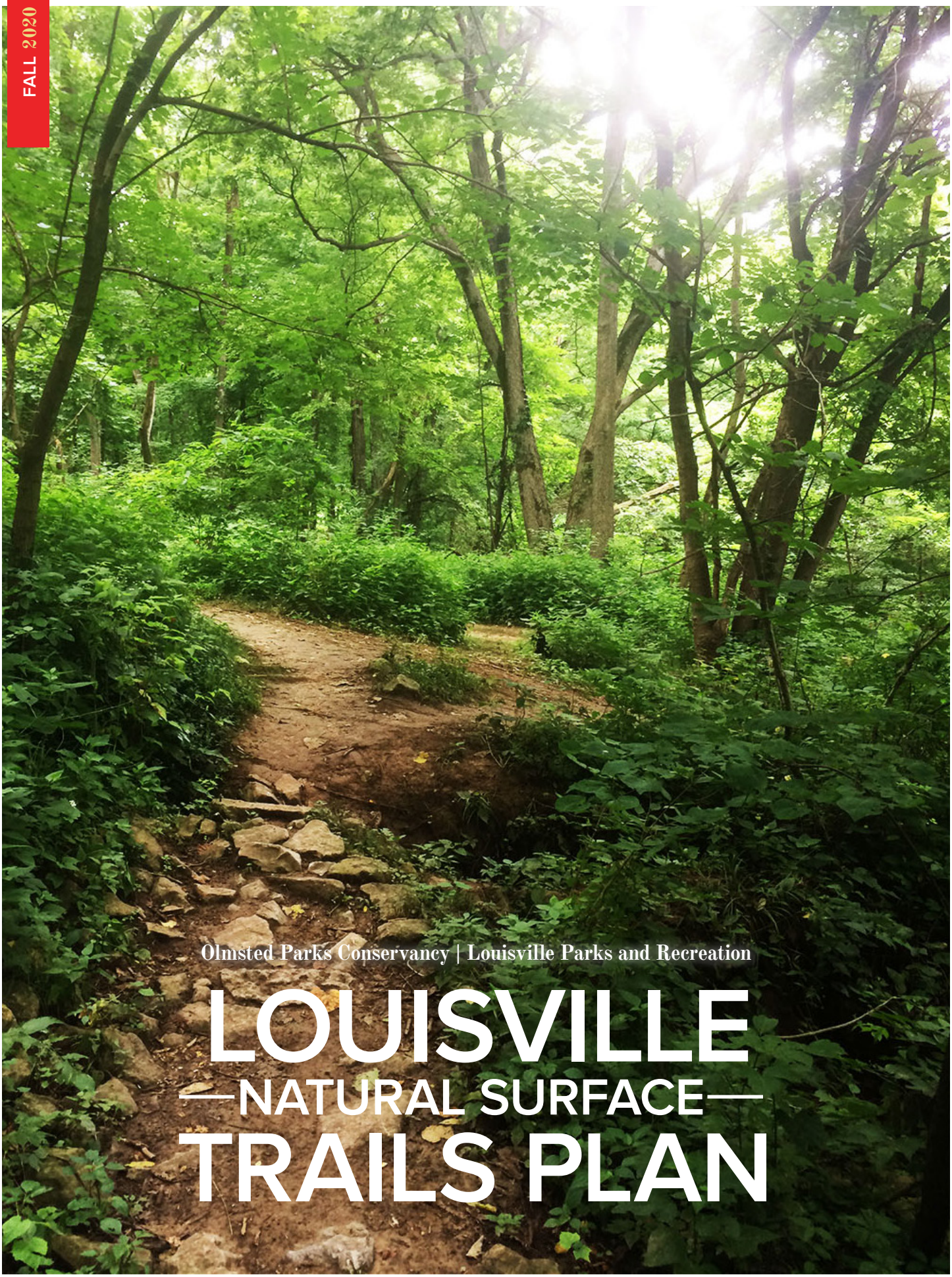
FALL 2020



Olmsted Parks Conservancy | Louisville Parks and Recreation

LOUISVILLE
NATURAL SURFACE
TRAILS PLAN

ACKNOWLEDGMENTS

Olmsted Parks Conservancy

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Environs/Jones

We would like to thank park trail users, OPC staff and City staff for their time, input and edits to this plan.

Table of Contents

Executive Summary

This natural surface trail plan will provide a 25-year guide for three of Louisville's Olmsted-designed parks, Cherokee, Seneca and Iroquois Parks. The plan will be guided by the landscape design philosophy of Olmsted, with careful consideration of forest management and sustainable trail design principles.

The Plan is guided by the following four main principles:

- **Environmental sustainability**
- **Social sustainability**
- **Economic sustainability**
- **Historic integrity**

Within the framework of these principles, this plan provides recommendations for enhancing and expanding existing trails in the three parks.

The trail plan considers the wide range of trail experiences and uses available to visitors, including hiking, managed mountain biking, equestrians, access to streams and natural features, environmental education and historical interpretation. The goal is that this Plan will promote a sustainable park trail system that will carry forward Olmsted's historic vision, providing additional opportunities for residents and visitors to experience Louisville's natural assets by foot, bike, or horse.

GOALS

1. Identify key design issues or conflicts that exist along the trail networks within each park.
2. Develop a sustainable, connected network of trails that provides equitable access to park users, balances user needs and demand, and preserves the natural and historic landscape.
3. Honor at least two of Olmsted's Seven S's: Separation and Suitability.
4. Recommend trails that accommodate all user levels and skills.
5. Identify opportunities for skills park, nature play, or respite along the trails where land, geology and access permit.
6. Prioritize sustainability and stewardship for all trail recommendations.
7. Identify potential revenue streams for trail maintenance.
8. Determine a set of realistic recommendations for future trails and decommissioned trails that are timeless and achieve the goals of this natural surface trail plan.

CHEROKEE PARK

Key recommendations for Cherokee include:

- **5.4 miles** of shared use trails
- **4.4 miles** of hike only trails
- **5.1 miles** of decommissioned trails

Other key recommendations include major reconstruction of the existing trail system to correct decades of heavy use by incorporating sustainable trail strategies into all new trail development and any historic trail retrofitting.

IROQUOIS PARK

Key recommendations for Iroquois include:

- **6.5 miles** of hike only trails
- **1.8 miles** of equestrian and hike trails
- **0.7 miles** of decommissioned trails

Other recommendations include improving the equestrian loop and providing hiking trails to and from key access points and destinations, such as overlooks and programmed areas, all while ensuring respect for the originally proposed Olmsted trail layouts for the park.

SENECA PARK

Key recommendations for Seneca include:

- **2.4 miles** of shared use trails
- **0.6 miles** of mountain bike trails, **0.5 miles** of which will be designated as bike optimized descending trails and **0.1 miles** of which will be designated as bike optimized climbing trails
- **3.1 miles** of decommissioned trails, mainly segments of the Wilderness Loop trail

Other recommendations include the reconstruction of existing trails to provide a bike-optimized trail experience and the management of invasive honeysuckle along I-64 in Kentucky Transportation Cabinet property.

POLICY AND PROGRAM RECOMMENDATIONS

1. Reduce conflict by anticipating issues, considering varied user goals, educating users, enforcing regulations, ensuring adequate capacity, and soliciting input from user groups.
2. Develop a wayfinding plan to help users to get where they want to go.
3. Develop a operations and management plan to ensure that the trail system is a sustainable, functional and attractive asset.
4. Hire a Trail Steward that is responsible for training, managing, and coordinating volunteer trail crews and ensuring that a work program of maintenance and management is carried out properly.
5. Invest in a combination of Crime Prevention Through Environmental Design (CPTED) principles, public education, maintenance, and programmatic measures to minimize negative safety perceptions, limit criminal and unwanted activity, and bestow positive impacts on the trails.

Cherokee Park | Recommendations

TRAIL NETWORK

PROPOSED

- Shared Use Trail
- Hiking Only

BOUNDARIES + DESTINATIONS

- Park limits
- Parking lot

Note that decommissioned trails are not included on the map. These will be determined in field.

PROPOSED TRAIL ALIGNMENTS - CHEROKEE PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: May 2019 by Alta Planning + Design

Seneca Park | Recommendations

TRAIL NETWORK

EXISTING

- Shared Use Trail - Natural Surface
- Paved Trail

PROPOSED

- Shared Use Trail
- Uphill Bikes-Only / Multi-Directional Hiking Trail
- Bike-Optimized Descending Trail
- Decommissioned Trail

BOUNDARIES + DESTINATIONS

- Park limits
- Parking lot

PROPOSED TRAIL ALIGNMENTS - SENECA PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: November 2019 by Alta Planning + Design

Iroquois Park | Recommendations

TRAIL NETWORK

EXISTING
- Equestrian and Hiking Trail
- Hiking Only Trail

PROPOSED
- Equestrian and Hiking Trail
- Hiking Only Trail
- Decommissioned Trail

BOUNDARIES + DESTINATIONS
- Park limits
- Parking lot

PROPOSED TRAIL ALIGNMENTS - IROQUOIS PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: November 2019 by Alta Planning + Design

LOUISVILLE PARKS AND RECREATION

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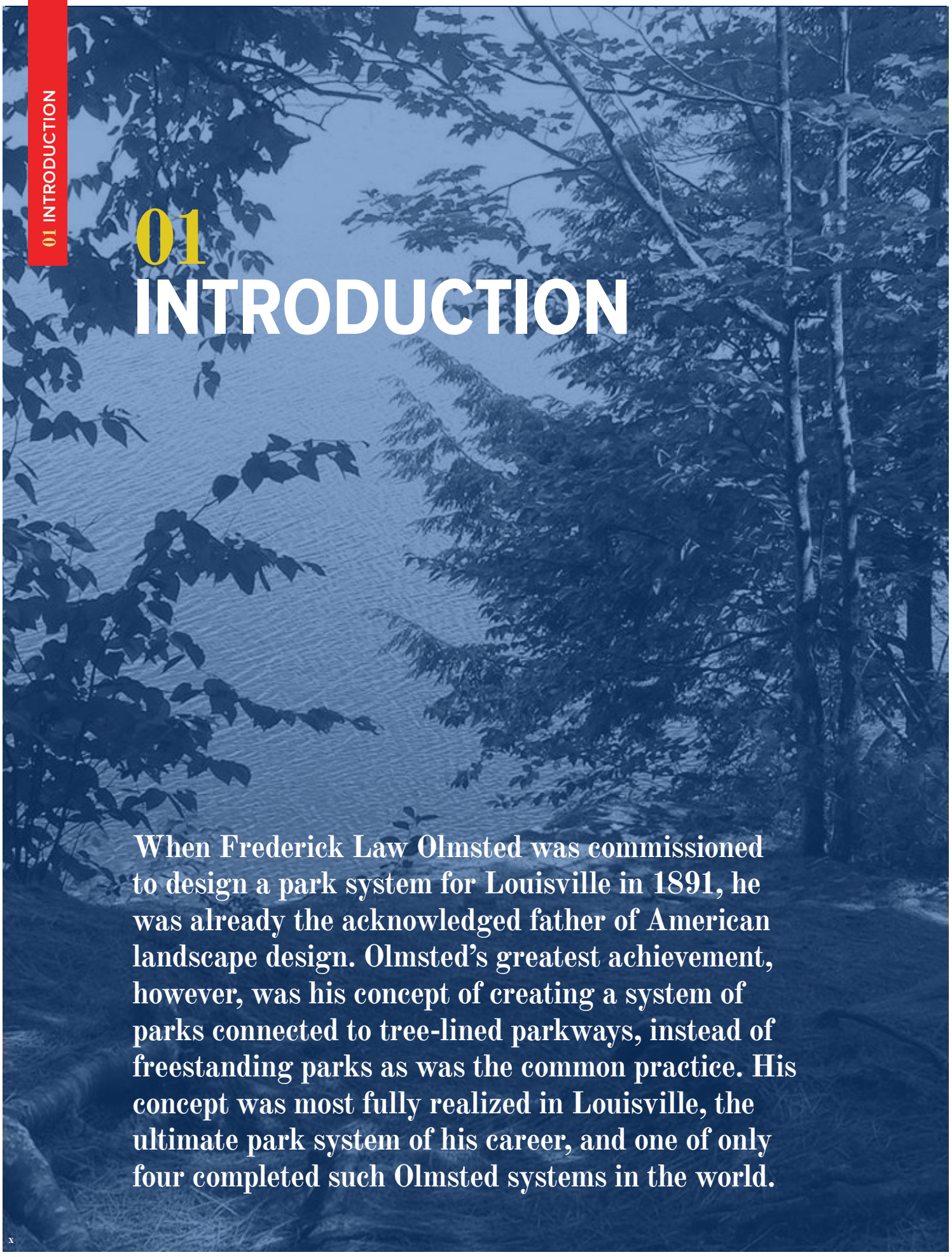


01 INTRODUCTION

When Frederick Law Olmsted was commissioned to design a park system for Louisville in 1891, he was already the acknowledged father of American landscape design. Olmsted's greatest achievement, however, was his concept of creating a system of parks connected to tree-lined parkways, instead of freestanding parks as was the common practice. His concept was most fully realized in Louisville, the ultimate park system of his career, and one of only four completed such Olmsted systems in the world.

History and Setting

Louisville's 17 Olmsted Parks and 6 connecting Parkways were designed by Frederick Law Olmsted, famed creator of Central Park, and the Olmsted Brothers firm. The system (which includes some of the city's most popular parks like Cherokee, Seneca, Iroquois, and Shawnee) is one of only four Olmsted-designed park systems in the world—and the last system Frederick Law Olmsted Sr. ever created.

The Olmsted Parks contain over 2,300 acres of parkland, making up 7.3% of all of Louisville and 19% of the City's parklands. Olmsted Parks are a major amenity to low-income residents. Nearly 40% of households within a 10-minute walk of an Olmsted Park make less than $25,000 annually.

Cherokee, Seneca, and Iroquois Parks, the three parks included in this plan, were each designed to work in deference to the native topography and intended to enhance the quality and enjoyment of life for all members of the community. See history figure on the following page for more information.

Cherokee Park was designed during the period of 1894 to 1897 by Frederick Law Olmsted and JC Olmsted and is approximately 400 acres in size. The land that incorporates the park was attractive to Frederick Law Olmsted because of the rolling topography of the Beargrass Creek Valley rising up to open pasture lands. Over time, the land form changed dramatically with a substantial increase in woodland area and decrease in open land. Today there is approximately 240 acres of woodlands in Cherokee Park with no visible representation of the 1897 and 1935 historic trail layout in today's trail network.

Seneca Park was designed in 1928 by the Olmsted firm. Most of the natural surface trails in Seneca Park are situated on federal land adjacent to I-64. In addition to trails on the federal land section, there is a popular biking, running and hiking trail that runs mostly through woodlands adjacent to an 18-hole golf course as well as residences on the perimeter of Seneca Park. Seneca Park and Cherokee Park lie adjacent to each other with a common border. Many consider these as one big contiguous park, but historically they were designed for very different uses. At one time, the Seneca Park trails were used by equestrians who kept their horses at a local horse club adjacent to the park.

Iroquois Park, in the southern part of Louisville, was designed in 1897 by Frederick Law Olmsted and JC Olmsted. Iroquois Park is approximately 800 acres of contiguous woodlands characterized by a 760 foot knob. Frederick Law Olmsted recognized the beauty of the land for its geologic and ecologic value and wanted it preserved as parkland for the quality of the overlooks and forest. The original 1897 circulation plan for the park included a network of pedestrian trails, equestrian paths and scenic drives. It was envisioned that electric rail drop off points would be placed around the park perimeter.

Olmsted's Vision

CHEROKEE PARK TRAIL HISTORY

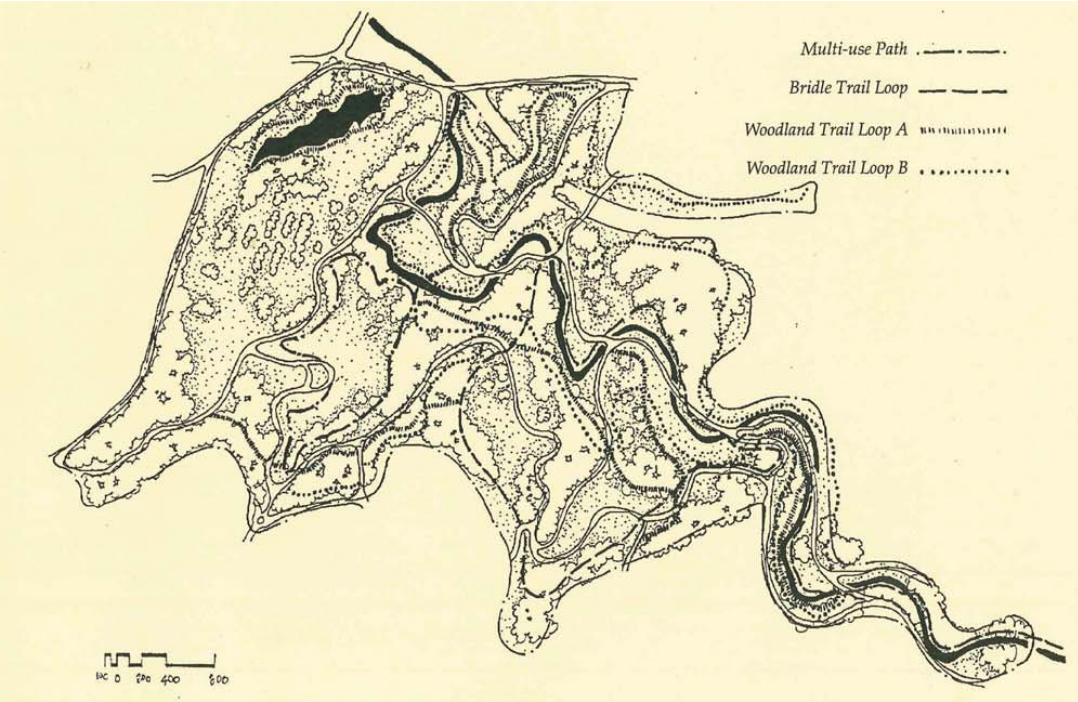
The 1994 Master Plan for Louisville's Olmsted Parks and Parkways states that Cherokee Park has a "longstanding controversy among park users regarding the use of Cherokee Park's woodland trails". Conflicts between various trail users, the development of rogue trails, and erosion issues continue to impact the trails today.

Original 1897 and 1935 Olmsted trail system proposals identified an extensive trail system that followed the contours of the land as shown in Figure 1.1, however this trail system was largely not implemented. Subsequent events, such as the 1974 tornado, and programmatic changes to the park, including the construction of I-64, have significantly altered the park and further confused the ability to restore or implement some semblance of the originally proposed Olmsted Trail system.

Olmstedian design philosophy is often summarized by the seven "s": scenery, suitability, style, subordination, separation, sanitation, and service. While adherence to all of these Olmsted principles should influence the trail system to some degree, two have particular importance. These include:

- **Separation of ways:** Providing separate corridors for those using the park to improve safety and mitigate conflicting uses
- **Suitability:** Planning and designing trails that are in keeping with the natural scenery and terrain of the park

Figure 1.1 Historic Olmstedian trail alignments in Cherokee Park



SENECA PARK TRAIL HISTORY

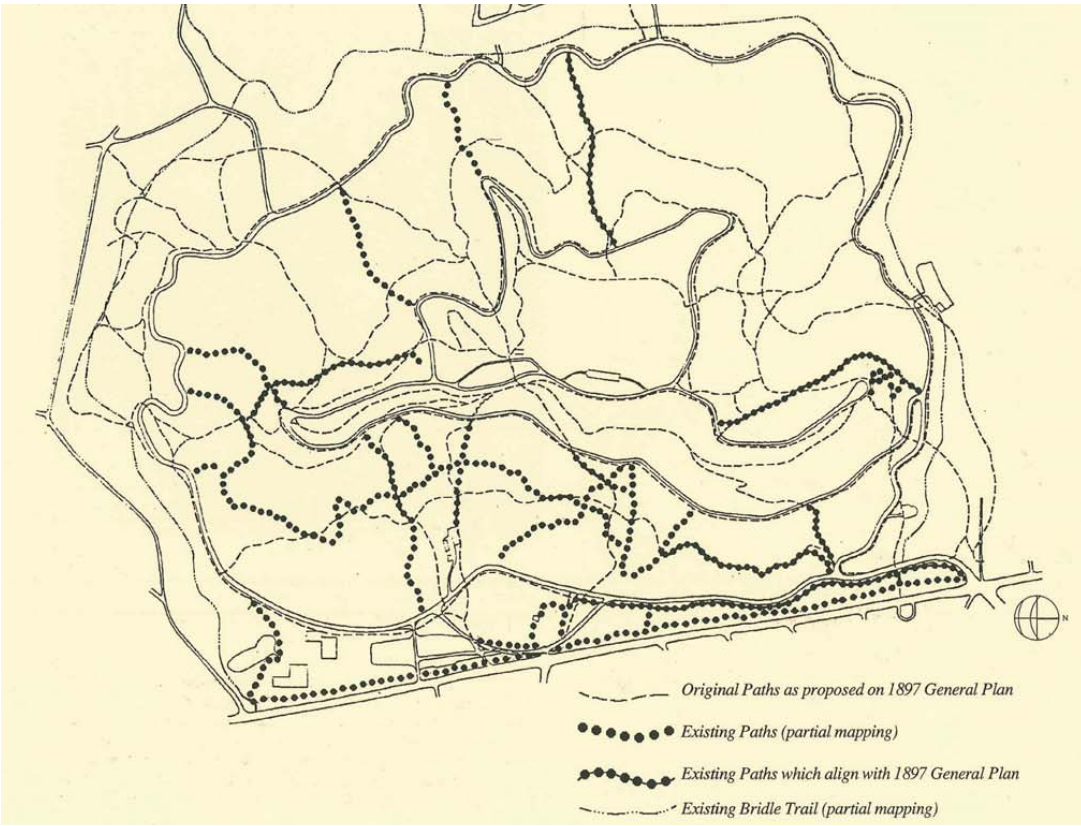
In 1928 the Louisville Board of Parks Commissioners purchased the land today known as Seneca park leasing 200 acres to Bowman Field. With the remaining acres, Olmsted Brothers firm began designing Seneca Park. Two years later the Board purchased the necessary land to connect Seneca and Cherokee Parks. Seneca Park was the last park in Louisville designed by the Olmsted firm.

IROQUOIS PARK TRAIL HISTORY

Located in the southern part of the city, Iroquois Park was designed in 1897 by Frederick Law Olmsted and JC Olmsted. Iroquois Park is approximately 800 acres of contiguous woodlands characterized by a 760 foot knob. Frederick Law Olmsted recognized the beauty of the land for its geologic and ecologic value and wanted it preserved as parkland for the quality of the overlooks and forest. The original circulation plan for the park included a network of pedestrian trails, equestrian paths and scenic drives, as shown in Figure 1.2.

Today, it appears that some of the planned pedestrian trails were constructed, but all have fallen into great disrepair. The only trail that is easily followed is the perimeter equestrian trail. Historically, no mountain bike trails have been constructed in the park and a note in the 1994 Master Plan regarding Iroquois trails states that no biking or equestrian use should be allowed until a comprehensive trail plan is conceived.

Figure 1.2 Historic Olmstedian trail alignments in Iroquois Park



Cherokee, Seneca & Iroquois Park History

1891 The City of Louisville foresaw the need to escape from the city into nature, enlisting the help of Frederick Law Olmsted, the father of Landscape Architecture famed for creating Central Park in New York, to build a park system in Louisville.

Cherokee Park and Iroquois Park are designed by Frederick Law Olmsted.

1928 Seneca Park is designed by the Olmsted Brothers firm.

1974 After nearly a century of use, the Olmsted Parks are well-worn, and in some cases completely devastated by natural disasters, including the 1974 tornado which destroyed Cherokee Park.

1989 Olmsted Parks Conservancy was created as an independent non-profit partner to Louisville Parks and Recreation, dedicated to enhancing restoring, and protecting Louisville's 17 historic Olmsted Parks and 6 Parkways across the city's East, South, and West ends.

1994 The Master Plan for the Olmsted Parks is created, which serves as the roadmap for our 17 Olmsted Parks and 6 Parkways, which are still referenced today. The first projects outlined in the plan took place in the Flagship parks: Cherokee, Iroquois, and Shawnee parks.

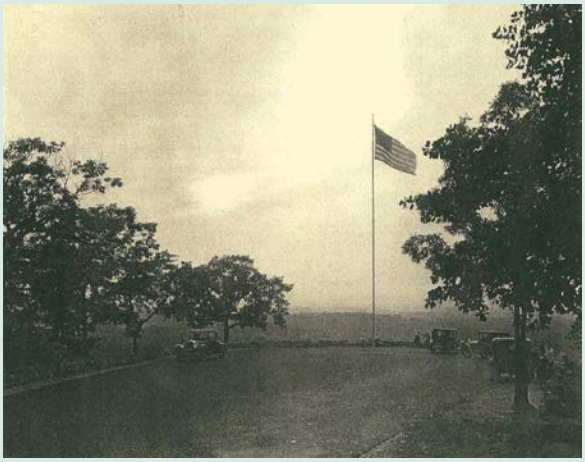
1999 Olmsted Parks Conservancy introduces a volunteer program to help manage invasive species and educate the community on the Olmsted Parks.

2006 Olmsted Parks Conservancy takes ownership of managing the parks' natural areas through the Woodlands Restoration Project and Team for Healthy Parks.

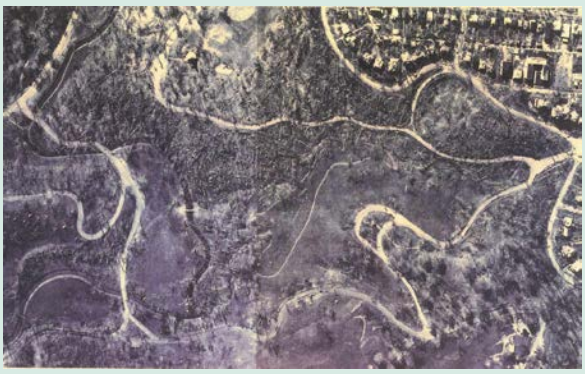
2019 Olmsted Parks Conservancy celebrates their 30th anniversary of connecting nature and neighborhood. Over the past three decades, they've overseen more than $40 million in capital investment, 63,000 volunteer hours, and 62,000 hours of natural areas management in Olmsted Parks and Parkways.

1928 aerial view of northern half of Iroquois Park

1928 aerial view of Cherokee Park



Historic view of North Overlook, Iroquois Park



Post tornado aerial view of Cherokee Park - April 5th, 1974

Plan Purpose

This natural surface trail plan will provide a 25-year guide for three of Louisville's Olmsted-designed parks, Cherokee, Seneca and Iroquois Parks. The plan will be guided by the landscape design philosophy of Olmsted, with careful consideration of forest management and sustainable trail design principles. The parks are on the National Historic Register and preserving historic trail alignments were prioritized to the extent possible. Balancing current park and trail user demands and conflicts with the history, natural environment and longevity of the trail systems was a challenge for this project.

The natural surface trail plan provides recommendations for enhancing and expanding existing trails in the three parks and provides a strategic plan for improvements. In some areas, improvements to the trails include the rerouting of the network to improve environmental conditions, user experience and connectivity.

The trail plan considers the wide range of trail experiences and uses available to visitors, including hiking, managed mountain biking, equestrians, access to streams and natural features, environmental education and historical interpretation.

A sustainable park trail system will carry Olmsted's historic vision forward, providing additional opportunities for residents and visitors to experience Louisville's natural assets by foot, bike, or horse.

Guiding Principles

ENVIRONMENTAL SUSTAINABILITY

Can the trail system provide for the protection of environmental resources?

Many of the trail systems have experienced widespread erosion and root exposure over the past decade. An intensive trail rehabilitation program is proposed for the parks that would decommission rogue trails while hardening or re-routing the most problematic trail segments. New trails will be constructed to sustainable trail design standards.

SOCIAL SUSTAINABILITY

Can the trail meet desired user outcomes in accommodating a high volume of users, various user groups, and diverse desired experiences?

Users recreate on trails in a variety of ways and some users would prefer trails that are designed and managed for a single use, such as hiking or mountain biking only. The proposed trail networks in Cherokee, Seneca, and Iroquois parks will consist of a blend of single-use trails and shared use trails. Single-use trails will provide a high-quality, customized experience to particular user groups while mitigating user conflicts.

ECONOMIC SUSTAINABILITY

Do the resources needed to maintain the trail system exist?

Maintenance funding and resources have struggled to keep pace with existing trail maintenance needs even without consideration for an expanded trail network. Diverse partnerships between Metro Parks, the Olmsted Parks Conservancy, and trail user groups will be critical in ensuring long-term maintenance of the parks' facilities.

HISTORIC INTEGRITY

Does the proposed trail system adequately reflect Olmsted's vision for the parks?

Conflicts between various trail users, the development of rogue trails, and erosion issues continue to impact the trail system today. Proposed trail networks should follow the Olmstedian principles of Separation of Ways and Suitability to provide separate and suitable trails for different user groups. This will allow proposed trails to preserve the geologic and ecologic value of the land for generations to come.

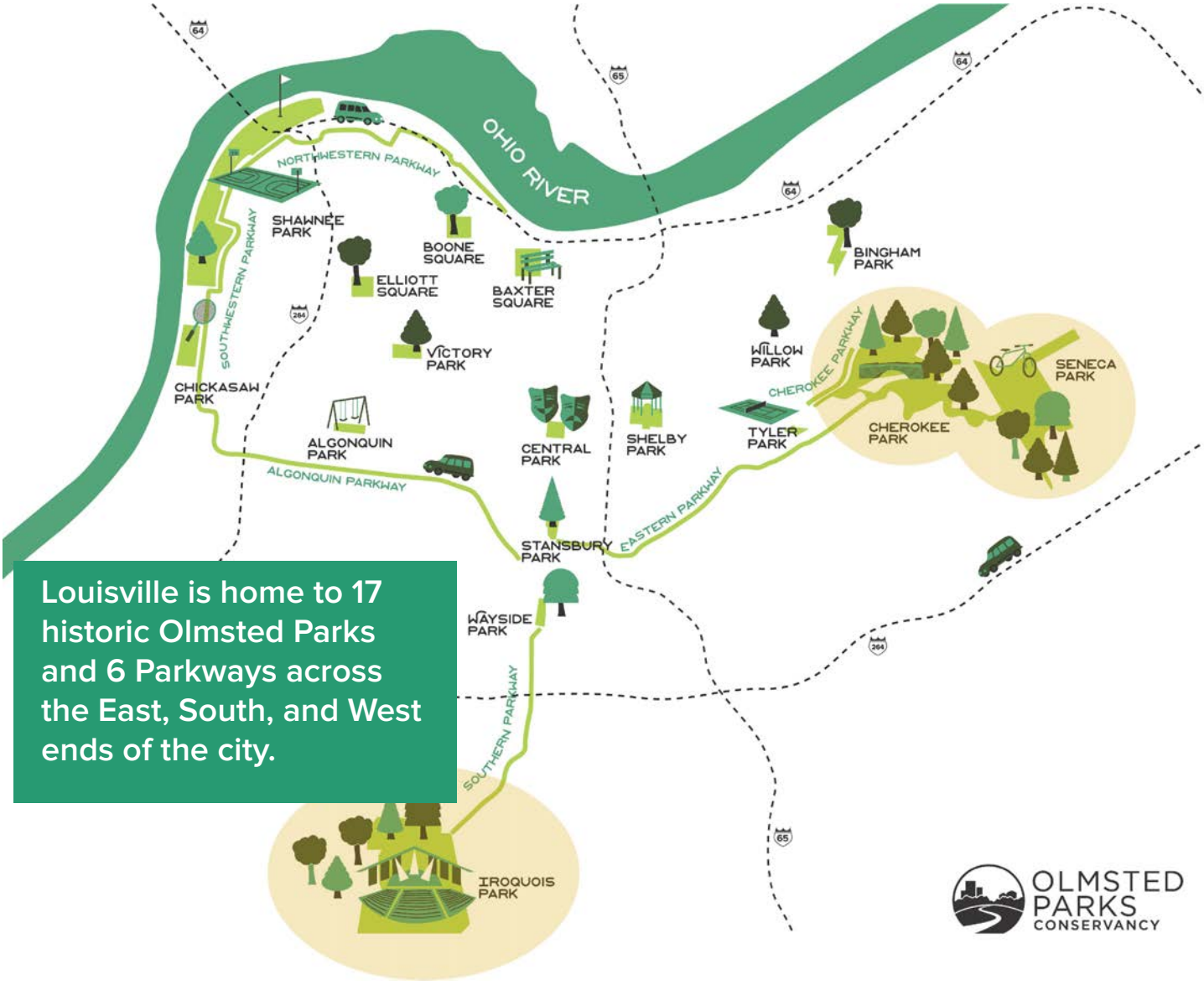
Project Goals

This project advances the ideals of the Olmsted parks as places for environmental conservation, accessible and equitable health and recreation, quality of life, connections to nature, and the promotion of local heritage. The following goals were established at the start of the project by Olmsted Parks Conservancy staff, Louisville Parks and Recreation staff, and project consultants:

1. Identify key design issues or conflicts that exist along the trail networks within each park.
2. Develop a sustainable, connected network of trails that provides equitable access for park users, balances user needs and demand, and preserves the natural and historic landscape.
3. Honor at least two of Olmsted's Seven S's: Separation and Suitability.
4. Recommend trails that accommodate all user levels and skills.
5. Provide trails that accommodate a wide variety of users and activities.
6. Prioritize sustainability and stewardship for all trail recommendations.
7. Identify potential revenue streams for trail maintenance.
8. Determine a set of realistic recommendations for future trails and decommissioned trails that are timeless and achieve the goals of this natural surface trail plan.

Study Area

This map illustrates the location of the Olmsted Parks and Parkways in Louisville and highlights the three parks in this study.



Louisville is home to 17 historic Olmsted Parks and 6 Parkways across the East, South, and West ends of the city.

OLMSTED PARKS CONSERVANCY

02 EXISTING CONDITIONS

Trail Types at Olmsted Parks

There are a variety of trail types in the Olmsted Parks, including paved paths, natural surface shared use trails, hiking trails, mountain biking trails, and equestrian trails. These trail types are defined below.

Note that the parks also contain several existing **paved paths**, which are typically 10-12' wide paths that are constructed of asphalt or concrete and accommodate pedestrians, bicyclists, and other non-motorized modes off street.

Shared use trails are natural surface trails designed to accommodate many types of users such as hikers, mountain bikers, or equestrians. While shared use trails offer the broadest recreational value, conflicts between trail users may exist depending on user volumes, sightlines, trail width, trail slope, and other site-specific conditions.

Hiking trails are designed specifically for foot travel. Hiking trails may incorporate elements such as narrow trail treads, tight switchbacks, or stairs that may be incompatible with other trail users such as equestrians or mountain bikers.

Mountain bike trails are trails that are designed around the needs of mountain bikers. They may include specific features such as rollers, banked turns, or other technical features geared specifically towards mountain bikes.

Equestrian trails are trails used exclusively by horses and their riders. They are typically constructed to be slightly wider and with greater vertical clearance.

Existing Park Trail Systems

The existing trail systems within Cherokee, Seneca, and Iroquois Parks offer a diverse experience for Louisville trail users. The overall park networks are summarized below.

CHEROKEE PARK (SEE PAGE 13)

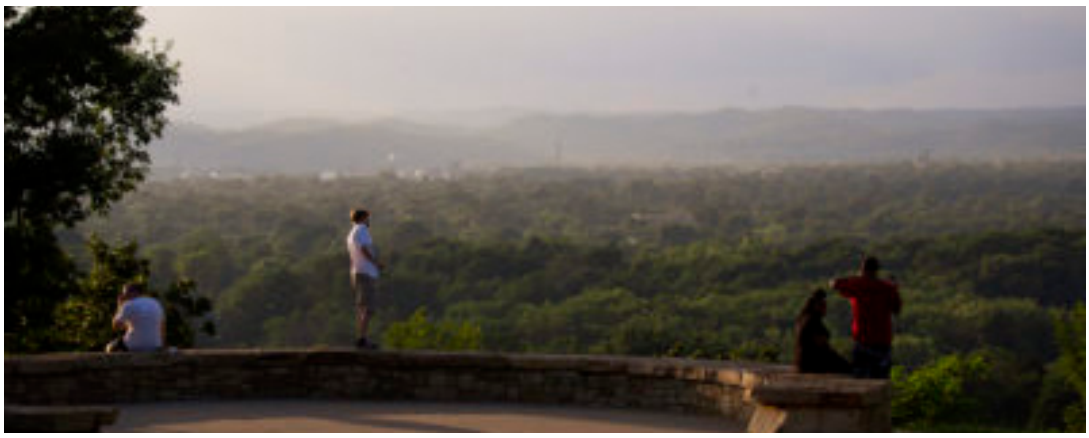
Cherokee Park was designed from 1894 to 1897 by Frederick Law Olmsted and JC Olmsted and is approximately 400 acres in size. The rolling topography surrounding Beargrass Creek hosts approximately 8 miles of mostly mixed use natural surface trails that run exclusively through relatively narrow fragments of woodlands areas. Trail users access the trail system from a variety of locations. Many residents of nearby neighborhoods walk or bike to the trails. The most popular trailheads are located near Hogan's Fountain and the gravel parking lot near the base of Cochran Hill.

SENECA PARK (SEE PAGE 14)

Seneca Park consists of approximately 400 acres of mostly recreational area but does have approximately 130 acres of woodlands with some natural surface trails,including a 4 mile trail used almost exclusively by cyclists and runners. Most of this trail is actually situated on federal land (Lady Bird Johnson land) adjacent to I-64. Much of this woodland area contains an understory composed of invasive Bush Honeysuckle. Many consider Cherokee and Seneca Parks as one contiguous park, but historically they were designed for very different uses. At one time, the Seneca Park trails were used by equestrians who kept their horses at a local horse club adjacent to the park but equestrian use has virtually disappeared in recent years.

IROQUOIS PARK (SEE PAGE 15)

Iroquois Park, in the southern part of the city, consists of approximately 800 acres of contiguous woodlands characterized by a 760 foot knob. The only trail that is easily accessible is the perimeter equestrian trail that runs around the base of the knob. This includes a shorter equestrian trail loop near the existing horse stables.



Iroquois Park offers expansive views from the North Overlook.

Analysis of Existing Conditions

In order to analyze the sustainability of existing trail systems and landscapes within Cherokee, Seneca, and Iroquois Parks the Planning Team employed a number of different analyses.

TRAIL PROFILE SLOPE ANALYSIS (SEE PAGES 16-18)

Some trails within Cherokee, Seneca, and Iroquois Parks have been carefully planned and constructed while others are simply the result of decades of informal social use. As such, the steepness and subsequent sustainability of trails throughout each park can vary significantly.

As a rule of thumb, sustainable trails should be constructed with an overall grade of 5% or less. Short sections of trail may approach 10% based on a variety of factors such as soils, anticipated user types, desired level of difficulty, and site-specific constraints. These should be carefully considered in the implementation of any trail segment.

The analysis on the following pages (Figures 2.4-2.6) illustrates existing trail profile slopes throughout the Cherokee, Seneca, and Iroquois Parks. This analysis reveals segments of trails that are constructed at reasonably sustainable slopes and those that likely should be considered for re-alignment, closure, or abandonment.

POSITIVE AND NEGATIVE CONTROL POINTS (SEE PAGES 16-18)

Identifying control points is an important step in planning a recreational trail system. Positive control points reflect places that should be connected to the proposed trail system. These could be scenic views, existing stream crossing infrastructure (culverts or bridges), unique landscapes, or other interesting features. Negative control points are features that the proposed trail system should avoid. These could be sensitive natural or cultural resources, or areas that pose safety or security hazards.

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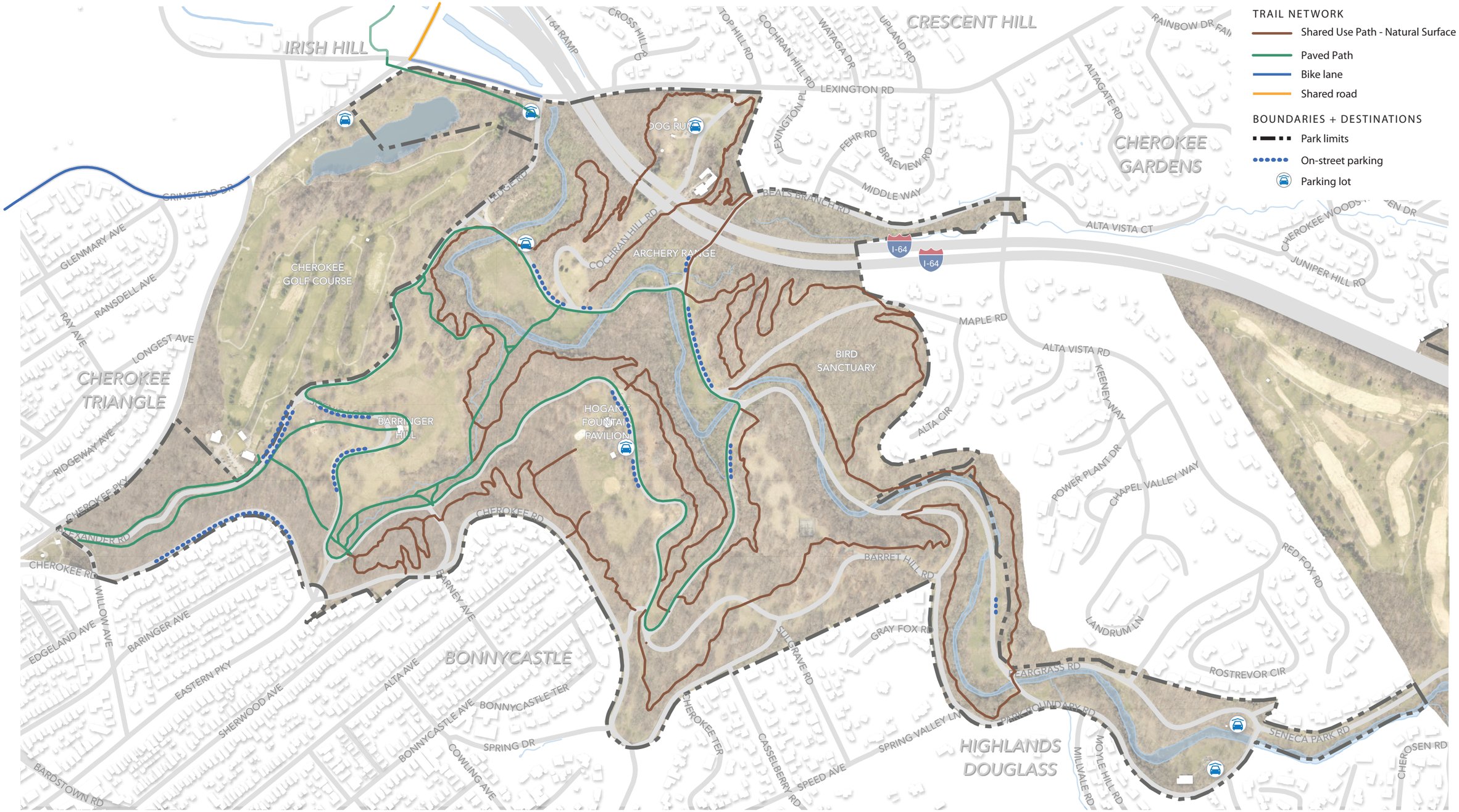
FIGURE 2.1 CHEROKEE PARK EXISTING TRAIL SYSTEM



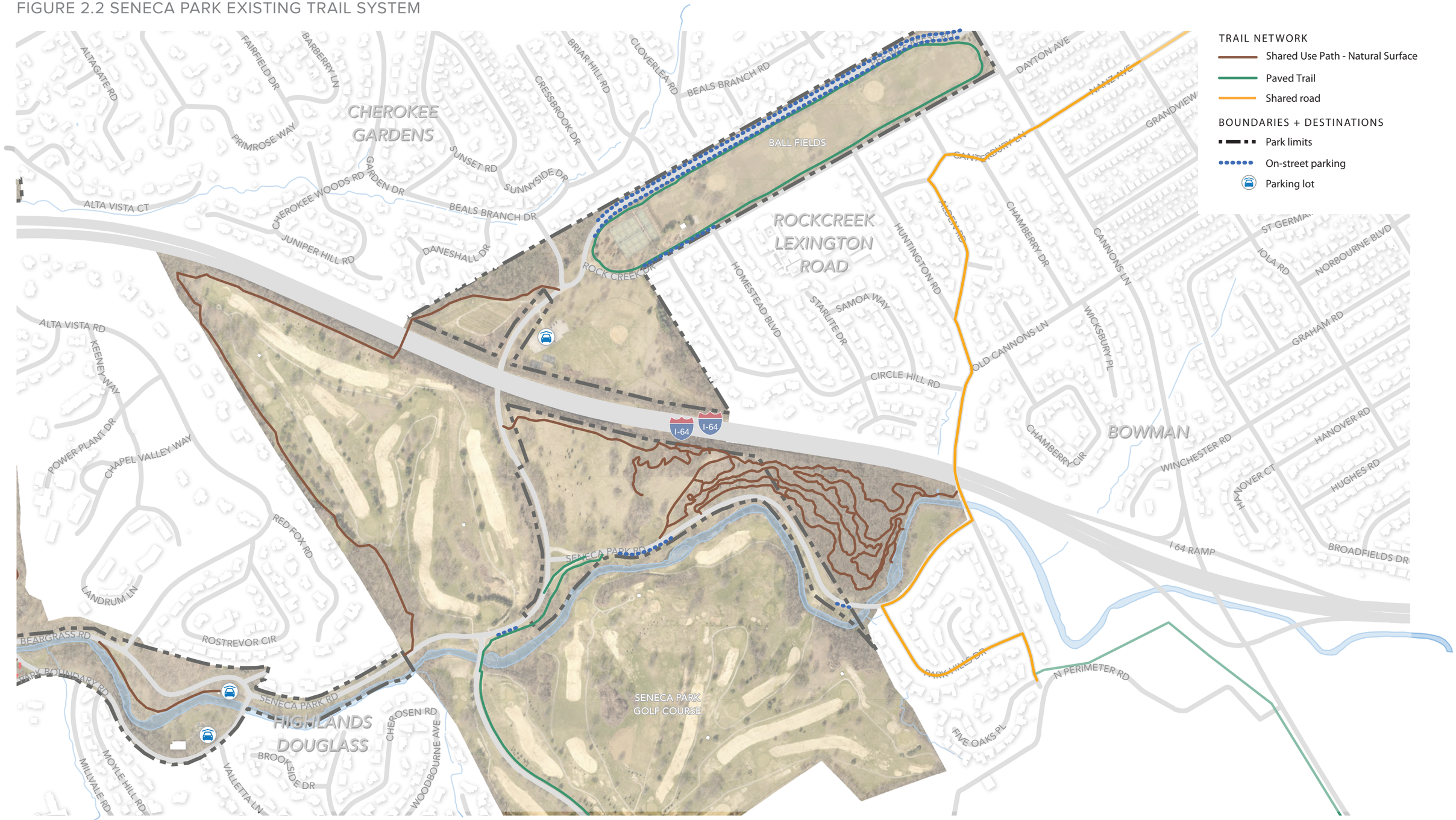
BASE MAP - CHEROKEE PARK

5.28.2019 | LOUISVILLE NATURAL SURFACE PARK TRAIL PLAN | LOUISVILLE METRO PARKS

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: May 2019 by Alta Planning + Design

FIGURE 2.2 SENECA PARK EXISTING TRAIL SYSTEM



BASE MAP - SENECA PARK

5.28.2019 | LOUISVILLE NATURAL SURFACE PARK TRAIL PLAN | LOUISVILLE METRO PARKS

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com
Map Produced: May 2019 by Alta Planning + Design

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FIGURE 2.3 IROQUOIS PARK EXISTING TRAIL SYSTEM

BASE MAP - IROQUOIS PARK

5.28.2019 | LOUISVILLE NATURAL SURFACE PARK TRAIL PLAN | LOUISVILLE METRO PARKS

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com
Map Produced: May 2019 by Alta Planning + Design

FIGURE 2.4 CHEROKEE PARK SLOPE AND CONTROL POINTS

TRAIL SEGMENT SLOPE (%)

- 0 - 5%: Sustainable
- 5 - 8%: Moderately sustainable
- 8 - 12%: Moderately unsustainable
- Over 12%: Unsustainable
- Paved Path

BOUNDARIES + DESTINATIONS

- Park limits
- Parking lot

Positive

Positive Control Points are places where resource managers want users to visit, including scenic overlooks, historic sites, waterfalls, rock outcroppings, lakes, rivers, and other natural features or points of interest.

Negative

Negative Control Points are places resource managers want users to avoid (such as low-lying wet areas, flat ground, extremely steep cross slopes or cliffs, unstable soils, environmentally sensitive areas, sensitive archaeological sites, safety hazards, and private property).

EXISTING CONDITIONS - CHEROKEE PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: November 2019 by Alta Planning + Design

LOUISVILLE PARKS AND RECREATION

FIGURE 2.5 SENECA PARK SLOPE AND CONTROL POINTS

TRAIL SEGMENT SLOPE (%)

- 0 - 5%: Sustainable
- 5 - 8%: Moderately sustainable
- 8 - 12%: Moderately unsustainable
- Over 12%: Unsustainable
- Paved Path

BOUNDARIES + DESTINATIONS

- Park limits
- Parking lot

Positive

Positive Control Points are places where resource managers want users to visit, including scenic overlooks, historic sites, waterfalls, rock outcroppings, lakes, rivers, and other natural features or points of interest.

Negative

Negative Control Points are places resource managers want users to avoid (such as low-lying wet areas, flat ground, extremely steep cross slopes or cliffs, unstable soils, environmentally sensitive areas, sensitive archaeological sites, safety hazards, and private property).

EXISTING CONDITIONS - SENECA PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: November 2019 by Alta Planning + Design

FIGURE 2.6 IROQUOIS PARK SLOPE AND CONTROL POINTS

TRAIL SEGMENT SLOPE (%)

- 0 - 8%: Sustainable
- 8 - 12%: Moderately sustainable
- 12 - 16%: Moderately unsustainable
- Over 16%: Unsustainable
- Shared use path

BOUNDARIES + DESTINATIONS

- Park limits
- Parking lot

Positive

Positive Control Points are places where resource managers want users to visit, including scenic overlooks, historic sites, waterfalls, rock outcroppings, lakes, rivers, and other natural features or points of interest.

Negative

Negative Control Points are places resource managers want users to avoid (such as low-lying wet areas, flat ground, extremely steep cross slopes or cliffs, unstable soils, environmentally sensitive areas, sensitive archaeological sites, safety hazards, and private property).

EXISTING CONDITIONS - IROQUOIS PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: November 2019 by Alta Planning + Design

LOUISVILLE PARKS AND RECREATION

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Summary of Primary Trail Constraints

Through analysis of Cherokee, Seneca, and Iroquois Parks, the Planning Team has identified a number of issues and constraints for each park that should be addressed by the planned trail system improvements. Some issues, such as a lack of wayfinding, are present throughout all three parks while others may be present at only one.

CHEROKEE PARK
(PP. 13, 16)

KEY ISSUES

- Wayfinding: The park is lacking in a comprehensive wayfinding signage system, and navigation along the trails and park roads is very challenging. A signage effort is currently underway to address all Olmsted Parks. This effort should consider wayfinding for natural surface trails as well.
- Roadway / Trail Crossings: Existing trail crossings of park roadways in Cherokee Park often have limited sightlines and geometry that could lead to conflicts between motorists and trail users, especially mountain bikers who may be traveling faster on trails.
- High Volumes of Users: The sheer number of users on the Cherokee Park trails continues to increase. As a result, user conflicts have increased proportionately and deferred maintenance of the trail system has been exacerbated by more and more trail users.
- Erosion and Root Exposure: Erosion and root exposure are a common issue throughout the Cherokee Park woodlands. This issue stems from a number of factors including heavy use, poor drainage, unsustainable trail construction or alignments, and deferred maintenance that has gradually degraded the trail system over time.
- Rogue Trails: The development of unauthorized, rogue trails in Cherokee Park has occurred over time as the trail system's popularity has increased. Improved design and construction of authorized trails and better wayfinding could help address this issue.
- User Conflict: Initial survey efforts of trail users show that conflicts between mountain bikers and hikers is problematic in Cherokee Park. Olmsted's classic design principle of "separation of ways" encourages separation of conflicting uses where feasible. Although creation of exclusive single-use trails for all possible trail users (mountain bikers, hikers, and equestrians) may not be feasible in each park, consideration should be given to development or management of certain trails or areas for a particular trail user. This management approach prevents conflicts between users and allows for a higher quality, specialized trail experience.

Seneca Park (PP. 14, 17)

KEY ISSUES

- Invasive Landscape Management: Much of the northeast corner of Seneca Park that lies on KYTC property is overrun with the invasive plant, Bush Honeysuckle. The Honeysuckle limits sightlines along the Wilderness Loop trail that also occupies this corner of the property.
- Poor Circulation: Seneca Park's trail system has evolved through piecemeal investments by volunteer trail groups. Seneca Park would benefit from a park-wide trail plan that considers trail opportunities and circulation throughout the park.
- Mountain bike focused use: Seneca Park is largely used by mountain bikers currently and many of the volunteer trail efforts involved KYMBA. There is potential in this area to invest in specific mountain bike trails to alleviate pressure on Cherokee Park and provide a more specialized trail experience.
- Unsustainable Trail Alignments: Some areas of the Seneca Park Trail system suffer from unsustainable trail alignments. In some cases, this may involve "fall-line" trails that create erosion and scouring while in other cases, stacked trail turns promote short-cutting and the proliferation of rogue trails.

Iroquois Park (PP. 15, 18)

KEY ISSUES

- Trail User Conflicts with Equestrians: Iroquois Park sees the most consistent equestrian use of the three parks addressed through this study. As such, managing conflicts between trail users in Iroquois Park will be very important to promoting the safety and trail experience of all users.
- Equestrian Trail: The existing perimeter equestrian trail is in need of maintenance and suffers from unsustainable trail alignments in some sections. Additionally, adjacent uses in some areas, such as near the golf course and the disc golf course, impact the safety and experience of the equestrian trail.
- Historic Integrity: The original Olmsted vision for Iroquois Park included a robust trail network. Many of these trails were either never constructed or lost over time due to lack of use or maintenance. The proposed trail system at Iroquois should seek to respect and incorporate these historic alignments while considering modern trail sustainability practices.

03
PUBLIC INVOLVEMENT

Overview

770
Survey Respondents

150
Open House Attendees

105
Website Comments

Much of the success of this project relied on input from stakeholders and community members in order to gain an understanding of existing conditions and develop meaningful recommendations. The planning process included a variety of public outreach methods through which the planning team attempted to reach as many everyday users of the area's trails as possible. Outreach methods included an online survey, two public open houses, and an online interactive map. In total, over 1,000 people participated in the development of the recommendations through the public process.

Efforts to get input from the public were organized into two phases. The focus of Phase 1 was to gather information concerning existing conditions and the needs of community members. The objective of Phase 2 input was to get feedback on proposed routes and trail types.

Results from these efforts guided the planning team in its development of the recommendations found in Chapter 4.

Photos (top right to bottom): The public open houses had more than 150 in attendance.

Trail Survey Results

During the Fall of 2019, OPC conducted park user surveys to determine their opinions and perceived needs of the trail systems in Cherokee, Seneca, and Iroquois parks. The 2019 survey was largely modeled after a previous 2009 survey of park users to understand how attitudes and opinions about park trails had changed over time. OPC also published this online survey on the OPC website. Survey results have been summarized on the following pages.

GENERAL OVERVIEW

770
Survey Respondents

VISITATION TRENDS

(Multiple selections allowed)

83% ***VISIT CHEROKEE PARK***

66% ***VISIT SENECA PARK***

41% ***VISIT IROQUOIS PARK***

DURATION & FREQUENCY

- The average trail user spends ***1-2 hrs at the parks per trip***.
- Most trail users spend ***10-15 days per month*** at the parks.

PERCEPTIONS OF SAFETY

97% of trail users report feeling safe at Cherokee and Seneca Parks

83% of trail users report feeling safe at Iroquois Park

PREFERRED TRAIL-BASED ACTIVITIES

(Multiple selections allowed)

HIKING = **63%** of trail users

MOUNTAIN BIKING = **47%** of trail users

RUNNING = **44%** of trail users

NATURE OBSERVATION = **39%** of trail users

DOG WALKING = **36%** of trail users

HORSEBACK RIDING **4%** of trail users

The percentage of mountain bikers has increased by nearly 20% since 2009 (Cherokee Trail User Survey). The percentage of hikers and runners has also increased since 2009, with hikers increasing by nearly 15% and runners by 4%.

TRAIL MANAGEMENT PREFERENCES

52%
of trail users prefer mixed-use trails for hiking and biking

49%
of trail users prefer segregated hiking and biking trails

TRAIL-FOCUSED COMMENTS

"I LIKE TO BIKE ON THE MTB TRAILS, THOUGH THEY ARE GETTING MORE AND MORE ROOTY EACH YEAR."

"TRAIL BIKES HAVE DAMAGED SO MANY OF THE TRAILS THAT I HAVE TO LOOK FOR THE ONES THAT ARE LESS USED BY BIKES."

"DEPENDING ON THE TIME OF DAY, I GRAVITATE TO THE TRAILS WITH LOWER TRAFFIC. THE MULTI USE TRAILS ARE THE ONES I FREQUENT THE MOST."

"I LIKE THE MORE TECH/NATURAL TRAILS IN THE PARK(S)."

"THE TREE CANOPY IS AN ESSENTIAL FEATURE OF THE PARK."

PERCEPTIONS OF TRAIL CONDITIONS

The majority of trail users described the trail conditions in the Cherokee, Seneca, and Iroquois Parks as "okay" or "good."

- Nearly 85% of survey respondents felt that trail erosion had a negative impact on trails
- Nearly 90% of survey respondents felt that ecological restoration within the parks is important or very important.

PERCEPTIONS OF WAYFINDING

The majority of trail users described the trail wayfinding in the Cherokee, Seneca, and Iroquois Parks as "poor" or "okay."

"I WOULD USE CHEROKEE OR SENECA MONTHLY IF THEY HAD BETTER MAPS AND SIGNAGE."

"I'VE GOTTEN LOST A FEW TIMES IN IROQUOIS WHICH IS PART OF WHY I DON'T VENTURE OUT THERE VERY OFTEN."

"I CAN GET LOST EASILY WITH ALL THE SWITCH OVERS / STREET CROSSINGS."

"THE LACK OF SIGNAGE AND MAPS MAKE ME FEEL UNSAFE."

MOST COMMONLY DESIRED TRAIL CHARACTERISTICS

- Woodland trails
- Length / Distance
- Interesting Features
- Challenging Terrain
- Solitude

TOP PRIORITIES FOR NEW TRAIL DEVELOPMENT

- Increased trail information, signage, and maps
- Designation of hike-and bike-only trails
- Increased maintenance and rehabilitation of current trails
- More destination trails like big rock
- Increased security at trailheads

Woodland trails were identified as a commonly desired trail characteristic.

Survey respondents commonly expressed desire in finding solitude on trails.

Public Open House

150 community members

187 Total Comments

59 Cherokee Park Comments

79 Iroquois Park Comments

28 Seneca Park Comments

The Existing Conditions Open Houses were held on Wednesday, November 13th and Thursday, November 14th at the Iroquois Park Amphitheater and the Seneca Golf Course Clubhouse. The purpose of these workshops was to present the project's goals and scope, introduce the project team to residents, listen to the community, and present preliminary concept trail alignments. The Open Houses incorporated several activities, including:

- Various stations related to existing conditions and trail recommendations
- Boards on project goals and objectives on which community members could reiterate the importance of certain goals and provide free comments on other desired goals for the project.
- Large roll plots of the three parks on which community members could place sticky notes and pins on the maps to identify trail needs and desires.

Community members were encouraged to post sticky notes on boards to provide feedback on particular parks or project goals. Common types of comments are listed below:

CHEROKEE PARK

- Expanded trail network through or around the Cherokee Golf Course
- Developing more sustainable trails
- More single-use trails
- Adherence to historic trail alignments
- Increased wayfinding and signage
- Increased educational signage about trail etiquette
- Expanded volunteer programs

SENECA PARK

- Increased equestrian access on trails and at trailheads
- Compliance with historic trail alignments
- Increased wayfinding and signage
- More single-use trails
- Increased trail connections from Cherokee Park to Seneca Park
- Connections from the recreational fields to trails

IROQUOIS PARK

- Improved equestrian trails and amenities, especially at parking areas
- Improve trail maintenance
- Address conflicts between the disc golf course and the equestrian trail
- Expand the trail network overall
- Respect the vision for the original Olmstedian trail plan in Iroquois Park
- Develop single-use trails to separate conflicting trail users

Photos (top to bottom): Public input comments on trail design goals and preliminary recommendations

Online Interactive Webmap

255
Website Visits

105
Unique Respondents

Community members were also invited to give input on an interactive online webmap made available through the various stakeholders' websites and social media outlets. This public outreach tool enables greater participation than is typically seen during in-person events and allows residents to give input on their own time.

Active for a five-week period starting in Summer 2020, the webmap showed proposed trail alignments in each of the three parks. Participants were able to like, dislike, or comment on any given recommendation and were asked to identify five "top priority" projects. Participants commented on a variety of topics, as discussed below.

Many of the comments received contained disparate opinions from different user groups, such as mountain bikers and equestrians. The planning team tried to accommodate all comments as best possible into the recommendations presented in Chapter 4.

CHEROKEE PARK

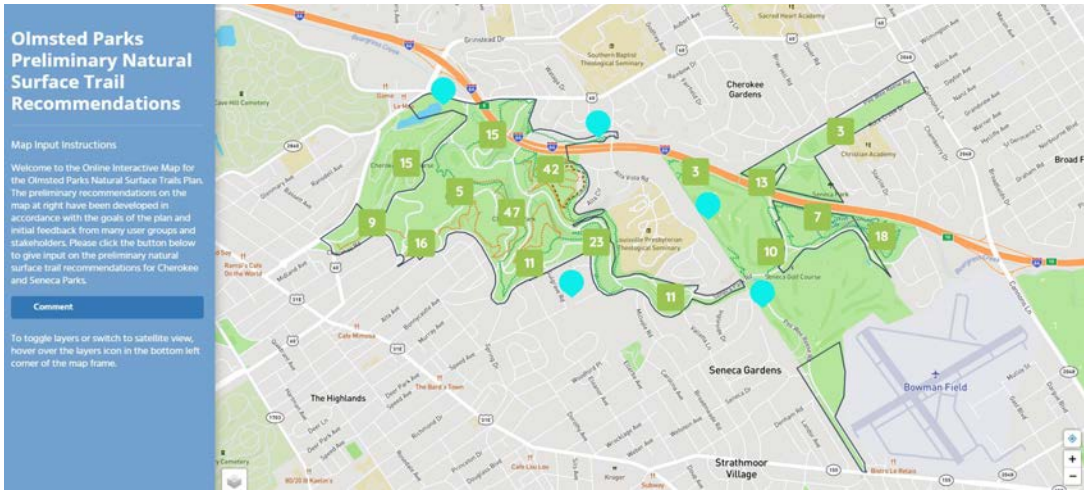
The majority of comments in Cherokee Park regarded a desire for more mountain bike trails, including trails with enhanced MTB features, as well as separated use trails for hikers and mountain bikers. Respondents also expressed desire in improving trail sustainability and erosion issues.

SENECA PARK

Seneca Park users desire increased signage and wayfinding, more shared use trails, and more MTB-specific trails. Many respondents also expressed desire in connecting Cherokee and Seneca Park via a single track trail connector.

IROQUOIS PARK

Iroquois Park users desire increased trails for both equestrian-only and mountain bike only trails. Users of both groups expressed concerns for sharing trails between these two uses as well as ensuring that trail degradation is minimized.



The online public input map allowed people to like, dislike, or comment on recommendations.

Word cloud of the top comments received from community members in the online interactive webmap

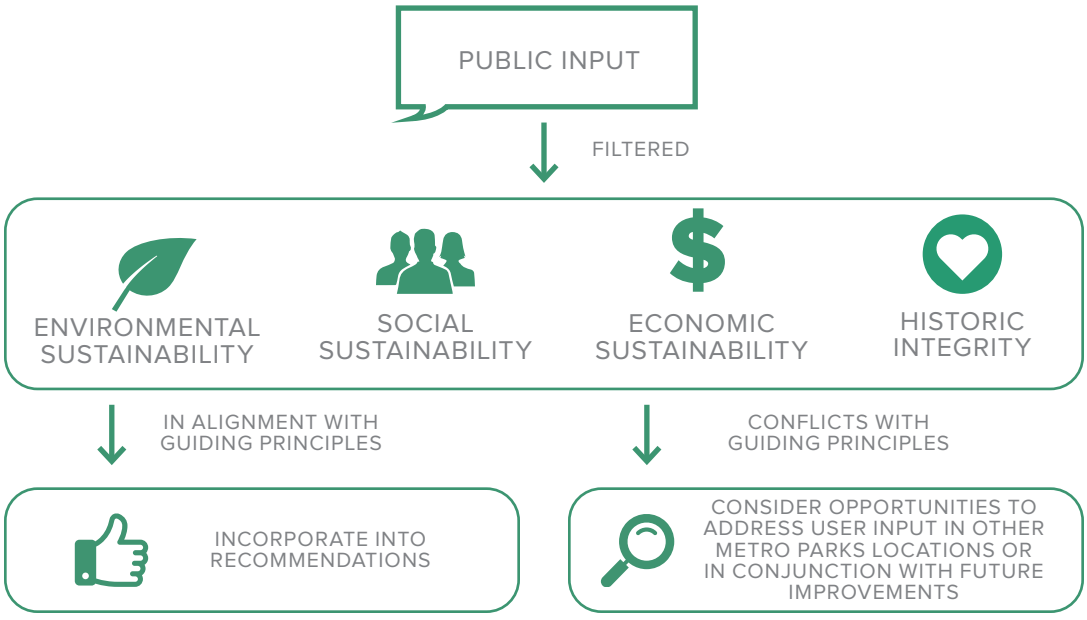
Key Public Input Takeaways

The most common types of comments for all three parks were related to more trails, increased maintenance and wayfinding signage, enhanced mountain bike trails and mountain bike features, increased neighborhood access points, and the redevelopment of the Cherokee Golf Course to include natural open space and trails. There were also many disparate comments regarding the desire for more single-use mountain bike trails and equestrian trails, especially in Iroquois Park.

While some feedback may seem at odds with one another, there is common ground to be found. For example, all users tend to agree that erosion and environmental impacts need to be addressed. All users also seem to agree that some amount of single-use trail management, whether that be for hikers, mountain bikers, or equestrians, is appropriate given trail user conflicts and use patterns. All user groups support improved wayfinding and signage efforts.

BALANCING DISPARATE INPUT AMONG TRAIL USER GROUPS

Throughout the public input process, disparate views from respective trail user groups including mountain bikers, equestrians, hikers have been heard specifically with regard to trail management and the development of new trails. While these contradictory views are common in natural surface trail planning, it is important to consider and filter this input through the four guiding principles of this planning effort.



04 RECOMMENDED IMPROVEMENTS

Recommended Trail Networks

The planning team worked with OPC, its respective stakeholders, and local residents to develop recommended trail networks for each of the three parks that enhance options for recreation, mitigates user conflicts, and promote Olmsted's vision for the parks. Guided by the project vision and goals, each recommended network serves the purpose of filling crucial gaps in the existing network, re-routing unsustainable sections of trail, enhancing options for all user groups, and striving to provide a more comfortable experience for a wider array of people.

This plan proposes the addition of over 27 miles of new trails within Cherokee, Seneca, and Iroquois Parks. These recommendations are separated into five categories: shared use trails, hiking only trails, mountain bike trails, equestrian trails, and decommissioned trails, and are shown in Maps 4.1 -4.3 and described in Tables 4.1-4.3 on the following pages.

The recommendations presented on the following pages support the four goals of this Plan: environmental sustainability, social sustainability, economic sustainability, and historic preservation. In addition, they also support many of the comments the Planning Team received related to the desire for more designated single-use trails.

CHEROKEE PARK

Recommendations include:

- **5.0 miles of proposed shared use trails**
- **4.2 miles of proposed hike only trails**
- **5.1 miles of proposed decommissioned trails, mainly unsustainable trails**

This will bring the total proposed mileage at full build out to 9.2 miles. These proposed trails will increase the trail mileage within the park and mitigate user conflicts by designating some trails as single-use.

SENECA PARK

Recommendations include:

- **2.4 miles of proposed shared use trails**
- **0.6 miles of mountain bike trails.** Of these trails, 0.5 miles will be designated as bike optimized descending trails and 0.1 miles will be designated as bike optimized climbing trails.
- **3.1 miles of proposed decommissioned trails, mainly unsustainable sections of the Wilderness Trail**

Combined with the Park's existing 1.7 miles of shared use trails, this will bring the total proposed mileage at full build out to 4.7 miles. These proposed trails will increase the trail mileage within the park and mitigate user conflicts by designating some trails as single-use.

IROQUOIS PARK

Recommendations include:

- **6.7 miles of proposed hike only trails**
- **1.8 miles of proposed equestrian trails**
- **0.7 miles of proposed decommissioned trails, mainly unsustainable trails**

Combined with the Park's existing 4.5 miles of trails, this will bring the total proposed mileage at full build out to 13.0 miles. These proposed trails will increase the trail mileage within the park and mitigate user conflicts by spreading out within the trail system.

FIGURE 4.1 CHEROKEE PARK PROPOSED TRAIL ALIGNMENTS

TRAIL NETWORK

PROPOSED

- Shared Use Trail
- Hiking Only

BOUNDARIES + DESTINATIONS

- Park limits
- Parking lot

Note that decommissioned trails are not included on the map. These will be determined in field.

PROPOSED TRAIL ALIGNMENTS - CHEROKEE PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: May 2019 by Alta Planning + Design

LOUISVILLE PARKS AND RECREATION

Cherokee Park Recommendations

The proposed trail network for Cherokee Park includes an array of uses and experiences while prioritizing user safety and trail sustainability. It combines the rehabilitation of existing routes with the recommendation of new sustainable and more enjoyable trails.

When fully constructed the system will be composed of:

- 5.0 miles of shared use trails
- 4.2 miles of hiking-only trails

These new miles of trails are new additions to the system, connecting gaps, and creating an environmentally sustainable, enjoyable, accessible, safe, and low-maintenance trail system.

Specific improvements include:

- Designating some existing shared use trails as hike only to mitigate user conflicts
- Re-routing existing unsustainable sections of trails along steep slopes/ river banks
- Creating more trail options near the bird sanctuary
- Developing a new trail connection on the northern perimeter of the park
- Re-routing the existing Big Rock trail to be more sustainable

Note that many of these proposed alignments address the unsustainable grades shown in the existing conditions map on page 16 of this document.

Proposed trail network by the numbers

9.2 miles of proposed new trails

5.1 miles of proposed decommissioned trails

TABLE 4.1 CHEROKEE PARK PROPOSED TRAIL ALIGNMENTS

Trail ID	Name	Mileage	Management	Trail Narrative	Type	Cost Estimate
CP-1	Alexander Road	0.3	Hike Only	Construct hike-only trail from Alexander Road to the Scenic Loop.	Proposed Hike Only	$13,013
CP-2	Chauffer's Rest Hike Loop	0.8	Hike Only	Construct a hike-only trail that rings the Meadow near the Chauffer's Rest parking area. Trail would provide a 10-min loop hike for novice hikers and park users. Seek to provide moderate slopes at or below 5%.	Proposed Hike Only	$31,533
CP-3	Re-Route	0.3	Hike Only	Re-route existing trail according to trail sustainability strategies.	Proposed Hike Only	$12,281
CP-4	Re-Route	0.1	Hike Only	Re-route existing trail according to trail sustainability strategies.	Proposed Hike Only	$667
CP-5	Re-Route	0.1	Hike Only	Re-route existing trail according to trail sustainability strategies.	Proposed Hike Only	$3,094
CP-6	Re-Route	0.3	Hike Only	Re-route existing trail according to trail sustainability strategies.	Proposed Hike Only	$11,668
CP-7	Nature Preserve	0.5	Hike Only	Construct hike-only trail within the existing nature preserve.	Proposed Hike Only	$19,769
CP-8	Beals Branch Rd Connector	0.5	Hike Only	Construct hike-only trail that connects from existing trail off of Beals Brach Road to proposed Maple Road re-route.	Proposed Hike Only	$19,823
CP-9	Bonneycastle Hill Re-Route	0.3	Hike Only	Re-route the existing trail to connect to the end of the on-street parking at Bonneycastle Hill.	Proposed Hike Only	$11,908
CP-10	Hogan Fountain	0.3	Hike Only	Re-route existing trail and designate as hike only.	Proposed Hike Only	$12,059
CP-11	Re-Route	0.3	Hike Only	Re-route existing hike-only trail according to trail sustainability strategies.	Proposed Hike Only	$13,621
CP-12	Connector	0.1	Hike Only	Construct connector from existing hike-only trail to the Scenic Loop.	Proposed Hike Only	$2,926
CP-13	Re-Route	0.3	Hike Only	Re-route existing hike-only trail according to trail sustainability strategies.	Proposed Hike Only	$12,311
CP-14	Re-Route	0.2	Hike Only	Re-route existing trail according to trail sustainability strategies.	Proposed Hike Only	$7,920
CP-15	Beals Branch Road	0.4	Shared Use	Construct a shared use trail parallel to Beals Branch Road.	Proposed Shared Use	$15,951
CP-16	Barret Hill Re-Route	0.8	Shared Use	Re-route the existing trail that connects Chauffer's Rest parking area to Beargrass Creek. Provide a trail with a more moderate grade by adding switchbacks.	Proposed Shared Use	$15,893
CP-17	Cochran Hill Re-Route	0.9	Shared Use	Re-route the existing trail to add an additinoal switchback to lessen trail grades and provide a more moderate descent from Cochran Hill.	Proposed Shared Use	$33,718
CP-18	Re-Route	0.5	Shared Use	Re-route existing trail according to trail sustainability strategies.	Proposed Shared Use	$37,138
CP-19	Re-Route	0.3	Shared Use	Re-route existing trail according to trail sustainability strategies.	Proposed Shared Use	$31,680
CP-20	Maple Rd Re-Route	0.8	Shared Use	Re-route the existing switchbacking trail to provide a moderate descent that parallels Maple Road. Seek to provide an overall trail slope of 6% or less.	Proposed Shared Use	$11,965
CP-21	Connector	0.1	Shared Use	Construct connector from Beals Branch Road to the Maple Rd Re-Route.	Proposed Shared Use	$2,086
CP-22	Connector	0.1	Shared Use	Construct a connector from Beals Branch Road to the Maple Rd re-route.	Proposed Shared Use	$2,984
CP-23	Hogan Fountain	0.7	Shared Use	Develop a new trail that connects from the existing shared use path up to Hogan Fountain. Develop stairs if needed at the connection to the existing path. Route the trail alignment along the contours ascending to the Hogan Fountain area.	Proposed Shared Use	$25,819
CP-24	Hogan Fountain Connector	0.1	Shared Use	Develop trail that connects the Scenic Loop to the proposed Hogan Fountain trail.	Proposed Shared Use	$2,008
CP-25	Bridge Connector	0.1	Shared Use	Renovate bridge over Beargrass Creek.	Proposed Shared Use	$795

Multi-Directional Shared Use

Hike Only

Note that 5.1 miles of existing trails are planned to be decommissioned, which will cost approximately $94,665.

FIGURE 4.2 SENECA PARK PROPOSED TRAIL ALIGNMENTS

TRAIL NETWORK

EXISTING

- Shared Use Trail - Natural Surface
- Paved Trail

PROPOSED

- Shared Use Trail
- Uphill Bikes-Only / Multi-Directional Hiking Trail
- Bike-Optimized Descending Trail
- Decommissioned Trail

BOUNDARIES + DESTINATIONS

- Park limits
- Parking lot

PROPOSED TRAIL ALIGNMENTS - SENECA PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: November 2019 by Alta Planning + Design

Seneca Park

Recommendations

The proposed trail network for Seneca Park includes an array of uses and experiences, including designated mountain bike-only trails, while also priortizing user safety and trail sustainability. It combines the rehabilitation of existing routes with the recommendation of new sustainable and more enjoyable trails.

When fully constructed the system will be composed of:

- 4.1 miles of shared use trails
- 0.6 miles of bike-optimized climbing and descending trails

Of these miles, 1.7 miles are already existing in Seneca Park and will most likely require rehabilitation and maintenance as part of the new system. The remaining 3.0 miles of trails are new additions to the system, connecting gaps, and creating an environmentally sustainable, enjoyable, accessible, safe, and low-maintenance trail system.

Specific improvements include:

- Decommissioning the Wilderness loop trail and developing bike-optimized downhill and climbing trails
- Re-routing existing unsustainable sections of the perimeter shared use trail
- Developing a shared use loop trail around the decommissioned Wilderness Trail area in the eastern section of the park
- Developing a shared use connection that parallels the Seneca Loop Rd

Note that many of these proposed alignments address the unsustainable grades shown in the existing conditions map on page 17 of this document.

Proposed trail network

by the numbers

3.0 miles of proposed new trails

1.7 miles of existing trails incorporated into the trail system

3.1 miles of unsustainable trails to be decommissioned

4.7 miles of trails at full build out

TABLE 4.2 SENECA PARK PROPOSED TRAIL ALIGNMENTS

Trail ID	Name	Mileage	Management	Trail Narrative	Type	Cost Estimate
SP-1	Golf Course Re-Route	0.2	Shared Use	Reroute the existing fall line trail on the west of the #7 fairway. Add 2-3 switchbacks through the woodlands to provide a more moderate slope and improve drainage off of the trail.	Proposed Shared Use	$9,201
SP-2	Seneca Loop Trail	1.7	Shared Use	Construct a shared use loop trail that rings the area north of Seneca Park Road. Trail should provide creek access at locations where there are obvious desire lines. Trail construction will require coordination and approval from KYTC.	Proposed Shared Use	$67,552
SP-3	Intermediate Descending Bike Trail	0.3	Bike Optimized Descending	Construct a new intermediate bike-optimized descending trail from the top of the ridge. Trail should be constructed with bermed turns and rollers to promote a fun and flowing mountain biking experience.	Bike Optimized Descending Trail	$11,880
SP-4	Bike Optimized Descending Trail	0.2	Bike Optimized Downhill	Construct a new novice bike-optimized descending trail from the top of the ridge. Trail should be constructed with mellow bermed turns and rollers to promote a fun and flowing mountain biking experience.	Bike Optimized Descending Trail	$7,920
SP-5	Climbing Trail	0.1	Climbing Trail	Construct a new uphill-bike and foot traffic only trail that leds from the Seneca Park Loop trail to the top of the ridge. This trail would allow mountain bikers to efficiently get to the top of the bike-optimized descending trails.	Uphill Bike / Multi-Directional Hike	$4,356
SP-6	Golf Course Trail - Shared Use	0.4	Shared Use	Develop a new shared use trail west of Pee Wee Reese Road adjacent to the Seneca Park Golf Course. Route trail along the contours through the woodlands and connecting to crosswalk and 3-way stop at the intersection of Pee Wee Road and Seneca Park Road.	Proposed Shared Use	$13,880
SP-7	Seneca Golf Course ReRoute	0.1	Shared Use	Reroute the existing shared use trail to be more sustainable.	Proposed Shared Use	$4,196

Note that 3.1 miles of existing trails are planned to be decommissioned, which will cost approximately $56,964.

Multi-Directional Shared Use

Bike Optimized Descending

Uphill Bike / Multi-directional Hike

FIGURE 4.3 IROQUOIS PARK PROPOSED TRAIL ALIGNMENTS

TRAIL NETWORK

EXISTING
- Equestrian and Hiking Trail
- Hiking Only Trail

PROPOSED
- Equestrian and Hiking Trail
- Hiking Only Trail
- Decommissioned Trail

BOUNDARIES + DESTINATIONS
- Park limits
- Parking lot

PROPOSED TRAIL ALIGNMENTS - IROQUOIS PARK

NATURAL SURFACE TRAIL PLAN | OLMSTED PARKS CONSERVANCY | LOUISVILLE PARKS AND RECREATION

1/4 MILE

Data Sources: Louisville/Jefferson County Information Consortium (LOJIC); Trailforks.com; Olmsted Parks Conservancy
Map Produced: November 2019 by Alta Planning + Design

LOUISVILLE PARKS AND RECREATION

Iroquois Park Recommendations

The proposed trail network for Iroquois Park includes an array of uses and experiences, including designated equestrian- and hike-only trails, while also priortizing user safety and trail sustainability. It combines the rehabilitation of existing routes with the recommendation of new sustainable and more enjoyable trails.

When fully constructed the system will be composed of:

- 7.2 miles of hiking trails
- 5.8 miles of equestrian and hiking trails

Of these miles, 4.5 miles are already existing in Iroquois Park and will most likely require rehabilitation and maintenance as part of the new system. The remaining 8.5 miles of trails are new additions to the system, connecting gaps, and creating an environmentally sustainable, enjoyable, accessible, safe, and low-maintenance trail system.

Specific improvements include:

- Re-routing existing sections of the perimeter loop trail to be more sustainable
- Developing more hike only options in the summit area of the park
- Connecting summit trails to scenic overlooks via hike only trails
- Providing neighborhood connections to the perimeter loop trail at Bruce Ave, Sanders Gate Rd, and Norway Dr
- Providing connections from the existing perimeter loop trail to the summit trails

Note that many of these proposed alignments follow Olmsted's original trail recommendations for Iroquois Park and address the unsustainable grades shown in the existing conditions map on page 18 of this document.

Proposed trail network by the numbers

8.5 miles of proposed new trails

4.5 miles of existing trails incorporated into the trail system

0.7 miles of unsustainable trails to be decommissioned

13.0 miles of trails at full build out

TABLE 4.3 IROQUOIS PARK PROPOSED TRAIL ALIGNMENTS

Trail ID	Name	Mileage	Management	Trail Narrative	Type	Cost Estimate
IP-1	Golf Course ReRoute	0.3	Equestrian and Hike	Re-route the existing equestrian trail to avoid conflicts with the golf course and segments of fall line trail. Proposed equestrian trail alignment is consistent with the original Olmstedian vision.	Proposed Equestrian and Hike	$12,938
IP-2	Rundill Road Trail	0.6	Equestrian and Hike	Develop a new equestrian and hike-only trail paralleling Rundill Rd. Trail would provide short loop options from the stables or amphitheater parking lot. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Equestrian and Hike	$24,518
IP-3	Norway Dr Connector	0.1	Equestrian and Hike	Develop a new equestrian and hiking trail that connects to the end of Norway Dr and enhances access for surrounding neighborhoods.	Proposed Equestrian and Hike	$5,528
IP-4	Rundill Dr Connector	0.1	Hike Only	Renovate and improve the existing trail connection from Rundill Rd to the Equestrian Trail.	Existing Hike Only	$1,953
IP-5	Jacob's Trail	1.0	Hike Only	Develop a new hike-only trail leading from Rundill Rd up the ridgeline to Toppill Rd. Provide segments of stairs where needed to navigate steep terrain. Ensure adequate visibility at road crossings. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$41,121
IP-6	North Entry to Overlook	0.5	Hike Only	Develop a new hike-only trail leading from the intersection of Rundill Rd and Iroquois Park Rd to the north overlook parking area. Provide segments of stairs where needed to navigate steep terrain. Ensure adequate visibility at road crossings. Proposed equestrian trail alignment is consistent with the original Olmstedian vision.	Proposed Hike Only	$18,469
IP-7	Playground Connector	0.2	Hike Only	Develop a new hike-only trail leading from the playground up the ridgeline to the new Upland Forest Loop Trail. Provide segments of stairs where needed to navigate steep terrain. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$9,508
IP-8	Olmsted Woodland Trail	0.6	Hike Only	Develop a new hike-only trail leading from the amphitheatre parking lot up the ridgeline to the Jacob's Lodge area. Route provides a relatively direct connection between the primary Iroquois Park trailhead and the summit. Provide segments of stairs where	Proposed Hike Only	$24,469
IP-9	Upland Forest Trail #2	1.5	Hike Only	Develop a new hike-only trail midway between the summit and the equestrian trail ringing the park. Ensure adequate visibility at road crossings. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$58,201
IP-10	Jacob's Lodge Connector	0.1	Hike Only	Develop a new hike-only trail that connect the proposed Overlook to Overlook Trail to the Jacobs Lodge area. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$2,313
IP-11	Palatka Road Connector	0.2	Equestrian and Hike	Develop a new equestrian and hike trail connecting Sanders Gate road to the proposed Rundill Rd Trail. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Equestrian and Hike	$6,188
IP-12	Palatka Road Connector	0.1	Hike Only	Provide a hiking-only trail connecting adjacent neighborhoods into the park trail system from Palatka Road.	Proposed Hike Only	$3,280
IP-13	Rundill Rd Trail to Equestrian Trail Connector	0.1	Equestrian and Hike	Connect a short equestrian and hiking trail connecting the Rundill Rd Trail to the existing equestrian trail. Trail provides short loop options for trail users coming from the stables or the amphitheater parking lot. Proposed alignment is generally consis	Proposed Equestrian and Hike	$1,014
IP-14	Neighborhood Connector	0.4	Hike Only	Develop a new hike-only trail that connects the equestrian trail to the proposed Upper Forest Loop Trail. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$13,869
IP-15	Overlook to Overlook Trail	0.6	Hike Only	Develop a new hike-only trail that links the North and South Overlooks just below the summit. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$23,805
IP-16	Disc Golf ReRoute	0.5	Equestrian and Hike	Reroute the existing equestrian trail to avoid conflicts with the disc golf area and to eliminate two fall line sections of trail. Ensure adequate visibility at proposed road crossing.	Proposed Equestrian and Hike	$18,390
IP-17	Upland Forest Loop Trail	0.1	Hike Only	Develop a new hike-only trail midway between the summit and the equestrian trail ringing the park. Ensure adequate visibility at road crossings. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$753
IP-18	Upland Forest Loop Trail	0.1	Hike Only	Develop a new hike-only trail midway between the summit and the equestrian trail ringing the park. Ensure adequate visibility at road crossings. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$23
IP-19	North Overlook Trailhead Connector	0.1	Hike Only	Develop a new hike-only trail connecting the Upland Forest Loop Trail to the north overloook trailhead. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$5,876
IP-20	Rundhill Road Trail #2	0.1	Equestrian and Hike	Develop a new equestrian and hike-only trail paralleling Rundill Rd. Trail would provide short loop options from the stables or amphitheatre parking lot. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Equestrian and Hike	$3,179
IP-21	Upland Forest Trail	1.4	Hike Only	Develop a new hike-only trail midway between the summit and the equestrian trail ringing the park. Ensure adequate visibility at road crossings. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$54,817
IP-22	North Overlook Connector	0.1	Hike Only	Develop a new hike-only trail connecting the Upland Foreset Loop to the north overlook. Proposed alignment is generally consistent with original Olmstedian vision.	Proposed Hike Only	$2,936
IP-23	Connector	0.1	Hike Only	Develop a new hike-only trail connecting the Corbly Trail to the North Overlook.	Proposed Hike Only	$5,052

Hike Only Equestrian and Hike

Note that 0.7 miles of existing trails are planned to be decommissioned, which will cost approximately $12,253.

Trail Sustainability Approach

All three of OPC's parks are well-loved, historic, and vital parts of Louisville's community fabric. Despite their special stature within the community, trail conflict and degradation is a long-standing problem that dates back to the early 1990s. The 1994 Olmsted Parks Master Plan recommended a suite of strategies to address environmental damage, limit conflicts between trail users, and maintain some level of historic integrity with Olmsted's original vision. In order to prevent further degradation of the Parks' natural resources and to protect the social and recreation benefits of the trail systems, this plan recommends the following comprehensive trail sustainability for the three parks. While some of these strategies are specific to particular parks, they can easily be transferred to the challenges faced in the other parks as well.

Trail Sustainability Strategies include:

- Implementing a comprehensive assessment and intensive maintenance program on the primary Cherokee Park loop trail system
- Developing additional trail opportunities in Seneca Park and Iroquois Park to lessen user demand on trails in Cherokee Park.
- Seeking to develop a financially-sustainable, formalized annual maintenance program with public and private support for the trail systems within Cherokee, Seneca, and Iroquois Parks.
- Developing an annual monitoring system to assess erosion, forest health, and other applicable environmental issues within all of the parks, and especially Cherokee Park.
- Considering additional management restrictions or trail closures if environmental impacts worsen or persist.

Photos (previous and current pages): Erosion issues in Cherokee Park.Many of the existing trails in the parks, and especially in Cherokee Park, show severe signs of erosion. This includes exposed roots, deep ruts, and water channels. Incorporating the trail sustainability strategies into trail management will help to address these challenges in the parks.

Programmatic Improvements

CONFLICT REDUCTION

In addition, this Plan recommends that significant action be taken to address current user conflicts. Posting signs, equipping volunteer trail patrol persons, and using brochures and campaigns through OPC's website to educate public on trail etiquette is strongly encouraged for the three parks. Emphasis should be on bicycle yield, equestrian courtesies, dog on leash and safe practice for emergencies.

Despite trail improvements that are made within Iroquois, Cherokee and Seneca Parks, user conflicts cannot be eliminated but they can be reduced. Steps to promote conflict reduction include:

- Anticipate issues—Including reckless and unsafe behavior; incompatible uses; trespassing; illicit use, disturbances and adverse environmental impacts. Respond to illegal or disturbing activity quickly.
- Consider varied user goals—Recognize the different goals of different users, such as equestrians and bicyclists, and separate where feasible.
- Educate—Provide user education through signage, volunteer patrol, maintenance volunteers, brochures, and media campaigns.
- Enforce—Post user courtesy signs and etiquette for bicyclists. Citing and ticketing is unlikely, but volunteer patrols can speak directly with users about reckless behavior including excessive speeds if caught in the act.
- Anticipate the need for adequate capacity—Provide equitable trail mileage and bicycle, pedestrian, and trail acreage across the three parks to accommodate user populations.
- Solicit input from user groups—By providing contact information to report problems and responding promptly and effectively to complaints, concerns, or suggestions.
- Monitor problems—Track, document, and log problem areas and address problems through design and management.

WAYFINDING SIGNAGE PLAN

A trail wayfinding plan and consistent signage design will reflect the character of Louisville parks and reinforce the value of the assets offered to visitors. Signage also helps with distance tracking and wayfinding. A consistent approach to selecting and signing trails is necessary where limited space is available for information and a multitude of potential points of interest exist. The most appropriate location for wayfinding is at trail intersections. Consideration of the natural landscape in wayfinding design and placement is of utmost importance in maintaining the integrity of the natural landscape.

Trails that overlap with the natural surface trails should be signed. Simple gateway signage is informative and helpful for trip tracking. See the Trail Design Guidelines section for general information to include on wayfinding signage.

MAINTENANCE RECOMMENDATIONS

Currently, the three parks do not have an

established operations and maintenance (O&M) plan. Developing a strong O&M plan is a critical step in maintaining a trail system that is sustainable, functional and an attractive asset. A well-maintained trail provides numerous benefits, but also requires considerable work. Those benefits include:

- Providing for a more positive user experience
- Protecting investment in the trail by identifying and rectifying issues in a cost-effective and timely manner
- Minimizing liability concerns
- Maintaining positive relations with trail neighbors and the larger community
- Creating more local pride in the trails as a positive community resource
- Improving user safety and safety perceptions
- Deterring acts of vandalism by demonstrating commitment to the trail

A detailed O&M plan for the park trails was not part of this project's scope of work. Investing in an O&M plan is recommended, especially if investments are made to upgrade, replace, or improve sections of trail based on this trail plan.

Develop Good, Current Data

Keeping good records of O&M activities and including documenting accidents, incidents, damage, and other issues on the trails will help with record-keeping and future improvements. This would be facilitated using GPS locations of problems and incorporating into GIS mapping systems. Good mapping helps identify possible "problem areas" and "incident clusters."

Monitoring Trail Conditions

Schedule and document inspections to determine the amount of use, location, age, type of construction, and condition of trails and their ancillary features: railings, bridges, signage, etc. Evaluate and remove all obstacles or objects that could impede facility usage such as debris, blow downs, snags, sink holes, etc. and provide solutions. Follow-up with the appropriate corrective measures in a timely manner.

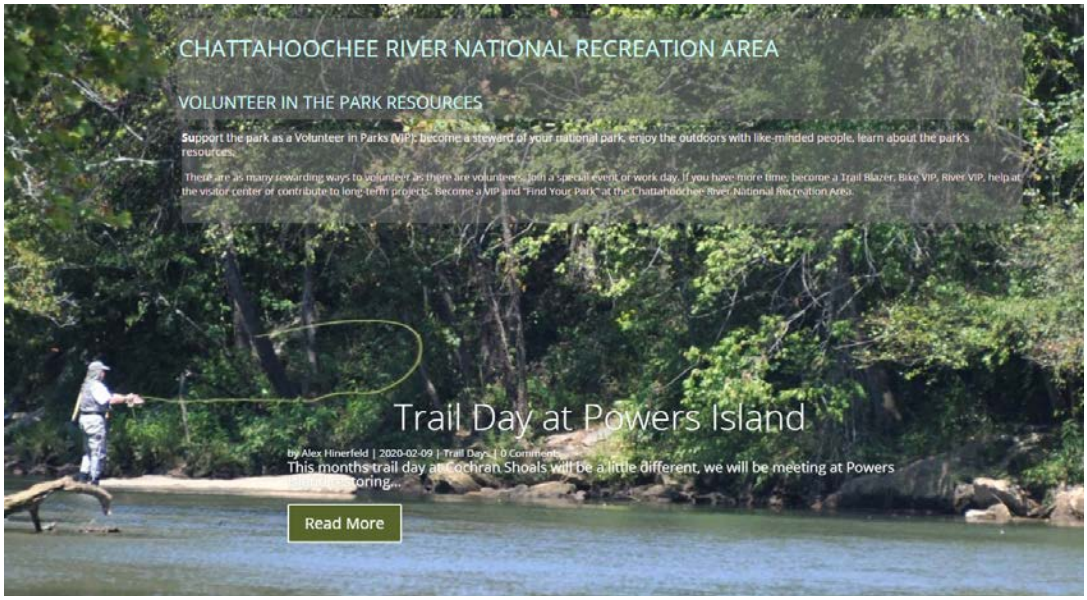
Preventative maintenance

Watch for and identify potential safety and drainage problems such as missing signage, eroded areas, a missing railing, washout from flood events, snow and ice buildups (especially hidden ice and snow), flash flood issues, storm water drainage and/or erosion issues. It is important to check for these after events like storms or post construction along the trails once improvements are made.

Landscape Management

Based on a field review of the trails in early spring 2019, invasive species are present in the parks. A detailed inventory of landscape was not completed as part of this project, and therefore the extent of infestation could not be determined. However, based on typical patterns of invasive species, populations will increase over time if control measures are not implemented, diminishing the aesthetic appearance, the wildlife habitat value, and the cost for control in the future.

The main invasive species noted in the parks are Bush Honeysuckle, and Olmsted Parks Conservancy has taken steps to manage it in several parks. The other dominant or more numerous invasive species noted were stiltgrass and privet.



The Chattahoochee River National Recreation Area has a model program for Trail Patrol and other volunteer maintenance programs. https://www.crnra.vip/

Cost for honeysuckle control ranges from approximately $3,000-$4,000/ac. As is typical for most invasive species management, there will need to be a followup treatment to eradicate invasives that survive the initial treatment.

STAFF RECOMMENDATIONS

Trail Steward

In total, Cherokee, Seneca and Iroquois Parks comprise over 27 miles of trails across all three parks. Given the acreage, mileage, maintenance demands and geographic challenges, a Trail Steward is recommended to oversee, coordinate and direct the trail management operations of the three parks. Ideally, the responsibilities of the Trail Steward will go beyond maintenance of existing trails and include the construction of future new trails. The Trail Steward should work very closely with Louisville Park staff and OPC staff to coordinate trail management activities.

The Trail Steward would be responsible for training, managing, and coordinating volunteer trail crews and ensuring that a work program of maintenance and management is carried out to properly steward trails, trailheads, signage systems, landscape and forest management, and other elements of Olmsted park trails. The Trail Steward should participate in preparing annual budgets for trail improvements or new trails and define the maintenance, management and operations of park trails. Monthly or biweekly email reports of trail conditions and labor accomplishments are an expected duty of the position.

VOLUNTEER TRAIL CREW

Currently, OPC works with individuals and organizations to maintain park trails, including the Kentucky Mountain Bike Association and Red Zone Youth Cycling

Team. Based on the extent of the three parks' trails and the maintenance required, a more recurrent program would balance the demands of the trails with available volunteer labor. For the summer and fall seasons, OPC should establish a Volunteer Trail Crew. An example of a concentrated volunteer work program would be a three-week staggered effort during the summer and a one-week effort in fall. The concentrated schedule will provide sufficient labor required without burdening resources.

Volunteer trail crews work directly with the Trail Steward to carry out trail maintenance, management, and stewardship of the trails, trailheads, signage systems, landscape, and vegetation along park trails. The trail crew will report to the Trail Steward, who will establish work schedules and priorities. Trail crews will be furnished with equipment, supplies, tools, and other necessary gear to carry out their responsibilities.

VOLUNTEER TRAIL PATROLS

OPC and Louisville Parks and Recreation should work together to establish volunteer trail patrol roles for the parks. Trail patrol roles can be limitless since the goal is for users to enjoy the trails but also become the eyes, ears and voice of the trail system. A similar model is employed by the National Park Service in their parks. Trail patrols will make the trail systems a more safe, clean and user-friendly place. Active involvement by users will deter and reduce unwanted behavior and increase maintenance action.

Each of the three parks has rules and regulations designed to make the park a safe and enjoyable place for visitors. Trail patrols will follow all of the park rules but also provide a positive role model to park visitors. Specifically for shared-use trails, communicating etiquette to trail users is one of the most important ideas to remind all trail users to use the trails courteously. Trail patrols could also be trained to provide first aid, report or take care of safety concerns, and repair minor bike mechanical issues.

Trail patrols would complete training provided by OPC and Louisville Parks and Recreation to understand all park rules and regulations, issues and reporting.

SAFETY AND SECURITY

CPTED AND TRAILS

Safety is a duty and obligation of public facility managers in the planning, design, and operation of public space. No park or trail is immune to crime or unwanted behavior, however, using multiple overlapping measures to combat crime can greatly reduce opportunities for unwanted or suspicious behavior on Olmsted park trails. A combination of Crime Prevention Through Environmental Design (CPTED) principles, public education, a strong maintenance program, and programmatic and operational measures can minimize negative safety perceptions, limit criminal and unwanted activity, and bestow positive impacts on the trails.

CPTED: Improving Quality of Life

CPTED is a proactive approach in which the design and effective use of the built environment can lead to a reduction in the fear of and incidents of crime and asocial behavior, and an improvement in quality of life. CPTED promotes high quality and visually pleasing solutions as first responses that aim to enhance the legitimate use of space, or in this case, the trails.

The Principles of CPTED are:

- Natural Surveillance
- Natural Access Control
- Territorial Reinforcement
- Maintenance

Natural surveillance

Increasing visibility by occupants, neighbors and casual observers increases the detection of unwanted behavior. For instance, if an eight-foot-high privacy fence blocks the view of a trail, the lack of visibility may invite behavior that impacts trail users negatively. The use of transparent fencing that allows an unobstructed view of the area by users or passers-by may discourage unwanted behavior. Positive natural surveillance along trails includes maintaining open sight lines, using transparent fencing where fencing is desired, keeping vegetation maintained, and working with adjacent uses to provide unobstructed views to the trail (“eyes on the trail”).

Natural access control

Natural access control employs both real and symbolic barriers—including fences, berms, and vegetation—to define and limit access to an adjacent building or other use along trails. For example, if there are adjacent apartments along a trail, a low berm or vegetated buffer could be planted that still allows natural surveillance from the buildings onto the trail but controls access between the apartments and the trail, delineating the two uses.

Territorial reinforcement

This is the process of establishing a sense of ownership, responsibility, and accountability for the public trail, and to impress upon visitors that a space is cherished by its neighbors. Olmsted Parks Conservancy is currently doing this within the parks with the consistent use of stone and other "identity" materials. However that aesthetic can be extended to the trail systems. Users pay more attention to and defend a particular space if they feel psychological ownership of it. Territorial reinforcement measures, which may be physical or symbolic, tell people they are in a defined public space. Territorial reinforcement along trails can use color, texture, and hardscape variations to signify that the trail is public. Branding techniques are also successful strategies, such as signage and wayfinding systems.

Maintenance

Neglected property can encourage mistreatment, while well-maintained property will elicit proper treatment. This strategy directly impacts the fear of crime in a community due to residents’ perceptions of responsibility and caring in the neighborhood. For Olmsted park trails, routine and remedial repairs of trail features, keeping landscape regularly maintained to limit areas of concealment, weed and invasives abatement, stormwater and drainage repairs and keeping wayfinding signage maintained.

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05 IMPLEMENTATION

Overview

Implementation of the this plan will require a phased approach that accounts for both capital construction and ongoing maintenance. Maintenance needs for the proposed, fully built-out trail system will vary significantly from existing maintenance practices that have been historically intermittent and reactive to emerging issues in the park. The proposed maintenance recommendations are intended to ward off major trail system problems by focusing on routine maintenance, improved coordination, and improved monitoring. Although maintenance efforts and associated funding should expand, the construction (or reconstruction) of new trails in a sustainable manner as detailed in the Design Guidelines section of this chapter should keep efforts at a sustainable level for OPC and Metro Parks.

This chapter specifies proposed phasing for the implementation of these proposed networks that addresses public needs, necessary permitting and pre-construction activities. Although project phasing is recommended, OPC and Louisville Parks and Recreation should remain flexible and opportunistic in regards to implementation. Deviation from the proposed implementation schedule may be warranted if opportunities exist to construct projects more economically, partner with other agencies, respond to specific grant funding, or address a pressing public need.

Note that the implementation for the recommended trail systems will vary by park, trail, and intended use.

Capital Costs

The following guidelines may be used to approximate capital costs prior to the bidding process. For planning purposes, new trail construction has been estimated at $7.50 / lineal foot for all new trails, however actual construction costs will likely vary due to site-specific constraints and timing of implementation. Additionally, some segments of the existing trail system may benefit from minor renovations that are not included in the existing cost estimates.

See Table 5.1 and the following sections for estimated capital construction costs and general best practices relevant to Cherokee, Seneca, and Iroquois Parks.

Maintenance Costs

Regular annual maintenance is a critical component of a high-quality trail system. Without proper and timely maintenance, trails are at risk of erosion, overgrowth, and degradation, which can have a negative impact on both safety and the user experience. Trail maintenance is also crucial for minimizing impact on the natural environment, wildlife, and aesthetic beauty of the landscape. Regular maintenance protects the investments made in building trails and ensures that trails will continue to be community assets long into the future.

Table 5.2 and the following sections provides a brief overview of typical trail maintenance tasks and cost estimates, and includes some general best practices.

TABLE 5.1 ESTIMATED CAPITAL CONSTRUCTION COSTS

TRAIL TYPE	SUB-TYPE	DISCUSSION/DESCRIPTION	PLANNING-LEVEL COST
Construction of hike, bike, or shared use singletrack, 30” - 40” wide	Typical	10% - 30% sideslopes; minimal vegetation; minimal rock; climbing turns or small berms; no drainages; no armoring or retaining walls; easy access to work site	$7.50 per LF
Decommission	Decommission	Decommissioning active existing trails for rehabilitation	$3-4.00 per LF

TABLE 5.2 ESTIMATED ANNUAL MAINTENANCE COSTS

MAINTENANCE / MANAGEMENT	SUB-TYPE	DISCUSSION/DESCRIPTION	PLANNING-LEVEL COST
Annual Maintenance	Sustainably-Built Trails	Costs increase slightly for backcountry trails because of the time associated with mobilizing personnel, equipment, and materials into remote areas.	4% of construction costs
	Unsustainable Legacy Trails	Difficult to estimate; each trail would have to be evaluated individually.	Require individual evaluation
Trail Ranger	Management / Enforcement	Develop a position for a ranger to monitor and manage trail-related activities within Cherokee, Olmsted, and Seneca Parks. Includes salary, benefits, fuel, equipment maintenance, and cell phone.	$81,500 / year

Natural Surface Trail Maintenance Resources

- » USFS Trail Construction and Maintenance Notebook
- » IMBA Trail Solutions: Chapter 7 Maintenance
- » Minnesota DNR Trail Planning, Design, and Development Guidelines

NATURAL SURFACE TRAILS

Natural surface trail maintenance varies widely based upon the original trail design and routing, soils, surrounding environment, drainage, user types, user volumes, and a number of other features. The following general maintenance activities should be conducted on trails that OPC will maintain.

INSPECTIONS

Inspections on natural surface trails should be conducted at least twice yearly in spring and fall. A trail assessment form should be completed by OPC staff that identifies and locates all trail maintenance issues in need of attention. IMBA and the USFS have sample forms that could be used for this purpose.

DRAINAGE AND TREAD REPAIR

Periodically, due to user traffic or drainage, trail treads will require maintenance. Trail tread should be restored to its original design condition. Restoration of the tread should include removal of slough or organic material, loose rocks, stumps, or roots that exceed the original specifications of the trail. Drainage repairs can vary widely from construction of drainage dips and knicks to culverts.

PRUNING AND VEGETATION REMOVAL

Pruning of vegetation and trees is a critical maintenance activity. Trails should typically be cleared four feet on the uphill side and a minimum of eight-feet overhead. Trees and shrubs should be cut as close to the ground as possible to prevent protruding stumps.

SIGN REPAIR OR REPLACEMENT

Proper maintenance and replacement of signs helps provide a good user experience and can prevent unauthorized social trails. Signs should be checked for fading or vandalism twice yearly, or as part of monthly visual inspections.

STRUCTURE MAINTENANCE

Structures such as trail bridges, culverts, and retaining walls should be checked yearly for failure or risk of failure. If any structures pose a safety risk to trail users, the trail should be closed and repaired as soon as possible. If closure is anticipated for more than a couple of days, an alternate route should be provided as a bypass. Trail bridges should be checked to make sure abutments and support members are structurally sound. Culverts should be

checked for blockages. Retaining walls should be checked for proper batter and loose stones.

TRAIL DECOMMISSIONING

Decommissioning, or removal, of undesirable social trails is an important component of a comprehensive natural surface maintenance strategy. Social trails can confuse users, increase the trail system's impact on the landscape. Decommissioning of unwanted socials trails can vary widely from simple closure signage to complete obliteration and naturalization of the trail. Unsustainable, rogue, or historically-problematic trail segments should be closed and decommissioned. Sufficient resources to close trails and access points, obliterate trail treads, and prevent future access so that social trails do not re-emerge should also be appropriated. Partner with local trail advocates to promote and enforce trail closures.

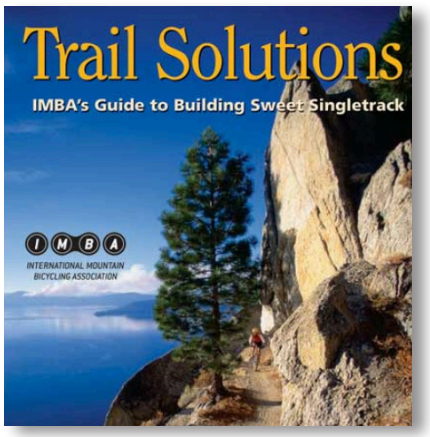
TYPICAL PLANNING LEVEL TRAIL MAINTENANCE COSTS

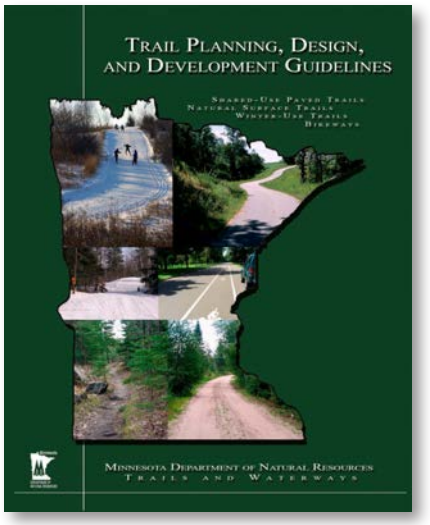
Trail maintenance costs can vary widely on natural surface trails due to a number of variables such as use levels, exposure, soils, and sustainability of the initial trail construction. As a rule of thumb, land managers should budget approximately 5% of the initial construction cost of a natural surface trail for annual maintenance activities, such as those described above. This estimated maintenance cost should only be applied to sustainably constructed trails. Social trails, fall-line trails, or other trails not constructed to sustainable trail standards may require significantly more maintenance depending on local conditions.

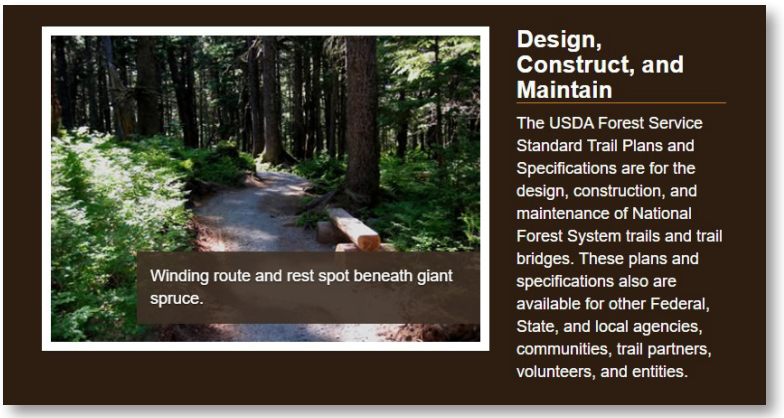
Trail Design Guidelines

Trails are one of the primary ways in which people experience Cherokee, Seneca, and Iroquois Parks. Natural surface trails that are carefully and sustainably sited within the these parks will promote an enjoyable user experience and minimize future maintenance requirements. These design guidelines specify how trails and supporting facilities should be designed and constructed. The following guidelines compile best practices from numerous natural surface trail design manuals including:

- The Federal Highway Administration's (FHWA) Manual on Uniform Traffic Control Devices (MUTCD) defines the standards to install and maintain traffic control devices on all public streets, highways, bikeways, and private roads open to public traffic.
- US Forest Service Standard Trail Plans and Specifications
- IMBA Trail Solutions: IMBA's Guide to Building Sweet Singletrack
- Minnesota DNR Trail Planning, Design, and Development Guidelines







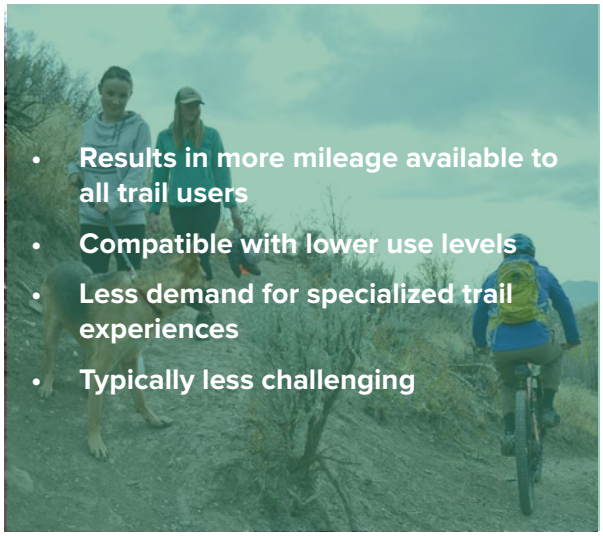
Recommended Trail Types

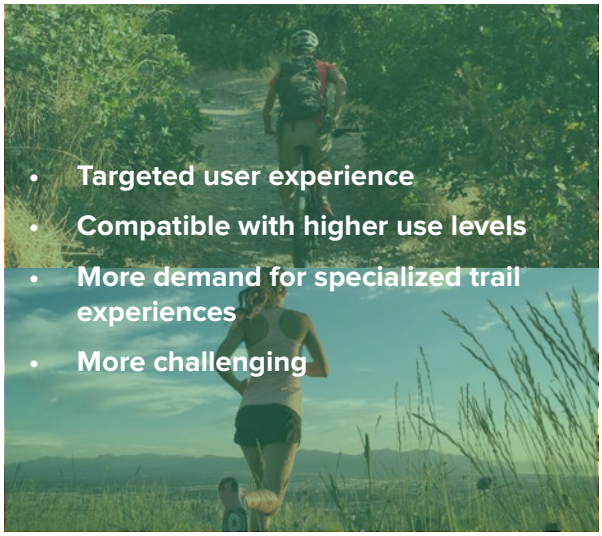
	SHARED USE TRAILS	BIKE-ONLY DESCENDING TRAILS	HIKE-ONLY TRAILS	UPHILL BIKE / MULTI-DIRECTIONAL HIKE	EQUESTRIAN / HIKE TRAILS
Description	Shared-use trails accommodate all types of non-motorized trail users (most commonly hikers, bicyclists, and equestrians)	Bike-only descending trails are constructed to enhance the experience and efficiency of riding a bicycle	Hiking-only trails are constructed to facilitate access to hikers and trail runners.	Uphill bike / multi-directional hike trails are designed to accommodate hikers in either direction and uphill bicyclists. No downhill bike traffic allowed	Equestrian / hike trails are designed exclusively for use by equestrian trail users, walkers, trail runners, and hikers.
Tread Width	36"-72"	36"-72"	12" min.	24"-40"	48" Min.
Running Slope	Overall running slope of 10% or less (up to 15% for short segments)	Overall running slope of 6-8% or less to limit braking (up to 15% for short segments)	Can be routed with steeper running slopes up to 15% (depending on local soil conditions)	Can be routed with steeper running slopes up to 15% (depending on local soil conditions)	Overall running slope of 10% or less (up to 15% for short segments)
Cross Slope	5% max	5% max	8% max	5% max	5% max
Appropriate Characteristics	Small berms, rollers, slow-speed technical features, clear sightlines on faster segments of trail	Larger berms and/or high speed features, jumps, drops, elevated structures, and other technical features suited to bicyclists	Narrow tread, steps (where needed), tight switchbacks	Gentle to moderate trail profile slopes, slow speed trail characteristics	Higher vertical clearance 10' required, good sightlines
Inappropriate characteristics	Large berms, jumps, drops, high-speed features	Mandatory advanced features without "ride-arounds"	Large berms, jumps, drops, high-speed features	Large berms, jumps, drops, high-speed features	Large berms, jumps, drops, high-speed features
Management Considerations	Typically managed as shared use	Direction of travel is commonly specified	May be designed as single-use, or preferred-use trails; if bicyclists are permitted, direction of travel may be specified	Post "No downhill bikes" at upper access points to trail	Include trail yielding etiquette signage

Trail Management Considerations

SHARED-USE TRAILS VS. SINGLE-USE TRAILS

Natural surface trails can be managed and designed as shared use (allowing all types of non-motorized trail users), preferred use, or single use (allowing a single type of trail user).





Shared Use ⟷ **Single Use**

SHARED USE DESIGNATION CONSIDERATIONS

- Shared use trails accommodate the broadest range of users and provide the most mileage available to all user groups.
- Promotes shared stewardship of the trails.
- Cost- and resource-efficient, taking advantage of available space and trail mileage. This results in fewer miles than would be necessary to accommodate trails for individual user groups.
- Support the most visitors. Trails that lead to specific major destinations, such as historic features and scenic vistas, should be considered for shared use, since most visitors will be drawn to the point of interest regardless of the mode they'll use to get there.
- Preferred-use trails allow two or more user types to access a trail but are designed to primarily accommodate the experience of only one of them.

SINGLE-USE DESIGNATION CONSIDERATIONS

- Single use trails can alleviate congestion and conflicts among user groups when used in conjunction with shared use trails.
- Single use trails can be more technical or rugged, or provide higher quality trail experiences catered to a single trail user group.
- Single use trails can accommodate narrower tread widths without compromising the safety or enjoyment of other trail users.
- Single use trails can also help to mitigate site-specific constraints such as poor sightlines, steep terrain (by allowing construction of stairs), or sensitive environmental areas.

Trail Alignment Best Practices

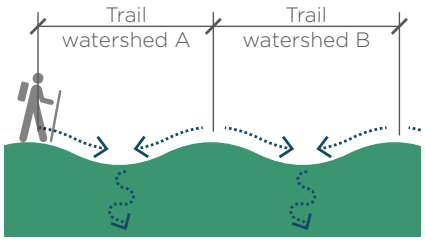
TRAIL ALIGNMENT PRINCIPLES*

IDENTIFY CONTROL POINTS

Positive control points are places that people want to go. These points might include scenic overlooks, trail access points, interesting landforms, water, or historic sites. Negative control points are places that the trail system should avoid. These could include places like private property, sensitive environmental resources, or safety hazards. By routing trail users to places they instinctively want to go and avoiding potential liabilities, trail planners can mitigate the potential for unauthorized social trails while limiting trail user exposure to unsafe or undesirable places.

ADHERE TO THE HALF RULE

Trails whose running slope generally exceeds more than half the grade of the sideslope it's crossing are considered "fall line" trails. Drainage crossing a fall-line trail will follow the trail rather than crossing it creating a high probability for erosion.

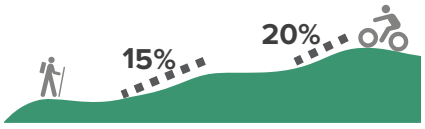


ROLLING CONTOUR TRAILS

Rolling contour trails gently undulate while traversing side slopes to divide trails into distinct trail watersheds. Trail watersheds limit the amount of drainage flowing across a trail by combining an out-sloped trail tread with frequent high and low points (grade reversals) along the trail profile.

10 % MAX. AVERAGE GRADE

An overall trail grade of less than or equal to 10% provides a general framework for a sustainable trail profile. An overall trail grade of 5-7% allows for some undulation and for short sections approaching 10%. Overall trail grades below 10% are also suitable for most soil types and minimizes erosion.



MAXIMUM SUSTAINABLE TRAIL GRADES

Maximum sustainable trail grades relate to short segments (10' or more) that may exceed the recommended overall average grade of 10%. Typically maximum sustainable trail grades vary between 15% and 20% depending on soil type, rock, annual rainfall, direction of travel or many other factors.

CREATE LOOPS

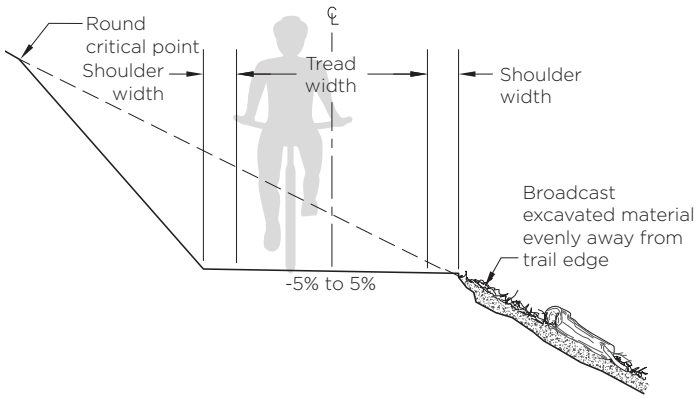
Routing trails as loops where feasible provides a more interesting trail experience. "Out and back", or dead-end trails sometimes promote the development of social trails when trail users are temped to create their own loops.

Trail Construction

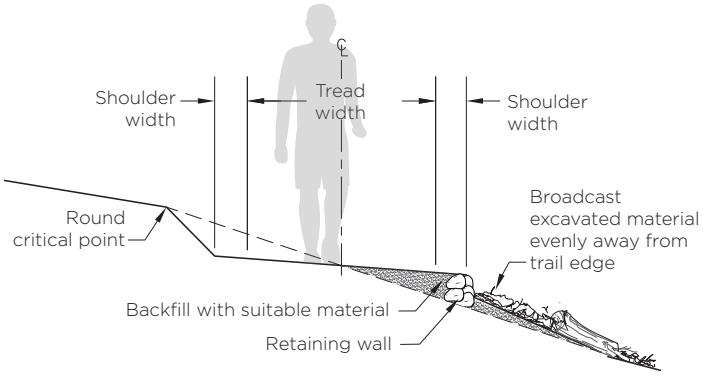
NATURAL SURFACE TRAIL CONSTRUCTION

Natural surface trails meet the recreational demands of hikers, mountain bikers, equestrians, and other non-motorized recreational trail users. Proper trail construction is important to reduce ongoing maintenance costs as well as to ensure that the trail is both usable and enjoyable for intended user groups.

FULL BENCH CONSTRUCTION TRAILS



PARTIAL BENCH CONSTRUCTION TRAILS



DESIGN STANDARDS

- **Tread:** Trail surface should be compacted native material soil.
- **Trail Benching:** Full bench trails provide the most durable trail construction however partial bench trails can provide an adequate trail surface where full bench trails are not possible or “singletrack” is desired without waiting for vegetation to re-naturalize adjacent to the trail. Partial bench trails are only allowed with retaining walls on the downhill side.
- **Trail Texture:** Trail texture should vary based on intended user skill level, with smoother trails for less-skilled users and rugged trails for more-skilled users
- **Tread Width:** Varies by anticipated use levels, skill levels, and types of users (24” - 8’-0”).
- **Horizontal Clearance:** A 1 ft. shoulder maintained with minimum vegetation should be provided free of obstacles.
- **Vertical Clearance:** 8 ft. min., 10’ where equestrian use in anticipated
- **Cross Slope** May vary from -5% to 5%, but always sloped counter to user forces.
- **Running Slope:** Varies by intended trail type, see guidelines on p. 42.
- **Drainage:** Provide regular grade reversals (approximately every 25’) and exits for trail drainage.
- **Erosion Control:** Spread approved native seed mix throughout disturbed soil areas along all new trails.
- **Additional Resources:** US Forest Service Standard Trail Plans and Specifications, IMBA Trail Solutions: IMBA’s Guide to Building Sweet Singletrack (2004)

Construction Methods

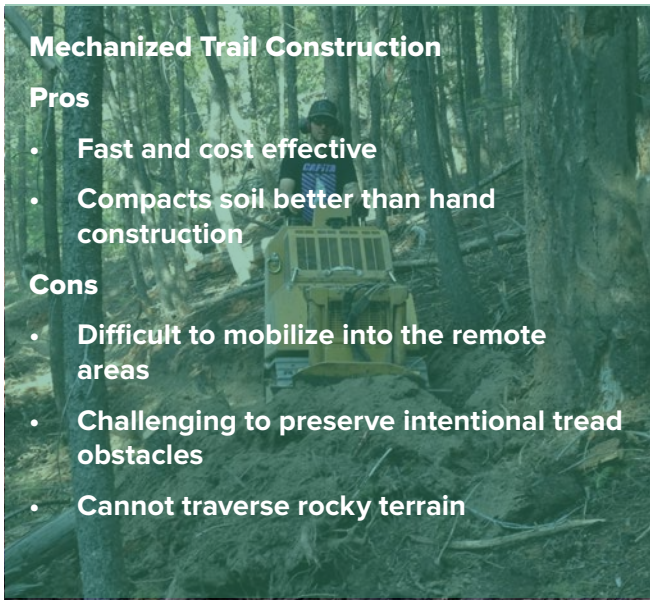
TRAIL CONSTRUCTION METHODS

The manner by which a trail is constructed (mechanized or by hand) influences the finished product. However, the two methods should not be conflated with a desired end result. Rather than rely on an implementation method, a proposed trail should be described using the following performance/design standards:

- Impacts (visual, soil and plant disturbance)
- Tread width
- Tread texture
- Tread shaping (in/out-slope, berms, lips/landings)
- Clearing limits
- Sinuosity/meander
- Drainage features (spacing and amplitude of grade reversals)
- Angle of repose of the back-slope
- Maximum height of tread obstacles

It is then up to the contractor to select the most cost-effective method to build the trail in conformance with the performance standards. For example, a narrow, rugged trail in the backcountry will likely be built by hand whereas a 48”-wide, smooth trail in the front-country will likely be built using mechanized equipment. Even with performance standards it is good practice to mandate maximum equipment size so that unqualified contractors don’t bid on a project expecting to use equipment that is better suited for road building than trail construction.

Other factors besides access and physical characteristics may influence the chosen trail construction method. Schedule and availability of volunteers may also impact trail construction methods.



(Photo Credit: Sagebrush Construction)

(Photo Credit: Bingham Cyclery)

Trail Turns

CLIMBING TURNS

Climbing turns help trail users to gain elevation at a consistent and sustainable grade. There is no constructed platform or landing, and users will be climbing directly in the fall line for a short segment. Therefore, climbing turns should be free-flowing and gentle, and are not suitable for sideslope grades steeper than 7 %.

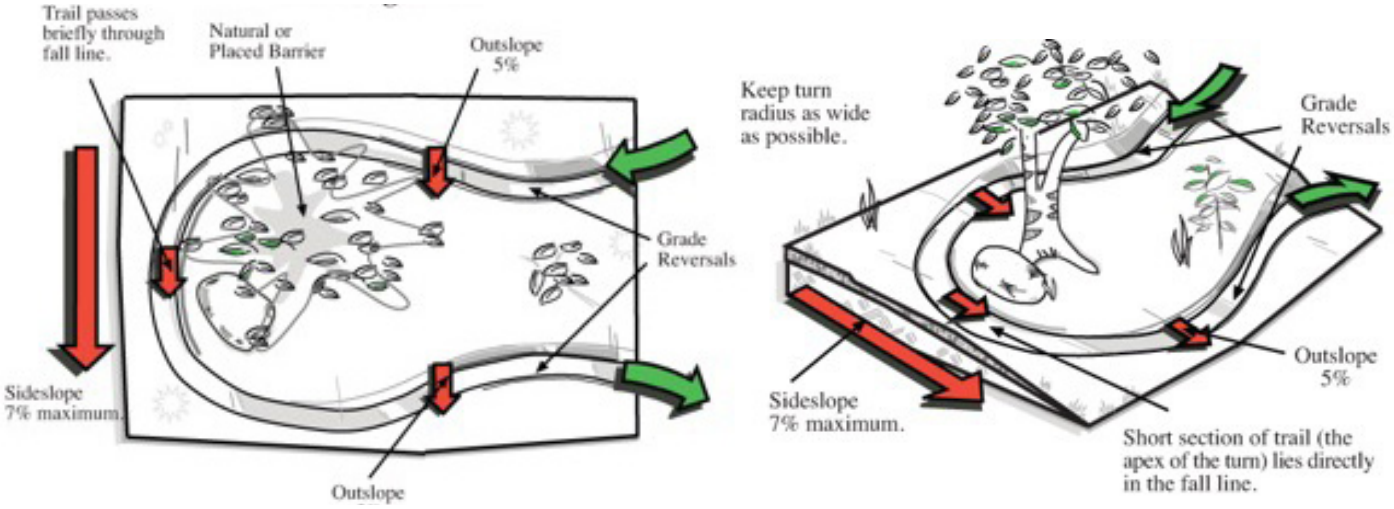


Image Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- Climbing turns can be located on shallow slopes at or below 7%.

Typical Construction

- Climbing turn radii should be kept as wide as possible, ideally 20' or more.
- Upper and lower legs of the turn are joined by a short section of trail that lies in the fall line. Armoring can be used to reduce maintenance on the fall line section of trail.
- Grade reversals should be located above and below the turn.

Trail Turns

SWITCHBACKS

Switchbacks allow trails to reverse direction via a small, constructed platform. Switchbacks are more sustainable than climbing turns on steeper slopes.

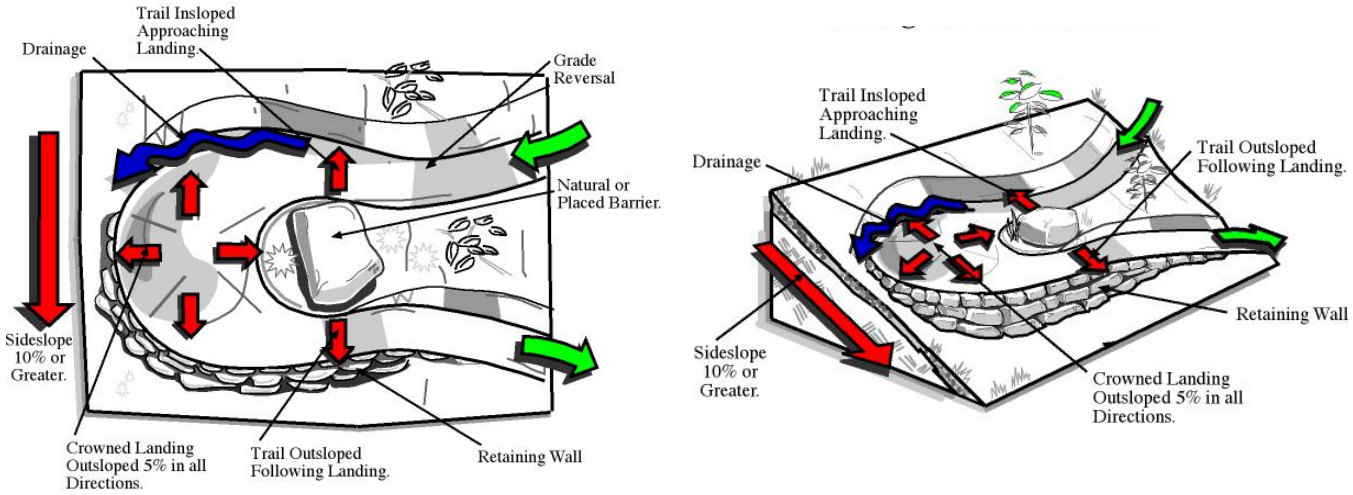


Image Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- Switchbacks should be located on the gentlest slope available. Gentle knobs or other natural platforms are good places to locate switchbacks.
- Stagger switchbacks to avoid short cutting.

Typical Construction

- Turn should be placed on a near level platform that is slightly crowned.
- The turning platform should have a minimum 6' radius.
- Approaches should follow the contour and include grade reversals in advance of the turning platform.
- Grade reversals should be located above and below the turn.
- Approaches should be designed to control trail user speeds into the turning platform to reduce braking and maintenance.
- Material excavated from the top leg can be used to build up the bottom leg.
- Excavated material forming the turning platform and lower leg should be held in place with a retaining wall.

Trail Turns

IN-SLOPED TURNS

In-sloped turns can limit skidding and trail widening for mountain bike trail users at turns in the alignment while providing a fun and sustainable feature.

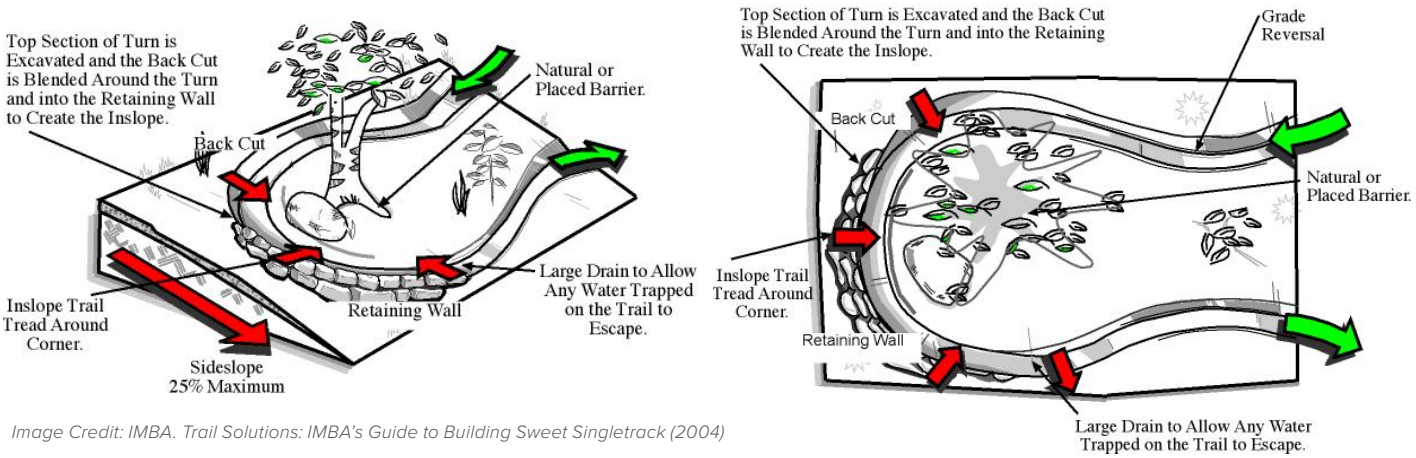


Image Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- In-sloped turns should be considered for any location where slowing is likely needed to allow a trail user to negotiate a turn.
- In-sloped turns work best on gentle sideslopes up to 25%.

Typical Construction

- Approaches should follow the contour and include grade reversals in advance of the turn.
- The approach above the turn should be kept at a relatively gentle grade (5-8%) to keep speeds in check prior to the turn.
- The approach below the turn should be brief but steep (around 15%).
- Keep the radius of the in-slope turn between 10 to 15 feet.
- Position the turn around a natural features such as a boulder or tree to prevent short-cutting of the turn.
- Keep sightlines clear since trail users will be capable of navigating these turns at higher speeds.

Trail Drainage Crossings

NATURAL SURFACE TRAIL DRAINAGE CROSSINGS

Trail crossings of drainages can span a variety of treatments depending on the size, flows, and frequency of water flowing through the drainage.

Direct Crossing

Hardened Crossing

Culvert

Bridge

Increasing drainage flows and frequency

Increasing construction complexity & cost

Increasing water quality protection

RECOMMENDATION APPLICATION

Direct Crossing

- Direct crossings can be utilized for drainages where flows are spread out and clearly intermittent and the facility is low-use.

Hardened Crossings

- Hardened crossings are most appropriate for drainages that experience seasonal, slow moving water that would otherwise erode a trail.
- Trail hardening can be accomplished through a variety of materials such road base or large flat stones tightly fitted together.

Culverts

- Culverts are most appropriate for drainages with periodic flows in narrow, defined channels where ramping up to the crossing is not necessary.
- Culverts shall be armored around the inlet.

Bridges / Boardwalks

- Bridges or boardwalks are the preferred crossing strategy for all drainages with flowing or continuously present water.
- Deck width shall match the trail width.

Trail Drainage Improvements

ROLLING GRADE DIPS

Rolling grade dips are useful in draining water from a trail whose slope is too steep to be drained by a knick alone. Rolling grade dips are preferred over waterbars which require frequent maintenance and compromise the trail user experience. Rolling grade dips may have limited application within the Louisville parks as they require cohesive soils that are not common throughout most of the project area.

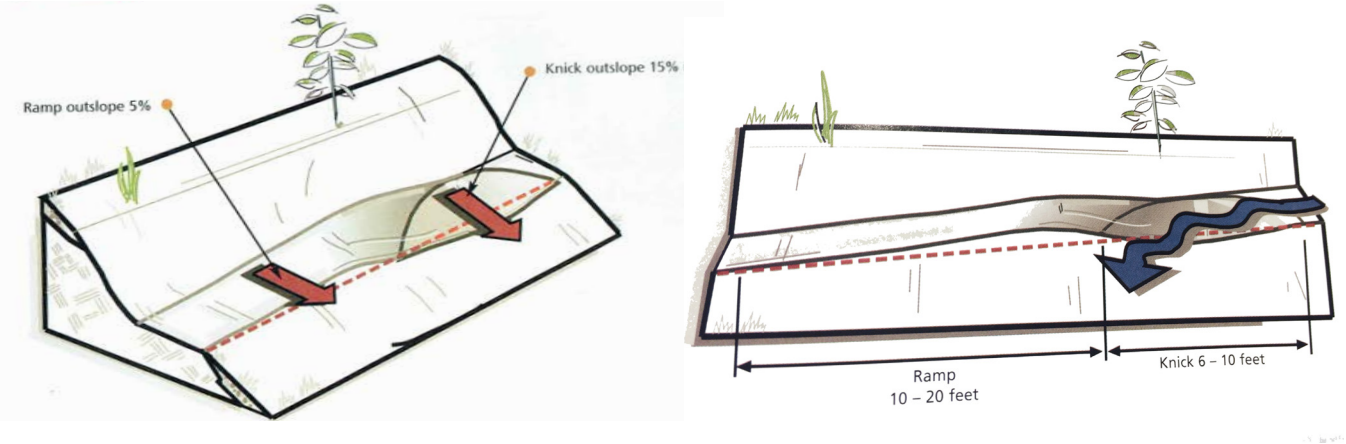


Photo Credit: IMBA. Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

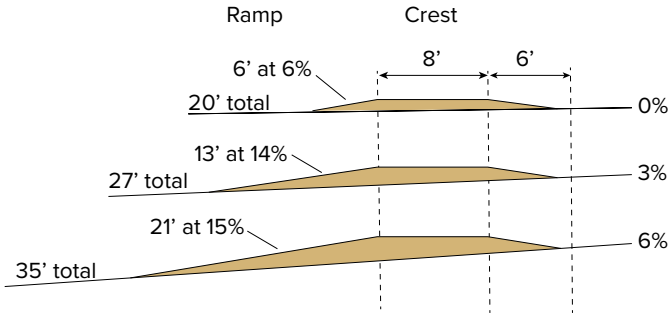
DESIGN STANDARDS

Typical Placement

- Rolling grade dips are typically located at sections of trail where water flows down the trail rather than across it.
- Rolling grade dips can be employed on steeper slopes than knicks.
- Rolling grade dips should only be installed on cohesive soils. Sandy or gravelly soils are not conducive to construction of rolling grade dips.
- Rolling grade dips are best located at a natural roll or change in trail grade that can be enhanced.
- Rolling grade dips are generally most useful when placed near the mid-point of a segment of descending trail.

Typical Construction

- A rolling grade dip features a knick followed by a crest and a long, gentle ramp hindering water from flowing down the trail
- Ramps and crests should be thoroughly compacted and consolidated to resist the velocity of water running down the trail.
- Typically, soil excavated from the knick can be used to construct the crest.



Diagrams adapted from MNDOT Trail Planning, Design and Development Guidelines (2006)

Trail Drainage Improvements

KNICKS

Knicks are effectively out-sloped drains. Knicks can be utilized to re-direct water off of poorly draining sections of trails on gentle slopes.

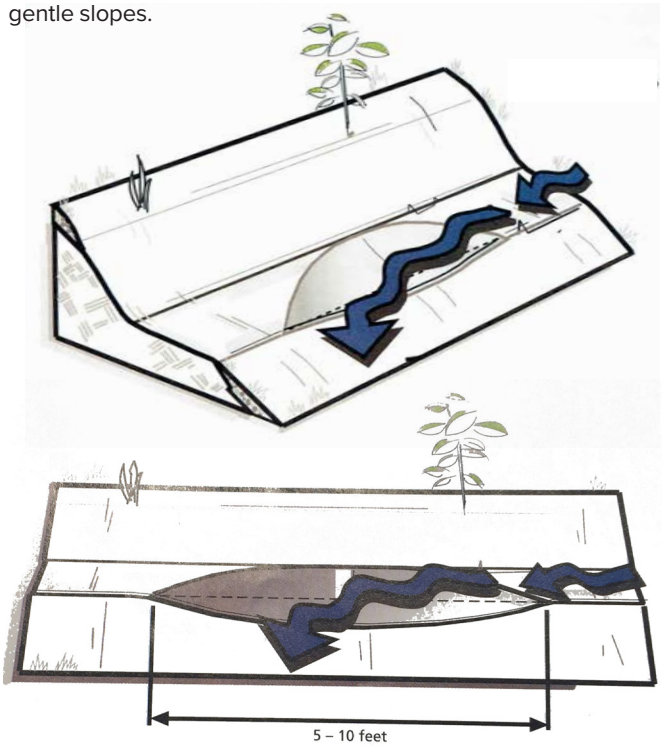


Image / Photo Credit: Trail Solutions: IMBA's Guide to Building Sweet Singletrack (2004)

RECOMMENDED APPLICATION

Typical Placement

- Knicks are normally located on gradual segments of existing trail where puddling occurs.
- Knicks should be located adjacent to ground lower than the trail so that the knick will have a place to drain.

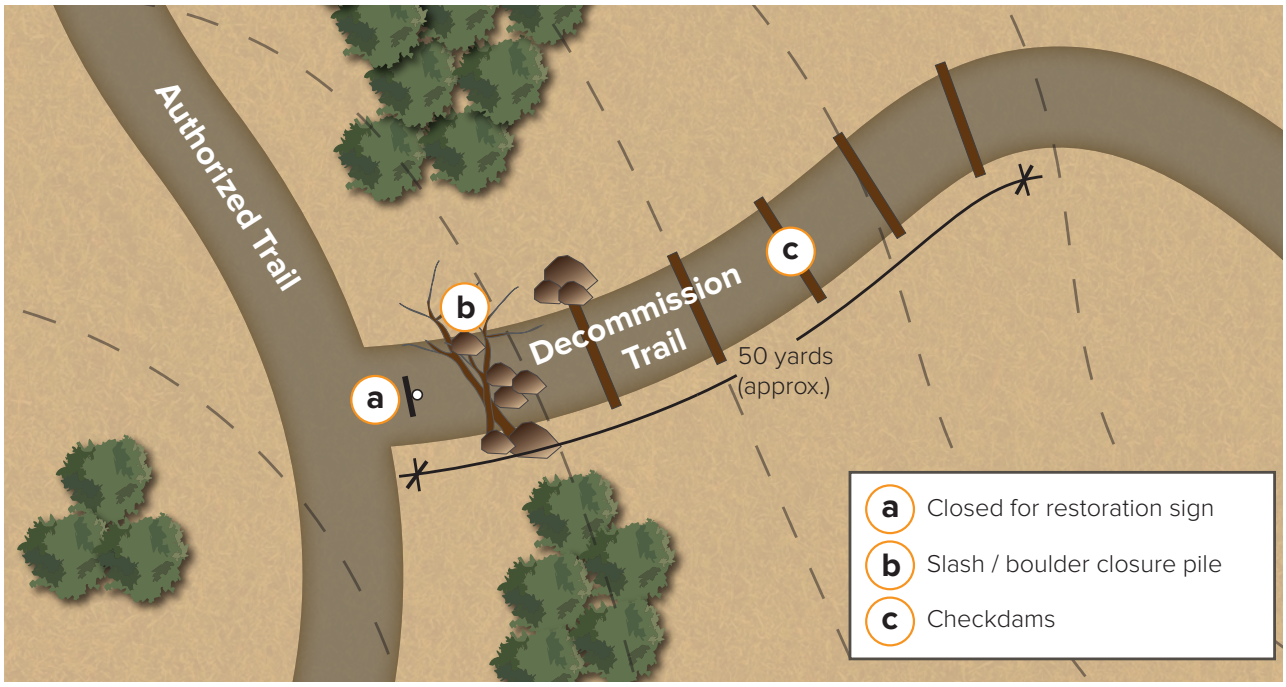
Typical Construction

- Knicks should be constructed as semi-circular depressions, about 10-feet in diameter, that direct water to the outside of the trail.
- Knicks should be constructed with a 15 % max. out-slope.

Trail Decommissioning

TRAIL DECOMMISSIONING

Trail decommissioning is recommended for trails that are actively eroding, highly susceptible to erosion, or are near sensitive environmental resources such as high quality habitat or watershed lands. Treatments for these locations attempt to deter trail user access and stop existing erosion. With management and time, these trails should be restored to a more natural state.



RECOMMENDED APPLICATION

Trail Entrance

- Place “Closed for Restoration” sign at entrance to trail to be decommissioned.
- Place slash and/or boulders completely across trail and behind signage to reinforce the trail closure.

Erosion Control

- Stabilize all existing erosion issues within the first 50 yards of the trail access. Assess the full length of the trail for other key drainage locations that may require erosion control measures.
- Place timber or boulder check dams at areas that are currently eroding.
- Fill trail ruts with soil and/or slash. Straw wattles or similar sediment catchment may also be used.
- Obliterate any major trail cuts and blend the trail bench back into the surrounding landform.

Revegetation

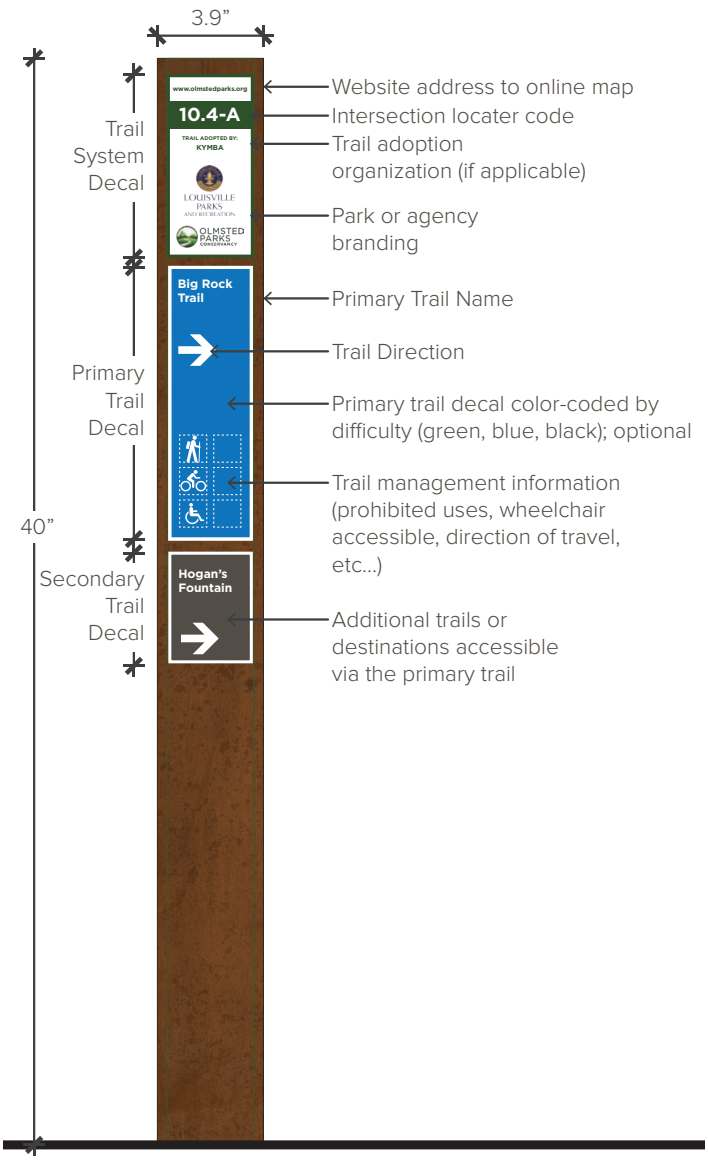
- Scarify soil 2”-6” and revegetate by broadcast or hydroseeding with an approved native seed mix. Seed only in the spring or fall.
- Erosion control blanketing may be utilized in difficult or critical areas.

TRAIL WAYFINDING

TRAIL MARKER

Recreational trail markers provide useful information at key decision points along a natural surface trails. Trail markers are utilized to assure users that they are on the correct trail, define where connecting trails lead, and indicated mileages and level of difficulty.

Markers should range from 36”-42” in height depending on amount of messaging required. Trail markers could be constructed of wood or carsonite. Agencies should consider the maintenance and aesthetic of the proposed material when developing the signage system.



RECOMMENDED APPLICATION

Construction

- **Post:** 3.9” wide dual-sided carsonite marker or triangular carsonite post depending on configuration of trail intersection.
- **Vinyl Decals:** Custom retro-reflective vinyl decals
- **Trail Name/Intended Uses/Level of Difficulty Decals:** Decals can include the trail name, level of difficulty (denoted by color: green, blue, or black), directional arrow, mileage to nearest trail junction (in one or both directions), and applicable management information such as approved trail uses, wheelchair accessibility, or directional travel information.
- **Trail System/Branding Decals:** Trail system or branding decals denote trails or destinations that are accessible from the primary trail. As with the primary trail decal, color can be used to denote the level of difficulty for a specific trail.
- **Intersection Locater Code (optional):** An intersection locater code can help facilitate precise wayfinding information for a variety of purposes such as emergency response or maintenance.

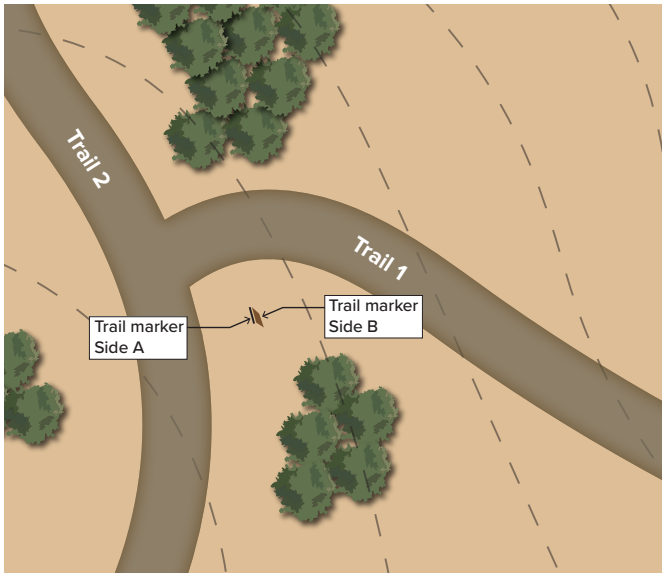
TRAIL WAYFINDING

TYPICAL TRAIL MARKER PLACEMENT

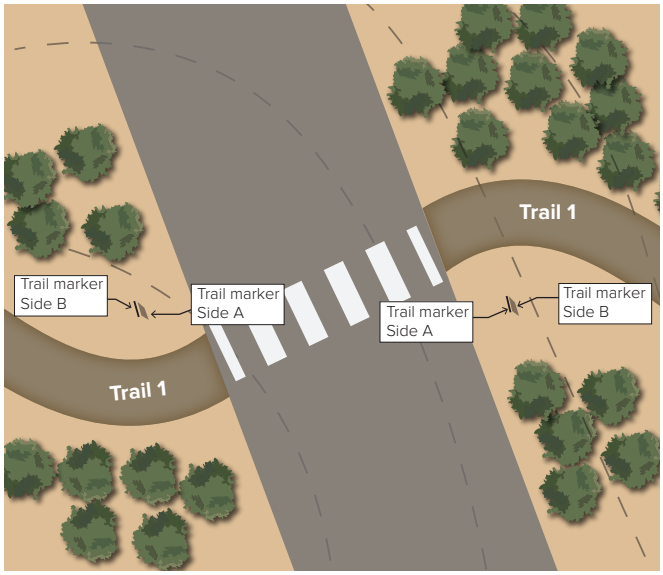
Trail markers should be placed at all official trail intersections within each of Louisville's Cherokee, Seneca and Iroquois Parks:

- Trail markers should be placed 2'-0" off of the trail in the most conspicuous location. Either two-sided carsonite markers or triangular carsonite posts may be utilized depending on which type provides the most visibility for the particular location. Trail markers should be placed on both sides of the intersection if trail continues across roadways/trails.

EXAMPLE APPLICATION - TRAIL INTERSECTION



EXAMPLE APPLICATION - ROAD CROSSING



Typical recreational trail marker

CHEROKEE PARK

- 15 trail junctions (18 trail markers required)
- 20 road crossings (30 trail markers required)
- **48 total trail markers***

SENECA PARK

- 9 trail junctions (11 trail markers required)
- 5 road crossings (8 trail markers required)
- **19 total trail markers***

IROQUOIS PARK

- 26 trail junctions (32 trail markers required)
- 25 road crossings (36 trail markers required)
- **68 total trail markers***

Note that these are estimates. Actual numbers required may vary depending on context.

NEXT STEPS

- MAJOR TO ADD CONTENT HERE