



Evaluation of Trail Entry Conditions and Recommendations for Improvements

Washington Grove, Cobb's Hill Park

City of Rochester, New York
Department of Recreation and Youth Services

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Washington Grove, Cobb's Hill Park—Recommendations for Improvement

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“LIBERTY, WHEN IT
BEGINS TO TAKE
ROOT, IS A PLANT
OF RAPID GROWTH.”

-GEORGE
WASHINGTON

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TABLE OF CONTENTS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

1.	List of Figures	5
2.	List of Tables	6
3.	Executive Summary	7
4.	Introduction	8
	A. Background and Purpose of Study	
	1. Study Area	
	2. Study Objectives	
	B. History	
	C. Steering Committee Meetings and Community Involvement	
	D. Relationship to Other Plans and Studies	
5.	Inventory and Analysis	13
	A. Physical and Environmental Conditions	
	1. Topography	
	2. Soils	
	3. Ecological Character	
	4. Drainage and Water Related Issues	
	5. Existing Land Use	
	6. Property Ownership	
	7. Existing Trail Network	
	B. Circulation and Transportation	
	C. Opportunities and Constraints	
	1. Opportunities	
	2. Constraints	
	3. Both	
6.	Recommendations	24
	A. Trail System Design Principles	
	B. Sustainable Trail Design	
	1. General Guidelines	
	2. Drainage Crossings	
	C. Trail Construction Standards	
	1. Tread Width	
	2. Clearing Width	
	3. Clearing Height	
	4. Slope (Sustained)	
	5. Slope Maximum	
	6. Cross Slope	
	7. Standards for Accessible Trails	

TABLE OF CONTENTS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

- 8. Trail Surface
- D. Erosion Control on Existing Trails
- E. Planning for Diverse Trail Users
 - 1. Pedestrians
 - 2. Non-Motorized Winter Sports Enthusiasts
- F. Development and Analysis of Alternatives
- G. Alternate 1—Preferred Trail Network
 - 1. Parking
 - 2. Recommended Entry Closures
 - 3. Recommended Access Points to Remain
 - 4. Recommended Access Point Amenities
 - 5. Primary Trails
 - 6. Secondary Trails
 - 7. Accessibility and Access Loop
- H. Alternate 2
- I. Nunda Blvd. Entrance Restoration
- J. Design Details
 - 1. Parking and Paved Areas
 - 2. Retaining Wall and Stair Material
 - 3. Trail Design and Materials
 - 4. Gateways, Trailheads and Interpretive Signage, Emergency Location Markers
 - 5. Reassurance Markers
 - 6. Drainage Improvements and Swale Crossings
 - 7. Guide Rails, Site Furniture and Access Control
 - 8. Boardwalk
 - 9. Bridges
- K. Trail Closure and Width Limitation
 - 1. Trail Widening
 - 2. Trail Closure
- L. Potential Funding Sources
- M. User Guidelines
- N. Trail Operations and Maintenance
 - 1. Trail Assessment and Inventory
 - 2. Maintenance Activities
 - 3. Maintenance Costs
- O. Economic Benefits of Parks and Trails
- P. Factors Not Addressed in the Study

TABLE OF CONTENTS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

7. References Cited

8. Figures

9. Appendices

- A. Survey Results
- B. Public Feedback
- C. Soils Mapping
- D. Soils Description

LIST OF FIGURES

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

	Figure
Project Location	A
Land Use	B
Property Ownership	C
Existing Trail Network	D
Existing Conditions Analysis	E
Overall Slopes Analysis	F
Slope Analysis of Trails	G
Drainage Map	H
Alternate – 1 Preferred Trail Network	I
Alternate – 1 Preferred Trail Network Improvements	J
Alternate – 2 Trail Network	K
Alternate – 2 Trail Network Improvements	L
Proposed Parking Area Concept	M
Alternate – 2 Accessible Trail Entrance Enlargement	N
Nunda Blvd Entrance Concept	O
Typical Trail Cross Sections	P
Typical Trail Details	Q

LIST OF TABLES

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

	Page
Chronology of Community Involvement..... Table 1.....	10
Common Pedestrian Characteristics by Age Group..... Table 2.....	33
Trail Construction Design Standards..... Table 3.....	36
Potential Funding Sources..... Table 4.....	46
Recommended Maintenance..... Table 5.....	52

EXECUTIVE SUMMARY

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

This study evaluates the number and condition of trails in Washington Grove at Cobb's Hill Park, in the City of Rochester, and makes recommendations for future improvements to trails and entry points, which aim to reduce the impacts of heavy use on the forest ecology of the Grove, and allow access to the trails for a greater diversity of users.

Washington Grove is a unique forest remnant existing within an urban area, and has been owned and protected by the City of Rochester as a public park for more than a century. For much of that time, however, the forest was not actively managed, with the result that much of the Grove was overtaken by aggressive non-native plant species. In recent years, a citizen group, the Friends of Washington Grove, working in partnership with the city, has undertaken extensive restoration efforts, including the removal of invasive species and the re-introduction of native forest plants. The Grove's ecological condition is currently good, considering its location and size, but it is threatened by overuse.

Recent years have also seen increased use of the trail system, which has led to the formation of new unplanned trails, as well as heavy erosion and compaction of trail surfaces and of the surrounding forest floor. A lack of clear signage and/or trail markers contributes to the problem by creating confusion and lack of differentiation between designated trails and spontaneous ones.

This study used extensive public input to create recommendations that balance the needs of diverse user groups and include protective measures for this ecological treasure. Through a combination of sensitive design for the natural environment and an appreciation for the need for people to connect with nature, a holistic approach to an improved trail system can accomplish the needs of multiple constituents.

There are currently several entrances to Washington Grove, from each direction. The east and west entrances are the most formal, easily traversable and used by the general public, while the southern entrance serves mainly residents of the Highland Heights neighborhood, and the northern entrances are mainly unplanned, steep sloped and used by the adjacent neighbors in the area. This study presents recommendations for the closure of some entrances and improvements to others.

The Grove currently presents both opportunities and constraints via internal and external forces upon its environment. The advantageous elements include: the location within the City and within the greater Cobb's Hill Park, the volunteer efforts that have long been underway and continue today, the interesting art of the water tanks near the northern edge of the Grove, the scenic views within and outward from the Grove, and the unusually high plant diversity for an urban park. On the other hand, some of the challenges currently present include: the detrimental intensity of use and trail width creep, conflicting uses within the small area covered by the Grove, differing views on the best type of restoration and the lack of handicap accessibility.

There are several general principles of sustainable trail design that can be applied in choosing which trails to keep and which to discourage. Among the topics these principles address are the slope of the trails (running, cross, and maximums), tread widths, clearing widths, clearing heights, and proper surface types. The ideal trail system should be able to last far into the future without major maintenance and without detriment to the ecological environment.

Input from the community during the study process indicated a strong desire for accessible trails and entrances to the Grove. Therefore, the identification of opportunities for accessible trails was a very important outcome of this study. These trails require more precise design to stay within standards that allow for all abilities to access the Grove in some capacity and ensure an inclusive environment for all to enjoy. Running slopes, trail surface selection, cross slopes and appropriate signage are all imperative for an accessible trail. This report provides analysis and recommends the trail sections where accessibility standards can be met, based on existing conditions.

EXECUTIVE SUMMARY

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

This study recommends the closure of selected trails in order to reduce erosion and protect forest habitat. Certain trails are recommended to become “primary”, with relatively wider width, and others to become “secondary”. Secondary trails would still play an important role in the user experience within the Grove and are deemed to be important, but they also have a higher risk of becoming ongoing maintenance problems if too much usage occurs on them.

The study presents two alternatives for improvement of the entrance closest to Reservoir Road, and a conceptual design for the restoration and improvement of the Nunda Blvd. entrance. These recommended improvements would benefit the Grove by clarifying entry points and making them more useable. Both Reservoir Road alternatives would create an accessible entrance at Reservoir Road and a connecting accessible loop trail which comply with federal standards for accessible trails as required by the Americans with Disabilities Act. Alternate 1 introduces a pedestrian bridge connecting parking on Reservoir Road to the water tank area. The bridge would create both an accessible route into the Grove, and a gateway feature when approached via the old Water Authority service road that passes beneath it, possibly connecting to additional parking off of Norris Drive in the future. This alternate would likely be more costly, but would disturb less of the site, by allowing an appropriate slope for accessible trails without requiring as much earthwork as a switchback trail would. Alternate 2 replaces the pedestrian bridge with an accessible switchback trail for a lower cost solution, but more earth disturbance.

This study offers a long list of potential funding sources that the City of Rochester and the Friends of Washington Grove can pursue in order to improve the Grove overall, with an emphasis on funding for trails projects. The list is by no means exhaustive, but it offers enough substantive leads to make some early upgrades and bring realistic improvements to Washington Grove.

Finally, this report explains simple user guidelines, signage, trail markers and other wayfinding elements to improve the experience and safety of those who love and enjoy the Grove, as well as basic maintenance practices that should be integrated to ensure a sustainable trail network for many years to come.

FUTURE STEPS

The City of Rochester promotes healthy communities and life styles. This report is a tool which the City of Rochester, Department of Parks will use in all stages of their development, planning, design, and implementation processes.

The recommendations from this study will be prioritized as per the City of Rochester, Department of Parks' masterplan. From soliciting proposals to the design development and construction phase; construction funding forms an important part of this process.

Ultimately, as the funding from various agencies becomes available, the masterplan will pre-determine the hierarchy of projects, making this document an important resource.



A. BACKGROUND AND PURPOSE OF STUDY

The purpose of the Washington Grove Trail Evaluation is to assess the number, variety and condition of trails in Washington Grove at Cobb's Hill Park in the City of Rochester, and to recommend appropriate modifications to ensure that multiple uses, including possible wheelchair access, can continue to coexist while reducing the impact of erosion and foot traffic on vegetation. This study evaluates the functionality of formal and informal infrastructure throughout the park (including trails, trailheads, rest areas, focal points, view sheds, barriers) and the impacts of this infrastructure on plant communities and fauna. After a thorough assessment of existing conditions, this study concludes with a series of recommendations for:

- the selection of effective existing trails;
- removal of detrimental trails;
- potential alternative trails;
- establishing a hierarchy of trails;
- concept-level design for trail entrances for the Nunda Blvd and Reservoir Road trailheads; and
- realistic maintenance strategies to ensure safety and sustainability for the park trail system.

1. STUDY AREA

As shown in **Figure A**, Washington Grove is located within Cobb's Hill Park on the east side of the City of Rochester. The study area is approximately 26 acres, and is primarily composed of relatively undisturbed Oak-Hickory forest. The site includes lands owned by the City of Rochester as part of Cobb's Hill Park, and by the Monroe County Water Authority. It also includes Rochester Gas and Electric utility easements. It is bordered by Cobb's Hill Reservoir to the west, by the Monroe County Water Authority's main office facility and Rochester City School #1 to the north, and by residential neighborhoods on the south and east. City Parks code prohibits the use of bicycles and OHV's (Off Highway Vehicles) throughout the trail network.

INTRODUCTION

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

2. STUDY OBJECTIVES

The Washington Grove Trail Evaluation was guided by the following objectives:

- Provide opportunities for universal access;
- Maintain user safety;
- Offer a high-quality user experience;
- Protect and enhance existing resources; and
- Emphasize sustainability and maintainability.

B. HISTORY

The area of interest, a remnant old growth forest, was acquired by the City of Rochester in 1912 as public concern for preservation and desire for public parkland increased, and was designated as the Washington Memorial Grove in 1932, the bicentennial of George Washington's birth. At that time, the Grove was seen as an opportunity to teach children patriotic values associated with Washington himself, and about the importance of nature. During much of the mid-20th century, the Grove was not actively managed, and developed a thick underbrush of non-native shrubs and young trees. In recent decades, public interest in, and use of, the Grove has increased, causing visible ecological impacts such as trail erosion and trampling of delicate plants. This has led to tension over the locations, extent, conditions, and preferred uses of trails, and concerns that the forest may be "loved to death".

In 2008-09, the City of Rochester partnered with interested residents to create a restoration and management plan for the Grove. Out of this planning effort came the Friends of Washington Grove, a citizen caretaker group composed of volunteers mainly from the surrounding neighborhoods. Since that time, restoration has begun in the form of invasive plant removal and planting of native species.

Further information on the history of Washington Grove can be found in "2009 Project to Restore and Protect the Washington Grove Management Plan", "2016 Friends of the Washington Grove Inputs to Trails and Entryways Consultancy" and also on the City of Rochester website, at www.cityofrochester.gov/washingtongrove/.

C. STEERING COMMITTEE MEETINGS AND COMMUNITY INVOLVEMENT

The evaluation and recommendations included in this study have been informed by local residents and key stakeholders through a community involvement process that has been continuous, comprehensive, participatory, and coordinated. **Table 1** chronicles the meetings and outreach that were conducted regarding this project.

Table 1: Chronology of Steering Committee and Community Involvement

Date	What	Purpose
December 30, 2015	Steering Committee Meeting	Project kick-off to plan the project
January 27, 2016	Steering Committee Meeting	Site walk to analyze existing conditions
March 24, 2016	Steering Committee Meeting	Solicit input from representatives of community / city
April 12, 2016	Highland Heights Neighborhood Meeting	Solicit input from adjacent neighbors
April – May 2016	Public Survey (Online & Hard Copy)	Solicit public input from a wider group
April 26, 2016	Public Meeting #1	Solicit input from surrounding community
May 13, 2016	Friends of Washington Grove Meeting	Solicit feedback from caretaker group
August 2016*	Public Meeting #2	Present evaluation report; solicit community comments

INTRODUCTION

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

The planning process for this study included outreach to both the general public and to key stakeholders. Representatives from the City of Rochester and the Friends of Washington Grove served on the project steering committee, and provided continuity and study oversight. The general public was invited to attend (2) meetings to learn more about the trail project, provide feedback to the committee and view the recommendations. The steering committee also reached out to the following organizations with regard to their use of Washington Grove and nearby properties:

- *Friends of Washington Grove (FOWG)* – This organization manages Washington Grove with the goal of preserving its natural history. It was important that the recommendations reflected their goals and complemented their management practices.
- *The Highland Heights Neighborhood Association* – Highland Heights is a private neighborhood to the south of Washington Grove. Currently, there are three entrances into Washington Grove from Highland Heights. Each trail contributes to erosion and habitat degradation, Highland Heights was encouraged to determine one ideal entrance into the park.
- *Monroe County Water Authority* – Monroe County owns the land to the west of Washington Grove, which includes some public trails. Since some of the study's proposals will be on their property, it was important to solicit their feedback.
- *Fleet Feet* – This athletic store/group is located across the street from Cobbs Hill Park. Fleet Feet holds training sessions and races within Cobbs Hill Park and Washington Grove. As part of its effort to reduce erosion and reduce hazards, the City of Rochester can work with Fleet Feet during race planning to determine where runners can go.



Public Meetings



Finally, a survey was distributed both online and at the public meeting. This survey was designed to solicit information on when and how the Grove was being used and to understand the concerns and desires of the public with regard to the Grove. A total of 74 individuals responded. The results of this survey can be seen in **Appendices 1 and 2**.

D. RELATIONSHIP TO OTHER PLANS AND STUDIES

The City of Rochester is actively engaged in a wide range of projects and initiatives to improve the quality of life in residential neighborhoods and increase investment opportunities in commercial districts. These projects include changes to streetscapes, environmental upgrades, educational programs and the adoption of new technology. Projects and initiatives of this type generally result in improvements in one or more of four key areas: public safety, economic development, education and customer service.

INTRODUCTION

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

The City actively promotes the use of its parks, trails, and greenspaces through programs such as the Flower City Feeling Good Program, River Romance, and others, and also partners with a variety of groups including, but not limited to, the Conkey Cruisers, Lower Gorge Foundation, Maplewood Neighborhood Association, Wegmans, and the Friends of Washington Grove to encourage active outdoor recreation.

The 2009 Management Plan document created by the Project to Restore and Protect Washington Grove, a collaboration between the city and community, includes a detailed discussion of the history and ecology of the Grove, as well as contemporary usage and perceived problems. It contains proposed actions which became the impetus for the current study. A 2016 document prepared by the Friends of Washington Grove provides detailed information about the existing trail system, including areas of concern and visions for improvement and restoration. Any changes to trails and park entrances proposed should be compatible with the general principles and specific projects found in these planning documents.

For additional information about these organizations and their activities visit their web sites:

www.gvc-adk.org/

www.cityofrochester.gov/washingtongrove/

www.cityofrochester.gov/comprehensiveplanupdate

www.cityofrochester.gov/projects/

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement



A. PHYSICAL AND ENVIRONMENTAL CONDITIONS

This section describes the existing environmental conditions within the study area and in some instances, the surrounding area. Information is presented on topography, soils, ecological character, drainage and water-related issues, and existing uses of the park.

1. TOPOGRAPHY

Information regarding topography and soils was obtained from aerial surveys, on-site observations and existing published sources.

Washington Grove is located at the eastern end of a glacial feature known as the Pinnacle Range, a line of hills that also includes Mount Hope Cemetery, Highland Park, and Pinnacle Hill. As shown in **Figures F and G**, the topography is rolling, with slopes ranging from 0 to 60 percent. Elevations within Washington Grove range from approximately 546 feet above mean sea level (AMSL) to approximately 626 feet AMSL.

Changing topography provides interesting and varied terrain for many trail users. In Washington Grove, this means elevated viewpoints along the north side of the park, and seasonally wet low points to the south. Certain trails are currently relatively stable and gently sloping. However, much of the terrain may present a challenge to those requiring an accessible pathway. The terrain includes several steep areas that would prevent the entire trail system from being accessible. Of particular concern is the fact that there is no current entrance to the Grove with an appropriate slope for people using wheelchairs or other assistive devices. To accommodate all potential trail users, at least one entrance to the trail system would require significant redesign.

2. SOILS

While the Soil Survey of Monroe County, New York has mapped general soil associations and soil types within the County, all soils within the City of Rochester are classified as “urban land”. Washington Grove, though largely undisturbed, is within this area, and therefore its soils have not been mapped and specifically described by the USDA NRCS Soil Survey.

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

The Pinnacle Range has been described as having characteristics of both a kame and a moraine, with the uppermost soil layers being primarily unsorted glacial till. The soils of this formation are generally described as sandy/gravelly, well drained, nutrient-poor, and easily eroded. The soils surrounding the hills are highly variable, but are generally silty loams. This information, combined with field observation, indicates that trails within the Grove traverse both highly erodible and relatively poorly drained soils.

3. ECOLOGICAL CHARACTER

The study area is a forest fragment entirely surrounded by urban development, and less than ¼ mile from the six-lane Interstate-490. There is no record of significant cutting or other major human disturbance to the Grove, meaning that it is a rare example of an old-growth forest remnant within an urban area. Major man-made structures within the study area are limited to two large water tanks belonging to the Monroe County Water Authority (MCWA); however, the Grove is bordered closely on two sides by single-family homes, and is in close proximity to park structures on the north side. The existing vegetation is typical of the Appalachian Oak-Hickory Forest ecosystem as described by the New York Natural Heritage Program inventory, and includes low areas which may function as vernal pools in particularly wet years.

Forest Composition

Appalachian Oak-Hickory Forest is a broadly-defined natural community. The exact species composition varies among locations, but the typical overstory of an Appalachian Oak-Hickory Forest community is dominated by some combination of:

- Red Oak (*Quercus rubra*)
- White Oak (*Quercus alba*)
- Black Oak (*Quercus velutina*)
- Pignut Hickory (*Carya glabra*)
- Shagbark Hickory (*Carya ovata*)
- Sweet Pignut Hickory (*Carya ovalis*)

Common canopy associates include:

- Red Maple (*Acer rubrum*)
- Sugar Maple (*Acer saccharum*)
- White Ash (*Fraxinus americana*)
- Hophornbeam (*Ostrya virginiana*)

The understory and shrub layers typically include:

- Flowering Dogwood (*Cornus florida*)
- Common or American Witch Hazel (*Hamamelis virginiana*)
- Serviceberry (*Amelanchier arborea*)
- Common Chokecherry (*Prunus virginiana*)
- Beaked Hazelnut (*Corylus cornuta*)
- Lowbush Blueberries (*Vaccinium angustifolium*)
- Red Raspberry (*Rubus ideaus*)
- Gray Dogwood (*Cornus racemosa*)
- Mapleleaf Viburnum (*Viburnum acerifolium*)

The herbaceous layer typically includes:

- Wild Sarsparilla (*Aralia nudicaulis*)
- False Solomon's Seal (*Maianthemum racemosum*)
- Pennsylvania sedge (*Carex pensylvanica*)
- Tick-trefoils (*Desmodium* sp.)
- Black Cohosh (*Actaea racemosa*)
- White Rattlesnake Root (*Prenanthes alba*)
- Silver-rod (*Solidago bicolor*)
- Mayapple (*Podophyllum peltatum*)
- Round-lobed Hepatica (*Hepatica americana*)

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

A 2009 study of the forest composition at Washington Grove found that the canopy consists of the following species, in order of dominance:

- | | |
|--|--|
| 1. Red Oak (<i>Quercus rubra</i>) | 9. Red Maple (<i>Acer rubrum</i>) |
| 2. Black Cherry (<i>Prunus serotina</i>) | 10. American Linden or Basswood (<i>Tilia americana</i>) |
| 3. White Oak (<i>Quercus alba</i>) | 11. Shagbark Hickory (<i>Carya ovata</i>) |
| 4. Black Oak (<i>Quercus velutina</i>) | 12. Common Chokecherry (<i>Prunus virginiana</i>) |
| 5. Sugar Maple (<i>Acer saccharum</i>) | 13. Mazzard or Sweet Cherry (<i>Prunus avium</i>)* |
| 6. Norway Maple (<i>Acer platanoides</i>)* | 14. White Ash (<i>Fraxinus americana</i>) |
| 7. Sassafras (<i>Sassafras albidum</i>) | *non-native |
| 8. Tulip Tree (<i>Liriodendron tulipifera</i>) | |

At that time the subcanopy composition was quite different from the canopy, with Norway Maple (*Acer platanoides*) the most dominant species, followed by Black Cherry (*Prunus serotina*), Sugar Maple (*Acer saccharum*), and White Ash (*Fraxinus americana*). Amongst seedlings and saplings, Norway Maple was also most common. Almost no recruitment of oak species was apparent, and young oaks were nearly absent from the understory, despite the presence of viable acorns. This lack of regeneration was considered to be likely due in large part to the heavy shade cast by canopy trees, but other significant factors included seed predation, deer browse, and disturbance of the leaf litter by heavy foot and paw traffic.

Restoration activities since 2010 have dramatically reduced the Norway Maple population in the Grove. Except along the eastern and northern edges, where there are concerns about destabilizing slopes by removing too many trees at one time, there are no longer large individuals or saplings present.

A site visit in May 2016 found that the herbaceous/ground layer was patchy, and consisted largely of Mayapple (*Podophyllum peltatum*), Lily of the Valley (*Convallaria majalis*), Maple seedlings, and Greater Celandine (*Cheladonium majus*). Although a complete survey was not conducted during this site visit, several other species were observed, including:

- | | |
|--|---|
| ▪ Garlic Mustard (<i>Alliaria petiolata</i>) | ▪ Solomon's Seal (<i>Polygonatum</i> sp.) |
| ▪ Poison Ivy (<i>Toxicodendron radicans</i>) | ▪ White Rattlesnake Root (<i>Prenanthes alba</i>) |
| ▪ Jumpseed, Woodland knotweed (<i>Persicaria virginiana</i>) | ▪ White Trillium (<i>Trillium grandiflorum</i>) |
| ▪ Virginia Creeper (<i>Parthenocissus quinquefolia</i>) | ▪ Early Meadow Rue (<i>Thalictrum dioicum</i>) |
| ▪ False Solomon's Seal (<i>Maianthemum racemosum</i>) | ▪ Pennsylvania sedge (<i>Carex pensylvanica</i>) |
| | ▪ Wild Geranium (<i>Geranium maculatum</i>) |
| | ▪ Daffodil (<i>Narcissus</i>) |

Young woody plants noted include Sassafras seedlings, Raspberry (*Rubus* sp.), and *Viburnum* spp. In some cases, native plants noted may have been planted during restoration efforts.

Invasive Species

Aggressive, non-native plant species are problematic in much of the study area. Species of concern that have been observed in the Grove include:

- | | |
|--|---|
| ▪ Norway Maple (<i>Acer platanoides</i>) | ▪ Autumn-Olive (<i>Elaeagnus umbellata</i>) |
| ▪ Tree-of-Heaven (<i>Ailanthus altissima</i>) | ▪ Tatarian Honeysuckle (<i>Lonicera tatarica</i>) |
| ▪ Common Buckthorn (<i>Rhamnus cathartica</i>) | ▪ Burning Bush (<i>Euonymus alatus</i>) |

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

- Common spindletree (*Euonymus europaeus*)
- Multiflora Rose (*Rosa multiflora*)
- Oriental Bittersweet (*Celastrus orbiculata*)
- Garlic Mustard (*Alliaria petiolata*)
- Greater Celandine (*Chelidonium majus*)
- Lily of the Valley (*Convallaria majalis*)
- Black swallow-wort (*Cynanchum louiseae*)
- English Ivy (*Hedera helix*)

Rare, Threatened, and Endangered Species

According to the NYSDEC online database, no rare, threatened or endangered (RTE) species have been documented in the vicinity of the study area. Additionally, no RTE species were observed during site visits. However, it is important to note that the NYSDEC database is limited and should be considered a preliminary indication of the presence of RTE species. If in the future significant construction activity is planned, then detailed plant and wildlife surveys, conducted during the growing season, would be recommended.

Habitat Assessment

Washington Grove is in better ecological condition than is common for urban woodlands, and it is close enough to other parks and nature preserves to serve as an important stop-over or “habitat island” for birds. Many forest-interior bird species tend to nest at least 300 feet from the forest edge. By this standard, Washington Grove may contain some degree of appropriate habitat for such species. However, given its small size and heavy human and dog traffic, it is unlikely that highly sensitive species reside there. A list of bird species observed within or overhead of the Grove between 1979 and 2009 is included in the 2009 Management Plan.

The Grove is currently home to several common mammal species, including gray squirrel, eastern chipmunk, and raccoon. Whitetailed deer and red fox are reportedly occasional visitors. A few mammal species which are generally very common have reportedly declined in the Grove, including opossum, woodchuck, cottontail rabbit, and white-footed mouse. With the exception of opossum, these are ground dwelling species, which may make them more vulnerable to disturbance by dogs.

In the southern section of the Grove, areas of wet or moist soils suggest that in some years vernal pool habitat may be available for amphibian reproduction. Red-backed salamanders, for example, were reportedly once common in the Grove, but their status is now unknown.

4. DRAINAGE AND WATER-RELATED ISSUES

There are no federal and state designated wetlands in or near the study area based on preliminary review of both United States Fish and Wildlife Service (FWS) National Wetlands Inventory (NWI) mapping and the NYSDEC freshwater wetlands mapping database.

For the purposes of this study, it is assumed that there are underground utilities within the Grove, though additional investigations are warranted if any earthwork or other disturbance of the soil surface is to be conducted in the future.

Drainage patterns are identified in **Figure H**.

5. EXISTING LAND USES

As part of a public park, Washington Grove is used primarily for recreation. Common activities reported by park users are hiking, jogging, bird watching, dog walking, volunteer ecological restoration activities, and botanical observation. The land use along the eastern and southern sides of the study area is primarily residential, and many users of the Grove are its neighbors.

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

6. PROPERTY OWNERSHIP

Washington Grove is owned by the City of Rochester, and is part of Cobb's Hill Park. The area between the Grove and the more developed part of the park, to the west of the Grove, is owned by the Monroe County Water Authority, but is still accessible to the public. There is currently no formal agreement between the city and county regarding the use of MCWA lands within the Grove. It is recommended that the acquisition of these lands by the City of Rochester be considered as a long-term goal, as they are no longer actively used by MCWA. There are also several Rochester Gas and Electric and other utility easements. To the north of the park are Water Authority facilities and a City of Rochester Public Elementary School (Martin B. Anderson School No. 1). To the east and the south are primarily residential properties.

Figure C shows property ownership around the Grove.

7. EXISTING TRAIL NETWORK

The existing trails in Washington Grove are numerous and largely unplanned. The density of trails has increased rapidly in recent years, as interest in and use of the park has increased. The current number of trails is excessive for a park of only 26 acres, and several paths lie only feet apart from one another. **Figure D** shows the current locations of trails.

The trails currently suffer from erosion, compaction, and unplanned widening. In some areas erosion is taking place in gullies, but much of it is on slopes below and between trails. Trail surfaces have been eroded by foot traffic in many places, and now function as stormwater gullies. Erosion and compaction are particularly noticeable in the northern section of the Grove, as the tops of ridges are worn bare by foot traffic. Unprotected by leaf litter or ground layer vegetation, and compacted by traffic, these areas are vulnerable to scour by rain, and also act as an impervious surface, contributing to increased sheeting of stormwater runoff down from the hill tops and further eroding the slopes below.



Old wooden steps near the Nunda Blvd entrance



Erosion on southern slope

In the lower section of the park, parts of the trail network become muddy, particularly in spring. This has led to trail widening as users keep to the edge of the trail to skirt around wet areas.

There is very little existing signage of any kind in the Grove. The trails are not marked, making it impossible for users to discern which are intended as designated trails and which are not. The lack of trail markers also makes the trail system unnecessarily confusing.

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement



Erosion and soil compaction on northern ridge trails



Erosion and compaction due to off-trail activity in the northern glacial kettle area of the Grove

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

B. CIRCULATION AND TRANSPORTATION

The Grove can be accessed via a series of trail connections and roadways, as shown in **Figure D**.

From the north

To the north, Hillside Ave runs parallel to Washington Grove, and features off-street parking and an entrance drive leading to Tay House Lodge, a Rochester City Park rental lodge that abuts the Grove. There are currently many trail access points from the north side of the Grove, all of which are very steep and in some cases unsafe. Current entry points include:

- The Water Authority facility located north of Washington Grove (Trail 67).
- The Tay House Lodge, located on City Park property along the northern border of Washington Grove (Trail 2).
- Public School #1, located north of Washington Grove (Trails 64, 68 and 1).



Existing conditions at the entry near School #1



Existing conditions at the southern Reservoir Road entry

From the west

Reservoir Road runs through Cobb's Hill Park near the west side of Washington Grove. On-street parking is available here. There are also several parking lots in Cobbs Hill Park off of Norris Drive; these are not adjacent to the Grove, but offer nearby off-street parking. Visitors who park here can walk through Cobb's Hill Park to the reservoir entrances. Current trail entry points include:

- Cobbs Hill Park Reservoir, located west of Washington Grove (Trails 61, 59, 55 and 37).

From the south

Highland Heights runs parallel to Washington Grove on the South. This is, however, a private community and these entrances are used primarily by residents. Currently there are three trails to access Washington Grove from the Highland Heights Neighborhood. Since each trail has an impact on the Grove in terms of erosion and habitat encroachment, only one trail from this neighborhood is recommended. During the process of this study, the Highland Heights Homeowners Association determined that a single, new entrance trail located just west of the Association's tennis court should replace the existing entries. The location of this proposed entry is shown in **Figure I**. Current entry points are:

- Highland Heights Neighborhood, located South of Washington Grove (Trails 65, 63, 54).

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

From the east

Nunda Blvd. terminates at Washington Grove on the east side of the park. Limited on-street parking is available here. The Nunda Blvd entrance was originally designed in 1937, but has been altered several times as a result of utility and tree work inside the Grove. The entry point is:

- Nunda Blvd, located east of Washington Grove (Trail 48).

There are no public roads running directly through Washington Grove, although Water Authority and utility trucks have an access road (see **Figure D**, trail nodes 33-36-32-66). There are no sidewalks running to or through Washington Grove.



Existing conditions at the Nunda Blvd entry

C. OPPORTUNITIES AND CONSTRAINTS

The following opportunities and constraints were considered in relation to the study area.

1. OPPORTUNITIES

The following characteristics of the trail corridor are presented as opportunities, or elements that can be used to the advantage of the project.

Location

Washington Grove's location within a city park is an advantage because it provides nature-based recreation in close proximity to other existing park amenities, including ball fields and playground equipment. Residents who initially come to Cobb's Hill Park for other reasons may discover the Grove and choose to explore. Contact with natural areas can have a number of benefits for physical and mental health, and a small urban habitat island of such quality offers an opportunity for those with little experience of the forest to become comfortable, as they can visit a forest that does not feel like an unpredictable wilderness. In particular, Washington Grove offers an opportunity for urban children to form an attachment to, and value for, natural areas.

Volunteer involvement

Because Washington Grove is located at the edge of a residential area, neighbors are among the Grove's most frequent visitors. Many nearby residents care strongly for the Grove and visit often enough to observe changes in the trail system and vegetation. The existence of a volunteer organization dedicated to the Grove (FOWG) both ensures some level of ongoing care and maintenance, and serves as an outlet for community members seeking opportunities to

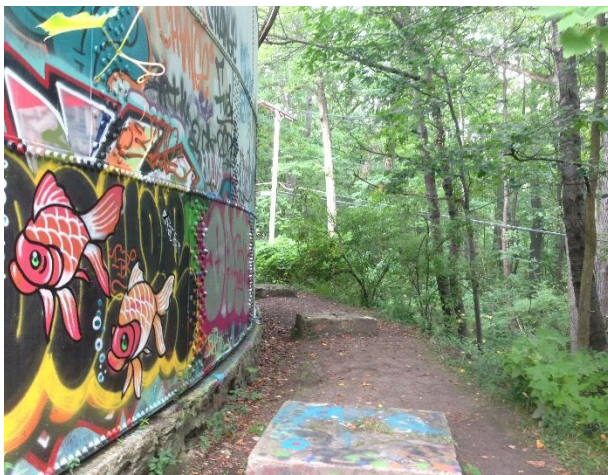
INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

volunteer their time. Volunteer work can also boost both physical health and emotional wellbeing, and the Grove can function as a source of pride for the members of the community actively involved in its care and maintenance.

Water tanks

The large water tanks located in the northwest corner of Washington Grove, which are no longer used or maintained by the Monroe County Water Authority, are currently a location for graffiti art. This artwork is complex, layered and ever-changing, and is well liked by many community members. While some view it as vandalism, others have expressed a desire for the creation of an “art park” that celebrates it. The presence of spontaneous folk art can be considered a positive feature of the Grove. There is, however, a danger that if it is over-legitimized by a formally created art park location, it may disappear or change significantly in character as the “guerilla” element of civil disobedience and public commentary is lost.



Graffiti art on MCWA water tanks

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Scenic views

High points in the north of the Grove afford views of the lower park and the eastern part of the City of Rochester, as well as views through the forest.

Habitat diversity

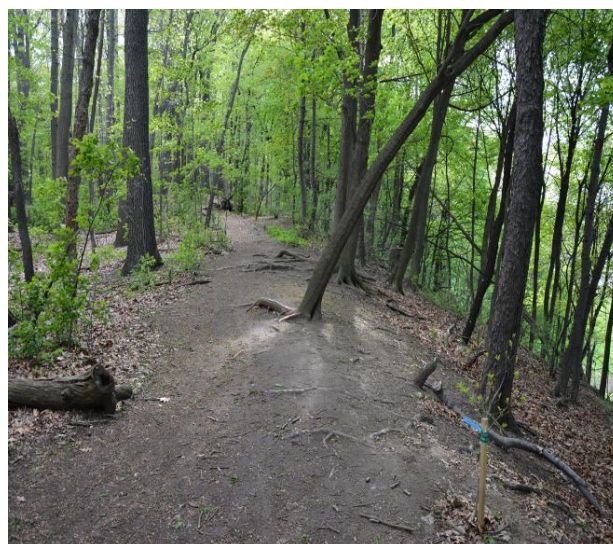
The varied terrain offers opportunities to traverse subtly varying vegetative communities, provided that restoration efforts are continued and successful. For example, understory plants common in the low areas will be different from those most common on slopes, and the communities found on south-facing slopes will be different in character from those on north-facing slopes. The restoration of these diverse plant communities could be highlighted through interpretive signage or online public information. Even if there were no formal interpretive installations, the Grove provides access and opportunities to view a natural landscape in a relatively developed area.

2. CONSTRAINTS

The following issues are presented as constraints, or elements that may challenge the success of the project.

Intensity of use

The relatively small size of the Grove, while advantageous in other ways, is a liability from the perspective of trail length. A walker, for example, can travel most of the existing trails in under an hour. A person running, particularly a serious runner, may cover all of the established trails in a short time and then seek or create new ones. In recent years the Grove has become increasingly popular among runners, with large organized groups of runners making use of the trails both for races and for informal recreation. In the past, trails were typically wide enough for groups walking single-file, but many trails have widened until they can accommodate two or three abreast. This intense use strains the capacity of the Grove to support both recreational use and high-quality natural communities.



Trail widening and slope erosion on northern ridge

Conflicting uses

Some of the desired uses of the Grove are in conflict with one another. For example, some users want to be able to run on as many trails as possible, while others are focused on the ecology of the Grove and feel that there should be fewer trails. In some cases, different trail uses benefit from different tread surfaces. A wood chip surface, for example, is suitable for walking but not for wheelchair use. The issue of appropriate presence of dogs has become divisive among Washington Grove users. The City of Rochester has made clear that it will not be made legal to let dogs run off-leash in the Grove, but as in many public nature areas, the leash requirement is difficult to enforce. Conflicting views on the importance of, and effect of dogs on, ecological restoration have further complicated the public discussion on this issue.

Differing views on restoration

Washington Grove has the advantage of being much beloved by a diverse community of users, but there is disagreement not only on solutions to problems, but on the nature of the problems and even as to whether a problem exists. The issue of ecological restoration has led to some conflict among neighbors. Some are in favor of aggressive

INVENTORY AND ANALYSIS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

restoration efforts, particularly removal of Norway Maples, and others consider such activities to be interference with nature. As the owner of the property, the City of Rochester has accepted the management plan developed in 2009, and is supportive of restoration as performed by the Friends of Washington Grove, while seeking to consider all viewpoints, and balance them with other competing imperatives such as cost, safety, and environmental health.

Accessibility

Due to the steepness of trail slopes in many areas, accessible trails will not be feasible throughout the entire Grove, but may be possible in certain areas. The current configuration of the trail entrances does not meet accessibility guidelines. Significant work will be needed in order to provide an accessible entrance.

Figure G shows the steepness of existing trails within the Grove.



Steep and eroded trail at the northern Reservoir Road entrance

Proximity of residential properties

The existing trail network runs directly adjacent to residential properties in some areas. Changes to trails may be a concern for property owners sensitive to traffic and trespassing, and therefore careful attention to the details of future trail design in these areas will be very important.

3. BOTH

Some issues are presented as both an opportunity and a constraint, because they have elements of advantage and challenge for the project's success.

Property ownership

The fact that Washington Grove is publicly owned presents both its most important advantage and its greatest challenge. Public ownership allows the forest to be maintained as a resource for the surrounding community, but simultaneously creates the need for either consensus or conflict management on the part of the City of Rochester and its constituents. Property ownership presents a further layer of complication, as parts of the Grove are currently owned by the City of Rochester and others by the Monroe County Water Authority.

Size and location

As described above, the relatively small size of Washington Grove is both a benefit and a liability, as it creates a manageable natural area that can be explored in a short period of time, but also one that is stressed by intense use of trails and off-trail foot traffic. Similarly, its urban location makes it a unique resource conveniently accessible to a large number of people, but surrounding development has disconnected the Grove from larger habitat areas, thereby reducing its value as a plant and wildlife sanctuary.

RECOMMENDATIONS

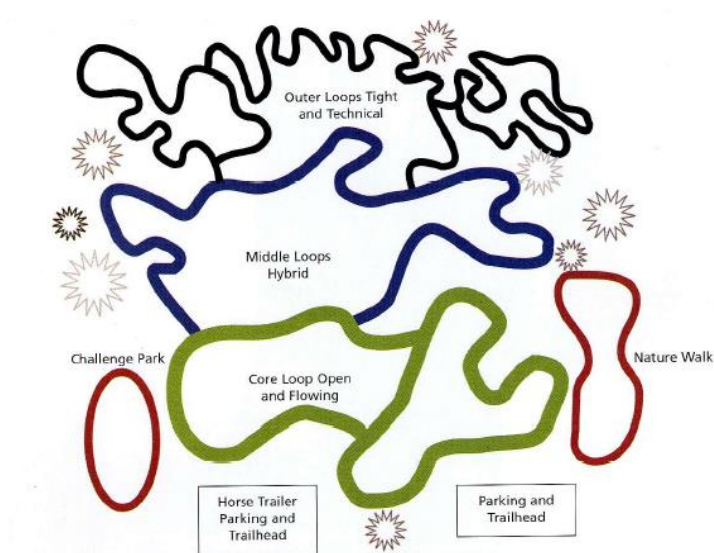
Washington Grove, Cobb's Hill Park—Recommendations for Improvement



A. TRAIL SYSTEM DESIGN PRINCIPLES

Unless a single-user trail system is desired, a system of looped trails should be designed to accommodate a variety of users. Main entry trails should be smooth and wide to appeal to all users, and provide either a standalone loop for beginners or a jump-off point for more advanced users. These primary trails may have a gravel surface to provide for accessibility and wet-weather use. Designing a trail system with multiple trailheads also allows for better control of user-conflicts and spreads traffic more evenly over a trail system. Restricting challenging trails to secluded and more difficult terrain will benefit all site users.

Example of Stacked Loop Trail System



B. SUSTAINABLE TRAIL DESIGN

Sustainable trails are defined by the US Forest Service as trails having a tread that will not be easily eroded by water and use, will not affect water quality or the natural ecosystem, will meet the needs of the intended users and provide a positive user experience, and that do no harm to the natural environment.

Sustainable trails in general can be used by a variety of non-motorized users including hikers, trail runners, and cross-country skiers. Motorized vehicles are normally prohibited unless operated by trail crews or a land manager. Prior to constructing a new trail, need for the trail should be determined based on condition and routes of existing trails. Surveys should be conducted of trail users to determine user expectations and rudimentary design guidelines.

Natural surface trails are dynamic systems that are constantly being re-shaped by a complex set of human-caused and natural forces. To be sustainable, trails must strike a balance between multiple elements. Type of use, amount of use and user behavior combine with natural factors to determine trails impacts and long-term sustainability.

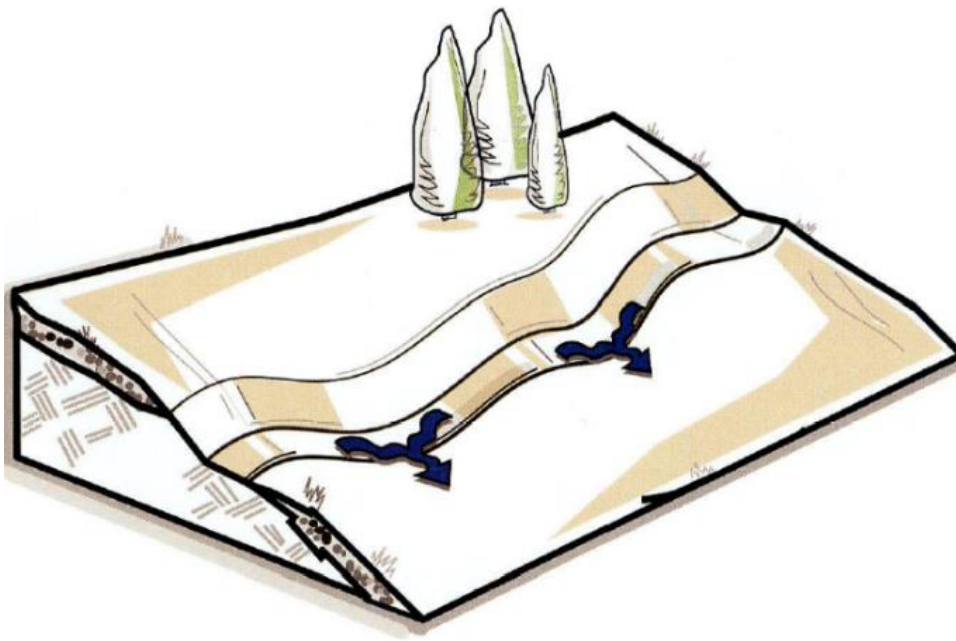
1. GENERAL GUIDELINES

The following general trail design guidelines can be adapted to specific site conditions including soil texture, slope, topographic position, existing vegetation, etc. These guidelines are most useful for the planning and construction of new pedestrian trails, but can also be useful for restoration and reconstruction of existing trails. These guidelines are general and not specifically appropriate for designing accessible trails. For accessibility guidelines, please see Section E.

The illustrations in this section are from: [*Trail solutions: IMBA's guide to building sweet singletrack*](#).

Rolling Contour Trails

Build paths to traverse hills cross-slope, characterized by a gentle grade and using grade reversals and an outsloped tread. Trails should avoid following fall lines at all costs, and should always be constructed on at least a slight slope to allow for drainage.



RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

The Half Rule

Trail grade should never exceed half the grade of the hillside the trail traverses. Trails that exceed half the sideslope are considered fall line trails, and funnel water, destroying the trail and causing greatly increased erosion.

The Ten Percent Average Guideline

Trail grade should average 10 percent or less for the length of the trail. Average percent grade should be calculated by dividing total elevation gain by total length, multiplied by 100. For trail conditions without sustained elevation gain, average trail-segment grades should be calculated in areas where the trail climbs. On most soil types, a 10 percent average slope will mitigate the effects of erosion caused by surface runoff and pedestrian traffic.

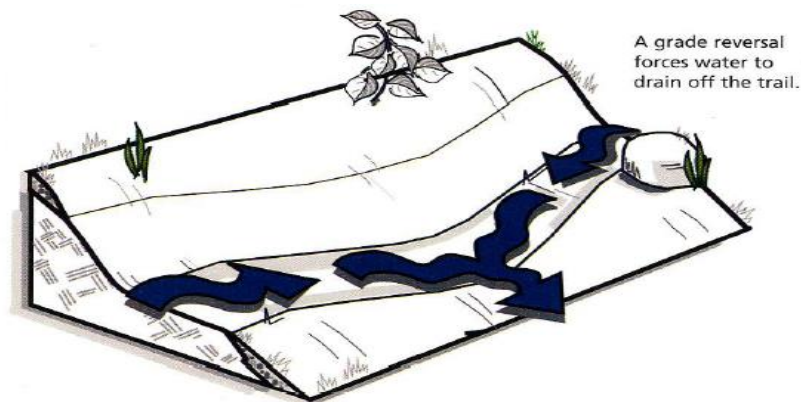
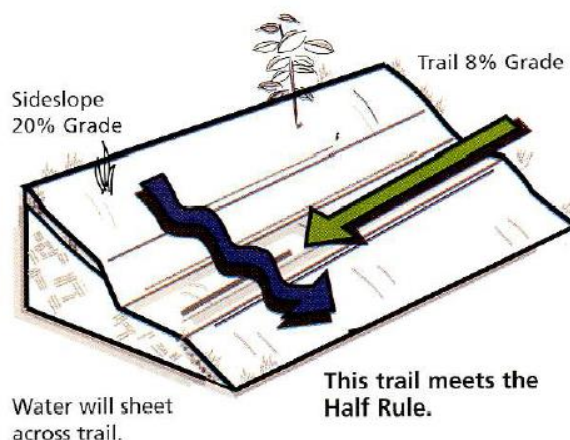
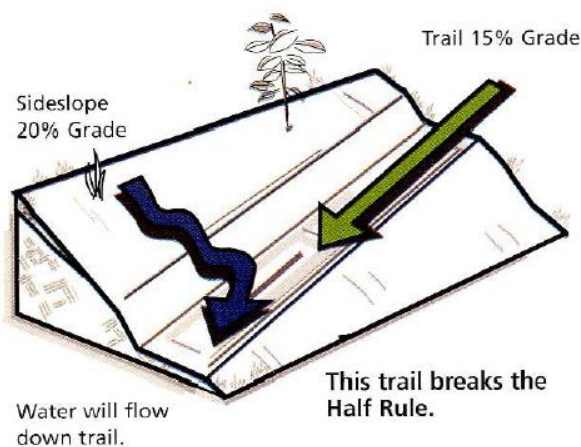
Maximum Sustainable Trail Grades

A trail's maximum grade is the steepest section of trail 10 feet or more in length. Acceptable maximum grades vary depending on the following factors:

- The grade of the existing sideslope
- Existing soil type
- Existing solid rock
- Annual rainfall amount
- Liberal use of grade reversals
- User groups / numbers
- Designed difficulty

Grade Reversals

Grade reversals are areas where a climbing trail levels, changes directions, drops slightly down slope for 10-50 linear feet, and rises again. This limits water velocity and volume build-up, thereby decreasing erosion. Grade reversals should be used on any trail climbing or traversing a sideslope, and should occur every 20-50 feet.

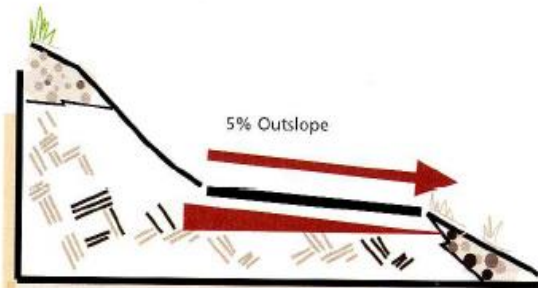
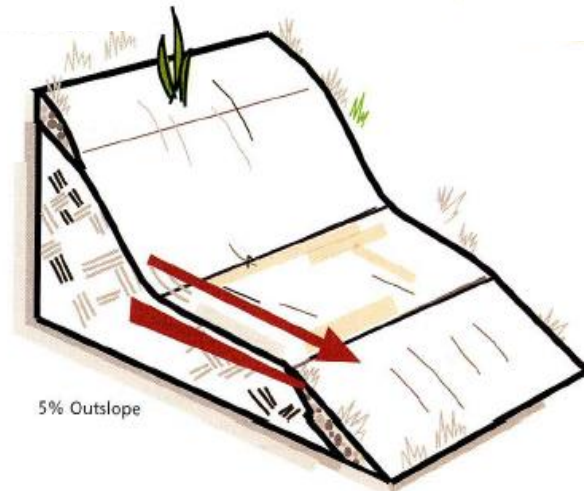
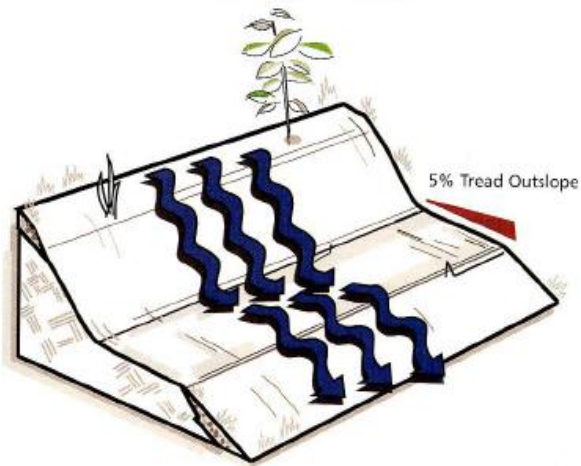


RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Outslope

Trails that traverse or climb a sideslope should always be graded so that the tread slopes slightly down and away from the high side of the slope. Creating an outslope will allow water to sheet flow across the trail and down the slope rather than funneling and creating ruts. A 5 percent cross slope is considered best when grading an outslope. If the trail is designed to be accessible, cross slope should not exceed 5 percent. If the soil type is loose where the trail is constructed, numerous grade reversals will be necessary to avoid erosion and maintain the tread and outslope.



Cut Trails

To create a durable and sustainable tread, a full bench trail is the recommended option. In this type of construction, the entire trail surface is made of compacted, native mineral soil with rounded and compacted backslope and downslope fill. Partial bench cut treads are a second option, but should only be constructed as a last resort, as half of the tread is built of fill, which often fails to compact and can erode easily over time. Partial bench treads are not considered to be a form of sustainable trail construction.

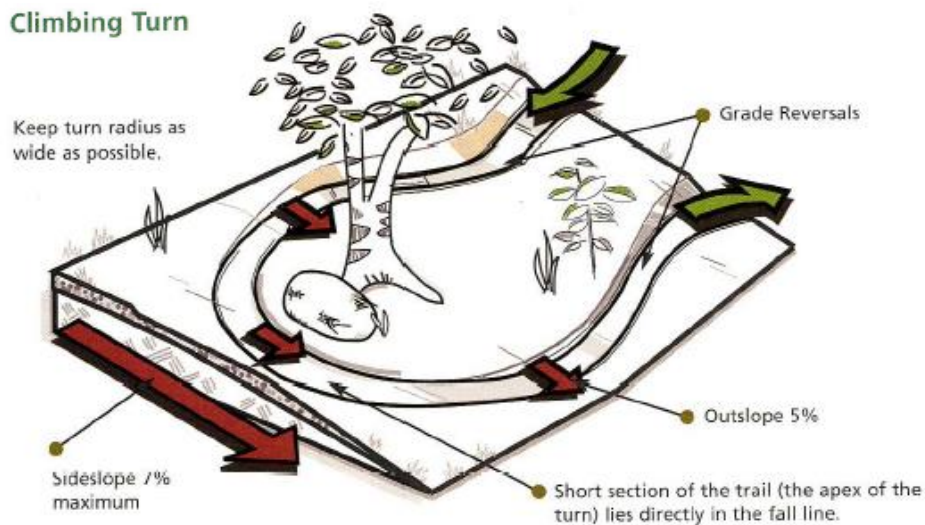
Climbing Turns

Climbing turns should only be used on sideslopes of 7 percent or less, as the trail will briefly follow the fall line, in order to decrease the chance for erosion. Design the turning radius with a minimum width of 20 feet with natural barriers placed on the inside of the trail curve to keep users on trail. Construct grade reversals above and below the curve to minimize water flow on the fall line. Construction of a choke point on the high side of the curve will also lessen user-wear erosion by reducing user movement on the curve.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

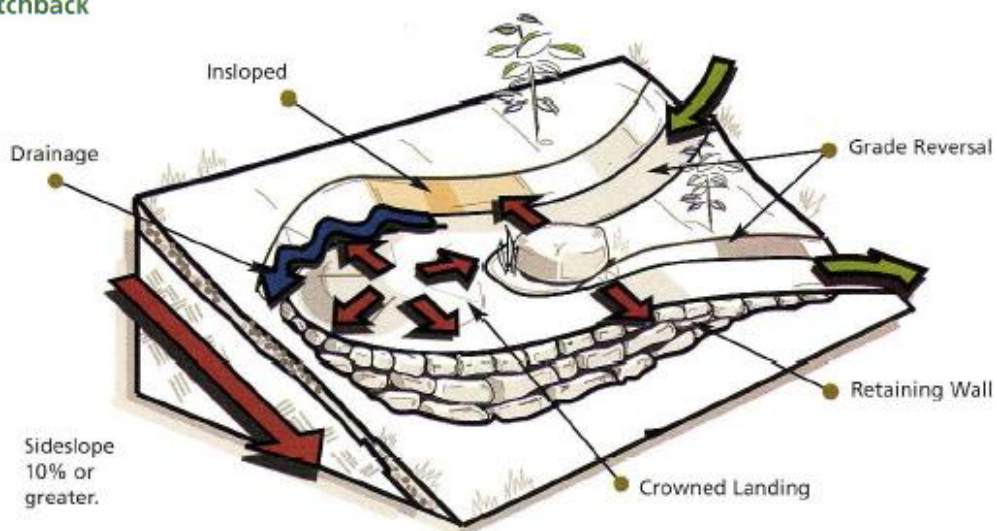
Climbing Turn



Switchbacks

A rolling crown switchback is similar to a climbing turn but is used on steep slopes and involves construction of a retaining wall to create a mounded, level platform at the apex of the curve. Construct the upper trail tread insloped toward the high side of the slope to drain water across the top of the curve and prevent it from sheeting to the lower trail. The lower tread should be outsloped as in usual construction. Fill from excavating the upper tread is used to construct the turning platform, and is compacted and mounded for even drainage. A retaining wall should be constructed of stone found on site or large timbers, preferably treated or found on site. Grade reversals should be used above and below the curve to minimize water flow on the switchback itself. Switchbacks should be staggered as a trail ascends a slope to prevent users from creating shortcuts and to disperse water flow more evenly along the hill.

Rolling Crown Switchback

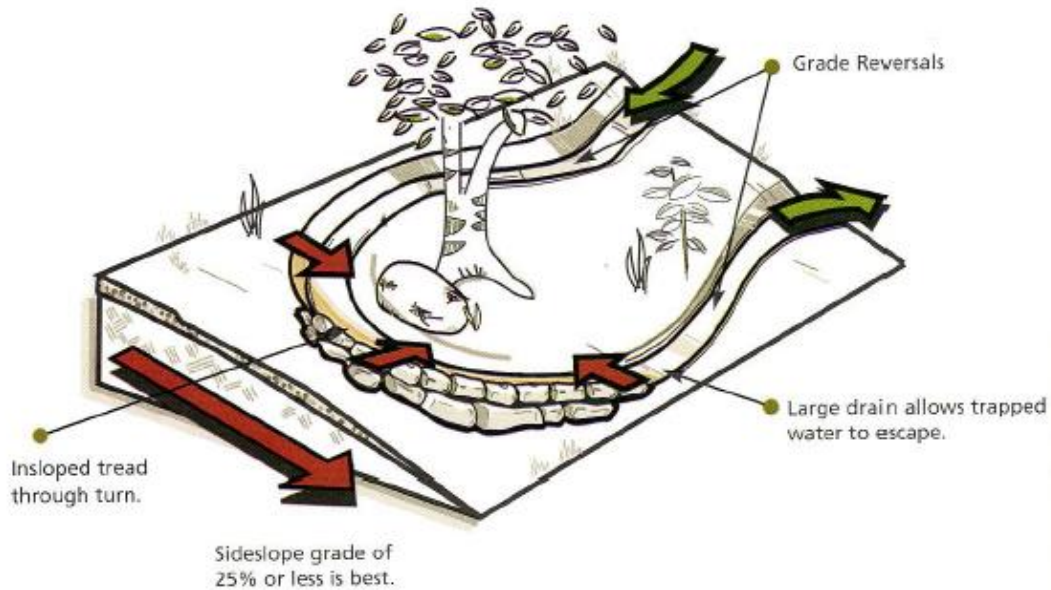


RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Insloped Turns

In situations where users are likely to cause lateral displacement of tread material, construction of an insloped turn is recommended. Properly designed and constructed insloped turns will improve tread life by reducing skidding and soil displacement by improving user flow along the trail. Curve banks of an insloped turn should be very well compacted and constructed in layers to prolong tread life and minimize soil displacement. A well-designed grade reversal above the curve is necessary to reduce water flowing down slope. Vegetation should be kept low in the center of the curve to maintain sightlines from the upper trail to lower trail.

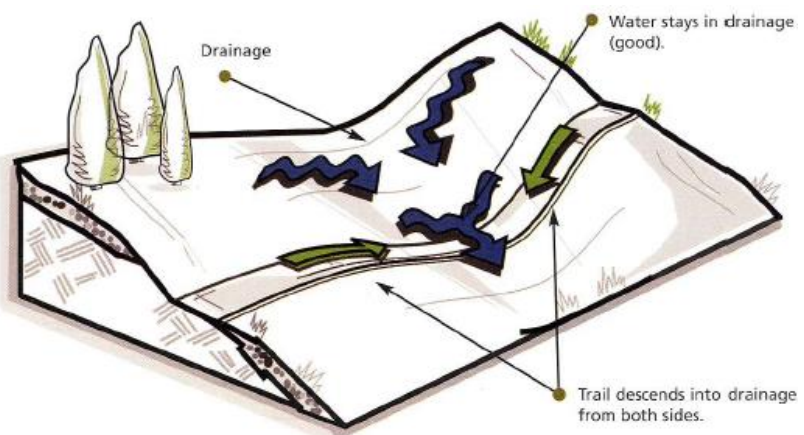


2. DRAINAGE CROSSINGS

In general trail design, direct drainage crossings should be avoided or minimized due to increased chance of erosion. If a crossing is necessary, it should be carefully sited where banks slope gently, ideally at a maximum of 8 percent. Trails approaching a drainage crossing should include well-designed and constructed grade reversals to prevent sediment from washing down the trail into the drainage course.

Bridges

Bridges may range from log footbridges to complex suspended or truss structures. Use of handrails is always recommended no matter the bridge's length, and an engineer should inspect all bridge plans prior to construction and use.



RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

C. TRAIL CONSTRUCTION STANDARDS

(Derived from "NORTH COUNTRY NATIONAL SCENIC TRAIL, A Handbook for Trail Design, Construction, and maintenance. August 1996)

"The objective of trail standards is to ensure a consistent look without compromising local initiative, a high standard of quality without over-building, a basic level of safety without removing all risk, accessible portions without compromising the character of the trail, and environmental and resource protection."

1. TREAD WIDTH

Tread width refers to the actual walking surface of the trail. The tread width should be constructed or smoothed to the recommended trail width. **Table 3** provides recommended tread widths for various trail types.

2. CLEARING WIDTH

Clearing width is the area kept free of brush, limbs, briars, tall grass, weeds, and other obstructions which would strike against the hiker or their pack, or soak them following a rain or heavy dew. In heavily wooded areas, the clearing width is normally maintained simply by pruning limbs. Appropriate clearing width varies with trail setting, but is typically one to two feet on either side of the tread surface. See **Table 3** for more information. In wooded areas there may be occasions when it is desirable to narrow the clearing width in order to route the trail between two large, visually interesting natural features such as rocks, trees or a natural stand of native plants. Narrowing the clearing width below the desired standard is not acceptable when done for aesthetic reasons only. In Washington Grove the area between the edge of the tread and the edge of the clearing should be leaf litter or short herbaceous plants. Clearing widths in Washington Grove will vary from nine feet for proposed accessible trail segments, to six feet for primary trails and five feet for secondary trails.

3. CLEARING HEIGHT

Recommended clearing heights also vary with setting, but typical heights are eight to ten feet. All trails in Washington Grove should be cleared to a height of 8 feet. Branches that may restrict the trail when weighted with rain or snow should also be removed. The clearing height does not require any additional height for snow pack due to the limited use by hikers with backpacks during the winter months.

4. SLOPE (SUSTAINED)

The slope (grade) of the trail may be the key factor contributing to tread stability. Trail grades should be easy to moderate, to promote a stable, maintainable tread. Designed trails should traverse slopes with gentle changes in grade. To minimize erosion, the slope should be less than 10%. Grades less than 7% in all soils are ideal. In flat areas, trail should be located so that there is some grade to provide for proper drainage. Grades shall vary slightly to allow for drainage and to create interest and challenges for trail users. Avoid long steep grades that may be tiring for hikers.

5. SLOPE MAXIMUM

Due to existing landforms and features, sustained slope guidelines could be difficult to meet within all of Washington Grove. In some locations, it might be necessary to use a short, steep segment of trail to regain access to more moderate slopes. In these instances, the maximum slope guidelines should be used and additional erosion control measures incorporated. Sections of trail exceeding the sustained grade standards should be less than 100 feet in length. In some areas similar to the Nunda Boulevard entrance it may be necessary to go up a very steep slope for a short distance. Steps may be necessary in these areas, but should be considered as a last resort due to the barrier they impose upon many people.

6. CROSS SLOPE

Cross slope is of particular importance when constructing trails across the face of a steep slope. A cross slope between 2 and 5 percent is desirable so that water moving down the face of the slope above the trail continues across the trail and down the opposite side. A cupped trail or a trail that slopes back into the hill collects water and is undesirable. The cross slope should not exceed the percentages shown in [Table 3](#).

7. STANDARDS FOR ACCESSIBLE TRAILS

Stricter standards apply when a trail segment is designed to be fully accessible. Please refer to [Table 3](#) and Section E (below) for a discussion of accessibility standards.

8. TRAIL SURFACE

Tread surface treatments can stabilize heavily used trails. Woodchips, for example, can protect the surface from feet and rain, and have in fact been used in Washington Grove with some success. Compacted areas along ridges may benefit the most from woodchips because the chips will behave like a sponge to reduce runoff downslope from the trail. Do not use wood chips on steep slopes as they do not stay in place. Do not use wood chips to correct wetness problems. Wood chips add more organic material to the trail surface as they decompose, increasing moisture retention. Wood chips are only acceptable on relatively level sections of trail to smooth a rough tread surface and to prevent weed growth and wear of the natural surface.

Gravel surfaces, particularly “crusher fines”, meaning crushed rock with a particle size up to 3/8”, ideally granite or other hard stone, can make a very stable trail surface for high use trails when built with proper subgrade preparation and drainage. The gravel must consist of angular particles, as rounded pebbles like pea gravel will move and shift against each other instead of locking into a hard surface. The material should have sufficient fines to act as natural binders so that when laid 4-5” deep, it will form a porous but erosion resistant slab. When properly built, these surfaces can be wheelchair accessible. They should be designed by a qualified design professional to the same standard as a paved trail. Drainage is critical when using these materials, as they are highly susceptible to washouts from running water. Grade should ideally be 5 percent or less, and should never exceed 8 percent, and tread surfaces should be crowned or outsloped at 2 percent.

Building up / restoring the vegetative ground layer along trail edges on ridges is another way of reducing erosion. Much like a vegetative stream buffer, the physical structure of the plant material will slow the water heading off the trail and downslope. The challenge in Washington Grove is to prevent trampling of new plantings long enough for them to establish, and to protect them from trail widening and trailblazing thereafter. The success of native planting efforts in recent years has been limited by the persistent widening of trails. Containing the edges of trails will also have the benefit of allowing leaf litter to build up in areas that are currently bare, providing further protection from erosion as well as improved conditions for many plants and small animals. For further discussion of trail widening, please see Section K (below).

The native material found in Washington Grove should be satisfactory for surfacing the primary and secondary trails. [Table 3](#) shows a range of surfaces that are acceptable in various recreation settings. For designated accessible trails, surfaces must meet standards established under the Americans with Disabilities Act (see Section E below).

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

D. EROSION CONTROL ON EXISTING TRAILS

Trails with a grade above 10 percent are at high risk for erosion and those with 15 percent or steeper grade (or with a slope alignment angle less than 23 degrees) show significantly more soil loss. Conversely, trails with slopes less than 2 percent are susceptible to muddiness.

Unfortunately, because the trails in Washington Grove are numerous and largely un-designed, little opportunity exists for comprehensive trail planning beyond strategic trail closure. In particular, trails that run directly down-slope are very difficult to protect from erosion, and would best be taken out of use. **Figure E** shows specific recommendations for trail closures. Methods of trail closure are discussed in Section K (below). Trails that initially remain in place could be re-evaluated and realigned in the future, after the effects of closures are seen.

Where existing trails cannot practically be rerouted, some modifications can reduce erosion. In cases where the tread surface is close to level with at least one side slope, the addition of water bars or rolling grade dips can direct water off the trail, reducing or preventing the formation of gullies. Side slope trails tend to develop levies on the outside of the tread. These can be breached to redirect water off the trail.

E. PLANNING FOR DIVERSE TRAIL USERS

The following section discusses different types of trail users, including pedestrians and non-motorized winter sports enthusiasts.

1. PEDESTRIANS

The American Association of State Highway and Transportation Officials (AASHTO) 2004 Pedestrian Guide provides an overview of different types of pedestrians. It is difficult to classify pedestrians into the same types of categories presented for bicyclists. Pedestrians exhibit a wide range of physical, cognitive, and sensory abilities and disabilities. Diverse pedestrians should be anticipated in the design of any trail system. **Table 2** lists some of the common characteristics of pedestrians at various ages.

Both AASHTO and the Federal Highway Administration (FHWA) note that there is no single “standard pedestrian” and that the transportation network should accommodate a variety of pedestrians. For example, children and adults perceive their surroundings differently. Young children require adult supervision in order to navigate a trail safely. Children sometimes walk more slowly than adults, and have a lower eye height. Older adults also have different needs. This group of pedestrians typically travels more slowly, desires more predictable surfaces, benefits from handrails in steep areas, and needs places to rest along their route. As our population ages, the needs of older pedestrians will be of increasing importance to trail design.

Pedestrian mobility can be limited in a variety of ways, from physical disabilities to pushing strollers. The ability to reach a destination depends on a person's speed, coordination, endurance, and the types of obstacles, grades and cross-slopes he or she encounters along the way. While the minimum operating space and pedestrian facility width are relatively the same between users, the skills, confidence and preferences of pedestrians vary. These variations are mostly a result of differences in age and differences in physical, cognitive and sensory abilities. Accessibility guidelines provide minimum specifications for accessibility that meet the needs of most people. However, exceeding the minimum standards will make environments accessible to more people.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Table 2. Common Pedestrian Characteristics by Age Group
(Adapted from AASHTO and FHWA)

Age Group	Ages	Characteristics
Infants and Toddlers	0-4	<ul style="list-style-type: none">▪ Learning to walk▪ Require constant adult supervision▪ Developing peripheral vision, depth perception▪ Act impulsively and unpredictably
Young Children	5-8	<ul style="list-style-type: none">▪ Increasing independence, but still requiring supervision▪ Limited peripheral vision and poor depth perception▪ Act impulsively and unpredictably
Preteens	9-13	<ul style="list-style-type: none">▪ Susceptible to “darting out” into intersections▪ Poor judgment▪ Sense of invulnerability
High School Aged	14-18	<ul style="list-style-type: none">▪ Improved awareness of traffic environment▪ Poor judgment▪ Feel invincible
Adults	19-40	<ul style="list-style-type: none">▪ Active, fully aware of traffic environment
Middle-Aged Adults	41-65	<ul style="list-style-type: none">▪ Are still active▪ May experience a slowing of reflexes, range of motion, and observational skills
Senior Adults	65+	<ul style="list-style-type: none">▪ Difficulty crossing street▪ Vision loss and reduced abilities under low light/night conditions▪ Difficulty hearing vehicles approaching from behind▪ High fatality rate if struck by vehicle

Accessible Trail Design Standards

The Americans with Disabilities Act (ADA) Standards address recreational facilities such as boating, swimming and golfing facilities, but do not directly address walking / hiking trails. The United States Access Board has developed proposed applicable guidelines for trails not covered by current ADA standards, which will become part of the standards in the future. More information on these proposed guidelines can be found at: <https://www.access-board.gov/guidelines-and-standards/recreation-facilities/outdoor-developed-areas/background/committee-report/trails>.

At the time of this report the most useful published guidelines come from new provisions to the Architectural Barriers Act (ABA) Accessibility Standards, which apply to outdoor areas developed by the federal government. A 2014 guide to these standards can be found at: <https://www.access-board.gov/attachments/article/1637/outdoor-guide.pdf>

Another useful resource is the set of guidelines developed by the USDA Forest Service, known as the Forest Service Trail Accessibility Guidelines (FSTAG) and outlined in the [Accessibility Guidebook for Outdoor Recreation and Trails \(2012 version\)](#). These guidelines comply with ABA requirements, and are legally enforceable only on Forest Service lands, but can be used by other agencies and organizations to maximize accessibility.

The following is a brief summary of the guidelines described above:

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

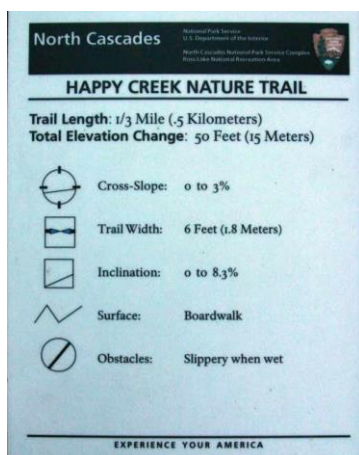
- Trail surfaces must be firm and stable; in other words, the surface must resist deformation by indentations, must not be permanently affected by normal weather conditions, and must be able to support expected use between planned maintenance activities. The clear tread width must be at least 36 inches, or 32 inches if conditions for an exemption exist. Openings in trail surfaces, such as between decking boards on a bridge or boardwalk, may be up to ½ inch in width.
- Running slopes greater than 5 percent are subject to length requirements: Portions of trails that are between 5 and 8.33 percent must have resting intervals no less than every 200 ft., portions with grades between 8.33 and 10 percent must have resting intervals no less than 30 feet, and portions between 10 and 12 percent must have rest opportunities every ten feet or less. Resting areas should be at least 60 inches long, with width requirements that vary depending upon whether they are within or beside the trail, and must not exceed 5 percent slope in any direction. Passing spaces of at least 60 inches in width should be provided at least every 1,000 feet if the clear tread width is less than 60 inches.
- Cross slopes should be 2 percent when trail surfaces are paved, or up to 5 percent when the surface is natural. Some cross slope is necessary for proper drainage, but cross slopes greater than 5 percent make both walking and wheelchair use more difficult.

Accessibility and signage

Accessible parking spaces should be designated using signage with the International Symbol of Accessibility. Signage at trailheads should clearly indicate that the trail is accessible. Such signs should also indicate:

- Trail or trail segment length
- Trail surface material
- Trail width
- Typical and maximum slope / cross slope

It is considered neither necessary nor desirable to include advisories such as “some individuals may require assistance,” as users typically know their own abilities and prefer to judge from the posted trail description whether it is appropriate for them.



Sign example from American Trails



Updated International Symbol of Accessibility, as adopted by New York State in 2014.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

An accessible trailhead sign should be placed in a clearing (as illustrated **Figure P**). All accessibility signs should have a non-glare finish, and text should contrast with the background. This increases the legibility of the sign, particularly for individuals with low vision. For more information on accessible trail signage, please review the Forest Service Trail Accessibility Guidelines and the Forest Service Outdoor Recreation Accessibility Guidelines (<http://www.fs.fed.us/recreation/programs/accessibility/>).

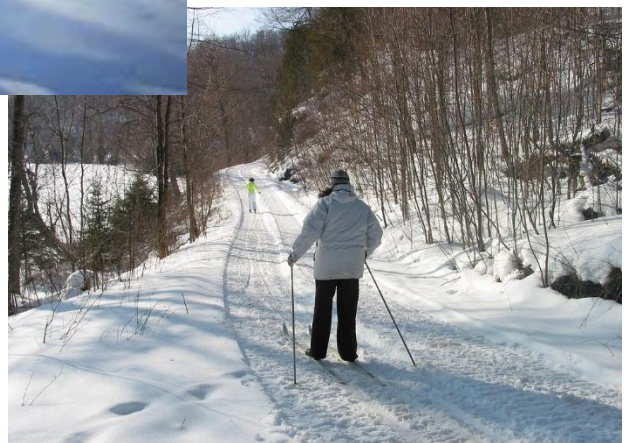
2. NON-MOTORIZED WINTER SPORTS ENTHUSIASTS

Upstate New York's long winters make sports that take advantage of cold and snow standard. Popular non-motorized winter trail uses include cross-country skiing, trail running and snowshoeing. Winter sports enthusiasts can often make use of hiking or multi-use trails when they are covered with snow.

The Washington Grove trails are well suited to snowshoeing, and are occasionally used by skiers. As ski trails are typically designed with lengths between 3 and 15 km, and significantly longer for advanced skiers, the available trail length in Washington Grove is inherently insufficient to attract many skiers. However, the availability of varied terrain and the convenient location of the Grove mean that the trails are likely to see occasional use by skiers. The grooming of trails within Washington Grove is not a feasible consideration and they therefore will likely be left in a "backcountry" condition.



Snowshoeing and cross country skiing are two of the Non-motorized winter sports that are currently enjoyed within the Washington Grove.



Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Table 3.

Standards (desired)	ROS Class			
	Urban	Rural and Roaded Natural	Semiprimitive	Primitive
<u>Tread Width</u> Hiking Segments Accessible Segments	48" 60"	24" 36"	18" 28"	*
<u>Clearing Width</u> (each side of tread))	24"	12" (WIDNR-24")	12"	*
<u>Clearing Height</u> (min.)	10'	8' (WIDNR-10')	8'	*
<u>Slope(max.sustained)</u> Hiking Segments Accessible Segments	10% 5%	10% 8%	15% 12%	*
<u>Slope (max.)</u> Hiking Segments Accessible Segments	15% for 100' 8% for 30'	20% for 100' 10% for 50'	30% for 100' 10% for 50'	*
<u>Cross Slope (max)</u>	3%	5%	8%	*
<u>Other Accessible Segment Standards</u> Passing Spot Int.-max Rest Area Interval-max	N/A 1200'	600' 1200'	1200' 1/2 mile	N/A N/A
<u>Surfaces</u>	Asphalt. Concrete. Stabilized- aggregate. Screening(1). Wood Chip. Sod.	Native. Wood Chip(2). Stabilized-aggregate. Screening(1).	Native	Native
<u>Accessible Surfaces</u>	Asphalt. Concrete. Stabilized- aggregate.	Asphalt. Stabilized-aggregate.	Native. Stabilized- aggregate.	Native

*In Primitive ROS (wilderness), human impacts and changes to the scenery are meant to be less obtrusive—when entering a wilderness area, one accepts greater personal risk. Trails in primitive areas lay "light-on-the-land." Because of this, no hard standards have been established. Generally, the tread is more faint, the grade varies depending on the terrain, etc. However, it is still important to consider trail design standards which protect the environment. Because trails in wilderness areas may receive less frequent maintenance, designing a trail that requires little maintenance is of utmost importance.

- (1) Limestone screenings include the fines.
- (2) Not in wet areas—adds to the problem.

F. DEVELOPMENT AND ANALYSIS OF ALTERNATIVES

The alternatives presented in this section were developed through the careful evaluation of data gathered in the inventory and analysis phase, including extensive public input regarding desirable and undesirable changes. The trail alignment alternatives are described here and illustrated in **Figures I – L**. Certain trails are recommended for closure based on their steepness and eroded condition and/or because they bisect high-quality wildlife and plant habitat areas. Others are recommended for treatment as secondary, or de-emphasized, trails. Entry points were carefully evaluated as well, and recommendations for closures and improvements are presented.

G. ALTERNATE 1 - PREFERRED TRAIL NETWORK

Members of the public and multiple user groups have expressed clear support for an accessible trail within the Grove, which will require improvements to parking and access to the trail. The slope analysis shown in **Figure F** indicates the optimum location for an accessible trail loop. The preferred trail network for Washington Grove, shown in **Figure I**, is a system of segments that can collectively provide a safe and enjoyable experience for trail users of all types. The trail system has one accessible trail (approximately 0.15 miles) and one accessible loop (approximately 0.35 miles). This alternative includes a pedestrian bridge to provide an accessible route over a valley, which will allow for the closure of a steep trail, thereby reducing erosion and removing an unsafe condition. Several other steep trails and a few redundant trails are also recommended for closure. Trail closures will require a physical barrier along with appropriate signage to be successful.

1. PARKING

The proposed Cobb's Hill entrance would be accessible from designated parking on Reservoir Road. Existing on-street parking at the Nunda Boulevard would remain. A potential future area for parking just west of the MCWA building is illustrated in **Figure I**.

2. RECOMMENDED ENTRY CLOSURES

Certain existing entry points are detrimental to the ecological health of the Grove and/or are unsafe, and should therefore be closed. See section K (below) for methods of trail closure.

North: All existing trails are very steep. It is recommended that a single, more gradual trail is designed and that unsafe trails are closed.

West: Many of the trails from Cobb's Hill Reservoir, located to the west of the study area, are steep and eroded. Eroding trails should be closed and alternative trails considered.

South: The Highland Heights Homeowners Association has decided on a location for a single, new entrance that will replace the three existing entry points.

3. RECOMMENDED ACCESS POINTS TO REMAIN

Alternate 1 recommends the following six community access points to the primary trails, each with a trailhead sign and posted trail rules:

- Nunda Boulevard
- Cobbs Hill Reservoir, north entrance
- Cobbs Hill Reservoir, south entrance
- Tay House Lodge
- School #1
- Highland Heights (private entrance)

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

4. RECOMMENDED ACCESS POINT AMENITIES

The following amenities are recommended at access points:

Nunda Boulevard entrance

- trail map
- wooden trailhead sign
- Grove rules
- dog waste bag dispensers
- stone seat wall
- stone paving
- native plantings
- stair improvements (see **Figure O**)

Cobbs Hill Reservoir south entrance

- wooden trailhead sign
- Grove rules
- dog waste bag dispensers

Tay House Lodge entrance

- wooden trailhead sign
- Grove rules
- dog waste bag dispensers

Cobbs Hill Reservoir north entrance

- wooden trailhead sign
- Grove rules
- dog waste bag dispensers
- large kiosk with trail map and interpretive information
- stone paving
- native plantings

School #1 entrance

- wooden trailhead sign
- Grove rules
- dog waste bag dispensers

Highland Heights entrance

- Grove rules

5. PRIMARY TRAILS

The preferred primary trails would remain natural surface trails, and would have a tread width of four feet and clearing width of six feet. Primary trails would mainly be located around the perimeter of the Grove, with several bisecting primary trails creating a series of large trail loops.

There are numerous primary trail improvements recommended throughout the Grove. The recommended locations and types of improvements are shown in **Figures J** and **L**.

6. SECONDARY TRAILS

The preferred secondary trails would remain natural surface trails with tread width of three feet and clearing width of five feet, connecting within the primary trails to create a series of small trail loops. Each secondary trail would be accessed from a primary trail. Please see **Figures I** and **K**.

There are numerous secondary trail improvements recommended throughout the Grove. The recommended locations and types of improvements are shown **Figures J** and **L**.

7. ACCESSIBILITY AND ACCESS LOOP

None of the entrances to Washington Grove are currently compliant with accessibility guidelines for outdoor recreation facilities. Potential alternatives for a re-design of the entrance located by the reservoir in Cobb's Hill Park can be seen in **Figures M** and **N**. Benches placed strategically at entrances and along trails can also make trails more accessible to individuals with limited mobility.

To accommodate users of all mobility levels, the trail system would include an approximately 0.35 mile accessible loop trail. This loop trail would be accessed from on-street parking on Reservoir Road, which would be improved to include

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

designated ADA-compliant spaces. The preferred accessible trails would have a stone dust surface compliant with accessibility guidelines with tread width of five feet and clearing width of nine feet, and would have benches set at regular intervals. See **Table 3** for specific recommendations on rest intervals. The accessible loop would likely include boardwalks; transitions from the trail surface to these boardwalks would need careful consideration.

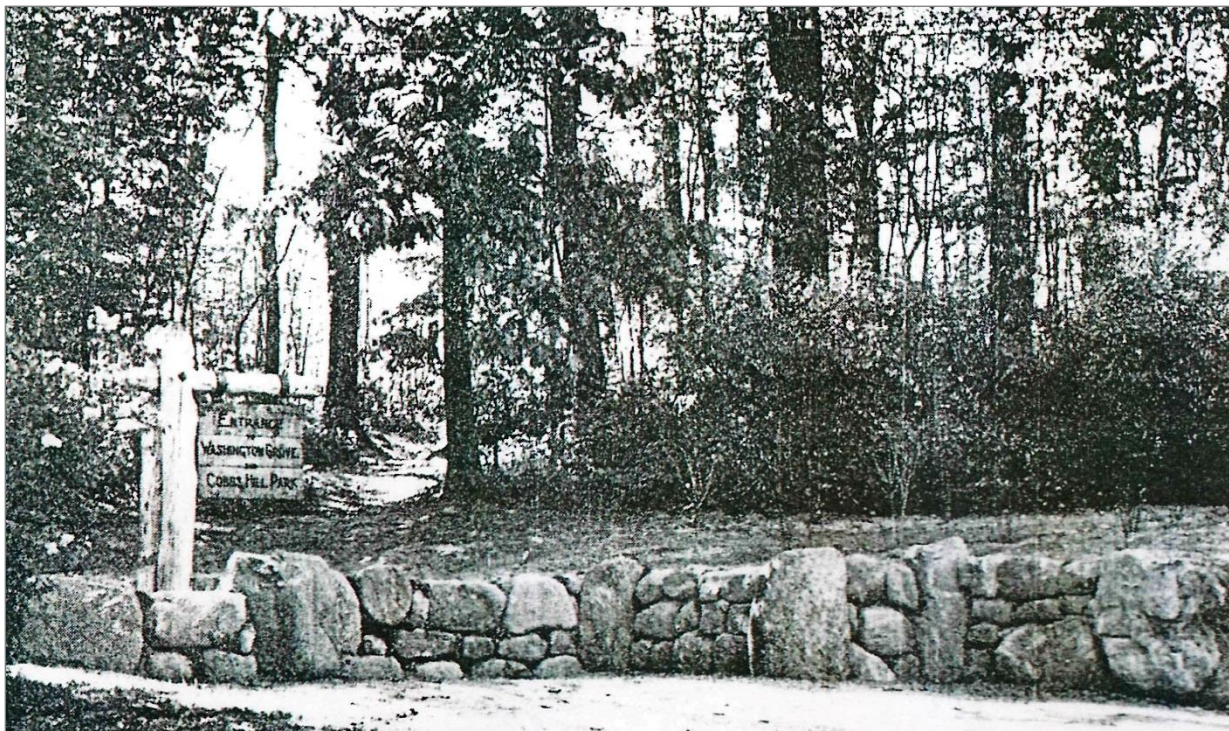
H. ALTERNATE 2

As shown in **Figures I** and **N**, this alternative is similar to Alternate 1, with the following variation:

Creation of a different new accessible trail (approximately 0.25 mile) that includes a long rolling crown switchback to traverse the steep slope on the MCWA parcel and allow access to Washington Grove and the trail network.

I. NUNDA BLVD ENTRANCE RESTORATION

The Nunda Blvd entrance, originally designed in 1937, has been disassembled and reassembled in a haphazard fashion more than once in order to bring large equipment and vehicles in when utility and tree work has been needed nearby. A redesign of the entrance would reduce erosion and appear more intentional than the current configuration. **Figure O** shows a conceptual rendering of how the entrance could look. This conceptual design provides signage more similar to that seen in the original design, naturalistic seating, and native plantings.



Nunda Blvd entrance, ca. 1930s

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement



Nunda Blvd entrance, ca. January 2016

J. DESIGN DETAILS

Based on the results of the analysis and inventory of Washington Grove, the following design elements are recommended.

1. PARKING AND PAVED AREAS

The proposed parking area should be asphalt paving. Permeable asphalt paving should be considered in conjunction with a geotechnical analysis of the existing soils. The proposed paved area at Nunda Boulevard should be a natural stone surface of cut bluestone or natural flagstone with tight joints.

2. RETAINING WALL AND STAIR MATERIALS

Retaining walls and stairs should be constructed using locally sourced natural stone.

3. TRAIL DESIGN AND MATERIALS

The recommended trail system is comprised of two different character types. The accessible loop trail should be a five-foot-wide stone dust trail surface. This width is above the three-foot minimum required by accessibility guidelines, but is practicable in select areas of Washington Grove and allows resting at any location along the trail, rather than only in certain places. The primary trails should have a natural surface with a width of four feet and the secondary trails should have a natural surface with a width of three feet. These widths exceed the minimum standards recommended for semi-primitive trails by the North Country National Scenic Trail Construction Design Standards (see [Table 3](#)), but are appropriate in a heavily used urban natural area.

4. GATEWAYS, TRAILHEADS AND INTERPRETIVE SIGNAGE, EMERGENCY LOCATION MARKERS

Trailheads require site amenities to define the trail's character, provide information, and keep trail users safe.

Gateways

Each trailhead presents an opportunity to define the character of the trail. Using the history of the Grove as a guide, the preliminary design for aesthetic features reflects the revered natural character. Trail gateways have been conceptually designed that make use of locally salvaged materials. These gateways would welcome trail users as they enter the trail. [Figure O](#) illustrates a proposed trail gateway.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Trailheads and Interpretive Signage

One trailhead is proposed at the Cobbs Hill reservoir entrance, and one at the Nunda Boulevard entrance. The Cobbs Hill Reservoir trailhead should have improved parking, as well as an informational kiosk with trail maps. The Nunda Blvd. trailhead should have a trail map. **Figure Q** provides examples of various signage types, including kiosks, directional signs, and milepost bollards. **Figure I** indicates proposed trailhead locations. It is recommended that the existing signs reminding visitors about the leash law be removed from the interior of the Grove, and only placed at entrances, in an effort to reduce visual clutter along the trails.

Emergency Location Markers

Markers should be located on remote sections of the trails where there are no easily identifiable landmarks by which a trail user could describe their location. Each sign has a unique code, is GPS located, and is entered into the 911 system with notes on how to access each specific location. Emergency location markers have been successfully installed in Turning Point Park and have received positive feedback from emergency responders and the Rochester Police Department. Refer to **Figure Q** for examples.

5. REASSURANCE MARKERS

The lack of trail markers in Washington Grove is a source of confusion and contributes to the problem of volunteer trails. In many locations it is unclear where the designated trail is, particularly in winter when the trails are covered in snow. The addition of periodic markers helps prevent trail users from inadvertently wandering off trail.

Marker Posts

Trail markers should be used if the correct trail path is not obvious or if it may be covered with snow at any point of the year. Blazes, when used, should be placed as often as necessary, and should be clearly visible from any point where the trail could be lost. In Washington Grove blazes are not preferred because there is a desire for minimal signage. Instead, post-mounted markers at strategic locations such as intersections are recommended. The images below provide examples of trail marker designs.



Trail signage example from the College of Charleston, designed by Ayers Saint Gross



Trail signage example from the Tehaleh planned community, by Community Design



Signage example from the North Vancouver Parks Department, by Ion Design

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

6. DRAINAGE IMPROVEMENTS AND SWALE CROSSINGS

In the southern part of Washington Grove, trails pass through relatively flat areas that are seasonally wet/muddy. There are several options for crossing wet areas, ranging from stepping stones to boardwalks. Use of corduroy is no longer widely recommended because of lack of durability, drainage issues, and difficult walking surface. Wood chips should not be used in wet or low spots because their absorbent nature will only exacerbate the problem.

Short sections of boardwalk are recommended as a part of creating an accessible trail loop. A foot bridge is required for Alternate 1 preferred trail network to accommodate the accessible entrance.

7. GUIDE RAILS, SITE FURNITURE, AND ACCESS CONTROL

Guide rails, site furniture and access control features are often required in order to make trails safe and comfortable.

Guide rails

In select areas of the trail, guide rails may be necessary to keep trail users safe from steep slopes and possibly to assist with trail closures. Timber guide rails are recommended in these cases.

Site Furniture

Locally sourced limestone slabs provide attractive, inexpensive, maintenance-free seating. Clusters of two or three boulders can provide natural-looking seating areas, which are recommended at regular intervals along the trail and at trailheads. Manufactured metal benches could be incorporated along the accessible loop at regular intervals, in order to provide more secure seating for visitors who require it.

Access Control

Trail access control gates are recommended at the Cobbs Hill Reservoir trail entrance, in order to limit use of the trails to pedestrians and emergency vehicles. The trail access gate can be a standard-issue gate, or reclaimed lumber can be used to inspire a more interesting gate.

8. BOARDWALK

The boardwalk should be designed using helical piles for the foundation, pressure treated southern yellow pine for structural members, and composite decking for the surface. Handrails are required when the elevated surface is greater than 30" from the ground below. If handrails are required, they will need to be 42" high. Handrails should be made from pressure treated southern yellow pine. All trail bridges that do not require a hand rail must have a curb rail. The curb rail should be made from either composite decking or reclaimed logs from on site. See **Figure P** for more detail.

9. BRIDGES

The bridge described in Alternate 1 should be a pre-engineered metal truss bridge. It should provide enough clearance to allow emergency and maintenance vehicles to pass.

K. TRAIL CLOSURE AND WIDTH LIMITATION

1. TRAIL WIDENING

Level of trail use has been shown to be weakly related to degree of erosion, but strongly related to trail widening. Many trails within Washington Grove show signs of unplanned widening due to heavy use. In these areas some trail surfaces have been covered in wood chips, but in most cases the surface is bare earth, compacted by foot traffic. At intersections and along ridges, in particular, paths have widened until trees are essentially within them. In these areas there is little to no leaf litter, and very little plant growth. Without vegetative cover, the exposed soil is subject to

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

dramatic erosion in several places. The question of appropriate trail maintenance in the Grove is somewhat contentious, with some users concerned that high traffic, for example large groups of runners, threatens the integrity of the forest, while others are concerned that creating too much restriction will limit access to a prime location for healthy recreation. In order to balance these needs, we recommend a combination of signage, trail improvements, edge delineation, and judicious trail closures.



Trail widening on north ridge



Trail edges delineated with logs in southwest Grove

One source of contention related to trail width is what method should be used to regulate it. Currently, the Friends of Washington Grove have a practice of using fallen logs (including debris from invasive species removal) to line the edges of trails. The intention is to create a visual edge to the trail, as well as a minor barrier to prevent incremental widening of the path. Such methods are recommended by some researchers in recreation management as a way of encouraging visitors to stay on designated trails. However, the use of log borders has been met with resistance from some users, who describe the effect as looking “junky”, and argue that it diminishes the forest and people’s experience of it by adding too-obvious evidence of human influence. This group of users is against the addition of anything “man-made”.

Given the concerns some users have about the appearance of the forest, it may be preferable to use logs and debris produced during restoration activities in subtler, more strategic ways. While the Washington Grove trails are not open to mountain biking, the design principles used to control speeds on bicycle trails may be of use in directing and containing foot traffic. On bicycle trails, chokes are created when the trail is approaching a point where users will need to slow down, for example at intersections, stream crossings, or merging trails. Chokes are points in the trail where the tread narrows to force reductions in speed. While on a pedestrian trail speed is not

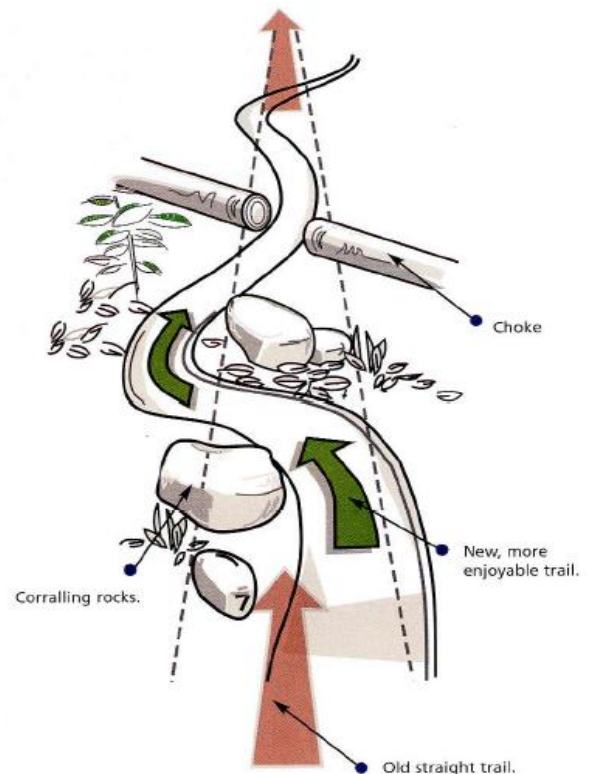


Image from: *Trail solutions: IMBA's guide to building sweet singletrack.*

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

an important consideration, the use of chokes may help prevent widening by directing users through a narrow gap.

These “choke” areas should appear to be natural and well defined to avoid users defining their own paths. Large objects should be used to define trail edges and turns; often boulders, logs, and plants work best. Objects should serve as both physical and visual barriers. In certain places within Washington Grove fallen logs have been placed or left across the trail, with a narrow section cut out to create an easiest path. This functions as a pedestrian “choke”, and may be effective without being overtly “man-made.” In particularly sensitive or difficult areas, a dry stone wall might add protection for slopes or native plantings while looking as appropriate to the setting as possible.

To those who view the Grove as a “virgin forest”, trail closure and narrowing methods that have little visual impact, such as spreading natural debris and rocks over the trail surface to visually obscure it and protect it from erosion may be less objectionable than deliberate-looking fencing or signage. Measures as subtle as this may, however, be insufficient for closing well-established trails, or for reducing unplanned widening.



Natural-looking log “choke” near Nunda Blvd entrance



Example of stone wall

2. TRAIL CLOSURE

Many of the trails in Washington Grove have arisen without planning and reflect the paths people choose in order to reach particular views, or to cut corners from one trail to another, or simply to explore. Because the Grove is relatively small, but has varied terrain, there are many paths of interest quite close together, leading to a proliferation of nearly redundant trails. See **Figures E** and **J** for specific recommendations on improvements to the overall trail network.

Closing trails can be difficult to accomplish. As long as a trail remains visible, it will be tempting to even the most conscientious of hikers. Some research has shown that in many cases “brushing in” a trail by simply piling debris across it is less effective than hoped, because trail users clear the debris, often thinking that they are helping to maintain the trail. Logs and debris piles placed only at the entrances to unwanted trails are often counter-productive, because determined hikers will go around the obstruction, widening the impacted area instead of reducing it. While fencing off a trail creates a more obvious intention of closure, the same difficulties apply.

The success of physical barriers without educational /informational signage is often limited. Unfortunately, while some community members have expressed a desire for increased educational and directional signage in the Grove, others have voiced the opposite opinion-- that the minimal signage already present is too much. Some have argued that

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

being asked to stay on trails is too confining, especially for children, who benefit from exploring nature. As described by J. Marion (2008), signs that present a “compelling rationale and clear behavioral plea” have been shown to be more effective in changing behavior than imperative “do” or “do not” messages. In Washington Grove, this message could be: *“Wandering feet can damage young plants—please help keep Washington Grove alive and well by staying on designated trails.”*

Because those opposed to additional signage feel strongly about the appearance of the forest, it is possible that they may be swayed by a visual comparison between Washington Grove and a less disturbed forest floor. Persuasive signage could include images such as the ones below, illustrating just how “man-made” Washington Grove’s current condition really is. Detailed information on the damaging effects of off-trail hiking can be provided at the proposed kiosk locations, while simple signs can be placed at every entrance.



Appalachian Oak-Hickory Forest, from NY Natural Heritage Program.
Photo credit: Timothy G. Howard



Lack of understory vegetation in Washington Grove

L. POTENTIAL FUNDING SOURCES

This section discusses funding sources. Funding opportunities exist through the public and private sector. Obtaining funding for community parks and trail projects can be challenging and these grants and assistance programs are constantly changing, both in terms of availability and application requirements. All the current available opportunities should be only viewed as a starting point in the search for funding. A number of private funding sources exist which can be used by local governments to implement pedestrian-related improvements. The following quick-reference table ([Table 4](#)) includes many potential funding sources that are described subsequently in greater detail.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Table 4: Potential Funding Sources

Funding Source	Category	Relevant Project Type(s)
OPRHP (Office of Parks, Recreation and Historic Preservation) Recreational Trails Program \$5,000–\$100,000	State	Acquisition, development and maintenance of trails.
CFA (Consolidated Funding Application)	State	Various state agencies, including the Environmental Protection Fund and the Department of State.
The Greater Rochester Health Foundation	Regional	Community health and prevention projects and programs.
The Corning Incorporated Foundation	Private	The Corning Incorporated Foundation supports educational, cultural, and community service projects.
The Pack Project Grants Program Up to \$2,500	Private	This funding opportunity supports pioneering projects and initiatives that result in increased active outdoor participation. Active outdoor recreation includes but is not limited to hiking, biking, paddling, running and general play.
Captain Planet Foundation \$500–\$2,500	Private	Hands-on environmental education programs for K-12 youth that help develop cooperation and planning and problem solving skills. September 30th- typically for spring and summer projects. February 28th- typically for fall and winter projects.
National Trails Fund (www.americanhiking.org/our-work/national-trails-fund)	Private	Hiking trails.
Global ReLeaf Program (www.americanforests.org/our-programs/global-releaf-projects/global-releaf-grant-application/global-releaf-project-criteria)	Private	Trail tree plantings.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Robert Wood Johnson Foundation (general) (www.rwjf.org/grants)	Private	Projects that improve the health and health care of all Americans. Promotes active living, including non-motorized transportation.
The Conservation Alliance Fund (www.conservationalliance.com/grants/grant_criteria)	Private	Protects wild places for their Habitat and Recreational Value.
Surdna Environment/Community Revitalization (www.surdna.org/grants/grants-overview.html)	Private	Community revitalization and environment, including greenway trail design.
American Hiking Trails Fund Society National	Private	Acquisition, constituency building campaigns, and traditional trail work projects. Applicants must be members of AHS' Alliance of Hiking Organizations. \$500 to \$5,000 per project.
Parks Matching Grants Program <i>A cap for grant awards is established annually</i>	State	Program for the acquisition or development of parks and recreational facilities.
Historic Preservation Grant Programs <i>A cap for grant awards is established annually</i>	State	A matching grant program to improve, protect, preserve, rehabilitate or restore properties listed on the National or State Registers of Historic Places.
Heritage Areas Program <i>A cap for grant awards is established annually</i>	State	A matching grant program for projects to preserve, rehabilitate or restore lands, waters or structures, identified in a management plan approved by the Commissioner.
Acquisition <i>A cap for grant awards is established annually</i>	State	A matching grant program for the acquisition of a permanent easement or fee title to lands, waters or structures for use by all segments of the population for park, trail, recreation, conservation or preservation purposes.
Land and Water Conservation Fund Program <i>A cap for grant awards is established annually</i>	State	A matching grant program for the acquisition, development and/or rehabilitation of outdoor park and recreation facilities.
Scott's Miracle-Gro Company's Gro1000 Grassroots Grants	Private	Up to \$1,500 The focus is on garden and green space beautification projects that incorporate the involvement and engagement of neighborhood residents. Eligible applicants include nonprofit organizations, educational institutions, and government agencies.
Ben & Jerry's Foundation \$1,001 - \$15,000	Private	Projects that lead to environmental change or address the root causes of environmental problems An ongoing basis

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

STATE AND REGIONAL FUNDING SOURCES

New York State's [Consolidated Funding Application \(CFA\)](#) is a streamlined resource through which applicants can access multiple financial assistance programs that are made available through various state agencies. The CFA offers the opportunity for local governments (and other eligible applicants) to submit a single grant application to any appropriate agencies that may have resources available to help finance a given proposal. All submitted CFAs are also reviewed by the applicant's [Regional Economic Development Council](#), which may elect to endorse the proposal as a regional priority project. Several grant resources have been made available that may be appropriate funding opportunities for implementation of active transportation efforts, including the Environmental Protection Fund's (EPF) Municipal Grant Program, EPF Recreational Trails Program, Department of State's Local Waterfront Revitalization Program, and the Environmental Facilities Corporation's Green Innovation Grant Program.

The Greater Rochester Health Foundation administers a competitive grant program to implement community health and prevention projects. The grant focus topics and cycles may vary from year to year, pedestrian-related projects and programs may frequently be well suited for these opportunity grants. <http://www.thegrhf.org/>

FEDERAL FUNDING SOURCES: MAP-21 FUNDED PROGRAMS

[The Recreational Trails Program](#) is now funded under the TA umbrella. Funds may be used for all kinds of trail projects. Of the funds apportioned to a state, 30 percent must be used for motorized trail uses, 30 percent for non-motorized trail uses, and 40 percent for diverse trail uses (any combination). Examples of trail uses include hiking, bicycling, in-line skating, equestrian use, cross-country skiing, snowmobiling, off-road motorcycling, all-terrain vehicle riding, four-wheel driving, or using other off-road motorized vehicles. The funding amount will remain the same as in 2009 (\$2,204,556). An important provision of the new bill allows the Governor of a state to opt out of the recreational trails program if the Governor notifies the U.S. Secretary of Transportation no later than 30 days prior to apportionments being made for any fiscal year.

COALITION FOR RECREATIONAL TRAILS

The Coalition for Recreational Trails (CRT) is a federation of national and regional trail-related organizations. Its members work together to build awareness and understanding of the Recreational Trails Program, which returns federal gasoline taxes paid by off-highway recreationists to the states for trail development and maintenance. CRT was formed in 1992 following the passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) to ensure that the National Recreational Trails Fund (now known as the Recreational Trails Program or RTP) established by that legislation received adequate funding. The Coalition for Recreational Trails is hosted by the [American Recreation Coalition](#).

PRIVATE FUNDING SOURCES

There are a number of for and non-profit businesses that offer programs that can be used to fund bicycle and pedestrian related programs and projects. Nationally, groups like National Trails Fund are involved in funding for hiking trails, the preservation of natural areas and the protection of hiking experiences. Locally, Wegmans and Excellus have a strong track record of supporting health-based initiatives and may be resources for partnership or sponsorship.

American Hiking Society National Trails Fund. The American Hiking Society's National Trails Fund is the only privately funded national grants program dedicated solely to hiking trails. National Trails Fund grants have been used for land acquisition, constituency building campaigns, and traditional trail work projects. Since the late 1990s, the American Hiking Society has granted nearly \$200,000 to 42 different organizations across the US. Applications are accepted annually with a summer deadline. <http://www.americanhiking.org/national-trails-fund/>

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

The Global ReLeaf Program. The Global ReLeaf Forest Program is American Forests' education and action program that helps individuals, organizations, agencies, and corporations improve the local and global environment by planting and caring for trees. The program provides funding for planting tree seedlings on public lands, including trailsides. Emphasis is placed on diversifying species, regenerating the optimal ecosystem for the site and implementing the best forest management practices. This grant is for planting tree seedlings on public lands, including along trail rights-of-way. <http://www.americanforests.org/our-programs/global-releaf-projects/global-releaf-grant-application/>

The Robert Wood Johnson Foundation. The Robert Wood Johnson Foundation seeks to improve the health and health care of all Americans. One of the primary goals of the Foundation is to "promote healthy communities and lifestyles." Specifically, the Foundation has an ongoing "Active Living by Design" grant program that promotes the principles of active living, including non-motorized transportation. Other related calls for grant proposals are issued as developed, and multiple communities nationwide have received grants related to promotion of trails and other non-motorized facilities. <http://www.rwjf.org/grants/>

Conservation Alliance. The Conservation Alliance is a group of outdoor businesses that supports efforts to protect specific wild places for their habitat and recreation values. Before applying for funding, an organization must first be nominated by a member company. Members nominate organizations by completing and submitting a nomination form. Each nominated organization is then sent a request for proposal (RFP) instructing them how to submit a full request. Proposals from organizations that are not first nominated will not be accepted. The Conservation Alliance conducts two funding cycles annually. Grant requests should not exceed \$35,000 annually.

<http://www.conservationalliance.com/>

Surdna Foundation. The Surdna Foundation seeks to foster just and sustainable communities in the United States, communities guided by principles of social justice and distinguished by healthy environments, strong local economies and thriving cultures. <http://www.surdna.org/>

Parks & Trails New York (PTNY). Parks & Trails New York is an advocacy group whose website provides information on funding opportunities. <http://www.ptny.org/our-work/support/park-trail-partnership-program>
<http://www.ptny.org/our-work/support/funding-opportunities>

M. USER GUIDELINES

The following user guidelines are recommended for inclusion in trailhead signage at Washington Grove.

Non-motorized trails are very popular, which results in congestion and potentially hazardous situations. Regardless of whether you are walking, jogging, snowshoeing or skiing, if you follow the same rules as everyone else, every user's journey will be safer and more enjoyable. To help make the trails safe for everyone, the following guidelines should be considered:

1. **BE COURTEOUS.** All trail users, including joggers, walkers, and people using wheelchairs, should be respectful of other users regardless of their mode, speed, or level of skill.
2. **BE PREDICTABLE.** Travel in a consistent and predictable manner to avoid collisions with other trail users.
3. **DON'T BLOCK THE TRAIL.** When traveling in a group with other trail users or your pets, use no more than half the trail so as not to block the flow of other users.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

4. KEEP RIGHT. Stay as near to the right side of the trail as is safe, except when passing another user.
5. PASS ON THE LEFT. Pass others, going your direction, on their left. Yield to slower and on-coming traffic.
6. STOPPING. When stopping, move to the side of the trail. Beware of others approaching you from behind and make sure they know you are stopping.
7. USE EXTRA CAUTION WHERE TRAILS CROSS. When entering or crossing a trail, yield to traffic on the trail.
8. DON'T USE A TRAIL UNDER THE INFLUENCE OF ALCOHOL OR DRUGS. Don't overestimate the safety of any trail. You may need all of your reflexes quickly, so it is important that they are not impaired.
9. BE RESPECTFUL OF PRIVATE PROPERTY. Trails are open to the public, but often the land on the side of the trail is private property. Please respect all property rights.
10. CLEAN UP LITTER AND PET WASTE. Do not leave glass, paper, cans, plastic, or any other debris on or near a trail.
11. OBEY LAWS. State, County and City Laws must be obeyed.
12. PETS. Pet Owners must clean up after their pets and keep dogs controlled by a leash.

N. TRAIL OPERATIONS AND MAINTENANCE

Well-maintained parks promote community engagement and civic pride. Neighborhood parks attract and connect individuals of all ages and ethnic backgrounds who share a vision for the betterment of their surroundings. Parks provide opportunities for people to take ownership of their community, which improves quality of life.

----city parks alliance

1. TRAIL ASSESSMENT AND INVENTORY

Trail assessments

When routine inspection discovers excessive maintenance needs that are beyond the current labor and material allowance, a detailed trail condition assessment can serve as a basis for applying for funds. One simple method of annual trail assessment and documentation of heavy maintenance needs is to use a paper assessment / inventory

form, which can be filled out while walking the trail, and then entered into an electronic database. An example is shown in **Table 5**. For a small trail system like Washington Grove's, this is a very practical method.

Inventory

A periodic detailed inventory of trail features and required maintenance will be desirable as the recommendations in this document are implemented. The City should keep on record all trail improvements including but not limited to kiosks, trail markers, benches, and trail surfacing. This record should include the manufacturer and model numbers for each purchased improvement and the contact person and phone number of the supplier. Routine assessment and record-keeping should not be forgotten when maintenance budgets are planned.

2. MAINTENANCE ACTIVITIES

When assessing trail maintenance needs, the following groups of general maintenance categories should be considered:

Trail Maintenance-Vegetation:

- Brushing/clearing areas
- Remove fallen trees/branches
- Hazard tree removal
- Slope revegetation
- Backslope grooming
- Vista maintenance
- Poison Ivy removal (herbicide)

Sign Maintenance:

- Sign repair/rehabilitation
- Sign replacement
- Barricade/closure device repair

Drainage Maintenance:

- Cleaning/repairing structures
 - culverts
 - drainage ditches
- Replacement of existing structures
 - culverts/underdrains
- Install additional drainage structures
 - waterbars
 - culverts
 - grade dips

Structure Maintenance:

- Bridge repair
- Boardwalk repair
- Retaining wall repair
- Barrier/guardrail repair
- Steps repair
- Fence repair

Tread Maintenance:

- Grading tread
 - slough and slide removal
 - slump repair
 - filling erosion ditches
 - grubbing rocks/ roots/stumps
- Spot surfacing
- Surface replacement (similar material)
- Surface repair
- Remove loose rocks

Litter Clean-up:

- Current discarded litter

Please refer to **Table 5** for recommended maintenance activities and frequency. Also refer to *NORTH COUNTRY NATIONAL SCENIC TRAIL, A Handbook for Trail Design, Construction, and maintenance* for additional maintenance recommendation and procedures.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Table 5: Recommended Maintenance

Frequency	Maintenance practice	Performed by
Spring (before May 30 th)	Remove tree limbs and fallen trees from the trail and prune encroaching limbs.	
	Repaint or replace the blazes as needed	
	Inspect all signs in the trail network	
	Inspect trail surface for water damage and repair	
	Inspect bridges and boardwalks. Immediate safety needs should be corrected on day of inspection. Note large corrective actions	
	Maintain trailheads and support structures	
	Create list of larger jobs that require different tools that can be fixed at the next visit	
	Schedule time for major projects identified	
	Pick up litter	
Mid-Summer (July 31)	Mow or cut all weeds, brambles, briar and high grass encroaching on the trail	
	Prune all brush and overhanging limbs that have grown into the trail clearing limits; all blazes and signs must be visible	
	Complete larger jobs identified in the spring	
	Maintain drainage ditches, and all trail structures	
	Identify noxious or exotic plant species. Remove, or inventory them for future vegetative management practices	
	Pick up litter	
Fall (September 30 th)	Finish uncompleted jobs	
	Recheck blazes and sign; replace if needed	
	Pick up litter	

3. MAINTENANCE COSTS

Maintenance costs will vary greatly depending on the type of trail, amount of volunteer labor available, construction quality, and available services. These costs, however, must be considered during the trail planning process, to ensure that trail owners can pay for the ongoing maintenance of the trails they develop.

Maintenance costs are rarely broken down into specific tasks such as those listed in **Table 5**. Most trails are maintained by an existing agency, such as a local or state park, public works, or maintenance department. Estimated costs, therefore, are broken down by the type of maintenance performed. There are three basic types of maintenance. Routine maintenance includes all the general activities, such as brush clearing, trash collection, and raking, that may take place on a regular basis throughout a season. Minor repairs refer to activities that can be expected every five years or so, such as amenity replacement, repainting, or re-striping. Major reconstruction refers to significant expenditures involving resurfacing or reconstruction. Major reconstruction is the most costly type of trail maintenance activity and should be planned for in advance.

Routine Maintenance

Typically, most of the routine maintenance of a trail facility will be performed by an existing agency or volunteer group. Local trail owners should be well equipped to include trail maintenance into their parks or public works maintenance budgets and activities. Activities considered routine maintenance include:

- Yearly facility evaluation to determine the need for minor repairs
- Tree and brush clearing
- Map/signage updates
- Trash removal and litter clean-up
- Repair of flood damage: silt clean-up, culvert clean-out, etc.
- Minor regrading, or stone dust replacement
- Planting, pruning, and general beautification

The yearly cost for routine maintenance depends on the maintenance capabilities already in place and the amount of volunteer labor used. In general, yearly routine maintenance costs can be estimated at \$5,000 per mile. This figure does not include snow removal, which is not a major consideration for most of the trail system in Washington Grove.

Minor Repairs

The need for minor repairs should be determined by a yearly facility evaluation (see Routine Maintenance, above). Minor repairs may include the following activities:

- Replacement, repair, or repainting of trail support amenities, such as signage, benches, trash receptacles
- Replacement of a portion of the trail

The cost for replacement, repair, or repainting of trail amenities is based on the initial cost of those amenities. Trail operators should maintain records of the general costs of trail amenities as a means of estimating future repair and replacement costs. If custom elements, such as lighting or benches are used in trail design, the trail owner should consider ordering extra elements at the time of construction and storing them for future use, thereby defraying the cost of single-runs later.

Major Reconstruction

There is one activity considered to be major reconstruction, the complete replacement, regrading, and resurfacing of all trails. Complete replacement of a trail involves removing the existing trail, regrading the trail base, and resurfacing

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

the facility. This kind of comprehensive maintenance will be necessary every 20 years, regardless of trail type. Even natural surface trails may need to be fully regraded after 20 years of use. Trail costs for reconstruction are the same as the cost of a new trail plus the cost of demolishing the existing trail. As with any major trail project, however, a detailed cost estimate should be performed during the project planning stages. The best guide for estimating the replacement cost of a trail is to consider the original construction cost.

A major cost such as trail replacement should be considered well in advance. It may be more difficult to secure large state or federal grants for trail reconstruction. Therefore, a trail owner should consider the eventual cost of trail replacement and financially prepare for that significant maintenance activity.

Just as well-maintained parks can support the economy, poorly-maintained ones can be dangerous, and impact community health. To capture the economic benefits of parks, however, a city must invest in their upkeep. Parks help the economy when they are well maintained and well used. They can have a negative effect when they are neglected, attracting vandalism, drug-dealing and other crime. — *American Society of Landscape Architects*

O. ECONOMIC BENEFITS OF PARKS AND TRAILS

In some communities, the creation of walking paths has been met by resistance from members of the community who worry that property values may be negatively impacted, that there will be loss of privacy, or there may be more crime in their neighborhood. However, studies from all over the country have shown that established trails can improve communities by providing recreation, transportation, a sense of community, and in fact lead to increased property values, and lower crime rates.

Although parks and historic sites generally have economic benefits, it would be a mistake to reduce their value to merely jobs and business sales. Individual parks that are part of a larger park system make numerous economic contributions that are real and valuable, but difficult to assess and price. Some of these invaluable benefits include, but are not limited to: 1. Maintaining the natural environment in an urban setting, 2. Providing an “escape from the hustle and bustle” for local residents and visitors, and 3. Protecting the City's heritage for future generations. Investments in park systems generate many different kinds of returns and all of these benefits should be considered in assessing the real contribution of parks and trails.

Investments made to local and regional parks not only raise the standard of living in our neighborhoods, towns and cities, but they also spark activity that can ripple throughout the economy. Parks provide intrinsic environmental, aesthetic, and recreation benefits to our cities. They are also a source of positive economic benefits. They enhance property values, increase municipal revenue, bring in homebuyers and workers, and attract retirees. Parks support public health, the economy, the environment, education, and community cohesion. They are also critical to workforce development, particularly green career jobs. Parks make our cities sustainable, livable and vibrant.

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement



Financial benefits

Parks are a good financial investment for a community. Understanding the economic impacts of parks can help decision makers better evaluate the creation and maintenance of urban parks. They are assets that turn our neighborhoods into exciting, connected and healthier communities that also spark economic prosperity throughout our nation.

There are many ways that parks and trails affect the local and national economies, including:

- Tourism
- Events
- Urban redevelopment
- Community improvement
- Property value
- Health care savings
- Jobs and investment
- General consumer spending

Environmental, health and community benefits

As an essential component of a city's infrastructure, parks produce measurable health, environmental, and community savings. Citizens devoted to revitalizing their neighborhood parks create safer communities, reining in the costs associated with public services such as fire and police protection.

Providing a safe public forest with trails for all levels of ability encourages visitors to strengthen themselves physically, mentally, and psychologically. An exercised mind and body are the keys to a longer, healthier and happier life which in turn lends itself to a healthier community in general and lower medical issues.

“...studies have found that overweight and obese children have lowered academic achievement in standardized test scores...”

(California Depart. of Education, 2005)

RECOMMENDATIONS

Washington Grove, Cobb's Hill Park—Recommendations for Improvement

Prescribing parks is rapidly increasing across the United States as it is being recognized by the medical community as a low-cost intervention that utilizes a known, generally trusted and accessible resource to influence positive health outcomes. For the largest 85 cities in the country with a total population of 57.2 million, the health savings from parks is an estimated \$3.08 billion.

The environmental savings are significant as well. Trees and vegetation in urban parks offer lower cost, natural solutions for addressing storm water runoff and air pollution. Parks in urban settings help migratory birds find a respite in their journeys, ensuring the survival of healthy bird and human communities.

“Parks as medicine is not a new concept. Frederick Law Olmsted, the noted landscape architect of the 19th century, strongly believed that parks could improve people, particularly their health.”

(Indianapolis Bicycle Master Plan)

P. FACTORS NOT ADDRESSED IN THE STUDY

In the course of preparing this study, there were a few issues that were not addressed or resolved. These issues should be considered as the proposed improvements move into the next phase of development. The following issues need to be considered:

1. Geotechnical, Archeological and Environmental investigation will most likely be required in the next phase of trail development, for boardwalk, new ADA connector access and parking but were not part of this study.
2. Land acquisition was not discussed in this report, but should be explored if a connection to Norris Drive is desired.
3. To get the trail constructed, the following steps will likely be necessary:
 - a. Secure funding for construction
 - b. Finalize property access points
 - c. SEQRA and permitting
 - d. Environmental testing (as required)
 - e. Design development
 - f. Construction documents
 - g. Bidding
 - h. Construction
 - i. Acceptance by client
 - j. Management and maintenance plan
 - k. Programming and community involvement
 - l. Identify possible community partners

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Washington Grove, Cobb's Hill Park—Recommendations for Improvement

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American Trails. www.americantrails.org

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City of Rochester, Comprehensive Plan Update. <http://www.cityofrochester.gov/comprehensiveplanupdate/>

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Project for Public Spaces, Urban Parks Institute. <http://www.pps.org/reference/the-urban-parks-institute/>

The Trust for Public Land. <https://www.tpl.org/economic-health-benefits>