

East Roanoke River Greenway

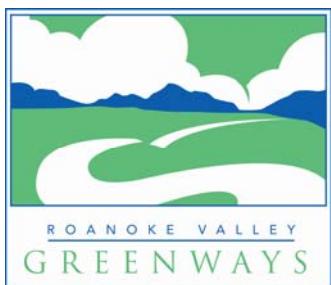
Master Plan



May 2003

Project Team

Prepared for:



Roanoke Valley Greenway Commission

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S T U D I O

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Introduction

Somewhere in geologic time, after many eons of persistently and patiently groping its way toward the sea, the Roanoke River breached the barricade formed by the eastern rim of the Roanoke Valley. Over time, people - from members of early indigenous tribes to modern railroad builders – have taken advantage of that breach. This document proposes that the community once again make use of this gap in the mountains; in this case, to build the East Roanoke River Greenway.

The East Roanoke River Master Plan contained in this report includes:

- a base map with existing conditions and landownership,
- an assessment of resources,
- a description alternative locations on the north and south sides of the river,
- an evaluation of constraints,
- a summary of citizen input,
- an estimation of costs, and
- a listing of possible trail locations suitable for further in-depth study (ie. Preliminary Engineering Report).

Background

The East Roanoke River Greenway will extend along a six mile stretch of the Roanoke River from the Roanoke City limits through the Town of Vinton and Roanoke County to Virginia's Explore Park. As indicated by its name, this greenway is the eastern-most portion of the Roanoke River Greenway, which, in turn, is considered the "backbone" of the Roanoke Valley greenway network.

Roanoke River Greenway

In time, the Roanoke River Greenway will be a 23-mile long linear park running west-east through the Valley. With its bicycle/pedestrian path, the greenway will make it possible to travel from Green Hill Park in Roanoke County through Salem, Roanoke City, Vinton, Roanoke County and, finally, Virginia's Explore Park, without an automobile. It will provide linkages to neighborhoods, industrial facilities, commercial areas, parks, schools, tourist destinations, and sports complexes. In addition, the greenway will offer a number of important opportunities, including conserving existing tree canopies, planting additional trees in denuded areas, establishing a riparian buffer along the Roanoke River, providing access to visitors and citizens, and utilizing the many environmental, ecological, and historical aspects of this river corridor for educational purposes.

What is a Greenway?

At their most basic, Greenways are linear spaces set aside to serve specific functions. These functions may include providing recreational space, serving as alternate (non-vehicular) transportation corridors, and protecting or enhancing natural and cultural resources.

Greenways are often built along rivers and streams, as well as scenic and historic routes. They often form an entire network, connecting important community features such as parks, cultural sites, schools, libraries, etc.

Process

The East Roanoke River Greenway project began in early spring of 2002. The Greenway Commission has worked hard to complete a vision for the entire Roanoke River. This Eastern section is the last leg and contains some of the most challenging terrain of the greenway network. Once the Commission secured funding for a greenway study, a request for proposals was issued by the County of Roanoke soliciting a master plan study of the feasibility and location possibilities of the Roanoke River Greenway along its eastern section.

Hill Studio, P.C. was brought on the team in early spring 2002. While the scope of work was finalized, Hill Studio began gathering field information. It was critical to gather as much understanding of the river, the river's gorge and rim, a cliff, and the overall land features in and around the river before new spring leaves come out. These field investigations consisted of using aerial photography and the vantage point of a canoe. This provided the project team a great understanding of the challenges involved in designing a greenway along a river with steep topography, narrow floodplains, and sensitive natural areas.

With a wealth of field gathered photographs, river experience and aerial maps in-hand, Hill Studio prepared an opportunities and constraints map of the project area with initial routes depicted as North and South Alternates. This aerial map and field work experience assisted the project Team in making preliminary decisions about greenway route locations.

Before the team continued further, a public workshop was held. The goal of this workshop was to solicit support, flush-out problems, and make local citizens and landowners aware of the project and its status. Approximately 100 people attended the meeting. They were generally very supportive of the project. Appendix A contains comments from the workshop.

Following the public workshop, the design team met many times to narrow down the choices for trail location. Cost figures were prepared section-by-section. The team found that the number of bridges and retaining structures needed for a particular section of trail became very important deciding factors. A retaining structure or bridge can raise cost to the point that a specific route is no longer feasible. Bridges and retaining structures may also mar the landscape with man-made structures in the very places that are being sought for their pristine natural beauty. Where retaining structures could not be avoided, the team attempted to keep them adjacent to the railroad corridor. Placing retaining structures where the railroad has already left its mark on the land, these man-made retaining walls will have less negative effect on the surrounding natural areas and scenic qualities of the river. Please see pages 34 through 39 for specific cost figures.

While choosing cost effective locations was a prime consideration, the team also considered other factors as well. Optimum trail locations considered the presence of south-facing (warm) slopes, natural features, views, access points for connecting to neighborhoods, disturbances to sensitive areas, landownership patterns, destinations, etc. These issues are discussed in the next section.

Once a thorough understanding of the public's input, opportunities and constraints, associated costs, and the key access points for neighboring communities had been gained, the Master Plan process leaped forward. The greenway trail was narrowed down to several alternate locations. These alternates are presented in this document.

Throughout the master planning process many alternatives were studied, and evaluated as previously mentioned. This process however has made apparent the difficulty in choosing a particular "preferred" alternative. Due to limited field data, and the general nature of this master plan, this document represents findings of many possible segments, and any number of possible combinations of these segments that can be made. Due to the simple nature of this project and the need for a Preliminary Engineering Report (PER) to show more accurate costs based on specific field data issues, a "preferred" alternative would be premature with this report.

The Master Plan presents the many possible segments and leaves open the possibility of putting together any number of segment combinations. This report attempts to delineate, describe, and define these segments and does not give preference to any particular segment combination.

Issues

A number of issues arose during the planning process that had to be addressed. These issues pertain to some or all of the segments, sometimes as opportunities, constraints, and can usually be thought of as things to consider.

Flooding

Many trail segments along the greenway will be subject to flooding. During a normal flood, these segments would be in a section of stream flow with slower moving water compared to the main channel. That means the trail will be subjected to silting, as well as being covered with debris. This presents additional operation and maintenance expense.

The greenway bridges should be built so that they are above the flood plain and do not affect water flow.

Security

Security is of particular concern for all segments. The trail will pass through some very isolated areas, and the available vehicle access points are limited. Some segments have more security concerns than others. In some places the greenway is nestled between the river and the railroad. This would propose long sections of the trail with no outside access. There is a possible future neighborhood connection at Wolf Creek, which would break up isolated stretches.

Several suggestions concerning security and safety have been made. The first would be to place call boxes along the greenway in critical areas and at equal intervals. This would allow trail users to contact emergency services if needed. Another suggestion is to have daily bike patrols along the greenway to show the presence of law enforcement along the trail.

Another concern will be to ensure that key locations have emergency vehicular access to get EMS equipment to all parts of the greenway, leaving no particular segment too remote from such services.

Niagara Dam

Niagara Dam presents a physical obstacle for the greenway, as well as a safety hazard. American Electric Power (AEP) continues to generate small amounts of electricity at this station, so the Greenway Commission must coordinate with AEP to find a safe and suitable passage around the facility. Currently, there exists a portage road around the dam, this can be adapted to suit the greenway if done safely.

Retaining Walls/Lay of the Land

The topography along the river within the project area ranges from flat fields to steep cliffs. Most of the proposed segment designs considered ADA access, and attempted locations

relevant to this requirement. Retaining walls will be required on some segments of the trail.

There are several locations where retaining walls will be needed along the proposed greenway segments because available land adjacent to the river is very narrow. Retaining walls are expensive and can require large equipment to build. The retaining walls in most cases would be located along the waters edge and would have to support fill adjacent to the railroad tracks or rock outcrops. Special plans for getting equipment to the site during construction will need to be made. This will incur additional construction costs.

Guardrails and railings will be required to be put in place with these retaining structures to prevent personal injuries and falling. These railings may inhibit the flow of water during floods if waters raise above the retaining structures.

It is possible to construct retaining walls that look natural in appearance (called faux rock); however, these treatments can be expensive, especially if done correctly.

Private Land

The trail will cross several tracts of private land. The Greenway Commission will want to negotiate with land owners to reach an agreement on purchasing right-of-way easements.

Soils

Soils vary tremendously throughout the project area. This is due to the fact that the trail system negotiates a variety of land types, each having its own subsoil and bedrock make-up. The typical land types include floodplains, land benches, former river bottoms, steep cliffs, man-made fill slopes, steep terrain side-slopes, and ridges. Geological forces have acted upon each of these land types in a different way, thus creating a variety of soils.

The most challenging of the soil types are those of the river's floodplain. These soils typically contain sediments and fine particulates that are soft and powdery when dry and gooey and spongy when wet. Managing trail construction in these areas will require a unique approach to stabilizing these spongy sub grade soils. Geosynthetic products may be used to help resist and stabilize these soils by creating a blanket or layer that makes an integral structural aggregate fill upon which the trail can be built. This ideally will reduce the amount of excavation necessary in areas with this type of unsuitable soil.

Norfolk Southern Railroad

The Norfolk Southern Railroad parallels the Roanoke River for the entire distance of the north side trail segments along the river except for the southern section of Segment J in Bedford County. Norfolk Southern has indicated that it may require railroad tracks be separated from the greenway by a fence in order to help eliminate personal injury along the tracks. This is a high speed track carrying heavy freight traffic. The railroad isolates the river because it restricts vehicle access and also presents a safety concern for recreationists.

Access

Access to the greenway is an issue because there are long sections separated by topography, railroads, water, and or land ownership patterns.

Trailhead locations are recommended as often as possible. Trailheads should be safe, and provide an easily accessible entry onto the trail system. Major access points that are suitable for trailhead locations include the following spots:

- 13th Street Bridge over the Roanoke River
- Golden Park
- Tinker Creek Trail Connection
- Niagara Dam (Holland Property)
- Blue Ridge Parkway Niagara Dam Overlook
- Roanoke River Parkway Overlooks
- Explore Park Service Road Entrance
- End of Rutrough Road at convergence of the Roanoke River and Back Creek
- Explore Park

These trailheads will often provide vehicle parking, trail information kiosks, as well as direct access to the greenway and potentially provide restroom facilities as the trails usage grows in popularity.

Project Location

The East Roanoke River Greenway project involves the City of Roanoke, County of Roanoke, and the Town of Vinton. It begins at the 13th Street Bridge near the Regional Wastewater Treatment Facility, and continues downstream for approximately six river-miles to Back Creek.

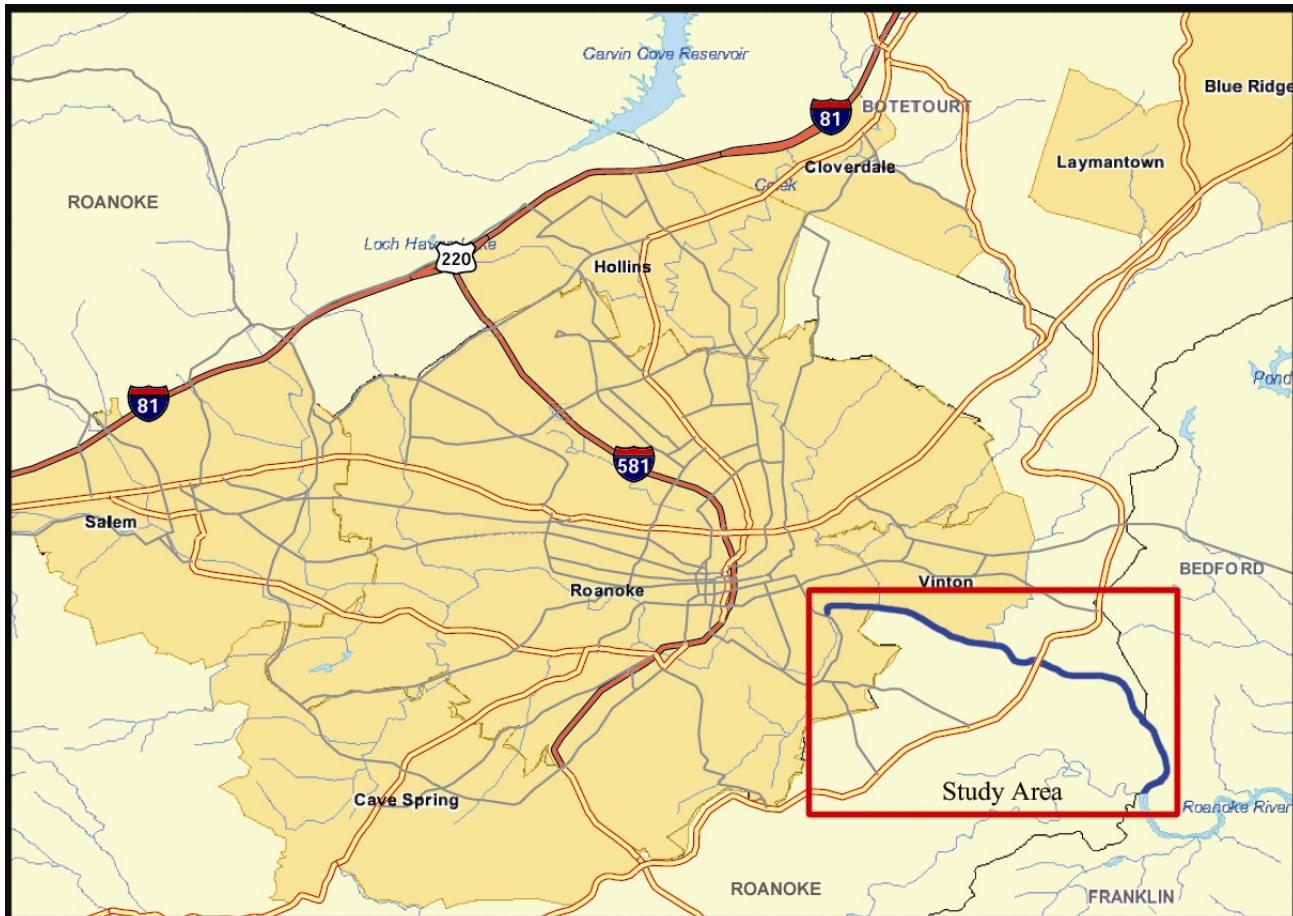


Figure 1 Location of Greenway in Roanoke, VA

Trail Descriptions

For the purposes of presentation, the routes considered for this plan have been divided into sections as shown in the diagram below. For a detailed map of the trail and its segments, please see page 21.

Segments A,B,C,D,E,F,G,H,I,J,K,L,M

Trail segments A and B are classified as Class I trails and are ADA accessible. Class I trails consist of a hard type surface (asphalt, concrete, resin or soil cement). Its width varies from 10 to 12 feet wide and contains grades of 0 to 5 %. Optimum activities include bicycling, in-line skating (roller blading), walking, running, and wheel chairs. Class I trails are not suitable for horseback riding or mountain biking, unless provisions are made for usage rights-of-way or adjacent parallel trails are provided for these users.

Trail segments C,D,E,F,G,H,I,K,L, and M are classified as a Class II trails for their entire length. A Class II trail can consist of either hard or soft type surfaces, such as asphalt, concrete, resin, soil cement, stone dust, or well-compacted fine-aggregate surface. Its width varies anywhere from 4' to 8' wide and contains grades of 0 to 12 %. Optimum activities for a Class II trail consist of casual bicycling, walking, interpretation, running, horseback riding, and hiking. Class II trails are not designed for activities such as in-line skating and present some accessibility issues for those with physical handicaps. Class II trails are not always ADA accessible

Trail segment J is classified as a Class III trial (nature trail). Class III trails consist of a soft type surface, such as stone and/or dust surface and measure anywhere from 18 to 48" inches wide. They contain grades up to, but no greater than, 20%. These trails usually have rough, rooty surfaces, and are very narrow. Stairs and/or switchbacks are common on these trails. Class III trails are used for hiking, walking, running, some mountain biking, and, in special cases, horseback riding if provisions are made for usage rights-of-way and trail etiquette usage.

The detailed maps beginning on page 21 show tenth of a mile increments as light blue dots with the mile points labeled as to their specific distance from the beginning of the segment. The charts detailing each segment begin on the next page show particular items along the trail and specify the mile marker where they can be found.

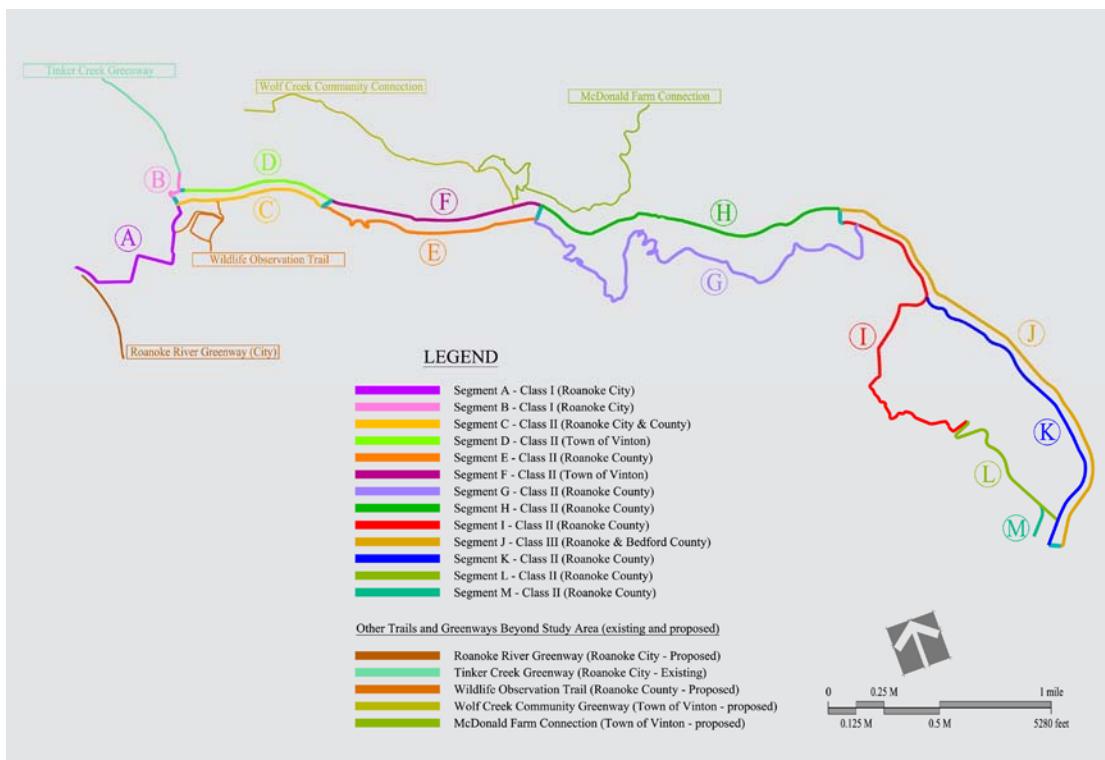


Figure 2 - Greenway Segments

Segment A

- 0.0 Segment A starting point at 13th Street Bridge.
- 0.1 Trail turns left onto Carlisle Avenue and proceeds east.
- 0.25 Trail turns left onto Spruce Street and proceeds northeast.
- 0.33 Golden Park, City of Roanoke, Virginia.
- 0.38 Trail turns right onto Underhill Avenue and proceeds southeast.
- 0.49 Trail proceeds straight through intersection with 16th Street, and continues along Underhill Avenue heading southeast.
- 0.54 Trail follows Underhill Avenue around corner to the Underhill Avenue access gates for the Roanoke Valley Wastewater Treatment Plant.
- 0.58 Trail enters Roanoke Valley Wastewater Treatment Plant property and proceeds in a northerly direction between four different sludge ponds within the facility. As the trail enters this property it provides access to a planned nature loop trail around an old treatment plant pond. This pond is well known for the abundance of birds that flock to it because of rich feeding resources. The pond will be turned into a wetland. The future loop trail would connect back to the trail at mile marker 1.0.
- 0.82 Trail meets the Roanoke River and intersection with Segments B and C.

Segment A is approximately 0.82 miles in length.

Segment B

- 0.0 Trail starts at end of bridge crossing Roanoke River from the South side.
- 0.07 Trail intersects with bridge crossing Tinker Creek to Segment D.
- 0.17 Trail connects to southern end of the Tinker Creek Greenway.

Segment B is approximately 0.17 miles in length.

Segment C

- 0.0 Trail proceeds east along the south side of the river.
- 0.25 Trail leaves Roanoke Wastewater Treatment Plant property and enters American Electric Power property easement along the river.
- 0.7 Trail segment ends at intersection of Segment E and Bridge 3 (B3).

Segment C is approximately 0.7 miles in length.

Segment D

0.41 Trail proceeds onto retaining structure between the edge of the river and the Norfolk Southern Railroad track. The retaining structure extends from this point to mile marker 0.68. The trail and retaining structure remain on American Electric Power property within this segment.

0.7 Segment ends at Bridge 3 (B3).

Segment D is approximately 0.7 miles in length.

Segment E

0.0 Segment begins at intersection of Segment C and Bridge 3 (B3). Trail proceeds east along south side of river and crosses onto private property at segment marker 0.06.

0.06 Trail proceeds in a southeast direction up a hill away from the river to get around a large rock outcropping located on private property.

0.4 Trail rejoins river side and proceeds east on private property to segment marker 0.47.

0.47 Trail leaves private property and enters AEP property along river.

0.5 Trail leaves AEP property and proceeds back onto private land until segment marker 0.7.

0.6 Trail joins AEP property and proceeds along the river to the end of segment at segment marker 1.11. At this location the trail intersects with Bridge 4 (B4) and Segment G.

Segment E is approximately 1.11 miles in length.

Segment F

0.0 Segment begins at intersection of Segment D and Bridge 3 (B3) on the north side of the river. The trail remains on AEP property for its entire length.

0.35 Trail proceeds onto retaining structure to skirt a rock outcropping overhanging the river.

0.44 Trail leaves retaining structure and continues along the river.

0.85 Trail crosses Wolf Creek. Wolf Creek is a potential greenway connection opportunity for the Town of Vinton.

0.96 Segment F ends at the intersection of Bridge 4 (B4) and Segment J.

Segment F is approximately 0.96 miles in length.

Segment G

- 0.0 Segment G starts at the intersection of Segment E and Bridge 4 (B4). Trail proceeds southeast downstream along the American Electric Power property line allowing the trail to stay out of low-lying wetland areas and silted areas immediately adjacent to the river.
- 0.2 Trail turns to the northeast and connects with an American Electric Power access road along a creek flowing in a northeast direction into the Roanoke River.
- 0.23 Trail crosses creek on American Electric Power access road and turns to the southwest following the access road until it reaches a clearing on the south side of Niagara Dam.
- 0.32 Trail leaves American Electric Power access road and turns east. It starts to proceed up the hillside on the south side of Niagara Dam. The trail remains on American Electric Power property until segment marker 0.4.
- 0.44 Trail leaves American Electric Power property and enters Virginia's Explore Park property.
- 0.7 Trail leaves Virginia's Explore Park property and enters National Park Service land along the Blue Ridge Parkway.
- 0.76 Trail intersects western connection for future horse trail loop extending along and across the Blue Ridge Parkway.
- 0.8 Trail turns northeast and follows an old roadbed parallel to the Blue Ridge Parkway until it reaches the parkway bridge over the Roanoke River.
- 1.15 Trail meets existing National Park Service trail.
- 1.09 Trail proceeds under Blue Ridge Parkway Bridge along existing National Park Service trail to segment marker 1.67.
- 1.13 Trail leaves existing National Park Service trail and begins switchback pattern up the hill on the east side of the Blue Ridge Parkway. This switchback pattern continues until mile marker 1.5. This entire section of switchback trail is located on National Park Service Property.
- 1.67 Trail leaves National Park Service Property and enters Roanoke Valley Resource Authority property.
- 1.7 Trail meets old landfill access road and follows it in a southeast direction along the northern tree line to segment marker 2.11.
- 2.11 The greenway trail turns northeast at this point and proceeds across on open field to segment marker 2.2. There is no access road between mile marker 2.1 and 2.2.

- 2.2 Trail meets another landfill access road and proceeds north to segment marker 2.3 where the road and trail turn to the southeast and proceed across the crest of the hill to the tree line at segment marker 2.46.
- 2.46 Trail turns southeast following old landfill access road along tree line to mile marker 2.6.
- 2.6 Trail and access road turn to the northeast and proceed downhill returning to the Roanoke River and an open field at the bottom of the hill at mile marker 2.76.

Segment G is approximately 2.77 miles in length.

Segment H

- 0.0 Trail begins at the intersection of Bridge 4 (B4) and Segment F and immediately proceeds onto a retaining structure on AEP property.
- 0.2 Trail leaves retaining structure and American Electric Power property and enters Norfolk Southern property. American Electric Power maintains an easement on the Norfolk Southern access road between Niagara Dam and the railroad track. The trail follows the road from segment marker 0.25 to segment marker 0.44.
- 0.38 Trail leaves Norfolk Southern property and enters American Electric Power property.
- 0.44 Trail leaves American Electric Power property and enters National Park Service property.
- 0.5 Trail passes under Blue Ridge Parkway Bridge and continues along the river to segment marker 1.09.
- 1.09 Trail leaves National Park Service property and enters private property belonging to Alvin B. Hammond III. The trail remains on the Hammond property along the river until segment marker 1.37.
- 1.37 Trail leaves the Hammond property and enters Virginia's Explore Park property on the north side of the Roanoke River.
- 1.46 Trail intersects Segment G and Bridge 5 (B5).

Segment H is approximately 1.46 miles in length.

Segment I

- 0.0 Trail begins at the south side of Bridge 5 (B5) and proceeds southeast along the river.
- 0.12 Trail leaves Roanoke Valley Resource Authority property and enters Virginia's Explore Park property. From this point the trail proceeds on an existing road bed along the Roanoke River until mile marker 0.48.

- 0.48 Between mile markers 0.48 and 0.53, the trail makes a wide sweeping turn to the west to avoid entering the fee area of Virginia's Explore Park.
- 0.53 The trail parallels a creek from this point to mile marker 0.61.
- 0.61 Trail intersects overlook access trail providing parking and access to the Roanoke River Parkway. At this point the trail turns in a southwest direction and proceeds along the south side of a pond located at mile marker 0.65.
- 0.65 The trail parallels a creek from this location to mile marker 0.96.
- 0.75 Trail leaves Virginia's Explore Park property and enters National Park Service property.
- 0.80 Trail passes under Roanoke River Parkway Bridge heading southwest.
- 0.94 Trail leaves National Park Service property and enters Virginia's Explore Park property.
- 0.96 Trail turns directly west until reaching mile marker 1.20.
- 1.20 Trail turns directly to the south along the Explore Park western property line and follows the property line until mile marker 1.10.
- 1.10 Trail turns slightly to the east to get around some topography and then continues south to mile marker 1.21.
- 1.21 Trail turns to the east and parallels Explore Park Service road to mile marker 1.32.
- 1.32 Trail proceeds across Explore Park service road heading southeast.
- 1.33 Trail proceeds down narrow ravine between this point and mile marker 1.41.
- 1.41 Trail provides connection to Explore Park bike and hiking trails.
- 1.48 Trail turns south proceeding along the contour lines to mile marker 1.53.
- 1.53 Trail turns to the east and parallels contours to mile marker 1.62.
- 1.69 Segment ends at intersection of Segment K and Segment L.

Segment I is approximately 1.7 miles in length.

Segment J

- 0.0 Trail starts at intersection of Segment H and Bridge 5 (B5) Explore Park property and proceeds east.
- 0.03 Trail leaves Explore Park Property and enters private land. The trail remains along the river.

- 0.2 Trail leaves private property and enters Explore Park property.
- 0.4 Trail leaves Explore Park Property and enters private land.
- 0.65 Trail crosses Roanoke County/Bedford County line and remains on private property in Bedford County.
- 1.18 Trail crosses small creek and continues on private land along the river to mile marker 2.1.
- 2.1 Trail proceeds across bridge and/or historical type ferry across Roanoke River to the eastern most trailhead of the Roanoke River Greenway system at Back Creek.

Segment J starts at the intersection of Segment H and Bridge 5 (B5) on Explore Park property on the north side of the river. It extends along the northern side of the river between the railroad tracks and the river to the point across the river from the convergence of Back Creek and the Roanoke River. The segment crosses into Bedford County and makes its way around steep terrain. It requires costly retaining structures to get around several major outcrops along this side of the river. Segment G is approximately 2.15 miles in length.

Segment K

- 0.0 Trail begins at intersection of Segment I and Segment L and proceeds east on an old road bed to the river at segment marker 4.1.
- 4.1 Trail turns to the south and follows river to segment marker 1.01.
- 1.01 Trail intersects end of Segment L and continues along the river to the eastern trailhead at segment marker 1.1.

Segment K is approximately 1.12 miles in length.

Segment L

- 0.0 Trail begins at intersection of Segment I and Segment K and proceeds in a switchback pattern to segment marker 0.3.
- 0.3 Trail follows contours along western side of Explore Property heading southeast to segment marker 0.68.
- 0.68 Trail intersects beginning of Segment M and continues heading southeast towards the river.
- 0.76 Segment ends at intersection with Segment K.

Segment L is approximately 0.76 miles in length.

Segment M

0.0 Trail starts along Segment L segment marker 0.68 and proceeds south to the proposed parking area at mile marker 0.15.

Segment M is the shortest segment of the East Roanoke River Greenway. It connects Segment L to the proposed parking area at the end of Rutrough Road. Segment M is approximately 0.15 miles in length.

Figure 3 - Overview of Greenway Segment Locations

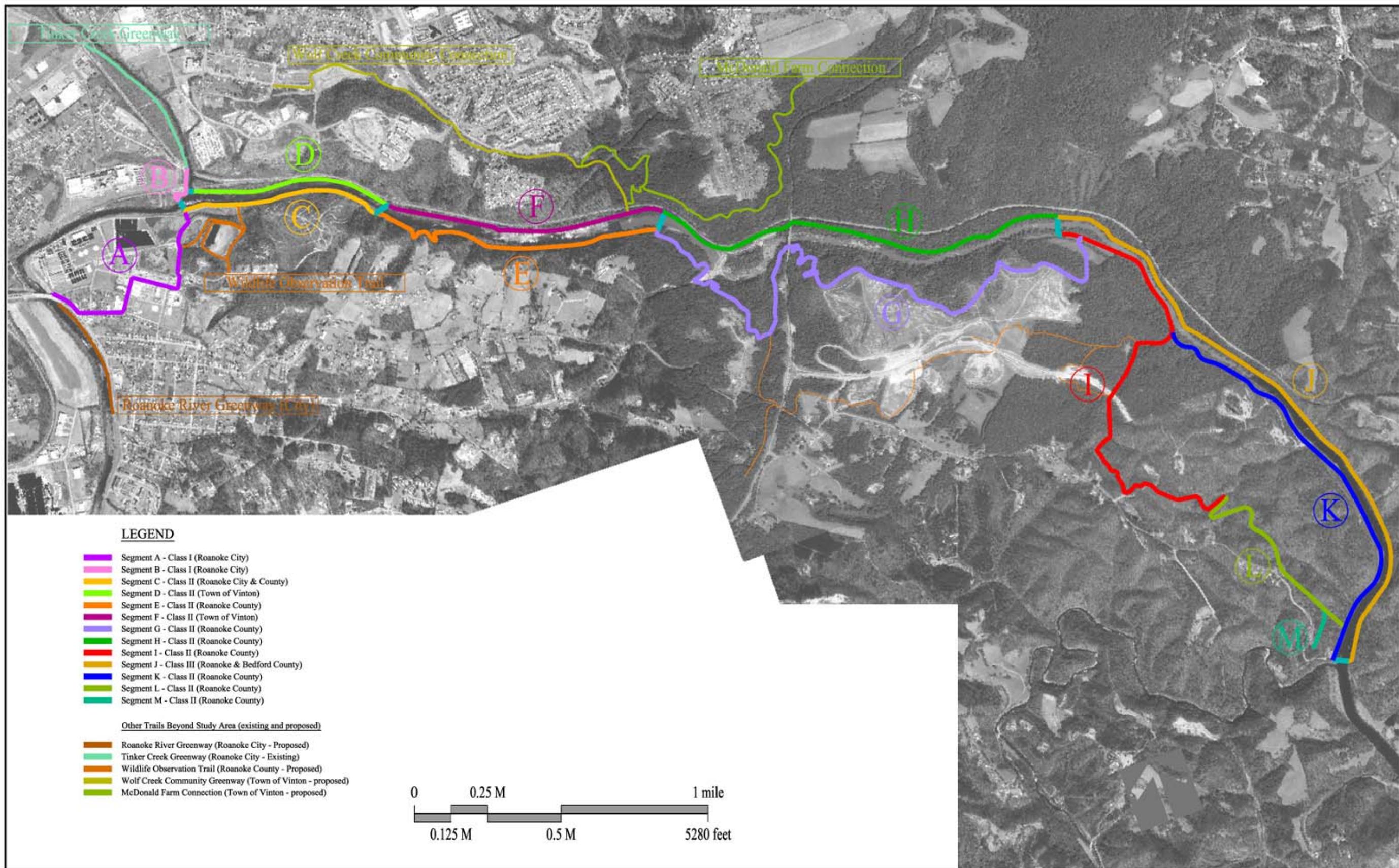
EAST ROANOKE RIVER GREENWAY
Overview Map

Figure 4 - Map 1 of 6 Greenway Segment Locations

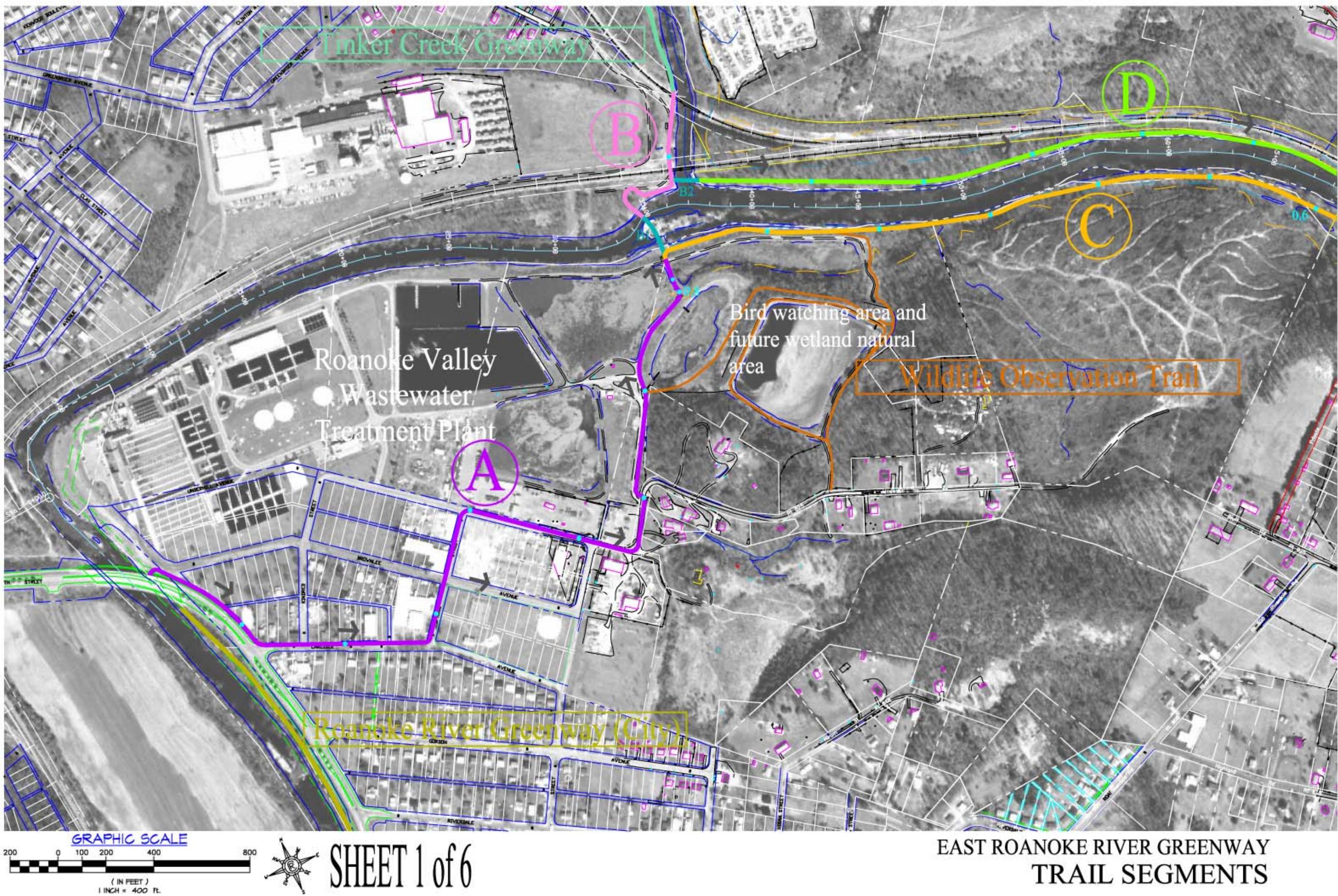


Figure 5 – Map 2 of 6 Greenway Segment Locations

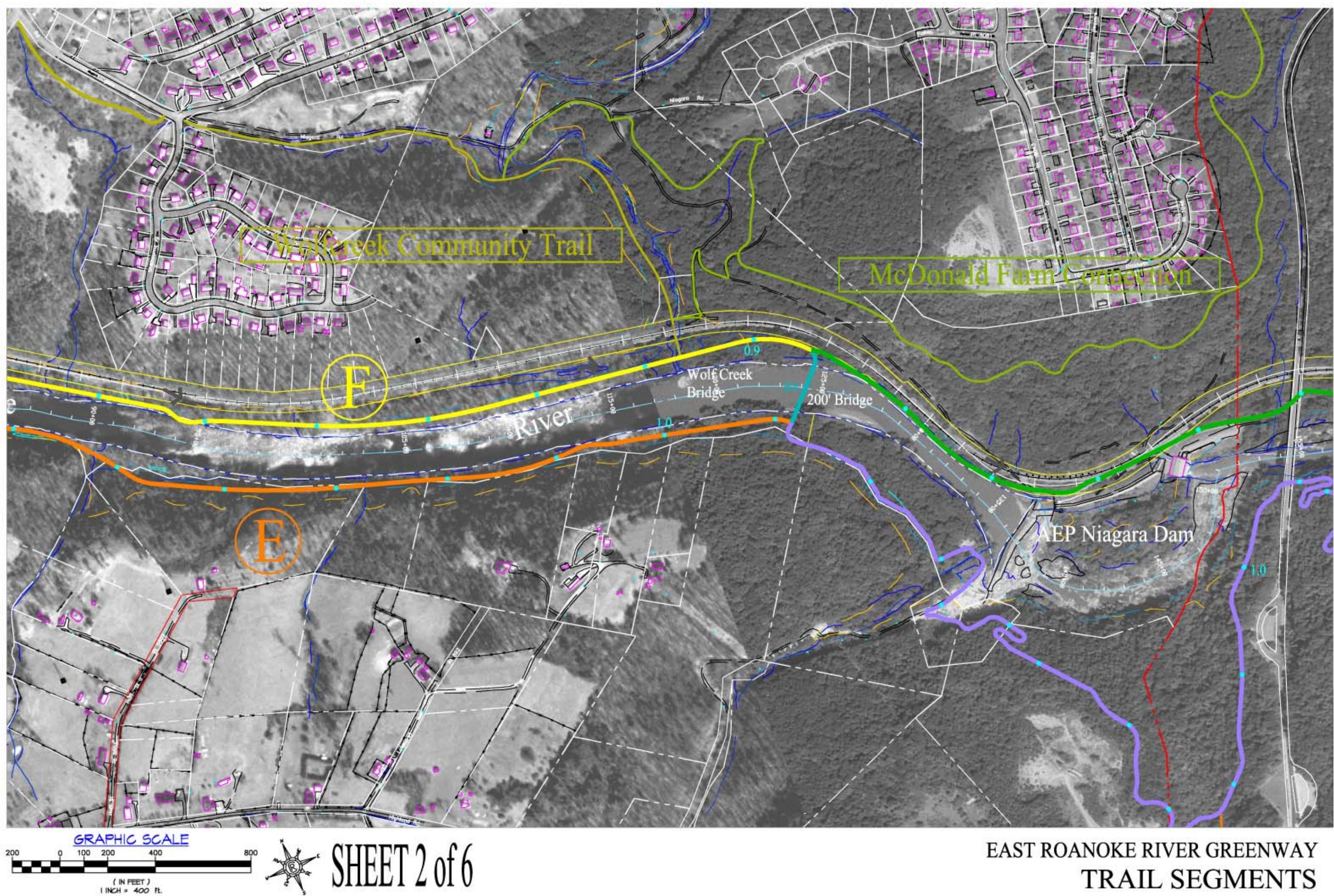


Figure 6 - Map 3 of 6 Greenway Segment Locations

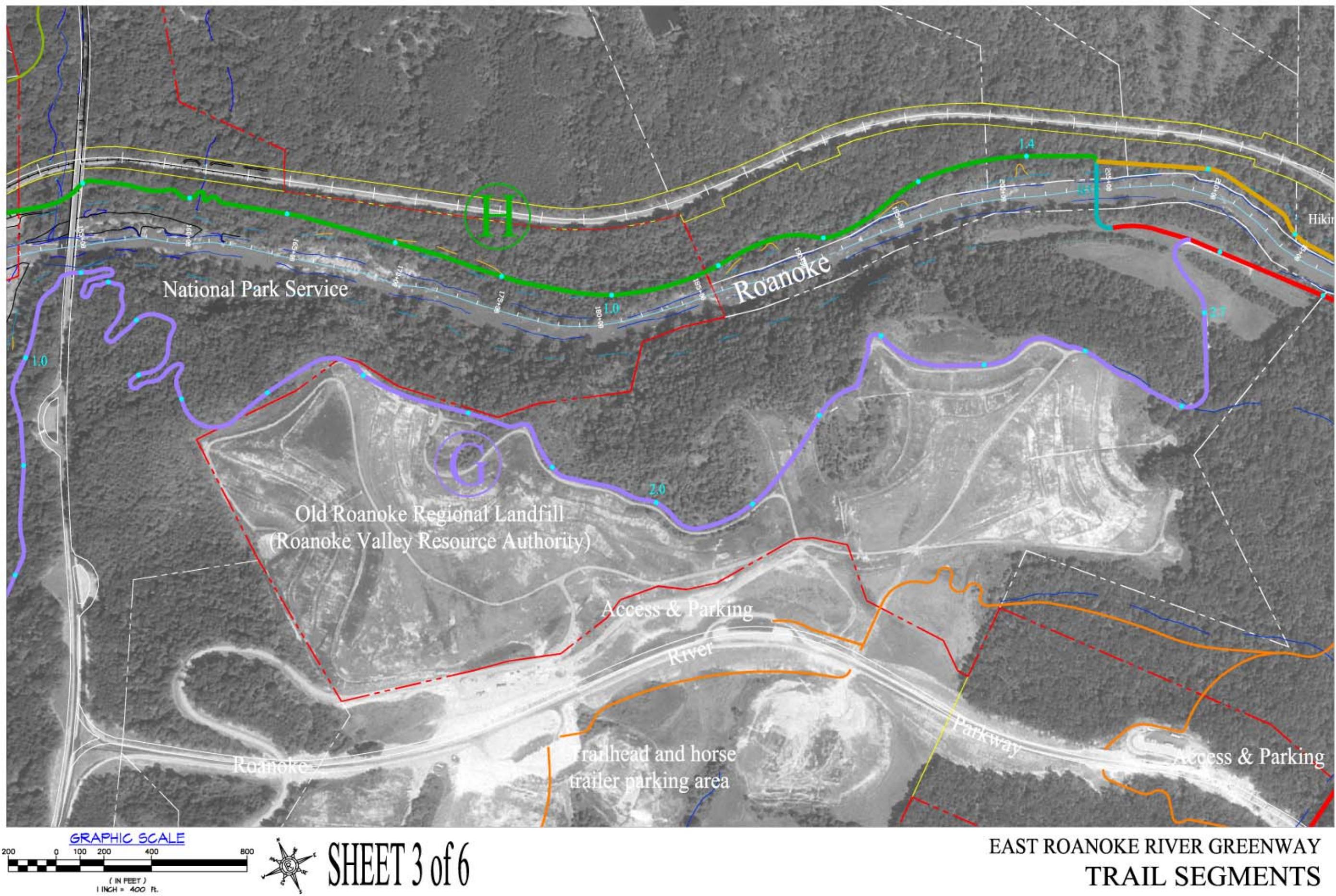


Figure 7 – Map 4 of 6 Greenway Segment Locations

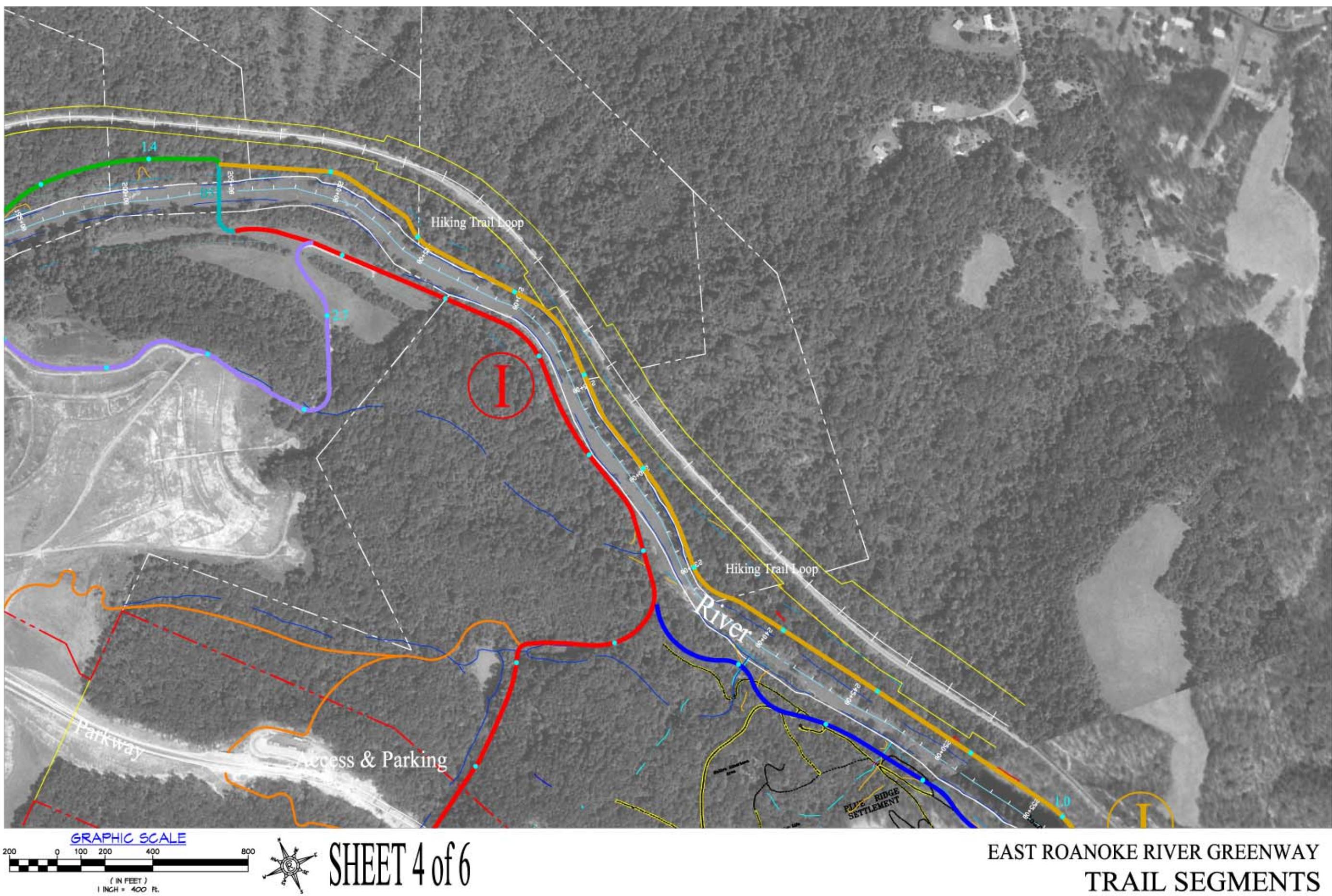


Figure 8 - Map 5 of 6 Greenway Segment Locations

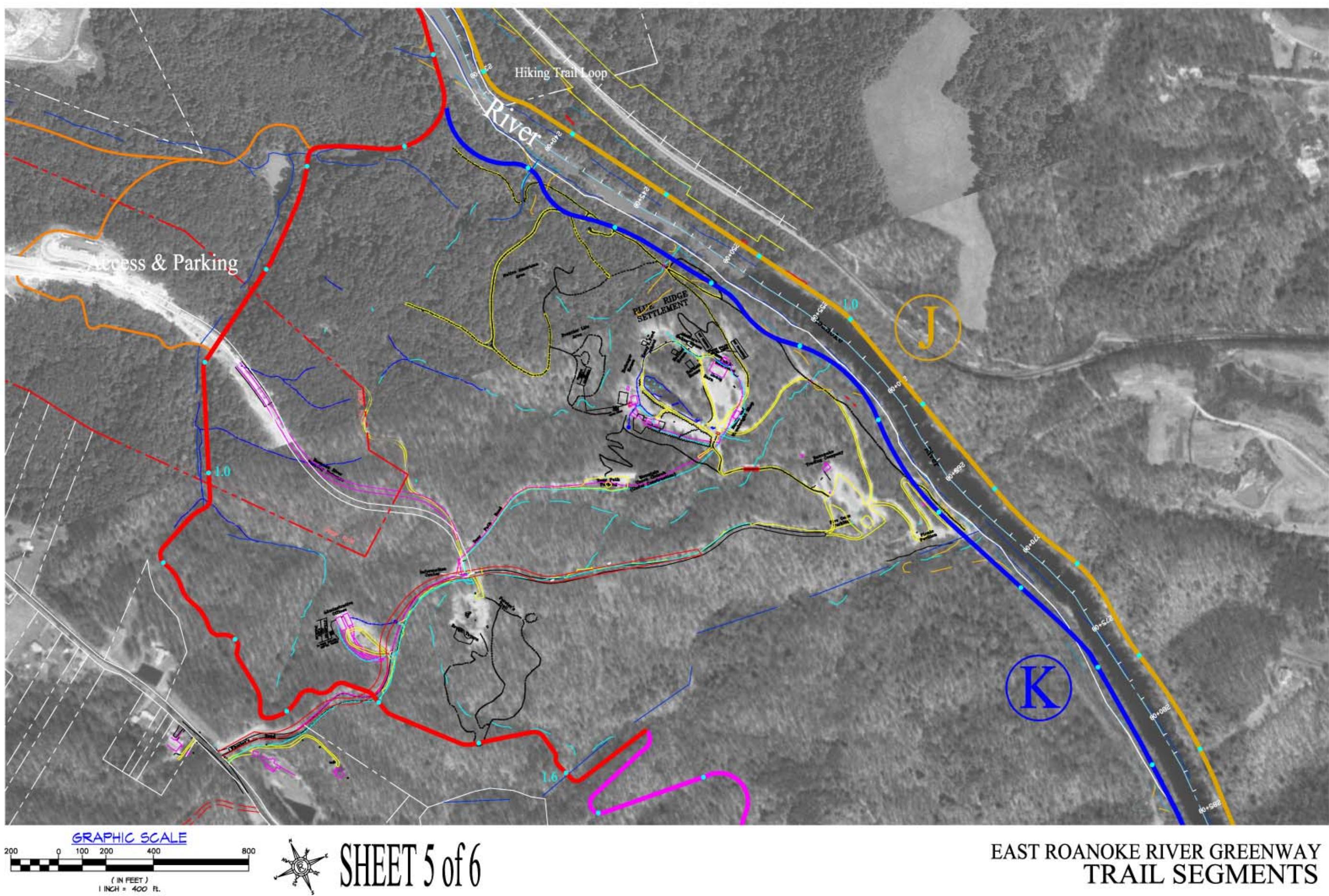


Figure 9 - Map 6 of 6 Greenway Segment Locations

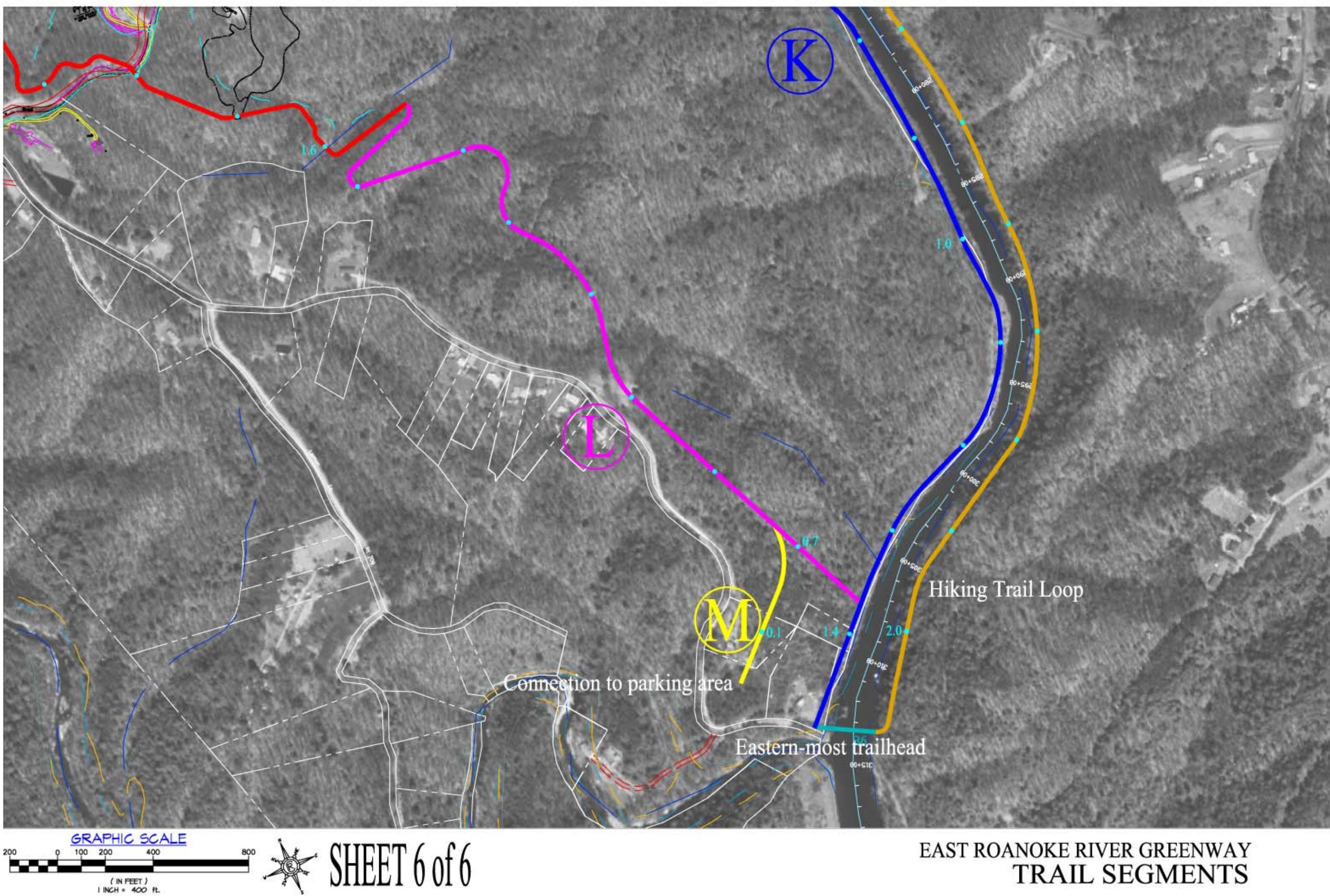
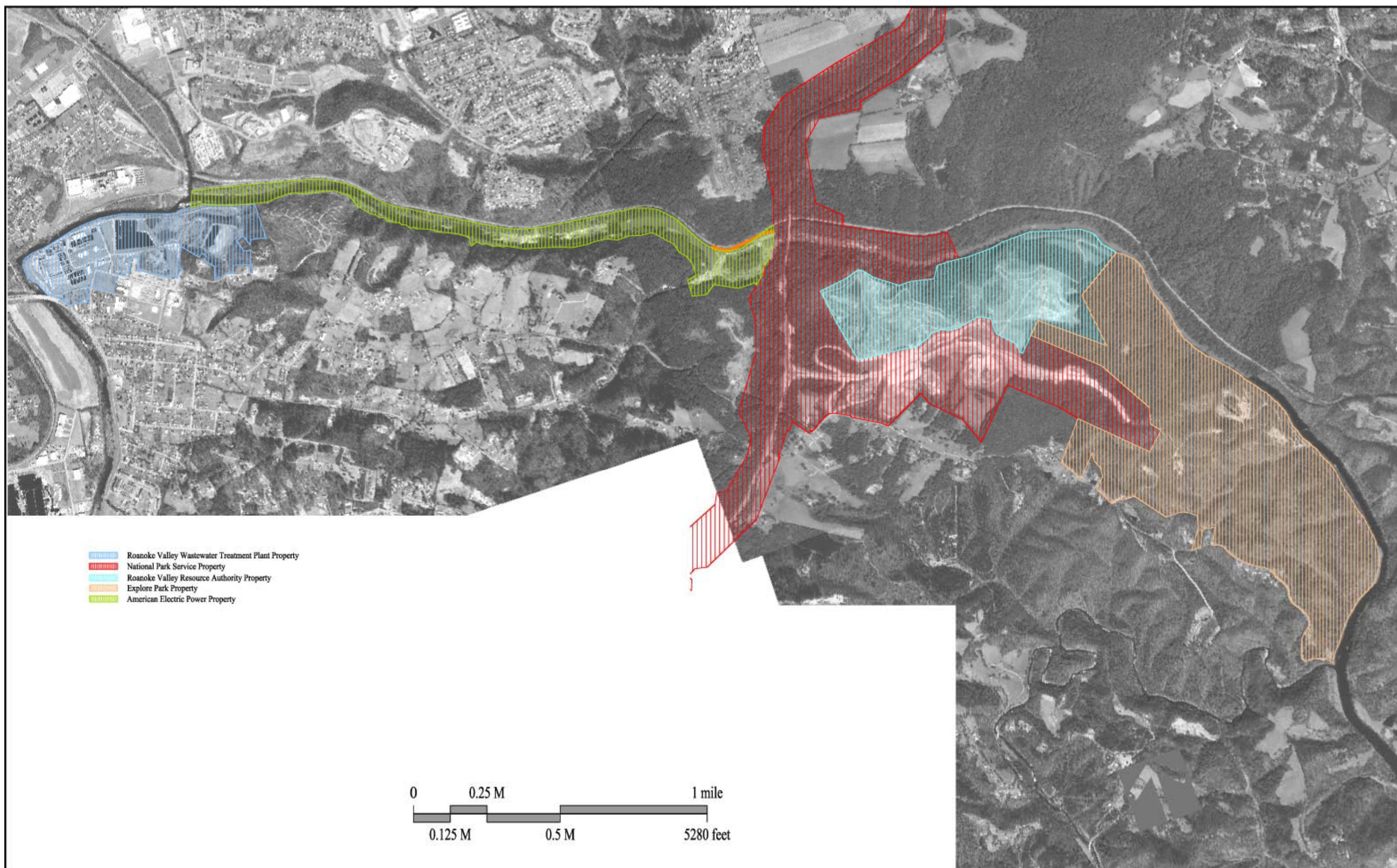


Figure 10 - Public and Corporate Lands Map



EAST ROANOKE RIVER GREENWAY
Public and Corporate Lands Map

Trail Design Details

Materials

Below is a description of trail classifications used in this report. They are based on general design standards and are listed here for purposes of definition. Specific materials proposed may change based on further field knowledge, information on the cause and effects of river flooding on pathway surfaces, and/or accessibility requirements. As previously discussed, Segments C,D,E,F,G,H,I,K,L, and M are all Class II trails. However, Segment J and some side trails mentioned that lead off from the main greenway will be Class III trails. Class I pathways, Segments A and B are multi-use and urban in character and would be used in the connection between the Tinker Creek Greenway and the Roanoke River Greenway.

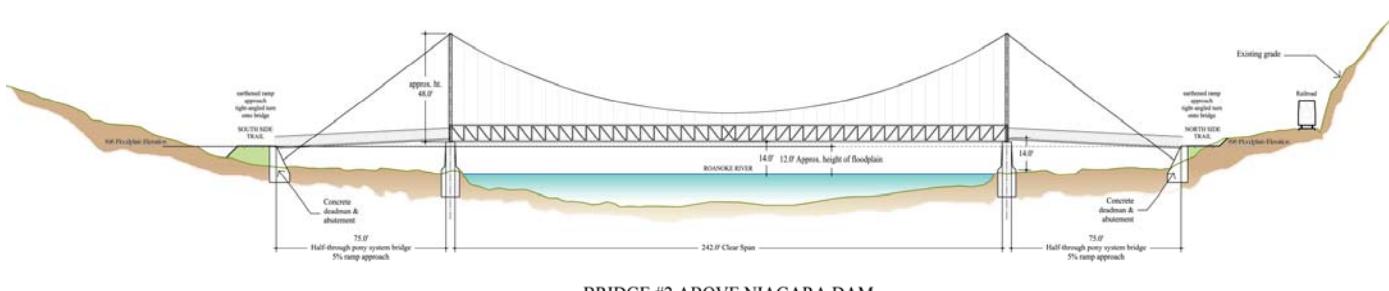
Trail Type	Surface Material	Width (typ.)	Min./Max. Grade	Terrain Suitability	Optimum Activities	Not Suitable Activities
Class I	Asphalt, Concrete, or Resin Soil Cement	10' to 12'	0% to 5%	Urban, multi-use activities, usually paved, handicap accessible, heavy-use, crowded situations, commuting	Road bicycling, casual bicycling, in-line skating (roller blading), walking, running, wheel chairs	Horseback riding, mountain biking
Class II	Asphalt, Concrete, Resin Soil Cement, Stone Dust, Well-compacted fine aggregate, wood chips	4' to 8'	0% to 12%	Single or dual usage, connector trails, narrow, limited-use activities	Casual walking, interpretation, running, horseback riding, hiking, mountain biking	In-line skating, may have accessibility issues
Class III	Stone Dust or Dirt, well compacted fine aggregate	18" to 48"	Any grade, no steeper than 20% w/out stairs	"Hiking Trails" usually a rough, rooty surface, and very narrow, challenging activities, greater than 25% use stairs for climbing or switchbacks - declare usage with signage for multi-use cases	Hiking, walking, nature trails, running, mountain biking, horseback riding	In-line skating, road or casual bicycling, accessible limited

Bridges

Ten foot wide pre-manufactured bridges are recommended for spanning the typical 200 foot distance across the Roanoke River. An advantage of pre-manufactured bridges is the predictable price of the bridge itself. However, costs for installation of the bridge can vary widely depending on the specific constraints of the site.

Spanning the plus or minus 200 foot wide river basin with a bridge is feasible, and often requires lighter weight materials to make the span distance. Avoiding immediate or a midpoint support abutment is highly recommended if a bridge is the chosen route. Lighter weight materials will also benefit the construction of these bridges due to their remote location and difficult construction access.

Smaller footbridges of 40 feet in length will be need to cross the smaller creeks and tributaries that feed into the Roanoke River such as Wolf Creek and the small creek near Niagara Dam.



BRIDGE #2 ABOVE NIAGARA DAM

Note: Light-weight prefabricated steel half-through h-section system bridge, corrugated steel roof, concrete deck, horse and bicycle suitable, 10' width. Minimal impact to river floodplain and floodway obstructions. No in-river structures required. Approximate installed cost \$800,000

Wolf Creek Tunnel

This tunnel is one of the few places that a trail connection or access point can be established. The railroad and steep slopes of the northern sections of the greenway often create a constrained and

isolated land mass on which the greenway must be situated. The disadvantage of using isolated or hard to reach land masses is that you cannot access neighborhoods across the tracks. The greenway can become remote and therefore unsafe without enough access points to neighborhoods and trailheads in these areas. Therefore this study has found that the Wolf Creek Tunnel connection trail will be an essential neighborhood connector, relieving this isolation. This tunnel will also provide direct access for a large number of trail users from the residents of Vinton to the trail system without having to drive to a far away trailhead.



Figure 11 - Wolf Creek Tunnel

Retaining Structures

Retaining structures or walls can be found in a few narrow locations where the trail can not negotiate steep terrain or cannot economically cross the river. Along the north side of the river, the Norfolk Southern railroad parallels the river, creating narrow land masses too difficult for a trail fit within. In these situations, a retaining structure would be built to provide a terrace for placement of the trail when a bridge is not economical. Usually these structures will be required between the river and the railroad. Other instances that require walls include where the wall heights are minimal, or short, around 4 foot maximum, these materials work best in natural areas where the character of the trail is important and or locally found stone is bountiful. Cliffs and other natural land features that require small crib-walls or locally-found-stone walls can be used.

The type of major retaining structure recommended is a gabion system with a "faux" rock face. If the concrete materials in this system are carefully worked, they will give the appearance of natural stone cliffs. In areas that will flood frequently, the walls should use quarried stone of substantial size that will resist the erosive forces of the river, and be anchored to bedrock or sound foundations. Other possible wall structures studied can be found in the chart on the next page.



Figure 122 – Gabion Wall

Retaining Structure	Material or Make	Typ. Load Allowed	Terrain Suitability and Typical Usage
Rock Crib Wall	Natural Stone, rubble, sand, backfill	Light duty, low height (typ. 3' to 4' max.)	Use for Class III trails, dependent on found suitable stone found during trail construction, good for remote or poor access
Timber Crib Wall	Locust or pressure treated lumber, rebar ties, large nails, stakes, boulder and rubble backfill	Light to medium duty, low height (typ.4' to 8' max.)	Use for Class III trails, and occasionally for Class II trails, good for remote or poor access
Gabion Wire Basket Retaining Structure	Welded or woven wire baskets filled with riprap and stacked with a 3:1 batter step, typically made in 12" to 24" deep cages and 6' by 12' dimensions	Medium duty, floodwater resilient, terracing designs available, height ranges (typ.4' to 18')	Use for Class I and II trails, requires access to site for medium size machinery and equipment, easier to assemble in field than poured in place concrete, requires less footing spread than concrete but is softer and less accurate. Built in cubical levels with regular backfill and geosynthetic soil separator behind wall.
Segmental Block Retaining Wall	Precast/manufactured segmental concrete block, geosynthetic reinforcing tieback, moderate structural options	Medium duty, terracing designs available, height ranges (typ.4' to 24')	Use for Class I and II trails, requires access to site for large machinery and equipment, easier to assemble In the field than poured in place concrete, requires less footing spread than concrete but geogrid tie-back the entire height of wall. Built in soil lifts of 6" and typically reinforced every 12" to 18" elevation interval
Concrib Precast Crib Wall	Pre-cast concrete units used in a crib fashion for building a retaining structure, structural backfill,	Medium to heavy duty, height ranges (typ.2' to 26' max.)	Use for Class I trails, requires access to site for large machinery and equipment, easier to assemble In the field. Design for taller walls not familiar with Built in soil lifts of 6".
Concrete Poured in Place Concrete Retaining Wall or Gravity Wall	Gravity or spread footing concrete wall, rebar & reinforcing, structural backfill, drainage pipes, weep holes, surface molding for specialized patterns	Heavy duty, terracing not recommended, height ranges (typ.4' to 18')	Use for Class I trails, requires access to site for large machinery and equipment, formwork and setup for pouring in place requires much preparation time. Requires expansive spread footings and depths. Drainage and waterproofing is important for longevity of the wall. Wall requires intensive calculations for load calculations and strength to ensure use below railroads and highways.

Trail Amenities

Signage

Informational, way finding, regulatory, and mile-marker signs should be consistent with similar signage found in other portions of the Roanoke Valley greenway system. Interpretive signage offers the opportunity for creativity; but, it too should be considered part of a larger sign system.

Benches

Providing trail users with benches on which to rest is often critical for their full enjoyment of the greenway, especially for those who have trouble climbing stairs or steep terrain. It is often possible to place benches where there is a view of a special place, thereby enabling people to rest while they experience the view.

Benches should be placed clear of the trail's edge to prevent injury to those passing by. Further safety is ensured if benches can be placed in an easily visible place.

Security Items – fencing, destination lighting, call boxes, telephones

Security items recommended include safety fencing near railroads, call boxes, destination lighting, and telephones. Fencing near railroads is important when the trail and the railroad come close together or where a substantial grade separation does not exist. The goal is to keep people from accidentally finding their way onto the rail lines and getting hurt or killed.

General lighting for the greenway is not recommended. Too much lighting can be expensive and wasteful, and often pollutes the natural areas with too much light. This light pollution can spill over into someone's private estate or home. However, destination lighting is recommended for trailheads where cars are parked and restrooms established or where people may gather. A bench might even require a light in order to prevent misuse.

Call boxes are a great comfort for users on trails that are not heavily traveled or are located in remote areas that can not be monitored very easily.

Telephones are a bit more expensive than call boxes, and are generally located near parking areas and restrooms.

Restrooms or Remote Toilets

Once the trail is built and trail usage has increased, restroom facilities will be required. Generally speaking, however, restroom facilities should be located in safe, well lit locations that are accessible by vehicle. Some logical locations to consider are trailheads with parking, and major access points. Design will vary in technology and style depending on the availability of electricity, sewers, and water. The architectural character should compliment either the specific historical context of the site or match a theme for all new Roanoke Valley greenway facilities.

Side and Loop Trails

Trails that leave the main greenway trail are considered side or loop trails, and generally consist of horse trails, hiking trails, nature trails, discovery trails, interpretive trails, mountain biking trails, and those trails of equal usage and character that intersect the greenway from adjacent neighborhoods and other greenways. Several such side trails have been discussed as part of this master plan. Since such side trails expand the possibilities for enjoyment of the greenway, they should be provided where finances permit.

Cost Estimates

It is very important to remember that the estimates that appear on the following two pages are just that – estimates. Cost figures could change substantially as engineering studies are done in later parts of the project. There are also a number of other factors that could affect costs such as ADA accessibility, security items, and necessary land purchases.

East Roanoke River Greenway Cost Estimate - By Segment/Bridge

Summary of Cost Estimate

Date: May 2003

<u>Trail Segments</u>	<u>Total Cost</u>	<u>Trail Length</u>	<u>Avg. cost per linear foot</u>
Segment A \$	332,475.00	4350 \$	76.43
Segment B \$	52,097.50	835 \$	62.39
Segment C \$	264,550.00	3600 \$	73.49
Segment D \$	926,575.00	3650 \$	253.86
Segment E \$	872,690.00	5880 \$	148.42
Segment F \$	731,575.00	5050 \$	144.87
Segment G \$	1,268,995.00	14690 \$	86.38
Segment H \$	1,726,270.00	7740 \$	223.03
Segment I \$	588,315.00	8930 \$	65.88
Segment J \$	798,460.00	11085 \$	72.03
Segment K \$	368,680.00	5960 \$	61.86
Segment L \$	187,720.00	4090 \$	45.90
Segment M \$	42,445.00	790 \$	53.73

<u>Major Bridges</u>	<u>Total Cost</u>	<u>Approx. Bridge Length</u>	<u>Avg. cost per linear foot</u>
Bridge - B1 \$	1,007,500.00	200 \$	5,037.50
Bridge - B2 \$	325,000.00	125 \$	2,600.00
Bridge - B3 \$	1,072,500.00	210 \$	5,107.14
Bridge - B4 \$	1,183,000.00	230 \$	5,143.48
Bridge - B5 \$	1,072,500.00	210 \$	5,107.14
Bridge - B6 \$	1,300,000.00	250 \$	5,200.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT A						
AMENITIES	Kiosk Signage	Trailhead Kiosk at 13th street parking lot with map, rules, and descriptions of greenway features, facts, and misc. signage along trail	LS	1	\$ 10,000.00	\$ 10,000.00
TRAIL	Class I Pathway	13th St. Bridge, past Golden Park, through wastewater treatment plant, meeting with Segments B (Tinker Creek Connection) and C (south side of river)	LF	4350	\$ 45.00	\$ 195,750.00
LAND	Right of Way Acquisition	Acquisition of R.O.W. parallel the roads through neighborhoods.	ACRE	0.5	\$ 100,000.00	\$ 50,000.00
					subtotal:	\$ 255,750.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 76,725.00
					SEGMENT A COST:	\$ 332,475.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT B						
AMENITIES	Signage	Signage along trail	LS	1	\$ 2,500.00	\$ 2,500.00
TRAIL	Class I Pathway	Section begins with Bridge crossing the Roanoke River and Connects to Tinker Creek Trail and optional connection to Segment D.	LF	835	\$ 45.00	\$ 37,575.00
					subtotal:	\$ 40,075.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 12,022.50
					SEGMENT B COST:	\$ 52,097.50

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT C						
AMENITIES	Signage	Signage along trail	LS	1	\$ 2,500.00	\$ 2,500.00
TRAIL	Class II Pathway	Trail changes to Class II. Starting where Segment A ends, the trail follows the south side of the river and continues until reaching Segment E and Bridge 3	LF	3600	\$ 35.00	\$ 126,000.00
LAND	Right of Way Acquisition	Acquisition of R.O.W. to secure trail location on higher ground.	ACRE	3	\$ 25,000.00	\$ 75,000.00
					subtotal:	\$ 203,500.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 61,050.00
					SEGMENT C COST:	\$ 264,550.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT D						
AMENITIES	Signage	Signage along trail	LS	1	\$ 2,500.00	\$ 2,500.00
TRAIL	Class II Pathway	from Tinker Creek trail terminus, cross Tinker creek and proceed parallel with R. river	LF	3650	\$ 35.00	\$ 127,750.00
WALL	Retaining Structure (1500 LF)	Retaining structure between railroad and river. 1' to 10' HT. (8' avg. HT.) retaining structure made w/ gabion structure at \$30 sq. ft. face, steep sections against railroad ballast show an increased costs up to \$45 SFF, this wall is filling in the floodway and floodplain, requiring special permitting	SFF	12000	\$ 45.00	\$ 540,000.00
LAND	Right of Way Acquisition	Acquisition of Railroad R.O.W. or usage, real estate land value is low but difficulty of acquisition is high	ACRE	0.85	\$ 50,000.00	\$ 42,500.00
					subtotal:	\$ 712,750.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 213,825.00
					SEGMENT D COST:	\$ 926,575.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT E						
AMENITIES	Signage	Signage along trail	LS	1	\$ 5,000.00	\$ 5,000.00
TRAIL	Class II Pathway	Starting where Segment C and Bridge 3 end, the trail follows the south side of the river, it leaves AEP property and climbs steep slopes to avoid cliffs along the river. Trail then descends back to the river's edge and continues until reaching Segment G and Bridge 4	LF	5880	\$ 35.00	\$ 205,800.00
WALL	Retaining Structure (1450 LF)	Retaining structure between steep embankment and river. 1' to 10' HT. (8' avg. HT) retaining structure made w/ gabion structure at \$30 sq. ft. face. With land acquisition this segment can be located partly out of the floodplain.	SFF	11600	\$ 30.00	\$ 348,000.00
LAND	Right of Way Acquisition	Acquisition of R.O.W. to secure trail location on higher ground.	ACRE	4.5	\$ 25,000.00	\$ 112,500.00
					subtotal:	\$ 671,300.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 201,390.00
					SEGMENT E COST:	\$ 872,690.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT F						
AMENITIES	Signage	Signage along trail	LS	1	\$ 5,000.00	\$ 5,000.00
TRAIL	Class II Pathway	Starting where Segment D ends and Bridge 3 crosses, the trail follows the north side of the river and continues until reaching Segment H or Bridge 4	LF	3250	\$ 35.00	\$ 113,750.00
BRIDGE	Small Bridge	Small bridge crossing Wolf Creek. 40' length, 10' wide pre-manufactured bridge, including abutments, foundations, and earthwork	LS	1	\$ 60,000.00	\$ 60,000.00
WALL	Retaining Structure (475 LF)	Retaining structure between steep embankment and river. 1' to 10' HT. (8' avg. HT.) retaining structure made w/ gabion structure at \$30 sq. ft. face. This structure may encroach the river's edge.	SFF	3800	\$ 30.00	\$ 114,000.00
BOARDWALK	Boardwalk	Boardwalk crossing lowland wet areas and soft soils	LF	1800	\$ 150.00	\$ 270,000.00
					subtotal:	\$ 562,750.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 168,825.00
					SEGMENT F COST:	\$ 731,575.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT G						
AMENITIES	Signage	Signage along trail	LS	1	\$ 30,000.00	\$ 30,000.00
TRAIL	Class II Pathway	Starting where Segment E ends or Bridge 4 crosses, the trail follows the south side of the river and continues until reaching Segment I or Bridge 5	LF	12890	\$ 35.00	\$ 451,150.00
WALL	Minor Retaining Structures (3000 LF)	Short retaining structures located in various places along trail to handle grade changes and switchbacks. 1' to 6' HT. (3' avg. HT.) made w/ stone or timber structure at \$20 sq. ft. face.	SFF	9000	\$ 25.00	\$ 225,000.00
BOARDWALK	Boardwalk	Boardwalk crossing lowland wet areas and soft soils	LF	1800	\$ 150.00	\$ 270,000.00
					subtotal:	\$ 976,150.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 292,845.00
					SEGMENT G COST:	\$ 1,268,995.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT H						
AMENITIES	Signage	Signage along trail	LS	1	\$ 10,000.00	\$ 10,000.00
TRAIL	Class II Pathway	Starting where Segment F ends or Bridge 4 crosses, the trail follows the north side of the river, moves along retaining structures, improvements to portage road, and continues until reaching Segment J or Bridge 5	LF	7740	\$ 35.00	\$ 270,900.00
BRIDGE	Small Bridge	Small bridge crossing an unnamed tributary. 20' length, 10' wide pre-manufactured bridge, including abutments, foundations, and earthwork	LS	1	\$ 30,000.00	\$ 30,000.00
WALL	Retaining Structures (1100 LF)	Major retaining structure located between a steep embankment of the railroad and north river's edge. The work may involve extensive engineering of the toe of slope to prevent trail slippage and collapse. Height ranges from 1' to 20' HT. (16' avg. HT.) made w/ gabion and faux rock surface at \$45 sq. ft. face.	SFF	17600	\$ 45.00	\$ 792,000.00
LAND	Right of Way Acquisition	Acquisition of R.O.W. on private land.	ACRE	9	\$ 25,000.00	\$ 225,000.00
					subtotal:	\$ 1,327,900.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 398,370.00
					SEGMENT H COST:	\$ 1,726,270.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT I						
AMENITIES	Signage	Signage along trail	LS	1	\$ 10,000.00	\$ 10,000.00
TRAIL	Class II Pathway	Starting where Segment G ends or Bridge 5 crosses, the trail follows the south side of the river, skirting through and around Explore Park proper, and continues until reaching Segments L and K.	LF	8930	\$ 35.00	\$ 312,550.00
BRIDGE	Small Bridge	Small bridges crossing unnamed tributary's. 20' length, 10' wide pre-manufactured bridge, including abutments, foundations, and earthwork	LS	3	\$ 30,000.00	\$ 90,000.00
WALL	Minor Retaining Structures (800 LF)	Short retaining structures located in various places along trail to handle grade changes and switchbacks. 1' to 3' HT. (2' avg. HT.) made w/ stone or timber structure at \$20 sq. ft. face.	SFF	1600	\$ 25.00	\$ 40,000.00
					subtotal:	\$ 452,550.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 135,765.00
					SEGMENT I COST:	\$ 588,315.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT J						
AMENITIES	Signage	Signage along trail	LS	1	\$ 2,500.00	\$ 2,500.00
TRAIL	Class III Pathway	Starting where Segment H ends or Bridge 5 crosses, the trail follows the north side of the river, moving across rugged terrain eventually crossing into Bedford County. Trails ends at Bridge 6.	LF	11085	\$ 20.00	\$ 221,700.00
WALL	Minor Retaining Structures (2000 LF)	Short retaining structures located in various places along trail to handle grade changes and switchbacks. 1' to 3' HT. (2' avg. HT.) made w/ stone or timber structure at \$20 sq. ft. face.	SFF	4000	\$ 25.00	\$ 100,000.00
BRIDGE	Small Bridge	Small bridges crossing unnamed tributary's. 20' to 30' length, 6' wide built in the field, timber type, including abutments, foundations, and earthwork	LS	2	\$ 20,000.00	\$ 40,000.00
LAND	Right of Way Acquisition	Acquisition of R.O.W. on private land.	ACRE	10	\$ 25,000.00	\$ 250,000.00
					subtotal:	\$ 614,200.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 184,260.00
					SEGMENT J COST:	\$ 798,460.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT K						
AMENITIES	Signage	Signage along trail	LS	1	\$ 5,000.00	\$ 5,000.00
TRAIL	Class II Pathway	Starting where Segment I intersects Segment L and K, the trail continues back to the river and follows the south side of the river. Trails ends at Bridge 6.	LF	5960	\$ 35.00	\$ 208,600.00
WALL	Minor Retaining Structures (200 LF)	Short retaining structures located in various places along trail to handle grade changes and switchbacks. 1' to 3' HT. (2' avg. HT.) made w/ stone or timber structure at \$20 sq. ft. face.	SFF	400	\$ 25.00	\$ 10,000.00
BRIDGE	Small Bridge	Small bridges crossing unnamed tributary's. 20' length, 10' wide pre-manufactured bridge, including abutments, foundations, and earthwork	LS	2	\$ 30,000.00	\$ 60,000.00
					subtotal:	\$ 283,600.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 85,080.00
					SEGMENT K COST:	\$ 368,680.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT L						
AMENITIES	Signage	Signage along trail	LS	1	\$ 1,250.00	\$ 1,250.00
TRAIL	Class II Pathway	Starting where Segment I intersects Segment L and K, the trail moves through the woods to the end at the river.	LF	4090	\$ 35.00	\$ 143,150.00
					subtotal:	\$ 144,400.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 43,320.00
					SEGMENT L COST:	\$ 187,720.00

Category	Item Name	Item Description	Unit	Qty	Unit Price	Total
SEGMENT M						
AMENITIES	Signage	Signage along trail	LS	1	\$ 5,000.00	\$ 5,000.00
TRAIL	Class II Pathway	Splitting off from Segment L and ending at a future trailhead.	LF	790	\$ 35.00	\$ 27,650.00
					subtotal:	\$ 32,650.00
		CONTINGENCY, DESIGN FEES, ENVIRONMENTAL REPORTS, LAND SURVEY'S, GEO. TESTING @ 30% of Construction budget:				\$ 9,795.00
					SEGMENT M COST:	\$ 42,445.00

Interpretation on the East Roanoke River Greenway

Interpretation is essentially informal education. The East Roanoke River Greenway offers an excellent opportunity to educate the public regarding several important pieces of a community's infrastructure that people have a tendency to overlook: wastewater treatment, trash disposal, and power generation. These three subjects should be a high priority among the possible subjects to include in an East Roanoke River Greenway interpretive sign program.

Roanoke Wastewater Treatment Plant

People seldom consider what happens to wastewater once it runs down a drain, but it is an understatement to say that proper wastewater treatment is critical to a community's health. The western trailhead parking area for the East Roanoke River Greenway will be on 13th Street near the Roanoke Wastewater Treatment Plant. An interpretive display located at the parking area would offer the opportunity to educate people on what is involved in the treatment of wastewater in Roanoke. Such a display would contain a flow diagram with explanations of the various treatment processes involved in wastewater treatment: screening, primary treatment, aeration, nitrification, coagulation, filtration, disinfection, biological aeration, and sludge processing.



Old Roanoke City Landfill

Another out-of-sight out-of-mind infrastructure function is solid waste disposal. The East Roanoke River Greenway may skirt the edges of the old Roanoke City landfill. If the route ultimately chosen for the greenway does pass by the landfill, two separate displays related to the landfill are recommended to help raise people's awareness of the challenges that solid waste brings. The first display would demonstrate the amount of trash that a typical American family generates every day- perhaps by creating an actual pile of (preserved)

trash. It could also give other facts related to solid waste and recycling (e.g. recycling one ton of newspapers saves 3 cubic yards of landfill.). The second display would concern the life cycle of a landfill, using the old Roanoke City Landfill as the case-in-point.

Niagara Dam and Power House

Our modern way of life is dependent on electricity. The Niagara Dam Power House is a small (3 mw) hydroelectric generating plant that AEP still uses for power generation when there is sufficient water flow. The dam and power house will be visible no matter which side of the river the greenway is on. They were originally built in 1906, so this facility has been in operation for almost 100 years. An interpretive sign displaying brief information about the facility, along with diagrams describing how such a facility works to generate electricity, would make an informative addition the greenway's interpretive program.



Niagara Dam

There are a number of other possible subjects for interpretive displays along the East Roanoke River Greenway. These are listed below:

The Railroad

No matter which side of the river the trail is built on, the trains traveling through the gap will be difficult for greenway users to ignore. Since trail users may wonder where the tracks lead, and what the trains are carrying, the answers to these two questions would be natural to include on an interpretive display sign located where there is a good view of the tracks and trains.



Flora and Fauna

A good approach to take on the subject of representative, or special, flora and fauna in the area of the East Roanoke Greenway, is to wait and see what comes to light as the trail is actually built. It may be, for example, that the trail passes by a particularly large oak, or through a marshy area with representative wetland plants. After the trail is established, a naturalist could identify sites or specimens that have particular educational value.

Origin of the Gap

The East Roanoke River Greenway travels along the river as it passes through a gap in the mountains. This offers the opportunity to educate people about the geologic history that created the gap.

The Cave

A large cave mouth can be seen along the southern shore of the Roanoke River approximately 3200 feet east of the river's confluence with Tinker Creek. The cave is very shallow and is not significant as caves go. However, if the cave is visible from the greenway, people will become curious about it.



Blue Ridge Parkway

A sign should identify the Blue Ridge Parkway as it crosses above the greenway, and also give a brief description of the parkway (i.e. it is a 469 mile long scenic highway, etc.)

Virginia's Explore Park

Explore Park is an important tourist draw for the Roanoke Valley. A sign, placed where the greenway crosses into park property - or passes closest to it – should identify and briefly describe the park's amenities.

Additional Signage

In areas where the greenway is close to the river, it will be beneficial to prevent people from walking on the river banks. Signs reading "*Every footprint along the banks of the river adds to the several tons of eroded soil that washes downstream every year. Please help us prevent this- stay on the trail at all times*" should be provided.

Interpretive Sign Design

The basic design of interpretive signs for the East Roanoke Greenway should be creative, but in accord with that used throughout the rest of the Roanoke River Greenway.



Appendix A: Public Meeting Comments & Findings

On July 11, 2002 a public meeting or workshop was held at the War memorial. The following comments were gathered by the staff and pulled into this report to reflect the choices and ideas local citizen's and user's of the greenway came up with.

Compilation of Comment Sheets

Roanoke River Greenway, Eastern Section July 2002

1. What activities would you like to see on a greenway along the river?

- #1 - Playgrounds, sitting areas (gathering areas)
- #2 - Walking, horse riding, bikes
- #3 - Road biking, walking. It should not be unpaved for horseback riding. There are areas away from population centers for mountain biking and horseback riding. The primary (and most popular) uses require pavement. Cycling, strollers, handicapped accessibility.
- #4 - Bicycling
- #5 - Walking/cycling/boating/green buffers/wildlife protection
- #6 - One or two canoe put-ins
- #7 - Boating, educational signs
- #8 - A road that would make it accessible for handicapped - similar to road in Wasena Park/Wiley Drive
- #9 - Trails, bikeways. Create a green belt along the river. Take the money from flood the reduction project and make a green park - very much patterned after European cities.
- #11 - Horseback riding - include horse trailer parking facility
- #12 - Boating access at or below Niagara Dam
- #13 - Interpretative exhibits at Niagara Dam, wastewater plant and Explore Park. Also Indian settlement site on Bennington Road.
- #14 - A safe way to bike from Wolf Creek Greenway to downtown
- #15 - 4 wheelers
- #16 - Blueway access with canoe put-in and take-out spots
- #17 - Parking and access to trail (length, not just the ends). River access/fishing access. Sitting areas (covered storm protection) (Emergency phones) Bathroom facilities.
- #18 - Hiking, fishing, strolling
- #19 - Hiking, biking, if possible I'd like a canoe launching site near the WWTP to take advantage of the flat water to Niagara Dam
- #25 - This will be a fantastic opportunity for horse users, and this section connects to Explore and a 17 mile loop. I just want you to know that there are many trail riding enthusiasts who would love to have horses included in the section of trail Linda has described above. There are also many competitive and endurance riding enthusiasts who would use such a trail. In fact, there is a world of trail riding enthusiasts who would drive from all over the region to use such a trail if horses are allowed, just like the Virginia Creeper Trail in far SW Va and other rails-to-trails corridors boost tourism in parts of the state that have the foresight to create such trails.
- #26 - Bicycling, hiking, and walking
- #27 - A trail for running, hiking, biking and roller-blading
- #28 - All non-motorized use
- #29 - Hiking, walking, trail bike
- #30 - Hike, bike, roller blade
- #32 - Bicycling
- #33 - Road cycling
- #34 - Cycling, walking

#35 – My concept of a greenway is an organization/structure which protects our natural resources from human abuse and ravages of erosion, storms, and other natural types of degradation. The type of activities I feel are appropriate are:

RESOURCE PRESERVATION & EDUCATION: planting projects, resource management, identifying and developing wildlife habitat, improving water quality through river cleanups and watchdogging/soliciting cooperation from businesses and residences who impact the waterways, etc.

CONTROLLED HUMAN RECREATIONAL USE: preferably non-commercial, “low tech” activity which would not require elaborate infrastructure, such as day hiking.

2. How would you and your family use the greenway?

- #1 - Exercise, transportation
- #2 - Walking
- #3 - Road biking, mountain biking
- #4 - Bicycling
- #5 - Exercise, education, relaxation, family activity
- #6 - Cycling, walking, canoeing
- #7 - Educational
- #8 - Bike riding, walking
- #9 - Picnic, bike, walk, hike, take visitors
- #11 - Horse trail, hiking
- #12 - Boating access
- #13 - Hike, bike, possibly canoe the river
- #16 - Walking
- #18 - Hiking, strolling
- #19 - Hiking, biking
- #26 - Often, as I bike and walk/run regularly
- #27 - Primarily running/hiking
- #28 - Biking and jogging
- #29 - Hiking, walking, picnicking
- #30 - Recreation, commute to work
- #31 - Biking, running, traveling to/from Explore Park for biking
- #32 - Bicycling
- #33 - Road cycling, jogging, walking
- #34 - Mostly cycling

#35 – I would “use” the greenway as an outlet for my urges to make up for the carelessness of our prior resource management, i.e. volunteer to help plant, maintain, or provide educational resources at the greenway. I like to hike but seldom find the time to go for extended jaunts, and there are already plenty of places to do this.

3. What surface would you prefer to see on the greenway - a paved, cinder, or natural surface?

- #1 - Paved or natural
- #2 - Cinder
- #3 - Paved. The section from the Tinker Creek Greenway upstream to the center section (at the very least)
- #4 - Paved - all the way. It benefits the most people. There are plenty of unused horse trails.
- #5 - Cinder or paved reduced maintenance cost
- #6 - Paved or cinder, depending on terrain
- #7 - Combination
- #8 - Paved! This would help handicapped if they can get to the road.
- #9 - a combination may be good depending on location, terrain & environment; you may want to use wooden decks in same areas
- #11- Cinder or natural
- #12 - Whatever

#13 - Paved or cinder with natural surface side trails

#16 - Cinder

#18 - Paved with patterned and colored asphalt; look at the Railside Linear Park for an example

#19 - Cinder

#22 - Please keep surfaces hard enough that normal bikes can ride them.

#23 - I hope the Roanoke River Greenway is hard surface and wide enough for road bikes to use and I hope that there is another route along the parkway that is a multi-use dirt trail to give other users a more twisty and natural path to chose. Many users may use both as a complete loop. I would like to see a wider Parkway on the busy section through Roanoke between 24 and 220 or some way to reduce the people using it as a highway to make it better for road bikes and other users including cars trying to enjoy the park at a less rushed pace.

#24 - No mulch, gravel or stairs for trail surface.

#26 - Although paved would be ideal, the expense of construction and upkeep would be high. Packed cinder are 2nd choice

#27 - Paved or Cinder

#28 - I like dirt best, but cinder or paved is fine. However please do not use deep mulch unless you are trying to prevent wheeled use.

#29 - Natural surface

#30 - Paved

#31 - Natural. Please: no mulch, gravel, or stairs

#32 - Natural. No mulch, gravel, or stairs, no swinging bridges

#33 - Paved

#34 - Paved

#35 - I believe a natural or cinder surface is the best choice, depending on the intended usage and the existing topography. Personally, I find no compelling reason to spend big bucks on pavement so people who are addicted to rubber wheels can go wherever they please on them. Besides pavement is the antithesis of GREENway. I feel disgusted whenever I consider the paved area that is being touted as a greenway in Wasena Park; what a huge waste when there is already a paved surface through the park!!

4. What features and resources along the Roanoke River should be preserved or enhanced?

#1 - Trees, Trees, open space

#3 - Water quality - but this is largely determined by the sewage treatment plant

#4 - Niagara Dam

#5 - Sound, visual & water quality, plantings & trees, nature & wildlife habitats

#7 - Preserved for wildlife and keep all areas as natural as possible

#9 - Try to put in a natural state - plant native plants - eliminate kudzu & non-native plants

#11 - All

#13 - Trees! a few picnic areas and/or benches; good views & access points to the river edge for canoe access

#16 - Historic structures and landscape features

#17 - Historical Society (arch. sites)

#18 - Water quality; there are at least 2 archeological sites

#19 - I'd like to see the island in the river at Tinker Creek be part of the Greenway, either as a rest stop, maybe, or watching wildlife

#26 - Natural items, with several overlooks of the river and woods

#27 - Rock outcroppings and most wooded areas should be maintained

#28 - Views of mountains and cliffs are nice. Cave is cool. Historic signs are good. Trail around large boulders can be fun and scenic. A side garden with footpaths and benches would be a good place to rest at. Emergency phones would be good idea.

#29 - Dam & power plant, railroad structures, trees, greenery

#31 - Accessibility to populated areas (downtown other parts of the city/county) desirable, however care should be taken to preserve diversity and separateness of the greenway. It should feel secluded, safe & clean (but not overly developed).

#32 - The natural surface.

#33 - Adjoining natural habitat

#34 - All possible consistent with a good trail

#35 – As many features and resources as possible should be preserved. What do you mean by enhancement? I’m sure many people cut down beautiful old trees to clear a view for their monster house-on-the-hill and consider this “enhancement”. I think cleaning out trash, stopping polluters, and minimizing human impact are the highest priorities.

5. Do you support development of this section of the Roanoke River Greenway?

#1 - yes

#2 - yes

#3 - yes - strongly

#4 - YES!

#5 - definitely

#6 - yes

#7 - yes, as long as everyone concerned has their needs met

#9 - yes

#11 - yes!

#12 - yes

#13 - yes, enthusiastically

#15 - No. Don’t want ATVs banned from the north side of the river. Don’t want the noise.

#16 - yes

#18 - yes

#19 - Yes, very much

#26 – No [but other comments indicated that he thought development mean commercial development and he supported the greenway]

#27 - Yes

#28 - YES

#29 - Yes

#30 - Yes

#32 - Yes, the big loop to Explore Park

#33 - Yes

#34 - YES!!

#35 – From the presentation at the public hearing, I gather it’s a tough stretch and it would be unrealistic to expect to develop the entire length. Why not focus on creating park-like pockets along the way instead of the linear “get from here to there” mindset?

6. Where should the greenway be, or not be, located?

#3 - It should stay as close to the river as practical and as flat as possible. It should connect to trail system paralleling the Parkway.

#4 - Location should be determined by connections

#5 - Utilize natural terrain as much as possible while minimizing water crossings; situated to best preserve nature yet provide adequate access

#6 - I don’t know the area in detail. Be sensitive to the contours of the land, don’t put pavement where runoff will flow into the river

#9 - Run the greenway from Salem to Smith Mtn. Lake & eventually connect to the New River Valley Trail and beyond to James River

#11 - Wherever it works best

#13 - Avoid RR right of way wherever possible; don’t be afraid of bridges - just make them basic and use donations and volunteer labor

#16 - Whatever works

#18 - Near the river and where a minimum of excavation is required

#19 - South side of Roanoke River (my opinion)

- #26 - It should follow the river where possible and avoid commercial areas and main arteries
- #27 - Care should be taken in routing to avoid the areas in the immediate vicinity of Niagara Dam due to safety concerns [AEP employee]
- #28 - I mostly like the idea of north side of river. But also would like access to Explore Park via bridge.
- #29 - Adjacent to river, if construction will not adversely affect quality of environment along waterway - i.e. no severe grading, tree removal, pavement, etc.
- #31 - Connection to Explore Park trail system desirable
- #32 - The eastern section
- #33 - Undecided
- #34 - Along the river where possible
- #35 – The way you word this question makes me understand that your idea of a greenway is pavement or trail! A greenway “should” be located where access is safe (for humans and Mother Nature) and/or the area needs attention/preservation or offers unique educational opportunity.

7. Which of the alternative routes do you prefer and why?

- #3 - Prefer the north route because it stays the closest to the river and avoid a climb followed by a drop; the north side seems flatter
- #4 - Probably north because of above
- #5 - North side closer to & access by more residents also minimizes water crossings
- #6 - No specific preferences yet
- #7 - Both sides
- #9 - Mill Mtn. to downtown & Tinker Creek to the entire river!
- #11 - Need to study more
- #13 - Ones that feature natural areas, scenic views and historic features - the trail needs to be interesting and informative to visitors
- #19 - South side of river to Niagra Dam. A short distance on the north side, there doesn't seem to be space enough between the river and the RR tracks.
- #26 - I don't have a preference, but I would personally prefer the one that avoids stairs, or steep climbs
- #27 - Prefer keeping it north of river from Tinker Creek to the parking bridge, then crossing to south side.
- #28 - I would like a connection to Mill Mountain trail system and Chestnut Loop at some point. Maybe this connection would be at Explore Park. So I am for whatever promotes that "big loop" idea.
- #29 - North (east) side - prefer because it's on my side.
- #33 – Unknown
- #35 – I don't know enough about the alternative routes to express a preference. Perhaps none of the above . . .

8. Do you have comments on the section from Tinker Creek to Blue Ridge Parkway?

- #3 - It should connect to the Tinker Creek Greenway; it ideally should not be caged by a tall fence (perhaps to shield the railroad and the trail)
- #4 - River smell may be an issue
- #6 - Ensure connections to Tinker Creek & Wolf Creek greenways
- #9 - Great idea - get it connected & make it happen
- #11 - Yes, both for horse use Tinker Creek to connect to Carvins Cove
- #13 - Green (southern) trail is more interesting
- #19 - So quiet and peaceful its hard to believe one is only a few miles from downtown.
- #20 – From what I know about this area from doing the other Master Plan, there seems to be a better place to cross the Roanoke River from an engineering stand point, if the trail extends on the north side of the river. When I was out there I actually walked through the woods all the way around the treatment plant and down to the river and was able to get a good feel of the area and possible crossing spots.
- #21 - One of the land owners is a former student of mine. Her name is Melissa Ayers. She owns 3 acres on the south side of the river. She was very adamant that if she is approached about selling any property, she said only all 3 acres or nothing. I told her and another lady who owns 4 acres to visit some greenways and see first hand how clean they are and ask land owners how they felt about the trails adjoining their property.

#26 - I endorse both.

#27 - Most of this portion is within the "Project Boundary" of Niagara Hydro and, as such, would require approval from the Federal Energy Regulating Commission (FERC)

#28 - North Side of river seems best due to Tinker Creek greenway and all the private small tracks of land that may make south side tricky. But I really don't know all the details, to give a final answer. If I lived near greenway, I would want to have access from my backyard or neighborhood. People on one side of the river will not have as easy access.

#29 - Keep more natural (Category III), follow terrain

#31 - In sections where stairs deemed necessary, also offer a non-stair option for bikers. Light development is preferred over theme parking junk. There's no reason to clutter the space with an excess of signs, manicured beds, and instructions. Let the beauty of the area shine through!

#33 - For

#34 - No

#35 - Don't know to comment specifically.

9. Do you have comments on the section from the Blue Ridge Parkway to Back Creek?

#3 - It should connect to the Explore Park trail system or close to the trail system; if it crosses the river at Explore Park, it would connect Explore property on both sides of the river and provide opportunities for Explore Park

#4 - If this is paved, road cyclists can connect with the road, vastly expanding the possible route

#6 - In the more natural areas, especially those with cliffs & rocks, maintain the natural feel of the area - don't overbuild.

#9 - Get it going

#11 - Connect thru Explore Park also

#13 - Green (southern) trail into Explore Park with possible crossing & extension to Co. line

#19 - Has anyone considered putting the greenway on the north side of river from Parkway bridge to Explore Park. Very scenic from either side, short canal bypass small waterfalls.

#26 - I endorse both

#27 - No

#28 - It seems best to have it on other side of river from Explore Park to keep out of their historic area. I do not know what land owner issues are like over on the other side though. A bridge allowing access to Explore trails would be needed.

I think bridges should allow easy wheeled crossing if possible. Avoid stairs on trail for same reason. I don't know if wheelchairs would use the greenway...but that would be pretty important to them too.

#29 - No comments

#32 - Make it a natural surface. Single track.

#33 - For

#34 - No

#35 - Don't know enough about either to comment on them specifically.

10. Other Comments and Issues

#8 - Good meeting. Informative.

#9 - Signage with mileage to certain locations; the history of the region; develop safety features along the trail

#10 - Use cable car for crossing the river. Pull yourself back. Help landowners find tax breaks.

#13 - Signage about the local fishes and wildlife that live along the route. Try Ken Cabarle, City of Roanoke, for info on river fisheries.

#15 - Squirrels are diseased in September. May reflect environmental problems.

#16 - David Hurt has info on Coopers Cove and Back Creek History.

#17 - 10 year time frame (too long) - short term Wolf Creek; loops are preferred; vandalism of interpretative areas; flooding

#18 - Don't forget Indian life along the river.

#19 - I'd like access to the river for canoeing - J.R. Cooper

#20 – I enjoyed the workshop and what you had to say. It looks like there will be some critical engineering challenges to tackle. From crossing the river, to marshy land in the flood plain, to the steep terrain. These were the issues on my mind as I listened and traveled down that canoe trip. It will take some innovative solutions to produce the dream that lies in the minds of many individuals. Please keep me in the loop with this project. I am interested in helping you out in anyway I can. – Jay McGuire, Anderson&Asso.

#22 - I just want to weigh in as one biker who knows how to get off the bike to use stairs or a narrow bridge. Everyone has to make compromises. Post a good warning sign so no one launches themselves. Mountain bikers want to ride switch-backs on steep side-hill, breaking down the trail like they do on North Mountain. So if a greenway has a feature which would be impaired by riding a bike over it, then it must be constructed in such a way as to force the rider to dismount.

#24 – This section of the Roanoke River Greenway between edge of Roanoke City and Explore Park is an important part of the Big Loop. It is part of the drive needed to get the National Park Service to approve adding the Chestnut Loop and horse trail along the Parkway to the Greenway system and making them multi-user. With the work being done on the Greenway and the work being done on a trail system on Mill Mountain, the Park Service will feel some pressure to help make this a connected system.

#27 – Can provide info on dam – 985-2469, Wayne Alexander

#30 – Can help with construction – Bob McCleary, Dale Avenue

#31 – Include mileage markers, inconspicuous signage, maps of trail systems touching or near the greenway

#35 – I am interested in helping with identifying area flora and fauna, especially the so called “weeds”. Also interested in cleanup projects and planting to repair man-made damage (ex: in the ravaged area of river along Wasena and Smith Park). Please consider coming at the greenway development from an ecological viewpoint instead of from a “consumer” mindset. I’d be delighted to have further input in this way, and believe many other folks who would “use” the greenway would agree with this approach. Have you considered partnering with schools or environmental groups to broaden the approach and create more volunteer support?

Please keep me posted on your plans! – Nancy Maurelli

Roanoke River Greenway, Eastern Section
Community Workshop
Senior Center, Vinton
July 11, 2002

Report on Group Discussions

Questions

Groups were asked to address the following questions:

1. What activities would you like to see on a greenway along the river?
2. What surface would you prefer on a greenway along the river - paved, cinder or natural?
3. Do you have comments on the section from Tinker Creek to the Blue Ridge Parkway?
4. Do you have comments on the section from the Parkway to Back Creek?

Comments as Recorded on Flip Charts

Group 1

Facilitators: Anita McMillan, Dinah Ferrance

Participants and their interests

Sean McGinnis	- Hiking and biking
Dee Copenhaver	- Volunteering, hiking, biking
Diane DiCarlo	- SCC, Explore Park, future
Gary Oberlender	- Horseback riding, jogging
Jay McGuire	- Anderson Consultant
Billy Wilson	- Property owner, hiking and biking, kids, Open spaces
Mr. and Mrs. Wilson	- In support. Fishing and hunting. Concern about blocking access trail 1/4mile from Niagara Dam.
Roger Holnback	- Western Va Land Trust-- Greenway support-conservation
Bob Peckman	- Bicycling
Kris Peckman	- Linkages with other greenways, conservation, features, spills to rivers
Bill Modica	- Exec. Director Blue Ridge Environmental Network - canoeing-access for canoes, boating (Explore Park), hiking and biking, wildflowers and animals

Activities along Greenway

Biking, hiking, canoeing, handicapped accessibilities, point of access, loading docks for canoes, boats.

Horseback trail, access.

Preservation of wildlife (bird feeders, turkey and deer).

Wildlife observation-bird watch.

Fishing, picnic sites/tables, shelter, benches

Bridges crossing - Fun activity-suspension bridge, especially for kids. Fords-shallow places for crossings, horses.

Surface/Trail Category

Combination of the three (3) surfaces due to existing conditions.

Towards Explore Park, go to C Type, look as natural as possible. When too flat, not conducive for hiking.

Safety concern due to N&S ROW and track.

Cinder surface - soft for walking, biking, horseback riding

Comments

Floodplain concerns.

Interpretative signage - more needed.

More multiple access points.

Down river towards the east, more natural looking, little construction.

Multiple uses – higher quality than Appalachian Trail.

Keep as natural as we can to keep wildlife

Insects - south side has springs, spongy

Width of the trail

Safety of trail for users

Lighting - solar

(Lighting is contradiction for the need to keeping it more natural)

Safety for residents/property owners adjacent to the trail.

Awareness of the need for handicapped to be able to use the trail.

Speed in developing the trail- due to the momentum (Don't miss the boat!)

Group 2

Facilitators: B. T. Fitzpatrick, Butch Kelly

1. 13th Street Indian Village - Buzzard Rock
2. Cave of little known significance
3. Silty substrate (hard to build trail on south side), water very deep
4. Flood prone (up to RR tracks)
5. May encourage walking over Niagara Dam
6. What about hunting?
7. How to cross river?
8. BRP bridge best way to cross
9. Raw sewage. Is it to be a problem?
10. Campsites
11. Parking access
12. Horse access
13. Odor from old landfill
14. Interpretive signs
15. Accommodating horses

Group 3

Facilitators: Michael LaRoche, Pete Haislip

Belly Bridge - Boat access to the river, parking at AEP road.

As much paved, Category A, as possible.

Minimize fences (caged feel).

Security

Liability of land owners

Trash/ maintenance

Tax benefits to land owners if sharing land?

Questions:

Fencing the trail from/on the property edges?

Horses? Where, which sections?

Access to the Greenway via connections to community

Advantages of north side

1. Connects to Tinker/Wolf and Parkway

2. Bridges for horses? Fording the river.

Non-motorized!!! enforced!!!

Include horse users in design

Adjacent small class B/C trails parallel to the Class A Trails.

Ability to plan for two extremes of costs and potential to allow for more development as money is available.--Momentum of development

Group 4

Facilitators: Mary Zirkle, David Holladay

Access issues/Parking

Continue Wolf Creek Greenway first

Connect Tinker Creek with Wolf Creek via River Greenway

Activities/ Interest

Walking, river access, fishing, canoeing, fishing access/piers. Rest stops-covered shelters. Emergency phones, security. Interpretive points, running trails. Bicycling.

Material surface preference:

Varied with terrain

Some wood structures

Dirt-cinder

Some pavement

Not practical to have wheelchair access for entire route

Multiple access points near major points of interest

Parking lots with spur trail access

Vandalism concerns

Restroom facilities

Transportation function

Archaeologic interest/contact Department of Historic Resources

Look at multiple funding resources

Sheltered rest stops, emergency phones, parking at key posts, access to river, use grants.

Comments on Tinker Creek to BRP

Parking

Link to Wolf Creek Greenway

Comments on BRP to Back Creek

Topography on south side

More suited to canoe access/Smith Mtn. Lake connection

Trail on north side-views of features on other side

Use TMDL funding for stream repair.

KREP grants, usual farm but impaired streams included.

Cover-solid tree canopy especially with paving