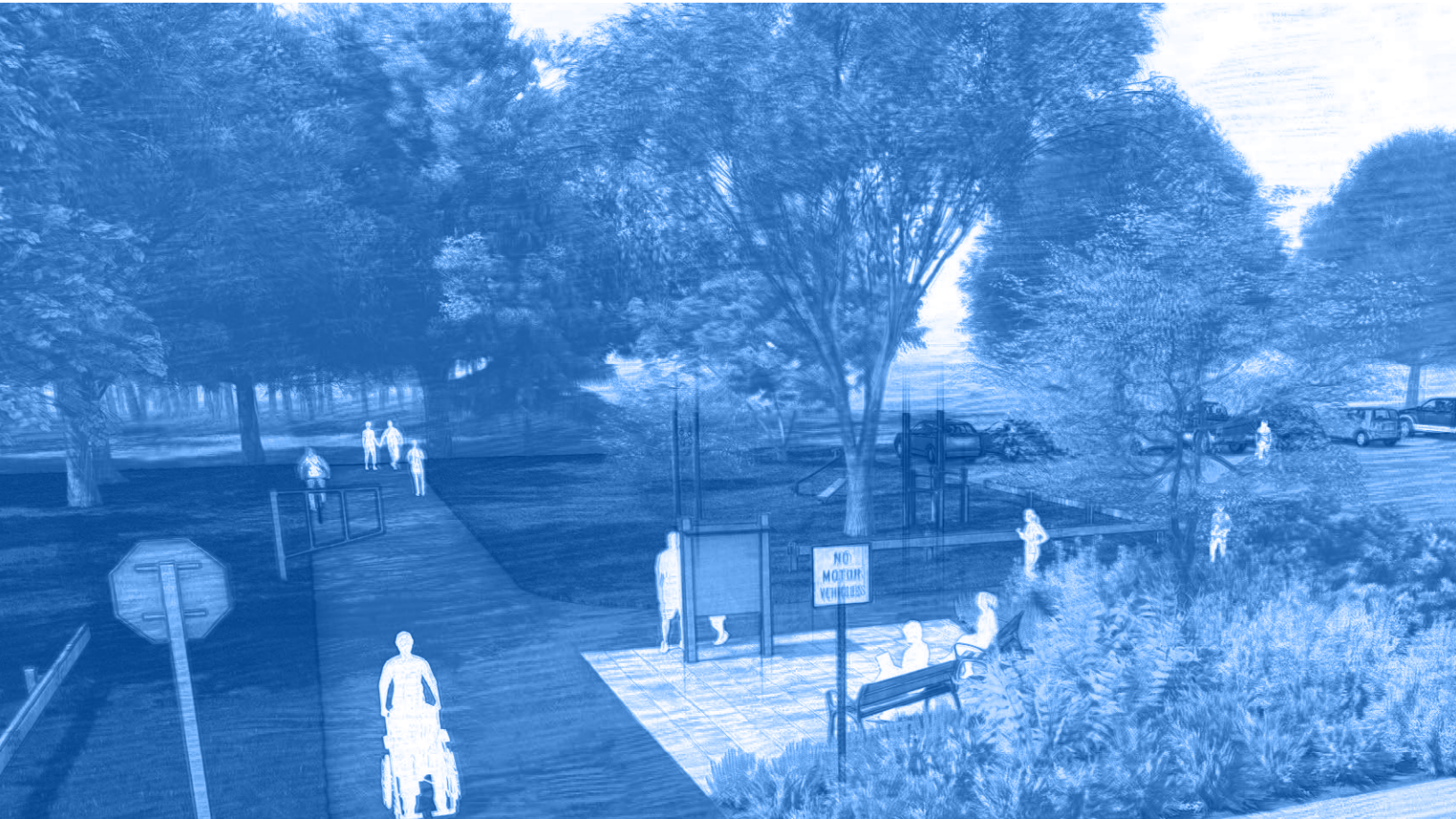




The Town of
Greece

GENESEE TRANSPORTATION COUNCIL

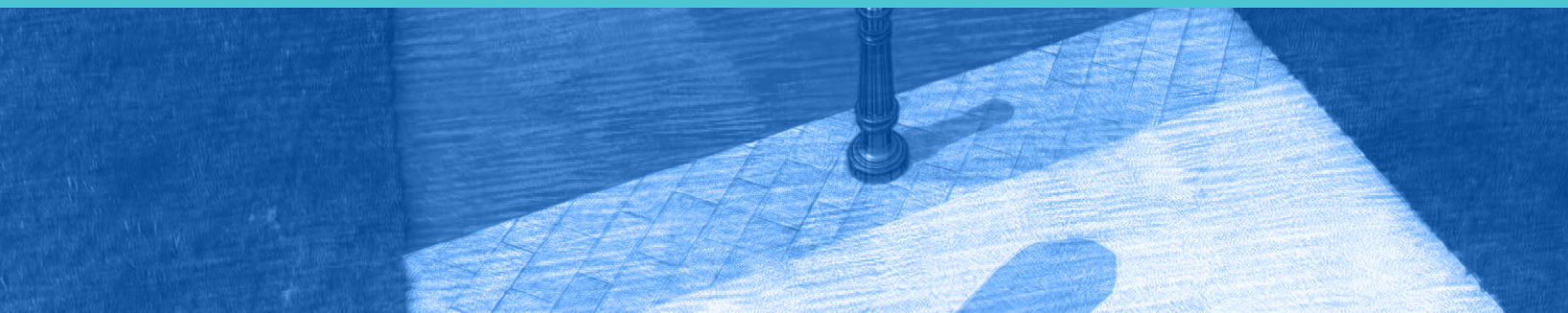
The Metropolitan Planning Organization for the Genesee-Finger Lakes Region



Route 390 Multi-use Trail Restoration Study

Conditions Inventory, Needs Assessment, and Restoration Recommendations

April 2021



ACKNOWLEDGMENTS

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GTC's Commitment to the Public

The Genesee Transportation Council assures that no person shall, on the grounds of race, color, national origin, disability, age, gender, or income status, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination under any program or activity. GTC further assures every effort will be made to ensure nondiscrimination in all of its programs and activities, whether those programs and activities are federally funded or not.

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En Español

El Consejo Genesee del Transporte asegura completa implementación del Título VI de la Ley de Derechos Civiles de 1964, que prohíbe la discriminación por motivo de raza, color de piel, origen nacional edad, género, discapacidad, o estado de ingresos, en la provisión de beneficios y servicios que sean resultado de programas y actividades que reciban asistencia financiera federal.

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LIST OF COMMON ACRONYMS

AASHTO: American Association of State Highway and Transportation Officials
FHWA: Federal Highway Administration
HMA: Hot Mix Asphalt
LOSP: Lake Ontario State Parkway
MCDOT: Monroe County Department of Transportation
NYSDOT: New York State Department of Transportation
PROWAG: Public Right-of Way Accessibility Guidelines
PASP: Pedestrian Safety Action Plan

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- Project Advisory Committee Presentations	- Trail Conditions Inventory Forms
- Public Meeting Presentations & Summaries	- Detailed Planning Level Cost Estimate



1

Summary of Findings

The Route 390 Multi-use Trail (Route 390 Trail) is a “shared use” pathway for diverse user types which is physically separated from vehicular routes and provides a non-motorized link through the Town of Greece, New York, and to the larger regional shared use trail network. The trail was constructed in 1980 along with the “Rochester Outer Loop” Route 390 expressway project. The 40-year-old trail is well used by the community but suffers from visible age, widespread pavement failure, and no longer meets current standards of safety, design, and other best practices for shared use trails.

The purpose of this study is to inventory the trail corridor in detail, assess needs and opportunities, engage with the community to collect feedback, and provide recommendations on trail restoration and funding strategies.

Broadly, the findings of this study indicate that the trail requires a major end-of-life rehabilitation effort. The Route 390 Trail has seen better days and



The trail is an extraordinary resource in the community. It provides off-road connections between several schools and neighborhoods, transits through a large municipal park, and provides visual and physical access to a remarkable number of unique, but sometimes concealed, natural and cultural assets.



SUMMARY OF FINDINGS

does not function at the level it should in terms of usability, safety, and other factors. Yet, despite these fixable issues, the trail is an extraordinary resource in the community. It provides off-road connections between several schools and neighborhoods, transits through a large municipal recreational park, and provides visual and physical access to a remarkable number of unique, but sometimes concealed, natural and cultural assets – from old-growth woodland patches and meadows to riparian creek valleys and the subtle topographic remnants of long removed fruit orchards. All the ingredients of a world-class shared use trail already exist. The trail itself just needs to be restored in a manner that better serves the community.

EXISTING CONDITIONS & ASSESSMENT SUMMARY

Overall, the inventory and assessment of existing conditions clearly indicates the Route 390 Trail needs comprehensive a major end-of-life rehabilitation. At 8-feet wide, the original 40-year-old trail design width is too narrow to support safe “shared use” between walkers, runners, cyclists, children, and those with other mobility needs. Likewise, shoulders are narrow in many areas and encroachment from vegetative material such as trees, shrubs, vines, and various debris effectively reduce the usable trail width further. Prior to the finalization of this report the Town of Greece has already begun to implement enhanced vegetative management throughout the corridor.

Perhaps the single-most disruptive existing condition impacting trail usability is widespread pavement failure, present in approximately 30% of the trail’s length. Multiple types of pavement failures exist along the corridor, but the most prevalent is damage from tree roots. This damage is often clustered in successive cracking around specific

END-OF-LIFE REHABILITATION?

- *The Route 390 Trail needs a comprehensive end-of-life rehabilitation.*
- *The trail is too narrow and does not meet current shared use trail design standards that increase user safety.*
- *The most disruptive existing condition impacting trail usability is widespread pavement failure.*
- *The pavement surface is not a suitable candidate for milling and overlay due to the thinness of the asphalt layer and other factors relating to construction process.*
- *The source of pavement failures, in base and subgrade layers, must be removed prior to surface repair.*
- *Due to these associated circumstances, any major end-of-life rehabilitation should effectively be considered a full reconstruction.*

trees, taking the form heaved fissures in the most severe forms. These fissures abruptly rise from the pavement and present a hazard to trail users. These pavement conditions were also widely commented on during the public engagement process.

The needs assessment summarizes the primary issues, deficiencies, and opportunities identified through the inventory and public engagement process. It identified five basic trail needs relating to: (1) Physical trail design; (2) Road crossing and safety; (3) Vegetation management; (4) Trail identify, wayfinding and connectivity; and (5) Amenities and infrastructure.

Based on the substandard trail design and the deteriorated conditions, the assessment included a feasibility review of various repair vs. replacement methods. It was determined that the trail pavement surface is not a suitable candidate for milling and overlay due to the thinness of the asphalt layer and other factors relating to construction process. It was also determined that adding pavement width to more closely align with current AASHTO shared use trail standards was not feasible due to the considerable failures present in the existing pavement.

Lastly, the source of widespread pavement failures, primarily due to adjacent trees and root systems present in the aggregate base and subgrade layers of the trail profile, must be removed before any repair of surface pavement layers is considered. Due to these associated circumstances, any major end-of-life rehabilitation should effectively be considered a full reconstruction.

RECOMMENDATIONS SUMMARY

Three trail restoration goals were developed based on the assessment of trail conditions, identification of needs and opportunities, and input from the public and project advisory committee. The goals are categorized to align with the recommendations.

Goal 1: Safety & Design Standards

Align existing multi-use trail more closely with current AASHTO multi-use trail design and safety standards and established best practices to create an accessible and functional trail for all users. Recommendations proposed to achieve this goal intend to restore the trail's basic functionality.

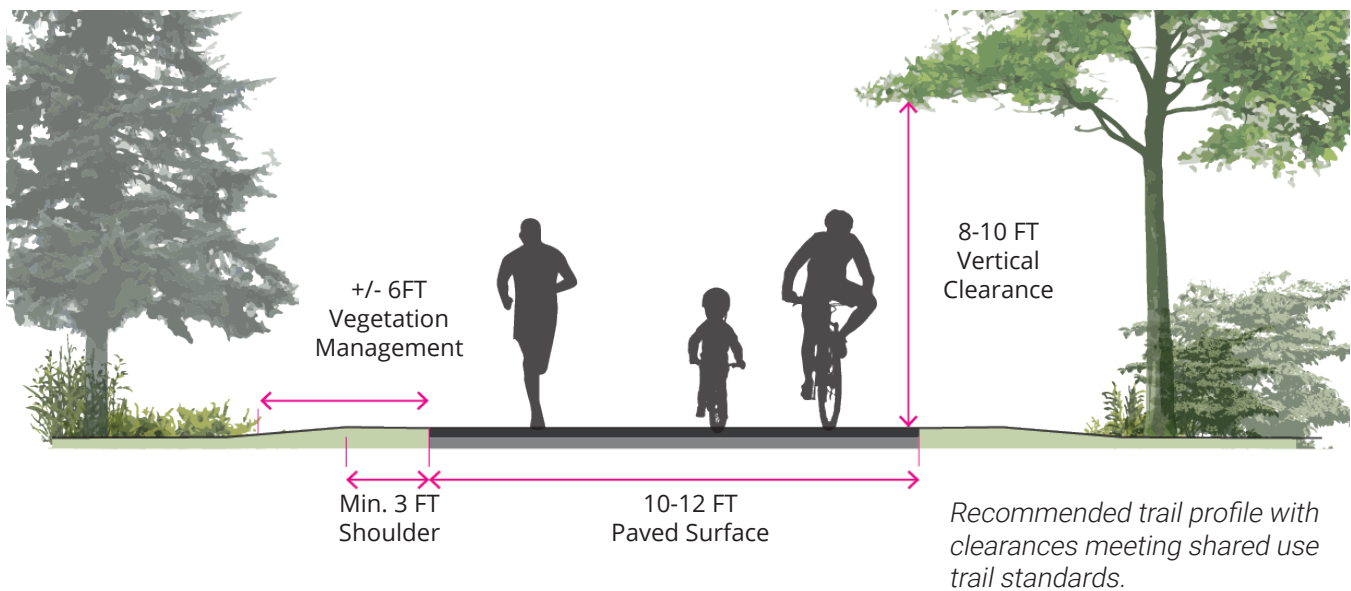
Goal 2: Maintenance & Management

Develop management and maintenance practices that ensure a safe and quality trail experience, ensure adequate staffing and budget support for



English Road trailhead concept design

SUMMARY OF FINDINGS



facilities, and rehabilitate the 40-year-old trail in a manner that minimizes maintenance burden. This goal intends to restore the trail's basic functionality. Recommendations proposed to achieve this goal intend to improve and preserve the trail's functionality.

Goal 3: Wayfinding & User Amenities

Amenities enhance community connectivity and enrich the trail user experience by improving trail access, wayfinding, orientation, tourism, economic development opportunities, and ensuring the trail includes meaningful connections to the Town of Greece's culture, environment, and history. Recommendations proposed to achieve this goal

will establish the trail as a significant option for non-vehicular transportation for residents and visitors alike.

Specific recommendations to achieve these goals are provided in detail throughout Part 4 of this report. They range in scope and scale and present a comprehensive set of interventions and enhancements involving basic trail design, road crossing safety, vegetation management and trail maintenance, wayfinding, new community trail access and connections, and new user amenities that will support expanded use and trail identity in the Town and region. These recommendations are supported by conceptual design illustrations for trailheads and other precedents.

IMPLEMENTATION

Implementation relies heavily on the timing and acquisition of funding. A detailed listing of potential funding programs and granting agencies is included. However, a basic recommended strategy of implementation proposes to drastically increase trail usability in the short-term and provide funding flexibility through prioritization of the recommendations into Immediate Needs, Basic Improvements, and User Enhancements.

Immediate needs address user safety and comfort but are not long-term or permanent trail improvement solutions. These recommendations

solve immediate public concerns and increase trail usability in the short-term. Basic Improvements are future restoration activities that bring the trail up to current shared use trail design standards, improve accessibility, and realign the trail in select locations to improve access and safety. They provide a minimum scope of improvement and prioritize basic trail safety above all other needs. User Enhancements enrich the user experience, contributing to easier wayfinding and orientation, greater community connectivity, and enhance tourism, programming, and recreational opportunities.

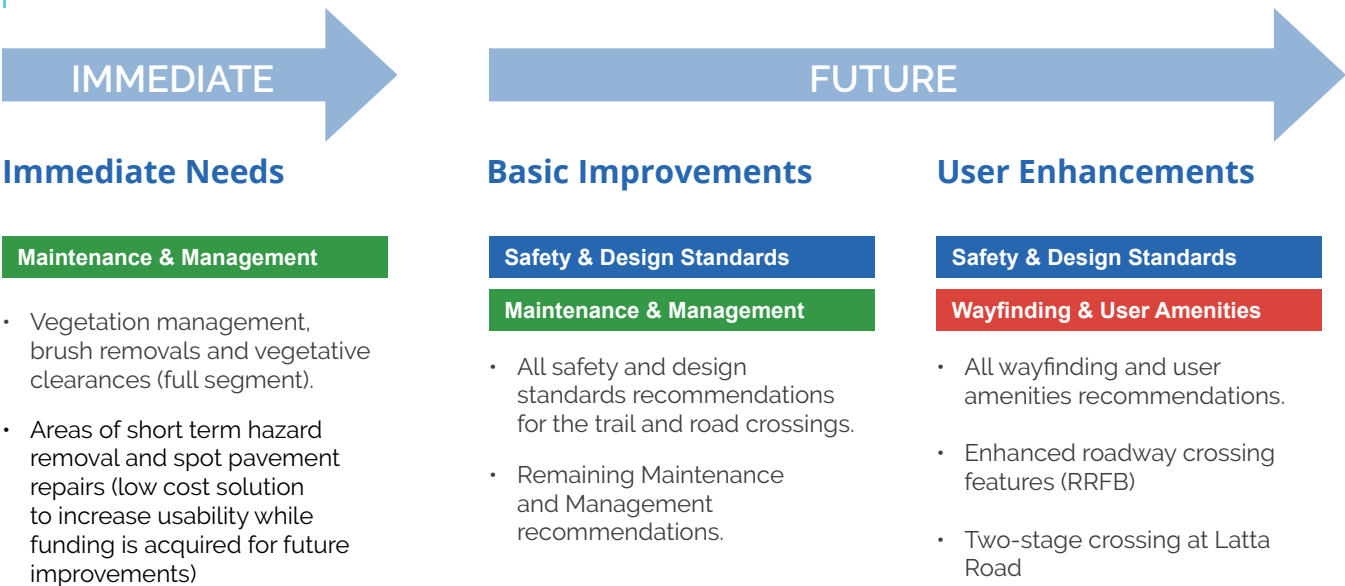


SUMMARY OF FINDINGS

Finally, the study includes an planning-level estimate of costs to assist with funding acquisition. The anticipated costs for Basic Improvements are approximately \$7.2 million and include all basic safety and design recommendations (with road crossings) and maintenance and management recommendations. Additional costs for User Enhancements (all wayfinding signage, trailheads, and other Wayfinding and User Amenities recommendations) are approximately \$1.2 million.

These costs are fully loaded and assume NYSDOT construction standards and processes for public realm durability, M/WBE participation, prevailing wage rates, and include work zone traffic control, mobilization, survey, erosion and sediment control, design services, and a 20% planning-level construction contingency. Costs are based on 2020 pricing but also include price escalation at 2% per year for an anticipated minimum 3 years to account for acquisition of funding.

An implementation strategy prioritizing immediate needs, basic improvements, and user enhancements was developed and is described within the Trail Recommendations section.



TOWN COMMITMENT

The Town of Greece has undertaken this study with the intent of restoring the Route 390 Multi-use Trail and upgrading it to meet current needs and best practices wherever possible. Funding acquisition for the trail restoration may take time. However, the Town has begun implementing several recommendations prior to the completion of the study.

The focus of these initial efforts is in direct response to the project needs assessment and public comments, and tackles maintenance and management recommendation that can be achieved with Town staff or limited funding. These include significant vegetation management, increasing visual safety near blind curve areas, and grinding down significant pavement fissure hazards as a temporary measure to increase trail usability in the near term.



Town of Greece staff implementing Maintenance and Management Recommendations and increasing trail safety prior to study completion (March 2021).





2

Project Background & Community Engagement

PROJECT BACKGROUND

OVERVIEW

The Route 390 Multi-use Trail was constructed 40 years ago (1980) along with the Route 390 Expressway project (NYSDOT D96515, “Rochester Outer Loop”), extending north through the Town of Greece. The trail extends approximately 4.7 miles and meets or crosses six vehicular routes, linking a regional commercial corridor at the south (West Ridge Road) to the Lake Ontario State Parkway at the north.

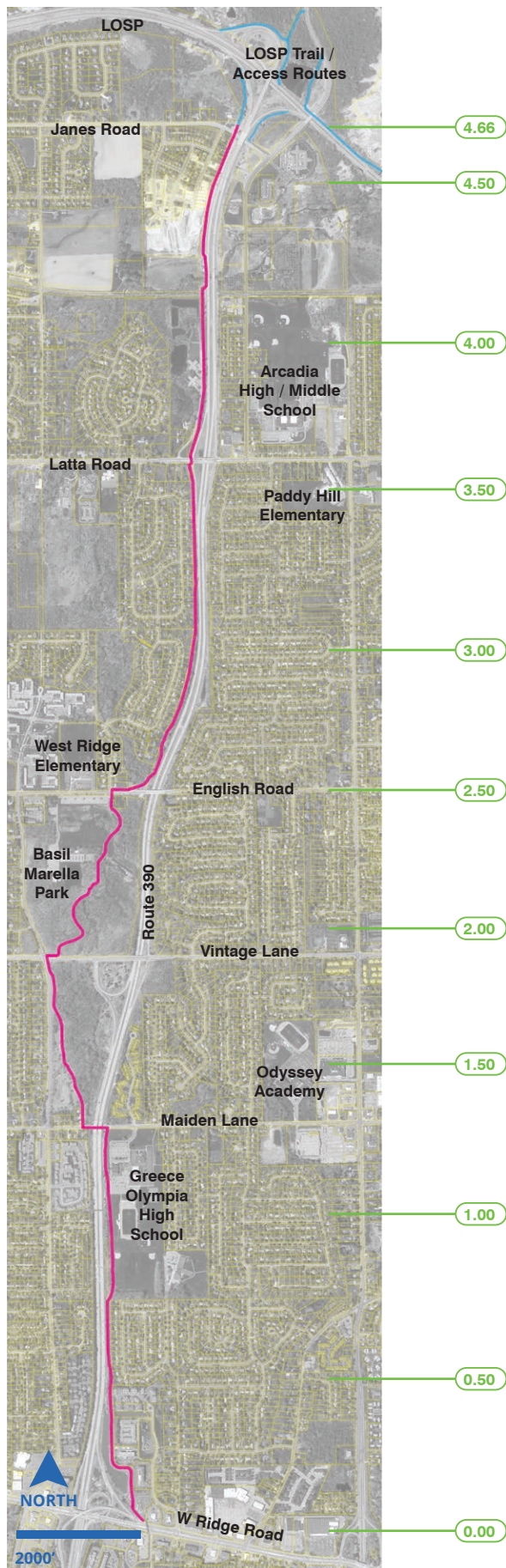
The shared use trail serves as an important local and regional off-road pedestrian and bicycle route for a variety of users. Six public and private K-12 schools are either directly served by the trail or within a half-mile of the trail along major corridors. The trail also links Town recreational facilities, unique natural assets, and other significant regional multi-use trails, both existing and planned. These include the Lake Ontario State Parkway Bikeway, the Genesee Riverway Trail, and the Erie Canal Trail / Empire State Trail, the Hojack Line (planned), and the 390 Trail Extension (planned).



TRAIL BASICS

- Constructed in 1980.
- Approximately 4.7 miles long.
- Major component of regional shared use trail network.
- Crosses or meets six east-west vehicular routes.
- Distinctive visual character in various segments.
- Land ownership primarily NYS-DOT.

PROJECT BACKGROUND & COMMUNITY ENGAGEMENT



Map of route 390 Multi-use Trail in Greece, NY

STUDY AREA & EXTENT

The project study area includes the extent of what is now known as the Route 390 Multi-use Trail (390 Trail), from the southern terminus at West Ridge Road to the northern terminus at the Janes Road parking area. Roadway crossings were also examined in the study, including Maiden Lane, Vintage Lane, English Road, Latta Road, and Janes Road. The trail is approximately 4.7 miles long based on GIS measurement.

The study also considered adjacent context within the assessment and recommendations. Town of Greece or Greece Central School District land ownership were considered regarding influence on the feasibility of enhancement and restoration goals, trail user needs, experiences, enhancement opportunities, or other safety and access considerations.

The study did not include an inspection of the pedestrian bridge over West Ridge Road, the pedestrian bridge over Route 390 at Greece Olympia High School, or detailed restoration recommendations for the Lake Ontario State Parkway Bikeway access trails north of Janes Road. Generally, the LOSP access ways suffer from the same deteriorated condition and design deficiencies as the 390 Trail, along with additional wayfinding and one-way access disorientation. It is recommended that all bridges in the project area are studied in a future effort to assess safety, conditions, and upgrade needs.



The purpose of this study is to inventory the trail corridor, assess needs and opportunities, engage with the community to collect feedback, and provide recommendations on trail restoration and funding strategies.

PURPOSE OF THE STUDY

The trail has been well used since construction but lacked a defined maintenance and management plan due to uncertainty of maintenance responsibility (predominantly on NYSDOT lands). However, AASHTO shared user trail design standards have changed in the last 40 years and the Town of Greece has undertaken this project to assess the condition, community needs, and obtain recommendations on future restoration. After years of pavement failures and vegetative encroachment within the unusually narrow corridor, the trail user conditions are substandard. Pavement is severely deteriorated, well beyond its life expectancy, and includes safety issues that must be addressed.

STUDY METHODS

Conditions were documented through in-field inventory of characteristics such as width, clearances, pavement conditions, accessibility and access, and amenities, among others. Field inventory sheets document conditions in 0.25-mile increments. A broader study also identified contextual relationships to the Town and region. Road crossings were inventoried with engineering staff to document safety deficiencies. Data / document review was used to identify policies and regulations as they relate to the trail (easements, maintenance responsibility, etc.) and understand historic construction details and profiles. A supplemental inventory of pavement conditions was performed during later phases due to significantly deteriorated trail conditions observed within the initial inventory. The extent of community feedback regarding these conditions influenced recommendations supporting near-term intervention.

The inventory allowed the study to assess needs and opportunities relative to recognized trail design standards, pavement failure best practices, and rehabilitation feasibility. The needs assessment also considered basic trail design criteria such as safety, slope, drainage issues, user amenities, signage and wayfinding, trailheads and access, community connections, and other issues impacting the trail.

A comprehensive set of recommendations was then developed based on assessed need and feedback provided by the public and Advisory Committee. The proposed recommendations include various restoration interventions that best resolve the issues identified. Recommendations were categorized to align with goals and ultimately prioritized with a focus on safety and trail usability.

REFERENCED STANDARDS & GUIDES

Multiple guides and standards were referenced for this study, including recognized standards on shared use trail design, pedestrian crossing safety, and pavement condition and inspection. The primary design guidelines referenced are the AASHTO Guide for the Development of Bicycle Facilities and the AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities. Additional pedestrian crossing and accessibility guides were referenced from the US Access Board and US Federal Highway Administration.

These documents form the basis for all restoration recommendations. Additional guides and literature regarding pavement materials, pavement repair processes, and pavement inspection were also consulted to assess conditions and the feasibility of various rehabilitation options.

List of Reference Material

- AASHTO Guide for the Development of Bicycle Facilities. American Association of State Highway and Transportation Officials. Fourth Edition, 2012.
- AASHTO Guide for the Planning, Design, and Operation of Pedestrian Facilities. American Association of State Highway and Transportation Officials. First Edition, 2004.
- Best Practices for Bicycle Trail Pavement Construction and Maintenance in Illinois. Illinois Center for Transportation and University of Illinois Urbana-Champaign. 2012.
- Genesee-Finger Lakes Regional Trails Initiative Phase III, Appendix B: Operations and Maintenance and Appendix C: Funding Sources. Genesee Transportation Council, 2016.
- Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations. U.S. Federal Highway Administration, Office of Safety and The University of North Carolina at Chapel Hill Highway Safety Research Center (HSRC), January 2018 (July 2018, Updated).
- Guide for the Design and Construction of Asphalt Pavements for Colorado Trails and Paths. Colorado Asphalt Pavement Association. Third Edition, 2005.
- Guideline for the Design and Construction of HMA Pavements for Trails and Paths. National Asphalt Pavement Association, Information Series 129. 2002.
- NACTO Urban Bikeway Design Guide. National Association of City Transportation Officials. 2012.
- NYSDOT Comprehensive Pavement Design Manual, Volume 1 – Pavement Evaluation, Appendix C, Distress Data Collection Procedures for Flexible Pavement or Flexible / Rigid Pavement. Materials Bureau, New York State Department of Transportation, 1992.
- NYSDOT Highway Design Manual, Bicycle Facility Design (Chapter 17) and Pedestrian Facility Design (Chapter 18).
- Public Right of Way Accessibility Guidelines (PROWAG), United States Access Board.

TRAIL CONTEXT

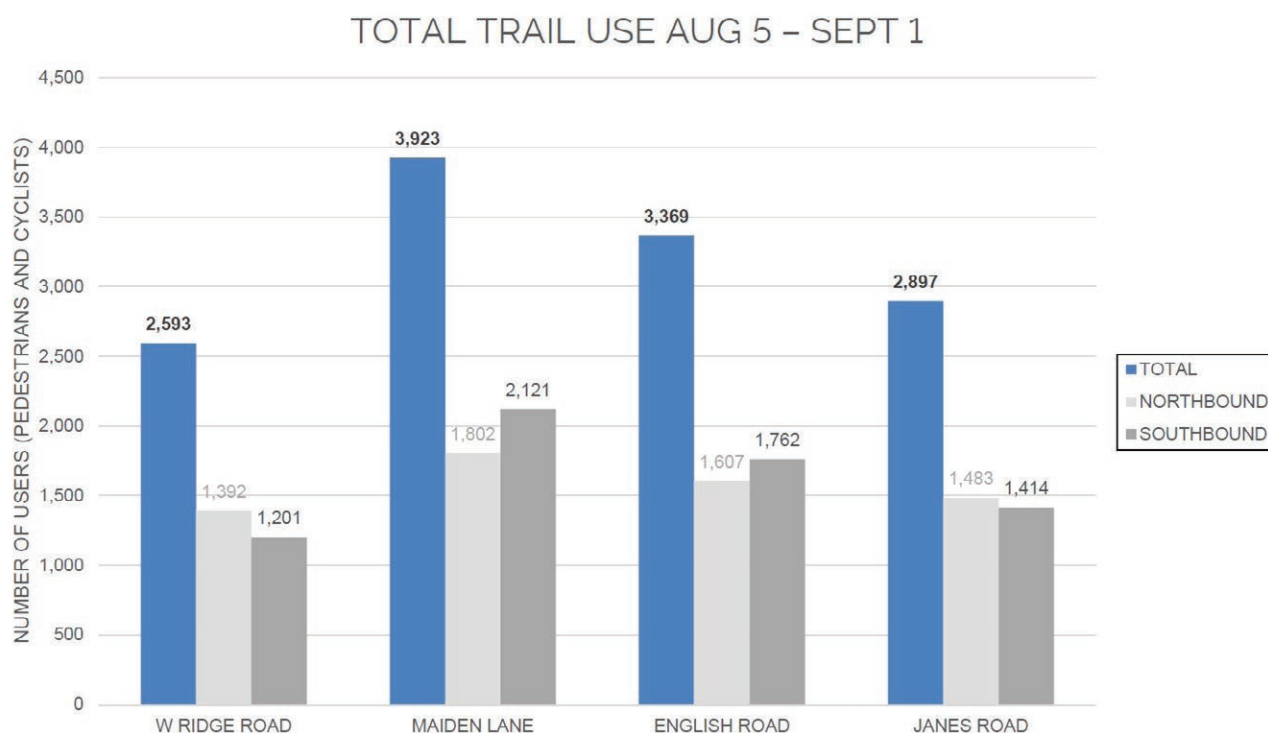
TRAIL USE

The Route 390 Multi-use Trail is a major component of the regional trail network and is well used by the community. Use numbers were provided by the Genesee Transportation Council based on counts recorded August 5 to September 1, 2020. It is unclear how the COVID-19 pandemic may have influenced trail use during this period. Community feedback suggests that poor pavement and hazard conditions likely have a considerable impact on trail use.

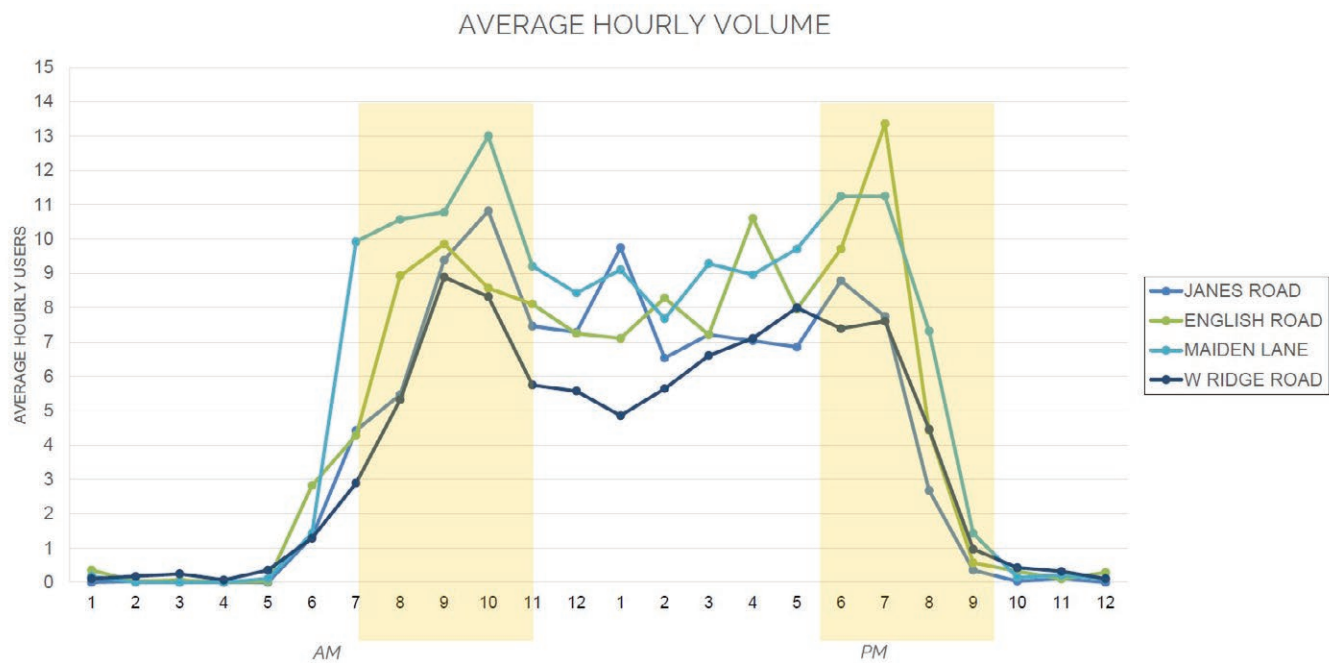
Trail counts were collected at four stations, including the trailhead at West Ridge Road, north of Maiden Lane, within Basil Marella Park near English Road, and south of Janes Road. The counts include both pedestrians and cyclists and identify direction (northbound vs. southbound).

The station with the highest total use during the period was Maiden Lane (3,923 users), with English Road (Basil Marella Park) as the second highest (3,369 users). The lowest user count was recorded near West Ridge Road (2,593 users). Northbound and southbound counts are relatively balanced at each station. Average hourly volume at all stations peaked in the morning between 8:00 and 10:00 AM (~10-13 hourly users) and then again from 6:00 to 8:00 PM (~7-14 hourly users). The lowest user period for all stations was between 12:00 and 4:00 PM (~5-9 hourly users).

Total trail use over 28 days (Aug 5 to Sep. 1, 2020)

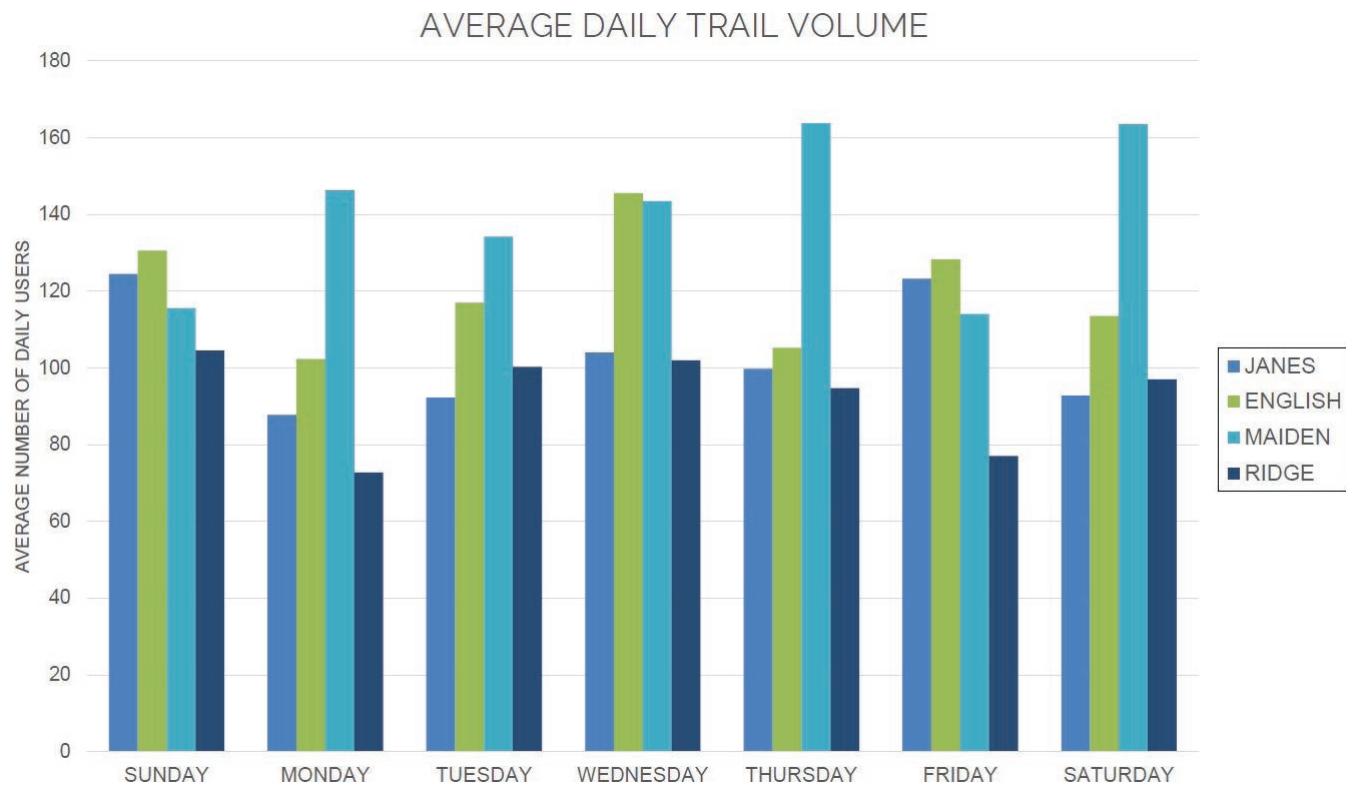


PROJECT BACKGROUND & COMMUNITY ENGAGEMENT



Average hourly trail use volume.

Average daily trail use volume.





Map of regional shared use trail connectivity.

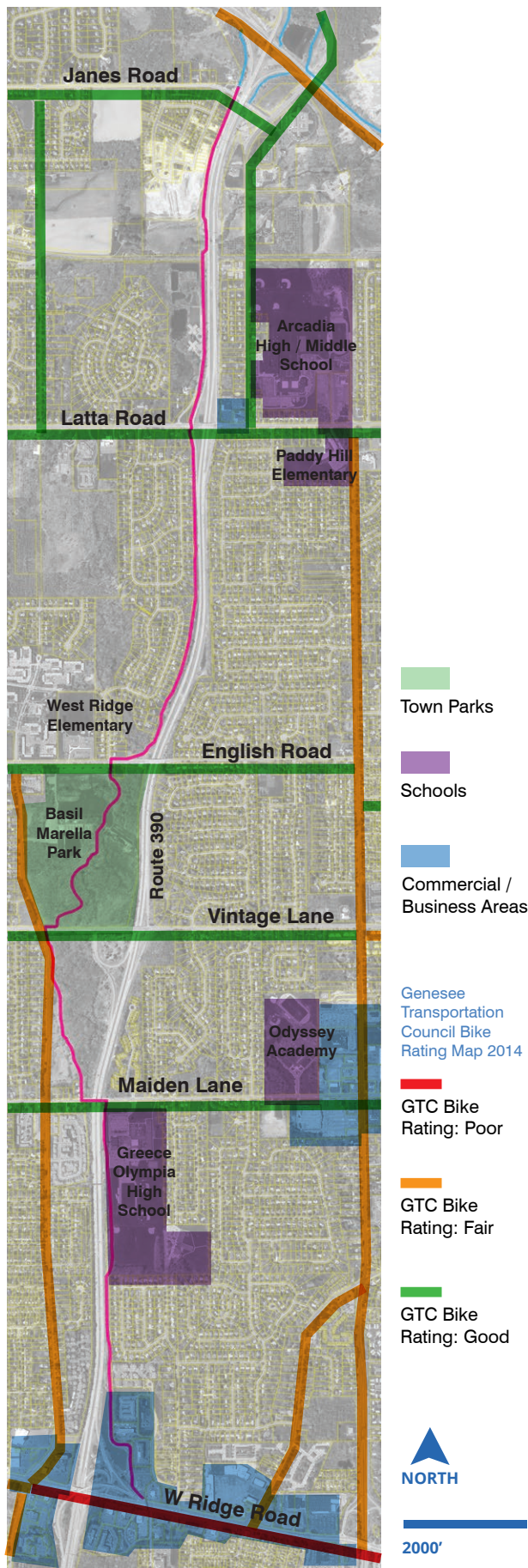
REGIONAL CONNECTIVITY

The 390 Trail is a key link within the regional network, connecting neighborhoods, schools, and businesses in the Town of Greece to destinations along the Lake Ontario State Parkway Multi-use Trail towards Irondequoit Bay and the Genesee Riverway Trail (Rochester, Chili, Henrietta), with minimal on-road segments. Moreover, via the Genesee Riverway Trail, this network includes connections to the Genesee Valley Greenway Trail and the Erie Canalway Trail (Empire State Trail), allowing multi-use trail access to dozens of counties and hundreds of communities across New York State. It is difficult to understate the importance of these regional connections in providing off-road active transportation opportunities for the community.

The 390 Trail also plays an important role servicing planned new connections within the network.

The planned '390 Trail Extension' would extend from West Ridge Road at the 390 Trail's southern terminus and continue south to Ridgeway Avenue. An additional future connection would extend to the Erie Canalway Trail / Empire State Trail. This would create a continuous trail loop of nearly 30 miles which circumnavigates the western side of the City of Rochester and its outer suburban communities.

Another planned connection would link the 390 Trail to the Village of Hilton approximately 6.1 miles west via the former rail corridor known as the Hojack Line. This corridor crosses the 390 Trail midway between Janes Road and Latta Road and the planned Hojack Line Multi-use trail would include a trailhead at this location.



ROAD NETWORK & CROSSINGS

A central safety consideration of the 390 Trail is potential pedestrian and bike user conflicts with vehicular traffic. Six east-west vehicular routes of varying traffic levels meet or cross the trail. These include West Ridge Road at the southern trail terminus, Maiden Lane near Greece Olympia High School, Vintage Lane, English Road, Latta Road, and Janes Road at the northern trail terminus.

Three of these roadways (Maiden Lane, English Road, and Janes Road) include unsignalized crossings for trail users. Vintage Lane and Latta Road include traffic signals and crosswalks. Detailed descriptions and assessment these roadways and crossings can be found in Part 3 of this report.

Nearby north-south vehicular routes include the Route 390 expressway (limited access highway), Mount Read Boulevard on the east, and lesser roads that do not extend the length of the trail corridor (Fetzner Road, Island Cottage Road, Kirk Road). The nearest major north-south vehicular route on the west side of the corridor is Long Pond Road.

AVERAGE DAILY VEHICLE TRAFFIC AT TRAIL CROSSINGS

(Vehicles Per Day, 2019)

West Ridge Road:	45,437 VPD
Maiden Lane:	9,472 VPD
Vintage Lane:	11,019 VPD
English Road:	5,835 VPD
Latta Road:	24,287 VPD
Janes Road:	2,053 VPD

CHARACTER SEGMENTS, TRAIL IDENTITY, AND PLACEMAKING

An essential principle guiding this study is the importance of ensuring that trails have meaningful cultural connections to the communities they serve. Visual and land use context, enclosure and vegetative character, and the sensory environment experienced or perceived by trail users strongly influences the relationship that a community has with their trail network. These experiences, both positive and negative, are intentionally and sometimes unintentionally designed, and may also be the result of deferred maintenance or disrepair. Character experiences will consciously and subconsciously set a tone for what the community expects when using the trail, that being an appealing and charming place to stroll or troublesome but necessary travel route.

Many of the existing character experiences along the 390 Trail are defined by relationships to vegetation, visual enclosure, and adjacent land uses. This study includes identification of Character Segments, which recognize differences in basic character along segments of the corridor and tease out opportunities to build upon them in a positive manner. Character Segments are more than identification of adjacent land-uses. Like a branding exercise, it represents an opportunity to define unique experiences within the trail network, enhance trail identity within the community, and add charismatic and human-centric wayfinding literacy throughout the trail.

Four character segments were identified. See **Part 3** and **Part 4** for descriptions of these character segments and future enrichment recommendations.



LAND OWNERSHIP & EASEMENTS

The 390 Trail exists predominantly on lands owned by the New York State Department of Transportation. These lands comprise of the Route 390 expressway right-of-way established as part of the NYSDOT Rochester Outer Loop constructed in 1980. The trail also traverses lands owned by the Town of Greece and Greece Central School District. Review of land ownership along the trail corridor was performed though record mapping and Monroe County data. Boundary survey was not performed in this study.

Town of Greece lands within the trail corridor include parcels surrounding Paddy Hill Creek north of English Road, and Basil Marella Park from English Road to Vintage Lane. The trail is adjacent to and crosses lands of the Greece Central School District south of Maiden Lane at Greece Olympia High School, primarily at the south end of campus near the recreation fields.

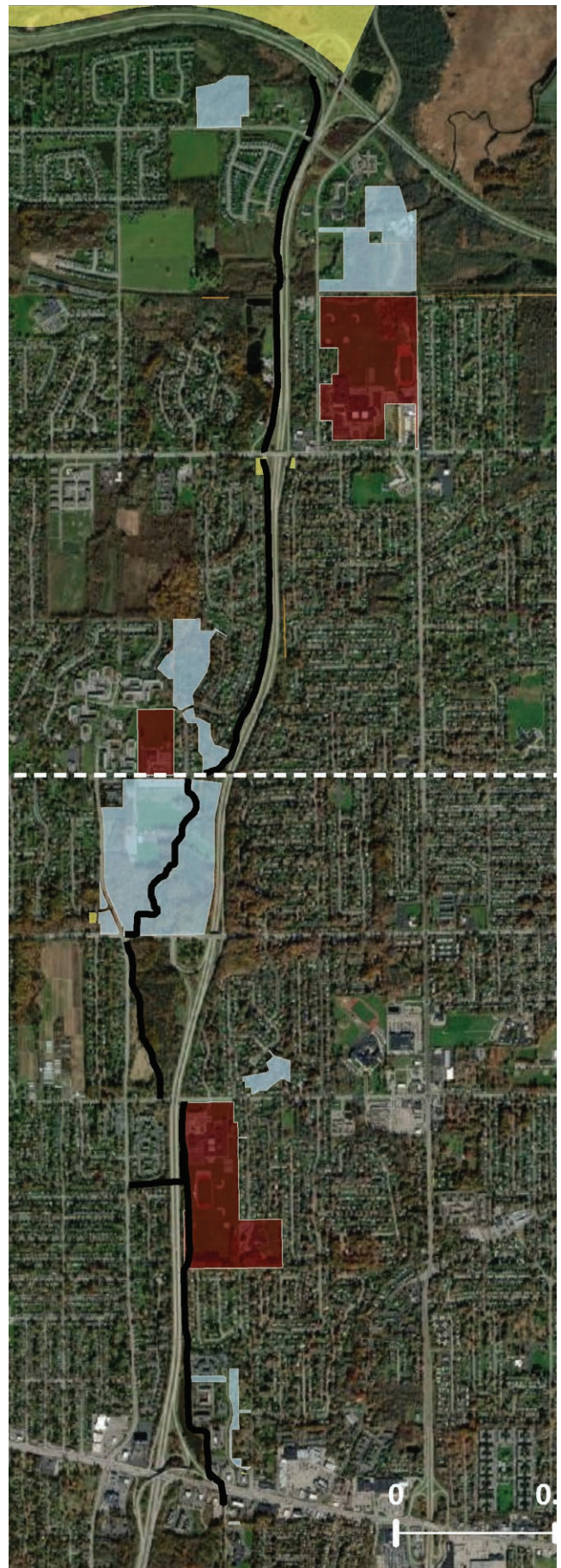
The trail is adjacent to or crosses a few easements along the corridor. They include an adjacent storm water easement near Center Place Drive (north of Ridge Road), a storm water easement crossing (across Route 390) near the residential lands at Quesada Drive, Bridgewood Drive, and Everwild Lane, and a sanitary easement crossing between Latta Road Nursing Home East and the Hojack Line corridor.

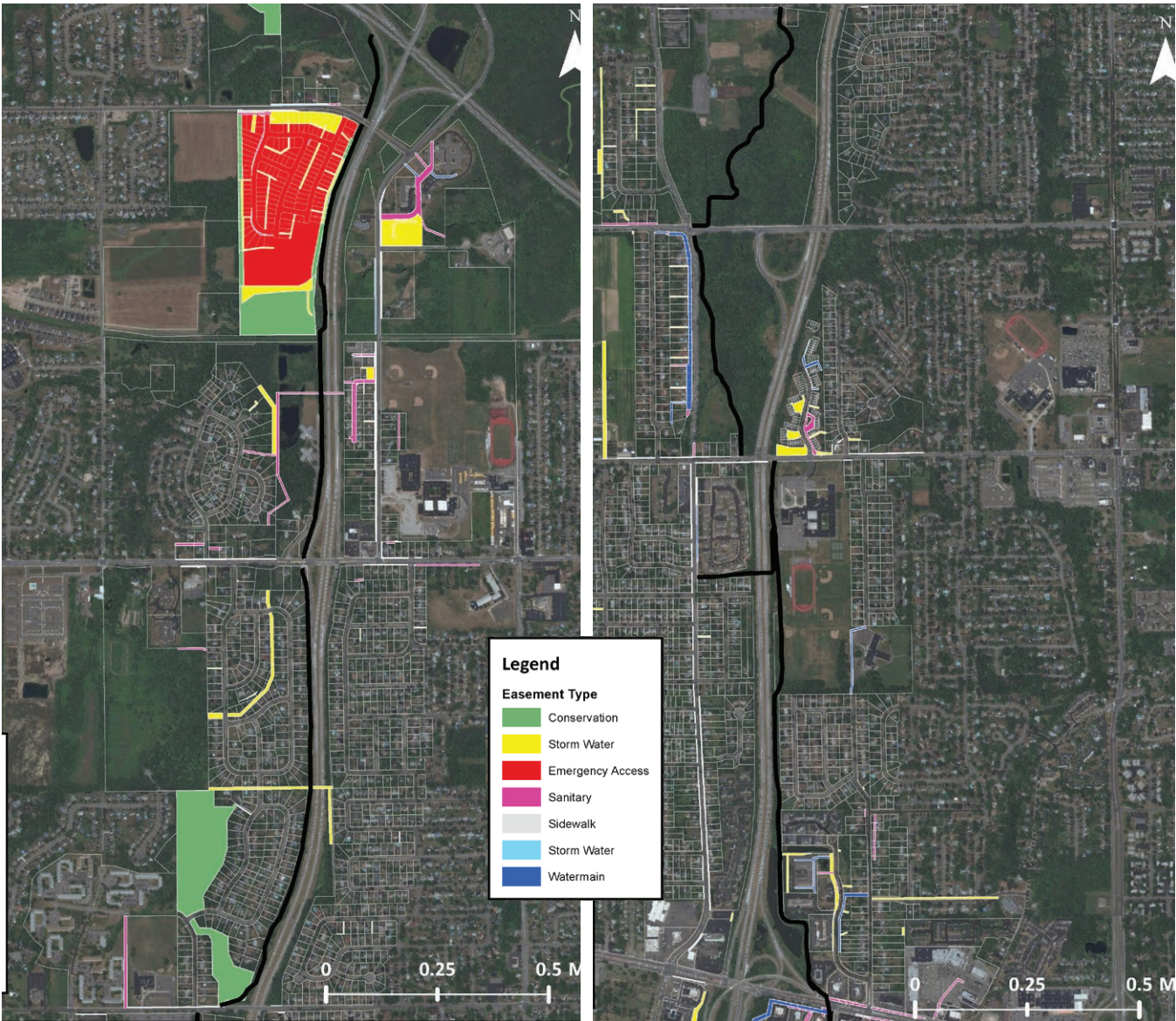
Legend

Ownership

- Greece Central School
- Monroe County Water Authority
- New York State
- Town of Greece

Land ownership map.





Easement map, English Road to LOSP

Easement map, West Ridge Road to English Road

MAINTENANCE JURISDICTION

As the 390 Trail was constructed along with the Route 390 project, record plans from 1980 (NYSDOT D95615) include maintenance jurisdiction tables for various project components. Drawing MNT-1, dated 6-80, indicates the Town of Greece as the responsible agency for the study area bikeway maintenance, including asphalt pavement, shoulders, slopes, drainage system, and landscaping. A Town resolution (#228) dated June 18, 1980 certifies the maintenance jurisdiction. The

documents indicate that NYSDOT is the responsible agency for LOSP Bikeway maintenance.

The pedestrian bridge over Route 390 near Greece Olympia High School was also constructed as part of the original highway project. Maintenance tables in the contract documents indicate that the bridge structure is to be maintained by NYSDOT and maintenance for the sloped embankments, fencing, and approaches is the responsibility of Greece school district.

COMMUNITY ENGAGEMENT

OVERVIEW

Multiple community engagement methods were utilized during the study. A public engagement plan was developed to understand community desires and concerns about the existing trail and future trail rehabilitation efforts. The results of the engagement informed the trail recommendations and implementation strategies. The overall Public Engagement Plan, meeting minutes, and community survey responses are available within the appendix.

PUBLIC MEETINGS

Two public events were held during the study. These included an October 2020 public workshop (Public Meeting #1) held at the trail junction within Basil Marella Park, and a live virtual community presentation held in February 2021 (Public Meeting #2, recorded and made available online). Meeting #1 provided project background information, summarized inventory findings, and obtained input on future trail improvement desires. Meeting #2 was held virtually and obtained feedback on community survey results, draft trail restoration recommendations, and a draft implementation strategy.

FEEDBACK HIGHLIGHTS

Community feedback was used to develop restoration recommendations. Responses to the trail survey are available in the appendix.

- Trail is well used by the community for many different type of activities.
- Felt trail was too narrow.
- Pavement condition was a major concern, described as “unusable” in areas.
- 94% of respondents reported that eliminating pavement hazards was the highest priority need.
- Concerns over drainage puddling.
- Lack of trailheads was noted, with a desire for trailhead improvements and wayfinding signage

COMMUNITY SURVEY

An online community survey was initiated in October 2020 and accepted comments through early November 2020. The survey coincided with outreach events gauging community sentiment on trail use, areas of concern or opportunity, and the types of improvements that were needed. The survey received a relatively high response rate with 156 respondents answering the 17 question survey. These responses informed the recommendations and implementation strategy. They survey responses are included within the appendix.



October 2020 public workshop held at Basil Marella Park.

PROJECT ADVISORY COMMITTEE

Project Advisory Committee (PAC) meetings were held throughout the study. Meetings were held virtually due to the ongoing COVID-19 pandemic. The PAC included Town of Greece parks, planning, zoning, and public works leadership, key New York State Department of Transportation and Monroe County Department of Transportation agency representatives, and Genesee Transportation Council staff. The meetings were used to discuss the progress and findings, inventory, and assessment, and provide guidance on the trail recommendations.

PROJECT WEBPAGE

A webpage for the trail study was provided by both the Town of Greece and the project consultant. The webpage includes public meeting information, presentations and informational materials, and links to recorded video of Public Meeting #2.



3

Inventory & Needs Assessment

INVENTORY OF EXISTING CONDITIONS

OVERVIEW

This section inventories the existing Route 390 Multi-use Trail conditions throughout the corridor. These include the state of physical conditions such as pavements, vegetation, drainage, trail access, roadway crossings, and user amenities.

WHY *CHARACTER SEGMENTS*?

- To identify unique and valuable assets that enhance the trail experience.
- To find opportunities to build upon those assets within the proposed restoration recommendations.
- They help build trail identity in the community and enrich wayfinding with an appealing and whimsical human-centric approach.

CHARACTER SEGMENTS

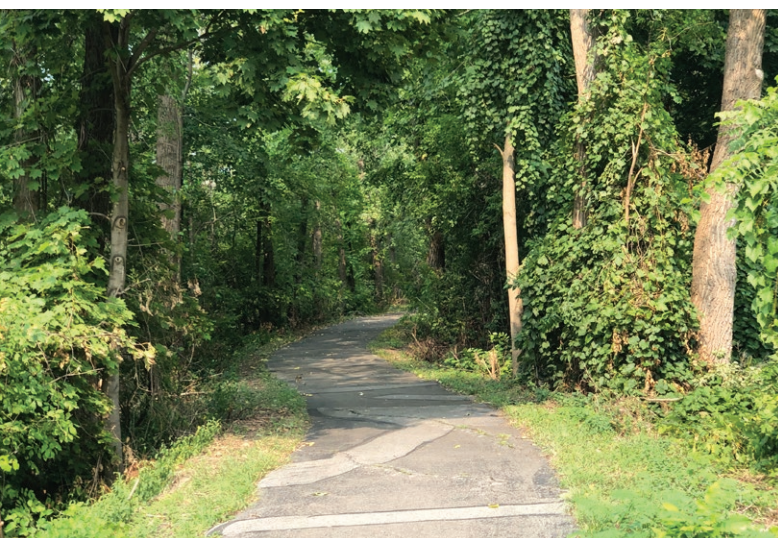
As described within the Part 2 (Trail Context) section of this report, identifying Character Segments are a useful tool to help future rehabilitation efforts develop meaningful cultural connections to the community. The Character Segments identify distinguishing features that may be used to develop recommendations which build upon trail identity and wayfinding.

The trail has been divided into three distinct segments based on observation of features and assets. Recommendations to further enrich trail character can be found within Part 4. These character segments are also used to reference locations within the inventory and assessment. For ease of future wayfinding efforts, one segment (The Narrows) has been further divided into subsections of roughly equal distance while maintaining similar character.



THE OAKS

This segment runs from the West Ridge Road trailhead to Maiden Lane. Initially passing along commercial development, the trail contains relatively sizable shoulder clearances with intermittent views to stormwater ponds and deeper woodlots. The segment eventually opens to the broad expanse of Greece Olympia High School's recreation fields edged by mature woodlands. Among the diverse tree species, the segment is distinguished by the presence of mature oak trees and a rare pre-1930's old growth forest patch at the south end of the high school fields.



THE VALLEY

This segment runs from Maiden Lane to Vintage Lane and continues through Basil Marella Park to English Road. The trail drops in elevation from Maiden Lane where views of Paddy Hill Creek begin and are continually teased throughout the segment from rolling bottoms and high overlooks. The segment is distinguished by rolling topography of the creek valleys. Users experience considerable uninterrupted lengths of natural brush and woodlands, meadows, and a shaded successional forest within the park.





THE NARROWS SOUTH

North of English Road the character of the trail changes as the right-of-way necks-down to a narrow corridor between private residences and the expressway. The segment tightens moving northward, with mature trees often just a few feet from the trail edge. Due to the constrained visual enclosure, users are substantially more aware of subtle changes in character, briefly exposed views, or the presence of infrastructure (fencing, culverts, etc.).



THE NARROWS NORTH

This section of The Narrows is similarly characterized by constraining vegetation and fencing, resulting in a tightly enclosed experience forcing focus on the trail ahead. The section differs from the southern Narrows section through the relative lack of residential properties. Though narrow feeling, the corridor is bordered by several naturalized brush or wooded areas on the western side, eventually opening to dramatic views of the Hojack Line corridor and nearby brushlands. Residential development borders the stretch of trail north of Round Pond Creek where the sense of strict enclosure all but disappears due to lack mature trees.



PHYSICAL TRAIL DESIGN

Original Pavement Profile: According to NYSDOT record plans the trail was designed as an 8-foot-wide bikeway in 1980. Trail shoulders were specified at 2-feet wide. The overall pavement section includes 6-inches of “Subbase Course, Type 4” (Item 304.05 per Estimate of Quantities, Sheet 19R1) placed upon “undisturbed existing ground,” with a single 2.5-inch asphalt layer (Item 608.02, Asphalt Concrete Driveways, Sidewalks, and Class 1 Bikeways, per Estimate of Quantities, Sheet 20R1). Cross slope was specified at ¼-inch per 1-foot (~2.0%) and a note requiring “2-inch weeps” to be “placed at low points” is present on the plan but not confirmed in the field. The pavement section was not confirmed through pavement cores. Embankment slopes beyond the shoulder were specified to be a maximum of 1 (vertical foot) per 2 (horizontal feet).

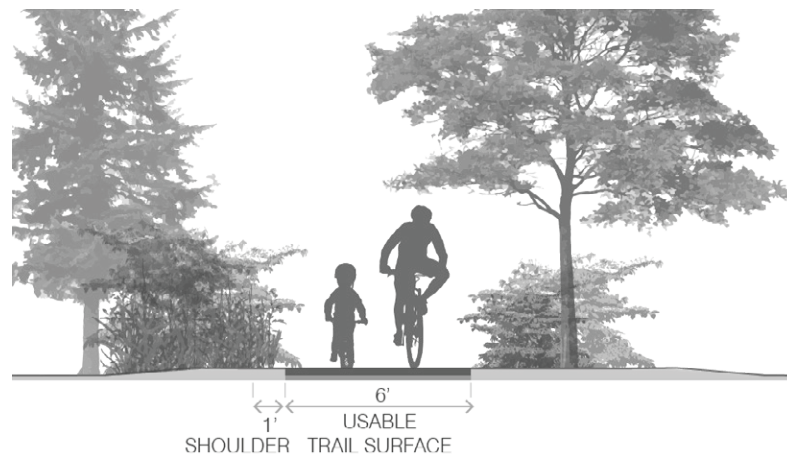
Trail Width: The trail includes 8-feet of paved surface in most areas. However, considerable lengths of the trail suffer from reduced width. These include segments of 6 to 7 feet of pavement width with selected areas of 5 to 6 feet. These seem to be the result of debris accumulation and ground vegetation encroachment resulting in a loss of or unusable pavement edge. This is especially

prevalent in The Narrows sections where debris has piled up against adjacent fencing and trail shoulders are often at a higher elevation than the trail surface.

Shoulder Width: Shoulder widths vary greatly along the trail corridor. Shoulders within The Oaks and The Valley segments range from 1 to +5 feet. Except for limited fencing in areas, narrow shoulders in these segments do not appear to be from infrastructure or property constraints, but rather from encroaching woody vegetation. Shoulders within the Narrows segments generally range from 1 to 3 feet, with a majority being 1 foot or less. Some sections of this trail segment have virtually no shoulder (0 feet) due to fencing and encroaching vegetation.

Clearances: The trail generally maintains substantial clearances to infrastructure obstructions. One exception is fencing, where both right-of-way chain link fencing and private residential fencing exists 0-3 feet of the pavement edge. This condition is common along The Narrows segments. It is exacerbated by vegetative encroachment from vines, bindweeds, woody shrubs, and trees growing over the pavement and on and within fencing.

Illustration of original trail design profile and existing reduced width of trail.



PAVEMENT CONDITIONS

Pavements along the trail corridor consist of asphalt (bituminous concrete), with short-distance concrete aprons (cementitious concrete) at West Ridge Road and Latta Road. The conditions inventory focuses on asphalt pavement and documents the presence of settlement, heaving, raveling (loose aggregate), the presence and condition of patching, and the presence and severity of cracking. Pavement conditions were documented in quarter mile (0.25 mile) increments using criteria established by NYSDOT pavement evaluation procedures. Individual inventory forms can be found within the appendix.

Overall Condition: Overall pavement conditions are significantly deteriorated at a widespread rate throughout the corridor. Conditions are severe enough to reduce usability of the trail and present hazards for pedestrians and bicyclists. These impacts are confirmed through public feedback, where survey respondents consistently describe the trail has too bumpy for bikes, uncomfortable, unsafe, and unusable. Though these poor

conditions are present along the full corridor, variations in concentration exist, with the Valley segment (Maiden Lane to English Road) having the lowest amount of deterioration and observed hazards.

Settlement / Heaving: Areas of settlement and heaving are present in all segments. Settlement is generally moderate and limited, associated with cracking, prior patching activity, or stone base or subgrade settlement resulting in drainage issues. A few significant instances of settlement exist at trail edges with the most severe being near the intersection with the Hojack Line. Heaving can be attributed to both crack fissures (roots) and prior patching / repair activity. Heaving due to tree roots is pervasive and is documented in more detail in this section.

Raveling (loose aggregate): Raveling is a condition where asphaltic binding material has degraded at the surface and aggregate stone within the mix is loose on the pavement. In extreme

Several types of cracking visible in this location, including thermal, longitudinal (edge settlement), and tree root impacts.



Location of pavement raveling (loose surface aggregate) north of Round Pond Creek.



forms the condition is a safety concern due to the potential for falls, particularly with runners and bicyclists making turning movements and slipping on the loose stone. Raveling is present in areas along the trail but generally in a minor form that is characteristic of the pavement age and does not present safety concerns. However, a severe length of raveled pavement exists immediately north of the Round Pond Creek bridge and continues more than 300 feet on a minor slope and curve presenting potential hazard for users. It is likely this isolated area is due to an asphalt mix defect at the time of construction.

Overlays and Patching: No existing overlays are apparent. Feasibility of milling and overlay is low due to the limited thickness of original asphalt material. Asphalt patching is widespread, with the least amount occurring within The Valley segment. Patching occurs in both small areas and long expanses extending more than 100 feet in select areas. These long patches appear to be due to prior cracking from tree roots. In many cases the specific trees causing issues can be identified along the shoulder. Additionally, a significant quantity of

raised cracking hazards from these root systems are reoccurring in patched areas. A supplemental pavement inventory was conducted and revealed that approximately 20% (The Valley, The Narrows North) to 40% (The Oaks, The Narrows South) of all severe-category cracking exists within patched areas. The history and timing of prior repair patching was not available and appeared to be last completed many years ago.

Pavement Cracking: Cracking in all forms and severity is widespread along the trail and is estimated to impact approximately 30% of the trail length. Types of cracking observed include raised fissures from tree roots, failure of patch joints or perforations from other infrastructure (bollards, etc.), thermal horizontal cracking, and some limited longitudinal cracking due to settlement at the trail edge. Tree root impacts to the pavement are by far the most prevalent type of failure and represent a significant hindrance to trail use. Severe cracks from root systems are often abruptly raised bulges between 2 and 6-inches in height and include fissures from 1/2-inch to several inches wide. These severe cracks significantly impact trail usability

Reoccurrence of tree root cracking at a formerly patched trail segment.



Tree root pavement impacts are a significant source of pavement failure.



and safety and are often clustered in large groups where single trees or clusters of mature trees are present near the trail edge. Severe cracks impact approximately 12% of the total trail length. Cracking classified as moderate is also prevalent throughout the trail. Moderate cracking consists of numerous fissures, root cracks, patch joint failures, and thermal cracking which are not currently raised or presenting immediate hazard. Moderate cracks are not currently causing significant impact to trail usability for most users. However, they are numerous and present potential to transition to severe cracking over time. Moderate cracking was observed in approximately 17% of the trail length.

CRACKING BY TRAIL SEGMENT

Lineal Feet Impacted
(% of Segment)

THE OAKS

Severe: +/- 925 LF (14%)

Moderate: +/- 1,440 LF (22%)

39% of severe cracks located within patches

THE VALLEY

Severe: +/- 265 LF (4%)

Moderate: +/- 980 LF (16%)

23% of severe cracks located within patches

THE NARROWS NORTH

Severe: +/- 800 LF (14%)

Moderate: +/- 1,000 LF (17%)

41% of severe cracks located within patches

THE NARROWS SOUTH

Severe: +/- 800 LF (15%)

Moderate: +/- 565 LF (10%)

19% of severe cracks located within patches

PAVEMENT FAILURE INVENTORY

A supplemental inventory of pavement focused on severe and moderate cracking was performed due to the extent of deterioration and community feedback concerning these hazards. It is general in nature, documenting **linear feet of trail impacted** by the crack hazards. The severity and extent of pavement deterioration was beyond the capacity of traditional pavement inspection criteria for vehicular roadways.

The inventory guided discussions with town staff regarding the near-term feasibility of removing the most significant hazards. It also shows that **recurrence of cracking is a major problem**, with 20 to 40% (depending on segment) of hazards being documented to exist within patched areas. This suggests the source of the original failures remained after patching.

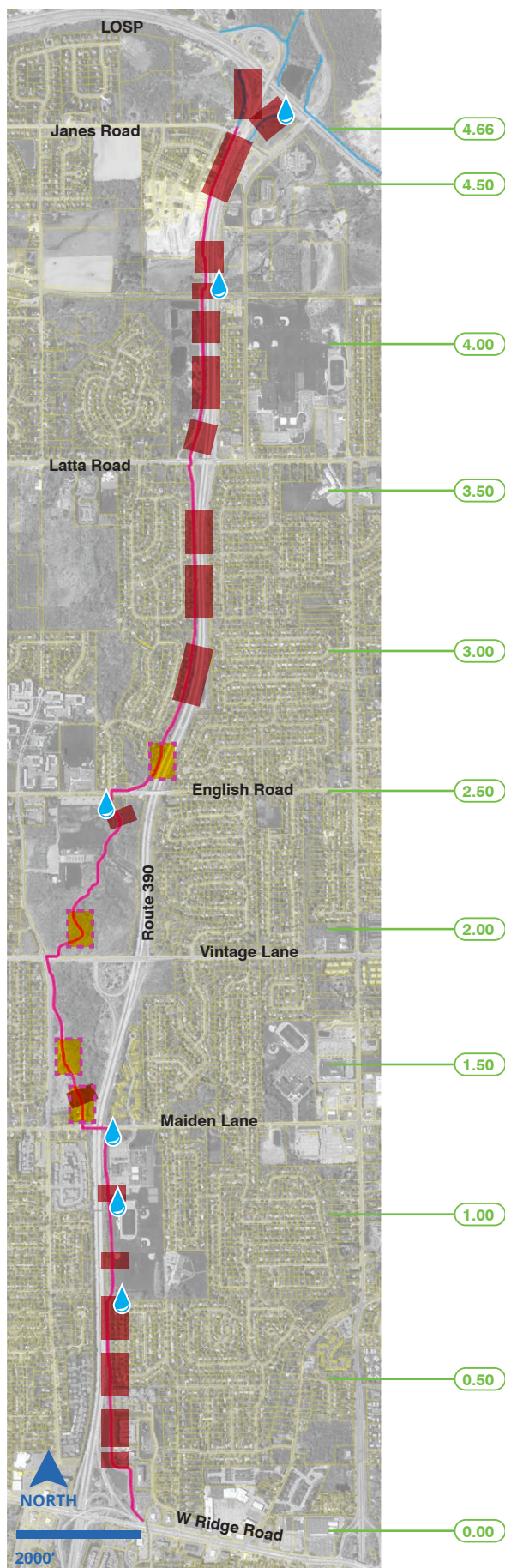
CRACK SEVERITY

Severe: Trail areas with many raised pavement bulges, cracks, and fissures which significantly impact trail usability and safety. Often clustered in groups less than 5 feet apart.

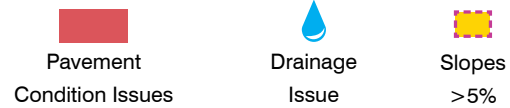
Moderate: Trail areas with many cracks that are not currently raised or significantly impacting trail usability, but clearly present potential to transition to 'severe' category failures in the medium to long term.

Other deterioration: Pavement raveling (loose aggregate) and settlement resulting in drainage issues.

INVENTORY & NEEDS ASSESSMENT



Pavement conditions map with generalized pavement cracking cluster areas.



DRAINAGE

Drainage issues that result in puddling and ice hazards are present many areas of the trail at a minor level due to the grading profile lacking a distinct crown, settlement, or the buildup of shoulder soil. The trail profile generally sheet drains to one side or is flat, wherein vegetative edge growth, shoulder debris, and soil accumulation prevent free drainage of stormwater off the pavement surface. Five areas where drainage issues are severe or substantially compounded by settlement were inventoried after a minor precipitation event. These include three locations within the Greece Olympia High School property (the south end of property, the pedestrian bridge junction, and the junction with Maiden Lane), the parking area and English Road sidewalk junction at Basil Marella Park, and a severe settlement area near the Hojack Line. Drainage issues were also identified at the LOSP eastbound accessway

SLOPES

Running slopes very along the trail corridor but generally remain at or below 5%, with some exceptions. Four general areas of slopes more than 5% were identified and typically involve topography adjacent to Paddy Hill Creek and connected drainage tributaries. Slopes in these areas were measured to be between 8% and 15% for distances of 50 to 300 feet. The areas include a long incline just north of Maiden Lane, multiple drainage culvert dips in the NYS-DOT woodlands between Maiden Lane and Vintage Lane, a drainage tributary dip at the south end of Basil Marella Park, and a long incline into the Narrows just north of English Road.

VEGETATION

Vegetative characteristics inventoried include presence of lawn shoulders, deciduous or evergreen woodlands, presence of invasive species, and other conditions impacting the environmental quality or use of the trail. Negative vegetative impacts to trail use are due to tree and understory shrub overgrowth and seasonal herbaceous material blocking sight distances and extending into the shoulders and pavement areas. Most of the corridor is edged by deciduous successional woodlands with presence of understory vegetation and invasive species in varying densities. Few lawn or mown shoulders are present. Lawn shoulders are mostly located along brief portions of trail within Basil Marella Park and Greece

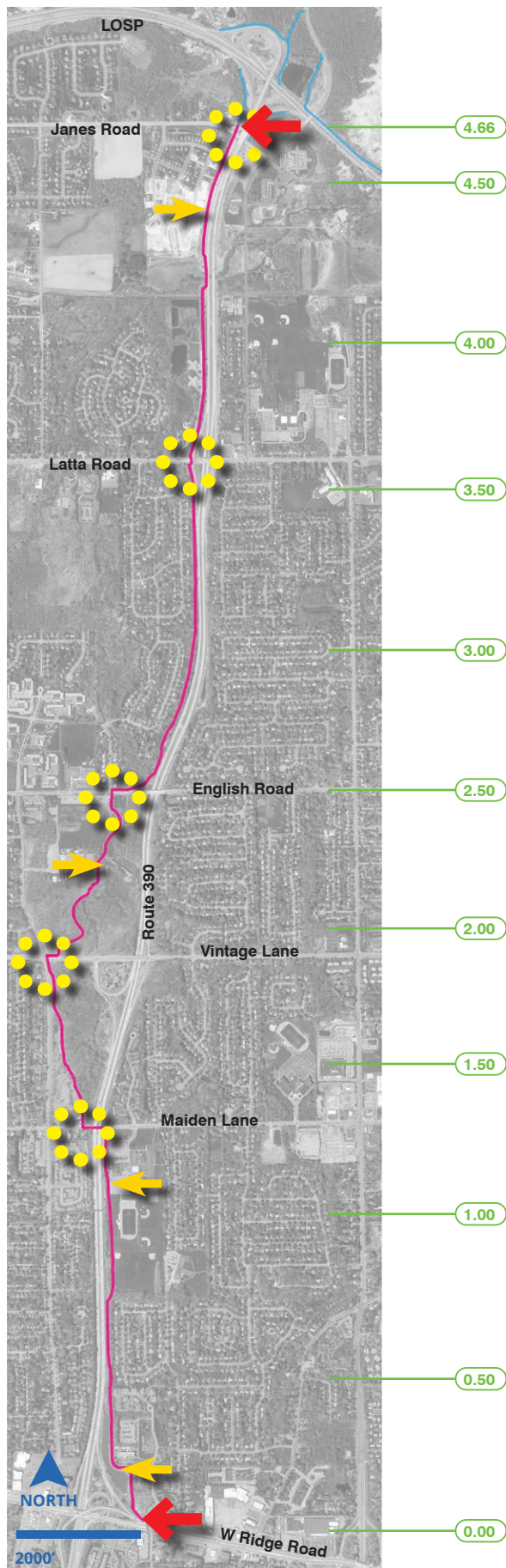
Olympia High School. A mixed grassy meadow exists within NYSDOT lands between Maiden Lane and Vintage Lane, which appears to be kept from successional woodland transition through semi-regular mowing. Though all trail segments contain vegetative overgrowth, the Narrows segments north of English Road are most significantly impacted due to constrained conditions, fencing, and encroachment of mature trees at the trail edge. These segments are also impacted by accumulated vegetative debris, with adjacent fencing or elevated shoulders preventing debris from being carried from the trail by natural forces such as rain or wind.

Drainage issues near English Road crossing at Basil Marella Park.



Overgrowth of vegetation within the narrows segments.





Trail access points map.



TRAIL ACCESS POINTS

Trail access points consist of three distinct types: trailhead termini / entries, road crossings, and other minor access spurs. Overall, access to the trail is considerably limited due to the Route 390 expressway preventing all access on one side (which switches at Maiden Lane). A total of only 10 access points were documented over the 4.7-mile trail length.

A trailhead entry is located at each terminus, West Ridge Road at the south and Janes Road at the north. Road crossings for the remaining four roadways (Maiden Lane, Vintage Lane, English Road, and Latta Road) include access from sidewalks. Minor access spurs vary in formality, with the highest likely access coming from the Greece Olympia High School pedestrian bridge junction, Basil Marella Park's tennis court area, and the residential trail spur at Falkirk Place. The remaining access point is visibly derelict fence gate leading to the Hampton Inn parking lot, off Center Place Drive. There are additional unimproved and informal access (dirt) points directly from residential or wooded areas.

Vehicular parking for trail access is also remarkably rare. Only the Janes Road northern terminus includes dedicated trailhead parking (8 total parking spaces, 1 accessible). Substantial parking is available for trail access at the Basil Marella Park lot along English Road. Parking at Greece Olympia High School is potentially used for trail use after school hours or weekends. No other authorized parking areas for trail users exist along the corridor. Parking for trail use is feasible in commercial lots near West Ridge Road at discretion of property owners.

ROADWAY CROSSINGS

Existing conditions at roadway crossings were inventoried to document crosswalks, traffic signals, signage, sight distances, and general compliance with accessibility. A detailed list of conditions at each crossing is available within the appendix with summaries below. The five crossings include Maiden Lane, Vintage Lane, English Road, Latta Road, and Janes Road. An inventory of the shared expressway / pedestrian bridge over Round Pond Creek is also included.

Maiden Lane: At Maiden Lane the trail runs along the south sidewalk to a mid-block, unsignalized NYSDOT Type S marked crosswalk west of Route 390. No curb ramps are present at the crossing, with narrow sidewalk meeting the crosswalk with a concrete gutter (not ADA accessible). The crossing has multiple ADA / Public Rights-of-Way Accessibility Guidelines (PROWAG) deficiencies. The roadway includes a vertical curve west of the crosswalk which partially hides the crossing from the viewpoint of drivers traveling east from the Fetzner Road intersection. Other documented conditions include irregular and insufficient pavement widths for trail users, vegetative and signage clutter, restricted

visibility, missing and potentially confusing markings and regulatory signage, and bridge drainage impacts to the trail route.

Vintage Lane: The trail crossing at Vintage Lane is located at an actuated traffic signal (MCDOT) serving the intersection of Vintage Lane and Fetzner Road. The crossing is a NYSDOT Type S crosswalk accessed by diagonal ramps. Pedestrian push buttons are varied, including accessible and non-accessible versions. Countdown timers are present in the signal box. Pedestrian crossing signs are stickers, partially worn away. Newer surface applied detectable warning mats exist on both ends of the crosswalk, but cross slopes of ramps are not PROWAG compliant.

English Road: Trail crossing at English Road is an unsignalized mid-block NYSDOT Type S crosswalk (milled at the time of inventory). Florescent yellow bike/ped ahead and crossing signs exist at each approach, but no vertical reflector strips or stop / stop ahead signage was present. Trail blaze signage was present but faded, though bent and not facing trail on the south side of road. Surface applied

Maiden Lane crossing, looking south.



Vintage Lane crossing looking north.





Latta Road crossing, looking north with unsignalized slip lane.

detectable warning mats were present on the north side of English Road but are not lined up with the trail crossing. No gutters, curb ramps, warning strips, or other markings are present on the south side of the crosswalk.

Latta Road: Trail crossing over the main lanes of Latta Road is through an actuated traffic signal and NYSDOT Type LS crosswalk. However, the crossing is made more complex by an unsignalized slip lane allowing right lane traffic of Latta Road eastbound to proceed directly onto the southbound onramp to Route 390. The configuration requires drivers to be mindful of the unsignalized crossing. It includes florescent pedestrian crossing signage with reflective strips and is partially impeded by vegetation and Route 390 directional signage approximately 80 feet to the west. A partially curbed refuge island is present between the slip lane and the main crossing. Slopes at ramps are not PROWAG compliant but pedestrian push buttons are accessible and include countdown timers.



Janes Road crossing, looking north.

Round Pond Creek Shared Pedestrian / Expressway Bridge: The trail shares a bridge crossing with the vehicular expressway over Round Pond Creek. The vehicular and trail travel lanes are separated by a 3-rail system with box beam guiderails approaching the bridge rail on each end. The trail lane also includes a 3-rail ped/bike rail on the outboard side with 10-feet of clearance between face the rails. The bridge rails are anchored to the structure with bolts and mortar pads and are galvanized and in good condition. The box beam guide rail is a snagging hazard for pedestrians and its deflection distance was not designed to protect an adjacent trail.

Janes Road: The trail crosses Janes Road at an unsignalized mid-block crossing with NYSDOT Type S crosswalk markings. It includes florescent bicycle crossing signage only facing the direction travel and without reflective post strips. Crosswalk approaches lack stop ahead or stop signage, detectable warning strips at the roadway, and the gutters are not accessible.

Trail features and amenities map.

Signage


No Motor
Vehicles



Ped.
Crossing



390
Trail



Lake
Ontario
Pkwy



Blind
Curve



Access
Bollard



Seating



Culverts



Other

TRAIL FEATURES & AMENITIES

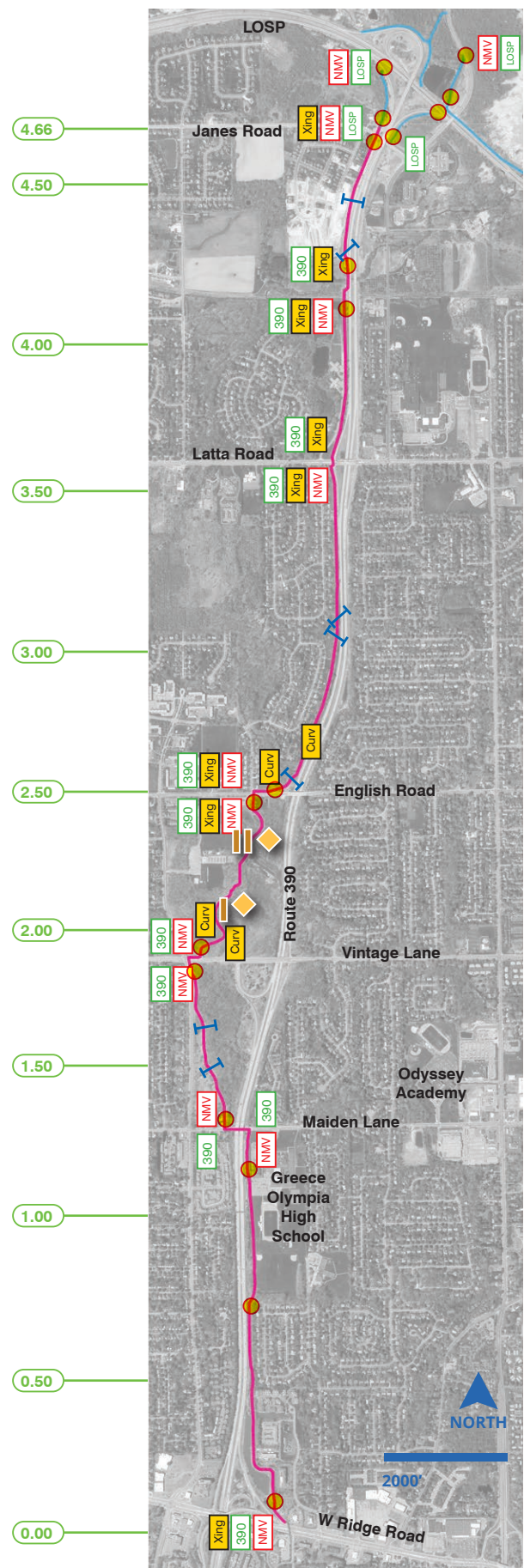
Overall, there are very few amenities associated with the trail. Virtually all non-signage amenities or bollards are associated with Basil Marella Park.

Signage in various forms and conditions is the predominant trail amenity and consists of assorted regulatory and safety signage and standard FHWA bicycle route guide blazes. No other mapping or wayfinding signage is present.

Access restriction bollards are located near all road crossings, often far back. The single-bollard devices are set in sleeved receivers at center of trail, consisting of 6x6 painted steel wood. Pavement conditions have deteriorated around several bollards.

Three benches exist along the trail and are all located within Basil Marella Park. A slab-style wood bench on steel posts is located off the trail edge in the fitness trail corridor. Two more benches are located near the recreation fields and locust tree rows further north within the park. The benches are set within non-ADA dirt or lawn surfaces or an elevated pad.

Basil Marella Park also contains 10 recreational fitness stations situated in small, wooded clearings with dirt, stone dust, or lawn surfaces. The fitness stations were not examined in detail but appear to be functional despite a worn-out appearance. The stations were observed to be in use by adults and children during the inventory.



NEEDS ASSESSMENT

OVERVIEW

This section builds upon the inventory by summarizing the primary issues, deficiencies, and opportunities as determined through assessment of the existing trail conditions. The assessment identifies five basic categories of need for future restoration efforts, including:

- (1) Physical trail design;
- (2) Road crossing and safety;
- (3) Vegetation management;
- (4) Trail identify, wayfinding and connectivity; and
- (5) Amenities and infrastructure.

Because pavement conditions were identified as a primary concern the assessment also summarizes the feasibility of various repair versus replacement initiatives.

Route 390 Trail crossing Maiden Lane, with 390 expressway overpass shown.

TRAIL-WIDE ISSUES AND OPPORTUNITIES ASSESSMENT

The inventory of existing conditions reveals several issues and opportunities that contribute to the development of proposed recommendations. These key findings are applicable to all portions of the trail. They generally summarize the deficiencies that should be solved through future restoration efforts and are as follows:

1. Physical Trail Design:

The trail design was completed over 40-years ago and does not meet current AASHTO multi-use trail standards and best practices. These deficiencies include overall trail width, shoulder width, shoulder clearances, slopes, and accessibility. The trail pavement section constructed in 1980 may also be inadequate to support the level of use, standard



and necessary trail / utility maintenance equipment, or tolerate the lack of a defined maintenance program for some of that period. Future restoration efforts provide the opportunity to align the trail more closely with design standards.

2. Road Crossing and Safety

Road crossings lack uniform treatments to highlight crossings to drivers and trail users, are deficient in accessibility / PROWAG compliance, and lack modern features that would enhance safety. Road crossings are the greatest safety risk for trail users. Upgrades to crossings provide the opportunity to improve accessibility and wayfinding, include audible push buttons and countdown timers at signals, and install contemporary warning devices that promote expanded use of the trail network such as rectangular rapid flashing beacons.

3. Vegetation Management

Existing vegetation conditions negatively impact user comfort, sight lines and visual access, safety, and the general perception of the trail within the community. Likewise, many of the pavement condition issues are directly related to the need for robust vegetative management. Trees and quality vegetation are an important characteristic of the trail experience and should be protected where truly valuable. However, the trail corridor is foremost a crucial component of the regional multi-use trail network and proper clearances to trees and vegetation are paramount to preserve usability and reduce the maintenance burden. Restoration provides an opportunity to recommit to vegetative maintenance, maintain clearances, perform regular hazard removals and pruning, manage invasive species, and remove offending root systems.

4. Identity, Wayfinding, and Connectivity

The existing trail lacks broader identity, interpretive experiences, and meaningful wayfinding infrastructure for all but the most knowledgeable and adventurous users. It is convenient and accessible for those adjacent, but also suffers from physical separation from the larger community due to access limitations. Restoration provides an opportunity to define unique experiences, enhance trail identity, and add charismatic and human-centric wayfinding literacy. Improving wayfinding with visually clear and branded information will improve safety and comfort for residents and help foster new recreation and tourism opportunities. Restoration provides the opportunity to focus on creating more publicly accessible connections to the trail wherever possible.

5. Amenities and Infrastructure

The existing corridor effectively lacks all common multi-use trail amenities such as marked gateways and trailheads, consistent signage, diverse seating opportunities, picnic tables, lighting, drinking fountains, bike storage / repair, and site-specific features such as overlooks that take advantage of scenic assets. In the few locations where amenities and infrastructure are present, such as access restriction devices or benches, they are generally inconsistent in design and materials, lack standard comfort features, or are visually aged or in disrepair. This contributes to an incoherent trail identity. Restoration provides opportunity to significantly improve the user experience by incorporating these amenities where appropriate and serviceable, expanding comfort and usability to more diverse range of users, and ultimately enhance the trail's sense of place.

ASPHALT TRAILS & TREE ROOTS

Tree roots are a common source of trail pavement issues. According to industry literature, 60% of trail managers within the United States report tree roots as a major source of trail damage. Rebuilds for this damage is often funded by Transportation Enhancement (TE) or Transportation Alternatives Program (TAP) grants and is a costly form of major rehabilitation due to the source of the issue being located within base or subgrade layers of the pavement system. Most tree root systems exist within the top 12 to 18-inches of soil and are particularly damaging to thin pavement profiles. Studies report that, in most cases, tree root damage can be prevented with better construction standards, the use of root barriers under certain conditions, or periodic maintenance trenching to sever root growth.

Communities are often reluctant to remove mature healthy trees that may be causing pavement issues. However, the removal of trees is not the only option to mitigate root impacts. Researchers at the Illinois Center for Transportation (University of Illinois

at Urbana Champaign) conclude there are three effective methods to minimizing root damage. Unfortunately, two of these methods are required at the time of construction (or reconstruction) and therefore maintenance phase work is limited in effectiveness. These methods include:

- 1. Physical Separation (at construction or reconstruction):** Keeping all portions of the trail horizontally separated from trees at a rate of 1 foot per 1 inch of mature trunk diameter, with a minimum distance of 6-feet to all tree sizes. This means that a 12-inch diameter tree should be a minimum 12-feet away from the trail edge.
- 2. Root Barriers (at construction or reconstruction):** Installation of root barriers at the edge of pavement base material, to a depth of minimum 1-foot. Effective root barriers are recycled polyethylene and are sometimes impregnated with root growth inhibitors.

Pavement failures from tree roots are common along the trail, presenting hazards for some users.



Reoccurrence of pavement failures at patched areas indicated that base and subgrade causes are not resolved.





Root issues often result in clusters of raised pavement heaving, creating an abrupt and extensive hazard to some users.

3. Tree Root Trenching (maintenance phase):

Physically cut all roots at the trail base edge or along the outer shoulder edge on a regular basis (approximately every two years). This method is not ideal due to the burden of reoccurring frequency necessary to minimize damage.

Patching of asphalt due to cracks or tree root damage is often used as a method of trail repair but is a poor long-term solution to the failure since in most cases the root system is left within the ground. If patching is performed, then researchers provide several recommendations:

- Issues in the base or subgrade layer must be rectified / removed prior to patching.
- Provide single large patches rather than many small patches.
- Cracking larger than 1/2-inch should be patched rather than sealed.



Individual culprit trees can be identified in several pavement failure areas.

- Patch perimeters should be saw cut for straight, uniform, smooth edges.
- A patch should not be smaller than 2 to 3 feet in width so that adequate compaction can be achieved.
- Hot Mix Asphalt must be used. Cold mix should only be used in emergency situations.
- The patch should be slightly raised above the surrounding pavement so that drainage issues do not arise if some settlement occurs.
- Patch perimeters should be sealed with joint sealant.

FEASIBILITY OF MAJOR END-OF-LIFE REHABILITATION OPTIONS

Major rehabilitation options include asphalt overlays (new asphalt layers placed over the existing surface), completely removing and replacing the asphalt layer, or complete reconstruction. Given the age, volume and severity of failures, cost of proper repair, and the need to otherwise increase the overall width, future restoration of the trail should be considered a major end-of-life rehabilitation effort.

Mill and Overlay: Trail pavements are not good candidates for mill and overlay (M&O) operations for several reasons. First, asphalt layers are generally thin compared to vehicular pavement designs. A milling operation will generally not leave enough workable material to receive an overlay and requires existing pavement to generally be in good condition. Second, the weight of common milling machines and construction traffic associated with the M&O will often destroy the remaining milled surface due to the thinness of the layer. Lastly, distress on the visible surface of pavements is generally present throughout the pavement, base, and potentially subgrade layers. M&O operations alone do not eliminate the origins of these failures. Root conflicts or other base and subgrade deficiencies will eventually reoccur or cause reflective cracking to propagate through the overlay.

Asphalt Removal and Replacement:

Replacement of the existing asphalt layer removes existing pavement distress but will require additional base and subgrade repairs to be completed. Removal and replacement of the HMA layer would only be cost effective if the trail were to remain at the current substandard width and base or subgrade failure causes are not present. This option should effectively be considered a full reconstruction given the need for widening of the pavement surface (new subgrade preparation, base material, shoulders, vegetation removals) and extensive removal of existing tree roots throughout the base and subgrade.

Add-On Pavement Width: Adding pavement width to the side of the trail was also considered as a restoration option to bring the trail more closely in line with multi-use trail design standards. However, the approach was not considered feasible, cost effective, and did not achieve overall restoration goals given the considerable failures noted within the existing pavement.

Shared expressway and trail bridge over Round Pond Creek, looking north. Safety deficiencies were identified in the railing system.



BASIC RECONSTRUCTION CONSIDERATIONS

A design engineer for any future reconstruction effort will provide detailed expertise concerning the overall design profile relative to subgrade conditions, trail width and shoulder feasibility on various portions of the corridor, and maintenance and protection of traffic during construction, among other subjects. However, with the goal of providing a long-lasting and low maintenance trail that will serve the region for many decades, a few important items should be considered:

Phasing and Access: Reconstruction is likely most cost efficient as a single project effort. However, funding availability and existing trail conditions may warrant prioritizing reconstruction of specific sections. The Valley segment (Maiden Lane to English Road) includes the fewest pavement failures. This section also has the best construction staging and access opportunities, which is a unique challenge for linear trail projects. Phasing considerations warrant a review of access and MPOT needs.

Pavement Design Profile and Maintenance:

The overall pavement profile should be designed to support the future traffic of the trail corridor, which may increase substantially as new amenities and connections are made. The profile should also be robust enough to mitigate subgrade deficiencies and support maintenance vehicle loads (routine maintenance vehicles, large utility agency vehicles). Geogrids are an effective solution for dealing with subgrade deficiencies along the corridor and may allow a thinner base profile. Though in some areas the trail would benefit from being raised above the adjacent ground level, which can be achieved by increasing the thickness of the base layer upon the approximately existing subgrade elevations.

Trail Grading and Drainage: Wherever possible, grading design of a reconstructed trail of 10 to 12 feet in width should include a crowned trail drainage profile rather than sheet draining to one side. Debris, vegetative encroachment, and soil buildup over time at the trail edge can often cause the trail surface to hold water. This is exacerbated where trail shoulders slope up from the pavement surface, often at odds with the sheet drainage direction. It is common to see even newly constructed trails in our region hold significant amounts of water due to these design lapses, effectively making them impassable during storm events or the spring melt season. Providing a crown that is substantially elevated above each shoulder is an effective way to increase the likelihood that stormwater will drain, and some portion of the trail is usable in all conditions.

January 2021 sports field construction along trail at Greece Olympia High School, looking south.



MAINTENANCE ASSESSMENT & CONSIDERATIONS

The 390 Trail has been maintained in years past, evident by pavement patching. The Town of Greece provides regular hazard removal (fallen trees) and other basic needs. However, the trail has lacked a defined maintenance program and management plan. No record of pavement maintenance history was available for this study. Historically there has been uncertainty regarding management responsibilities because the trail is primarily located on New York State lands (NYSDOT). Collected documentation identifies the Town of Greece as the responsible agency for maintenance. NYSDOT is the responsible agency for maintenance of the LOSP access trails north of Janes Road.

Regular maintenance is recommended to keep trails in good condition, provide the best long-term performance, and the lowest overall life cycle costs. Ultimately the level of maintenance performed is an owner / municipal decision based on the desired level of serviceability and available funding. Consideration should also be made regarding the goals of maintenance. For example, pavement maintenance to preserve the trail surface

integrity achieves different objectives than other types of routine maintenance such as graffiti and trash removal, vegetative debris removal, fencing repair, signage and furnishings maintenance, and landscape / lawn moving.

One focus of this study is the identification of a need for regular pavement maintenance. HMA-surfaced pavement maintenance recommendations include checking drainage components for proper function, regular vegetative clearing, identifying and completing crack sealing, identifying and competing patching, and performing seal coating.

All trail maintenance is important and contributes to the community's perception of value of the trail and its lifespan. A long-term maintenance plan should be developed by the Town of Greece that establishes regular practices and sets aside reasonable budget and staffing to perform the work. Resources are available to assist in the development of maintenance plans. A good source is *Best Practices in Trail Maintenance (2014)* prepared by the Lyles School of Civil Engineering and Indiana Local Technical Assistance Program at Purdue University.

Trail crossing at Janes Road with vehicle access restriction bollards, looking north.



RECOMMENDED MAINTENANCE SCHEDULE

Maintenance Task	First Application (years after construction)	Subsequent Applications (interval)
Check Drainage Components	After 1 yr	Every 1 year
Vegetative clearing of woody tree and shrub material within the shoulder zone	After 2 yrs	Every 2 years
Tree root trenching / cutting (problem areas of existing trails)	n/a	Every 2 years
Shoulder mowing of herbaceous material	varies	Min. 2X per year
Basic hazard identification	varies	Monthly
Routine amenity inspection, trash removal	After 1 yrs	Every 1 year
Identify and complete crack sealing	After 2 yrs	Every 6 years
Identify and complete patching	After 2 yrs	Every 6 years
Perform seal coating	After 4 yrs	Every 4 years

Debris and vegetative overgrowth along the Narrows trail segments. In some instances it was observed that adjacent residences leave yard and seasonal waste along trail corridor, including over the ROW fencing to the expressway.





4

Trail Restoration Recommendations

RECOMMENDATIONS OVERVIEW

TRAIL RESTORATION GOALS

Three focused **trail restoration goals** were developed based on the assessment of trail conditions, identification of needs and opportunities, and input from the public and project advisory committee. The goals are categorized to align with the recommendations.

Goal 1: Safety & Design Standards

Align existing multi-use trail more closely with current AASHTO multi-use trail design and safety standards and established best practices to create an accessible and functional trail for all users. Recommendations proposed to achieve this goal intend to restore the trail's basic functionality.

Goal 2: Maintenance & Management

Develop management and maintenance practices that ensure a safe and quality trail experience, ensure adequate staffing and budget support for

facilities, and rehabilitate the 40-year-old trail in a manner that minimizes maintenance burden. This goal intends to restore the trail's basic functionality. Recommendations proposed to achieve this goal intend to improve and preserve the trail's functionality.

Goal 3: Wayfinding & User Amenities

Enhance community connectivity and enrich the trail user experience by improving trail access, wayfinding, orientation, tourism, economic development opportunities, and ensuring the trail includes meaningful connections to the Town of Greece's culture, environment, and history. Recommendations proposed to achieve this goal will establish the trail as a significant option for non-vehicular transportation for residents and visitors alike.



ENRICHING CHARACTER SEGMENTS

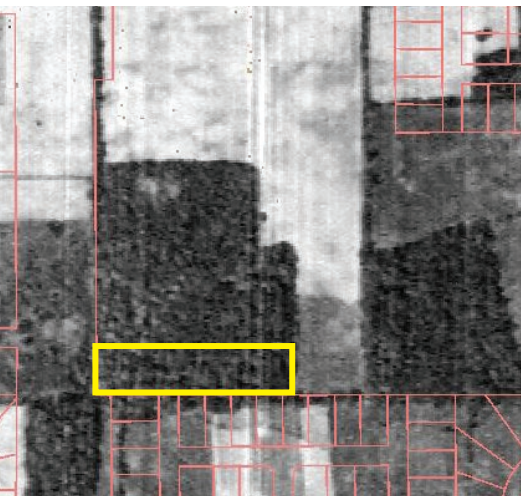
The recognition of differences in basic character along the corridor is an effective way to enhance trail identity and increase wayfinding literacy. A primary objective of any future restoration should be to design improvements in a thoughtful way that builds upon these positive characteristics. It is therefore recommended that projects consider the following enrichment opportunities:

The Oaks

Enhancements should focus on integrating with the natural woodland character, **native oaks**, and understory vegetation that promotes seasonal interest. Interventions should build upon existing **trailside views** of the stormwater ponds and frame those views with existing or new deciduous trees. **Wider shoulders** in the wooded portion of this segment should offer ample views and maintained shoulder separation to the woodlands beyond. Effort should be made to make the trail an asset to businesses by creating a more **promenade-like experience** that removes barriers and makes connections to the adjacent commercial area. Historic and cultural interpretive opportunities include the unique **pre-1930s old growth woodlot** at the south end of Greece Olympia High School.

The Valley

Restoration within this segment should focus on promoting meaningful connections to the diverse assortment of natural assets, including **Paddy Hill Creek** and its various drainage tributaries. **Scenic views and overlooks** to the creek valley should be considered a primary attraction, and such should be supplemented with the creation of **new view corridors** from the trail, restoration and enhancement of native understory and riparian vegetation, and a focus on invasive species management / removal. Historic and cultural interpretive opportunities include unique



1930



1980



2020

Old growth (+100 years) woodland remnants exist at the southern boundary of Greece Olympia High School. Unique trail experiences such as these should be preserved and enhanced through interpretive opportunities and management.

floodplain protection infrastructure within the park and agricultural site history with **topographic remnants of historic orchard furrows** visible within the successional forest.

The Narrows South

Tightly constrained by the expressway and residential properties, enhancements should focus on creating better visual and vegetative relationships to the adjacent embankments and prioritizing the **comprehensive management of vegetation**. Management should include removal or suppression of invasive species and the encouragement of high-quality native species. Efforts should also be made by the Town to promote **private stewardship** of the transitional interface between backyards and the trail corridor though maintenance dialogue or simply the encouragement of **unique and quirky displays, artwork, or pet watering stations** - which truly enliven the trail experience and establish a **respectful bond** between homeowners and trail users.

The Narrows North

This northern corridor benefits from a less dense land use in the tightly enclosed and vegetated areas and a more open and **naturalistic character toward Janes Road** where relatively few mature trees exist along the trail. The substantial amount of **coniferous trees** at the south end are unique to the entire corridor and should be preserved or augmented as trees succumb to maturity where they do not conflict with the trail pavement. This segment also has a **unique rural visual quality** in areas, such as periodic views of the barns along Mahlon Drive and the horse properties near Janes Road. These visual experiences should be promoted through **viewshed management**.

SAFETY & DESIGN STANDARDS RECOMMENDATIONS

RECONSTRUCTION TO AASHTO SHARED USE PATH STANDARDS

Based on assessed need and feasibility of major end-of-life rehabilitation alternatives, it is recommended that the trail be fully reconstructed to meet AASHTO Shared Use Path design standards wherever possible (AASHTO Guide for the Development of Bicycle Facilities, Chapter 5). These standards are based on the operating characteristics of path users, with criteria established for trail width, horizontal and vertical clearances, slopes, shoulder design, visual access, and other safety standards. The trail design should also comply with Public Rights-of-Way Accessibility Guidelines (PROWAG).

The trail is recommended to be reconstructed at 12-feet wide to provide safe two-way travel for diverse user types with varied mobility skills and accommodate a greater level of use as a major link to the regional trail network. Unforeseen constraints may limit ability to meet standards in some areas. The minimum width of reconstruction for a two-way path is 10-feet.

ROAD CROSSING SAFETY & ACCESSIBILITY FEATURES

All crossings should include a basic package of safety and accessibility enhancements. This includes signage, high-visibility markings, accessible curb ramp transitions, countdown timers and push buttons (at signalized crossings), and clearing of obstructed sight lines. These enhancements should be consistent with local Pedestrian Safety Action Plans (PASP) currently being implemented around the region by NYSDOT, Monroe County, as well as Public Rights-of-Way Accessibility Guidelines (PROWAG) established by the U.S. Access Board. It is also recommended that rapid rectangular flashing beacons (RRFB) are installed at all unsignalized crossing locations. It is also recommended that site-specific improvements are made, including (enhanced descriptions available within the appendix):

Maiden Lane – Crosswalk Relocation and Side Path: Relocate the unsignalized roadway crossing to the east side of the Route 390 overpass to

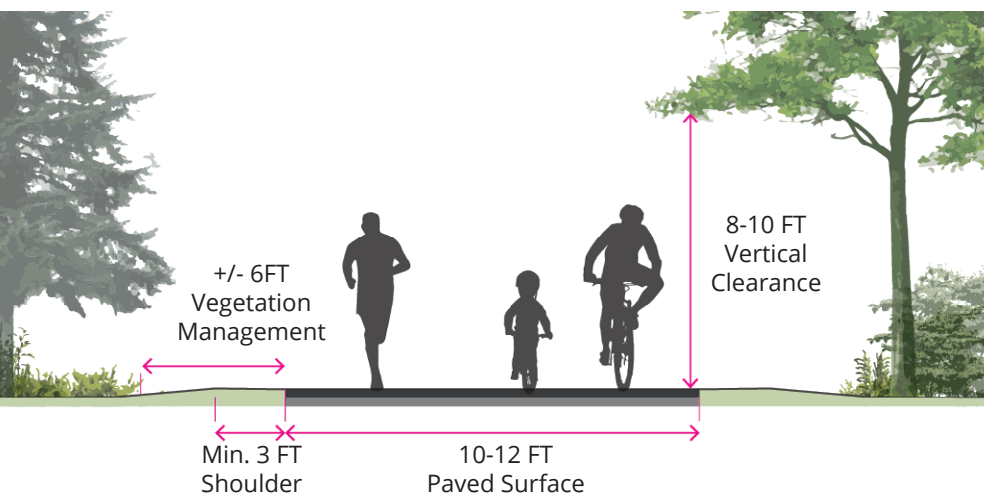


Illustration showing recommended trail section with proper width and clearances.

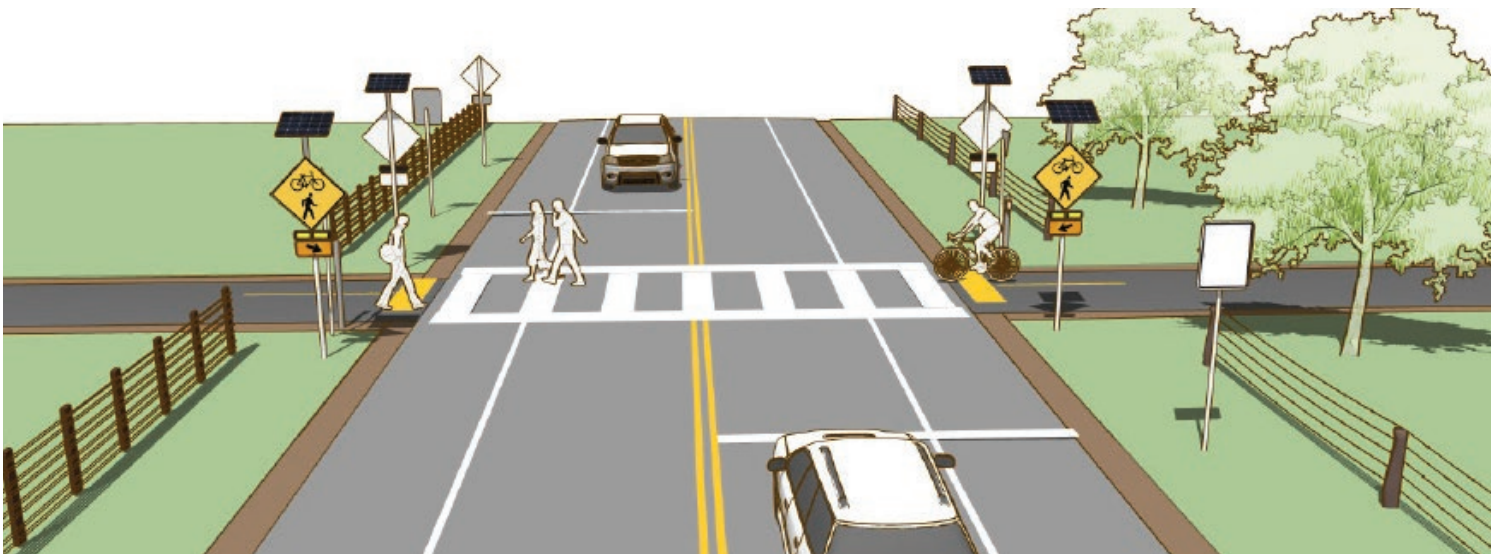


Illustration of selected Basic Safety Enhancements for shared use trail road crossings. Specific enhancements should follow the Pedestrian Safety Action Plans (PASP) currently being implemented around the region by NYS-DOT, Monroe County, as well as Public Rights-of-Way Accessibility Guidelines (PROWAG) established by the U.S. Access Board. Image from Small Town and Rural Design Guide (ruraldesignguide.com)

improve sight lines and move the crossing further from the crest of an existing vertical curve. This would include the design of a new shared use “side path” (minimum 10-foot wide). The Town may also consider narrowing Maiden Lane eastbound (east of proposed crossing) to shorten the length of the crossing and act as a traffic calming feature on approach to the school entrance.

English Road – Curb Ramp Adjustments, Side Path, and Bus Stop Connectivity: Curb ramps in the northwest quadrant of English Road and Jefreelind Drive should be aligned with crosswalks and removed where there are no crossings. The approach on the south side of English Road should be renovated to consider the intersection of sidewalks, new trailhead improvements, and a nearby RTS bus stop. The trail parallel to the north side of English Road should also be rehabilitated to make better use of the available ROW area, eliminating the sidewalk, while providing an overall wider trail and side path.

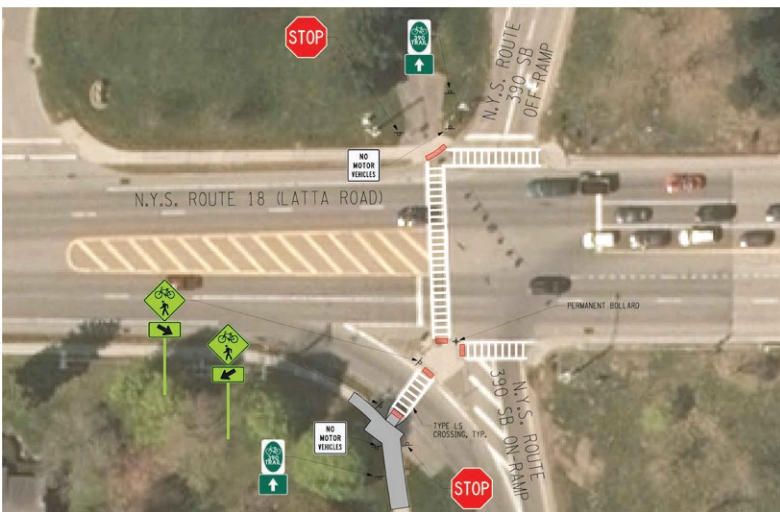
Latta Road – Slip Lane Safety and Pedestrian Refuge: Improvements should include advanced signage warning for trail users about the slip lane, RRFBs for the unsignalized slip lane crossing, and

additional protection measures for trail users within the existing refuge island. Future enhancements should also consider providing a new color contrasting, raised median island pedestrian refuge in place of the wide hatched area in the middle of Latta Road. This pass-through should be outfitted with additional pedestrian signals, push-buttons, and countdown timers. Planning for this larger refuge will require more detailed engineering analysis of utilities, maintenance agreements, and other constraints.

Route 390 Bridge over Round Pond Creek – Railing Upgrades and Signage: Ideally, trail traffic should be re-routed to a separate multi-use trail bridge. If this is not feasible then railings on the shared bridge should be upgraded to bicycle-safe styles, including rub-rails to prevent snagging, and both railings and transitions should be upgraded along the highway to meet current crash standards. Signage prohibiting trail users from entering the expressway should also be included.

Janes Road / LOSP – Access Signage: A package of signage identifying one-way trail routes and prohibiting pedestrians from entering the LOSP and the Route 390 ramps is recommended.

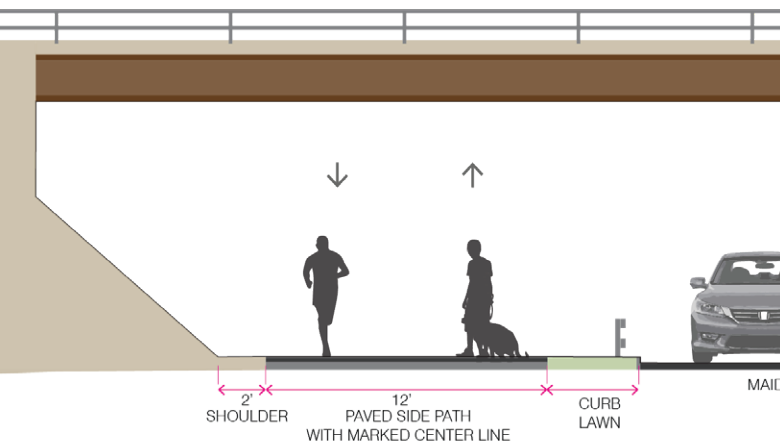
TRAIL RESTORATION RECOMMENDATIONS



Latta Road crossing safety enhancements. Stop signs shown are trail stop signs (not vehicular traffic stop signs).



Latta Road crossing safety enhancements with optional pedestrian island refuge. Stop signs shown are trail stop signs (not vehicular traffic stop signs).



Maiden Lane side path illustration showing clearances to vehicular travel lane.



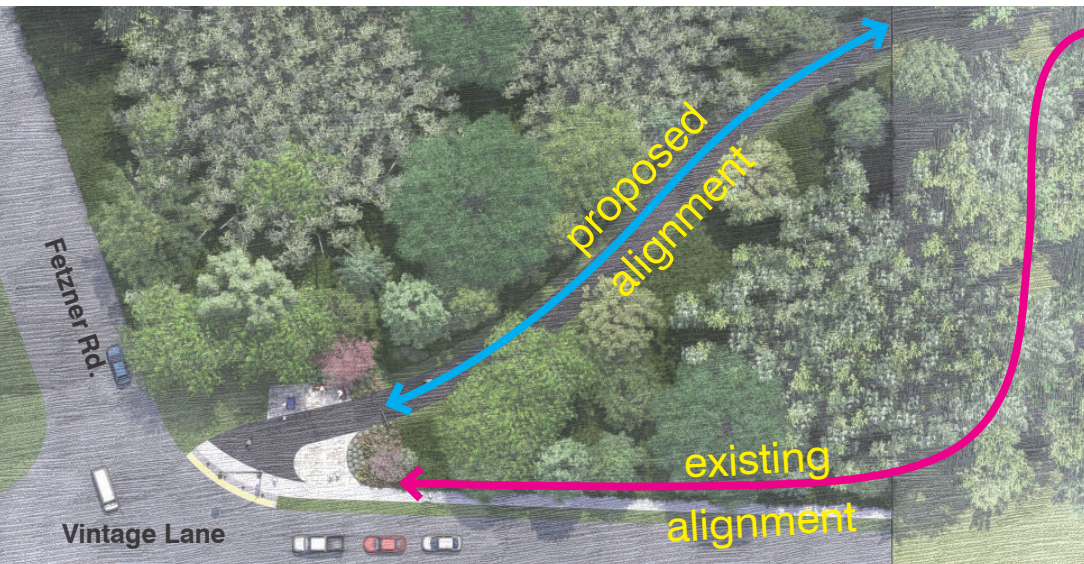
Maiden Lane crosswalk relocation and side path enhancements. Stop signs shown are trail stop signs (not vehicular traffic stop signs).

TRAIL RE-ALIGNMENTS

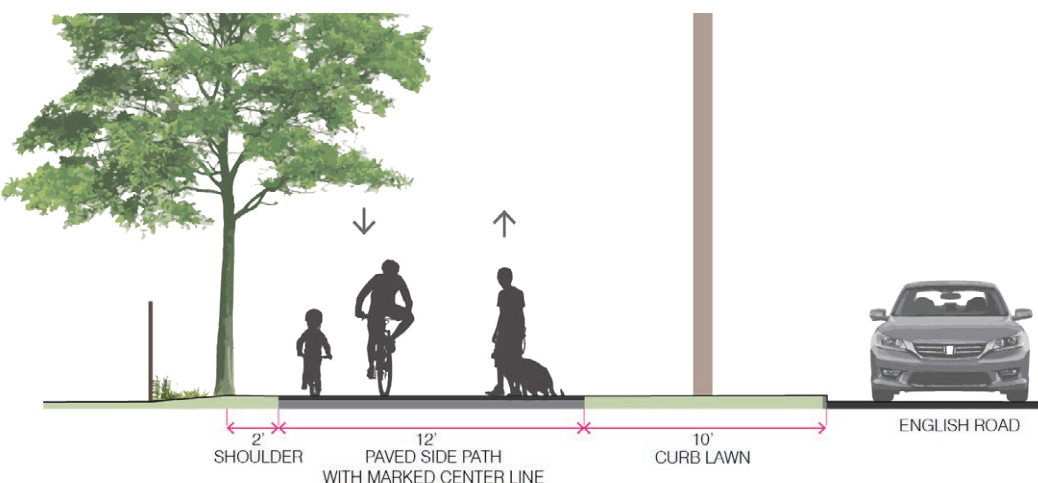
Trail realignments at Maiden Lane and north of Vintage Lane are recommended to increase safety and improve sight lines. The Maiden Lane realignment corresponds to the proposed relocation of the crosswalk and consists of a new side path on the north side of Maiden Lane. Realignment at Vintage Lane should eliminate the existing side path and blind curves within the initial +/- 300 feet of trail. The proposed alignment improves sight lines and should be developed in conjunction with trailhead improvements. Potential

constraints to be considered include a drainage culvert near the intersection and edge overlap of a disc-golf hole within the park.

A third potential realignment includes the separation of the trail from the existing Route 390 bridge over Round Pond Creek. The realignment proposes to move the trail westward in conjunction with future Hojack Line trailhead development and provide a new multi-use trail pedestrian and bicycle bridge over Round Pond creek.



Recommended realignment of trail north of Vintage Lane.



Section showing side path enhancements at English Road, near the crossing to Basil Marella Park.

This aerial photograph shows the proposed English Road corridor. The road runs horizontally across the middle of the image. To the left, it intersects with Side Path, which runs vertically. Further down the left side, it intersects with Trailhead, also running vertically. The road surface is dark grey. There are several vehicles on the road: a white car, a red car, and a black car. A white bus is also visible on the left side of the road. The road is flanked by green grass and trees. A large green field is visible in the bottom right corner. The labels 'Side Path', 'English Road', and 'Trailhead' are overlaid on the image in white text.

April 2021 | Town of Greece, NY

THE OAKS

SAFETY & DESIGN STANDARDS RECOMMENDATIONS

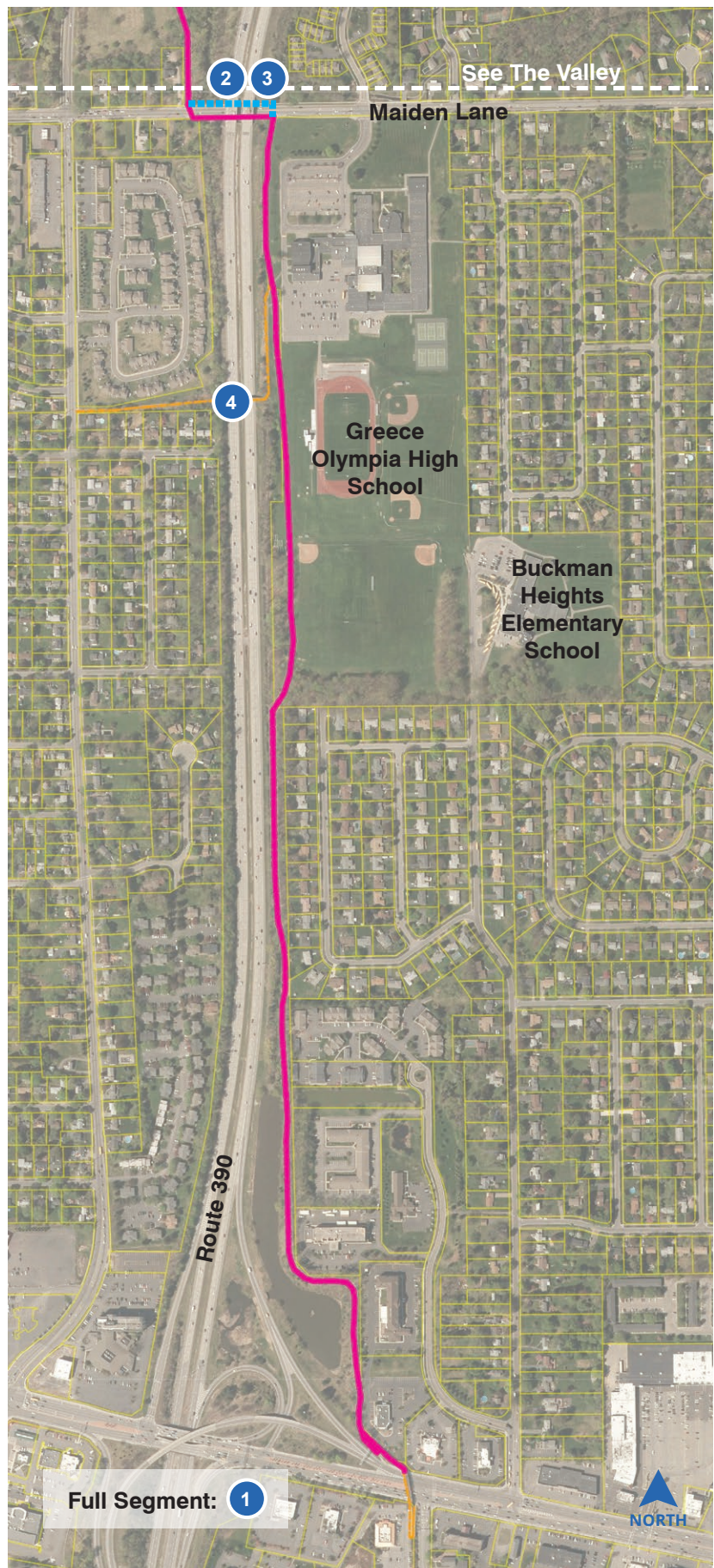
- 1 Reconstruct trail to meet AASHTO Shared-Use Trail design standards **(full segment, where feasible)**.
- 2 Trail realignment to include new side-path on north side of Maiden Lane.
- 3 Maiden Lane 'Basic Safety & Accessibility Enhancements' package
- 4 Future follow-up study of pedestrian bridge conditions and coordination with responsible maintenance agencies (NYSDOT and Greece Central School District, see Maintenance Jurisdictions pg 21).

Maiden Lane Specific Measures

Relocate crossing to east side of Route 390 overpass, including new segment of shared use trail (10-12') along north side of Maiden Lane.

Install roadway railing system / guide-rail with bicycle rub rail on trail side of posts.

Potential narrowing of Maiden Lane eastbound east of proposed crossing as traffic calming feature on approach to Greece Olympia High School.



Full Segment: 1

THE VALLEY

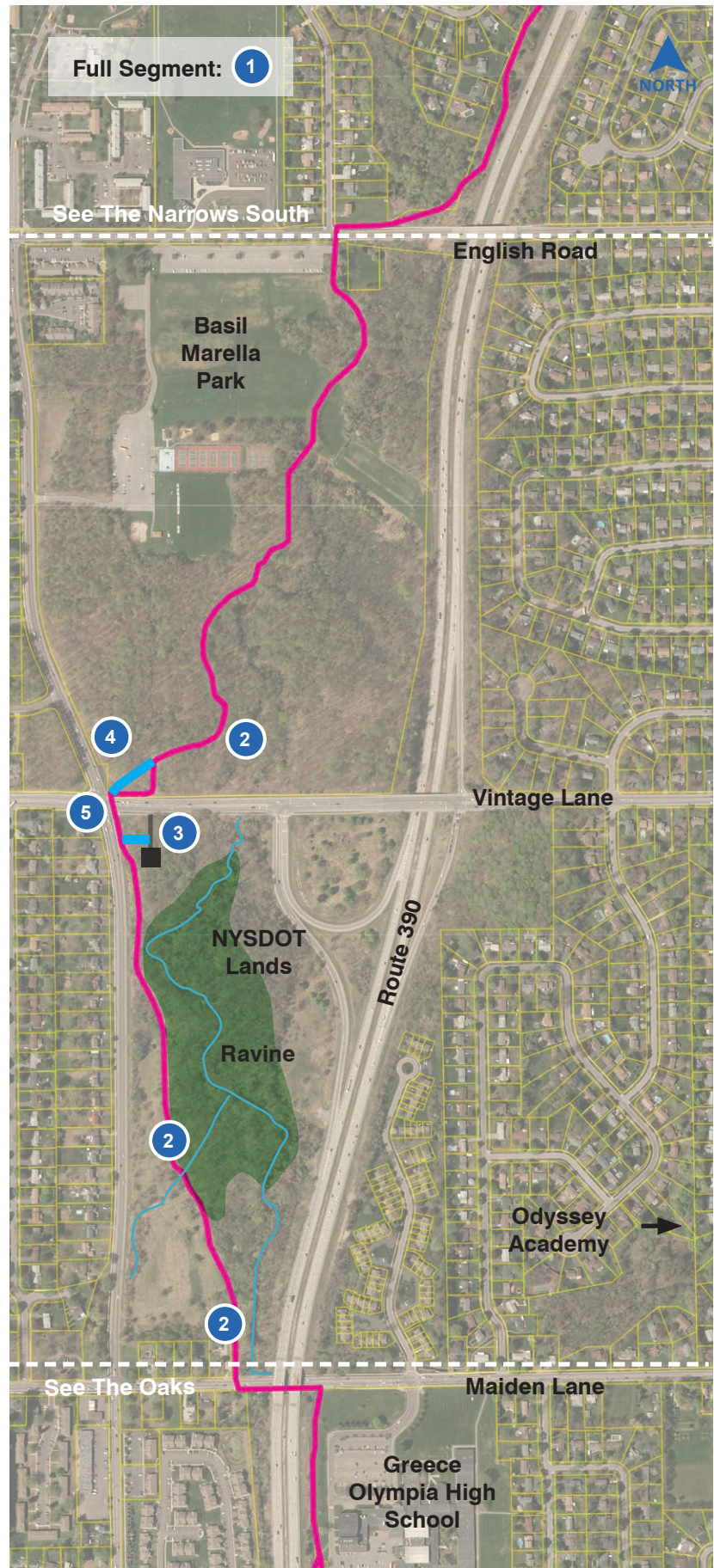
SAFETY & DESIGN STANDARDS RECOMMENDATIONS

— New Alignment

- 1 Reconstruct trail to meet AASHTO Shared-Use Trail design standards **(full segment, where feasible)**.
- 2 Reconstruction to address area with slopes in excess of 5%.
- 3 Potential vehicular parking area for trail access; shared drive access with cell-tower.
- 4 Trail realignment to eliminate side-path and improve sight lines.
- 5 Vintage Lane Basic Safety & Accessibility Enhancements package.

Vintage Lane Specific Measures

Upgrade pedestrian signs.



THE NARROWS SOUTH

SAFETY & DESIGN STANDARDS RECOMMENDATIONS

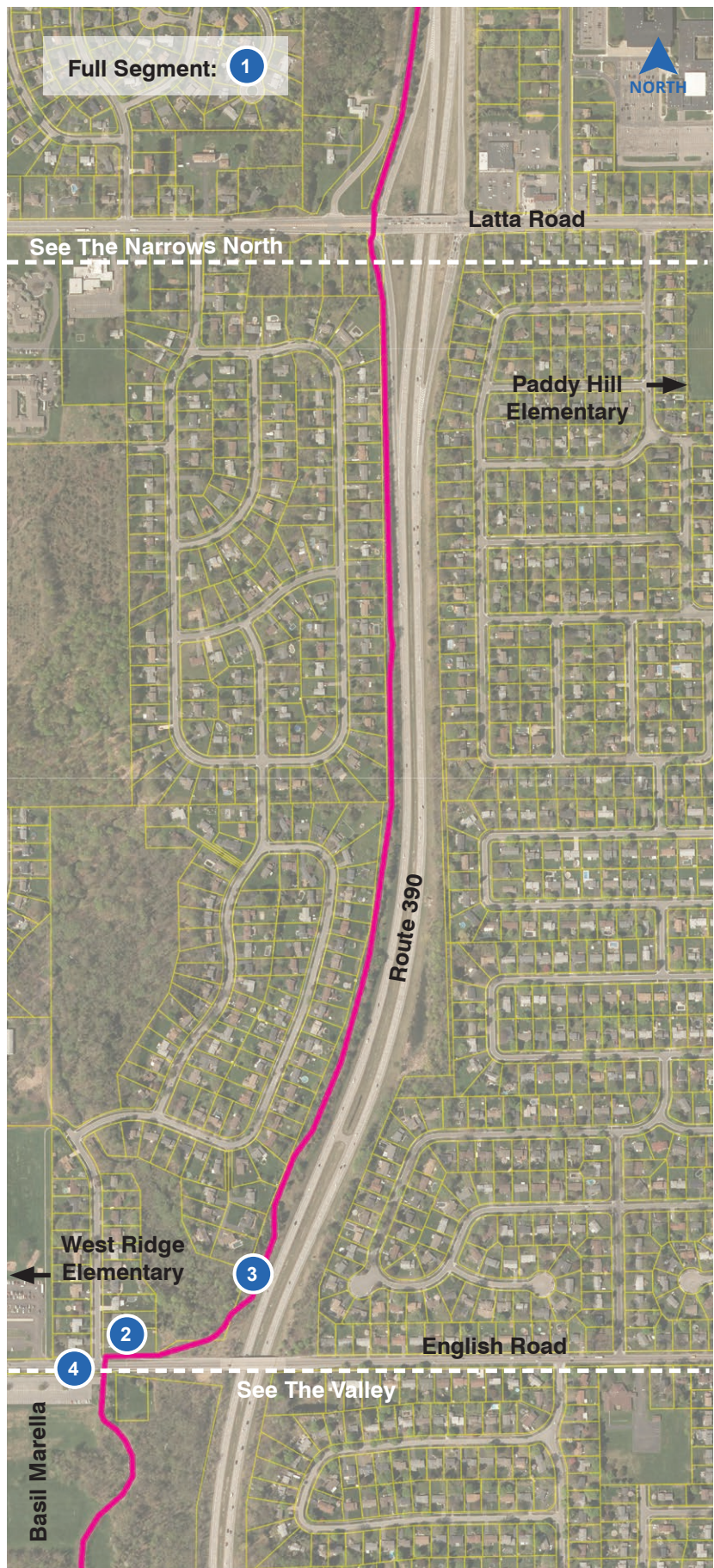
- 1 Reconstruct Route 390 trail to meet AASHTO Shared-Use Trail design standards (full segment, where feasible).
- 2 English Road side path reconstruction to meet AASHTO design standards.
- 3 Reconstruction should address area with slopes in excess of 5% if feasible.
- 4 English Road Basic Safety & Accessibility Enhancements package.

English Road Specific Measures

Provide blended transition curb ramp at east side of English / Jefreelind Road that aligns with crossing for pedestrians and bicyclists.

Eliminate curb ramp at west side of Jefreelind Road as it does not lead to another ramp or a road crossing

Highlight connectivity to adjacent RTS bus stop east of the trail on English Road.



THE NARROWS NORTH

SAFETY & DESIGN STANDARDS RECOMMENDATIONS

- 1 Reconstruct Route 390 trail to meet AASHTO Shared-Use Trail design standards (**full segment, where feasible**).
- 2 Latta Road Basic Safety & Accessibility Enhancements package.
- 3 Railing Safety Improvements on Route 390 Bridge over Round Pond Creek.
- 4 Trail realignment; provide pedestrian creek crossing separated pedestrian highway. (ALT)
- 5 Jane's Road 'Basic Safety & Accessibility Enhancements' package.
- 6 On-road connector trail safety improvements (390 Trail to LOSP Multi-use trail).
- 7 LOSP Bikeway route safety signage and pavement repair.

Latta Road Specific Measures

Add push-button activated Rapid Rectangular Flashing Beacons (RRFB) to multi-use trail crossing signage where crosswalk is unsignalized (slip lane).

Add color-contrasting raised median island to allow for pedestrian and bicycle refuge



MAINTENANCE & MANAGEMENT RECOMMENDATIONS

VEGETATION MANAGEMENT & CLEARANCES

The development and implementation of a comprehensive vegetation management strategy is recommended to establish and maintain vegetative clearances, improve safety and visual appearance, and increase the lifespan of the reconstructed trail. Initial vegetative clearing of the existing trail is also recommended and has been executed by Town staff prior to the completion of this study. Vegetation management should also include implementation of forest management practices to high value trees and woodlands within the corridor – which provide priceless appeal along the trail.

Clearances to vegetation should conform to or exceed AASHTO Shared Use Path standards wherever possible, including a minimum of 4 feet clearance to trail edges and 10 feet of overhead clearance (minimum 8 feet vertical clearance). Consideration should also be made for passage of emergency or utility maintenance vehicles, which may require more than 10 feet. Additional clearances to trees should be considered to further reduce potential for pavement root damage. Recommended tree clearances are described in Part 3.

SHORT-TERM HAZARD REMOVAL & SPOT REPAIR

Removal of pavement hazards and spot pavement repair of the existing trail pavement surface is recommended in the short-term to drastically increase usability. The quantity and severity of these hazards is extensive. Methods and scope of this recommendation vary based on timing of long-term trail reconstruction efforts and available staff or funding to complete the work. It is not cost effective to provide proper asphalt patch repair for all hazard areas. A more immediate, less costly, and temporary solution may be warranted, such as grinding raised areas down without new asphalt patching. This is not a long-term or durable solution but will improve conditions while funding acquisition and design for the larger reconstruction effort is in process. The objective of this recommendation is to reduce existing hazards rather than preserve the longevity of a trail that already requires major end-of-life rehabilitation.



The most severe raised pavement failures should be addressed in the near-term through temporary solutions to increase basic trail usability.

ROUTINE TRAIL AND PAVEMENT INSPECTION & MAINTENANCE PROGRAM

Routine trail and pavement inspection and maintenance should be conducted to ensure best long-term performance and lowest overall life-cycle costs of the trail. A long-term maintenance plan should be prepared that defines and schedules essential regular maintenance practices and identifies annual budget and staff to conduct

the program. Maintenance practices should include graffiti and trash removal, fencing repair, signage and furnishings maintenance, vegetative management, and preventative pavement maintenance and repair. Pavement maintenance considerations can be found in Part 3.

All trail features, including pavement markings and drainage issues, should be inspected on a regular basis as part of a comprehensive long term maintenance plan with budgets and staffing needs identified.



The Town of Greece has begun clearing much of the vegetative overgrowth shown here.



Maintenance should also include debris removal from pavement surfaces.

CLEARING FOR SCENIC QUALITY & VIEWS

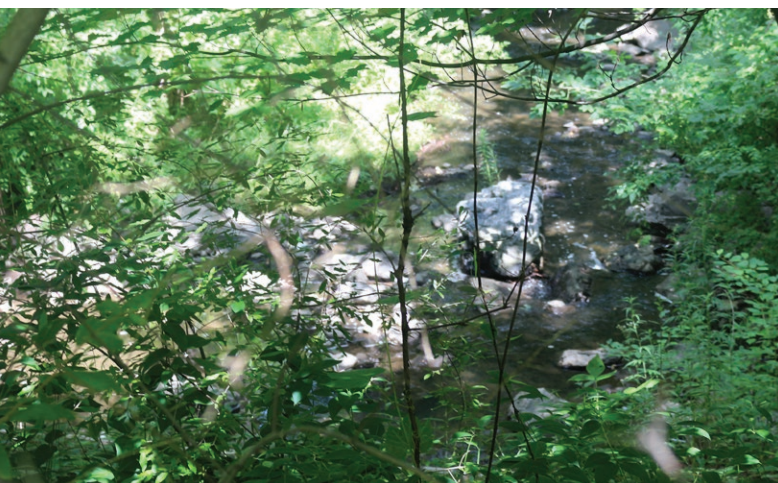
Selective vegetative management and clearing is recommended to create better visual relationships between the trail and adjacent scenic assets. Park and trail design for recreational enjoyment is enhanced by creating and managing specific views to natural and cultural assets. Creating openings in the wooded cover also adds visual and ecological diversity. The most cherished world-class parks focus as much on creating openings and views as preserving or planting trees, which generates valuable memorable experiences for users. The result is a more recognizable, admired, and pleasing

public space. Of course, healthy mature native trees should be preserved where possible, instead focusing on how to use these asset trees as framing devices at the edge of newly opened viewshed.

A few priority opportunity areas for enhanced scenic access are recommended. These include selective clearing along the boundary between commercial development near West Ridge Road (establish a more promenade-like trail experience and benefit commercial properties), and spot clearing at multiple locations for ravine overlooks and scenic views to Paddy Hill Creek.



Significant naturalistic portions of landscape along the trail should be used as unique assets, with special view corridors identified, preserved, and managed.



Selected views to Paddy Hill Creek should be opened up to create more significant visual connections.



The boundary between commercial properties and the trail should be rehabilitated to a more promenade-like experience, eliminating visual and physical barriers and benefitting both the trail and business.

THE OAKS

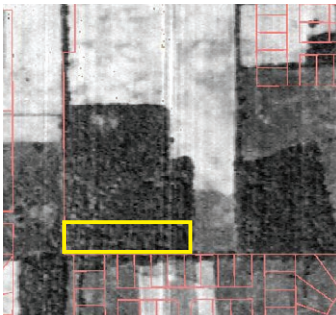
MAINTENANCE & MANAGEMENT RECOMMENDATIONS

- Side Path
 ||||| Vegetation Clearing

- 1 Vegetation management, tree removals and vegetative clearances (**full segment**).
- 2 Area of necessary short term patching and spot pavement repairs (tree roots, thermal cracking, raveling).
- 3 Strategic and owner-coordinated clearing for improved visual / physical access to businesses.
- 4 Specific woodland preservation and urban forest management, with invasive species removal in unique old growth forest patch.
- 5 Conduct a routine trail and pavement inspection and maintenance program.

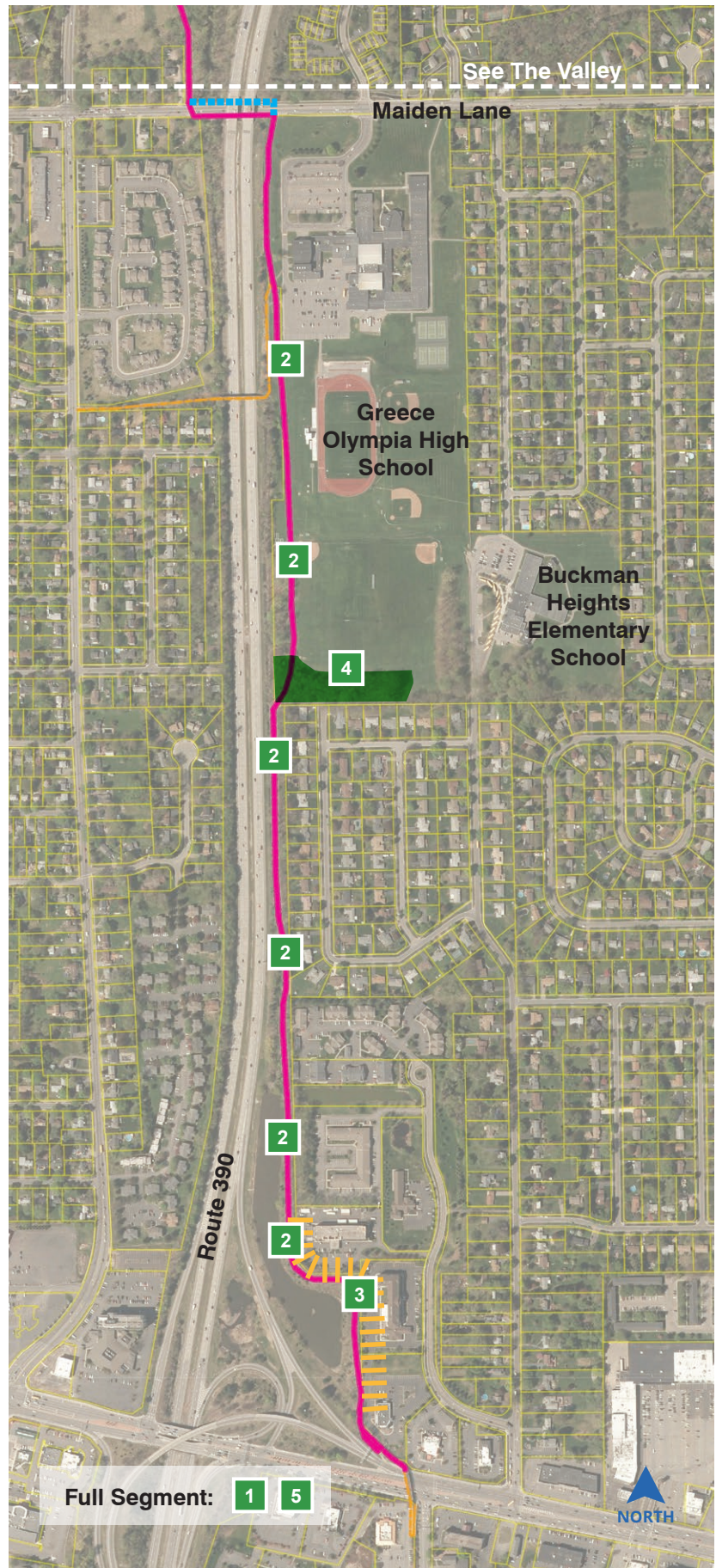


2020



1930

4



Full Segment: 1 5

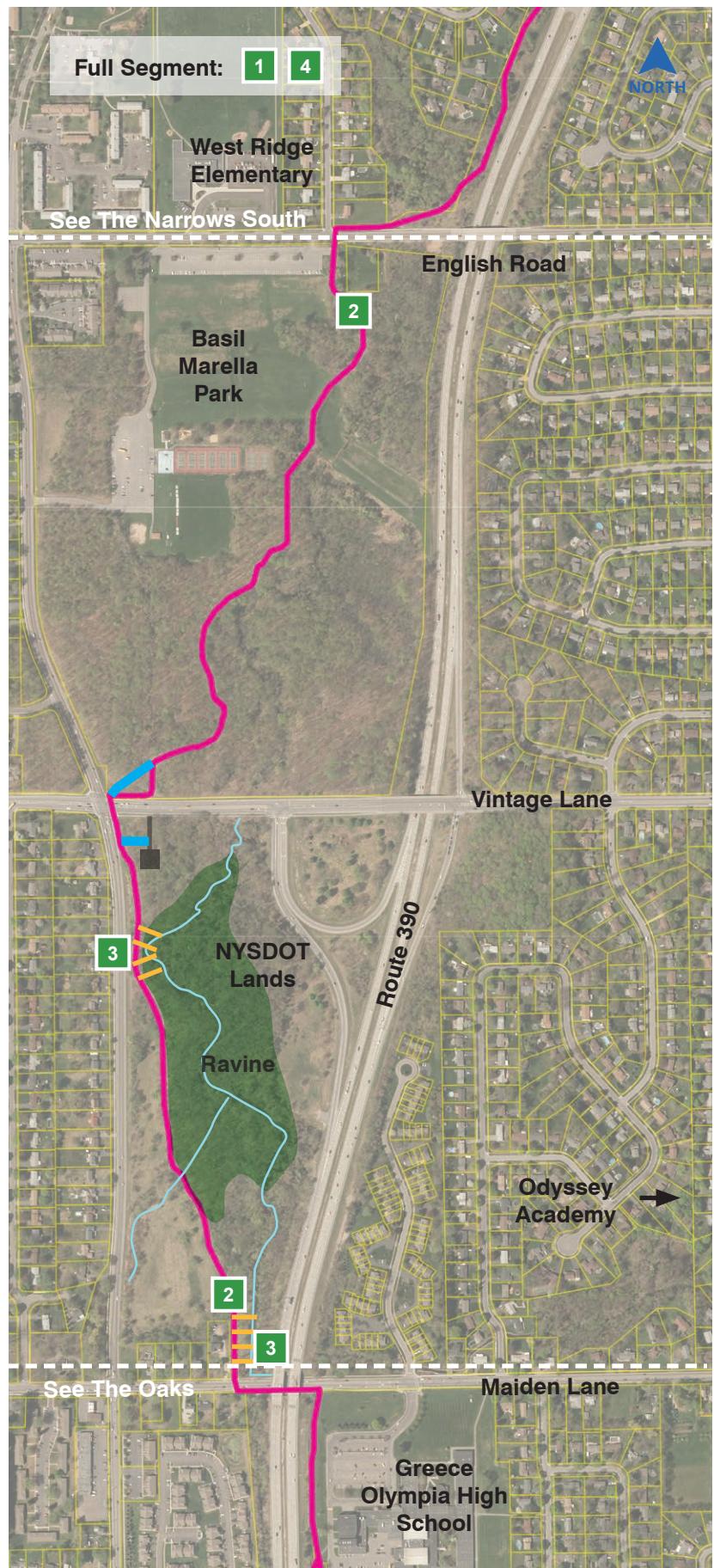


THE VALLEY

MAINTENANCE & MANAGEMENT RECOMMENDATIONS

- New Alignment
- ||||| Vegetation Clearing

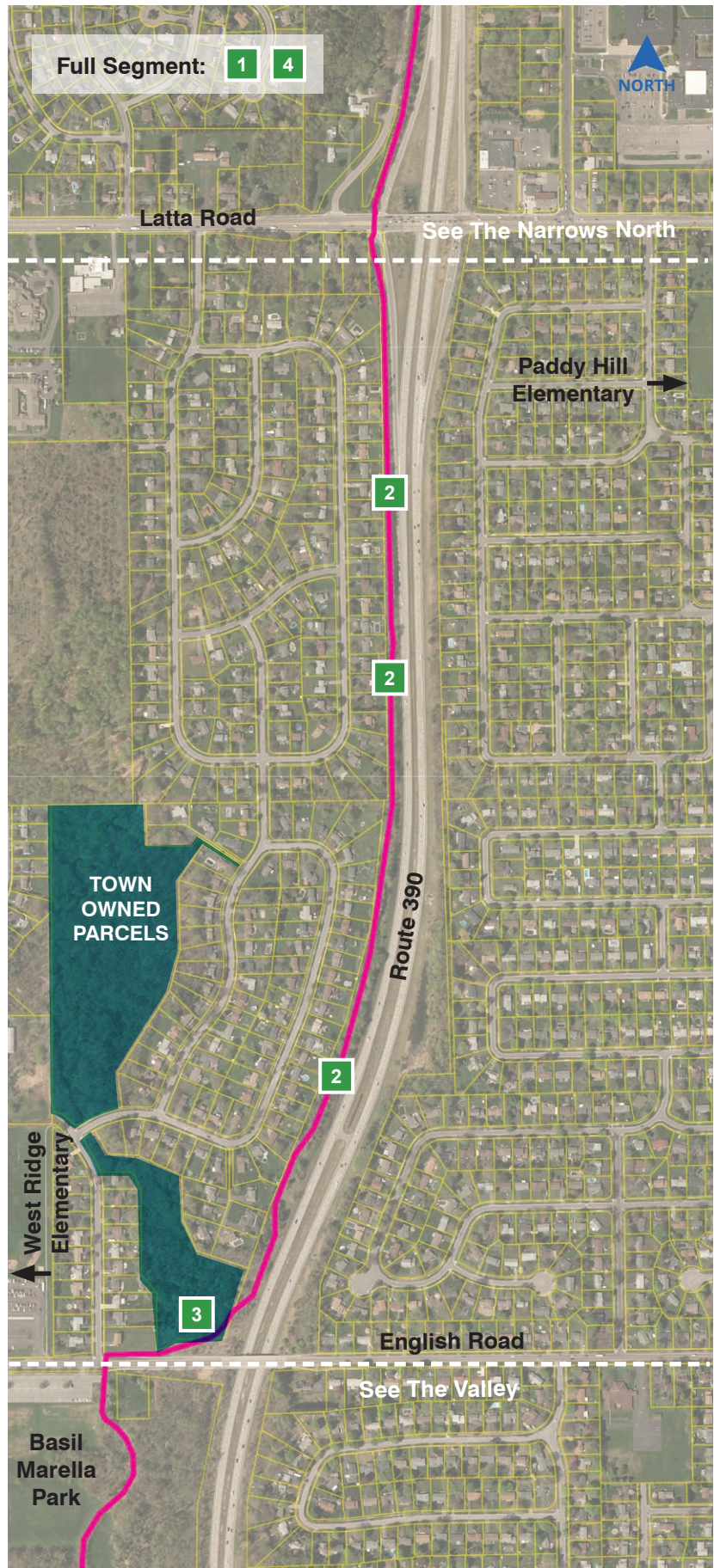
- 1** Vegetation management, tree removals and vegetative clearances **(full segment)**.
- 2** Area of necessary short term patching and spot pavement repairs (tree roots, thermal cracking, raveling).
- 3** Ravine edge strategic clearing for sight lines, scenic views.
- 3** Ravine edge strategic clearing for sight lines, scenic views.
- 4** Conduct a routine trail and pavement inspection and maintenance program **(full segment)**.



THE NARROWS SOUTH

MAINTENANCE & MANAGEMENT RECOMMENDATIONS

- 1** Vegetation management, tree removals and vegetative clearances (**full segment**).
- 2** Area of necessary short term patching and spot pavement repairs (tree roots, thermal cracking, raveling).
- 3** Paddy Hill Creek strategic clearing for sight lines, scenic views, invasive species removals.
- 4** Conduct a routine trail and pavement inspection and maintenance program (**full segment**).



THE NARROWS NORTH

MAINTENANCE & MANAGEMENT RECOMMENDATIONS

- 1 Vegetation management, tree removals and vegetative clearances **(full segment)**.
- 2 Area of necessary short term patching and spot pavement repairs (tree roots, thermal cracking, raveling).
- 3 LOSP Bikeway route vegetation management (NYSDOT).
- 4 Conduct a routine trail and pavement inspection and maintenance program **(full segment)**.



WAYFINDING & USER AMENITIES RECOMMENDATIONS

ENHANCED COMMUNITY CONNECTIONS

Due to the relatively low quantity of trail access points, it is recommended that new trail access is created from neighborhoods, commercial zones, and schools wherever possible. Specific recommendations for new access points include West Ridge Road commercial areas and Buckman Heights Elementary School. Similarly, new access points from the trail to adjacent improved public spaces should be created, such as the NYSDOT and Town owned parcels surrounding portions of Paddy

Hill Creek which already contain unimproved hiking trails. Additional areas for public parking access to the trail should also be identified, including a shared parking and access arrangement with the newly constructed cell tower south of Vintage Lane. Shared parking use at utility access points has been successful along trails in other local communities.



The future Hojack Line shared user trail provides a link from the 390 Trail to the Village of Hilton.



The community has created their own access point in this area near West Ridge Road. It highlights the need and opportunity to create new formal access points.

TRAILHEAD IMPROVEMENTS

Reconstruction should add and enhance trailheads at strategic areas to improve wayfinding and orientation, user comfort, and community trail identity. Trailheads act as an interface between trails and the adjacent community and should be purposefully designed to provide amenities such as directional signage, informational kiosks, seating, bike repair stations, trash receptacles, landscaping, and other features that serve a variety of trail users. Design of trailheads should also pique curiosity and celebrate the trail character and the culture of a place through interpretive signage, historic markers, and public art.

Newly proposed or enhanced trailhead location recommendations include enhancements to the southern trail terminus (West Ridge Road), Greece Olympia High School pedestrian bridge trail intersection, the northeast corner of Vintage Lane and Fetzner Road, Basil Marella Park at English Road, and enhancements to the existing trailhead at Janes Road.



Concept illustration of recommended trailhead at Vintage Lane, designed in conjunction with a minor trail realignment.



Trailheads should include a variety of safety improvements and amenities.



Vintage Lane trailhead concept-level plan.

TRAIL RESTORATION RECOMMENDATIONS



Illustration of concept crosswalk and trailhead improvements at English Road.



English Road concept-level trailhead plan.



illustration showing concept trailhead design at English Road. The trailhead should include user amenities, wayfinding devices and support access to other transit opportunities as well and connections to Basil Marella Park.

ORIENTATION KIOSK / IDENTITY BRANDING

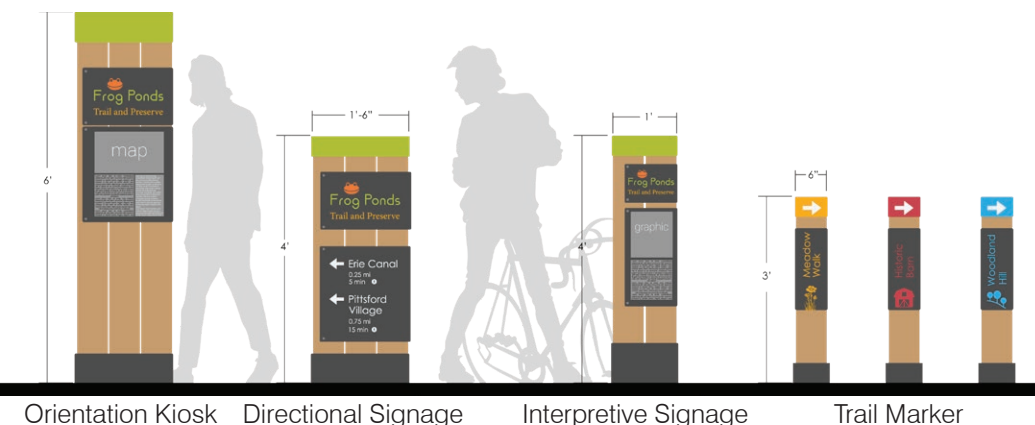
Orientation kiosks should be included at trailheads or major junctions where higher volumes of traffic enter and exit the trail. Orientation kiosks should include mapping or other orientation devices, provide information on the trail route and nearby community destinations, and notify users about special hazards, emergency contact procedures, or other municipal or landowner regulations. Orientation kiosks represent what the trail has to offer to the community and not only orient users to the trail route and nearby destinations, but also set expectations about trail conditions. Careful consideration should be given to design detailing

and materials durability so that this infrastructure represents the trail system well for many years. Kiosks and other signage should also be consistent in design throughout the trail, forming a clearly identifiable signage family.

Identity branding may also be incorporated into all forms of signage. It is a particularly useful way to humanize communication, increase trail literacy, and create meaningful connections to community culture or history.



Example orientation kiosk with mapping and interpretive signage at a trailhead for the Brighton Brickyard Trail.



Example of trail identity branding concepts and signage for the Frog Ponds Trail within the Town of Pittsford, NY.



DIRECTIONAL SIGNAGE

Directional signage helps ensure safety and makes the trail experience more enjoyable. Regulatory and warning signs should follow the Federal Highway Administration's Manual on Uniform Traffic Control Devices. However, directional and wayfinding signage provides an opportunity to reinforce trail identity and branding. In all cases, signage and markings should be clear, concise, and consistent throughout the corridor. Directional signage may take the form of distance markers, trail direction arrows, trail and spur naming / logos, and also benefits from clear display of distances or walking times to destinations.

Interpretive signage informing the community about natural communities at the Brighton Brickyard Trail, Brighton NY.



INTERPRETIVE SIGNAGE

Interpretive signs aim to educate trail users about local culture, nearby ecology and nature, or other unique site histories that provide a richer user experience. The National Park Service and US Forest Service provides basic guidelines on ways to design and construct interpretive signage, including recommendations on how to communicate information in an appealing and digestible way and general layout best practices. Recommended interpretive opportunities developed from this study include the old-growth woodland at the south end of Greece Olympia High School, the former farmhouse and agricultural orchard landscape (orchard rows can be seen within the Basil Marella Park micro-topography), and Paddy Hill Creek.



Example of clear and legible wayfinding mapping.



Trail branding and directional signage example for the Johnson City Rail Trail.

GENERAL COMFORT & RECREATIONAL IMPROVEMENTS

Additional general recreational and comfort recommendations include the rehabilitation of fitness trail stations within Basil Marella Park and providing new seating opportunities dispersed throughout the corridor (outside of trailheads). Intermittent seating along long stretches of trail provides an opportunity for rest and is especially important for trail users with limited stamina or mobility impairments. Drinking fountains are also a common feature along trail networks and may be appropriate where existing utility services allow.



Example of views through opened vegetation at a natural overlook point.



Example of exterior fitness machines on a fitness trail.



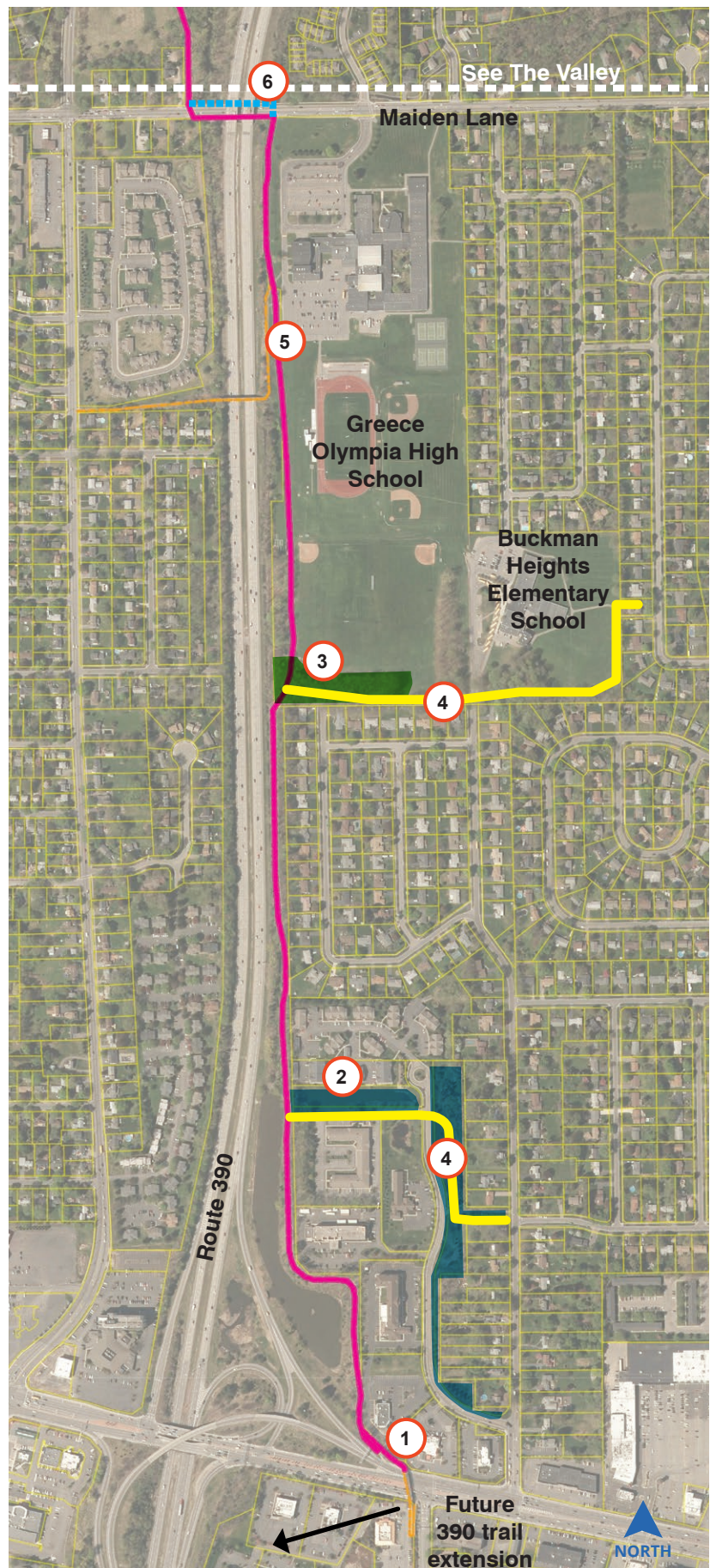
A wide shared use trail bridge over Buckman Creek in Brighton, NY.

THE OAKS

WAYFINDING & USER AMENITIES RECOMMENDATIONS

- Side Path
- Secondary Trail
- Town Property

- 1** Trailhead improvements at trail and pedestrian bridge / Ridge Road junction include seating, orientation kiosk, trail identification improvements, and connections to adjacent businesses.
- 2** Directional signage and enhanced community connections to expand community trail use with access to adjacent businesses and neighborhoods (hospitality / tourism), provide orientation signage at junctions.
- 3** Directional and interpretive signage for orientation and wayfinding at new path junction, include interpretive signage about old growth woodland.
- 4** Enhance community connection with secondary path development to adjacent residential neighborhood.
- 5** Trailhead improvements at pedestrian bridge intersection, including seating, orientation kiosk, and trail identification enhancements.
- 6** Directional signage at north and south sides of Maiden Lane with new alignment.

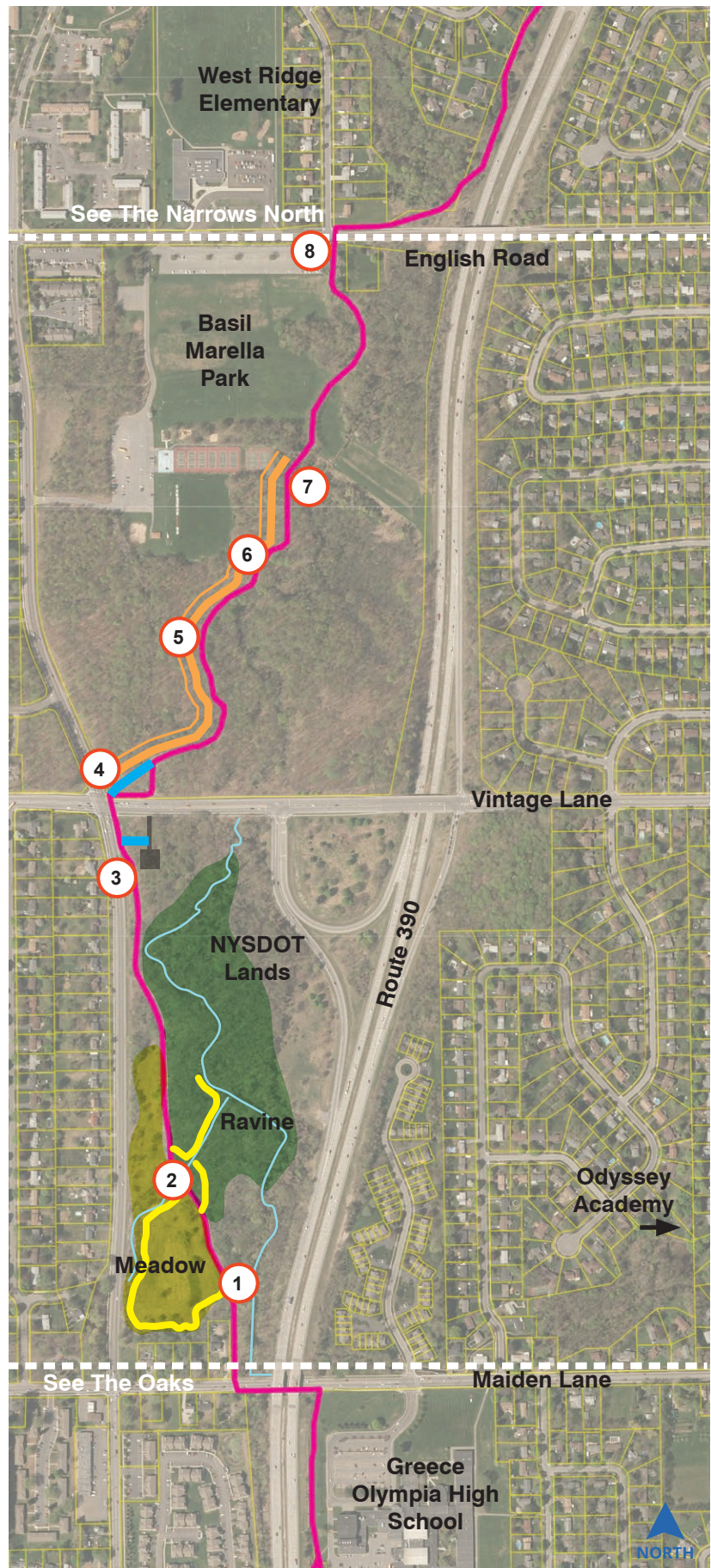


THE VALLEY

WAYFINDING & USER AMENITIES RECOMMENDATIONS

- New Alignment
- Secondary Trail
- Fitness Trail

- 1** Interpretive signage for former farmhouse and orchards site, historical land-use education.
- 2** Directional signage for hiking trail connections throughout NYSDOT ravine and meadow.
- 3** Directional signage for orientation and wayfinding south side of Vintage Lane.
- 4** Trailhead improvements at Basil Marella Park entrance from Vintage Lane, including seating, orientation kiosk, and trail identification enhancements.
- 5** Fitness trail rehabilitation and enhancements, including replacing existing stations and new trail identity branding.
- 6** Overlooks and educational interpretive signage (forest and creek) and sitting area with views to creek.
- 7** Directional signage for connection to existing trails in Basil Marella Park.
- 8** Trailhead improvements at Basil Marella Park including seating, orientation kiosk, and trail identification enhancements.

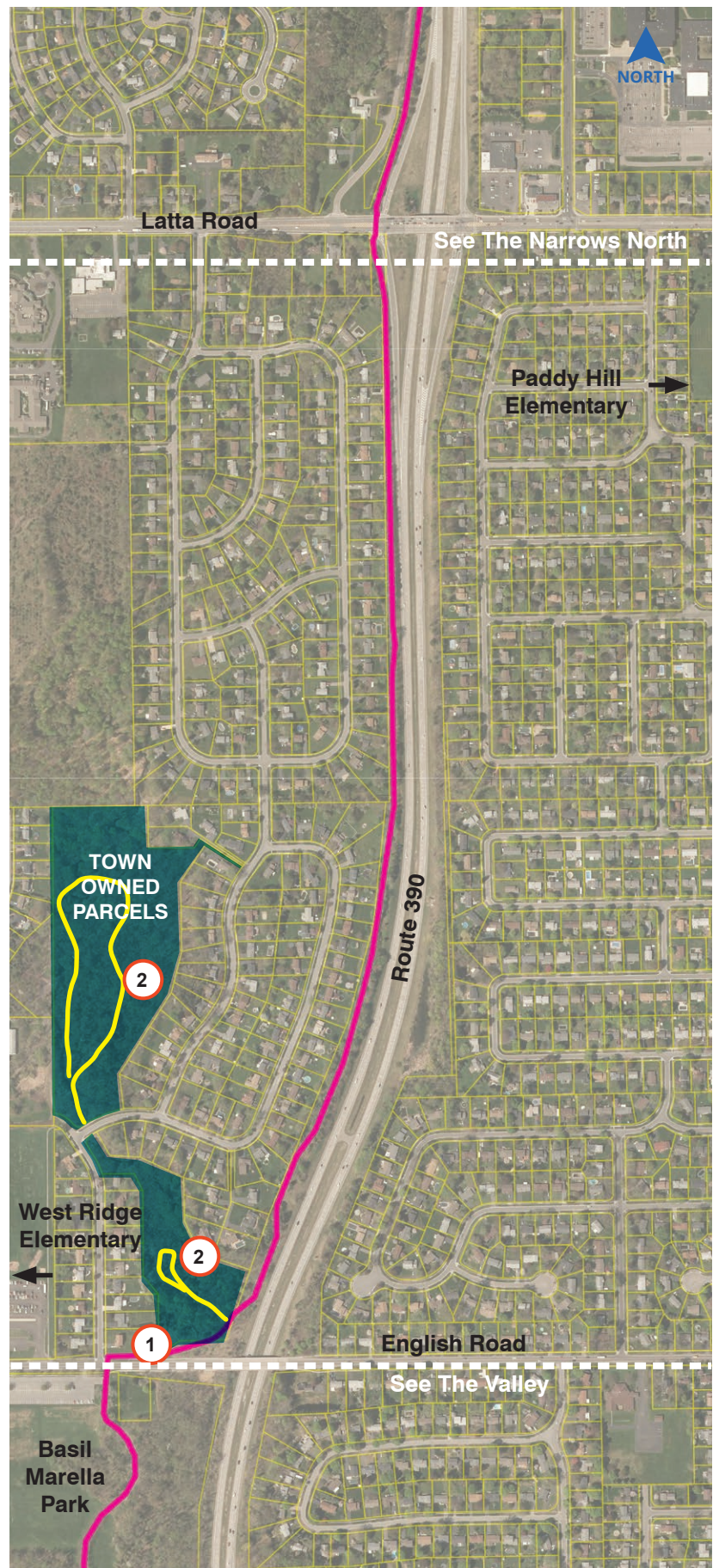


THE NARROWS SOUTH

WAYFINDING & USER AMENITIES RECOMMENDATIONS

- Secondary Trail
- Town Property

- 1** Directional signage; north of English Road (entering off-road segment).
- 2** Potential nature preserve opportunity; side trails, interpretive signage, and additional neighborhood connections.



THE NARROWS NORTH

WAYFINDING & USER AMENITIES RECOMMENDATIONS

- Trail Connection
- Town Property

- 1** Directional signage, Latta Road entry points.
- 2** Community connection, senior housing, staff use.
- 3** Directional signage at future Hojack Trail connection.
- 4** Janes Road trailhead improvements including seating, orientation kiosk, and trail identification enhancements.
- 5** Directional signage at LOSP MUT trailhead.
- 6** Potential trailhead expansion area; with expanded vehicular parking, dog park, nature trails, or other amenities.
- 7** Rural viewshed preservation, barn and horse properties

- LOSP Bikeway
- On road access to LOSP Multi-use Trail
- LOSP Multi-use Trail



IMPLEMENTATION

IMPLEMENTATION STRATEGY

Implementation relies heavily on the timing and acquisition of available funding. Potential funding sources are noted in this section. However, a basic recommended strategy proposes to drastically increase trail usability in the short-term and provide funding flexibility through prioritization of the future recommendations. This includes three categories:

Immediate Needs:

Improvements that address user safety and comfort but are not long-term or permanent trail improvement solutions. These recommendations solve immediate public concerns and considerably increase trail usability in the short-term.

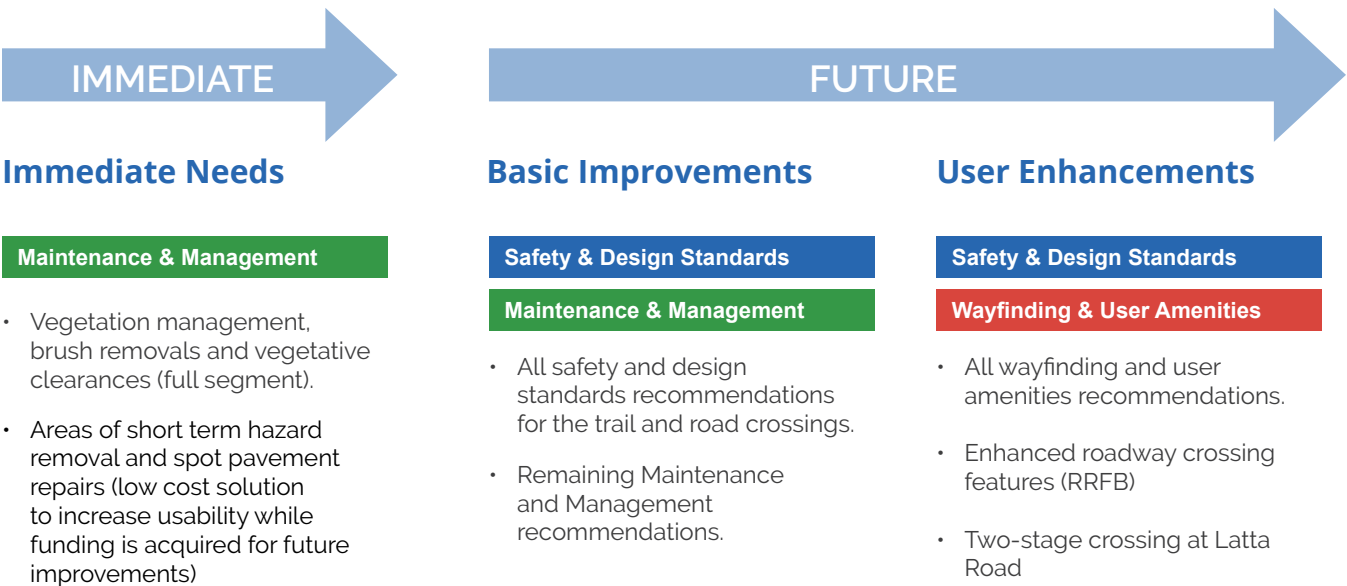
Future Basic Improvements:

Improvements that bring the trail up to current shared use trail design standards, improve

accessibility, and realign the trail in select locations to improve access and safety. These recommendations provide a minimum scope of improvement and prioritize basic trail safety above all other needs. This may be undertaken in phases as funding allows, with an initial focus on the most severely distressed segments.

Future User Enhancements:

These improvements will enrich the user experience, contributing to easier wayfinding and orientation, greater community connectivity, enhance tourism, programming, and recreational opportunities. They also add recommended minor safety measures beyond those recommended within local Pedestrian Safety Action Plans (PASP). This may be undertaken in phases as funding allows and should generally be implemented along with basic improvements where possible.



RESTORATION OPINION OF COSTS

An order-of-magnitude level opinion of probable construction costs was prepared to assist with funding acquisition. Costs assume NYSDOT construction standards, M/WBE participation, prevailing wage rates, and include work zone traffic control, mobilization, survey, erosion and sediment control, design services, construction phase design support, construction inspection, and a **20% planning-level construction contingency**.

Costs are categorized by **Basic Improvements** and **User Enhancements Costs** per the recommended

implementation strategy. Costs for **Immediate Needs** (pavement hazard removal) are not included. These near-term usability improvements are being explored by the Town of Greece outside of the larger end-of-life restoration project.

Costs are based on 2020 pricing but also include price inflation at 2% per year for an anticipated minimum 3 years to account for acquisition of funding. Potential unforeseen costs for ROW acquisition, utility relocation, and environmental mitigation are not included. Detailed costs are included in the appendix.

ORDER OF MAGNITUDE OPINION OF CONSTRUCTION COSTS

BASIC IMPROVEMENTS

The Oaks	\$1,156,000
The Valley	\$1,003,000
The Narrows South	\$954,000
The Narrows North	\$861,000
Road Crossings	\$390,000
MPOT, Survey, Mobilization	\$502,000

Construction Subtotal \$4,866,000

Design (10%)	\$486,600
Construction Inspection (10%)	\$486,600
Construction Contingency (20%)	\$973,200
Inflation (~2%/yr, 3 years)	\$380,000

TOTAL \$7,192,400

USER ENHANCEMENTS

The Oaks	\$94,000
The Valley	\$333,000
The Narrows South	\$24,000
The Narrows North	\$82,000
Road Crossings	\$196,000
MPOT, Survey, Mobilization	\$83,000

Construction Subtotal \$812,000

Design (10%)	\$81,200
Construction Inspection (10%)	\$81,200
Construction Contingency (20%)	\$162,400
Inflation (~2%/yr, 3 years)	\$63,000

TOTAL \$1,199,800

TOTAL BASIC + ENHANCEMENTS TRAIL RESTORATION \$8,392,200

FUNDING SOURCES

The implementation of proposed improvements along the 390 Trail corridor will require funding assistance from a variety of sources at the local, state and federal level. The table below provides a summary of potential financial resources potential sources that can be leveraged to facilitate implementation of the recommendations in this study. It should be noted that funding sources vary annually; therefore, the Town of Greece and project partners should monitor their availability on an annual basis. There may also be other non-traditional sources of funds that local officials should identify and pursue.

The Town can take advantage of the New York State's Consolidated Funding Application (CFA) to implement the active transportation recommendations in this study. The CFA is a streamlined resource where applicants can access multiple funding assistance programs made through state agencies. The availability of CFA funding and project types also varies year to year.

Many of these sources noted below require local match funding; therefore local funding should be evaluated and identified in annual operating budgets, as appropriate.

PROGRAM	DESCRIPTION	PROJECT TYPES	AGENCY	NOTES
Transportation Alternatives Program / Air Quality Improvement Program (TAP/ CMAQ)	Used to support bicycle, pedestrian, multi-use path and non-motorized transportation- related projects. Projects must be related to surface transportation.	Construction of pedestrian and bicycle facilities, recreational trails, and safe routes to schools, as well as community improvements such as historic preservation and projects that reduce congestion and gas emissions.	Federally funded program, administered NYSDOT.	Application timing varies year to year. Up to 80% of total project costs eligible, with 20% local share.
Green Innovation Grant Program (GIGP)	Provides grants on a competitive basis to projects that improve water quality and implement green infrastructure in New York State.	A range of green infrastructure-focused installation projects, including the installation of permeable pavements, bioretention and stormwater street trees.	Funded and overseen by the NYS Environmental Facilities Corporation (EFC).	Typically funded through the NYS CFA process. Covers up to 75% to 90% of total project costs.
Recreation Trails Program (RTP)	Provides funds to develop and maintain recreational trails and trail-related facilities for both nonmotorized and motorized recreational trail uses. Funded projects must be identified in, or further a specific goal of, the Statewide Comprehensive Outdoor Recreation Plan (SCORP).	Funds the maintenance and restoration of existing trails, the purchase and lease of trail construction equipment, acquisition of easements, construction of new trails and assessments.	An assistance program of the U.S. DOT's Federal Highway Administration (FHWA). The RTP is administered by the Office of Parks, Recreation and Historic Preservation (OPRHP).	Funding is through the states' CFA process. Specific guidelines provided in association with each grant cycle.

PROGRAM	DESCRIPTION	PROJECT TYPES	AGENCY	NOTES
Environmental Protection Fund (EPF)	Funding for a range of planning and capital projects that protect the environment and enhance local communities.	Fundable projects cover a range of parks, open space, historic preservation and waterfront revitalization activities.	Multiple state agencies administer funding programs through the EPF, including DOS, DEC and OPRHP.	Funding is through the states' CFA process. Specific guidelines provided in association with each grant cycle.
Empire State Development (ESD) / Market New York	Promotes efforts that strengthen tourism in New York State, with an emphasis on projects that "create family memories through activities including but not limited to outdoor recreation, historic sites and museums, food and drink, festivals and the performing arts."	Tourism capital costs eligible under the program include acquisition or leasing of land, buildings, machinery and / or equipment; pre-development costs; remediation costs; improve accessibility services; purchase of equipment and/or event amenities (ex. permanent staging, fixed assets, etc.); and new construction, renovation or leasehold improvements.	Funding is offered and administered through Empire State Development (ESD).	Funding is through the states' CFA process. Specific guidelines provided in association with each grant cycle.
Consolidated Local Street and Highway Improvement Program (CHIPS)	Funds support the construction and repair of highways, bridges and highway railroad crossings, and other facilities not in the State highway system.	Funds can be used for resurfacing, shoulder improvements, new drainage systems, sidewalk improvements, traffic calming installations, and bus shelters.	Funding is administered through the NYS DOT.	Appropriations are defined annually.
Surface Transportation Block Grant program (STBG)	The Surface Transportation Block Grant program (STBG) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.	Funds can be used for transportation alternatives and recreational trail projects.	Funding is provided through the US Department of Transportation. Program is competitive at national level.	Available funding varies.
Ralph C. Wilson Jr. Foundation, Parks and Trails Initiative	Funding to make connections and eliminate gaps in regional trail systems, with some funding earmarked for future maintenance and sustainability of trail assets.	Trail enhancements, placemaking, trail extensions and amenities and other projects - including green infrastructure - which promote active lifestyles and meet the goals and objectives of the foundation.	Projects are reviewed and funded by the Foundation.	On-going application process, via the Foundation website. Requires local match and contribution.