



New York City Strategic Trails Plan



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Executive Summary

The 10,000 acres of natural areas within New York City’s parks have always served as a place of refuge and respite. With so many of us feeling isolated inside our great city, a world-class trail network can connect us both to natural spaces and to each other. The Strategic Trails Plan for New York City presents a bold vision of a nature trail network in one of the most urban areas on Earth. Using research originally conducted to create the Forest Management Framework for New York City in 2018, the Natural Areas Conservancy (NAC) identified trails as a unique resource that can increase the health of the forests as well as foster greater connection between people and nature through care and management.

New York City’s 350 miles of nature trails offer visitors a range of experiences, from hiking through old growth forests to birdwatching along coastal wetlands and marshes, all of which connect people to the vast natural areas in city parks. The NAC has been working in partnership with NYC Parks to improve trails since 2017. With the input of partners and park users, the NAC has created the first Strategic Trails Plan for NYC, which lays out a vision for the formalization of a citywide trails system, with concrete recommendations to bring that vision to reality.

The plan quantifies the investment required to build and maintain a trails system by leveraging public, non-profit, and corporate investments, as well as a corps of volunteers, to bring environmental, recreational, and public health benefits to all New Yorkers. It also provides design and maintenance standards for the perpetual care of the trails. The plan was informed by months of inventory and analysis of the existing trails and their conditions, case studies, and extensive outreach to public and internal trail stakeholders to form a shared vision for NYC’s nature trails. Above all, this plan showcases an immense natural resource within New York City’s parks, one that holds untapped potential to connect us — to nature and each other.



Puncheons at Hunter Island in Pelham Bay Park in the Bronx



NAC staff member installs a trail marker in Bayswater Park in Queens

Vision & Goals



Vision

We envision a network of well-maintained, fully-supported nature trails that provide diverse experiences for all New Yorkers and inspire an appreciation of the natural world.



Credit: NAC

As of 2020, there are 350 miles of official and unofficial nature trails that provide access to the 10,000 acres of forests and wetlands on New York City Parks property. Nature trails exist in 75 of the city's park properties, the vast majority of which are located within the coastal edges of the Bronx, Brooklyn, Staten Island, and Queens.

The Strategic Trails Plan was informed by months of inventory and analysis of these existing trails. In addition to existing conditions research, the following engagements and interactions with trail stakeholders were used to formulate this document:

- 6 focus group interviews
- 1 internal workshop
- 1 public workshop
- 6 public "hikeshops"

The plan that follows identifies and defines the goals that will make the above vision a reality, and includes recommendations for how to achieve these goals.

Goals

This strategic plan puts forth six overarching goals to help realize the vision stated on the previous page. The Key Recommendations section elaborates on concrete strategies and tactics to achieve these goals.

1 CREATE A TRAIL SYSTEM THAT PROVIDES A RANGE OF EXPERIENCES SHOWCASING THE NATURAL DIVERSITY OF NYC PARKLAND.



Staten Island Greenbelt | Credit: Street Plans

2 SUPPORT AMBASSADOR OR STEWARDSHIP GROUPS TO ADOPT EVERY NATURE TRAIL IN THE CITY.



Inwood Hill Park | Credit: NAC

3 USE SIGNAGE, MAPS, AND WAYFINDING IN PARKS AND ONLINE TO MAKE PARKS ACCESSIBLE TO A RANGE OF VISITORS.



Inwood Hill Park | Credit: Street Plans

4 ADOPT CONSISTENT APPROACHES TO DESIGN, CONSTRUCTION, AND MAINTENANCE OF NATURE TRAILS.



Credit: NAC

5 OFFER REGULAR PROGRAMMING IN EVERY PARK WITH A NATURE TRAIL TO ENGAGE MEMBERS OF THE COMMUNITY.



Credit: NYC Parks

6 DEVELOP DIVERSE AND STABLE FUNDING STREAMS TO FULLY FUND AND SUPPORT THE TRAIL MANAGEMENT PROGRAM.



Staten Island Greenbelt | Credit: Street Plans



*Volunteers clean gullies at Inwood Park in Manhattan.
Credit: NAC*

NYC Trails Today

Thank you for
visiting the
Salt Marsh
Nature Trail.



NYC Parks

Marine Park
Credit: NAC

TRAIL NETWORK

New York City is home to more than 20,000 acres of natural areas — forests, wetlands, and grasslands — and 10,000 of those acres are in city parks. These natural resources are vast and vary in typology, health, and condition. They provide many environmental and social benefits to New Yorkers, including space to experience wild nature within the city.

Within the natural areas that are under NYC Parks' jurisdiction, visitors can access over 350 miles of formal and informal nature trails. This trail system is spread across approximately 75 parks, and provides unique trail experiences within each park. As of March 2020, more than 42 miles of trails in 19 parks feature official trail markers.

New York City's trails have evolved over hundreds of years. Some were formally designed while others

emerged organically, through years of use and visitation. This inconsistent development has caused the city's current trail system to lack uniformity, and the system needs formalization and consistent management in order to be transformed into a coherent network across the parks.

While formalizing the city's existing trail network will decrease its total mileage, it will ensure the trails receive better maintenance, are easier to navigate, contribute to the overall health of the forest, and are accessible for all New Yorkers. To achieve such goals, in 2016, the Natural Areas Conservancy and NYC Parks partnered to create the Citywide Trails Team, a team of dedicated staff who perform specialized tasks to improve New York City's overall trail system. This plan identifies the resources the team needs to bring the entire network into a universal standard of formalized care and management.



PHYSICAL CONDITIONS

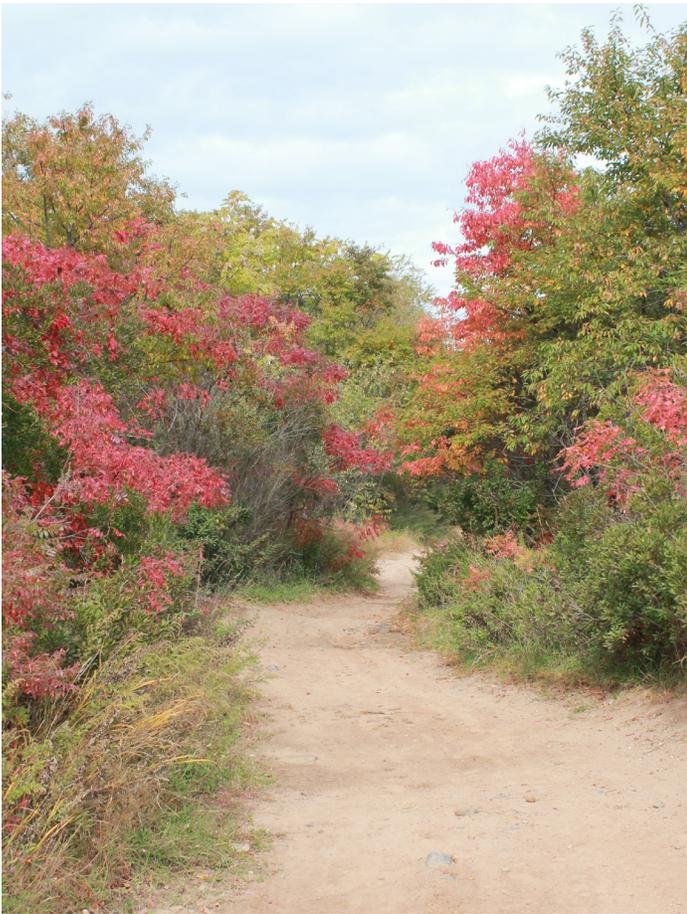
In 2014, NYC Parks started mapping all existing nature trails on its property using handheld GPS devices, recording information about trail surface type, width, and difficulty (in accordance with USDA Forest Service standards). These data require regular review and updates to ensure accuracy. It's an invaluable management tool and is the basis of all analyses and recommendations within this plan.



Alley Pond Park | Credit: Street Plans



Marine Park | Credit: Street Plans



Marine Park | Credit: NAC



Inwood Hill Park | Credit: NAC

Trail Difficulty

NYC Parks currently uses the difficulty level of the trails as a classification to prioritize work. Trail difficulty rating is included in the citywide GPS trail inventory, and is indicated on a scale of 1–4. The grade of the trail refers to its degree of inclination, which can be used to approximate the level of difficulty using the following ratings:

Level 1

< 5% grade
Flat terrain

Level 2

< 10% grade
Uneven terrain with slight elevation change

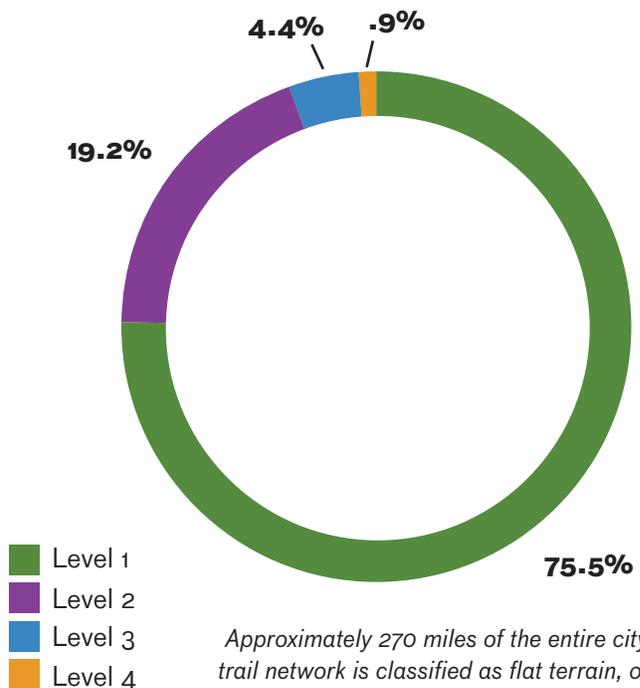
Level 3

< 15% grade
Moderate elevation and/or rough surface

Level 4

15%+ grade
Strenuous climb

The trail difficulty rating is broken down into following percentages across the citywide trail network:



Trail Types & Uses

- | | | | |
|---|--|--|--|
| <p>1</p> <p>NATURAL SURFACE TRAIL</p>  | <p>223.87 miles</p> <p>A soft surface, multiuse trail through natural areas as designated by NYC Parks, including organic “desire lines” outside the formal trail system.</p> | <p>2</p> <p>PAVED TRAIL</p>  | <p>102.41 miles</p> <p>A paved multiuse facility through an NYC park.</p> |
| <p>3</p> <p>BRIDLE PATH</p>  | <p>6.88 miles</p> <p>A trail intended to be used by people riding horses in an NYC park.</p> | <p>4</p> <p>BOARDWALK</p>  | <p>2.64 miles</p> <p>A wooden walkway over wetland or otherwise unstable soils that is typically (but not always) one segment of a larger multiuse trail.</p> |
| <p>5</p> <p>RAILWAY TRAIL</p>  | <p>1.32 miles</p> <p>A multi-use trail composed of soft or hard materials that is located partially or fully within an active or inactive rail right-of-way.</p> | <p>6</p> <p>ON-STREET PATH</p>  | <p>N/A*</p> <p>A multiuse path for non-motorized users located within a street right-of-way.</p> |
| <p>7</p> <p>PARK PATH/DRIVE</p>  | <p>N/A*</p> <p>A paved multiuse thoroughfare used in part or in full by non-motorized, recreational users within an NYC park.</p> | <p>14 miles of natural surface trails in NYC parks permit mountain bikes.</p> <hr/> <p>*Data for these two typologies are not currently collected in the Citywide Trails Team database.</p> | |

TRAIL MAINTENANCE & IMPROVEMENTS

Routine and consistent maintenance are among the most critical components of a successful trail system. NYC Parks, Borough Operations conduct routine maintenance of all Parks properties (including trails), such as trash pick up, amenity and sign repairs, and responses to hazards or vandalism. The Citywide Trails Team currently conducts episodic and planned maintenance activities, such as invasive species removal, soil decompaction, tree and shrub plantings, trail blaze replacement, gully clearing, and erosion control measures. This plan calls for all maintenance activities to become routine and consistent in order to avoid long-term damage to trails.

A common management concern is the emergence of informal trails, also called “desire lines,” which are created when individuals walk off of the designated formal trail system, potentially damaging sensitive natural areas. Desire lines must be closed via plantings or shrub obstacles and must be monitored to ensure they are not reopened. Vandalism does occasionally occur when members of the public remove plantings to reopen desire lines.

NYC Parks’ Forestry, Horticulture and Natural Resources (FHNR) division has helped increase volunteer engagement in the city through the creation of the Super Steward program. The program trains volunteers to independently care for forests, wetlands, or street trees across the five boroughs. In 2019, NYC Parks, the Natural Areas Conservancy, and the New York-New Jersey Trail Conference partnered to build upon the existing Super Steward program to include the Trail Maintainers, a type of Super Steward that focuses on trails. The program currently recruits existing Super Stewards to receive training from the NAC and NYC Parks staff on basic trail maintenance best practices. Trail Maintainers are then permitted to perform approved maintenance and improvement projects independently on assigned trail segments.

Trail Maintainers are required to submit reports on the work they’ve conducted, but currently there is no mechanism to assess the effectiveness of their maintenance activities. As of March 2020, there were

18 Trail Maintainers assigned to seven parks citywide. In addition to maintenance, NYC Parks has a robust Parks Inspection Program (PIP) that inspects parks citywide and rates them on cleanliness, safety, landscape, and structural concerns, though it is mostly focused on the landscaped and built areas of parks. While the inspections look closely at common concerns like vandalism, litter, and trip hazards, they do not focus on trail blazing, pathway spacing, invasive growth, or erosion—all of which are common concerns for trails.

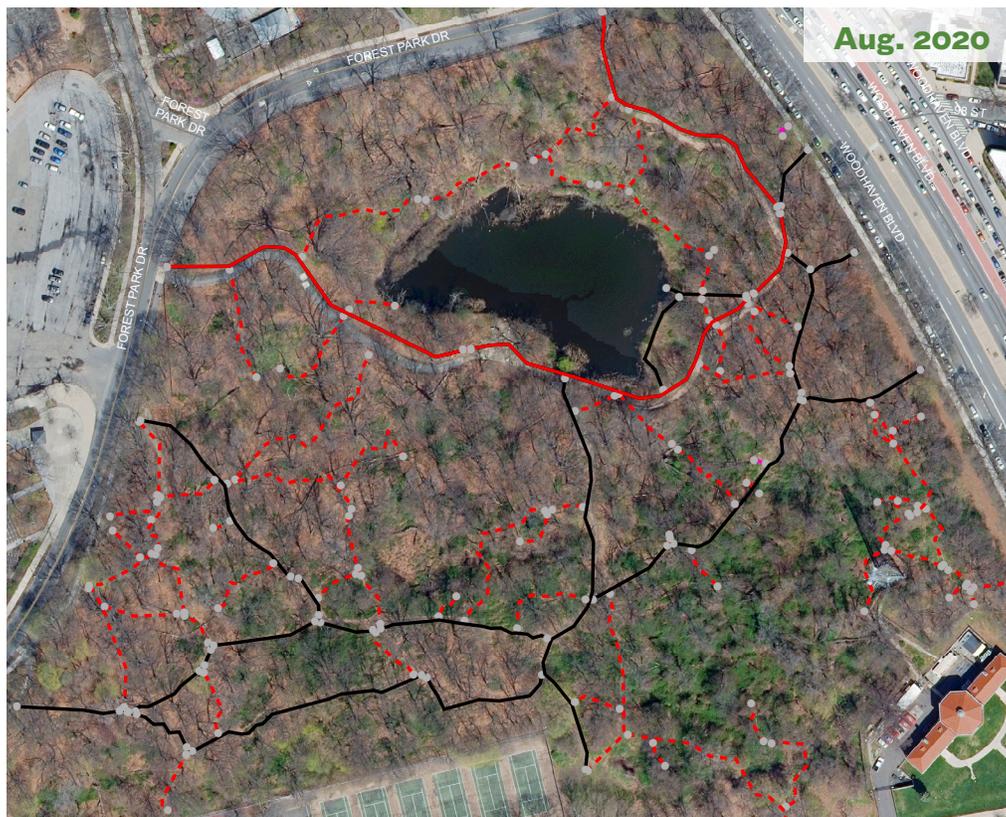
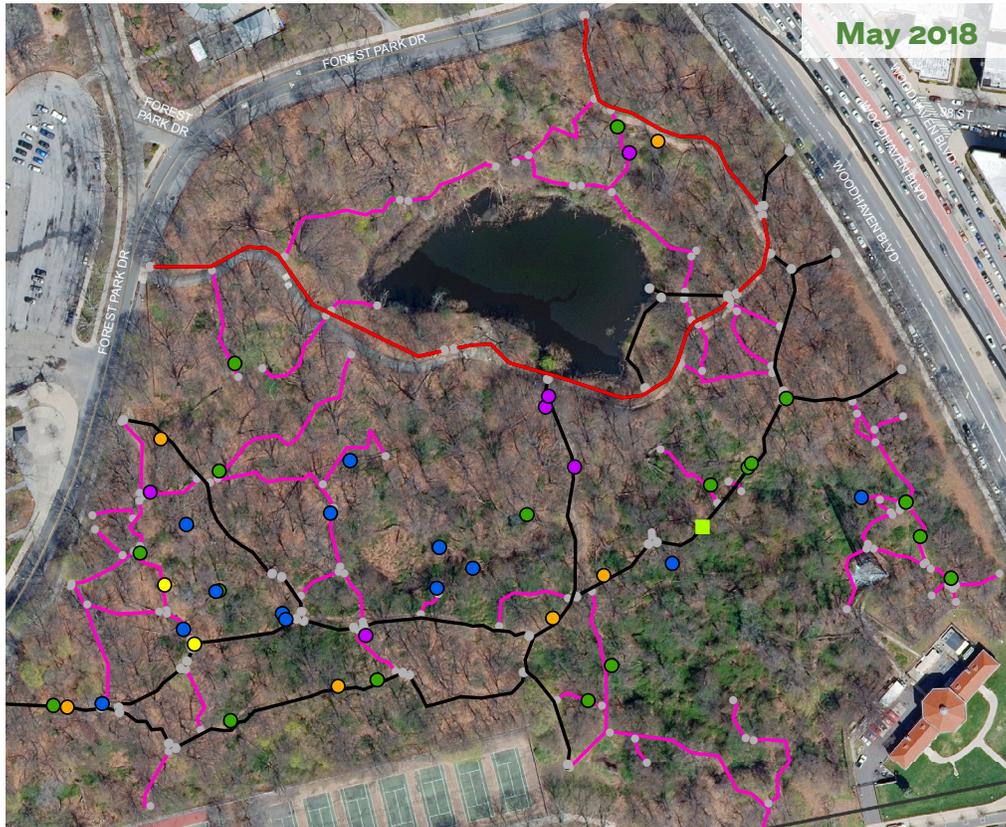
Most issues in parks are reported by NYC Parks staff or by the public through 311. However it can be challenging to record the location of a maintenance concern using the 311 system, especially on a long trail. NYC Parks Rangers have frequent contact with trails through their programming and patrols, and are most likely to observe and report concerns to Borough Operations or Central Communications.

In addition to NYC Parks, there are also other city, state, and federal agencies that have regulatory and operating involvement that may be adjacent to or connected with trails in NYC Parks’ natural areas. These agencies include the New York City Department of Environmental Protection, the New York City Department of Transportation, New York State Parks, and the National Park Service, but their management practices were not evaluated as part of this plan.



These maps of Marine Park in Brooklyn illustrate the process of trail formalization. The lower map does not illustrate the current status of trails but the desired outcome of trail formalization.

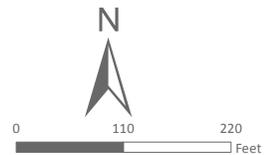




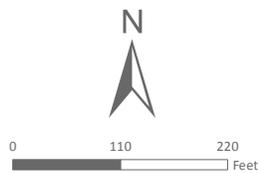
These maps of Strack Pond in Forest Park in Queens from 2018 (top) and 2020 (bottom) illustrate desire line closures, as documented in the images on the following page.

Queens, NY

- Fire Pit
- Party Spot
- Obstacle
- Erosion Concern
- Invasive Species Concern
- Overgrown Trail Corridor
- Red Trail
- Official Trail
- To be closed

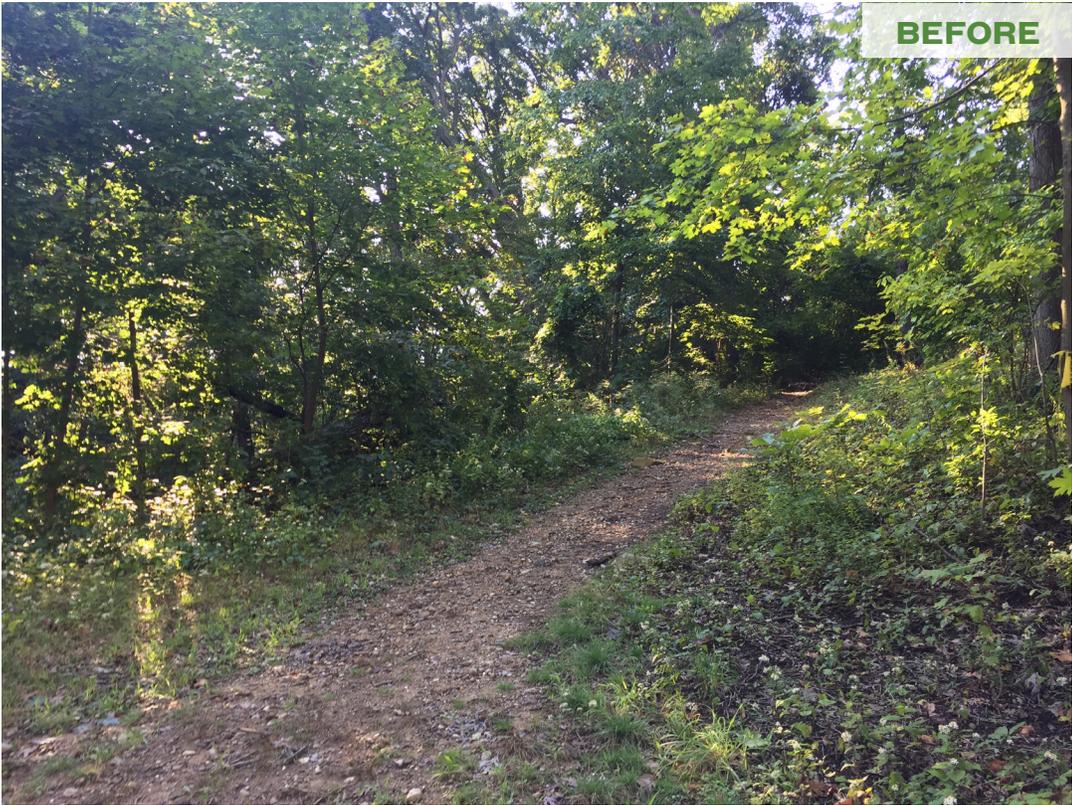


- Red Trail
- Official Trail
- To be closed
- - - Closed



Prepared by Forestry, Horticulture and Natural Resources, February 06, 2020
 Data Source: NYC Parks NRG
 April 2016
 Copyright 2016, NYC Parks

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BEFORE

Image of informal trail in Forest Park in Queens before being restored.

Credit: NAC



AFTER

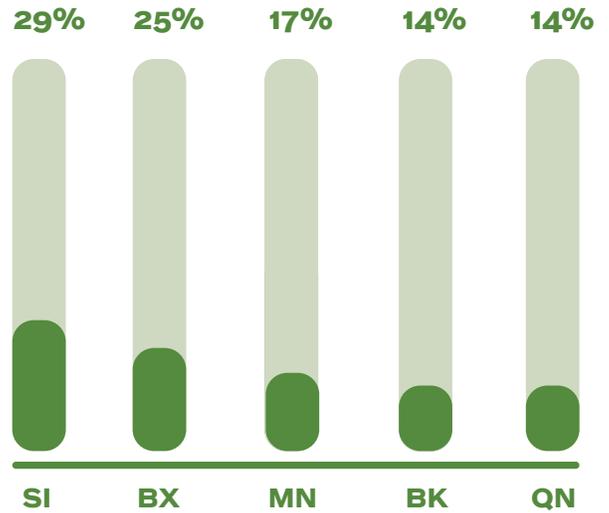
TRAIL LOCATIONS & ACCESS

New York City’s nature trails are most commonly located along the coastal edges of the Bronx, Brooklyn, Queens, and Staten Island. Their peripheral location is one reason for their continued existence — they have largely escaped the impacts of development.

1.34 million New Yorkers — more than 15% of the city’s population — live adjacent to parks with natural area trails. Although most subway lines do not extend directly to natural area parks, New York City’s transportation network offers many hybrid options, including subway, bus, rail, bike lanes, and ferry lines, to help New Yorkers reach the trailheads.

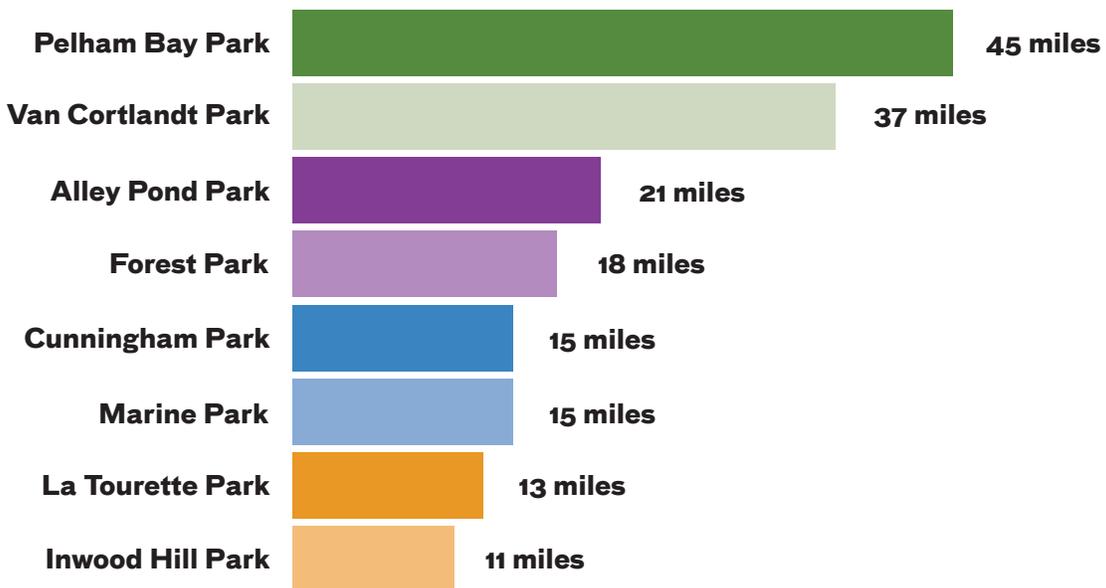
Additional programming and marketing initiatives could further increase the number of New Yorkers traveling to local nature trails and further engage the communities that live close by.

Percentage of Parks with Over 2 Miles of Trails



Of the 28 parks with significant nature trails (at least two miles), eight of them are in Staten Island.

Parks with the Largest Trail Networks Citywide



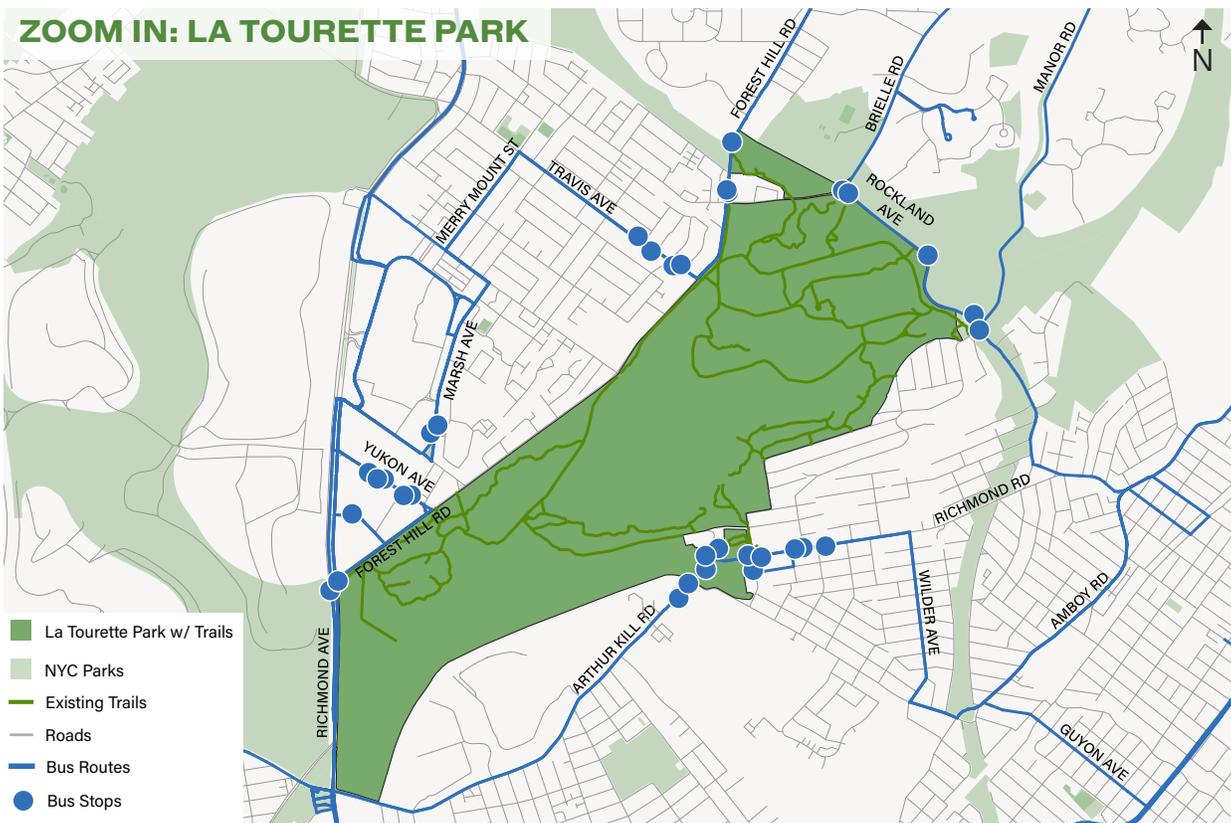
175 miles (or 50%) of nature trails citywide are concentrated in eight parks.

ZOOM IN: INWOOD HILL PARK



Within .25 mile of the trails within Inwood Hill Park in Manhattan, there are three MTA subway stops (the 1 and the A lines) and 22 bus stop stops (the M100, BX20, and BX7 lines).

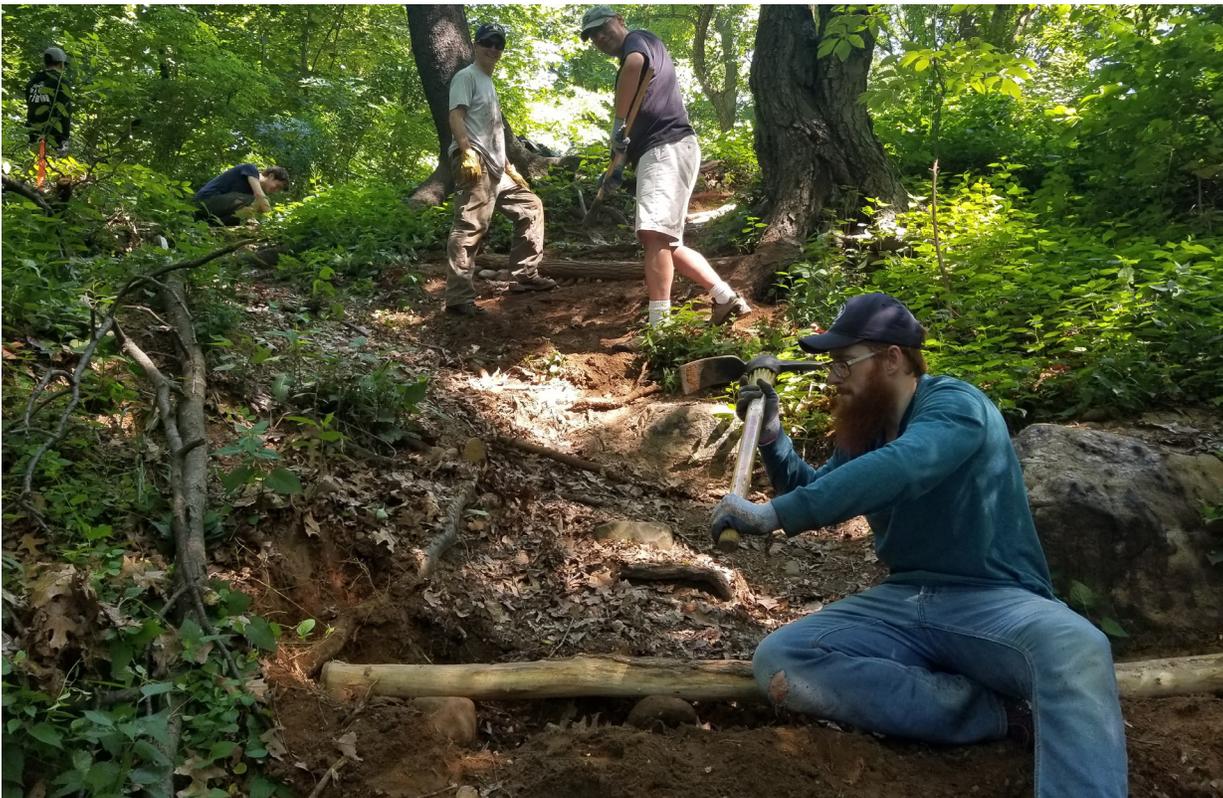
ZOOM IN: LA TOURETTE PARK



Eight MTA bus lines can drop recreationalists within .25 mile of the trails in La Tourette Park in Staten Island across a total of 34 different stops.



26 bus stops drop recreationalists within .25 mile of Forest Park in Queens. Both the LIRR and J-Z MTA subway lines have stops just outside of the .25-mile radius.



Volunteers install rustic check steps at Forest Park in Queens.

Credit: NAC

ORGANIZATIONAL RESOURCES

Currently, multiple NYC Parks divisions are involved in different aspects of trail management, and each division is very knowledgeable in their particular area of expertise. However, the planning of trail-related work happens independently within the various divisions, and there is potential to increase the collaborative planning and execution of trail-based maintenance, operations, and programming across the agency and with partners.

- Planning
 - Mapping and periodic assessment of trail system (conditions and features)
 - Scoping trail improvement needs
- Formalization
 - Designing trail improvement projects
 - Building structures and closing desire lines
- Programming and Education
 - Wildlife and environmental education
 - Volunteer trail events
 - Recreation activities
- Maintenance
 - Routine inspections for hazards and compliance, maintenance of formalized trails
 - Wayfinding and signage (trailhead and on-trail)
- Outreach and Promotion
 - Online map production and promotion
 - Public relations and increasing visibility

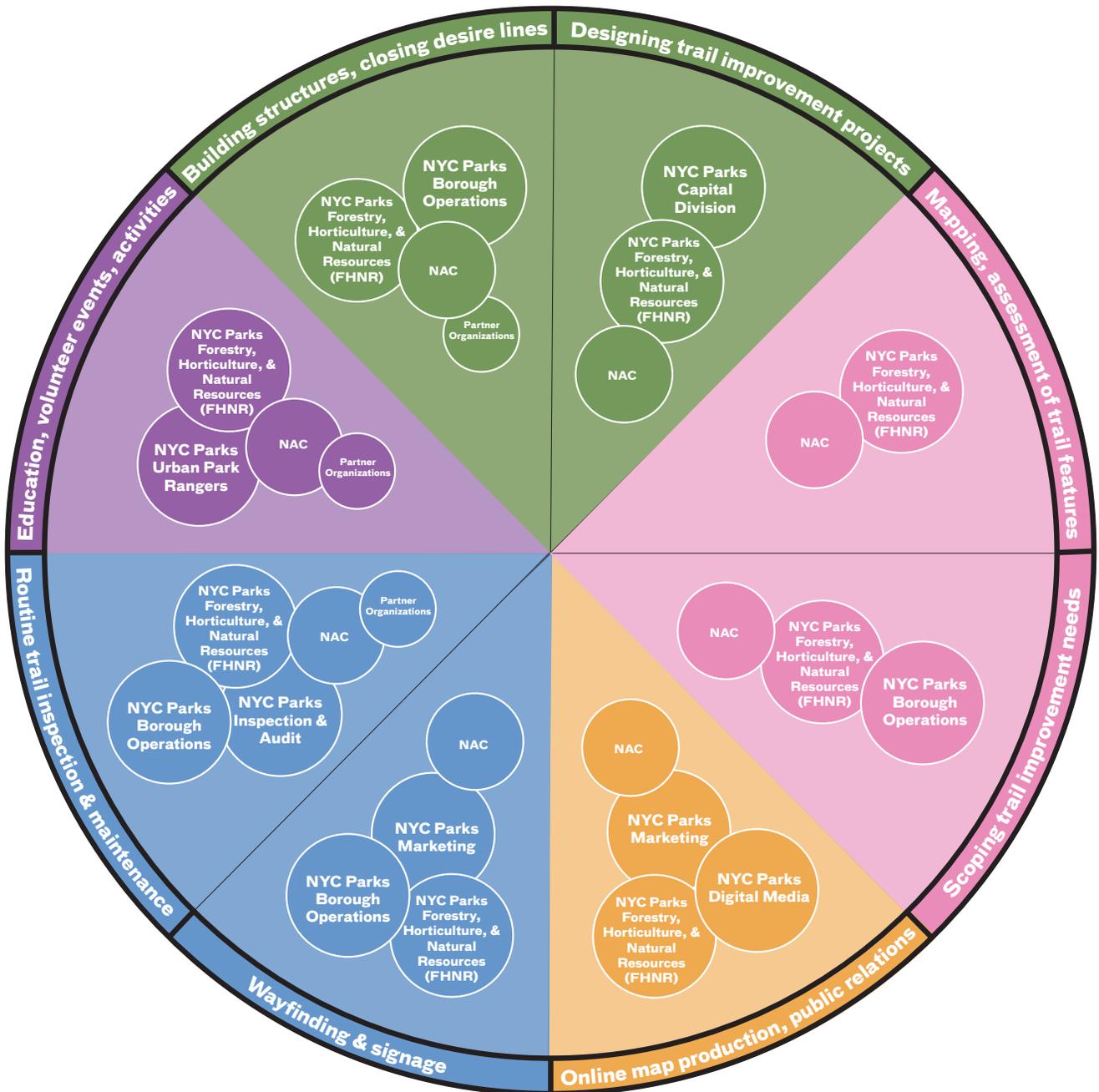
7 separate entities

work in both the Trail Maintenance and Trail Programming & Education service categories.

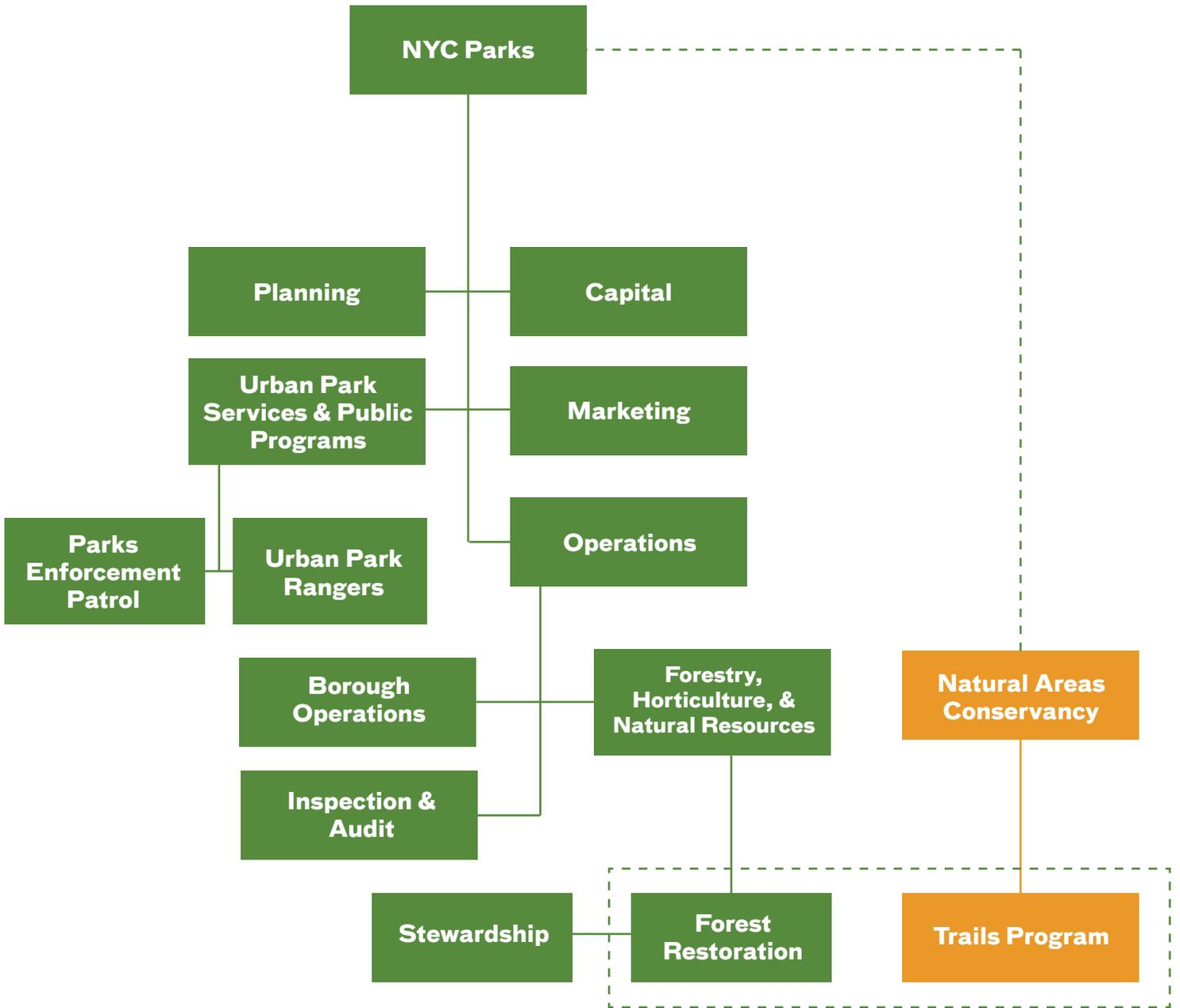
NYC Parks' Forestry, Horticulture, and Natural Resources; Urban Park Rangers (within the Public Programs division); Inspection & Audit; Borough Operations; and Marketing divisions, in addition to the Natural Areas Conservancy and partner organizations, are all working on areas such as trail maintenance (stewardship), environmental education, recreation activities, and routine trail inspections.

The diagram on the following page is divided into the five service categories, and contains the core tasks across those categories. For each core task or group of tasks, the NYC Parks divisions involved in execution are shown, as well as involvement from either the Natural Areas Conservancy or partner organizations. The diagram emphasizes which core tasks, or groups of tasks, are being performed by multiple entities, especially within NYC Parks.

- Planning
- Formalization
- Maintenance
- Programming & Education
- Outreach & Promotion



NYC Parks Divisions & NAC Overlap



Staff Resources & Funding

As outlined in Organizational Resources, there are numerous NYC Parks divisions and units charged with different aspects of trail management, all providing a variety of services with different, overlapping values and objectives. No single office is responsible for oversight and coordination of the overall citywide trail management effort. This presents an opportunity to further align and promote the activities of these groups in a cohesive, strategic way that advances the common goals proposed in this plan.

The primary NYC Parks divisions involved with day-to-day maintenance and programming of trails include Forestry, Horticulture, and Natural Resources; Inspection and Audit; Urban Park Service and Public Programs; and Borough Operations. Combined, these units have 102.5 full-time employees that spend 25% or more of their time with the trail system at an annual cost of just over \$5 million. The majority of this staff are Urban Park Rangers who conduct nature education programming.

Partner organizations and other groups are also actively involved in trails, some playing a crucial role in stewardship. As of 2019, the Natural Areas Conservancy has five employees working on trails at an annual cost of approximately \$200,000. The Prospect Park Alliance and the Van Cortlandt Park Alliance also have staff involved in trail maintenance at those facilities. Other groups, such as the New York-New Jersey Trail Conference, conduct volunteer stewardship activities throughout the city, however their staffing investment is not captured in a central database for easy assessment alongside the data from NYC Parks and the NAC.

NYC Parks + Organizational Staff Involved with Trails (2019 data)*		
Unit / Organization	# Employees	Annual Cost
Maintenance & Administration		
Forestry, Horticulture, & Natural Resources	4.5	\$250,860
Borough Operations	7	\$208,069
Parks Inspection Program	N/A	N/A
Sub-total	11.5	\$458,929
Public Programs		
Urban Park Rangers	81	\$4,249,087
Urban Park Service		
Park Enforcement Patrol	7	\$167,856
Natural Areas Conservancy		
Staff	3	\$182,250
Other		
Prospect Park Alliance, Van Cortland Parks Alliance, NYNJ Trails Conference, etc.	N/A	N/A
TOTAL ANNUAL STAFF LABOR	102.5	\$5,058,122

*Note: Only employees who spent 25% or more of their time on trails have been included in this tabulation.

Trail Maintenance & Improvement Costs

While developing this plan, the NAC and NYC Parks conducted an exercise to determine the cost of trail maintenance and improvement projects. The chart below provides a snapshot of the cost per mile of trail work, based on who performs the work: the Citywide Trails Team, a contractor, or volunteers.

NYC Trail Maintenance & Improvement Costs per Mile		
In-House Crews	Contractor	Volunteers
\$73,191	\$429,843	\$110,395



Photo Courtesy: NAC,
Forest Park.

AMENITIES

Amenities that are located along or near NYC Parks' nature trails include: nature centers, comfort stations, public seating at scenic locations, interpretive signs, and historical markers. NYC Parks maintains 15 nature centers within close proximity to nature trails in the parks listed below. Some amenities are licensed to private operators, such as the Alley Pond Environmental Center.

Bronx: Pelham Bay Park (x2), Van Cortlandt Park

Brooklyn: Prospect Park, Marine Park

Manhattan: Central Park (x2), Inwood Hill Park (x2)

Queens: Forest Park, Alley Pond Park, Idlewild Park (opening by 2021)

Staten Island: Staten Island Greenbelt, High Rock Park, Blue Heron Park

Each nature center typically offers visitors access to baseline amenities such as bathrooms, drinking fountains, interpretive information, basic shelter, event space, and educational resources. In more car-dependent neighborhoods, some centers offer vehicular parking.

Baseline amenities at all trailheads that are far from a nature center or are located in a natural area without existing facilities would be especially beneficial for park users. Examples of such trails can be found in parks like Riverdale Park in the Bronx, Riverside and Fort Tryon Parks in Manhattan, and Cunningham and Kissena Parks in Queens.



Marine Park Nature Center | Credit: Street Plans



Shorakkopoch Rock historical marker, Inwood Hill Park
Credit: Street Plans

INFORMATION

Maps

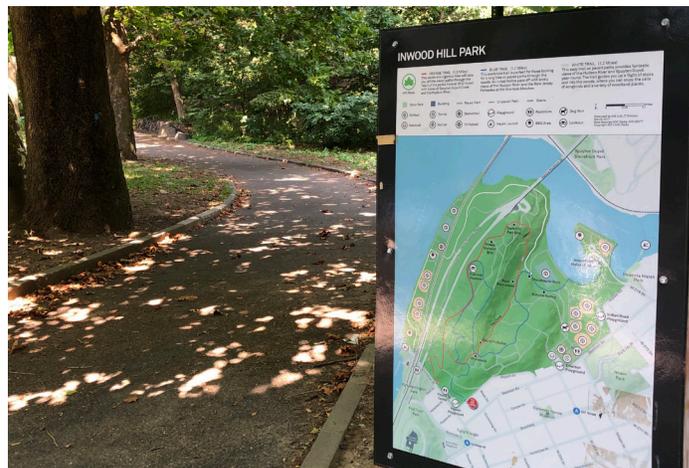
The Citywide Trails Team’s geodatabase of existing NYC Parks nature trails encompasses all trails that are within or adjacent to natural areas. The database does not include park drives or on-street paths that could serve as pathways to trailheads as they often serve larger user groups.

In 2019, NYC Parks developed a design for high-quality official trail maps and created maps for the trails within 12 signature park properties. Additional trail maps are provided by partner organizations such as for Van Cortlandt Park and the Staten Island Greenbelt. Most of the officially designated park trails are catalogued on the NYC Parks website with interactive maps highlighting points of interest.¹ The official maps are also available for PDF download. However, not all parks with trails have official maps, and there are no trails maps available in a mobile-specific interface, e.g. a smartphone app.

Trail Navigation

In 2019, the NYC Parks Marketing division designed and began fabricating its own official trail blazes in an effort to eliminate the practice of painting marks on trees. These new blazes are round discs that are typically nailed to trees along the designated trail. They display the NYC Parks leaf logo, contain the name of the park or trail (if one exists), and are color coded according to the respective trail on the map.

While the blazes provide a welcome upgrade to inconsistent wayfinding and spray-painted alternatives, there are a few shortcomings with this new system. So far, many trails have not been blazed, and when trails are blazed the discs are frequently subject to theft. Newer trail blazes are made from a more durable alloy, which may curtail vandalism, but these have not yet replaced all former trail blazes. And from a park user’s perspective, although they provide directional information via their placement (and not with arrows), visitors must be familiar



Inwood Hill Park | Credit: Street Plans



Forest Park | Credit: Street Plans

with this blazing methodology in order to interpret directional instructions at decision points.

Additional types of NYC Parks wayfinding signage include high quality map signs at trailheads and “post and arrow” directional signs at decision points. But both of these tools have their own shortcomings. Trailhead maps have sometimes been placed in a location or at an elevation that makes them difficult to read. And “post and arrow” directional signs are inconsistent — even in the few parks where they exist — presumably due to the cost and effort associated with installing and maintaining them. Continuing to standardize and improve physical and digital information (maps, blazes, wayfinding, and so on) is an important and relatively low-cost opportunity to improve the overall park user experience.

1 <https://www.nycgovparks.org/places-to-go/hiking>

TRAIL USE & EXPERIENCE

NYC Parks and the NAC do not currently collect trail use or user data. However, it is clear that visitors are engaged in a wide variety of activities including, walking, running, bird watching, mountain biking, and even illicit uses such as riding ATVs and dirt bikes. Anecdotally, trails are used by a wide range of age and demographic groups; however, better understanding who uses trails, why they use them, and when they use them will support programming and maintenance efforts to align marketing and maintenance activities with user patterns and preferences.

The 2014 study “Reading the Landscape: Citywide Social Assessment of New York City Parks and Natural Areas in 2013-2014” (Ayeung, et al.) provides useful insight into the social dynamics of New York City’s nature trail system. Three key findings are most relevant to the natural trail system:

- 1) Parks are tremendously social spaces that support a wide range of activities. Natural areas are valued for physical recreation and nature connection, but are also used for artistic expression, personal reflection, memorialization, and spirituality.
- 2) Just as park edges influence a community’s feelings of safety, ownership, and attachment, they also influence who uses natural areas. Park edges need inviting entrances, clear wayfinding, and accessible nature experiences to reach their use potential.
- 3) More than half of those interviewed visit natural areas, but those who don’t cited lack of awareness in addition to concerns about safety and accessibility as deterrents.

Finally, six public “hikeshops” were organized in the fall of 2019 as part of this Strategic Plan’s community engagement process. Over 50 participants hiked trails in all five boroughs and their feedback revealed a number of interesting insights into trail user perceptions.

Generally, hikeshop participants felt nature trails offer a unique and visceral NYC experience: the sites,



Forest Park hikershop | Credit: Street Plans



Pelham Bay Park in the Bronx | Credit: Street Plans

smells, and sounds all help hikers feel completely separated from the city. Participants particularly underscored the diversity of flora and fauna and the variety of interest points as highlights. However, participants also voiced a wide variety of common concerns, including lack of consistent wayfinding; trail conditions, such as erosion and mud; evidence of illicit behavior; noise from proximate highways; and the presence of trash.

PROGRAMMING

While much of the trail programming efforts in city parks are coordinated by the Public Programs division of NYC Parks, many groups (including park conservancies, community groups, schools, or activity-based clubs) organize recreation, education, and drop-in volunteer events year round. These year-round events include themed hikes, nature walks, interpretive education, and volunteer activities. There are 15 nature centers in 12 parks with natural areas. Nature centers feature ranger stations with educational facilities, restrooms, event spaces, and a variety of other programs and services that help encourage more structured use of the nature trail system. These can serve as anchor facilities to leverage and amplify core programming for the community.

Since user needs and interests vary, so does the programming on trails today. For example, experienced adult hikers may be seeking long-distance natural paths with varying degrees of difficulty, whereas Park Rangers are more frequently working with school-aged children and express a need for more short-distance loop trails near the nature centers to accommodate lower attention spans and physical stamina. (Good examples of well-programmed trails with segments less than a mile long can be found in Brooklyn's Canarsie Park and Paerdegat Park, and in Bayswater Park and Forest Park in Queens.)

Many programming activities on the trail system are drop-in volunteer events. These events don't require advanced training or on-going commitment, and include activities such as litter removal, plantings, invasive species removal, and other general trail maintenance activities. Drop-in volunteer events are organized by NYC Parks, local conservancies, community groups, corporations, and schools. These activities are primarily viewed as engagement opportunities for the community and are not evaluated for their effectiveness and impact on the natural resource. On some occasions, the Citywide Trails Team offers guidance to volunteers to achieve ecological goals. When feasible, NYC



Pelham Bay Park in the Bronx | Credit: NAC

Parks Stewardship staff try to align service projects with real-time need, so that even drop-in volunteers understand their work will have a valuable ecological impact.

Despite the extent of the programming available on trails citywide, there is no formal program or system for cataloging these groups or activities, so the full extent of their efforts is not currently known. NYC Parks requires organizers to apply for special event permits for events or activities over 20 people, but programming by groups below 20 is not tracked and is likely unknown to the agency or local conservancies. These special permit events are also tracked separately from the programming efforts of the Urban Park Rangers, so the information is located in disparate places and formats, thus making it challenging to evaluate collectively.

KEY FINDINGS

In addition to the six public hikes, this Strategic Plan's discovery phase included an internal strategic plan workshop with more than 50 people, an internal strategic plan workshop with nearly 20 NAC and NYC Parks staff, an open public workshop that drew 35 participants, and agency and partner focus group interviews with the following eight groups:

- NYC Parks, Urban Park Rangers
- Citywide Trails Team
- NYC Parks, FHNR
- NYC Parks, Marketing
- NYC Parks, Maintenance and Operations
- NYC Parks, Planning
- NYC Parks, Inspection & Audit
- Partnership for Parks

We recorded many insights, opinions, and priorities during the discovery phase. What follows is a short summary of key findings that emerged from these engagement activities. Specific strategies and recommendations for overcoming challenges and maximizing opportunities are outlined further in the Key Recommendations section.

1 UNCLEAR ROLES

No one division or unit at NYC Parks or NAC is responsible for the nature trails system. Therefore, various units conduct work on trails without operating under a broader coordination effort, which, at times, leads to conflicting priorities and activities.



An internal strategic plan workshop was convened by the Natural Areas Conservancy and hosted by NYC Parks in the fall of 2019. Credit: Street Plans

2 RESOURCE CHALLENGES

Feedback from stakeholders during the discovery phase indicated ongoing resource constraints and a need for increased staff and skillset resources in the field to meet ongoing management needs, including administrative assistance, time for more strategic planning, and resources to monitor, evaluate, and report the work completed by maintenance and stewardship teams in the field.

3 UNCOORDINATED PROGRAMMING

While the various units and divisions within NYC Parks have a shared goal to increase programming that results in more users and more stewards contributing positively to the nature trails system, coordination efforts can be challenging. Natural resource managers at NYC Parks and local conservancies primarily activate trails through stewardship and volunteer events and Urban Park Rangers primarily activate trails through education, but there is little to no coordination between these groups of these various activities. Also, many parks have nature centers, which are great assets for programming, but their management and terms of use are complicated and not well defined.

4 UNSTRUCTURED STEWARDSHIP

Engaging and training volunteers across the trail system to take on consistent and specific stewardship roles has proven to be a challenge. To expand volunteer involvement, there needs to be a more structured approach to project assignment, more program development, and a longer recruitment and training timeline with more outreach. Unfortunately, the resources to do so are not currently in place. Furthermore, there is currently a higher demand to volunteer than staff can manage.

5 IRREGULAR MAINTENANCE

Regular maintenance of the trails is difficult to attain primarily due to the lack of dedicated staff at NYC Parks and NAC. There is not enough staff to perform regular, basic maintenance and the staff that do exist are stretched too thin to perform basic maintenance, while other improvements and building projects suffer. The lack of resources for day-to-day oversight and enforcement creates additional obstacles for maintenance, allowing unsanctioned behavior to proliferate which could deter public use of the trails.

Additionally, some trails are maintained either routinely or sporadically by outside groups while

others have no dedicated community steward at all. NAC and NYC Parks aren't always aware of the work of these groups, and the work they do isn't necessarily sanctioned or inclusive of the NYC Parks standards for design and maintenance.

6 LIMITED PUBLIC AWARENESS

Most New Yorkers aren't aware the trail system exists and likely don't know the extent of it. The nature trail system is not widely marketed to the public or within the parks themselves, and the available maps are currently challenging to find on the NYC Parks website.

7 LACK OF USER DATA

Existing data on the trail conditions and the work conducted on them is extensive, helps characterize the nature trails, and can inform the Citywide Trails Team on future planning projects. However there is no data on who currently uses the nature trail system. This causes challenges when making strategic decisions about trail formalization, programming, and maintenance.

8 INCONSISTENT TRAIL DEFINITION

What is (and isn't) considered a "trail" by NYC Parks is inconsistent with other cities' definitions. Moreover, the system lacks a consistent, cohesive citywide identity. These obstacles are among the many challenges in increasing public awareness of a trail's purpose, gaining support for development, formalizing the system, and clarifying maintenance roles.

9 INCONGRUENT TRAIL NAVIGATION

Blazing, mapping, wayfinding, naming, legibility, and accessibility of trails varies considerably. This makes it hard for novice users to find their way and to know what to expect — a possible deterrent to greater use.

Key Recommendations



*Inwood Hill Park in Manhattan
Credit: NAC*

The following key recommendations are the result of numerous interviews, surveys, and workshops, as well as research into New York City’s current trails program and the best practices of other urban trail programs across the country.

Within these recommendations are multiple avenues for NYC Parks and the Natural Areas Conservancy to further establish and maintain a formal partnership that fully integrates their nature trail management efforts. By working together, both partners will further amplify the existing initiatives and resources for funding, maintaining, and activating New York City’s trail system. A formal partnership that increases capacity and promotes cohesion to improve the city’s nature trails is critical to the implementation and success of the following recommendations.

This unique partnership between a city agency and a non-profit partner is a coordinated approach that will leverage private-sector fundraising opportunities and agency-based resources to create a unified and fully-embedded program that can incubate new program initiatives, advocate for a financially sustainable trails program, and enact new formalization and stewardship models. This new formal structure, which will include additional positions for both organizations, should be established and documented as a priority for the implementation of the following recommendations.

1 ENSURE NYC’S TRAIL SYSTEM PROVIDES A RANGE OF EXPERIENCES THAT SHOWCASE THE NATURAL DIVERSITY OF NYC PARKLAND.

A. Use the term “nature trail” to describe trails in natural areas.

This plan focuses on trails in natural areas, where the location and the ecological surroundings are the primary attraction, so we suggest using the term “nature trail” to emphasize the resource being enjoyed rather than the activity being performed, as it would be if one used the term “hiking trail.”

B. Plan and formalize a nature trail system that showcases the diversity of natural areas in New York City.

In every park where nature trails are appropriate, formalize trails that provide access to scenic points of interest, provide a range of experiences and levels of difficulty, and balance the desire to encourage visitation with the need to protect sensitive habitats and areas that are not appropriate for access, such as steep slopes.

C. Establish agency branding and messaging standards unique to nature trails that celebrate natural areas in New York City.

These unique brand standards would be akin to existing distinct NYC Parks branding for facilities like pools, beaches, dog runs, and tennis courts.

D. Create an engaging environment at all formal trailheads.

In addition to a new brand awareness campaign, there is an opportunity to set new standards and create engaging trailheads, including clear signage indicating the trailhead location, bike racks, benches, and enhanced lighting to make visitors feel welcome and comfortable at the trailhead.

E. Increase access to natural areas for people of all abilities.

2 USE SIGNAGE, MAPS, AND WAYFINDING IN PARKS AND ONLINE TO MAKE PARKS ACCESSIBLE TO A RANGE OF VISITORS.

A. Blaze, sign, and map all formal nature trails.

Continue the progress of the Citywide Trails Team to blaze, sign, and map nature trails throughout the city, so that every formal trail is easy to find and navigate.

Post official signage within and outside of park boundaries, promoting the location of trailheads.

Ensure all trails are uniformly blazed according to design guidelines, and inspect and restore all blazes quarterly, using a combination of volunteers, partners, and in-house staff to implement and track.

Give all formal nature trails a name. If no name exists, name the trail by park and color, e.g. Forest Park Orange Trail. Eventually, all formal trails should have unique names and in some instances this could be a sponsorship opportunity to increase funding for the trail system. For example, the “Veteran’s Trail” could be a partnership with the veteran-oriented Home Depot Foundation.

B. Complete and update all official trail maps and curate a resource for planning nature trail visits.

Update and complete official trail maps for all formal nature trails and explore strategies for maximizing the visibility and accessibility of those maps to users. In addition to including trail maps in a more visible and prominent location on the NYC Parks website, create the first NYC Trails mobile app. This would require coordination with NYC Parks, Digital Media, NYC Parks Marketing, and possibly a consultant.

In addition to continuing to host digital maps of trails, compile all maps into a comprehensive printed guide of NYC Nature Trails (partnership with the NAC, REI, or the New York-New Jersey Trail Conference) to distribute at park facilities, and make available for download. The printed trail map guide would be akin to the National Geographic and Trails Illustrated maps available at REI.

C. Launch a campaign to celebrate nature trails and programs.

Increase public awareness of nature trails citywide, including how to locate them, how to navigate them, and activities to do when on them.

D. Include existing trail conditions (such as slope, grade, and surface type) on all trail maps.

E. Create an inventory of existing ADA and semi-accessible trails to be available to the public on the NYC Parks website.

3 SUPPORT THE ADOPTION OF EVERY NATURE TRAIL IN THE CITY BY AN AMBASSADOR OR STEWARDSHIP GROUP.

A. Every trail or trail segment in NYC should be adopted by volunteers.

These volunteers will perform routine maintenance activities to promote the general appearance and upkeep of trails. They will also report issues requiring higher levels of skill or equipment to the Citywide Trails Team, such as erosion concerns, obstacles, unofficial markers, or missing markers.

B. Advanced volunteers should have metrics-based goals for their adopted segments.

Advanced volunteers trained through the Trail Maintainers program should be given specific goals and targets to achieve for their segments, such as length of corridors pruned, number of inspections performed, and/or number of monthly service projects/workshops hosted.

C. Advanced volunteer program should have a tier-based system of increased skill levels.

NYC Parks Trail Maintainers program should provide opportunities for volunteers to be promoted to various tiers, thus allowing them to autonomously perform more highly skilled tasks. Promotion to higher tiers can be the result of a combination of technical training and workshop participation and number of volunteer hours logged. This will increase volunteer engagement, the skill level and experience of volunteers, and reporting compliance in order to accurately track their volunteer hours.



Credit: NAC

4 ADOPT CONSISTENT APPROACHES TO DESIGN AND MAINTENANCE OF NATURE TRAILS.

A. All stakeholders working on trails — in-house staff, partner organizations, and volunteers — should formally adopt approved design guidelines for caring for nature trails.

The design guidelines included in this Strategic Plan will provide a universal standard for partners involved in nature trail stewardship to conduct technical projects such as slopes, drainage, erosion controls, steps, bridges, and other features made with natural, locally-available materials.

Shift the language describing the work of desire line closures to be additive and valuable, for example, “restorations” or “plantings” instead of “trail closures,” which has a negative connotation.

B. Establish Trail Management Objectives (TMO) and maintenance and inspection plans to streamline trail protocols.

Establish a routine period for inspections of various trail conditions, for example safety hazards, ecological health, and wayfinding. Leverage a web-based platform to integrate geolocation data for crowdsourced reporting of issues to more effectively coordinate reporting from volunteers or citizens and thus further expand capacity for tracking issues.

Create specialized citywide or borough-based trail maintenance units to respond to priority work orders coming from district staff, ranger reports, volunteers, and 311.

C. Establish roles and responsibilities for trail inspection and issue tracking among the various stakeholders involved in trails.

In addition to the inspection work currently conducted by NYC Parks, partners, and volunteers, identify the extent of inspection and issue tracking needed and match those needs with the appropriate stakeholder.

This will increase capacity for inspecting the citywide trail system on a routine basis. Inspections and reporting should include reviewing concerns of safety, ecological health, and user experience.

Utilize the trail segment IDs created by the Citywide Trails Team to enhance internal reporting between NYC Parks, Central Communications and other units. Define protocol and utilize the IDs for citizen issue reporting.

Continue to survey and document all formal and informal trails. Update GPS data and gauge level of difficulty for all trail segments every three years.

E. Have NYC Parks Planning inform the design guidelines and toolkit of the citywide trails team to make cost-effective structures more accessible while minimizing harm to the natural area.



Marine Park in Brooklyn | Credit: Street Plans

5 OFFER WEEKLY PROGRAMMING IN EVERY PARK WITH A NATURE TRAIL TO ENGAGE MEMBERS OF THE COMMUNITY.

A. Make sure that every park with nature trails has regular weekly programming in spring, summer, and fall.

NYC Parks and partner groups should continue their programming and expand into a more coordinated effort to offer a wide variety of weekly experiences in every park with nature trails, including nature walks, hikes, wildlife observations, education, trail maintenance, survival skills, art, retreats, forest bathing, sensory walks, sunrise or sunset walks, lectures, festivals, and fundraising events.

Continue to calibrate programming for specific user groups and enhance the marketing of those programs to reach new user groups, e.g. school-age children, seniors, hikers, birders, couples, photographers/artists, writers, naturalists, or health and wellness groups.

Create a standard template for interpretive education materials and signage for nature trails.

B. Ensure every NYC public school student attends a ranger-guided nature walk before graduating high school.

C. Increase coordination between programming and maintenance staff.

Develop an effective mechanism to increase two-way communication between maintenance and programming staff, promoting newly completed trails to programming staff or notifying them when trails are under maintenance so they can adjust their programming activities accordingly.



Credit: NAC

D. Encourage community groups to use natural areas for their programming activities, such as walking and birding clubs or scout troops.

E. Curate list of available nature trail experiences with different levels of access so that individuals or groups can easily program trails for people of all abilities.

6 DEVELOP A DIVERSE AND STABLE SET OF FUNDING STREAMS TO FULLY FUND AND SUPPORT THE TRAIL MANAGEMENT PROGRAM.

A. Define funding roles of partners to maximize the investment in trails.

Clearly define which trail stakeholders should be responsible for pursuing the following funding opportunities:

- City funding
- Private philanthropy
- Corporate volunteerism
- Government grants

Pursue NYC-based companies with Corporate Social Responsibility (CSR) programs that support environmental, health, and wellness activities.

B. Develop an inventory of sponsorable assets.

Create a database of trail features or segments that could be opportunities for corporate sponsorship, adopt-a-trail, volunteer events, or retreats

Create one-pager marketing materials to share with interested funders/sponsors. Collaborate with Parks Marketing to lead the development of outreach and marketing materials.

C. Develop corporate volunteer event opportunities and a team-building retreat program.

This program should articulate clear educational and team-building benefits for specific group sizes, making it easy for HR and CSR professionals to plan and execute. This could provide a healthy revenue stream for the nature trail system, as companies already pay \$10,000–\$25,000 to host “volunteer

day” events in signature parks like Central Park and Madison Square Park.

Launch activity-based fundraising events on trails themselves, such as sponsored hiking/walking/running and ticketed events. Events on trails require fewer permits and expenses than events that require street closures, which is logistically and financially appealing. One example of successful fundraising is the trail-based group Friends of the Wissahickon, who raised nearly \$20,000 in 2019 through a trail challenge campaign, whereby participants solicited donations for every mile walked or jogged on the trail system and tracked on a wellness app.



Fort Tilden | Credit: NAC

FUTURE OPPORTUNITIES

Enhance connectivity with the city's broader network of transit and bike infrastructure and other trails.

- The network of nature trails extends across New York City, and is benefitted by an extensive system of subways, bus routes, ferries, bike lanes, and greenways. Increased signage and wayfinding communicating the existence of nearby trails at public transit stops, as well as high-quality bike parking at trailheads and major trail access points would help connect nature trails to public transit. Nature trails can also be linked to each other by increasing wayfinding signage on existing park pathways, perimeter park sidewalks, and greenways.
- Consider how needs and opportunities to reach trail users may shift at different times of the day, week, and year. Ways to meet people where they are include movable signage, guided hikes, or pop-up activations at nearby schools or greenmarkets.

Establish a citywide on- and off-street network for distance hiking.

Building on the concept of linking nature trails to the surrounding neighborhood, in the long-term, trail master planning efforts should explore citywide connectivity using greenways and on-street trails that cover long distances and link together. This would serve the widest possible range of users and attract residents and visitor hikers. A comprehensive network would prioritize continuous paths between boroughs, major parks, along greenways and waterfronts, and link major destinations.



Alley Pond Park | Credit: Street Plans

PRIORITY RECOMMENDATIONS: ACHIEVING THE GOALS & VISION FOR TRAILS

This Strategic Plan offers recommendations for many projects, programs, and initiatives to achieve the vision and the goals for a trail system that is a cherished resource, cared for, and supported citywide. The following six points outline how the core recommendations outlined above should be prioritized in order to achieve the goals set forth at the beginning of this plan.

1 Ensure the trail system is fully funded.

Without increasing internal and external funding streams, the vision, goals, and recommendations put forth in this Strategic Plan will not come to fruition in a meaningful timeline.

2 Standardize the nature trail system.

Standardizing the design and maintenance of trails is a critical first step for a successful trail system. NYC Parks and partners should adopt the design guidelines included in this Strategic Plan.

3 Institutionalize nature trail management.

It is critical to centralize trail management with a dedicated office that can assess, coordinate, and align the efforts of the various agency divisions and partners involved in trail programming and stewardship. This office will be responsible for implementation of the Strategic Plan and for promoting alignment with the plan goals among various trail partners, such as NYC Parks FHNR, Urban Park Rangers, the Natural Areas Conservancy, and New York-New Jersey Trail Conference's Metro region trails program. This office can direct internal resources and lead efforts to fundraise and implement the other plan recommendations.

4 Formalize the nature trail system.

Making the nature trail system more navigable and more consistent is a multi-layered initiative which can start small but grow over time. Doing so will



Inwood Hill Park | Credit: Street Plans

have an outsized impact on attracting trail users and supporters. Many of the recommendations in this section, such as ensuring uniform blazing and signage and developing paper maps, are not costly but will be valuable improvements.

5 Prioritize connectivity with neighborhoods adjacent to parks with nature trails.

Ensure trails and trail access points connect to their surrounding neighborhoods, and that they attract and serve adjacent populations. According to a social assessment of park users who visit natural areas, nearby residents are likely to be a trail's most frequent visitors and most engaged users. Local residents see trails as an asset for their community and are a prime pool of prospects to attract as volunteers and potential donors, so it is critical to reach them and ensure their needs are supported.

6 Activate the nature trail system.

Without waiting for additional resources, studies, or trail-building activity, the existing nature trail network can and should be activated more intensively. This should start immediately and involves developing a system for tracking programming activity on trails and starting to pursue the programming goals and initiatives outlined in this Strategic Plan.

Trail Management & Design Guidelines



GETTING STARTED

Here we provide guidance for the management and formalization of existing nature trails and the design and construction of new trails. These guidelines are intended to support the preservation of delicate ecologies and encourage safe enjoyment by trail visitors and users. They may prove especially useful for volunteer groups and nonprofit organizations seeking to maintain and improve local nature trails.

The section starts by addressing informal trails and the specific considerations for either their formalization or restoration. Next, it presents basic nature trail parameters and standards for managing the system, based on trail user and trail difficulty. These parameters are followed by guidance for trail structures and signage. Lastly, this section includes a discussion of nature trail construction and maintenance.

ASSESSING INFORMAL TRAILS

Before committing to formalization, informal trails should be assessed and either become formalized into one of the acceptable trail typologies or restored to native vegetation. To determine if a trail should be formalized, it is important to consider some of the following questions:

1. Does the informal trail cut through ecologically sensitive areas?
2. Would the desire line increase accessibility for people with limited mobility?
3. Why does this trail exist? Was the trail created intentionally by humans? For what reason?
4. Does the informal trail provide a more efficient connection between key destinations?
5. Can the trail be easily constructed and maintained?
6. Is the informal trail redundant? Do nearby trails provide similar connections?
7. How frequently is the informal trail used over the course of a day/week/season?

Answering these questions and collecting related base information will help determine whether the informal trails are needed and whether their closure would be sustainable.

CONSIDERING ADDITIONAL TRAILS

In limited cases, there may be circumstances that warrant the development of new trails. An additional trail could provide connections to scenic overlooks or historic sights or it could complete a loop in an existing trail network. There may be an informal trail that, due to environmental conditions, grade, or slope, cannot be made formal. Creating a new trail that provides parallel connections may be easier to construct.

ASSESSING THE TRAIL ROUTE

Whether constructing a new trail entirely, formalizing an informal trail, or maintaining an existing trail, it is important to make note of its condition and establish trail management objectives (TMOs). TMOs are a way of recording essential information needed for constructing or maintaining a trail.¹

Prior to designing the trail, the Citywide Trails Team should take note of the following elements, which will influence planning and design decisions:

- Average grade, steep areas, min. and max. slope
- Drainage conditions and washed-out/wet areas
- Obstructions
- Dangerous conditions and environmental hazards
- Intended use
- Adjacent land uses
- Points of interest and views
- Presence of invasive species, rare species, or sensitive habitats
- Connectivity to existing trails

Understanding these fundamental components will assist in routing a trail that avoids unnecessary damage to natural areas. Furthermore, establishing TMOs will provide a template for how to maintain a trail according to its intended use.

¹ https://www.fs.fed.us/recreation/programs/trail-management/documents/trailfundamentals/1623-3801_TrailFdml+T-MO_Sec508_11-14-16_15dpi.pdf

NATURE TRAIL BASICS

Let's explore the various elements of a trail, which include clearing limits, cross slope, linear grade, surface, and tread width. The dimensions of these parameters will vary based on two factors: the trail user and the overall difficulty of the trail. The trail difficulty levels are based on those found on page 14.

1 CLEARING LIMITS

The area over and beside the trail tread that is cleared of trees, limbs, and other obstructions.

- a. **Clearing height:** The height of the clearing limit measured vertically from the trail tread. The standard is 8 feet.
- b. **Clearing width:** The width of the clearing limit measured perpendicular to the trail. The standard is 2 feet.

2 CROSS SLOPE

The percentage of rise to length ("run") when measuring the trail tread from edge to edge perpendicular to the direction of travel. This shall be 2% for Level 1 trails, and range from 2% to 4% for Level 2, Level 3, and Level 4 trails.

3 LINEAR GRADE

The trail grade that is determined to be appropriate to accommodate the managed uses of a trail. This ranges from less than 5% for Level 1 trails, to 15% or more for Level 4 trails.

- a. **Target grade:** The trail grade that is determined to be appropriate over most of a trail to accommodate its managed uses.
- b. **Short pitch maximum:** The steepest grade that is determined to be appropriate based on the managed uses of a trail, that generally occurs for a distance of no more than 200 feet, and that does not exceed the maximum pitch density.
- c. **Maximum pitch density:** The maximum percentage of a trail with grades that exceed the target grade and that are less than or equal to the short pitch maximum, which is determined to be appropriate based on the managed uses of the trail.

4 SURFACE

Characteristics of the trail surface like material-type, grading, compaction, and roughness of the trail tread.

- a. **Native:** A surface composed of soil, rock, or other naturally occurring materials found on or near the trail.
- b. **Firm:** A surface that is not noticeably distorted or compressed during the seasons for which it is managed, under normally occurring weather conditions, by the passage of a device that simulates a trail user in a wheelchair.
- c. **Stable:** A surface that is not permanently affected by normally occurring weather conditions and able to sustain normal wear and tear caused by the uses for which the trail is managed between planned maintenance cycles.
- d. **Surface protrusions:** Trail tread imperfections, such as rock, roots, holes, stumps, steps, and structures, that are within the acceptable range of tread roughness and challenge level for the trail and that do not obstruct the managed uses of the trail.
- e. **Surface obstacles:** Trail tread imperfections, such as rocks, roots, holes, stumps, steps, downed logs, and structures, that are beyond the acceptable range of tread roughness and challenge level for the trail and that obstruct one or more managed uses of the trail.

5 TREAD WIDTH

The tread width is the actual walking surface of a trail and is defined in terms of surface type, surface protrusions, and surface obstacles. For Level 1 trails, the standard tread width is 36 inches. For Level 2, Level 3, and Level 4 trails, the width can vary from 18 to 30 inches.



TRAIL MANAGEMENT GUIDELINES

	LEVEL 1	LEVEL 2	LEVEL 3	LEVEL 4
CROSS SLOPE	2%	2% - 4%	2% - 4%	2% - 4%
LINEAR GRADE	<5%	<10%	<15%	15%+
SURFACE	Stable; Firm or Native	Native, w/ Surface Protrusions	Native, w/ Surface Protrusions	Native, w/ Surface Protrusions
TREAD WIDTH	36"	18" - 30"	18" - 30"	18" - 30"

TRAIL STRUCTURES

Additional trail structures may be required to pass obstacles due to site-specific constraints. Below is a list of structures which assist in crossing wet areas and in ensuring adequate drainage adapted from the National Park Service and the U.S. Forest Service.¹

TURNPIKE

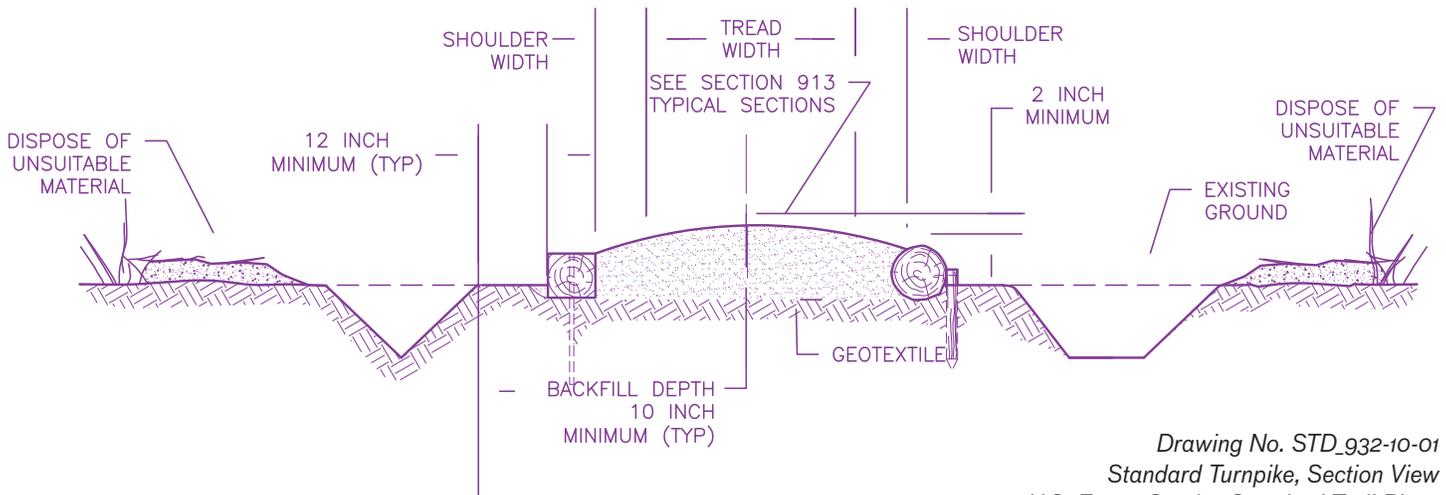
In areas with poor drainage, turnpikes can be utilized to raise the tread surface material and provide an even, dry walking surface.

First, the tread width is defined by placing logs on either side of the trail. When logs are in place, the filling process should begin with medium-sized stones that will allow water to pass under the causeway. A fill of small stones, gravel, soil, or a mixture of materials should be used to create the elevated causeway and ensure a smooth walking surface. The surface should be rounded 2 inches above the elevation of the defining logs or rocks to provide better drainage and allow for settling.

This allows moisture to drain to the sides of the trail, providing a sturdy tread and preventing damage associated with walking through muddy areas. If additional drainage is needed, a ditch can be dug on either side of the trail.²



Van Cortlandt Park
Credit: NAC



¹ <https://www.fs.usda.gov/managing-land/trails/trail-management-tools/trailplans>
² https://www.nps.gov/noco/learn/management/upload/NCT_CH5.pdf; pg. 41

PUNCHEON

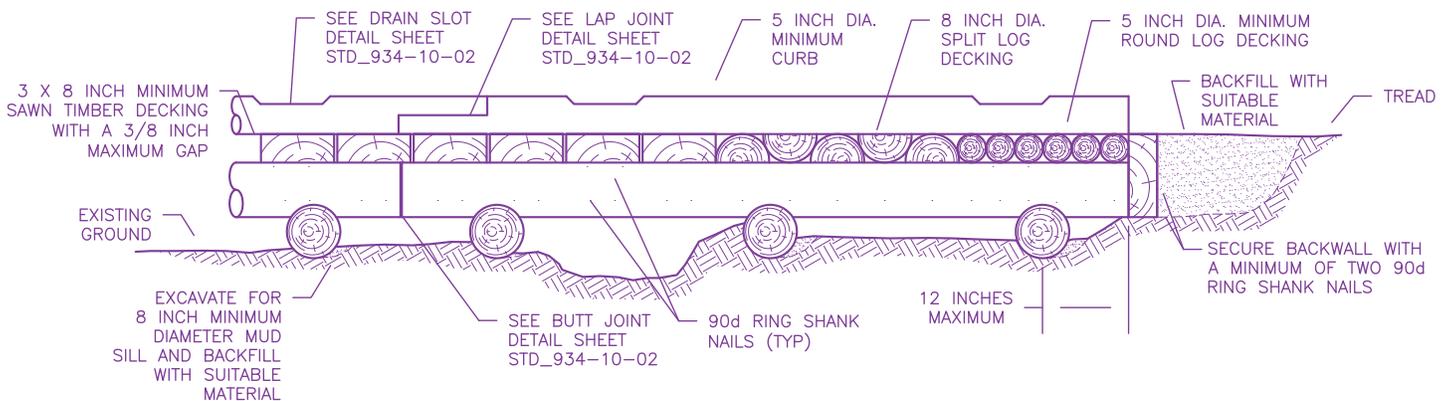
In areas that are difficult to drain, puncheons can be used to elevate the walking surface to provide crossings over wet areas. They can range from 10 feet long to hundreds of feet long, depending on the size of the wet area being traversed. Puncheons can resemble boardwalks and are typically composed of wooden walkway planks (most typically 2" x 8" x 8' and 6" x 6" x 8' pressure treated lumber) that are nailed to wooden support structures, or sills (most typically made from long-lasting native material like cedar, tamarack, locust, etc.).

Once the route is cleared, the sill logs are placed directly on the wet surface. These logs can range from 3 to 6 feet long, depending on the desired width of the puncheon, and the level of support given by the wet surface. The stringers (walking surface) are then placed on top (perpendicular to the sills) and secured with large spikes. Puncheons are normally built in 8 to 10 foot sections, with no more than 6 inches from the end of one section to the beginning of the next.

It is important that both ends perpendicular to the puncheon remain dry to avoid damage and the eventual expansion of the puncheon system.



Alley Pond Park
Credit: Street Plans



Drawing No. STD_934-10-01
Standard Puncheon, Elevation View
U.S. Forest Service Standard Trail Plans

WATERBAR

Waterbars are barriers embedded in the trail to divert water onto the adjacent forest floor. The barriers can be large rocks, logs, or treated timber.

The actual number and spacing of waterbars depends on the amount of water entering the trail, the steepness of slope, the construction of the treadway, and the availability of places to divert the water. Final placement of waterbars is dictated by terrain. They must be placed where diverted water does not return to the trail. If this is not possible, a waterbar should not be installed.

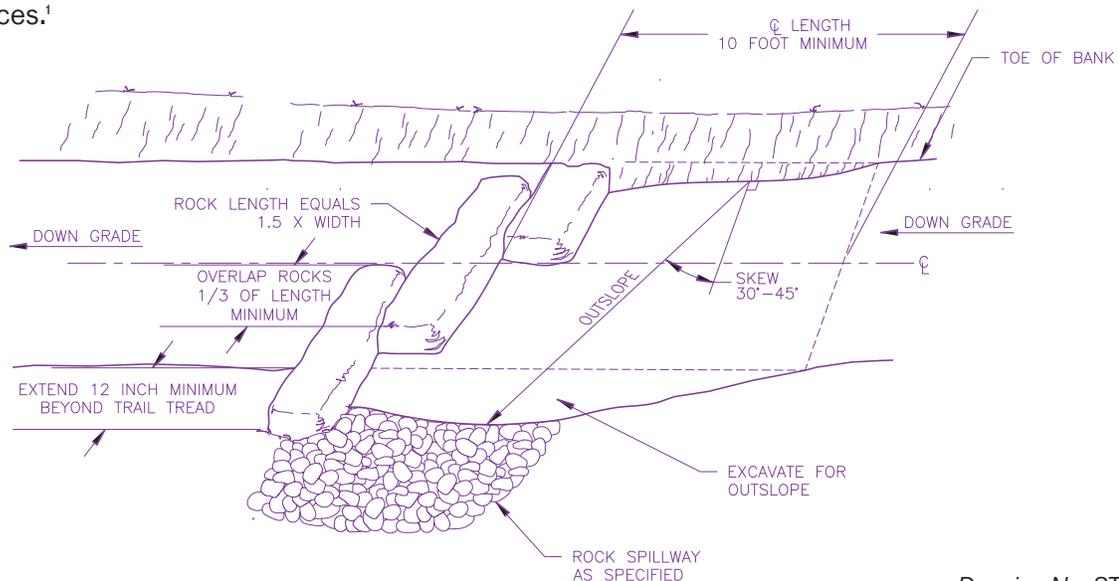
After waterbar spacing and location is determined, a trench should be dug across the trail at about a 45° angle. The trench should be deep enough to contain about half of the diameter of a log waterbar, and should be a minimum of 4 inches above the level of the ground on the uphill side. The waterbar should extend 12 inches into the side of the hill and 6 inches beyond the side of the trail on the downhill side.

Rebars are often used to fasten log waterbars in place. When used, holes are drilled through the log at a slight angle and the rebars driven so that no portion protrudes above the log. If using native material for stakes, a tree 2 to 3 inches in diameter should be cut into 18-inch pieces.¹



Inwood Hill Park
Credit: NAC

Additional graphics for Log or Timber Waterbars can be found in Drawing No. STD 922-20-01 of the U.S. Forest Service Standard Trail Plans



Drawing No. STD_922-10-01
Rock Waterbar, Perspective View
U.S. Forest Service Standard Trail Plans

¹ https://www.nps.gov/noco/learn/management/upload/NCT_CH5.pdf; pgs. 47-49

CHECK STEP

Check steps function to stabilize the trail tread from erosion while offering support for hikers on an incline. To prevent erosion, they are intended to slow and hold surface water long enough to deposit transported sediment. The material used in the steps should be seated in an excavated footing that extends into the sides of the gully.

If the check steps are intended only to slow down erosion on a 25-percent grade, relatively wide spacing is sufficient, every 20 meters (65 feet).

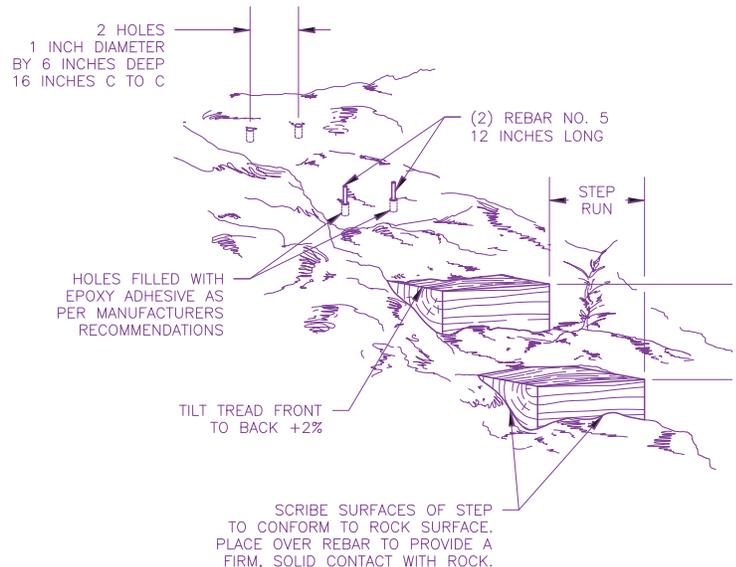
For steps to be comfortable for hikers, each step should be 6 to 8 inches high. The maximum recommended step tread, or depth, is 18 inches. To calculate the step depth, you must first calculate the total rise and run between the desired top of the steps and bottom (step “carriage”):

1. Use a clinometer to mark and calculate the total rise of the step carriage.
2. Use a tape measure to calculate the total run.
3. Divide the total rise by the maximum height of each step to get the number of steps.
4. Subtract 1 from the total number of steps to get the number of treads. Divide the total run calculated in Step 1 by this number to find the step depth. If it is longer than 18 feet, the step carriage must be shortened.¹



Credit: NAC

Additional graphics for Steps can be found in Drawing No. STD 936-10-02, STD 936-20-01, and STD 936-20-02 of the U.S. Forest Service Standard Trail Plans.



Drawing No. STD_936-10-01
Individual Timber Pinned Step, Perspective View
U.S. Forest Service Standard Trail Plans

¹ <http://www.parks.ca.gov/pages/1324/files/Chapter%2017%20-%20Trail%20Steps.FINAL.12.27.18.pdf>; pgs. 17-6 - 17-7

TRAILHEADS AND SIGNS

There are five primary signage types: trailhead signs, directional signs, mile markers, trail blazes, and interpretive/informational signs. Posts for each sign type should be placed off of paths, but not at such a distance that it lures pedestrians and cyclists from trails. Appropriate distances are usually between 2 to 6 feet from a trail's edge.

TRAILHEAD SIGNS

Trailhead signs are the most useful signage type and often provide maps in addition to directional signage. Maps provide an overview of how trails interact with surrounding communities and show one's location relative to adjacent landmarks, streets, trails, and paths. This orients runners, hikers, and joggers and allows them to make decisions along their route. These signs should be placed at trailheads, parking lots, support facilities, and where trails meet urban streetscapes and bike paths. They should be placed perpendicular to paths and securely installed in the ground. Enough room should be provided for people to view the maps and signage without standing in the way of trails.

DIRECTIONAL SIGNS

Directional signs make trail users aware of their contextual surroundings. They allow people to stay on trails and also indicate direction, distances, and travel times to nearby destinations such as landmarks, community spaces, and even commercial areas. For people coming from these areas, directional signs indicate the existence and proximity of trails from community destinations. They should be placed perpendicular to the paths and securely installed in the ground.

MILE MARKERS

Mile markers facilitate decision-making and help trail runners and hikers plan their routes. They indicate the distance one has traveled on a particular trail and are generally 3.5 feet high. These signs should correlate with maps provided on trailhead sign types. Signage posts should



Trailhead sign, Alley Pond Park
Credit: Street Plans



Directional sign, Staten Island Greenbelt
Credit: Street Plans



Example of mile marker
Credit: Arterial

be located between two to six feet from the trail surface and securely mounted to the ground

TRAIL BLAZES

Trail blazes are much smaller than other sign types. Their main function is to assure trail users that they are on the correct path. They can be hung on trees, placed in trail pavement, or fixed to wayfinding posts similar to mile markers. They should be placed at regular intervals along trails and at key decision making areas, i.e. when multiple trails intersect with each other. The design of these signs should conform to NYC Parks' blazing standards.

INFORMATION/INTERPRETIVE SIGNS

At culturally or historically significant sites or places with significant wildlife, these signs can provide an educational component for trail users. They feature text and imagery that honor the location's ecology and depict site-specific stories or environmental issues.



Interpretive / informational sign, Forest Park
Credit: Street Plans

NYC Parks has a consistent and cohesive palette used for all signage within parks, though there is not a distinct palette or brand for trails specifically.

In order to request a sign (or flyer, new apparel, etc.) from NYC Parks, Marketing, the NAC contacts Digital Media at FHNR at least one month before the item is needed. Digital Media at FHNR will facilitate the art request process with NYC Parks Marketing. Once the NAC is satisfied with the design, the city's sign shop will create the product.

CONSTRUCTION¹

The condition of New York City's nature trails often varies from park to park — and therefore the work required to maintain these trails can vary depending on the location. Most commonly, trails require general maintenance, rather than new construction. However, there may be instances where trail segments have degraded to the point that reconstruction is necessary. And on rare occasions, construction is required when formalizing informal trails or providing new connections.

TRAIL CLEARING

The first step of construction is the clearing of a trail corridor to adhere to a specific project's design and management parameters. It is important to follow all safety procedures during this process.

Trail crew leaders and their crews should understand that clearing too much can create as many problems, if not more, than clearing too little. Crews should clear a trail corridor to the appropriate design specifications to provide an adequate clearance buffer along the edges of the trail tread. (Refer to the trail management guide for appropriate clearing widths.) Furthermore, the crew leader needs to understand and communicate to the crew that the designer used trees and other features to accentuate turns, limit speeds, prevent trail widening, and screen adjacent trails from view. Therefore it is critically important for crews to consider these factors when clearing.

Before clearing the trail corridor, install all temporary and/or permanent erosion control features that the designer specified for the trail. Clearing involves removing blow downs and brushing the corridor. During the clearing process, avoid cutting large trees to minimize the need for stump removal.

Trees left on the side of the trail define the trail and often are stabilizing the soils. Whenever a sizable tree



Jamaica Bay Park | Credit: NAC

needs to be removed, the trunk should be considered for use as material for bridges, retaining walls, or other rustic features.

To clear the corridor the trail builders should use the door technique. The door technique involves walking the trail and imagining one is carrying a door vertically, like a shield, along the corridor. The size of the door corresponds to the vertical and horizontal clearing requirements identified in the project's design specifications. Everything that falls within the outline of the door should be removed. Look for branches or limbs that touch the door. They should be removed as well to reduce future maintenance requirements. Once the corridor is cleared and brushed, the tread can be constructed.

TREAD RECONSTRUCTION

At this point the trail corridor should be clear so crews can safely and easily work on the tread. To construct the tread, the ground should be cleared of organic materials and topsoil so the mineral soil can be shaped into the trail tread. It is necessary to remove the organic materials and soil to provide a

¹ Pennsylvania Department of Conservation & Natural Resources, Harrisburg, PA - Pennsylvania Trail Design & Development Principles Guidelines for Sustainable, Non-motorized Trails, 2013.

firm base for the trail tread. On very flat trails it may be necessary to fill the void created by removing this material, or if borrow material is not available it may be necessary to leave the organic material and soil so the tread is not entrenched into the surrounding grade.

To remove organic material and soil use a mattock, fire rake, or other scraping tool. Be sure to mark the sides of the treadway and follow the marks to ensure a consistent tread width. Remove all roots exposed during this process with a fire rake or a root ax. All organic matter should be placed on the downslope side of the trail, far enough away from the trail that it does not impede drainage. If the trail is near a stream, intermittent water course, or other body of water, transport the organic material away from the tread and the watercourse to ensure it does not enter the water.

Where the designer has specified the use of geotextile, and/or specifies a form of tread hardening, remove saturated mineral soil to firm soil. After exposing the mineral soil, follow the prescribed tread cross section as selected by the designer. Crews may have to construct the trail on the existing grade, or they may need to construct a bench to accommodate the trail. If a bench construction is prescribed by the trail designer, ensure that all organic material and soil has been removed so there is a sound foundation to work from.

With the mineral soil exposed, begin cutting the bench by starting on the uphill side, and pulling excess mineral soil to the downhill side of the tread. Continue working across the tread until one has achieved the desired elevation and width for the tread. Ensure the stability of both the upslope and downslope banks that have been on the trail.

Typically the sideslopes supporting the tread should be no steeper than 2:1, or a 50% slope — less is better. As crews construct the sideslopes, they should carefully smooth and finish them. Time spent fine tuning their shape will reduce future maintenance

requirements. Once construction of the tread is complete and the sidehills are finished, cover them with humus and leaf litter, or seed them with a native seed mix. This step initiates the revegetation process and stabilizes the soils to reduce rilling and splash erosion.

As crews progress along the length of the trail, they should follow the designer's specifications and install drainage features such as dips, drainage lenses, culverts, and any other trail structures.

Once the tread has been established it should be finished. This means crews may need to rake the tread smooth while maintaining the specified cross slope to direct water off of the tread. Or it may mean the tread is ready to receive a specified cross section to harden its surface. Follow the specified requirements for compacting the tread base when installing geotextiles, and/or when hardening a tread.

Once construction is completed, review the construction with the trail manager and address any areas that are unstable, unsafe, have eroded, or that otherwise do not meet the designer's specifications. Complete any required remedial work as quickly as possible.

Ideally, new natural surface trails should remain closed for three months following construction in order to improve long-term stability. The tread should be allowed to settle and bond before use. The process is the same whether the trail is constructed by hand or with mechanized equipment.

We highly recommend that all land managers, trail crews, and volunteers have a copy of the *USDA and USFS Trail Construction and Maintenance Notebook* (2007 edition). First published in 1996, it is still the best overall, single resource about trail construction and maintenance. Pocket-sized, it can be carried into the field to guide trail construction and maintenance.

MAINTENANCE

Regular, ongoing maintenance is essential to enabling long-term, sustainable, and safe use of trails that are accessed by its intended users at the level of service that was originally intended. Sustainable trail management, planning, design, and construction includes scheduled, organized maintenance practices.

The objectives of trail maintenance should also seek to protect adjacent resources and preserve investment in trails. Thus, if questions arise whether seldom used stretches of trail are worth the time and effort required to maintain them, the response ought to be: “If the trail is not maintained, why should anyone use them?” Therefore, while some trails may receive more attention than others, all trails should be maintained in the best condition possible — a well-maintained trail is a physically, environmentally, and economically self-perpetuating asset.

Contemporary trail maintenance execution should utilize recognized, sustainable best management practices for their particular managed uses and designed use. Trail maintenance should not alter or change the intended design parameters for a specific trail. Rather, all trail maintenance activities should always be concerned with supporting the identified Trail Management Objectives, thus controlling water-flow and erosion, and therefore maintaining a stabilized trail tread.

THE SIX BASIC TRAIL MAINTENANCE TASKS

Scheduled, organized trail maintenance practices should include the following six, basic tasks:

1. Berm removal along trail tread and corridor to maintain drainage off of the trail and beyond the trail corridor.
2. Tread drainage management includes maintaining the following to encourage sheet flow off the trail:
 - i. grade reversals
 - ii. grade dips
 - iii. nicks
 - iv. waterbars

3. Maintain drainage structures by cleaning debris from swales, culvert pipes, and related erosion control structures. For minor trail tread maintenance, source mineral soil by excavating off-trail or from the root ball of a fallen tree.

4. Clearing, brushing, pruning, grubbing, mowing and minor chainsaw use (tree falls only) to maintain height and width clearances for trail corridors, as well as, drainages.

5. Maintaining signage and blazing.

6. Invasive plants removal.

MAINTENANCE SCHEDULING AND DOCUMENTATION

Trail maintenance tasks, including the Six Basic Maintenance Tasks above, are incorporated into the following five primary maintenance categories:

- a. Trail corridor maintenance
- b. Trail tread maintenance
- c. Trail drainages maintenance
- d. Trail structures maintenance
- e. Trail sign and wayfinding maintenance

The *USDA USFS Trail Construction and Maintenance Notebook* clearly states: “Because there will always be more work to do than people or time to do it, how do you decide what to do?” Therefore it’s important to:

- Monitor trail conditions closely
- Decide what can be accomplished as basic maintenance
- Determine what can be deferred
- Identify the areas that will need major work.

Whatever the priority, maintain the trail when the need is first noticed to prevent more severe and costly damage later.

MAINTENANCE ACTIVITY PLAN (12 MONTHS)

Maintenance Activity	Optimal Frequency							Notes
	Weekly	Monthly	Quarterly	Annually	Spring/Fall	After Storm	Other	
General								
Safety Inspection				X				
Debris & Trash Clearing							As needed	
Vandalism Inspection				X				
Encroachment Inspection				X				
Signage/Wayfinding				X				
Dirt Tread								PER TMOs
Tread Assessment				X				
Berm removal							As needed	Hand tools
Patching				X				Hand tools
Erosion Repair						X		Hand tools
Linear/cross-slope grading							As needed	Hand tools
Grass Tread								PER TMOs
Turf assessment				X				
Mowing							As needed	
Patching			X					
Reseeding							As needed	
Erosion repair						X		Hand tools
Structures								PER TMOs
Boardwalk/bridge inspect				X				Non-structural
Retaining walls impact				X				Non-structural
Check step inspect/repair			X					
Turnpike inspect/repair			X	X				
Steps inspect/repair				X				
Drainages								PER TMOs
Culvert clearing					X			
Catch basin clearing					X			
Swale/ditch clearing					X			
Vegetation								PER TMOs
Corridor trimming			X	X				Depending on vegetation type
Treadway tree removal						X	X	Chainsaw, bucking only
Corridor tree inspection				X				
Corridor tree maintenance							X	Certified chainsaw only

TOOLS & TRAINING

Basic trail maintenance can be performed by crews and volunteers with hand tools and power tools.¹

The fundamental components of contemporary, sustainable trail planning and management are referred to as Trail Management Objectives (TMOs). Trail Management Objectives should be established for every trail, as opposed to one TMO for an entire system of trails. Equally important to TMO standards and practices, are contemporary construction and maintenance standards. Such standards indicate the parameters for executing maintenance, the types of equipment and tools to be utilized in various scopes of work, and the necessary experience and capacities with regard to manpower. Just as TMOs provide the parameters by which a particular trail is designed and constructed, so too should there be parameters that provide the proper tools for a specific project and the particular staff, contractor, or volunteer labor to execute that scope of work.

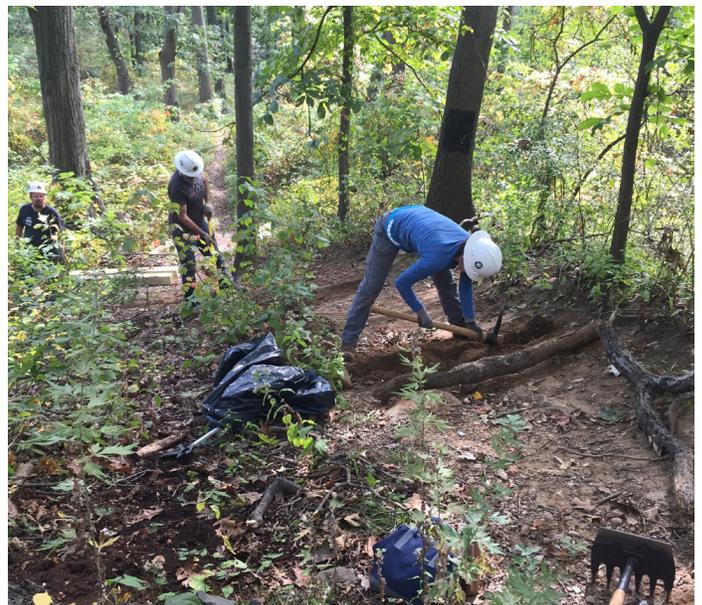
Contemporary tools and training, combined with TMOs, further ensure continuity and consistency over time and through personnel changes.

The table on the following page provides a recommended inventory of natural surface trail equipment and tools for trails construction and maintenance projected for the Citywide Trails Team. These recommendations represent Penn Trails's suggestion of industry standard tools and equipment, which are used by trails-trained the Citywide Trails Team staff and volunteers to execute and meet the NAC's Trail Management Objectives. The combination of contemporary tools and contemporary training will further help the Citywide Trails Team, NYC Parks, Borough Operations, and local park conservancies to:

- Manage and maintain an economically sustainable

trails infrastructure and utilize the Trail Management Objectives over the life of the trails.

- Create ecologically sustainable trails that utilize materials and construction methods that enhance natural resources, minimize negative impacts to those resources, and are realistically maintainable over the life of those trails.
- Offer a quality recreational experience, which meets the needs for a range of users, over a variety of terrain and routes within a natural setting.



Forest Park | Credit: NAC

¹ Trail Construction and Maintenance Notebook - Missoula, MT : USDA, Forest Service, Technology and Development Program, [2007], <https://www.fs.fed.us/t-d/pubs/pdfpubs/pdf07232806/pdf07232806dpi72.pdf>

TRAIL CONSTRUCTION MAINTENANCE & EQUIPMENT

[alphabetical order]

Description (Tool Name / Manufacturer)	Current Inventory [Units]
Bow Saw	
↳ Bow Saw Replacement Blade	
Buckets (5 gallon)	
Chainsaw – heavy use – 4hp - example; Stihl MS 311	
↳ Chainsaw - extra chain	
↳ Chainsaw - Chaps	
↳ Chainsaw - helmet	
↳ Chainsaw - carry case	
↳ Chainsaw – oil/gas mix	
↳ Chainsaw - filing guide	
↳ Chainsaw - Plastic wedges	
↳ Chainsaw - bar oil	
Clinometer	
Drill – battery - 20 v – 9amp	
Digging Bar	
Heavy Duty Extension Cord - 25' – 15amp 12/3	
Fire Extinguisher	
First Aid Kit – for chainsaw level response	
Flagging Tape	
Gas Can, Diesel Can - 5 gal.	
Oil Mix Can – 3 gal.	
Indian Tank Fire Pump	
Level – 36” plastic	
Loppers - bypass	
Mattock – cutter type and pick type	
McLeod-hoe rake	
Measuring wheel - mechanical	
Pin Flags	
Pulaski Axe	
Rake – steel tooth for aggregate and plastic for leaf	
Rogue Hoe Triangle Head Hoe /Pick	
Rope – heavy duty, for towing, etc.	

Description (Tool Name / Manufacturer)	Current Inventory [Units]
Safety Cones 18" orange	
Safety Gear for Crew – Glasses, leather gloves, orange vests, hard hats	
Shovels – long handle, D-handle	
Sledge Hammer – long handle	
Stakes - wood 36”	
Tape Measure – 25’ tape and 100’ reel	
Tie Down Straps	
Wheelbarrow – two-wheel – 10 cf size	

Appendix



Case Studies

As a part of the initial analysis, the project team interviewed three other urban-trail/natural-area entities to glean what made their operations, volunteer programming, stewardship, and trail maintenance successful. Below are 13 key lessons learned, with bullet points that relate to New York City's existing trail system, followed by summaries of each entity and its best practices.

1 Master planning a trail system can have a galvanizing effect with managers, funders, and partners, especially when focusing on accessibility, connectivity, amenity, and enjoyment.

- Creating a master plan for New York City's nature trails may galvanize supporters and offer a more detailed and nuanced set of physical and programmatic recommendations than those contained in this Strategic Plan, particularly ones related to connecting with the city's existing neighborhoods and transportation network (see below).

2 Connecting the trail network to the city's pedestrian and bicycle network can be a good way to attract users and supporters.

- New York City is a walking and transit city. Increasingly, it's a cycling city too. Thus, more clearly linking trailheads to the sidewalk and bikeway network, as well as making trailheads more visible and accessible, will increase usage of the nature trail system.

3 Articulating the needs and long-term stewardship goals is critical for making steady progress in the short-term. You can start opportunistically and then build up as resources grow.

- New York City's nature trail system is stewarded by a wide variety of formal and informal partners. Articulating needs and better coordinating partnerships and resources among all partners will enhance the quality of the trail system.

4 Collecting user data (e.g. through automatic counters) is crucial for establishing metrics and meeting performance goals.

- There is no ongoing data source for who, how, and why people use New York City trails. Numerous and increasingly low-cost digital counters and data feed platforms can provide high-quality data when human resources are limited and could help NYC Parks and its partners best understand how to plan, steward, and maintain the city's trail system.

5 Trail users need to be engaged in trail planning and stewardship, especially those who are using trails in ways that are unsanctioned, such as mountain bikers. Through this engagement you can strive to accommodate the needs and interests of these groups in a way that will encourage them to participate in stewardship, but clearly define what areas they can and can't use.

- The need to better manage illicit trail use is one of the core challenges identified in this Strategic Plan. Outreach to existing users of all types and better understanding needs is an ongoing opportunity to improve the use of the city's trail system.

6 Establishing trail management areas through a citywide plan can be a useful tool for prioritizing which trails to close and which to consider for formalization (through a process of community engagement).

- Trail management is a key issue for the New York City trail system and core to the recommendations in this Strategic Plan.

7 Engaging the local community in the planning, design, programming, and construction of trails is a great way to catalyze a constituency for stewardship.

- 1.6 million people live in census tracts abutting New York City's parks with nature trails. Intentionally targeting local residents and businesses in these areas would likely expand the trail system's dedicated constituency.

8 Structured and recurring volunteer activities on specific trails can help build a reliable base of weekly, monthly, and seasonal volunteers.

- New York City's nature trails are already well-programmed, especially during the warmer months of the year. That said, this Strategic Plan recommends increasing trail activation as soon as resources allow, which would help match programs to interests, and reach a broader and more diverse constituency of users, matching programs to interests.

9 Demonstrating large volumes of volunteer participation is attractive to funders.

- Collecting detailed participation data across all New York City nature trails programming could be dovetailed with more comprehensive data collection to help inform operations, including fundraising.

10 Partnering with other organizations to bring in their technical expertise will provide more compelling programming.

- The thoughtful strengthening and formalization of relationships with partner organizations could help adapt programming to meet hyper-local needs and interests.

11 Focus intensively on one park to build a robust volunteer team and effective stewardship program and then use that one park as a model which can be expanded to other parks. It helps for people to see an example of what they are working towards and to learn from other groups.

12 A core group of volunteers can be started among those who already use the trails the most. Developing a professionalized, structured volunteer program with training, specialization, and progressively responsible roles will have higher rates of involvement and retention.

- NYC Parks' Super Stewards program is a great, working example that can be expanded as resources are made available.

13 Original, intriguing events can help recruit potential volunteers and increase awareness of trails.

- Offering more events at trailheads or along trails and the ecologically diverse lands they traverse is also an opportunity for fundraising.

Friends of the Wissahickon

Type: Nonprofit

Jurisdiction: Wissahickon Valley Park | Greater Philadelphia Fairmount Park System

Scale: 1,800 acres, 57 miles of natural trails

Funding Sources: William Penn Foundation, private donors, state grants (capital projects)

2018 Total Expense Budget: \$1,724,913

~\$700,000 in government and private foundation grants awarded in prior years, but expended in 2018

~\$1,000,000 in individual or donor advised donations ranging from \$5 to \$50,000 (~\$825,000); corporate gifts, including sponsorships or matching gifts (~\$25,000); earned revenue from rent, investment income, and special events (\$100,000); and bequests (\$50,000)

Local Partners: Philadelphia Parks & Recreation, Philadelphia Water Department

Programming/Events: In addition to trail services and clean-ups, Friends of the Wissahickon works with their trained volunteers to create captivating events. Hikes and lectures have unique themes, and outside experts and guests are often included to strengthen partnerships.

SUMMARY

Friends of the Wissahickon (FoW) has been stewarding the Wissahickon Valley Park since 1924, but they didn't have a professional staff until 2000. Prior to the staff, the nonprofit relied solely on its board, donors, and volunteer base to help maintain and steward the Wissahickon Creek and Gorge, and the natural trails throughout. In the late 1990s, the local on-street and mountain biking community substantially increased its volunteerism as a way of creating legitimacy. Unfortunately, by the mid-2000s, the increased visitation of mountain bikers in Wissahickon Valley Park had started to cause trail erosion and user conflicts.

Having had years to grow, the nonprofit's volunteer constituency was fairly active by the time it acquired its Executive Director and staff, but it received a boost in 2006 when FoW began to more heavily engage the public in response to the damaged trails. At this time, FoW became much more focused on



Image Credit: Friends of the Wissahickon

trail stewardship, and began to more heavily engage volunteers to come out and take care of the trails. For example, the organization helped organize the local mountain biking community into a more formal group, publicized service opportunities to them, and tried to develop a culture where the group promoted appropriate trail use among its members. FoW also met with equestrians in their barns to hear their feedback and recommendations on trail usage, and held a multitude of public meetings about their plans and projects. Combined with the release of its Sustainable Trails Initiative in 2006, this period marked the beginning of how trails came to become a more prominent part of the organization's narrative. Trails have been integrated into its four core focus areas — habitat, water, trails, people — and are the focus of its trained volunteer programs.

Evidencing FoW's volunteer service has become key to leveraging private and foundation funding, and to bolstering its political impact. There's more to the park than just the natural habitat and paths. Wissahickon Valley Park is about education, people, and community.

SPOTLIGHT: VOLUNTEER MOBILIZATION

When asked how they managed to build up such a strong volunteer base, Deputy Director Ruffian Tittman pointed to the “magic” and scale of the park, the community champions they’ve been able to mobilize, and to their volunteer training programs. Because the park is so big, people can really feel like they’re alone in the middle of nature. It has become an extremely special place to the neighborhoods that border or surround it, offering FoW the opportunity to connect with a multitude of Community Development Corporations, churches, schools, neighborhood groups, and business associations for outreach and events. Second, FoW has identified and engaged volunteers who are able to spend a lot of time in the park, like teachers at neighboring schools who had taken their students to service days in the park. These are individuals that had a history with the park, and had repeatedly committed more of their free time to volunteer events in the past. These individuals have become the organization’s “mouthpieces,” continuing to inspire volunteerism in others and sharing the work of FoW. Finally, FoW began to offer potential volunteers something beyond trash removal.

With funding from the William Penn Foundation, FoW staff trains individuals to become a part of the following four volunteer groups:

- **Trail Ambassadors:** This group of volunteers is on the trails every day, selling trail maps, administering first aid, leading hikes and lectures, conducting hiking patrols, and sending daily reports on the status of the trails to the FoW staff. Each week, the FoW Volunteer Manager sends the Ambassadors the schedule of hikes and talks, and they decide which they’d like to lead.
- **Crew Leaders (Trails Crew):** These volunteers are specially trained in leading other volunteers in building and maintaining trails, restoring habitat, and planning and leading FoW’s open volunteer days. FoW’s Trail Crew Coordinator delegates weekly tasks to the Crew Leaders, providing them with supplies and other volunteers.

- **Structures Crew:** A small group of “legacy” volunteers who are delegated tasks by the FoW staff to maintain and build structures in the park, such as fences, signs, benches, foot-bridges, and bird and bat boxes. Their tasks are also often done with other volunteers that the group oversees.
- **Sawyers:** A specially trained volunteer group that clear fallen trees from the park’s trails. They are trained in safety measures, chainsaw operation and maintenance, flagging, swamping, and communicating in the field. They’re led by a US Forest Certified contractor. These volunteers all sign waivers, work under the supervision of the certified contractor, and are additionally insured.

FoW accepts applications for these groups and executes the training once a year. Selected applicants pay a small fee to receive the training, which is similar to training that the FoW staff receives upon their onboarding. Volunteers are not only trained in their specific area of expertise, but also in how to read FoW’s scopes of work and keep track of the organization’s running list of trail projects. Just as there is a process to “hire” volunteers, they can also be dismissed.

This unique structure of volunteer onboarding creates a sense of autonomy and ownership over the positions. The volunteer groups’ ability to recruit and organize other volunteers makes their tasks more efficient and higher quality. FoW meets regularly with the senior staff at the City of Philadelphia’s Parks & Recreation Department, which has a district office with several park rangers within the park. When maintenance tasks arise, FoW will decide whether they can handle it with their volunteers. If not, they’ll forward it to the Parks & Recreation Department, or, when appropriate, to the Water Department, which also has infrastructure in the park.

In addition to the volunteer programs, FoW executes approximately three open volunteer/service days per week. The trained volunteers are relied upon to spread the word, bring other volunteers, and help manage them with the staff.

City & County of Denver

Type: City Departments

Jurisdiction: City and County of Denver

Scale: 80 miles of off-street trails (through parks, neighborhoods, including regional trails)

Funding Sources: Capital Improvements Fund, arts & venue seats tax, Winter Park lease funds, 2A tax measure

Local Partners: Sand Creek Regional Greenway Partnership, High Line Canal Conservancy

SUMMARY

The City of Denver has over 80 miles of off-street (paved, soft-surface, and natural) trails cutting through parks, running along waterways, spanning neighborhoods, and even connecting multiple municipalities. Denver's Dept. of Parks & Recreation's Trails Program consists of a single Trails Planner (a position created within the last several years), maintenance and operations staff, and park rangers. The Parks & Recreation Dept.'s long-term goals include increasing their staff, and instituting procedures to engage the area's trail advocacy groups, such as the High Line Canal Conservancy and the Sand Creek Regional Greenway Partnership, on a more regular and continuous basis. Right now, engaging these groups in project work or programming is more opportunistic. The Department's park rangers work with volunteers on "courtesy patrols," but there isn't a robust program to engage volunteers in trail maintenance and stewardship. To work toward this goal, the Park Rangers are beginning more "pop-up" engagements on the trails to educate users about safety, enforce proper trail usage, and to start collecting more regular feedback outside its social media channels.

Acknowledging that Denverites wanted more trails that extend outside of the city's parks, and in an effort to promote safe and increased use of the city's trail system, the Public Works Dept. and Parks & Recreation Dept. initiated a master planning process in 2016 that emphasized connectivity between the trails and the street network.



Image Credit: Denver Parks & Recreation

SPOTLIGHT: DENVER MOVES PEDESTRIANS & TRAILS

For the Trail Planner interviewed, the fact that the Master Plan was a joint effort between the Public Works and Parks & Recreation Departments was key. The Pedestrians & Trails Master Plan was initiated alongside the Denver Moves: Transit Plan, both of which are part of an effort to improve mobility and expand transportation options throughout Denver and Denver County. Connectivity to all pedestrian and bicycle infrastructure, including trails, was critical to this expansion. To fulfill the public's desires for more infrastructure that's not for cars, the City and County set two top goals for its trails element as: (1) connectivity and (2) destination access. Connectivity included addressing gaps in formal trails, improving access to the trails from the streets, and closing the distance between some neighborhoods and trailheads. Furthermore, the City and County wanted to address how some of the region's trails had limited or few access points. The Trails Planner said the existing network really breaks down at the neighborhood level. At the regional level, the Master Plan prioritizes above-grade crossings where trails meet the street network.



Image Credit: Denver Parks & Recreation

To help prioritize improvements to Denver’s trail and pedestrian networks, the Master Plan integrates Pedestrian Priority Areas, areas put forth in Blueprint Denver, the City and County’s concurrent land use and transportation planning effort. This plan identifies Pedestrian Priority Areas as those where land use, built environment, and demographic factors lead to high levels of walking. Pedestrian Priority Areas are located on downtown streets, main streets, and mixed-use streets, all of which are street typologies put forth in Blueprint Denver. Within these areas, streets should be designed to serve high levels of walking, and support economic vitality and a sense of place.

To estimate the latent demand for walking on the street network, the master plan’s consultants created the Pedestrian Demand Index, which evaluates demand based on variables known to contribute to high levels of walking, including population and employment density, intersection density, and projections of population growth.

To engage trail users with the master plan, the planning team held multiple public meetings, and online and social media channels were kept current with plan updates and bulletins. The planning team also utilized local partners, like the Greenway Partnership and High Line Canal Conservancy, to engage their constituents. Targeted outreach by trail

user type wasn’t performed. The Mayor’s Bicycle Advisory Committee and Parks Advisory Board were also major stakeholders.

Denver Department of Public Works and Denver Parks & Recreation released the master plan for public comment in November 2017, and received 90 comments in its fall 2018 review period. Parks & Recreation is still developing metrics to gauge the success of implementing the plan’s priorities (connectivity, access, and safety). The Trail Planner is working to add trail counters to the network so that the department can collect more usage data, on which it would base its performance metrics.

Near-term, Denver Parks & Recreation and the Department of Public Works want to implement trail maintenance capital projects that have been in the queue and integrate the Master Plan’s design guidelines (which were updated by the City and County for the master plan according to nationwide best practices). Currently, there isn’t a system to prioritize implementation of the guidelines. The departments are generally focused on implementation within the broad categories of connectivity, access, and safety, and takes an opportunistic approach to upgrade trails to the design guidelines standards. For example, they jump on other department’s projects, ask private developers to make improvements and connections, etc. Furthermore, a lot of the trail signage and wayfinding needs to be updated. As a part of the plan implementation, Denver Parks & Recreation is planning to ramp up its marketing strategies to engage more of the public in trail planning and usage.

Toronto Dept. of Parks, Forestry, & Recreation

Type: City Department

Jurisdiction: City of Toronto

Scale: 155+ miles of nature trails

Funding Sources: City funds

Local Partners: International Mountain Biking Association, Don Valley Trail Association

Programming/Events: Crothers Woods “drop-in” volunteer events, Ridge Trail Saturday volunteer events, City Community Stewardship Program

SUMMARY

The City of Toronto’s Parks, Forestry, & Recreation Division has had a history of planning efforts and strategies, but in 2013 it published its first plan dedicated to natural-surface trail management and planning. The Natural Environment Trail Strategy (NETS), developed by the Urban Forestry branch, is ultimately a conservation effort, but it also includes explicit goals to increasingly engage the community and utilize community partners in the restoration, building, and stewardship of the city’s nature trails. A long-established and passionate mountain biking community had grown in the 1990s and early 2000s, and while this produced a constituency of active trail users, it also promoted unsustainable and damaging use of the trails. As a part of the process of developing the NETS, the city engaged with the trail community to help delineate and prioritize trail management areas, guided by criteria such as: under-resourced or underserved areas, ecological sensitivity, volume of current trail use, degree of trail connectivity, barriers to trail development, etc. Instead of simply closing damaged and unsustainable trails, they used the NETS to recommend sustainable design guidelines. They also set goals to create long-term community partnerships and structured, volunteer/stewardship opportunities for community members who had felt a sense of ownership over the trails for years.

SPOTLIGHT: CROTHERS WOODS TRAIL STEWARDSHIP TEAM

Many of the City of Toronto’s nature trails are what it would call “unofficial,” ones that may have been created by the adjacent communities and/or mountain bikers. However, the City is working to gradually



Image Credit: Toronto Parks, Forestry, & Recreation

incorporate these trails into its official network, guided by the established Priority Management Areas, and community engagement is an important part of this process.

Crothers Woods was one of the first areas in which the City “formalized” a previously unofficial natural surface trail, creating an area-specific Trail Management Strategy and undertaking redesign and reconstruction for much of the problematic trail infrastructure. During this process, the community was invited to contribute through public consultation sessions, as well as at volunteer trail-building and maintenance events to help implement the recommended changes.

Volunteer engagement in Crothers Woods continued over the years and has evolved into what is now the Crothers Woods Trails Stewardship Team (image at right). Part of a broader city-led program called the Community Stewardship Program, volunteers meet weekly to perform trail maintenance and improvements. The team manages drainage and trail tread issues, maintains sight lines, closes unwanted unofficial trails, and performs invasive species management and native tree and shrub planting. To help measure the impact of the volunteer team, the



Image Credit: Matt Forsythe



Image Credit: Matt Forsythe

City tracks metrics such as the number of volunteers, their hours, the total length of trails managed each season, and the number of trees/shrubs planted each season.

The City also offers weekend drop-in volunteer trail events in the spring and fall. All volunteer trail stewardship events and sessions are led by City staff, but much of the technical trail expertise is provided in partnership with a newly incorporated community not-for-profit organization. The group, called the Don Valley Trail Association, was founded by active trail users and is dedicated to trail advocacy and outreach.

The City's Natural Environment Trail Strategy supports expanding the stewardship team model in addition to partnerships with local associations for more autonomous "adopt-a-trail" models of maintenance and management.

