Route 2 Bicycle Facility Planning Study Recommendations

To:Kate Rattan, SCCOG & Town of North StoningtonFROM:Christopher Granatini, PE & Craig Yannes, PE, PTOE, RSP1DATE:June 30, 2021

This technical memorandum summarizes the recommendations borne from the Route 2 Bicycle Facility Planning Study, undertaken by Tighe & Bond at the direction of the Southeastern Connecticut Council of Governments (SCCOG) and the Town of North Stonington (Town). This document provides the Town and SCCOG with an implementable solution and an understanding of potential construction costs to improve bicycle and multimodal travel along the Route 2 corridor between Holly Green at the north and Route 184 at the south end of the study area. The memo, including the purpose and need statement, aim to assist with future funding requests to facilitate the construction of the improvements to support multi-modal travel.

Purpose and Need

SCCOG and the Town of North Stonington seek to implement bicycle and pedestrian facilities to enhance local and regional bicycle mobility and provide safe accommodation for alternative travel modes in North Stonington. Bicycle and pedestrian mobility are desired in the town center to encourage and provide safe alternative mode travel between the schools, municipal buildings, and commercial properties.

Route 2 is included on the Connecticut Department of Transportation (CTDOT) Statewide Bicycle Planning Network as an On-Road Bike Network. The corridor serves an important regional role in bicycle travel connecting the Rhode Island border and local municipalities, to Norwich and beyond. In addition, the Southeastern Connecticut Regional Bike & Pedestrian Plan prepared by SCCOG, which included a survey of 806 regional residents, indicated that Route 2 was identified as a corridor where bike and pedestrian facilities are needed. A majority of respondents indicated that the existing facilities were poorly connected to amenities without the use of a car and that they would bike more if there were more trails and sidewalks.

The existing Route 2 roadway configuration in the study area between Holly Green and Route 184 does not accommodate bicycle or pedestrian traffic in several areas with minimal roadway shoulders and roadside obstructions that limit the ability for efficient and safe alternative mode travel. A fatal car versus pedestrian crash (Crash ID 700611) occurred along this segment that may have been correctable with an accommodating facility. The proposed improvements provide a continuous facility for bicyclists between an on-road bicycle lane and off-road multi-use trail, which will also accommodate pedestrians, and additional sidewalks connections for pedestrians to encourage safe alternative modes travel in the study area.

Project Understanding & Goals

The study area consists of a 2.75-mile segment of State Route 2 (Norwich-Westerly Highway) between Holly Green Plaza and Route 184 (Providence-New London Turnpike). The segment is divided into the three discrete sections detailed below. The following section detail the land development patterns, expected users, and potential alternatives that were identified by SCCOG and Town during the project initiation phase and reviewed by Tighe & Bond during the study phase. It is important to note that the sections were selected based upon roadway geometry, roadway user, and land development characteristics while also starting and ending at a roadway intersection. The Construction Phasing section of this memo includes a discussion on construction phasing that deviates slightly from these discrete segments to facilitate staged construction and maintaining safe transitions at the start and end points of each phase.

Holly Green Plaza to Route 627 (Mystic Road) & Main Street (North)

The north section is rural and sparsely developed with a shopping plaza, a restaurant, and two hotels situated at the north extent and open space to the south. This segment will primarily serve confident cyclists and some intrepid walkers. Paint-buffered bike lanes or standard roadway shoulders could accommodate the more experienced cyclists with lower upfront investment and ongoing maintenance cost. A sidewalk and/or multi-use path, generally located in the available right of way on the east side of Route 2, could also be considered in this segment when paired with the on-road bicycle facilities for safe pedestrian accommodations while further supporting more recreational cyclists in an off-road facility.

Route 627 (Mystic Road) & Main Street (North) to Main Street (South)

The central section of the study corridor forms one side of the civic triangle of North Stonington Village. Municipal facilities, including all three public schools, open space, recreation fields, town offices, and the library and village center are accessible from either end of Main Street or Rocky Hollow Road. Due to the potential juvenile/family-centric road users and the higher density of development, this section requires a more robust facility to safely accommodate anticipated users. An off-road multi-use path separated by a utility area from the northbound lanes and standard shoulders is the favored type of facility for this section of the corridor. However, roadside issues and limited available ROW within this section will impact the design of the multi-use path.

Main Street (South) to Route 184

The Southerly section is rural and sparsely developed with the exception of the commercial development on the east side of the roadway just south of the Main Street intersection. A review of available parcel mapping shows that the Route 2 right of way is constrained along this segment. Like the northern segment, the primary users in this segment are expected to be experienced cyclists that could be accommodated with paint-buffered bike lanes and/or standard roadway shoulders. A multi-use path connection to the commercial properties is desired along this segment to facilitate pedestrian and bicycle travel to/from North Stonington Village.

Recommendations

Through careful consideration of the project needs, goals and initial guidance provided by SCCOG and the Town, conceptual improvement plans (Figures 1 through 7) and typical sections (Figure 8) have been developed to illustrate the recommended improvements. Improvements were determined based on the purpose and needs balanced with constructability constraints, such as traffic operations, available right-of-way, utility and drainage impacts, and roadside geometry. A summary of the recommended improvements for each segment of the corridor is provided in the following sections.

Holly Green Plaza to Route 627 (Mystic Road) & Main Street (North)

For the northern segment, 4' on-street bike lanes with 3' painted buffers including longitudinal rumble strips are proposed between Buon Appetito restaurant and the Route 627 (Mystic Road) and Main Street north junction intersection. North of Buon Appetito, the buffered bike lanes will end, and the roadway will transition back to the existing cross-section, which includes shoulders wide enough to accommodate bike traffic. It is expected that mostly experienced cyclists will use the bicycle facility along this segment. Additionally, a 12' separated multi-use path with 5' utility strip is proposed on the east side of Route 2 from the south end of the Buon Appetito property to the south to facilitate multi-modal connectivity to this commercial node. The pathway transitions to a 5' sidewalk approaching the restaurant, where it will continue along the site frontage adjacent to the roadway.

A 5' sidewalk with a 5' utility strip is also proposed on the west side of the road between Hilltop Inn & Suites and Bellissimo Grande hotel. In front of Buon Appetito, a crosswalk with rectangular rapid flashing beacons (RRFB) is proposed to increase the safety of the crossing in a location that maximizes the crosswalk's visibility to drivers.

At the Hewitt Road intersection, it is recommended to remove the landscaped island and relocate the Hewitt Farm sign to better control roadway access and reduce the pathway crossing distance. Additionally, the south Buon Appetito driveway curb cut width is excessive and is recommended to be reduced with a standard paved driveway apron. The Buon Appetito parking lot layout may also need to be revised to facilitate the sidewalk construction along the frontage and improve safety and operations at the driveway. Depending on the final layout of the sidewalk, the front row of parking (15 spaces) may be impacted and efforts should be taken to relocate the spaces or revise the lot to maintain the existing parking supply.

Route 627 (Mystic Road) & Main Street (North) to Main Street (South)

With the goal of facilitating alternative modes within the town center, a 12' separated multiuse path with 5' utility strip is proposed on the east side of Route 2. Additionally, the buffered bike lanes continue from the northern section to the north side of the Route 627 (Mystic Road) at Main Street intersection (#101-201). At the traffic signal, a protected crossing will be provided to transition between the on-street facilities and the multi-use path. This will be accommodated by improved crossings and accessible pedestrian signal upgrades to the existing traffic signal equipment that was installed in 2010.

In addition to the separated multi-use path, this segment will include 5' shoulders on both sides of the road south of Mystic Road to accommodate experienced cyclists that decide to remain on the roadway. The standard shoulders encourage path usage by bicyclists. At the signalized intersection with Rocky Hollow Road (#101-208), another protected crossing will be provided to transition users between the multi-use path and buffered bike lanes proposed on the south segment (see next section) via the improvements anticipated as part of CTDOT SPN #172-496. To enhance connectivity in proximity to the school properties, the traffic signal

at the intersection with the driveways (#101-210), constructed in 1995, should be replaced including pedestrian crossing upgrades and accessible pedestrian equipment.

Main Street (South) to Route 184

The southern segment from the south junction with Main Street to Route 184 is proposed to include the buffered bike lanes to provide a continuous facility for experienced cyclists through the study area. At the south end, the bike lanes will end as the roadway cross-section transitions back to meet the existing conditions that include standard 4' shoulders and 11' lanes approaching the Route 2 at Route 184 intersection. Continuing from the central segment, the separated 12' multi-use path with 5' utility strip is proposed on the east side of the roadway to provide connectivity from the central segment to the commercial properties to the south for less experienced pathway users.

Construction Phasing

Construction of improvements of this scale and nature may require a phased approach for funding considerations. Proposed phasing should consider the completeness of the proposed alternative modes network and termination of the segments that result in safe conditions for all roadway users (see 'Safe Transitions' Section). SCCOG indicated that full implementation of the corridor-wide improvements may be completed in as little as 10-years, depending upon funding allocation.

Based on discussions with the SCCOG and the Town, the central segment between the signalized intersections of Mystic Road (Route 627) and Rocky Hollow Road would be a logical first phase that would provide immediate benefit to the key portion of the project area and provide alternative modes with a connected network and safe termini at the signalized intersections. This first phase, Phase 1, also includes the extension of the multi-use path to the commercial node on the east side of the roadway south of Main Street creating a continuous facility connecting North Stonington Village to the adjacent school and commercial properties. The remainder of the pedestrian and bicycle network shown in the northern and southern sections, Phase 2A and 2B, respectively, could then be constructed as funding becomes available. Figure 9 attached shows the approximate outline of each phase of construction geographically.

In the near-term, accessible pedestrian signal upgrades can be incorporated in advance of the other improvements. Additionally, access management for the commercial properties and intersecting roads mentioned Properties and Access Management section can be implemented as redevelopment of the subject properties occur. Finally, the sidewalks and the crosswalk with RRFB in the north section can be constructed with limited impact on the remaining work to improve pedestrian safety between the commercial properties on the north and south side of the roadway.

Another important phasing consideration is the pavement conditions and CTDOT's pavement rehabilitation schedule. The corridor will likely require mill and overlay for a majority of the project length to accommodate the proposed roadway and marking revisions. Phasing of this project should be coordinated with the CTDOT paving schedule to maximize the benefit-cost. CTDOT has indicated that the section of Route 2 was last paved in 2011 and rehabilitation is anticipated between 2023 and 2026. Based on the complexity of the proposed improvements and potential lack of immediate funding, SCCOG, the Town, and CTDOT should try to align the project and rehabilitation schedules by delaying the pavement rehabilitation, if possible.

Opinion of Probable Construction Cost

For funding purposes, an opinion of probable construction cost (OPCC) was developed for the improvements proposed under this project. The OPCC, prepared based upon CTDOT Cost Estimating Guidelines, itemizes construction costs by proposed construction phase detailed in the previous section. Per the guidelines, the OPCC includes itemized major construction items including roadway widening/mill and overlay, path/sidewalk, curbing, driveway reconstruction, utility impacts, drainage improvements, signal upgrades, and landscaping. CTDOT typical pavement structure 4, superpave level 3 was used as the basis for roadway widening quantities per the Department's pavement design guidelines for Route 2 in the study area. The multi-use path and sidewalk were estimated as CTDOT standard bituminous concrete sidewalk and concrete sidewalk, respectively.

Percentage based allowances were applied to the itemized cost to account for additional cost including 20% for minor items, 2% for clearing/grubbing, 1% for construction staking, 4% for maintenance and protection of traffic, 7% for mobilization, 25% incidentals with a 20% contingency. A review of recent LOTCIP project funding requests and CTDOT cost estimating guidelines were used to develop these allowances.

A total opinion of probable construction cost of approximately \$7.9 million was estimated for the full construction of the improvements. By phase, the construction cost is estimated at approximately \$2.66 million (\$785 per linear foot) for Phase 1, \$1.78 million (\$460 per linear foot) for Phase 2A, and \$3.47 million (\$480 per linear foot) for Phase 2B.

Design Considerations

The following sections summarizes key design considerations that were reviewed during the study resulting in the final study recommendations. The key considerations were balanced with the project purpose and needs to formulate feasible and cost-effective recommendations while achieving safe pedestrian and bicycle accommodations in the study area along Route 2.

Collision History

Collision data was collected from the Connecticut Crash Data Repository for 2016 through 2020. A summary of the data is provided in the attached collision history map (Figure 10), showing the location and severity of all 104 collisions reported in the study area along Route 2 within the five-year data set. The data is also summarized in Table 1 for the project area and in Tables 1A through 1H for each major intersection and segments between. As shown in the map and tables, one fatal car vs. pedestrian collision occurred approximately 0.5 miles north of the Route 184 intersection, a location where minimal shoulder width and roadside obstacles resulted in pedestrians walking within the roadway. The most common collisions were rear-ends, fixed object, and angle crashes that were spread throughout the corridor, increase their frequency at high traffic volume intersections.

Route 2 at Route 184

The Route 2 at Route 184 traffic circle intersection serves as a key junction between regional state routes as well as a gateway to the North Stonington Town Center to the north on Route 2. After a review of the intersection and discussion with SCCOG and the Town, landscaping and signage is recommended within the existing splitter islands to improve the aesthetics and capitalize on the gateway opportunities the traffic circle provides in its current configuration. Sidewalks are not recommended in this area under this project due to the lack of pedestrian generating land uses surrounding the circle.

SCCOG and the Town should coordinate with CTDOT to consider a detailed study of the Route 2 at Route 184 intersection to re-envision this important regional interchange. The current configuration, with the large 350' diameter traffic circle, yield control at the entries, and weaving within the quadrants, is outdated for current design standards. The study should evaluate the possibility of reducing the size of the intersection to a safer, modern roundabout (125'-175' diameter) configuration and utilizing the additional space for alternative mode connections and other community uses. Another alternative could be to reconstruct the entries and exits to the existing circle to have a traffic calming effect providing modern roundabout techniques for yield at the entry points and a singular circulating lane, which would provide some additional ROW around the circle for alternatives modes while maintaining the potential to utilize the space within the circle for community purposes.

Buffered Bike Lanes vs. Standard Wide Roadway Shoulders

The North Stonington Highway Foreman raised concern over the safety of paint-buffered onroad bike lanes on Route 2 in the study area. Based on the existing lack of accommodation for bicycle travel along the corridor, including narrow lanes and narrow shoulders along significant stretches of the study corridor, and the presence of cyclists utilizing the roadway, paint-buffered bike lanes combined with the multi-use path connecting the key commercial and municipal uses within central study area, would be a cost-effective, implementable safety improvement for the corridor. The current roadway configuration does not meet current design standards in many locations and SCCOG and the Town have identified this corridor as needing improvements, in addition to the fact that the corridor is included in the Statewide Bicycle Network. The proposed improvements help achieve the region's goal of providing space for cyclists and improving connectivity to the surrounding area and trails in a manner that is acceptable to CTDOT and Town maintenance.

The proposed bicycle lanes with a painted cross hatch buffer and rumble strips will provide context to the driver within the standard 11' travel lane and act as traffic calming for vehicular traffic. The current roadway, despite the narrow shoulders, provides little traffic calming context due to the straight segments and limited roadside development. A shoulder wider than the standard 4-5' is not recommended without the proposed buffering treatments due to the possibility that the wider pavement width could induce faster vehicular traffic speeds.

Connectivity

As mentioned, Route 2 is part of the Statewide Bicycle Network, identifying it as a key regional corridor for bicycle traffic. The proposed bicycle improvements as well as the multi-use path and sidewalks will provide a continuous network for alternatives modes along within the study area. The improvements will fill an existing gap within the regional trail network and could lead to further connections with trails to the north and south including the Narragansett Trail, a 16.3-mile trail that crosses Route 2 approximately one mile to the north of Holly Green.

Safe Transitions

Target users for each section have varying facility needs, as previously identified. This investigation recommends a higher level of accommodation within the central segment, extending south to the extent of development. It is therefore necessary to provide safe transitions between facility types. The southerly transition was given particular consideration as Main Street (south) is unsignalized and existing commercial developments are anticipated to draw diverse users south of that intersection. It is recommended that the Multi-use Path be extended south to the existing extent of commercial development and the buffered bike lane be extended north to Rocky Hollow Road, the nearest signalized intersection where less confident cyclists will be able to transition to the buffered bike lanes.

Pedestrian Accommodations at Public Schools

Based on discussions with CTDOT and SCCOG, the crossing of Route 2 in the vicinity of the public schools is recommended at the signalized intersection at the northern junction with the school driveways (#101-210). The Town indicated that further consideration would be given to the southern driveway junction with respect to the plans for the potential redevelopment of the school property on the east side of Route 2. Consideration for revisions to driveway location, directional flow, and options for the pedestrian tunnel under Route 2 were discussed.

Signal Replacement/Upgrades

The existing signalized intersections were reviewed for age/condition and the following improvements were incorporated into the proposed recommendations:

- Rocky Hollow Road (#101-208): Upcoming CTDOT SPN 172-496 that will replace the traffic signal equipment at the Route 2 intersection with Rocky Hollow Road and CTDOT has indicated that they will coordinate the design of the replacement with the proposed concept to facilitate future construction of the improvements without modifications/improvements to the signal equipment.
- Route 627 (Mystic Road) and Main Street (#101-201): The signal equipment was recently replaced in 2010 and the proposed project includes pedestrian crossing and signal upgrades.
- School Driveways (#101-210): Signal equipment was installed in 1995, and the proposed project includes the replacement of all equipment including proposed crossing and accessible pedestrian equipment.

Rectangular Rapid Flashing Beacon (RRFB) Design Criteria

RRFB are implemented by CTDOT based upon the attached "Pedestrian Safety Countermeasure Guidance at Marked Uncontrolled Crosswalks" table, which review the traffic volume and roadway travel speeds to recommend pedestrian crossing treatments. A review of the average daily traffic data available from CTDOT shows that Route 2 carries approximately 12,500 cars per day and the traffic speed data from RITIS provided by SCCOG shows speeds at or above 40 miles per hour in both directions. Based on the average daily traffic and speed, the CTDOT table suggests that RRFB could be warranted at a pedestrian crossing of Route 2 and RRFB have been included at the proposed crossing at the northern commercial node. The CTDOT criteria table should be revisited with updated traffic volume and measured speed data during design to confirm that an RRFB will be acceptable to CTDOT.

Wetlands and Topography

The recommended improvements largely avoid steep roadside topography and considerations have been identified to fill and grade the roadside per design standards.

A review of available wetland soils mapping indicates no direct conflict between the proposed improvements and the wetlands. Existing culverts are proposed to be extended where necessary for the widened roadway cross-sections and have been included in the OPCC. Permitting needs will need to be reviewed during design activities, including conducting wetland flagging and mapping, preparing associated reports, and identifying the scope of the impacts to support project permitting. Available wetland and topography information is included within the CAD files created for the concept plans that are available upon request.

Lighting

Lighting is recommended along the multi-use path. Through discussions with SCCOG and the Town, separate decorative street lighting, given the rural context, was not preferred and lighting on existing or additional utility poles through cooperation with Eversource's municipal street lighting polices should be considered as a cost-effective option.

Utility Impacts

Impacts to above and below ground utilities have been reviewed through the development of the concept plans. Relocation/modification of utility poles and drainage structures have been incorporated into the project. The steel gas main, believed to be approximately 10-15 years old, is present along the east side of Route 2. The main largely follows the existing roadway curb line and is therefore expected to be located under the roadway or within the utility strip for a majority of the corridor. In areas where the gas main is located away from edge of road, the multi-use path may be constructed over the gas main without conflict.

Properties & Access Management

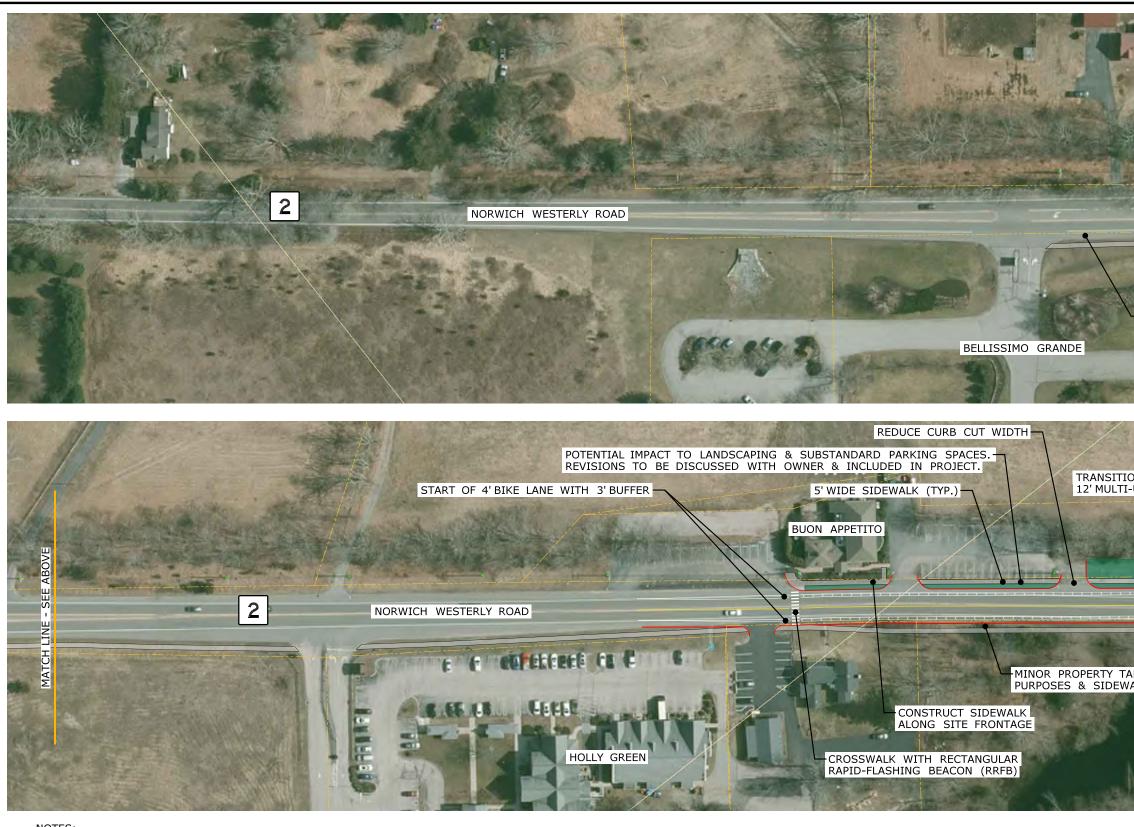
The commercial area between Jake's Restaurant and Rocky Hollow Road would see improved safety and operations with the implementation of access management. Improved interconnectivity between adjacent properties and consolidated access points on Route 2 are recommended for the area as shown on the concept plans. Due to right-of-way restrictions and the small scale of the existing and potential future development, additional roadway widening is not recommended.

Funding

SCCOG indicated that funding for the construction of the improvements may be through the Surface Transportation (STP) and/or Local Transportation Capital Improvement Program (LOTCIP) funding programs. The study and resulting recommendations have been prepared to facilitate future STP and LOTCIP funding applications by including detailed discussion on the project's purpose and need, concept plans, and OPCC, which can serve as the basis for future funding applications.

Enclosures: Concept Improvements Plans (Figures 1 through 7) Typical Sections (Figure 8) Construction Phasing Plan (Figure 9) Opinion of Probable Construction Cost Collision History Figure (Figure 10) & Tables (Tables 1 & 1A-1H) CTDOT Pedestrian Safety Countermeasures Table

J:\S\S5068 SCCOG\007 N Stonington Route 2 Bike Study\Report_Evaluation\2021_06-30 - Route 2 Study Memo.docx



NOTES:

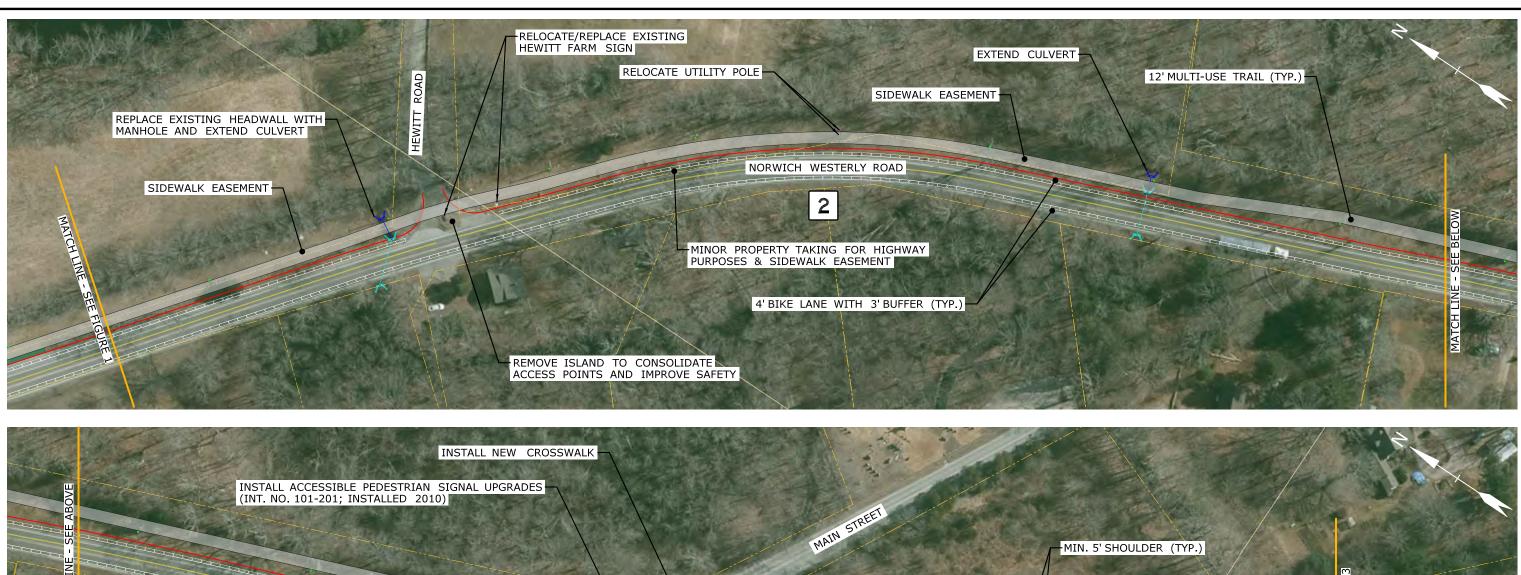
- LIGHTING TO BE PROVIDED ALONG MULTI-USE PATH VIA COORDINATION WITH EVERSOURCE & TOWN EVERSOURCE ACCOUNT. CONCEPTUAL LAYOUT APPROXIMATED USING 2019 ORTHOPHOTOGRAPHIC 1.
- 2. IMAGERY FROM THE STATE OF CONNECTICUT.
- MULTI-USE TRAIL ASSUMED TO BE CTDOT STANDARD BITUMINOUS CONCRETE SIDEWALK WITH ACCESSIBLE SIDEWALK RAMPS AT CROSSWALKS. 3.
- 4.
- 5.
- SIDEWALK ASSUMED TO BE CTDOT STANDARD CONCRETE SIDEWALK. ACCESSIBLE SIDEWALK RAMPS TO BE PROVIDED AT ALL CROSSWALKS. PROPERTY LINES ARE APPROXIMATE AND IMPACTS MAY CHANGE SUBJECT TO 6. FURTHER INVESTIGATION DURING DESIGN.
- MAINTENANCE AGREEMENTS BETWEEN THE TOWN AND CTDOT WILL BE REQUIRED 7. FOR BICYCLE LANE PAVEMENT MARKINGS, SIDEWALKS, AND MULTI-USE PATH.

LEGEND

- SIDEWALK/MIXED-USE TRAIL
- PROPOSED LANDSCAPING
- PROPOSED CURB
- EXISTING UTILITY POLE
- RELOCATED UTILITY POLE

- EXISTING CATCH BASIN
- EXISTING CULVERT HEADWALL
- EXISTING STORM PIPE/CULVERT
- PROPOSED CATCH BASIN
- PROPOSED CULVERT HEADWALL
- PROPOSED STORM PIPE/CULVERT
- GRAPHI

A.		14	1
A a filling			
			SEE BELOW
	- Address		MATCH LINE - SH
SIDE	WALK EASEMENT	-	MATC
	TAKING FOR EXIST PROPERTY & SIDEW		
		· Rank	
SIDEWALK		4	
ANSITION TO START OF "MULTI-USE TRAIL			
			E FIGURE 2
			- SEE
ERTY TAKING FOR HIGHWA	Y		
ERTY TAKING FOR HIGHWA	Y		- SEE
ERTY TAKING FOR HIGHWA	Y		- SEE
ERTY TAKING FOR HIGHWA SIDEWALK EASEMENT	ROUTE 2 BIO FACI	CYCLE/PEDESTR LITY STUDY TONINGTON, CT	
ERTY TAKING FOR HIGHWA SIDEWALK EASEMENT	ROUTE 2 BIO FACI NORTH S		



END OF 4' BIKE LANE WITH 3' BUFFER (TYP.) 11 SHELL

- NOTES: LIGHTING TO BE PROVIDED ALONG MULTI-USE PATH VIA COORDINATION WITH EVERSOURCE & TOWN EVERSOURCE ACCOUNT. CONCEPTUAL LAYOUT APPROXIMATED USING 2019 ORTHOPHOTOGRAPHIC 1.
- 2. IMAGERY FROM THE STATE OF CONNECTICUT.
- IMAGERY FROM THE STATE OF CONNECTICUT. MULTI-USE TRAIL ASSUMED TO BE CTDOT STANDARD BITUMINOOUS CONCRETE SIDEWALK WITH ACCESSIBLE SIDEWALK RAMPS AT CROSSWALKS. SIDEWALK ASSUMED TO BE CTDOT STANDARD CONCRETE SIDEWALK. ACCESSIBLE SIDEWALK RAMPS TO BE PROVIDED AT ALL CROSSWALKS. PROPERTY LINES ARE APPROXIMATE AND IMPACTS MAY CHANGE SUBJECT TO FURTHER INVESTIGATION DURING DESIGN. 3.
- 4.
- 5.
- 6.
- MAINTENANCE AGREEMENTS BETWEEN THE TOWN AND CTDOT WILL BE REQUIRED FOR BICYCLE LANE PAVEMENT MARKINGS, SIDEWALKS, AND MULTI-USE PATH. 7.

LEGEND

- SIDEWALK/MIXED-USE TRAIL
- PROPOSED LANDSCAPING
- PROPOSED CURB
- EXISTING UTILITY POLE
- RELOCATED UTILITY POLE

- EXISTING CATCH BASIN
- EXISTING CULVERT HEADWALL

NORWICH WESTERLY ROAD

2

CONSTRUCT 5' SIDEWALK TO CONNECT SOUTHBOUND BIKE LANE TO MULTI-USE PATH VIA CROSSWALK

- EXISTING STORM PIPE/CULVERT
- PROPOSED CATCH BASIN
- PROPOSED CULVERT HEADWALL
 - PROPOSED STORM PIPE/CULVERT

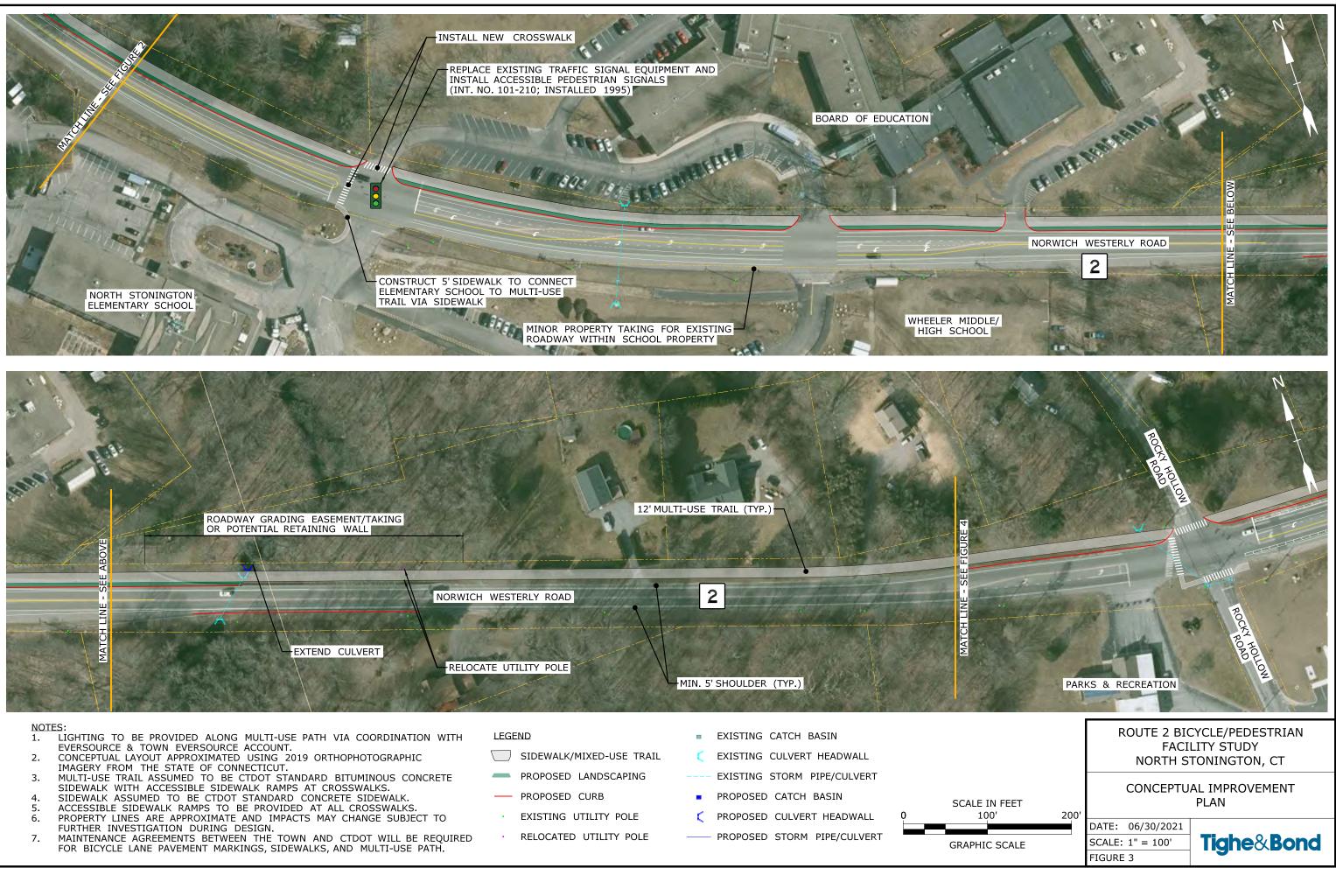


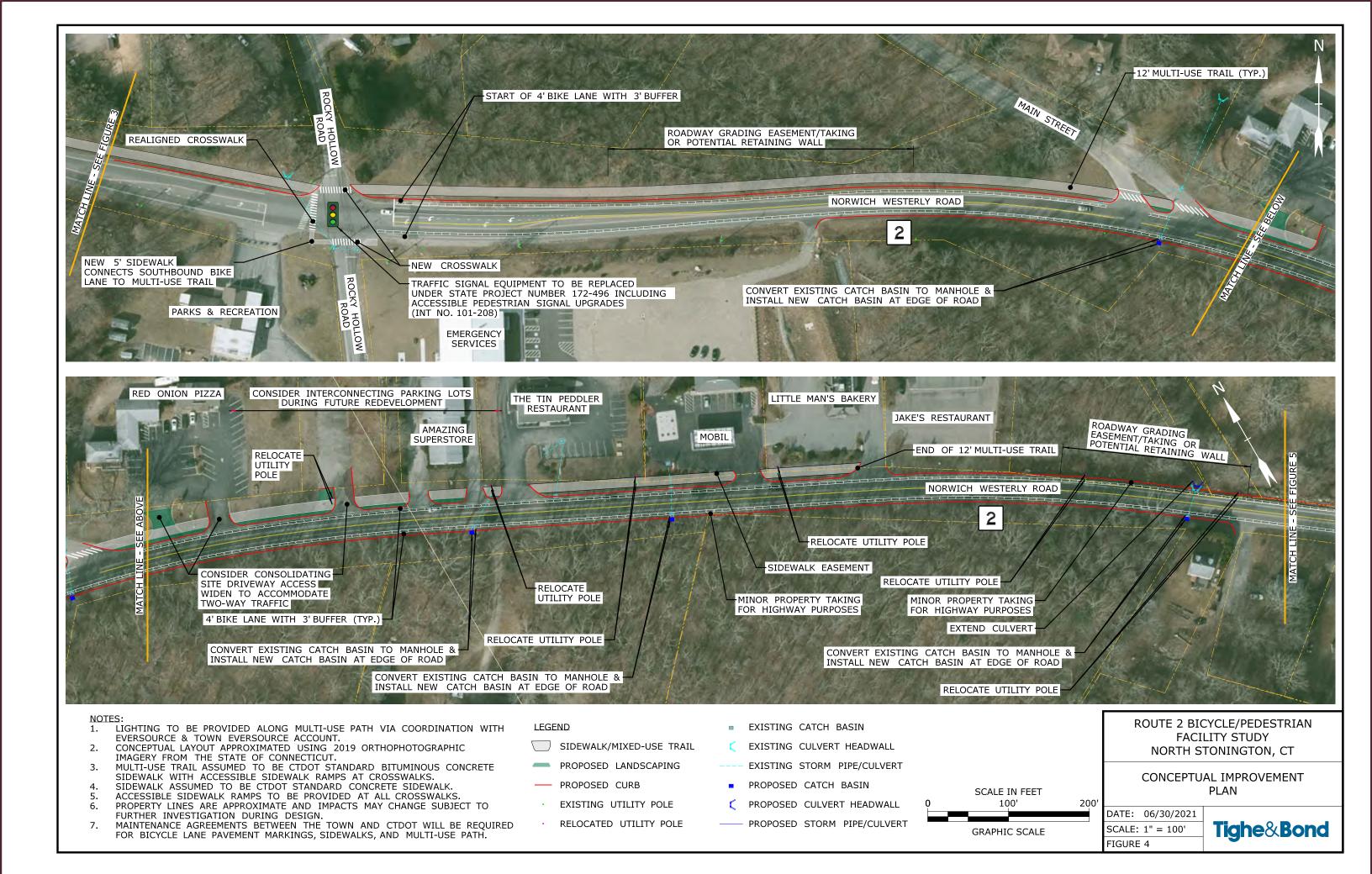
SCALE

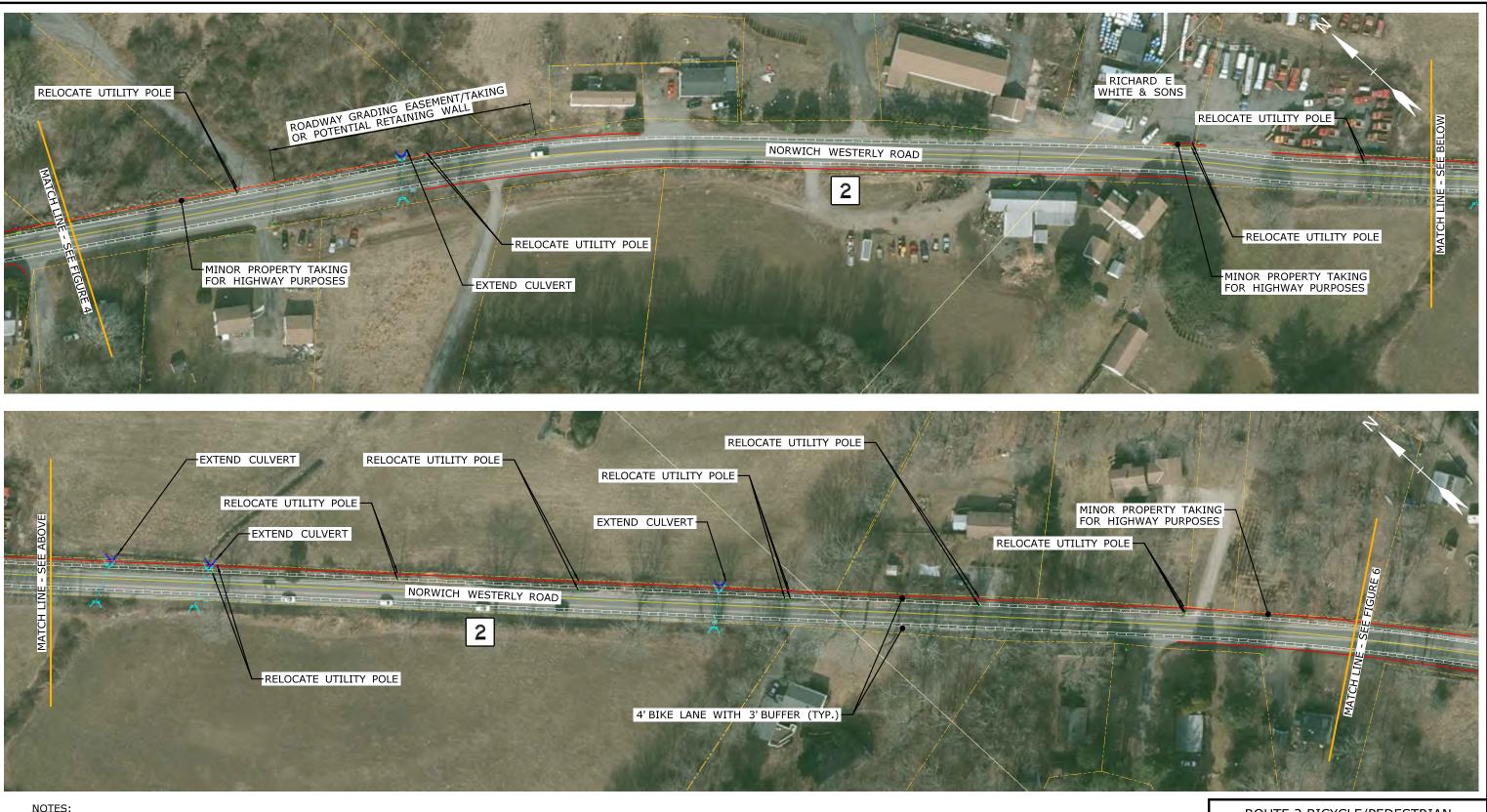
1

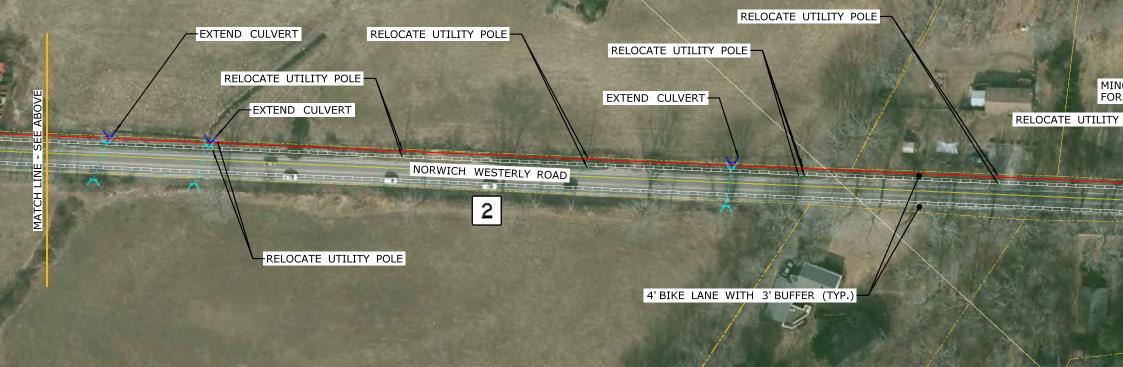
		F	FACI	CYCLE/PEDESTRIAN LITY STUDY TONINGTON, CT
IN FEET)0'	200'		CONCEPTU	AL IMPROVEMENT PLAN
C SCALE			06/30/2021 1" = 100' 2	Tighe&Bond











NOTES:

- LIGHTING TO BE PROVIDED ALONG MULTI-USE PATH VIA COORDINATION WITH EVERSOURCE & TOWN EVERSOURCE ACCOUNT. CONCEPTUAL LAYOUT APPROXIMATED USING 2019 ORTHOPHOTOGRAPHIC 1.
- 2.
- IMAGERY FROM THE STATE OF CONNECTICUT. MULTI-USE TRAIL ASSUMED TO BE CTDOT STANDARD BITUMINOUS CONCRETE SIDEWALK WITH ACCESSIBLE SIDEWALK RAMPS AT CROSSWALKS. 3.
- 4.
- 5.
- SIDEWALK ASSUMED TO BE CTDOT STANDARD CONCRETE SIDEWALK. ACCESSIBLE SIDEWALK RAMPS TO BE PROVIDED AT ALL CROSSWALKS. PROPERTY LINES ARE APPROXIMATE AND IMPACTS MAY CHANGE SUBJECT TO 6. FURTHER INVESTIGATION DURING DESIGN.
- MAINTENANCE AGREEMENTS BETWEEN THE TOWN AND CTDOT WILL BE REQUIRED FOR BICYCLE LANE PAVEMENT MARKINGS, SIDEWALKS, AND MULTI-USE PATH. 7.

LEGEND

- SIDEWALK/MIXED-USE TRAIL
- PROPOSED LANDSCAPING
- PROPOSED CURB
- EXISTING UTILITY POLE
- RELOCATED UTILITY POLE

- EXISTING CATCH BASIN
- EXISTING CULVERT HEADWALL
- EXISTING STORM PIPE/CULVERT
- PROPOSED CATCH BASIN
- PROPOSED CULVERT HEADWALL
- PROPOSED STORM PIPE/CULVERT



		F	FACI	CYCLE/PEDESTRIAN LITY STUDY TONINGTON, CT
SCALE IN FEET 100'	200'		CONCEPTU	AL IMPROVEMENT PLAN
100		DATE:	06/30/2021	
GRAPHIC SCALE		SCALE:	1" = 100'	Tighe&Bond
		FIGURE	5	



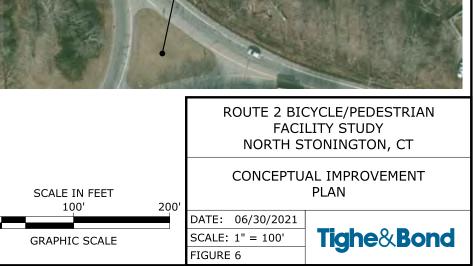
NOTES:

- LIGHTING TO BE PROVIDED ALONG MULTI-USE PATH VIA COORDINATION WITH EVERSOURCE & TOWN EVERSOURCE ACCOUNT. CONCEPTUAL LAYOUT APPROXIMATED USING 2019 ORTHOPHOTOGRAPHIC 1.
- 2.
- CONCEPTUAL LAYOUT APPROXIMATED USING 2019 ORTHOPHOTOGRAPHIC IMAGERY FROM THE STATE OF CONNECTICUT. MULTI-USE TRAIL ASSUMED TO BE CTDOT STANDARD BITUMINOUS CONCRETE SIDEWALK WITH ACCESSIBLE SIDEWALK RAMPS AT CROSSWALKS. SIDEWALK ASSUMED TO BE CTDOT STANDARD CONCRETE SIDEWALK. ACCESSIBLE SIDEWALK RAMPS TO BE PROVIDED AT ALL CROSSWALKS. PROPERTY LINES ARE APPROXIMATE AND IMPACTS MAY CHANGE SUBJECT TO FURTHER INVESTIGATION DURING DESIGN. MAINTENANCE AGREEMENTS BETWEEN THE TOWN AND CTDOT WILL BE REQUIRED FOR BICYCLE LANE PAVEMENT MARKINGS, SIDEWALKS, AND MULTI-USE PATH. 3.
- 4.
- 5.
- 6.
- 7.

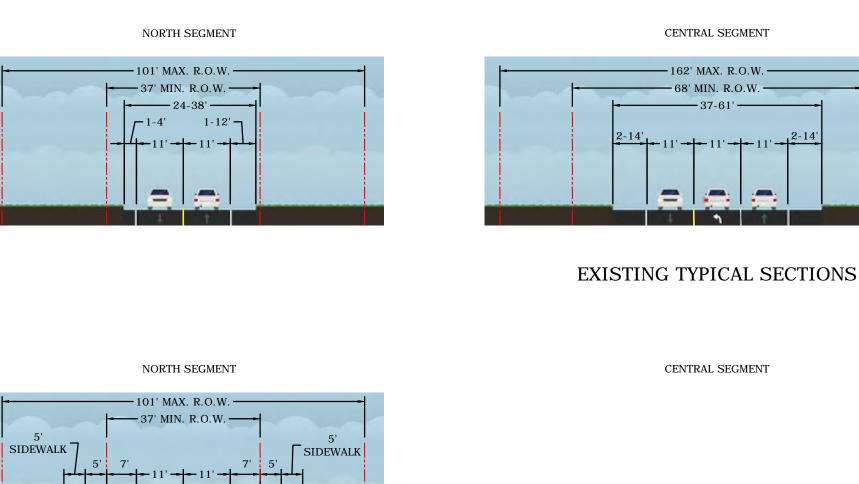
LEGEND

- SIDEWALK/MIXED-USE TRAIL \Box
- PROPOSED LANDSCAPING
- PROPOSED CURB
- EXISTING UTILITY POLE
- RELOCATED UTILITY POLE

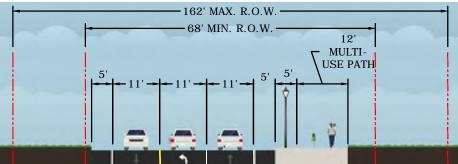
- EXISTING CATCH BASIN
- EXISTING CULVERT HEADWALL
- EXISTING STORM PIPE/CULVERT
- PROPOSED CATCH BASIN
- PROPOSED CULVERT HEADWALL
- PROPOSED STORM PIPE/CULVERT

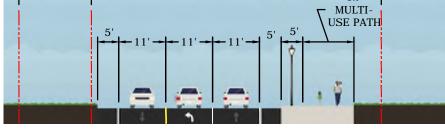






0





PROPOSED TYPICAL SECTIONS

-101' MAX. R.O.W. -37' MIN. R.O.W. -12' · MULTI-USE PATH 7' 5' ← 11' -

41

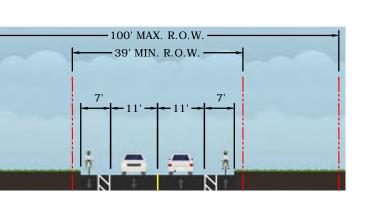
SCALE: N.T.S. FIGURE 8

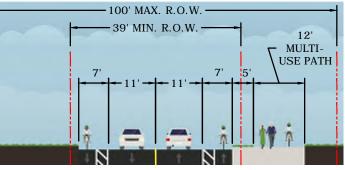
DATE: 06/30/2021



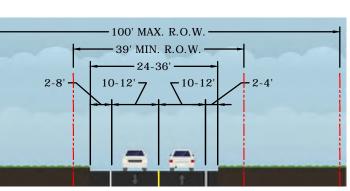
TYPICAL SECTIONS

ROUTE 2 BICYCLE/PEDESTRIAN FACILITY STUDY NORTH STONINGTON, CT





SOUTH SEGMENT



SOUTH SEGMENT





Opinion of Probable Construction Cost

Route 2 Bicycle & Pedestrian Facility Study Based on Conceptual Plans (Figures 1 through 6; dated 06/30/2021) -----

	Q	uantity by Phas	se in the second se					С	ost by Phase				
Unit	Phase 2A (North)	Phase 1 (Central)	Phase 2B (South)	U	nit Price*		Phase 2A (North)		Phase 1 (Central)		Phase 2B (South)		Total Cost
SY	3,075	6,425	0	\$	60.00	\$	184,500.00	\$	385,500.00	\$	-	\$	570,000.00
SF	9,400	925	0	\$	12.00	\$	112,800.00	\$	11,100.00	\$	-	\$	123,900.00
SF	14,000	1,325	52,450	\$	13.50	\$	189,000.00	\$	17,887.50	\$	708,075.00	\$	914,962.50
Mill	91,000	163,000	171,000	\$	2.30	\$	209,300.00	\$	374,900.00	\$	393,300.00	\$	977,500.00
SY	380	375	790	\$	60.00	\$	22,800.00	\$	22,500.00	\$	47,400.00	\$	92,700.00
LF	425	500	2,400	\$	10.00	\$	4,250.00	\$	5,000.00	\$	24,000.00	\$	33,250.00
EA	1	0	4	\$	5,000.00	\$	5,000.00	\$	-	\$	20,000.00	\$	25,000.00
EA	0	0	4	\$	4,000.00	\$	-	\$	-	\$	16,000.00	\$	16,000.00
LF	50	15	30	\$	1,500.00	\$	75,000.00	\$	22,500.00	\$	45,000.00	\$	142,500.00
LF	0	0	25	\$	135.00	\$	-	\$	-	\$	3,375.00	\$	3,375.00
EA	2	1	5	\$	8,000.00	\$	16,000.00	\$	8,000.00	\$	40,000.00	\$	64,000.00
EA	0	1	0	\$	250,000.00	\$	-	\$	250,000.00	\$	-	\$	250,000.00
EA	0	1	0	\$	50,000.00	\$	-	\$	50,000.00	\$	-	\$	50,000.00
LS	1	1	1	\$	20,000.00	\$	20,000.00	\$	20,000.00	\$	20,000.00	\$	60,000.00
EA	1	5	12	\$	10,000.00	\$	10,000.00	\$	50,000.00	\$	120,000.00	\$	180,000.00
SF	400	1,000	2,500	\$	125.00	\$	50,000.00	\$	125,000.00	\$	312,500.00	\$	487,500.00
	SY SF SF Mill SY LF EA EA LF EA EA EA EA EA	Unit Phase 2A (North) SY 3,075 SF 9,400 SF 14,000 Mill 91,000 SY 380 LF 425 EA 1 EA 0 LF 50 LF 0 EA 0 EA 0 LF 1 EA 0 LF 50 LF 0 EA 0 LS 1	Unit Phase 2A (North) Phase 1 (Central) SY 3,075 6,425 SF 9,400 925 SF 14,000 1,325 Mill 91,000 163,000 SY 380 375 LF 425 500 EA 1 0 EA 0 0 LF 50 15 LF 0 0 EA 1 1 EA 0 15 LF 0 0 LF 1 1 EA 0 1 EA 1 1 EA 0 1 EA 1 1	Unit Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 SF 9,400 925 0 SF 14,000 1,325 52,450 Mill 91,000 163,000 171,000 SY 380 375 790 LF 425 500 2,400 EA 1 0 4 EA 0 0 4 LF 50 15 30 LF 0 0 25 EA 0 1 5 EA 0 1 0 LF 50 15 30 LF 0 0 25 EA 2 1 5 EA 0 1 0 LF 1 1 1 EA 0 1 1 1	Unit Phase 2A (North) Phase 1 (Central) Phase 2B (South) U SY 3,075 6,425 0 \$ SF 9,400 925 0 \$ SF 14,000 1,325 52,450 \$ Mill 91,000 163,000 171,000 \$ SY 380 375 790 \$ LF 425 500 2,400 \$ EA 1 0 4 \$ EA 0 0 4 \$ EA 1 0 4 \$ EA 1 0 4 \$ EA 0 0 2,400 \$ EA 0 15 30 \$ LF 50 15 30 \$ EA 2 1 5 \$ EA 0 1 0 \$ EA 0 1 0<	Unit Phase 2A (North) Phase 1 (Central) Phase 2B (South) Unit Price* SY 3,075 6,425 0 \$ 60.00 SF 9,400 925 0 \$ 12.00 SF 14,000 1,325 52,450 \$ 13.50 Mill 91,000 163,000 171,000 \$ 2.30 SY 380 375 790 \$ 60.00 LF 425 500 2,400 \$ 10.00 EA 1 0 4 \$ 5,000.00 LF 50 15 30 \$ 1,500.00 LF 50 15 30 \$ 1,500.00 LF 0 0 25 \$ 135.00 LF 0 15 30 \$ 1,500.00 LF 0 0 25 \$ 135.00 EA 2 1 5 \$ 8,000.00 EA 0 1 0 \$ 250,000.00 EA 0 1 0	Unit Phase 2A (North) Phase 1 (Central) Phase 2B (South) Unit Price* SY 3,075 6,425 0 \$ 60.00 \$ SF 9,400 925 0 \$ 12.00 \$ SF 14,000 1,325 52,450 \$ 13.50 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ SY 380 375 790 \$ 60.00 \$ LF 425 500 2,400 \$ 10.00 \$ EA 1 0 4 \$ 5,000.0 \$ EA 1 0 4 \$ 5,000.0 \$ LF 50 15 30 \$ 1,500.00 \$ LF 0 0 25 \$ 35.00 \$ EA 0 1 5 \$ 8,000.00 \$ EA 0 1	Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 SF 9,400 925 0 \$ 12.00 \$ 112,800.00 SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 SY 380 375 790 \$ 60.00 \$ 22,800.00 LF 425 500 2,400 \$ 10.00 \$ 4,250.00 EA 1 0 4 \$ 5,000.00 \$ 5,000.00 EA 1 0 4 \$ 5,000.00 \$ 5,000.00 EA 1 0 4 \$ 5,000.00 \$ 5,000.00 EA 0 0 25 \$ 135.00 \$ LF 50 15 30 \$ 1,500.00 \$ 75,000.00 LF 0 0 25 \$ 38,000.00 \$ <	Unit Phase 2A (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 2A (North) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ EA 0 0 4 \$ 5,000.00 \$ 5,000.00 \$ LF 50 15 30 \$ 1,500.00 \$ 75,000.00 \$ LF 0 0 25 \$ 135.00 \$ - \$ \$ LF 0 </td <td>Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,887.50 Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ 5,000.00 EA 1 0 4 \$ 5,000.00 \$ - \$ - EA 0 0 4 \$ 5,000.00 \$ - \$ - LF 50 15 30 \$ 1,500.00 \$ - \$ - LF 50 15 30 \$ 1,500.00 \$ 22,500.00 LF</td> <td>Unit Phase 2A (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 \$ SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,887.50 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ 5,000.00 \$ EA 1 0 4 \$ 5,000.00 \$ - \$ \$ EA<td>Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ - SF 9,400 925 0 \$ 112,00 \$ 112,800.00 \$ 11,100.00 \$ - SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,887.50 \$ 708,075.00 Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ 393,300.00 SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ 47,400.00 LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ 22,500.00 \$ 24,000.00 EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ 22,500.00 \$ 47,400.00 LF 50 15 30 \$ 10.00 \$ 5,000.00 \$ 22,500.00 \$ 47,400.00 LF <td< td=""><td>Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ - \$ SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 \$ - \$ SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,87.50 \$ 708,075.00 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ 393,300.00 \$ SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ 47,400.00 \$ LF 425 500 2,400 \$ 10.00 \$ 5,000.00 \$ - \$ 20,000.00 \$ 44,000.00 \$ EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ 22,500.00 \$ 44,000.00 \$ LF 50 15 30 \$ 1,500.00 \$ 7</td></td<></td></td>	Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,887.50 Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ 5,000.00 EA 1 0 4 \$ 5,000.00 \$ - \$ - EA 0 0 4 \$ 5,000.00 \$ - \$ - LF 50 15 30 \$ 1,500.00 \$ - \$ - LF 50 15 30 \$ 1,500.00 \$ 22,500.00 LF	Unit Phase 2A (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 \$ SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,887.50 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ 5,000.00 \$ EA 1 0 4 \$ 5,000.00 \$ - \$ \$ EA <td>Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ - SF 9,400 925 0 \$ 112,00 \$ 112,800.00 \$ 11,100.00 \$ - SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,887.50 \$ 708,075.00 Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ 393,300.00 SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ 47,400.00 LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ 22,500.00 \$ 24,000.00 EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ 22,500.00 \$ 47,400.00 LF 50 15 30 \$ 10.00 \$ 5,000.00 \$ 22,500.00 \$ 47,400.00 LF <td< td=""><td>Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ - \$ SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 \$ - \$ SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,87.50 \$ 708,075.00 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ 393,300.00 \$ SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ 47,400.00 \$ LF 425 500 2,400 \$ 10.00 \$ 5,000.00 \$ - \$ 20,000.00 \$ 44,000.00 \$ EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ 22,500.00 \$ 44,000.00 \$ LF 50 15 30 \$ 1,500.00 \$ 7</td></td<></td>	Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ - SF 9,400 925 0 \$ 112,00 \$ 112,800.00 \$ 11,100.00 \$ - SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,887.50 \$ 708,075.00 Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ 393,300.00 SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ 47,400.00 LF 425 500 2,400 \$ 10.00 \$ 4,250.00 \$ 22,500.00 \$ 24,000.00 EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ 22,500.00 \$ 47,400.00 LF 50 15 30 \$ 10.00 \$ 5,000.00 \$ 22,500.00 \$ 47,400.00 LF <td< td=""><td>Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ - \$ SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 \$ - \$ SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,87.50 \$ 708,075.00 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ 393,300.00 \$ SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ 47,400.00 \$ LF 425 500 2,400 \$ 10.00 \$ 5,000.00 \$ - \$ 20,000.00 \$ 44,000.00 \$ EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ 22,500.00 \$ 44,000.00 \$ LF 50 15 30 \$ 1,500.00 \$ 7</td></td<>	Unit (North) Phase 1 (Central) Phase 2B (South) Unit Price* Phase 2A (North) Phase 1 (Central) Phase 2B (South) SY 3,075 6,425 0 \$ 60.00 \$ 184,500.00 \$ 385,500.00 \$ - \$ SF 9,400 925 0 \$ 12.00 \$ 112,800.00 \$ 11,100.00 \$ - \$ SF 14,000 1,325 52,450 \$ 13.50 \$ 189,000.00 \$ 17,87.50 \$ 708,075.00 \$ Mill 91,000 163,000 171,000 \$ 2.30 \$ 209,300.00 \$ 374,900.00 \$ 393,300.00 \$ SY 380 375 790 \$ 60.00 \$ 22,800.00 \$ 22,500.00 \$ 47,400.00 \$ LF 425 500 2,400 \$ 10.00 \$ 5,000.00 \$ - \$ 20,000.00 \$ 44,000.00 \$ EA 1 0 4 \$ 5,000.00 \$ 5,000.00 \$ 22,500.00 \$ 44,000.00 \$ LF 50 15 30 \$ 1,500.00 \$ 7

Prep'd Date

Ch'kd Date

Project No.

Sheet No.

Town of

06/30/21

06/30/21

28-5068-007

North Stonington

1

Bу

Bу

of

T. Wamser

C. Granatini

1

Phase Descriptions (See Figure 9):	Itemized Subtotal	\$ 898,650.00	\$ 1,342,387.50	\$ 1,749,650.00	\$ 3,990,687.50
	Minor Items (20%)	\$ 179,730.00	\$ 268,477.50	\$ 349,930.00	\$ 798,137.50
Phase 2A (North) - Holly Green to Main St./Mystic Rd Approx. 3,900 LF					
4' Bike Lane with 3' Buffer	Clearing & Grubbing (2%)	\$ 21,567.60	\$ 32,217.30	\$ 41,991.60	\$ 95,776.50
5' Sidewalk between Bellissimo Grande & Buon Appetito	Construction Staking (1%)	\$ 10,783.80	\$ 16,108.65	\$ 20,995.80	\$ 47,888.25
12' Multi-Use Path from Buon Appetito to Mystic Rd./Main St.	Maintenance & Protection of Traffic (4%)	\$ 43,135.20	\$ 64,434.60	\$ 83,983.20	\$ 191,553.00
	Mobilization (7%)	\$ 75,486.60	\$ 112,760.55	\$ 146,970.60	\$ 335,217.75
Phase 1 (Central) - Main St./Mystic Rd. to Rocky Hollow Rd Approx. 3,44	00 LF				
5' Shoulder & 12' Multi-Use Path	SUBTOTAL	\$ 1,229,353.20	\$ 1,836,386.10	\$ 2,393,521.20	\$ 5,459,260.50
Extension of 12' Multi-Use Path from Rocky Hollow Rd. to Commercial Not	e Contingency (20%)	\$ 245,870.64	\$ 367,277.22	\$ 478,704.24	\$ 1,091,852.10
	Incidentals (25%)	\$ 307,338.30	\$ 459,096.53	\$ 598,380.30	\$ 1,364,815.13
Phase 2B (South) - Rocky Hollow Rd. to Rt. 184 - Approx. 7,250 LF					
4' Bike Lane with 3' Buffer	Opinion of Probable Construction Costs	\$ 1,782,562.14	\$ 2,662,759.85	\$ 3,470,605.74	\$ 7,915,927.73
(NOTE: 12' Multi-Use Path Included in Phase 1)	Opinion of Probable Construction Costs (Per LF)	\$ 457.07	\$ 783.16	\$ 478.70	\$ 544.05

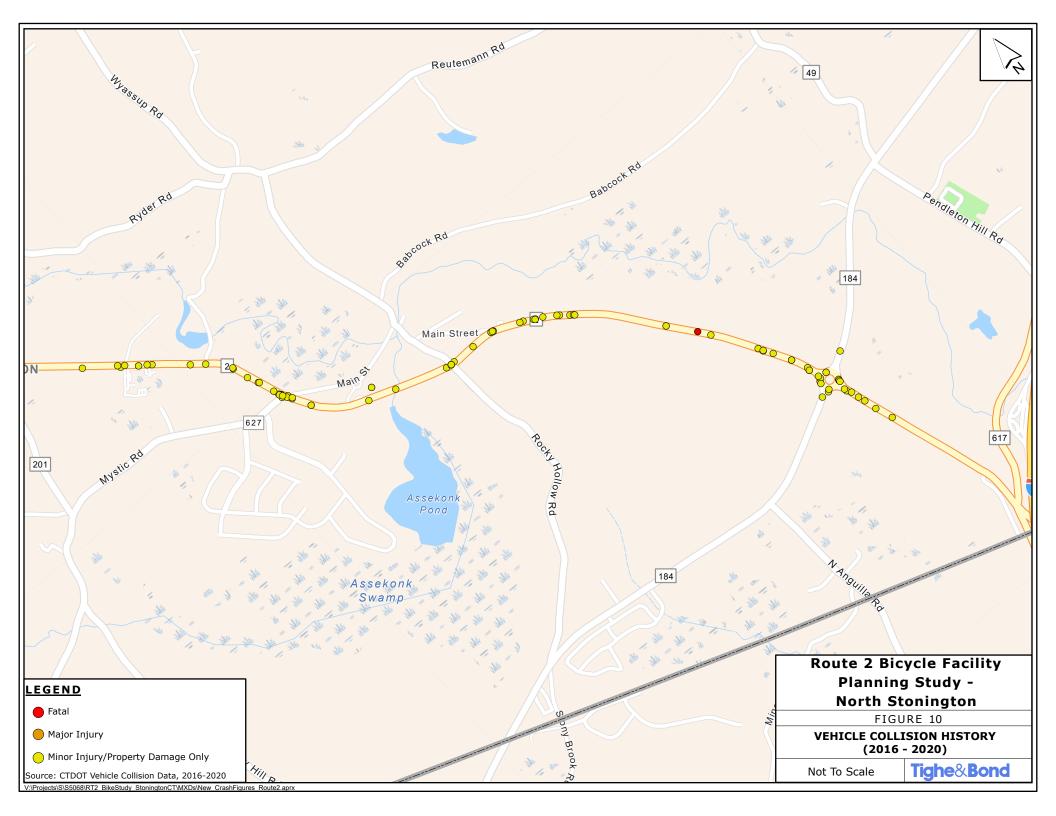


TABLE 1Corridor/Study Area Collision History Summary

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		15	20	7	10	9	61	58.7%
Fixed Object		3	3	2	2	2	12	11.5%
Angle		2	3	3	1	2	11	10.6%
Head-On		0	3	0	3	0	6	5.8%
Other Non-Fixed Object		2	1	0	0	1	4	3.8%
Other		0	1	0	1	1	3	2.9%
Sideswipe, Same Direction		1	1	0	0	1	3	2.9%
Animal		0	0	0	1	0	1	1.0%
Not Applicable		0	1	0	0	0	1	1.0%
Pedestrian		0	0	1	0	0	1	1.0%
Sideswipe, Opposite Direction		0	0	0	0	1	1	1.0%
	TOTAL	23	33	13	18	17	104	100%

SEVERITY

		2016	2017	2018	2019	2020	Total	Percent
Fatal		0	0	1	0	0	1	1.0%
Serious Injury		0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)		23	33	12	18	17	103	99.0%
	TOTAL	23	33	13	18	17	104	100%

BY STUDY AREA INTERSECTION/SEGMENT

	2016	2017	2018	2019	2020	Total	Percent
Route 2 from Holly Green Plaza to Hewitt Rd	3	2	0	2	1	8	7.7%
Route 2 at Hewitt Rd	0	0	0	0	2	2	1.9%
Route 2 from Hewitt Rd to Route 627 & Main St (North Leg)	1	0	1	2	1	5	4.8%
Route 2 at Route 627 & Main St (North Leg)	3	8	6	2	1	20	19.2%
Route 2 from Route 627 & Main St (North Leg) to Rocky Hollow Rd	1	1	0	3	1	6	5.8%
Route 2 at Rocky Hollow Rd & Main St (South Leg)	5	6	2	1	2	16	15.4%
Route 2 from Main St (South Leg) to Route 184	3	6	2	3	5	19	18.3%
Route 2 at Route 184	7	10	2	5	4	28	26.9%
TOTAL	23	33	13	18	17	104	100%

TABLE 1ASegment Collision History SummarySegment: 2

From Holly Green Plaza to Hewitt Rd

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		2	1	0	1	0	4	50.0%
Angle		1	0	0	0	0	1	12.5%
Fixed Object		0	0	0	1	0	1	12.5%
Other		0	1	0	0	0	1	12.5%
Other Non-Fixed Object		0	0	0	0	1	1	12.5%
	TOTAL	3	2	0	2	1	8	100%

	2016	2017	2018	2019	2020	Total	Percent
Fatal	0	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)	3	2	0	2	1	8	100.0%
TOTAL	3	2	0	2	1	8	100%

TABLE 1B

Intersection Collision History Summary Intersection:

Route 2 at

Hewitt Rd

COLLISION TYPE

	2016	2017	2018	2019	2020	Total	Percent
Fixed Object	0	0	0	0	2	2	100.0%
TOTAL	0	0	0	0	2	2	100%
SEVERITY							
	2016	2017	2018	2019	2020	Total	Percent
Fatal	0	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)	0	0	0	0	2	2	100.0%
TOTAL	0	0	0	0	2	2	100%

TABLE 1CSegment Collision History SummarySegment: 2

From Hewitt Rd to Route 627 & Main St (North Leg)

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		0	0	1	1	1	3	60.0%
Fixed Object		1	0	0	0	0	1	20.0%
Head-On		0	0	0	1	0	1	20.0%
	TOTAL	1	0	1	2	1	5	100%

	2016	2017	2018	2019	2020	Total	Percent
Fatal	0	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)	1	0	1	2	1	5	100.0%
TOTAL	1	0	1	2	1	5	100%

TABLE 1D

Intersection Collision History Summary Intersection:

Route 2 at

Route 627 & Main St (North Leg)

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		2	6	5	2	0	15	75.0%
Angle		0	2	0	0	0	2	10.0%
Sideswipe, Same Direction		1	0	0	0	1	2	10.0%
Fixed Object		0	0	1	0	0	1	5.0%
	TOTAL	3	8	6	2	1	20	100%

	2016	2017	2018	2019	2020	Total	Percent
Fatal	0	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)	3	8	6	2	1	20	100.0%
TOTAL	3	8	6	2	1	20	100%

TABLE 1ESegment Collision History SummarySegment: 2

From Route 627 & Main St (North Leg) to Rocky Hollow Rd

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		0	1	0	1	1	3	50.0%
Fixed Object		0	0	0	1	0	1	16.7%
Head-On		0	0	0	1	0	1	16.7%
Other Non-Fixed Object		1	0	0	0	0	1	16.7%
	TOTAL	1	1	0	3	1	6	100%

	2016	2017	2018	2019	2020	Total	Percent
Fatal	0	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)	1	1	0	3	1	6	100.0%
TOTAL	1	1	0	3	1	6	100%

TABLE 1F

Intersection Collision History Summary Intersection:

Route 2 at

Rocky Hollow Rd & Main St (South Leg)

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		5	2	0	0	2	9	56.3%
Angle		0	1	2	0	0	3	18.8%
Head-On		0	3	0	0	0	3	18.8%
Animal		0	0	0	1	0	1	6.3%
	TOTAL	5	6	2	1	2	16	100%

	2016	2017	2018	2019	2020	Total	Percent
Fatal	0	0	0	0	0	0	0.0%
Serious Injury	0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)	5	6	2	1	2	16	100.0%
TOTAL	5	6	2	1	2	16	100%

TABLE 1GSegment Collision History SummarySegment: 2

From Main St (South Leg) to Route 184

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		2	3	0	1	2	8	42.1%
Angle		0	0	1	1	2	4	21.1%
Other Non-Fixed Object		1	1	0	0	0	2	10.5%
Fixed Object		0	1	0	0	0	1	5.3%
Head-On		0	0	0	1	0	1	5.3%
Not Applicable		0	1	0	0	0	1	5.3%
Other		0	0	0	0	1	1	5.3%
Pedestrian		0	0	1	0	0	1	5.3%
	TOTAL	3	6	2	3	5	19	100%
SEVERITY								
		2016	2017	2018	2019	2020	Total	Percent
Fatal		0	0	1	0	0	1	5.3%

Fatal	0	0	1	0	0	1	5.3%
Serious Injury	0	0	0	0	0	0	0.0%
Minor Injury / Property Damage Only (PDO)	3	6	1	3	5	18	94.7%
TOTAL	3	6	2	3	5	19	100%

TABLE 1HIntersection Collision History SummaryIntersection:

Route 2 at

Route 184

COLLISION TYPE

		2016	2017	2018	2019	2020	Total	Percent
Rear-End		4	7	1	4	3	19	67.9%
Fixed Object		2	2	1	0	0	5	17.9%
Angle		1	0	0	0	0	1	3.6%
Other		0	0	0	1	0	1	3.6%
Sideswipe, Opposite Direction		0	0	0	0	1	1	3.6%
Sideswipe, Same Direction		0	1	0	0	0	1	3.6%
	TOTAL	7	10	2	5	4	28	100%
SEVERITY								
		2016	2017	2018	2019	2020	Total	Percent
Fatal		0	0	0	0	0	0	0.0%

TOTAL	7	10	2	5	4	28	100%	
Minor Injury / Property Damage Only (PDO)	7	10	2	5	4	28	100.0%	
Serious Injury	0	0	0	0	0	0	0.0%	
Fatal	0	0	0	0	0	0	0.0%	

Pedestrian Safety Countermeasure Guidance at Marked Uncontrolled Crosswalks

The Table below should be used after an engineering study has been performed and determined that a marked uncontrolled crosswalk is appropriate. Countermeasures shown in the chart are not mandated or required, and should be based on engineering judgment.

Town: Location:	-	# of Lanes/Crosswalk Length: Ped. Generator Nearby:		ADT: Posted Speed:		Presence of Lighting: # of Pedestrians/Hour:		Median Presence: r: Sightline:		
		Roadway Average Daily Traffic (ADT) and Posted Speed Limit*								
	1,5	1,500 < ADT < 9,000			9,000 < ADT < 15,000			ADT ≥ 15,000		
# of Lanes	≤ 30 MPH	35 MPH	≥ 40 MPH	≤ 30 MPH	35 MPH	≥ 40 MPH	≤ 30 MPH	35 MPH	≥ 40 MPH	
2	Α	А	C/D	А	Α	C/D	Α	Α	D	
3 (w/ raised median)**	Α	А	C/D	А	C/D	C/D	Α	C/D	D	
3 (w/o median)	Α	А	D	А	C/D	D	Α	D	D	
4+ (w/ raised median)**	Α	Α	D	A	C/D	D	C/D	D	D	
4+ (w/o median)	A/B	В	B/D	В	B/C/D	B/D	B/C/D	B/D	B/D	

Countermeasures (include A at a minimum):

A - <u>High-Visibility Crosswalk</u> with markings, signage (consider including <u>overhead lighting</u>)

B - Pedestrian Refuge Island

C - <u>Rectangular Rapid Flashing Beacon</u> (RRFB) – Minimum crossing volume of 20 pedestrians/hour recommended; or 10 pedestrians/hour if there are a high number of vulnerable users, or if the reduced volume is met for three consecutive hours

D - Pedestrian Hybrid Beacon (PHB; previously HAWK) – Refer to MUTCD Figures 4F-1 and 4F-2 for minimum criteria conditions

Additional countermeasures (less commonly used):

Curb Extensions

<u>Road Diet</u> – Consider this countermeasure for all roadways with four or more lanes without a raised median; typically, Road Diets are considered for roadways with current and future ADT equal to or less than about 20,000 vehicles per day

In-Street Pedestrian Crossing Sign – Towns may request this countermeasure on State roads under encroachment permit

Raised Crosswalk - Not used on State roads but can be installed by municipalities on local roads

Crossing treatments are generally not installed at locations where the ADT is lower than 1,500 vehicles per day. Exceptions may be made at school and trail crossing locations where the peak hour vehicle traffic exceeds 10% of the ADT; school crossings are defined as locations where 10 or more student pedestrians are crossing per hour.

For questions or guidance about using this form, please contact <u>TrafficSafety.DOT@CT.gov</u>. For questions regarding installation of countermeasures on State roads, please contact <u>DOT.TrafficEngineering@CT.gov</u>.

This Table was created using the Federal Highway Administration's Guide for Improving Pedestrian Safety at Uncontrolled Crossing Locations.

*if available, 85th percentile speed should be used instead of the posted speed

**assumes raised median is at least 4' wide and 6' long to adequately serve as a refuge area for pedestrians