



Town of Greenwich North Road Pedestrian Connector Feasibility Report

DRAFT 10/11/2021

Prepared by:



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I. Introduction & Goals

On behalf of the Town of Greenwich, the Adirondack/Glens Falls Transportation Council (A/GFTC), in conjunction with Barton & Loguidice, has prepared this Feasibility Report for a pedestrian connection along North Road to provide access to the Thunder Mountain Recreation Area. This stretch of roadway is a popular route for pedestrians and cyclists of all ages, yet there are no dedicated facilities to accommodate these activities.

The goal of this Feasibility Report is to provide an overview of existing conditions, a framework to evaluate alternatives, concept-level cost estimates, and information concerning funding opportunities and implementation. This information is furnished to the Town to guide further decision making; it is recommended that outreach to affected landowners, town residents, and the Village of Greenwich be conducted prior to moving forward with future planning, design, and/or construction.

A. Existing Conditions

This section contains general information about conditions which may affect the design and/or construction of pedestrian amenities. This information is provided only to inform the evaluation of conceptual alternatives and is not a substitution for a land survey.

1. Land Use and Community Context

The project study area includes the portions of Prospect Street/North Road located between Gray Avenue in the Village of Greenwich and the Thunder Mountain Recreation Area entrance within the Town. In this area the land use transitions from neighborhood-scale residential to a more agricultural/rural context.

As stated previously, North Road is heavily used by walkers, cyclists, joggers, and people using strollers (see Figure 1). The road connects to the main entrance to Thunder Mountain Recreation Area, a Village-owned and maintained facility which contains trails and a popular fishing spot. In addition, there is a farm/bakery stand on the west side of the roadway which has become a local destination.



Figure 1 - Pedestrian walking along North Road

2. Roadway Geometry

North Road is a town-maintained facility with a functional classification of a rural local road. The pavement width is approximately 20-22' within the study corridor. The pavement is unmarked and the shoulders are grass turf. Slopes and curves along the corridor are gentle, providing long lines of sight for the most part.

3. Roadside Conditions

Roadside conditions vary widely within the corridor. Although there are long stretches of open field, in other areas pockets of forest or mature hedgerows are located 10' or less from the edge of pavement. In addition, numerous utility poles, large trees, fences, mailboxes, stone walls, and built structures are located near the edge of pavement. See Appendix 1 for more detail. Any future construction must take into account the need to avoid or relocate these elements; coordination with adjoining landowners will be necessary.

In particular, there are three structures located relatively close to the roadway on the west side of the street. This includes two homes and a barn (see Figure 3.) Although it may be physically feasible to construct a path between these structures and the edge of pavement, this may result in an undesirable condition for both the path users and the residents of the homes.

4. Traffic Counts & Speed

Traffic volume and speed data was collected for one week between Thursday, August 19, 2021 and Thursday, August 26, 2021. The data was collected using two roadside radar Automatic Traffic

Recorders (ATRs) that were located approximately 1,000 ft. and 1,750 ft. south of the Thunder Mountain Recreation Area entrance. It is noted that the farm/bakery stand is located between the two counters and was in operation during the data collection period. The traffic and speed data is summarized in Table 1.

	AADT	AM Peak	PM Peak	85th % Speed
Location #1 1,000 ft. south of Thunder Mtn.	316 vpd	7:00 AM	3:00 PM	42 MPH
Location #2 1,750 ft. south of Thunder Mtn.	374 vpd	10:00 AM	5:00 PM	45 MPH

Table 1 - Traffic Volume & Speed



Figure 2 -- Example of stone wall/vegetation near roadway. Image courtesy maps.google.com



Figure 3 - Homes located close to edge of pavement. Images courtesy maps.google.com

Speed data was also collected at the two count locations, both within the posted 45 MPH zone. The 85th percentile speed represents the speed at which 85% of vehicles travel at or below. The 85th percentile speeds at the two locations were 42 and 45 MPH, respectively.

5. Environmental Concerns

To determine the likelihood of potential environmental impacts, the NYSDEC Environmental Resource Mapper was consulted. See Appendix 2 for the environmental overview map. The map indicates that there may be freshwater wetlands in the project area. These are located primarily on the west side of North Road along an unnamed Class C stream. This stream runs under North Road via a culvert, eventually connecting to the former reservoir on the Thunder Mountain Recreation site. The culvert, which runs diagonally under the roadway, extends a few feet beyond the edge of pavement. It is likely that an off-road pedestrian amenity would require an extension of the culvert. In addition, all wetlands within the project area will require delineation during project design. A NYS Freshwater Wetlands Permit is required for any physical disturbance within the designated wetland or within the adjacent area of a state protected freshwater wetland. The adjacent area usually extends 100 feet from the wetland but has been extended beyond 100 feet under unusual circumstances. Ideally, the proposed pedestrian amenity will minimize or avoid impacts to the wetland and stream.

The environmental resource mapper also indicates the possible presence of rare animals or plants within a portion of the study area. NYSDEC should be consulted during project design to determine whether a permit will be required.

To determine the presence of agricultural lands within the project area, the Washington County Real Property Service Web Map was consulted. There are several identified farmland parcels along North Road that are included in Consolidated Agricultural District 4, as shown in Appendix 2. Potential project impacts and property easements on farmlands will need to be identified during the State Environmental Quality Review Act (SEQR) process when the project design and construction is progressed.

II. Evaluation of Alternatives

For the purpose of this analysis, three bicycle/pedestrian facility types were examined. The factors which affect the feasibility of construction include right-of-way impacts (as measured by number of parcels affected), roadside obstacles, environmental impacts, and stormwater/drainage. In addition, the desirability of each alternative in terms of the pedestrian and/or cyclist experience was also addressed.

A. Widen Shoulders (Not Recommended)

The first alternative is to widen the roadway to create shoulders on each side, which would allow space for pedestrians and cyclists to travel without the need for drivers to veer into the opposite lane to pass them. This can reduce the likelihood of pedestrian and bicycle crashes. The FHWA “Small Town and Rural Multimodal Networks” guide recommends a minimum shoulder width of 4’, though a width of 5-6.5’ is more desirable. To create a visual separation from the travel lane, the shoulders should be delineated, preferably in conjunction with rumble strips. To further enhance the visual separation, an 8” wide white stripe, or two 4” white stripes with an 18” buffer between them, can be used.

From a mobilization standpoint, widening the road would require coordination with every landowner in the corridor. Although the wider roadway will fit likely within the existing ROW, construction easements will be required for grading and drainage, utility poles and mailboxes will need to be relocated, and a significant number of trees will need to be removed on both sides of the roadway. This may cause major impacts to the surrounding community character and visual environment.

It is important to note that a shoulder is not a dedicated pedestrian or bicycle facility; it is considered part of the roadway. As such, vehicles may use the shoulder to pull over and park, blocking use by pedestrians and cyclists. In addition, increased roadway width is correlated to higher vehicle speed¹. Widening the roadway may therefore lead to higher traffic speeds, which would be further detrimental to the pedestrian bicycle experience. For this reasons, wide shoulders are not recommended.

B. Pedestrian Path

The next alternative entails the construction of a 5'-wide pedestrian path (see Figures 4 & 5). These differ from sidewalks in that they are not immediately adjacent to the roadway and do not require a curb. Pedestrian paths are generally set back from the road and separated by a ditch, green area, or tree plantings. These paths can be constructed along, but not immediately adjacent to, a roadway. The recommended minimum separation between a pedestrian pathway and the roadway is 4' (noted as the 'furnishing zone' in Figure 4); however, this can be reduced to as little as 2' in constrained areas.²

Recommended pavement applications for a pedestrian path include concrete, stone dust, and asphalt. Asphalt in particular offers a level of design flexibility to create a meandering alignment which can easily wind around large trees, utility poles, and other constraints while providing an easy-to-maintain, durable surface.

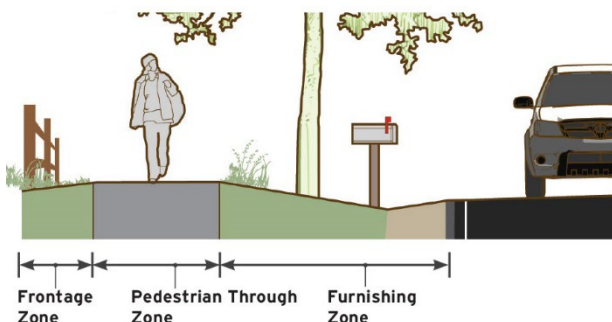


Figure 4 - Typical Pedestrian Path without curb
Source: FHWA



Figure 5 - Concrete Pedestrian Path
Source: Cornell Local Roads Program

¹ <https://nacto.org/publication/urban-street-design-guide/street-design-elements/lane-width/>

² [Small Town and Rural Multimodal Networks](#). FHWA, 2016.

It is important to note that this alternative does not specifically provide accommodation to cyclists; as with sidewalks, pedestrian paths are designed for use by pedestrians. However, there is no legislation that would prevent cyclists from using the facility. The pedestrian path could be useful for children and cyclists who are not comfortable riding in the travel lane; however, with only 5' of pathway width, this could create conflicts with pedestrians using the path at the same time.

To support cyclists on North Road, a “Narrow Lane” bicycle warning sign (Figure 6) may be installed in conjunction with the pedestrian path.³ This will alert drivers to the increased presence of bicycles along this stretch of roadway.



Figure 6 - Narrow Lane sign assembly

C. Shared Use Path

A shared use path (also known as a multi-use path or sidepath) is an 8-12' wide paved facility designed for use by both cyclists and pedestrians, as shown in figures 7 and 8. By providing a facility separate from non-motorized traffic, shared use paths create a low-stress experience and comfortable environment for users of every age and ability. A 2' shoulder/clear zone is recommended on either side of the path to facilitate drainage and user safety; however, this may be reduced in constrained environments. In addition, the minimum recommended separation from the roadway is 5'. Recommended pavement applications for a shared use path include asphalt and stone dust.

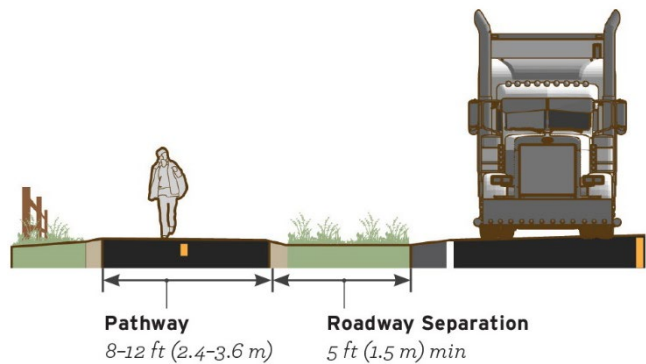


Figure 7 - Typical Shared Use Path configuration
Source: FHWA

This facility would face the same constraints as the pedestrian path regarding the location, with an additional constraint posed by existing stone retaining walls on the east side of the roadway. The stone walls are located approximately 8'-10' from the edge of pavement. As such, there may not be room to fit a shared-use path between the wall and the roadway in this location while maintaining a buffer from the edge of the pavement. If a shared use path is desired, this constraint may be accommodated by reducing the width of the path in this location (with provision of appropriate warning signage) and/or providing a vertical barrier or rumble strips between the roadway and the path.



Figure 8 - Shared Use Path, Fire Road, Glens Falls
Source: A/GFTC

³ [NYSDOT Shared Lane Marking Policy](#), 2013.

Since the shared use path is wider than a pedestrian path, it is likely that additional ROW acquisitions will be required, most likely for the majority of the approximately 25 parcels affected. In addition, the wider shared use path may require more extensive vegetative clearing. However, this option provides a comfortable experience for both cyclists and pedestrians, as both groups are fully separated from traffic.

D. Path Alignment

1. East Side

It is recommended that the location of a pedestrian or shared use path should reduce the need for users to cross the street to access the facility. NYSDOT notes that in cases where paths or sidewalks are located across from residences, “Pedestrians may cross where drivers of vehicles do not expect them, but rather where it is more convenient for the pedestrian to access the sidewalk. For example, a pedestrian originating from a residence on the side of a road without pedestrian facilities may opt to cross midblock rather than travel along the roadway to reach an intersection in order to cross and access the sidewalk.”⁴ As noted above, although traffic volume is light, vehicle speeds in the corridor can reach 45 mph. This further underscores the need to reduce unnecessary pedestrian road crossings as much as possible from a safety perspective.

Given that the residential development along North Road is not evenly distributed, the pedestrian path is recommended to be located on the side of the road which could be accessed by the most residents – in this case, the east side. This will require coordination from approximately 25 landowners. This option also avoids potential conflicts with the structures and wetlands on the west side of the road. To further reduce the potential for uncontrolled pedestrian crossings, the Town could consider adding a dedicated crosswalk leading to the farm stand/bakery, as it is a pedestrian generator within the corridor.

2. Alternate Sides

As noted above, the recommended alignment of either a pedestrian or multi-use path would be along the east side of the roadway. However, if there is an unsurmountable constraint (for example, needed ROW cannot be acquired, or a physical/ environmental obstacle cannot be mitigated), it may be necessary to locate a portion of the facility along the west side of the road. As discussed previously, there are several constraints on the east side of North Road, including ROW, fencing, retaining walls, and others. To determine the potential ROW impacts, the Washington County Real Property Services Parcel Viewer was reviewed. It is noted that the public highway boundary is not centered on the roadway (see Figure 9). This may be due to alignment errors between the digital parcel lines and the available aerial photography; in the absence of other data (such as a survey), this apparent offset is assumed to be accurate for the purposes of this report. A survey would be required to determine the actual available ROW on either side of the roadway.



Figure 9 -- Possible Offset Road Alignment

⁴ [NYSDOT Highway Design Manual, Chapter 18, Pedestrian Facility Design](#), 2017.

With the possibility of constrained availability of public ROW, the west side of North Road was investigated as an alignment option for the path. A summary of the advantages and constraints for construction have been collected and summarized in Table 2 table below.

Table 2 – Construction Advantages and Constraints				
	West Side		East Side	
Segment	Advantages	Constraints	Advantages	Constraints
Sloan Drive to Queens Gate Drive (South)	<ul style="list-style-type: none"> • Less earthwork to construct • Lower cost to construct 	<ul style="list-style-type: none"> • 2 Tree removals or ROW taking required • 3 Large trees in front of homes to be removed • 6 driveways • Very close to houses • Utility impacts 	<ul style="list-style-type: none"> • 1 Tree removals or ROW taking required • 2 driveways • Houses set far back from road • No utility impacts • Majority of users will not have to cross the street to access the path 	<ul style="list-style-type: none"> • More earthwork • 1 large tree in front of house • Fencing to replace • Higher cost to construct • Path crosses 105' of agricultural district farmland • Highway ROW is tight and additional taking may be required
Between Queens Gate Drive intersections	<ul style="list-style-type: none"> • Homes are set back from the road • Potentially no ROW taking • Less drainage work • Lower cost to construct 	<ul style="list-style-type: none"> • More driveways to cross • More earthwork • Path crosses/is adjacent to 470' of agricultural district farmland 	<ul style="list-style-type: none"> • Majority of users will not have to cross the street to access the path • Fewer driveways to cross • Less earthwork 	<ul style="list-style-type: none"> • Homes are closer to the road • 1 Tree removals or ROW taking • More drainage work • Highway ROW is tight and additional taking may be required
Queens Gate Drive (north) to the farm/bakery stand	<ul style="list-style-type: none"> • No ROW impacts • Less earthwork • Does not cross in front of homes • Located on the same side as the farm/bakery stand • Lower cost to construct 	<ul style="list-style-type: none"> • More tree clearing required • Crosses farmland • 2 Barns close to road, path will need to be narrowed • Impact to some parking for the farm/bakery stand • Large amounts of fence to replace • Path crosses/is adjacent to 745'/815' of agricultural district farmland 	<ul style="list-style-type: none"> • Majority of users will not have to cross the street to access the path • Less tree clearing • Homes located far from street • No impacts to the farm/bakery stand • Less fencing to replace 	<ul style="list-style-type: none"> • 4 properties with large trees to remove or ROW taking • Large earthwork cuts will need to be made in properties front yards • Users will have to cross the street to access farm/bakery stand • Highway ROW is tight and additional taking may be required • Path crosses 740' of agricultural district farmland
Farm/bakery stand to Thunder Mountain Entrance	<ul style="list-style-type: none"> • Does not cross in front of homes • Lower cost to construct • Less earthwork required 	<ul style="list-style-type: none"> • Potentially one ROW taking • Wetland impacts to cross stream and avoid trees • More drainage work • Farm fields impacted • Path crosses/is adjacent to 45'/1195' of agricultural district farmland 	<ul style="list-style-type: none"> • Less impacts to farm land • Avoid crossing the street at Thunder Mountain 	<ul style="list-style-type: none"> • 2 Properties with large trees or ROW taking required • Homes close to road • Highway ROW is tight and additional taking may be required

While the east side option provides the more desirable connection to Thunder Mountain Recreation Area by reducing the need for pedestrian crossings, due to construction and ROW constraints it may be necessary to align the path on alternating sides of the road, beginning on the east side and then crossing to the west. In this case, the path would begin on the east side of Prospect Street at Sloan Drive, avoiding the residences which are close to the road, then would cross North Road at the northern intersection of Queens Gate Drive. This would require a marked crosswalk. The path could then continue along the west side of the road, ultimately crossing back at the entrance of Thunder Mountain Recreation Park, again using a marked crosswalk. Both the preferred and alternate alignments are shown in Appendix 3.

E. Advisory Shoulder (Village Portion Only)

As noted above and on the map in Appendix 1, there is an existing stone wall located along a residential driveway just north of the Gray Avenue intersection. This feature presents a constraint to the construction of a path; as such it is recommended that any off-road path facility should begin at the intersection of Sloan Drive.

However, this leaves the section of Prospect Street between Sloan Drive and Gray Avenue without any accommodation for cyclists and pedestrians. A potential solution would be to create a facility known as Advisory Shoulders (see Figures 10 & 11). This treatment is only suitable for roadways with vehicle speeds of 35 m.p.h. or less; as such, it could be located only within the Village 30 m.p.h. speed zone.

Advisory shoulders demarcate space for bicyclists and pedestrians on a roadway that is otherwise too narrow for other options. The shoulder is delineated by pavement marking, creating two 4' – 6' wide shoulders with a 10' – 13.5' center lane. Motorists may enter the shoulder when no bicyclists or pedestrians are present and must overtake these users with caution due to potential oncoming traffic.

It should be noted that advisory shoulders are a new treatment type in the United States. To install advisory shoulders, an approved Request to Experiment is required as detailed in Section 1A.10 of the Manual of Unified Traffic Control Devices (MUTCD).

This alternative could be used as an interim solution to provide a bike/ped facility within the Village to connect to an off-road pedestrian or shared-use path as described previously. Given that the Village recently paved Prospect Road, the advisory shoulders could be implemented (pending FHWA approval) simply by adding pavement markings to the roadway. This alternative could be located along Prospect Street between Gray

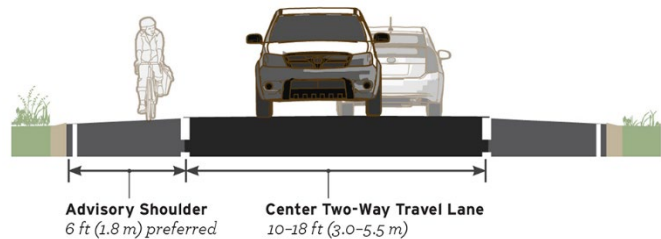


Figure 10 - Typical Advisory Shoulder. Source: FHWA



Figure 11 - Advisory Shoulder in Hanover, NH. Source: FHWA.

Avenue and Sloan Drive, or it could extend further south on Prospect Street to the intersection of Cooper Street. It is not recommended to extend south past Cooper Street due to sight distance constraints.

III. Cost Estimate

Planning level cost estimates were prepared for each alternative, summarized below in Table 3. For the detailed cost breakdown, see Appendix 4. The estimate also includes project “soft” costs for the survey, design, construction inspection, and ROW (easement) phases that would be required through the state or federal aid grant programs.

The cost estimates were prepared assuming the project would be funded through a federal or state grant and constructed through a traditional design-bid-build process. Typical grant programs through NYSDOT or the NYS Consolidated Funding Application range from 50-80% project funding; as such, the potential cost to the Town has also been included in Table 3 in the event that grant funding is procured. In some cases, the local match may be cash or in-kind labor.

Table 3 – Cost Estimate Summary					
	5' Pedestrian Path East Side	10' Shared Use Path East Side		10' Shared Use Path Alternate Sides	
	Asphalt	Stone Dust	Asphalt	Stone Dust	Asphalt
CONSTRUCTION COSTS:	\$ 522,300	\$ 753,300	\$ 841,300	\$ 552,100	\$ 640,100
CONTINGENCY (25%)	\$ 131,000	\$ 189,000	\$ 211,000	\$ 139,000	\$ 161,000
SUBTOTAL (2021 DOLLARS)	\$ 653,300	\$ 942,300	\$ 1,052,300	\$ 691,100	\$ 801,100
AWARD AMOUNT INFLATED 3% (2022 DOLLARS)	\$ 673,000	\$ 971,000	\$ 1,084,000	\$ 712,000	\$ 826,000
ENGINEERING AND SURVEY	\$ 90,000	\$ 90,000	\$ 90,000	\$ 75,000	\$ 75,000
CONSTRUCTION INSPECTION	\$ 61,000	\$ 78,000	\$ 87,000	\$ 72,000	\$ 83,000
RIGHT OF WAY COSTS*:	\$ 125,000	\$ 200,000	\$ 200,000	\$ 10,000	\$ 10,000
TOTAL COSTS:	\$ 949,000	\$ 1,339,000	\$ 1,461,000	\$ 869,000	\$ 994,000
COST TO TOWN WITH 80% GRANT MATCH	\$ 189,800	\$ 267,800	\$ 292,200	\$ 173,800	\$ 198,800
COST TO TOWN WITH 50% GRANT MATCH	\$ 474,500	\$ 669,500	\$ 730,500	\$ 434,500	\$ 497,000

* ROW estimates are conservative and based on the assumption that North Road is constrained on the east side by property lines. If a survey determines that the roadway is not offset to the degree anticipated based on GIS analysis, the ROW costs for the east side option may decrease.

IV. Implementation & Next Steps

This report was prepared to outline the physical feasibility of the various alternatives for a bicycle/pedestrian facility. It is recommended that, should the Town decide to pursue design and construction, a robust public outreach effort should be commenced. As noted above, both the pedestrian path and shared use path alternatives will require extensive coordination with the residents of the adjoining parcels. Although in some cases the narrower pedestrian path may be accommodated within the existing ROW, some residents and landowners may choose to grant additional easements to reduce the need to remove large trees or landscaping features. In other areas, additional ROW may be needed to allow for proper grading and drainage. Once the

path is constructed, residents may have concerns about ongoing maintenance, for example concerning snow removal in the winter.

As such, reaching out to residents in a proactive manner is a crucial element of the process. In addition, demonstrating community support for the path may increase the favorability of the project from a grant funding perspective. On a related note, coordination with the Village will also be necessary for the portions of the corridor located in that jurisdiction.

A. Grant Funding

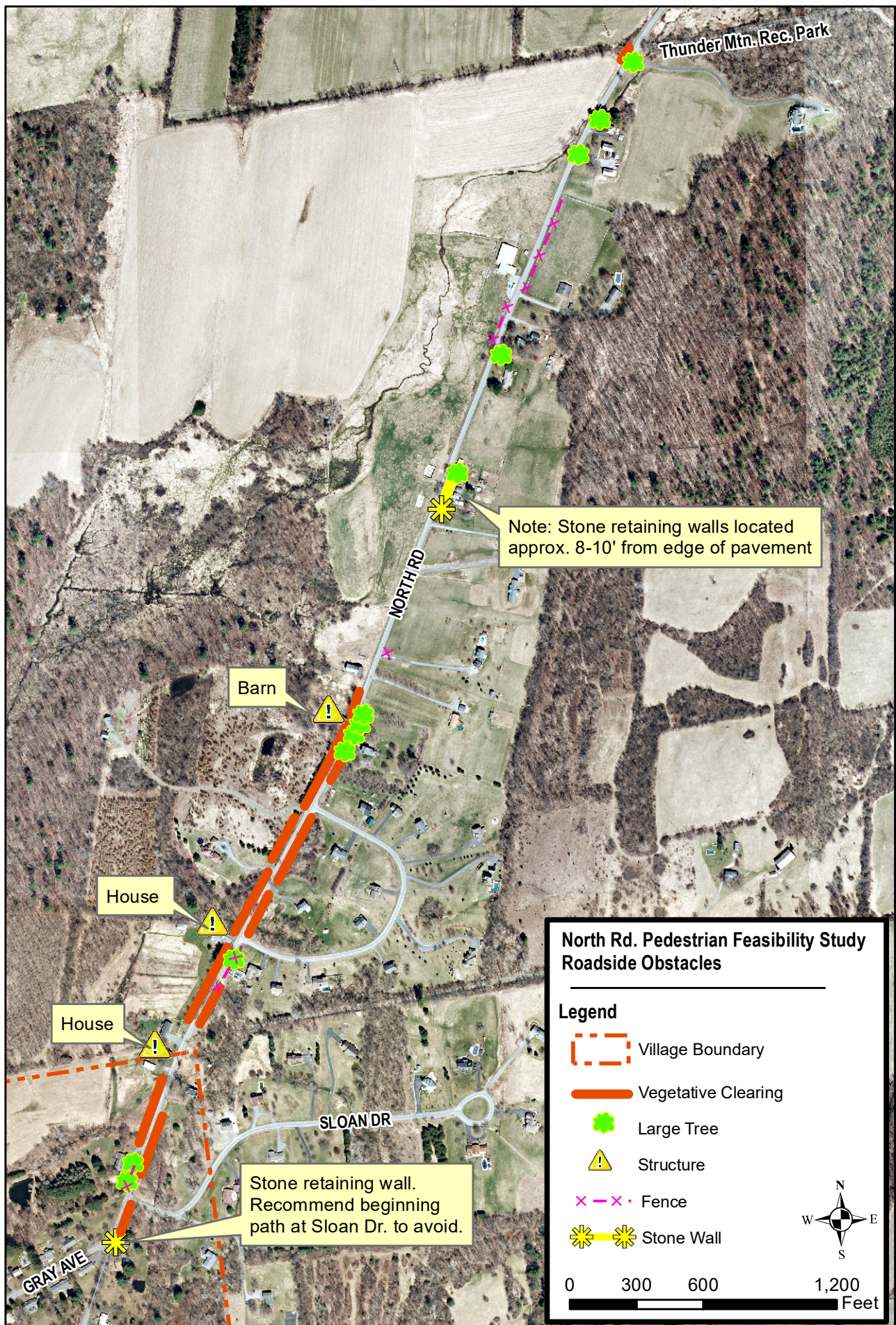
There are a variety of funding sources for pedestrian/shared use path design and construction. When seeking funding sources, it is important to consider funding minimum/maximums as well as any stipulations regarding local match and funding procurement, project deliverability, and any requirements specific to the funding program. In addition, the grant sources listed below are reimbursement programs; the Town must first-instantiate project costs before funds will be disbursed.

Potential Funding Sources	Notes*
Hudson River Valley Greenway: Conservancy Trail Grant	<ul style="list-style-type: none"> Trail Construction: Up to \$75,000 Trail Design or planning: Up to \$40,000 50% local/non-state match, in-kind allowed
OPRHP: Recreational Trails Program	<ul style="list-style-type: none"> Trail development/construction: Min. \$25,000, max \$250,000 Property acquisition is allowed in ask 80% local/state/federal match, in-kind allowed
NYS DOT Transportation Alternatives Program (TAP)	<ul style="list-style-type: none"> Project Design/Construction: Min. \$500,000, Max \$5M 80% local match Federal aid procedural requirements apply
A/GFTC Make the Connection Program	<ul style="list-style-type: none"> Trail Design Only: Min. \$20,000 Trail Construction or Design & Construction: Min. \$60,000 80% local match Federal aid procedural requirements apply

*Grant requirements subject to change

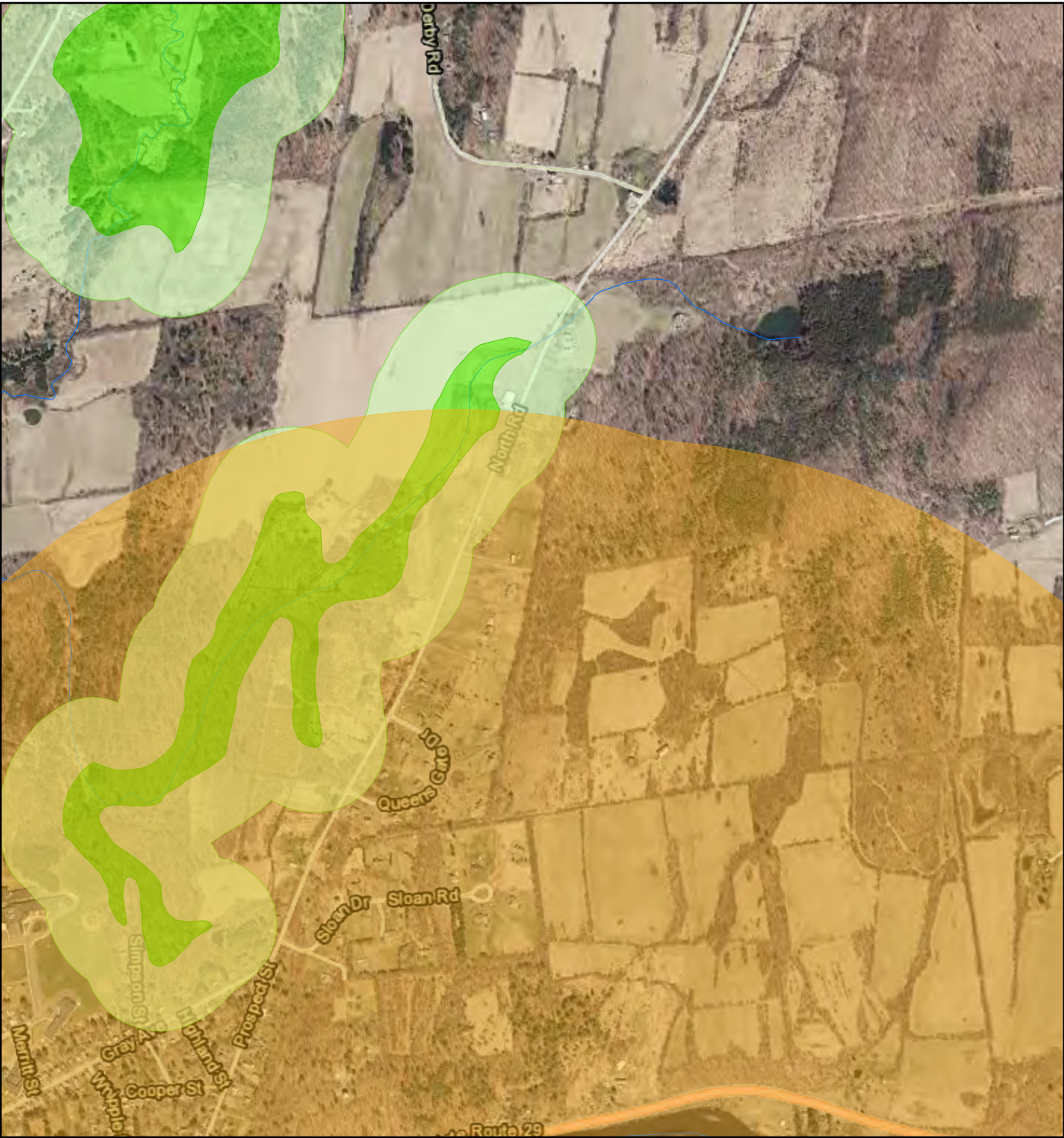
One option which may increase the chances of receiving a significant award, such as the Transportation Alternatives Program, is to leverage a smaller grant, such as the Hudson River Valley Greenway, to begin the survey/design process. This would enable the Town to determine the exact ROW constraints and create a more robust cost estimate. In addition, leveraging more than one funding source can be an advantage on grant applications.

Appendix 1 – Roadside Obstacles and Constraints






Appendix 2 – Environmental Constraints

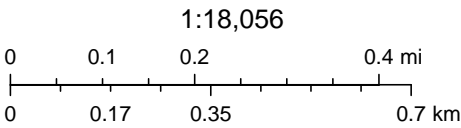
North Road Pedestrian Feasibility Analysis
Environmental Conditions



August 13, 2021

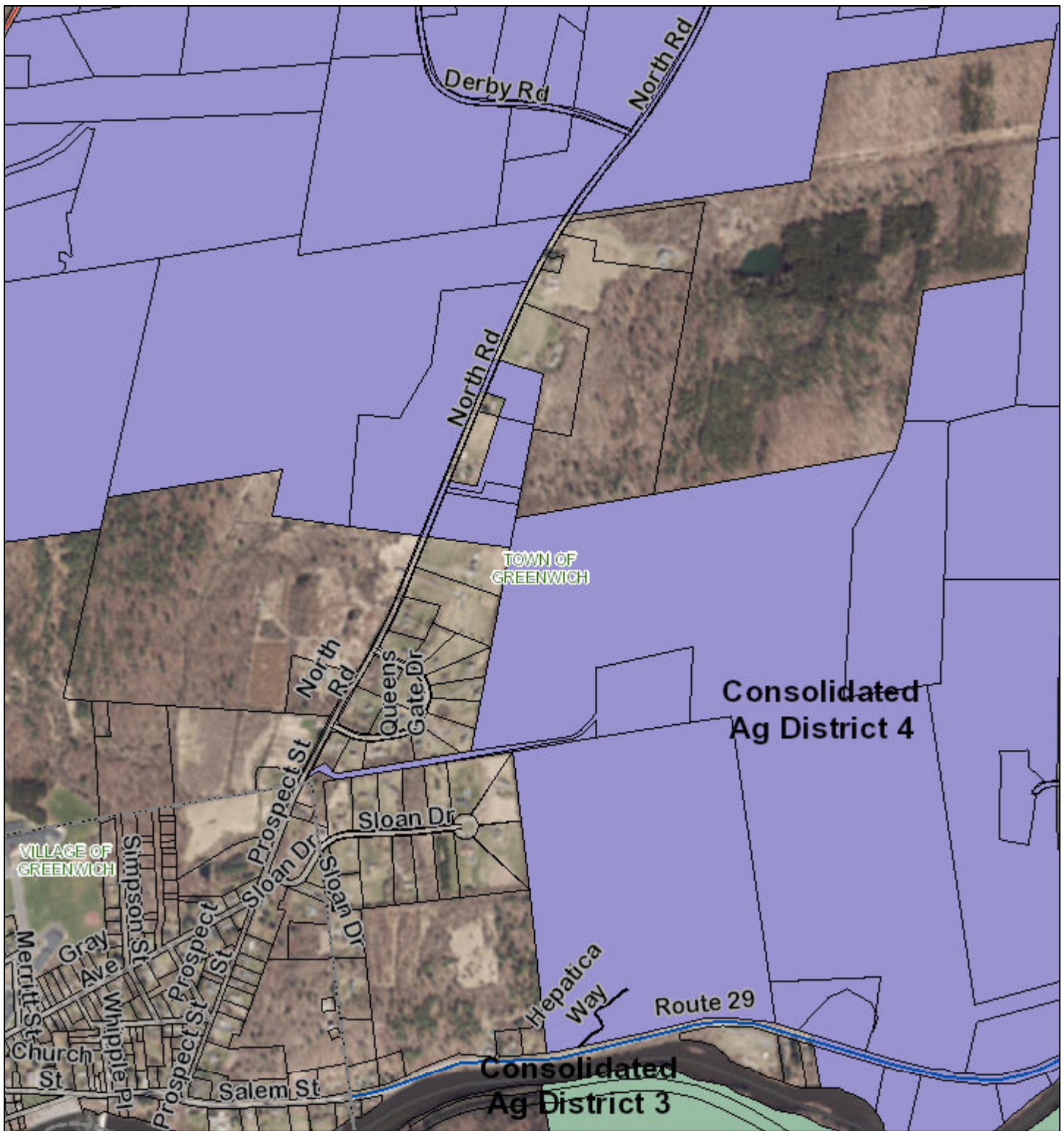
Legend

-  NYS Regulated Wetland check zone
-  NYS Regulated Freshwater Wetland
-  Rare Plants or Animals

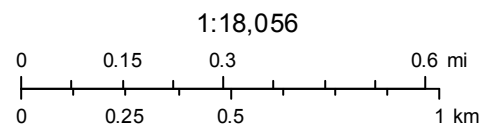


Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community, NYS ITS GIS Program Office, Westchester County GIS, Esri, HERE, Garmin, (c) OpenStreetMap contributors

North Road Agricultural Districts

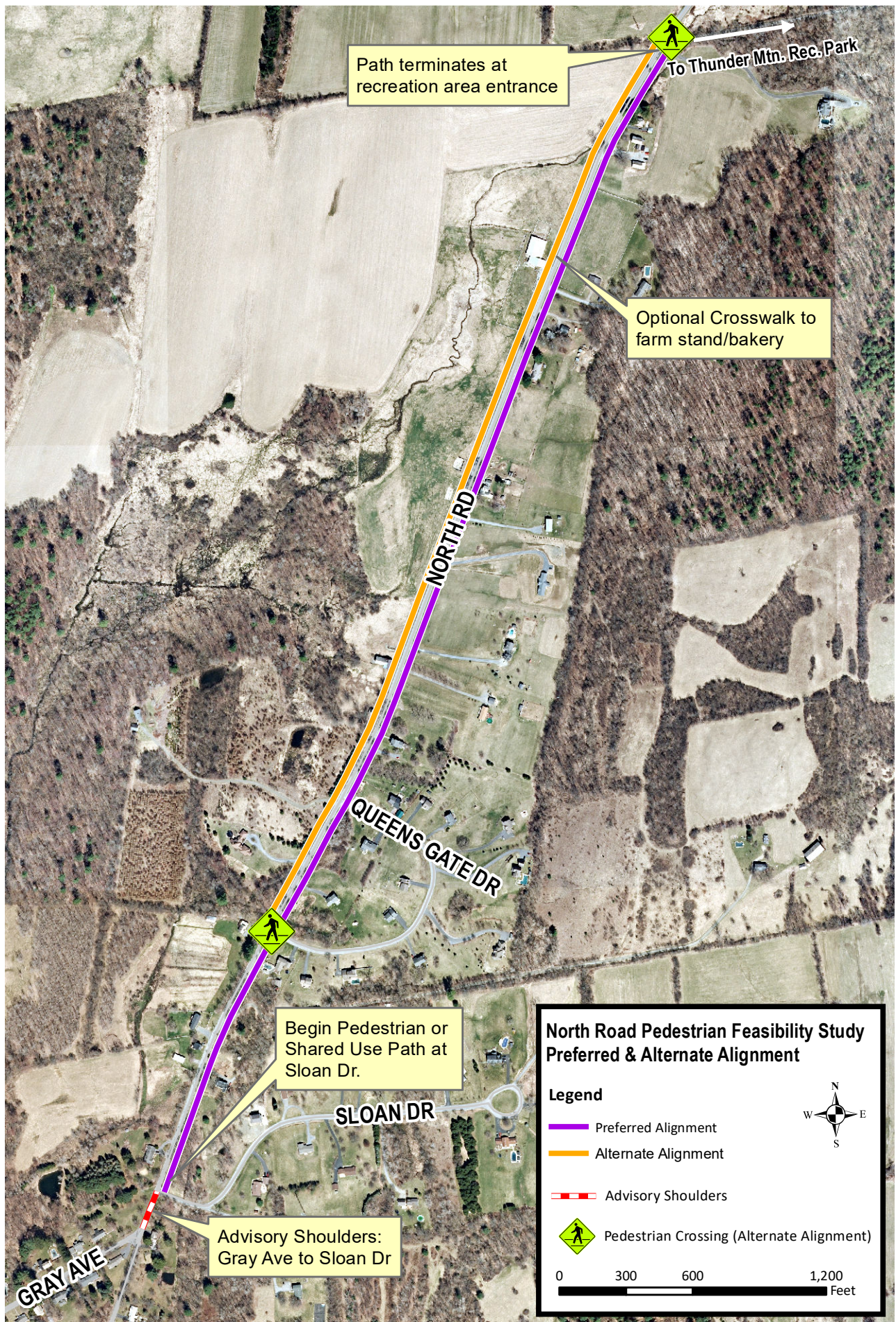


October 11, 2021



Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Appendix 3 – Preferred & Alternate Alignment



Map created by A/GFTC, September 2021. Data Source(s): NYSGIS Clearinghouse, Washington County Real Property Tax Service, NYSDOT

Appendix 4 – Detailed Cost Estimate

PRELIMINARY PROJECT ESTIMATE
A/GFTC - North Road Pedestrian Connector Feasibility Report
October 8, 2021
B&L JN 1896.003.001

	5' Wide Shoulders, Both Sides	5' Pedestrian Path East Side	10' Shared Use Path East Side		10' Shared Use Path East Side to Queens Gate Drive West Side to Thunder Mtn. Park	
	Asphalt	Asphalt	Stone	Asphalt	Stone	Asphalt
CONSTRUCTION ITEMS:						
CLEARING & GRUBBING:	\$ 60,000	\$ 40,000	\$ 60,000	\$ 60,000	\$ 30,000	\$ 30,000
EARTHWORK:	\$ 203,000	\$ 135,000	\$ 286,000	\$ 286,000	\$ 162,000	\$ 162,000
PATH	\$ 782,000	\$ 226,000	\$ 294,000	\$ 382,000	\$ 227,000	\$ 315,000
DRAINAGE	\$ 44,600	\$ 26,300	\$ 31,300	\$ 31,300	\$ 29,100	\$ 29,100
FENCE	\$ 113,000	\$ 12,000	\$ 16,000	\$ 16,000	\$ 84,000	\$ 84,000
RETAINING WALL	\$ -	\$ 63,000	\$ 46,000	\$ 46,000	\$ -	\$ -
WORK ZONE TRAFFIC CONTROL:	\$ 35,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000	\$ 20,000
CONSTRUCTION COSTS:	\$ 1,237,600	\$ 522,300	\$ 753,300	\$ 841,300	\$ 552,100	\$ 640,100
CONTINGENCY (25%)	\$ 310,000	\$ 131,000	\$ 189,000	\$ 211,000	\$ 139,000	\$ 161,000
SUBTOTAL (2021 DOLLARS)	\$ 1,547,600	\$ 653,300	\$ 942,300	\$ 1,052,300	\$ 691,100	\$ 801,100
AWARD AMOUNT INFLATED 3% (2022 DOLLARS)	\$ 1,595,000	\$ 673,000	\$ 971,000	\$ 1,084,000	\$ 712,000	\$ 826,000
ENGINEERING AND SURVEY	\$ 140,000	\$ 90,000	\$ 90,000	\$ 90,000	\$ 75,000	\$ 75,000
CONSTRUCTION INSPECTION	\$ 112,000	\$ 61,000	\$ 78,000	\$ 87,000	\$ 72,000	\$ 83,000
RIGHT OF WAY COSTS:	\$ 125,000	\$ 125,000	\$ 200,000	\$ 200,000	\$ 10,000	\$ 10,000
TOTAL COSTS:	\$ 1,972,000	\$ 949,000	\$ 1,339,000	\$ 1,461,000	\$ 869,000	\$ 994,000

North Road Pedestrian Feasibility Report -- Shoulder Alternative (Estimate Prepared 10/8/2021)							
DESCRIPTION OF WORK	ROUNDED	EST. COST	ITEM #	DESCRIPTION	QUANTITY	UNIT	COST
CLEARING & GRUBBING:	\$60,000	\$60,000		201.06 CLEARING & GRUBBING	1	LS	\$ 60,000.00 \$ 60,000.00
EARTHWORK:	\$203,000	\$202,150	203.02	UNCLASSIFIED EXCAVATION	4760	CY	\$ 35.00 \$ 166,600.00
			203.03	EMBANKMENT	1185	CY	\$ 30.00 \$ 35,550.00
PATH	\$782,000	\$781,347	304.12	SUBBASE	2307	CY	\$ 65.00 \$ 149,955.00
			402.128303	12.5 F3 TOP COURSE HMA, 80 SERIES COMPACTION	2130	TON	\$ 105.00 \$ 223,650.00
			402.198903	19 F9 BINDER COURSE HMA, 80 SERIES COMPACTION	1396	TON	\$ 95.00 \$ 132,620.00
			402.378903	37.5 F9 BASE COURSE HMA, 80 SERIES COMPACTION	686	TON	\$ 85.00 \$ 58,310.00
			407.0102	DILUTED TACK COAT	5665	GAL	\$ 3.00 \$ 16,995.00
			203.24010017	SHOULDER BACKUP MATERIAL	226	TON	\$ 25.00 \$ 5,650.00
			610.1403	TOPSOIL - LAWNS	2624	CY	\$ 65.00 \$ 170,560.00
			610.1602	TURF ESTABLISHMENT - LAWNS	7869	SY	\$ 3.00 \$ 23,607.00
DRAINAGE	\$44,600	\$44,580	603.9812	SMOOTH INTERIOR CORRUGATED POLYETHYLENE CULVERT AND STORMDRAIN 12 INCH DIAMETER	623	LF	\$ 60.00 \$ 37,380.00
			603.171016	GALVANIZED STEEL END SECTIONS-PIPE (2-2/3" X 1/2"CORRUGATIONS) 12 INCH DIAMETER, 16 GAUGE	40	EA	\$ 180.00 \$ 7,200.00
FENCE	\$113,000	\$112,630	607.97000008	REMOVE AND RESET EXISTING FENCE	3,218	LF	\$ 35.00 \$ 112,630.00
							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
RETAINING WALL	\$0	\$0	206.01	STRUCTURE EXCAVATION		CY	\$ 60.00 \$ -
			554.45	FILL TYPE RETAINING WALL (GREATER THAN 30FT.)		SF	\$ 132.00 \$ -
							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
DRIVEWAYS	\$0	\$0					\$ -
							\$ -
							\$ -
							\$ -
WORK ZONE TRAFFIC CONTROL:	\$35,000	\$35,000					

North Road Pedestrian Feasibility Report -- Pedestrian Path Alternative (Estimate Prepared 10/8/2021)							
DESCRIPTION OF WORK	ROUNDED	EST. COST	ITEM #	DESCRIPTION	QUANTITY	UNIT	COST
CLEARING & GRUBBING:	\$40,000	\$40,000		201.06 CLEARING & GRUBBING	1	LS	\$ 40,000.00
EARTHWORK:	\$135,000	\$134,725	203.02	UNCLASSIFIED EXCAVATION	3293	CY	\$ 115,255.00
			203.03	EMBANKMENT	649	CY	\$ 19,470.00
PATH	\$226,000	\$225,026	304.12	SUBBASE	630	CY	\$ 40,950.00
			402.128303	12.5 F3 TOP COURSE HMA, 80 SERIES COMPACTION	700	TON	\$ 87,500.00
			610.1403	TOPSOIL - LAWNS	1050	CY	\$ 68,250.00
			610.1602	TURF ESTABLISHMENT - LAWNS	9442	SY	\$ 28,326.00
DRAINAGE	\$26,300	\$26,280	603.9812	SMOOTH INTERIOR CORRUGATED POLYETHYLENE CULVERT AND STORMDRAIN 12 INCH DIAMETER	342	LF	\$ 20,520.00
			603.171016	GALVANIZED STEEL END SECTIONS-PIPE (2-2/3" X 1/2"CORRUGATIONS) 12 INCH DIAMETER, 16 GAUGE	32	EA	\$ 5,760.00
FENCE	\$12,000	\$11,725	607.97000008	REMOVE AND RESET EXISTING FENCE	335	LF	\$ 11,725.00
							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
RETAINING WALL	\$63,000	\$62,700	206.01	STRUCTURE EXCAVATION	45	CY	\$ 2,700.00
			554.45	FILL TYPE RETAINING WALL (GREATER THAN 30FT.)	400	SF	\$ 60,000.00
							\$ -
							\$ -
							\$ -
							\$ -
							\$ -
DRIVEWAYS	\$0	\$0					\$ -
							\$ -
							\$ -
							\$ -
WORK ZONE TRAFFIC CONTROL:	\$20,000	\$20,000					

North Road Pedestrian Feasibility Report -- Shared Use Path EAST Alternative (Estimate Prepared 10/8/2021)								
DESCRIPTION OF WORK	ROUNDED	EST. COST	ITEM #	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST
CLEARING & GRUBBING:	\$60,000	\$60,000		201.06 CLEARING & GRUBBING	1	LS	\$ 60,000.00	\$ 60,000.00
EARTHWORK:	\$286,000	\$286,000	203.02	UNCLASSIFIED EXCAVATION	7550	CY	\$ 35.00	\$ 264,250.00
			203.03	EMBANKMENT	725	CY	\$ 30.00	\$ 21,750.00
PATH Stone Dust	\$294,000	\$293,800	304.12	SUBBASE	1155	CY	\$ 65.00	\$ 75,075.00
			623.02	CRUSHED GRAVEL, BY WEIGHT (TOP COURSE)	1135	TON	\$ 75.00	\$ 85,125.00
			610.1403	TOPSOIL - LAWNS	1610	CY	\$ 65.00	\$ 104,650.00
			610.1602	TURF ESTABLISHMENT - LAWNS	14475	SY	\$ 2.00	\$ 28,950.00
Asphalt	\$382,000	\$381,175	304.12	SUBBASE	1155	CY	\$ 65.00	\$ 75,075.00
			402.128303	12.5 F3 TOP COURSE HMA, 80 SERIES COMPACTION	1380	TON	\$ 125.00	\$ 172,500.00
			610.1403	TOPSOIL - LAWNS	1610	CY	\$ 65.00	\$ 104,650.00
			610.1602	TURF ESTABLISHMENT - LAWNS	14475	SY	\$ 2.00	\$ 28,950.00
DRAINAGE	\$31,300	\$31,260	603.9812	SMOOTH INTERIOR CORRUGATED POLYETHYLENE CULVERT AND STORMDRAIN 12 INCH DIAMETER	425	LF	\$ 60.00	\$ 25,500.00
			603.171016	GALVANIZED STEEL END SECTIONS-PIPE (2-2/3" X 1/2"CORRUGATIONS) 12 INCH DIAMETER, 16 GAUGE	32	EA	\$ 180.00	\$ 5,760.00
FENCE	\$16,000	\$15,075	607.97000008	REMOVE AND RESET EXISTING FENCE	335	LF	\$ 45.00	\$ 15,075.00
								\$ -
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								\$ -
								\$ -
RETAINING WALL	\$46,000	\$45,400	206.01	STRUCTURE EXCAVATION	90	CY	\$ 60.00	\$ 5,400.00
			554.45	FILL TYPE RETAINING WALL (GREATER THAN 30FT.)	400	SF	\$ 100.00	\$ 40,000.00
								\$ -
								\$ -
								\$ -
								\$ -
DRIVEWAYS	\$0	\$0						\$ -
								\$ -
								\$ -
								\$ -
WORK ZONE TRAFFIC CO	\$20,000	\$20,000						

North Road Pedestrian Feasibility Report -- Shared Use Path WEST Alternative (Estimate Prepared 10/8/2021)									
DESCRIPTION OF WORK	ROUNDED	EST. COST	ITEM #	DESCRIPTION	QUANTITY	UNIT	UNIT PRICE	COST	
CLEARING & GRUBBING:	\$30,000	\$30,000		201.06 CLEARING & GRUBBING	1	LS	\$ 30,000.00	\$ 30,000.00	
EARTHWORK:	\$162,000	\$162,000	203.02	UNCLASSIFIED EXCAVATION	3150	CY	\$ 35.00	\$ 110,250.00	
			203.03	EMBANKMENT	1725	CY	\$ 30.00	\$ 51,750.00	
PATH Stone Dust	\$227,000	\$226,885	304.12	SUBBASE	1155	CY	\$ 65.00	\$ 75,075.00	
			623.02	CRUSHED GRAVEL, BY WEIGHT (TOP COURSE)	1135	TON	\$ 75.00	\$ 85,125.00	
			610.1403	TOPSOIL - LAWNS	725	CY	\$ 65.00	\$ 47,125.00	
			610.1602	TURF ESTABLISHMENT - LAWNS	6520	SY	\$ 3.00	\$ 19,560.00	
Asphalt	\$315,000	\$314,260	304.12	SUBBASE	1155	CY	\$ 65.00	\$ 75,075.00	
			402.128303	12.5 F3 TOP COURSE HMA, 80 SERIES COMPACTION	1380	TON	\$ 125.00	\$ 172,500.00	
			610.1403	TOPSOIL - LAWNS	725	CY	\$ 65.00	\$ 47,125.00	
			610.1602	TURF ESTABLISHMENT - LAWNS	6520	SY	\$ 3.00	\$ 19,560.00	
DRAINAGE	\$29,100	\$29,040	603.9812	SMOOTH INTERIOR CORRUGATED POLYETHYLENE CULVERT AND STORMDRAIN 12 INCH DIAMETER	406	LF	\$ 60.00	\$ 24,360.00	
			603.171016	GALVANIZED STEEL END SECTIONS-PIPE (2-2/3" X 1/2"CORRUGATIONS) 12 INCH DIAMETER, 16 GAUGE	26	EA	\$ 180.00	\$ 4,680.00	
FENCE	\$84,000	\$83,280	607.97000008	REMOVE AND RESET EXISTING FENCE	2,082	LF	\$ 40.00	\$ 83,280.00	
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									\$ -
									\$ -
									\$ -
									\$ -
RETAINING WALL	\$0	\$0	206.01	STRUCTURE EXCAVATION		CY	\$ 60.00	\$ -	
			554.45	FILL TYPE RETAINING WALL (GREATER THAN 30FT.)		SF	\$ 100.00	\$ -	
									\$ -
									\$ -
									\$ -
									\$ -
									\$ -
DRIVEWAYS	\$0	\$0						\$ -	
									\$ -
									\$ -
									\$ -
WORK ZONE TRAFFIC CO	\$20,000	\$20,000							