the sewer, water and gas easements follow the existing road networks in the region.

Utility easements offer opportunities for Greenway development. Easements include above and below ground utilities such as natural gas or electric. They offer wide (8-30') swaths of linear open space and are typically located on gentle grades and often in floodplains. Manholes and similar structures create obstacles at some locations but generally can be avoided by adjusting the alignment of the trail within the easement. The use of easements could create a benefit to the municipality responsible for maintenance by providing a vehicle service access route. Maintenance of the trail clear zones through mowing and debris removal can accomplish the same goals required for the maintenance of the easement.

Community Impact

Community Impact: Possibilities in Health, Education, and Economic Well-being

Discussed below are the expected effects of the Brushy Blue Greenway upon two general levels of community:

- 1) The Cities and County
- 2) Landowners and neighborhoods directly affected.

Expected Effects upon the Cities of Buena Vista, Lexington and Rockbridge County

1). **Monetary support:** Planning and organizational costs for the Brushy Blue Greenway have so far been secured from public and funding sources and grants—an approach that will continue to be maintained after the Greenway is operating.

2). **Recreation:** The experience of other communities shows that greenways are used by a broad spectrum of the public. The Brushy Blue Greenway will freely serve all the community.

3). **Environment:** The Brushy Blue Greenway will be good for both watershed (erosion and flood control, bank stabilization) and wildlife (creating and safeguarding habitat and improved opportunities for observing wildlife). By promoting alternative transportation and thus reducing the number of cars in use, and concurrently by encouraging planting of trees, the Brushy Blue Greenway will also improve air quality.

4) **Revenue:** Greenways have been shown to improve property values of adjacent lands and stimulate tourism and are frequently cited as promoting local economies. Additionally, the Brushy Blue Greenway will improve access to existing businesses and cultural sites, improve the regions overall image, and encourage the proliferation of “niche” businesses in downtown areas and along the corridor.

A large population of retirees are increasingly looking for places to travel and recreate. Birding trails and historic theme related trails have become increasingly popular in recent years. An increased interest in local history, flora and fauna has created a market for related amenities and attractions. Communities that provide such

amenities and market them to visitors will find increased visitorship and revenues. The cost of trail development can provide larger return benefits, such as increased sales revenue and property values.

An economic development study of the Miami Scenic Trail in Warren County Ohio (1999) showed that trail users spend an average of \$13.54 per person per visit. This money was spent on items such as food, lodging and retail items and generated more than \$2 million per year for local communities along the trail.

Discussions with business people and community residents will help to foster an understanding of how the Brushy Blue Greenway might benefit the local economy. Greenways enhance the local economy through:

5) **Education:** The Brushy Blue Greenway will serve as a living classroom for area schools, colleges and universities, and provide an example of community development.

6) **Civic Pride:** Through service and recreation opportunities, the Brushy Blue Greenway will bring people together, encouraging community building and melding of cultures and generations. The Greenway offers the opportunities for City/County cooperation and continued collaboration with private property owners.

7) **Legal Liability:** If the Brushy Blue Greenway is added to existing park properties, little change to liability coverage will be required, and it may provide statutory protections for which property owners are not currently eligible. Specific legal liability will be determined as each section of trail is developed with detail plans.

8) **Transportation:** The Brushy Blue Greenway will provide pedestrian and bike routes free from vehicular traffic. The Brushy Blue Greenway connects transportation modes that enhance the regions long-term transportation goals.

9) **Public Health:** The benefits of regular, moderate-intensity exercise are well documented, and the Brushy Blue Greenway's multi-use trail will provide excellent and free opportunities for exercise. When people exercise, they are more productive and generally enjoy greater overall physical and mental health.

Expected Effects Upon Directly Affected Landowners and Neighborhoods

1) Increased Property Values: Data from other greenways indicates that landowners' property values typically increase. Brushy Blue Greenway will be a marketable amenity for realtors, developers, and economic development personnel (attracting new businesses).

2) No Tax Liability: Depending on the portion of their properties allocated as greenway easement or transferred as fee simple property, landowners could receive tax benefits.

3) No Reduction in Privacy: Landowner privacy can be addressed in the detailed planning process. Experience from other greenways indicates when greenways are cooperatively planned with landowners, privacy can be maintained.

4) Liability: There are legal mechanisms that can limit and indemnify liability of landowners when they grant easements for recreational uses to municipalities. Maintenance and liability concerns can reside with the holder of the easement.

5) Transportation and Accessibility: Children and residents within neighborhoods adjacent to Brushy Blue Greenway will have direct access to biking and walking without vehicular conflicts. Landowners will have direct access to the Brushy Blue Greenway.

6) Accessibility to Land: With proper planning, the Brushy Blue Greenway should not create an obstruction for landowners accessing their property for agricultural, maintenance and other routine needs.

7) No Cost to Landowners: Because the Brushy Blue Greenway will be financed through a combination of public and private funds, there will be no cost to landowners.

8) Building Families and Neighborhoods: The Brushy Blue Greenway will provide highly accessible facilities and opportunities for people to gather and recreate together—an essential ingredient for maintaining strong ties in families and neighborhoods.

Design Guidelines

Introduction

When making recommendations for the design and implementation of a greenway trail, it is important to first understand purpose of the trail and the projected users. Meeting discussion determined that the users for Brushy Blue Greenway will include a wide range of individuals (see user needs and assessment). The trail will accommodate pedestrians and bicyclists and will be considered a non-motorized, “multi-use” trail. This multi-use trail will serve as a recreational outlet for the community. The trail will provide access to and will enhance community amenities such as historical sites, residential areas, and parks. It is important to note that this system will be more than a connection between places. It will serve as a linear park and center of community activity. The trail will serve a broad cross-section of the community. The trail must be designed to provide a pleasing and safe experience for all users.

Multi-use trails accommodate a variety of users and are designed to satisfy a broad range of requirements. The trail must be wide enough to accommodate two-way traffic and several pedestrians across its width. The trail will be designed with appropriate curves and with proper slopes and clear zones.

The following guidelines are based on design standards established by the Federal Government and other organizations. The following references should be used when designing a multi-use trail:

- The American Association of State Highway and Transportation Officials (AASHTO), provides specific guidelines for the design of bicycle trails.
- The Manual on Uniform Traffic Control Devices (MUTCD) provides guidelines for signage and pavement markings.
- Americans with Disability Act (ADA) provides guidelines for accessibility.
- Local and State codes and ordinances.
- Trails for the 21st Century, published by the Rails to Trails Conservancy, provides general guidelines for the planning and implementation of multi-use trails.

Trail Types



Trail next to a rural road

The Brushy Blue Greenway will be of two distinct location types. The first being a solely off-street trail in open areas not within road right-of-ways. The second will be a trail located within the road right-of-way and alongside the road. Although the latter option is not located within the right-of-way, usually the trail is separated from the road by a physical barrier. It is also important to note that bicyclists using the trails system should not be directed to or placed onto street lanes. Corridors shown in the plans along roads should always be developed with separation from the road and high-traffic volume situations should be separated with a barrier.

Accessibility

Design of trails must consider use by people with varied physical abilities. The Americans with Disabilities Act (ADA) became law in 1990. The Act requires employers, building owners, and municipalities to provide assessable facilities to disabled persons. The U.S. Forest Service has also developed a design guide for Accessible Outdoor Recreation. These guidelines and others establish criteria for minimum and maximum dimensions, slopes on paths and ramps, and for the design of other amenities. The following are criteria for longitudinal slopes along the centerline of a trail:

- People in wheel chairs: 0-5% preferred, 8% maximum (for distances under 30').
- Pedestrians: 0-5% preferred, there is no maximum slope.
- Bicyclists: 0-3% preferred, 8% maximum.
- Equestrians, 10% maximum.

The eastern and western sections of Brushy Blue Greenway may not be suitable as accessible trails due to the steep topography. For the remaining portions of this multi-use Greenway, it is recommended that trails be developed with slopes not exceeding 5%.

Alignment

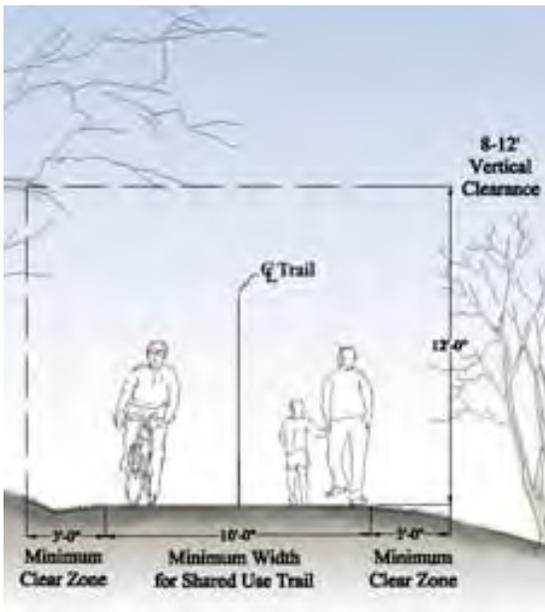
The AASHTO Guide for the Development of Bicycle Facilities sets standards for the vertical and horizontal alignment of bicycle facilities. This guide should be followed when developing a detailed alignment for the trail.

Horizontal Alignment

The design relationship of curves and tangents of the centerline of the trail as well as inside and outside radii of trail curves. The horizontal alignment will change in order to avoid problem situations, create interest, and to minimize construction costs.

Vertical Alignment

The relationship of slopes and transitions along the centerline of the trail. The vertical alignment will change in order to minimize construction costs, impacts, and accommodate changes in design speed. The AASHTO Guide establishes criteria for minimum vertical curve lengths required for changes in slope and design speed.



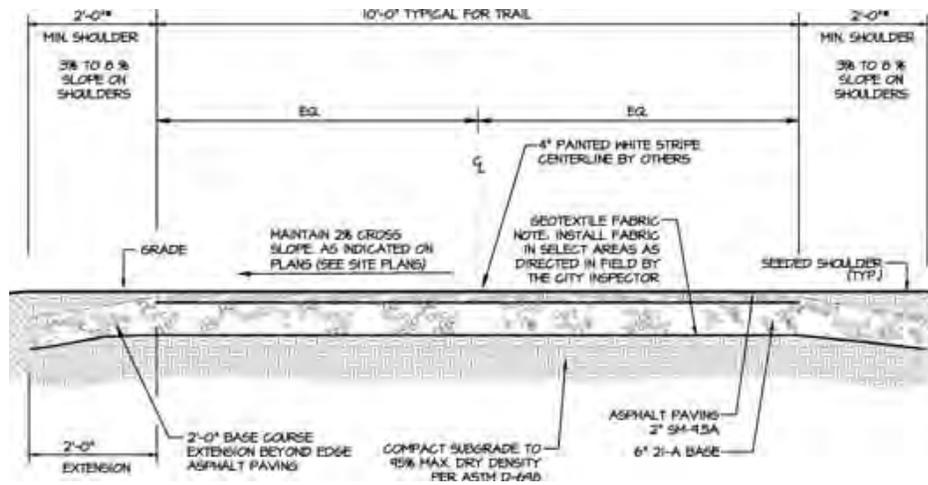
Typical multi-use trail

Trail Dimensions

The width of the trail for horizontal and vertical clearance. Trail width varies depending on the type of user or users. A single use trail for pedestrians may be only 5' or 8' wide. A trail designed for bicycles only may be 5' or 10' wide depending on one-way or two-way traffic. It is recommended that trails be a minimum of 10' wide where two-way traffic is expected and where multiuse is expected. A 12' width is preferred as a more accommodating alternative. A 14' width is preferred where use is expected to be of high volume. Clear zones are required along the trail for safety purposes. A clear zone ensures that people will have enough room to move out of the way or off the trail if they need to without colliding with a fixed object or structure. Vertical clearance is also required for safety purposes. In most cases this will require the limbing of trees and ensuring that overhead wires and underpasses are at the appropriate heights. The AASHTO Guide for the Development of Bicycle Facilities recommends standards for widths and clear zones for multiuse facilities.

Materials

Many materials are available for the construction of trails. These include concrete, asphalt and aggregates, such as crushed gravel or cinders placed over a compact sub-base. Equestrian trails are often soft materials such as earth, grass, loose gravel or mulch. Each material has its own appropriate use depending on the application.



Typical trail section.

Sub-Base

The sub-base is composed of large aggregates placed over compact fill or undisturbed earth. Sub-bases are designed to provide support for the trail and will vary in materials and thickness per soil conditions.

Surface

Aggregates

Aggregates consist of crushed gravel, cinders or gravel fines spread over a compacted base material. This application is generally the least expensive to install and can have a natural appearance. However, aggregates wear easily, are prone to washouts and weeds, and are not suitable for skaters. The top surface will need to be repaired and replaced more frequently than asphalt or concrete surfaces.

Asphalt

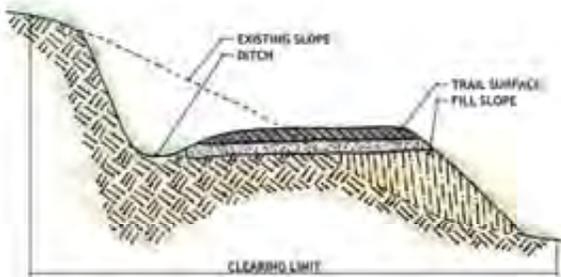
Asphalt consists of small aggregates mixed with tar that is placed and rolled over a compacted sub-base. This application is generally moderate in installation and maintenance cost. Asphalt is relatively easy to install and can provide a smooth continuous surface. However, asphalt is prone to heaving, root damage, surfaces can be hot, can soften, and can be prone to flood damage. Asphalt should be

protected in floodway areas where higher velocities of flow are expected.

Concrete

Concrete consists of a reinforced slab formed and poured over a compact sub-base. Concrete is the most expensive surface to install and replace. Maintenance costs are generally low and the life of this surface is higher than asphalt or aggregates. This material can also be used in a variety of situations with variations in color, scoring and pattern. Concrete is the most durable surface in floodway areas where high velocities of flow are expected. Concrete is non resilient, requires properly placed control joints and can crack and heave at joints.

Grading



Section, balanced cut and fill

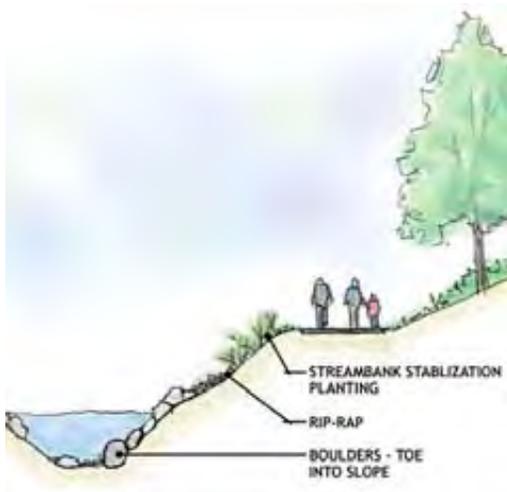
The construction of a trail requires moving of earth. This is achieved by both cut and fill. Standard engineering practices for earthwork and erosion control need to be followed to ensure that proper drainage, slopes, stabilization and erosion control is provided for the trail. The following items should be considered when preparing grading plans for trails:

- Cut and fill should be balanced along individual segments of the trail to avoid costly charges associated with hauling soil away or bringing soil to the site.
- Soil conditions should be considered. Specifically the soil's ability to bear the proposed facility. This will affect the design of the sub-base and surface in situations such as wet areas.
- Surface drainage must be carefully considered so that water always drains off the trail and so existing drainage patterns are not impacted.
- Impacts on existing vegetation should be limited by keeping grading out of the drip line of trees where possible.
- Erosion and sediment control measures should be implemented per local and state standards.
- The path of least resistance should be selected where possible to reduce overall earthwork volumes.
- The Virginia Department of Transportation and the Virginia Erosion and Sediment Control Manual provide specific methods and guidelines for grading and erosion and sediment control.



Use of retaining wall to avoid fill in creek

Stabilization



Stabilization of a streambank

There are several locations where the trail will be close to Woods Creek, the Maury River and Indian Gap Run. In some of these locations the embankments have deteriorated due to erosion. This creates an opportunity to stabilize embankments in conjunction with the construction of the trail. Bank stabilization consists of “armoring” the embankment. When the trail is close to the creek, it may become necessary to use an armoring structure to protect the edge of the trail. It is desirable to use low-tech or natural materials where possible in order to help naturalize the stream bank. The following methods are appropriate for Brushy Blue Greenway:

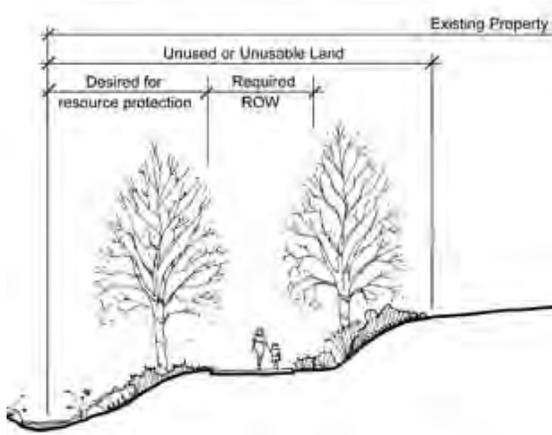
- Use of large boulders to protect the toe of the embankment.
- Use of fibrous, deep-rooted plantings to re-vegetate exposed soil embankments.
- Benching of the embankment in conjunction with armoring and plantings.
- Use of large riprap or gabion rock structures to armor the embankment in conjunction with toe protection and plantings.
- Use of erosion control fabrics to retain soil on embankments.

Environmental Resource Protection

Environmental resources along the Brushy Blue Greenway corridor include habitat for flora and fauna such as meadows, woods, wetlands, marshlands, and the riparian environment. These areas are often located within the flood plains and floodways of creeks and rivers. The quality of habitats depends on the overall health of the ecosystem and the types of species it supports. The quality of the habitat provides a gauge for how sensitively development of trails should proceed. An environmental inventory should be performed for each corridor section before final design plans begin (see the environmental section of this report). The floodplain is also an environmental resource in that it can absorb volumes of water created by storm events thus reducing flooding in downstream areas. It will be desirable to maintain the maximum distance possible between environmental resources such as creeks and streams and the trail. This is so that proper biological buffers can be established and so people are not encouraged to walk in areas where they can cause

damage such as erosion of embankments. In many cases the flood plain will be the only available land to develop a trail. In these cases, care should be taken to minimize impacts and to avoid constructing in portions of the flood plain where the water will be at higher velocities. The following guidelines should be followed when designing the trail:

- Avoid areas known to contain endangered plant and animal species.
- Avoid high sensitivity habitats such as wetlands, marshlands, riparian thickets, woodlands and riverbanks.
- Avoid development of trail directly adjacent to banks of rivers and streams.
- Avoid development of trail infrastructure within the floodway.
- Avoid large quantities of fill material in flood plains and floodways.
- Create opportunities for habitat restoration and creation where degraded habitats or no habitats exist.
- Create biological buffer zones between resources and the trail construction. Buffer zones should increase in depth as the sensitivity of the resources increases.
- Provide the maximum distance possible, given easement and space restraints, between streams, rivers and the trail.



Trail Infrastructure



Pedestrian bridge with bollard and rub-rail

Bridges

Pedestrian bridges are needed on trail projects where interruption or fill of drainage channels, streams or rivers is not possible, or conflicts with major roads exist. Pedestrian bridges provide uninterrupted travel along a trail corridor while providing viewing opportunities of natural and cultural resources. They also provide an opportunity to avoid impacts to environmental resources. In several locations along Woods Creek Trail and Chessie Trail, existing bridges are effectively serving a role as pedestrian only bridges. To provide a multi use trail, upgrades, repairs and replacements will be necessary. Information to consider when designing and placing greenway trail bridges:

- Locate bridges perpendicular to features to cross and at the shortest location position to reduce span lengths.
- Locate bridges above the one hundred year floodplain where possible. If placed below the 100-year flood plain and within the floodway, a flood study must be performed.
- When crossing wetlands or state waters, provide all applicable permits with the Department of Environmental Quality, the Virginia Marine Resources Commission, the Department of Game and Inland Fisheries, the Army Corps of Engineers and local government.
- Provide loading for maintenance vehicles where applicable.
- Provide vehicle access control with bollards or other non-restrictive measures.
- Provide appropriate rail heights for bicyclists and pedestrians.
- Provide appropriate rail spacing meeting safety codes. Typically spacing must not exceed 4".
- Provide "rub rails" at handle bar height for bicyclists.
- Provide approach railings for bridges to protect users from steep approach grades.



Trail over a culvert crossing



Woods Creek stone bridge underpass will have to be upgraded for Greenway



A trail developed under a highway overpass

Culverts

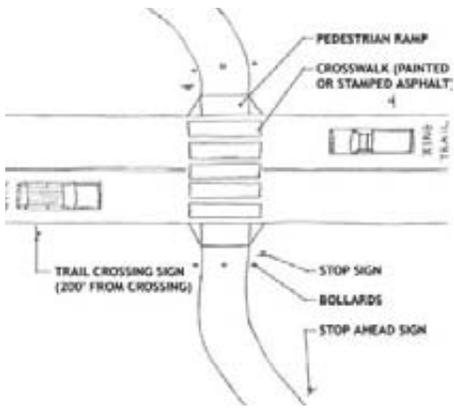
Drainage swales and small creeks can be crossed using a culvert crossing. In the case of Chessie Trail, many existing culverts can be utilized for the Greenway. Culverts consist of a concrete or metal pipe with fill material placed and compacted on top in order to bridge the drainage area. Culverts often have end sections to allow the control of erosion around the end of the culvert. The following items should be considered when designing a culvert crossing:

- Drainage calculations will be required to determine flow volume, velocity and appropriate pipe size and materials.
- Minimize disturbance to natural drainage systems with valuable habitat.
- Drainage channels with high volumes and velocities should be avoided.
- Provide the proper scour protection and outfall protection.
- Provide appropriate cover for pipes.
- Provide pedestrian railings where fill slopes are steep or difference in elevation is greater than 24”.

Underpasses

Fill embankments of roads and railroads and existing bridges can create barriers in many instances along a trail corridor. It is desirable to pass under these in most cases so that at grade crossings of busy streets can be avoided. This also provides uninterrupted use of the trail. Existing bridge underpasses and box culverts can be used for this purpose but typically require significant and expensive retrofits. In some cases it may be appropriate to “tunnel” through an existing fill bank using a box culvert type structure. This is expensive and should only be examined when other alternatives are not feasible. The following items should be considered when designing an underpass:

- Provide the proper vertical clearance; 9’ is recommended for pedestrians; 10’ is required for maintenance vehicles.
- Provide adequate width considering for proposed use. The trail should not be narrowed unless absolutely necessary.
- Provide adequate lighting in longer spans where natural lighting is not effective.
- Provide a shelf and railing above mean high water under bridges and in existing box culverts.

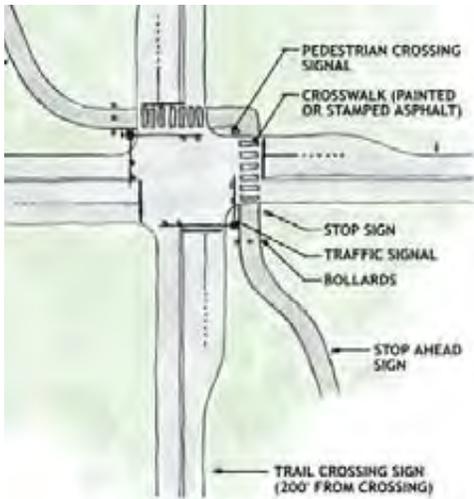


Typical mid block road crossing

- Consult a qualified engineer to determine if the proposed retrofits will create a problem with flow capacity and characteristics of existing structures.
- Consult a qualified engineer to design any new tunnels.

At Grade Crossings

At grade crossings are required when a trail crosses an existing street. This creates an interruption in the continuity of the trail and creates a conflict point between trail users and vehicles. It is important to provide the appropriate safety measures and to create awareness of drivers to trail users. It is also important to determine which user has the right-of-way. The following items must be considered when developing an at grade crossing:



Typical urban intersection crossing

- The trail should intersect perpendicular to the roadway.
- The trail should be separated from the road until they meet.
- Provide the proper sight distances for vehicles and trail users and appropriate stopping distances are provided. Consult the AASHTO Guide for Development of Bicycle Facilities.
- Consider retrofitting existing low volume bridges or building grade separated overpasses on bridges where high traffic volumes and multiple lanes must be crossed.
- Always utilize existing intersections where possible. Signaled intersections are preferred at high volume intersections .
- Provide the appropriate signalization, signage and pavement markings. Consult the Manual for Uniform Traffic Control Devices (MUTCD).
- Provide bollards to restrict vehicle access.
- Do not allow “right on red” turns at crossings.
- Provide appropriate handicapped ramps and features per ADA.



Trail Crossing of Road and Rail

Signage



Trail entrance with regulatory sign and pavement markings

Signage is required in many forms and locations along a trail to appropriately instruct users of trail rules, provide information, provide direction, and warn of potential hazards. Sign categories include: Regulatory signs, Warning signs, Directional signs and Informational signs.

- Follow MUTCD standards for warning and regulatory signs where applicable.
- Locate signs outside of safety clear zones of trails.
- Install signs at the proper heights; 5' is usually desired.
- Provide appropriate “universal” colors for signs.

Orange	Construction
Black/white	Regulatory
Yellow/green	Vehicle crossing
Brown	Recreational information
Blue	Service information

- Use durable, vandal resistant materials that are easy to maintain and replace.

Site Furniture

Site furniture is usually installed at trail rest stops, neighborhood access areas, trailheads, and pocket parks. Types of furnishings include: benches, trash receptacles, bike racks, fountains, bollards, picnic shelters, picnic tables, lights, fitness and play equipment and restroom facilities.

- Provide low maintenance vandal resistant furniture.
- Provide architectural consistency among different types of furniture in specific areas. For example, furniture at trailheads may be of a consistent style and quality while furnishings along the trail may be of a different style. Consider themes related to the culture and history for distinct areas along the trail.
- Provide simply constructed and designed furniture.
- Anchor all furniture to protect from theft and flooding.
- Develop design and construction specifications for site furniture that control appearance and quality when future implementation or donations occur.
- Locate furniture in accessible and visible areas.
- Provide shade for seating furniture.

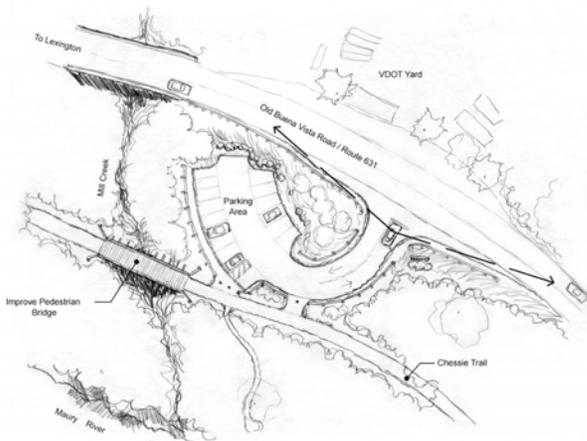
Trailheads and Pocket Parks

Trailheads are usually located at beginning and end points of trails or at intermediate access points. Intermediate points are usually located to serve a neighborhood population, attract trail users to other trail amenities such as historic sites, schools and parks. Trailheads are often located along state or city roads that provide safe vehicle access .

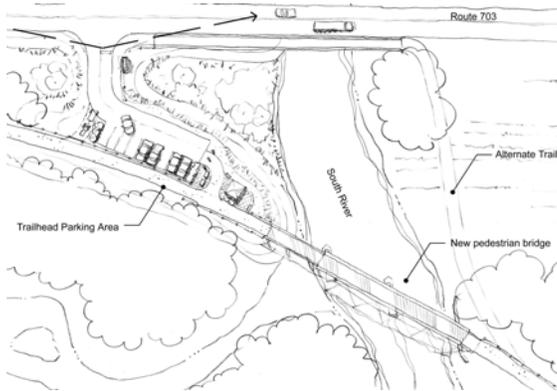
- Locate trailheads where vehicular and pedestrian access is convenient.
- Design and locate trailheads to maintain visibility and passive surveillance from roads and adjacent buildings.
- Create a simple and straightforward design easy for vehicles, pedestrians and bicyclists to navigate.
- Target trailhead locations in level areas to reduce construction costs.
- Develop trailheads in conjunction with other amenities such as pocket parks, regional parks or cultural centers.

Trailheads should include appropriate infrastructure and amenities designed to accommodate the level of use expected. This includes:

- Parking, typically 10-20 spaces with handicapped parking depending on level of use. For equestrian use horse trailer access, unloading and parking requirements must be considered.
- Directional and informational signage.
- Educational signage for cultural, historic and environmental resources.
- Play equipment.
- Bike racks.
- Benches.
- Picnic tables and shelters.
- Trash receptacles.
- Restroom facilities.
- Drinking fountains.
- Adequate site lighting with minimal spill-over.
- Emergency telephones.



Typical intermediate trailhead, at Old Buena Vista Road.



Typical intermediate trailhead, at the South River

Crime Prevention and Liability Management

Liability

There are inherent risks to operating a greenway and trail and to the users of the trail system. Liability often increase when the facility is poorly designed or improperly maintained. It is important to design a greenway trail with the health, safety and welfare of the public in mind. The following issues should be considered when developing a detailed design for a trail system:

- Consult with a qualified design professional who understand trail design standards and regulations.
- Follow nationally accepted design standards and regulation and follow local codes and ordinances.
- Develop a well concieved, staffed and funded maintenance program. The program should identify responsible organizations and specific tasks and schedules.
- Post clear and concise warnings and hazards and trail use regulations to eliminate misunderstandings.
- Restrict use of areas under construction or repair.
- Develop a security plan that provides structure for law enforcement. The plan should identify agencies providing staff, hours of service and emergency response times and procedures.
- Establish specific hours of use for the greenway.

Security

Greenway trails provide access for many types of users. Greenways trails can reduce crime by creating more activity and surveillance of forgotten or out of the way spaces. It is desirable to create attractive gathering places with the presenpce of security measures, often eliminating or reducing inappropriate activity. The following items should be considered when developing a trail:

- Develop a security plan that provides structure for law enforcement. The plan should identify agencies providing staff, hours of service and emergency response procedures.
- Provide clear and concise trail regulation and penalty signs.
- Provide adequate lighting in high use areas anticipated to support night time activity. If night time activity is not supported, adequate signage and gates should be provided.
- Provide emergency call boxes in high activity areas.
- Provide multiple access points for response teams.
- Provide clear lines of sight to and from the trail and to areas adjacent to the trail.
- Follow guidelines established for reducing crime in designed spaces. The national program Crime Prevention Through Environmental Design (CPTED) offers training and design guidelines in this area. Contact the Virginia Crime Prevention

Association for more information. In some instances it will be desirable to use designers who have CPTED training.

- Increase user-ship by encouraging use during all days of the week.

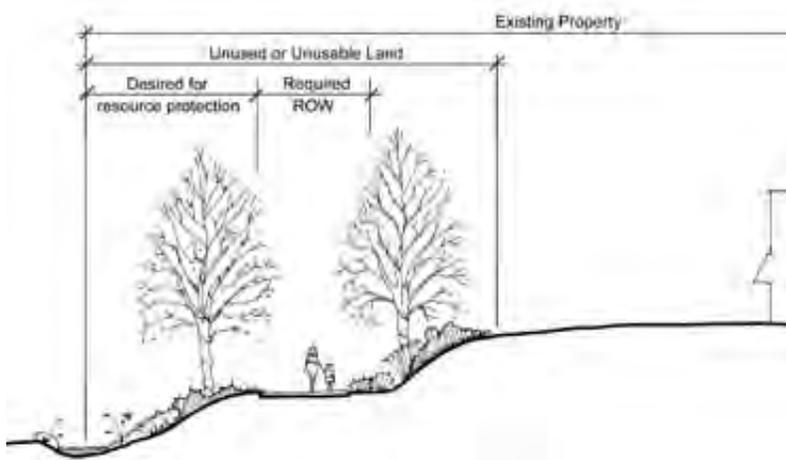
Trail Right-of-way Acquisition and Negotiation

Trail Right-of-Way

Trail right-of-way (ROW) can be considered two uses; the right to pass over someone's land and the path or area on which such passage is made. Greenway right-of-way is a linear strip of ranging from 15 to 30 feet in width to provide an area for the creation of a path, trail, drainage way, structure, fencing and buffer. In most cases the right-of-way corridor can be confined to an edge of a property. In situations such as agricultural and pasture land along Chessie Trail, the trail right of way often bisects a parcel, requiring unique corporation between trail users and the property owner. This sketch illustrates a trail right-of-way corridor on a typical land use. The sketch shows that in many cases the trail will be located within portions of undeveloped or unusable land. Space can be provided between the trail and a natural resource area, such as wooded area or creek. This situation however limits maintenance access. It is

recommended that the trail right-of-way include the resource area so that maximum environmental buffers can be established and conflicts can be minimized.

In areas of transition, intersections, or at the beginning of a trail, it is often desirable to obtain larger portions of right-of-way. In these conditions, the entirety of a property may be considered for right-of-way acquisition. The following section explains that right-of-way can be attained through a number of methods.



Acquisition of Trail Right-of-Way

Trail right-of-way acquisition is the process through which trail developers can negotiate legal access to private properties desired for trail development. Before property acquisition is made, impacted properties must be identified. For the Brushy Blue Greenway Master

Plan, property owners were identified along the full length of the corridor. Further research can be performed to identify conditions of deeds or easements that may be attached to ownership properties. Additionally, it is recommended that greenway trail developers obtain assistance from an attorney experienced with right-of-way acquisition and knowledgeable of local real estate law, considering there are many methods of trail right-of-way acquisition.

In order to boost public support and clarify the intentions of the Brushy Blue Greenway, and to potentially ease the trail right-of-way process, public meetings were held to introduce the Greenway. Along with public announcements through newspaper, radio and the web, it is ideal to personally invite each of the effected landowners to the community meetings. For Brushy Blue Greenway, all Rockbridge County landowners did receive invitation. As the Greenway planning process continues, it will be important to meet with each individual landowner. According to state law, a greenway cannot cross private property without the consent of the landowner. Considering that greenway projects are truly community projects, separate from roads, industrial and commercial development and utility construction, it is important to keep the lines of communication open. The time should be take to discuss and explain to landowners the benefits of the greenway project. Landowners should be made aware of the likelihood of increased property values and the benefit of direct access to the greenway trails. Specific details should also be discussed and determined with landowners with pasture land and grazing cattle, to ensure their livelihoods are not negatively impacted. An advising attorney should also be on hand to discuss possible tax benefits for property owners and that their property would be assessed for its fair market value.

It may be useful to develop a phasing strategy for easement acquisition. In order to gain the confidence of the public, certain locations may be initially focused on for acquisition and trail implementation. Areas of intended high use, public visibility, and ease of property acquisition may be considered first. It is also useful to determine the method of acquisition that will best benefit the trail developer and the landowner. This may be in part determined by the existing land use, topography or quantity of land desired.

Methods of land acquisition vary from temporary easements to land purchases. There is a legal mechanism for property owners to limit and indemnify liability of landowners when they grant easements for recreational use. They could also potentially be covered under a greenway's insurance program. The following are methods of acquisition:

Donation of land is the most ideal scenario, and the landowner will receive an income tax credit for this charitable gift.

Land Dedication is often associated with the subdivision of property. The subdivider, or developer, dedicates certain portions of land for greenway use. Certain localities mandate this action in order to comply with zoning ordinances. This type of zoning ensures future green spaces and possible opportunities for trails.

Lease or License will convey almost all rights, control, and liability from the landowner to the trail developer. Ideally a lease will be enacted for a minimum of 99 years. Upon its termination, the lease may be renewed or the land may be purchased or donated. The owner is compensated for the terms of the lease.

Revocable Permits, Access or Use Agreements are similar to a lease, however, the landowner may revoke access if the terms of the agreement are not being met. Breach of terms may include improper trail maintenance, damage of property, unauthorized activities or vandalism. Termination may also occur due to land use changes or the sale of the land.

Easements may be donated, sold, or traded. This legally binding agreement grants right of public access, with the landowner maintaining the land. If this agreement is granted in perpetuity, the easement is attached to the title of the land if it is sold. Income tax incentives are sometimes provided to encourage such easements. Easements are ideal for properties that include a floodplain, or otherwise unusable land. The property owner can receive tax benefits from temporary and permanent easements from land that may have been providing no other value.

Often, utility corridors provide opportunities for greenway easements as throughways have already been created. Sometimes the utility companies lease the land they are using. These will need to be looked into on a case-by-case basis. Existing sewer easements provide the best opportunity because they are often located in gradually sloping areas and are wide enough for trail development.

Purchase of a Title is another means of land acquisition. A fee-simple purchase is the purchase of the land for its fair market value. A bargain sale is when the owner sells the property for less than full value in exchange for income tax credits. The purchase of a title can include the entire property or a portion of the property.

Rail Banking is a method to be used in areas where railroad lines are abandoned or soon to be abandoned. Rail banking is a process where rail corridors, bridges and trestles can be secured for use in the trail system. Generally the railroad will want compensation for this land, and it may be restored to rail use in the future.

Once the landowner has accepted the acquisition offer, transfer documents (titles, easements, etc.) are created in compliance with the format and procedures of the local courts. Papers are signed and filed with the court for recording in the deed books. The task is to acquire title, leases, easements and access agreements to parcels or portions of parcels for the greenway. The greenway boundaries can include only the property necessary for the trail, or additional property for to the overall character of the greenway or associated amenities.

In cases where the greenway follows a river or stream, it is recommended to acquire a permanent easement or acquire property from the edge of the trail to the water line. This protects and preserves land increasing the environmental quality of the greenway. It can often removes from a landowners responsibility property that is usually unusable for development.

Several steps will be required to acquire property for greenway use:

- Identify land parcels.
- Make offers of acquisition of right-of-way.
- Transfer the proper documentation.
- Record the proper documentation.

Greenway Master Plan

The following sections are comprised of specific recommendations for alignments, infrastructures and amenity development. General greenway and trail construction costs are examined as well including an outline for implementation. These recommendations are the direct result of the planning process involving workshops with the working group committee, field reconnaissance, design analysis, and public meetings and input (see planning process). The resulting recommendations and plans include locations for trail, trail types, trailheads, at grade crossings, bridges, underpasses, and other trail infrastructure. The recommendations shall serve as a tool for future detailed planning and construction of individual phases of the Brushy Blue Greenway.

Design Recommendations

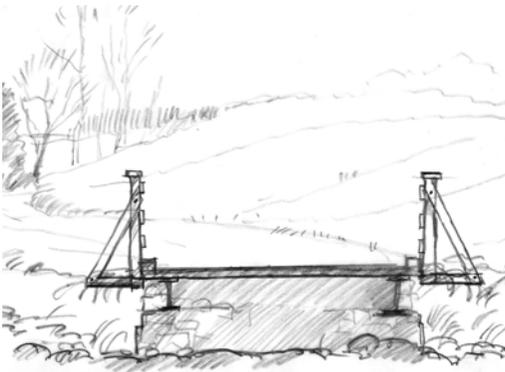
Section One – Proposed Greenway West

This section is a mixture of steep wooded upland, rolling agricultural land interspersed with residential properties. This section begins within Brushy Blue Preserve and ending at Waddell School property and the beginning of the existing Woods Creek Trail. This section falls within Rockbridge County and the City of Lexington.

- Provide a pedestrian only trail (5-6' max width) from the existing Brushy Hills Preserve Trails to the proposed hard surface multi use trail (10' min. width) along Enfield Road. Minimized excavation and removal of native trees and vegetation through the wooded areas. This trail will require negotiation for easements with private landowners.
- The issue of providing equestrian trail use was discussed in the existing conditions within this master plan and at both community meetings. There is the potential of providing equestrian access within the Brushy Hills Preserve. This would have to be discussed in more detail with the landowner and the municipalities. The final design could include equestrian use but

trail width and trail clearing would have to increase significantly over a pedestrian only trail.

- Provide a hard surface multi use trail (10' min. width) from the along Enfield Road. It is recommended the surface of the trail be asphalt or compacted aggregate. This trail will require negotiation for easements with a private landowner and also careful coordination to ensure active grazing operations and access points are not effected. It is intended that this section of trail could be coordinated with potential future improvements to Enfield road.
- Continue multi use trail through Kendal at Lexington. An eastern and western route are shown through Kendal. This trail will require negotiation for easements with a private landowner and also careful coordination to ensure the seniors community future phase is coordinated with the trail alignment. For the western route, provide as much separation as possible from the trail and the creek along the edge of Kendal.
- Upgrade the existing bridge over Woods Creek to support a multi use trail. See the LA Gates information.
- Provide a pedestrian on grade crossing at Rebel Ridge Road.
- Provide a multi use trail along Woods Creek into Waddell School property. An alternate route along Ross Road and preferred route along Woods Creek into Waddell School property is shown. This section of trail will require negotiation for easements with multiple residential properties and careful coordination to ensure their access and privacy concerns are respected. The preferred route is more cost effective relative to trail construction although it would require the installation of a new multi use pedestrian bridge (10-14' width) over the small creek the flows into Woods Creek. A potential long term strategy for this section is to purchase the residential properties.



Improved bridge in Kendal at Lexington

Section Two – Woods Creek Trail

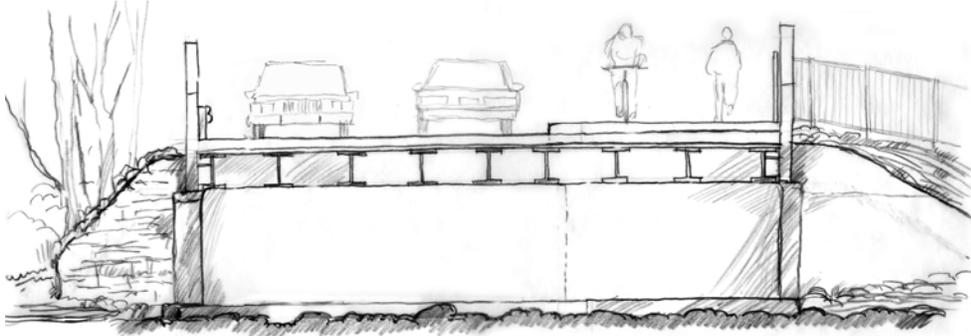
This section follows Woods Creek along the existing Woods Creek pedestrian trail from Waddell School to Jordan’s Point on the Maury River within the City of Lexington.

- For the alternate route that connects to Waddell School via Ross Road, upgrade the existing pedestrian bridge to accommodate multi use (10-14' width) over the small tributary of Woods Creek.
- Upgrade Woods Creek Trail throughout this section to a multi use trail (10' min. width). It is recommended the surface be



asphalt with potentially concrete in very high use and flood prone areas.

- Improve the on grade pedestrian crossing at Jordan Street.
- The preferred trail route is provide a low water creek crossing over Woods Creek upstream from Lime Kiln Road, similar to the upgraded low water crossing below Lime Kiln Road. Following the low water crossing provide an on grade crossing at Lime Kiln Road.
- An alternate is to modify the existing vehicular bridge for Lime Kiln Road at Woods Creek to accommodate a multi use trail and then provide an on grade crossing at Lime Kiln Road. See the LA Gates information.
- From Lime Kiln Road to West Nelson Street/Route 60, continue to modify Woods Creek Trail to a multi use trail,. A steep area is encountered as you approach West Nelson Street. This will require grading and potentially protection of the bank of Woods

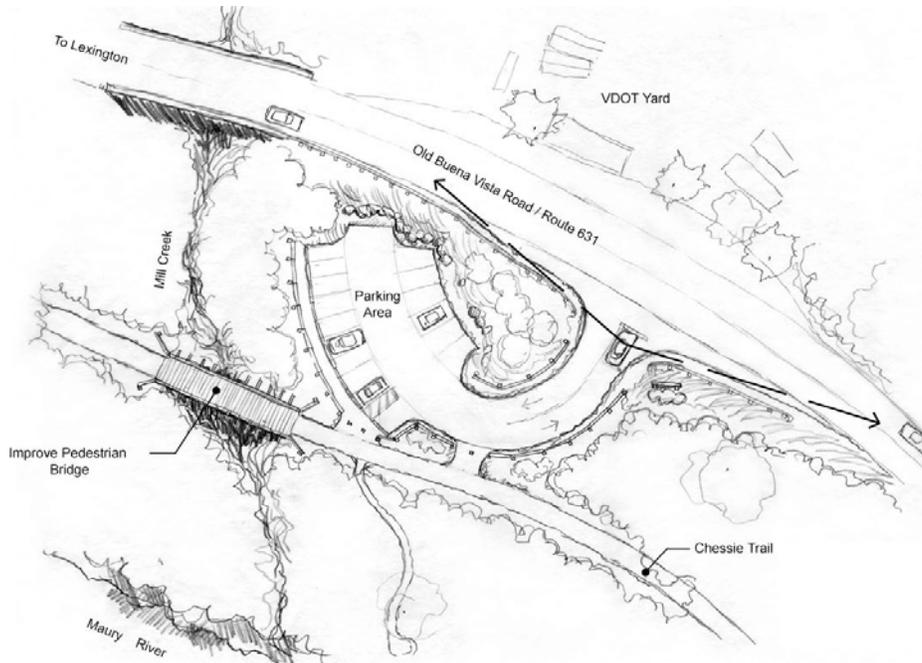


Trail alternate over Lime Kiln Road

Creek. This section of trail may require negotiation for a minor easements with two residential landowners, due to realignment of Woods Creek Trail for multi use.

- Improve the existing Woods Creek Trail low water crossing for multi use. See the LA Gates information.
- Continue under the West Nelson Street/Route 60 Bridge.
- Improve the second existing Woods Creek Trail low water crossing for multi use. Similar to the upstream crossing identified in the LA Gates information.
- Improve the existing Woods Creek Trail as it passes under stone bridge within Washington & Lee University. LA Gates has identified two options for improving this underpass. One option is to fully culvert the creek and the second is to partially fill the creek, similar to current conditions.
- Improve the on grade pedestrian crossing at the access road within Washington & Lee University.
- Improved the existing Woods Creek Trail as you ascend the slope up to East Denny Circle, within Washington & Lee University.
- Provide an improved connection to East Denny Circle.

- Within the North Post area of VMI, improve the on grade pedestrian crossing at the access road.
- There are long term planning goals within VMI for the North Post area. The future location of Woods Creek Trail through VMI will have to be coordinated with the North Post Master Plan and approved by VMI.
- At Jordan’s Point Park, a preferred trail is depicted connecting to the future low water multi-use pedestrian bridge over the Maury



Trailhead, Old Buena Vista Road.



Typical gate- self closing with walk-around

River. If the future bridge is not constructed, an alternate route is shown using the existing Route 11 bridge over the Maury River.

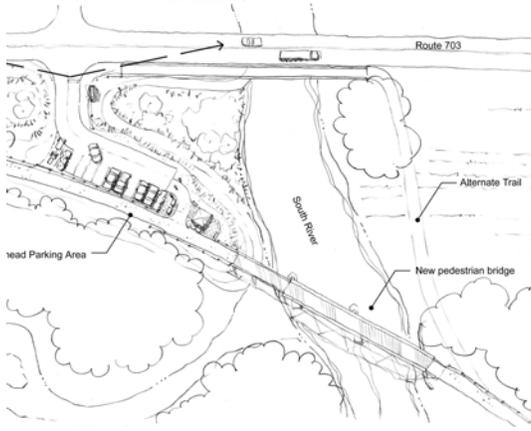
- For the preferred route through Jordan’s Point Park, improve the existing vehicular bridge over the millrace to accommodate a multi use trail . See the LA Gates information.
- For the alternate route through Jordan’s Point Park, provide a new multi use trail and multi use bridge over Woods Creek and connect to the existing sidewalk system for the Route 11 Bridge. The Route 11 bridge width allows the opportunity to modify the road striping and potential add a guardrail separation between the vehicle lanes and the trail crossing over the bridge. Lane modifications on the Route 11 bridge would have to be coordinated and approved by VDOT. The alternate route would connect to Chessie Trail on the north side of the Maury River via a new multi use trail connection. There is also the potential of a small trailhead area to be provided along Old Buena Vista Road north and west of Route 11. Cost for this alternate trailhead are not including in this Master Plan.

- All Brushy Blue Greenway improvements within Jordan's Point Park should be carefully coordinated with the Jordan's Point Park Master Plan and all future plans for the park, which include the final location of the new Maury River low water bridge, internal trail improvements, new parking areas and park support amenities.

Section Three – Chessie Nature Trail

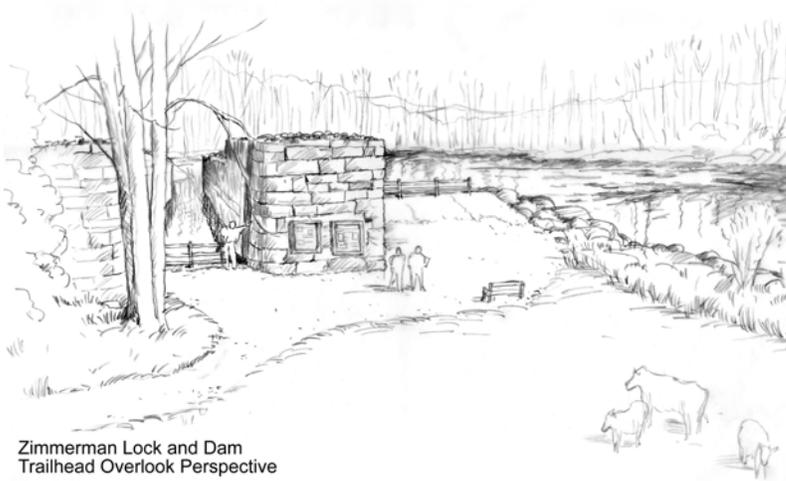
This section follows the existing Chessie Trail along the Maury River in Rockbridge County, from Jordan's Point in the City of Lexington, to the Route 60 bridge, near the City of Buena Vista. The Chessie Trail is located on an old railroad bed, providing a solid surface with a gentle slope.

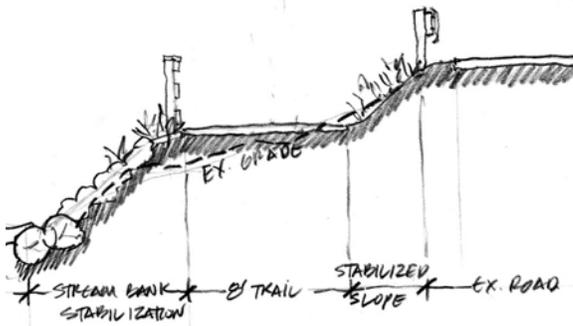
- The issue of providing equestrian trail use along the Chessie Trail was discussed in the existing conditions within this master plan and also was discussed at both community meetings. Due to limited size for access points that could potentially accommodate horse trailers, it is the recommendation of this master plan not to provide equestrian access for the Chessie Trail section of the Brushy Blue Greenway.
- Along the length of the existing Chessie Trail, improve the trail to accommodate a multi use Brushy Blue Greenway trail (10' min. width). The surface should be asphalt in the high traffic areas with the option of aggregate surface in the lower traffic areas. The improvements to Chessie Trail to multi use will require the VMI Foundation to renegotiate easements with a private landowners along its length. Careful coordination is also necessary for agricultural areas to ensure grazing operation concerns are addressed.
- Improve the separation from the industrial businesses along Old Buena Vista Road. Ensure that the riparian edge along Maury River is impacted as minimally as possible.
- Remove existing Chessie Trail bridge over small creek and install culvert. See LA Gates information.
- Improve existing Chessie Trail bridge over Mill Creek to meet multi use trail standards. See LA Gates Information.
- Provide a trailhead parking area at Mill Creek off of Old Buena Vista Road. The detailed entry design of this trailhead will have to be coordinated and approved by VDOT.
- Upgrade the existing gate to a new gate with a self closing system, including new signage.



Trailhead, at the South River, Route 703

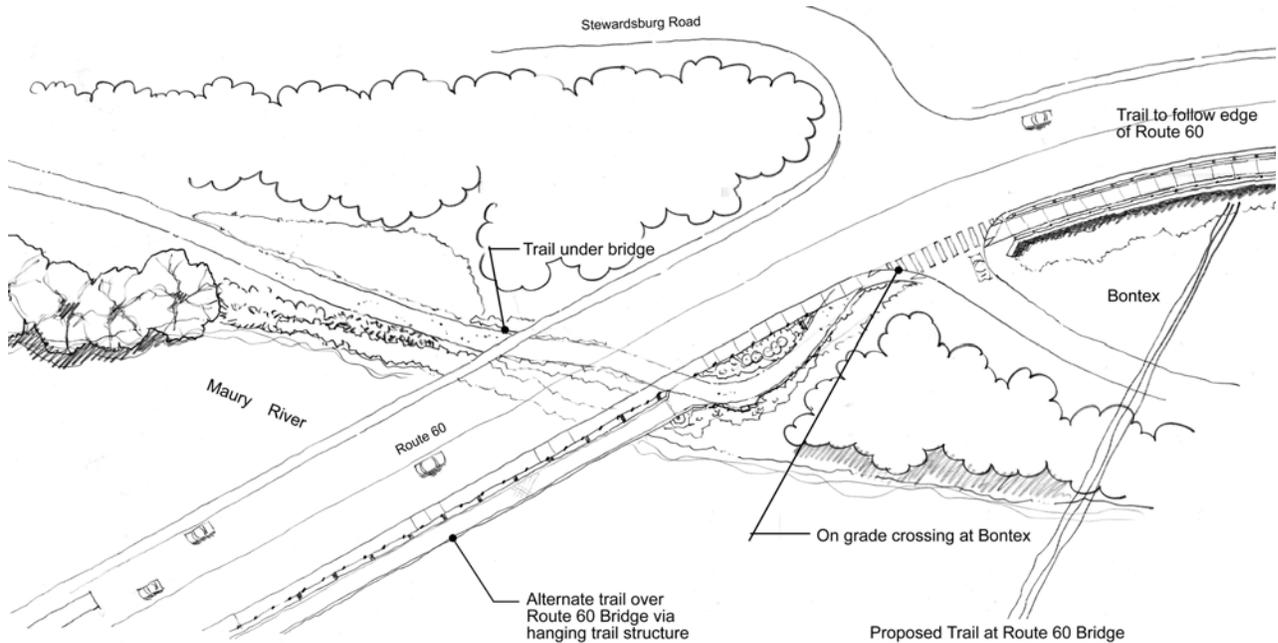
- Install safety signage at falling and loose rock area along trail. Fencing to catch falling rock and debris can be explored in the detailed design of this section.
- Provide a trail pull of area with interpretive signage at the Reid’s Lock and Dam area.
- At three additional locations, upgrade the existing gates to a new gate with an self closing system, including new signage.
- Provide a trailhead parking area on the north side of the South River, off of Route 703. The detailed entry design of this trailhead will have to be coordinated and approved by VDOT. It is also important to design the trailhead to accommodate access for landowners with agricultural operations in the vicinity.
- At the South River two trail options are shown, the preferred is providing a new multi use bridge over the South River. The alternate is modifying the existing Route 703 vehicular bridge over the South River to accommodate a multi use trail and connect to the trail on the south side of the South River.
- For the preferred route LA Gates had originally proposed reinstalling the existing railroad trestle bridge that has washed into the river from the past hurricane. Their revealed that the bridge was reusable. However the trestle bridge has been salvaged for scrap and is no longer on site. It will be necessary to negotiate temporary and permanent easements in the South River area for the a new bridge installation as well as the construction of a new trailhead parking area. A budget cost has been included in the report for a potential new bridge. See LA Gates information.
- For the alternate route over the Route 703 bridge, coordination and approval will be necessary by VDOT. Also the negotiation of easements will be necessary to connect to the trail on the north side of the South River.





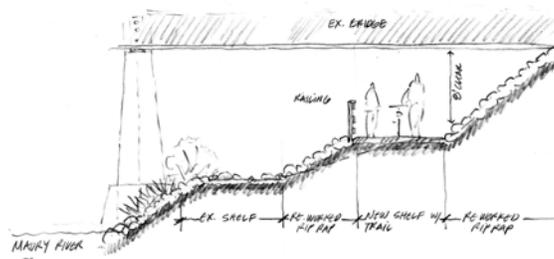
Trail along Stewardsburg Road

- A potential South River spur trail is shown. Cost is not included for a spur trail in this master plan.
- The installation of fencing may be necessary through the agricultural areas or at a minimum additional signage to address the issue of cattle open grazing along the multi use trail. Cost for fencing in the agricultural areas are not included in this master plan.
- Provide a trail pull of area with interpretive signage at the Zimmerman Lock and Dam area. Also provide river edge stabilization measures to protect to protect the lock and dam. An ACOE permit will be necessary in this location.
- Install safety signage at falling and loose rock area along trail. Fencing to catch falling rock and debris can be explored in the detailed design of this section. Cost for safety fencing are not included in this master plan.
- Provide adequate vehicle controls with a new self closing gate system as the trail approaches Stewardsburg Road.



Trail at Route 60 Bridge

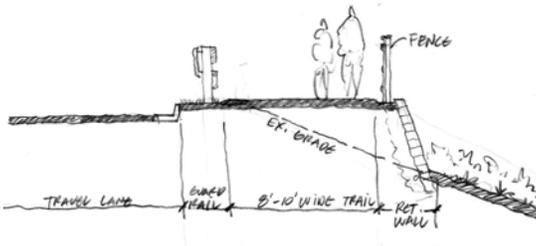
- Provide improvements to allow the trail to parallel Stewardsburg Road and the Maury River. An ACOE permit will be necessary in this location.
- Upgrade the existing parking area at the Route 60 bridge to serve as a minor trailhead and maintain the current small boat launch area.



Trail under Route 60 Bridge

Section Four – Proposed Greenway East A

This section begins at the Route 60 Bridge, generally following the Maury River in the City of Buena Vista, then turning through downtown and connecting to Laurel Park. This section of trail is a mixture of land uses and site conditions, including industrial, commercial, residential and openspace.



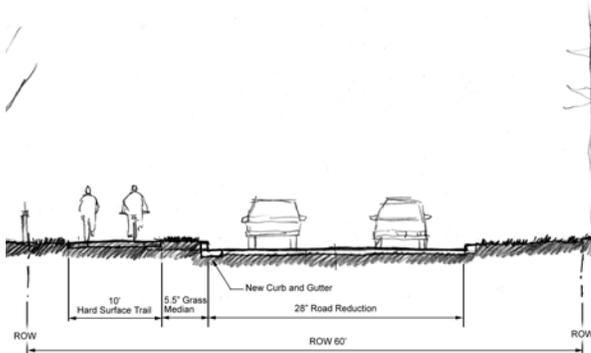
Trail along Route 60 near Bontex



- At the Route 60 bridge a future alternate connection was discussed connecting the greenway to Glen Maury Park. The alternate would provide a multi use trail over the Route 60 Bridge on the downstream side of the bridge and connect to Glen Maury Park via the new Vista Links golf course access road. This alternate will require detailed engineering for a multi use trail structure to be attached to the Route 60 Bridge. This would also require coordination and approval from VDOT as well as potential ACOE permits.
- For the preferred route, provide a new multi-use trail under the Route 60 bridge and provide an on grade crossing of the truck access for the Bontex property.
- Provide a multi use trail along the edge of Route 60 and the Bontex property. If detailed design requires this section to partially occur with the Route 60 ROW, coordination and approval from VDOT will be necessary. It will also require negotiation for easements with a the Bontex plant and careful coordination to ensure their activities as well as their security concerns are addressed.
- Provide an on grade pedestrian crossing at the main entry to the Bontex property.
- After the on grade crossing transition the multi use trail from edge of road, down the slope to parallel the railroad spur line for Bontex. Provide safety fencing between trail and railroad spur line.
- Provide an on grade pedestrian crossing at the last entry to the Bontex property.
- At the last Bontex property entrance, a preferred and alternate greenway trail route is shown.
- For the preferred trail route, continue to parallel the railroad spur line along Bontex on the north side of the tracks. Provide a new pedestrian multi-use bridge at Chalk Mine Run. Provide an on grade railroad crossing for the spur line and continue along the south side of the tracks to the improved trailhead parking area at 21st Street.
- For the alternate route, provide an on grade railroad crossing in the vicinity of the last Bontex property entrance, and parallel the spur line along Bontex on the south side of the tracks. Connect to and improve the existing levee walk trail. The improved levee

trail would connect to the improved trailhead parking area at 21st Street.

- The existing trailhead parking area at the west end of 21st Street will be improved to allow greater control of vehicular and pedestrian circulation. It will also serve as a gateway to the waterfront for the City of Buena Vista, with signage, planting, bollards, trashcans and other site amenities.
- The preferred route will continue directly east on 21st Street as a multi use trail with an on grade railroad crossing of the spur line and the main railroad line. This area will become a visual gateway for the waterfront area, with signage, planting, inlayed paving and other support amenities.
- From the on grade rail line crossings to Laurel Park, the preferred route will take on the character of a downtown streetscape improvement project as well as a multi use trail. Throughout this downtown area the trail will include neck downs and painted crossings, modifications of curblines to accommodate the 10' min. trail width, street tree planting, signage and other support amenities. The trail within the downtown core area is recommended to be concrete at a minimum. The opportunity also exist to use partial or complete inlayed pavers. As you move east on 21st Street the multi use trail could change to asphalt.



Trail section, 21st Street

- A longer alternate route, called the Indian Gap Run Trail option, within downtown Buena Vista, has been depicted as locating a multi use trail from the trailhead parking area at 21st Street, along the levee walk and east on Indian Gap Run to Laurel Park. This option would require improving the levee walk to multi use trail standards and creating new multi use trail along Indian Gap Run. The railroad lines would be crossed as an underpass parallel to Indian Gap Run.



- At Magnolia Avenue the Indian Gap Run trail option would turn north following the west side of Magnolia Avenue as a roadside multi use trail and crossing Magnolia Avenue at 17th Street and following the north side of 17th Street connecting back to Indian Gap Run. This diversion of the trail away from Indian Gap Run from Magnolia Avenue to 17th Street is due to extremely restrictive existing site conditions along the Run. From 17th Street the multi use trail would follow Indian Gap Run to Laurel Park. Neck downs and painted crosswalks with planting and signage are shown at seven different locations. It will also require negotiation for easements with several landowners and careful coordination to ensure their activities as well as their security concerns are addressed.
- The Indian Gap Run trail option also depicts the potential of modifying the channelized Run between 18th and 19th and returning the Run to a more natural condition. A pocket park

would be created along the trail with the benefit of habitat, water quality and visual character. Detailed design and flood studies will be required for the modification of the Run. Multiple street crossings with neck downs, painted crossing, planting and signage will be necessary at 18th Street, Maple Avenue, 19th Avenue and Cedar Avenue.



- Finally the Indian Gap Run trail option will cross the Run near Cedar Avenue with a new multi use pedestrian bridge. The greenway trail would then follow the south side of the Run and cross back over the Run with another multi use pedestrian bridge, at the entry to Laurel Park, connecting to the preferred trail route.
- At the entry to Laurel park the new multi use trail will follow the north side of Indian Gap Run and loop around the ballfields connecting to the park access road. Vehicle controls and signage will be necessary at this location and serve as a trail head for the final section of the Brushy Blue Greenway.
- The existing parking area within Laurel Park can serve as a trailhead parking area for the pedestrian only trail in eastern connector B section, and the multi use hard service trail within this section.
- Within this section spur connections are also depicted to Glen Maury Park. No cost for these spur connections are included in this master plan. Spur connections include three potential pedestrian bridge connections to Glen Maury Park; a single span, low water, pedestrian bridge, a multiple span low water pedestrian bridge incorporated the island in the center of the river, and a pedestrian connection via the existing vehicular bridge into Glen Maury Park. A fourth spur is depicted on the overall map of a potential alternate connection to the Blue Ridge Parkway via providing a trail along an existing road.



Section Five – Proposed Greenway East B

This section is primarily steep wooded upland, a mixed hardwood forest typical for the Shenandoah Valley. This section begins at Laurel Park in the City of Buena Vista and continues through Rockbridge County, George Washington National Forest, connecting to the Blue Ridge Parkway.

- Provide a pedestrian only trail (5-6’ max width) from the trailhead area within Laurel Park at the end of the park access road, along Indian Gap Creek, to the existing overlook parking area within the Blue Ridge Parkway. Minimized excavation and

removal of native trees and vegetation through the wooded areas and maintain the riparian vegetation along the Run.

- Water bars will need to be installed in several locations along the trail to minimize erosion. Several small feeder creekers will require culverts or small pedestrian only bridges.
- There is the potential of providing equestrian access along the trail from the trailhead area at Laurel Park to the Blue Ridge Parkway. This issue would have to be discussed in more detail with the Park Service, the Forest Service and the municipalities. The final design of this section of trail could include equestrian use but the width and clearing involved would have to increase significantly over a pedestrian trail. The existing parking area within Laurel Park could also be modified to include a truck and trailer area and a horse staging area.

Priorities and Long Term Goals

Merits, Priorities and Potential Phasing

Brushy Blue Greenway Sections Merits

The Brushy Blue Greenway will ultimately provide connectivity between many of the region's resources. Each section of the corridor in the system is different to the degree that it provides this connectivity. Each corridor section is also different in terms of what types of resources are being connected. For example, some portions of the greenway system provide strong and well-defined connections between parks and schools. Others connect neighborhoods to parks or to schools. The types of connections will have a bearing on how important or necessary the community feels one corridor section is improved first over another section. This master plan document will serve to identify merits of each section and will attempt to reveal sections of the Greenway that may be considered priorities.

Section One – Proposed Greenway West

From Brushy Blue Preserve to the Waddell School property and the beginning of the existing Woods Creek Trail. Within Rockbridge County and the City of Lexington.

- This section will connect a natural area and agricultural area to the city and ultimately to a school.
- This section will require negotiations for multiple easements, particularly along Enfield Road and Ross Road..
- This section is split with a pedestrian only wooded portion and a multi-use portion.
- This section has limited number of vehicle conflicts and street crossings.

Section Two – Woods Creek Trail

The existing Woods Creek pedestrian trail, from Waddell School to Jordan’s Point on the Maury River, within the City of Lexington.

- This section will connect neighborhoods, schools, universities, and parks, a valuable urban trail.
- This section offers the opportunity to highlight historic resources for the region.
- This section has a moderate level of vehicle conflicts and street crossings.
- This section will require a limited number of easements considering most of Woods Creek Trail is publicly owned.
- This section requires work within the floodway and modifications to creek crossings.

Section Three – Chessie Nature Trail

This Chessie Trail along the Maury River in Rockbridge County, from Jordan’s Point in the City of Lexington, to the Route 60 bridge, near the City of Buena Vista.

- This section connects trail users to parks and to a river with scenic river status potential.
- This section has a limited number of vehicle conflicts and street crossings.
- This section offers the opportunity to highlight historic resources for the region.
- This section will require a reexamination of established trail easements along its length. Although this could be considered a large task, the positive is that landowners have a history with a trail system.
- This section will require careful negotiation with agricultural landowners, several having active grazing operations along the current trail.
- This section requires work within the floodway of a river and modifications to creek and river crossings.

Section Four – Proposed Greenway East A

From the Route 60 Bridge, generally following the Maury River in the City of Buena Vista, through downtown and connecting to Laurel Park.

- This section connects parks, neighborhoods, downtown businesses and waterfront areas.
- This section will require a limited number of easements considering most of this section is owned publicly or planned to be developed within city street right-of-way.
- This section includes many vehicle conflicts and crossings due to its urban nature.

Section Five – Proposed Greenway East B

From Laurel Park in the City of Buena Vista, through Rockbridge County, George Washington National Forest and connecting to the Blue Ridge Parkway.

- This section connects parks, National Forest and National Park Service land.
- This section has minimal vehicle conflicts (crossing of Blue Ridge Parkway to existing trailhead parking area) and street crossings due to its wooded nature.
- This section will not require typical easements considering it falls within publicly owned land, however, an agreement will be necessary with the Forest Service and Park Service.

Priorities and Phasing

It is important to develop a list of priorities and phasing strategies when considering the advantages and disadvantages of each greenway trail section. For example, is one greenway trail section recreational resources more important than a section that provides connectivity between resources? For the purpose of this master plan, priority recommendations were made using the qualities listed below. It is assumed that connectivity between community resources was of the highest importance. The corridors were ranked on the presence of these qualities:

- Connects schools to neighborhoods.
- Connects neighborhoods to parks.
- Connects schools to parks.
- Connects parks to other parks.
- Provides recreational and cultural resources in urban areas.
- Provides general community recreation.
- Is relatively free of obstacles to development.
- Has created interest and action in the community

General phases for the Greenway are based on order of importance. Specific construction phasing will be examined during future planning efforts. Construction phasing will be based on decisions made by each municipality, detailed corridor designs and construction cost estimates.

Demonstration Projects

Demonstration projects include constructing specific portions of a with the intent of demonstrating the benefit or effect of the complete project to the community. A demonstration project is also implemented to show immediate progress and results of previous planning efforts. Demonstration projects are not always selected based on how they fit into an overall phasing schedule. However, it is desirable to implement a demonstration project that can also relate to the first phase of trail development. Demonstration projects are often selected based on the level of visibility and the level of cooperation between interests. For example, a demonstration project involving the cooperation and support between advocacy groups, business owners, residents, and government is highly desirable because the effort demonstrates support and cooperation. Demonstration projects are often selected because interest and momentum are already established.

The following is a list of priorities or phasing strategies ranked from highest to lowest, based on the qualities listed above. Each section has strong merits and the community will need to decide which merits are most important. The list does not consider the actual constructability or cost of each segment:

- I. Section 2 -Woods Creek
Portion could be demonstration project
- II. Section 4 - East Connector A
(primary trail route, 21st St. trailhead to Laurel Park)
Portion could be demonstration project
- III. Section 3 – Chessie Trail
- IV. Section 4 – Eastern Connector A
(alternate Indian Gap Run trail route)
- V. Section 4 - East Connector A
(remaining section from Route 60 to 21st Street trailhead)

VI. Section 1 – Western Connector

VII. Section 5 – Eastern Connector B

Implementation

Planning and Implementation Process

Many accomplishments have been made in the planning for the Brushy Blue Greenway. The completion of the Brushy Blue Greenway Master Plan has set the stage for further planning and implementation efforts. The following steps must be taken in order to make the Greenway a reality:

1. Presentation and adoption of Brushy Blue Greenway Master Plan.
2. Establish entity in charge of planning and implementation of the greenway for each municipality.
3. Identification of specific Greenway phases.
4. Establish an ongoing program for fundraising.
5. Develop management and maintenance programs for the Greenway.
6. Identification of the demonstration project(s).
7. Preparation and submittal of Grant Applications for design and construction.
8. Prepare design, environmental, and bid documents for the demonstration project(s).
9. Construct the demonstration project(s).
10. Prepare design and construction plans for Phase I.
11. Negotiate easements, purchase property and record the proper documentation.
12. Construct Phase I.
13. Re-evaluate phasing and priorities.
14. Continue the development of each phase, re-evaluating the priorities issues at each milestone.

Funding Opportunities

The most frequently used funding sources for trail projects are the federal government, state government, local government, and the private sector. The following is a summary of several funding sources. Others may be available that are not outlined.

Federal Sources

- ❑ Transportation Enhancement Program (also known as TEA-21 Enhancement funds). To be eligible for this program the Brushy Blue Greenway must fall under one of the following categories:
 - Bicycle or pedestrian facility.
 - Scenic easement and scenic or historic sites/preservation.
 - Landscaping or other scenic beautification.
 - Preservation of abandoned railway corridor.
 - Environmental mitigation for wildlife protection.

Contact: VDOT at 1-800-444-7832. A 20% match is required to receive funding.

- ❑ Surface Transportation Program (also know as STP). To be eligible for this program the project must provide pedestrian and bicycle transportation. Ten percent (10%) of STP funds are available only for transportation enhancement activities.

Contact: National Transportation Enhancements Clearinghouse at 1-800-388-6832. The federal share is 80% (sometimes higher in states with large amounts of federal land).

- ❑ Public Lands Highways Discretionary Program (also know as PLH). To be eligible for this program the project must be able to provide access to federal lands that are open to the public.

Contact: Federal Highway Administration at www.fhwa.dot.gov/discretionary. There is no local match required to obtain this funding.

- ❑ National Scenic Byways Program. To be eligible for this program the project must be related to designated scenic byways in one of the following ways:
 - Constructing a bicycle and pedestrian facility along a scenic byway.
 - Interpretive sites or information about the byway and overlooks along a scenic byway.
 - Protection of resources (scenic, historical, natural, etc.) adjacent to a scenic byway.

Contact: Federal Highway Administration at www.fhwa.dot.gov/discretionary or www.byways.org. Awards are made with a local match of 20% and are based on an annual competitive grant application process.

- ❑ Community Development Block Grant Program. To be eligible for this program the project must be located in a low or moderate-income area. The funds may be used for neighborhood revitalization, economic development, and improvements to community facilities.

Contact: The U.S. Department of Housing and Urban Development.

- ❑ Land and Water Conservation Fund (also known as LWCF). These funds are used to provide park and recreation facilities to communities throughout the U.S.

Contact: State Parks Department or Conservation Agency. Funds are distributed annually and a 50% match must come from the community.

- ❑ Transportation and Community and System Preservation Pilot Program (also known as TCSP). To be eligible for this program the project must meet the following criteria:
 - Make the transportation system more efficient.
 - Reduce transportation impacts on the environment.
 - Provide better access to jobs and services.

Contact: Federal Highway Administration at www.fhwa.dot.gov/tcsp. No local match needed for these funds.

- ❑ Recreational Trails Program. To be eligible for this program the trail or related facility must be open to the public. If the trail is on private land it is not eligible.

Contact: the Virginia Department of Conservation and Recreation at 804-786-3218. A local funding match of 20% is required.

State Sources

- ❑ Virginia Outdoors Fund. This program is for outdoor recreation land acquisition and development projects. Greenways and trails are eligible for funding through this program.

Contact: the Department of Conservation at 804-786-3218. A 50% match is required.

- ❑ Bike Ways.

Contact: the Virginia Department of Transportation. This program offers 100% funding.

- ❑ Urban and Community Forestry Assistance Grants. This program offers assistance for tree planting.

Contact: the Virginia Department of Forestry. This program requires a 100% match.

- ❑ Recreational Access Roads.

Contact: the Virginia Department of Transportation. This program offers 100% funding.

- ❑ Virginia Land Conservation Fund. This program is for land purchase assistance only.

Contact: the Virginia Department of Conservation and Recreation. This funding requires a 100% match.

- ❑ Virginia Recreational Trails Fund Program. This fund is for development.

Contact: the Virginia Department of Conservation and Recreation. This program requires a 100% match.

Local Sources

- ❑ Cities, towns, and counties can be used to meet the local match requirements for some grant programs. Local funds are good to use for taxes, impact fees, bond referenda, local capital improvements programs, development proffers, and railroad franchise agreements.

Private Sector Sources

Private sector contributions can help develop trails in the following ways:

- Land trusts.
- Local and national foundations.
- Local businesses.
- Service clubs.
- Individual sponsors.
- Volunteer work.

Long Term Responsibilities

Management and Maintenance

A successful project is effected by the agency chosen to manage the greenway and trail. There are advantages of having one agency managing the greenway and trail. With one agency the greenway and trail can be developed comprehensively with uniform design, such as having a uniform trail surface. The maintenance will be consistent and the regulations will be of a single set.

However, a group of agencies can communicate effectively to manage a successful greenway trail. This is often assisted by creating a management manual with regional greenway standards and guidelines.

Management Options

Local Agency Management. The following departments of cities and counties define this option:

- Parks department.
- Recreation department.
- Public works department.
- Board of supervisors.
- Clerk's office.

Nonprofit Agency Management. This option is usually chosen when a government entity cannot provide management. Because of the low budget and volunteer nature of this option, it is best used for partnering in the management process. Some examples of nonprofit agencies:

- Private foundations.
- Land trusts.
- Local citizen's organizations.
- Clubs

Private Sector Partnering. This option is defined by establishing a partnership between public and private sectors in a community. Examples:

- Local groups.
- Homeowners associations.
- Local companies.
- Trail user organizations.
- Community groups.
- Civic organizations.

Private Sector groups can provide major or minor maintenance tasks, such as:

- Community patrols
- Upkeep of plantings.
- Litter removal.
- Regular mowing and weed control.

General Management Goals for Brushy Blue Greenway

Maintenance Categories

Regular trail maintenance ensures the safety on the trail and extends the life of the trail. The following tasks will help ensure these issues are addressed:

- Signs in good condition.
- Clear and prominent pavement markings.
- Clear sight distances.
- Trim overgrown or dying vegetation to allow adequate clearances.
- Trail surface patches and repair.
- Remedy drainage problems. Clear culverts and catch basins after major storms.
- Manage icy and snowy trail surfaces.
- Sweep trail surface.
- Structure inspections.
- Keep lights clean and make necessary improvements.

Typical Maintenance Activity Schedule:

- Replace missing and damaged directional signs.
- Repaint worn pavement markings.
- Trim vegetation for clear sight distances.
- Patch poles and fill cracks in trail pavement.
- Clean drainage systems.
- Sweep trail pavement.
- Mow regularly.
- Pick up trash and regularly empty trash receptacles.
- Maintain furniture and other structures.
- Clean restrooms and drinking fountains.
- Remove graffiti from all surfaces.
- Prune dense understory growth.
- Remove fallen or dying trees and limbs.
- Clean and replace lights.
- Spray for weed control.
- Remove snow and ice from trail surface.
- Maintain irrigation lines.
- Maintain emergency phones and citizen maintenance request lines.
- Install and remove snow fence.

Resources, Reports, Maps & Estimates

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 22036
(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)

State Organizations

Department of Conservation and Recreation
203 Governor Street, Suite 213
Richmond, VA 23219-2094
(804) 786-6140
Robert Munson, Env. Program Planner

Virginia Trails Association
PO Box 1132
Ashland VA 23005
(804) 798-4160
Angela LaCombe, Executive Director

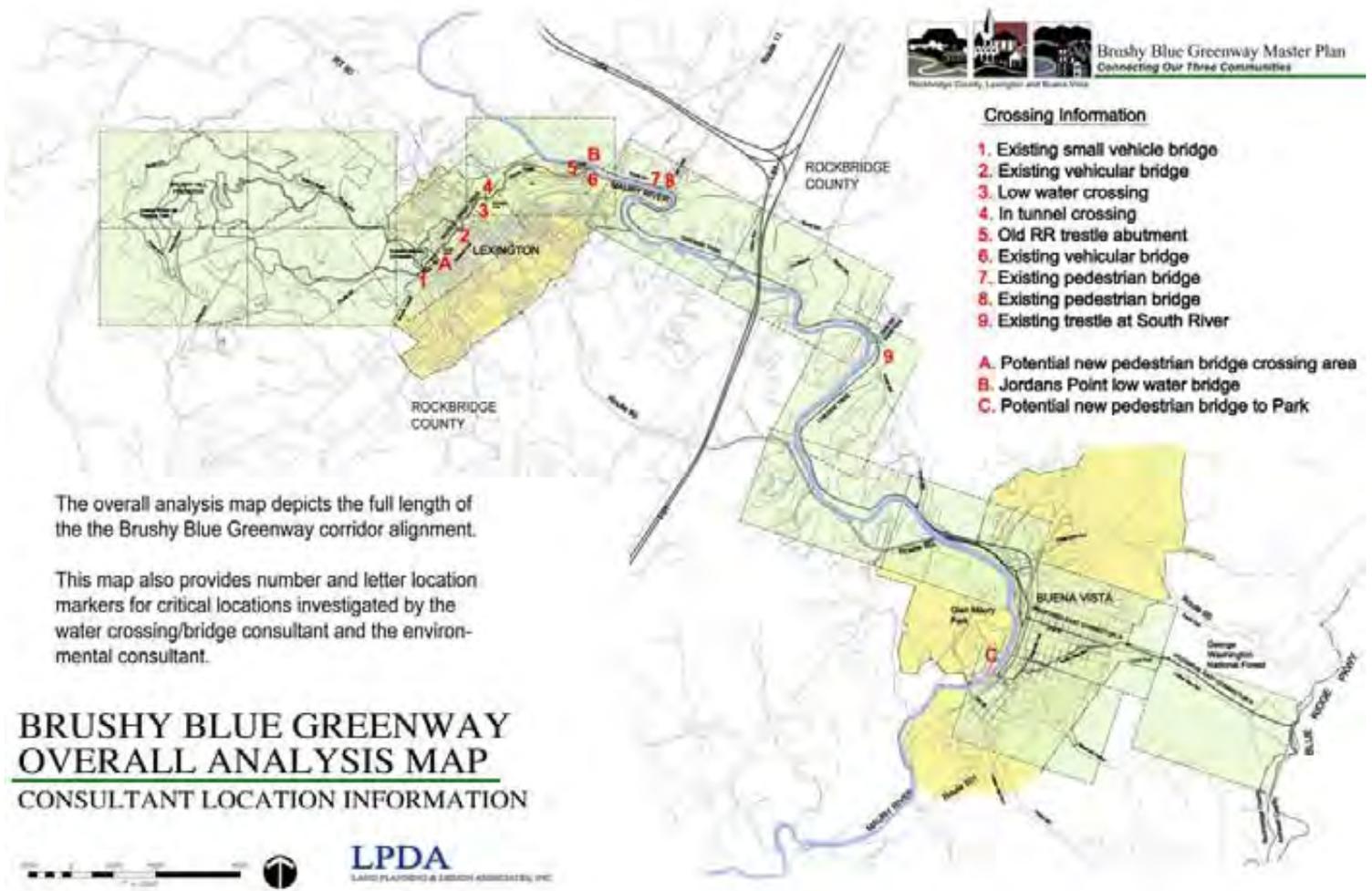
Support Resource Documents

- Connecting Our Commonwealth: The Virginia Greenways and Trails Toolbox. Richmond, VA: Parsons Harland Bartholomew & Associates, Inc., 1999.
- Designing Sidewalks and Trails for Access Part 1: Review of Existing Guidelines and Practices. Axelson, Peter W., et al. U.S. Department of Transportation, Federal Highway Administration, 1999.
- Designing Sidewalks and Trails for Access Part 2: Best Practices Design Guide. Kirschbaum, Julie B., et al. U.S. Department of Transportation, Federal Highway Administration, 2001.
- Guide for the Development of Bicycle Facilities. Washington, DC: American Association of State Highway and Transportation Officials, 1999.
- Guide Specifications for Design of Pedestrian Bridges. Washington, DC: American Association of State Highway and Transportation Officials, 1997.
- Guide to Select Federal Funding Sources. Sidwell, Heather, Public Policy Associate. National Recreation and Park Association, 1999.
- Park Planning Guidelines. Fogg, George E. National Recreation & Park Association, 2000, Third Edition.
- Trails for the 21st Century: Planning, Design, and Management Manual for Multi-Use Trails. Flink, Charles A., Olka, Kristine, Searns, Robert M. Washington, DC: Rails-to-Trails Conservancy, 2001.

Sub-consultant Reports for Brushy Blue Greenway

Included are the sub-consultant reports prepared as a part of the Brushy Blue Greenway Master Plan.

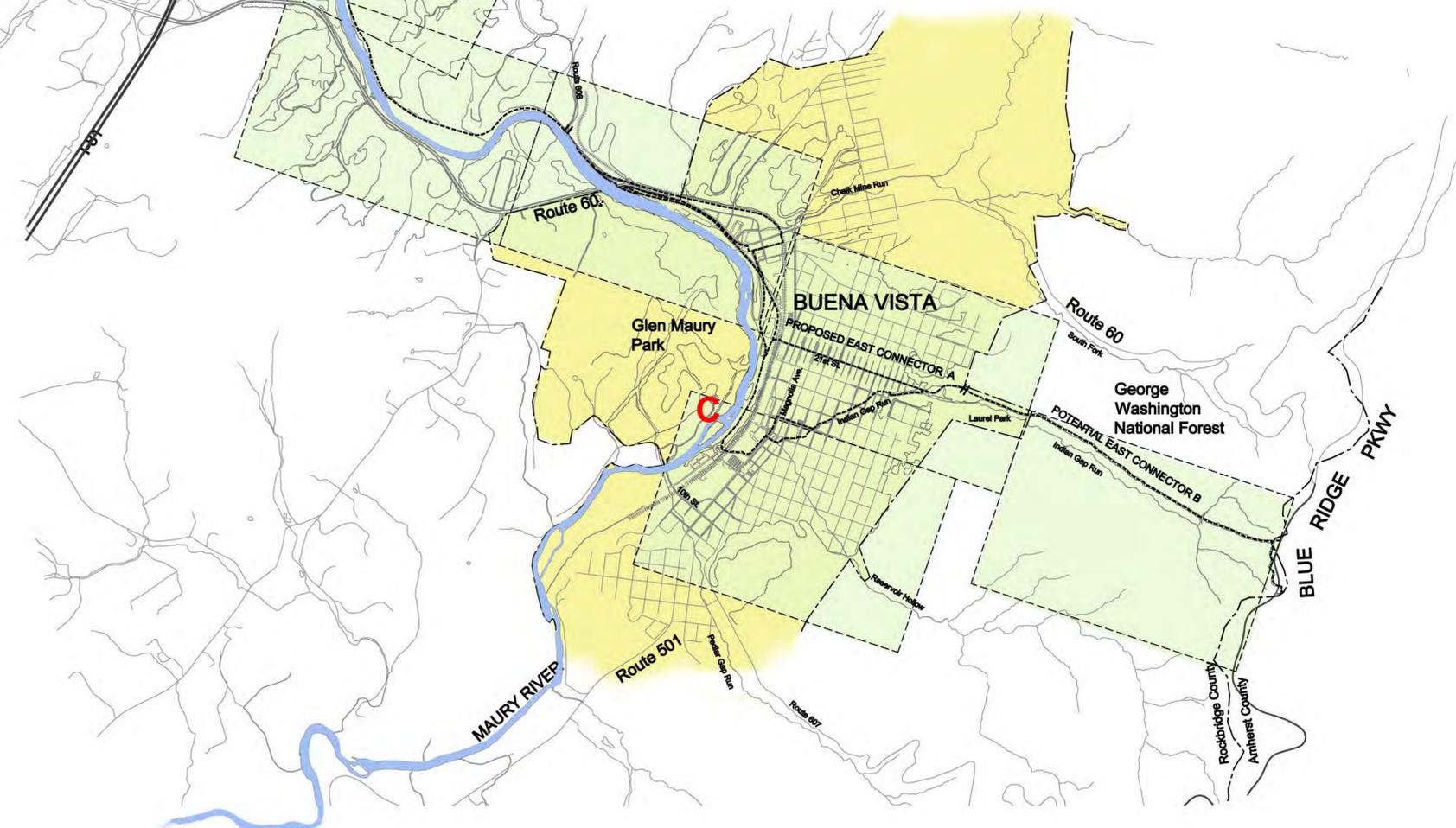
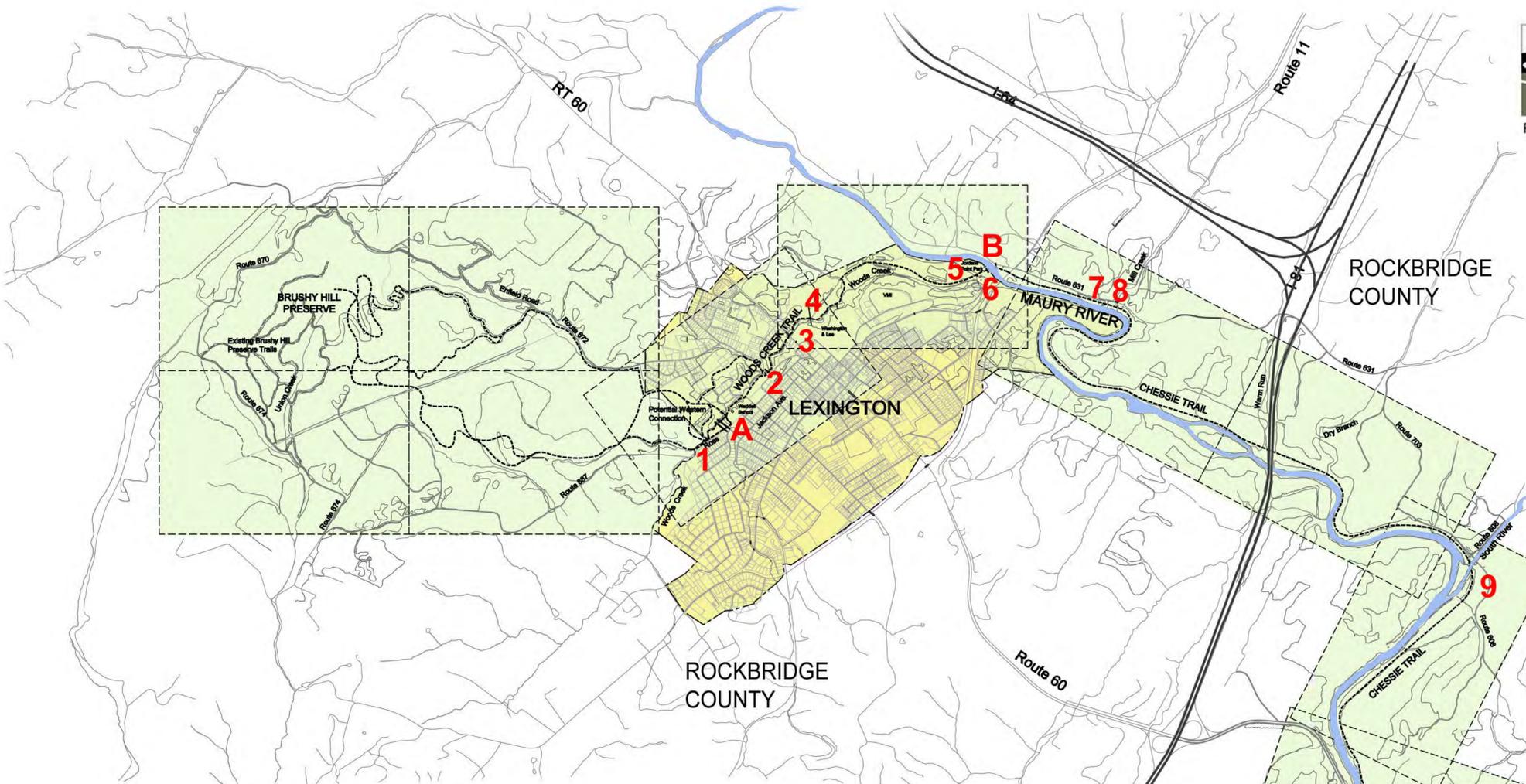
- Bridge and Water Crossing Investigation - LA Gates Company
- General Environment Investigation -Draper Aden Associates
- General Historic Resources Investigation - Rivanna Archeological



Crossing Information

- 1. Existing small vehicle bridge**
- 2. Existing vehicular bridge**
- 3. Low water crossing**
- 4. In tunnel crossing**
- 5. Old RR trestle abutment**
- 6. Existing vehicular bridge**
- 7. Existing pedestrian bridge**
- 8. Existing pedestrian bridge**
- 9. Existing trestle at South River**

- A. Potential new pedestrian bridge crossing area**
- B. Jordans Point low water bridge**
- C. Potential new pedestrian bridge to Park**

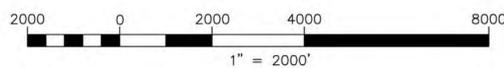


The overall analysis map depicts the full length of the the Brushy Blue Greenway corridor alignment.

This map also provides number and letter location markers for critical locations investigated by the water crossing/bridge consultant and the environmental consultant.

BRUSHY BLUE GREENWAY OVERALL ANALYSIS MAP

CONSULTANT LOCATION INFORMATION



Site 1

Site 1 is located on an old farm in Lexington (Kendal in Lexington). The bridge at this site is 11 feet wide and 19 feet long. The support system is steel rolled beams with timber deck and the abutments are made of stone.

Current Condition and Recommendations

The bridge appears to be in fair condition. The steel beams are in good condition, and the decking shows few signs of rot (See photo below). However, the abutments, particularly the one to the east, are in need of repair. Significant scour was observed at this abutment (See Photo 4). This scour will have to be repaired prior to utilization of this bridge. The repairs should be completed as soon as possible to prevent the collapse of the abutment and subsequently the bridge.

In addition to the structural repairs, we recommend adding handrails to each side of the bridge and removing the existing cattle guard from the west side. The cost estimate below assumes that the bridge will remain basically the same width after improvements and no consideration has been given in the estimate for widening the structure.

Estimated Cost of Repairs - Site 1

Scour Repair at Abutments	\$	4,000
Install Guardrails	\$	2,500
Remove Cattle Guard	\$	400
Total at Site 1	\$	6,900



Site 2

Site 2 is an existing vehicular bridge with a sidewalk at Lime Kiln Road (see photos below). The bridge spans approximately 39 feet and has aesthetic steel trusses attached to each side. There are numerous utilities around the bridge, including a sewer line and a gas line on the downstream side of the bridge and two storm sewer pipes that empty at the upstream end.

Current Condition and Recommendations

The bridge is in good condition and it appears that it could easily be widened at the upstream side of the bridge (See photos below). This would require extending the abutments and pier, adding 2-3 additional beams, and relocating the aesthetic truss and handrail to the new edge of the bridge. An additional handrail would be installed where the current handrail is to separate the vehicle traffic from the trail traffic. It appears that the current abutments and pier bear on rock, therefore extending the abutment and pier can be easily accomplished at a reasonable cost. The estimate reflects the costs of extending the bridge surface for the trail approximately 14 feet upstream.

Estimated Cost of Repairs - Site 2

Extend Abutments	\$	20,000
Extend Pier	\$	8,000
Steel Beams	\$	9,500
Concrete Deck	\$	10,000
Relocate Truss	\$	7,500
New Guard Rail Between Traffic	\$	1,200
Approach Work	\$	7,000
Total at Site 2	\$	63,200



Site 3

Site 3 is an existing low water crossing on the campus of Washington and Lee University (see photos below). The crossing is approximately 30 feet long and very narrow.

Current Condition and Recommendations

The crossing itself is in good condition. However, it is too narrow for two way pedestrian or horse traffic, and the stream banks have scoured and will continue to scour at each approach to the crossing (See photo below). We recommend removing the existing structure and replacing it with a wider low water crossing. This will allow water to flow at normal depths and cross over top during flooding. In addition, we recommend reinforcing the stream bank with riprap where signs of scour are evident. Due to the potential water depths at this location during flooding, a crossing should be designed to be overtopped during high water events. Because of this criteria, it is uneconomical to build a bridge at this location and we have estimated a 14 foot wide low water crossing at this location.

Estimated Cost of Repairs - Site 3

Scour repair at abutments	\$	4,000
New low water crossing	\$	30,000
Approach Work	\$	5,500
Total at Site 3	\$	39,500



Site 4

Site 4 is a tunnel with a sidewalk running through, located on the Washington and Lee University campus (See photos below). The sidewalk is approximately 90 feet long and is 5'-9" wide. Due to the stones projecting from the sides, the lateral clearance is reduced to 5'-0" in many places (See Photos).

Current Condition and Recommendations

The sidewalk itself appears to be in good condition. From our observations, we could not determine the condition of the underside of the structure or how the sidewalk is supported.

At the downstream end of the tunnel, there has been significant scour at the end of the sidewalk. A small wall level with the ground and 15-20 feet long at the end of the walk should be built to prevent the further erosion of the gravel walk. Backfill this wall with stone, and add riprap to the stream bank beyond the wall to prevent this from happening again.

One feasible solution is to install a series of culvert pipes or vertical walls with a concrete deck across the entire bottom of the tunnel. This would allow water to flow under the deck during normal water flow, but would allow water to overtop the deck during high water. The entire width of the tunnel could be used during normal water flow periods. Our cost estimate assumes the entire width of the tunnel has been utilized as a walkway with an allowance for a transition area both upstream and downstream.

Estimated Cost of Repairs - Site 4

Remove existing sidewalk	\$	4,500
Install culverts or walls	\$	18,000
Install concrete deck	\$	22,000
Approach work	\$	6,500
Total at Site 4	\$	51,000



Site 5

Site 5 is an old railroad bridge abutment over the millrace within Jordan's Point Park, just upstream from Site 6 (see photo below). The structure is not situated to use as a support structure for a pedestrian bridge and to use it as a pier would require extensive construction of abutments at each approach. The pier structural condition will also require extensive rehabilitation. *We do not recommend the use of this structure.*



Site 6

Site 6 is an existing vehicular bridge that spans the millrace within Jordan's Point Park. The vehicular bridge has abutments that extend approximately 8 feet from the upstream side of the bridge on each side (see photos below although abutments on upstream side not shown). The bridge spans approximately 23 feet.

Current Condition and Recommendations

The bridge abutments appear to be in good condition. Since the substructure is already in place, we recommend using the existing abutments to support a pedestrian bridge. This would only involve designing and constructing the superstructure and approaches and would be significantly less costly than constructing a new bridge. Our estimate reflects the addition of a 10 foot wide trail lane on the upstream side of the structure.

Estimated Cost of Repairs - Site 6

Approach work	\$	8,500
Abutment repairs	\$	2,500
Install Bridge	\$	35,000
Total at Site 6	\$	46,000



Site 7

Site 7 is an existing pedestrian bridge along the Chessie Nature Trail that crosses a drainage ditch (see photos below). The ditch has been redirected with a stone wall into a large concrete pipe. Beyond the wall, water from the roadway drains into the eroded ditch. The bridge girders are in fair condition as are the support posts. It appears the bridge was constructed on already failing abutments made of railroad ties. Significant scour can be seen beneath the east abutment.

Current Condition and Recommendations

This site is probably best suited to abandon the existing bridge and fill the area below the bridge with fill material. This will require the installation of a retaining wall, piping to divert water through the fill material, fill material, and removing the existing bridge. We propose removing the existing retaining wall on the upstream side of the rail bed, installing a drop inlet to collect water from the roadway, installing another large pipe parallel to the existing pipe to take flow from the ditch and drop inlet, repairing and extending the retaining wall at the outfall, removing the bridge and filling the ditch. Our estimate assumes the trail width will be maintained.

Estimated Cost of Repairs - Site 7

Remove stone retaining wall	\$	1,500
Install new headwall	\$	8,000
Install new concrete pipe	\$	8,000
Repair and extend lower retaining wall	\$	11,500
Remove existing bridge	\$	3,500
Fill area of old rail bed	\$	18,000
Scour protection at stream bank	\$	7,500
Total at Site 7	\$	58,000



Site 8

Site 8 is an existing pedestrian bridge along the Chessie Nature Trail that crosses Mill Creek (see photo below). It is 66½ feet long and 5'-2" wide. It is a single span, 2 girder structure. Girders are W30x99. The girders rest on 4" posts at the east end and on a concrete abutment at the west end.

Current Condition and Recommendations

The superstructure and the abutment on the east end of the bridge are in good condition. The abutment on the west end has a large scour hole beneath the concrete (See Photo) and is constructed over fill materials such as old rail ties, etc. Therefore, we recommend removing the superstructure, demolishing the west abutment and building a new abutment at this location that bears on suitable materials or piles and is longer in order to accommodate a wider bridge. Subsequently, the superstructure should be widened to 14 feet when reconstructed. This will require the addition of one additional girder of approximately the same size as the existing ones.

Estimated Cost of Repairs - Site 8

Remove and store existing bridge	\$	8,500
Remove west abutment	\$	6,500
Install new abutment	\$	14,500
Modify East Abutment	\$	8,500
Reinstall old bridge girders 8'	\$	7,500
Additional Girder	\$	8,500
Install deck and handrails	\$	15,000
Approach work	\$	7,500
Total at Site 8	\$	76,500



Site 9

Note: Since the completion of this evaluation, the existing bridge has been removed off site. A new bridge and new abutment will have to be installed at this location. The project cost estimate includes a budget number for a new span with new abutments.

Site 9 is a former railroad truss bridge that was converted to a pedestrian bridge. The bridge abutment scoured and failed and the bridge was washed into the river (see photo below). The truss itself is 150 feet long. When the bridge was originally built, the truss spanned the entire creek and the abutment that is now in the middle of the creek was on the stream bank. Over time, the creek scoured at the stream bank and circumvented the abutment. At this point, the wooden trestle was built to span over the widened creek to the truss. The stream continued to scour at the abutment and the abutment failed during a high water event causing the truss to fail and washing it downstream a short distance.

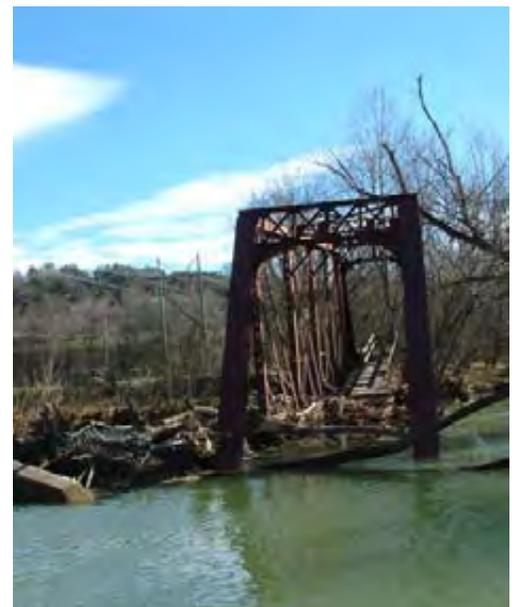
Current Condition and Recommendations

It appears that generally speaking, the truss is in very good condition. A few of the members on the downstream side (where the truss landed) are bent and some of the tension members have experienced stress reversal. Further inspection of the members will be required prior to attempting a repair. The abutment in the middle of the river is a total loss and should be removed.

For reconstruction of the bridge, a new pier will have to be constructed in the middle of the stream to support the truss and the adjoining span. The adjoining span may be able to be supported on the existing trestle piles, but knowing the history of scour in this area, further inspection of the bearing conditions needs to be investigated by means of an underwater inspection (See Photo 28). Most of the lower truss members should also be inspected before removing the truss from the stream. All of the debris that is on the structures at this time must be removed before an inspection can take place. Our cost estimate assumes a structure width of 14 feet is maintained.

Estimated Cost of Repairs - Site 9

Remove debris and unusable portions of the bridge	\$	30,000
Construct new pier	\$	60,000
Jack structure onto foundation	\$	250,000
Repairs to truss	\$	50,000
New deck (150 x 14)	\$	45,000
New span to truss	\$	115,000
Approach work	\$	24,000
Total at Site 9	\$	574,000



Site A

Site A is a proposed location for one or two creek crossings on Woods Creek and its tributary at Waddell School in the City of Lexington (see photos below). This area would be a good location for a creek crossing. The stream bed in the tributary stream is rock, therefore, scour will probably not be an issue for the foundations.

One solution to allow a crossing in any direction would be to construct the crossing at the intersection of the tributary and main stream. This would allow crossing in any direction from any side of either stream. See Sketch # 4 depicting the orientation of the crossing.

Estimated Cost for the Three Way Culvert including the required wingwalls and access ramps is approximately \$75,000.



Site B

Note: The project cost estimate includes a budget number for a new low water span with new abutments and piers downstream for the existing piers.

Site B is the location of the Jordan's Point Pedestrian Bridge that has already been designed by L.A. Gates Company (see photo below for general location). Funds have been appropriated for this structure. The request for bids was advertised on March 21, 2004, with received bids higher than available funds. The current strategy is to modify the design and the location to reduce the cost and re-advertise for construction. A major part of the strategy for reducing cost could include moving the position of the bridge downstream and not use the existing piers within the river (alignment still within Jordan's Point Park).



Site C

Site C is located in Buena Vista at connecting the Levee area with Glen Maury Park (see photo below for general location). The proposal is to have a bridge from the trail on top of the floodwall across the Maury to the Park. At this point, the river is very wide and the flood level is very high, as can be seen by the levee built by the Corp of Engineers. If a pedestrian bridge is built at this location, the best option would probably be a suspension bridge because of the large spans. However, this would be a costly bridge because of the total length required to cross the river at this location. Any bridge built here would need to be out of the flood plain to prevent debris buildup during a flood event.



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With any project involving proximity to wetlands or waters of the U.S., avoidance and minimization of impacts is the first step of design. If impacts become unavoidable, then any impact to jurisdictional wetlands and waters of the U.S. will require coordinating and possibly permitting with the proper agencies. There are three permitting agencies in the State of Virginia:

The U.S. Army Corps of Engineers (USCOE). The USCOE is responsible for determining if jurisdictional areas actually existing within the project area and issuing permits if impacts to these areas are unavoidable. Isolated wetlands do not fall under the USCOE's jurisdiction; however, isolated wetlands were not observed during our site reconnaissance. If impacts for certain projects are less than 0.5 acres, then the USCOE usually defers all wetland permitting to the State agency (see below). The USCOE is also responsible for approving any compensatory mitigation should impacts to jurisdictional areas become necessary.

Observations: Very few wetland areas were observed during the site reconnaissance. One area exists where the walking trail appears to bisect a wetland area associated with the Maury River. Any outward expansion of the walking trail would require fill in these wetland areas and coordination with the USCOE.

The existing walking trail follows some major drainages and crosses several smaller drainages. Any construction activity involving crossing the major drainages or otherwise impacting the smaller drainages would require coordination with the USCOE.

The Department of Environmental Quality (DEQ). Beginning in 2001, Virginia authorized the DEQ to oversee all wetland-related activities. Similar to the USCOE, the DEQ issues permits for any unavoidable wetland impacts, including those to isolated wetlands. The DEQ does not determine if jurisdictional areas exist, they rely on the USCOE to do so. Typically, if impacts are less than 0.5 acres of wetlands (or less than 300 linear feet of stream), the DEQ will supercede the USCOE with regard to wetland permitting. If impacts are greater than these limits, then both agencies will issue wetland permits and approve any required compensatory mitigation.

Observations: Very few wetland areas were observed during the site reconnaissance. One area exists where the walking trail appears to bisect a wetland area associated with the Maury River. Any outward expansion of the walking trail would require fill in these wetland areas and coordination with the DEQ.

The existing walking trail follows some major drainages and crosses several smaller drainages. Any construction activity involving crossing the major drainages or otherwise impacting the smaller drainages would require coordination with the DEQ.

The Virginia Marine Resource Commission (VMRC). The VMRC is tasked with overseeing all permitting issues related to impacts to major State waters, which are

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defined as any stream having an upstream watershed greater than 5 square miles. Any crossing of these designated waters (either through, beneath or above) will require a permit from the VMRC and sometimes an annual royalty for impacting State-owned waters.

Observations: The only three drainages falling under the jurisdiction of the VMRC would likely be Woods Creek, the Maury River, and the South River. Any activity across, beneath or over these water bodies would require coordination with VMRC.

Other agencies are involved in the permitting process. Even though the agencies discussed below do not issue permits, their comments may become part of the conditions of the permits issued by either the USCOE, DEQ, or VMRC. These agencies are:

Virginia Department of Inland Game and Fisheries. This agency is tasked with reviewing projects with regard to impacts to biological resources, including Federal and State listed threatened and endangered species. This agency may also comment on impacts to local fishes or anadromous fishes (species that live in salt water but migrate to fresh water to spawn, such as shad) with regard to any impacts the Maury River.

Observations: Our literature search revealed that there are thirteen species listed as either federally or state threatened and endangered in Rockbridge County, Virginia. Several other species are listed as Species of Concern; however, this designation has no legal status. The species are:

Species	Taxonomic name	designation	required action
Bald eagle	Haliaeetus leucocephalus	Federal and State threatened	may require construction time restrictions
Bewick's Wren	Thryomanes bewickii	State threatened	may require construction time restrictions
Peregrine Falcon	Falco peregrinus	State threatened	may require construction time restrictions
Upland Sandpiper	Bartramia longicauda	State threatened	may require construction time restrictions
Loggerhead Shrike	Lanius ludovicianus	State threatened	may require construction time restrictions
Dwarf Wedgemussel	Alasmidonta heterodon	Federal and State endangered	may require a survey near any impacts to the Maury or South River

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Atlantic Pigtoe (mussel)	Fusconaia masoni	State threatened	may require a survey near any impacts to the Maury or South River
James Spiny mussel	Pleurobema collina	Federal and State endangered	may require a survey near any impacts to the Maury or South River
Madison Cave isopod	Antrolana lira	Federal and State threatened	no action likely required
Shaggy coil (snail)	Helicodiscus diadema	State endangered	no action likely required
Rubble coil (snail)	Helicodiscus lirellus	State endangered	no action likely required
Appalachian Grizzled Skipper (butterfly)	Pyrgus centaurae wyandot	State threatened	may require construction time restrictions
Shale-barren Rockcress	Arabis serotina	Federal endangered State threatened	may require survey

Virginia Department of Conservation and Recreation. This agency also comments on the status of State listed threatened and endangered species.

Observations: Our literature search revealed that there are nine species listed as either federally or state threatened and endangered in Rockbridge County, Virginia. Several other species are listed as Species of Concern; however, this designation has no legal status. See table above.

U.S. Fish and Wildlife. This agency also comments on the status of Federal listed threatened and endangered species.

Observations: Our literature search revealed that there are nine species listed as either federally or state threatened and endangered in Rockbridge County, Virginia. Several other species are listed as Species of Concern; however, this designation has no legal status. See table above.

Virginia Department of Historical Resources. This agency is tasked with protecting all listed historical and archaeological sites in accordance with Section 106 of the Clean Water Act.

Observations: Based on our literature search, many listed historical and archaeological sites exist along the walking trail. The Department of Historical Resources will likely require Phase 1 Cultural Resource surveys for any work along the trail, especially along the Maury River, where pre-historic sites are typically found.

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Virginia Department of Health. This agency reviews projects for health issues typically related to water and sewer projects.

Observations. The Virginia Department of Health will not likely comment on this project.

EPA. EnviroFacts, EPA's online environmental database, was queried for both the Town of Lexington and Buena Vista with regard to any potential impacts along the trail corridor. No specific or significant findings were reported.

Detailed Site Observations

The following are detailed observations at the various stations along the existing and proposed trail. Sites 1 through 9 and including Site B related to the sites in the bridge investigation report prepared by LA Gates Company and also referenced in the Overall Analysis Map Consultant Location Information.

Western Section of Greenway Area

Area is primarily deciduous and coniferous forestland. Will require clearing and trail stabilization measures due to topography.

Site 1

Confluence of two creeks located at the beginning of this section. Proposed trail section runs through an urban subdivision. Various sewer lines are exposed along creek bed. A permit will be required for a pedestrian bridge crossing. Additional bank stabilization measures (large cobbles, tree plantings/live stakes, and/or biologs) are needed to handle increased pedestrian traffic.

Area behind Waddell School, between sites 1 & 2, has the above mentioned stream bank improvement/restoration measures already in place.

Site 2

Trail runs along small creek behind several local businesses. Road/traffic bridge present. Bridge should be widened to accommodate pedestrian traffic from trail. At this location the trail crosses the creek, however, creek crossing is not shown on map. The trail is lined with coarse mulch.

Site 3

At the end of the mulched section, the trail crosses the creek via a long, diagonal low-water bridge. Bridge has been constructed of concrete rubble and asphalt. Bridge is in poor condition and presents a pedestrian hazard during periods of increased flow. Further downstream the trail crosses another low-water bridge. While this second bridge is in fair condition, it is considerably narrower than all other crossings.

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Site 4

Creek flows through arched tunnel. Widening or path improvement will be considerably costly if the tunnel is to be widened as well. The downstream entrance to the tunnel needs improvement/widening. A guardrail or handrail would offer additional pedestrian safety. Further downstream is an additional vehicle bridge. While the trail does not traverse this bridge, crosswalk improvement at this location is recommended.

Sites 5 & 6

The trail crosses a creek near a picnic/recreational area in Jordan's Point Park. An old trestle piling is present. Considerable structural investigation of this piling for use as a possible pedestrian crossing location will be required. Recommend the nearby vehicular crossing as point of trail crossing.

Site B – Maury River Crossing

Proposed trail to cross the Maury River utilizing existing bridge pilings. Large woody debris present at time of field survey. The debris at the time of observation was taller than existing pilings. Pilings may be too low. Proposed bridge should be raised on existing pilings to prevent possible catastrophic damage during large storm events.

Site 7

Trail crosses small drainage creek via footbridge. Footbridge is in good condition.

Site 8

Trail crosses Mill Creek via footbridge. Footbridge is in good condition. Some slight erosion of the trail exists near the footbridge. Standing ice remains along the trail section after several days of 40°F+ weather. Right side of analysis map 6 shows wetland/riparian area. Large dense stand of non-native bamboo located on the right side of the trail. A spring creek flows through corrugated steel channel under the trail and off to the right through the bamboo stand. No visible surface flow on the left side of trail. Subsurface flow indicates possible perennial subsurface saturation. Beyond this location the wetland shifts to the left side of the trail (left side of analysis map 7). This section of the trail on the right side of analysis map 7 has considerable erosion from livestock. Livestock herding pen is present on right side of the trail. Large spring seep on left side of the trail flows under the trail via small corrugated steel pipe and empties into the Maury river on the right (bottom left side of analysis map 8). An additional spring is located approximately 100 yards downstream. An old abandoned springhouse is located on the right side of the trail. The springhouse construction is unstable. Large culvert on left side of trail near state route 703 may pose possible erosional concerns. Historical barge loch on right side of trail is unstable.

Site 9

A possible wetland area is located on left side of trail approaching the confluence of the South and Maury rivers. Wetland/riparian zone is located along right side of trail leading up to steel pedestrian bridge. An abandoned steel-frame bridge used for pedestrian trail traffic has been washed away from its foundation. Extensive permitting will be required for reconstruction. Erosional concerns exist along right hand side of trail.

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Natural drainage areas and erosional concerns exist along the trail section near marker #6 (left through middle section of analysis map 9). Historical loch is located along route 60 on opposite side of Maury River from trail. Cattle crossing footbridge is in need of repairs and/or stabilization.

Stewardsburg Road Area

Trail ends at the end of the Chessie trail section at Stewardsburg Road. The proposed additional trail section is a narrow grass strip located in a riparian zone/flood plain along Stewardsburg Road. Limited space and bank stability are likely to hinder construction. Recommend widening of the roadside to accommodate possible trail location. Route 60 bridge underpass section will need extensive stabilization due to unstable sandy, silty soil.

The trail section passing in front of the Bontex facility will need extensive construction to insure pedestrian safety. Possible wetland concerns near the proposed pedestrian trestle bridge. Sewer system will require expansion to handle raw sewage overflow issues near proposed pedestrian bridge. Raw sewage overflowing out of manholes and sewer covers at the time of field inspection. Raw sewage seeping through proposed trail section.

Buena Vista Waterfront Area

Various urban impacts to proposed trail section through downtown Buena Vista. Small drainage creeks completely channelized in concrete spillways. Pedestrian bridge crossings located downtown can utilize currently closed roadways. Glen Maury Park section of trail is heavily structured with riprap. Permit will be required for Maury River crossing construction.

Eastern Section of Greenway Area

Area east of Laurel Park will require extensive stabilization due to topography. Both rocky terrain and steepness of hillsides will likely present potential erosional concerns.

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Historical Resources

Task #1: Identification of Significant Historical Resources adjacent to or within the proposed Brushy Blue Trail right-of-way.

To facilitate discussion, the Historic Resources adjacent to or within the proposed Brushy Blue Trail right-of-way were divided up into two separate resource components, Historic Districts and Historic Sites.

Historic Districts: Four distinct historic districts lie adjacent to or within the right of way for the proposed location of the Brushy Blue Trail. These historic districts lie predominantly in the Lexington vicinity and are briefly described below. The information on Historic Districts contained in this list was obtained from the Department of Historic Resources site files and reports, websites for Washington and Lee University and the Virginia Military Institute, the *Field Guide to the Chessie Nature Trail* (1988), and the *Maury River Atlas* (1991).

- *Lexington Historic District*

The City of Lexington was established shortly after Rockbridge County, ca. 1778 and served as the county seat. Composed predominantly of the central and northern half of Lexington, the Lexington Historic District consists of a unique assemblage of commercial, academic, religious, and residential structures dating from the eighteenth to nineteenth centuries. The Lexington Historic District was listed on the Virginia Landmarks Register in 1971 and National Register of Historic Places in 1972. The Stonewall Jackson house was individually listed on the Virginia Landmarks Register in 1972 and the National Register of Historic Places in 1973. The Alexander-Withrow House was individually listed on the Virginia Landmarks Register and the National Register of Historic Places in 1971.

- *Washington & Lee University Historic District*

Robert Alexander founded Augusta Academy, a small school 20 miles north of Lexington, in 1749. In 1776, Augusta Academy was renamed Liberty Hall. In 1782, Liberty Hall was moved to the Lexington area. Two years later it was chartered as Liberty Hall Academy by the Virginia General Assembly. In 1796, the school changed its name to Washington Academy after George Washington donated \$20,000 in James River Company stock to the institution. General Robert E. Lee took over as president of the institution in 1865. After Lee's death in 1870, the institution was renamed Washington and Lee University. The core of the historic district, the Colonnade, represents an architecturally harmonious and spatially related neoclassical assemblage of buildings. The neoclassical front

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campus of Washington and Lee University was individually designated a National Historic Landmark in 1961. The Washington & Lee University Historic District was listed on the Virginia Landmarks Register and National Register of Historic Places in 1970. Lee Chapel, built under Robert E. Lee's supervision in 1867 and containing Lee's burial and that of his horse 'Traveler,' was individually designated a National Historic Landmark in 1960 and was also individually listed on the Virginia Landmarks Register in 1969 and the National Register of Historic Places in 1966.

- *Virginia Military Institute Historic District*

Shortly after the War of 1812, a storage arsenal was established at Lexington. By 1834, it was proposed that the arsenal be turned into a military college where students could guard the arsenal and also receive an education. John T. L. Preston was the primary advocate the establishment of a state military school. The Virginia Military Institute, the 'West Point of the South,' enrolled its first cadets in 1839. The Institute was shelled and burned in June of 1864 by Union troops commended by General David Hunter. VMI was reopened as an educational institution in October of 1865. The historic district encompasses a considerable area of VMI including a complex of buildings constructed during the most historic period, ca. 1839-1862. The buildings are mostly neo-Gothic, mixing the subsidiary styles variously known as collegiate, academic, military, cathedral and Tudor Gothic. In nearly all the buildings there is evidenced the conscious attempt to repeat such features as the battlement parapets. The Virginia Military Institute is the oldest state supported military college in the United States. The Virginia Military Institute Historic District was listed on the Virginia Landmarks Register in 1969 and the National Register of Historic Places in 1974. The Virginia Military Institute was also designated a National Historic Landmark in 1974. The Cadet Barracks was also individually designated a National Historic Landmark in 1965 and was also individually listed on the Virginia Landmarks Register in 1969 and the National Register of Historic Places in 1966.

- *East Lexington Historic District*

East Lexington may be generally defined as that portion of Lexington that fronts the Maury River including several residential and commercial properties on the north side. The late eighteenth and early nineteenth century commercial and industrial importance of the Point and adjacent East Lexington predates the settlement and development of Lexington proper. Many of those individuals who are prominently associated with the history and development of Lexington were also involved in the commercial and industrial development of East Lexington. Jordan's Point Park is currently listed as a destination on Virginia's Civil War Trails program. According to the Department of Historic Resources, the East Lexington Historic District has been surveyed and has the potential to be eligible for listing on the National Register of Historic Places under Criteria A, B, C, and D. (See 'The Point' 44RB181 below for a more detailed description).

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Historic sites: In order to aid the identification and discussion of historic sites, the proposed route of the Brushy Blue Trail has been divided up into three discrete sections. The information on the sites contained in this list was obtained from the Department of Historic Resources site files and reports, HAER VA-61 documentation, the *Field Guide to the Chessie Nature Trail* (1988), and the *Maury River Atlas* (1991).

Section A: Between Brushy Blue Hill and the Maury River, including the City of Lexington

- *44RB0053* – John Moore Cabin site:

Substantial evidence for a late 18th century domestic site including oval depression, orchard trees, former road and limestone slabs. Historic period cultural affiliation.

- *44RB0018* – Bartenstein site:

Approximately 50 x 75 foot knoll above a small intermittent stream sheltered by surrounding high hills. Site contains variety of artifacts including Kirk Stem, Guilford rounded base points, and many flakes. Archaic period cultural affiliation.

- *44RB0168* – Shaner site:

A large lithic scatter site on a secondary terrace overlooking Maury River to the south. Owner reported finding numerous points on site over 40 years of plowing. Shovel cuts revealed several flakes and FCR. Undetermined cultural affiliation.

- *44RB0167* – Tolley #1 site:

A large lithic scatter site on a secondary terrace overlooking Maury River to the south. Twelve Savannah River type points, two triangular Woodland points, performs, knives, scrapers, cores, numerous flakes. Late Archaic and Woodland Period cultural affiliation.

- *44RB0172* – Confederate Vidette position / McCausland's Ridge:

Approximately 25 x 25 foot site on ridge overlooking Maury River. Metal detector survey located several unfired minie balls, eight percussion musket caps and an Enfield musket nipple protector with brass chain. Confederate sniper position defending Lexington captured by R. B. Hayes on June 11, 1864.

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- *44RB0181* – The Point / VMI Island / Bloody Island / Jordan’s Point / Lexington Docks / Beechenbrook Ironworks

Mill ruins and stone wharves constructed for canal boats line the southeastern portion of this artificial island. The Lexington docks were once Lexington’s industrial and transportation center. On north side of island are remains of Jordan’s (Lexington’s) mill dam constructed ca. 1810 by John Jordan. Originally a crib dam with a lock in the southern end, the dam is now concrete. A covered bridge built overtop the dam ca. 1834, was burned by retreating Confederate troops in 1864. The bridge was rebuilt in 1870 until it was torn down in 1946. Jordan’s mill dam backed up water to a canal race on the southern side of the island. The race powered cotton, woolen, flour, grist and lumber mills.

- *44RB0472* – Wood’s Creek site #1:

Small historic period domestic site and prehistoric lithic scatter on ridge overlooking Maury River. Phase I survey conducted but no diagnostic materials recovered. Area was the location of two homes that have recently been demolished as they were deemed in the floodplain and not significant.

Section B: The Chessie Nature Trail along the north side of the Maury River including the City of Buena Vista

- *44RB0238* – Stone abutment of bridge / canal culvert, North River Navigation:

Remains of R&A railroad over Mill Creek (?)

- *44RB0302* – Maury River / Kanawha Canal Freight Boat:

Former canal boat is half covered by island in middle of Maury River. Artifacts in bilges recovered from exposed section including knife blades, pewter spoon, leather shoe. Remains measured approximately 10 x 20 feet.

- *44RB0180* – Reid’s (Ross’s / Emore’s) Lock and Dam complex at Alexander’s Landing, North River Navigation:

Remains of stone and concrete dam.

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- *44RB0373* – Cheatham’s Island Boat:

Former canal boat, possibly a James River and Kanawha freighter, including recovered samples 6 feet wide and 11 feet long. Remains documented but not removed. Believed to be constructed after 1840 but before 1880.

- *44RB0242* – South River Lock and Dam complex, North River Navigation:

Remains of stone dam and lock gate recesses. Stone abutment on north bank. A tram road ran from this location approximately 1.5 miles up the South River to the Old Buena Vista Furnace.

- *44RB0034* – Joyce Site:

Primary terrace camp possible occupation site approximately 100 x 160 feet in dimension on north bank of South River. Rich midden-like soils noted containing a “low narrow ridge within a roughly circular 40 foot diameter depression.” Small triangular point, Savannah River point, biface, flakes and fire cracked rock present. Early Archaic through Late Woodland cultural affiliation.

- *44RB057* – Old Glasgow Farm #1 site:

Large transient camp site approximately 60 by 147 yards located in channel scarred floodplain of South River. Artifacts mixed with those of *44RB058* below. Archaic period artifacts including Guilford and Savannah River types are represented. Early to Late Archaic period / Transitional cultural affiliation.

- *44RB0058* – Old Glasgow Farm #2 site:

Site located on floodplain / eroded terrace of the South River; near conjunction of South and Maury Rivers. A 1979 alteration of Route 608 destroyed portions of the site. Artifacts mixed with those of *44RB057* above. Early to Late Archaic period / Transitional cultural affiliation.

- *44RB0033* – Sprunt site:

Approximately 200 x 600 foot site located on a secondary terrace along south bank of South River. Fairly thin artifact scatter including cores, flakes, bifaces, preform, knife, hand-axe and Savannah River, Guilford, Stanley / Kirk stemmed points. Archaic period cultural affiliation.

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- *44RB0060* – Pete Rhodes Site:

Large transient camp or possible base camp site located on a secondary terrace on the south bank of the South River, near confluence of South and Maury Rivers. 1979 alteration of Rte. 608 runs across primary and secondary terraces. Auger tests conducted. Middle to Late Archaic / Transitional period cultural affiliation.

- *44RB0182* – Lock #1, North River Navigation:

- *44RB0183* – Lock #2, North River Navigation:

Outside stonework of Lock #2 is visible from the river.

- *44RB0179* – Ben Salem (Dunlap's) Lock and Dam complex, North River Navigation:

Ripple and wood foundations of the stone dam visible. Stones were salvaged to build the Columbian Paper Mill ca. 1890.

- *44RB0184* – Zimmerman (Stratton's) Lock and Dam complex, North River Navigation:

North end of stone dam and lock are visible and in good condition. Wood floor and turbine units were built into lock chamber and served as Buena Vista's hydro-electric plant.

- *44RB0239* - Boatman's House Ruin:

- *44RB306* – Moomaw's Landing site:

Portions of canal located via extensive subsurface mechanical trenching. Canal was determined to be ca. 35 – 40 feet wide and 4 – 5 feet deep. Approximately 100 feet of the canal survive in this location. Locus of canal has been heavily impacted by railroad construction and current industrial use. Historic Glasgow plantation house, built shortly after the American Revolution, stood opposite Moomaw's landing. A railway station, built to resemble a canal boat was also built nearby.

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- *44RB0236* – Chalk Mine Run Aqueduct, North River Navigation:

Construction related to the aqueduct occurred between 1851 and 1858. It was completed by Mr. William Gibson. Abutments are of dressed stone. By 1916, the Chalk Mine Run had been converted into a railroad bridge. Aqueduct abutments were modified to provide support for a small railroad bridge across the run. East abutment is intact but only traces of the west abutment are visible.

- *44RB0237* – Moomaw's Dam and Guard Lock complex, North River Navigation:

Built in ca. 1853-1858 for the North River Navigation by William Gibson and Duncan Grant, Moomaw's dam replaced an earlier dam constructed by Glasgow that is noted on maps as early as 1837. The 304 foot long, 15 feet high stone dam created a pool that extended upriver to Zimmerman's Dam and Guard Lock. The lock lift was 4.1 feet and routed traffic from the river to a canal extending to the south on the east bank of the river. Glasgow's old mill dam, also shown on an 1837 survey, was located a third of a mile downriver. The old mill dam powered a sawmill. Moomaw's Guard Lock is presently intact and located within the Bontex plant on the north bank of the Maury River. The existing dam has been faced with cement and raised approximately a foot in height.

- *44RB0235* – Peddlar Gap Run Aqueduct / Lock #3, North River Navigation:

Constructed ca. 1858, the aqueduct consisted of two dry-laid roughly coursed limestone abutments that carried a timber-frame trough. Aqueduct abutments were reused ca. 1880-1881 as a railroad bridge. Only the north portion of the abutment on the east and west sides of the stream survive.

Constructed ca. 1857 and built of standard dressed stone, the lock has a lift of 8.4 feet and was 1.6 miles below Moomaw's Dam. Field lock #3 is buried northwest of where a dirt road crosses a railroad spur. Some coping stones of the downstream entrance are sometimes visible after a heavy rain. An 1837 survey of the North River Navigation noted Robert Glasgow's saw mill nearby.

- *44RB0466* – Buena Vista #2 site:

Approximately 100 x 350 meter site located on the southwestern end of the Maury River floodplain. Extensive lithic scatter represented including ceramics. Multi-component sites dating from Late Archaic / Transitional period (2,500 – 1,200 BC) to Middle to Late Woodland period (500 BC – 1600 AD).

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- *44RB0234* – Indian Gap Run Aqueduct, North River Navigation:

Aqueduct abutments were altered ca. 1880-1881 for use as railroad bridge. Constructed ca. 1858, the aqueduct consisted of two dry-laid roughly coursed stone abutments that carried a timber-frame trough. Prior to the construction of the aqueduct, a mill and distillery located in the vicinity were powered by the stream. No visible above ground evidence for these features survive.

- *44RB0178* – Lock #4, North River Navigation:

Lock located in canal path parallel to and on east side of the Maury River. Constructed ca. 1851 – 1857, Lock #4 was 135 feet in length, with a chamber length of 99 feet between the gates. The channel width was 15 feet 6 inches. Walls of lock built of roughly coursed rubble with a facing of locally quarried, dressed limestone. Lock #4 abandoned when canal went into disuse. Lock #4 razed due to city of Buena Vista flood wall construction.

- *44RB0233* – Lock #5 and Toll House, North River Navigation:

Constructed ca. 1856 and built of standard dressed stone, the old lock lies alongside the railroad tracks between the Georgia Pacific Lumber yard and the Buena Vista flood wall. The lock had a lift of 6 feet. A lock house, since destroyed, stood nearby and served locks #4 and #5.

- *44RB0065* – Buena Vista #1 site:

Approximately 120 x 150 meter site located in floodplain approximately 75 meters from the Maury River. Phase I and Phase II investigations conducted. Midden context identified. Guilford point, flakes, and fire cracked rock recovered including grit-tempered ceramics. Middle to Late woodland period, ca. 500-900 AD and 900 – 1600 AD.

- *44RB0413* – Greenwood Cemetery:

Large cemetery 2.89 acre historic period cemetery containing approximately 100 internments. Cemetery reserved for ‘colored’ people and ‘paupers.’ Dickinson family acquired the property from the town of Buena Vista in 1916.

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- *44RB232* – Lock #6 (Lock Laird) , North River Navigation:

Well preserved stone lock near historic Laird house.

- *44RB231* – Savernake’s (Laird’s) Dam: Walls and guard gate:

Frame timbers and stone walls of the guard gate are still visible.

- *44RB230* – Lock #7, North River Navigation:

- *44RB308* – Dinky Mine Site:

Late 19th to early 20th c. iron ore mining complex located on Mineral Ridge adjacent to Buena Vista. Iron ore was mined in this area as early as 1890 and well into the 20th century. Many surface features related to mining, including open pits, adits, prospecting pits, shafts, and tailing piles are present. A narrow gauge rail line carried the mined ore to a washing plant. The small engine that pulled the ore cars along the rail line was described as a ‘Dinky.’

Section C: East of city limits for Buena Vista to Blue Ridge Parkway

No known historic resources have been identified in this section.

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Task 2: Summary of Potential Interpretive Themes

A very general review of the history of the project area and its immediate vicinity has identified nine broad historical themes that may be potential interpretive opportunities for the Brush Blue Trail. The themes are: American Indian Occupation, Rockbridge County and Early European Settlement, Iron Production in Rockbridge County, the North River Navigation, the Civil War, Railroads, and Floods. In addition, the founding and historical development of the City of Lexington and the City of Buena Vista are also suggested as interpretive possibilities. Each of the potential interpretive themes is addressed to a greater or lesser degree in the historical summaries below.

American Indian Contexts

Due to the relative lack of prehistoric archaeological data, the prehistory of the project area has been established by drawing upon evidence from the larger Rockbridge region. The environmental context of the North River and adjacent minor drainages and landforms, a rich alluvial flood plain bottomland and upland ridges and terraces, clearly makes it an ideal habitat for prehistoric human occupation. Identified archaeological sites within and beyond the project area suggest evidence for human occupation of the larger region is strongest during the Archaic (8,000 – 1,000 BC) and Woodland periods (1,000 BC – 1,650 AD). Within and adjacent to the project area however, Archaic period sites statistically predominate. Limited surveys in the project area have identified the confluence of the Maury and South Rivers as the area most heavily utilized during this broad chronological period. Site types represented within and adjacent to the project area are temporary camp sites and work areas, and resource procurement and processing sites, all generally characterized by repeated seasonal use. These sites are generally located adjacent to or near a convenient water source.¹

Rockbridge County

King George II granted 92,100 acres of land to Benjamin Borden in 1738. The land contained much of what is now Rockbridge County. Rockbridge County, named after the Natural Bridge, was formed from parts of Augusta and Botetourt Counties by an Act of the Virginia General Assembly in 1778. The town of Lexington was subsequently established as the county seat on just over 26 acres of land adjacent to the Great Wilderness Road donated by Isaac Campbell. The first Europeans to immigrate the area were Scotch-Irish Presbyterians who came down the Valley from Pennsylvania between 1735 and 1745. They settled the rich agricultural bottom lands adjacent to the major rivers. Predominantly rural, most residents farmed wheat, corn, rye, oats and barley and

¹ John M. McDaniel, "Archaeological Sites Along the Chessie Trail," 123-136. In *Field Guide to the Chessie Nature Trail*, Larry I. Bland, ed. (Lexington: Rockbridge Area Conservation Council, 1988); The Louis Berger Group, Inc., "Cultural Resources Survey, VDOT Lexington Residency, Lexington, Virginia," 7-9. VDHR File No. 2002-0079. Prepared for MSA, P.C., Virginia Beach, Virginia, 2002.

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produced dairy products. By the mid-eighteenth century, the North River became an important transportation route for the region's farmers who floated their produce downriver to Lynchburg by bateaux where it was sent on to Richmond. The relative isolation of Rockbridge County led to the early establishment of numerous local mill seats and the development of small-scale industry along the North River.²

Lexington

The Lexington vicinity became a significant settlement due to its location at the point where the Great Road, established in 1745, crossed the North River. The Great Road crossed the North River at a place called Campbell's Ford. The 27 acre town of Lexington, named after the first battle in the Revolutionary War, served as the county seat shortly after the creation of Rockbridge County in 1778. The late eighteenth and early nineteenth century commercial and industrial importance of the Point and adjacent East Lexington would come to drive the settlement and development of Lexington proper. The importance of the Lexington vicinity was recognized by the earliest settlers. The William Alexander family owned and developed the Point during the last quarter of the eighteenth century. John Jordan extended the development of the Point during the first half of the nineteenth century, constructing a flour mill, saw mill, a textile factory, a foundry and forge, bateaux docks, and eventually a covered toll bridge that crossed the North River. A majority of the Jordan property was eventually acquired by the James River and Kanawha Company in 1860.³

Buena Vista Furnace

The early iron industry in Virginia was centered predominantly in the Shenandoah Valley. The Jordan family, prominent in the development of antebellum Lexington, was to dominate the iron production industry in Rockbridge County and elsewhere. Located on Rte. 608, near its junction with Rte. 631, the Buena Vista Furnace was built in 1847-1848 by Samuel F. Jordan and B. J. Jordan. The furnace manufactured munitions that were reported to have been used in the Battle of Buena Vista in the Mexican-American War. It was burned by General Hunter's Union troops in 1864.

² Catharine M. Gilliam, "Jordan's Point – Lexington, Virginia: A Site History," 109-113. In *Proceedings of the Rockbridge Historical Society*, Volume IX (1975-1979), Sharon R. Ritenour and Larry I. Bland, eds. (Lexington: Rockbridge Historical Society, 1982); Laura Moore Stearns, "First Years and First Families: Rockbridge County, 1735-1745," 117-118, 122-123. In *Proceedings of the Rockbridge Historical Society*, Volume X (1980-1989), Larry I. Bland, ed. (Lexington: Rockbridge Historical Society, 1990); The Louis Berger Group, Inc., "Cultural Resources Survey, VDOT Lexington Residency, Lexington, Virginia," 10-14. VDHR File No. 2002-0079. Prepared for MSA, P.C., Virginia Beach, Virginia, 2002.

³ Catharine M. Gilliam, "Jordan's Point – Lexington, Virginia: A Site History," 109-113. In *Proceedings of the Rockbridge Historical Society*, Volume IX (1975-1979), Sharon R. Ritenour and Larry I. Bland, eds. (Lexington: Rockbridge Historical Society, 1982); The Louis Berger Group, Inc., "Cultural Resources Survey, VDOT Lexington Residency, Lexington, Virginia," 10-14. VDHR File No. 2002-0079. Prepared for MSA, P.C., Virginia Beach, Virginia, 2002.

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North River Navigation Canal

The North River was the important transportation link for Rockbridge County to points south and east. In 1801, the James River Company ‘improved’ approximately 20 miles of the North River building sluices and wing dams. The James River and Kanawha Company’s James River canal reached Buchanan in 1851. In that year, the North River Navigation Company was formed and began building dams, locks and canals up to Lexington. With the aid of the James River and Kanawha Company, the canal reached Lexington in 1860. The entire work spanned 20 miles and consisted of 9 stone dams, 1 crib dam, 9 stone guard locks, 14 lift locks, 1 stone guard gate (half lock), 5 small aqueducts with timber troughs, 22 road bridges, 4 ferries, and 12 lock houses. In 1863, the canal carried the body of Stonewall Jackson from Lynchburg to Lexington via packet boat. Portions of the North River Navigation were destroyed by Federal troops in 1864. The North River Navigation was severely damaged by the floods of 1870 and 1877. Due to extensive cost of repair and increased competition from the railroad, the James River & Kanawha Company sold their property to the Richmond & Alleghany Railroad in March of 1880. In 1945, the Virginia General Assembly renamed the North River the Maury River after Matthew Fontaine Maury, ‘Pathfinder of the Seas.’⁴

The Civil War

While no major battles took place in the vicinity of the project area, on June 11, 1864 Union troops under the command of General Rutherford B. Hayes managed to capture a heavily defended Lexington under the command of General John McCausland. During the armed conflict, the Virginia Military Institute and portions of Lexington proper were shelled by Union artillery. Adjacent to the project area a site named McCausland’s Ridge (44RB0172), a Confederate sniper position has been identified.⁵

Richmond and Alleghany Railroad, Lexington Branch

Built between 1880-1881, the Lexington Branch of the Richmond and Alleghany Railroad largely followed the towpath of the former North River Navigation. In October of 1881, the last rail was laid on the Lexington Branch and trains soon arrived in Lexington. The Richmond and Alleghany Railroad was taken over by the Chesapeake and Ohio Railroad in 1890. In 1969, flood waters from hurricane Camille destroyed much

⁴ William E. Trout, III, “The North River Navigation: Lexington’s Link with the Sea,” 1966. Ms. in possession of the author; William E. Trout, III, *The Maury River Atlas*, 3. Prepared for the Virginia Canals and Navigation Society, 1991. HAER No. VA-61, “North River Canal System,” 3-9. Historic American Engineering Record; D. E. Brady Jr., “The Canal and the Chessie Trail,” 137-144. In *Field Guide to the Chessie Nature Trail*, Larry I. Bland, ed. (Lexington: Rockbridge Area Conservation Council, 1988).

⁵ Robert J. Driver, Jr., *Lexington and Rockbridge County in the Civil War* (Lynchburg: H. E. Howard, Inc., 1989) 61-66.

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of the Chesapeake & Ohio Railway's line along the Maury River. A year later, rail service between Buena Vista and Lexington was discontinued.⁶

Buena Vista

In 1746, Silas Hart obtained a patent on 400 acres of rich bottom land located between the North River and the Blue Ridge Mountains. This land was eventually to become known as Hart's Bottom, property was used for farming and grazing into the early nineteenth century. In the late eighteenth century, Robert Glasgow purchased property adjacent to Hart's Bottom and established a grist and sawmill also building a residence that he called Green Forest. By the mid-nineteenth century, Hart's Bottom had been transformed into a small industrial complex containing a grist mill, distillery, and sawmill. After the organization of the North River Navigation Company the property adjacent to the North River dramatically increased in value. A strip of land adjacent to the North River was sold to the North River Navigation Company and a canal, and a series of locks and aqueducts were soon constructed. Benjamin C. Moomaw acquired the Glasgow property and by 1858 Moomaw's Landing was the brief terminus of the North River Navigation. The Richmond and Alleghany Railroad purchased the James River and Kanawha Company's interest in the North River Navigation in 1880 and built their line to Lexington. The railroad passed through Buena Vista before reaching Lexington in 1881. A year later, the Shenandoah and Valley Railroad also ran their own line to Lexington. Due to primarily to the confluence of two railroads at his property, Benjamin C. Moomaw was able to attract the Appold and Sons tannery his property in 1882. The small village formed by the workers housing was called Green Forest ('Glasgow'). Capitalizing on a brief industrial and mining boom during the late 1880s and early 1890s, Moomaw was subsequently able to attract other businesses to Green Forest such as a pulp mill and canning factory. By 1887, A. T. Barclay, Benjamin C. Moomaw and Samuel Jordan organized the Buena Vista Company and began to sell stock. The Company purchased the Hart's Bottom and Green Forest properties and the town was subsequently laid off and lots sold quickly. The town of Buena Vista, named after the Furnace of the same name, received its charter in 1890 and was organized as a City in 1892. In just two short years, Buena Vista had a population of 5,240 and boasted 22 industrial enterprises and businesses. By 1893, a national panic had set in and the boom had ended with businesses failing and property values plummeting.⁷

⁶ Matthew W. Paxton, Jr., "Bringing the Railroad to Lexington, 1866-1883," 181-190. In *Proceedings of the Rockbridge Historical Society*, Volume X (1980-1989), Larry I. Bland, ed. (Lexington: Rockbridge Historical Society, 1990); Matthew W. Paxton, Jr., "The Railroads and the Chessie Trail," 155-167. In *Field Guide to the Chessie Nature Trail*, Larry I. Bland, ed. (Lexington: Rockbridge Area Conservation Council, 1988).

⁷ Royster Lyle, Jr., "Buena Vista and its Boom, 1889-1891," 131-138. In *Proceedings of the Rockbridge Historical Society*, Volume VIII (1970-1974), Larry I. Bland, ed., (Lexington: Rockbridge Historical Society, 1979); William and Mary Center for Archeological Research, "Phase I / II Archeological Investigation of Area #4 and Documentation of the North River Navigation System (HAER VA-61) Associated with the Buena Vista Floodwall Project, Buena Vista, Virginia," 21-31. Prepared for Telemarc, Inc. and U. S. Army Corps of Engineers, Norfolk Division, 1992.

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Chessie Nature Trail

The Rockbridge Area Conservation Council was the first to recognize the potential of the abandoned Chesapeake & Ohio Railway right of way. In 1978, the Nature Conservancy accepted deed to just over seven miles of abandoned Chesapeake & Ohio Railway line between Lexington and Buena Vista. On May 8, 1979 ownership of the right of way was transferred from the Nature Conservancy to the Virginia Military Institute. With the aid of a grant, preservation and improvement of the railway line was actively begun by VMI in 1980. In late 1981, the Chessie Nature Trail was formally dedicated a scenic and historic resource for the enjoyment of hikers, joggers and nature enthusiasts.⁸

Recommendations

- It is strongly recommended that the Brushy Blue Work Group adopt an educational and interpretive program to enhance the usability of the Brushy Blue Trail system. This program should consider focusing on one or more of the themes identified above.
- It is strongly recommended that some type of interpretive signage be placed at selected locations along the route of the proposed Brushy Blue Trail. Interpretive signage has proven to be an effective educational tool particularly when both text and images are used. Signage can be placed at trail access points or in intermittent waysides adjacent to user corridors to provide high visibility.
- It is strongly recommended that the Brushy Blue Work Group work with existing historic resource and preservation organizations within and outside of the project area to finalize educational and interpretive themes and proposed signage. These organizations should include but not necessarily be limited to Washington and Lee University, Virginia Military Institute, the Rockbridge Historical Society, the Rockbridge Area Conservation Council, the Historic Lexington Foundation, the Virginia Canals and Navigation Society, the National Park Service, the U. S. Forest Service, the Historic American Engineering Record, the Archaeological Society of Virginia, the Association for the Preservation of Virginia Antiquities, and the Virginia Department of Historic Resources.

⁸ Larry I. Bland, ed., *Field Guide to the Chessie Nature Trail*, ix-x. (Lexington: Rockbridge Area Conservation Council, 1988).

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Task #3: Identification of Areas that contain Sensitive Historical Resources. Section 106 NHPA Compliance Requirements

Sensitive Prehistoric Sites

Prior to European arrival, the major waterways of what would become Rockbridge County were significant occupation and settlement sites for American Indians. The Maury River and its adjacent drainages lie within an area considered as having the potential to contain a substantial number of prehistoric sites. The evidence for *known* prehistoric archaeological sites within the Brushy Blue Trail project area and surrounding vicinity is rather sparse. However this is likely based less on the absence of sites, than on the lack of comprehensive archaeological surveys for the region. Short of a comprehensive project area vicinity survey, the potential for a particular area to contain prehistoric sites may only be generally predicted.

Previous archaeological surveys within or immediately adjacent to the project area have been limited and consist predominantly of mitigation work. Between 1950-1952, C. G. Holland conducted a five county survey including Rockbridge County. A total of 18 sites were identified along the Maury River but none within the project area vicinity. In 1975, Washington and Lee University conducted a survey of the Maury River flood plain adjacent to Buena Vista. The survey identified two prehistoric lithic scatter sites, 44RB0065 dating from the Middle Archaic to the Middle Woodland periods, and 44RB0066 dating to the Late Archaic period. Each of these sites received additional Phase II investigations. In 1982, a Washington and Lee University pedestrian and subsurface survey of the north bank of the Maury River along the Chessie Nature Trail identified three prehistoric sites, each adjacent to the Chessie Nature Trail. None of the sites were given state site numbers. Pedestrian and subsurface investigations were conducted on the 66-acre Green Forest Industrial Park for the City of Buena Vista in 1984. Two 20th c. ruins and two prehistoric lithic scatters (44RB267 and 44RB268) were identified adjacent to Chalk Mine Run and northeast of the City of Buena Vista. 44RB267 was found to be extensively disturbed but a Phase II investigation was subsequently initiated on 44RB268. In 1990, an intensive survey of the Hadson-Ultrasonics Coal Unloading Station in the City of Buena Vista was conducted. No sites were identified using standard shovel testing methods. In 1991, Archaeological Associates, Ltd. surveyed a portion of the Buena Vista flood plain. No prehistoric sites were identified. Finally, in 1991-1992, the College of William and Mary conducted a Phase I and II survey associated with the construction of the Buena Vista floodwall project.⁹

⁹ William and Mary, Center for Archaeological Research, "Phase I / II Archaeological Investigation of Area #4 and Documentation of the North River Navigation System (HAER VA-61) Associated with the Buena Vista Floodwall Project, Buena Vista, Virginia," 4. Prepared for Telemarc, Inc. and U. S. Army Corps of Engineers, Norfolk Division, 1992; John M. McDaniel, "Archaeological Sites Along the Chessie Trail," 123-136. In *Field Guide to the Chessie Nature Trail*, Larry I. Bland, ed. (Lexington: Rockbridge Area Conservation Council, 1988); Calvert W. McIlhany, "A Phase I Investigation of Archaeological Resources at the Green Forest Industrial Park, Rockbridge County, Virginia," ii, 1984. Report prepared by MAAR Associates, Inc., Bristol, Tennessee. Report submitted to City of Buena Vista, Buena Vista, Virginia.

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While several known prehistoric sites lie *adjacent* to the proposed Brushy Blue Trail, there are no *known* prehistoric sites *within the area of potential impact* encompassed by the 7.2 mile Chessie Nature Trail. Where the proposed Brushy Blue Trail leaves the Chessie Nature Trail west of Lexington and east of Buena Vista, the potential to impact *unknown* prehistoric sites becomes greater. Any type of trail development, other than the existing Richmond and Alleghany Railroad / Chessie Nature Trail bed, could have the potential to adversely impact unknown prehistoric sites.

Sensitive Historic Sites

For many of the same reasons as their American Indian predecessors, European Americans recognized the North River and its adjacent lands as a significant resource. Initial and continued regional settlement focused on the lands adjacent to the North River and Chessie Nature Trail project area.

North River Navigation Canal and associated features (1851 – 1877):

Along its approximately 7 mile length, the Chessie Nature Trail follows the approximate course of the North River Navigation. The North River Navigation was constructed between 1850 and 1860 and contains canals, locks, dams, aqueducts, toll houses and other related architectural and archaeological features. In 1880-1881, the Richmond and Alleghany Railroad built its line on the abandoned North River Navigation largely following the course of the canal and tow path. Historic resources associated with the North River Navigation are not currently listed on the Virginia Landmarks Register or the National Register of Historic Places.

Many of the North River Navigation features are located within or adjacent to the Brushy Blue Trail right-of-way. Those historic resources that lie within the Brushy Blue Trail right-of-way appear to be adequately preserved due to the ca. 1880-1881 fill required for the bed of the Richmond and Alleghany Railroad line. If the proposed Brushy Blue Trail stays within the bed of the former Richmond and Alleghany Railroad line, it is not anticipated that there will be any adverse impact to known or unknown North River Navigation features. If the Brushy Blue Trail leaves the bed of the former Richmond and Alleghany Railroad line, the impact to known or potential historical resources will have to be assessed on a case by case basis taking into consideration the location and integrity of the resource and the specific activity proposed.

Many of the existing bridges utilized by the Chessie Nature Trail use portions of known historical resources related to the North River Navigation. Any alteration to these features (e.g. aqueducts, dams, abutments, etc.) will need to take into consideration the sensitive nature of the resource.

Richmond and Alleghany Railroad (1881 – 1969)

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Along its approximately 7.2 mile length, the Chessie Nature Trail follows the bed of the former Lexington Branch of the Richmond and Alleghany Railroad. Constructed between 1880-1881, this was the first railroad to provide a direct link to the Buena Vista and Lexington area of Rockbridge County. The railroad was abandoned after hurricane Camille destroyed its line along the Maury River in 1969. The former portion of the Lexington Branch of the Richmond and Alleghany Railroad bed is not currently listed on the Virginia Landmarks Register or the National Register of Historic Places.

The minimal changes proposed to the existing Chessie Nature Trail and underlying railroad bed (e.g. scraping off organic matter on ballast, applying a crushed gravel base or top coat to fill in voids, and applying a light asphalt top coat), would not have an adverse impact on the integrity of this resource. For areas adjacent to the Richmond and Alleghany Railroad bed needing special treatment (e.g. correcting drainage, ditch problems, or water crossings), the problem areas would have to be identified and the potential impact of each solution assessed on a case by case basis. This assessment would need to take into consideration the location and integrity of known and potential historic resources and the specific activity proposed.

Many of the existing bridges utilized by the Chessie Nature Trail use portions of known historical resources related to the Richmond and Alleghany Railroad. Any proposed alteration to these features (e.g. river bridges, piers, abutments, etc.) will need to take into consideration the sensitive nature of the resource.

Recommendations

- It is strongly recommended that any proposed development of the 7.2 mile Chessie Nature Trail avoid all known historic resources. Where avoidance is not possible, archaeological mitigation may be necessary prior to construction development. Beyond the Chessie Nature Trail in the areas west of Lexington and east of Buena Vista, any new grading and hard surface trail construction have the potential to impact any unknown resources. In these areas, the CSPDC or its consultant may be required to conduct a Phase I archaeological identification survey along the proposed route.

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Task #4: Review of Section 106 Compliance

Section 106 of the National Historic Preservation Act Summary of Requirements

If Federal monies or a Federal permit is involved in the implementation of the proposed Brushy Blue Trail, the project may be required to undergo Section 106 Review.

Section 106 of the National Historic Preservation Act requires Federal Agencies to take into account the effects of their actions on historic properties and afford the Advisory Council on Historic Preservation (ACHP) an opportunity to comment. (See ACHP website for more details: <http://www.achp.gov/regs.html#800.1>).

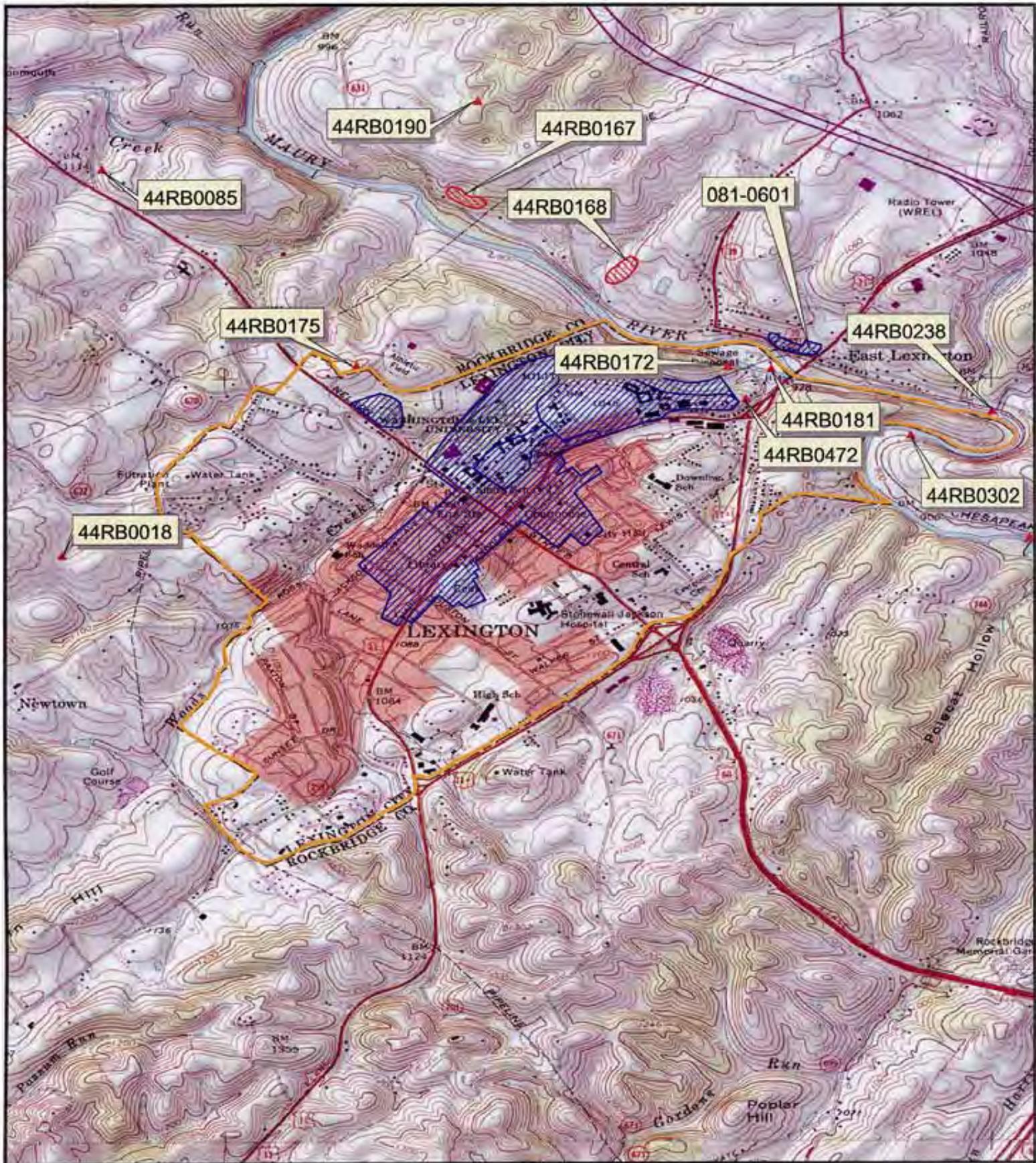
The goal of the Section 106 process is to identify historic properties that may be potentially affected by the Federal undertaking, assess its effects and ultimately seek ways to avoid, minimize or mitigate any adverse effects on historic properties.

If the Federal undertaking is determined to be a type of activity that may have a potential effect on historic properties, assuming such historic properties are present, the Federal Agency in consultation with the Department of Historic Resources in Richmond, Virginia (DHR) is required to determine and document the area of potential effects, review the existing information on historic properties within the area of potential effects, including any data on possible historic properties not yet identified, and make a good faith effort to carry out appropriate identification efforts.

If historic properties are identified, then an evaluation of historical significance according to the Criteria listed in the National Register of Historic Places must be carried out to determine whether the properties would be eligible for listing.

In consultation with DHR, the Federal Agency shall apply the criteria of adverse effect to historic properties within the area of potential effects. An adverse effect is found when an undertaking may alter, directly or indirectly, any of the characteristics of an historic property that qualify the property for inclusion in the National Register in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. A finding of no adverse effect is determined when the undertaking's effects do not meet the above criteria.

If an adverse effect is found, the Federal Agency in consultation with the SHPO shall develop and evaluate alternatives or modifications to the undertaking that could avoid, minimize or mitigate adverse effects on historic properties.



Virginia Department of Historic Resources
Historic Resources Location Map

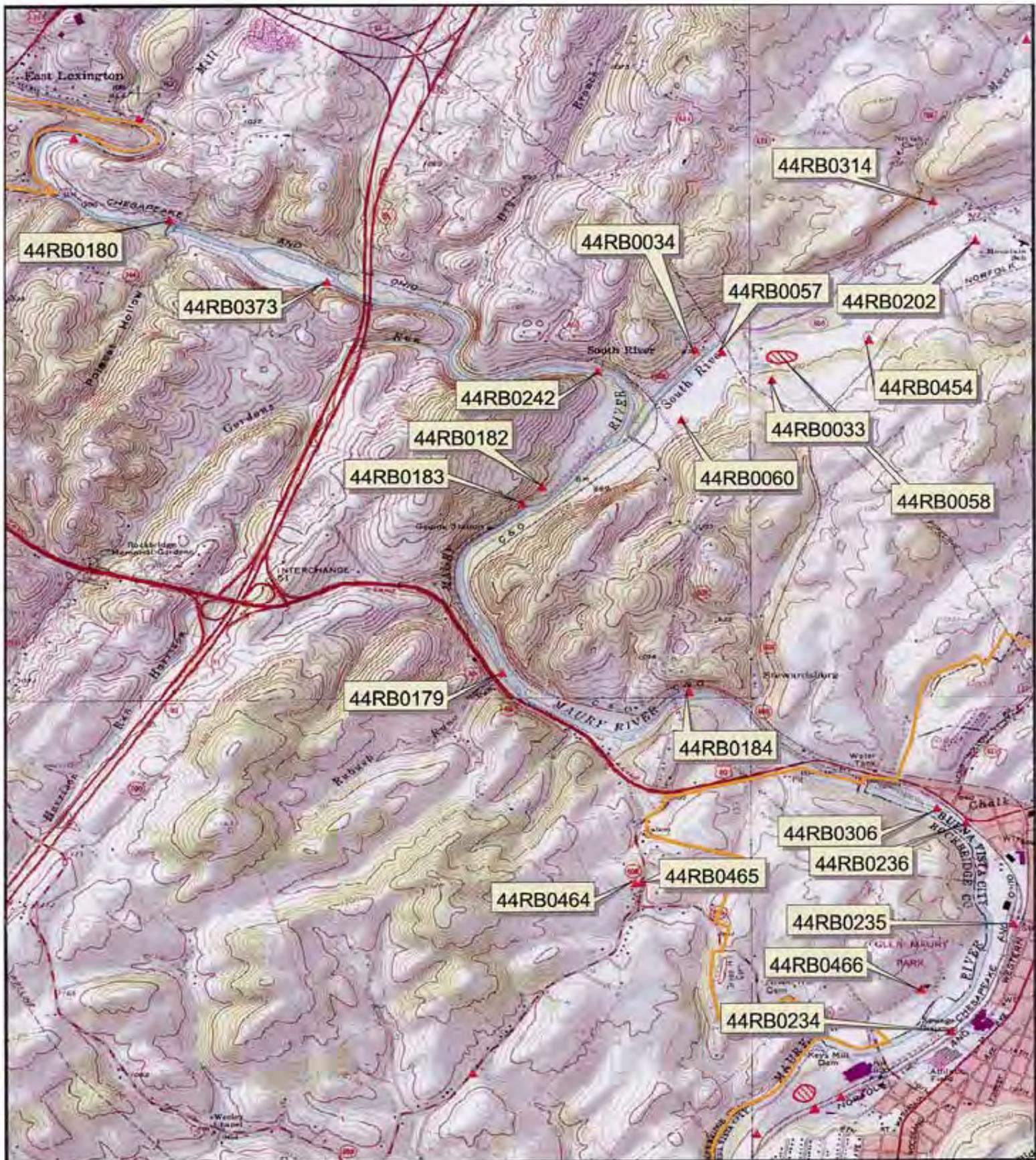
Project Name
 Project Information
 Quad/County
 Created by
 Created Date



- County.shp
- Architecture Points
- Architecture Lines
- Architecture Polygons
- Archaeology Polygons
- Archaeology Lines
- Archaeology Points



Data Source:
 Virginia Department of
 Historic Resources 2003,
 VDOT 2001, National
 Geographic 2003.



Virginia Department of Historic Resources
Historic Resources Location Map

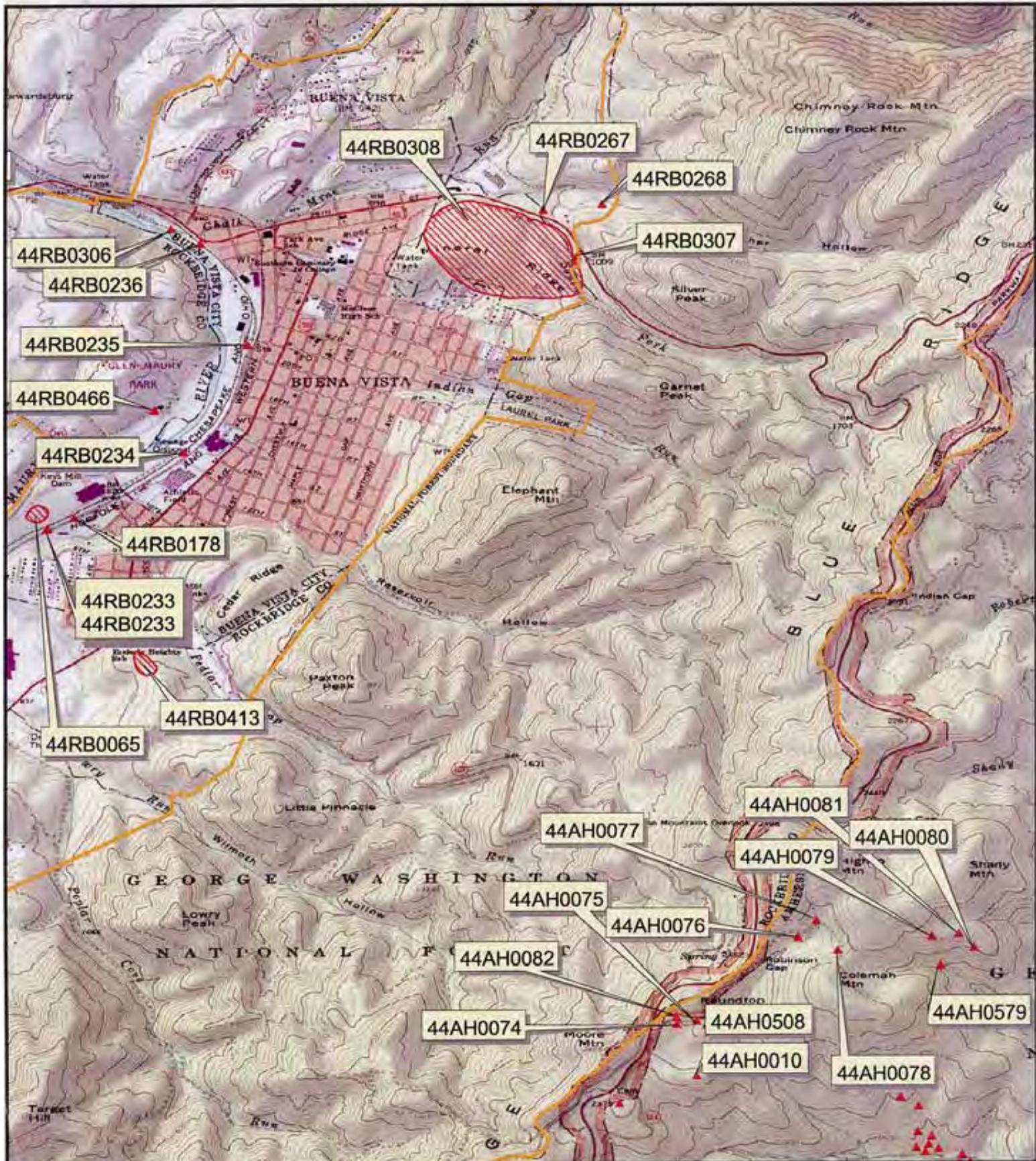
Project Name
 Project Information
 Quad/County
 Created by
 Created Date



-  County.shp
-  Architecture Points
-  Architecture Lines
-  Architecture Polygons
-  Archaeology Polygons
-  Archaeology Lines
-  Archaeology Points



Data Source:
 Virginia Department of
 Historic Resources 2003,
 VDOT 2001, National
 Geographic 2003.



Virginia Department of Historic Resources
Historic Resources Location Map

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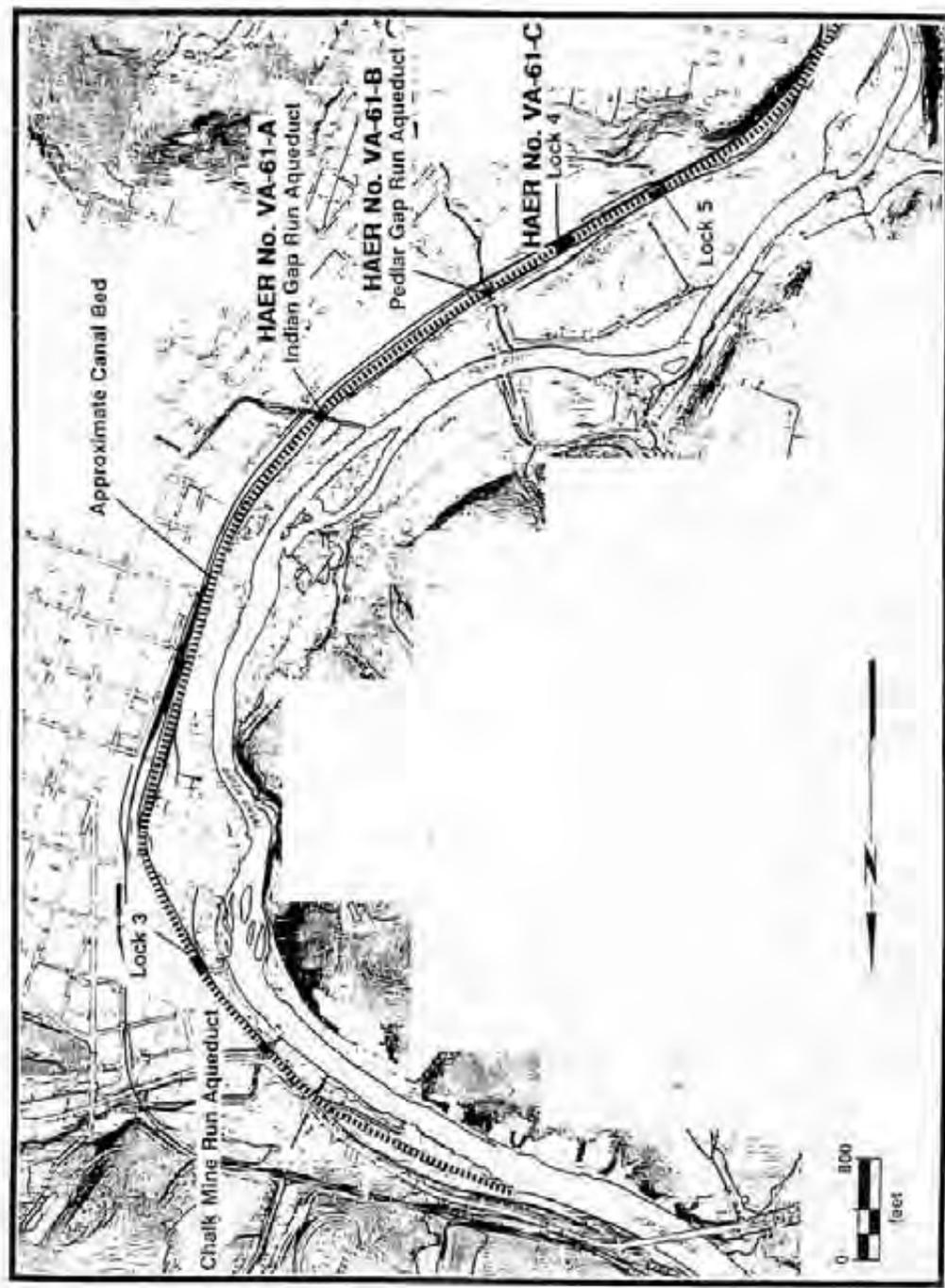
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-  County.shp
-  Architecture Points
-  Architecture Lines
-  Architecture Polygons
-  Archaeology Polygons
-  Archaeology Lines
-  Archaeology Points



Data Source:
 Virginia Department of
 Historic Resources 2003,
 VDOT 2001, National
 Geographic 2003.

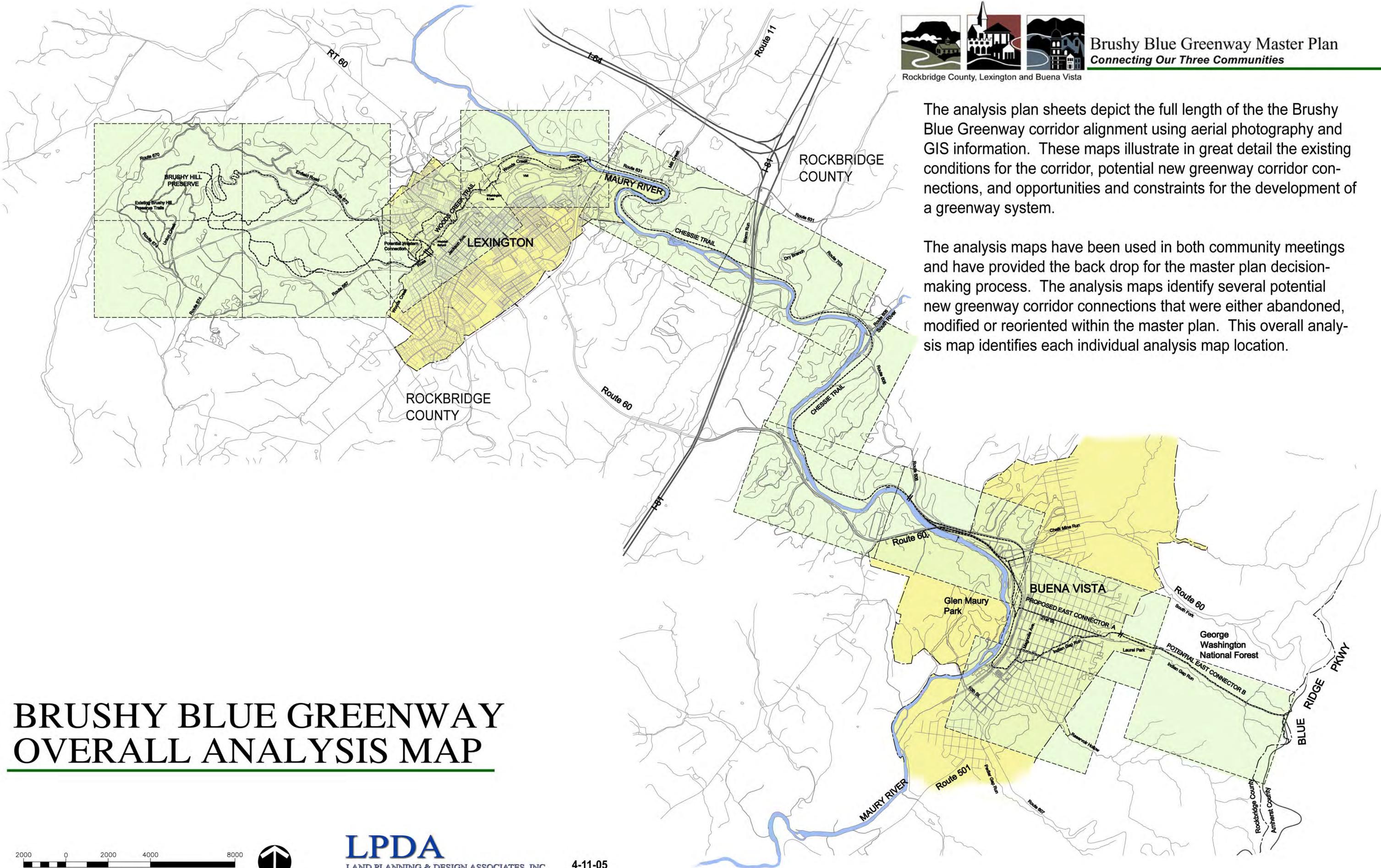
Site Plan



Analysis Maps for Brushy Blue Greenway

The analysis plan sheets depict the full length of the Brushy Blue Greenway corridor alignment using aerial photography and GIS information. These maps illustrate in great detail the existing conditions for the trail sections, potential new greenway corridor connections, and the opportunities and constraints for the development of a greenway system. The analysis maps have been used in both of the community meetings and provided the back drop for the master plan decision-making process. The analysis maps identify several potential new greenway corridor connections that were either abandoned, modified or reoriented within the master plan.

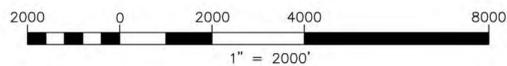




The analysis plan sheets depict the full length of the the Brushy Blue Greenway corridor alignment using aerial photography and GIS information. These maps illustrate in great detail the existing conditions for the corridor, potential new greenway corridor connections, and opportunities and constraints for the development of a greenway system.

The analysis maps have been used in both community meetings and have provided the back drop for the master plan decision-making process. The analysis maps identify several potential new greenway corridor connections that were either abandoned, modified or reoriented within the master plan. This overall analysis map identifies each individual analysis map location.

BRUSHY BLUE GREENWAY OVERALL ANALYSIS MAP



Cost Estimates for Brushy Blue Greenway

The cost estimates are organized by each corridor section. Each corridor section estimate is detailed with major elements required to complete the greenway trail. The cost estimates are general in nature, although ranges of costs are based on actual construction estimates and pricing from similar projects. The cost estimates are intended to provide a general magnitude of cost and assist in the decision-making process for selecting specific priorities or phases. Detailed cost estimates will have to be prepared for each portion of Brushy Blue Greenway as more detailed planning and design is completed.

Several assumptions were made in the cost estimates that have a direct bearing on cost and should be examined in more detail as each corridor section is developed.

Trail Surface – The master plan has made assumptions on the type of trail surface to be constructed for each section. Several greenway sections are divided into two different trail surface types:

- Section One - Proposed Greenway West, a pedestrian trail with a gravel surface and a 5-6' width, is estimated from Brushy Hills Preserve to Enfield Road. The remaining trail within this section is estimated using an asphalt surface with a 10' width.
- Section Two - Woods Creek Trail, is estimated using an asphalt surface with a 10' width.
- Section Three - Chessie Trail is estimated using an asphalt surface with a 10' width.
- Section Four - Proposed Greenway East A, is estimated with an asphalt surface with a 10' width from the Route 60 Bridge to the 21st Street trailhead parking area. From the parking along 21st Street to Laurel Park, a concrete surface with a 10' width was used. The alternate route for Proposed Greenway East A, along Indian Gap Run, is estimated using an asphalt surface with a 10' width.
- For Section 5 - Proposed Greenway East B, a pedestrian trail with a gravel surface and a 5-6' width was use for the estimate.

BRUSHY BLUE GREENWAY MASTERPLAN

Rockbridge County, Lexington and Buena Vista
Cost Estimate

7/30/2004

PROPOSED TRAIL WEST	\$603,468.75
ALTERNATE- NORTHEAST KENDAL with contingencies	\$162,287.50
ALTERNATE- ROSS RD with contingencies	\$520,743.75
ALTERNATE- BOXERWOOD PRIMARY SPUR. with contingencies	\$190,859.38
ALTERNATE- BOXERWOOD SECONDARY SPUR. with contingencies	\$51,540.63
ALTERNATE-SUNNYSIDE FARM PROPERTY OPTION with contingencies	\$48,165.00
WOODS CREEK TRAIL	\$1,272,981.25
ALTERNATE-ROUTE 11 BRIDGE with contingencies	\$189,881.25
CHESSIE TRAIL	\$4,143,347.50
PROPOSED TRAIL EAST A	\$1,059,137.50
ALTERNATE- INDIAN GAP/PORION OF LEVEE with contingencies	\$925,750.00
PROPOSED TRAIL EAST B	\$152,812.50
TOTAL PRIMARY GREENWAY TRAIL:	\$7,231,747.50

BRUSHY BLUE GREENWAY MASTERPLAN

Rockbridge County, Lexington and Buena Vista
Cost Estimate

7/30/2004

PROPOSED WESTERN CONNECTOR

18943 LF
3.59 MILES

GRADING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Clearing & Grubbing	6	ACRE	\$ 3,500.00	\$ 21,000.00
Regular Excavation	4200	CY	\$ 4.50	\$ 18,900.00
			Subtotal:	\$ 39,900.00

PAVEMENT ITEMS	QNTY.	UNIT	COST	SUBTOTAL
10' Asphalt Trail- (2" 9.5A over 6" 21-B)	8225	LF	\$ 35.00	\$ 287,875.00
5-6' wide- 3" gravel (21A) walking trail- 10718 LF	595	CY	\$ 100.00	\$ 59,500.00
Asphalt pavement-Parking on Route 674 Brushy Hills	4500	SF	\$ 3.00	\$ 13,500.00
Striping & Marking	2	LS	\$ 500.00	\$ 1,000.00
			Subtotal:	\$ 361,875.00

MISC. ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Site Furniture- Trashcans	2	EA	\$ 1,000.00	\$ 2,000.00
Site Furniture- benches	4	EA	\$ 1,200.00	\$ 4,800.00
Bollards- 8x8	14	EA	\$ 250.00	\$ 3,500.00
Bollard- Removable	5	EA	\$ 400.00	\$ 2,000.00
Interpretive Signage	3	EA	\$ 750.00	\$ 2,250.00
General Trail Signage	7	EA	\$ 300.00	\$ 2,100.00
LA GATES- Site 1- upgrade existing bridge in Kendal	1	EA	\$ 6,900.00	\$ 6,900.00
Striping & Marking	4	LS	\$ 500.00	\$ 2,000.00
Bike Racks	2	EA	\$ 1,000.00	\$ 2,000.00
			Subtotal:	\$ 27,550.00

EROSION CONTROL ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Construction Entrance	1	LS	\$ 2,000.00	\$ 2,000.00
General E&S Measures	6	AC	\$ 7,000.00	\$ 42,000.00
			Subtotal:	\$ 44,000.00

PLANTING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Large Shade Trees -2" cal.	10	EA	\$ 300.00	\$ 3,000.00
Flowering Trees - 1.5" cal.	10	EA	\$ 250.00	\$ 2,500.00
Evergreens - 6-8'	10	EA	\$ 200.00	\$ 2,000.00
Shrubs-large	25	EA	\$ 35.00	\$ 875.00
Shrubs-small	20	EA	\$ 20.00	\$ 400.00
Perennials/ Annuals	50	EA	\$ 10.00	\$ 500.00
Mulching	5	CY	\$ 35.00	\$ 175.00
			Subtotal:	\$ 9,450.00

ALTERNATE-KENDAL	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	660	CY	\$ 4.50	\$ 2,970.00
10' Asphalt Trail- (2" 9.5A over 6" 21-A)	3586	LF	\$ 35.00	\$ 125,510.00
General Trail Signage	2	EA	\$ 300.00	\$ 600.00
Interpretive Signage	1	EA	\$ 750.00	\$ 750.00
			Subtotal:	\$ 129,830.00

ALTERNATE- ROSS RD.	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	400	CY	\$ 8.00	\$ 3,200.00
General E&S Measures	0.5	AC	\$ 7,000.00	\$ 3,500.00
10' Asphalt Trail- (2" 9.5A over 6" 21-A)	1077	LF	\$ 35.00	\$ 37,695.00
Pedestrian Bridge Upgrade- trib. To Woods Creek	60	LF	\$ 325.00	\$ 19,500.00

Bollards- 8x8	4	EA	\$ 250.00	\$ 1,000.00
Bollard- Removable	2	EA	\$ 400.00	\$ 800.00
General Trail Signage	4	EA	\$ 300.00	\$ 1,200.00
Site Furniture- Trashcans	1	EA	\$ 1,000.00	\$ 1,000.00
Site Furniture- benches	1	EA	\$ 1,200.00	\$ 1,200.00
Striping & Marking	5	LS	\$ 500.00	\$ 2,500.00
Retaining Wall	1500	LF	\$ 200.00	\$ 300,000.00
Railing	1500	LF	\$ 30.00	\$ 45,000.00
			Subtotal:	\$ 416,595.00

ALTERNATE- BOXERWOOD PRIMARY SPUR.	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	775	CY	\$ 4.50	\$ 3,487.50
10' Asphalt Trail- (2" 9.5A over 6" 21-A)	4180	LF	\$ 35.00	\$ 146,300.00
Bollards- 8x8	4	EA	\$ 250.00	\$ 1,000.00
Bollard- Removable	2	EA	\$ 400.00	\$ 800.00
General Trail Signage	2	EA	\$ 300.00	\$ 600.00
Striping & Marking	1	LS	\$ 500.00	\$ 500.00
			Subtotal:	\$ 152,687.50

ALTERNATE- BOXERWOOD SECONDARY SPUR.	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	195	CY	\$ 4.50	\$ 877.50
10' Asphalt Trail- (2" 9.5A over 6" 21-A)	1053	LF	\$ 35.00	\$ 36,855.00
Bollards- 8x8	4	EA	\$ 250.00	\$ 1,000.00
Bollard- Removable	2	EA	\$ 400.00	\$ 800.00
General Trail Signage	4	EA	\$ 300.00	\$ 1,200.00
Striping & Marking	1	LS	\$ 500.00	\$ 500.00
			Subtotal:	\$ 41,232.50

ALTERNATE-SUNNYSIDE FARM PROPERTY OPTION	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	696	CY	\$ 4.50	\$ 3,132.00
5-6' wide- 3" gravel (21A) walking trail	348	CY	\$ 100.00	\$ 34,800.00
General Trail Signage	2	EA	\$ 300.00	\$ 600.00
			Subtotal:	\$ 38,532.00

SUBTOTAL	\$	482,775.00
15% CONTINGENCY	\$	72,416.25
10% MOBILIZATION	\$	48,277.50
TOTAL:		\$603,468.75

Prepared By: Land Planning and Design Associates Inc. Charlottesville, VA

BRUSHY BLUE GREENWAY MASTERPLAN

Rockbridge County, Lexington and Buena Vista

Cost Estimate

7/30/2004

WOODS CREEK TRAIL- LF OF TRAIL

12951 LF
2.45 MILES

GRADING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Clearing and Grubbing	3	AC	\$ 3,500.00	\$ 10,500.00
Regular Excavation	3500	CY	\$ 4.50	\$ 15,750.00
			Subtotal:	\$ 26,250.00

PAVEMENT ITEMS	QNTY.	UNIT	COST	SUBTOTAL
10' Asphalt Trail- (2" 9.5A over 6" 21-A)	11286	LF	\$ 35.00	\$ 395,010.00
Curb Ramp	10	EA	\$ 1,000.00	\$ 10,000.00
Striping & Marking	6	LS	\$ 500.00	\$ 3,000.00
			Subtotal:	\$ 408,010.00

MISC. ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Site Furniture- Trashcans	5	EA	\$ 1,000.00	\$ 5,000.00
Site Furniture- benches	10	EA	\$ 1,200.00	\$ 12,000.00
Bollards- 8x8	16	EA	\$ 250.00	\$ 4,000.00
Bollard- Removable	10	EA	\$ 400.00	\$ 4,000.00
Interpretive Signage	3	EA	\$ 750.00	\$ 2,250.00
General Trail Signage	18	EA	\$ 300.00	\$ 5,400.00
Bike Racks	4	EA	\$ 1,000.00	\$ 4,000.00
Railing	950	LF	\$ 30.00	\$ 28,500.00
New Pedestrian Bridge- trib. to Woods Creek	60	LF	\$ 800.00	\$ 48,000.00
New low wate crossing @ Woods Creek above Lime Kiln Rd.	1	EA	\$ 45,000.00	\$ 45,000.00
Alternate-LA GATES- Site 2-Bridge at Lime Kiln Rd.	1	EA	\$ 63,200.00	\$ 63,200.00
LA GATES- Site 3-low water crossing @ Woods Creek	1	EA	\$ 39,500.00	\$ 39,500.00
Upgrade low water crossing @ Woods below Nelson Rd.	1	EA	\$ 45,000.00	\$ 45,000.00
LA GATES- Site 4-Tunnel under Woods Creek.	1	EA	\$ 51,000.00	\$ 51,000.00
			Subtotal:	\$ 356,850.00

EROSION CONTROL ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Construction Entrance	2	LS	\$ 2,000.00	\$ 4,000.00
General E&S Measures	3	AC	\$ 7,000.00	\$ 21,000.00
Streambank Stabilization	950	LF	\$ 200.00	\$ 190,000.00
			Subtotal:	\$ 215,000.00

PLANTING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Large Shade Trees -2" cal.	20	EA	\$ 300.00	\$ 6,000.00
Flowering Trees - 1.5" cal.	10	EA	\$ 250.00	\$ 2,500.00
Evergreens - 6-8'	10	EA	\$ 200.00	\$ 2,000.00
Shrubs-large	20	EA	\$ 35.00	\$ 700.00
Shrubs-small	20	EA	\$ 20.00	\$ 400.00
Perennials/ Annuals	50	EA	\$ 10.00	\$ 500.00
Mulching	5	CY	\$ 35.00	\$ 175.00
			Subtotal:	\$ 12,275.00

ALTERNATE- ROUTE 11 BRIDGE	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	650	CY	\$ 4.50	\$ 2,925.00
10' Asphalt Trail- (2" 9.5A over 6" 21-A)	1000	LF	\$ 35.00	\$ 35,000.00
10' Concrete Modified Sidewalk Trail	10000	SF	\$ 5.00	\$ 50,000.00
Demolition Concrete	185	CY	\$ 8.00	\$ 1,480.00
Pedestrian Bridge- over creek in Jordan's Point Park	70	LF	\$ 800.00	\$ 56,000.00
Bollards- 8x8	4	EA	\$ 250.00	\$ 1,000.00
Bollard- Removable	2	EA	\$ 400.00	\$ 800.00
General Trail Signage	4	EA	\$ 300.00	\$ 1,200.00
Striping & Marking	7	LS	\$ 500.00	\$ 3,500.00
			Subtotal:	\$ 151,905.00

SUBTOTAL	\$	1,018,385.00
15% CONTINGENCY	\$	152,757.75
10% MOBILIZATION	\$	101,838.50
TOTAL:	\$	\$1,272,981.25

BRUSHY BLUE GREENWAY MASTERPLAN

Rockbridge County, Lexington and Buena Vista

Cost Estimate

7/30/2004

CHESSIE TRAIL

39745 LF
7.53 MILES

GRADING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Clearing and Grubbing	5	AC	\$ 3,500.00	\$ 17,500.00
Regular Excavation	11000	CY	\$ 4.50	\$ 49,500.00
			Subtotal:	\$ 67,000.00

UTILITY/DRAINAGE	QNTY.	UNIT	COST	SUBTOTAL
18" RCP Culvert	80	LF	\$ 40.00	\$ 3,200.00
			Subtotal:	\$ 3,200.00

PAVEMENT ITEMS	QNTY.	UNIT	COST	SUBTOTAL
10' Asphalt Trail- (2" 9.5A over 6" 21-B)	39745	LF	\$ 35.00	\$ 1,391,075.00
Striping & Marking	4	LS	\$ 500.00	\$ 2,000.00
Asphalt pavement-Pull off	1175	SF	\$ 3.00	\$ 3,525.00
			Subtotal:	\$ 1,396,600.00

MISC. ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Site Furniture- Trashcans	5	EA	\$ 1,000.00	\$ 5,000.00
Site Furniture- benches	10	EA	\$ 1,200.00	\$ 12,000.00
Bollards- 8x8	8	EA	\$ 250.00	\$ 2,000.00
Bollard- Removable	4	EA	\$ 400.00	\$ 1,600.00
Interpretive Signage	6	EA	\$ 750.00	\$ 4,500.00
General Trail Signage	14	EA	\$ 300.00	\$ 4,200.00
Bike Racks	3	EA	\$ 1,000.00	\$ 3,000.00
LA GATES- Site 6- Bridge @ vehicle road in Jordan's Point	1	EA	\$ 46,000.00	\$ 46,000.00
Site B- New low water bridge over Maury River	1	EA	\$ 550,000.00	\$ 550,000.00
LA GATES- Site 7-Ped bridge upgrade on Chessie	1	EA	\$ 58,000.00	\$ 58,000.00
LA GATES- Site 8-Ped bridge upgrade on Chessie	1	EA	\$ 76,500.00	\$ 76,500.00
Site 9-NEW BRIDGE @ South River 180' x 14'	1	EA	\$ 520,000.00	\$ 520,000.00
Cattle Gate- self closing	5	EA	\$ 2,000.00	\$ 10,000.00
Railing	2550	LF	\$ 30.00	\$ 76,500.00
			Subtotal:	\$ 1,369,300.00

EROSION CONTROL ITEMS	QNTY.	UNIT	COST	SUBTOTAL
General E&S Measures	18	AC	\$ 7,000.00	\$ 126,000.00
Construction Entrance	1	LS	\$ 2,000.00	\$ 2,000.00
Streambank Stabilization- several locations	500	LF	\$ 200.00	\$ 100,000.00
			Subtotal:	\$ 228,000.00

PLANTING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Large Shade Trees -2" cal.	50	EA	\$ 300.00	\$ 15,000.00
Flowering Trees - 1.5" cal.	25	EA	\$ 250.00	\$ 6,250.00
Evergreens - 6-8'	10	EA	\$ 200.00	\$ 2,000.00
Shrubs-large	25	EA	\$ 35.00	\$ 875.00
Shrubs-small	50	EA	\$ 20.00	\$ 1,000.00
Perennials/ Annuals	50	EA	\$ 10.00	\$ 500.00
Mulching	10	CY	\$ 35.00	\$ 350.00
			Subtotal:	\$ 25,975.00

TRAILHEAD ITEMS- Route 631/ Old Buena Vista Rd	QNTY.	UNIT	COST	SUBTOTAL
Clearing and Grubbing	1	AC	\$ 3,500.00	\$ 3,500.00
Regular Excavation	3500	CY	\$ 4.50	\$ 15,750.00
General E&S Measures	1	AC	\$ 7,000.00	\$ 7,000.00
Site Furniture- Trashcans	2	EA	\$ 1,000.00	\$ 2,000.00
Site Furniture- benches	2	EA	\$ 1,200.00	\$ 2,400.00
Bollards- 8x8	4	EA	\$ 250.00	\$ 1,000.00
Bollard- Removable	2	EA	\$ 400.00	\$ 800.00
Interpretive Signage	1	EA	\$ 750.00	\$ 750.00
General Trail Signage	4	EA	\$ 300.00	\$ 1,200.00
Bike Racks	2	EA	\$ 1,000.00	\$ 2,000.00
Curb Ramp	1	EA	\$ 1,000.00	\$ 1,000.00
Curbing	156	LF	\$ 9.00	\$ 1,404.00
Striping & Marking	1	LS	\$ 1,000.00	\$ 1,000.00
Asphalt pavement	11645	SF	\$ 3.00	\$ 34,935.00
3 Rail Fence	510	LF	\$ 20.00	\$ 10,200.00

Large Shade Trees -2" cal.	5	EA	\$ 300.00	\$ 1,500.00
Flowering Trees - 1.5" cal.	5	EA	\$ 250.00	\$ 1,250.00
Evergreens - 6-8'	5	EA	\$ 200.00	\$ 1,000.00
Shrubs-large	20	EA	\$ 35.00	\$ 700.00
Shrubs-small	25	EA	\$ 20.00	\$ 500.00
Perennials/ Annuals	50	EA	\$ 10.00	\$ 500.00
Mulching	2	CY	\$ 35.00	\$ 70.00
Subtotal:			\$	90,459.00

TRAILHEAD ITEMS- Highland Farm Rd./ South River	QNTY.	UNIT	COST	SUBTOTAL
Clearing and Grubbing	0.3	AC	\$ 3,500.00	\$ 1,050.00
Regular Excavation	500	CY	\$ 4.50	\$ 2,250.00
Site Furniture- Trashcans	2	EA	\$ 1,000.00	\$ 2,000.00
Site Furniture- benches	2	EA	\$ 1,200.00	\$ 2,400.00
Bollards- 8x8	4	EA	\$ 250.00	\$ 1,000.00
Bollard- Removable	2	EA	\$ 400.00	\$ 800.00
Interpretive Signage	1	EA	\$ 750.00	\$ 750.00
General Trail Signage	4	EA	\$ 300.00	\$ 1,200.00
Bike Racks	2	EA	\$ 1,000.00	\$ 2,000.00
Curb Ramp	1	EA	\$ 1,000.00	\$ 1,000.00
Curbing	156	LF	\$ 9.00	\$ 1,404.00
Striping & Marking	2	LS	\$ 500.00	\$ 1,000.00
Asphalt pavement	12000	SF	\$ 3.00	\$ 36,000.00
3 Rail Fence	510	LF	\$ 20.00	\$ 10,200.00
Large Shade Trees -2" cal.	5	EA	\$ 300.00	\$ 1,500.00
Flowering Trees - 1.5" cal.	5	EA	\$ 250.00	\$ 1,250.00
Evergreens - 6-8'	5	EA	\$ 200.00	\$ 1,000.00
Shrubs-large	20	EA	\$ 35.00	\$ 700.00
Shrubs-small	25	EA	\$ 20.00	\$ 500.00
Perennials/ Annuals	50	EA	\$ 10.00	\$ 500.00
Mulching	2	CY	\$ 35.00	\$ 70.00
Subtotal:			\$	68,574.00

TRAILHEAD ITEMS- Stewardsburg Rd.	QNTY.	UNIT	COST	SUBTOTAL
Clearing and Grubbing	1	AC	\$ 3,500.00	\$ 3,500.00
Regular Excavation	1000	CY	\$ 4.50	\$ 4,500.00
River ramp improvements	1	EA	\$ 5,000.00	\$ 5,000.00
Site Furniture- Trashcans	2	EA	\$ 1,000.00	\$ 2,000.00
Site Furniture- benches	2	EA	\$ 1,200.00	\$ 2,400.00
Bollards- 8x8	10	EA	\$ 250.00	\$ 2,500.00
Bollard- Removable	2	EA	\$ 400.00	\$ 800.00
Interpretive Signage	1	EA	\$ 750.00	\$ 750.00
General Trail Signage	4	EA	\$ 300.00	\$ 1,200.00
Bike Racks	1	EA	\$ 1,000.00	\$ 1,000.00
Curb Ramp	1	EA	\$ 1,000.00	\$ 1,000.00
Curbing	100	LF	\$ 9.00	\$ 900.00
Striping & Marking	2	LS	\$ 500.00	\$ 1,000.00
Asphalt pavement	9500	SF	\$ 3.00	\$ 28,500.00
3 Rail Fence	250	LF	\$ 20.00	\$ 5,000.00
Large Shade Trees -2" cal.	5	EA	\$ 300.00	\$ 1,500.00
Flowering Trees - 1.5" cal.	5	EA	\$ 250.00	\$ 1,250.00
Evergreens - 6-8'	5	EA	\$ 200.00	\$ 1,000.00
Shrubs-large	20	EA	\$ 35.00	\$ 700.00
Shrubs-small	25	EA	\$ 20.00	\$ 500.00
Perennials/ Annuals	50	EA	\$ 10.00	\$ 500.00
Mulching	2	CY	\$ 35.00	\$ 70.00
Subtotal:			\$	65,570.00

SUBTOTAL \$ 3,314,678.00

15% CONTINGENCY \$ 497,201.70

10% MOBILIZATION \$ 331,467.80

TOTAL: \$4,143,347.50

BRUSHY BLUE GREENWAY MASTERPLAN

Rockbridge County, Lexington and Buena Vista

Cost Estimate

7/30/2004

PROPOSED TRAIL EAST A

12440 LF
2.36 MILES

GRADING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	3700	CY	\$ 4.50	\$ 16,650.00
Clearing & Grubbing	2	ACRE	\$ 3,500.00	\$ 7,000.00
Demolition Concrete	750	CY	\$ 8.00	\$ 6,000.00
			Subtotal:	\$ 29,650.00

PAVEMENT ITEMS	QNTY.	UNIT	COST	SUBTOTAL
10' Asphalt Trail- (2" 9.5A over 6" 21-A)	7940	LF	\$ 35.00	\$ 277,900.00
10' Concrete Modified Sidewalk Trail	45000	SF	\$ 5.00	\$ 225,000.00
Curb Ramp	45	EA	\$ 1,000.00	\$ 45,000.00
Curbing	500	LF	\$ 9.00	\$ 4,500.00
Striping & Marking	18	LS	\$ 500.00	\$ 9,000.00
			Subtotal:	\$ 561,400.00

MISC. ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Site Furniture- Trashcans	10	EA	\$ 1,000.00	\$ 10,000.00
Site Furniture- benches	10	EA	\$ 1,200.00	\$ 12,000.00
Bollards- 8x8	16	EA	\$ 250.00	\$ 4,000.00
Bollard- Removable	8	EA	\$ 400.00	\$ 3,200.00
Interpretive Signage	3	EA	\$ 750.00	\$ 2,250.00
General Trail Signage	20	EA	\$ 300.00	\$ 6,000.00
Bike Racks	10	EA	\$ 1,000.00	\$ 10,000.00
Pedestrian Bridge @ RR	100	LF	\$ 800.00	\$ 80,000.00
Planter Pots	20	EA	\$ 200.00	\$ 4,000.00
In ground Tree Planter	20	EA	\$ 1,500.00	\$ 30,000.00
			Subtotal:	\$ 161,450.00

EROSION CONTROL ITEMS	QNTY.	UNIT	COST	SUBTOTAL
General E&S Measures	2	AC	\$ 7,000.00	\$ 14,000.00
Construction Entrance	1	LS	\$ 2,000.00	\$ 2,000.00
			Subtotal:	\$ 16,000.00

PLANTING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Large Shade Trees -2" cal.	75	EA	\$ 300.00	\$ 22,500.00
Flowering Trees - 1.5" cal.	25	EA	\$ 250.00	\$ 6,250.00
Evergreens - 6-8'	20	EA	\$ 200.00	\$ 4,000.00
Shrubs-large	50	EA	\$ 35.00	\$ 1,750.00
Shrubs-small	50	EA	\$ 20.00	\$ 1,000.00
Perennials/ Annuals	150	EA	\$ 10.00	\$ 1,500.00
Mulching	15	CY	\$ 35.00	\$ 525.00
			Subtotal:	\$ 37,525.00

TRAILHEAD ITEMS- BY LEVEE	QNTY.	UNIT	COST	SUBTOTAL
Site Furniture- Trashcans	2	EA	\$ 1,000.00	\$ 2,000.00
Site Furniture- benches	2	EA	\$ 1,200.00	\$ 2,400.00
Bollards- 8x8	14	EA	\$ 250.00	\$ 3,500.00
Bollard- Removable	4	EA	\$ 400.00	\$ 1,600.00
Interpretive Signage	1	EA	\$ 750.00	\$ 750.00
General Trail Signage	2	EA	\$ 300.00	\$ 600.00
Bike Racks	2	EA	\$ 1,000.00	\$ 2,000.00
Striping & Marking	1	LS	\$ 500.00	\$ 500.00

Asphalt pavement	6970	SF	\$ 3.00	\$ 20,910.00
Large Shade Trees -2" cal.	10	EA	\$ 300.00	\$ 3,000.00
Flowering Trees - 1.5" cal.	5	EA	\$ 250.00	\$ 1,250.00
Evergreens - 6-8'	5	EA	\$ 200.00	\$ 1,000.00
Shrubs-large	20	EA	\$ 35.00	\$ 700.00
Shrubs-small	20	EA	\$ 20.00	\$ 400.00
Perennials/ Annuals	50	EA	\$ 10.00	\$ 500.00
Mulching	5	CY	\$ 35.00	\$ 175.00
Subtotal:			\$	41,285.00

ALTERNATE- INDIAN GAP/LEVEE TRAIL	QNTY.	UNIT	COST	SUBTOTAL
Regular Excavation	400	CY	\$ 8.00	\$ 3,200.00
General E&S Measures	4	AC	\$ 7,000.00	\$ 28,000.00
10' Asphalt Trail- (2" 9.5A over 6" 21-B)	13000	LF	\$ 35.00	\$ 455,000.00
Bollards- 8x8	60	EA	\$ 250.00	\$ 15,000.00
Bollard- Removable	16	EA	\$ 400.00	\$ 6,400.00
Interpretive Signage	2	EA	\$ 750.00	\$ 1,500.00
General Trail Signage	14	EA	\$ 300.00	\$ 4,200.00
Striping & Marking	19	LS	\$ 500.00	\$ 9,500.00
Streambank Stabilization	300	LF	\$ 200.00	\$ 60,000.00
Railing	1885	LF	\$ 30.00	\$ 56,550.00
Pedestrian Bridges- two on Indian Gap Run	150	LF	\$ 600.00	\$ 90,000.00
Large Shade Trees -2" cal.	25	EA	\$ 300.00	\$ 7,500.00
Shrubs-large	50	EA	\$ 35.00	\$ 1,750.00
Shrubs-small	100	EA	\$ 20.00	\$ 2,000.00
Subtotal:			\$	740,600.00

SUBTOTAL	\$	847,310.00
15% CONTINGENCY	\$	127,096.50
10% MOBILIZATION	\$	84,731.00
TOTAL:		\$1,059,137.50

Prepared By: Land Planning and Design Associates Inc. Charlottesville, VA

BRUSHY BLUE GREENWAY MASTERPLAN

Rockbridge County, Lexington and Buena Vista
Cost Estimate

7/30/2004

PROPOSED TRAIL EAST B

10293 LF
1.95 MILES

GRADING ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Clearing & Grubbing	2	ACRE	\$ 3,500.00	\$ 7,000.00
Regular Excavation	1500	CY	\$ 4.50	\$ 6,750.00
Tree Protection Measures	1	LS	\$ 10,000.00	\$ 10,000.00
			Subtotal:	\$ 23,750.00

UTILITY/DRAINAGE	QNTY.	UNIT	COST	SUBTOTAL
Drainage Diversion	83	EA	\$ 100.00	\$ 8,300.00
			Subtotal:	\$ 8,300.00

PAVEMENT ITEMS	QNTY.	UNIT	COST	SUBTOTAL
5-6' wide- 3" gravel (21A) walking trail	490	CY	\$ 100.00	\$ 49,000.00
			Subtotal:	\$ 49,000.00

MISC. ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Site Furniture- Trashcans	2	EA	\$ 1,000.00	\$ 2,000.00
Site Furniture- benches	3	EA	\$ 1,200.00	\$ 3,600.00
Bollards- 8x8	2	EA	\$ 250.00	\$ 500.00
Bollard- Removable	1	EA	\$ 400.00	\$ 400.00
Interpretive Signage	2	EA	\$ 750.00	\$ 1,500.00
General Trail Signage	4	EA	\$ 300.00	\$ 1,200.00
Bike Racks	1	EA	\$ 1,000.00	\$ 1,000.00
Pedestrian Bridge- small over Indian Gagg Creek	60	LF	\$ 250.00	\$ 15,000.00
			Subtotal:	\$ 25,200.00

EROSION CONTROL ITEMS	QNTY.	UNIT	COST	SUBTOTAL
Construction Entrance	1	LS	\$ 2,000.00	\$ 2,000.00
General E&S Measures	2	AC	\$ 7,000.00	\$ 14,000.00
			Subtotal:	\$ 16,000.00

SUBTOTAL \$ 122,250.00

15% CONTINGENCY \$ 18,337.50

10% MOBILIZATION \$ 12,225.00

TOTAL: \$152,812.50

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