

FINAL Technical Memorandum  
Village of Granville D&H Rail Trail  
Crossings and Resurfacing Recommendations



Memo To: Mr. Jack Mance, Senior Transportation Planner  
Adirondack/Glens Falls Transportation Council

Date: February 21, 2025

From: Barton & Loguidice, D.P.C. (B&L)

File: 1896.011.001

**I. Introduction:**

On behalf of the Village of Granville, the Adirondack/Glens Falls Transportation Council (A/GFTC) and Barton & Loguidice, DPC (B&L) have prepared this Technical Memorandum to evaluate potential improvements for a 4.75-mile section of the Delaware and Hudson (D&H) Rail Trail from Depot Street to the Vermont border. The Village, in coordination with the Lake Champlain-Lake George Regional Planning Board and the US EPA, recently completed a Community Action Plan for the Recreation Economy for Rural Communities program. This plan established several goals and action items in the Village including conducting a signage assessment and to improve the rail trail. Some improvements have already been implemented including installing benches and landscaping along the trail. This report provides a comprehensive overview of the existing conditions of the surface of the D&H Rail Trail and roadway crossings within the noted limits of the Rail Trail and provides improvement recommendations.

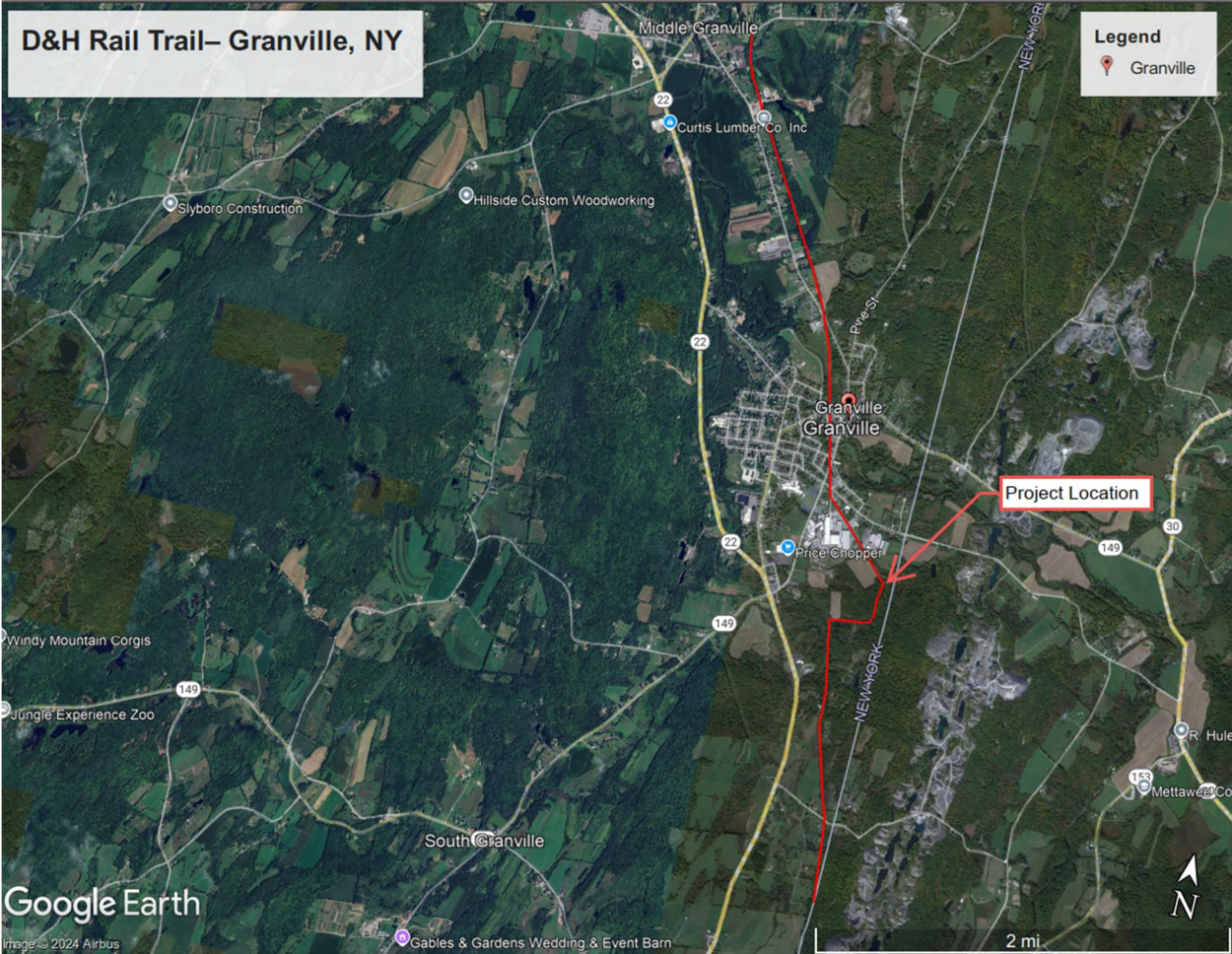


Figure I-1: Project Location  
Source: Google Earth

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## II. Existing Conditions

This section contains general information about the existing conditions along the D&H Rail Trail project corridor. The existing conditions were assessed using ArcGIS Survey123, a mobile application enabling real-time data collection. B&L personnel visited the trail corridor on August 29, 2024 to assess and document the existing conditions utilizing the application to record data on surface conditions, signage, pedestrian crossings, and other significant elements along the corridor. Each recorded data point was supplemented with a photograph and a corresponding GPS location.

### A. Land Use and Community Context

The D&H Rail Trail is a recreational resource, extensively used by pedestrians, cyclists, and joggers, as well as functioning as a snowmobile trail during the winter season. The trail exhibits significant variability in its conditions and surrounding land use. Starting at Depot St., the northern end of the study limits, the trail passes through a densely wooded area. To the north of Granville, it is surrounded by open fields and residential homes, with the landscape characterized by natural forest and open terrain. As it progresses southward, the trail enters the downtown setting, where it passes through the central part of the Village, integrating with local community features such as small businesses, restaurants, stores and residential homes. Southeast of Village the segment of the trail transitions back to a mixed landscape of open fields and densely wooded areas.



Figure II-1 – D&H Trail Next to Station house Bed and Breakfast.

### B. Trail Characteristics

The geometry of the trail, including surface conditions, width, and clear width, were systematically documented throughout the corridor. Beginning at Depot Street, it was observed that the original gravel surface has been overtaken by grass in many areas, although the trail is still mowed and maintained to its full width in most locations. Despite the growth of grass altering the surface composition and covering parts of the original surface, the overall effective width of the trail remains fully maintained. This grass-covered surface extends for the first 1.5 miles from Depot St to North St. (CR 24). Then from CR 24 to Main Street (0.5 miles), the trail surface was predominantly gravel, though grass had started to impede from the edges. From the Station House to Water Street (0.2 miles), the trail was entirely grass with no visible remnants of the former trail surface or rail bed. The trail then crosses over the Mettawee River via a bridge before meeting up with Water Street. This 0.1 mile section of the trail has a gravel surface on each approach to the bridge. From Morrison Ave. to Church Street, a 4 ft. wide asphalt path was present (0.06 mi). For the following 0.5 miles southeast of Village, the trail remained largely grass-covered, the final 1.9 miles that continued to the south consisted mainly of gravel, with occasional grass strips along the center in certain sections.



Figure II-2- Trail Section Between Depot St. and CR 24

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The clear width was measured from the edge of the gravel trail to the edge of the adjacent vegetation, with the total clear width calculated by summing the clear space on both sides of the trail from the edge of the trail to the edge of the pavement. The trail width refers to the distance across the gravel surface itself. In cases where the trail shoulder was distinguishable, the clear width plus the trail width were combined to determine the effective width. In areas where no clear boundary existed between the shoulder and trail surface, the total distance from the vegetation on one side to the vegetation on the other was recorded as the effective width (See Figure II-3 for details). The average effective width is approximately 19 ft., with a minimum recorded width of 10 ft. at one location between Depot St and CR 24.

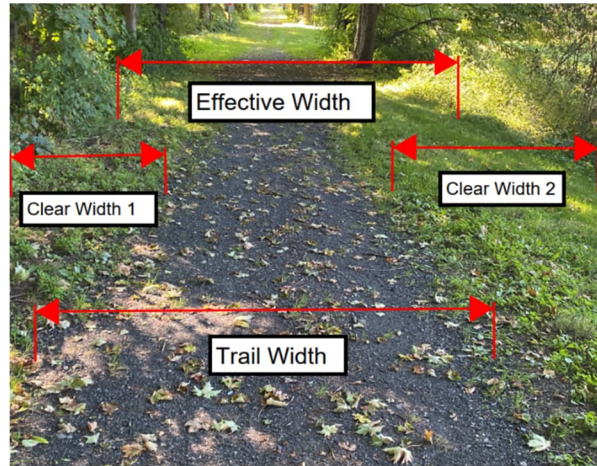


Figure II-3: Measurement Diagram

The right-of-way (ROW) along the trail varies considerably, ranging from sections as narrow as 20 ft. to others as wide as 130 ft. Across the evaluated section, the average ROW was determined to be 72 ft.

## C. Signage

A comprehensive assessment of signage along the D&H Rail Trail identified a total of 113 signs. This includes signage intended for both trail users and motorists at roadway crossings. Specifically, 33 signs are pedestrian crossing warning signs intended to alert drivers. Six of the seven crossings had some level of crossing signage for drivers. Additionally, 50 signs conform to the Manual on Uniform Traffic Control Devices (MUTCD) standards, providing clear guidance and information for trail users. The remaining 30 signs serve various functions, including navigational aids and informational displays about the trail.

## D. Crossings

A total of seven roadway crossings of the trail were reviewed for conformance with the current design standards for multi-use trail crossings, including the American Association of State Highway and Transportation Officials (“AASHTO”) Guide for the Development of Bicycle Facilities 2012, NYSDOT Highway Design Manual (HDM), 2023 Manual on Uniform Traffic Control Devices (MUTCD), FHWA Guide for Improving Pedestrian Safety at Uncontrolled Crossing locations, and the Empire State Trail Design Guide (further referred to as the “Trail Design Standards”). Of those evaluated, five crossings included painted crosswalks to enhance visibility of the crossing location. The trail crossing of CR 24 was the only crossing with advance warning signage for vehicles and this signage was only present for southbound traffic. Additionally, several intersections featured pedestrian crossing signs but lacked MUTCD-compliant elements, such as signage on both sides of the crosswalk and both front and back of the sign post. Table II-1 provides a detailed summary of the signage documented at each crossing.



Figure II-4 – Water Street Crossing

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Trail Crossing Signage							
Intersecting Street	Trail Crossing			Advance Warning			
	Sign Posts	W11-15 (Bicycle/Ped)	W16-7p (Arrow)	Sign Posts	W11-15 (Bicycle/Ped)	W11-15p (Trail X-ing)	W16-9p (Ahead)
North Street	2	4	4	1	1	1	1
Main Street	2	4	4	0	0	0	0
Water Street	1	1	1	0	0	0	0
Morrison Ave	2	2	2	0	0	0	0
Church Street	2	2	2	0	0	0	0
E Potter Ave	2	2	2	0	0	0	0
Andrews lane	0	0	0	0	0	0	0

*Table II-1-Trail Crossing Signage*

The roadway classifications and traffic data for each roadway crossing were reviewed on the NYSDOT Traffic Data Viewer to assist in the analysis of each roadway crossing on the D&H Rail Trail. See table III-2 below.

Trail Crossing Traffic Data					
Intersecting Street	Roadway Classification	AADT	Posted Speed Limit (MPH)	85th Percentile Speed (MPH)	
North Street	Rural Minor Collector	2,373	30	38.2	
Main Street	Rural Minor Collector	4,346	30	29.7	
Water Street	Rural Local	No Data	30*	No Data	
Morrison Ave	Rural Local	No Data	30*	No Data	
Church Street	Rural Major Collector	2,997	30	31.6	
E Potter Ave	Rural Local	No Data	30	No Data	
Andrews lane	Rural Local	No Data	30*	No Data	

\*No speed limit posted, 30mph assumed based on roadway characteristics

*Table II-2- Crossing Traffic Data*

Each crossing was also assigned an accessibility rating based on compliance with the Americans with Disabilities Act (ADA). Elements of ADA compliance include the presence of a curb ramp, detectable warning strips (DWS), slope of curb ramp, whether or not the pavement surface is flush with the edge of the curb ramp, and the overall condition of the pavement in the crosswalk. The crossing located on Main Street was the only crossing identified as fully accessible, meeting all relevant ADA criteria including curb ramps on both sides of the crossing. The remaining crossings were rated as partially accessible, indicating that improvements are needed to achieve full ADA compliance.

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In addition to the roadway crossings, there were six driveway crossings, including one that passes through an active farm where vehicles, livestock, and heavy equipment frequently cross. The high volume and type of traffic at this crossing may impact trail user safety, warranting further consideration in the trail's design and operational planning. The remaining driveway crossings appear to exhibit low traffic volumes and are not expected to significantly affect trail user access or safety.



*Figure II-5 Crossing through active farmland*

### E. Other Notable Features

Additional features documented along the trail include three bridges and three culverts. A New York State Department of Environmental Conservation (DEC) posting was also observed, located in a small stream next to Saint-Gobain Performance Plastics indicating an ongoing spill investigation in the area.

Within the farm section located at the Kenneth property (parcel ID 108.-1-3.4), the farm's operations and much of its infrastructure are situated within the trail right-of-way, utilizing dirt roadways on and across the existing trail. The farm appears to use the trail ROW for its regular operations as well as an area for storing cow hutches. Additionally, the trail features a cow pass located beneath it, which is a component of the farm's infrastructure. The cow pass stands approximately 7 ft. high, resulting in a steep and unstable slope that trail users must navigate. Figure II-7 displays a photograph of the steep slope. It should be noted that this location is outside of the Village of Granville and is assumed to be under the jurisdiction of NYS Office of Parks and Recreation. As such, no improvements or changes have been proposed under the auspices of the current analysis.



*Figure II-6 - Steep slope*

### III. Recommended Improvements

#### A. Trail Surface

This trail surface comparison will consider factors such as durability, maintenance requirements, and user safety to determine the most appropriate material for ensuring long-term functionality, improved usability, and overall trail sustainability. The trail surface material selected should be installed to establish a 10-12 ft. wide trail with 2-5 ft. shoulders on each side, as recommended by the Empire State Trail Design Guide. Additionally, this design guide recommends that trails accommodating snowmobile use should have a width of 12-14 ft. (10 ft. minimum) to ensure safe operations during winter. As noted in the field reconnaissance, the existing average effective width is 19 ft., therefore it is feasible to establish a recommended trail width of 12 ft. with 2 ft. shoulders along this corridor.

##### 1. Asphalt Surface

An Asphalt surface provides a smooth, durable top course that enhances accessibility for a variety of users, including pedestrians, cyclists, and individuals with mobility impairments. Asphalt is well-suited for trails due to its longevity and minimal maintenance requirements. The smooth, paved surface also improves user comfort and safety, especially for cyclists, in-line skaters, and wheelchair users, reducing the likelihood of rutting and erosion.

Asphalt is best suited for snowmobile trails in areas where snow accumulates 1 ft. or more and consistently covers the surface. This snow layer acts as a protective barrier, reducing wear on the asphalt from snowmobiles' studded tracks, which could otherwise wear on the trail surface.



*Figure III-1-Kingston Rail Trail, Ulster County*

Asphalt also offers a significant advantage over gravel in terms of snow removal efficiency in areas that are not used as a snowmobile trail. Plowing a paved surface is more straightforward and results in less wear on maintenance equipment, as the smooth solid surface allows plows to glide over its surface. Furthermore, asphalt is less susceptible to damage from snowmobiles compared to gravel, which can be displaced or eroded during winter use, leading to a more durable and lower-maintenance surface throughout the year.

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**2. Crushed Stone**

An alternative to the traditional hard surface material, is a crushed stone aggregate surface course that is bound by clay particles. The natural materials of this surface course appeal to the environmental setting of the project by maintaining the natural aesthetic and feel of the D&H corridor, blending with the surrounding environment. Examples of this durable stone course system use includes the D&H Canal Trail in the Town of Mamakating, NYS OPRHP Minnewaska State Park, the Rockefeller State Park Preserve, and the Ashokan Rail Trail in Ulster County.



*Figure III-2 D&H Canal Trail, Town of Mamakating*

Crushed Stone paths provide a durable and relatively flat surface, making them suitable for various types of trail users. While crushed stone trails can be ADA compliant, they may not offer the same level of convenience and smoothness as other surface materials, such as asphalt. Crushed stone is susceptible to vegetation growth impeding the trail width from the sides of the trail, which can occur if the trail is not regularly maintained.

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**3. Cost Estimate**

The cost estimate below for both an asphalt and stone surfaced trail assumes that full excavation of the existing trail material is needed due to the heavy presence of organic material that is present within the existing trail limits. Constructing the trail on top of the existing material could lead to pre-mature failure of the trail system. Additionally, the clearing and grubbing line item includes trimming back the vegetation that is encroaching onto the trail corridor. The estimate includes the cost of resurfacing the entire length of the trail system. Cost per mile have been included below the table as well to facilitate phase improvement planning.

<b>Village of Granville - D&amp;H Rail Trail Resurfacing Cost Estimate</b>			
<b>Items of Work / Road Crossing</b>	<b>Asphalt Trail Surface</b>	<b>Crushed Stone Surface</b>	<b>Lighting (Entire Trail)</b>
ASPHALT SURFACE COURSE	\$ 1,127,471	-	-
CRUSHED STONE TOP COURSE	-	\$ 386,031	\$ -
SUBBASE STONE	\$ 501,600	\$ 501,600	\$ -
EXCAVATION	\$ 445,867	\$ 445,867	\$ -
CLEARING AND GRUBBING	\$ 50,000	\$ 50,000	\$ -
LIGHTING	\$ -	\$ -	\$ 1,400,000
MISCELLANEOUS	-	-	-
<b>ITEMIZED CONSTRUCTION SUBTOTAL:</b>	<b>\$ 2,125,000</b>	<b>\$ 1,384,000</b>	<b>\$ 1,400,000</b>
FIELD CHANGE ORDER (5%)	\$ 106,250	\$ 69,200	\$ 70,000
MOBILIZATION (USE 4%)	\$ 89,300	\$ 58,200	\$ 58,800
CONTINGENCY / RISK (10%)	\$ 212,500	\$ 138,400	\$ 140,000
<b>PRIVATE CONTRACTOR SUBTOTAL:</b>	<b>\$ 2,534,000</b>	<b>\$ 1,650,000</b>	<b>\$ 1,669,000</b>
ENGINEERING / APPROVALS	\$ 506,800	\$ 330,000	\$ 333,800
CONSTRUCTION INSPECTION	\$ 304,080	\$ 198,000	\$ 200,280
<b>FEDERAL-AID PROJECT COSTS:</b>	<b>\$ 3,344,900</b>	<b>\$ 2,178,000</b>	<b>\$ 2,203,100</b>

	<b>Cost / Mile</b>		
ITEMIZED CONSTRUCTION SUBTOTAL:	\$ 448,000	\$ 292,000	\$ 295,000
PRIVATE CONTRACTOR SUBTOTAL:	\$ 534,000	\$ 348,000	\$ 352,000
FEDERAL-AID PROJECT COSTS:	\$ 705,000	\$ 459,000	\$ 464,000

*Table III-1: Trail Resurfacing Cost Estimate*



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**B. Trail Crossings**

The seven (7) road crossings were evaluated by assessing the existing features that are present at each location, such as signage, pavement markings, detectable warning strips, etc. The crossings were then compared to standardized crossing features established by the Trail Design Standards to determine if features are missing and what improvements should be made to each crossing.

An ideal at-grade roadway crossing has a variety of features present that warn the trail users that there is a roadway crossing present, and that warns roadway users that pedestrians and bicyclists may be crossing the roadway. The emphasis of safety should be placed on both interactions equally as it is both users responsibility to operate safely at crossings. Nearly all of the crossings evaluated need some level of improvements to the warning signs posted at and in advance of the trail crossing. At a minimum, each crossing should have pedestrian/bicyclist warning signs (B) and a crosswalk (A) installed at the location of the trail crossing, and advanced pedestrian/bicyclist crossing warning signs (C). The advanced pedestrian warning signage should be installed 200 ft. from all of the seven D&H Rail Trail crossings. See figure below from the Empire State Trail design guide.



Figure III-3: Trail Crossing Components

On roadways with higher vehicle volumes, or where drivers regularly fail to yield at the crossings, additional measures, such as Rapid Rectangular Flashing Beacons (RRFB) should be installed at the crossing to increase pedestrian and cyclist safety. Additionally, all pedestrian warning signs should be made of retroreflective fluorescent yellow-green sign sheeting and should also include the retroreflective sign post strip for enhanced visibility.

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**1. CR 24**

This crossing currently includes some of the recommended signage, including pedestrian crossing signs and advance warning signage, (only provided for southbound traffic). It is recommended that advance warning signage be installed south of the crossing to alert northbound traffic of the crossing.

Due to the existing speeds on the roadway reportedly exceeding the posted speed limit, Rectangular Rapid Flashing Beacons (RRFBs) should be installed at this location in addition to the standard pedestrian-bicycle crossing signage. RRFBs are high-intensity flashing yellow beacons mounted on standard pedestrian warning signs at uncontrolled crosswalks, see Figure III-4 for an installed example. These beacons are activated by pedestrians pressing a button before crossing. RRFB installations are cost-effective and have been proven to significantly improve motorist yield rates at marked crosswalks. The beacons can be powered by either solar energy or a connection to the electrical grid. For this installation, two beacon assemblies should be positioned on the west and east sides of CR 24, with flashing beacons installed on both sides of the posts to provide coverage for each approach to the crosswalk.



*Figure III-3: RRFB Installation*

During the evaluation of existing conditions, it was noted that both sides of the pavement have a slight drop from the pavement edge to the trail surface, making the trail inaccessible to users with disabilities and inconvenient for cyclists. To address this, a curb ramp should be installed across the full width of the trail, providing a smooth transition from the trail to the roadway. To meet ADA compliance, the curb ramp must include detectable warning strips (DWS) covering the entire width of the trail. This design will improve accessibility for pedestrians and cyclists, ensuring a seamless transition between the roadway and the trail. For specific signage requirements at each crossing, refer to Table III-2.

The crosswalk is currently oriented at an angle across the roadway. The crossing distance is 75 ft. and prolongs pedestrian exposure to traffic. It is recommended that the crosswalk be reconfigured so that the crossing is perpendicular to the roadway, which will reduce the crossing distance to 26 ft. and therefore, reduce the time to cross the road.

**2. Main Street**

The Main Street crossing appears to have been recently constructed, featuring a painted crosswalk and ADA-compliant curb ramps equipped with detectable warning strips. Proper signage is also in place to warn motorists of the crossing. Advance warning signage should be installed 200 ft. prior to the crossing in each direction. For specific signage requirements at each crossing, refer to Table III-2.



*Figure III-5: Main St Crossing*

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**3. Water Street, Morrison Ave, E. Potter Avenue**

Water Street, Morrison Avenue, and E. Potter Avenue are all low-volume local roads used primarily for residential traffic. Each crossing has faded or missing crosswalks and missing signage. The crosswalks at each location should be repainted using the "NYSDOT Type LS" design (the same type as installed at the Main St. crossing), which includes parallel stripes and ladder bars for enhanced visibility. The pavement markings should be applied with epoxy paint containing glass beads for retro-reflectivity or retro-reflective thermoplastic to ensure long-term durability and improved visibility, particularly at night.

In addition, a concrete slab similar to one described on CR 24 equipped with detectable warning strips should be installed at all three crossings to meet ADA compliance. Each crossing must be marked with signage on both approaches to the crosswalk, clearly indicating that pedestrians and cyclists may be crossing the roadway in this location. Each post should have signage on both the front and back, providing left and right crosswalk markings from the driver's perspective. For details on recommended signage at each crossing, refer to Table III-2.

**4. Church Street**

Church Street was identified as having the highest AADT among all the evaluated crossings with 2,997 vehicles per day. The current crossing features a recently painted crosswalk with grass approaches on both sides. However, these grass approaches exhibit an elevation difference between the trail and the edge of the pavement, making the crossing inaccessible for users with disabilities and inconvenient for cyclists. To address this issue, a curb ramp matching the width of the trail should be installed, with detectable warning strips spanning the full width of the trail. This will provide a smooth transition from the trail to the roadway while ensuring compliance with ADA standards.



*Figure III-6: Church St Crossing*

Additionally, the crosswalk is currently oriented at an angle across the roadway, creating an 80 ft. crossing distance and prolonging pedestrian exposure to traffic. It is recommended that the crosswalk be reconfigured so that the crossing is perpendicular to the roadway, reducing the crossing distance to 30 ft. and reducing the crossing time by more than 50%.

Reconfiguring the crossing to achieve a perpendicular alignment would likely necessitate minor property acquisition to accommodate the trail adjustment.

The crossing currently includes warning signs on one side of each post. Signage should be added so it is present on both sides of the posts, ensuring visibility from both directions of the crossing. Finally, advance warning signage should be installed 200 ft. in advance of the crossing. See Table III-2 for details on recommended signage. Additionally, due to the higher traffic volume, Rectangular Rapid Flashing Beacons (RRFBs) should be installed to enhance driver awareness of the crossing location.

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**5. Andrews Lane**

Andrews Lane is a low volume gravel roadway, utilized by local traffic only. The crossing currently lacks warning signs for drivers and does not have a painted crosswalk due to the gravel surface. This evaluation identified an elevation change between the roadway and the trail, making the crossing inaccessible to users with disabilities. It is recommended that this crossing be re-graded by adding material to create an ADA compliant slope up to the roadway surface on both sides. A concrete curb ramp with DWS should also be added at the crossing. The surface material of this slope should match the existing trail surface to maintain consistency. Additionally, signage indicating the trail crossing from both directions should be installed. See Table III-2 for detail on recommended signage.

Recommended Trail Crossing Signage							
Intersecting Street	Trail Crossing			Advance Warning			
	Sign Posts	W11-15 (Bike/Ped)	W16-7p (Arrow)	Sign Posts	W11-15 (Bike/Ped)	W11-15p (Trail X-ing)	W16-9p (Ahead)
North Street	0	2	2	0	0	0	0
Main Street	2	0	0	0	0	0	0
Water Street	1	3	3	0	0	0	0
Morrison Ave	0	2	2	1	1	1	1
Church Street	0	2	2	0	0	0	0
E Potter Ave	0	2	2	2	2	2	2
Andrews lane	2	4	4	0	0	0	0

*Table III-2- Recommended Crossing Signage*

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**6. Cost Estimate**

The total cost to implement the aforementioned improvements at each roadway crossing is shown in the table below. A full breakdown by roadway crossing and improvements is included in Appendix 2, if the Village wishes to make these recommended improvements incrementally.

<b>Village of Granville - D&amp;H Rail Trail Road Crossing Improvements Cost Estimate</b>	
<b>Items of Work / Road Crossing</b>	<b>Itemized Total</b>
SIGNS	\$ 10,500
STRIPING	\$ 10,500
ADA RAMPS / CONCRETE LANDING	\$ 60,000
RRFB'S	\$ 50,000
TRAIL APPROACH (Trail material, grading)	\$ 21,000
MISCELLANEOUS	\$ -
WORK ZONE TRAFFIC CONTROL	\$ 15,200
<b>ITEMIZED CONSTRUCTION SUBTOTAL:</b>	<b>\$ 152,000</b>
FIELD CHANGE ORDER (5%)	\$ 7,600
MOBILIZATION (USE 4%)	\$ 6,800
CONTINGENCY / RISK (20%)	\$ 30,400
<b>PRIVATE CONTRACTOR SUBTOTAL:</b>	<b>\$ 196,800</b>
ENGINEERING / APPROVALS	\$ 40,000
CONSTRUCTION INSPECTION	\$ 30,000
<b>FEDERAL-AID PROJECT COSTS:</b>	<b>\$ 266,800</b>

*Table III-3: Roadway Crossing Improvement Cost Estimate*

## Appendix 1 – Trail Data

### Trail Geometry and Pavement

ObjectID	Trail Width (ft)	Clear Width (ft)	Effective Width (ft)	Trail Material	Trail Condition (1-5)	Vegetation Condition	Trail Deficiency	Is it Accessible	x	y
4	7	13	20	Grass	2	Pruning Needs	Uneven_Surface	Partly	-73.27759885	43.43351427
5	8	17	25	Stone/Gravel	3	Fully Maintained	Uneven_Surface,Potholes	Mostly	-73.2773703	43.43245223
6	7	14	21	Grass	2	Pruning Needs	Uneven_Surface	Partly	-73.27715653	43.4317717
9	20	5	25	Stone/Gravel	3	Fully Maintained	Potholes,Uneven_Surface	Mostly	-73.27412381	43.42741167
10	6	14	20	Grass	1	Pruning Needs	Uneven_Surface	Partly	-73.27445569	43.42777819
17	6	11	17	Grass	2	Pruning Needs	Uneven_Surface	Partly	-73.27412176	43.42740283
19	6	10	16	Grass	2	Pruning Needs	Uneven_Surface	Partly	-73.27278	43.42568188
27	4	17	21	Stone/Gravel	3	Pruning Needs	Uneven_Surface	Mostly	-73.27107734	43.42352209
28	6	10	16	Grass	3	Pruning Needs		Mostly	-73.27080013	43.42318071
29	2	8	10	Grass	2	Pruning Needs		Mostly	No Data	No Data
30	1	15	16	Stone/Gravel	3	Pruning Needs		Mostly	-73.26820092	43.41987778
41	17	0	17	Grass	4	Fully Maintained	Potholes	Mostly	-73.26725806	43.41870807
46	16	0	16	Grass	4	Fully Maintained	Uneven_Surface	Mostly	-73.26508289	43.41593972
60	8	6	14	Grass	4	Fully Maintained		Mostly	-73.26377183	43.41368564
62	8	4	12	Stone/Gravel	4	Fully Maintained		Mostly	-73.26311512	43.41260016
71	10	0	10	Grass	4	Fully Maintained		Mostly	-73.26120333	43.40703019
72	11	0	11	Grass	4	Fully Maintained		Mostly	-73.26104258	43.40661098
83	12	8	20	Stone/Gravel	4	Fully Maintained	Uneven_Surface	Mostly	-73.26071259	43.40542766
87	10	20	30	Stone/Gravel	4	Fully Maintained		Mostly	-73.26049014	43.40465354
94	4	11	15	Asphalt	5	Fully Maintained		Fully	-73.26033354	43.40401698
101	30	0	30	Grass	4	Fully Maintained		Mostly	-73.2599743	43.40284902
109	12	10	22	Grass	4	Fully Maintained		Mostly	-73.25962515	43.40169137
113	16	0	16	Grass	4	Fully Maintained		Mostly	-73.25564576	43.39841859
116	8	5	13	Stone/Gravel	4	Pruning Needs		Mostly	-73.25391009	43.39705779
119	9	8	17	Stone/Gravel	4	Fully Maintained		Mostly	-73.25239287	43.39533156
125	9	7	16	Stone/Gravel	4	Fully Maintained	Uneven_Surface	Mostly	-73.25364278	43.39275405
128	7	24	31	Stone/Gravel	3	Pruning Needs		Mostly	-73.25689047	43.39224205
131	9	24	33	Stone/Gravel	4	Fully Maintained	Uneven_Surface	Mostly	-73.25562294	43.38554214
132	8	12	20	Stone/Gravel	3	Pruning Needs	Uneven_Surface	Mostly	-73.25402416	43.38075644
141	9	14	23	Stone/Gravel	4	Pruning Needs	Uneven_Surface	Mostly	-73.2527485	43.37733797

## Signage

ObjectID	Date	Trail Feature	Road Signage (for Motorists)	Trail Signage	Signage Style	x	y
1	8/29/2024 12:48	Signage		No motorized vehicle	other	-73.2777	43.43363
2	8/29/2024 12:52	Signage		Trail Info	Wayfinding	-73.2776	43.43359
3	8/29/2024 12:54	Signage		Stop Sign	MUTCD	-73.2776	43.4336
7	8/29/2024 13:18	Signage		Intersection Ahead	MUTCD	-73.2757	43.42944
11	8/29/2024 13:27	Signage		Straight Arrow	Wayfinding	-73.2743	43.42757
12	8/29/2024 13:32	Signage		Mile marker	Wayfinding	-73.2743	43.42757
13	8/29/2024 13:33	Signage		Steep hill	MUTCD	-73.2743	43.42755
14	8/29/2024 13:34	Signage		Mile Marker 5.75	Wayfinding	-73.2743	43.42758
15	8/29/2024 13:35	Signage		Intersection Ahead	MUTCD	-73.2743	43.42761
16	8/29/2024 13:38	Signage		Caution	MUTCD	No Data	No Data
18	8/29/2024 13:44	Signage		Stop ahead	MUTCD	-73.2729	43.4258
20	8/29/2024 13:48	Signage		Stop Sign	MUTCD	-73.2726	43.42538
22	8/29/2024 13:49	Signage		Stop Sign	MUTCD	-73.2721	43.42482
23	8/29/2024 13:51	Signage		No motorized vehicle	other	-73.2721	43.42481
25	8/29/2024 13:53	Signage		No motorized vehicle	other	No Data	No Data
26	8/29/2024 13:54	Signage		Mile marker 5.5	other	-73.2715	43.424
33	8/29/2024 14:16	Signage		Warning	MUTCD	-73.2681	43.4198
34	8/29/2024 14:18	Signage		Caution	MUTCD	-73.2681	43.41976
35	8/29/2024 14:18	Signage		Stop ahead	MUTCD	-73.2677	43.41933
36	8/29/2024 14:19	Signage		Stop ahead	MUTCD	-73.2677	43.41925
38	8/29/2024 14:21	Signage		No motorized vehicle	other	-73.2673	43.41877
39	8/29/2024 14:22	Signage		Corridor 9	Wayfinding	-73.2673	43.41876
40	8/29/2024 14:23	Signage		Trail Marker	other	-73.2673	43.41875
42	8/29/2024 14:26	Signage		Stop Ahead	MUTCD	-73.267	43.41826
43	8/29/2024 14:28	Signage		Trail hours	other	-73.2664	43.41763
47	8/29/2024 14:36	Signage		Stop Ahead	MUTCD	-73.2642	43.41455
48	8/29/2024 14:37	Signage		Stop Sign	MUTCD	-73.264	43.41416
49	8/29/2024 14:39	Signage		Trail info	other	-73.2641	43.41414
50	8/29/2024 14:40	Signage		No motorized vehicle		-73.2641	43.41414
51	8/29/2024 14:41	Signage		Speed limit 25	MUTCD	-73.2641	43.41418
52	8/29/2024 14:42	Signage	Trail Crossing Ahead			-73.2646	43.41447
53	8/29/2024 14:44	Signage	Pedestrian Crossing (Both Sides)			-73.2639	43.41394
54	8/29/2024 14:46	Signage	Pedestrian Crossing (Both Sides)			-73.2639	43.41401
56	8/29/2024 14:48	Signage		Trail info	Private	-73.2639	43.41381
57	8/29/2024 14:49	Signage		No motorized vehicle	other	-73.2638	43.4138
58	8/29/2024 14:50	Signage		Trail info	other	-73.2637	43.4138
59	8/29/2024 14:51	Signage		Speed limit 10	MUTCD	-73.2638	43.41367
63	8/29/2024 16:11	Signage		Stop Ahead	MUTCD	-73.2614	43.4077
64	8/29/2024 16:12	Signage		Stop Ahead	MUTCD	-73.2614	43.40762
65	8/29/2024 16:13	Signage		No Motorized Vehicles	other	-73.2614	43.4076
66	8/29/2024 16:14	Signage		Stop Sign	MUTCD	-73.2613	43.40753
68	8/29/2024 16:16	Signage	Pedestrian Crossing (Both Sides)			-73.2612	43.40736
69	8/29/2024 16:17	Signage	Pedestrian Crossing (Both Sides)			-73.2613	43.40719
70	8/29/2024 16:19	Signage		Stop Sign	MUTCD	-73.2612	43.40713
73	8/29/2024 16:22	Signage		Stop ahead	MUTCD	-73.2609	43.406
74	8/29/2024 16:24	Signage		Stop Sign	MUTCD	-73.2608	43.40565
75	8/29/2024 16:24	Signage		Trail Info	other	-73.2608	43.40564
76	8/29/2024 16:25	Signage		Speed Limit 10	MUTCD	-73.2608	43.40564
77	8/29/2024 16:27	Signage		Trail hours	other	-73.2608	43.40565
79	8/29/2024 16:28	Signage	Pedestrian Crossing (One Side)			-73.2607	43.40563
80	8/29/2024 16:29	Signage		No Motorized Vehicles	other	-73.2608	43.40555
81	8/29/2024 16:30	Signage		Stop Sign	MUTCD	-73.2607	43.40552
86	8/29/2024 16:36	Signage		No Motorized Vehicles	other	-73.2605	43.40474
88	8/29/2024 16:38	Signage		Stop Ahead		-73.2605	43.40459
89	8/29/2024 16:38	Signage		Stop Sign	MUTCD	-73.2604	43.40424
91	8/29/2024 16:40	Signage	Pedestrian Crossing (One Side)			-73.2603	43.40402
92	8/29/2024 16:41	Signage		No Motorized Vehicles	other	-73.2603	43.40399
93	8/29/2024 16:42	Signage		Stop Sign	MUTCD	-73.2603	43.40402
95	8/29/2024 16:44	Signage	Pedestrian Crossing (One Side)			-73.2601	43.40345
96	8/29/2024 16:44	Signage		Stop Sign	MUTCD	-73.2601	43.40337



## Signage

ObjectID	Date	Trail Feature	Road Signage (for Motorists)	Trail Signage	Signage Style	x	y
97	8/29/2024 16:45	Signage		Stop Ahead	MUTCD	-73.2602	43.40349
99	8/29/2024 16:47	Signage		No Motorized Vehicles	other	-73.26	43.4032
100	8/29/2024 16:48	Signage	Pedestrian Crossing (One Side)		MUTCD	-73.2601	43.40308
102	8/29/2024 16:51	Signage		Stop Ahead	MUTCD	-73.2598	43.40235
103	8/29/2024 16:52	Signage		Stop Sign	MUTCD	-73.2597	43.40204
104	8/29/2024 16:53	Signage		Stop Ahead	MUTCD	-73.2599	43.4025
107	8/29/2024 16:56	Signage	Pedestrian Crossing (One Side)		MUTCD	-73.2597	43.40184
108	8/29/2024 16:57	Signage		No Motorized Vehicles	other	-73.2597	43.40184
110	8/29/2024 16:58	Signage		Stop Ahead	MUTCD	-73.2595	43.40153
111	8/29/2024 16:59	Signage		Mile Marker 3.75	Wayfinding	-73.2593	43.40123
115	8/29/2024 17:09	Signage		Trail info	other	-73.2549	43.39791
117	8/29/2024 17:16	Signage		Mile Marker 3.25	Wayfinding	-73.2524	43.39568
118	8/29/2024 17:16	Signage		Mile Marker 3.25	Wayfinding	-73.2523	43.39563
120	8/29/2024 17:19	Signage		Curvy road	MUTCD	-73.2526	43.39465
121	8/29/2024 17:20	Signage		Private property	Private	-73.2526	43.3946
122	8/29/2024 17:22	Signage		Right turn	MUTCD	-73.2526	43.39311
123	8/29/2024 17:23	Signage		Left turn	MUTCD	-73.2527	43.39294
124	8/29/2024 17:24	Signage		Culvert ahead	other	-73.2533	43.39272
126	8/29/2024 17:27	Signage		Left turn	other	-73.2563	43.39258
127	8/29/2024 17:30	Signage		Junction	Wayfinding	-73.257	43.39251
129	8/29/2024 17:32	Signage		Mile Marker 2.75	Wayfinding	-73.2567	43.39169
130	8/29/2024 17:42	Signage		Stop Sign	MUTCD	-73.2557	43.38576
133	8/29/2024 17:54	Signage		Intersection Ahead	MUTCD	-73.2535	43.37935
134	8/29/2024 17:54	Signage		Intersection Ahead	MUTCD	-73.2534	43.37923
135	8/29/2024 17:55	Signage		Stop Sign	MUTCD	-73.2532	43.37863
137	8/29/2024 17:57	Signage		other	Wayfinding	-73.253	43.3783
138	8/29/2024 17:58	Signage		Stop Sign	MUTCD	-73.253	43.37824
139	8/29/2024 17:59	Signage		other	MUTCD	-73.2528	43.3776
140	8/29/2024 18:00	Signage		Intersection Ahead	MUTCD	-73.2528	43.37758
144	8/29/2024 19:01	Signage		other	other	-73.2601	43.40333

### Crossings

ObjectID	Intersecting Street Name	Curb Ramp Present	Is there a Painted/Designated Crosswalk	Crosswalk Material	Curb Ramps Present on	Crossing Deficiencies	Is it Accessible?	x	y
55	North Street	No	Yes	Painted	None		Partly	-73.2639	43.41389
67	Main Street	Yes	Yes	Painted	Both Side		Fully	-73.26125	43.40739
78	Water Street	No	Yes	Painted	None		Partly	-73.26077	43.40566
90	Morrison Ave	No	No		None		Partly	-73.26037	43.40406
98	Church Street	No	Yes	Painted	None		Partly	-73.26007	43.40336
105	E Potter Ave	No	Yes	Painted	None		Partly	-73.2597	43.40197
136	Andrew's lane	No	No		None	Uneven_Pavement_Surface	Partly	-73.25319	43.37862

### Driveway Crossings

ObjectID	Date	Condition	x	y
21	8/29/2024 13:49	Driveway Crossing	-73.27249781	43.42534517
24	8/29/2024 13:52	Driveway Crossing	-73.27208347	43.42482734
37	8/29/2024 14:20	Driveway Crossing	-73.26735083	43.41883025
142	8/29/2024 18:25	Driveway Crossing	-73.25563409	43.38557993
112	8/29/2024 17:01	Driveway Crossing Commercial	-73.25838888	43.40048377
8	8/29/2024 13:20	Farm intersection	-73.27551331	43.42916193

## Appendix 2 – Estimate

**Village of Granville - D&H Rail Trail Road Crossing Improvements  
Preliminary Cost Estimate**

Items of Work / Road Crossing	County Route 24	Main Street	Water Street	Morrison Ave	East Potter Avenue	Church Street	Andrews Lane	Itemized Total
SIGNS	\$ 500	\$ 1,000	\$ 3,000	\$ 1,000	\$ 1,000	\$ 2,000	\$ 2,000	\$ 10,500
STRIPING	\$ 2,000	-	\$ 2,000	\$ 2,000	\$ 2,000	\$ 2,500	-	\$ 10,500
ADA RAMPS / CONCRETE LANDING	\$ 10,000	-	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000	\$ 60,000
RRFB'S	\$ 25,000	-	-	-	-	\$ 25,000	-	\$ 50,000
TRAIL APPROACH (Trail material, grading)	\$ 8,000	-	-	-	-	\$ 8,000	\$ 5,000	\$ 21,000
MISCELLANEOUS	-	-	-	-	-	-	-	\$ -
WORK ZONE TRAFFIC CONTROL	\$ 4,550	\$ 100	\$ 1,500	\$ 1,300	\$ 1,300	\$ 4,750	\$ 1,700	\$ 15,200
<b>ITEMIZED CONSTRUCTION SUBTOTAL:</b>	<b>\$ 45,500</b>	<b>\$ 1,000</b>	<b>\$ 15,000</b>	<b>\$ 13,000</b>	<b>\$ 13,000</b>	<b>\$ 47,500</b>	<b>\$ 17,000</b>	<b>\$ 152,000</b>
FIELD CHANGE ORDER (5%)	\$ 2,275	\$ 50	\$ 750	\$ 650	\$ 650	\$ 2,375	\$ 850	\$ 7,600
MOBILIZATION (USE 4%)	\$ 2,000	\$ 100	\$ 700	\$ 600	\$ 600	\$ 2,000	\$ 800	\$ 6,800
CONTINGENCY / RISK (20%)	\$ 9,100	\$ 200	\$ 3,000	\$ 2,600	\$ 2,600	\$ 9,500	\$ 3,400	\$ 30,400
<b>PRIVATE CONTRACTOR SUBTOTAL:</b>	<b>\$ 58,900</b>	<b>\$ 1,400</b>	<b>\$ 19,500</b>	<b>\$ 16,900</b>	<b>\$ 16,900</b>	<b>\$ 61,400</b>	<b>\$ 22,100</b>	<b>\$ 196,800</b>
ENGINEERING / APPROVALS								\$ 40,000
CONSTRUCTION INSPECTION								\$ 30,000
<b>FEDERAL-AID PROJECT COSTS:</b>	<b>\$ 58,900</b>	<b>\$ 1,400</b>	<b>\$ 19,500</b>	<b>\$ 16,900</b>	<b>\$ 16,900</b>	<b>\$ 61,400</b>	<b>\$ 22,100</b>	<b>\$ 266,800</b>