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BYER PLANNING

GREENWICH BIKE AND PEDESTRIAN CONNECTIVITY IMPROVEMENTS

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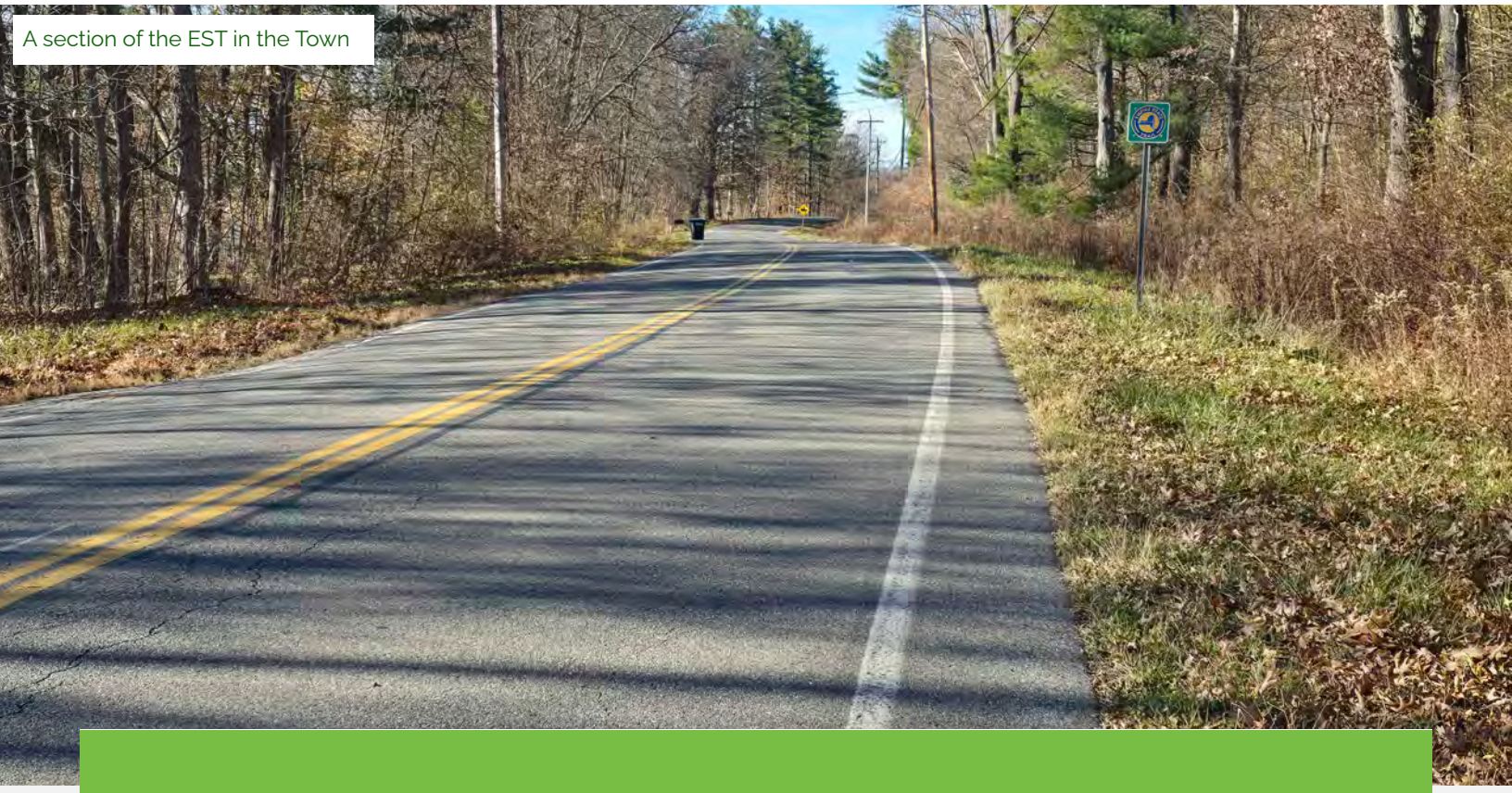


A section of the EST in the Town

INTRODUCTION

The Town and Village of Greenwich Connectivity Plan provides a long-term vision for improving bicycle and pedestrian connections. The Connectivity Plan is a direct outcome of the 2023 Town and Village Comprehensive Plan, which identified the importance of improving pedestrian and bicycle connectivity. The Greenwich Connectivity Plan was developed with the support of Adirondack-Glens Falls Transportation Council (AGFTC) funding.

Improving pedestrian and bicycle connectivity will allow residents and visitors alike to better capitalize on the communities' amenities. Safer connections and improved signage will link Greenwich's diverse parks, historic hamlets, community centers, and downtown core. Clear connections between the Empire State Trail and the rest of the Town and Village will support the local economy. Long-term alternate use of underutilized railway corridors will create safe, off-road connections that highlight the community's history and landscape.

THE PLANNING PROCESS

The planning process for this project was guided by a dedicated committee that led efforts to assess existing conditions, gather public input, and develop a comprehensive connectivity strategy. The process followed a structured timeline, beginning with a review of existing conditions, which analyzed land use and bicycle/pedestrian conditions to identify opportunities for improvement. Public outreach played a crucial role, with engagement efforts such as an interactive web map and community meetings used to collect feedback on local needs and priorities. Using this input, the committee worked on system development, identifying potential routes and treatments to enhance bicycle and pedestrian connectivity. Finally, priority projects were selected based on feasibility, demand, and safety considerations, ensuring that recommendations align with community goals and long-term mobility improvements.

PROJECT ADVISORY COMMITTEE

Jim Nolan, Town of Greenwich Supervisor
Amanda Hurley, Village of Greenwich Mayor
Audrey Burneson, NYS Department of Transportation
Pamela Landi, Washington County Planning
Jack Mance, A/GFTC
Pamela Fuller, Greenwich resident
Teri Ptacek, Greenwich resident

Main Street in the Village

EXISTING CONDITIONS

The existing conditions highlight the need for improved bicycle and pedestrian connectivity in Greenwich.

While the Village has a network of sidewalks that aid connectivity, most are not fully ADA-accessible and require upgrades to improve accessibility and safety. The Empire State Trail and State Bicycle Route 9 provide existing cycling infrastructure, but additional connections are needed to enhance access to local amenities.

High-traffic routes and intersections, particularly along State Route 29 and Main Street, present safety concerns due to high vehicle speeds and crash data indicating areas needing attention. Land ownership considerations show that most land is privately held, requiring coordination for off-road infrastructure.

Additionally, road slopes vary throughout the Town, influencing route feasibility for cyclists and pedestrians. These factors helped guide the planning and prioritization of connectivity improvements.

The full existing conditions memo can be found in the appendix.

A pedestrian crossing at the Rte 29/40 roundabout in the Town


ADA non-compliant sidewalks in the Village


Multimodal trail connecting to Hudson Crossing Park

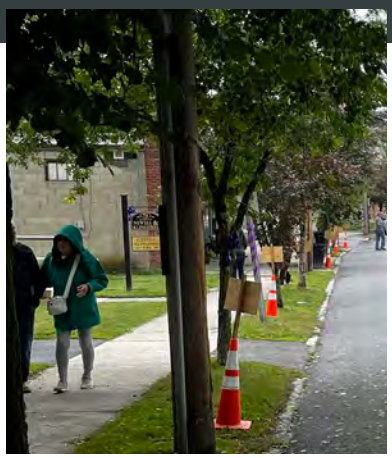
PUBLIC ENGAGEMENT

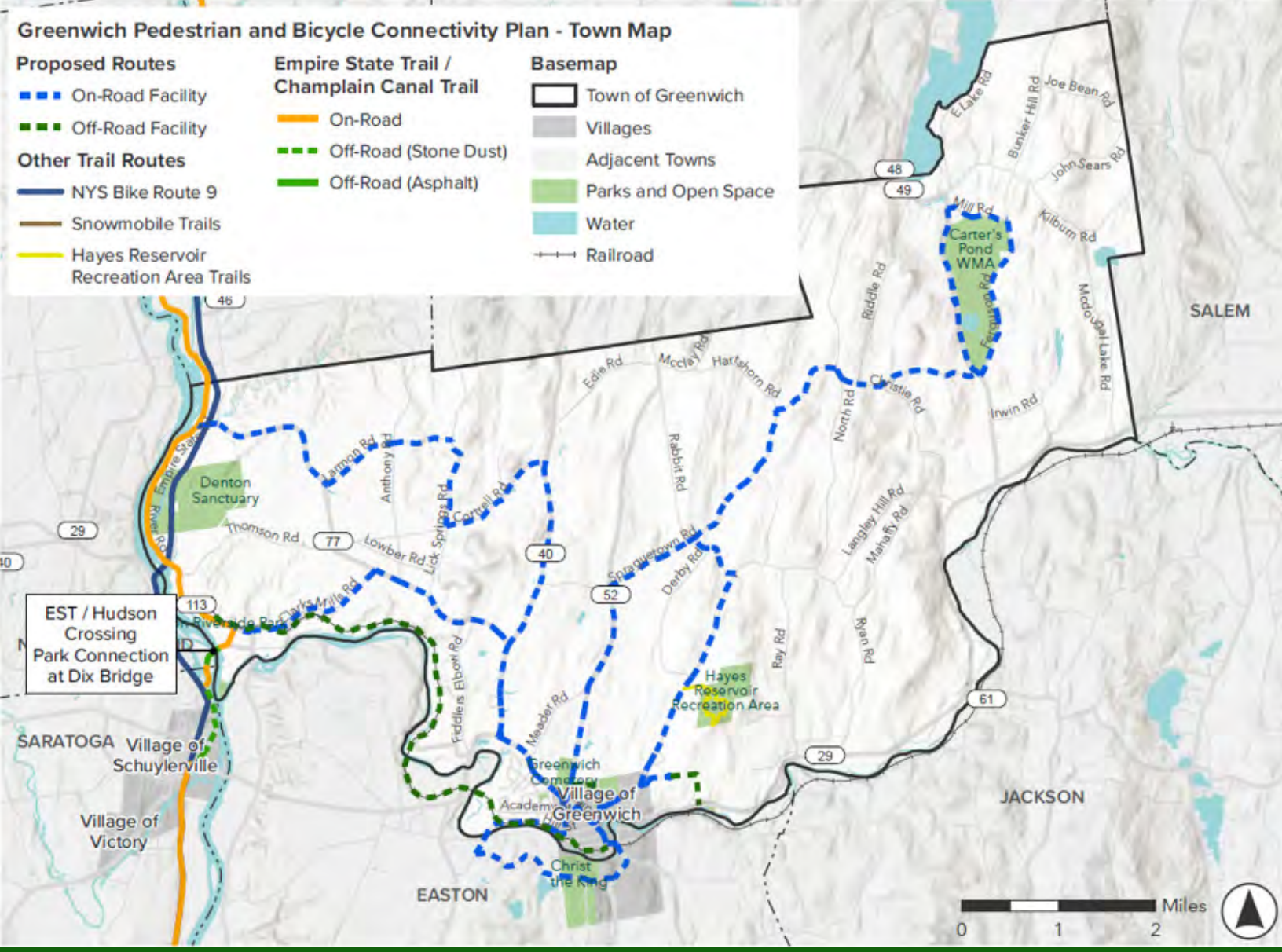
Public engagement played a critical role in shaping this plan by identifying key community priorities and infrastructure needs. An interactive web map gathered 75 location-based contributions and 85 comments from 25 unique users, and suggestions emphasized the need for bike racks, crosswalks, sidewalk improvements, flashing pedestrian signage, and traffic calming measures throughout the Village and Town.

Other outreach efforts, including press releases, online media content, and local flyers, helped drive participation. Additionally, an in-person engagement component featured interactive boards at the Greenwich Library and Town and Village Halls, where residents could mark maps and complete a written survey. While participation varied for each type of engagement, responses consistently emphasized the need for safer, more accessible, and better-connected walking and biking routes. Safety and accessibility were top concerns, with a strong interest in expanded pathways, improved sidewalks, and dedicated cycling infrastructure. These insights guided recommendations for future pedestrian and bicycle improvements in Greenwich and helped to further prioritize projects.

FINAL PUBLIC ENGAGEMENT

Once recommendations were developed based on guidance from the public and committee, the draft concepts were presented to the public for final feedback. A video explaining the different concepts was developed and participants completed a survey to indicate their thoughts, and preferences. Generally, when asked whether the recommended improvements would encourage them to bike or walk more in the Town and Village, all said yes or maybe, with the majority choosing yes. The top proirity identified by the public in the survey was a rail to trail connection to the Empire State Trail, but overall, responses were very positive, higlighting that the concepts could support improved safety, access to key amenities for residents and further encourage walking and biking in the community.





Connectivity Plan

The Connectivity Plan for the Town and Village of Greenwich aims to enhance bicycle and pedestrian access by linking key destinations, including the Empire State Trail, the Village center, and Hudson Crossing Park. Existing infrastructure consists of both on- and off-road bike facilities, but gaps remain that limit safe and continuous connections.

The map above highlights existing greenspaces and proposed trails and facilities identified in previous studies, including the Empire State Trail and State Bicycle Route 9. The Empire State Trail is a 750-mile route stretching north-south from New York City to Rouses Point on the New York-Quebec border and east-west from Albany to Buffalo. It consists of a mix of on- and off-road trails with varying surface types. The State Bicycle Route 9 is a 345-mile signed, on-road bicycle route that follows a similar north-south alignment from New York City to Rouses Point. These two routes run parallel for much of their length, serving as key regional cycling corridors.

A primary focus of the Connectivity Plan is filling in gaps within the existing network to create a safer, more seamless system for recreational cyclists and other users. By improving infrastructure and addressing missing connections, the plan enhances access to local businesses, parks, and community spaces, fostering a more bike-friendly and well-connected community for residents and visitors alike.

PRIORITY IMPROVEMENTS

Three priority improvement areas were identified with the committee and advanced to concept level design. This section provides a description of each of the recommended improvements. Priority numbers one through three are only used to identify the list and do not imply preference or level of importance of each priorty.

PRIORITY 1: EMPIRE STATE TRAIL (EST) CONNECTIONS

Priority 1 encompasses opportunities to improve bicycle connections between the Village and the Empire State Trail, and presents an opportunity to reuse a currently inactive section of railroad within the town for residents and visitors. Both on-road and off-road opportunities were explored. The Empire State Trail (EST) is a 750-mile trail network connecting people to areas all throughout New York State.

Due to high traffic volume and speed on the road network, facilities such as separated bike lanes or shared-use paths are recommended. Both of these options separate cyclists from vehicle traffic and create infrastructure that's safest and most effective for users.

The conversion of underutilized sections of the Battenkill Railroad to a trail was identified by the Town and Village as a priority due to its proximity to the Empire State Trail and great potential for recreational use by residents and visitors for biking, walking, and jogging. The Town and Village have initiated contact in the past with the rail operator, and the non-profit organization responsible for preserving the railway, but based on public feedback and committee guidance, there was an interest in further investigating alternatives in the context of this planning document. To develop concepts for this conversion, both rail-to-trail and rail-with-trail options were considered.

TIE-INS

When evaluating a bicycle and pedestrian network, it is important to assess the existing conditions at tie in points to ensure recommendations are consistent with selections at either end of the network. They are also used to identify if there are opportunities to extend a treatment to a point of interest or enhanced facility if within a reasonable distance of our study area limit. Two tie-in locations were identified.

WESTERN TIE-IN AT DIX BRIDGE ROAD

The Empire State Trail, and the off-road segment identified for analysis, terminates at the Dix Bridge. The bridge crosses the Hudson River, connecting the town of Greenwich with the town of Schuylerville. While the Empire State Trail continues into Greenwich, there is a transition from a shared-use path into a shared-use road with no designated on-street space for bicyclists. Hudson-Crossing Park in Schuylerville and the entrance to the Empire State Trail serve as key destinations at the end of this study area.

EASTERN TIE-IN AT THE VILLAGE BOUNDARY

NY-29 at Wilson Street is a high-volume, low-speed road through the village, serving as the primary connector heading east and west. There are currently sidewalks on both sides of the road, with commercial buildings on the south side, and a cemetery on the north side.

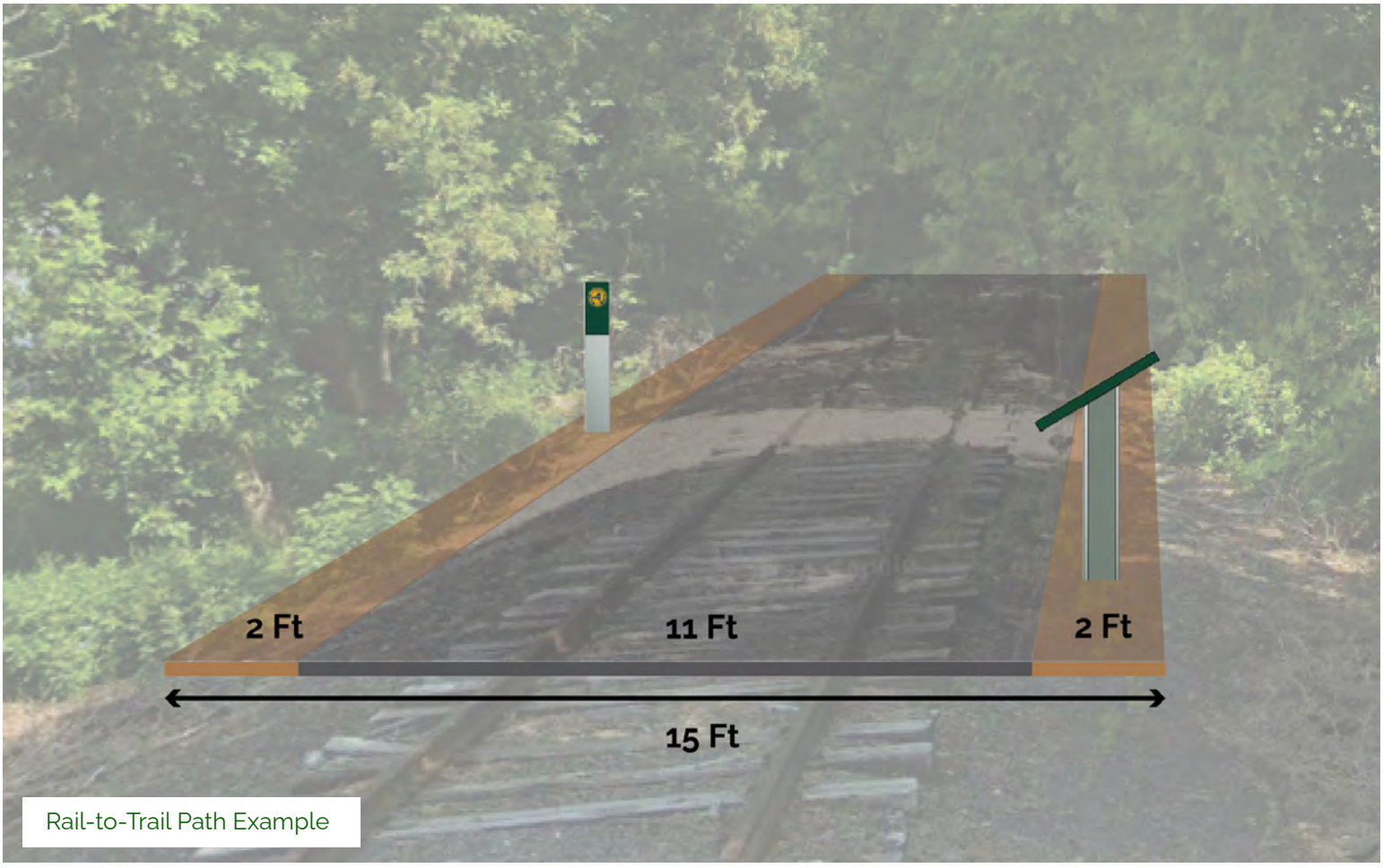
Both rail-to-trail and rail-with-trail options have benefits and challenges. Creating a rail-with-trail path is a lower-cost option which preserves a railbed for current or future use, while providing a facility for walkers and cyclists that's separated from motor vehicle traffic. However, there are safety considerations, especially along an active corridor and it requires more land to adhere to the required space needed. The rail-to-trail option creates a path on an area that has already been cleared for use and usually connects to destinations and other corridors. While rail-to-trail is often preferred, it is more costly due to the construction needed to remove the tracks and pave.

The on- and off-road options were reviewed with the committee, and the rail-to-trail off-road option was selected as the preferred option.

The rail-to-trail design would take the existing railroad line and convert it to a shared-use path. This design would allow users to enter and exit the Empire State Trail and remain on a separated facility from traffic. At its current right-of-way width, a 15-foot path would fit along the railbed. This adheres to the American Association of State Highway and Transporation Officials (AASHTO) and Empire State Trail guidelines, which require a minimum of 10 feet and 2 feet of clearance on each side. Since it provides a connection to the Empire State Trail, the trail's Design Guide would be applicable here, providing wayfinding recommendations and accessibility requirements. This would also reactivate a corridor that has been inactive for many years due to reduced passenger and freight demand in the area. The figure below shows an example of what the path would look like along the railbed.

WAYFINDING

Wayfing must be a key component of any EST connection project, including enhancing the Dix Bridge connection, as it serves as a critical link between the Town of Greenwich and the regional trail network. Improvements to this connection would enhance safety, accessibility, and overall user experience for pedestrians and bicyclists. Potential upgrades could include wayfinding signage, surface enhancements, and improved transitions between the bridge and existing trail segments. Strengthening this connection would not only support increased trail usage but also promote tourism, local economic activity, and seamless access to recreational opportunities within the region.



Rail-to-Trail Path Example

PRIORITY 2: ROUTE 29 COMMERCIAL CORRIDOR

A second priority was identified along the Town's Route 29 commercial corridor, between the Route 29/40 roundabout and the Village border, with a particular interest in improving pedestrian safety and connections at/around the former Big Lots Plaza intersection. There are gaps in the existing pedestrian and bicycle networks along this segment of Route 29. Improving access and mobility to the businesses within this area and facilitating connections to community destinations within walking/biking distance of the project area is a main priority for this section. There is also a need to fill in the sidewalk gap on the south side of the roadway. Along with connectivity, a desire for safety improvements exists due to historical crash injuries. A 0.15-mile sidewalk is recommended to be installed on the south side of Route 29 to provide pedestrian access and connections to key destinations, including the little league fields and Cumberland Farms. This sidewalk would fill a critical existing network gap.

While the sidewalk would help with pedestrian connectivity, the committee also identified a need to improve cycling infrastructure along the corridor. After evaluating the context, volume, and user type, two potential improvement options were reviewed: constructing a shared-use path or establishing a bike lane. The shared-use option was selected as the preferred improvement as it would require less space than a bike lane due to it replacing the existing north side sidewalk.

In addition to the above improvements, signal upgrades and protected crossings are also recommended at the plaza's signalized entrance to improve safety. This includes marked crosswalks and curb ramps. These upgrades ensure ADA compliance and better serves pedestrians, including those with disabilities. effective for users.

Shared-Use Path and Sidewalk Cross Section

Route 29 Full Concept

PRIORITY 3: ACADEMY/CHURCH/ MAIN/COTTAGE INTERSECTION

The final priority identified with the committee was the Academy/ Church/Main/Cottage Street intersection in the Village. The intersection has four main approaches, with Cottage Street forming a fifth approach just to the west on Main Street. Main Street is free flow, with the other legs stop controlled. There are three crosswalks across Main Street, with the middle crossing located in an area that causes confusion for motorists. Students crossing the intersection is a primary concern for Greenwich, due to the proximity to multiple community uses (library, youth center, school). The focus of this priority area is to improve accessibility for pedestrians and overall operations.

Potential improvements, including physical roadway geometry changes, signage, stop controls, and directional restrictions, were identified and were shared with the committee and public for feedback. A signal warrant analysis was also conducted for the intersection to confirm the viability of a signal at the intersection (refer to Appendix 2).

Church Street crossing at Main Street

Based on the feedback from the committee and the public, a multi-pronged approach is recommended. This would involve first working towards implementing physical improvements to the intersection, including curb bump outs and reworking and realigning the marked crosswalks.

Concurrently, traffic flow analyses could be conducted to evaluate the impacts of installing all-way stop signs or a traffic signal. Installing a traffic signal at the intersection offers several key benefits, improving both safety and efficiency for all road users. A signal helps regulate traffic flow, reducing confusion and the likelihood of collisions, particularly at high-traffic locations. It provides dedicated crossing opportunities for pedestrians and cyclists, enhancing accessibility and safety. Additionally, traffic signals can help manage congestion by assigning right-of-way, minimizing delays, and improving overall intersection performance. In areas with varying traffic volumes, signal timing can be optimized to accommodate peak travel periods, ensuring smoother movement through the intersection. By creating a more controlled and predictable environment, a traffic signal enhances safety, mobility, and the overall functionality of the roadway network.

These aspects could be completed alongside continued assessment and potential implementation of the directional restriction at Cottage Street.

When asked about preferred design improvement for the Academy/Church/Main/ Cottage intersection during the final public survey, participants preferred RRFBs, raised intersections, and raised crosswalks as potential treatments, with some participants also identifying curb extensions and access management (changing Cottage to a one-way street) as their preference.

Academy/Church/Main/Cottage Intersection Potential Improvements

COST ESTIMATES

Priority Project	Component	Approximate Distance (LF) or Count	Areas	Average Unit Cost	Estimated Cost
1: Empire State Trail Connections	Rail to Trail	6.1 miles		$1,000,000	$5.5M - $7M
	Wayfinding Signage				$15,000
	Enhanced Multi Use Path to Dix Bridge	1,584 LF	12,672	$15	$150,000 - $200,000
2: Rt2 29 Commercial Corridor	Sidewalk Extension	792 LF	4,752	$10.000	$50,000 - $75,000
	Traffic Signal Modifications	2 (count)		$50,000	$75,000 - $125,000
	Shared-Use Path	3,168 LF	31,680	$15	$425,000 - $525,000
3: Academy/ Church/Main Cottage/ Intersection	All-Way Stop Control		4	$1,250	$10,000
	RRFBs	4 (count)		$15,000	$50,000 - $75,000
	Traffic Signal	1 (count)		$300,000	$250,000 - $350,000
	Directional Restriction Signage	1 (count)		$2,500	$2,500
	Channelized Intersection Concept with All Way Stop Control (curb extensions, crosswalk realignment & supporting infrastructure)				$300,00- $500,000

IMPLEMENTATION STRATEGY

The implementation of trail and on-street projects in the Town and Village of Greenwich requires careful consideration of right-of-way constraints and coordination with property owners. For Priority 1, which involves the development of a multi-use path, the jurisdiction lies primarily with the Town and Village, requiring close collaboration to ensure successful execution. Meanwhile, the redesign of key intersections will necessitate a coordinated effort between the State and the Town/Village to address safety and connectivity needs effectively. Open communication with property owners will also be critical to addressing concerns, ensuring equitable solutions, and fostering community support for these improvements. This approach will ensure the successful implementation of these priority projects.

PRIORITY 1: KEY NEXT STEPS

Step 1: Continue Outreach and Partnership Building
The Town and Village should continue outreach to the non-profit entity that owns the rail corridor to establish a working relationship and discuss the potential for rail-to-trail conversion. Given the uncertainty surrounding ownership details and deed restrictions, open communication with the property owner will be essential to clarify their interests, concerns, and willingness to collaborate.

Step 2: Conduct a Title Report and Ownership Review
To gain a clearer understanding of property rights, easements, and restrictions, the Town/Village should pursue a Title Report for the affected section of the railroad. This involves working with the County Clerk's Office to review historical deeds, property records, and any existing rights-of-way. A title search professional or attorney can assist in identifying any legal obstacles, such as reversionary clauses or deed restrictions that could impact conversion efforts.

Step 3: Assess Regulatory and Funding Considerations
Once ownership and legal considerations are clarified, the Town/Village should evaluate applicable local, state, and federal regulations governing rail-to-trail conversions. This will include environmental permitting, zoning requirements, and accessibility standards. Additionally, identifying potential funding sources, such as state grants, federal transportation programs, or private partnerships, will be critical for implementation. Some of these potential funding sources are described in the "Funding Opportunities" section below.

PRIORITY 2: KEY NEXT STEPS

Step 1: Identify and secure funding for the projects
Potential funding sources include safety grants. Additionally, local funding opportunities and partnerships may be explored to supplement grant funding and ensure the project moves forward efficiently.

Step 2: Initiate the design and engineering phase
This phase will develop detailed plans for the intersection improvements. Permitting and approvals will be required to move the project forward. The Town should work with NYSDOT and other relevant agencies to obtain necessary permits for construction.

PRIORITY 3: KEY NEXT STEPS

Step 1: Conduct a Traffic Flow Analysis
The Village should prepare a traffic flow analysis to compare the impacts of installing a traffic signal or all-way stop controls at the intersection. The results of the analysis should be shared with the public to address any potential concerns with this major project.

Step 2: Continued Public Engagement
The Village should continue to engage with stakeholders, including residents on the roads comprising the intersection to provide updates and get feedbacks on key components. Engaging with Cottage Street residents will be ciritical to any potential future advancement of a directional restriction along the roadway.

Step 3: Coordinate with the NYSDOT
The Village should coordinate with NYS Department of Transportation to formally propose the installation of a traffic signal and/or all-way stop control at the intersection. Early discussions with NYSDOT will help determine the feasibility of the improvements and ensure that design parameters align with State standards.

Step 4: Identify and secure funding for the projects
Potential funding sources include safety grants, such as the Highway Safety Improvement Program (HSIP), as well as State and Federal programs that support pedestrian and intersection safety improvements.

Step 5: Initiate the design and engineering phase
This phase will develop detailed plans for the intersection improvements, incorporating the new traffic signal/all-way stop control and pedestrian enhancements such as bump-outs and crosswalk realignments. The design will ensure compliance with ADA accessibility requirements and include high-visibility crosswalk markings, and potentially pedestrian countdown signals. Permitting and approvals will be required to move the project forward. The Village should work with NYSDOT and other relevant agencies to obtain necessary permits for construction.

FUNDING OPPORTUNITIES

There are numerous funding opportunities available to support the implementation of bicycle and pedestrian infrastructure and connection improvements, in the Town and Village of Greenwich. These funding sources can play a crucial role in advancing the recommended designs by providing financial support for planning, design, and construction. Information on the most relevant programs, including their matching requirements, funding limits, and timelines, is outlined below to guide the Town and Village in securing the necessary resources.

New York Forward
The Village of Greenwich, as of March, 2025, was announced as a recipient of $4.5 through the New York Forward (NYF) program. NYF is program meant to invirograte and enliven downtowns in New York's smaller communites. The grant can be used to fund transformative projects identified as priorities by the community, and could be used to implement elements of this connectivity plan.

A/GFTC Make the Connection Program is available to assist municipalities with funding to improve the region's non-motorized travel network. Project types that are considered in the program include new sidewalk and trail connections, pedestrian safety improvements, and pavement marking improvements. Make the Connection Funding is available through the Federal Highway Association (FHWA), although this is not a specific FHWA program, but rather an A/GFTC program utilizing a setaside of FHWA funds and administered by the A/GFTC.

- 20 percent local match
- Design Only Projects have a minimum of $25,000
- Design and Construction or Construction Only Projects have a minimum of $75,000
- Federal Aid procedures apply

NYSDOT Transportation Alternatives Program (TAP) is available for projects that improve the quality of life of the community through the construction of pedestrian and bicycle facilities and pedestrian safety improvements. The program is a Set-Aside of funds from the Surface Transportation Block Grant Program. The FHWA has set aside a minimum of $1.4 billion annually for this program through 2026.

- The current round is open with
- applications due January 9, 2024
- 20 percent local match
- Federal Aid Procedures Apply
- Design and Construction:
- Minimum=$500,000; Maximum $5 million

NYSOPRHP RTP provides funding for the development and maintenance of recreational trails or trail-related facilities. RTP funding is available through the FHWA and administered by the NYSOPRHP. RTP can be applied for through the NYS CFA in 2025.

- 20 percent local match
- Federal Aid procedures apply
- Design and construction: Minimum = $25,000; Maximum = $250,000

NYSOPRHP Municipal Parks and Recreation (MPR) grant program is a new grant program that was launched by NYSOPRHP in March 2025. Applications are due on May 2, 2025, with an anticipated second round of funding later this year. MPR funding is available for the construction of recreational facilities and other improvements to municipally owned recreational sites and parks.

- 10 percent local match
- Maximum = $1,000,000
- $20 million available through two rounds of applications.
-

Hudson River Valley Greenway Community Grants Program provides funding to greenway communities and compact communities to develop plans or projects consistent with the five Greenway criteria: natural and cultural resource protection, economic development, public access, regional planning, and heritage and environmental education.

- 50 percent local match
- Federal aid procedures apply
- Maximum = $10,000
- Applications accepted quarterly

Hudson River Valley Greenway Conservancy Trail Grants Program is dedicated to funding recreational trail projects. Special consideration is given to projects that seek to implement the goals of the Greenway Trail Program. The application emphasizes connections to the Empire State Trail. Eligible projects includ trail construction, planning, and design; trail rehabilitation or improvement; and trail education or interpretation.

- Funding amount varies by project type from a low of $25,000 for maintenance projects to up to $250,000 for construction
- 50% match requirement
- Applications accepted quarterly

Safe Streets and Roads for All (SS4A) implementation grants provide federal funds to implement projects and strategies identified in an eligible Action Plan to address a roadway safety problem. Projects and strategies may be infrastructural, behavioral, and/or operational activities. Implementation grant funding requests may also include project-level planning and design activites, supplemental safety Action Plan activities, in support of a plan, and safety demonstration activities.

- LCLGRPB is currenty progressing a Safety Action Plan which is a precursor to implementation funding applications. The status of this should continue to be monitored for future potential funding.

APPENDIX A: EXISTING CONDITIONS

GREENWICH BIKE/PEDESTRIAN CONNECTIVITY PLAN

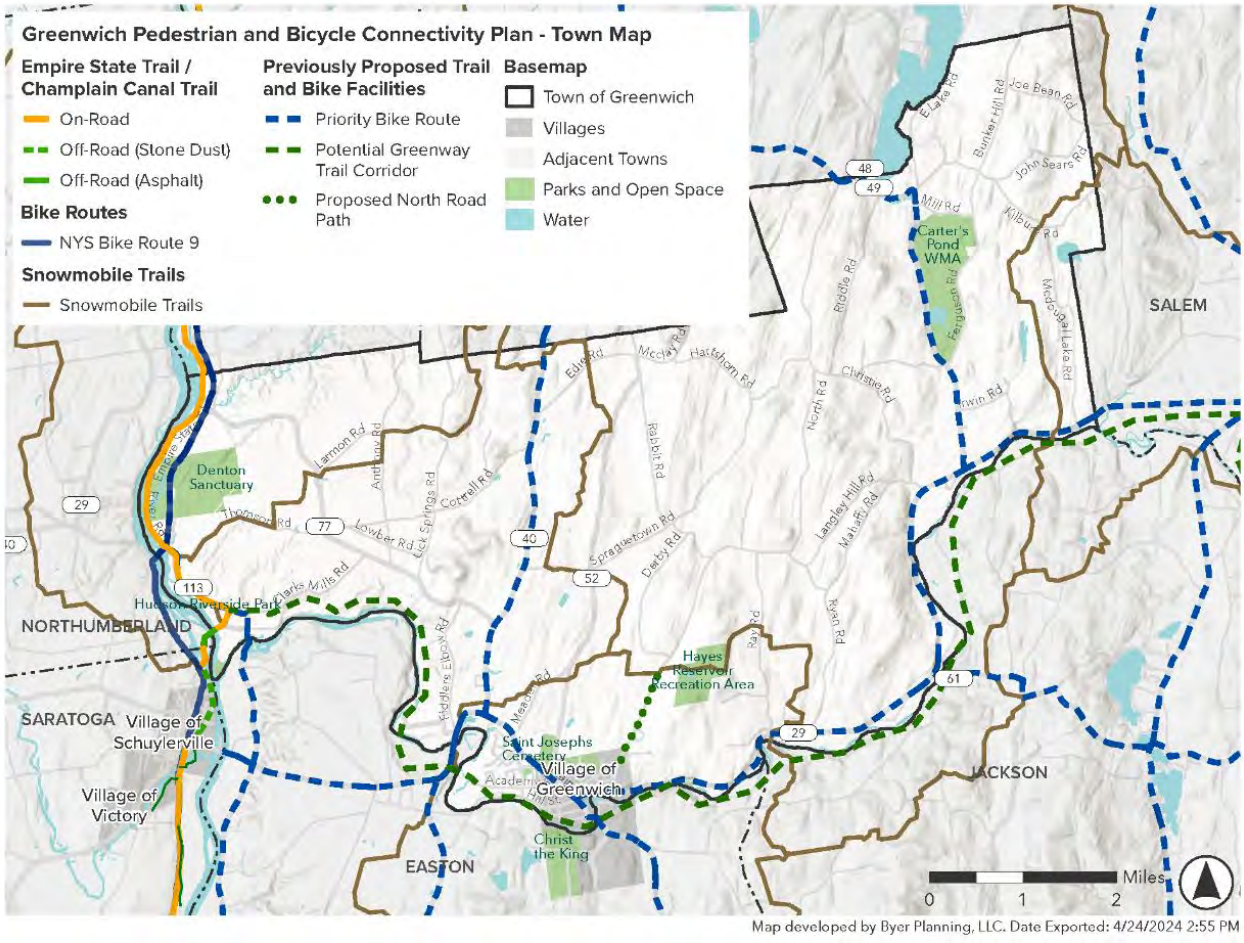
EXISTING CONDITIONS MEMO

Introduction

The intention of the Connectivity Plan for the Town and Village of Greenwich is to improve bicycle and pedestrian connections for residents and visitors to local amenities in a safe and accessible way. Clear connections between existing amenities and trail networks will help to support the local economy, highlight the community's history and landscape, and improve safety and access to recreation and transportation for residents.

Bicycle Infrastructure and Trail Network

To help improve cyclist and pedestrian connectivity in the Town and Village of Greenwich, new connections will build upon existing bicycle and pedestrian infrastructure and trail networks. The below summarizes existing bike routes that travel through the Town and or Village, which are also shown on the below map.



The Empire State Trail (EST) is a 750-mile bike trail in New York that includes routes from New York City, through the Hudson River Valley, west to Buffalo along the Erie Canal, and north to the Champlain Valley and Adirondacks. The EST runs through a part of the Town of

Greenwich along its western border, and aligns with the Champlain Canalway Trail through the Town. It then runs outside of the Town to the north and south. The part of the EST that passes through Greenwich is an asphalt, on-road portion of the trail and provides an opportunity to connect cyclists with other amenities in the rest of the Town and Village.

State Bicycle Route 9 is a signed, on-road bicycle route that extends 345 miles from New York City to Rouses Point on the New York – Quebec border. The route runs along roadways, and a small portion of the route runs through the Town of Greenwich along its western edge.

In addition to existing bike trails in the Town and Village, there are also some proposed bike trails and priority bike routes identified in previous local, regional, and State planning efforts. Proposed trails include the potential NYS Greenway Trail, which runs along the southern edge of the Town, and the proposed North Road Path that connects the Village with the Hayes Reservoir Recreation Area.

The 2021 Statewide Greenway Trails Plan is a comprehensive plan intended to improve New York's statewide system of non-motorized multi-use trails (Greenway Trails). The plan identifies potential Greenway Trails as viable corridors, like unused rail routes, that could eventually be used for new greenway trails but would first require acquisition, abandonment, planning, or other major steps to determine feasibility. The potential Greenway Trail Corridor in Greenwich would run along the Battenkill Railway, within both the Town and Village, and could serve as another multi-use connection through the community. The conversion of this underutilized railway into a rails-with-trails facility was similarly identified in the Town and Village's 2022 Greenwich Revitalization Plan.

Additionally, the Adirondack – Glens Falls Transportation Council (A/GFTC) has mapped regional priority bike routes, some of which run through Greenwich, specifically along Routes 40, 29, and 49. These mapped routes are intended to identify priority routes for cyclists traveling for transportation, rather than for recreational purposes. They are on-road connectors that would connect people to community services using only their bike and do not necessarily indicate existing safe or preferred bike routes in the Town. These routes, however, should be considered when assessing connectivity to ensure a good balance of both recreational opportunities for cyclists and pedestrians, and transportation for those not using a vehicle.

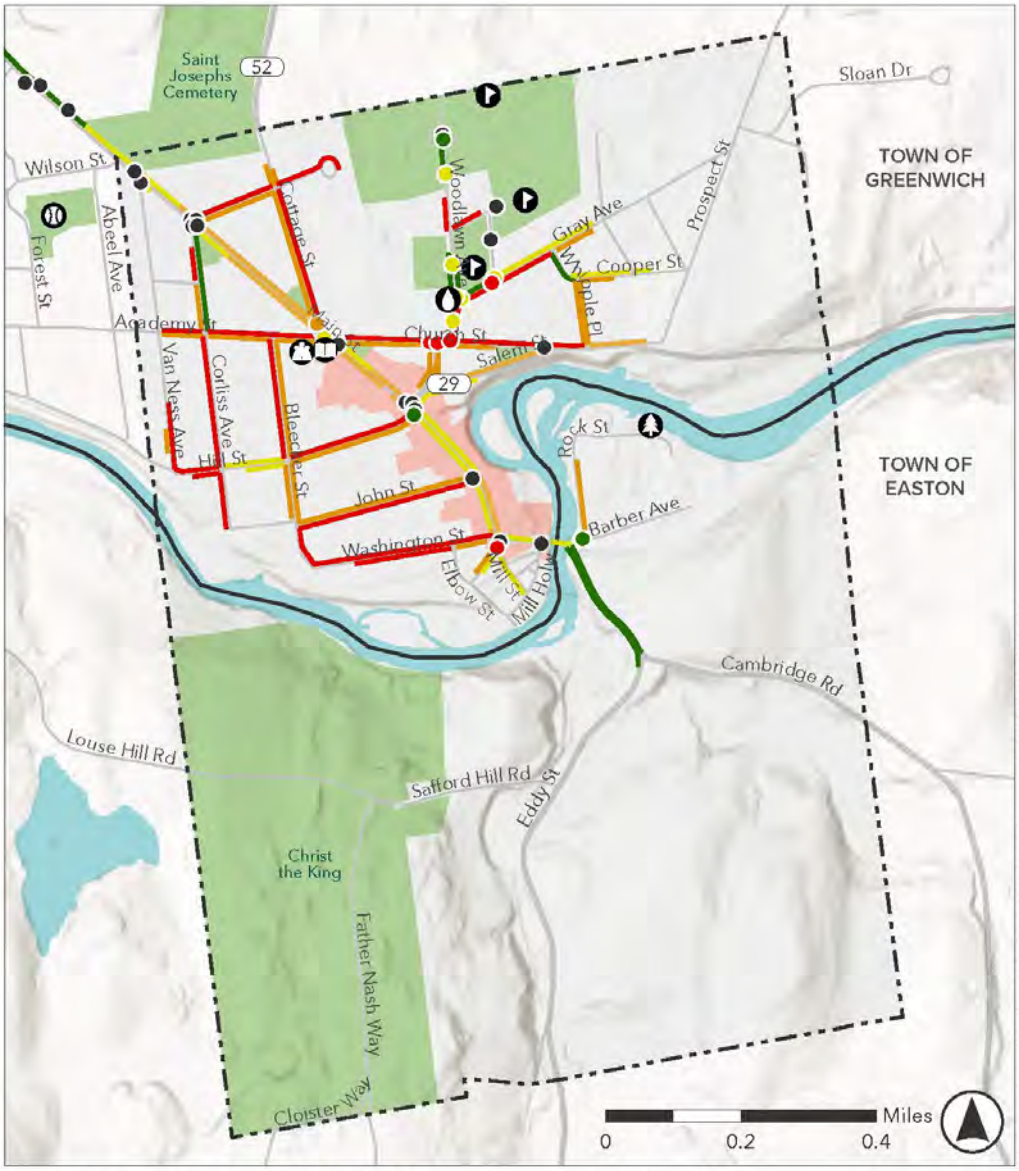
Lastly, there are several designated snowmobile trails within the Town of Greenwich. While not designated for bicycle or pedestrian use, these trails, which run along roadways and through both public and private property, represent an opportunity to explore for multi-season recreational use.

Pedestrian Network and Accessibility

In addition to existing bike routes and trails, assessing existing conditions of pedestrian infrastructure will help inform improved connectivity in Greenwich. Much of the Village is served by sidewalk infrastructure and crosswalks. Outside of the Village, many of the roads do not have sidewalks.

Accessibility of Village sidewalks and crosswalks was assessed based on data gathered by an A/GFTC Traffic Study conducted in 2018-2019, with additional data on accessibility along

State Routes 29 and 372 provided by NYSDOT. This information is presented in the below map and show several areas throughout the Village in need of improvements, especially along Church Street and its adjoining side streets. Along State Route 29, pedestrian facilities are in need of improvements but are considered partially accessible; many of the crosswalks along Route 29 are unreviewed at this time, and only a few crosswalks reviewed throughout the Village are considered fully accessible.



Greenwich Pedestrian and Bicycle Connectivity Plan - Village Map

Sidewalk Accessibility
- Fully accessible
- More accessible
- Less accessible
- Not accessible
- Unreviewed

Crosswalk Accessibility
- Fully accessible
- More accessible
- Less accessible
- Not accessible
- Unreviewed

Destinations
- Greenwich Central Schools
- Splash Pad
- Little League Fields
- Riverfront Park
- Library
- Youth Center

Basemap
- Village of Greenwich
- Commercial Core
- Parks and Open Space
- Water

Annual Average Daily Traffic (AADT)

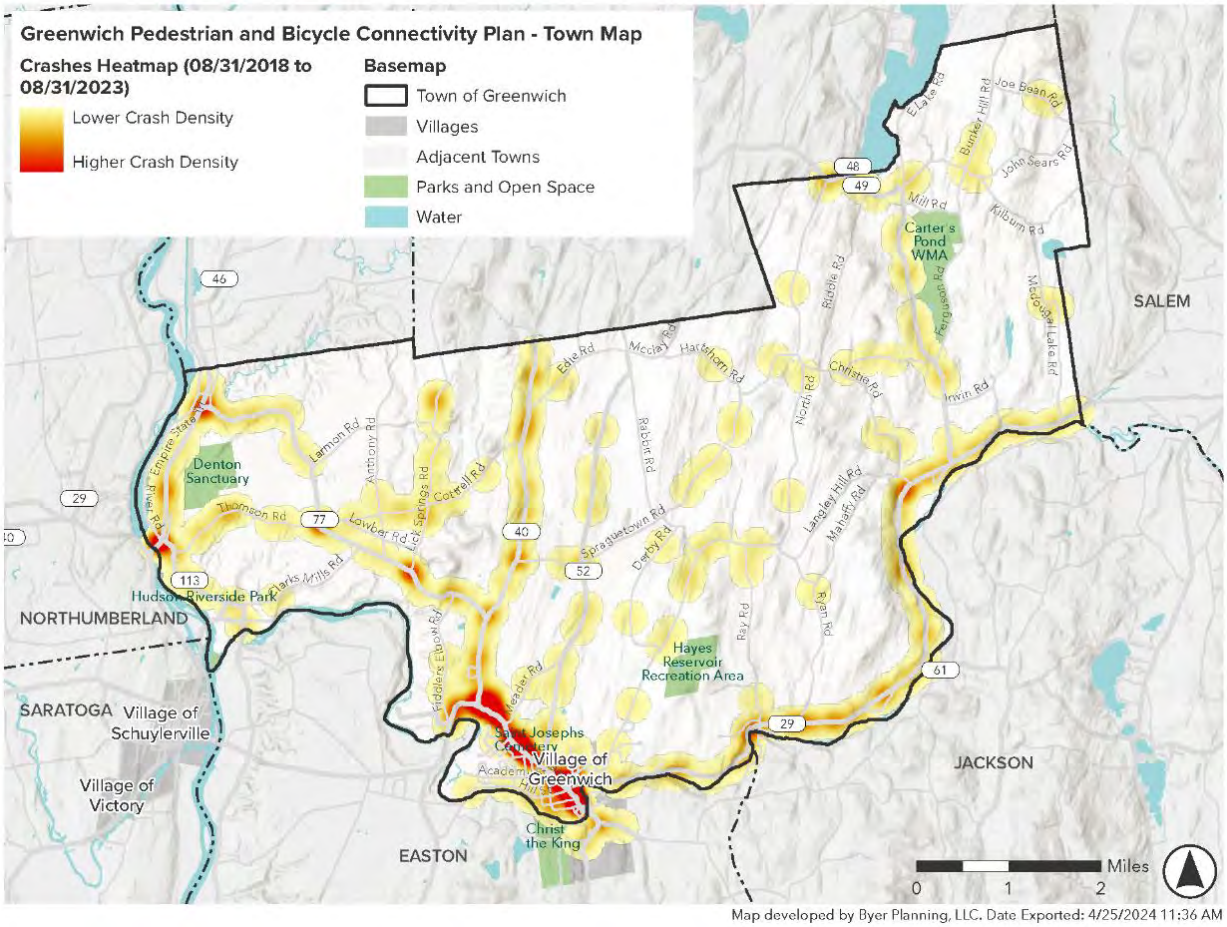
When considering areas to prioritize for improved cycling and pedestrian connectivity in Greenwich, it is also important to consider how much traffic frequents major routes. Annual Average Daily Traffic (AADT) measures the volume of vehicles using a road on a typical day. The most highly trafficked route in the Town and Village of Greenwich is State Route 29 where it intersects with State Route 40. AADT remains high along route 29 as it becomes Main Street in the Village of Greenwich and travels east out of the Village. State Route 40 is a busy route as well as it travels north out of the Town, and New York State Route 4 has an AADT of 4,252 vehicles when it runs through the Town.

Roadway Posted Speeds

Most of the state routes throughout the Town and Village of Greenwich have a speed limit of 55 mph. Speeds through and around the Village tend to be slower, typically 30 mph. There is other variation throughout the Town, but most of the highly trafficked routes also have higher speed limits.

Crash Data

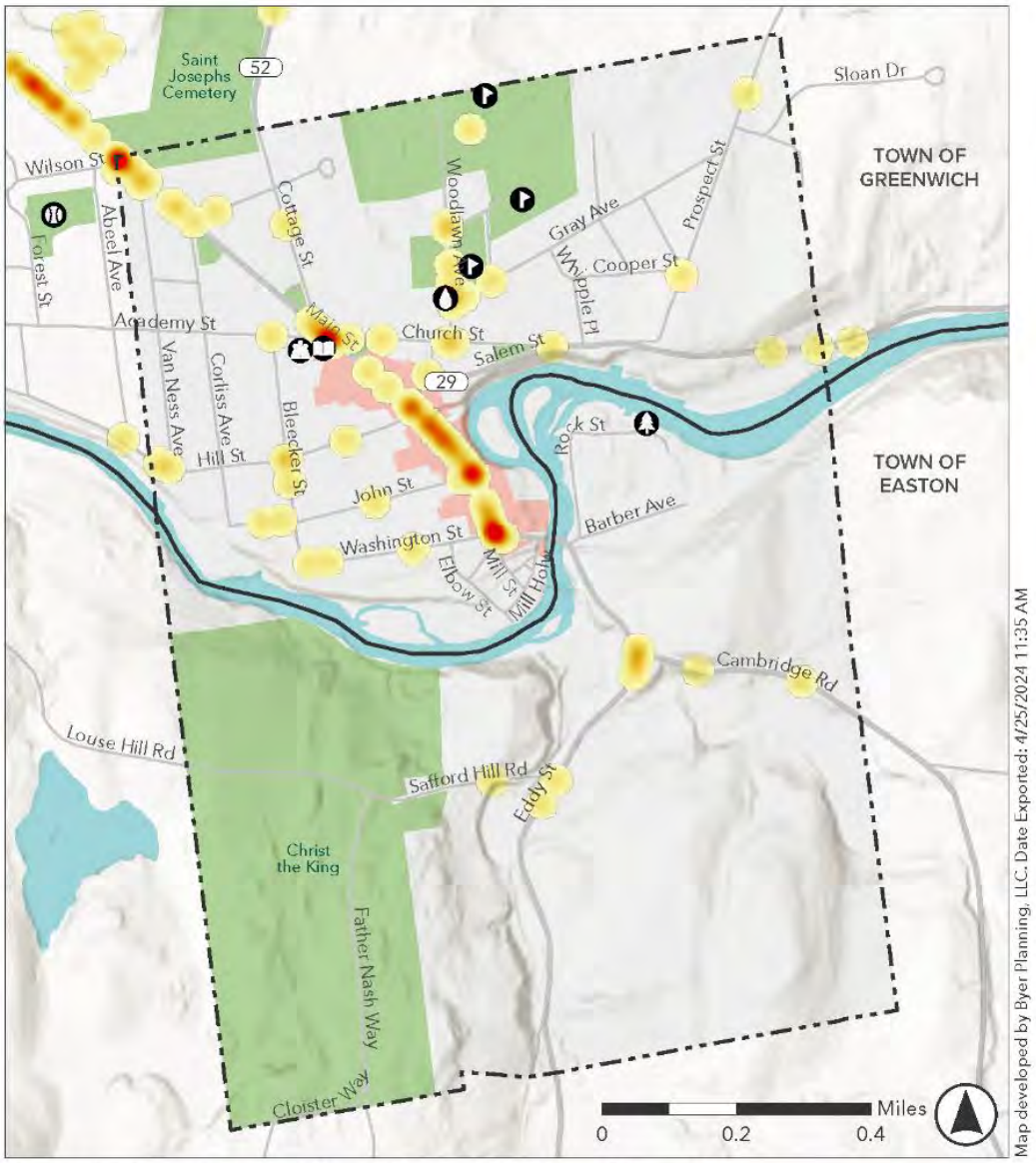
Crash data from 2018 to 2023 within the Town and Village were reviewed. Within Greenwich, crashes were more common at intersections along major routes, with the highest concentrations along Route 29 and within and adjacent to the Village. Zooming in on the



Map developed by Byer Planning, LLC. Date Exported: 4/25/2024 11:36 AM

Village, the highest incidences of crashes are along Route 29/Main Street between Hill Street and Bridge Street.

Most of the identified crashes in the Town and Village were with other motor vehicles or were other types of crashes, but there was a bicyclist-involved crash and a pedestrian-involved crash within the Village, and one crash of each scenario within the Town outside of the Village, as well.



Greenwich Pedestrian and Bicycle Connectivity Plan - Village Map

Crashes Heatmap (08/31/2018 to 08/31/2023)

- Lower Crash Density
- Higher Crash Density

Destinations

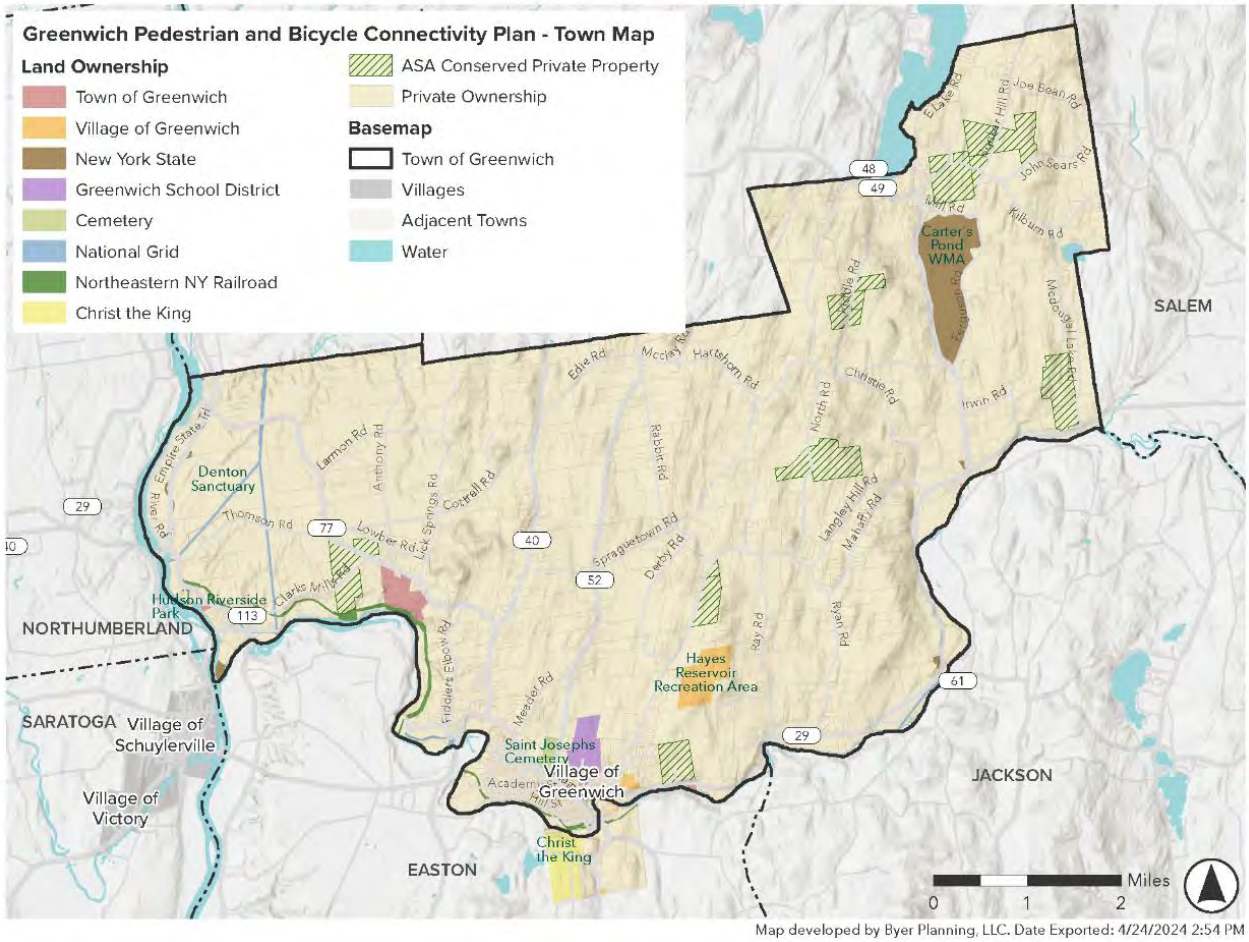
- Greenwich Central Schools
- Splash Pad
- Little League Fields
- Riverfront Park
- Library
- Youth Center

Basemap

- Village of Greenwich
- Commercial Core
- Parks and Open Space
- Water

Land Ownership and Land Use

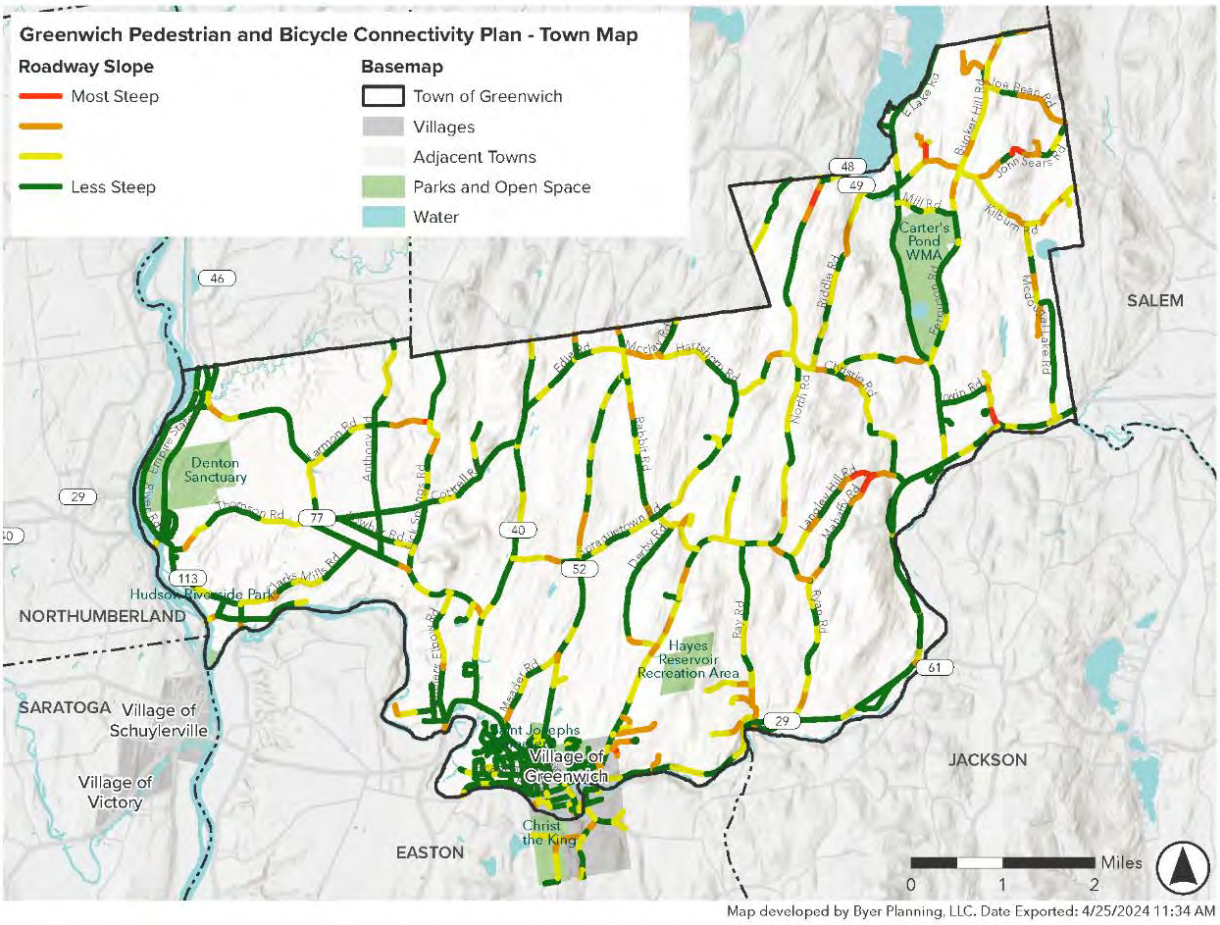
Land ownership and land use within the Town and Village were reviewed to identify potential opportunities for off-road bicycle and pedestrian infrastructure. Most of the land in the Village and Town of Greenwich is privately owned, with some exceptions for parcels owned by the Town, Village, and Greenwich School District,. There are also several private parcels that are conserved through a conservation easement with the Agricultural Stewardship Association. In terms of land use, much of the land is residential use, in addition to a commercial corridor, green spaces, and significant agricultural use, and some large parcels identified as community services, like at the school.



Map developed by Byer Planning, LLC. Date Exported: 4/24/2024 2:54 PM

Roadway Slope

The slope and steepness of Town and Village roadways was assessed to inform identification of potential cyclist and pedestrian routes throughout Greenwich. The map below shows all of the major roads on a color scale from least steep, to the steepest. Much of the Village has flatter terrain, while the northeast portion of the Town, along with several segments scattered throughout the Town have steeper slopes. Paths along steeper slopes could discourage cyclists or pedestrians utilizing trails for recreation or travel but could be considered for cyclists seeking more challenging routes.



APPENDIX B: SIGNAL WARRANT ANALYSIS

MEMORANDUM

TO: Douglas Teator, PE

FROM: Fior Perez, EIT, RSP1

DATE: February 7, 2025

RE: Greenwich Bike Ped Connectivity Plan – Main Street and Academy Street/Church Street Signal Warrant Analysis

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Introduction

A traffic signal warrant evaluation was conducted at Main Street (NYS Route 29) and Academy Street/Church Street intersection to determine if the exiting traffic volumes conditions the installation of a traffic signal. The intersection is located in the Village of Greenwich, Washington County, NY.

Existing Conditions

Study Area Intersection

The Main Street and Academy Street/Church Street is a four-leg intersection controlled by stop signs on the eastbound Academy Street approach and on the westbound Church Street approach, which are off-set by approximately 50 feet. All approaches at the intersection provide a shared left-turn/through/right-turn lane. Marked crosswalks are provided on the east, west, north, and south legs of the intersection. There is also a marked crosswalk from the northeast and southwest corners of the intersection to cross Main Street. The crosswalks are supplemented with Pedestrian Crossing signs (W11-2) for Main Street. Sidewalks are provided on all corners of the intersection. The Greenwich Free Library and various public offices are located on the southeast corner of the intersection. Exhibit 1 depicts an aerial of the intersection.

Exhibit 1 – Main St & Academy St/Church St Intersection

Data Collection

LaBella collected turning movement counts (TMCs) at Main Street and Academy Street/Church Street intersection on Thursday, January 16, 2025, for a period of 24 hours. The raw turning movement count data is included under Attachment A. The 2025 traffic volumes form the basis for the signal warrant analysis.

Signal Warrant Evaluation

Methodology

The traffic conditions and signal at the intersection were correlated to the signal warrant criteria contained in the *National Manual on Uniform Traffic Control Devices* (MUTCD), 11th Edition, published by the Federal Highway Administration (FHWA). Section 4C.01 of the MUTCD specifies the minimum criteria that must be met in order for a traffic signal to be considered. The satisfaction of a signal warrant is not necessarily justification for a traffic signal; other engineering and operational factors must be considered.

The MUTCD contains nine warrants, six of which were applicable and evaluated in detail:

- Warrant 1 – Eight-Hour Vehicular Volume – This warrant is satisfied if for any eight hours of an average day the traffic volumes for Condition A or Condition B specified in Table 4C-1 in the MUTCD are met for the main arterial and the higher volume side road approach to the intersection.
- Warrant 2 – Four-Hour Vehicular Volume – This warrant is met when for any four hours of any average day, points plotted on the graph presented on Figure 4C-2 of the MUTCD fall above the appropriate curve.
- Warrant 3 – Peak Hour – This warrant is met when for any one hour of an average day, points plotted on the graph presented on Figure 4C-4 of the MUTCD fall above the appropriate curve.
- Warrant 4 – Pedestrian Volume – This warrant is met when for any four hours of an average day, points plotted on the graph presented on Figure 4C-8 of the MUTCD fall above the appropriate curve. The lower threshold volume is 93 pedestrians per hour on the major street.
- Warrant 5 – School Crossing - The warrant is intended for application where the presence of schoolchildren crossing the major street is the principal reason to consider installing a traffic control signal.
- Warrant 7 – Crash Experience – This warrant is met when crash experience at the subject intersection is at or greater than what is summarized in MUTCD Tables 4C-2 and 4C-3, for one-year period and three-year periods, respectively.

Signal Warrant Analysis Results

Warrant 1 – Eight-Hour Vehicular Volume; Warrant 2 – Four-Hour Vehicular Volume; Warrant 3 – Peak Hour[1]

Tables 1 summarizes the analyses for Signal Warrants 1, 2, and 3 based on the existing traffic volumes and existing intersection geometry. A "Yes" under the "Signal Warrants Met?" column indicates that the criteria are satisfied for that hour. The detailed evaluation for Warrants 2 and 3 is included under Attachment B.

Table 1 – Traffic Signal Warrants 1-3 Analysis

Time Begin (1-hour Period)	Existing Volumes			Signal Warrants Met?			
	Main St	Academy St	Church St	#1 – Eight Hour Volume		#2 – Four Hour Volume	#3 – Peak Hour Volume
				Condition A	Condition B		
6:00 AM	316	2	94	No	No	No	No
7:00 AM	502	14	148	Yes	No	Yes	No
8:00 AM	446	14	197	Yes	No	Yes	No
9:00 AM	413	17	115	Yes	No	No	No
10:00 AM	514	29	120	Yes	No	Yes	No
11:00 AM	567	24	115	Yes	Yes	Yes	No
12:00 PM	589	34	122	Yes	Yes	Yes	No
1:00 PM	601	24	103	No	Yes	Yes	No
2:00 PM	676	27	167	Yes	Yes	Yes	Yes
3:00 PM	684	23	226	Yes	Yes	Yes	Yes
4:00 PM	774	27	180	Yes	Yes	Yes	Yes
5:00 PM	765	19	148	Yes	Yes	Yes	Yes
6:00 PM	461	12	66	No	No	No	No
7:00 PM	343	14	58	No	No	No	No
8:00 PM	201	4	99	No	No	No	No
Required volumes	**One Lane Major Street**			**350**	**525**	**See Figure 4C-2**	**See Figure 4C-4**
	One Lane Minor Street			**105**	**53**		
Overall Warrant Met?				**Yes**	**No**	**Yes**	**Yes**

Table 1 indicates that Warrant 1 – Eight Hour Vehicular Volume Condition B is not met at the subject intersection. Warrant 1 – Eight Hour Vehicular Volumes Condition A, Warrant 2 – Four Hour Vehicular Volume, and Warrant 3 – Peak Hour are met.

Warrant 4 – Pedestrian Volume

Pedestrians were observed from 6:00 a.m. to 8:00 p.m. during the intersection turning movement counts. Table 2 summarizes the analysis of Warrant 4 using this day. A "Yes" under "Signal Warrant Met?" column could indicate the criteria are satisfied that hour.

[1] Isolated community with a population of less than 10,000; therefore 70% factor was considered for Warrants 1, 2 and 3.

Table 2 – Traffic Signal Warrant 4 Analysis

Time Begin (1-hour Period)	Existing Traffic Volumes on Main Street	Existing Pedestrian Volume Crossing Main Street	Signal Warrants Met?
6:00 AM	316	0	No
7:00 AM	502	6	No
8:00 AM	446	11	No
9:00 AM	413	1	No
10:00 AM	514	5	No
11:00 AM	567	2	No
12:00 PM	589	2	No
1:00 PM	601	3	No
2:00 PM	676	19	No
3:00 PM	684	9	No
4:00 PM	774	3	No
5:00 PM	765	0	No
6:00 PM	461	1	No
7:00 PM	343	0	No
8:00 PM	201	0	No
Warrant	**Pedestrian Four-Hour Volume**		**No**
	Pedestrian Peak Hour		**No**

Table 2 indicates existing pedestrian volumes observed at the study intersection for 14 hours that include morning conditions through afternoon peak conditions are not high enough to meet the minimum traffic signal criteria for Warrant 4.[2] The existing observed pedestrian volumes at the intersection fell short for the minimum pedestrian threshold associated with the mainline traffic volumes, therefore, Warrant 4 is not met under these conditions.

Warrant 5 – School Crossing

The Greenwich Primary School, Junior-Senior High School, and Central School District are located within half a mile of the intersection. Existing conditions indicate that there is pedestrian connectivity from the school to the intersection.

The MUTCD offers two quantitative thresholds for this warrant:

1. An adequate number of gaps in traffic when school children are using the crossing.
2. A minimum of 20 school children crossing during the highest hour.

As part of this warrant, a gap analysis was not conducted at the intersection. However, data collected shows that the maximum number of pedestrians crossing Main Street is 19. Based on this count, the warrant is not met under these conditions.

It is important to note the possible effects of temperature during the counts. Historical data shows that the maximum temperature during the counts was 28 degrees Fahrenheit, creating unfavorable conditions for pedestrians. It is reasonable to expect a higher number

[2] Minimum of 75 pph for the four-hour warrant and minimum 93 pph for the peak hour warrant.

of pedestrians during warmer seasons. The count span also only covered one day of the week. Thus, the warrant could be met under different weather conditions, or with a wider count span, however, for the purposes of this memorandum to vet if a signal is warranted, further study on the pedestrian volumes is not required at this time.

Warrant 7 – Crash Experience

Record of the motor vehicle collisions at the study intersections and roadway segments were obtained from the New York State Department of Transportation (NYSDOT) via Freedom of Information Law (FOIL) request. The data obtained included the most recent three-year period, from June 1, 2021, to May 31, 2023. Table 3 summarizes the reported collisions that the Crash Experience warrant considers.

Table 3: Collision Summary Signal Warrant 7

Collision Type	Number of Collisions				Number of Collisions Resulting in Injury				Number of Collisions Resulting in Fatalities			
	2021	2022	2023	2024	2021	2022	2023	2024	2021	2022	2023	2024
Left-Turn	0	0	0	0	0	0	0	0	0	0	0	0
Right-Turn	0	0	0	0	0	0	0	0	0	0	0	0
Right Angle	0	0	0	0	0	0	0	0	0	0	0	0
Collision with Bicyclist	0	0	1	0	0	0	1	0	0	0	0	0
Collision with Pedestrians	0	0	0	0	0	0	0	0	0	0	0	0
Total	**0**	**0**	**1**	**0**	**0**	**0**	**1**	**0**	**0**	**0**	**0**	**0**
Three-Year Total	**1**				**1**				**0**			

Table 1 shows that one collision resulting in an injury was reported over the three-year period.[3] No angle collisions, pedestrian crashes were reported at the intersection. Zero crashes resulting in a fatality was reported at the intersection. The number of crashes is less than the minimum number of crashes in MUTCD Tables 4C-2 and 4C-3, and therefore Warrant 7 is not met.

Conclusion

The signal warrant analysis of the Main Street and Academy Street/Church Street intersection indicates that Warrant 1 Eight-Hour Vehicular Volume, Warrant 2 – Four-Hour Vehicular Volume, and Warrant 3 – Peak Hour are met. Warrant 4 and Warrant 5 are not met due to low pedestrian volumes. Crash history at the intersection do not meet Warrant 7.

[3] A total of five collisions were reported at the intersection.

ATTACHMENT A

TURNING MOVEMENT COUNT DATA

GREENWICH BIKE PED CONNECTIVITY PLAN
MAIN STREET AND ACADEMY STREET/CHURCH STREET
VILLAGE OF GREENWICH
WASHINGTON COUNTY, NY

National Data & Surveying Services

Intersection Turning Movement Count

Location: Main St/SR 29 & Academy St/Church St
City: Greenwich
Control: 2-Way Stop(EB/WB)

Project ID: 25-380003-001
Date: 1/16/2025

Data - Total

NS/EW Streets: Main St/SR 29 | Main St/SR 29 | Academy St/Church St | Academy St/Church St

AM

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
12:00 AM	0	1	0	0	1	3	0	0	0	0	0	0	0	0	1	0	6
12:15 AM	0	2	0	0	5	4	0	0	0	0	0	0	0	0	1	0	12
12:30 AM	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	2
12:45 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2
1:00 AM	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
1:15 AM	0	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	4
1:30 AM	0	0	0	0	0	2	0	0	0	0	0	0	0	0	1	0	3
1:45 AM	0	3	0	0	1	2	0	0	0	0	0	0	0	0	0	0	6
2:00 AM	0	2	0	0	1	3	0	0	0	0	0	0	0	0	3	0	9
2:15 AM	0	1	0	0	0	2	1	0	0	0	0	0	0	0	0	0	4
2:30 AM	0	4	0	0	4	1	0	0	0	0	0	0	0	0	1	0	10
2:45 AM	0	2	0	0	0	5	0	0	0	0	0	0	0	0	1	0	8
3:00 AM	0	3	0	0	0	2	0	0	0	1	0	0	0	0	1	0	7
3:15 AM	0	5	0	0	1	0	0	0	0	0	0	0	0	0	1	0	7
3:30 AM	0	2	0	0	0	0	0	0	0	0	0	0	0	0	2	0	4
3:45 AM	0	1	0	0	0	2	0	0	0	0	0	0	0	0	3	0	6
4:00 AM	0	4	0	0	0	1	0	0	0	0	0	0	0	0	1	0	6
4:15 AM	0	6	0	0	2	1	0	0	0	0	0	0	0	0	2	0	11
4:30 AM	0	5	0	0	1	4	0	0	0	0	0	0	0	0	10	0	20
4:45 AM	0	9	0	0	3	6	0	0	0	0	0	0	0	2	8	0	28
5:00 AM	0	11	0	0	1	8	0	0	0	1	0	0	0	0	11	0	32
5:15 AM	0	18	0	0	2	4	0	0	1	0	1	0	1	0	8	0	35
5:30 AM	0	25	0	0	2	9	0	0	0	0	0	0	0	1	20	0	57
5:45 AM	0	33	1	0	8	11	0	0	0	0	0	0	0	1	11	0	65
6:00 AM	0	25	0	0	7	8	0	0	0	0	0	0	0	1	14	0	55
6:15 AM	0	43	0	0	10	19	0	0	0	2	0	0	0	1	23	0	98
6:30 AM	2	61	0	0	15	33	0	0	0	0	0	0	0	1	19	0	131
6:45 AM	0	48	0	0	22	23	0	0	0	0	0	0	0	1	34	0	128
7:00 AM	0	38	0	0	21	30	2	0	1	1	0	0	0	0	37	0	130
7:15 AM	1	62	0	0	25	32	1	0	0	1	0	0	1	1	27	0	151
7:30 AM	0	51	0	0	40	23	1	0	0	7	0	0	0	0	37	0	159
7:45 AM	1	49	0	0	94	31	0	0	0	3	1	0	0	0	45	0	224
8:00 AM	1	51	0	0	40	31	1	0	0	5	0	0	0	6	72	0	207
8:15 AM	1	55	0	0	17	30	1	0	1	2	2	0	0	2	59	0	170
8:30 AM	1	53	0	0	25	36	1	0	1	1	1	0	1	0	19	0	139
8:45 AM	4	52	0	0	11	31	4	0	1	0	0	0	0	3	35	0	141
9:00 AM	1	41	0	0	19	30	3	0	2	1	2	0	0	0	29	0	128
9:15 AM	0	51	0	0	19	45	3	0	1	0	1	0	1	1	23	0	145
9:30 AM	2	57	0	0	7	33	4	0	2	1	1	0	0	3	23	0	133
9:45 AM	1	47	1	0	15	33	1	0	3	1	2	0	0	0	35	0	139
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	15	924	2	0	421	541	24	0	13	27	11	0	4	24	617	0	2623
APPROACH %'s :	1.59%	98.19%	0.21%	0.00%	42.70%	54.87%	2.43%	0.00%	25.49%	52.94%	21.57%	0.00%	0.62%	3.72%	95.66%	0.00%	
PEAK HR :	07:30 AM - 08:30 AM																TOTAL
PEAK HR VOL :	3	206	0	0	191	115	3	0	1	17	3	0	0	8	213	0	760
PEAK HR FACTOR :	0.750	0.936	0.000	0.000	0.508	0.927	0.750	0.000	0.250	0.607	0.375	0.000	0.000	0.333	0.740	0.000	0.848
	0.933				0.618				0.750				0.708				

NOON

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
10:00 AM	2	41	0	0	14	45	1	0	4	3	6	0	0	1	26	0	143
10:15 AM	2	61	1	0	28	55	1	0	1	2	2	0	1	2	34	0	190
10:30 AM	3	66	0	0	16	47	0	0	4	4	0	0	0	0	26	0	166
10:45 AM	0	53	0	0	24	53	1	0	0	0	3	0	0	3	27	0	164
11:00 AM	2	39	3	0	28	52	1	0	2	6	0	0	1	0	28	0	162
11:15 AM	3	56	0	0	33	57	2	0	3	0	3	0	1	1	34	0	193
11:30 AM	1	71	1	0	23	43	3	0	1	2	2	0	0	2	22	0	171
11:45 AM	2	59	1	0	23	62	2	0	3	2	0	0	0	0	26	0	180
12:00 PM	0	61	0	0	30	55	2	0	8	3	3	0	0	0	31	0	193
12:15 PM	1	53	0	0	24	53	2	0	3	1	5	0	1	1	38	0	182
12:30 PM	3	72	1	0	26	55	1	0	2	1	3	0	2	2	24	0	192
12:45 PM	0	57	0	0	29	60	4	0	3	1	1	0	0	2	21	0	178
1:00 PM	4	45	0	0	25	53	5	0	4	1	4	0	0	1	23	0	165
1:15 PM	3	65	1	0	35	54	3	0	3	0	0	0	1	1	24	0	190
1:30 PM	3	48	1	0	41	58	1	0	4	0	2	0	0	0	26	0	184
1:45 PM	1	63	0	0	35	55	2	0	1	2	3	0	0	2	25	0	189
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	30	910	9	0	434	857	31	0	46	28	37	0	7	18	435	0	2842
APPROACH %'s :	3.16%	95.89%	0.95%	0.00%	32.83%	64.83%	2.34%	0.00%	41.44%	25.23%	33.33%	0.00%	1.52%	3.91%	94.57%	0.00%	
PEAK HR :	11:45 AM - 12:45 PM																TOTAL
PEAK HR VOL :	6	245	2	0	103	225	7	0	16	7	11	0	3	3	119	0	747
PEAK HR FACTOR :	0.500	0.851	0.500	0.000	0.858	0.907	0.875	0.000	0.500	0.583	0.550	0.000	0.375	0.375	0.783	0.000	0.968
	0.832				0.963				0.607				0.781				

PM

	NORTHBOUND				SOUTHBOUND				EASTBOUND				WESTBOUND				
	0	1	0	0	0	1	0	0	0	1	0	0	0	1	0	0	
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
2:00 PM	3	52	2	0	58	66	1	0	3	5	3	0	0	1	26	0	220
2:15 PM	1	55	0	0	43	52	5	0	1	4	4	0	4	4	36	0	209
2:30 PM	2	65	1	0	37	57	1	0	1	0	1	0	0	6	60	0	231
2:45 PM	1	63	2	0	48	58	3	0	2	1	2	0	1	3	26	0	210
3:00 PM	1	54	1	0	43	63	0	0	2	4	1	0	1	1	44	0	215
3:15 PM	1	73	0	0	35	60	2	0	1	2	3	0	0	8	77	0	262
3:30 PM	3	53	1	0	41	77	2	0	1	3	2	0	0	1	52	0	236
3:45 PM	1	43	0	0	49	81	0	0	1	0	3	0	0	0	42	0	220
4:00 PM	0	65	2	0	32	97	2	0	1	1	5	0	0	1	38	0	244
4:15 PM	1	74	1	0	47	62	1	0	3	2	2	0	1	4	52	0	250
4:30 PM	0	54	4	0	61	84	3	0	1	1	0	0	0	3	31	0	242
4:45 PM	0	51	1	0	57	73	2	0	1	4	6	0	0	4	46	0	245
5:00 PM	1	63	1	0	53	74	1	0	0	1	1	0	1	2	49	0	247
5:15 PM	1	77	3	0	68	67	3	0	3	4	2	0	1	3	31	0	263
5:30 PM	0	54	4	0	46	68	1	0	3	1	0	0	1	1	36	0	215
5:45 PM	2	59	1	0	50	65	3	0	3	1	0	0	0	2	21	0	207
6:00 PM	3	38	2	0	31	38	3	0	0	1	2	0	1	0	12	0	131
6:15 PM	0	49	0	1	27	62	2	0	1	0	0	0	0	0	10	0	152
6:30 PM	2	35	0	0	34	38	2	0	0	2	1	0	0	2	31	0	147
6:45 PM	1	29	0	0	35	27	2	0	2	3	0	0	0	0	10	0	109
7:00 PM	1	20	0	0	35	42	2	0	1	4	1	0	1	3	20	0	130
7:15 PM	0	22	0	0	15	48	0	0	2	1	3	0	0	3	10	0	104
7:30 PM	0	18	1	0	21	33	0	0	0	1	0	0	0	1	11	0	86
7:45 PM	1	18	0	0	22	43	1	0	0	1	0	0	0	0	9	0	95
8:00 PM	0	14	0	0	13	28	3	0	1	1	0	0	0	2	9	0	71
8:15 PM	1	12	0	0	15	18	0	0	2	3	0	0	0	3	19	0	73
8:30 PM	1	14	0	0	17	22	0	0	0	0	0	0	0	3	43	0	100
8:45 PM	0	16	0	0	7	19	1	0	3	1	0	0	0	2	18	0	67
9:00 PM	0	9	0	0	9	15	1	0	0	1	1	0	0	1	6	0	43
9:15 PM	0	10	0	0	12	14	0	0	0	1	1	0	0	0	5	0	43
9:30 PM	0	8	1	0	8	13	0	0	0	0	0	0	0	1	7	0	38
9:45 PM	0	6	0	0	4	9	0	0	0	0	0	0	0	0	2	0	21
10:00 PM	0	5	0	0	3	9	1	0	0	0	0	0	0	0	1	0	19
10:15 PM	0	6	0	0	5	14	1	0	0	0	0	0	0	0	3	0	29
10:30 PM	0	2	0	0	5	6	0	0	0	0	0	0	0	0	1	0	14
10:45 PM	0	5	0	0	4	10	0	0	0	0	0	0	0	0	4	0	23
11:00 PM	0	8	0	0	1	8	1	0	0	0	0	0	0	0	3	0	21
11:15 PM	0	3	0	0	2	3	0	0	0	0	0	0	0	0	0	0	8
11:30 PM	0	4	0	0	3	3	1	0	0	0	0	0	0	0	3	0	14
11:45 PM	0	2	0	0	5	6	0	0	0	0	0	0	0	0	0	0	13
	NL	NT	NR	NU	SL	ST	SR	SU	EL	ET	ER	EU	WL	WT	WR	WU	TOTAL
TOTAL VOLUMES :	28	1308	28	1	1101	1632	51	0	39	54	44	0	12	65	904	0	5267
APPROACH %'s :	2.05%	95.82%	2.05%	0.07%	39.55%	58.62%	1.83%	0.00%	28.47%	39.42%	32.12%	0.00%	1.22%	6.63%	92.15%	0.00%	
PEAK HR :	04:30 PM - 05:30 PM																TOTAL
PEAK HR VOL :	2	245	9	0	239	298	9	0	5	10	9	0	2	12	157	0	997
PEAK HR FACTOR :	0.500	0.795	0.563	0.000	0.879	0.887	0.750	0.000	0.417	0.625	0.375	0.000	0.500	0.750	0.801	0.000	0.948
	0.790				0.922				0.545				0.822				

National Data & Surveying Services

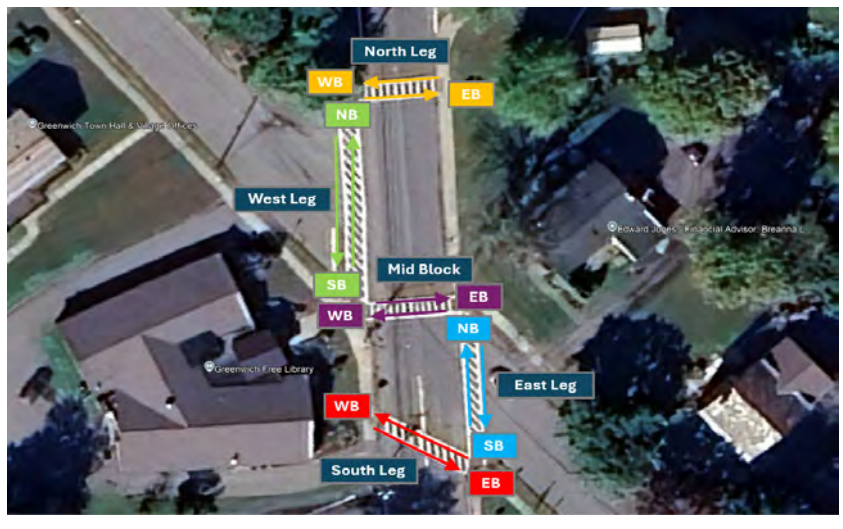
Intersection Turning Movement Count

Location: Main St/SR 29 & Academy St/Church St
City: Greenwich

Project ID: 25-380003-001
Date: 1/16/2025

Data - Pedestrians (Crosswalks)

NS/EW Streets:	Main St/SR 29		Main St/SR 29		Academy St/Church St		Academy St/Church St				
AM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		MID BLOCK		
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	TOTAL
12:00 AM	0	0	0	0	0	0	0	0	0	0	0
12:15 AM	0	0	0	0	0	0	0	0	0	0	0
12:30 AM	0	0	0	0	0	0	0	0	0	0	0
12:45 AM	0	0	0	0	0	0	0	0	0	0	0
1:00 AM	0	0	0	0	0	0	0	0	0	0	0
1:15 AM	0	0	0	0	0	0	0	0	0	0	0
1:30 AM	0	0	0	0	0	0	0	0	0	0	0
1:45 AM	0	0	0	0	0	0	0	0	0	0	0
2:00 AM	0	0	0	0	0	0	0	0	0	0	0
2:15 AM	0	0	0	0	0	0	0	0	0	0	0
2:30 AM	0	0	0	0	0	0	0	0	0	0	0
2:45 AM	0	0	0	0	0	0	0	0	0	0	0
3:00 AM	0	0	0	0	0	0	0	0	0	0	0
3:15 AM	0	0	0	0	0	0	0	0	0	0	0
3:30 AM	0	0	0	0	0	0	0	0	0	0	0
3:45 AM	0	0	0	0	0	0	0	0	0	0	0
4:00 AM	0	0	0	0	0	0	0	0	0	0	0
4:15 AM	0	0	0	0	0	0	0	0	0	0	0
4:30 AM	0	0	0	0	0	0	0	0	0	0	0
4:45 AM	0	0	0	0	0	0	0	0	0	0	0
5:00 AM	0	0	0	0	0	0	0	0	0	0	0
5:15 AM	0	0	0	0	0	0	0	0	0	0	0
5:30 AM	0	0	0	0	0	0	0	0	0	0	0
5:45 AM	0	0	0	0	0	0	0	0	0	0	0
6:00 AM	0	0	0	0	0	0	0	0	0	0	0
6:15 AM	0	0	0	0	0	0	1	0	0	0	1
6:30 AM	0	0	0	0	0	0	0	0	0	0	0
6:45 AM	0	0	0	0	0	0	0	0	0	0	0
7:00 AM	0	0	1	0	0	0	0	0	0	0	1
7:15 AM	0	0	0	1	0	0	0	0	0	0	1
7:30 AM	2	0	0	0	0	0	0	0	0	0	2
7:45 AM	0	0	0	0	0	0	0	1	2	0	3
8:00 AM	1	0	2	0	0	0	1	0	1	1	6
8:15 AM	0	0	0	2	0	1	1	0	0	1	5
8:30 AM	1	0	0	2	0	1	1	0	0	0	5
8:45 AM	0	0	0	0	0	0	0	0	0	0	0
9:00 AM	1	0	0	0	0	0	1	0	0	0	2
9:15 AM	0	0	0	0	0	0	0	0	0	0	0
9:30 AM	0	0	0	0	0	0	0	0	0	0	0
9:45 AM	0	0	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	5	0	3	5	0	2	5	1	3	2	26
APPROACH %'s :	100.00%	0.00%	37.50%	62.50%	0.00%	100.00%	83.33%	16.67%	60.00%	40.00%	
PEAK HR :	07:30 AM - 08:30 AM										TOTAL
PEAK HR VOL :	3	0	2	2	0	1	2	1	3	2	16
PEAK HR FACTOR :	0.375		0.250	0.250		0.250	0.500	0.250	0.375	0.500	0.667
	0.375		0.500		0.250		0.750		0.625		



NOON	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		MID BLOCK		
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	TOTAL
10:00 AM	0	0	0	1	0	0	1	0	2	0	4
10:15 AM	0	0	1	0	1	0	0	1	0	0	3
10:30 AM	0	0	0	0	0	1	0	0	0	0	1
10:45 AM	0	0	0	1	0	0	0	0	0	0	1
11:00 AM	0	0	1	0	0	0	0	0	0	0	1
11:15 AM	0	0	0	0	0	0	0	0	0	0	0
11:30 AM	0	0	0	0	0	0	1	0	0	0	1
11:45 AM	0	0	0	1	0	0	0	0	0	0	1
12:00 PM	0	0	1	0	0	1	0	1	0	0	3
12:15 PM	0	1	0	0	0	0	1	0	0	0	2
12:30 PM	0	0	0	0	0	0	0	0	0	0	0
12:45 PM	0	0	0	0	0	0	0	1	0	0	1
1:00 PM	0	0	0	0	0	0	0	0	0	0	0
1:15 PM	0	0	0	0	0	0	0	1	1	0	2
1:30 PM	0	0	0	0	0	0	0	0	0	2	2
1:45 PM	0	0	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	1	3	3	1	2	3	4	3	2	22
APPROACH %'s :	0.00%	100.00%	50.00%	50.00%	33.33%	66.67%	42.86%	57.14%	60.00%	40.00%	
PEAK HR :	11:45 AM - 12:45 PM										TOTAL
PEAK HR VOL :	0	1	1	1	0	1	1	1	0	0	6
PEAK HR FACTOR :		0.250	0.250	0.250		0.250	0.250	0.250			0.500
	0.250		0.500		0.250		0.500				

PM	NORTH LEG		SOUTH LEG		EAST LEG		WEST LEG		MID BLOCK		
	EB	WB	EB	WB	NB	SB	NB	SB	EB	WB	TOTAL
2:00 PM	0	0	1	0	0	0	0	0	0	0	1
2:15 PM	0	0	0	0	1	0	0	0	0	13	14
2:30 PM	0	0	1	0	0	0	0	0	0	3	4
2:45 PM	0	0	0	0	0	0	0	0	1	0	1
3:00 PM	0	0	0	0	0	0	1	0	0	0	1
3:15 PM	0	0	0	0	1	1	0	2	0	3	7
3:30 PM	0	0	0	0	0	0	0	0	0	3	3
3:45 PM	0	0	0	0	0	2	0	0	0	3	5
4:00 PM	0	0	0	1	0	2	4	0	1	0	8
4:15 PM	0	0	0	0	1	0	0	0	0	0	1
4:30 PM	0	0	0	0	0	0	0	4	1	0	5
4:45 PM	0	0	0	0	0	0	0	0	0	0	0
5:00 PM	0	0	0	0	0	0	0	0	0	0	0
5:15 PM	0	0	0	0	0	0	0	0	0	0	0
5:30 PM	0	0	0	0	0	0	1	0	0	0	1
5:45 PM	0	0	0	0	0	0	0	0	0	0	0
6:00 PM	0	0	0	0	0	0	0	0	0	0	0
6:15 PM	0	0	0	0	0	0	0	0	1	0	1
6:30 PM	0	0	0	0	0	0	0	0	0	0	0
6:45 PM	0	0	0	0	0	0	0	0	0	0	0
7:00 PM	0	0	0	0	0	0	0	0	0	0	0
7:15 PM	0	0	0	0	0	0	0	0	0	0	0
7:30 PM	0	0	0	0	0	0	0	0	0	0	0
7:45 PM	0	0	0	0	0	0	0	0	0	0	0
8:00 PM	0	0	0	0	0	0	0	0	0	0	0
8:15 PM	0	0	0	0	0	0	0	0	0	0	0
8:30 PM	0	0	0	0	0	0	0	0	0	0	0
8:45 PM	0	0	0	0	1	0	0	0	0	0	1
9:00 PM	0	0	0	0	1	0	0	0	0	0	1
9:15 PM	0	0	0	0	0	0	0	0	0	0	0
9:30 PM	0	0	0	0	0	0	0	0	0	0	0
9:45 PM	0	0	0	0	0	0	0	0	0	0	0
10:00 PM	0	0	0	0	1	0	0	0	0	0	1
10:15 PM	0	0	0	0	0	0	0	0	0	0	0
10:30 PM	0	0	0	0	0	0	0	0	0	0	0
10:45 PM	0	0	0	0	0	1	0	0	0	0	1
11:00 PM	0	0	0	0	0	0	0	0	0	0	0
11:15 PM	0	0	0	0	0	0	0	0	0	0	0
11:30 PM	0	0	0	0	0	0	0	0	0	0	0
11:45 PM	0	0	0	0	0	0	0	0	0	0	0
	EB	WB	EB	WB	NB	SB	NB	SB	NB	SB	TOTAL
TOTAL VOLUMES :	0	0	2	1	6	6	6	6	4	25	56
APPROACH %'s :			66.67%	33.33%	50.00%	50.00%	50.00%	50.00%	13.79%	86.21%	
PEAK HR :	04:30 PM - 05:30 PM										TOTAL
PEAK HR VOL :	0	0	0	0	0	0	0	4	1	0	5
PEAK HR FACTOR :								0.250	0.250		0.250
							0.250		0.250		

ATTACHMENT B

SIGNAL WARRANTS 2 AND 3
FIGURE 4C-2 AND FIGURE 4C-4

GREENWICH BIKE PED CONNECTIVITY PLAN
MAIN STREET AND ACADEMY STREET/CHURCH STREET
VILLAGE OF GREENWICH
WASHINGTON COUNTY, NY

Figure 4C-2
Reduced Four-Hour Vehicular Volume Warrant
Source: Federal MUTCD

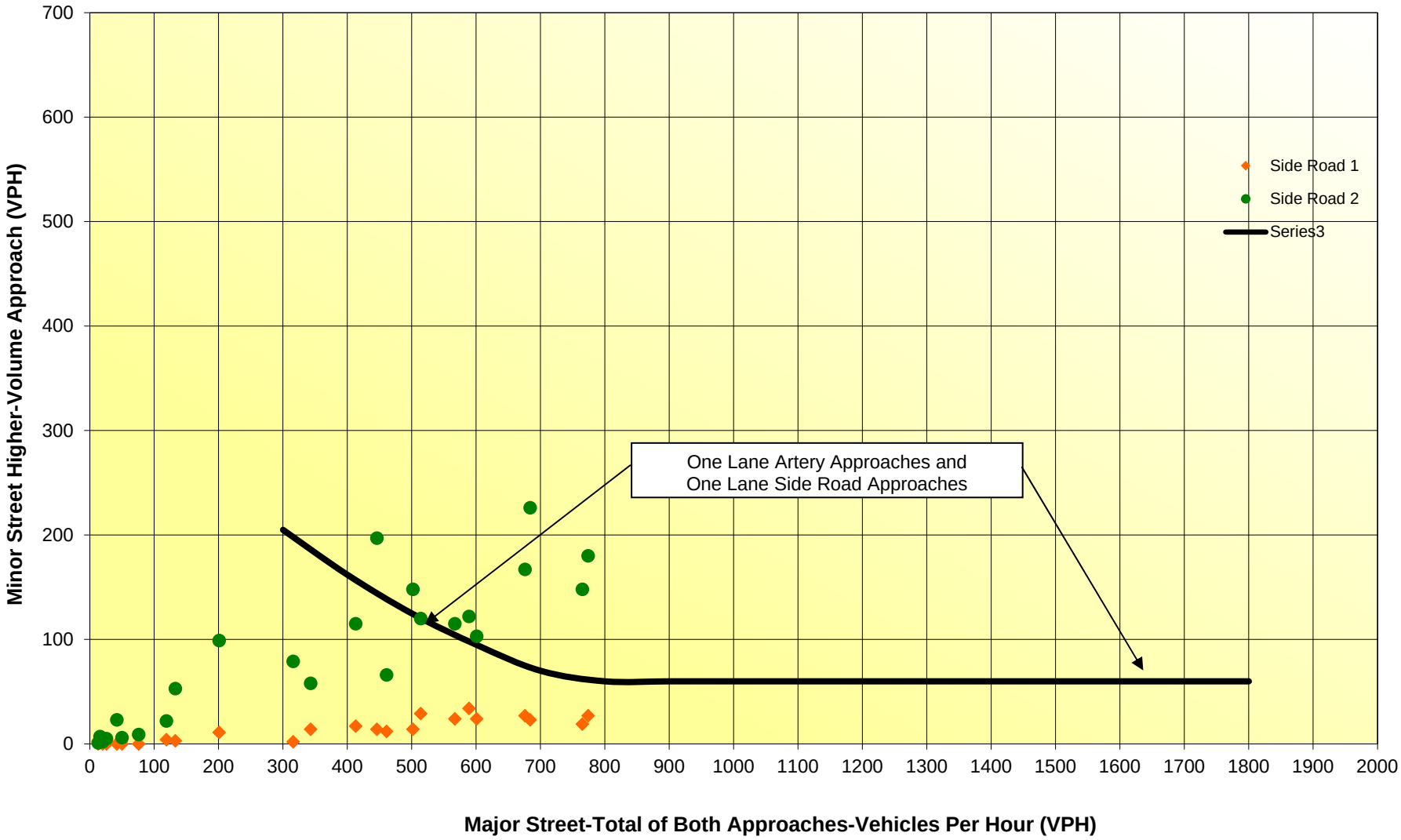
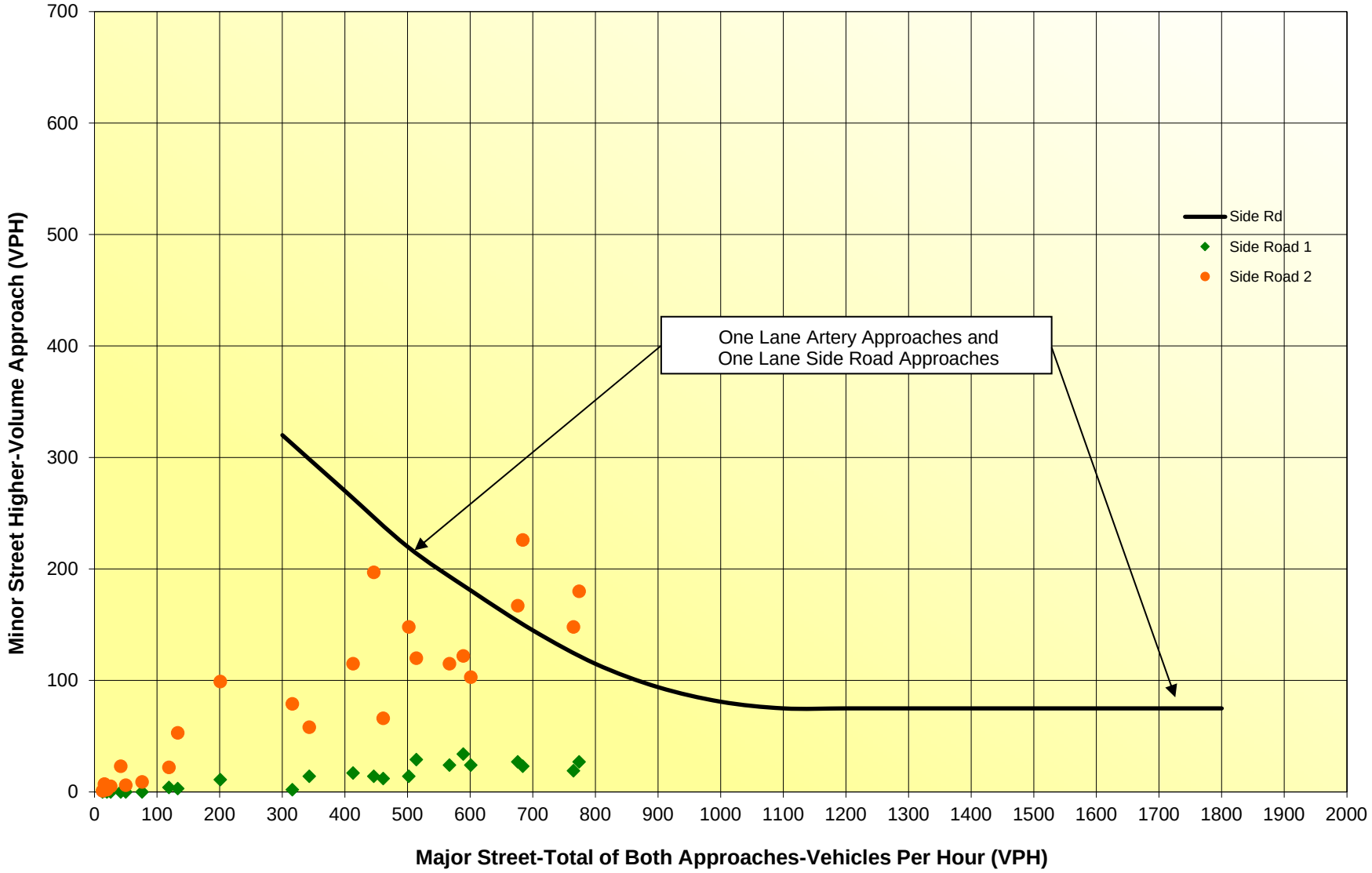


Figure 4C-4
Reduced Peak Hour Volume Warrant
Source: Federal MUTCD



APPENDIX C: INTERACTIVE MAP SUMMARY

BYER PLANNING

MEMORANDUM

To: Norabelle Greenberger, LaBella; Mirren Galway, LaBella
From: Laura Byer, Byer Planning
Date: October 4, 2024
Re: Greenwich Bike/Ped Connectivity Plan– Interactive Map Summary

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The following technical memorandum has been developed to summarize public input gathered via an interactive webmap for the Greenwich Bike/Ped Connectivity Plan. An interactive webmap was developed to gather public input to indicate areas in need of active transportation-related improvements. The public were asked to add points within the Town and Village of Greenwich to identify locations for where they think it would be beneficial to install new bike racks or crosswalks as well as identify popular bike route locations and where sidewalks are in need of repair or where new sidewalks are needed.

Executive Summary

- Timeline: The interactive webmap was open and active for 14 weeks.
- Communications: A wide variety of communications were used to promote the project and interactive map to the general public:
    - Press Release
    - Email to committee members so they could share with their networks
    - Flyers posted around town
    - Several social media posts
    - Pop-up on the Village website and the link to the map was featured on the home page
- Number of Points Added: 75
- Number of Individual Users: 25
- Number of Written Comments via Interactive Webmap: 85
- Number of “Agree” Votes on all Input: 27
- Number of “Disagree” Votes on all Input: 7

Interactive Webmap Input Received

The interactive webmap received 75 input points for complete streets improvements within the Village of Cambridge. These recommendations were submitted by 25 individual users. Users had the opportunity to vote "agree" or "disagree" on input points added by the public. There were a total of 27 "agree" votes split between 15 of the input points. There were a total of 7 "disagree" votes split between 5 of the input points.

Table 1: Number of Input Types Added to Interactive Map

Input Type	Number of Points Added
Bike Rack: I would like to see a bike rack here	13
Popular Bike Route: This is a popular street for bicyclists	8
Crosswalk: I would like to see a crosswalk here	7
New Sidewalk: I would like to see a new sidewalk here	14
Sidewalk Repair: This sidewalk is in need of repair	7
Other: Please use this input point and include a comment describing what type of improvement you would like to see at the location you identify (e.g., traffic calming, bike amenity, wayfinding signs)	26
TOTAL	75

Bike Rack Input Locations:

- Gannon Park (2 points added)
- Greenwich Library
- Riverside Park
- Big Lots Plaza
- Main Street/Salem Street Intersection
- Main Street/John Street Intersection (Grooming Gail's Pet Salon)
- Mowry Park
- Veteran's Memorial Park
- Dorr Park
- Washington Square
- Main Street, just south of Hill Street
- Main Street, just north of John Street (Whipple City Health and Wellness Center)

Popular Bike Route Input Locations:

- Corliss Avenue (2 points added)
- Eddy Street – point located south of Route 372
- Hill Street
- County Route 52
- Richards Road

- North Road
- State Route 40

Crosswalk Input Locations:

- Gray Avenue, just south of Simpson Street
- Corliss Avenue / Hill Street Intersection
- Main Street / Van Ness Avenue (comment indicates existing crosswalk is in need of repainting)
- State Route 29, at the light between Cumberland Farms and McDonald's
- Main Street, midblock between Hill Street and John Street
- Main Street / Academy Street / Church Street Intersection (comment indicates a need for a "push button" crossing with lights to alert drivers to crossing pedestrians)
- Main Street / Hill Street Intersection (comments indicates a desire for the existing crosswalk to be positioned diagonally)

New Sidewalk Input Locations:

- Hill Street (2 points added) – south side from just east of Corliss Avenue to Van Ness Avenue
- Gray Avenue (2 points added) – both sides from existing sidewalks just west of Simpson Street to Prospect Street/North Road
- State Route 40 – from north entrance of Galesville Drive south to the traffic circle
- Woodlawn Avenue – east side from Church Street to existing sidewalk
- John Street – south side between Bleecker Street and Corliss Avenue
- Academy Street – north side from Bleecker Street to Main Street
- Greenwich Town Hall – requests a pedestrian path which connects the Village Hall, Youth Center, Town Hall, and Library
- Eddy Street – west side south of Route 372
- Main Street (general) – "commercial area needs new sidewalks and green area to be more welcoming"
- Cottage Street – west side to connect existing sidewalk to the cemetery
- Van Ness Avenue – east side from existing sidewalk to Academy Street
- Prospect Street – no side or description listed; point is place between Highland Street and Gray Avenue

Sidewalk Repair Input Locations:

- Main Street / Church Street Intersection – north side of Church Street just east of Main Street
- Main Street / Church Street Intersection – approximately 200 feet east of Main Street
- Main Street / Cottage Street Intersection – east side of Main Street just north of Cottage Street
- Main Street / Cottage Street Intersection – just north of Main Street
- Hill Street – north side of Hill Street approximately 120 west of Main Street
- Gray Avenue – north side of Gray Avenue between Merritt Street and Whipple Place

- Main Street – south/west side of Main Street between Corliss Avenue and Academy Street (approximate address: 162 Main Street)

Other Input Locations:

The public had the opportunity to utilize an "Other" category to identify requested improvements that may not fall into the other categories listed above. These were further categorized into the sub-categories below:

- Traffic Calming
    - 2 requests for speed limit reduction:
        - State Route 40 – "Speed limit of 55 mph changed to 40 mph one mile north of the north entrance of Galesville Road. TY"
        - Hill Street (point located between Abeel Avenue and Dixson Drive) – "Popular street for runners, walkers, and children walking to school. We should reduce the speed limit for this block of Hill Street considering many will walk to Dixson to loop back around to the village."
    - 2 requests for speed bumps:
        - 1 point added on Gray Avenue just west of intersection with Simpson Street
        - 1 point added on Gray Avenue just east of intersection with Merritt Street
    - Reduce heavy truck traffic on Main Street – "People would walk and ride more if there was less truck traffic along main st. Huge logging and tanker trucks weave through the narrow lane available when cars are parked along the curb. NYSDOT must be petitioned to limit weight or height of these vehicl"
- Pedestrian Crossing Signage
    - "Flashing sign for pedestrians like they have in middle falls" – comment added for 4 locations:
        - Main Street / Academy Street / Church Street intersection
        - Main Street mid-block crossing at Stewart's
        - Main Street crossing at intersection with Washington Street
        - Main Street / Corliss Avenue / Mowry Avenue intersection
    - Main Street crossing at Hill Street intersection – "It's difficult for pedestrians to "see" the traffic light (red, yellow or green) at certain crossing areas here. Is it possible to install "Walk" and "Don't Walk" signals?"
- Trail Development
    - 3 requests for Rail Trail development:
        - Rail Trail from County Route 61 to Village center
        - Rail Trail east of Village center
        - "In the village we need an expansion of space for both biking and walking. It would be wonderful if we could somehow utilize the railway beds that are no longer functioning in our town. We could connect with Cambridge ,Salem and other areas of interest."
    - Hayes Reservoir trail expansion – "Hiking trails and mountain biking trails"
- Bike Route

    - "A bike and walking/running route from Helping Hands down Eddy Street over Safford, Louse, Hegaman Bridge, Washington St. Great Route!"
    - "Bike Route: Eddy Street, Rt. 372 to Old Cambridge Rd, back around to Rt. 29 into the Village of Greenwich."
- Traffic Control Improvements
    - Woodlawn Avenue at intersection with Gray Avenue – "Stop sign instead of Yield"
        - Main Street / Academy Street / Church Street – "A better way to have traffic stop when crossing the street. I feel this intersection needs something to help those crossing."
        - Route 29 at Dunkin Donuts – "Something to reduce the line of cars for the Dunkin drive thru that sometimes extends dangerously into the road"
- Public Parking Area
    - 2 requests for public parking areas to promote local businesses:
        - 1 point placed on Main Street south of Hill Street
        - 1 point placed at private lot just northwest of 132 Main Street
- On-Street Parking Reduction
    - 2 requests for on-street parking reductions:
        - 1 point placed on Main Street between Hill Street and John Street – "village streets should have parking on one side only the other side should be a bike lane, residents would have to use their driveways for parking instead of leaving their cars on the street 24/7"
        - 1 point placed on Hill Street at intersection with Corliss Avenue – "One side parking. When vehicles are parked on both sides for fire call, the corner becomes blind. Crossing Hill becomes dangerous."
- Sidewalk Maintenance
    - General location – "All sidewalks in entire village should be cleaned within 48 hours of any snowfall over 1 inch by hmeowners do away with village plow"
    - Main Street – southwest side at intersection with Cottage Street – "Bushes need major trimming, they impede the sidewalk"
- Cemetery Access
        - "Possibly not within the scope of the town/village work, but why isn't there a working entrance to the cemetery at these gates? It is one of the best places to walk in Greenwich, and it would be so nice to connect it to Main Street"

Table 2: Top 3 Input Points with Most Public Consensus

Location	Input Type	Number of People who "Agree"	Consultant Summary
Intersection of Main Street / Academy Street / Church Street	Other (Pedestrian Crossing Signage)	4	Flashing signage to improve safety for pedestrians crossing
Main Street mid-block crossing at Stewart's	Other (Pedestrian Crossing Signage)	4	Flashing signage to improve safety for pedestrians crossing
Main Street	Other (Traffic Calming)	3	Reduce heavy truck traffic along Main Street to make commercial area more comfortable for pedestrians and bicyclists

Communications

A wide variety of communications were used to promote the project and interactive map to the general public:

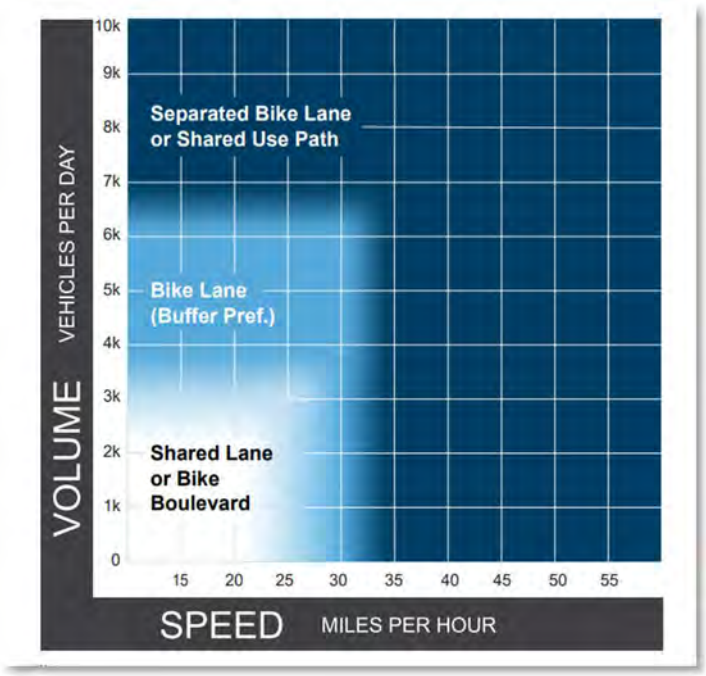
- Press Release
- Email to committee members so they could share with their networks
- Flyers posted around town
- Several social media posts
- Pop-up on the Village website and the link to the map was featured on the home page

APPENDIX D: GUIDANCE

GUIDANCE

Federal Highway Administration Bikeway Selection Guide

To inform decision making around bikeway planning, the Federal Highway Administration (FHWA) developed the **Bikeway Selection Guide**. This guide takes existing tools and applies context, constraints, and opportunities to treatment recommendation. Two tools from the guide were used to select treatment types throughout this analysis.

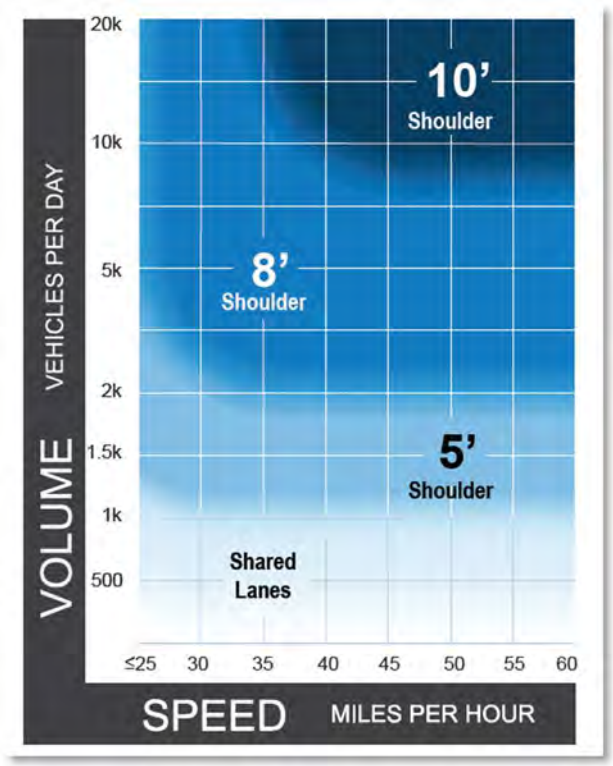


Preferred Bikeway Type for Urban, Urban Core, Suburban, and Rural Town Contexts

This tool helps determine the preferred bikeway type based on motor vehicle volume (y-axis) and speed (x-axis), tailored to the "Interested but Concerned" cyclist—a common user type in urban, suburban, and rural town contexts. Higher speeds and volumes call for more protective bikeways, such as separated bike lanes or shared-use paths, while lower speeds and volumes may only require shared lanes or bicycle boulevards. The recommendations prioritize more protective facilities to accommodate less confident cyclists, even if such protection might not be essential for more experienced riders.

Preferred Shoulder Widths for Rural Roadways

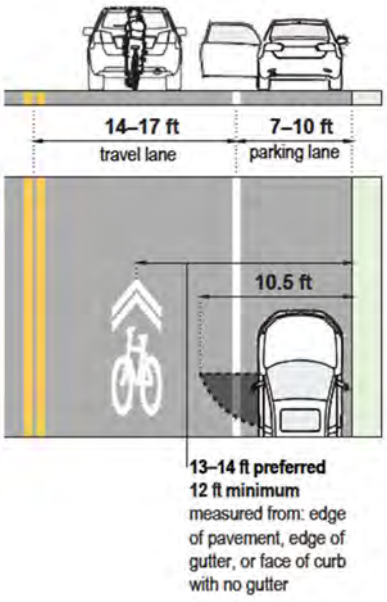
This tool also looks at volume and speed, but in the context of rural roads. Most riders in this context are confident or somewhat confident riders and partake in recreational rides rather than a commuter trip. Shared lanes, wide shoulders, and shared-use paths are all appropriate treatments for rural roads. While a shared-use path is recommended to accommodate less-confident cyclists and connect key destinations, any shoulder is better than no shoulder in the most constrained of conditions.



American Association of State Highway and Transportation Officials (AASHTO) Guide for the Development of Bicycle Facilities

The AASHTO Guide for the Development of Bicycle Facilities provides comprehensive guidelines for designing and implementing bicycle infrastructure. It emphasizes creating safe, accessible, and comfortable facilities for all cyclist types, from casual riders to confident commuters. It outlines how to choose the right treatment based on various attributes including user type, volume, speed, and roadway width. There are detailed recommendations for planning on-road treatments such as bike lanes, shared lanes, and paved shoulders, as well as shared-use paths. This guide is also informed by key references that establish standards and best practices for designing safe and effective bicycle infrastructure. These include the Manual on Uniform Traffic Control Devices (MUTCD) for signage and markings, the AASHTO Green Book for roadway design principles, and the Highway Capacity Manual (HCM) for analyzing traffic flow and capacity. It also incorporates insights from Federal Highway Administration (FHWA) publications, the NACTO Urban Bikeway Design Guide, and other research studies and state guidelines. Together, these resources ensure that the guide provides evidence-based and applicable recommendations for creating connected and accessible bicycle facilities across diverse environments.

For on-road treatments**,** the guide offers guidance on lane widths, signage, and pavement markings to ensure safe interaction between cyclists and motor vehicles. It also addresses considerations like traffic volume, speed, and roadway geometry to determine appropriate facilities. The figure to the right shows bicycle boulevard road markings when there is a parking lane and a travel lane greater than 14 feet. This is an example of an on-road treatment.



For shared-use paths**,** the guide outlines design standards for width, alignment, and surface materials to accommodate both bicyclists and pedestrians. It emphasizes connectivity, minimizing conflicts at crossings, and integrating paths into existing transportation networks.

In planning for Greenwich, the AASHTO Guide aided in identifying suitable on-road treatments for areas with varying traffic conditions and designing a shared-use path that connect the town and the Empire State Trail, while prioritizing safety and accessibility for all users. The figure on the right is an example of safety guidance, showing minimum shoulder widths for shared-use paths, alone with vertical and horizontal clearance for obstructive items on or near the path.