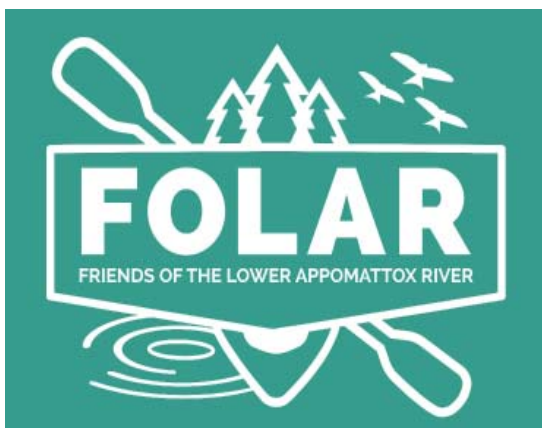


Appomattox River Trail

MASTER PLAN



DRAFT
Oct 13, 2016



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SECTION 1

Field Reconnaissance and Analysis





Project work team

Field Reconnaissance

The FOLAR planning team and LPDA staff spent three days exploring potential trail routes along the banks and edges of the Lower Appomattox River between Lake Chesdin and City Point Park. The team primarily focused efforts on the south side of the river (or the east side in some areas), but also explored connections and trail spurs on the north/west side.

There are currently over 6.5 miles of trails on the south side of the river and almost 3 miles of trail on the north side within the study area (See Map 1 [pg 9], Lower Appomattox Existing Conditions). The access points to the existing trail segments are primarily at riverside parks and/or small public trailheads.

Opportunities

The Lower Appomattox River corridor is rife with visual, natural, and historic treasures, some of which can be accessed by the current trails and some of which should be accessed by future trails.

Existing Parks and Trails

On the North/West side of the River:

Just east of the Lake Chesdin dam there is a parking area and canoe launch at the Appomattox River Canoe Launch. From the launch, there is a trail through the John J. Radcliffe Conservation Area. The trail is close to 1.5-miles in length and the eastern terminus is located near an old dam structure that almost connects the north and south sides of the river.

On the north side of the river, across from the Battersea neighborhood, the Appomattox River Scenic Trail at Ettrick is currently under construction. Further to the east, across from Patton Park, there is a private fishing park called Dimirack Park. A utility corridor along the north bank of the river connects Dimirack Park to Appamatuck Park, future trailhead for the Appomattox River Trail (C.H.A.R.T.S. trail). This trail currently begins under the Route 1 underpass and follows the north bank of the river, under I-95, to Roslyn Landing Park.

Continuing to the east along the north side of the river, Fort Clifton Park and R. Garland Dodd Park at Point of Rocks have river access (both on the north side of the river).



Existing bridge

On the South/East side of the River:

From the historic abutment dam below Lake Chesdin, the trail, called the Lower Appomattox River Trail, follows an historic tow path adjacent to a canal along the south side of the river to Ferndale Appomattox Riverside Park. This park has river access and picnic tables and event amenities. The trail continues to the east, past the Battersea neighborhood and several river access points, to University Blvd., where it terminates at Patton Park.

Patton Park has a well-used fishing beach as well as interpretive signs and picnic areas. About a half-mile downstream from Patton park is a .6-mile long trail around Pocahontas Island, which terminates under I-95.

Just west of the I-295 bridge, Appomattox River Regional Park, which has trails and a boat launch, connects to the Cameron's Landing development via a trail under the highway.

In Hopewell, there are three parks along the river: Riverside Harbor Park, City Park, and City Point Park. There is a current effort to connect City Park to the Hopewell City Marina with the Hopewell Riverwalk Trail.

There are several parks that are not on the banks of the river but that are close enough still be part of the "river park system":

McKenzie Street Park

Atwater Park and Soccer Complex

Mathis Park and Crystal Lake

Riverside Park and City Point National Cemetery

Fort Abbott Park



Path along Temple Avenue

Existing Trail Access Points

Along the existing 10+ miles of trail in the trail corridor, there are currently 14 trail access locations (See Map 1 [pg 9], Lower Appomattox River Existing Conditions):

1. Appomattox River Canoe Launch: accessing the John J. Radcliffe Conservation Area trail
2. (Ferndale) Appomattox Riverside Park: accessing the Lower Appomattox River Trail
3. N West Street In Battersea Neighborhood: accessing the Lower Appomattox River Trail
4. Patton Park: accessing the Lower Appomattox River Trail
5. Sapony Street on Pocahontas Island
6. Rolfe Street on Pocahontas Island
7. Parking area on Magazine Road on Pocahontas Island
8. Appamatuck Park: accessing the Appomattox River Trail
9. Roslyn Park: accessing the Appomattox River Trail
10. Appomattox River Regional Park : accessing its own trails
11. Cameron's Landing: accessing Appomattox River Regional Park trails
12. Riverside Park: accessing Riverside Park trail
13. Riverside Ave. parking area: accessing Riverside Park trail
14. City Point Park parking lot: accessing City Point Park trail

River Access Points

River access is a major benefit of having a riverside trail system. The current public river access points are primarily at riverside parks, marinas, and fishing paths off trail segments. These are the public (or semi-public) river access points (See Map 1 [pg 9], Lower Appomattox River Existing Conditions):

SOUTH SIDE:

Ferndale Appomattox Riverside Park
 Battersea neighborhood
 Patton Park
 Pocahontas Island
 Appomattox Boat Harbor
 Appomattox River Regional Park
 Anchor Point Marina
 Weston Plantation
 Riverside Harbor Park
 Hopewell City Marina
 City Park
 City Point Park



Historic Battersea remnants

NORTH SIDE:

- Appomattox River Canoe Launch
- John J. Radcliffe Conservation Area
- Appomattox River Scenic Trail at Ettrick
- Dimirack Park
- Roslyn Landing Park
- Fort Clifton Park
- R. Garland Dodd Park at Point of Rocks
- Historic Point of Rocks

Historic and Cultural Features

The historic and cultural features along the river, including the cities of Petersburg, Colonial Heights, and Hopewell, are not only important sights to see, but also help define the character of the entire corridor. There are remnants of historic dams, bridge abutments, mill structures, railroad trestles, and river-side buildings. These historic features are noted on the maps (See Map 3 [pg 11], Lower Appomattox River Existing Conditions).

There are a series of historic dam remnants along the Appomattox River, including at the eastern end of John J. Radcliffe Conservation Area and the Harvell Dam and Power Plant in Petersburg. There are also many historic railroad bridges and decommissioned trestles that cross the river, especially in the Petersburg/Colonial Heights area where

one crosses between the Appomattox River Scenic Trail at Ettrick and the Battersea neighborhood, Campbell's Bridge between Virginia State University and Patton Park, historic abutments at the Harvell Dam in Petersburg, historic abutments at Pocahontas Island in Petersburg, and an active bridge I-295 and Rt. 10 in Hopewell.

Utility Corridors

There are several utility corridors within the project boundaries that offer long passages of connectivity primarily free of obstructions (See Map 2 [pg10], Lower Appomattox River Existing Conditions). One utility corridor connects the Petersburg Wastewater Treatment Facility on the south side of the river to a power station just east of Temple Ave. This route follows an access road along a spit of land in the river until the overhead power lines cross the river to the south bank at the power station. A second overhead utility line corridor runs from the Appomattox River Regional Park to Mathis Park in Hopewell. This utility corridor crosses residential areas as well as undeveloped land.



Appomattox Street in Hopewell

Existing Road Corridors with Pedestrian Improvements

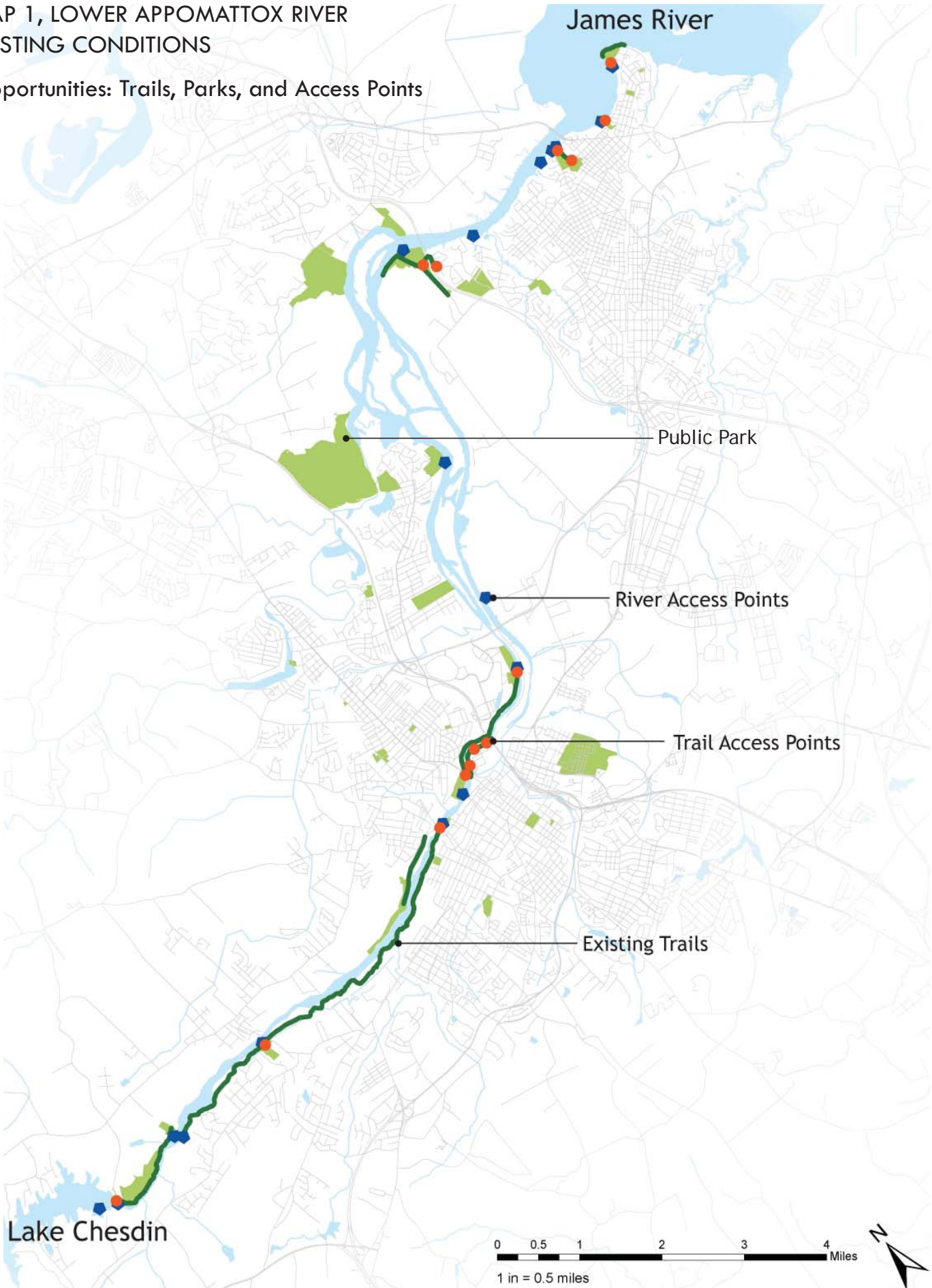
Several road corridors within the project area have existing pedestrian or bicycle improvements that already make them safe and passable (See Map 2 [pg10], Lower Appomattox River Existing Conditions). These areas include Grove Avenue in Petersburg and Broadway Avenue and Appomattox Street in Hopewell.

Adjacent Attractions

The Lower Appomattox River is a thread stringing together a series of important locations. Virginia State University, Historic Petersburg, Downtown Hopewell, parks, and historic sites are all adjacent to the river, and could access or be accessed by the proposed Appomattox River Trail.

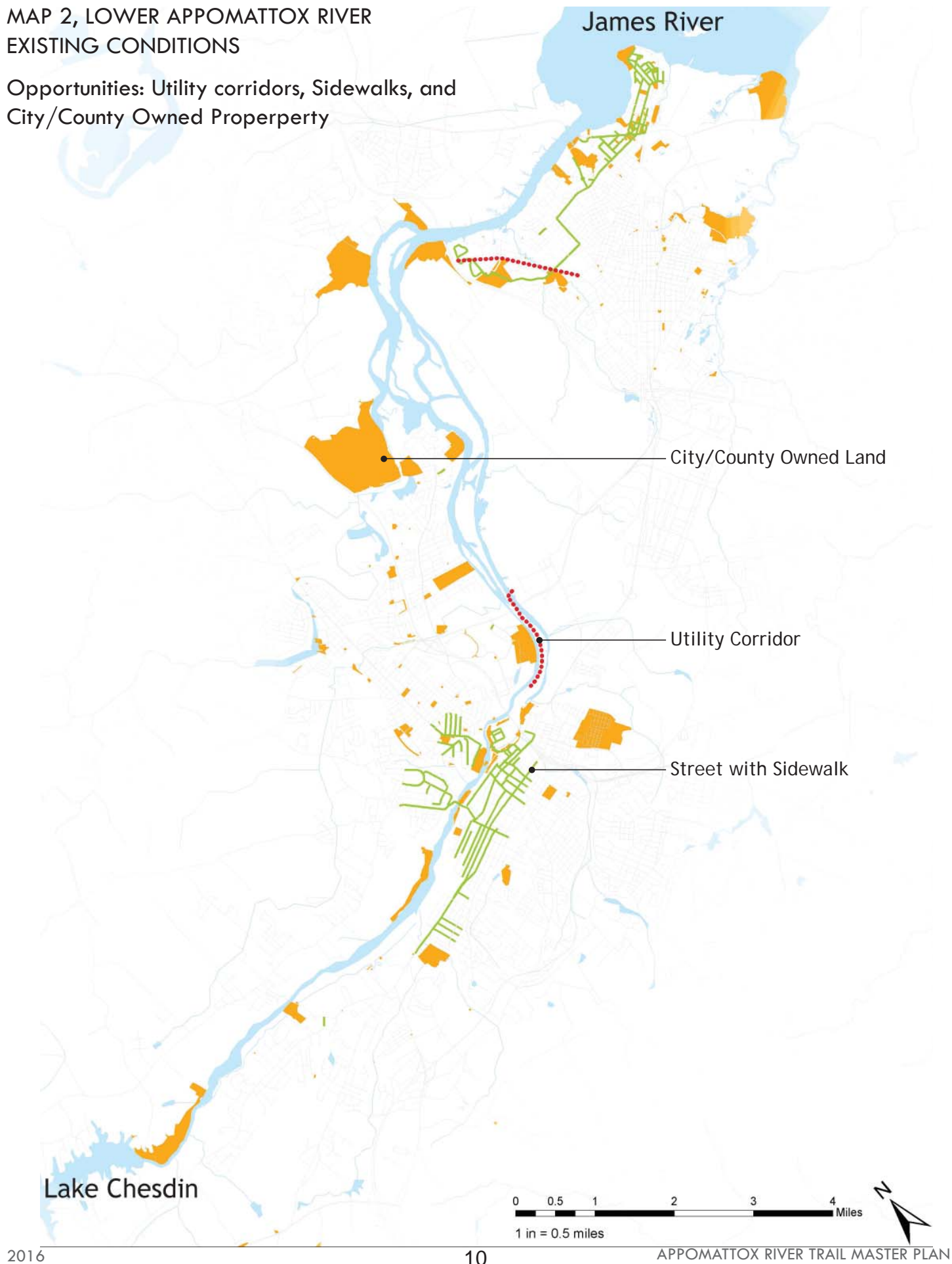
MAP 1, LOWER APPOMATTOX RIVER
EXISTING CONDITIONS

Opportunities: Trails, Parks, and Access Points



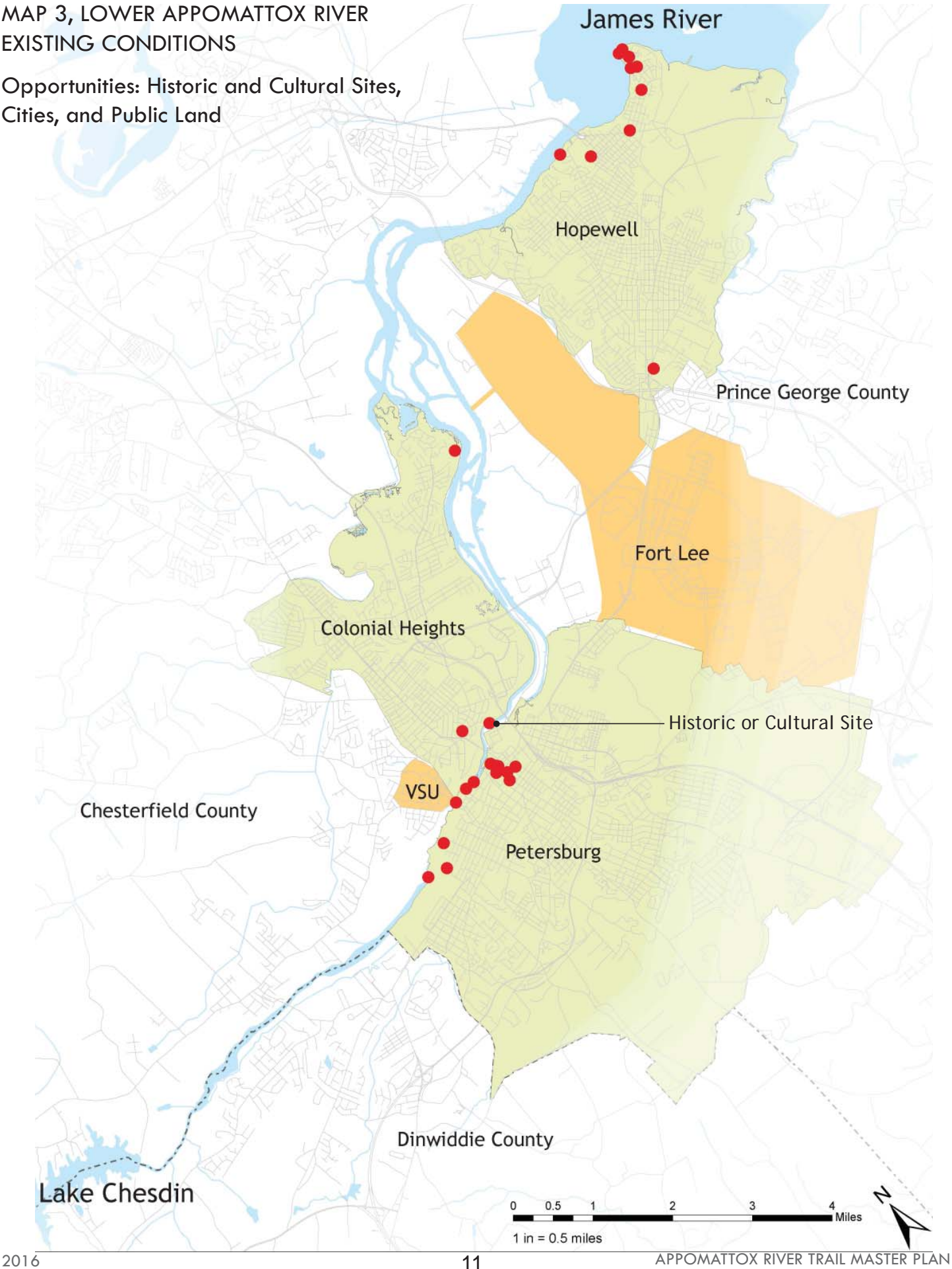
MAP 2, LOWER APPOMATTOX RIVER
EXISTING CONDITIONS

Opportunities: Utility corridors, Sidewalks, and
City/County Owned Property



MAP 3, LOWER APPOMATTOX RIVER
EXISTING CONDITIONS

Opportunities: Historic and Cultural Sites,
Cities, and Public Land





Historic Abutment Dam

Constraints

For a project of this type and scale, it is best to think of constraints in terms of physical limitations and political limitations. Constraints in both categories can be dealt with, but the processes for doing so would be different.

Physical Constraints

The primary physical constraints along the 23-mile corridor are either environmental-- steep slopes, tributaries, and wetlands; or built-- structures, railroads, and major roadways.

In some cases steep slopes can be an amenity as well (when they act as a screen from adjacent land-uses). In some instances along the river corridor the steep slopes divide the river (and existing or potential trail corridor) from residential properties (See Map 4 [pg 14], Lower Appomattox River Existing Conditions). This is the case at the west end of the canal, near Autumn Drive and Westbriar Lane. And while the slopes serve to separate the trail from the houses, they also present a barrier between the neighborhood and potential trail access.

Between Patton Park and Pocahontas Island there are steep slopes along the river's edge, making it very challenging to put a trail along the river.

In the City of Hopewell there are several areas with steep slopes along the river. These occur mostly in dense residential areas.

When tributaries join the Lower Appomattox River it presents an amenity as well as a constraint (See Map 4 [pg 14], Lower Appomattox River Existing Conditions). In addition to the opportunities for blueways connections and attractive wayside locations, crossing a tributary often requires a bridge or a culvert. Depending on the width of the tributary, the cost can be manageable to prohibitive. The Canal that stretches from the area near Ferndale Circle to the historic dam structure below the Lake Chesdin dam acts as a constraint much like a tributary. It inhibits pedestrian connection between the adjacent neighborhoods and the trail.

Buildings, railroads and major roadways are constraints in many locations along the corridor. In some cases, such as I-95, I-295, and Route 10, there is already sufficient passage under the roadway. In other cases there will need to be at-grade crossings, pedestrian bridges, or tunnels.

Railroads are prevalent along this corridor and help to define the character of the area, but they also hinder connections between some neighborhoods and downtown areas and the river/trail. This is



Trail on Pocahontas Island

the case between Appomattox Riverside Park and downtown Petersburg. Although there are some locations where pedestrians can cross the railroad tracks, there are lengthy stretches of trail that have no access point because of the tracks. (See Map 5 [pg 15], Lower Appomattox River Existing Conditions).

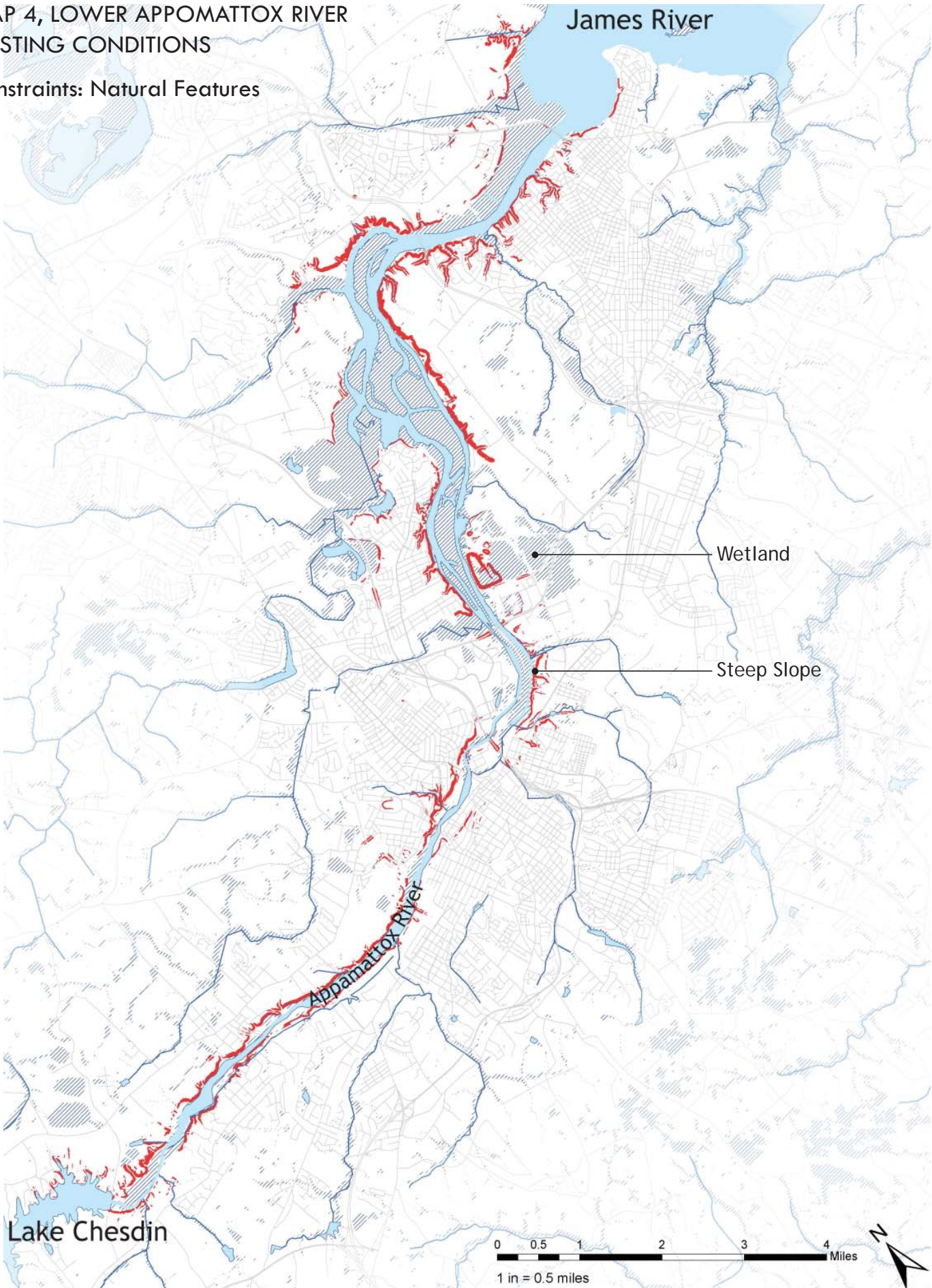
Wetlands are also common along this corridor and again, they are an amenity as well as a physical constraint. With proper planning, mitigation, design and collaboration, wetlands may not hinder the passage of the trail along this corridor.

Political and Property Constraints

Many of the potential political constraints associated with this project have already been mitigated. With all six municipalities involved, the political issues that the project may face will likely be associated with individual property owners, developers, commercial properties, and state and federal lands. At this point in the project, the team has not yet identified whether the landowners will be constraints or opportunities. Property ownership along the river is a mix of public, commercial, and private residential. (See Map 5 [pg 15], Lower Appomattox River Existing Conditions).

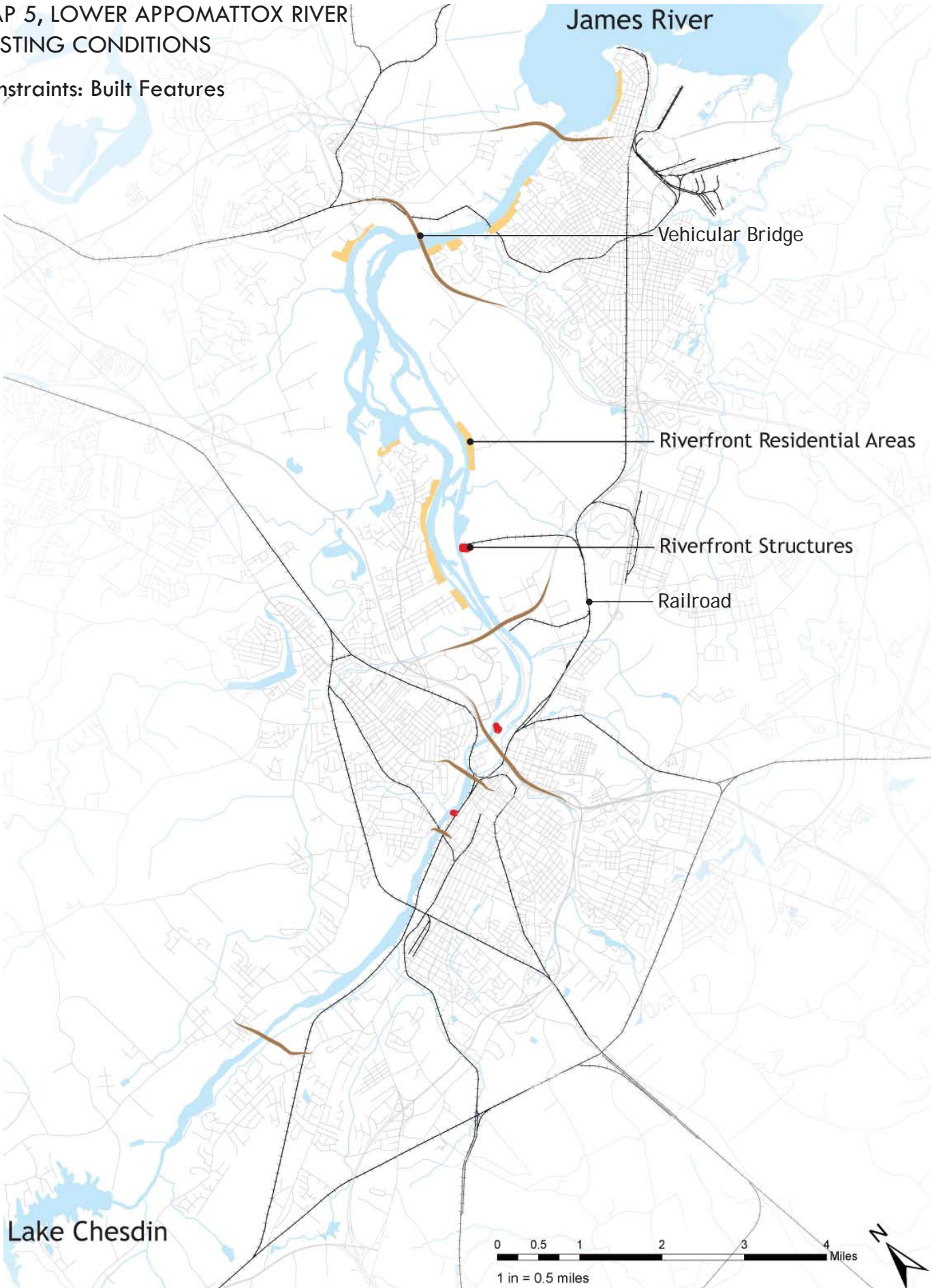
MAP 4, LOWER APPOMATTOX RIVER
EXISTING CONDITIONS

Constraints: Natural Features



MAP 5, LOWER APPOMATTOX RIVER
EXISTING CONDITIONS

Constraints: Built Features



SECTION 2

Recommendations





Historic bridge abutment

After exploring the corridor, documenting the existing conditions, and analyzing the information, LPDA compiled a list of recommendations that will inform the design of the Master Plan. These recommendations could be condensed into the following categories:

- Trail Types
- Trail heads and park improvements
- Neighborhood connections
- River and road crossings
- River access and amenities
- Trail alignment

The Virginia Department of Conservation and Recreation has published a Greenways and Trails Toolbox available for free online at <http://www.dcr.virginia.gov/recreational-planning/greentrailtools>. This is an excellent resource for trail design and management. Chapters 4 and 5 offer support and guidance for trail construction, enhancement, and maintenance, and direct readers to additional sources for more information.

Chapter 4 of the DCR Greenways and Trails Toolbox discusses how to take your trail from a concept on paper to a built product. It gives details on common trail implementation practices, including

land acquisition, liability issues, trail types, and construction methods. The proposed Appomattox River Trail runs through public and private land, undeveloped and urban areas, and includes several different types of trails. Chapter 4 offers valuable guidance on how to overcome these issues.

Chapter 5 of the DCR Greenways and Trails Toolbox gives information on how to operate and maintain a trail after construction is completed. This is discussed further in Section 4 of this Master Plan report.



Multi-modal trail

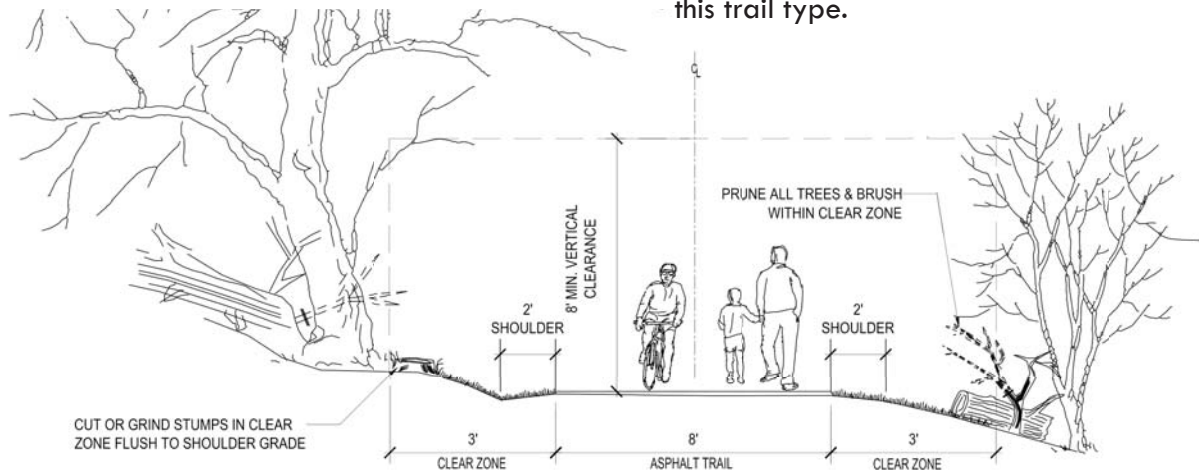
Trail Types

The corridor has several different character areas and environments that require different types of trails. Some trails are designed to be used for wildlife viewing and scenic beauty, some for recreation and non-motorized transpiration, and others for urban pedestrian connections. There are three trail types proposed for this corridor:

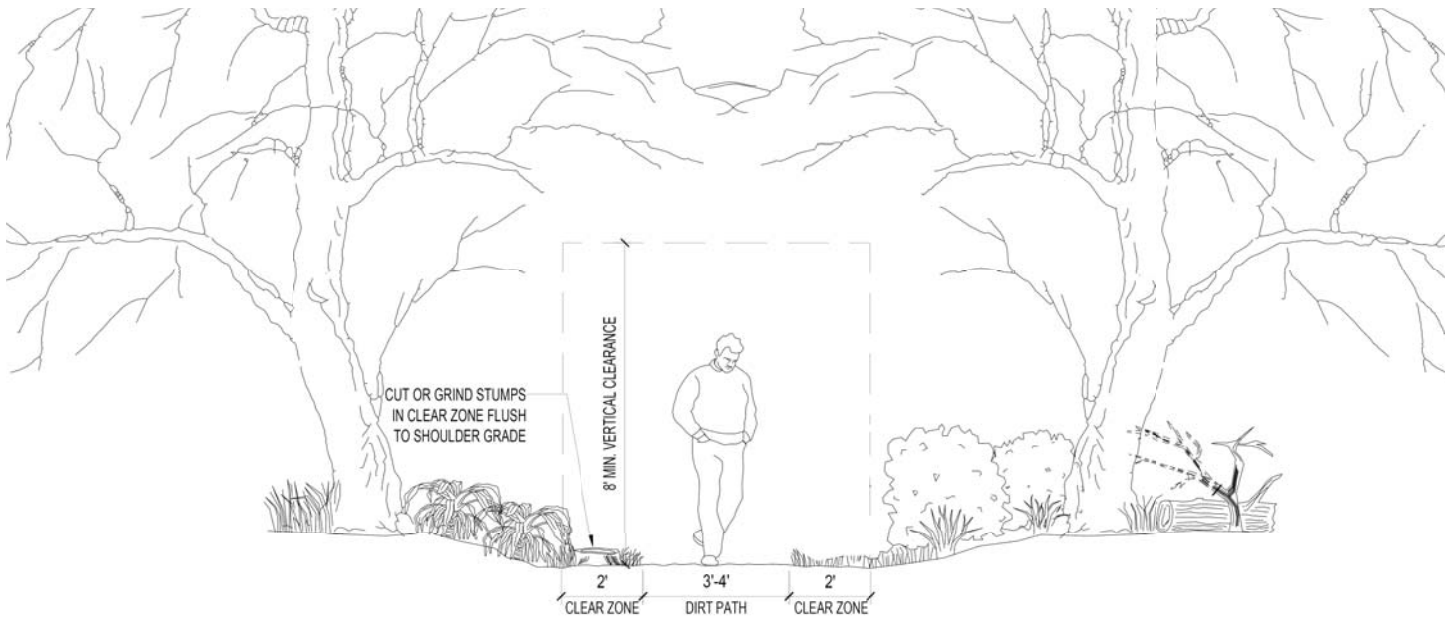
- Multi-modal (8' asphalt)
- Rustic (dirt or stone dust)
- Wide sidewalk (6' concrete)

Multi-modal trails

Multi-modal trails are intended to accommodate several different non-motorized transportation types on the same trail - walkers, joggers, cyclists, skaters, and strollers. The trail will be 8' wide asphalt with 2' shoulders to accommodate a higher volume of use and higher travel speeds. This trail type will be implemented as the primary trail type of the Appomattox River Trail, and will run through natural areas along the river and also through some urban areas as right-of-way and property ownership permits. The route will improve existing sections of trail, like the stone dust trail along the historic canal path, and develop new sections of trail. Benches, trash cans, picnic tables, water fountains, stretch stations, and other amenities can be added along this trail type.



Typical section for the multi-modal trail



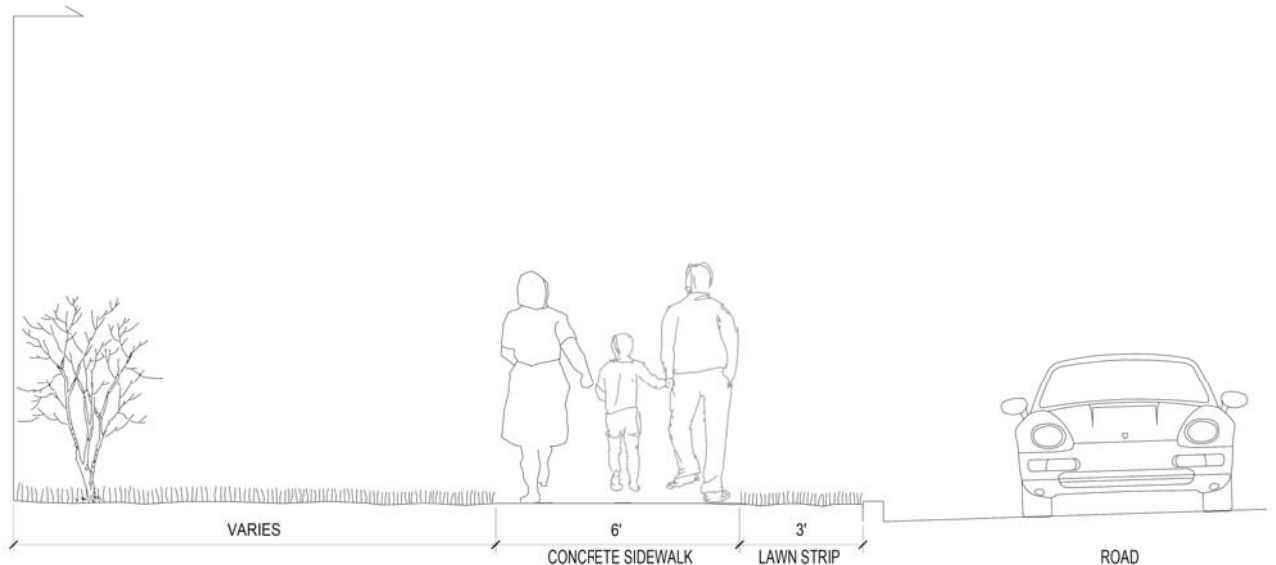
Typical section for the rustic trail

Rustic Trails

Rustic trails are suitable for natural areas or sections that have limited foot traffic. Existing hiking trails and fishing trails will be improved and extended to create a system of interconnected trails along the corridor. The rustic trail may parallel a multi-modal path, but with a route that brings it closer to the river or near a historic feature. Rustic trails are intended for foot traffic and to provide access to the river bank, scenic natural areas, or historic cultural features. The trail surface will be dirt or stone dust and may feature uneven terrain and grade change. These trails may be enhanced with benches and interpretive panels.

Wide Sidewalks

Wide Sidewalks provide two-way pedestrian connection through urban and neighborhood areas. The 6' wide concrete sidewalks will either be added along a road, or existing sidewalks will be improved. Wide sidewalks will be implemented in areas where there is not space within right-of-way for a multi-modal trail, but where a two-way route is preferred. The wide sidewalks will provide connections within the neighborhood and access to the extended Appomattox River Trail route.



Typical section for the wide sidewalk



Example of trail along a river

Trailheads and Park Improvements

In general, existing trail sections and trail heads should be upgraded with signage, location maps, and amenities (benches, trash receptacles, and bike racks). Planting areas should be kept minimal, easily maintained, and tidy. Public parking areas should be clearly indicated, visible from the main vehicular thoroughfare, and visible from the trail. Lighting should be provided where necessary.

For a trail access point to be public, it must include public parking and be located in a public right-of-way or trail easement.

Additional parks and open green spaces along the corridor should be considered in locations with high interpretive value, desired river access, pedestrian and vehicular accessibility, or existing public ownership.

Neighborhood Connections

Neighborhood connections are intended as semi-private access from a neighborhood to the Appomattox River Trail system. No public parking or directional signage will be provided, though there will be identification signage saying that this route provides access to the Appomattox River Trail. They are a way for local residents to access the trail from their front door. These connections are an important way to link the surrounding communities to this resource, and to connect the residents with an alternate transportation route to work, businesses, and friends.

Providing neighborhood connections builds community support for and awareness of the Appomattox River Trail project. This support is beneficial when trying to acquire easements, fundraising, and establishing volunteer maintenance crews.

There are no public access points along sections of the proposed trail on the south side of the Appomattox River between the John J. Radcliffe Conservation Area and Ferndale Appomattox Riverside Park, so providing neighborhood access points along this trail section will increase the usership of the trail.



Example of rustic trail bridge

River and Road Access

The trail corridor is divided by the Appomattox River and intersected by several major roads and highways. These features need to be addressed in order to provide complete access from the Lake Chesdin Dam to the James River.

The Appomattox River is the defining feature of this trail corridor. And while it offers many benefits, it, and its tributaries, also presents a challenge when seeking to connect the communities and trail networks on each bank. A series of bridges will need to be constructed as part of this trail project. Three different types of bridges will be constructed, depending on the trail type and existing infrastructure:

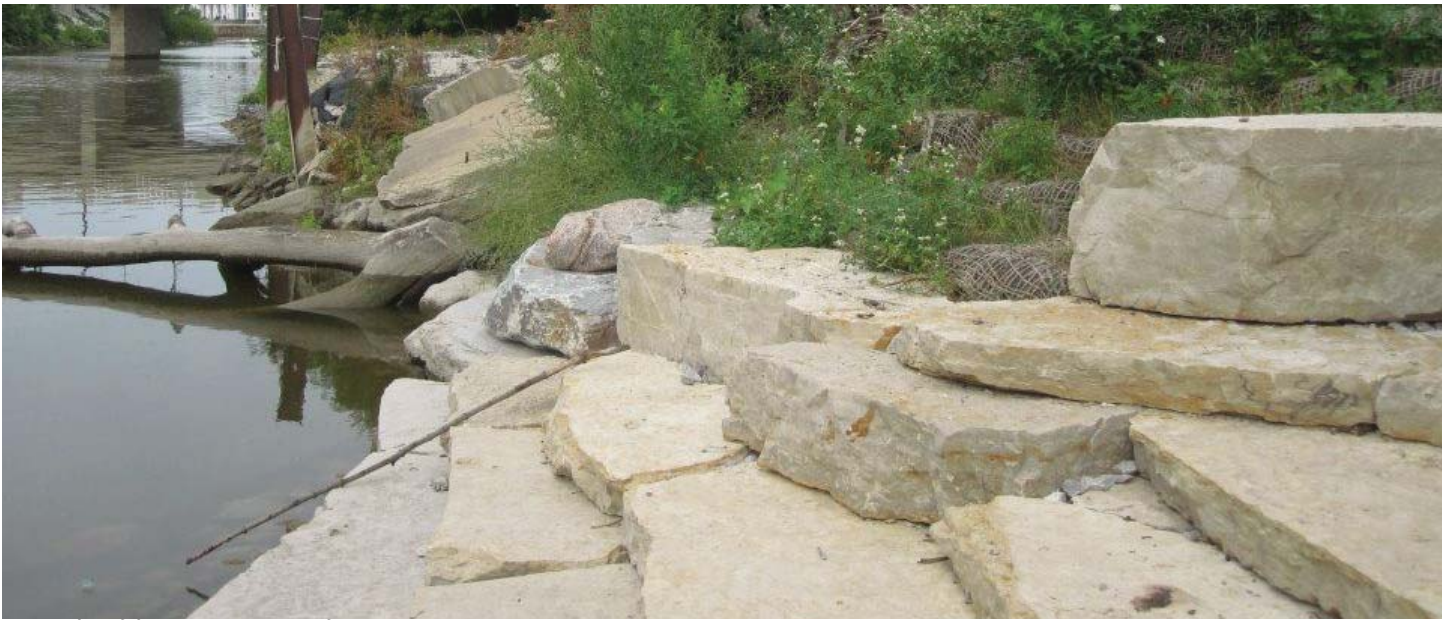
- **Rustic:** These are wooden bridges meant for pedestrian use in natural settings. They will be located on rustic trails and used to cross tributaries of the Appomattox River.
- **Historic Abutments:** There are several historic bridge abutments that cross the Appomattox River. These will be redeveloped as multi-modal trail bridges with new infrastructure atop the historic infrastructure. Redeveloping the historic abutments as a part of a new bridge is a way to highlight the area's history, as well as reduce construction costs.

- **New:** There are a few places along the Appomattox River where a crossing is required and there is not existing or appropriate infrastructure to support it. In these places a complete new bridge will need to be constructed. Existing elements may be able to be incorporated, for example, like suspending a multi-modal bridge beneath the existing Temple Avenue bridge. But this will still require major construction plans and cost.

While the river divides the project area linearly, several major roads divide the area laterally. These roads include Ferndale Road, Boulevard/Route 1, I-95, Temple Avenue, I-295, and Route 10. The trails will need to cross these roads at or below grade.

Where possible, the trails should cross the roads at a different grade, such as using the underpass created by the bridge abutments along the river. Care will need to be taken to provide enough clear width for the trail between the bridge abutment and the river bank, and additional safety fencing along the river bank may need to be installed.

Where it is not possible for the trail to have a grade-separated crossing, the trail will cross the



Example of large stone steps for water access

road at-grade. Care needs to be taken in the design of this intersection to provide predictable and orderly operation by both trail users and drivers. There are many design features that will enable a safe intersection. These can include striping, advance warning signs, stop and caution signs, and in-roadway warning lights. Trail users can also have advance warning signs, stop signs, and bike dismount signs. Refer to AASHTO's *Guide for the Development of Bicycle Facilities, 2012*, AASHTO's *Guide for the Planning, Design, and Operation of Pedestrian Facilities (2)*, and the *Urban Bikeway Design Guide* by the National Association of City Transportation Officials for more detailed information.

River Access and Amenities

Besides access to the trail, it is also important to think about how and where the trail provides access to the river. The Lower Appomattox River is a wonderful amenity for this area. There are a wide array of recreational opportunities associated with the river and the trail will act as a complimentary system to the greenway.

Ideally, there would be numerous river access points along the trail and they would vary in their structure. For example, there may be highly-developed access points such as marinas and public beaches, or they may be as simple as a foot path off the trail to a

small rock outcrop and swimming hole. Some access points may include vehicular parking while others may just be for pedestrian trail users.

Where swimming, playing with dogs, and wading are encouraged, there should be attractive and safe transitions to the water. Avoid steep, muddy, drop offs or places where the water is too deep or quickly moving. Consider using large native rocks to create "steps" into the water, or build a dock with wide steps down to the water. Where possible, use the existing riverbanks. Provide amenities such as benches, trash receptacles, comfort stations, and safety signage. Water access points should be visible from the trail.

Where fishing and gathering on the banks of the river is encouraged, there should be a separation from the active river recreation zones. These should be quiet areas, sometimes shaded, that include river side benches, docks, and/or stable vegetated areas for seating or standing.

Water access points should also be defined in a manner that fits the setting: a mowed cleared area in a rustic setting or boulders outlining the access area in a more developed setting. Defining the edges of the river access point prevents



Improved canoe access

degradation of the riverbanks up and down stream. The Appomattox River is a quality habitat and diverse area, and these resources must be protected as the river's edge becomes more developed.

There should also be ample opportunity for boat access along the river, both carry-in locations and canoe launches. These points should provide safe access to the water via a beach, dock, or launch. Canoe launches should be located adjacent to public parking locations for ease of transport from the vehicle to the water. It is possible to combine boat access with other types of water access, for example a wading beach or as part of a fishing dock. Signage directing the type of boat access at a location should be posted, as well as appropriate safety and warning signs. Adequate parking should be available near these launch points to accommodate the longer activity time of the boat users as well as other, shorter visits.

Ensure that spaced along the Appomattox River there are ADA accessible water access points, fishing areas, and boat docks, with accessible routes to appropriate parking locations. These will be easiest to incorporate into more developed areas, like parks or marinas rather than natural areas.

Trail Alignment

The Lower Appomattox River area includes three counties, three towns, a university, and many parks and natural areas. All of these organizations, as well as some state and national ones, have developed trail master plans within this region (See Appomattox River Trail - Trails by Organizations in the Region map at the end of this section for the route locations and organizations). The alignment of the proposed Appomattox River Trail seeks to link or integrate as many of these pre-existing built and planned routes as possible. Considering these other plans when designing the Appomattox River Trail route means a more cohesive and connected future for the region. By linking to already established or planned trail networks, the Appomattox River Trail efficiently broadens its users reach. Integrating the proposed Appomattox River Trail route with other trail routes makes it easier to gain support for that trail section. Drawing in the organizations with integrating trails will create partnerships in advocacy, fund raising, construction, and maintenance.

The trail alignment also tries to follow historic routes through the region that may no longer be in use. By following these historic routes, the new trail highlights the region's history and easements are more easily procured than alignments through private property.

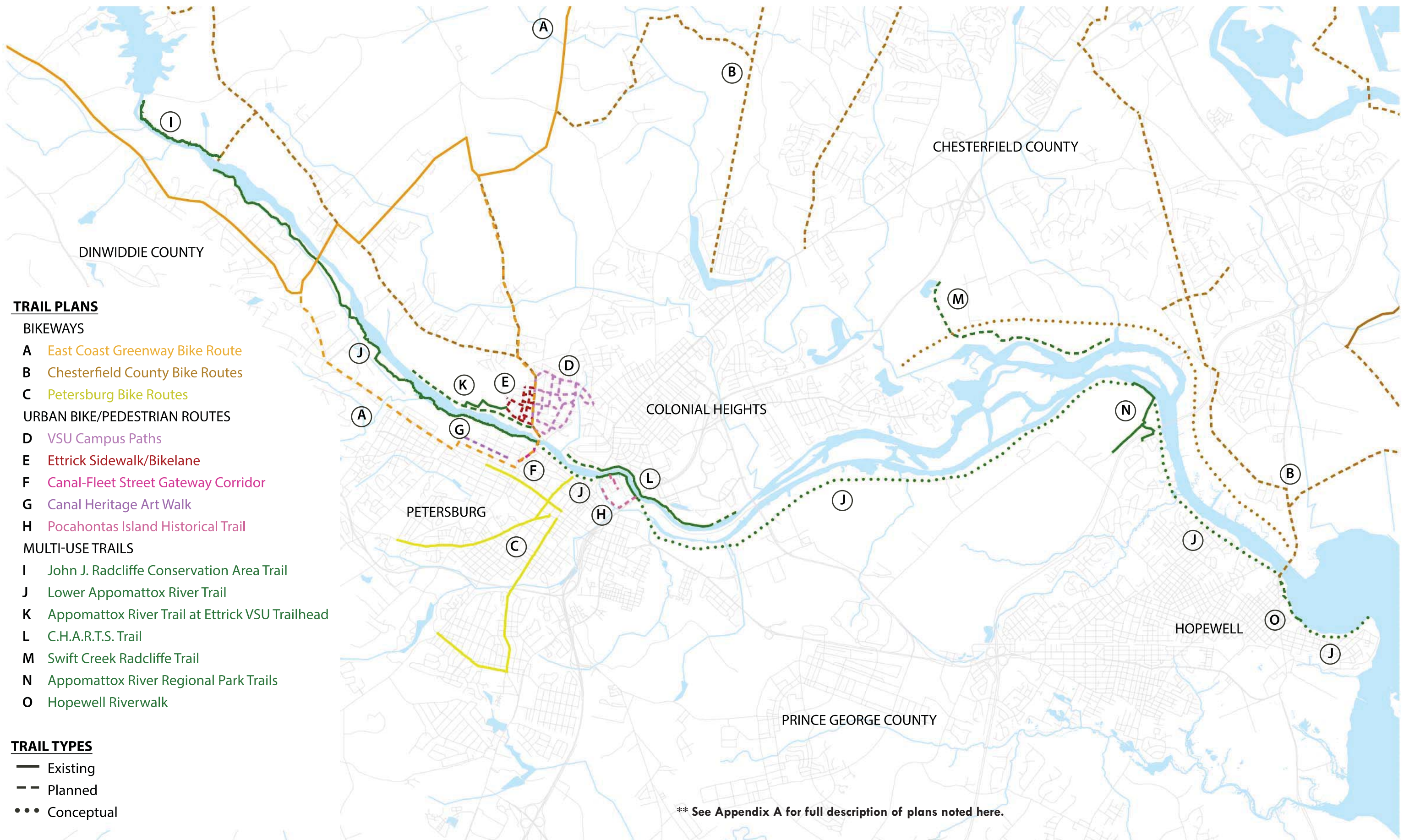


Trail on a previous railroad bed

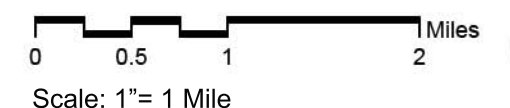
The Appomattox River Trail includes an existing trail on a historic tow path and canal for several miles up and downstream of Ferndale Appomattox Riverside Park. The proposed trail alignment also follows a historic train right-of-way through the Battersea neighborhood of Petersburg and through the Virginia State University campus.

Incorporating utility easements into the alignment of the Appomattox River Trail is another way streamline the trail development process. The easements are cleared, direct routes, often through undeveloped land that offers scenic value to the trail users. Working with one property owner, or incorporating a trail easement with a utility easement simplifies the land acquisition procedure.

Based on these variables, LPDA has developed a recommended route for a trail along the Lower Appomattox River and suggested locations for amenity improvements. These recommendations are refined into a trail master plan in Section 3 of this report.



Appomattox River Trail - Trails by Organizations in the Region

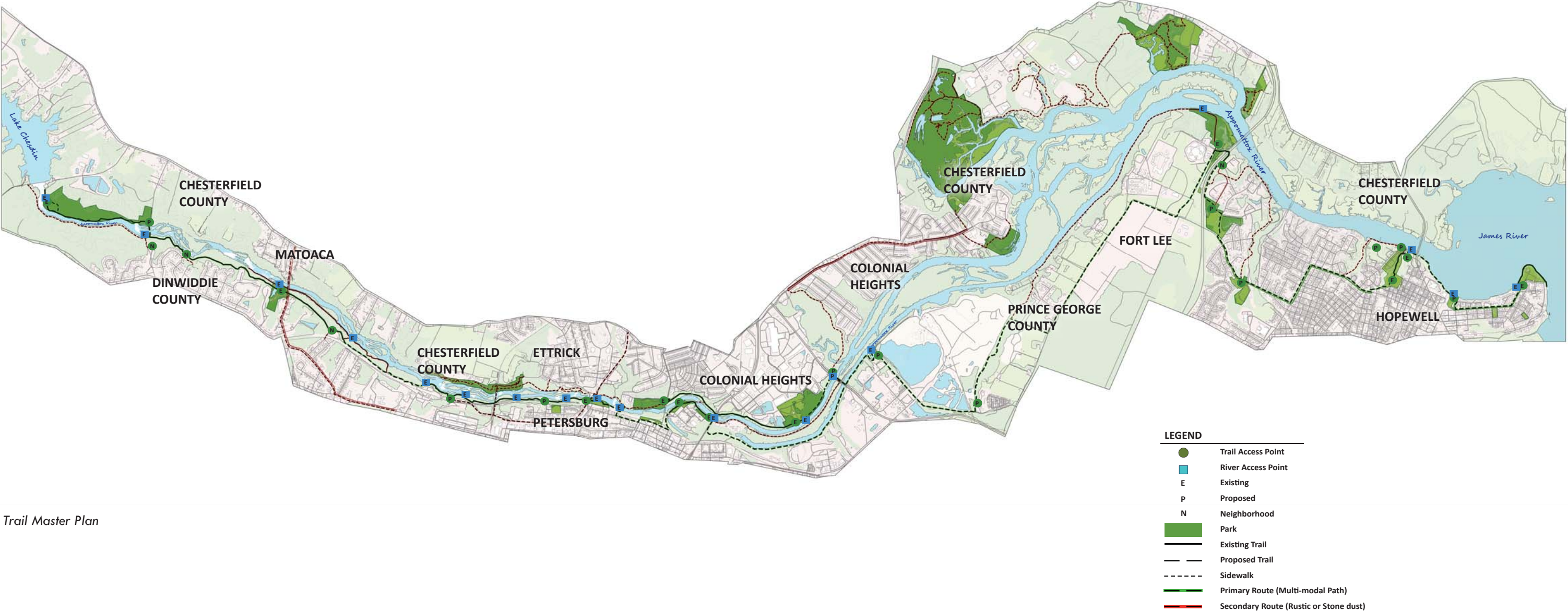


SECTION 3

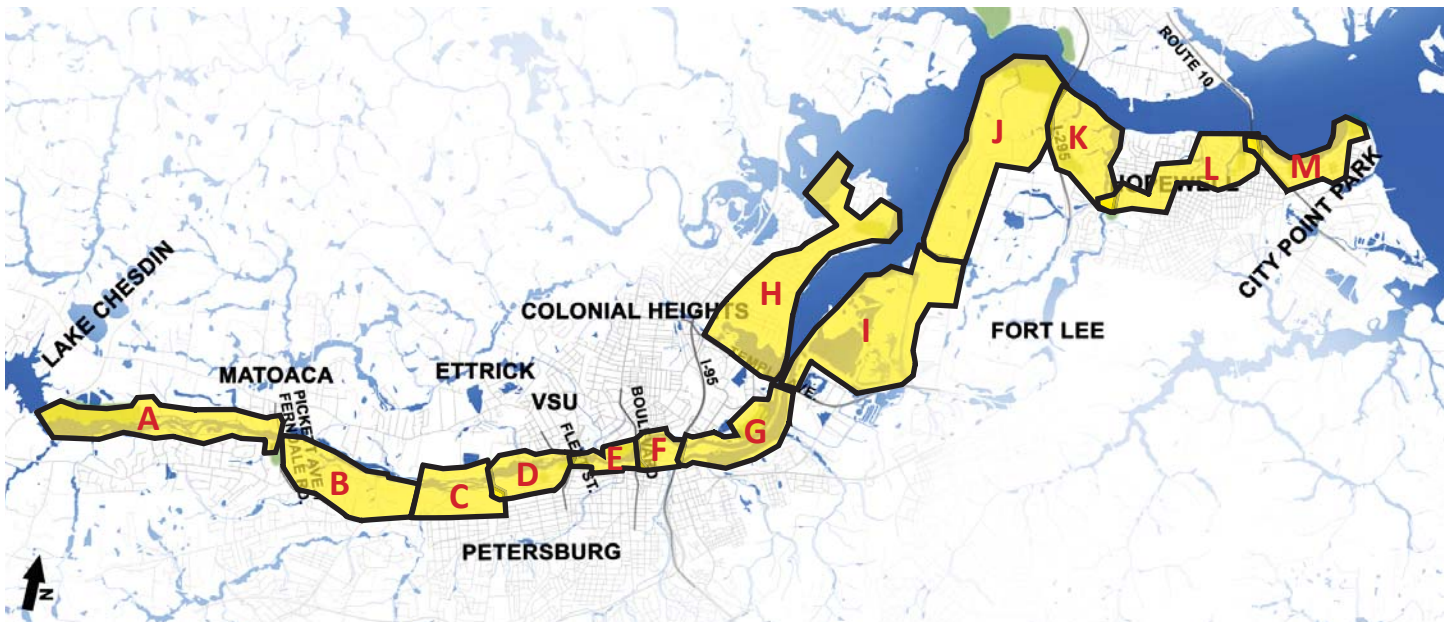
Master Plan (DRAFT)



-photo by Tara Ciavarella



Trail Master Plan

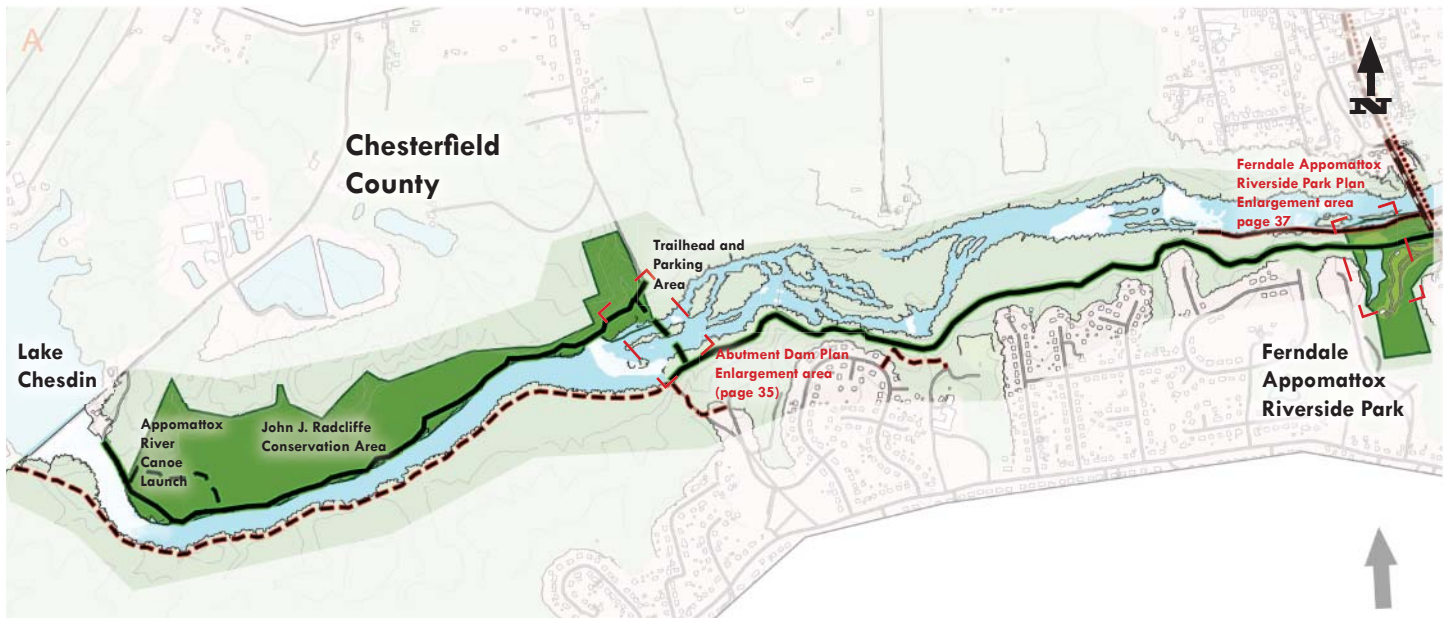


For this chapter, the 23-mile trail and river corridor is divided into 13 sections (see map above). The design recommendations for each section will be in **bold**. The sections are:

- A- Lake Chesdin to Ferndale Appomattox Park
- B- Ferndale Appomattox Park to Rawlings Lane
- C- Rawlings Lane to Battersea Lane
- D- Battersea Lane to University Blvd.
- E- University Blvd. to Boulevard
- F- Boulevard to I-95
- G- I-95 to Temple Ave.
- H- Temple Ave. to Irwin Road (North)
- I- Temple Ave. to Irwin Road (South)
- J- Irwin Road to I-295
- K- I-295 to Cabin Creek Road
- L- Cabin Creek Road to Route 10
- M- Route 10 to City Point Park



Trail near Riverside Park in Hopewell



Section A

Lake Chesdin to Ferndale Appomattox Riverside Park

This section includes a completed trail on the north side (Chesterfield County) through the John J. Radcliffe Conservation area, originating at the Appomattox River Canoe Launch and extending over a mile downstream, thus making the Canoe Launch the westward starting point of the proposed greenway system. **Wayfinding signage directing users to the Canoe Launch needs to be improved along River Road and Chesdin Road. Parking should be expanded as the park usage increases and park amenities should be added, such as a comfort station, safety signage, and picnic facilities. Consider redesigning the boat launch to minimize steepness and allow easier boat access.**

A trailhead and parking area should be added to the eastern end of the John J. Radcliffe Conservation Area. This would also include an emergency access route. The new access road and parking would be located on the north side of the Lower Appomattox River, near the remnants of the abutment dam, which diverts river water into the canal on the south side of the River. The Lower Appomattox Trail is located in between the River and the canal and follows the original tow path. It connects the historic abutment dam to Ferndale Appomattox Riverside Park.



Restrooms

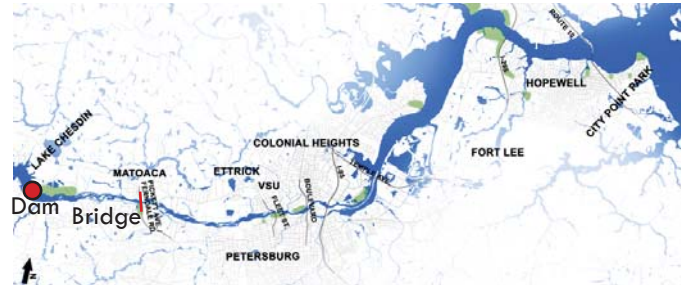


Canoe/kayak launch



Dam at Lake Chesdin

In order to complete this trail segment, the trails on the north and south sides of the river need to be connected. **The recommended option is to connect the river islands with a foot bridge on piers (downstream of the historic abutment dam).** This would allow for viewing the historic dam (see image above and section below). A second option would be to construct a suspension bridge where the river and flood plain are narrow.



The Lower Appomattox Trail between the abutment dam and Ferndale Appomattox Riverside Park is a beautiful trail (the historic tow path) along a charming section of historic canal. **Although there are currently no public access points to the trail that cross the canal, there is a metal structure that could be converted into a neighborhood access bridge (see photo at right) from East Autumn Drive or perhaps even a public access point in partnership with Grace Baptist Church. There could also be a neighborhood access point off Westbriar Lane which would connect to the western end of the trail.**



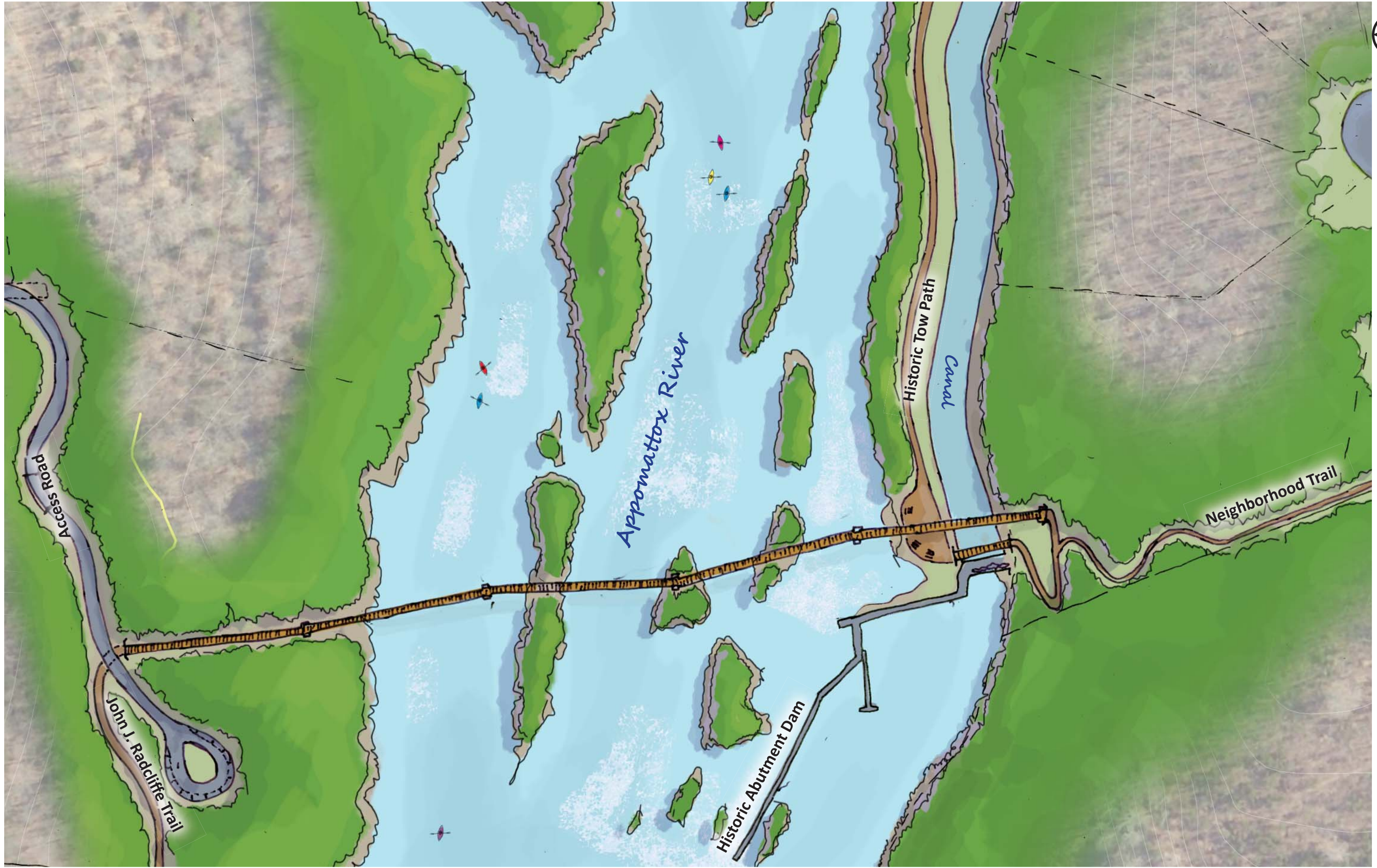
Existing bridge frame



Rendering of potential re-use



Proposed river crossing section



Abutment Dam Plan Enlargement Area
2016



1"=100'



Aerial Map of park location

Ferndale Appomattox Riverside Park

This park is a valuable amenity for the cities and counties in this area as well as for the trail system and river. Its location affords it frequent visits from residents of Dinwiddie and Chesterfield Counties, Petersburg and Colonial Heights, and walkers and boaters from further afield. This Park is the location of festivals (Appomattox RiverFest), float trip parking, and localized recreation. **It is a destination park and should be upgraded in order to support this designation.**

The historic trolley building could be reinvented as a visitor center with comfort stations, boat and bike rentals, and occasional concessions. The canoe and kayak launch should be clearly marked and accessible for all users. The Park, in partnership with local historical societies, Friends of the Lower Appomattox River (FOLAR), and Dinwiddie County, could offer interpretive canal and trail tours.



Swimming opportunity

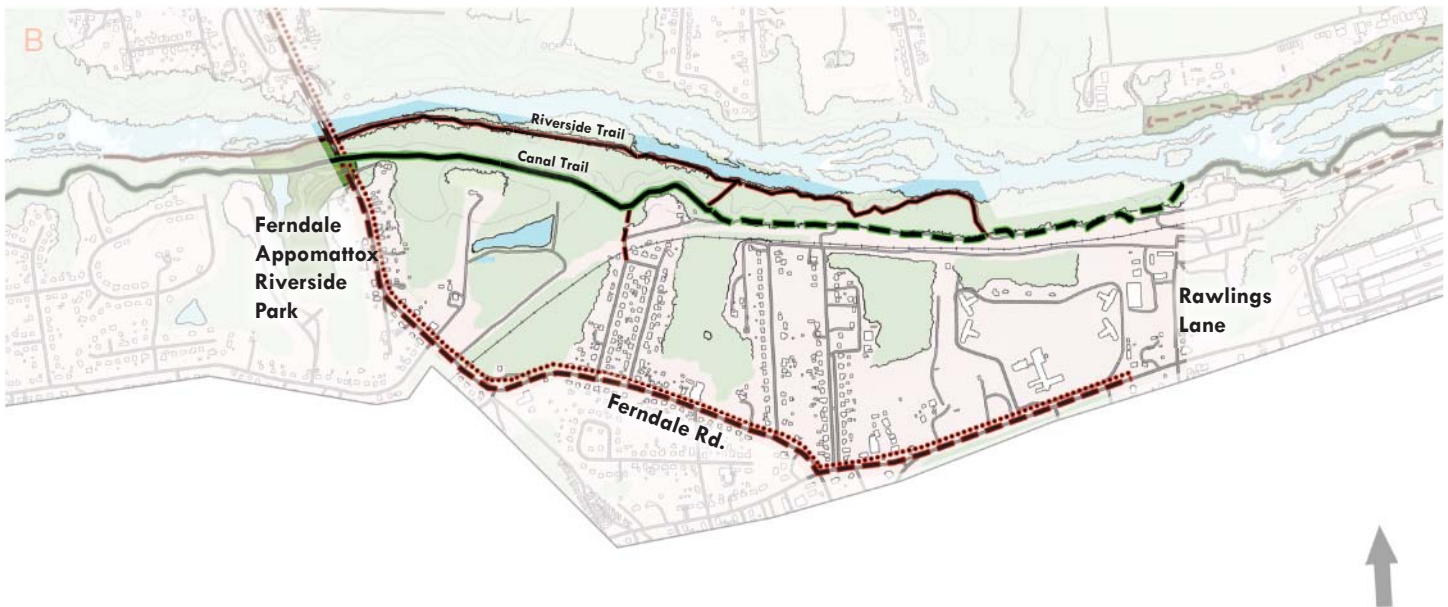


Existing building



Rendering showing use as equipment rental location





Section B

Ferndale Appomattox Riverside Park to Rawlings Lane

This section is largely comprised of an upper trail (Canal trail) and a lower trail (Riverside trail). The upper trail is the continuation of the Lower Appomattox Trail along the historic canal. The lower trail is a meandering nature trail that provides access to the river banks. About halfway through this section, the canal breaks and the trail along the canal is rerouted down the slope to join the nature trails. **It is recommended that the upper trail, the wide and flat, fully ADA accessible trail, continue at the upper elevation, just north of the railroad tracks and utility corridor. The steeper and more narrow nature trails should be retained as dirt or stone dust paths with simple wooden bridges and seasonal vegetation management.**

There is currently access across the railroad track and across the reinforced canal (see photo at right) at Ferndale Circle. **Consider making this an official neighborhood access point or even a public access point in partnership with the property owners.**

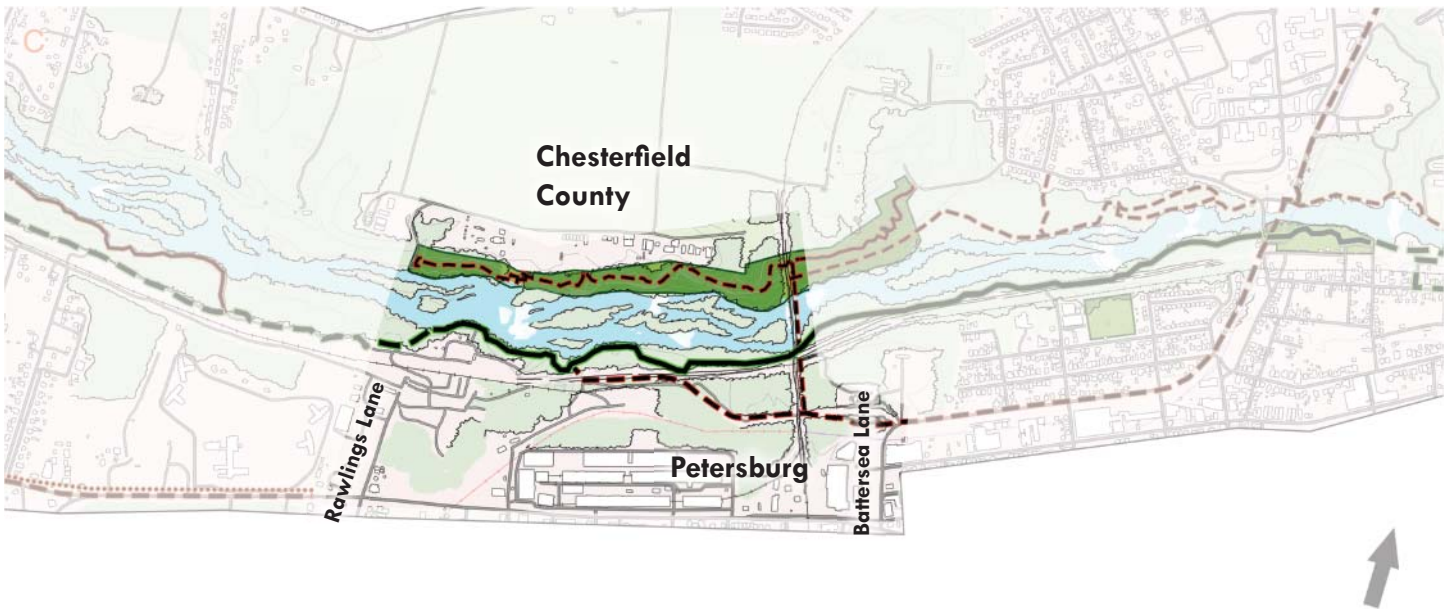
In addition to the existing 5' wide pedestrian path on the east side of the Ferndale Ave bridge, sidewalks should be added along Ferndale Ave. and Route 1, to the Petersburg city line.



Existing footbridge across canal



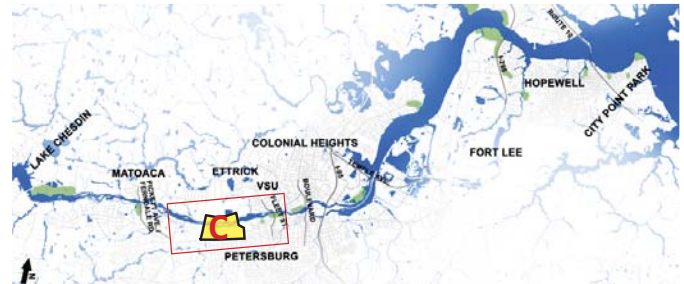
Interpretive signage



Section C

Rawlings Lane to Battersea Lane

On the north side of the Lower Appomattox River, across from the laydown yard and Battersea, VSU and Chesterfield County are constructing a trail, the Appomattox River Trail, that also has **significant interpretive opportunities** (The Ettrick Mill dam, Ettrick Mill Race [now dry], and Ettrick Mill).



On the South Side, at Rawlings Lane, or the Dominion Virginia Power laydown yard, the trail follows the banks of the River and crosses two creeks. **This is the location of the historic Locks Aqueduct, which could be toured and interpreted in partnership with Dominion Virginia Power** (see photo at right).

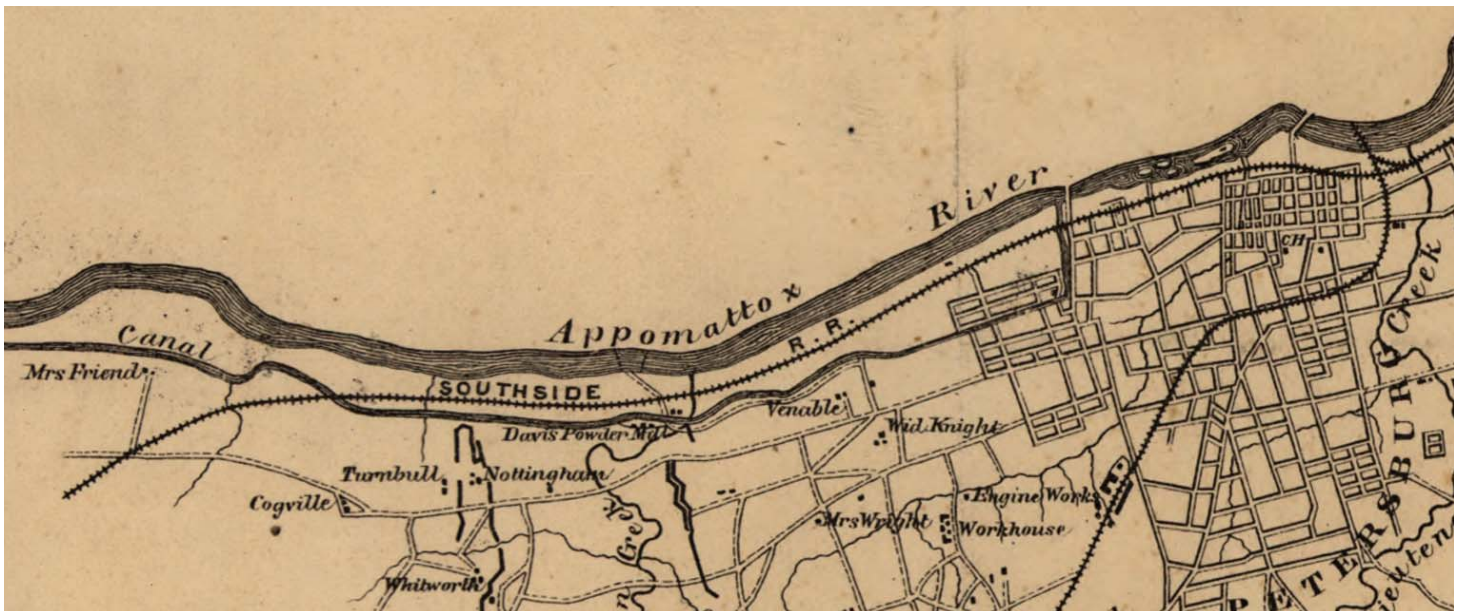


Remnants of historic canal structures

Beyond the laydown yard, the trail continues to Petersburg between the railroad tracks and the River. **There are some valuable interpretive opportunities along this stretch of trail, including the old Pocahontas Mill Race (now dry), remnants of Battersea dam, Banister's Mill, and the old South Canal.**

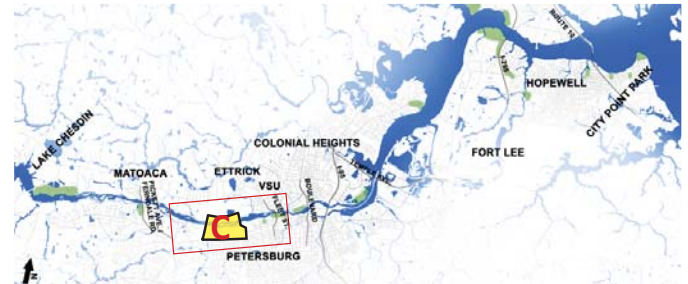


Remnants of Battersea Mill

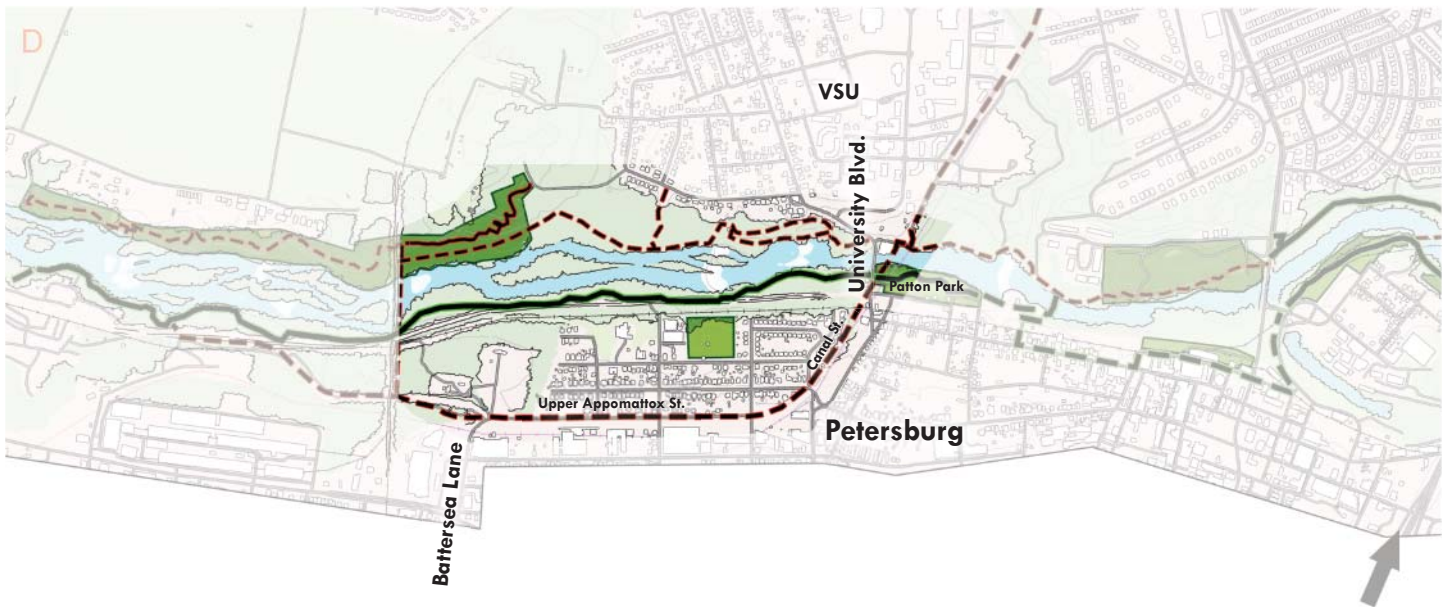


Historic map of canal through Petersburg

Historically, the canal continued past the Locks Aqueduct (at the current laydown yard), under the railroad tracks, and into downtown Petersburg, along what is now Upper Appomattox Street. **There should be a spur trail that follows this historic canal alignment (still quite evident and undeveloped, see historic map above). In addition to the primary trail along the river, this is a great location for a side trail that connects to the west side of downtown Petersburg.**



Clear, flat utility corridor adjacent to Upper Appomattox Street in Petersburg



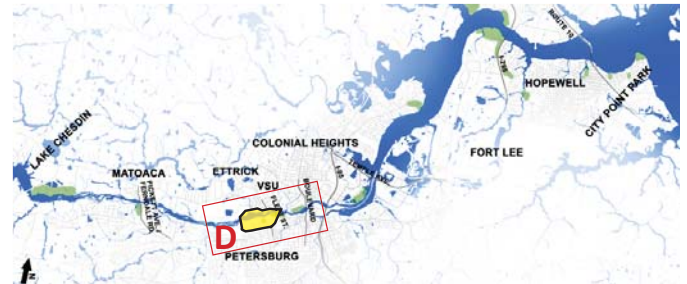
Section D

Battersea Lane to University Blvd.

The spur trail that runs parallel to Upper Appomattox Street would provide access to Battersea Plantation, the historic canal basin, and Canal Street (The “Street of Mills”). Because the historic canal path was later used as a railroad bed, the new trail could utilize existing railroad abutments along this route (see photos below).

The entrance to the Lower Appomattox River Trail is on the west side of University Blvd. (See photo at right). The trailhead here should be expanded to include benches, a trail map, trail signage, and a safe option for crossing University Blvd. to access Patton Park.

On the north side of the River, the Appomattox River Trail will connect to the west side of VSU.



Entrance to existing trail at University Blvd.



Remnants of old bridge



Rendering showing potential pedestrian bridge



Section E

University Blvd. to Boulevard

This section of river, with trails on both the north and south banks, functions as the central node of the greenway system. This area is also rife with history, recreational opportunities, and connectivity possibilities. **In Colonial Heights, a new trail will connect VSU to the trail at Appamatuck Park. This existing trail extends to Roslyn Landing Park and will eventually connect to Temple Avenue.**

On the south side, Patton Park should be redeveloped as the destination-quality park of the Petersburg riverfront. Vehicular circulation and parking should be allowed only in designated areas, fishing access improved with natural stone steps or fishing dock (see photos at right), and pedestrian trails to access interpretive areas and picnic amenities.

There are current plans (by the Cameron Foundation, see drawing on next page) to make improvements to Patton Park and to utilize the historic Campbell's Bridge abutments for a trail bridge across the River to VSU.



River access



River access/canoe launch/fishing dock



Model showing potential improvements for Patton Park

The pedestrian trails in Patton Park will include a trail that takes people past the old Harvell Dam site and to a small park at the boat ramp and historic abutments just east of the Dominion Virginia Power substation (see photos at right). These abutments could be used for a pedestrian trail across the River, creating a convenient loop trail which would include the bridge abutments and both sides of the River.

East of these bridge abutments, the trail would cross the railroad tracks into historic downtown Petersburg and continue east along Grove Avenue to the historic Peter Jones Trading Post (see section below). At this point, the trail will move over to Pike Street/River Street, a picturesque cobblestone street with ample opportunities for additional commercial ventures such as cafes, galleries, and gift shops. The trail along River Steet continues east under Boulevard, past the train depot, and across the tracks at the 3rd street crossing.



Existing conditions along edge of river



Rendering showing potential improvements along river

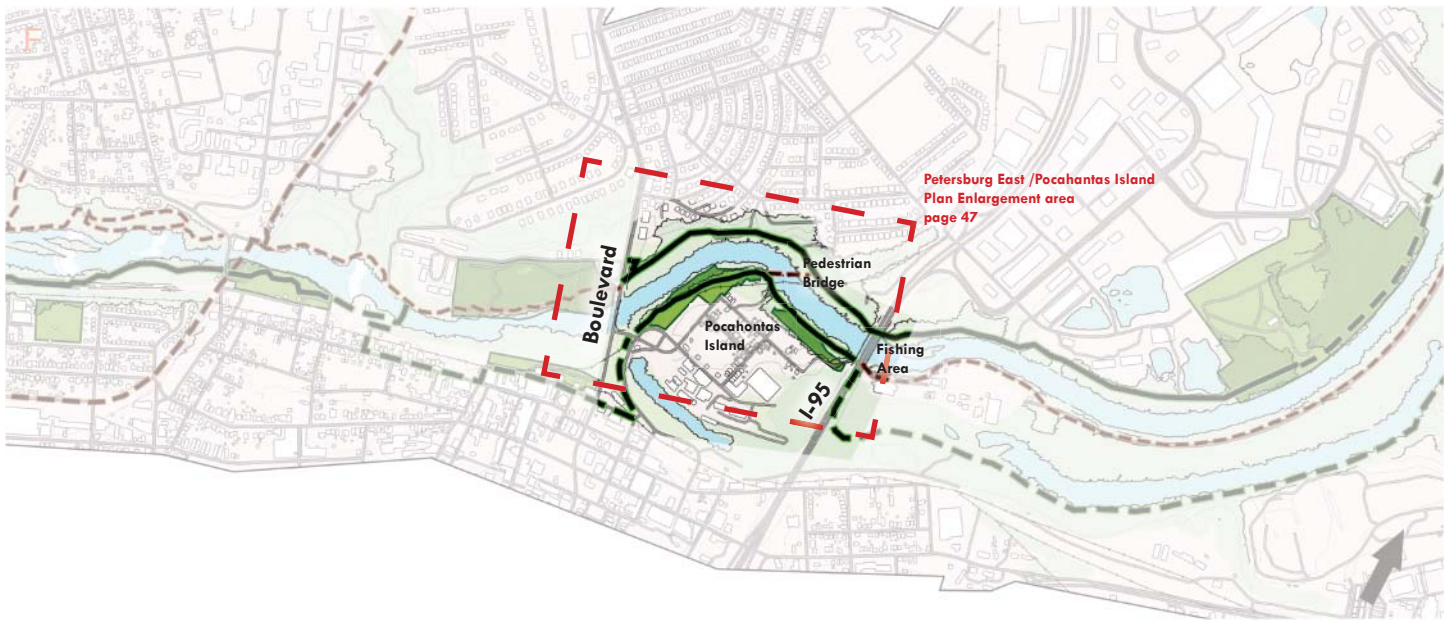


Grove Avenue section
2016



1"=500'



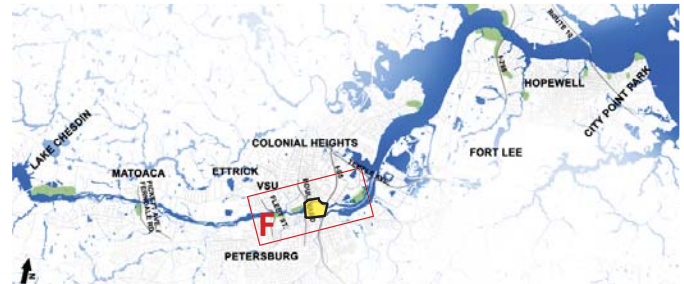


Section F

Boulevard to I-95

The section of trail on Pocahontas Island is established, ADA accessible, and moderately well-used.

The halfway point along this existing trail segment is across the River from a trail overlook (see photo at right) that is directly in line with a set of historic bridge abutments. **This would be an ideal location for a pedestrian bridge that links the north and south banks of the River (see photos below).**



Trail overlook on north side of river



Existing bridge abutments



Rendering showing potential pedestrian bridge



Existing parking and trail access at Pocahontas Island

Other recommended improvements include expanding the sidewalk network, connecting to the sidewalks on the Boulevard bridge, paving the trail for use by skaters and wheelchairs (see photos below), clearly defining a parking area and trailhead with signage, adding a playground and comfort stations and benches, and redesigning the fishing area on the east end of the trail (below I-95) (see photo at right).

Improvements could also include expanding the existing field sports area, converting the old railway line to a trail, and adding a community garden (see photo at right).



Potential fishing access



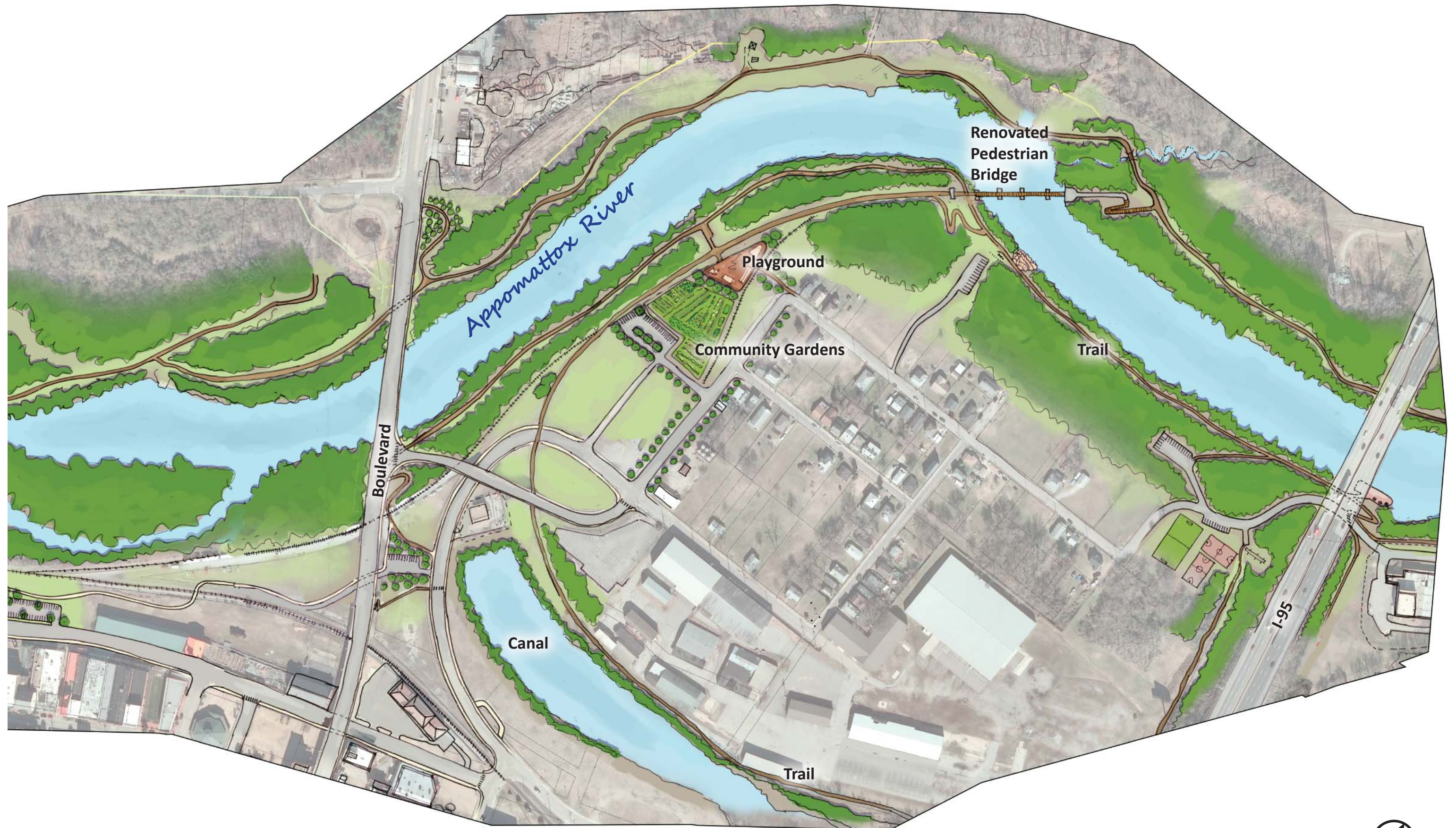
Potential community garden

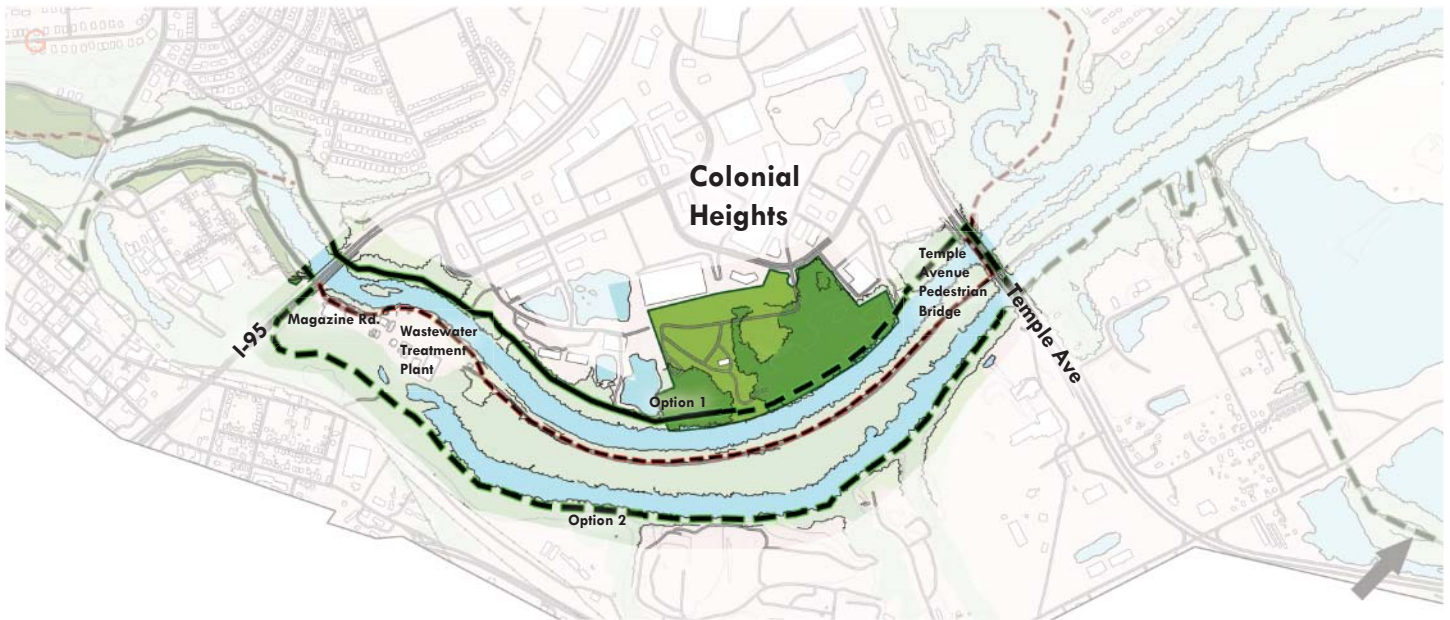


Existing trail at Pocahontas Island



Rendering showing potential trail improvements





Section G

I-95 to Temple Ave.

Once the fishing area under I-95 is redesigned and includes a pedestrian route up to Magazine Road, the trail can continue along two separate routes (likely constructed independently of each other and as parcels and easements become available).

From the Wastewater Treatment Plant on the north/east side of I-95, the proposed trail routes would diverge (see map above). **Option 1 would be located on the river-side of the Wastewater Treatment Plant (they would need to move their fence about 10-feet, see photos at right) and would then continue along Magazine Road to Temple Avenue and slightly beyond. This trail could connect to the Colonial Heights trail by a pedestrian bridge that is attached to the Temple Avenue abutments.**

Option 2 would follow the south bank of the river, through a few industrial properties, and connect with the proposed pedestrian improvements along Temple Avenue.



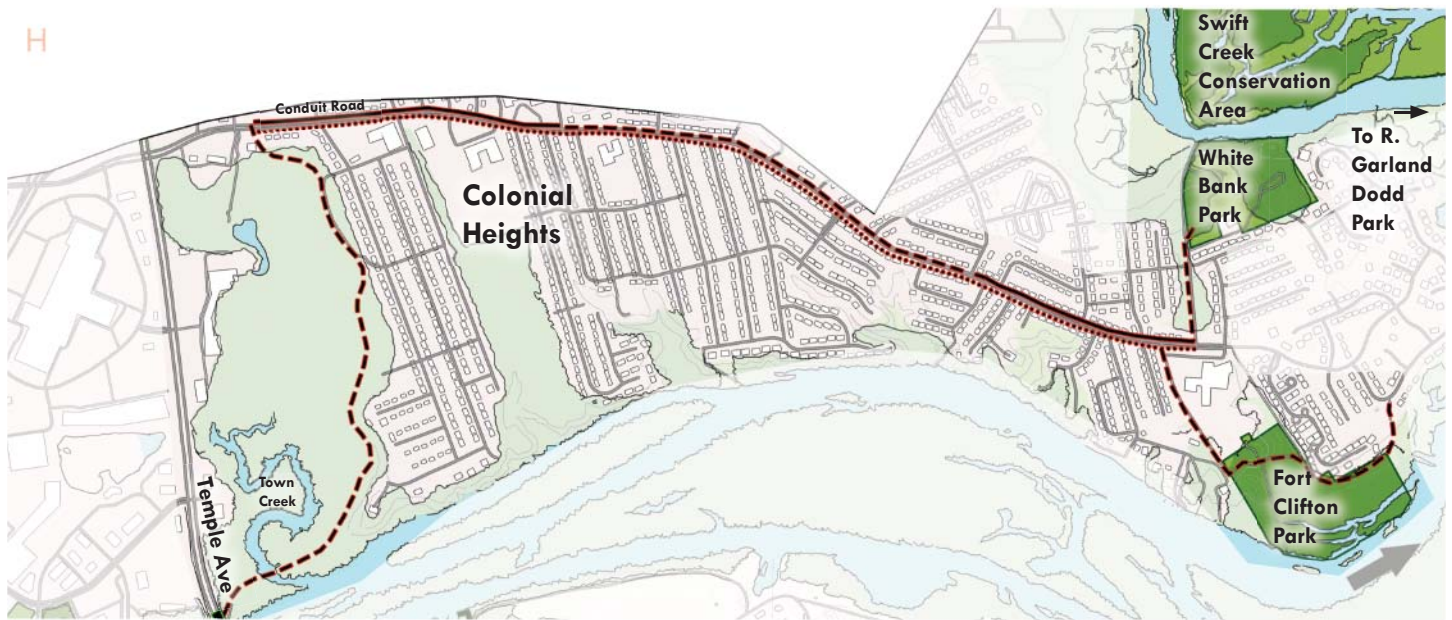
Fence at Wastewater Treatment facility



Photo simulation of relocated fence and trail



Hanging bridge under Temple Avenue



Section H

(North) Temple Avenue to Fort Clifton Park
Colonial Heights / Chesterfield

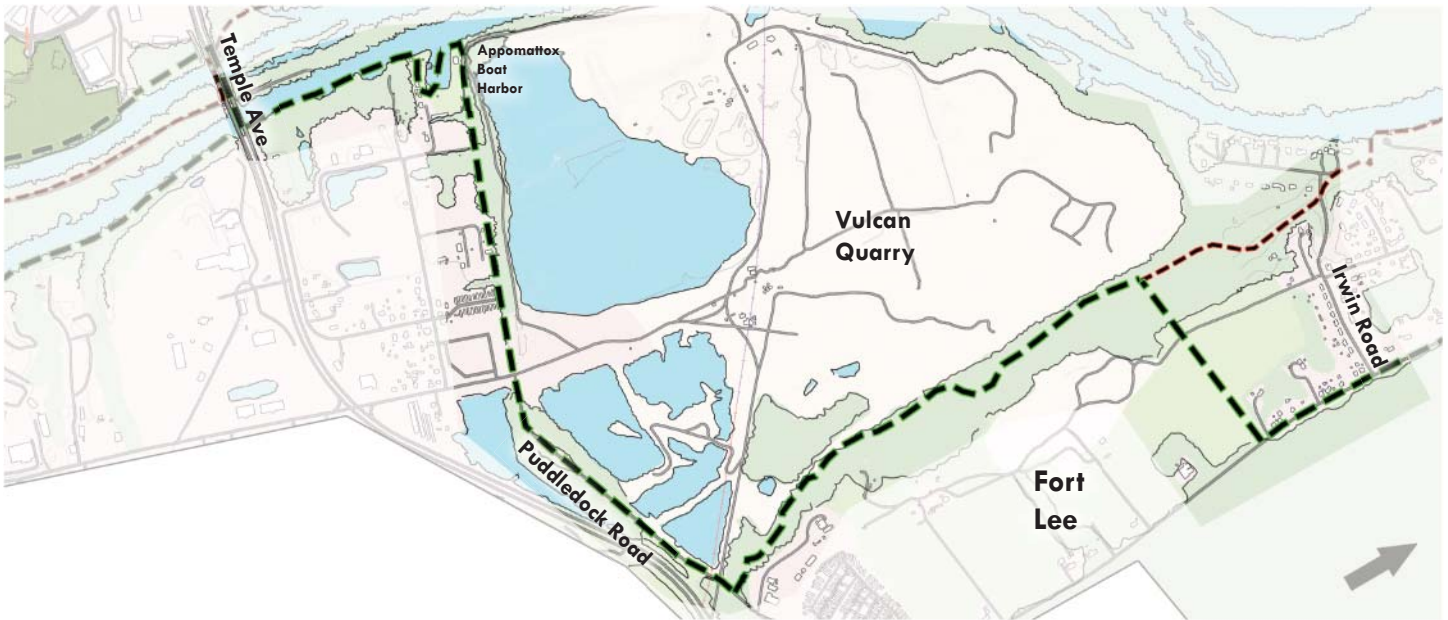
There are some exciting opportunities for trails and parks in this section. **On the Colonial Heights/ Chesterfield side of the River, the existing trail should extend under Temple avenue, cross Town Creek, and follow the upland edge on the north side of the creek until it reaches Conduit Road, which has sidewalks along it all the way to Fort Clifton, The Old Brick House (see photo at right), and White Bank Park (see photo below). From White Bank Park, a pedestrian trail could connect to Swift Creek Conservation Area and link into the proposed trail route between Swift Creek Conservation Area and R. Garland Dodd Park at Point of Rocks (Chesterfield County Parks and Recreation Department, see plan on page 25).**



Old Brick House



River access at White Bank Park



Section I

(South) Temple Avenue to Irwin Road Prince George County

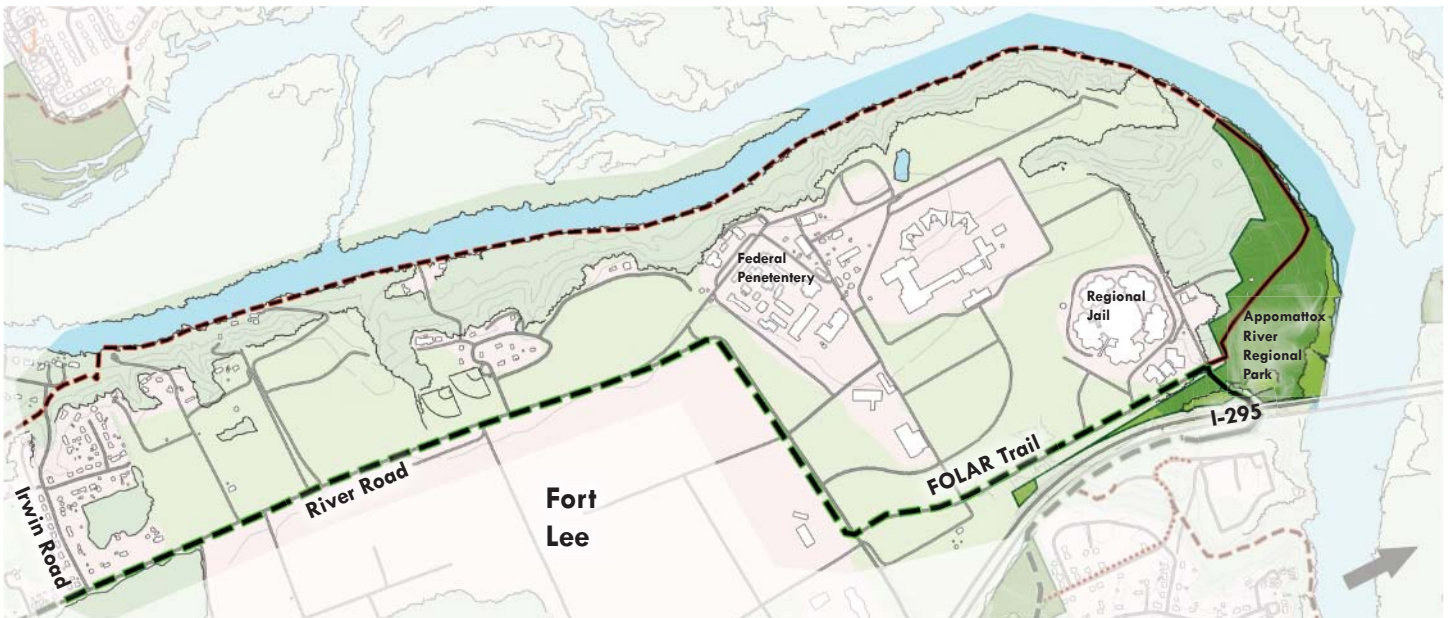
On the south (Prince George County) side of the River, the proposed trail route hugs the river bank between Temple Avenue and the Appomattox Boat Harbor, a valuable amenity for recreation, entertainment, and river access (see photo at right). Beyond the Boat Harbor is the Vulcan Quarry, 900 acres of rock mining activities (see photo at right). Depending on the end-use plan for the quarry and the expected duration of mining, this property could transition into a regional destination park with walkable communities and commercial nodes amidst the picturesque lakes and park-like features.



Appomattox Boat Harbor



Vulcan Quarry

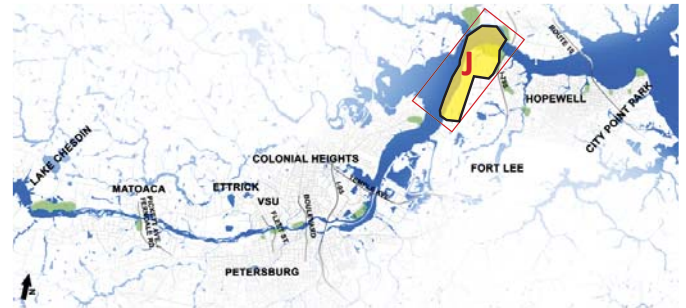


Section J

Irwin Road to I-295

Irwin Road leads to a residential community along the banks of the Lower Appomattox River. **The proposed trail route in this location would most likely be pulled away from the river bank to one of two locations. The trail could either weave through the neighborhood on each side of Irwin Road and continue on along the banks of the River, or it could be located directly adjacent to River Road (see photos below). Either way, the trail will connect to Appomattox River Regional Park where it will follow an existing trail under I-295.**

On the Chesterfield County side of the River, R. Garland Dodd Park at Point of Rocks and Point of Rocks Park will connect (see map on page 25).



Map of Appomattox River Regional Park trails



Existing conditions



Rendering showing potential multi-use path along road



Section K

I-295 to Cabin Creek Road

This section has many options for trail routes. It is likely that they will get realized as easements become available.

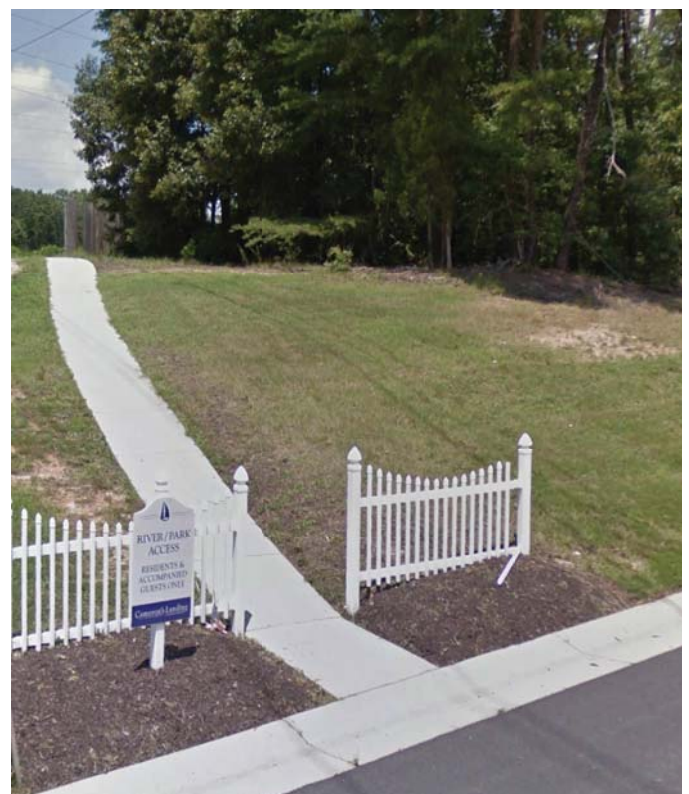
Once the trail passes under I-295 from the Appomattox River Regional Park, there are essentially four options (in order of preference if feasible):

A) Follow the banks of the River using a combination of boardwalks and flood-plain approved trails. Pass through the Anchor Point Marina, and then follow the banks of Cabin Creek south towards River Road.

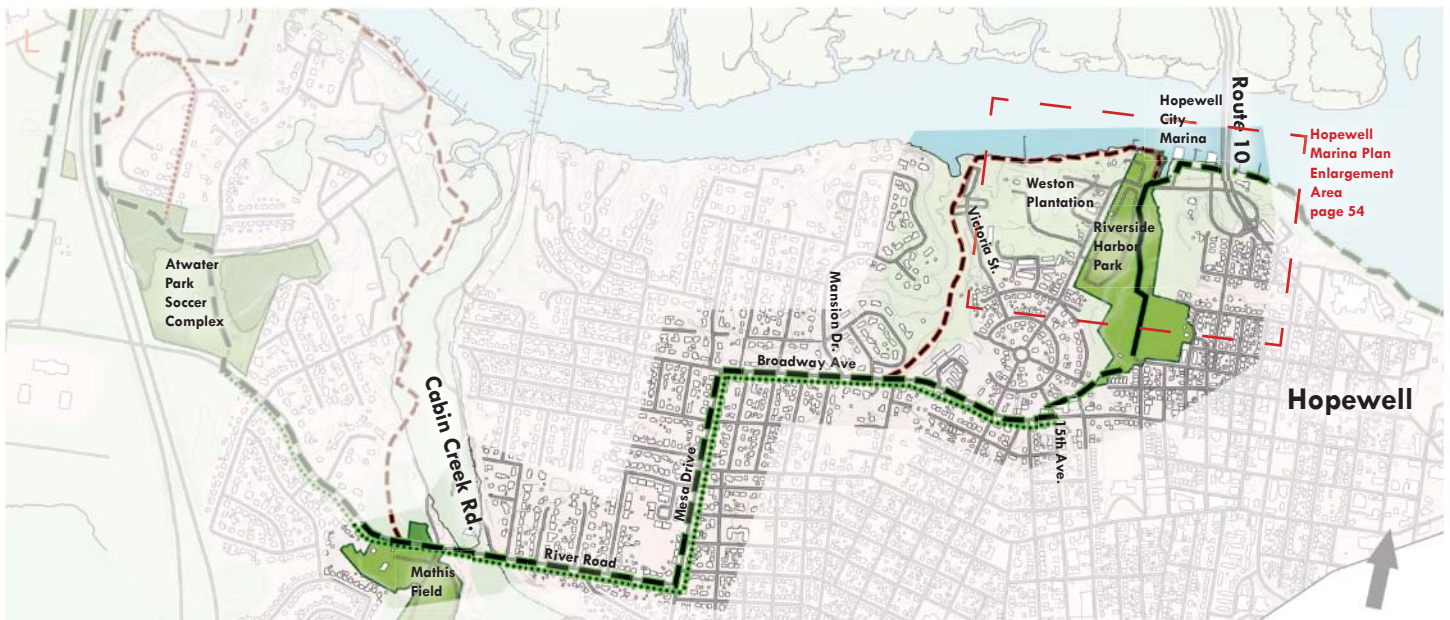
B) Continue the existing trail and park access road (shown in green on map at right) along the east side of I-295 to reach Atwater Park and Soccer Complex. Continue to the improved sidewalk system along River Road.

C) Follow the Utility corridor through Cameron's Landing and Anchor Point to connect to River Road and Mathis Field.

D) Use the Cameron's Landing sidewalk network to connect to Atwater Park and Soccer Complex and then to the sidewalk system along River Road.



Trail access from Cameron's Landing



Section L

Cabin Creek Road to Route 10

Much of this section of trail will run concurrently with the road network, providing users with access to adjacent parks, commercial establishments, and neighborly interactions.

The trail route could stay along River Road to Mesa Drive and then continue towards downtown Hopewell on Broadway. Or, if the trail follows Cabin Creek up the draw, it could cross the railroad track at Cabin Creek Road and follow Broadway from that point.

From Broadway, there is a tributary between Mansion Drive and Victoria Street that could be a scenic route to the banks of the Lower Appomattox River, providing access to Weston Plantation, Riverside Harbor Park. Otherwise, the trail route proceeds along Broadway to 15th Avenue where it continues on City property to Riverside Park and then to the Hopewell City Marina.

There are plans for a significant revitalization of the Route 10 gateway into Hopewell. This trail will be an important component of that project, building on the Gateway's momentum for redevelopment, as well as helping to revitalize the adjacent riverfront areas.



Possible park improvements



Possible riverfront trail style





Section M

Route 10 to City Point Park

From the Hopewell City Marina, the trail will connect to the proposed Hopewell Riverwalk Trail, which will connect to City Park (see plan above).

City Park, located in downtown historic Hopewell, would greatly benefit from a new entrance drive, enhanced property usage, and increased visibility from Appomattox Street.

East of City Park, the trail would proceed along the improved pedestrian path adjacent to Appomattox Street and Cedar Lane, reach the (current NPS building, the “Hunter House”) redesigned and repurposed FOLAR visitor Center and Eastern Trailhead for the Appomattox River Trail.



Hunter House



Beach behind Hunter House



1"=100'

SECTION 4

Implementation



-photo by Tara Ciavarella



Trail through John. J Radcliffe Conservation Area

Project implementation will likely happen in phases. Each phase will include easement acquisition (or similar), funding, detailed design and engineering, construction, signage and wayfinding, and maintenance.

Prioritization

In order to determine an appropriate phasing sequence, LPDA compiled a detailed priority matrix (see appendix B) which considers the core values of the project (Conservation, Health and Wellness, Social Equity, and Economic Development) as well as a feasibility component (current use, ownership, cost, etc.). More than 60 sections of trail, including park improvements, were rated according to 12 “core value” characteristics and 5 “feasibility” characteristics. Each section was given a score of 1-5 for each category. It scored a “1” if it has very little or no opportunity to fulfill that value. It was given a “5” if it is very likely to fulfill that value. Scores of 2-4 were given if the likelihood is uncertain at this point.

The top 5 trail segments, in terms of meeting the core value requirements are (60 points possible):

1. Improvements to Patton Park (59)
2. Trail between VSU and Appamatuck Park (59)
3. Patton Park extension to the east (57)
4. Hopewell City Park improvements (57)
5. Trail-related reuse of Hunter House (56)

It is no coincidence that these 5 projects are in the developed areas of Petersburg and Hopewell; when looking at the color-coded matrix it is clear that the high-priority segments are in densely developed areas. There are the areas that rate highest in terms of social equity and economic development.

The feasibility scores differ slightly in that they only consider the perceived ease of project implementation. The top 5 trail segments (not including park improvements) for feasibility are (25 points possible):

1. Paving trail on Pocahontas Island (23)
2. Paving trail through Riverside Park in Hopewell (23)
3. Paving canal trail between Ferndale Appomattox Riverside Park and University Blvd. (22)
4. Widen sidewalk between Atwater Park and Mathis Park (22)
5. Paving canal trail west of Ferndale Appomattox Riverside Park (21)

Park improvements rate very high in terms of feasibility. The cost estimates for park improvements have not been assembled for this draft report, so the feasibility ratings for park do not include the points for cost. Due to this missing piece, no park improvement projects scored in the top 5 for



Wiki Waki beach area -photo by Tara Ciavarella

feasibility. Depending on the extent and cost of improvements, many of the parks will have feasibility ratings equal to or higher than the trail segments listed above. Park improvements (trailheads and trail access points included) are great projects for increasing the visibility of the trail and park system, providing community amenities, and utilizing community volunteer resources.

Priority should be given to the trail segments and parks that rate the highest in terms of Core Values as well as feasibility. However, there are other factors to consider (combining two or more trail segments for construction efficiency, community support and need, related projects by other municipalities or organizations, etc.).

In addition to the feasibility rating system employed by LPDA, two consultant groups looked at specific areas along the trail corridor and prepared reports discussing the feasibility of constructing trail segments in those areas (see appendices C and D). These findings will be integrated into the Final Master Plan report.

Cost Estimate

In order to compile a suitable master-plan level cost estimate, LPDA looked at comparable projects in the region. Total probable project costs were distilled into simplified cost-per-linear-foot numbers. Each trail segment was measured and the total estimated cost was generated (see appendix E). After estimated costs were assigned to each segment, a rating system was employed in order to rate the project costs for the feasibility matrix. The rating system is as follows:

- < \$50,000 (5)
- \$50,000- \$200,000 (4)
- \$200,000- \$400,000 (3)
- \$400,000- \$1,000,000 (2)
- > \$1,000,000 (1)

The priority matrix described in the previous section looks at several feasibility factors, including cost, in order to determine ease of construction. However, based on cost alone, the 3 projects that are likely to be the least expensive are:

1. Improving the rustic trail along the river adjacent to Ferndale Appomattox Riverside Park (improve trail tread with grading, add wooden trail bridges where needed, control seasonal vegetation)



Wiki Waki beach area -photo by Tara Ciavarella

2. Constructing neighborhood access paths to canal trail from adjacent neighborhoods (if access across the canal is already in place)
3. Connecting the C.H.A.R.T.S. trail to the sidewalk along Boulevard (Rt. 1)

Funding Sources

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

1. Transportation Enhancement Program (also known as TEA-21 Enhancement funds). To be eligible for this program the trail project 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.

2. Surface Transportation Program (also known 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).

3. Public Lands Highways Discretionary Program (also known 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.

4. 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.



Wiki Waki beach area -photo by Tara Ciavarella

- 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.

5. 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.

6. 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.

7. 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.

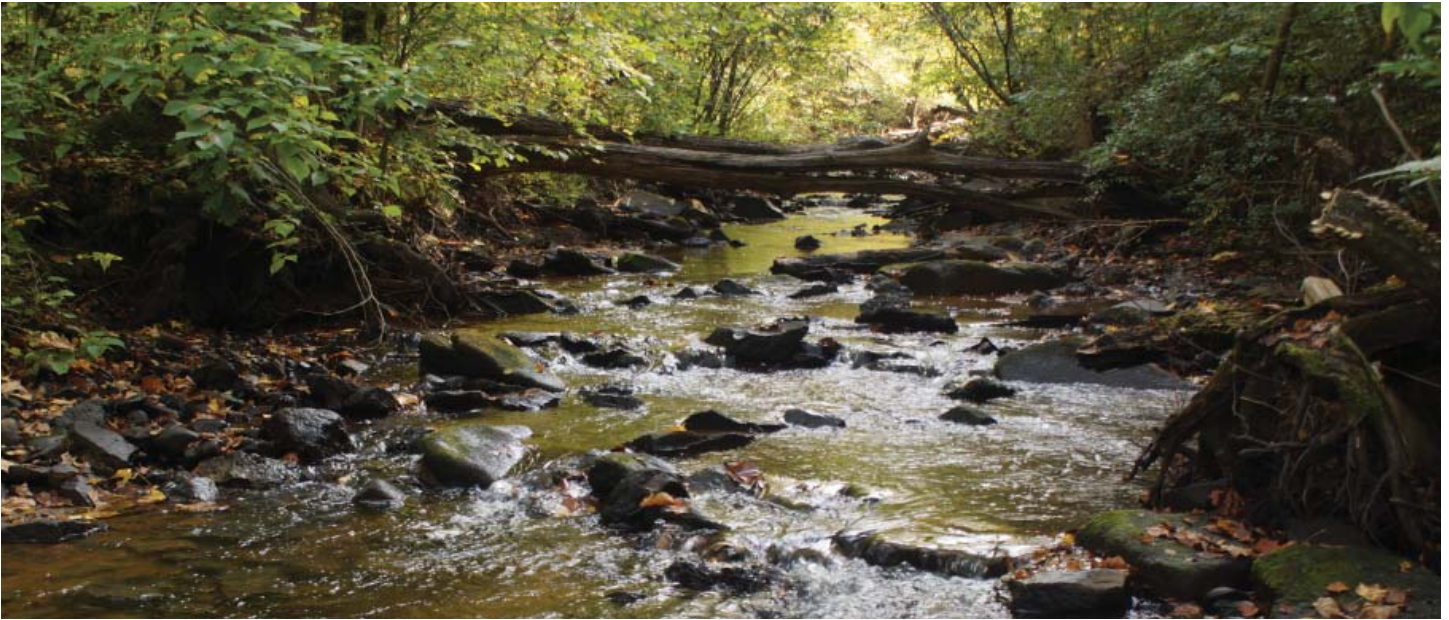
8. Recreational Trails Program. To be eligible for this program the trail or related facility must be open to the public. If the trail is on private land it is not eligible.

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

State Sources

1. 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.



Wiki Waki beach area -photo by Tara Ciavarella

2. Bike Ways.

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

3. 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.

4. Recreational Access Roads.

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

5. 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.

6. 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

7. 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.



Wiki Waki beach area -photo by Tara Ciavarella

Property Ownership and Easements

LPDA compiled a comprehensive property owner matrix for the parcels along the Master Plan trail route (see appendix F). This document can be updated and refined as property owners are contacted, as parcels are purchased, and as easements are acquired.

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

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

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

In order to boost public support and clarify the intentions of the Appomattox River Trail, and to potentially ease the trail right-of-way process, public meetings were held to introduce the trail project. As the trail 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. Landowners should be made aware of the likelihood of increased property values and the benefit of direct access to the greenway trails. 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.



Wiki Waki beach area -photo by Tara Ciavarella

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 sub divider, 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 thoroughways 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.



Wiki Waki beach area -photo by Tara Ciavarella

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.

Signage

Signage and wayfinding are an extremely important component of a successful greenway or trail system project. FOLAR has contracted the design services of AB Designs for the signage and wayfinding component of this project. Those findings will be incorporated into the Final Master Plan.

Maintenance

Chapter 5 of the DCR Greenways and Trails Toolbox gives information on how to operate and maintain a trail after construction is completed. Different trail types require different schedules of maintenance to keep them in fit condition. The Appomattox River Trail provides an amazing recreational, cultural, and economic resource and it needs to continue to be a beautiful and functional place to visit in order to succeed. Implementing a routine maintenance schedule, proper budgeting, and leveraging community volunteers, as described in this chapter, is key to the trail's long-term success.



Wiki Waki beach area -photo by Tara Ciavarella

Utilizing volunteer time is a valuable resource in trail maintenance and supervision. There are several volunteer trail groups in the region that do an excellent job of recruiting enthusiastic and knowledgeable volunteers, keeping them engaged, and promoting the local trail systems at the same time. Two examples of different types of volunteer organizations are the James River Park System in Richmond Virginia (www.jamesriverpark.org/be-a-friend/volunteer.php) and the Crozet Trails Crew in Crozet Virginia (www.crozettrailscrew.org).

Action Plan for Implementation

Coming in Final

APPENDIX A

Area Trail Plans (descriptions and bibliography)



A. East Coast Greenway

Source: *East Coast Greenway Virginia, East Coast Greenway Alliance, 2012*

The East Coast Greenway is a designated bike route running from Maine to Florida and is a mixture of on- and off-road trails. The route passes through Ettrick, crosses the Appomattox River on Pickett Avenue bridge, and continues south through Dinwiddie County. There is an alternate official route through Petersburg crossing Fleet Street bridge.

B. Chesterfield County Bike Routes

Source: *Chesterfield County Board of Supervisors, 2015*

In 2015 the Chesterfield County Board of Supervisors approved a bikeways and trails plan as part of the County's Comprehensive Plan. These routes include existing and proposed on or along road routes and separate shared use paths. The routes shown on the map are conceptual and actual alignment will be determined based on site conditions and other factors summarized in the Bikeways and Trails chapter of the Comprehensive Plan.

C. Petersburg Bike Routes

Source: *City of Petersburg*

Petersburg has designated bike routes, as defined by the City's GIS department.

D. VSU Campus Paths

Source: *2015 Campus Master Plan, Virginia State University*

As part of the campus master plan, Virginia State University identified routes for safe pedestrian and bicycle circulation. Some of these routes are existing and some will be developed in the future.

E. Ettrick Sidewalk/Bikelane

Source: *Ettrick VSU Special Area Plan, Chesterfield County Board of Supervisors, 2015*

The Chesterfield County Board of Supervisors adopted the Ettrick VSU Special Area Plan in 2015. This plan provides detailed guidance and recommendations for the future growth and development of the community of Ettrick and Virginia State University (VSU). This plan identifies pedestrian and biking facilities on-road and trail development on the VSU Randolph Farm and along the Appomattox River.

F. Canal-Fleet Street Gateway Corridor

Source: *City of Petersburg Comprehensive Plan, 2011*

In their 2011 Comprehensive Plan, the City of Petersburg identified the route from the Fleet Street bridge up Canal Street to the the Canal-High Street intersection as a corridor for focused improvement of vehicular flow patterns, new bike routes, pedestrian improvements, and landscaping.

G. Canal Heritage Art Walk

Source: *Battersea Rising, Quality of Life Plan, Virginia Local Initiative Support Corporation in association with Pathways, 2010*

The Battersea Rising plan conducted an assessment of the Petersburg Battersea neighborhood using resident input to establish goals and identify solutions that could revitalize the neighborhood. One of the future projects identified was to develop a walking path along the historic canal way through the neighborhood. The path will be a location for the placement of thematic public art creating wayside locations for interpreting the canal and the railroad's history.

H. Pocahontas Island Historical Trail

Source: Pocahontas Island Neighborhood Plan, City of Petersburg, 2014

Petersburg is working towards revitalizing the city, focusing in part on the historic harbor as a redevelopment district. In 2014 VSU Planning Department prepared the Pocahontas Island Neighborhood Plan for the City of Petersburg. This plan outlines the a plan for dredging the historic harbor and redeveloping the old industrial district. As part of this plan, an intepretive historic walking trail will be developed through the island.

I. John J. Radcliffe Conservation Area Trail

Source: Lower Apomattox Trail Plans, Chesterfield Parks & Recreation, 2016

The John J. Radcliffe Conservation Area is an 87 acre woodland park just below the Brasfield Dam. The site contains the Appomattox River Canoe Launch and 1.5 miles of trail and over 500 feet of elevated boardwalk through swampland and along the Appomattox River.

J. Lower Appomattox River Trail

Source: Greenway and Blueway Concept Plan for the Lower Appomattox River Corridor, Community Design Assistance Center of Virginia Polytechnic Institute and State University, 2001

FOLAR, the Friends Of the Lower Appomattox River, is an non-profit organization developing a series of trails along the Appomattox River. The Lower Appomattox River Trail runs along the south bank, and follows the historic canal for a section. The trail is a predominately a multi-use trail. The section of trail on Pocahontas Island in Petersburg is known as the Appomattox River Heritage Trail. In conjunction with the Crater Planning District, FOLAR's long term plan is to extend the trail along the entire lenght of the lower Appomattox River from the Brasfield Dam to City Point Park in Hopewell.

K. Appomattox River Trail at Ettrick VSU Trailhead

Source: Lower Apomattowx Trail Plans, Chesterfield Parks & Recreation, 2016

A trailhead and trail through the VSU Randolph Farm currently exist, with plans to extend the trail along the river bank upstream to the edge of the VSU Trail Park and downstream to connect with Chesterfield Avenue.

L. C.H.A.R.T.S. Trail

Source: City of Colonial Heights

The Colonial Heights Appomattox River Trail System (CHARTS) is a greenway along the Appomattox River from Roslyn Landing Park to the western city boundary, approximately two miles in length.

M. Swift Creek Radcliffe Trail

Source: Lower Apomattox Trail Plans, Chesterfield Parks & Recreation, 2016

The Chesterfield County Parks and Recreation Department's Lower Appomattox Trail Plans proposed walking trail connecting Swift Creek Conservation Area with R. Garland Dodd Park.

N. Appomattox River Regional Park Trails

Source: Prince George County

This 67 acre park has hiking trails, a canoe launch, and picnic facilities and is maintained by the Prince George Parks and Recreation Department in partnership with FOLAR. There is a private access trail to the park for the residents of the Cameron's Landing development on the east side of I-295 from the park.

O. Hopewell Riverwalk

Source: City of Hopewell

The City of Hopewell is developing a riverfront trail connecting Festival Park below the library to the Hopewell City Marina.

APPENDIX B

Priority Matrix



	CONSERVATION				HEATH AND WELLNESS		SOCIAL EQUITY			ECONOMIC DEVELOPMENT		TOTAL	FEASIBILITY				TOTAL				
	Streambank rehabilitation opportunity	Habitat or plant community rehabilitation opportunity	Protect/interpret Historic or cultural features	Connects to existing trail	Connects to park or other recreational opportunity	Direct river access	Connects to transit/ services/ amenities	Multi-modal path	Direct neighborhood access	Community revitalization opportunity	Tourism opportunities	Public access (parking)	Existing trail	Current easement or ownership	Established route	Visibility/ Project promotion	Cost Estimate				
A section of proposed trail scored a “1” if it has very little or no opportunity to fulfill that value. It was given a “5” if it is very likely to fulfill that value. Scores of 2-4 were given if the likelihood is uncertain at this point.	A: Lake Chesdin to Ferndale Appomattox Riverside Park																				
	Rustic trail on south side of river	3	3	1	3	2	2	1	1	1	2	1	21	1	1	1	4	8			
	John J. Radcliffe Trail (improvements)	4	4	3	4	4	5	1	1	1	2	4	36	5	5	3	2	20			
	Bridge across river	4	3	4	5	5	5	1	1	2	3	4	2	1	1	5	1	9			
	Historic tow path (improvements)	2	3	5	5	4	2	1	4	2	2	2	33	5	5	4	2	21			
	Neighborhood access trail to Westbriar Lane	1	2	2	5	1	2	1	1	5	2	1	24	4	2	3	1	15			
	Neighborhood access trail to West Autumn Drive	1	3	3	5	1	2	1	1	4	2	1	25	2	1	2	1	11			
	Rustic trail along river (improvements)	5	5	3	3	3	5	1	1	2	2	2	33	3	3	4	1	16			
	Ferndale Appomattox Riverside Park improvements	5	5	5	5	5	2	5	2	4	5	5	53	5	5	5	5	20			
	Ferndale Appomattox Riverside Park to Rawlings Lane																				
B: Ferndale Appomattox Riverside Park to Rawlings Lane	Sidewalk on Ferndale Road	1	1	1	5	5	2	5	5	4	2	2	38	1	2	3	4	12			
	Rustic trail along river (improvements)	5	5	3	3	3	5	1	1	2	2	1	33	3	3	4	1	16			
	Historic tow path (improvements)	2	3	5	4	5	2	2	4	2	3	1	35	5	5	5	4	22			
	Historic tow path (extension)	1	2	3	5	2	1	1	4	2	3	1	27	3	2	2	4	13			
	Neighborhood access trail to Ferndale Circle	1	2	2	5	2	1	1	1	5	2	1	24	4	1	3	1	14			
	C: Rawlings Lane to Battersea Lane																				
	VSU trail extension- west																				
	Trail along south side of river (improvements)	3	3	3	5	2	5	1	3	1	3	1	33	5	4	5	4	3	21		
	Trail through Battersea Neighborhood	1	1	5	4	3	1	5	5	5	5	4	44	2	2	4	5	3	16		
	Pedestrian bridge across river	3	2	4	5	3	4	2	2	3	4	2	37	1	1	1	3	1	7		
D: Battersea Lane to University																					
	VSU trail extension- east																				
	Trail along south side of river (improvements)	3	3	3	5	5	5	3	4	2	2	4	4	43	5	5	5	4	3	22	
	Trailhead west of Patton Park (improvements)	1	2	1	4	4	1	3	3	4	5	5	38	5	5	5	5	5	20		
	Trail through Battersea Neighborhood	1	1	5	4	3	1	5	5	5	5	5	45	2	2	4	5	3	16		
	Connection to McKenzie Street Park	1	2	2	5	5	1	4	3	5	4	3	40	3	2	3	3	5	16		
	E: Fleet Street to Boulevard																				
	Pedestrian bridge across Campbell's Bridge abutments	2	2	5	5	5	4	5	5	5	5	5	53	2	5	3	5	1	16		
	Patton Park improvements	5	5	5	5	5	5	4	5	5	5	5	59	5	5	5	5	5	20		
	Patton Park extension-east	5	5	5	5	5	5	4	5	5	5	4	57	4	2	4	5	5	15		
F: Boulevard to I-95	Pedestrian bridge across brick abutments	3	2	5	2	4	4	3	4	5	4	3	2	41	2	2	1	4	2	11	
	Sidewalk improvements along Grove Ave.	1	1	4	4	4	1	5	5	5	5	5	45	3	4	5	4	4	20		
	Shared-use path along Pike/River Streets	1	1	4	5	3	1	5	5	5	5	5	45	3	3	5	5	4	20		
	Trail connection VSU- Appamatuck Park	4	5	5	5	5	5	5	5	5	5	5	59	2	1	3	4	2	12		
	G: I-95 to Temple Ave.																				
	Sidewalk along Pocahontas Street from 3rd Street	1	1	1	5	2	1	5	5	5	3	3	4	36	4	4	5	3	4	20	
	Historic rail line converts to trail	1	1	5	5	2	2	3	3	4	5	4	40	2	2	5	3	4	16		
	Trail along south side of river (improvements)	5	5	5	5	2	5	2	5	4	5	5	53	5	5	5	4	4	23		
	Connect trail along north side of river to Boulevard	1	2	2	5	1	1	4	4	3	2	2	1	28	1	4	2	4	5	16	
	Pedestrian bridge across historic abutments	2	1	5	5	4	2	2	5	4	5	5	4	44	3	3	4	3	1	14	
G: I-95 to Temple Ave.	Improve fishing area and trail extension	5	5	2	5	3	5	2	3	4	4	3	5	46	5	5	5	3	3	18	
	Trail along Magazine Rd.																				
	Trail on north side of river- extend east	1	2	3	1	1	1	1	4	1	2	2	1	20	2	3	5	2	3	15	
	Trail on south side of river	4	4	2	5	5	3	5	5	4	4	5	5	51	1	2	4	4	3	14	
	Pedestrian bridge under Temple Ave.	2	1	2	4	2	2	5	5	4	5	3	40	3	3	3	5	1	9	15	
	H: Temple Ave. to Irwin Road (North)																				
	Rustic trail along Town Creek drainage	5	5	4	5	4	2	3	1	3	4	3	1	40	1	1	1	2	3	8	8
	Sidewalk improvements along Conduit Road.	1	1	1	3	5	1	5	5	5	4	3	4	38	3	4	5	4	3	19	
	Access to Fort Clifton and White Bank Parks	1	1	3	3	5	1	5	4	5	4	3	4	39	1	3	3	3	3	13	
	I: Temple Ave. to Irwin Road (South)																				
J: Irwin Road to I-295	Trail between Temple Ave. and the marina	4	4	2	1	4	4	5	5	5	5	5	49	1	1	1	5	3	11	11	
	Trail around Vulcan property	1	3	3	1	1	1	2	3	4	3	2	27	1	1	1	4	1	8	8	
	K: I-295 to Cabin Creek Road																				
	Trail along River road/ Fort Lee	1	1	2	4	5	1	3	5	3	4	5	4	38	1	1	5	5	1	13	13
	Trail on south side of river, Fed. Penn	4	4	3	4	5	4	1	4	1	2	3	2	37	1	1	1	3	1	7	7
	Appomattox River Regional Park trails (Improvements)	3	3	3	4	5	5	1	4	5	2	3	4	42	5	5	5	3	3	18	18
	L: I-295 to Cabin Creek Road																				
	Trail along I-295 to Atwater Park	1	2	1	5	5	1	3	5	5	5	5	5	43	1	1	4	5	2	13	13
	Sidewalk improvements in Cameron's Landing	1	1	1	5	5	1	2	3	5	2	1	3	30	5	5	5	2	4	21	21
	Trail through drainage and along river banks	4	4	2	5	5	4	1	2	5	2	2	1	37	1	1	1	2	4	9	9
M: Route 10 to City Point Park	Trail through Cabin Creek drainage	4	4	2	3	3	5	2	3	3	2	2	1	34	1	1	1	2	3	8	8
	Sidewalk improvements on River Road	1	1	1	3	5	1	3	5	5	4	3	5	37	5	5	5	4	3	22	22
	N: Cabin Creek Road to Route 10																				
	Sidewalk improvements on River Road/Mesa Broadway	11	1	2	2	4	1	3	5	5	4	3	4	45	5	5	5	4	2	21	21
	Rustic trail through drainage	3	4	2	4	5	4	3	2	5	4	5	5	46	1	1	1	3	3	9	9
	Trail connection next to Baptist Church	1	1	3	5	5	1	4	5	5	5	5	5	45	1	5	3	4	4	17	17
	Riverside Harbor Park improvements	5	4	4	3	5	5	4	5	5	5	5	55	5	5	5	5	5	20	20	
	Trail along Riverside Ave. to Riverwalk Trail	1	1	3	5	5	3	5	5	5	5	5	5	48	1	2	4	5	4	16	16
	Trail through Riverside Park (improvements)	1	3	2	5	5	1	3	4	4	2	4	5	39	5	5	5	4	4	23	23
	O: Route 10 to City Point Park																				
Hopewell Riverwalk Trail	Hopewell Riverwalk Trail	4	3	3	1	5	5	3	2	2	4	5	5	42	1	4	2	5	2	14	14
	Hopewell City Park improvements	5	5	3	4	5	5	5	5	5	5	5	57	5	5	5	5	5	20	20	
	Trail connection between City Park and Appomattox St.	1	2	2	5	5	1	4	4	5	3	2	5	39	4	2	5	3	5	14	14
	Sidewalk improvements on Appomattox St./Cedar Ln.	1	1	2	2	5	1	4	5	5	4	4	5	39	5	3	5	4	3	17	17
	Trailhead at Hunter House	4	4	5	5	5	5	4	4	5	5	5	56	4	3	5	5	5	17	17	

APPENDIX C

Technical Memorandum from EEE Consulting



TECHNICAL MEMORANDUM

Lower Appomattox River Heritage Trail

Proposed Greenway - Master Plan

October 2016

1.0 Executive Summary

EEE Consulting, Inc. (EEE), under contract with Land Planning & Design Associates (LPDA), developed an environmental constraints assessment as a part of the master planning process for the proposed greenway and sidewalk trails located in the Lower Appomattox River Corridor. The Friends of the Lower Appomattox River Group (FOLAR) is proposing to construct/improve approximately 39 miles of sidewalks, greenways, and multi-use trails, creating a network of trails connecting existing parks throughout the region. As part of the master plan process, EEE is providing information concerning possible environmental constraints, as well as the permits and additional studies that may be required during the design/construction of the proposed trail system. Specifically, EEE looked at site location, topography, threatened and endangered species, wetlands and other Waters of the United States (WOUS), and cultural resources.

Summary and Key Points

Depending on the funding source for each trail section or phase, documentation may be required to satisfy the National Environmental Policy Act if federal funds are used. This project would likely qualify for a Programmatic Categorical Exclusion (PCE) or a Categorical Exclusion (CE) since the project should not involve significant environmental impacts or property acquisition. PCEs can typically be completed and approved in several weeks while CEs may take four to six months.

• Permitting

A Virginia Marine Resources Commission (VMRC) Sub-aqueous Bed Permit for the proposed work over the Appomattox River may be required. A VMRC permit requires submittal of a Joint Permit Application (JPA) and a minor Royalty Fee. A U.S. Army Corps of Engineers (USACE) Nationwide Permit (NWP) may also be required depending on project impacts and the results of a wetland delineation that will identify the wetland boundaries within the project limits of disturbance. The request for the VMRC and NWP can be submitted in unison using the same JPA form. The wetland/stream impact thresholds for the NWP are up to ½ acre of non-tidal WOUS and up to 300 linear feet of stream channel. If the impacts to wetlands and streams are greater than these thresholds, the project may require an Individual Permit increasing costs and agency review time. Coordination with additional agencies (Department of Historic Resources, Department of Conservation and Recreation, Department of Game and Inland Fisheries, and the US Fish and Wildlife Service) will be conducted during this permitting process. It is our professional opinion that no major issues should result from this coordination since the project does not involve significant environmental impacts and that the project should qualify for a NWP. The review of the JPA by VMRC and USACE typically takes 45 to 60 days from submittal of a complete permit package.

• Threatened and Endangered Species

Of the threatened and endangered species listed in Table 1 below, the northern long-eared bat is likely to require the highest level of permit coordination during the design and permitting phases of the project. There could be a time-of-year restriction placed on tree removal depending on the results of the coordination with the Department of Conservation and Recreation, Department of Game and Inland Fisheries, and the US Fish and Wildlife Service (USFWS).

TABLE 1: DOCUMENTED SPECIES

Scientific Name	Common Name	Legal Status	Primary Habitat	Remarks
<i>Picoides borealis</i>	Red-cockaded Woodpecker	FESE	Mature pine forests with longleaf pines averaging 80 to 120 years old and loblolly pines averaging 70 to 100 years old	Unlikely in project area.
<i>Acipenser oxyrinchus</i>	Atlantic Sturgeon	FESE	Juveniles stay in brackish waters before moving out into the ocean waters. Travel upstream to spawn. May occur in Appomattox river during spawning run.	
<i>Enneacanthus chaetodon</i>	Blackbanded Sunfish	SE	Largely restricted to acidic waters in weedy ponds and sluggish streams.	Unlikely in project area.
<i>Laterallus jamaicensis</i>	Black Rail	SE	Inhabits fresh and saline marshes, wet meadows and savannas.	Unlikely in project area.
<i>Myotis lucifugus</i>	Little Brown Bat	SE	Inhabits buildings, caves, trees, rocks, and wood piles as roost sites.	May occur in project area.
<i>Myotis septentrionalis</i>	Northern Long-eared Bat	FT	Winter: subterranean refuges; summer: woodlands with specific tree	

conditions, tend to use open waters for feeding. May occur in project area.

<i>Corynorhinus rafinesquii</i>	macrotis	Eastern Big-eared Bat	SE	Inhabits large hollow trees, buildings, attics, and caves.	May occur in project area.
<i>Perimyotis subflavus</i>		Tri-colored Bat	SE	Inhabits caves or mines and foliage during summer.	May occur in project area.
<i>Hyla gratiosa</i>		Barking Tree Frog	ST	Variety of wooded habitats but require fishless wetlands to breed.	Unlikely in project area.
<i>Falco peregrinus</i>		Peregrine Falcon	ST	Bridges, recesses in high cliffs and platforms, towers.	March through May brooding period.
<i>Lanius ludovicianus</i>		Loggerhead Shrike	ST	Inhabits open pastures or grasslands	Unlikely in project area.
<i>Lasmigona subviridis</i>		Green Floater	ST	Prefers smaller streams, pools with gravelly sandy bottoms.	Unlikely in project area.
<i>Lanius ludovicianus</i>		migrans	ST	Open country with scattered shrubs and trees.	Unlikely in project area.
<i>Aeschynomene virginica</i>		Sensitive Joint Vetch	FT	Fresh to slightly brackish tidal river systems, within the intertidal zone where populations are flooded twice daily.	Unlikely in project area.

Key: FT = federal threatened; FE = federal endangered; SE = state endangered; ST = state threatened.

• Cultural Resources

The project area is located in a region rich in cultural and architectural resources which may require additional studies in order to identify and assess these resources in order to satisfy Section 106 of the National Historic Preservation Act. This may require close coordination with the Department of Historic Resources (DHR) during the design/permitting phases. A Phase I Cultural Resource Survey will help determine the distribution of historic architectural and archaeological resources in the project area and whether the proposed project would impact these resources. Additional more intensive studies (Phase II and Phase III) could be required depending on the results of the Phase I study and the coordination efforts with DHR.

2.0 Methodology

EEE reviewed available information to identify potential environmental constraints associated with the proposed trail network. LPDA provided mapping illustrating the location of the trail network, including five (5) areas of concern, which are illustrated on Figure 1. The environmental constraints developed by EEE for technical consideration are based solely on review of existing information and do not include any field work or detailed supplemental research.

General Project Area Constraints

Jurisdictional Waters of the U.S.

EEE conducted a desktop review to determine the approximate locations of jurisdictional wetlands and other WOUS (e.g., streams, open water, etc.) within the proposed project area. WOUS are regulated under Section 404 and 401 of the Clean Water Act by the USACE and U.S. Environmental Protection Agency. The purpose of this wetlands review was to provide a planning level estimate of potential wetlands and other WOUS that may occur within the project area and the permit that may be required to impact these resources. This reconnaissance is based on a cursory review of the project area and does not constitute a formal delineation, nor does it constitute a jurisdictional determination from the USACE. The project area contains palustrine forested (PFO) wetlands, palustrine scrub-shrub (PSS) wetlands, palustrine emergent (PEM) wetlands, palustrine unconsolidated bottom (PUB) freshwater ponds, one lacustrine unconsolidated bottom (LUB) lake, approximately 20 jurisdictional streams and traditionally navigable waters (Appomattox and James Rivers).

Rare, Threatened, and Endangered Species Database Review

EEE reviewed available online databases for threatened and endangered species to determine whether known occurrences of protected species are present within the vicinity of the project area. Species lists were generated from the state online databases provided by the Department of Conservation and Recreation Division of Natural Heritage (DNH) and the Virginia Department of Game and Inland Fisheries (DGIF) Fish and Wildlife Information Service. A search of the USFWS' Information, Planning, and Conservation (IPaC) System web site was also conducted. The database research results are provided in Appendix A. The potential presence of listed threatened and endangered, candidate, and proposed species with legal protection should be taken into consideration for project planning and timely permit acquisition. Table 1 provides a summary of the documented species within the project area.

Cultural Resources

EEE reviewed the information provided by DHR's online database. The list of known cultural resources in the region is extensive and more detail is provided in Section 3. The cultural resource sites within the project area that are eligible for listing on the National Register of Historic Places (NRHP) are provided in Appendix B.

3.0 Identified Areas of Concern

Area 1

Area 1 consists of constructing a pedestrian bridge across the Appomattox River, linking two existing trails along the Appomattox River below Lake Chesdin dam at the Appomattox Riverside Park (see Figures 2 and 3). The property for the park was donated by Dominion Virginia Power and is now controlled by the City of Petersburg. It consists of 137 acres of predominately undeveloped open wooded space containing hiking and biking trails, and access to the river for boating and fishing.

Environmental Permits and Wetland/Streams

A VMRC subaqueous bed permit may be required for the crossing of the Appomattox. Depending on the construction methods and bridge footprint Area 1 may also require a USACE NWP 42 for Recreational Facilities. The desktop review of the project area indicates that impacts associated with the bridge would be minimal and well below the NWP thresholds.

Cultural Resources

A Phase I survey for cultural and architectural resources may be required due to the historical significance of the project area. According to the DHR database, the Upper Appomattox Canal (DHR ID: 123-0084) is considered potentially eligible for listing in the NRHP for its historic context of technology/engineering and transportation/communication. A description of the resource is provided below.

- **Architectural description:** The Appomattox was possibly cleared for bateau navigation sometime after 1745, when an act was passed to that effect. The Upper Appomattox Company, incorporated in 1795, built by 1816 the 5 1/2 mile Upper Appomattox Canal from the head of the falls to a basin in Petersburg, and constructed numerous wing-dams from Farmville down to the canal, a distance of 100 miles. Works on the canal included four well-built stone locks connected in staircase fashion; a stone-arch aqueduct; several stone culverts and the basin. The four mills along the river had locks in their dams; two of these were of stone. The navigation was rebuilt in the 1830's under the engineer John Couty, as a lock-and-dam system, still for poled bateaux, involving 3 1/2 more miles of canal and 13 more wooden locks. In one section, the wing-dams were retained and can still be seen. Parts of the navigation continued to be used into the 1890s. Today, little remains of the wooden locks and the mills. Over 10 miles of the navigation, including the best canal works and the only remaining surviving single stone lock, has been inundated.

Additional more intensive studies (Phase II/III surveys) may be required to determine the project impacts to the identified resources. This would be determined during the permitting and coordination process.

Threatened and Endangered Species

Depending on the proposed construction methods, there could be a time-of-year restriction placed on instream work for anadromous fish (i.e., those saltwater species which seasonally migrate upstream to freshwater to spawn) species and for the Atlantic sturgeon spawning months from February 15 through June 30. NWP have regional conditions requiring all anadromous fish areas documented by the Virginia DGIF be subject to time-of-year restrictions to protect fisheries resources. Early coordination in the permit process could reduce or eliminate uncertainty regarding the time-of-year permitting conflicts.

Impacts to other species in Table 1 would be unlikely and additional surveys and/or clearances would not be anticipated for project advancement.

Area 2

Area 2 proposes to construct a multi-use trail through an undeveloped parcel along the southern bank of Lieutenant Run, a tributary to the Appomattox River near I-95 (see Figures 4 and 5). The area is located between an existing wastewater treatment plant and the CSX railroad and consists primarily of undeveloped wooded areas and a large wetland complex associated Lieutenant Run.

Environmental Permits and Wetland/Streams

Depending on the location of the multi-use trail, a USACE NWP 42 for Recreational Facilities may be required due to the potential impacts to the wetlands and stream located in this area. Review of the national wetland inventory mapping indicates that the potential impacts associated with the multi-use trail would be minimal and well below the NWP thresholds mentioned above. No VMRC subaqueous bed permit would be required for crossing Lieutenant Run because the drainage area is less than five square miles.

Cultural Resources

A Phase I survey for cultural and architectural resources may be required due to the historical significance of the project area. According to the Virginia DHR database, the Petersburg Battlefield II (DHR ID: 123-5025) is considered potentially eligible for listing in the NRHP for its historic context of military/defense. A description of the resource is provided below.

- Site description: Petersburg's 10-month siege took place over a county-sized area east, south, and southwest of the city. Petersburg National Battlefield preserves much of the siege times to the east - including the initial assaults, the Crater, and Fort Stedman. A swath of commercial and residential development has eradicated nearly all historic resources along Crater Road, the main road to the south. Many fortifications southwest of the city are preserved by the National Park Service (NPS) or the City of Petersburg on land transferred by the NPS.

Due to the minimal disturbance associated with the construction of a multi-use trail and the heavy development experienced in the immediate area of the proposed trail, EEE anticipates that the project would not adversely affect the eligible resource. This would be determined during the permitting and coordination process and additional studies could be required.

Threatened and Endangered Species

Depending on the extent of tree removal required for the multi-use trail, there could be a time-of-year restriction placed on the tree removal due to the potential presence of the northern long-eared bat. The time-of-year restriction is typically April 15 through September 15, but could be reduced or removed during the permitting process and consultation/coordination with the USFWS. In addition, surveys for the bats could be conducted within the project area to avoid the time-of-year restrictions if project scheduling becomes an issue. Impacts to other species in Table 1 would be unlikely and EEE does not anticipate any additional surveys or clearances for project advancement.

Area 3

Area 3 consists of the construction of an unpaved multi-use trail through an undeveloped parcel north of Route 144 (Temple Avenue), near the northern bank of the Appomattox River (see Figure 4). The area is located between Temple Avenue, Elmont Drive to the north, and Conduit Road to the west. The area

consists primarily of undeveloped wooded areas with an extensive wetland complex associated with Old Town Creek, a tributary to the Appomattox River.

Environmental Permits and Wetland/Streams

Depending on the location of the multi-use trail, a USACE NWP 42 for Recreational Facilities may be required due to the potential impacts to the wetlands and Old Town Creek in this area. Depending on the construction methods and design of the trail through this area, impacts could be closer to the permit thresholds if the trail is not elevated for the crossing of Old Town Creek and the associated wetlands. Mitigation for the forested wetland impacts could also be required if the trail is not elevated, increasing project costs. Review of the national wetland inventory mapping indicates an extensive forested wetland feature along Old Town Creek. Once the trail is to the north of Old Town Creek there are steeper slopes that the trail could utilize avoiding additional wetland impacts. No VMRC subaqueous bed permit would be required for the crossing Old Town Creek because the drainage area is less than five square miles.

Cultural Resources

A Phase I survey for cultural and architectural resources may be required due to the historical significance of the project area. According to the Virginia DHR database, there are no known historic resources located within the area. The Phase I survey could potentially uncover unknown resources but due to the minimal disturbance associated with the construction of a multi-use

trail. *EEE* anticipates that the project would not adversely affect any resources uncovered.

Threatened and Endangered Species

Depending on the extent of tree removal required for the multi-use trail, there could be a time-of-year restriction placed on the tree removal due to the potential presence of the northern long-eared bat. The time-of-year restriction is typically April 15 through September 15, but could be reduced or removed during the permitting process and consultation with the USFWS. In addition, surveys for the bats could be conducted within the project area to avoid the time-of-year restrictions if project schedule becomes an issue. Impacts to other species in Table 1 would be unlikely and *EEE* does not anticipate any additional surveys or clearances for project advancement.

Area 4

Area 4 consists of the construction of an unpaved multi-use trail through an undeveloped parcel north of River Road along Cabin Creek in Hopewell (see Figures 6 and 7). The area is located north of River Road and west of a CSX railroad. It consists primarily of undeveloped wooded areas and forested wetlands associated with Cabin Creek, a tributary to the Appomattox River.

Environmental Permits and Wetland/Streams

Depending on the location of the multi-use trail, a USACE NWP 42 for Recreational Facilities may be required due to the potential impacts to the wetlands associated with Cabin Creek. Review of the national wetland inventory mapping indicates that the potential impacts associated with the multi-use trail would be minimal and well below the NWP thresholds. No VMRC subaqueous bed permit would be required for the crossing of Cabin Creek because the drainage area is less than five square miles.

Cultural Resources

A Phase I survey for cultural and architectural resources may be required due to the historical significance of the project area. According to the Virginia DHR database, there are no known historic resources located within this area. A Phase I survey could potentially uncover unknown historic resources but due to the

minimal disturbance associated with the construction of a multi-use trail *EEE*, anticipates the project would not have an adverse effect.

Threatened and Endangered Species

Depending on the extent of tree removal required for the multi-use trail, there could be a time-of-year restriction placed on the tree removal due to the potential presence of the northern long-eared bat. The time-of-year restriction is typically April 15 through September 15, but could be reduced or removed during the permitting process and consultation/coordination with the USFWS. In addition, surveys for the bats could be conducted within the project area to avoid the time-of-year restrictions if project schedule becomes an issue. Impacts to other species in Table 1 would be unlikely and *EEE* does not anticipate any required surveys or clearances for project development.

Area 6

Area 6 consists of the construction of an unpaved multi-use trail through an undeveloped parcel north of West Broadway in Hopewell (see Figures 7 and 8). The area is located north of West Broadway and will provide access to Riverside Park. The area consists primarily of undeveloped wooded areas with wetlands associated with two unnamed tributaries to the Appomattox River.

Environmental Permits and Wetland/Streams

Depending on the location of the multi-use trail, a USACE NWP 42 for Recreational Facilities may be required due to the potential impacts to wetlands associated with two unnamed tributaries. Review of the national wetland inventory mapping indicates that the potential impacts associated with the multi-use trail would be minimal and well below the NWP thresholds. No VMRC subaqueous bed permit would be required for the creek crossings because the drainage areas of these two tributaries are less than five square miles.

Cultural Resources

A Phase I survey for cultural and architectural resources may be required due to the historical significance of the project area.

According to the Virginia DHR database, there are no known historic resources located within this area. The Phase I survey could potentially uncover unknown historic resources but due to the minimal disturbance associated with the construction of a multi-use trail, EEE anticipates the project would not have an adverse effect.

Threatened and Endangered Species

Depending on the extent of tree removal required for the multi-use trail, there could be a time-of-year restriction placed on tree removal due to the potential presence of the northern long-eared bat. The time-of-year restriction is typically April 15 through September 15, but could be reduced or removed during consultation/coordination with the USFWS during the permitting process. Surveys for the bats could be conducted within the project area to avoid the time-of-year restrictions. Impacts to other species in Table 1 would be unlikely and EEE does not anticipate any required surveys or clearances for project development.

Table 2 summarizes the environmental permits and additional actions that may be required if future design and development of the trail network is implemented. This summary is provided as a guide for future decisions concerning the master plan and trail development.

TABLE 2: SUMMARY OF PERMITTING

Permits/Actions Likely Needed	Area 1	Area 2	Area 3	Area 4	Area 5		
US Army Corps of Engineers (USACE)	Yes	Yes	Yes	Yes	Yes		
Virginia Marine Resources Commission (VMRC)		Yes	No	No	No	No	
Virginia Department of Environmental Quality (VDEQ)			No	No	No	No	No
Phase I Cultural Resource Survey	Yes	Yes	Possibly	Yes	Yes		
Wetland Delineation and Jurisdictional Determination				Yes	Yes	Yes	Yes
Categorical Exclusion (CE)	Possibly	Possibly	Possibly	Possibly	Possibly		
Remarks	The project should qualify for a CE if federal funds are used. Possible time-of-year restriction for anadromous fish. Cultural Resources could be an issue. The project should qualify for a CE if federal funds are used. Possible time-of-year restriction on tree clearing. Cultural Resources could be an issue. The project should qualify for a CE if federal funds are used. Possible time-of-year restriction on tree clearing. The project should qualify for a CE if federal funds are used. Possible time-of-year restriction on tree clearing. The project should qualify for a CE if federal funds are used. Possible time-of-year restriction on tree clearing.						

A photograph of a dirt path leading through a dense forest. The path is covered in fallen leaves and branches, and the surrounding trees are lush green. The path leads towards a bright, open area in the distance, possibly a clearing or a body of water. The overall scene is peaceful and natural.

APPENDIX D

Field Findings from ABA Consulting

Appomattox River Trail

1. Penmar Drive Crossing

The crossing the Appomattox River at any location will involve potential impacts to the floodplain. The Federal Emergency Management Agency (FEMA) regulates the floodplain delineation along the river as well as its major tributaries. FEMA maintains the models, data and mapping of all floodplains in the United States and they require a detailed set of specific computer model calculations to justify any modifications to a floodplain. The process is called a “Letter of Map Revision” or LOMAR.

The best way to avoid any impacts to the floodplain is to span it completely. The river near Penmar Drive has a parallel canal along the southern bank. The photograph below shows part of the canal opposite Penmar Drive in September. The water is very low.

The photo shows the canal portion along the southern bank but does not show the entire floodplain. Spanning the Appomattox and its floodplain can result in a very long bridge. Typically, to reduce the bridge length, engineers will provide a plan that crosses the river at a narrow location and the alignment will be perpendicular to the floodplain. An excerpt from the FEMA map is provided below that shows the varying width of the floodplain in the area.

According to the FEMA map for this area, we do have a fairly narrow section of floodplain, approximately 1000 feet upstream of the Penmar Drive area. To span the area as shown on the master plan a bridge span of nearly 800 feet would be required whereas a bridge as little as 400 feet could span the area upstream. To span the 400 feet with a truss pedestrian bridge would likely cost between \$750K and \$1M whereas spanning the 800-foot section would likely be require footings in the Appomattox River and cost between \$2M-\$2.5M.

2. Pickett Avenue Crossing

Picket Avenue crosses the Appomattox River south of the village of Matoaca. The bridge is two lanes with a sidewalk on one side and is posted 40 mph. As shown in the photo below, the sidewalk along the southbound side is 5’ wide with a 3’ shoulder along the northbound side.

The approach roads to the north and south have 4’ shoulders confined by guardrail. This existing crossing will accommodate pedestrians on one side but would require major modifications to accommodate any additional width.

3. Canal Tributary Crossing

The canal along the south bank of the Appomattox River, just east of Matoaca has suffered damage from a tributary flowing north into the canal. Approximately 500’ to the south of the river is a parallel railroad. The tributary drains through a structure under the railroad and has created significant scour hole on the downstream side. The discharge and debris has washed down toward the canal and has likely caused maintenance issues with the trail along the river. The trail crossed the tributary with a small bridge, shown in the photograph below.

The best solution to remedy the erosion being caused by the broken canal is to restore the stream from the railroad tracks north to the river, approximately 500 feet. It may also be best to restore the stream approximately 200 feet west to ensure the erosion does not return. With the stream restoration a pedestrian crossing could be designed. The stream restoration is likely to cost between \$400 and \$500 per linear foot.

4. University Boulevard Crossing

The University Boulevard crossing of the Appomattox is considered a “Gateway” entry in the Petersburg Comprehensive Plan. It is also one of the main entrances to Virginia State University. Adjacent to the road, among the abandoned bridge piers is a historic “Civil War Trails” interpretive site. The site is striking and any modifications will invite input many interested parties.

The abandoned row of railroad piers is massive. The pier below is 40’ tall with 11.5’ of space between the legs. The crossing at the river is even higher.

The actual river crossing site is also remarkable as shown in the photo above. The channel is narrow, deep and lined with rock. The channel photograph is taken from an existing bridge only a few hundred feet upstream.

Pedestrians and bicycles can cross the river on the existing Fleet Street roadway bridge. Alternatively, a bridge may be feasible along the old rail alignment. Considering the elevation of the upstream bridge, a multiuse trail bridge could be located along the rail alignment, between the pier legs and a little higher than the existing roadway bridge. The 105' span bridge may be feasible with no impact to the existing floodplain.

5. Historic Crossing at Boat Ramp

Downstream from the Fleet Street crossing is a power substation and a boat ramp. Another set of abandoned railroad piers cross the river at this park area. The combination concrete and masonry piers are about 86' apart and each pier is about 8' by 16' in plan area as shown below.

The piers could be rehabilitated to support a light bridge and possibly avoid any impact to the Appomattox floodplain

6. Historic Crossing at Pocahontas Island

The abandoned rail crossing at Pocahontas Island is very similar to the boat ramp crossing. The piers are 5.5' by 25' by about 13' high, above the water level. The piers are concrete with cracks and effervescence and they are about 64' apart. All of the old rail crossings may be rehabilitated and refitted for a multi-use path. They may require additional permitting because of possible historic significance.

7. Route 144 Crossing

Route 144 is Temple Avenue and it crosses the Appomattox downstream of Petersburg. The crossing is a 4 lane divided arterial with an ADT of 33000 (2015) and a posted speed of 55 mph. An experienced bicyclist may be willing to cross the river using the bridges because the outside shoulders are 7.5' wide southbound and 9' wide northbound. Based on background research we have found the 1984 Environmental Impact Statement for the Temple Avenue Extension over the Appomattox River. In that report the Coast Guard required a 40' clear height from mean water elevation and the report identified that this minimum height would be provided. Therefore, we believe that a bridge underneath the Temple Ave bridge would not be practical. A crossing in this location would likely require the addition of a parallel pedestrian bridge.

8. I-295 Crossing

Interstate 295 crosses the Appomattox between Petersburg and Hopewell. The bridge could be used to support a pedestrian bridge underneath. Any modifications to the bridge will require approval from the FHWA and not diminish the function as a highway bridge. Any additional load added to the bridge will require structural calculations that demonstrate the capacity to support the load.

In addition, as shown in the photograph, the shipping channel is designated and marked at the bridge high point. Any impacts or reductions in clearance will require approval from the Coast Guard.

9. Trail Extension along I-295

Appomattox River Regional Park is located on the southwest quadrant of I-295 and the Appomattox River. The residential area on the other side of the interstate is connected to the park via a trail that passes under the I-295 bridge. The Appomattox Trail could tie in with the existing trail to provide some desirable connectivity.

Interstate 295 is a limited access facility. The limited access boundary is typically identified by a limited access fence. The Cameron's Landing subdivision has provided the trail facility along a maintenance easement between the limited access fence and a privacy fence across the back lot lines of several lots. The trail connects the park, under the bridge, along I-295 to a residen-

tial road in the subdivision. The easement along the interstate is shown in the photograph below.

Review of the subdivision parcels in Cameron's Landing where there is the existing trail shows lots with shallow back yards such that the trail can be placed between the limited access fence and residential privacy fences. The lots further south of this trail do not have these shallow lots and therefore any trail extension would need to be in the 295 limited access right of way. Placing pedestrian facilities parallel to limited access roads and in limited access rights of way is not something that VDOT or FHWA does regularly, would require an exception to regulations, and would likely require fencing and guard rails to separate pedestrians from the interstate. We would not anticipate a high likelihood of success in pursuing this option. As an alternative, the subdivision streets could be marked to direct bicycles and pedestrians along a desirable route.

10. Bike Lane through Hopewell

If the Appomattox River Trail is to be contiguous with City Point Park it must go through Hopewell. We are proposing a route from Cameron's Landing, East along River Road, north on Mesa Drive and then east through town on West Broadway Avenue.

From Cameron's Landing Subdivision, near the Atwater Soccer Complex, River Road is already marked with bike lanes on both sides of the road, to Mesa Drive. Mesa Drive is a 4 lane urban section with sidewalks on both sides of the road. The lanes appear to be VDOT minimum 12' width lanes with a 2' utility strip and 4 foot sidewalks. Further, Mesa Drive appears to have significant utilities along the right of way and homes quite close to the road. A number of options could be feasible to add paths to this area:

1. **Rebuild Mesa Drive Section** – The sidewalks on both sides of Mesa Drive are narrow and not conducive to bike traffic. A potential solution could be to rebuild the road section and remove the sidewalk from one side and place a wider path on one side of Mesa Drive. Significant utility relocations would be required in this option
2. **Restripe Mesa Drive and Add Shared Use Path in Lane** – Mesa Drive could be restriped to provide a single travel lane in each direction with an opposable left turn lane in the middle. The vehicular traffic would be offset to the east or west and the fourth lane could be converted into a shared use path. If a simple striped lane is not desired, physical separations of the shared use path could be added which could range from plastic lane dividers to raising the lane up to sidewalk level.
3. **Clean Up Existing Sidewalks** – The existing sidewalks could be swept, patched, and repaired to provide a smooth clean walking surface. Also, the grass strips in this area are quite narrow so sidewalk could be placed directly against the curb to add some additional width to the pedestrian paths.

From Mesa, the route could continue through Hopewell via West Broadway Avenue. West Broadway is 48' between curb lines with 4' sidewalks on one or both sides of the street and carries an ADT of 7800 (2015). Parking lines the street on both sides of the road. Using VDOT standard 12' lanes and 8' wide parallel parking spaces it would be conceivable to restripe the road and maintain an 8' shared use path. The path could be at road grade or could be built up to provide a wider sidewalk. The typical section is shown below.

As an alternate, the bicycle route could cross through town on West City Point Road. West City Point is also 4 lanes wide, with a little less on-street parking and has an ADT of 7000 (2015).

From West Broadway the route could continue through Hopewell via Appomattox Street. Appomattox Street has a nearly identical section to West Broadway and could be improved in the same manner.

APPENDIX E

Cost Estimate



FOLAR - Lower Appomattox River Heritage Trail Master Plan					October 4, 2016	
Estimate Summary					JEM, JMO	
Prepared By: Land Planning and Design Associates Inc. Charlottesville, VA						
Total Trail Length: xx.xx miles					Length	Unit Cost
					Material	TOTAL
A: Lake Chesdin to Ferndale Appomattox Riverside Park						
Rustic trail on south side of river					Dirt	7,730 \$ 25 \$ 193,250
John J. Radcliffe Trail (improvements)					Asphalt Overlay	8,400 \$ 50 \$ 420,000
Bridge across river					New Bridge	1,000 \$ 3,000 \$ 3,000,000
Historic tow path (improvements)					Asphalt Overlay	8,800 \$ 50 \$ 440,000
Neighborhood access trail to Westbriar Lane					Dirt	750 \$ 25 \$ 18,750
Neighborhood access trail to West Autumn Drive					Dirt	1,000 \$ 25 \$ 25,000
Rustic trail along river (improvements)					Dirt	800 \$ 25 \$ 20,000
Ferndale Appomattox Riverside Park improvements					N/A	N/A
Subtotal					\$	\$ 4,117,000
B: Ferndale Appomattox Riverside Park to Rawlings Lane						
Sidewalk on Ferndale Road					Wide sidewalk	12,770 \$ 75 \$ 957,750
Rustic trail along river (improvements)					Dirt	500 \$ 25 \$ 12,500
Historic tow path (improvements)					Asphalt Overlay	4,240 \$ 50 \$ 212,000
Historic tow path (extension)					New Asphalt	4,890 \$ 100 \$ 489,000
Neighborhood access trail to Ferndale Circle					Dirt	610 \$ 25 \$ 15,250
Subtotal					\$	\$ 1,686,500
C: Rawlings Lane to Battersea Lane						
VSU trail extension- west					New Asphalt	3,000 \$ 100 \$ 300,000
Trail along south side of river (improvements)					Asphalt overlay	5,800 \$ 50 \$ 290,000
Trail through Battersea Neighborhood					Stone Dust	3,500 \$ 65 \$ 227,500
Pedestrian bridge across river					New Bridge	1,300 \$ 3,000 \$ 3,900,000
Subtotal					\$	\$ 4,717,500
D: Battersea Lane to University						
VSU trail extension- east					New Asphalt	4,000 \$ 100 \$ 400,000
Trail along south side of river (improvements)					Asphalt Overlay	4,150 \$ 50 \$ 207,500
Trailhead west of Patton Park (improvements)						900 SF, bench, informational sign,
Trail through Battersea Neighborhood					Stone Dust	4,800 \$ 65 \$ 312,000
Connection to McKenzie Street Park					Stone Dust	610 \$ 65 \$ 39,650
Subtotal					\$	\$ 959,150
E: Fleet Street to Boulevard						
Pedestrian bridge across Campbell's Bridge abutments					Bridge decking	600 \$ 2,000 \$ 1,200,000
Patton Park improvements						N/A
Patton Park extension-east						N/A
Pedestrian bridge across brick abutments					Bridge decking	300 \$ 2,000 \$ 600,000
Sidewalk improvements along Grove Ave.					Wide sidewalk	1,700 \$ 75 \$ 127,500
Shared-use path along Pike/River Streets					Asphalt overlay	1,600 \$ 50 \$ 80,000
Trail connection VSU- Appamatuck Park					New Asphalt	4,450 \$ 100 \$ 445,000
Subtotal					\$	\$ 2,452,500
F: Boulevard to I-95						
Sidewalk along Pocahontas Street from 3rd Street					Wide sidewalk	1,200 \$ 75 \$ 90,000
Historic rail line converts to trail					Stone Overlay	2,200 \$ 45 \$ 99,000
Trail along south side of river (improvements)					Asphalt overlay	3,100 \$ 50 \$ 155,000
Connect trail along north side of river to Boulevard					New Asphalt	340 \$ 100 \$ 34,000
Pedestrian bridge across historic abutments					Bridge decking	550 \$ 2,000 \$ 1,100,000
Improve fishing area and trail extension						4000 SF, asphalt trail, stone river access steps, benches.
Subtotal					\$	\$ 1,388,000
G: I-95 to Temple Ave.						
Trail along Magazine Rd.					Stone overlay	8,500 \$ 45 \$ 382,500
Trail on north side of river- extend east					New Asphalt	2,500 \$ 100 \$ 250,000
Trail on south side of river					New Asphalt	10,110 \$ 100 \$ 1,011,000
Pedestrian bridge under Temple Ave.					New Bridge	1,000 \$ 3,000 \$ 3,000,000
Subtotal					\$	\$ 6,031,500
H: Temple Ave. to Irwin Road (North)						
Rustic trail along Town Creek drainage (incl boardwalks)					Dirt	6,500 \$ 50 \$ 325,000
Sidewalk improvements along Conduit Road.					Wide sidewalk	4,500 \$ 75 \$ 337,500
Sidewalk improvements along Brockwell Lane					Wide sidewalk	1,500 \$ 75 \$ 112,500
Trail through Fort Clifton Park					Dirt	2,400 \$ 25 \$ 60,000
Trail along White Bank Road					Stone overlay	1,250 \$ 45 \$ 56,250
Subtotal					\$	\$ 891,250
I: Temple Ave. to Irwin Road (South)						
Trail between Temple Ave. and the marina					New Asphalt	3,000 \$ 100 \$ 300,000
Trail around Vulcan property					New Asphalt	16,000 \$ 100 \$ 1,600,000
Subtotal					\$	\$ 1,900,000
J: Irwin Road to I-295						
Trail along River road/ Fort Lee					New Asphalt	10,000 \$ 100 \$ 1,000,000
Trail on south side of river, Fed. Penn					Stone Dust	17,000 \$ 65 \$ 1,105,000
Subtotal					\$	\$ 2,105,000
K: I-295 to Cabin Creek Road						
Trail along I-295 to Atwater Park					New Asphalt	5,500 \$ 100 \$ 550,000
Sidewalk improvements in Cameron's Landing					Wide sidewalk	2,500 \$ 75 \$ 187,500
Trail through drainage and along river banks					Dirt	3,800 \$ 25 \$ 95,000
Trail through Cabin Creek drainage (incl. boardwalks)					Dirt	5,300 \$ 50 \$ 265,000
Sidewalk improvements on River Road					Wide sidewalk	2,700 \$ 75 \$ 202,500
Subtotal					\$	\$ 1,300,000
L: Cabin Creek Road to Route 10						
Sidewalk improvements on River Road/Mesa Broadway					Wide sidewalk	8,800 \$ 75 \$ 660,000
Rustic trail through drainage					Stone Dust	5,000 \$ 65 \$ 325,000
Trail connection next to Baptist Church					New Asphalt	550 \$ 100 \$ 55,000
Riverside Harbor Park improvements						N/A
Trail along Riverside Ave. to Riverwalk Trail					New Asphalt	850 \$ 100 \$ 85,000
Trail through Riverside Park (improvements)					Asphalt overlay	2,500 \$ 50 \$ 125,000
Subtotal					\$	\$ 1,250,000
M: Route 10 to City Point Park						
Hopewell City Park improvements						11 acres, new driveway, restructured parking, beach restoration, playground, trail connections, walkways, new pedestrian entrance
Trail connection between City Park and Appomattox St.					Wide sidewalk	400 \$ 75 \$ 30,000
Sidewalk improvements on Appomattox St./Cedar Ln.					Wide sidewalk	4,500 \$ 75 \$ 337,500
Trailhead at Hunter House						1.25 acres, restore historic house, add parking (3-4 spaces), trail to beach, elevated viewing deck, trail to City Point Park parking lot, benches, informational signs.
Subtotal					\$	\$ 367,500
GRAND TOTAL					\$	\$ 29,165,900

*This estimate represents 2015 dollars. Costs will need to be re-examined in subsequent years for increases in material, labor costs and inflation.

APPENDIX F

Property Ownership Matrix



-photo by Tara Ciavarella

	Parcel ID	Parcel Owner	Zoning	City/County	Contacted	Next Steps
A: Lake Chesdin to Ferndale Appomattox Riverside Park						
Rustic trail on south side of river	8 - 1	Gray Lumber Company	RR	Dinwiddie		Acquire trail easement for rustic trail
	8-8	Donald Henshaw Inc.	A-2	Dinwiddie		
	8-9	Gray Lumber Company	A-2	Dinwiddie		
John J. Radcliffe Trail (improvements)	7676051733	Appomattox River Water Auth.	Park?	Chesterfield		Repair any failing sections, expand parking if visitation increases, add park amenities as visitation increases, add access road on east end of park.
	7706060406	County of Chesterfield	Park?	Chesterfield	LPDA spoke to Chesterfield Co. Parks and Rec. in Sept. 2016	
Bridge across river	7736065981	Sam McEwen		Chesterfield		
Historic tow path (improvements)						
Neighborhood access trail to Westbriar Lane	9H-7-3	Chestnut Gardens Associates	R-1	Dinwiddie		
	9H-7-2	Deitz John R & Charlotte E	R-1	Dinwiddie		
	9H-7-1	Paula Allen	R-1	Dinwiddie		
Neighborhood access trail to West Autumn Drive	9H-4-B-22	Anjanette Moring	R-1	Dinwiddie		
	9H-4-B-21	Wells Fargo Bank	R-1	Dinwiddie		
	9-6A	Grace Baptist Church	R-1	Dinwiddie	LPDA spoke to receptionist in August 2016. She conveyed reluctance in allowing public or neighborhood access through their property.	
B: Ferndale Appomattox Riverside Park to Rawlings Lane						
Sidewalk on Ferndale Road		VDOT		Dinwiddie	Dinwiddie Co. planning dept. is receptive and even enthusiastic about this.	
Rustic trail along river (improvements)	10-7B	Commonwealth of Virginia		Dinwiddie		Repair problem areas, add wooden bridges across wet areas, reroute trail where needed, increase volunteer maintenance program scope
Historic tow path (improvements)	10-7B	Commonwealth of Virginia		Dinwiddie		
	27010005	Null		Petersburg		
Historic tow path (extension)	10-7B	Commonwealth of Virginia		Dinwiddie		Acquire trail easement for 12' trail corridor plus buffer.
Neighborhood access trail to Ferndale Circle	9-27A	Richard and Sharon Grenoble		Dinwiddie		
	9-27B	George Mayes		Dinwiddie		
	RR ROW					
C: Rawlings Lane to Battersea Lane						
VSU trail extension- west	7976118599	Commonwealth of Virginia		Chesterfield	Chesterfiled Co. is working on this project.	
Trail along south side of river (improvements)	027010005	Null		Petersburg		
	026010001	City of Petersburg	M-1	Petersburg		
	025030800	City of Petersburg		Petersburg		
Trail through Battersea Neighborhood	026010001	City of Petersburg		Petersburg	Petersburg planning dept. is receptive and enthusiastic about this.	
	RR ROW	(Abandoned)		Petersburg		
Pedestrian bridge across river	7886575188	Seaboard Coastline Railroad Co. City of Petersburg		Chesterfield Petersburg	Chesterfiled Co. Park and Rec. is working on this project.	
D: Battersea Lane to University						
VSU trail extension- east	7956098069	Joshua & Ingrid Greenwood		Chesterfield	Chesterfiled Co. Park and Rec. is working on this project.	Acquire permanent easements.

	Parcel ID	Parcel Owner	Zoning	City/County	Contacted	Next Steps
Trail along south side of river (improvements)	7966095567	County of Chesterfield		Chesterfield		
	7966098683	Joshua & Ingrid Greenwood		Chesterfield		Acquire permanent easements.
	7976118599	Commonwealth of Virginia		Chesterfield		
	025030800	City of Petersburg	M-1	Petersburg		
	009010001	Joshua & Ingrid Greenwood	M-2	Petersburg		Acquire permanent easements.
	009010002	Joshua & Ingrid Greenwood	M-2	Petersburg		Acquire permanent easements.
	009010003	Friends of Lower Appomattox River	M-2	Petersburg		
	009010004	Joshua & Ingrid Greenwood	M-2	Petersburg		Acquire permanent easements.
	009010006	City of Petersburg	M-2	Petersburg		
Trailhead west of Patton Park (improvements)	009010006	City of Petersburg	M-2	Petersburg		
Trail through Battersea Neighborhood	RR ROW	(Abandoned)			Petersburg planning dept. is receptive and enthusiastic about this.	
Connection to McKenzie Street Park	027010012	City of Petersburg		Petersburg		
	025030002	Battersea Foundation		Petersburg		
	025030001	Battersea Foundation		Petersburg		
	RR ROW			Petersburg		
	010010009	Seaboard System Railroad	M-1	Petersburg		
	010010007	City of Petersburg	M-1	Petersburg		
	010010001	Virginia Holding Corporation	M-1	Petersburg		
	010010002	Southeastern Investment Co.	M-1	Petersburg		
	009050001	James Campbell III	R-2	Petersburg		
E: Fleet Street to Boulevard						
Pedestrian bridge across Campbell's Bridge abutments	7986114060	Virginia State University		Chesterfield	Cameron Foundation and City of Petersburg are working on this project	
Patton Park improvements	009010005	City of Petersburg	M-2	Petersburg	Cameron Foundation and City of Petersburg are working on this project	
Patton Park extension-east	010030002	City of Petersburg	M-2	Petersburg		
	010030001	City of Petersburg	M-2	Petersburg		
	010040003	City of Petersburg	MXD2	Petersburg		
	010040004	Virginia Holding Corporation	MXD2	Petersburg		
		Public ROW		Petersburg		
Patton Park extension-east	010040001	N/A		Petersburg		
	010040800	Harvell Dam Corporation	M-2	Petersburg		
Pedestrian bridge across brick abutments	010040800	Harvell Dam Corporation	M-2	Petersburg		
		Old RR ROW		Petersburg		
Sidewalk improvements along Grove Ave.	ROW			Petersburg		
Shared-use path along Pike/River Streets	ROW			Petersburg		
Trail connection VSU- Appamatuck Park	011010802	City of Petersburg	M-2	Petersburg		
	011010002	City of Petersburg	M-2	Petersburg		
	7906088842	Commonwealth of Virginia		Chesterfield	LPDA contacted VSU representative, left message.	
	7986114060	Virginia State University		Chesterfield		
	320A0100001	Harvell Dam Assoc. LLC		Colonial Heights		
	320A0100002	Joshua Greenwood		Colonial Heights		
	34000200001	William Matthew Dimirack		Colonial Heights		
		Old RR ROW		Colonial Heights		

	Parcel ID	Parcel Owner	Zoning	City/County	Contacted	Next Steps
	34000200002	RV Limited Partnership C/O: Virginia Houseing Dev.		Colonial Heights		
	3500040002B	City of Colonial Heights		Colonial Heights		
F: Boulevard to I-95						
Sidewalk along Pocahontas Street from 3rd Street	ROW					
	011020801	City of Petersburg		Petersburg		
	007100002	City of Petersburg		Petersburg		
Historic rail line converts to trail	007070009	Economic Development Authority	M-2	Petersburg		
	007080001	City of Petersburg		Petersburg		
	8026129050	City of Petersburg		Chesterfield		
	8096152568	Roslyn Farms Corp		Chesterfield		
		Boulevard ROW?		Petersburg		
Trail along south side of river (improvements)	8026129050	City of Petersburg		Chesterfield		
	8096152568	Roslyn Farms Corp		Chesterfield		
Connect trail along north side of river to Boulevard	36000300001	USA		Colonial Heights	Cameron Foundation is working on this project.	
	ROW			Colonial Heights		
Pedestrian bridge across historic abutments	8096152568	Roslyn Farms Corp		Chesterfield		
	44000400050	City of Colonial Heights		Colonial Heights		
Improve fishing area and trail extension	ROW					
G: I-95 to Temple Ave.						
Trail along Magazine Rd.	8066123364	South Central Wastewater Auth.	M	Chesterfield		
	8076125193	City of Petersburg		Chesterfield		
	8096152568	USA		Chesterfield		
		Road ROW?				
Trail on north side of river- extend east	69020900002	City of Colonial Heights		Colonial Heights		
	68215600001	Jennick Properties LLC		Colonial Heights		
	68216100002	Sandpiper Colonial Heights LLC		Colonial Heights		
	Temple Ave. ROW			Colonial Heights		
Trail on south side of river	006010800	South Central Wastewater Auth.	M-2	Petersburg		
	006020004	City of Petersburg	M-2	Petersburg		
	005010802	Norfolk & Western Railway Co.		Petersburg		
	002010001	CFS Group Disposal	M-1	Petersburg		
	220(01)00-169-0	Puddledock Road Properties LLC		PG County		
	220(0A)00-002-0	Puddledock Road Properties LLC		PG County		
	220(04)00-003-0	Crossroads Holdings LLC		PG County		
Pedestrian bridge under Temple Ave.	I-95 ROW			PG County		
H: Temple Ave. to Irwin Road (North)						
Rustic trail along Town Creek drainage	68170000018	Roslyn Farm Corporation		Colonial Heights	LPDA spoke to Roslyn Farms about whole project. They were amenable to most components, but were skeptical about the feasibility of this segment.	
	68174800005	Faison Colonial Retail Assoc.		Colonial Heights		
	Colonial Heights ROW			Colonial Heights		
Sidewalk improvements along Conduit Road.	Colonial Heights ROW			Colonial Heights		
	6605170000A	Kennon Pointe Condominium Unit		Colonial Heights		
	66082600002	Conjurers Neck HOA Etc		Colonial Heights		
	66060000010	City of Colonial Heights		Colonial Heights		

	Parcel ID	Parcel Owner	Zoning	City/County	Contacted	Next Steps
I: Temple Ave. to Irwin Road (South)						
Trail between Temple Ave. and the marina	11A(01)00-017-0	Crista Manieri		PG County		
	11A(01)00-019-0	Michael Seitz		PG County		
	11A(01)00-020-0	James Smithson		PG County		
	11A(01)00-021-0	James Smithson		PG County		
	11A(01)00-022-0	Hill City Holding LLC		PG County		
	11A(01)00-023-0	Virginia Utilities Contractors Inc.		PG County		
	11A(01)00-024-0	Virginia Utilities Contractors Inc.		PG County		
	11A(01)00-025-0	Carol Fulcher		PG County		
Trail around Vulcan property	110(01)00-00C-0	Vulcan Lands Inc.		PG County	LPDA spoke to a Vulcan board member in Sept. 2016. He was unsure about the feasibility of a trail on Vulcan property, definitely not along the water. He indicated it will be a long time before the quarry is at the point of implementing an end-use plan.	
	110(0A)00-021-0	Alvin Sanford & David Sanford		PG County		
	110(0A)00-021-B	David Sanford		PG County		
	110(0A)00-028-0	Vulcan Lands Inc.		PG County		
J: Irwin Road to I-295						
Trail along River road/ Fort Lee	Road ROW			PG County	LPDA spoke to planner at Fort Lee in Sept. 2016. He is checking on road ROW width and feasibility of trail corridor on Fort Lee property.	
Trail on south side of river, Fed. Penn	110(05)00-007-0	David Sanford		PG County		
	11C(03)00-034-0	Claiborne & Donna Tucker		PG County		
	11C(03)00-035-0	John & Jung Curd		PG County		
	11C(03)00-036-0	Yee Yan Yam & Hing Lo Sau		PG County		
	11C(03)00-037-0	Tauna Fallin		PG County		
	110(0A)00-011-0	Herbert Renn et als		PG County		
	110(0A)00-011-B	Howard & Donna Dixon et als		PG County		
	110(0A)00-011-C	Pemela Crossley		PG County		
	110(0A)00-011-D	Natalie Renn		PG County		
	110(0A)00-011-F	Douglas Renn		PG County		
	11C(03)00-020-0	Wolfgang & Ursula Grimm		PG County		
	220(03)00-00B-0	Federal Correctional Institute		PG County		
	220(03)00-00C-0	VA Department of Corrections		PG County		
	220(0A)00-004-0	USA		PG County		
Appomattox River Regional Park trails (Improvements)	220(03)00-00A-0	VA Department of Corrections		PG County		Improve/maintain trailas as needed.
	220(03)00-00B-0	Federal Correctional Institute		PG County		
	220(03)00-00D-1	County of Prince George		PG County		
K: I-295 to Cabin Creek Road						
Trail along I-295 to Atwater Park	ROW			Hopewell		
	118200-36375-2290085	Camerons Landing LLC		Hopewell		
	Prince George Co.	Prince George County		Hopewell		
Sidewalk improvements in Cameron's Landing	ROW			Hopewell		
Trail through drainage and along river banks	118200-36375-1060245	Camerons Landing LLC?	R-1	Hopewell		
	118250-36350-2850005	Anchor Point Prperties LLC	R-4	Hopewell		
	118225-36375-1060015	Doris Atwater	R-1	Hopewell		

	Parcel ID	Parcel Owner	Zoning	City/County	Contacted	Next Steps
Trail through Cabin Creek drainage	118225-36375-1060030	Nancy Atwater	R-1	Hopewell		
	118225-36375-930040	Atwater Properties LLC	R-1	Hopewell		
	118225-36375-1060580	John & Cheryl Ross	R-1	Hopewell		
	118225-36350-1060063	Deborah Barber	R-4	Hopewell		
	118225-36325-1060061	Deborah Barber Trustee	R-1	Hopewell		
	118250-36325-1060155	Patricia Gonzales	R-4	Hopewell		
	118250-36325-1060160	Patricia Gonzales	R-4	Hopewell		
	118250-36350-2850025	MPD Ventures LLC	R-1	Hopewell		
	118225-36350-2850035	MPD Ventures LLC	R-4	Hopewell		
	118250-36350-2850045	MPD Ventures LLC	R-4	Hopewell		
Sidewalk improvements on River Road	Hopewell ROW			Hopewell		
L: Cabin Creek Road to Route 10						
Sidewalk improvements on River Road/Mesa Broadway	Hopewell ROW			Hopewell		
Rustic trail through drainage	118300-36350-610243	City of Hopewell	R-4	Hopewell		
	118300-36375-610351	City of Hopewell	R-4	Hopewell		
	118300-36350-610380	Ingram & Traylor L.P.	R-4	Hopewell		
	118300-36350-620005	Ingram & Traylor L.P.	R-4	Hopewell		
	118300-36375-610231	Historic Hopewell Foundation	R-4	Hopewell		
	118300-36375-610232	Historic Hopewell Foundation	R-4	Hopewell		
	118300-36375-311400	Doris Renn	R-4	Hopewell		
	118300-36375-311440	Doris Renn	R-4	Hopewell		
	118300-36375-610430	Doris Renn	R-4	Hopewell		
	ROW		ROW	Hopewell		
	118300-36375-311511	City of Hopewell	B-3	Hopewell		
	Trail connection next to Baptist Church	Hopewell ROW			Hopewell	
Trail along Riverside Ave. to Riverwalk Trail	118300-36375-660003	City of Hopewell	B-3	Hopewell		
Trail through Riverside Park (improvements)	118300-36375-311383	Appomattox Municipal Cemetery	R-3	Hopewell		
	118300-36350-660002	City of Hopewell	R-3	Hopewell		
M: Route 10 to City Point Park						
Hopewell Riverwalk Trail	118325-36375-660880		B-3	Hopewell		
	118350-36375-801072	City of Hopewell	R-2	Hopewell		
	ROW		ROW	Hopewell		
	118325-36375-660005	City of Hopewell	B-3	Hopewell		
	118325-36375-660010	City of Hopewell	B-3	Hopewell		
	118325-36375-660885	City of Hopewell	B-3	Hopewell		
	118325-36375-111386	Columbia/HCA John Randolph Inc.	B-2	Hopewell		
	118325-36375-111503	Columbia/HCA John Randolph Inc.	B-2	Hopewell		
	118350-36375-111960	Hopewell Real Estate LLC	B-2	Hopewell		
	118325-36375-660888	Old Dominion Water Corp.	B-3	Hopewell		
	118325-36375-111505	Haralambos Papanicolaou	B-2	Hopewell		
	118325-36375-660675	Haralambos Papanicolaou	B-3	Hopewell		
	Hopewell City Park improvements	118350-36375-801072	City of Hopewell	R-2	Hopewell	
Trail connection between City Park and Appomattox St.	118350-36375-801072	City of Hopewell	R-2	Hopewell		
Sidewalk improvements on Appomattox St./Cedar Ln.	ROW		ROW	Hopewell		

Trailhead at Hunter House

Parcel ID	Parcel Owner	Zoning	City/County	Contacted	Next Steps
118375-36375-270005	USA (NPS?)	TH-1	Hopewell		
118375-36375-270010	USA (NPS?)	TH-1	Hopewell		
118375-36400-270015	USA (NPS?)	TH-1	Hopewell		

APPENDIX G

Signage Plan (Coming in Final)



-photo by Tara Ciavarella