The James River Park System
Trail Connectivity PLAN

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Trails consolidate and connect communities, rather than encourage them to expand and fragment.

—DAVID BURWELL, President, Rails-to-Trails Conservancy, 1997
A plan to connect the trail network and identify official off-road routes in the City of Richmond, Virginia

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The City of Richmond Parks Trails Manager
The President of the Richmond Mid Atlantic Off Road Enthusiasts

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See you on the trails!
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Executive Summary

What would it take for Richmonders to walk out their front door and within a mile or two, access a trail network that winds through the city accessing everything from the central business district, restaurants, schools, workplaces, historical or cultural areas, to the open spaces surrounding James River and then takes them back home without retracing their steps? This report was commissioned by the City of Richmond, Virginia to answer this very question. Mayor Dwight Jones is taking a pro-active approach to developing an off-road trail network for transportation and recreational purposes. The citizens have shown and stated consistently that they want to be able to bike, walk, hike or run throughout the city using a safe off-road trail network. Additionally, the trail network should connect people to the city’s most valuable natural resource; the James River and Parks that line its banks.

This study aims to identify the following:

1. Identify and map the existing trails and other facilities
2. Detect the assets and liabilities of the existing trails
3. Identify the gaps in the trails and facilities
4. Recommend a type of trail or pathway that will close the gap

“By linking open spaces we can achieve a whole that is better than the sum of the parts.”
William Whyte, The Last Landscape, 1968
Executive Summary - Continued

In an attempt to document the existing trails, the process of meticulously recording each trail and cataloguing each engineered structure using a geographic positioning system (GPS) was employed. The GPS data was converted to geographic information system (GIS) shape files and an integrated geodatabase. This invaluable tool allowed the panel to visually see each trail on a map and geospatially analyze each trail for connectivity. During each site visit, a trail survey was completed that identified the name of the trail, the trail surface, the condition, the trail width, and finally each trail was given a connectivity value. The connectivity value was identified from a series of questions regarding safety, trail hazards, access issues, and an inspection of the existing engineered structures. In addition to the documentation of existing trails and discovering the connectivity value, another important aspect of this project has been the research and review of existing plans that describes how and where trails are built in the State of Virginia. This section is called the gap analysis and contains information about riparian buffers, conservation easements, recreational easements (tort law), rails with trails and on-road facilities. Lastly, the gap analysis studies the existing trail literature and examines the proposed trail development strategies.

After pulling together this information, the short and long term goals are identified and the gaps are filled with a prescribed trail or pathway. The plan identifies the official route, type, surface, the estimated distance and how the gaps will be closed using information gathered during the gap analysis. Lastly, the plan identifies who should build the trail or pathway and how the network should be managed.

“Trail opportunities should exist within 15 minutes of most American’s homes.”
American Trails, Trails for All Americans report, 1990
Organization of the Document

The plan will be organized in four phases: (I) the introduction, (II) the existing trails, (III) the gap analysis and (IV) the plan of development and management strategy. The introduction will contain four parts including (1) the introduction of the City of Richmond (2) the plan purpose, (3) state of the art of trail planning, and (4) the precedent plans that outline the planning methodology. This section sets up the document and explains the methodology and process of beginning the project.

Phase II is entitled the Existing Trails and describes the existing conditions and connectivity value of the existing trails. This phase is comprised of three sections: (1) the existing trail facilities and (2) the assets and liabilities of the existing trail facilities and (3) the existing gaps in the facilities that are in need being closed.

Phase III is the Gap Analysis and will be comprised of 2 parts including: (1) the analysis of riparian buffers and easement types and (2) the existing trail plans for prescribed corridors. This section will identify the “key corridors” from previous plans and will describe how to use public right-of-way for connectivity purposes. The potential trail connections will be identified and mapped using Geographic Information System (GIS) software. The new route will be examined by its primary purpose (transportation or recreation), principle user type, length in miles, and type of trail material to be used and address the existing liabilities at the connection points. Furthermore, the connections will be broken down to two options (short and long term goals).

Phase IV is the Plan of Development and Management Strategy. The Plan will draw from the short term and long term goals from of the aforementioned recommendations and clearly explain the proposed routes to close the gaps in the existing facilities. Furthermore, this phase explains who should build the new facilities and how they should be managed.
Glossary of Terms

**Trail:** A generic term that describes a broad range of paths for recreation and or transportation within a Park, natural environment, or designated corridor that is not classified as a highway, road or street. In the City of Richmond, the urban trail system will use off-road facilities, facilities in the public right-of-way, natural surface trail, improved surface pathways, informal trails and pathways, fire-roads, engineered structures and pedestrian bridges.

**Off-Road Facility:** A generic term that describes a trail or pathway that is not associated with a public right-of-way.

**On-Road Facility:** A portion of a roadway which has been designated by striping, signing and pavement markings for the preferential or exclusive use of pedestrians and bicyclists. These should only be employed where off-road facilities are not achievable.

**Natural Surface Trail:** A narrow, natural surface trail that is typically 12” – 18” in width and just wide enough for one person or bicycle. This type of trail tends to wind around obstacles such as trees, large rocks and bushes and blends into the surrounding environment. Native surface trails disturb much less ground and are easier to maintain than improved surface trails.

**Improved Surface Pathways:** A pathway that is (4’ – 12’) in width that is typically paved with asphalt or other hardened surfaces and has specific design standards that are compliant with the Americans with Disabilities Act (ADA) and American Association of State Highway Transportation Officials (AASHTO) requirements.

**Informal Trails and Pathway:** These types of facilities were created without a specific purpose or design. Typically, informal trails and pathways are created from the reclamation of a long forgotten road or bushwhacked by users.

**Fire Road Facility:** Unpaved road that is wide enough for an emergency vehicle and used for emergency access. Fire road facilities are generally closed to motorized vehicles.

**Engineered Structure:** A manmade structure such as a bridge or a culvert pipe that allows users to traverse over or under an obstacle such as a railroad line, road, ravine, river, creek or stream.

**Pedestrian Bridge:** An engineered structure that carries trail users from one side of the river to the other. These structures should also comply with the Americans with Disabilities Act (ADA) design requirements.
INTRODUCTION

The James River Park System - Trail Connectivity Plan was requested by City of Richmond, Virginia and the Richmond Mid Atlantic Off-Road Enthusiasts. The plan also fulfills the requirements of the Masters of Urban & Regional Planning program in the L. Douglas Wilder School of Government and Public Affairs at Virginia Commonwealth University.

The City of Richmond is the state capital of the Commonwealth of Virginia. It is centrally located in the state, one hundred miles south of Washington DC and seventy miles east of the City of Charlottesville. The city is located on the border of the piedmont and tidewater regions and is located on the fall line of the James River which runs from West to East through the city and empties in the Chesapeake Bay. The city is bordered by Chesterfield County to the south and Henrico County to the north, east and west. The City of Richmond is 62 square miles in area and has a population of 204,214 residents. (State & County QuickFacts 2012)

Spearheading the initiative to make the City of Richmond a bicycle and pedestrian oriented city, Richmond’s Mayor Dwight Jones appointed a Pedestrian, Bicycling and Trails Planning Commission to “give his administration advice on ways to incorporate walking and bicycling as viable methods of transportation in the City of Richmond.” (The Mayor's PBT Report 2010). The Mayor’s PBT Commission developed a report that outlines the need for on and off-road facilities throughout the city and describes how to achieve these goals in 18 – 24 months. Furthermore, the plan identifies the possibility of an interconnected trail system.

Building from the recommendations in the Mayor’s PBT report, City Hall has assembled a capable team to oversee the various bicycle and pedestrian projects throughout the city.
The James River Park System – Trail Connectivity Plan 2012

Figure 1: Location of the City of Richmond, Virginia
Plan Purpose

The initiative to make the City of Richmond a more bicycle and pedestrian friendly city is a new initiative for City Hall. Currently, there are no existing plans that identify the possibility of an interconnected trail network and the existing trails have not been accurately mapped or identified as official recreation or transportation routes. The proposed trail connectivity plan will serve the client with a clear guide that will identify the official routes, address the short and long term connectivity goals and make recommendations for facilities that will close the current gaps.

Currently, the City of Richmond is in a unique situation. It has an urban park and trail system that is unlike that of any other city. The James River Park System has a 13 mile loop of world renowned off-road facilities. This plan addresses the problem that is posed by the scattered nature of other trails in the City of Richmond, and the lack of connectivity and access to the James River and the Park system that lines its banks. Outside of the James River Park System, the trails begin and end unexpectedly and are isolated to individual Parks. Most importantly, the trails are not used if they don’t go anywhere. For example, the Cannon Creek greenway trail is in critical need of integration within a city trail network. Although, the pathways is being constructed in phases, the existing half-mile trail takes users from one public road to another, and ends in an industrial district with undersized roads creating a conflict with automobile traffic. Another example of the lack of trail connectivity can be found at the western edge of the James River Park System. The trail ends abruptly upon private property and empties on a public street. This plan will attempt to solve these issues by researching each gap and solving the problems that are keeping the trails disconnected.
State of the Art

This section describes how trail planning is typically researched in contemporary urban and regional planning. It will explain the key insights of, and cite the most important literature for trail planning and explains the planning process. Finally, this section will address the key questions that will inform the research necessary to complete the plan.

Trail Planning

Trail planning in Virginia began around the turn of the 20th century. Today, trail planning is a primary objective of rural and urban localities throughout state. According to the Virginia Department of Conservation and Recreation Greenways and Trails Toolbox, there are two major steps in developing a trails plan. The first step requires that appropriate parties conduct a feasibility study. The second step involves the development of a master plan. Tasks included in the feasibility study consist of developing a mission statement, meeting with key individuals, generating a physical inventory and analyzing potential benefits. Tasks included in the master plan phase consist of developing goals and objectives, location information, summary of outreach results, a summary of resource inventories, development plan, an implementation timetable, cost estimate and management plan.

Figure 3: The Buttermilk Spring
Planning Theory

Before beginning any planning exercise, it is necessary to understand the role of the planner throughout each phase of the planning process. The rational theory planning model (see figure 3) is a decision making tool widely used to achieve an objective in contemporary urban planning. The National Association of Recreation Resource Planners provides a planning framework to follow when generating a new recreation resource plan. Although, “its proponents will readily admit that in the real world it cannot be carried out precisely as described, many would argue that it still constitutes a kind of holy grail” method of decision making (Levy 2006). Furthermore, the “idea behind the model, as its name suggests, is to make the planning process as rational and systematic as possible. A listing of steps in the model follows.” (Levy 2006) This hierarchical model is also described as a centralized approach to the planning process. A centralized approach tends to “posit a high degree of control over the decision making situation on the part of the decision maker.” (Etzioni 1967)

For this plan, a six person steering committee has been formed and is represented by the multiple clients and the planner. Together, the committee will address the issues, research and develop solutions for an interconnected trail network and presented to the Mayor and Richmond City council for consideration in the next Capital Improvement Plan. In addition, this plan process also follows the collaborative model wherein the organization for which the plan is being completed plays an integral role in the entire process.
Precedent Plans - Methodology

This plan utilized several precedent plans to guide the organizational structure of the planning process and the composition of the final document. The James River Park System – Trail Connectivity Plan identified the following plans as documents valuable in informing the methodology of trail planning.

1. Pedestrian, Bicycling and Trails Planning Commission Report. This plan, developed in 2010, advocates for on and off-road bicycle and pedestrian facilities throughout the City of Richmond. The plan surveyed the community at the beginning of the planning process, and found support for the official promotion of the trails through “prioritizing greenways, blue way trails on-road bicycle and pedestrian routes as official routes of the City of Richmond.” (The Mayor’s PBT Report 2010)

Furthermore, the plan called for the following recommendations from the survey results:

- Upgrade/develop formal trail head facilities on existing and planned trails
- Purchase equipment needed to develop trail facilities more efficiently with Park staff and volunteers
- Develop Bike Park Facility at Gillies Creek Park in conjunction with the Gillies Creek Greenway
- Formalize Operational and Capital Improvement funding for trail construction and maintenance
- Develop and produce maps of trail system to be sold; – funds generated should into fund for trail maintenance and development
- Develop projects on City land first.
- Create a coordinated approach to working with CSX and Norfolk Southern for Trail and Greenway developments
- Use “Recreation Easements” to develop trail and Greenway projects that need to cross private land
2. The Virginia Outdoors Plan was created in 2007 by the Virginia Department of Conservation and Recreation (DCR). This plan provides overall guidance for outdoor recreation throughout the State of Virginia, especially local greenway and trail planning efforts. The plan assesses the “needs and trends, and provides policy recommendations at both the statewide and regional level. In particular, the plan promotes the concept of livable and walk-able communities based on the desire by citizens to reduce automobile use, improve health, and address the economic burden of rising fuel costs and roadway congestion.” (Virginia Department of Conservation and Recreation 2007)

3. The Richmond Regional Bicycle and Pedestrian Plan completed in 2004, was developed by the Richmond Regional Planning District Commission and identifies the methods used to generate a bicycle and pedestrian oriented plan. The methods include the scientific evaluation of bicycle level of service, pedestrian level of service, and latent demand along study area roadways. The bicycle level of service is used to rate existing corridors based on a variety of factors important to bicyclists. Pedestrian level of service is used to rate existing corridors based on a variety of factors important to the typical pedestrian’s need for safety, security, and convenience. The latent demand model provides a relative comparison of projected use by bicyclists and pedestrians among alternate routes before they are built.

4. James River Branch Rail-Trail Concept Plan was developed by the Southside Richmond Rail-Trail Project Team. The collaboration of many different government and non-government organizations created the vision for converting the existing CSX property to an urban greenway and trail that would connect residential neighborhoods, workplaces, shopping centers, schools, churches, Parks, transit stops, and other destinations. The planning process framework began with a feasibility study, followed by data collection and field analysis, a community engagement workshop, the plan of development and an implementation strategy.
5. **The East Coast Greenway through Richmond Plan** was created as by Matt Weaver in 2010. The methodology used in creating the plan started with a paper map of potential greenways within the city boundary. The map was created from the Trails Manager for the City of Richmond and the Richmond Regional Planning District Commission to better understand where the potential was high for building off-road trails. The map identified three potential greenways for future trail development that could be used in routing the East Coast Greenway through the City of Richmond. The greenways were identified as Cannon Creek Greenway, Reedy Creek Greenway and the Pocosham Creek Greenway. The existing conditions that helped determine the location of the off-road trails were the location of floodplains, the demographics of the study area, the land use and ownership of property, the crime and the existing transportation infrastructure.

6. **The Cannon Creek Greenway plan** was produced by Katherine Wright. The methodology used to develop the plan included the research of existing plans and extraction of the pertinent data relating to the Cannon Creek Greenway. Throughout the document, Wright examines the existing conditions of the corridor and uncovers the potential for a shared-use pathway. The document ends with a potential alignment for the pathway and a list of design upgrades.
Approach and Methods

This section will explain the planning approach and methodology. According to the *Virginia Department of Conservation and Recreation Greenways and Trails Toolbox*, the planner should generate a feasibility study to begin the planning process. In order to generate the appropriate data, the committee will pose the following questions:

1. **What is the scope of the project?**

   According to the *Virginia Department of Conservation and Recreation Greenways and Trails Toolbox*, this process is described as the fleshing out of the vision of the trail network at the beginning of the planning process. A paper map is developed to roughly identify the proposed key corridors that link up the existing trail network and locates where each connection should begin and end. The map will also identify possible connections to neighborhoods as well as cultural, shopping and natural areas. This document will also establish the framework for the way which the committee will proceed to carry out the project. At this phase of the plan, the research of the corridors is conducted and information is compiled in an easily accessible location.

2. **How do you define the word “trail”?**
   a. What is the difference between Regional trails compared to local trails?
   b. What types/surfaces are commonly used in trail construction?

3. **Who uses the existing trails?**
   a. Observations of trail users will be documented during site visits.
   b. Trail users will be different at each location.
4. What trails are existing and where are the possible connection points?
   a. This phase of the planning process includes a physical inventory that will identify the existing conditions. According to the *Virginia Department of Conservation and Recreation Greenways and Trails Toolbox*, the inventory should include an inventory of natural resources, hazardous and residual waste, engineered structures including bridges and ramps, public services and utilities, scenic resources, historical and cultural resources, transportation characteristics, Parks – open space and community facilities. The physical inventory will be completed using a global positioning system (GPS) navigation instrument. Geographic Information System (GIS) will be used to map the information documented during this phase of the planning process for analysis.

5. How will the trails be analyzed during site visits?
   a. A trail inspection checklist will be generated to inventory the following:
      i. Trail surface and width
      ii. Potential Hazards
      iii. Ingress/Egress
      iv. Inadequacies
      v. Inventory of engineered structures
      vi. Connectivity value

6. Is there likelihood that the land can be acquired, or can easements be placed to place the off-road trail?
   a. Utilities and Easements – CITY RECREATIONAL EASEMENTS
   b. Private Land Ownership / Access
7. What are the environmental issues attributed to building trail?
   a. Rivers and Streams
   b. Chesapeake Bay Areas
   c. Soils – International Mountain Bicycle Quick Soils Test – See Appendix
   d. Tree Canopy / Impervious Area Analysis

8. How will on-road connections be analyzed?
   a. Bicycle level of service and Pedestrian level data from the Regional Bicycle/Pedestrian plan from 2004 will be used for on-road connections. These models provided an “evaluation of bicyclist and pedestrian perceived safety with respect to motor vehicle traffic and comfort in using the roadway corridor.” (Transporation 2004)
   b. Identify existing and proposed bicycle routes using Geographic Information Systems.

9. What will be the actual alignment of the corridors?
   a. What alternatives alignments are possible if problems occur?
   b. Where will the access points be located?
   c. What type of surface will meet the proposed usage and loads on the trail?
   d. Existing trail plans contain useful data including visitation counts, community survey data and demographics.

10. How will the new off-road facilities be prescribed?
    a. Trail Type Identifier – See the Appendix
    b. Trail Surface Identifier – See the Appendix
THE EXISTING TRAILS

The City of Richmond has a number of existing trails. The most prominent location for use of the off-road trails is along the banks of the James River. The James River Park System is currently the only connected series of off-road trails in the city accounting for approximately 13 miles of singletrack, shared use improved pathways, informal trails and fire-roads. Trail users traverse the rapids of the James River using the pedestrian bridges on the north and south boundary of Belle Isle and the Nickel Bridge to the west. Because of its location, the James River Park System will serve as the anchor of the trail network.

This section outlines the process in which the existing trails of the City of Richmond were identified and documented.

The section answers the following questions:

• How do you define the word trail?
• What types of trails exist?
• How are the existing trails used?
• How were the trails documented and mapped?
• Where are the trails located in the city?
• Where does each trail go?

Figure 5: The James River Park System Trails
What Is a Trail?

A “trail” is a generic term that describes a broad range of identified routes for recreation and transportation within a Park, natural environment, or designated corridor. In the City of Richmond, the urban trail system is comprised of off-road facilities, on-road facilities, natural surface trails, improved pathways, fire road facilities, engineered structures and pedestrian bridges. Each type of trail has its own purpose, intended user, and should have an intentional entry point and destination.

Regional Trails
Regional trails are built for multiple uses and span over multiple jurisdictions. These trails are typically easily maneuverable using a hard surface construction material such as crushed gravel or pavement. These regional trails are typically well planned and require a larger budget to build. A good example of a regional trail is the Virginia Capital Trail that connects Williamsburg to Richmond, Virginia.

Local Trails
While local trails are also built for multiple uses, they are typically built inside of a specific jurisdiction or boundary. These trails range from being easily maneuverable to highly challenging and are constructed by either the local Government or a citizen led volunteer workforce.

Figure 6: Trails – Macro vs. Micro Level
Existing Facilities - Types and Surfaces

Improved Surface Pathways
These facilities are constructed with a firm surface that can be easily traveled. Access and use to the pathway should be inclusive in accordance with the Americans with Disabilities Act (ADA).

Native Surface Trails
Native Surface facilities are constructed on the natural surface including dirt, rock and tree roots and are more likely to be subject to erosion. Fortified dirt trails may contain natural rocks or flat rocks at the surface to reduce the risk of erosion but occasional observations and maintenance will be needed. These trails consist of singletrack, double track and in some cases, informal trails.

Informal Trails and Pathways
Informal trails and pathways exist in the City of Richmond. These facilities are not designed for a specific purpose or use but are typically an impromptu access to the river, a trail, pathway or other type of facility.

Facilities in the Public Right-Of-Way
The types of facilities that can be employed in public right-of-way are comprised of bicycle lanes, sharrows and sidewalks. These facilities reduce the conflict between users and automobiles on quiet streets and are often cheaper to install than building a new trail or pathways because the roads and sidewalks are existing.
Figure 7: Trail Types

- **Improved Surface Pathways**
  - Paved Asphalt & Other Hardened Surfaces
  - Crushed Stone
  - Chipped Wood
  - Multiple Surface

- **Native Surface Trails**
  - Singletrack
  - Doubletrack
  - Fire Road

- **Informal Trails and Pathways**
  - Abandoned Roads
  - Bushwhacked Trail
  - Utility Easements
  - Informal Pathways

- **Facilities in the Public Right-of-Way**
  - Bicycle Lanes
  - Sharrows
  - Sidewalks
Native Surface Trails

Use Case:
This type of trail should be employed in natural areas that have undulating or rugged terrain. For example, singletrack trail is built for single file use. These trails are typically 12” – 36” in width and are built of natural surfaces such as dirt and stones. Typically, these trails are located in existing Parks or along natural riparian buffers.

Primary Users: The primary users of this trail type are citizens who are active such as hikers, dog walkers, nature observers and mountain bicyclists.

Diagram Source: (Bentonville Bicycle & Pedestrian Master Plan 2011)
**Improved Surface Pathways**

**Use Case:**

This type of facility should be employed in areas that have less rugged terrain and should be built with a surface that is easily traveled. These facilities are typically 8’ - 12’ in width and are constructed using a gravel base and either a crushed gravel or an asphalt paved surface. Different types of users should be able to easily pass one other. Engineered trail design and drainage should be in accordance with the Americans with Disabilities Act (ADA) and American Association of State Highway Transportation Officials (AASHTO).

**Primary User:**

Improved shared use paths should be built for multiple user types including, but not limited to recreational bicyclists, walkers, joggers, dog walkers, commuters and nature observers.
Informal Trails and Pathways

Use Case:
The development or deterioration of visitor-created or reclaimed trails in a protected area can be a big land management issue. These types of facilities were created without a specific purpose or design. Typically, informal trails and pathways are created from the reclamation of a long forgotten road or bush-whacked by new user attempting to access a resource. Land Managers and stakeholder groups typically attempt to cover these trails with large natural objects such as rocks and branches to stop the intruders from creating a permanent trail or pathway. For example, Forest Hill Park has two examples of informal trails and pathways. The southern entrance from Riverside Drive seems like a gravel shared-use pathway but was not designed for a bicycle or pedestrian use. Originally, the pathway was designed to carry a street car in to Forest Hill Park. Another example of an informal trail is the bushwhacked trails that adjoin the western parking lot. Land Managers have attempted to reclaim the trails with large branches and rocks.

Primary User:
Informal trails that result from an illegal or inappropriate use are less acceptable than a legitimate or permitted user attempting to access a natural resource. If the trail is heavily used, the Land Manager should alter the trail alignment to address the situation.
Facilities in the Public Right-of-Way

Use Case:
Any urban trail network will need to cross or follow a road at some point. Although, roads should only be used to connect the off-road facilities as a last resort, these facilities should be well marked with appropriate signage. Bicycle lanes and sharrows present the opportunity to share the road way for cyclist and pedestrians alike. Another option for on-road connectivity is the use of sidewalks. These facilities already exist and should be used when the trail is located near public facilities such as schools and playgrounds. Sharrows should be used in cases where the road width is too narrow to support a separate bicycle lane.

Primary Users:
Shared roadways will only be used to connect off-road facilities that have no other opportunities for connectivity due to private land constraints. The users are typically road and mountain bicyclist who are connecting to other facilities for recreational or transportation purposes.
How Are The Existing Trails Used?

In the City of Richmond, most of the existing trails exist in public Parks. These spaces provide the citizens in the surrounding communities with a chance to encounter nature in an otherwise urban setting. These facilities also play an important role in local recreation, transportation and outdoor education.

Recreation Purposes

Most of the existing off-road trails are located in recreational Parks. These areas provide recreational opportunities and open space amenities such as shelters, cooking areas, water features, shaded tree canopies, playground equipment, meeting spaces and an escape from the urban landscape. The close proximity of the Parks to one another provides the opportunity to connect the green spaces and to allow users to take advantage of accessing multiple Parks at once.

Transportation Purposes

Off-road trails provide transportation options for the citizens in the surrounding communities to connect with a trail and to commute to work or run errands by riding a bicycle, walking or skating. These alternative modes of transportation are considered healthy, viable options to traveling by automobile and help reduce carbon emissions, dependence on gas and maintenance costs on vehicles. An interconnected trail network provides the opportunity for those seeking a chance to travel throughout the city without a personal vehicle in a safe, natural environment.

Education Purposes

Interpretive trails are designed for outdoor recreation with educational opportunities for participants. The education signage is installed directly adjacent to the trail offering educational information about ecology, history or culture.
Off-Road Facilities Inspection Process

Trails in the City of Richmond were identified by observations during site visits by the author beginning December 30, 2011 – January 30, 2012. In an attempt to document the existing trails, the process of meticulously recording each trail and cataloguing each engineered structure using a geographic positioning system (GPS) was employed. The GPS data was converted to geographic information system (GIS) shape files and an integrated geodatabase. This invaluable tool allowed the panel to visually see each trail on a map and geospatially analyze each trail for connectivity. Also, during each site visit, a trail survey was completed that identified the name of the trail, the trail surface, the condition, the trail width, and finally each trail was given a connectivity value. The connectivity value was gleaned from a series of questions regarding safety, trail hazards, access issues, and an inspection of the existing engineered structures. The aforementioned surveys and map of the proposed greenways was used to inspect each of the facilities for connectivity purposes. This map was generated by the City of Richmond, Trails Boss and the Richmond Regional Planning District Commission and provided the potential for future trail connectivity throughout the city. The map labeled “Potential Greenways, City of Richmond” is located in the appendix.

The list of existing off-road facilities catalogued in this plan is as follows:

- Ancarrow’s Landing – Part of Richmond’s Slave Trail
- Brown’s Island Canal Walk, Virginia Capital Trail
- Cannon Creek Greenway
- Huguenot Flatwater / Wetlands Trails
- Flood Wall Walk
- Forest Hill Park
- The James River Park System – Belle Isle, Buttermilk, Buttermilk West, Dogwood Dell, North Bank Trails
- Lewis G. Larus Park
- Powhite Park
- Joseph Bryan Park
Ancarrow’s Landing – Richmond Slave Trail

Facilities:
Ancarrow’s Landing, a Park in the City of Richmond is located on the southern bank of the James River immediately across from Rockets Landing. This Park contains the singletrack section of the Richmond Slave Trail. This section is identified as an interpretive (educational) walking trail that is comprised of singletrack, doubletrack, crushed gravel and paved shared use pathways that weave through the City of Richmond. The trail begins at the Manchester Docks and continues .6 miles through Ancarrow’s Landing Park, following the banks of the James River, and ends at the eastern side of the Flood Wall Walk. The Slave Trail is described as a “walking trail that chronicles the history of the trade in enslaved Africans from Africa to Virginia until 1775” (The Richmond City Council Slave Trail Commission 2012).

Amenities:
Singletrack: .6 miles
Non-Compacted Gravel / Paved Shared Use Path: 5 miles
Engineered Structures: 3
Americans with Disabilities Act (ADA) Accessible: No

Connectivity:
North: The trail is bordered by the James River to the north.

East: The trail is bordered by the James River to the east.

South: The trail is bordered by a mining site (Vulcan Mines) immediately to the south. A potential long-term connection could be achieved by navigating around the mining site and connecting to the Bellemade Elementary School and Bellemade Community Center.

West: The western side of the Park has the most potential for connectivity to the rest of the trail network. The City of Richmond sewage treatment facility and Intestate I-95 are immediately adjacent to the Park. Brander Street is the only access through the floodwall and under I-95. The slave trail connects to the Flood Wall Walk just to the west of I-95.
Anncarrow’s Landing – Richmond Slave Trail

**Trail Type:**
Local Trail

**Trail Surface:**
Native Surface

**Trail Use:**
Educational
Recreational

**Mileage:**
.6
Brown’s Island, Canal Walk & the Virginia Capital Trail

**Facilities:**
The Canal Walk is a pedestrian passageway through a canal along the James River. The Canal Walk is located on the north side of the James River and is located just below the central business district. The pathway takes users from Brown’s Island Park to the Mayo Island Bridge. Along the way, public art and educational signs give pedestrians an indication of the region’s history. The eastern-most part of the pathway is a foot path through an open field and over railroad tracks that takes users to the pipeline recreation area and the Virginia Capital Trail. It should be noted that bicycling is not an allowable use on the Canal Walk.

**Amenities:**
- Improved Asphalt Pathway (Virginia Capital Trail): .6 miles
- Improved Pathway Canal Walk: .6
- Improved Pathway: .6 miles
- Engineered Structures: 3 (along linear route)
- Americans with Disabilities Act (ADA) Accessible: Yes

**Connectivity:**
**North:** The north is blocked by the Central Business District

**East:** The eastern-most portion of the Virginia Capital Trail is bordered by the Great Shiplock Park and Private Property.

**South:** Connectivity to the south is achievable by the Mayo Island Bridge. The bridge has improved sidewalks for pedestrians.

**West:** The western-most section of the trail is connected to the James River Park system using an aggregate sidewalk that meanders along the north bank of the James River. The sidewalk ends at the Belle Isle pedestrian bridge.
Brown’s Island, Canal Walk & the Virginia Capital Trail

**Trail Type:** Regional and Local Trail

**Trail Surface:** Shared-Use Pathway & Sidewalk

**Trail Use:** Educational, Recreational, Transportation

**Mileage:** \( \text{.6} \)
Cannon Creek Greenway

Facilities:
The Cannon Creek Greenway is located just north of Shockoe Bottom in the Cannon Creek ravine where “the creek runs through an underground manmade culvert to its confluence with the James River and no part of the creek is visible above ground.” (Wright 2010)
The pathway begins at Dove Street to the north and winds along Richmond Henrico Turnpike through the Highland Park Southern Tip neighborhood and ends at Valley Road. The shared use pathway is comprised of asphalt (paved) and is approximately .6 miles long at the moment. Plans to build the second phase of the pathway will take the existing greenway north to East Brookland Park Boulevard in the near future.

Amenities:
Asphalt (Paved) Shared Use Pathway: .6 miles
Engineered Structures: 0
Americans with Disabilities Act (ADA) Accessible: Yes

Connectivity:
North: East Brookland Park Boulevard is the end of the proposed pathway. Private land issues may prohibit the trail from extending further north.

East: Private land issues may prohibit the pathway from extending east from its current location.

South: Currently, the pathway ends abruptly at the intersection of Richmond Henrico Turnpike and Valley Road. In order to connect to the James River Park System, the pathway could connect to on-road facilities along Oliver Hill Way or it could follow railroad right of way that extend to the river. A feasibility study should be completed to identify if the railroad right of way could carry a continuation of the pathway.

West: Private land issues may prohibit the pathway from extending west through the Southern Barton heights neighborhood.
Cannon Creek Greenway

**Trail Type:**
- Local Trail

**Trail Surface**
- Shared Use Pathway
- Asphalt

**Trail Use:**
- Recreation
- Transportation

**Mileage:**
- .6
Huguenot Woods Flatwater / Pony Pasture / Wetlands

Facilities:
Huguenot Woods Flatwater, Pony Pasture and Wetlands Parks contain shared use pathways and singletrack trails. Access to the facilities exists at several locations. The eastern most access point is located at the terminus of Landria Drive in the Willow Oaks Neighborhood. The second entrance is located at the Pony Pasture Parking facilities at the western end of the Wetlands. Lastly, access to the Huguenot Woods Flatwater section of the trail exists at the Parking facilities along Riverside Drive. The Parks contains two major trails identified as the Riverside Trail and the Pleasant Creek Trail. Both of these facilities have been identified as shared use multi-surface pathways that are generally 8’ – 10’ in width. At the western end of the network, the trail turns to singletrack dirt trail, extends under the Huguenot Bridge and abruptly ends on private property.

Amenities:
Share Use Pathway: 1.66 miles
Singletrack Dirt Trail: 1.62 miles
Engineered Structures: 6
Americans with Disabilities Act (ADA) Accessible: No

Connectivity:
North: The Park is bordered by the James River to the north.

East: The east is blocked by private property. At the terminus of the singletrack just to the east of the Huguenot Bridge abruptly ends on private property.

South: The Parks are bordered to the south by the Willow Oaks neighborhood and the public right-of-way for Riverside Drive.

West: To the west, the Parks are bordered by the Willow Oaks Country Club. Access to the country club is blockaded by a creek that acts as a shared property line.
Huguenot Woods Flatwater / Pony Pasture / Wetlands

**Trail Type:**
- Local Trail

**Surface**
- Improved & Native Surface

**Trail Use:**
- Recreation

**Mileage:**
- 2.5
Flood Wall Walk

Facilities:
The Flood Wall Walk is a shared use pathway that is divided in half between the eastern and western side of the Mayo Island Bridge and connects to the Slave Trail to the east and the Manchester Wall area to the west. The pathways vary between six and ten feet in width and consist of asphalt and stone surfaces. The route caters to hikers due to the steep access stairs that take users to the top of the floodwall. The only engineered structures are the pedestrian bridges that allow users to traverse the railroad right-of-way that travels through a break in the flood wall.

Amenities:
Asphalt Surface Improved Pathway: .32 miles
Compacted Stone Surface Improved Pathway: .73 miles
Engineered Structures: 3
Americans with Disabilities Act (ADA) Accessible: No

Connectivity:
North: The pathway is bordered by the James River immediately to the north.

East: The east is currently connected to Ancarrow’s Landing Park by way of the Richmond Slave Trail.

South: The pathway is bordered by railroad right-of-way and the Manchester industrial district.

West: The western edge of the pathway takes users to the James River Park System through a series of pedestrian bridges and sidewalks.
Flood Wall Walk

**Trail Type:**
- Local Trail

**Trail Surface**
- Improved Pathway

**Trail Use:**
- Recreation
- Transportation

**Mileage:**
- 1.05
Forest Hill Park

Facilities:
Forest Hill Park contains multi-surface pathways and singletrack dirt trails. The multi-surface pathways are 8’ – 10’ (feet) in width and include a gravel entrance from Riverside Drive that quickly changes to asphalt. The singletrack dirt trail varies from 1’ – 3’ (feet) and is located along the hill-sides of the Park. The pathways change surfaces throughout the Park and sometimes end abruptly.

Amenities:
Multi-Surface (Gravel and Asphalt) Pathway – 1.67miles
Dirt Singletrack – 3 miles
Engineered Structures – 5
Americans with Disabilities Act (ADA) Accessible - No

Connectivity:
North: The Park borders the James River Park System to the north.

East: The Park borders the Woodland Heights neighborhood to the east.

South: The Park borders Forest Hill Avenue to the south. The potential greenway map identified in the Appendix shows a pathway or trail that connects to the greenway by going under the Forest Hill Avenue Bridge and continuing south along Reedy Creek. This potential greenway could link Crooked Branch Raving Park and ultimately the proposed James River Branch Trail.

West: The western edge of the Park borders the neighborhood Forest Hill and is terminated by private property.

Figure 17: Potential Connectivity under Forest Hill Avenue
Forest Hill Park

**Trail Type:**
- Local Trail

**Trail Surface**
- Improved & Native Surface

**Trail Use:**
- Recreation

**Mileage:**
- 3.4

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**Trails & Pathways**
- Native Surface Trail
- Improved Surface Pathway
- Public Right-Of-Way Facilities
- Engineered Structures
- Parks
- James River and Streams
- City Boundary

NORTH 0.05 Miles
The James River Park System

Facilities:
The James River Park System (JRPS) is the most prominent location to experience the off-road trails is along the banks of the James River. These facilities are the only connected series of off-road trails in the city, accounting for approximately 13 miles of singletrack, shared use improved paths and fire-roads. Trail users traverse the rapids of the James River using the pedestrian bridges on the north and south boundary of Belle Isle and the Nickel Bridge to the west. Because of its location, the James River Park System will serve as the anchor of the trail network. It should be noted that bicycle riding is currently prohibited from the Boulevard Bridge.

Amenities:
Gravel Doubletrack (Fire Road): 1.76 miles
Native Surface Singletrack: 13 miles
Engineered Structures: 17
Americans with Disabilities Act (ADA) Accessible: No

Connectivity:
North: The Park borders the James River Park System to the north.

East: The Park borders the Woodland Heights neighborhood to the east.

South: The Park borders Forest Hill Avenue to the south. The potential greenway map identified in the appendix shows a pathway or trail that connects to the greenway by going under the Forest Hill Avenue Bridge and continuing south along Reedy Creek. This potential greenway could link Crooked Branch Raving Park and ultimately the proposed James River Branch Trail.

West: The western edge of the Park borders the neighborhood Forest Hill and is terminated by private property.
The James River Park System

Trail Type: Local Trail

Trail Surface: Improved & Native Surface

Trail Use: Recreation, Transportation

Mileage: 13
Lewis G. Larus Park

Facilities:
Lewis G. Larus Park is the western most Park in the City of Richmond and contains approximately 2 miles of singletrack trail. The park has a couple of small streams that flow from south to north through the Park and continue under Chippenham Parkway through a large drainage culvert. This culvert is also used as a point of access to the north side of Chippenham for Park users.

Amenities:
Singletrack Dirt Trails: 2 miles
Engineered Structures: 3
Americans with Disabilities Act (ADA) Accessible: No

Connectivity:
North: Traversing underneath Chippenham Parkway allows users to exit the park and access the Southampton and Stony Point neighborhoods. The northern most point of the trail is only 1 mile from the Huguenot Woods Flatwater trail head.

East: The east is blocked by Huguenot Road and Chippenham Parkway.

South: The main trail entrance is located behind Fire Station #25 on Huguenot Road just south of the Chippenham Parkway. Connectivity is blocked by the shared boundary with Chesterfield County.

West: The western edge of the Park borders the Huguenot neighborhood and the trails end at the Stony Point Shopping Center and the adjacent office buildings.
Lewis G. Larus Park

Trail Type: Local Trail
Trail Surface: Native Surface
Trail Use: Recreation
Mileage: 2
Powhite Park

Facilities:
Powhite Park has an established native surface trail system that is used for recreation and transportation purposes. The facilities offer a singletrack trail that is approximately 12”-24” in width. The park is bordered by a large floodplain and wetland along with two major highways and contains undulating hills that produces an impressive network of trails. However, the existing trail entrances and overgrown and heavily eroded.

Amenities:
Singletrack Native Surface Trails: 2 miles
Engineered Structures: 1
Americans with Disabilities Act (ADA) Accessible: No

Connectivity:
North: The Park is bordered by a large floodplain and wetland along with two major highways.

East: The Park borders private property but branches out to the intersection of German School Road and Janke Road. This creates the opportunity to improve German School Road with facilities to access the southern-most portion of the City of Richmond.

South: The Park is bordered by Janke Road and Chippenham Hospital

West: Connectivity to the west is blocked by Chippenham Parkway.
Powhite Park

**Trail Type:**
Local Trail

**Trail Surface:**
Native Surface

**Trail Use:**
Recreation, Transportation

**Mileage:**
3
Joseph Bryan Park

Facilities:
Joseph Bryan Park contains very little native surface trail. The vast majority of the trail network is comprised of roads that are closed by gates and allow users to traverse the outer boundaries of the park. The native surface singletrack trail is comprised of access pathways that lead to a small stream in the northeastern section of the Park.

Amenities:
Singletrack Native Surface Trails: .7 miles
Public Right-Of-Way (Gated for Pedestrians): 2.12 miles
Engineered Structures: 1
Americans with Disabilities Act (ADA) Accessible
Native Surface Trails – No
Gated Public Right-Of-Way - Yes

Connectivity:
North: The Park is bordered by the city boundary to the north.

East: The Park grants access to Hermitage Road using overpasses that traverse interstate highway I-95. These roads are open to automobiles.

South:
The Park is bordered by major interstates to the south. Access can be granted underneath the highways by using drainage culverts but seems to have too many obstructions such as private land and railroad rights of way. At this time the connectivity to the James River Park System seems infeasible.

West: The Park is bordered by Henrico County to the west.
Joseph Bryan Park

**Trail Type:**
Local Trail

**Trail Surface**
Native Surface & Public-Right-Of-Way

**Trail Use:**
Recreation & Transportation

**Mileage:**
2.8
Assets of the Existing Facilities

- The majority of the existing infrastructure is built on public land that is owned by the City of Richmond.
- Many of the existing facilities grant access to commercial areas for shopping.
- The existing facilities link neighborhoods.
- The trails utilize open spaces that contain floodplain while assisting to conserve resource protection areas.
- The existing singletrack is well maintained.
- The existing engineered structures are in moderate/fair condition.
- The facilities were crowded during winter days during site inspections.

Liabilities of the Existing Facilities

- Currently, there is not a central location or “hub” for the city trail facilities.
- Some of the facilities entrances and existing connectivity points are overgrown and eroded.
- Improved pathways have issues with drainage after a heavy rain.
- Some of the improved pathways do not comply with the Americans with Disabilities Act (ADA) requirements.
- Undeveloped public and open spaces throughout the city are often used as trash dumps.
- Bicycles are currently prohibited from being ridden and the Boulevard Bridge and the Canal Walk. This hinders connectivity and impedes the possibility of a complete interconnected network of trails.
- Currently, trails have abrupt endings and lack connectivity.
- Some existing trails have too many barriers to be connected to the James River Park System.
Gaps Identified

The James River Park System – Trail Connectivity Plan 2012

Gaps Identified

Trails & Pathways

Gap Identified

Existing Bicycle / Pedestrian Facility

Existing On-Road Facilities

1

NORTH

Miles

Drawn By: William Moffett
Date: 4/16/12

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GAP ANALYSIS

Now that the gaps have been identified, the process of researching how to close the gaps has been initiated. The gap analysis phase of the planning process identifies how others have attempted to plan for bicycle and pedestrian facilities throughout the City of Richmond. It will also show some of the methods of gaining access or preserving land for developing trail on privately owned land.

- Riparian Buffers
- Conservation Easements
- Recreation Easements
- Rails with Trails
- Precedent Plans
  - The City of Richmond Potential Greenways Map
  - James River Branch Trail Plan
  - Cannon Creek Greenway Plan
  - East Coast Greenway Through Richmond Plan
  - The Virginia Capital Trail Plan
  - Forest Hill Park Trail Redevelopment Plan (MOU)
  - Richmond Regional Bicycle and Pedestrian Plan
    - Bicycle Level of Service
    - Pedestrian Level of Service

Figure 22: Trail Work along Buttermilk Trail
Riparian Buffers

One of the first steps in developing new trail in the City of Richmond is to understand the environmental impact to the local rivers and streams. Due to the rapid growth of development in the early 20th century, the urban landscape took shape around the natural resources and tributaries of the James River including Reedy Creek, Shockoe Creek, Pocosham Creek, Cannon Creek, Powhite Creek, leaving a natural buffer of open space. Much of this land is located in low lying regions such as wetlands and floodplains and is typically the only areas left to build off-road trail.

An excellent example of a riparian buffer is the Reedy Creek Greenway. The creek runs south to north through the city and empties in the James River just beyond Forest Hill Park. The creek has stopped development due to environmental issues and the swath of land remains vacant from development. Currently, the creek remains void of trail development outside of Forest Hill Park but it is available for creating opportunities for future bicycle and pedestrian facilities.

Figure 23: Reedy Creek in Forest Hill Park
Conservation Easements

A conservations easement protects a tract of land or structure from being altered. On February 23, 2009 the City of Richmond approved ordinance (2009-10-30) that placed a conservation easement on the land generally known as the James River Park System to protect the park land from the future threat of development. An easement is a “legally-binding agreement between the property owner and trail builder where the property owner grants the right to build a trail and allow public access but still retains ownership of the land. The easement may have a time limitation or may be granted in perpetuity.”

(Recreation 2011)

Figure 24: James River Park System - Conservation Easement
Recreation Easements

A recreation easement is similar to a traditional easement but includes the Virginia Tort Law that dismisses the liability of the city and private land owners from legal liability and insurance issues. According to the Virginia Department of Conservation and Recreation, there are three categories of people who are concerned about liability issues, trail managers, private landowners who have granted access to their land for trails, and private landowners whose land abuts trail corridors or easements.” (Recreation 2011) In Virginia, there are laws to protect all three parties called the Virginia Tort Claims Act and the Recreational Use Statute.

Virginia Tort Claims Act:
The Virginia Tort Claims Act covers land owners and local and state governments who build a trail for public use. It also includes a concept called Duty of Care that describes the responsibility of the land owner or manager to identify or provide safety for a trail user. The law classifies users into four categories including trespasser, licensee, invitee, and child. The law states that the land owner or manager has less of a duty of care to a trespasser who entered the land illegally than to a child who uses the trail for recreation purposes.

Recreational Use Statute:
Whereas the Virginia Tort Claims Act is primarily designed to protect local and state Governments from liability, the Recreational Use Statute (RUS) is primarily provided for private land owners who open their land for recreational use by the public. In order for a private land-owner to take advantage of the RUS, they must provide access to their land for public recreational use and not charge the user a fee. The RUS also assists public entities who build recreational trail on private land for public use through the use of recreational easements. The only way the manager or land owner can be found at fault is in cases of gross negligence against the trail user.
Rails with Trails

The City of Richmond has a few barriers that keep the existing trail network from expanding. Although, railroad corridors create opportunities for trail development they are also typically built in riparian buffers and environmentally protected areas and compete for land with local parks and trails. In many cases, railroad corridors block access to the trails that lead to the river and hinder connectivity possibilities. To alleviate the issue of public access, pedestrian bridges have been constructed to safely traverse the railroad corridors and access the trails or the river.

These situations require the trail planner to research the most appropriate opportunity for the City of Richmond to either purchase the land, or achieve an easement inside of the rail corridor by working in cooperation with the Virginia Department of Conservation and Recreation and the railroad company. Although, these situations may become very tedious; the opportunity for developing trail along railroad corridors opens the land designated as public and open space throughout the city and land adjacent to the James River that would otherwise not be accessible to the citizens of the City of Richmond.
Existing Trail and Greenway Plans

The Potential Greenways of the City of Richmond

The potential greenways map was developed by the Trails Manager for the City of Richmond and the Richmond Regional Planning District Commission. It outlines the greenways that possess the ability to accommodate future bicycle and pedestrian infrastructure, such as trails and pathways. By definition, greenways and trails are very different. A greenway is a linear, natural area that usually follows a natural feature such as a lake, river, stream, ridge-line or a ravine. Sometimes, greenways exist along vacated man-made features such as canals, utility easements, and railroad right-of-ways. These vegetative buffers provide a wonderful public and open space for the city and are in need of being conserved for public use.

The map identifies the Virginia Capital Trail, Gillies Creek Greenway, Cannon Creek Greenway, Southside Rail Trail (aka the James River Branch Trail), Midtown Greenway, James River Park, Reedy Creek Greenway, Powhite Creek Greenway and the Pump house Greenway.
The James River Branch Rail – Trail Concept Plan

The proposal:
The James River Branch Rail – Trail Concept Plan identifies an important linkage in the overall trail network. The plan statements explain “The purpose of the James River Branch Rail-Trail is to preserve a linear open space corridor in Southside Richmond that provides a safe place for non-motorized trail activities, and promotes wellness and physical activity. The trail will connect to regional trails and greenways, and also provide local connections to employment sites, shopping areas, schools, and other key neighborhood facilities.” (Team and Co 2010)

Today:
Today, the James River Branch Rail – Trail remains a vacant, immobile corridor that has a potential to impact the region as a whole. If the trail is built as prescribed, it will empower the citizens of the City of Richmond to reclaim the corridor for transportation and recreational purposes.
The Cannon Creek Greenway Plan

The Proposal:
The Cannon Creek Greenway Plan was written by Katherine Wright as a studio assignment for the completion of the Master of Urban and Regional Planning program at Virginia Commonwealth University. The plan outlines a potential trail in place of a natural spillway located approximately 2 miles north of the James River and is located just to the north of Shockoe Valley along Richmond Henrico Turnpike. The greenway was created from an easement that protects a creek that runs below the surface of the ground. Wright explains her perspective from a visual inspection “the creek runs through an underground manmade culvert to its confluence with the James River and no part of the creek is visible above ground” (The Cannon Creek Greenway Plan n.d.)

Today:
Today, only .6 miles of the Cannon Creek Greenway trail is constructed. The trail is made of asphalt and crosses Richmond – Henrico Turnpike in several locations with appropriate signage and markings. At the moment, the trail has two end-points; Dove Street to the north and Valley Road to the south that is home to an existing industrial park. The connection to the south ending in the James River Park is possible along Oliver Hill Way.
East Coast Greenway through Richmond Plan

The Proposal:
The East Coast Greenway through Richmond Plan was written by Matthew Weaver as a Studio II assignment for the completion of the Master of Urban and Regional Planning program at Virginia Commonwealth University. The plan identifies a route through the City of Richmond using on and off-road alternatives. The plan identifies three areas for proposed trail locations including the Cannon Creek Greenway, Reedy Creek, and Pocosham Greenway. Weaver created a map that identified the potential trail routes “utilizing floodplains, abandoned rail lines, city owned property and on-road segments to create eleven potential greenways “ (Weaver 2010).

Today:
Today, visitors to the City of Richmond who utilize the east coast greenway for transportation or recreational purposes will use public roads to travel through the city.
The Virginia Capital Trail Plan

The Proposal:
The Virginia Capital Trail is a 55 mile paved shared-use pedestrian and bicycle trail that connects Williamsburg to the City of Richmond. The trail is intended to “travel through portions of Henrico, Charles City, and James City counties along the way as it connects the previous capitals of Jamestown (1607-1699) and Williamsburg (1699-1780) to its current capital of Richmond (1780-present)” (Virginia Capital Trail 2012).

Today:
Today, the Virginia Capital Trail has been completed in sections. The completed sections include the Colonial Parkway, Greensprings, Chickahominy Riverfront and Charles City Courthouse phases. The Richmond Riverfront section is partially complete and identifies .6 miles of paved use trail along the north bank of the James River.
Forest Hill Park Trail Redevelopment Plan – Memorandum of Understanding (MOU)

The Proposal:
The Forest Hill Park trail redevelopment plan was created in 2010 by Nathan Burrell the City of Richmond Trails Boss with the Department of Parks, Recreation and Community Facilities. This memorandum of understanding functions as a basic understanding between stakeholder groups, and gains overall support for the project. The plan outlines the need for the new trail and concurrently supports the reclamation of the old trail.

Today:
Today, Forest Hill Park is a vibrant open space for outdoor recreation. The singletrack and shared use path network are heavily used. During site visits, many bicyclists and hikers were observed using the singletrack trail.

Map Source: www.richmond-more.org
Richmond Regional Bicycle and Pedestrian Plan

The Proposal:
The Virginia Department of Transportation has identified the bicycle level of service (BLOS) for on road routes throughout the City of Richmond. The plan illustrates a ranking order of on-road bicycling conditions on existing roadways. The Richmond Regional Bicycle and Pedestrian plan explains the method of using “statistical regression, the model reflects the effect on bicycling suitability or “compatibility” due to factors such as roadway width, bike lane widths, striping combinations, traffic volume, pavement surface conditions, motor vehicle speed and type and on-street parking” (Transportation 2004).
The ranking of roadway environments was calculated using a scale from A to F. An A level of service is the best rating a roadway can achieve while an F is the worst level of service for bicycles.

Figure 28: Bicycle Level of Service
Richmond Regional Bicycle and Pedestrian Plan

The Proposal:
Similar to the Bicycle level of service, the Virginia Department of Transportation has also identified the pedestrian level of service of the existing roadway corridors. The pedestrian level of service is used as an inspection process to evaluate the existing roadway conditions for pedestrian use. The model “reflects the effect on walking suitability or “compatibility” due to factors such as roadway width, presence of sidewalks and intervening buffers, barriers within those buffers (i.e. landscaping), traffic volume, motor vehicles speed, and on-street parking” (Transportation 2004).
THE PLAN

This phase of the planning process outlines the plan of development. The plan was developed from the previous research, analysis and understanding of the precedent methodology, the existing trails and the gap analysis. The information gathered through the previous sections contributed to the design of the following official trail routes for the City of Richmond.

The Vision

By 2017, our world class trails will connect the citizens of the City of Richmond to the outdoors. Our trails will provide gateways to environmental, recreational and economic resources in the heart of the city. They should link communities to their Parks and extend from the central business district to the neighborhoods throughout the city. The City of Richmond will lead by example by connecting its world class trail network and reinforce its identity as a city with an outdoor culture.

The Goals

- Create Official Off-Road Routes throughout the City of Richmond
- Link all existing trails to the James River Park System
- Identify what the proposed trail route, type, surface, estimated distance
- Recognize what each trail connects or accesses
- Identify the responsible party and time frame for completion
**Route # 1 - The Stony Point Route**

The Stony Point route is located on the south side of the James River and is approximately 8 miles in length. The route begins in the James River Park System at Belle Isle and traverses the James River using the south side pedestrian bridge. It passes immediately through the Woodland Heights, Forest Hill, Westover Hills, Westover Hills West, Willow Oaks, Stratford Hills, Southampton, Stony Point and Huguenot neighborhoods, and ends at Lewis G. Larus Park. Another major destination is Stony Point Fashion Park.

**Total planned Length:** 8 miles  
**Number of Gaps to close:** 2 Short Term / 1 Long Term  
**Route Type:** Bicycle and Pedestrian facilities in the public right-of-way and the use of recreational easements  
**Route Surface:** Asphalt and Native Surface Trail

**Short Term Goals (.5 – 2 years):**  
**ST 1.1 – Buttermilk West Trail to the Wetlands**  
This on road connector already exists and is marked with the Route 1 bicycle route signage.  
**ST 1.2 – Huguenot Woods –Flatwater to Lewis G. Larus**  
This on road connector is comprised of three roads identified as Southampton Road, Cherokee Road and Oakleaf Rd. This connector is approximately 1 mile in length and should be marked appropriately for bicycle and pedestrian use by the City of Richmond.

**Long Term Goals (2 – 5 years)**  
**LT 1.1 – Buttermilk West Trail through Willow Oaks Country Club**  
The connector only needs 10’ of recreational easement for trail users to connect the two parks along the southern bank of the James River. The City of Richmond should work with the Willow Oaks Country Club to find an appropriate route.
Route # 2 – The East Coast Greenway

The East Coast Greenway trail is outlined as described in the previous Studio II project by Katherine Wright and Matthew Weaver identified in the existing plans section of the plan. To the north, the proposed route begins at the East Brooklyn Park Boulevard and follows the Cannon Creek Greenway to Belle Isle and the James River Park System. After traversing the James River, the pathway routes through Forest Hill Park and follows the proposed Reedy Creek Greenway Trail. To exit the City of Richmond to the south, the proposed Pocosham Creek Greenway trail must be constructed. The pathway connects the neighborhoods in north Richmond to the Central Business District and Canal Walk. From the James River Park, the route connects with many of the neighborhoods in south Richmond and shopping opportunities. The route should a continuous surface modeled after Phase 1 of the Cannon Creek Greenway Shared-Use Pathway.

Total planned Length: 13 Miles

Number of Gaps to close: 2 Short Term / 3 Long Term

Route Type: Bicycle and Pedestrian facilities in the public right-of-way, riparian buffers and recreational easements

Route Surface: Asphalt On-Road Connector and Shared-Use Pathways

Short Term Goals (.5 – 2 years):

ST 2.1 – Cannon Creek Greenway Trail to the Canal Walk
This on-road connector should be outfit Valley Road and Oliver Hill Way with bicycle and pedestrian facilities. Sidewalks already exist, but bicycle lanes or sharrows should be introduced.

ST 2.2 – German School Road / Whitehead Road Connector
German School Road is used as an excellent connector for the proposed Reedy Creek and Pocosham Greenway. The route should be marked with bicycle and pedestrian facilities by the City of Richmond. Sidewalks already exist along the route, but bicycle lanes or sharrows should be introduced.

Long Term Goals (2 – 5 years)

LT 2.1 – Cannon Creek Greenway Trail to the Canal Walk
The proposed route follows the railroad right of way under interstate I-95 and ends at the Canal Walk.

LT2.2 – Reedy Creek Greenway to German School Road/Whitehead Road Connector
The proposed route begins at the southern end of Forest Hill Park traveling underneath Forest Hill Avenue.

LT2.3 – Pocosham Creek Greenway The proposed route follows the alignment proposed in Weaver’s East Coast Greenway plan and the Proposed Greenways for the City of Richmond noted in the gap analysis. The plan proposes a shared use pathway.
Route # 3 – Powhite Creek Greenway Trail

The Powhite Creek Greenway route is on the south side of the James River and is approximately 2.5 miles in length. The route begins at the end of the James River Park System where Buttermilk Trail ends on Riverside Drive. The trail continues along the southern bank of the James River and passes underneath the Powhite Parkway (James River Bridge) and heads south along western property line of the Willow Oaks Country Club. The property is owned by the Richmond Metropolitan Authority along Powhite Creek, and 10’ will be needed for a native surface (singletrack) trail. The trail continues on the north side of the Powhite Parkway and underneath Forest Hill Avenue using the existing drainage culverts. Engineered structures like wooden or steel bridges may be needed to cross the Powhite Creek in some places. The trail finally traverses underneath the Powhite Parkway in order to avoid property in the Gravel Hill subdivision. The trail ends at the Powhite Park singletrack.

Total planned Length: 2.5 miles
Number of Gaps to close: 1 Short Term
Route Type: Riparian Buffers and Recreational Easements on Richmond Metropolitan Authority owned property
Route Surface: Native Surface Trail

Short Term Goals (.5 – 2 years):
ST 3.1 – Buttermilk West Trail to Powhite Park
The proposed route follows Powhite Creek and will utilize native surface (singletrack) construction techniques.
Route # 4 – The James River Branch Trail and Bellemeade Connector

Based on the research conducted by the Southside Richmond Rail – Trail Project Team and the James River Branch Rail – Trail Citizens Advisory Committee, the proposed trail reclaims a vacant railroad right-of-way that has been abandoned by the railroad. At the western end of the James River Branch Trail is the Bellemeade Connector Trail. This proposal extends the James River Branch Trail back to the James River Park System by way of Ancarrow’s Landing. The route was produced to extend to Bellemeade Elementary School and Bellemeade Community Center and follows a stream through private property to the James River. The entire route connects city residents to “employment sites, shopping areas, schools, and other key neighborhood facilities” (James River Branch Rail-Trail Concept Plan 2010).

**Total planned Length:** Approximately 6 miles

**Number of Gaps to close:** 1 Short Term / 2 Long Term

**Route Type:** Riparian Buffers and Acquisition of abandoned Railroad Right-of-Way

**Route Surface:** Shared-Use Pathway

**Short Term Goals (.5 – 2 years):**

**ST 4.1 – James River Branch Trail to Powhite Park**

The proposed route follows the Reedy Creek Greenway trail to German School Road. German School Road ends at Janke Road and is less than 100 yards from the Powhite Park public entrance.

**Long Term Goals (2 – 5 years)**

**LT 4.1 – Reedy Creek Greenway to Belleview Connector**

The proposed route follows the abandoned railroad right-of-way until it ends at Jefferson Davis Highway. The trail will connect to employment, shopping, schools, and other vital community resources.

**LT 4.2 – The James River Branch Trail to Ancarrow’s Landing**

The proposed route extends the proposed shared-use path from the James River Branch Trail and ends at Ancarrow’s Landing. The trail follows a stream that leads to the James River.
Who Builds the Trails?

The Richmond Chapter of the Mid Atlantic Off Road Enthusiasts are a grass-roots volunteer trail building workforce organization that assists the City of Richmond with construction and maintenance of the native surface trails such as singletrack and double track trails, along with engineered structures that allow users to traverse creeks, streams and ravines that would otherwise prohibit a trail. The City of Richmond has also called upon trail contractors and the Army Corps of Engineers to build the more complex trails such as shared-use pathways and bicycle and pedestrian facilities in the public right-of-way, such as bicycle lanes and sharrows.

Source: (Virginia Greenways and Trails “Toolbox” 2011)
Trails Management Strategy

The proposed trail system in the City of Richmond is vast and far reaching. It spans to the outer reaches of the city limits and will be heavily used for daily recreation and transportation uses. This means the trails must remain open for residents to use. The Virginia Department of Conservation and Recreation received survey information from existing localities with a trail system like the one proposed in this document. The most prominent daily trail maintenance activities include patrols by the local police and non-police agencies, followed by trash and natural debris cleanup. The plan recommends that hands down, “as needed” is the most common frequency for all maintenance tasks except for trash and toilets (Virginia Greenways and Trails “Toolbox” 2011).

Lastly, the trails should be open for legitimate users after dark. There are a variety of legitimate purposes and having these users in the park after dusk helps the land manager control the misconduct of illegal users by simply having eyes on the trails. The following list identifies recreation and transportation uses that are considered legitimate:

- Bicycling
- Observing Nature
- Fishing
- Hiking
- Jogging / Running
- Commuting

**TOOLBOX TIP:**
Common Management Activities Include:
- Supervising Staff and Volunteers
- Raising Operational Funds
- Administering the Operating Budget
- Managing User Conflicts
- Defining and Implementing Policies
- Conducting Public Relations Activities
- Planning Future Work
Conclusion

The panel encourages the City of Richmond to adopt this plan and utilize it in their upcoming bicycle, pedestrian and trail projects. In order to implement an interconnected network of trails and greenways, it is necessary to have the support and commitment of the local public agencies and private organizations that are willing to collaborate for the benefit of the Richmond region as a whole. Also, the regional network of trails may not become a reality without public support. This document was created to pull together all of the data that exists and give a model for future planning initiatives. Now, each corridor must go to the public for their opinion. After all, the trails are to be used by the citizens, and they must have a hand in the decision making process. As a follow up, each route should be studied independently and taken to the public for participation.

The ultimate goal of this plan is to see it come to fruition. The trail network will wind through the city and allow the citizens to access everything from the central business district, restaurants, schools, workplaces, historical or cultural areas, to the open spaces surrounding James River, and then take them back home after experiencing the wonderful outdoors.
Appendix
James River Park System: Trail Connectivity Plan
Trail Inspection Checklist for Nomination of Designated Off-Road Route

Name: B. Moffett
Phone: 
Email: 

Inspector’s Report:
Trail name:
Date(s) of Inspection:

1. What is trail surface material(s) & estimated percentage of each (for completed phases of this trail only):

<table>
<thead>
<tr>
<th>Trail Surface</th>
<th>Asphalt</th>
<th>Concrete</th>
<th>Stone Dust</th>
<th>Crushed Gravel</th>
<th>Packed Dirt</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td></td>
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<td></td>
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<tr>
<td>Percentage</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Condition*</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
<td></td>
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</tr>
</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

2. *Width of trail 12”-18” inches wide or 10’-15’ feet wide

* (Please see question 5 for any qualifying conditions)

Nomination Qualifications:
3. Are there any street, business, or residential crossings that present a hazard?
   *Yes (No)
   * If yes please locate each on map.

4. Are there any issues with this trail (including at its access points) that would hinder access? (e.g., grade or steps, lack of curb cuts, trail surface problems, other impediments)?
   *Yes (No)
   * If yes please describe and locate on map.

5. Please indicate if you encountered any of the following issues with the trail during the inspection:
   - Inadequate trail width for users
   - Design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc)
   - Surface problems (e.g., protruding tree roots, cracked pavement, too soft, etc.)
   - Maintenance problems (e.g., encroaching vegetation, litter/ broken glass, etc.)
   - Other similar substantial or hazardous conditions?
   Please list: [Space for notes]

6. Please provide details about any issues indicated above and locate affected trail areas on map:

7. Engineered Structures Inspection:

<table>
<thead>
<tr>
<th>Engineered Structures:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials: Wood, Concrete, Metal, Other:</td>
</tr>
<tr>
<td>Bridge: Yes</td>
</tr>
<tr>
<td>Ramp: Yes</td>
</tr>
</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

8. Is there a connectivity option to another existing trail or park? [Yes] [No]
   * If yes, please show the area with high potential for connectivity to another trail or park on a map.

9. In your opinion, how easy could the potential connection trail be constructed? Is there:
   a. A potential greenway along a river, stream or creek or other environmental area?
      ○ List the name: [Name]
   b. A potential thoroughfare or road to make the connection?
      ○ List the name: [Name]
   c. A utility easement that may be used to make the connection?
      ○ What type: [Type]
      ○ List the name: [Name]
   d. A railroad right-of-way?
      ○ List the name: [Name]
   e. A piece or multiple parcels of private property?
      ○ List the GPRN# [Number]

Report Summary:
If the potential segment recommended for permanent off-road route designation:
[Yes] [No]

*If Segment not recommended for off-road route designation explain why below:
The James River Park System – Trail Connectivity Plan 2012

James River Park System: Trail Connectivity Plan
Trail Inspection Checklist for Nomination of Designated Off-Road Route

Name: B. McFerr
Phone: Email:

Inspector’s Report:

Trail name: Cannon Creek Greenway Trail
Date(s) of Inspection: 2/25/12

1. What is trail surface material(s) & estimated percentage of each (for completed phases of this trail only):

<table>
<thead>
<tr>
<th>Trail Surface</th>
<th>Asphalt</th>
<th>Concrete</th>
<th>Stone Dust</th>
<th>Crushed Gravel</th>
<th>Packed Dirt</th>
<th>Other</th>
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<tr>
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<tr>
<td>Percentage</td>
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<td></td>
</tr>
<tr>
<td>Condition*</td>
<td>Good</td>
<td>Good</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

2. *Width of trail: 60 inches wide or 8 feet wide

3. * (Please see question 5 for any qualifying conditions)

Nomination Qualifications:

3. Are there any street, business, or residential crossings that present a hazard?
   *Yes No

* If yes, please locate each on map.

4. Are there any issues with this trail (including at its access points) that would hinder access (e.g., grade, steps, lack of curb cuts, trail surface problems, other impediments)?
   *Yes No

* If yes please describe and locate on map:

5. Please indicate if you encountered any of the following issues with the trail during the inspection:
   - Inadequate trail width for users
   - Design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc.)
   - Surface problems (e.g., protruding tree roots, cracked pavement, too soft, etc.)
   - Maintenance problems (e.g., encroaching vegetation, litter/broken glass, etc.)
   - Other similar substandard or hazardous conditions?

   Please list:

6. Please provide details about any issues indicated above and locate affected trail areas on map:

7. Engineered Structures Inspection:

   | Materials: Wood Concrete Metal Other |
   |-----------------------------|-----------------|-----------------|-----------------|
   | Bridge                     | Ramp            |                 |                 |

   Please rate “Condition” as: good, fair, or poor

8. Is there a connectivity option to another existing trail or park? *Yes No
   *If yes, please show the area with high potential for connectivity to another trail or park on a map.

9. In your opinion, how easy could the potential connection trail be constructed? Is there:
   a. A potential greenway along a river, stream or creek or other environmental area?
   b. A potential thoroughfare or road to make the connection?
   c. A utility easement that may be used to make the connection?
   d. A railroad right-of-way?
   e. A piece or multiple parcels of private property?

   *List the GPIN/DR

Report Summary:

A potential segment recommended for permanent off-road route designation:
*Yes No Too nice to leave disconnected

Connectivity to neighbor:

*If Segment not recommended for off-road route designation, explain why below:
James River Park System: Trail Connectivity Plan
Trail Inspection Checklist for Nomination of Designated Off-Road Route

Name: B. White
Phone:  
Email:  

Inspector's Report:
Trail name: Flood Wall Walk

Date(s) of Inspection: 2/25/12

1. What is trail surface material(s) & estimated percentage of each (for completed phases of this trail only):

<table>
<thead>
<tr>
<th>Trail Surface</th>
<th>Asphalt</th>
<th>Concrete</th>
<th>Stone Dust</th>
<th>Crushed Gravel</th>
<th>Packed Dirt</th>
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<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>Condition</td>
<td>Good</td>
<td>Good</td>
<td>Good</td>
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</tbody>
</table>

*Please rate "Condition" as: good, fair, or poor

2. *Width of trail: 120" inches wide or 10' feet wide

* (Please see question 5 for any qualifying conditions)

Nomination Qualifications:
3. Are there any street, business, or residential crossings that present a hazard? (Yes) No
* If yes please locate each on map.

4. Are there any issues with this trail (including at its access points) that would hinder access (e.g., grades, steps, lack of curb cuts, trail surface problems, other impediments)? (Yes) No
* If yes please describe and locate on map.

5. Please indicate if you encountered any of the following issues with the trail during the inspection:
   - Inadequate trail width for users
   - Design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc)
   - Surface problems (e.g., protruding tree roots, cracked pavement, too soft, etc)
   - Maintenance problems (e.g., overgrowth vegetation, litter/broken glass, etc)
   - Other similar substandard or hazardous conditions? Please list:

6. Please provide details about any issues indicated above and locate affected trail areas on map:

7. Engineered Structures Inspection:

Engineered Structures:

<table>
<thead>
<tr>
<th>Materials</th>
<th>Wood</th>
<th>Concrete</th>
<th>Metal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ramp</td>
<td></td>
<td></td>
<td>✔️</td>
<td></td>
</tr>
</tbody>
</table>

*Please rate "Condition" as: good, fair, or poor

8. Is there a connectivity option to another existing trail or park? (Yes) No
* If yes, please show the area with high potential for connectivity to another trail or park on a map: Flood Wall Walk, JPD'S West.

9. In your opinion, how easy could the potential connection trail be constructed? Is there:
   a. A potential greenway along a river, stream or creek or other environmental area? (Yes) No
   o List the name:  
   b. A potential thoroughfare or road to make the connection?
      o List the name:  
   c. A utility easement that may be used to make the connection?
      o What type:  
   d. A railroad right-of-way?
      o List the name:  
   e. A piece or multiple parcels of private property?
      o List the GPIN#  

Report Summary:
Is the potential segment recommended for permanent off-road route designation? (Yes) No

*If segment not recommended for off-road route designation explain why below:
James River Park System: Trail Connectivity Plan

Trail Inspection Checklist for Nomination of Designated Off-Road Route

Name: B. Mullet

Inspector's Report:

Trail name:  
Date(s) of Inspection: 2/18/12

1. What is trail surface material & estimated percentage of each for completed phases of this trail only:

Trail Surface: Asphalt Concrete Stone Dust Crushed Gravel Packed Dirt Other:  
Surface Percentage Condition*  
*Please rate "Condition" as: good, fair, or poor

2. Width of trail: 12'6" wide or 8'8" feet wide
   * (Please see question 5 for any qualifying conditions)

Nomination Qualifications:

3. Are there any street, business, or residential crossings that present a hazard? Yes No  
   * If yes please locate each on map.

4. Are there any issues with this trail (including at access points) that would hinder access (e.g., grade steps, lack of curb cuts, trail surface problems, other impediments)? Yes No  
   * If yes please describe and locate on map.

5. Please indicate if you encountered any of the following issues with the trail during the inspection:
   - Inadequate trail width for users
   - Design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc.)
   - Surface problems (e.g., protruding tree roots, cracked pavement, etc.)
   - Maintenance problems (e.g., encroaching vegetation, litter, broken glass, etc.)
   - Other similar substandard or hazardous conditions?
   
   Please list: Wet Other Rain

6. Please provide details about any issues indicated above and locate affected trail areas on map.

7. Engineered Structures Inspection:

   Engineered Structures:  
   Materials: Bridge Ramp  
   Wood Concrete Metal Other: X  
   * Please rate "Condition" as: good, fair, or poor

8. Is there a connectivity option to another existing trail or park? Yes No  
   * If yes, please show the area with high potential for connectivity in another trail or park on a map (Connectivity to Lewis G. Louis, James River Park)

9. In your opinion, how easy could the potential connection trail be constructed? Is there:
   a. A potential greenway along a river, stream or creek or other environmental area? List the name: No
   b. A potential thoroughfare or road to make the connection? List the name: Plaisance to Forest Hill Ave.
   c. A utility easement that may be used to make the connection? List what type: No
   d. A railroad right-of-way? Yes No
   e. A piece or multiple parcels of private property? List the property name: REA property adjacent to Park Dr. Why?

Report Summary:

The potential segment recommended for permanent off-road route designation: Yes No  
*If Segment not recommended for off-road route designation explain why below:
### James River Park System: Trail Connectivity Plan

**Trail Inspection Checklist for Nomination of Designated Off-Road Route**

**Name:** B. McAlister  
**Phone:**  
**Email:**

**Inspector’s Report:**

**Trail name:** Jane Rice Park  
**Date(s) of Inspection:** 2/18/12

1. What is trail surface material(s) & estimated percentage of each [for completed phases of this trail only]:

<table>
<thead>
<tr>
<th>Trail Surface</th>
<th>Asphalt</th>
<th>Concrete</th>
<th>Stone Dust</th>
<th>Crushed Gravel</th>
<th>Packed Dirt</th>
<th>Other:</th>
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<tr>
<td>Surface</td>
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<td>5%</td>
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<td>Condition*</td>
<td>✔️</td>
<td>✔️</td>
<td>✔️</td>
<td></td>
<td></td>
<td>✔️</td>
</tr>
</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

2. *Width of trail: ✔️* 24 inches wide or *no* wider

* (Please see question 5 for any qualifying conditions)

**Nomination Qualifications:**

3. Are there any street, business, or residential crossings that present a hazard?  
   - Yes ☑️  
   - No ☐

* If yes please locate each on map.

4. Are there any issues with this trail (including at its access points) that would hinder access?  
   - Yes ☑️  
   - No ☐

* If yes please describe and locate on map.

5. Please indicate if you encountered any of the following issues with the trail during the inspection:
   - Inadequate trail width for users
   - Design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc)
   - Surface problems (e.g., protruding tree roots, cracked pavement, too soft, etc)
   - Maintenance problems (e.g., erosion, vegetation, litter/broken glass, etc)
   - Other similar substandard or hazardous conditions?
   - Please list: ✔️ None - Good Shape

6. Please provide details about any issues indicated above and locate affected trail areas on map:

7. **Engineered Structures Inspection:**

<table>
<thead>
<tr>
<th>Materials:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bridge</td>
</tr>
<tr>
<td>✔️</td>
</tr>
<tr>
<td>Ramp</td>
</tr>
</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

8. Is there a connectivity option to another existing trail or park?  
   - Yes ☑️  
   - No ☐

* If yes, please show the area with high potential for connectivity to another trail or park on a map.

9. In your opinion, how easy could the potential connection trail be constructed? If there:
   a. A potential greenway along a river, stream or creek or other environmental area?
      - List the name:  
   b. A potential thoroughfare or road to make the connection?
      - List the name:  
   c. A utility easement that may be used to make the connection?
      - What type:  
   d. A railroad right-of-way?
      - List the name:  
   e. A piece or multiple parcels of private property?
      - List the GRN#:  

**Report Summary:**

As the potential segment recommended for permanent off-road route designation:  
Yes ☑️  
No ☐

* If Segment not recommended for off-road route designation explain why below:
James River Park System: Trail Connectivity Plan
Trail Inspection Checklist for Nomination of Designated Off-Road Route

Name:
Phone:
Email:

Inspector’s Report:

Trail name: Lewis 6. Lewis Park Trails
Date(s) of Inspection: 2/18/12

1. What is trail surface material(s) & estimated percentage of each (for completed phases of this trail only):

<table>
<thead>
<tr>
<th>Trail Surface</th>
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<th>Concrete</th>
<th>Stone Dust</th>
<th>Crushed Gravel</th>
<th>Packed Dirt</th>
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<td>Percentage</td>
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<tr>
<td>Condition*</td>
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</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

2. *Width of trail: 7'-9" inches wide or 2.3' feet wide

* (Please see question 5 for any qualifying conditions)

Nomination Qualifications:
3. Are there adjacent, business, or residential crossings that present a hazard? Yes No

* If yes please locate each on map.

4. Are there any issues with this trail (including at its access points) that would hinder access? (e.g., grade or steps, lack of curb cuts, trail surface problems, other impediments)? Yes No

*If yes please describe and locate on map:

5. Please indicate if you encountered any of the following issues with the trail during the inspection:
   - Inadequate trail width for users
   - Design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc.)
   - Surface problems (e.g., protruding tree roots, cracked pavement, too soft, etc.)
   - Maintenance problems (e.g., encroaching vegetation, litter/broken glass, etc.)
   - Other similar substandard or hazardous conditions?
     Please list: Live down trees.

6. Please provide details about any issues indicated above and locate affected trail areas on map:

7. Engineered Structures Inspection:

<table>
<thead>
<tr>
<th>Engineered Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Materials:</td>
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<td>---------------------</td>
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<td>Underpass</td>
</tr>
</tbody>
</table>

* Please rate “Condition” as: good, fair, or poor

8. Is there a connectivity option to another existing trail or park? Yes No
   * If yes, please show the area with high potential for connectivity to another trail or park on a map.

9. In your opinion, how could the potential connection trail be constructed? Is there:
   a. A potential greenway along a river, stream or creek or other environmental area?
      o List the name: Underpass Creek or St.
   b. A potential thoroughfare or road to make the connection?
      o List the name: Cherokee Rd
   c. A utility easement that may be used to make the connection?
      o What type: underground utility, easement or right-of-way?
      o List the name:
   d. A railroad right-of-way?
      o List the name:
   e. A piece or multiple parcels of private property?
      o List the CPIN#?

Report Summary:

The potential segment recommended for permanent off-road route designation: Yes No

*Great connectivity value!

*If Segment not recommended for off-road route designation explain why below:
The James River Park System – Trail Connectivity Plan

James River Park System: Trail Connectivity Plan
Trail Inspection Checklist for Nomination of Designated Off-Road Route

Name: B. McNeil
Phone: 
Email: 

Inspector’s Report:

Trail name: Forest Hill Park Trails

Date(s) of Inspection:

1. What is trail surface material(s) & estimated percentage of each (for completed phases of this trail only):

<table>
<thead>
<tr>
<th>Trail Surface</th>
<th>Asphalt</th>
<th>Concrete</th>
<th>Soil</th>
<th>Dust</th>
<th>Crushed Gravel</th>
<th>Packed Dirt</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percentage</td>
<td>85%</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

2. *Width of trail: 150” inches wide or 13’ feet wide.*

* (Please see question 5 for any qualifying conditions)

Nominating Qualifications:

3. Are there any street, business, or residential crossings that present a hazard? 
   Yes: _Riverside Drive_ - ADA access
   * If yes please locate each on map.

4. Are there any issues with this trail (including at its access points) that would hinder access (e.g., grade or steps, lack of curb cuts, trail surface problems, other impediments)?
   No: _Steep grade, no curb cuts, trail surfaces._
   *If yes please describe and locate on map.

5. Please indicate if you encountered any of the following issues with the trail during the inspection:
   - Inadequate trail width for users - No
   - Design issues (e.g., dangerous turns, excessively steep grades, poor drainage, etc)
   - Surface problems (e.g., protruding tree roots, cracked pavement, too soft, etc.)
   - Maintenance problems (e.g., encroaching vegetation, litter, broken glass, etc.)
   - Other similar substandard or hazardous conditions?
   * Please list: No curb cuts for ADA access

6. Please provide details about any issues indicated above and locate affected trail areas on map:

7. Engineered Structures Inspection:

<table>
<thead>
<tr>
<th>Bridge Type</th>
<th>Materials</th>
<th>Wood</th>
<th>Concrete</th>
<th>Metal</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bridge</td>
<td>Yes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Please rate “Condition” as: good, fair, or poor

8. Is there a connectivity option to another existing trail or park? *Yes/No

* If yes, please show the area with high potential for connectivity to another trail or park on a map:

9. In your opinion, how easy could the potential connection trail be constructed? Is there:
   a. A potential greenway along a river, stream, or creek or other environmental area?
      - List the name: _Reedy Creek Greenway, Riverside to Steps_
   b. A potential thoroughfare or road to make the connection?
      - List the name: _Riverside to Steps_
   c. A utility easement that may be used to make the connection?
      - Type: _No_
   d. A railroad right-of-way?
      - List the name: _No_
   e. A piece or multiple parcels of private property?
      - List the GIPN: _No_

Report Summary:

If the potential segment recommended for permanent off-road route designation:

*Yes/No* _Riverside to Steps Greenway, Reedy Creek Greenway_.

*If Segment not recommended for off-road route designation explain why below:
Figure 31: Potential Greenways of the City of Richmond
Figure 32: International Mountain Bicycle Association - Soil Test

<table>
<thead>
<tr>
<th>No Ball</th>
<th>Ball</th>
<th>Ribbon</th>
</tr>
</thead>
</table>
| If it is not possible to make a ball or it crumbles easily it will drain will, but will probably not support steeper grades. | Soil has low cohesion but best drainage  
Reduce average grades by 3%  
Reduce maximum running grades by 5%  
Side slopes should be at least 10% in grade to maintain drainage | Soil that can be formed into a 1" to 2" long ribbon with thumb and forefinger has an even higher clay content and will support steeper grades with higher shear forces, but doesn't drain well or support wet weather use as well. |
|                                                                                                 | Good cohesion and good drainage  
Average grades can be up to 7% and running grades can be up to 15%  
Side slopes should be at least 20% or greater in grade to maintain drainage | Excellent cohesion but poor drainage  
Increase average grades by 3% and maximum running grades by 5%  
Armor low spots and enhance drainage features |

**IMBA's Quick Soil Test**

Grab a handful of soil from your proposed trail route and try to make it into a ball. Refer to the guidance above for how the soil does or does not form a ball.
Figure 33: Trail Type Decision Tool

<table>
<thead>
<tr>
<th>TRAIL TYPE</th>
<th>Walking</th>
<th>Mountain Bike</th>
<th>Single-Skin Uphill</th>
<th>Wake/Water</th>
<th>Snowmobile / Alpine</th>
<th>Snowshoe / Fatbike</th>
<th>Bike Line</th>
<th>Hiking Trail</th>
<th>Bushland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trail Factors</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cost To Construct</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Construction Intensity</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Potential to Harm Environment</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Potential for Agency Reviews</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>Potential for Shared-Use Activity</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>Moderate</td>
</tr>
<tr>
<td>Potential Intended Users</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walkers and Joggers</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Backcountry Hikers &amp; Trail Runners</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mountain Bikes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Road/Path Bicyclists</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Espresso</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>Snowmobilers</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<tr>
<td>Off Highway Vehicles</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Kayakers and Canoers</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cross-country Skiers</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

1. Based on level of intrusion upon existing site and amount of construction required.
2. Based on potential for users to leave designated trails.
3. Based on potential need for site planning, VDOT, ESD, and other formal reviews.
4. Based on potential for physical characteristics of trail to support multiple users regardless of conflicts.
5. Based on the primary type of intended trail user for each trail category; does not account for shared uses.
**Figure 34: Trail Surface Decision Tool**

<table>
<thead>
<tr>
<th>TRAIL SURFACES</th>
<th>Pavement</th>
<th>Grill and Soil</th>
<th>Crushed Stone</th>
<th>Gravel Slurry</th>
<th>Wood Chips</th>
<th>Shredded Tire Rubber</th>
<th>Blacktop</th>
<th>Natural Tap Surf</th>
<th>Mason Gravel</th>
<th>Wood Chip</th>
<th>Gravel and Wood Chip Bond</th>
</tr>
</thead>
<tbody>
<tr>
<td>DIRT SURFACE</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NAIL SURFACE</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>METAL SURFACE</td>
<td>High</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>CONCRETE</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>ASPHALT</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>GRAVEL</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>

**trail factors**

1. Based on level of disturbance to surrounding areas required to install materials
2. Based on maintenance costs relative to other trail surfaces
3. Based on ease of acquiring and importing materials to site from local or regional sources
4. Based on the primary type of intended trail user for each trail category.
Works Cited


