HIGHLANDS RAIL TRAIL FEASIBILITY STUDY

May 2017
Highlands Rail Trail Feasibility Study

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# Highlands Rail Trail Feasibility Study
**PROJECT PURPOSE**

The purpose of this feasibility study is to evaluate the creation of the Highlands Rail Trail, a bicycle- and pedestrian-friendly pathway. The historic alignment of the New York and Greenwood Lake Railway, identified as a priority bicycle and pedestrian corridor in the County’s Transportation Element of the Master Plan, will provide the foundation for the alignment of the proposed trail. The Highlands Rail Trail was identified in the County’s Heritage Tourism Element of the Master Plan as an opportunity to “link bicyclists and pedestrians to businesses, civic uses and recreational opportunities along the constrained Ringwood Avenue corridor, and provide a link between communities in northern and southern Passaic County.” The trail will utilize interpretive elements of the historic railroad and the scenic beauty along the corridor to create a regional draw for tourism and a source of local pride for Passaic County.

**Vision for the Highlands Rail Trail**

Greenways or rail trails are corridors of open space managed for conservation, recreation and transportation purposes. Greenways often follow natural land or water features, and link nature preserves, parks, cultural features, historic sites, and other public spaces with each other and with populated areas. The long-term vision for the Highlands Rail Trail is an off-street facility to the greatest extent possible. However, sections of both the short-term and long-term Rail Trail will include a combination of sidewalks, separated bikeways and shared-use paths to create a linear route that follows the historic railroad alignment as closely as possible. Although the on-street sections will not be a “trail” in the traditional sense, for the purposes of this study, “trail” is used to describe both the on-street and off-street conditions. The following statements describe the vision for the Highlands Rail Trail:

- Passive recreational trail that promotes historic significance of New York and Greenwood Lake Rail line and adjoining properties
- Creation of multi-modal transportation links within and through the County
- Environmentally sensitive, low-impact trail development that protects nearby water bodies
- Non-motorized bike paths and on-street bicycle facilities where appropriate
- Signage to improve wayfinding and safety
- Furnishings and interpretive signage to enhance heritage and cultural tourism

**Goals and Objectives**

The following goals of the feasibility study were established by the project team:

1. Develop a bicycle- and pedestrian-friendly route
2. Connect the lower and upper portions of Passaic County and integrate into the greater trails network
3. Connect community facilities, commercial centers and public institutions
4. Promote cultural and heritage tourism
5. Connect, preserve and restore open space throughout the County
6. Promote environmental sustainability

The primary objective of this plan is to identify an alignment that can guide future development of the trail which would involve all stakeholders including property owners, municipal and County officials and others. Because land use and property ownership along the former railroad right-of-way has evolved since its abandonment, the development of the Highlands Rail Trail will be required to be a collaborative effort. The implementation of the trail will need to occur incrementally and over an extended period of time. This document is intended to provide context for the overall process, with the preferred long-term alignment as the core focus of the process. The implementation strategies described herein are to address short-term and long-term development of the trail. This deployment may involve use of existing streets and sidewalks as well as portions of the former right-of-way.

**Project Scope of Work**

The feasibility study scope of work included the creation of a high-level planning document to guide development of the Rail Trail. The following tasks were inclusive in the scope:

1. Establish a vision
2. Review existing conditions
3. Develop preferred alignments
4. Identify opportunities and constraints
5. Generate implementation actions

**Stakeholder and Public Outreach**

Throughout the course of the study, the project team engaged key stakeholders, interested parties and members of the community through a comprehensive public outreach process. Public input was an important component in the development of this study.

**Project Website** ([www.passaiccountynj.org/highlandsrailtrail](http://www.passaiccountynj.org/highlandsrailtrail))

A project website was developed by the County on its site to provide outreach to members of the community and stakeholders. The website served as a repository of information, and a source of project updates. Materials for the public outreach sessions were posted on the website and important contact information was given.

**Public Meetings**

A public open house meeting was held on November 2, 2016, to provide the public with an opportunity to offer input on the alignment options, future design, and any other perspectives that might inform the development of the trail. The meeting was held at the Wanaque Elementary School auditorium. The workshop was divided into three formats: presentation, open house and interactive mapping exercises. The meeting format allowed for both one-on-one and group discussions. In addition, attendees were provided with comment sheets to leave additional feedback. Flyers were prepared and distributed in advance by the County staff. The results of the workshop are provided in the Appendix.
PROJECT CONTEXT

Relationship to Prior Plans
The Highlands Rail Trail was identified and referenced Passaic County’s planning documents. A recommended implementation action is to formally adopt this plan and to incorporate the proposed short-term and long-term alignments into the County’s Master Plan, referencing this Plan as The Highlands Rail Trail Plan. It is important to update the Master Plan and present the trail with as much detail as possible, including maps of the proposed alignments, in order to establish the relationship to related planning strategies and recommendations.

Current references to the creation of the Highlands Rail Trail in the County’s Planning documents are outlined below.

Transportation Plan Element of the Passaic County Master Plan (2012)
The Transportation Plan Element of the Passaic County Master Plan emphasized the importance of the development of safe cycling and walking facilities in order to “address energy independence, public health, the environment and creating more sustainable places to live and work.” The Plan Element recognized the need to utilize the County’s Complete Streets guidelines as a foundation for planning and designing such facilities throughout the County while identifying distinct “Priority Corridors that will create a cohesive county-wide framework of pedestrian, bicycle and river access...for a more complete transportation system for visitors and residents.” Map 4.1 Bicycle and Pedestrian Priority Corridors Northern Passaic County of the Plan Element (page 33) identified the former New York & Greenwood Lake railroad right-of-way as one such priority corridor as an off-road facility for cycling and walking.

Heritage Tourism Plan Element of the Passaic County Master Plan (2013)
The Heritage Tourism Plan Element of the Passaic County Master Plan also identified priority bicycle and pedestrian corridors to support tourism and economic development opportunities in the County. Increasing access to the Wanaque Reservoir and surrounding lands owned by the North Jersey District Water Supply Commission were recognized by the plan as a priority in order to maximize their potential as tourist attractions for the County. The Greenwood Lake Railroad Greenway (this trail) was recognized as an opportunity to “build an educational element from the historical railway as well as a major access point...recreational facilities at local schools.” The Heritage Tourism Plan Element also detailed the history of the New York & Greenwood Lake Railway and the existing conditions of the former right-of-way.

History
The New York & Greenwood Lake Railway operated between Jersey City/Hoboken and Greenwood Lake in West Milford beginning in 1867. During its time in operation, the rail line was used to transport ice from Greenwood Lake to the urban areas to the southeast, as well as transport tourists to the Lake’s resorts hotels. The line also served commuters from the area to jobs in Hoboken. The Ringwood Branch spur of the railway connected the Peter’s Mine area in Ringwood to the Ringwood Junction station, providing industrial operations to the south with access to iron.

Within the feasibility study area, the NY&GL Railroad was serviced by stations at Wanaque, Midvale, Ringwood Junction, Erskine, Ringwood, and Monks. While the stations themselves have been removed, evidence of the existence of these buildings exist to this day.

With the advent of accessibility to Greenwood Lake by car and the struggle of the iron mines, the rail line north of Ringwood Junction was abandoned in 1939, making the Wanaque Midvale station the end of the line. In 1943, the NY&GL railroad property was purchased by Erie Railroad. The railroad was abandoned in stages following the merger between Erie Railroad and Delaware, Lackawanna and Western Railroad (which became the Erie-Lackawanna Railroad) and was fully abandoned by the mid-1960’s.

Regional Significance
The focus area for this study is the region in the “Highlands” of Passaic County where the former New York & Greenwood Lake Railway once operated. This area encompasses the Borough of Pompton Lakes, the Borough of Wanaque, the Borough of Bloomingdale, the Borough of Ringwood, and the Township of West Milford.

The Highlands Rail Trail will provide this portion of Passaic County with opportunities to connect important public institutions such as parks, schools and services with commercial and retail centers, as well as the natural landscape of Wanaque Reservoir. Future development of the rail trail to the south in Pompton Lakes may result in the connection to the Morris Canal Greenway, which is planned to terminate in the Borough. This potential linking of trails would result in a continuous bicycle and pedestrian pathway spanning the entire length of Passaic County. Additionally, potential trail extensions in the north could provide linkage to existing NY/NJ Trails Conference trails, which could allow users to access New York State.

In addition to enhancing opportunities for tourism and economic development, the proposed Highlands Rail Trail will support healthy lifestyles, expand access to open space and recreational amenities, and renew the connection between the community and its history.
ALIGNMENT

The following aspects were analyzed for their potential to create a contiguous pedestrian/bicycle trail that would address the project’s goals and objectives:

- Develop a bicycle- and pedestrian-friendly route
- Connect the lower and upper portions of Passaic County and integrate into the greater trails network
- Connect community facilities, commercial centers and public institutions
- Promote cultural and heritage tourism
- Connect, preserve and restore open space throughout the County
- Promote environmental sustainability

Existing Conditions

Land Use Inventory

The study area for this feasibility report focused on the corridor of the former New York & Greenwood Lake Railway. An inventory and analysis of land use was conducted in the area surrounding the proposed Highlands Rail Trail, with a particular focus on existing commercial and community centers, open space and recreational facilities, and other public spaces that could be linked by the trail. In addition to recreational facilities, the inventory identified land uses that represent potential amenities along the rail trail, such as commercial districts, mass transportation links, and other public facilities. The analysis encompasses land that is approximately one half-mile from the proposed rail trail.

The data used to create the inventory are the Passaic County Tax Parcels obtained from the New Jersey Office of Information Technology and 2012 Land Use/Land Cover (LU/LC) data supplied by the NJDEP. Both data sets were reviewed using geographic information system (GIS) software to create a comprehensive existing land use map for the proposed rail trail corridor. This information was then compared with aerial imagery from NJDEP, Google Maps and Bing Maps, along with input from the County and stakeholder groups in order to accurately reflect the existing landscape.

The inventory analyzes the proximity of different land uses along the rail trail to highlight the potential opportunities and challenges for trail development. For example, potential opportunities would be the presence of existing trail networks or public lands that could provide potential connections to other trails and other recreational amenities. Challenges could range from environmental constraints, such as wetlands or steep slopes, which would require additional engineering and permitting, to limited publicly-owned lands that can be used for trail development, to limited roadway space for shared pedestrian/vehicle access. This feasibility study reviewed such opportunities and challenges through the use of the GIS analysis described earlier in the report. The subsequent mapping that was produced from this analysis was shared with the public during the public outreach process, and is also included throughout this report.
Existing Land Use Characteristics

The rail corridor examined as part of this study begins in Wanaque Borough just south of I-287, and extends to the northern end of the Wanaque Reservoir in Ringwood Borough. The physical constraints that led to the rail line being constructed in this area are easily identifiable in the Environmental Constraints mapping, which is included with this report. While the former rail right-of-way is located in a relatively flat area, the surrounding corridor includes many areas with steep slopes. Given this dynamic, many portions of the rail right-of-way are located near wetlands, flood hazard areas and waterways. Trail design and future maintenance in these areas should account for the potential of flooding. The effective management of stormwater generated by the trail should also be a priority.

Section 1

Land uses around I-287 are largely commercial in character, more specifically, retail and services, including a grocery store, fast food restaurants and hotel. Traveling north from there, the corridor transitions to residential uses along the Greenwood, Haskell and Ringwood Avenue corridors. The Posts Brook passes between Haskell Avenue and Ringwood Avenue, before connecting to Rainbow Lake and Lakeside Park. Just north of First Avenue, the former rail corridor passes an industrial site and Laurie Field, a public park. The area around First Avenue is still largely residential, but also includes a commercial strip along Ringwood Avenue. East of Greenwood Avenue, the former rail right-of-way becomes visible. East and west of the rail right-of-way, the predominant land use is residential, with several exceptions. The Haskell Town Center is located along Ringwood Avenue to the north of Laurie Field, which includes a variety of retail and other commercial services. To the east of the Town Center is an existing industrial area, and to the west is the public Rainbow Lake and Lakeside Park. The corridor continues north, where it passes residential communities, as well as the Haskell Elementary School, and the St. Francis of Assisi Catholic School. At this point, the corridor narrows and is bounded by the Wanaque Reservoir and the public Hagstrom Field. The former rail right-of-way then crosses west to east across Ringwood Avenue.

Corridor Section 2

The corridor continues along the east side of Ringwood Avenue, where it passes through existing residential and forested areas, before crossing the Wanaque River. North of Warren Hagstrom Boulevard, the corridor widens again with many surrounding residential communities. This area also includes the Wanaque Borough Hall. Commercial uses are largely located along Ringwood Avenue, although several commercial properties are located along Villa Place, before the road terminates at the Wanaque First Aid Squad. North of the First Aid Squad is the Wanaque Elementary School, located adjacent to Addice Park, which itself is located adjacent to the Lakeland Regional High School. To the west of the corridor is Memorial Park. As the corridor extends into Ringwood, the predominant uses along Ringwood Avenue are commercial in character, except for the reservoir, which is the predominant land use to the west.
Section 3

At the intersection of Ringwood Avenue and Westbrook Road, the rail corridor enters into the Wanaque Reservoir, which is owned and managed by the North Jersey District Water Supply Commission.

Sections 4-5

Unlike the first three sections, which are arranged in a contiguous linear fashion, Sections 4 and 5 split at the northern terminus of Section 3. Section 4 extends north through the Wanaque Reservoir, before exiting near the intersection of Margaret King Avenue and Peters Mine Road. Going north, the Peters Mine Road corridor is largely residential for the first quarter-mile, before passing an electrical transmission line right-of-way and transformer station. Further north along Peters Mine Road are sporadic residential developments and public lands, part of Tranquility Ridge County Park and Sterling Forest. Section 5 continues northwest through the Wanaque Reservoir before terminating at the Monksville Reservoir.

Schools, Parks, Open Space, and Community Facilities

One of the goals of a Highlands Rail Trail would be to connect community facilities, commercial centers and public institutions. A review of public land was conducted along the corridor of the proposed Highlands Rail Trail, focusing on open space resources and other community resources. The purpose of this analysis is to understand the potential alignment and connections to other amenities that a Rail Trail could provide for all County residents and visitors, including community facilities and preserved open space. Not only does a trail increase the participation in fitness-related activities through access to open space and recreation facilities, it can also provide access to facilities focused on learning and education.

Connectivity would increase opportunities for pedestrians and bicyclists in order to provide an alternative to vehicular travel, thereby increasing...
Highlands Rail Trail Feasibility Study

fitness, improving air quality and contributing to health benefits, such as reducing childhood obesity and asthma rates. Schools, parks/preserved open space and community facilities along, or proximate to, the proposed Rail Trail corridor include the following:

- Laurie Field
- Hagstrom Field
- Memorial Park
- Addice Park
- Haskell Elementary School
- St. Francis of Assisi School
- Wanaque Elementary School
- Lakeland Regional High School
- Robert Erskine Elementary School
- St. Catherine of Bologna School
- Wanaque Public Library
- Ringwood Public Library

In recent years the increase in childhood obesity rates has prompted a resurgence of fitness in children’s lives. The Rail Trail would be a safe way for children to walk to and from school. This would reduce the use of the family automobile to drop students off, and introduce a consistent regime of exercise in the child’s daily routine.

Pedestrian and Bicycle Paths

The goal of the Highlands Rail Trail is to create a contiguous walking or hiking path along the former route of the New York & Greenwood Railroad. By following this route, the Rail Trail will create a safe and pedestrian-friendly means of traversing Ringwood and Wanaque, while offering non-motorized travel connections to other trails in Passaic County and the greater northern New Jersey region.

Trail identification was conducted from the perspectives of both pedestrians and bicyclists. It identifies and evaluates opportunities and constraints to create a contiguous route for both user groups. To assess the walkability of the route, the Project Team physically inspected sections of the former rail right-of-way. The team documented the ability to access the remaining portions of the right-of-way. In areas where the right-of-way has since been sold into private ownership or developed, alternative paths were identified and reviewed by the Project Team. In locations where existing roadways were found to be the preferred or most feasible alternative, the team documented the presence of sidewalks, crosswalks and other pedestrian-friendly amenities. In addition, access for people with disabilities was considered as part of the inventory.

It is envisioned that a significant portion of the Rail Trail will welcome bicycles. However, the introduction of bicyclists along the trail also introduces special considerations for safety, wayfinding and the potential need for other infrastructure amenities, such as bike racks and bike lanes on roadways, as well as potential surface treatment of the path. Furthermore, bicycle usage is more constrained by terrain conditions, such as steep slopes, especially for seniors and less mobile or experienced bicyclists.

Transportation Connectivity

The Rail Trail could have substantial potential to act as a transportation corridor because of its linear character, both by itself and by connecting different existing transportation facilities located along its route. The proposed Rail Trail would be located within close proximity to 33 New Jersey Transit bus stops along the 197 Line of New Jersey Transit. Rail Trail users could have the opportunity to take a one-way bus ride from an originating location (northern or southern) along the trail and then walk or ride back to their starting location. This makes one-way use of the Rail Trail a possibility and could increase the use for those interested in shorter trips or commuting.
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In addition to mass transit, the Rail Trail could also connect or provide close access to other existing or planned pedestrian trails. These trails include the Stonetown Circular Trail, the Cooper Union Trail, Posts Brook Trail, and numerous trails in the Ramapo Mountain State Forest. In addition, the connection to the Morris Canal Greenway could theoretically provide a non-motorized trail connection to both the Delaware River in Warren County and the Hudson River in Hudson County.

Table 1: Ownership of trail right-of-way sections by Municipality. Please note, this data is based on 2016 MOD-IV Tax Data and the proposed trail segments, and is subject to change based on changes in ownership and the finalized trail route. This table does not include the potential trail spurs, such as Section 2a and 3a. Maps showing ownership of the right-of-way can be found in the Appendix.

<table>
<thead>
<tr>
<th>Ownership by Municipality</th>
<th>Length of Trail (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ringwood Borough</td>
<td></td>
</tr>
<tr>
<td>No. Jersey Dist. Water Supply Comm.</td>
<td>33,854.05</td>
</tr>
<tr>
<td>State of New Jersey DEP</td>
<td>183.27</td>
</tr>
<tr>
<td>Quality Carton Inc.</td>
<td>121.60</td>
</tr>
<tr>
<td>Total (Ringwood)</td>
<td>34,158.91</td>
</tr>
<tr>
<td>Wanaque Borough</td>
<td></td>
</tr>
<tr>
<td>Hackensack Water Co &amp; N.J.D.W.S.C.</td>
<td>5,539.13</td>
</tr>
<tr>
<td>Hackensack Water Company</td>
<td>2,042.85</td>
</tr>
<tr>
<td>JCP&amp;L</td>
<td>1,722.11</td>
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<tr>
<td>Pulte Communities NJ Ltd.</td>
<td>1,641.88</td>
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<tr>
<td>Other</td>
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<td>County of Passaic</td>
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<tr>
<td>No. Jersey Dist. Water Supply Comm.</td>
<td>494.33</td>
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<tr>
<td>Lakeland Reg Bd. Of Education</td>
<td>348.81</td>
</tr>
<tr>
<td>Borough of Wanaque</td>
<td>339.75</td>
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<tr>
<td>Borough of Wanaque Golden Agers</td>
<td>73.07</td>
</tr>
<tr>
<td>Total (Wanaque)</td>
<td>14,355.10</td>
</tr>
<tr>
<td>Grand Total</td>
<td>48,514.01</td>
</tr>
</tbody>
</table>

Table 2: Business categories based on 2016 MOD-IV property tax data business use classifications, when available, within ¼ mile of the proposed Rail Trail.

Wanaque Borough
- Offices
- Medical Offices
- Restaurants
- Stores
- Garage/Storage/Service Stations
- Mixed-Use Commercial
- Banks
- Industrial/Manufacturing

Ringwood Borough
- Garage/Storage/Service Stations
- Restaurants
- Stores
- Offices

Strengths, Weaknesses, Opportunities, and Threats (SWOT)

Based on the research conducted for this study and the input received as part of the public engagement process, the following summary of strengths, weaknesses, opportunities, and threats has served as a guide for the preparation of this Feasibility Study.

Strengths
- The characteristics of a Highlands Rail Trail that would serve as an advantage over other areas:
  - Proximity to other trail networks
  - Historic character
  - Natural assets, such as the reservoir, and proximity to other public lands
  - Existing portions of rail right-of-way that have not been developed for other, non-transportation uses
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Weaknesses
The characteristics of a Highlands Rail Trail that would function as disadvantages:
- Availability of parking
- Sections of right-of-way that have been developed
- Narrow roadways

Opportunities
External elements that can be utilized to the benefit of a Highlands Rail Trail:
- Market shift toward favoring walkable and transit-oriented communities
- Increased interest in alternatives to automobile usage
- Potential connection between trails in New York State and the Morris Canal Greenway
- Active interest from trail affinity groups
- Creation of a safe pedestrian route could reduce automobile traffic for some local trips
- Creation of a trail that connects to local amenities could encourage walking, which provides a variety of health benefits

Threats
External elements that could be detrimental to a Highlands Rail Trail:
- Availability of funding for trail development and maintenance
- Perceived safety concerns from neighboring residents

Site Selection Process
The site selection process identified key sites or sections of the Rail Trail that could substantially affect the overall feasibility of creating a continuous trailway. These sites may represent insurmountable challenges that could reduce the overall length of the Rail Trail.

Through detailed field inspections, GIS mapping, information obtained during public outreach meetings, and in consultation with local experts and members of the Project Team, it was determined that a substantial portion of the former New York & Greenwood Lake Railroad could be assembled for use as a Rail Trail. The rail right-of-way in northern and southern sections of the study area remains largely in the ownership of the North Jersey District Water Supply Commission (NJDWSC). In consideration of the importance of this segment, the Passaic County Planning Department has initiated discussions with NJDWSC to enable public use of the land above the NJDWSC reservoir for passive recreational purposes. The results of this discussion should be integrated into a subsequent Rail Trail plan. The middle section of the study area has been developed in many parts, requiring the Study Team to analyze and review alternatives for a continuous trail.

The following analysis discusses lands other than those owned by NJDWSC, and the opportunities and challenges that they represent in achieving the goals of a future Highlands Rail Trail. Other considerations, such as the acquisition of private residential property, were not considered in this study, especially in cases where alternate access opportunities can be realized.

Route Selection Criteria
Several factors were developed to determine which sites would be eligible for consideration in terms of improvements. The following criteria were established utilizing similar criteria to that used by the Open Space and Farmland Preservation Trust Fund Advisory Committee in their funding selection process, as stated in the 2001 Passaic County Open Space and Recreation Master Plan. Such criteria were established early as fundamental to the site selection process, and were stipulated in the ANJEC grant application documentation:

- Sites (areas) of existing open space along the canal and parcels highly deserving of preservation and/or should be restored to open space due to environmental sensitivity or location.
- Sites (parcels) that enable connectivity whereby residents will be able to traverse the entire length of the trail on foot or by bicycle safely.

After closer physical inspection of the proposed route, a better understanding of the site-specific conditions was achieved and additional, more specific criteria were identified. Because the Rail Trail has not yet been established as a distinct entity, many of the sites along the proposed route would benefit from relatively minor site-specific improvements, such as the addition of sidewalks or repairs of existing sidewalks. While such improvements are important, the focus of this study is to identify key impediments or opportunities that need to be addressed to enable the creation of a contiguous trail.

Discussion among the Team members as well as public input indicated a variety of conditions to review throughout the route. The
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Discussion regarding specific sites often focused on basic measures and key considerations, including addressing more practical concerns such as cost, difficulty in implementation, safety, and environmental impact.

New goals emerged as a result of internal and public discussions that tie into additional or increased funding sources for aspects such as community livability, public health, environmental sustainability, mobility independence, and self-sufficiency. For all these factors, pedestrian and bicycle transportation have become increasingly important tools.

The following sections provide an overview of how each factor was considered in the site selection process. The combination of all factors represent a transparent decision process, benefitting from considerable public input sessions. In addition to the criteria, an estimated time frame for implementing the proposed site improvements are discussed.

Alternative Options
In some cases, the recommended improvements or selected pathway for a site may not represent the only option to create a safe and usable Rail Trail. Other safe alternatives may be available but may not be as desirable, or may create a route that is difficult to navigate. As part of the planning and outreach process, potential alternatives were explored, especially where the former rail right-of-way had been developed and a new route was needed. Other alternatives were explored when environmental constraints or safety factors would cause a negative impact to the trail or impede its development. In other cases, suggested alternatives were introduced in order to improve the trail experience, such as a detour that could provide better views. An account of possible alternatives is included in the mapping.

Connectivity Factors
Given the key objective of creating a contiguous Rail Trail, the ability of a parcel, site or Rail Trail section to connect to the other parts of the Rail Trail is a critical factor. It is assumed that the longer the Rail Trail extends, the more valuable an asset it becomes for County residents and the general public. This is especially true if a site serves a significant portion of the proposed trail, thereby providing access to both the trail and resources located along its route.

The connectivity contribution of a site also depends upon the location of the site and its relation to the rest of the proposed Rail Trail. Sites in the mid-most sections of the proposed Rail Trail would have a higher value because any investment creating these contiguous connections for a Rail Trail would bear the most fruit. In addition, the potential of a site to connect schools, libraries, parks, and other public facilities along the trail will be a key factor for evaluation.

Estimated Construction Costs for the Sections
At this stage in the process, it is not practical to estimate precise construction costs for each section but a order of magnitude cost estimate have been prepared for sections 1, 2 and 3 to serve as “ballpark” estimates of the likely cost for the project and the detailed breakdown can be found in the Appendix. Additionally, to gauge the potential costs of infrastructure needed for the various sites, this study also estimates the costs in a relative manner to the other sections being proposed with a high, low and medium cost factor will be assigned to each section.

The estimated project cost include construction cost along with engineering design, permitting and construction administration cost but do not include maintenance, but rather focus on the initial capital expenditure that would be used for the trail, new signage, road paint for cross walks, or other infrastructure improvements that would contribute to the overall project cost. It is important to note, however, that for facilities and destinations to be tourism destinations, they must be maintained in a premiere condition in terms of appearance and safety.

Section 1
The estimated cost for this section of the proposed trail can be assigned a medium-cost factor and the order of magnitude project cost has been estimated at $1,657,500. The major cost factors would be the surface treatment of the trail as well as traffic signage and markings along the roadway sections and roadway crossing of the trail. Other cost factors include the amenities selected along the trail. The majority of the route is currently cleared and would be readily accessible by construction equipment. No bridges or major structural features would be required for this section.

Section 2
The estimated cost for this section of the proposed trail can be assigned a low cost factor and the order of magnitude project cost has been estimated at $826,150. The major cost factors would be the surface treatment of the trail as well as traffic signage and markings along the roadway.
sections and roadway crossing of the trail. Other cost factors include the amenities selected along the trail. The majority of the route is currently cleared and would be readily accessible by construction equipment. It should be noted that if a pedestrian/bicycle bridge were to be constructed across the Wanaque River that this would result in a high cost factor for this section. The costs associated with a pedestrian/bicycle bridge has not been included in the order of magnitude cost estimate. This cost factor could be mitigated by routing the proposed trail onto Ringwood Avenue.

Section 3
The estimated cost for this section of the proposed trail can be assigned a medium-cost factor and the order of magnitude project cost has been estimated at $2,144,106.25. The major cost factors would be the surface treatment of the trail that would utilize existing NJDWSC maintenance roads. Other cost factors include the amenities selected along the trail. As this section is entirely on NJDWSC property, safety features such as fencing may be an additional cost consideration for this section. Additionally, construction access could be limited within this section, which could also impact costs.

Sections 4 and 5
The estimated cost for these sections of the proposed trail can be assigned a medium-cost factor. The major cost factors would be the surface treatment of the trail that would utilize existing NJDWSC maintenance roads. Other cost factors include the amenities selected along the trail. Like Section 3, a large portion of these sections are on NJDWSC property, so safety features such as fencing may be an additional cost consideration for these sections. Additionally, construction access could be limited within these sections, which could impact costs.

Environmental Sensitivity
As with any construction project, the impact the project has on the environment is always a concern. This is particularly true if the project is meant to enhance the public's ability to enjoy the outdoors in natural surroundings. Any intrusion on the natural landscape would negatively impact the trail's aesthetics and diminish its experience for users interested in seeing natural landscapes.

Both Wanaque Borough and Ringwood Borough are in the Highlands Preservation Area, an area established by the 2004 Highlands Water Protection and Planning Act ("Highlands Act"). This act regulates certain types of major developments in the Preservation Area to restore and protect water quality in the region. Per the Highlands Act, a "major Highlands Development" includes non-residential development in the preservation area, any capital project by the state or local entity that requires environmental land use or water permits, or that results in the ultimate disturbance of one acre or more of land, or a cumulative increase in impervious surface by a quarter acre or more. That said, the Highlands Act does permit exemptions for the construction or extension of trails with non-impervious surfaces on publicly- or privately-owned lands where a conservation or recreational use easement has been established and filed. Additional exemptions exist for the reactivation of rail lines and rail bed existing prior to the adoption of the 2004 Highlands Act, as well as the construction of transportation safety projects and bicycle/pedestrian facilities by a State or local governmental unit, if the activity is consistent with the goals and purposes of the Highlands Act and does not result in the construction of any new through-capacity travel lanes. In both of these additional examples, it is unclear if a rail trail, which would reactivate a preexisting rail right-of-way for bicycle and pedestrian uses, would qualify as an exempted activity. Regardless, attention should be given to trail development that minimizes the use of impervious surfaces, which is consistent with some of the recommendations by the public at the November 2016 Open House for the trail to utilize a more "natural" surface.

Safety Considerations
Safety considerations were paramount when evaluating each site. Safety considerations along the proposed Rail Trail relate to roadway crossings, signage, the availability and conditions of sidewalks, and other factors. In addition, conditions for persons with disabilities are of special concern. As an example, safety improvements to important sites (for connectivity or other reasons) that have poor sidewalk conditions and cross roadways with relatively high traffic volumes and speeds may be more urgent than a similar site with less traffic.

In sections of the proposed Rail Trail where bicyclists and pedestrians utilize the same trail, a major concern is the additional liability created by shared use. In the State of New Jersey, local governments are exempt from being sued over accidents unless the accident is caused by negligence in design or poor maintenance. To provide the maximum amount of safety and Federal Highway Administration (FHWA) approval, it is recommended that the County follow American Association of State Highway and Transportation Officials' (AASHTO) Guide for the Development of Bike Facilities. An additional resource is the New Jersey Department of Transportation (NJDOT) Bicycle...
Compatible Roadways and Bikeways Planning and Design Guidelines. It should be noted that this study is conceptual in nature and does not represent design-level improvements. Any such improvements should be developed in accordance with applicable standards and regulations by licensed professionals in future stages of the project.

Administrative Challenges

In many instances, the ability to clear administrative obstacles is often thought of after the proposal of a project. Once proposed, the project could be stalled by bureaucratic, legal or fiscal uncertainty. Even though there is no clear timeline that can be estimated for these types of challenges, the involvement of multiple jurisdictions can often delay the implementation process. Therefore, it was generally assumed that the more jurisdictions associated with a site (including permits and approvals), the greater its implementation challenge.

Proposed Trail Alignment

The proposed Highlands Rail Trail can be broken into five distinct sections and extends along the original alignment of the New York & Greenwood Lake Railway right-of-way, wherever possible. The study utilized the New Jersey Department of Transportation (NJDOT) geographic information system (GIS) abandoned railroad right-of-way layer as a guide to locate the original route of the railroad in Passaic County. Several site visits were conducted and tax map data was reviewed to verify the route. While the route, and potential connections, would extend further north and west to provide potential future connections into West Milford and New York state (Sections 4 and 5), this feasibility study focuses on a portion of the proposed Rail Trail that extends approximately 7.15 miles from I-287 in Wanaque, north to the Greenwood Lake Turnpike/Sloatsburg Road split in Ringwood (Sections 1-3).

While staying on or near the former alignment of the New York & Greenwood Lake Railway is the top priority for the long-term alignment of the trail, there has been land development and other constraints that render it infeasible to follow the historic railroad right-of-way. A prime example is where the railroad had traversed what is now the bottom of Monksville Reservoir.

In instances where the Railway’s alignment traversed an insurmountable obstacle such as major roadways, private lands, or rivers and streams that cannot be easily crossed, or any other impediment, the safest and most accessible option available was assumed for the proposed Rail Trail. In some cases, the study identifies both short-term and long-term alternatives for such obstacles.

Section 1

The southern section of the proposed trail, “Section 1” totals approximately 2.15 miles and runs adjacent to the properties on the west side of Ringwood Avenue (CR 511). Most of the property that makes up the historical railroad ROW in this section is owned by the North Jersey District Water Supply Commission (NJDWSC).

This section is relatively flat, uninterrupted and defined by three centers of activity. The southern end of this section provides access to the businesses located near the I-287 interchange, the Passaic County Community College Wanaque satellite campus and potential redevelopment sites along Union Avenue.

The intersection of Ringwood Avenue (CR 511) and 2nd Avenue in Wanaque is characterized by a number of commercial developments as a result of the most current redevelopment efforts. Access to Rainbow Valley Lake and a number of off-road trails via Lakeside Avenue and Doty Road are located to the west of this connection. Stakeholders have expressed some concerns over the narrow vehicular Doty Road crossing that would likely need to be utilized if a pedestrian bridge is not installed.

The northern end of section is where the trail crosses over to the eastern side Ringwood Avenue (CR 511) between F.A. Orecchio Drive and Warren Hagstrom Boulevard, with the Raymond Dam serving as a major landmark. Determining the feasibility of creating the Rail Trail in this area will require detailed investigation regarding any utilities that may be located within the ROW as well as negotiating bicycle and pedestrian access with the NJDWSC.

Section 2

The middle portion, “Section 2” totals approximately 2.25 miles. This section starts at the Ringwood Avenue (CR 511) crossing and runs adjacent to the properties along the east side of Ringwood Avenue (CR 511) until it meets back up with the roadway near West Brook Road. Portions of the historic railroad ROW have been developed as private properties or converted to municipal roadways. Remaining undeveloped portions of the ROW are owned by the Borough of
Wanaque, Jersey Central Light & Power and other private property owners. The intersection of Ringwood Avenue (CR 511) and Warren Hagstrom Boulevard provides a short-term solution to crossing the Wanaque River because the historic railroad bridge no longer exists. This intersection also provides a striking view of the Raymond Dam that would serve as a major landmark. Extending the trail along Warren Hagstrom Boulevard (formerly Highland Avenue) would also provide access to recreational ball fields and off-road trails accessible through the age-restricted housing development constructed at the eastern end of this local roadway. From there, the trail could cross onto Belmont Avenue, travel north along Laura Avenue, cross onto Second Street, before reconnecting with the former rail right-of-way, currently owned by the Lakeland Board of Education, Borough of Wanaque and JCP&L. At the intersection with Conklington Road, the Rail Trail could exit north onto Ringwood Avenue, where it would connect with Section 3 at the intersection of West Brook Road. It is suggested that this section (the Wanaque Elementary School and Lakeland Regional High School) serve as major destinations midway along the northern section of the potential trail.

In addition to the constraints raised above, such as the development of some sections of the former rail right-of-way, and limited available crossings across the Wanaque River, some concerns were addressed through the Stakeholder engagement and public outreach processes. This included the potential traffic bottleneck near the Wanaque Elementary School, First Aid Squad, and the Golden Agers Club. To address some of these constraints, consideration should be given to a pedestrian-activated crossing signal, such as a HAWK signal or RRFB in order to cross Ringwood Avenue. In the area near the Wanaque River crossing, the right-of-way for Ringwood Avenue is 40 feet wide, with a 30-foot cartway. The use of sharrow markings (on-road graphics that notifies motorists that the road is expected to be shared with bicyclists) could be used in the short term. A long term recommendation would be to replace the former railroad bridge across the Wanaque River.

An alternative, or secondary spur to Section 2, shown on the maps as “Section 2a”, could address some of the concerns. From south to north, the proposed spur would pass behind the Golden Agers Club, where it would then travel north along Mullen Avenue, which connects to an existing trail leading to the Wanaque Elementary School. This would then pass to the east of the school, traveling past the athletic fields, and north through Adlice Park, before exiting west onto Meadow Brook Avenue. The trail would continue along Meadow Brook Avenue until it reached Ringwood Avenue, where it would continue north for a half block. The Trail would exit Ringwood Avenue onto War Veterans Place, where it could provide a connection to Memorial Park. From there, the Trail could potentially connect to an existing, although not currently authorized, trail on the NJDWSC property, which travels along the reservoir, before it reconnects with Sections 2 and 3.

Section 3
The northern section, “Section 3”, totals approximately 2.75 miles and is located entirely on NJDWSC property. This section starts at the intersection of Ringwood Avenue and West Brook Road. The rail would then utilize existing NJDWSC maintenance roads on its way north along the reservoir. Potential spurs for additional trail access could be considered, and are listed in the maps as Section 3A. These spurs leave NJDWSC property to connect to the Ringwood Park-and-Ride and Ringwood Public Library, with an extension along Skyline Drive to access a nearby commercial plaza.

Future Extensions into Section 4 and Section 5
As reviewed earlier, Sections 4 and 5 represent a longer-term effort to create extensions to neighboring trail networks in both New Jersey and New York. Sections 4 and 5 split at the northern terminus of Section 3. Section 4 extends north through the Wanaque Reservoir, before exiting near the intersection of Margaret King Avenue and Peters Mine Road. Going north, the Peters Mine Road corridor is largely residential for the first quarter mile, before passing an electrical transmission line right-of-way and transformer station. Further north along Peters Mine Road are sporadic residential developments and public lands, part of Tranquility Ridge County Park and Sterling Forest. Section 5 continues northwest through the Wanaque Reservoir before terminating at the Monksville Reservoir.
**DESIGN GUIDELINES**

In addition to site-specific measures, several general improvements were evaluated for their potential along the entire trail. These improvements are not associated with a specific site, but may justify additional resources as they would increase the value of individual investments at specific sites.

The Highlands Rail Trail should integrate sustainable principles and a conservation design that fits the design with the existing topography and hydrologic patterns, and protects and highlights, as appropriate, important sensitive natural, historical and cultural features as identified. Design should also make use of existing infrastructure and facilities to the greatest extent possible in order to minimize disturbance and keep development costs down.

Most importantly, all capital projects should consider the historic and cultural significance of the railway and reservoir in the development of the neighboring communities. Design of trail elements should reflect these local characteristics in design, construction, signage, and safety. While site plans on County Roads are required to obtain approval from the County Planning Board, the Rail Trail traverses both municipal roads and off-road trails as well. All projects along the proposed Highlands Rail Trail would be encouraged to contact the County Planning Department to coordinate.

**Trail Signage and Wayfinding**

Providing users with a set of consistent directional signs along the route and orienting them to the location relative to the surrounding area allows them the ability to follow the trail throughout different neighborhoods and landscapes with ease. Signs ought to be positioned in areas that are highly visible to enable users to clearly see the direction they must travel to continue along the trail.

Proper signage also provides a level of comfort for users who are less familiar with the area. Supplementary signage could also be provided to assist specific audiences; such as signs that offer assistance to persons with disabilities. In addition, wayfinding signage should direct users to amenities located along the trail, such as shops, restaurants, schools, and other facilities (including those that may provide comfort stations), as well as bus stations within walking distance. In some instances, additional signs should be placed in areas of historical or natural significance to provide ancillary context to the area.

A signage design plan is not part of this study; however, signage should be reviewed as part of a larger question toward the ultimate identity of the Highlands Rail Trail. If the intent of the Rail Trail is for it to function as its own distinct entity, then signage should be designed in conjunction with an overall “branding” plan for the Trail. Alternatively, if the Trail is to function as a component of a greater trail system, such as the Morris Canal Greenway, then it may be possible to adopt signage that follows, or complements an existing plan.

To supplement the trail experience, avoid signage “clutter” and reduce the cost of installing and maintaining signs, the County may also consider developing a Highlands Rail Trail wayfinding smart phone application. This tool would provide trail users to utilize their hand-held devices to find their way using the trail as a guide. Additional information, such as key historical site locations, photos of how the area looked historically, and other historical facts tied to the route could be incorporated into the application to provide a richer experience. In addition, there could be options for users to upload comments and photos while “in the field” that could provide advice and assistance to other users. This tool could also be used to report issues or concerns to the appropriate entities, such as maintenance or public safety. These computer applications could also be used in schools to teach students about the significance of the New York & Greenwood Railroad and the development of the Wanaque Reservoir.

**Pedestrian and Bicycle Amenities**

As with many other transportation projects, amenities for the travelers of the Rail Trail will most likely be needed to enhance the users’ experiences and provide much needed comforts along the route.

These amenities could assist users in the efficient use of the trail and provide areas for reflection along the route. Until routes are secured, at this stage it is unknown as to the number, location and type of facilities needed. These facilities could be implemented incrementally, depending upon user feedback, trail location, and budget for capital and maintenance costs.
At the public presentation in early November 2016, participants expressed their preferences for benches, linear gardens/stormwater retention plantings, public art, and wayfinding. There was less interest in lighting and interpretive signage, and even less interest in exercise stations along the trail. Limiting the amount of lighting on a trail would help to enforce a policy of no use after dark, and could help to alleviate the concerns of neighboring property owners. In areas where the trail would utilize existing streets, participants expressed a general interest in design elements that would buffer pedestrians and bicyclists from vehicular traffic. These included dedicated or even separated lanes for bicycle/pedestrian traffic. There was also preference for lanes and intersections that are painted a different color as a way to direct bicycle/pedestrian traffic as well as inform motorists to the presence of these lanes. Participants expressed less interest in shared lanes and electronic bicycle signals.

On-road bicycle facilities should comply with the Passaic County Master Plan Transportation Element – Moving Passaic County, NJ DOT Bicycle Compatible Roadways and Bikeways: Planning and Design Guidelines, and Federal Highway Administration (FHWA) guidance. The FHWA States:

* Bicycle and pedestrian ways shall be established in new construction and reconstruction projects in all urbanized areas unless one or more of three conditions are met:
  - Bicyclists and pedestrians are prohibited by law from using the roadway. In this instance, a greater effort may be necessary to accommodate bicyclists and pedestrians elsewhere within the right-of-way or within the same transportation corridor.
  - The cost of establishing bikeways or walkways would be excessively disproportionate to the need or probable use. Excessively disproportionate is defined as exceeding twenty percent of the cost of the larger transportation project.
  - Sidewalks, shared-use paths, street crossings (including over- and under-crossings), pedestrian signals, signs, street furniture, transit stops and facilities, and all connecting pathways shall be designed, constructed, operated and maintained so that all pedestrians, including people with disabilities, can travel safely and independently.

The design and development of the transportation infrastructure shall improve conditions for bicycling and walking through the following additional steps:

- **Planning projects for the long-term.** Transportation facilities are long-term investments that remain in place for many years. The design and construction of new facilities that remove bicycles and pedestrians from prohibited roadways should anticipate likely future demand for bicycling and walking facilities and not preclude the provision of future improvements. For example, a bridge that is likely to remain in place for 50 years might be built with sufficient width for safe bicycle and pedestrian use in anticipation that facilities will be available at either end of the bridge even if that is not currently the case.

- **Addressing the need for bicyclists and pedestrians to cross corridors as well as travel along them.** Even where bicyclists and pedestrians may not commonly use a particular travel corridor that is being improved or constructed, they will likely need to be able to safely and conveniently cross that corridor. Therefore, the design of intersections and interchanges shall accommodate bicyclists and pedestrians in a manner that is safe, accessible and convenient.

- **Receiving exceptions approved at a senior level.** Exceptions for the non-inclusion of bikeways and walkways shall be approved by a senior manager and be documented with supporting data that indicates the basis for the decision.

- **Designing facilities to the best currently available standards and guidelines.** The design of facilities for bicyclists and pedestrians should follow design guidelines and standards that are commonly used, such as the AASHTO Guide for the Development of Bicycle Facilities, AASHTO’s A Policy on Geometric Design of Highways and Streets, and the ITE Recommended Practice “Design and Safety of Pedestrian Facilities.”

Furnishings

* **Kiosks** In concert with signage, an informational kiosk can educate visitors on use policies as well as provide directions and information to trail and nearby amenities.
Bench

Benches should be evenly placed along the trails to aid accessibility, provide resting locations and assist walkers in calculating distance traveled. Trails should be widened slightly in bench areas. Bench design shown in the photos provides consideration for the potential flooding on site through anchoring. The simple addition of backs to the bench design, such as in the second photo, could be considered as a way to provide more restful areas throughout the trail network on site.

Bike Racks

Bike racks will allow bicyclists using the trail to secure their bikes if they choose to go into town. By providing bike racks, it can help discourage bicyclists from locking their bikes to trees, signs and other areas where it is not desired.

Pet Waste Stations

Pet waste stations will be installed around parking areas and at trail entrances. Installation of pet waste stations will help to encourage dog owners to clean up after their pets while hiking the trail and reduce cleanup costs.
Garbage
Garbage receptacles may be a part of the overall phased development of the Rail Trail. The decision to install garbage receptacles will ultimately be governed by use policies established by the County or the municipalities, as well as from any requirements stipulated in the right-of-way access agreements with landowners. Plans for regular maintenance and garbage pickup will be critical if receptacles are utilized. They should be installed near parking areas and trail entrances. Garbage receptacles should be animal-proof in design to avoid messes and additional maintenance needs. Alternatively, where permitted, a “carry in, carry out” or “leave no trace” policy may be utilized, however, this would not avoid the need for regular trail maintenance and cleanup.

Stormwater Management
There was positive feedback from the November 2016 public workshop for the use of stormwater management along the trail, through the use of green infrastructure. Rain gardens, such as those in the photograph above, could be used to collect and reuse stormwater along the trail. This would provide multiple benefits that include stormwater management, but the aesthetic benefits of landscaping.

Landscaping
Trees and plantings
Trees and plantings along the trail can be used to help aid in wayfinding, by directing users to remain on the pathway. Plantings can also be used to provide a buffer between private properties and the Trail, to help alleviate some concerns regarding privacy. Furthermore, the use of trees along the trail can help provide shade and moderate the outside temperatures for trail users during the summer months.

Public Art
Similar to rain gardens, public art along a trail can provide aesthetic benefits and also attract different users to the trail. Similar to the photo (Figure 3), public art can include sculptures, but it can introduce other forms of media as well. For example, the Robert Frost Interpretive Trail in Ripton, Vermont includes verses from the late poet’s works.

On-Street Facilities
Actuated Crossing Signals
Unlike regular crossing signals, pedestrian-actuated signals immediately notify motorists that a pedestrian is entering the roadway. This can be activated through the use of a button or a motion sensor. Unlike other crosswalks, which allocate a set time to allow pedestrians to cross, these crosswalks are demand-based.

Roadway Treatments
In areas where the Rail Trail is collocated on a public street, it is recommended that pedestrian lanes and crossings be painted a distinct color for the safety of both trail users and motorists. If necessary, “Sharrows” (a graphic roadway treatment that indicates that the roadway is to be shared by motorists and pedestrians) could be utilized.
Dedicated Lanes
Going a step further from the roadway treatments would be to install a separate lane where space permits. This could help to buffer pedestrians from motorists, such as along Section 3, where a narrow path currently exists alongside a roadway used by NJDWSC. While this path, and the existing fence would need improvements, this could provide a safety buffer between motorized and non-motorized traffic.

Off-Street Facilities

Trail Design
Feedback from the November 2016 public meeting suggested that crushed stone and natural earth surfaces were more preferable trail surfaces, followed by asphalt and soil cement. There appeared to be little interest in concrete, resin-based stabilized material and woodchip paving surfaces.

The proposed location of the trail does present some challenges to construction. Areas located within the floodplain will necessitate trail construction that can withstand the erosion that results from periodic flooding. This eliminates basic cinder and woodchip trails as viable options, as erosion will require regular replacement of the trail surface. Other considerations should be given to surfaces that enhance accessibility for older users and those with disabilities.

To avoid long-term costs and regular trail repair, it is suggested that the trail utilize a crushed stone surface, utilizing an aggregate mixture designed for surfacing trails in order to withstand traffic and erosion better than traditional aggregates. The use of drainage swales along the trail may help to reduce standing water and direct runoff away from the path. That said, the use of crushed stone and other impervious surfaces should be limited, where possible, to increase compliance with the Highlands Act.
IMPLEMENTATION
Securing the right-of-way and installing the trail infrastructure will be an important step in making the Highlands Rail Trail a reality. It is also important to recognize, however, that funding beyond the trail development will also be critical for the long-term operation and maintenance. Development of this trail should incorporate both costs.

Next Steps: Securing Right-of-Way
While portions of the proposed Highlands Rail Trail are currently walkable, additional investments will be needed to secure access agreements with appropriate entities and ensure long-term maintenance, install signage, landscaping and the appropriate improvements necessary to make the Rail Trail a success.

The sections of the proposed Rail Trail owned by the NJDWSC are also walkable and are surrounded by natural wooded areas and scenic views of the Wanaque Reservoir. These areas offer views of cultural and historical sites to tie the County’s historical heritage together using the Highlands Rail Trail as a common thread. As it was historically with the New York and Greenwood Lake Railroad, the modern Rail Trail will pass through downtown economic centers, near schools, parks, and other public facilities, allowing citizens to enjoy their public investments through the use of a sustainable pedestrian and bicycling amenity.

Although many sections of the Rail Trail are theoretically usable, the current condition of the Rail Trail in its entirety is still not sufficient for public use. For instance, the land owned by the NJDWSC would require permission to access through an easement. Additional improvements along some areas would need to be completed before the entire Rail Trail could become a reality.

Phased development of the Rail Trail will reduce upfront costs, and increase the feasibility of the trail’s creation and implementation of the site facilities. Furthermore, it is likely that development of the trail will take place as segments and funding become available. Due to the variability of these factors, this study does not recommend a specific targeted phasing list. Assuming that the different sections of the proposed trail can be completed, the Highlands Rail Trail will create a contiguous, safe, and traversable trail through the boroughs of Wanaque and Ringwood that will provide the citizens of the County and beyond a means to safely walk and bike.

Funding
The following potential funding sources are described in greater detail below:

- Federal
  - National Highway System (NHS) Funding
  - Surface Transportation Program (STP) Funds
    - Scoping and Local Lead Projects
    - Transportation Enhancement Program
    - Hazard Elimination Program
  - National Recreational Trails Program (Symms Trails System Act)
  - Congestion Mitigation and Air Quality Improvement Program (CMAQ)
  - Safe Routes to School
- State
  - NJDOT Bicycle/Pedestrian Planning Assistance
  - New Jersey Historic Trust
  - Freshwater Wetlands Mitigation Council
- County
  - Passaic County Open Space, Recreation and Historic & Farmland Preservation Trust Fund
  - Passaic County Corridor Enhancement Program
- Other
  - PeopleforBikes (Bikes Belong)

Federal Funding Sources

National Highway System (NHS) Funding
NHS funding for projects on NHS roadways can be used for bicycle and pedestrian improvements, or on land adjacent to any NHS system highway, including interstate highways. This includes incidental improvements within larger projects, which enable bicycle compatibility, such as paved shoulders and bicycle-safe drainage grate, designated bicycle facilities such as bikeways, signed routes, bike lanes and paths, as well as pedestrian accommodations such as sidewalks, signals, overpasses and crosswalks. It also includes funding of independent bicycle and pedestrian projects (that are initiated primarily to benefit bicycle and pedestrian travel) along or in the vicinity of NHS roadways.

Surface Transportation Program (STP) Funds
This federal program is broadly defined and gives the states flexibility to invest in a wide variety of transportation activities. Bicycle and pedestrian facilities and walkways are specifically listed as eligible activities under this program. As with NHS, pedestrian and bicycle improvements may be incidental upgrades within larger projects that establish bicycle compatibility, or designated bicycle and pedestrian accommodations.

The funds can also be used for independent bicycle and pedestrian projects along or in the vicinity of roadways. Projects could include shoulder paving, bicycle-safe drainage grates, construction of sidewalks or bikeways, as well as the installation of pedestrian signals, crosswalks or overpasses. Under the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA-LU), it is specified that these funds may be used for the modification of sidewalks to comply with the Americans with Disabilities Act. It should be noted that STP funds may be used for non-construction projects (such as maps, brochures and public service announcements) related to safe bicycle use and pedestrian travel.

Local Scoping and Local Lead Projects
The Local Scoping program (through NJTPA) provides a set-aside of federal (STP) funds directly to the sub-regions for the advancement of project proposals through the NEPA process, ultimately making that project eligible for inclusion in the Statewide Transportation Improvement Program (STIP) as a Local Lead project. The Local Lead Program provides funding to move projects from final design to construction. Local Scoping and Lead projects are chosen via a competitive selection process.

The Local Lead program is an opportunity for sub-regions to apply for federal funding toward the advancement of projects through final design, right-of-way and/or construction, and is a highly competitive program. In Passaic County, NJTPA selects the projects for inclusion in the program. Applications are evaluated on a myriad of factors including, but not limited to, whether the project improves air quality, reduces travel time and congestion, optimizes capacity, creates a community of place, and so on.

Each of these sources of funds may be used to advance bicycle or pedestrian projects. Local Scoping/Local Lead projects can also benefit the non-motorized modes if they incorporate, incidentally, features that address bicycle and pedestrian travel needs.
Transportation Enhancement Program
Ten-percent (10%) of annual STP funds are set aside to support non-traditional transportation projects whose objectives support more livable communities, enhance the travel experience and promote new transportation investment partnerships. The Transportation Enhancement Program links state and federal policy, and focuses on transportation projects designed to preserve and protect environmental and cultural resources, as well as to promote alternative modes of transportation.

These grants are used to help local governments creatively integrate transportation facilities into their local surroundings. Two of the possible types of projects that may be funded with these grants are directly related to pedestrian and bicycle facilities (and activities), and several others are indirectly related. The types of projects that can qualify include “provision of facilities for pedestrians and bicyclists” and “provision of safety and educational activities for pedestrians and bicyclists.” Others include “acquisition of scenic easements and scenic or historic sites” that could be used to enhance the pedestrian experience, “landscaping and other scenic beautification” that might be part of a streetscape project beneficial to pedestrians and “preservation of abandoned railway corridors (including the conversion and use thereof for pedestrian and bicycle trails),”

Hazard Elimination Program
Ten-percent (10%) of the STP program is to be used to fund safety projects. The Local Safety Program provides $3 million ($1 million per MPO) annually to counties and municipalities for the improvement of known safety hazards on local and county roadways. Projects should focus on crash-prone locations and may include, but not be limited to intersections and other road improvements, including installation and replacement of guide rail and pavement markings to enhance pedestrian and vehicular safety. These safety improvements are construction-ready and can be delivered in a short period of time. Funding is provided for safety-oriented improvements that either directly or indirectly improve conditions for pedestrians.

National Recreational Trails Program (Symms Trails System ACT)
An annual sum is apportioned to the states for use in developing trails-related projects, many of which benefit bicyclists and pedestrians. In New Jersey, the program, including solicitation of projects and project selection, is administered by the Office of Natural Lands Management in the Division of Parks and Forestry, State, county, and local governments as well as non-profit organizations are eligible for funds.

The Congestion Mitigation and Air Quality Improvement Program (CMAQ)
Authorized by SAFETEA-LU, the Congestion Mitigation and Air Quality Improvement Program provides funds for surface transportation and other projects that help to reduce congestion and improve air quality. The funds are mainly used to help communities in nonattainment areas and maintenance areas to reduce emissions. Non-attainment areas are those areas designated by the Environmental Protection Agency (EPA) as not meeting the National Ambient Air Quality Standards (NAAQS).

Bicycle and pedestrian programs that can be funded under this program can come in one of many forms. Some include creating trails, storage facilities or marketing efforts designed to encourage bike riding and walking as forms of transportation. Education and outreach programs are also eligible for CMAQ funds, and could be used to increase public knowledge about the benefits of biking and walking.

Safe Routes to School
Safe Routes to School (SRTS) is a Federal-Aid program created in SAFETEA-LU and administered by State Departments of Transportation. The program provides funds to states to substantially improve the ability of primary and middle-school students to safely walk and bicycle to school. The purposes of the program are to enable and encourage children to walk and bicycle to school, to make bicycling and walking to school a safer and more appealing transportation alternative, thereby encouraging a healthy and active lifestyle from an early age. Another purpose is to facilitate the planning, development and implementation of projects and activities that will improve safety and reduce traffic, fuel consumption, and air pollution in the vicinity (approximately 2 miles) of primary and middle schools (grades K-8).

State Funding Sources

Bicycle/Pedestrian Planning Assistance
This program provides NJDOT consultant support designed to develop local pedestrian/bicycle circulation plans and facility inventories.

New Jersey Historic Trust
The Historic Trust provides matching grants, loans and protection for New Jersey’s historic resources. Funding assistance is limited to certified non-profit organizations and units of local or county governments.

Freshwater Wetlands Mitigation Council
The Freshwater Wetlands Mitigation Council’s role in the state’s wetland mitigation program is to serve as a repository for land donations and monetary contribution collected as a result of freshwater wetlands/state open water impacts that cannot be mitigated for on-site, off-site, or at a wetland mitigation bank, the latter of which the Council also reviews and approves.
Once a final route is planned, specific locations should be identified for signage, buffer plantings and fencing to prevent unauthorized access. There was also interest from the public and stakeholders that the trail should not contain lighting; this would serve as an acknowledgement that the trail is only to be used during the daytime hours. Assuming that the trail becomes a component of the Passaic County Parks System, this would fit within the County’s existing guidelines, whereby parks are closed from dusk to dawn, and the County would work with the Passaic County Sheriff to enhance patrols of the Rail Trail, just as are performed in all other Passaic County Parks. Most importantly, the anticipated increase in activity from the establishment of a formalized Rail Trail creates more “eyes on the street,” that would either deter suspicious activity and other problems that would otherwise normally go unreported, or enhance the likelihood that they would be reported to law enforcement.

Sections of the former railroad right-of-way that are currently inaccessible to vehicles by locked gates will need to be upgraded with other moveable barriers to allow vehicular access for special users such as the NJDWSC, municipal public works, and first responders in cases of emergencies, repairs, or maintenance. These barriers will need to utilize designs that can also accommodate wheelchairs and other mobility aids, while deterring private use by ATVs and other motorized vehicles.

Maintenance
Proper maintenance of the Rail Trail will be required to ensure safety and property appearance. Maintenance costs were raised as an issue during the public and stakeholder outreach process that inclusion of the Rail Trail would impact their town’s budget.

Although people may unofficially utilize portions of the proposed Rail Trail currently owned by the North Jersey District Water Supply Commission, JCP&L, the municipalities and the schools, this is not officially sanctioned, nor are the trails maintained to the anticipated passive recreational use as a trail. It is anticipated that the Rail Trail would be incorporated into the County Parks system and maintained through County funds, with sharing and/or easement access agreements by the NJDWSC, the host municipalities and other responsible entities.

The purpose of the Passaic County Corridor Enhancement Program is to bring more business and tourism to Passaic County by providing a safer and more attractive environment along the commercial and recreational corridors of the County. It helps to improve the physical health and welfare of citizens and visitors alike by encouraging exercise and by promoting pedestrian, bicycle and mass transit usage. This funding source is especially useful for creating a more attractive Rail Trail because it can fund capital improvement projects such as “bricks and mortar” enhancements to make the corridors safer, more attractive and more user-friendly. This could be streetscape enhancements like new or improved sidewalks and crosswalks, street furniture, lighting, landscaping, trash receptacles, and/or benches. These dollars, generated through a few charged via General Safety and Security
Safety and Emergency Access
In many of the public sessions, residents expressed concern regarding the potential for vandalism and other sorts of negative activity. This was a special focus in the sections where the proposed Rail Trail could be located adjacent to, or within close proximity to residential neighborhoods.

Other Funding Sources
PeopleForBikes (formerly Bikes Belong)
PeopleForBikes, formerly known as Bikes Belong, is sponsored by the U.S. cycling industry and their goal is to increase bicycle usage. The
APPENDICES

Public Outreach
- Survey Results
- Flyers
- Open House Presentation
- Open House Sign-In Sheet
- Pictures of Open House Boards
- Open House Comment Cards

Ownership of Intact Sections of the Right-of-Way
Additional Maps for Sections 4 and 5
SEPTMBER 23, 2016
WALKING TOUR OF HIGHLANDS GREENWAY

Passaic County to propose new multi-modal greenway in Wanaque and Ringwood!

The Passaic County Planning Department is conducting a Feasibility Study to create the Highlands Greenway, a bicycle- and pedestrian-friendly pathway. The historic alignment of the New York and Greenwood Lake Railway, identified as a priority bicycle and pedestrian corridor in the County’s Transportation Element, will provide the foundation for the alignment of the proposed Greenway.

TO SIGN UP:
Contact Jason Gennusa, Senior Environmental Planner for Passaic County
Phone: 973-569-4045
Email: jgennusa@passaiccountynj.org

This Tour will provide members of the public with an inside look of what could be

Tour will begin at Hagstrom Field, Warren Hagstrom Blvd. In Wanaque (parking available)

The Walking Tour will take place from 1:00 PM – 4:00 PM on 9/23/2016

This event is FREE!!!
RSVP required

HIGHLANDS RAIL TRAIL FEASIBILITY STUDY OPEN HOUSE

WEDNESDAY, NOVEMBER 2, 2016
6:00 PM – 8:00 PM
WANAQUE ELEMENTARY SCHOOL
1 FIRST STREET, WANAQUE, NJ 07465

TO SIGN UP:
Contact Jason Gennusa, Senior Environmental Planner, Passaic County Department of Planning
planning@passaiccountynj.org; phone: 973-569-4045
Public Outreach: Open House Presentation

Feasibility Study Team

Peter Bondar, PE
Mike Manzella, PP, AICP
Nick Dickerson, PP, AICP

Michael Lysicatos, PP, AICP
Jason Simmons
Kathleen Caren
Jason Miranda
Highlands Rail Trail Feasibility Study

Agenda

1. Context
2. Project Goals
3. Project Scope
4. History
5. Greenway Vision
6. Public Outreach
7. Land Use & Connectivity Benefits
8. Constraints
9. General Features
10. Next Steps

Context

Identified as priority bicycle and pedestrian corridor in County Transportation Element and Heritage Tourism Element

“...link bicyclists and pedestrians to businesses, civic uses and recreational opportunities along the constrained Ringwood Avenue corridor, and provide a link between communities in northern and southern Passaic County.”

Build upon the success of the Morris Canal Greenway
Highlands Rail Trail Feasibility Study

Project Goals

1. Provide bicycle and pedestrian-friendly route
2. Connect lower and upper portions of County; become part of greater trails network
3. Connect community facilities, commercial centers and public institutions
4. Promote cultural and heritage tourism
5. Preserve and restore open space throughout the County
6. Promote environmental sustainability

Project Scope of Work

Create a high-level planning document to guide development of the Greenway
- Establish a vision
- Review existing conditions
- Develop preferred alignments
- Identify opportunities and constraints
- Generate implementation actions
History

New York & Greenwood Lake Railway (1867 – 1943)
- Connected Jersey City/Hoboken with Greenwood Lake in West Milford
- Transported ice and tourists
- Ringwood Branch provided service to Ringwood (mines)
- Operated by Erie Railroad until 1943
- Property directly purchased by Erie, abandoned in stages

Trailway Vision

- Passive recreational trail that promotes historic significance of New York and Greenwood Lake Rail line and adjoining properties
- Creation of multi-modal transportation links within and through the County
- Environmentally sensitive, low-impact trail development that protects nearby water bodies
- Non-motorized bike paths and on-street bicycle facilities where appropriate
- Signage to improve wayfinding and safety
- Furnishings and interpretive signage to enhance heritage and cultural tourism
Public Outreach

- Identified 70+ key stakeholders
  - Local officials, agencies, nonprofit groups
  - Conducted online survey [https://www.surveymonkey.com/r/YXGPF6Z](https://www.surveymonkey.com/r/YXGPF6Z)
- Preliminary engagement with NJDWSC has been conducted
- Walking tour of proposed alignment held 9/26/16

Preliminary Trail Route
Highlands Rail Trail Feasibility Study

Preliminary Trail Route

Focus of feasibility study

Trail Section Overview

- Section 1
  - Right-of-way largely cleared
  - Residential land uses
  - Ownership – largely NJDWSC
  - Approx. 2.15 miles
- Section 2
  - Right-of-way has been developed
  - Residential land uses
  - Varied ownership
  - Approx. 2.25 miles
- Section 3
  - Outstanding views
  - Entirely on NJDWSC property
  - Approx. 2.75 miles
Preliminary Greenway Route

Section 1

Constraints

Doty Road Crossing

Preliminary Greenway Route

Section 1

Constraints

Doty Road Crossing
Highlands Rail Trail Feasibility Study

Section 2

Preliminary Greenway Route

Constraints

Ringwood Avenue Crossing

Short term: Sharrows

Initial crossing HAWK signal or RIP

Long term: Replace crossing

Ownership

Borough of Wanaque
Lakeland Board of Education
Wanaque Fire & Rescue Squad
Hockey Rink
Wanaque Fire & Rescue Squad

Public

Communities

JCP&L

20
Preliminary Greenway Route

Section 3

Constraints

General Features

- Lighting (wired, solar, battery powered)
- Wayfinding (interpretive/educational signage)
- Amenities (Water Fountains, Rest Areas, Benches, Trash)
- Public Art
- Linear Gardens
- Green Infrastructure
- Surface (asphalt, concrete, crushed stone, resin-based)
Implementation

- Securing Right-of-Way Agreements
- Funding
- Property and Personal Safety Considerations
- Maintenance

QUESTIONS
THANK YOU
Public Outreach: Pictures of Open House Boards
Public Outreach: Open House Comment Cards

HIGHLANDS RAIL TRAIL FEASIBILITY STUDY
PUBLIC OPEN HOUSE COMMENT SHEET
Are there any additional comments regarding the Highlands Rail Trail that you would like the project team to consider? Please provide comments below.

- The more easily that trail users can bike, 1 to 3 miles or more, the better. Connect to existing trails and open space increase use and awareness of all of these.
- Plant native species, rain gardens, acknowledge local history/railroad.

HIGHLANDS RAIL TRAIL FEASIBILITY STUDY
PUBLIC OPEN HOUSE COMMENT SHEET
Are there any additional comments regarding the Highlands Rail Trail that you would like the project team to consider? Please provide comments below.

- Why not start at the North Seymour and look south? Ringwood to Wallingford. The route has the clearest roads and is available now to ride and hike.

HIGHLANDS RAIL TRAIL FEASIBILITY STUDY
PUBLIC OPEN HOUSE COMMENT SHEET
Are there any additional comments regarding the Highlands Rail Trail that you would like the project team to consider? Please provide comments below.

- Prevent ATV access/use to protect runners, walkers, bikers.
Ownership of Intact Sections of the Right-of-Way
## Order of Magnitude Cost Estimates for Section 1, Section 2 and Section 3

### Highlands Rail Trail Feasibility Study

#### Order of Magnitude Project Cost Estimate Section 1: 1-2.5 Miles County of Passaic

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**Total Cost:** $119,500

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### Highlands Rail Trail Feasibility Study

#### Order of Magnitude Project Cost Estimate Section 2: 2.5 - 5 Miles County of Passaic

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**Total Cost:** $120,500

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### Highlands Rail Trail Feasibility Study

#### Order of Magnitude Project Cost Estimate Section 3: 5+ Miles County of Passaic

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**Total Cost:** $121,500
Highlands Rail Trail Feasibility Study

Additional Maps for Sections 4 and 5