GILLIES CREEK
GREEN INFRASTRUCTURE PLAN
A plan to connect people, water and communities

Richmond, VA
May 2018
Acknowledgments

The project team, led by Skeo Solutions with support from the James River Association and Ecosystem Services Inc., acknowledges the contributions of all those who contributed to this planning effort.

A cross-departmental city work group convened over the course of the project to inform the process and provide an integrated framework for collaboration across departments.

City Work Group
- City of Richmond Department of Public Utilities (DPU)
- City of Richmond Department of Public Works (DPW)
- City of Richmond Parks, Recreation and Community Facilities
- City of Richmond Parks, Recreation and Community Facilities, James River Park System
- City of Richmond Planning and Development Review
- City of Richmond Economic and Community Development

Community Partners
The following community organizations participated in the project and provided input to inform the strategies outlined in this report.

- James River Association
- Groundwork RVA
- Richmond Redevelopment and Housing Authority
- Richmond Regional Planning District Commission
- rvaMORE
- Stone Brewing
- Bike Walk RVA (Sports Backers)
- Greater Fulton Neighborhood Resource Center
- RVA Rapid Transit
- Richmond Cycling Corps
- Gillies Creek Park Foundation
- Replenish Richmond
- Virginia Department of Health: Safe Routes to School
- Virginia Capital Trails Foundation

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Introduction

The City of Richmond is actively revitalizing the James River riverfront guided by the City’s 2010 Riverfront Plan. In addition, the City is planning to build the Gillies Creek Greenway which will connect Richmond’s East End along the creek to the parks along Richmond’s redevelopment riverfront.

With these significant investments and anticipated new development, the City’s Department of Public Utilities (DPU) recognizes the need for a concept plan to incorporate stormwater management strategies into new and improved public spaces that connect residents with urban waterways.

Through a grant from the National Fish and Wildlife Foundation (NFWF), Skeo Solutions led an effort to convene city departments, community organizations, local partners and residents surrounding Gillies Creek to identify goals and prioritize projects in the Gillies Creek watershed (shown in light blue on the map) that can improve water quality while meeting community needs for safe streets and connections to local assets and amenities. This report outlines the results of this planning process which include a concept plan for integrating green stormwater infrastructure into the City’s Gillies Creek Greenway and other public and private improvements.

Goals

Since July 2017, the project team has engaged a broad range of stakeholders including residents and community organizations working in the Fulton, Chimborazo, Churchill and Montrose Heights neighborhoods, and City of Richmond departments including Public Utilities, Public Works, Planning, and Recreation and Parks. Through this engagement process, stakeholders have identified the following goals:

Connectivity

• Ensure safe biking and walking routes to and across the neighborhoods to connect adjacent neighborhoods and the proposed Gillies Creek Greenway.
• Connect communities, particularly youth, to Gillies Creek and the James River.

Healthy waterways

• Reduce the volume of water entering Gillies Creek and the James River.
• Improve the water quality of Gillies Creek and other Richmond waterways.
• Enhance the natural beauty of waterways and natural drainage features.

Integrated planning for sustainability

• Collaborate across city departments to identify green infrastructure and alternative on-site stormwater management strategies in city-wide redevelopment and new development activity.
• Ensure investments in trails, sidewalks and bike lanes serve both new development and existing communities.

Stewardship

• Engage neighborhoods and organizations in stewardship of green stormwater infrastructure projects.
• Raise awareness of the importance of healthy rivers and streams and importance of keeping waterways pollution-free.
Study Area

The Gillies Creek Green Infrastructure Planning effort focused on the area surrounding Gillies Creek, and includes mostly residential areas in Fulton, Chimborazo, Oakwood and Montrose Heights neighborhoods, Chimborazo Park, Gillies Creek Park, a large waste transfer property, and a rapidly developing area of riverfront between Rocketts Landing and Shockhoe Bottom. The site is part of the Gillies Creek watershed, which includes 1.8 square miles of urban development, from which stormwater runoff flows into Gillies Creek and then the James River.

Gillies Creek

Gillies Creek, which once ran through Fulton neighborhood causing frequent flooding, was redirected in the 1970’s to flow in a linear concrete channel north of the neighborhood, along the railroad tracks below Chimborazo Park, and into the James River. A large volume of water enters the channel from Henrico County before reaching Richmond. In heavy rain events, the water rises rapidly and flows quickly towards the James River. Several combined sewer overflow systems have outfalls at Gillies Creek, which infrequently overflow (see page 7).

Neighborhoods

The areas of Fulton and Montrose Heights included in the project area are primarily single-family housing with several multi-family developments. New housing and redevelopment are rapidly filling vacant areas of Fulton. Oakwood and Chimborazo neighborhoods include residential housing, schools and several smaller neighborhood parks.

Catalyst Site and Riverfront Redevelopment

Gillies Creek flows into the James River in a riverfront area undergoing rapid transformation. Nearby redevelopment, including Stone Brewing and Rocketts Landing, serve as catalysts for growing interest in the revitalization of former industrial properties east of Williamsburg Avenue. The recently completed Virginia Capital Trail, which runs along the James River between Williamsburg and Richmond provides a new bike connection along the riverfront at Gillies Creek.

Gillies Creek Park

Gillies Creek Park attracts visitors from the neighborhood and across Richmond. The park includes a shady area where community members gather for chess, a BMX track, recreational fields that are heavily used for kickball, disc golf, horseshoe pits, a natural area around a remnant creek channel, and a few smaller unprogrammed spaces.
Fulton Neighborhood History

Prior to the 1970’s, Gillies Creek wound through the Fulton neighborhood and flowed into the James River (see light blue line on map). The street grid of the historic Fulton Neighborhood, a thriving predominantly African American community with restaurants, stores, row houses and a school, extended on both sides of the creek (see gray streets on adjacent map). Urban Renewal erased much of the fabric of historic Fulton. More than 800 homes and buildings were razed.

Around this time, Gillies Creek was channelized, and its course was redirected in a linear route north of the neighborhood, along the railroad tracks below Chimborazo Park (see dark blue line on map). Gillies Creek Park was built over most of the original creek bed, and a new development of single-family homes, curving streets and cul-de-sacs replaced the southern portion of historic Fulton (current street network shown in orange on map). Fulton Street, which once connected Fulton neighborhood to Chimborazo and Church Hill, was terminated at Stony Run Road, as significant new infrastructure would be required to cross the channelized creek.
Local Efforts

Many initiatives are proposed or underway along Gillies Creek. Collaboration between City of Richmond departments and local organizations working in the area can leverage public and private investments to provide multiple benefits. These initiatives are outlined below for reference with additional images on page 5.

Gillies Creek Greenway
The Gillies Creek Greenway, proposed in 2015 in the Gillies Creek Greenway Plan, will be a ten-foot wide paved path for pedestrians and bicyclists. The greenway will connect neighborhoods to the James River and increase visibility of Gillies Creek. The greenway is planned to extend from the James River along Gillies Creek to Oakwood Cemetery and be built in phases. The first phase to be constructed when funding is available is Phase 2, the segment along Stony Run Road.

Richmond Riverfront Plan
The Richmond Riverfront Plan, a multi-stage plan to guide revitalization of the riverfront and increase public access and amenities along the James River, outlines redevelopment in the Gillies Creek project area in the “Downriver” section. A bistro is planned on the site of the former Intermediate Terminal Building, and public parks are planned on the riverfront parcels (known as Lehigh and Intermediate Wharf) adjacent to the mouth of Gillies Creek. The facilities and programming are slated to include passive and active recreation opportunities including a non-motorized boat launch.

RVA H2O
RVA H2O is an initiative of the City of Richmond’s Department of Public Utilities to educate the community about ways to keep our waterways pollution-free, and the importance of integrating drinking water, wastewater, and stormwater under one watershed management program. DPU recently released the RVA Clean Water Plan to guide collaboration with stakeholders to more efficiently reduce pollutant discharges into rivers and streams. The plan prioritized Gillies Creek Watershed as one of the top three watersheds to focus efforts in the near term.

Bus Rapid Transit
GRTC oversees the construction of a new bus rapid transit system, which begins service in summer 2018. The Pulse is a modern, high quality, high capacity rapid transit system that will serve a 7.6 mile route along Broad Street and Main Street, from Rocketts Landing in the City of Richmond to Willow Lawn in Henrico County. One Pulse stop is located where Gillies Creek flows under East Main Street.

Chimborazo Park
Community members have been working on restoration efforts in lower Chimborazo Park for over a year. The group has cleared invasive vegetation and uncovered old cobblestone roadbeds and walking paths. Efforts continue to stabilize the historic walkways and steps, replacing cobblestones where needed from lower Chimborazo Park to Government Road. The Gillies Creek Park Foundation, which is leading the effort, plans to create a picnic area at the bottom and complete trails around the entire lower perimeter.

Map provided by Groundwork RVA of the proposed trail connecting Gillies Creek to Armstrong High School.
EXISTING INITIATIVES

Initiatives underway
- Gillies Creek watershed
- Riverfront redevelopment
- Pending bike lanes
- Bus Rapid Transit station (BRT)
- Railroad

Phase 1: Williamsburg to Riverfront
0.36 miles

Phase 2: Williamsburg to Jennie Scher RR Crossing
0.97 miles

Phase 3: Jennie Scher RR Crossing to Briel St.
0.65 miles

Richmond Riverfront Plan excerpt.

Remnant cobblestone steps and paths at Chimborazo Park.
Connectivity and Safe Passage

Five neighborhoods surround Gillies Creek and the proposed greenway path. Comprised of single family and multi-family homes, many of the neighborhoods lack continuous maintained sidewalks, connections to other neighborhoods and proximity to public transportation.

In discussions about Gillies Creek and the relationship between healthy waterways and healthy communities, residents shared that it was difficult to access Gillies Creek and the surrounding historic neighborhoods. The Safe Routes to School Chimborazo Walkabout map illustrates the concentration of students in the study area who are disconnected by the lack of safe pedestrian and bicycle routes between Montrose Heights and Chimborazo.

Connectivity challenges include:

- Arterial streets with high speed traffic.
- Gillies Creek and the active railroad tracks create physical barriers between the neighborhoods.
- Key routes to Gillies Creek and between neighborhoods lack sidewalks, bicycle lanes, crosswalks and marked intersections.
- The steep grade change between neighborhoods north and south of the creek makes the connection difficult for pedestrians.

Safe Routes to School Chimborazo Walkabout map. Yellow, orange and red areas indicate higher numbers of residents who attend Chimborazo Elementary School. Orange and red streets indicate the longest walking time to school (20-43 minutes).
Water Quantity and Quality

While channelization of Gillies Creek has reduced flooding in the surrounding neighborhood, it also presents challenges for reducing the volume and cleanliness of stormwater that enters Gillies Creek and the James River. Water that might have infiltrated into the ground or filtered through plants after a storm now flows into the creek through pipes, reducing opportunities to minimize water flowing into the creek. In the Gillies Creek Watershed, stormwater runoff either flows into a stormwater pipe system to an outfall at a nearby stream or into a combined sewer pipe system to the waste water treatment plant (see map below). During heavy rain events, a combined sewer overflow (CSO) can occur, which results in combined sewer and stormwater overflow into the waterway. The Chesapeake Bay Preservation Act has designated a Resource Protection Area buffer on either side of the creek which restricts uses to protect water quality.

Richmond’s Department of Public Utilities and watershed organizations working in the Richmond are committed to addressing the challenges for urban water systems like Gillies Creek. Several strategies that can be applied in the Gillies Creek project area include:

• Integrating green stormwater infrastructure in new development and redevelopment.
• Reducing flow into combined sewer systems to prevent overflow in large storm events.
• Increasing visibility of Gillies Creek and awareness of the importance of watershed health.

Additionally, community members have provided input on two areas of flooding, likely due to the creek’s natural path, that might be addressed in green stormwater infrastructure planning.
Community Green Stormwater Infrastructure Concept Plan

The concept plan below outlines a series of strategies to integrate green stormwater infrastructure into the City’s Gillies Creek Greenway and identifies opportunities to improve water quality while meeting community needs for safe streets and connections to local assets and amenities. The strategies outlined below are described in more detail on the subsequent pages. Preliminary estimates for drainage areas and stormwater treatment volume are provided for planning purposes to assist with initial prioritization of projects.

Methods

The concept plan uses three green stormwater infrastructure methods to manage stormwater: capture, detain and infiltrate.

Capture: Capture stormwater from major streets, prioritizing those that drain into combined systems, to reduce the load on existing gray infrastructure.

Detain: Create and expand areas to detain stormwater and slowly release water volume in heavy rain events to avoid overflow into Gillies Creek.

Infiltrate: Increase plantings in open areas as well as in new bioretention swales, planted curb extensions and riparian areas to decrease water entering storm or combined systems.
Strategies

Green stormwater infrastructure and safety improvements strategies in the Gillies Creek project area include:

**Riverfront and Greenway Landscape.**
Plant attractive, drought-resistant, low-maintenance natives that complement the plant palette and visual identity of the Richmond Riverfront to maximize infiltration of stormwater runoff.

**Bioswale Features.**
Direct runoff from streets into planted or grassy swales that hold water during heavy rain events.

**Riparian and Wetland Restoration.**
Repair wetland areas to restore natural ecological functions that support water quality, flood resilience, biodiversity and natural filtration.

**Education and Art.**
Provide environmental education about the creek, habitat and stormwater features through signage and art.

**Permeable Paving.**
Cluster parking on a permeable surface that allows water to infiltrate into underlying soil.

**On-street Bike and Pedestrian Safety and Water Quality Improvements.**
Install sidewalks and well-marked bike lanes to provide a continuous network with curb cuts, inlets and planted features to retain and infiltrate street runoff.

**Safe Pedestrian and Bike Crossings.**
Clearly mark crosswalks and install planted curb extensions (or infiltration bump outs) to slow traffic and capture stormwater in heavy rain events.
1 **Stony Run**

Stony Run Road is one of the most active areas along Gillies Creek. Cars line the wide street during peak weekends at Gillies Creek Park, and fast-moving truck traffic moves constantly along the stretch. The lack of sidewalks and bike paths, along with frequent flooding and litter, cause difficulty for pedestrians and bicyclists. The first segment of the Gillies Creek Greenway will be constructed between Gillies Creek and Stony Run Road within the Resource Protection Area.

**Recommendations**

Green stormwater infrastructure proposed for the area along Stony Run Road includes:

- Extend the riverfront landscape along the greenway to provide visual continuity and predictable maintenance requirements.
- Capture stormwater from both sides of Stony Run Road through a system of swales to reduce on-street ponding and water volume entering Gillies Creek.
- Cluster parking on a permeable pavement surface that provides designated parking during peak use at Gillies Creek Park and future needs as a trail head for the Gillies Creek Greenway and Virginia Capital Trail. Parking area can be increased as need increases.
- Add two street crossings on Stony Run Road and improved intersections at Williamsburg Avenue and Government Road will enhance safety and potentially capture additional stormwater.

2 **Chimborazo Connector**

This section of Government Road is the critical connection between Fulton, Montrose Heights and Church Hill neighborhoods. The steep grade of Government Road, lack of sidewalks and bike lanes and high speed traffic make walking or biking toward Church Hill difficult and dangerous. Residents prefer walking on Glenwood Avenue, which is more narrow but has fewer cars and a more gentle slope. Stormwater from Government Road and Glenwood Avenue enters a combined system, contributing to the volume that flows toward one of the few remaining combined system outfalls into Gillies Creek.

**Recommendations**

Green infrastructure strategies can build on pending and proposed investments in this area to integrate stormwater management and enhance safety. DPW has designed buffered bike lanes for Government Road and has also identified the need for slope stabilization along a section of Government Road. This infrastructure improvement provides a potential opportunity to integrate other green infrastructure strategies and trail connections into one project. A new development on Glenwood Avenue may also provide funding for improved pedestrian infrastructure along the narrow road.

- Add a Gillies Creek Greenway connector on the city-owned property south of Government Road that would separate pedestrian and bicycle traffic on Government Road, providing paths to join the upper and lower walkways in Chimborazo Park.
- Capture stormwater from Government Road with a swale, reducing water volume entering the combined system; landscaping consistent with the greenway helps to identify the connector and increases infiltration.
- Plant bump-outs, which slow traffic and capture stormwater entering the combined system drains at the intersection of Glenwood Avenue and Government Road.
Stony Run and Chimborazo concepts.

1 Stony Run

Section AB view of the Stony Run Concept.
The concept includes a one-way entry into permeable parking areas across from Gillies Creek Park. A series of bioswales integrated between the parking, greenway and Stony Run Road captures stormwater from the impervious surfaces. Bioswales along the south side of Stony Run Road capture street runoff and direct the stormwater into the restored wetlands of the remnant Gillies Creek segment in Gillies Creek Park.

2 Chimborazo Connector

Section CD view of Chimborazo Connector concept.
The Chimborazo Connector concept illustrates separate bike/walk greenway connectors that meet the upper and lower sections of Chimborazo Park and a planted swale along the south side of Government Road that captures street runoff through curb cuts.
3 Gillies Creek Wetland

A remnant creek section and wetlands located along the original location of Gillies Creek receive stormwater from Fulton. It is piped under Stony Run Road and empties into Gillies Creek. The remnant creek section is barely visible due to overgrowth. The creek and surrounding thick underbrush appear to host a variety of birds and likely other wildlife seeking a protected habitat in the urban area.

Recommendations

Restoration of the creek can improve natural drainage functions, water holding capacity, and detention of water from Stony Run Road if redirected to the channel. Improved visibility and access to the creek may reposition the creek as an amenity for surrounding neighborhoods and park visitors.

- Restore the creek and surrounding wetlands to improve ecological functions that will improve water quality, capacity and natural beauty.
- Swales along Stony Run Road can convey stormwater to the wetland/creek area to reduce volume entering Gillies Creek without filtration.

4 Montrose Heights Connector

The segment of Government Road south of Gillies Creek serves as the key connector to the Gillies Park Greenway for Montrose Heights and Fulton residents. High-speed traffic and intermittent bike lanes present key connectivity challenges.

An open channel southwest of Government Road is piped under parts of city-owned property along this section, entering a swale in Gillies Creek Park. Early studies and cost estimates indicate that daylighting the stream and restoring the swale’s riparian function are cost prohibitive relative to DPU’s stormwater goals in the watershed (Montrose Heights Connector B, in map to the right). However, smaller interventions to improve water quality and safe passage exist along this route.

Recommendations

Building on DPW’s proposed Government Road bike lane improvements by integrating stormwater features, such as traffic-calming bump outs at intersections and street side swales can intercept stormwater runoff from Government Road that enters a combined system (Montrose Heights Connector A).

- Direct runoff from Government Road into swales on city property on the south side of Government Road from Stony Run to Denny.
- Consider possible locations for curb extensions to slow traffic and intercept street runoff entering inlet.
- Continue greenway landscaping on city-owned property along Government Road to increase infiltration.
Coordinating Investment and Stewardship Strategies

1 Gillies Creek Greenway
DPW has applied for funding under Virginia Department of Transportation’s (VDOT) Transportation Alternative Program (TAP) for the segment of the Gillies Creek Greenway between Williamsburg Road and Jennie Scher Railroad Crossing. Official announcement of grant awards are anticipated in June 2018 and design and planning could begin in late 2018 and construction in late 2019. The TAP grant would provide funding for design and construction of a 10 foot paved path and basic intersection improvements at Stony Creek and Government Road intersection. There are potential opportunities for other city departments and community partners to coordinate with DPW to leverage this potential initial Gillies Creek Greenway investment to implement additional strategies for improved access, safety and stormwater management:

- Coordinate with DPU to integrate green stormwater infrastructure improvements as part of the greenway design and construction, such as a small permeable parking lot(s), native plantings along the greenway and expanded intersection improvements with plantings that can help absorb additional stormwater.
- Explore mid-block crossings along Stony Run to connect greenway users to Gillies Creek Park at key park entrances.
- Explore opportunities to integrate a creek overlook along the greenway, especially at the location of the original Fulton Street crossing. Signage at this overlook or along the greenway could provide historical and cultural education about the history of the neighborhood and environmental education about the Gillies Creek watershed and how residents can be good stewards.
- Coordinate with community partners to assist with invasive plant removal between Gillies Creek Greenway and Gillies Creek, planting native plants, and periodic maintenance such as litter and debris removal and weeding.

Government Road Bike Infrastructure
DPW plans to paint stripes to create a buffered bike lane along Government Road. Bike lanes on Government Road south of Stony Run intersection are anticipated once a new water line project is complete, which is estimated in 1-2 years (2019-2020). Bike lanes on Government Road north of Stony Run are on hold pending slope stabilization of this segment of the road, which could be an additional 5-6 years.

- Explore whether temporary bike lanes can be extended north on Government Road when the southern portion is striped.

4 Montrose Heights
The intersection of Government Road and Admiral Gravely Boulevard is a neighborhood priority for traffic calming and safe crossing improvements. A gap analysis is needed to determine which safe-crossing strategy would be best to provide a safe gap between pedestrians and vehicular traffic flow. This type of analysis is currently unfunded.

- Consider integrating a gap analysis and safe crossings strategies into a grant application that would address stormwater management improvements at this intersection. Stormwater management strategies could include curb extensions, planted swales or a stormwater roundabout (see page 12).

2 Chimborazo
Residents in Church Hill need a safe pedestrian connection from Chimborazo to the first segment of the greenway to be constructed to access the greenway. The anticipated delay for infrastructure improvements to Government Road north of Gillies Creek due to road stabilization elevates the priority for considering an off-road connector on City property along Government Road.

- Identify potential funding sources for this connector with multiple community benefits (pedestrian safety, stormwater management, wildlife habitat).
Looking Forward

Through the course of this planning effort, participants identified a list of potential projects and existing community partner activities and interests to support implementation of the greenway and green stormwater infrastructure. Community partners can play a key role in watershed stewardship, potential opportunities are listed below.

Stewardship Opportunities

Projects and Activities
1. Bioswale planting and maintenance along Stony Run, Chimborazo Connector and Montrose Connector.
2. Greenway and street tree planting and maintenance.
3. Litter removal along Stony Run and Government Road and parking areas before it enters Gillies Creek.
4. Invasive plant removal on public property, including Gillies Creek Greenway implementation and Gillies Creek Park as part of the wetland restoration effort.
5. Marketing and education to promote use of Gillies Creek Greenway and the Capital Trail.
6. Watershed education and awareness programming to foster environmental stewardship.
7. Safe biking education and awareness programming.
8. Habitat/birding/wildlife education (especially in restored creek area).

Potential Partners

For next steps, the City could convene these community partners to coordinate efforts and advance the activities listed above.

- James River Association leads volunteer efforts and seeks grant funding to implement projects to restore and protect the James River watershed.
- Groundwork RVA programs provide hands-on roles for youth in creating positive changes to enhance green spaces in Richmond communities.
- Stone Brewing employees can organize to assist with clean up, planting and invasive removal.
- Neighborhood groups may be interested in leading or supporting bioswale maintenance and stewardship activities. The city could explore creating an “Adopt a Rain Garden Program” to support these local volunteer efforts.
- Organizations supporting related efforts locally include: Richmond Tree Stewards assists with invasive plant removal; EnRichmond’s tree lab provides lightweight trees for planting; and Alliance for the Chesapeake Bay assists with tree plantings.
- Capital Trees incorporated low impact design strategies and a distinct plant palette into the Low Line that could be extended through Gillies Creek Greenway.
- Backpackers assists with bike lane cleaning and trail clearing, including tree limb trimming and litter removal.
- Virginia Capital Trail is interested in coordinating with partners on trail cleanup and creating trailheads and increased connections with the Capital Trail.
- Clean City Commission or Central Virginia Waste Management Authority (CVWMA) may be able to help with volunteer recruitment for cleanup projects.
- Local sports groups, such as participants and leagues who use the BMX park, kickball fields, football fields, etc. may be able to organize cleanups events in and around the areas they use within Gillies Creek Park.
- Existing organizations, such as Plant More Plants, provide environmental education and tools that could be helpful for sharing information to foster environmental stewardship.
- Local corporate partners have programs to invest in community projects.

Contact

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