

Transportation Project Report

DRAFT Design Report

March 2020

County Road 46 at Smith Road Intersection Improvements
PIN 4ON0.04
Town of Hopewell
Ontario County



Ontario County
Department of Public Works
2962 County Road 48
Canandaigua, New York 14424



Department of
Transportation



U.S. Department of Transportation
Federal Highway Administration

Prepared by:

B BERGMANN
ARCHITECTS ENGINEERS PLANNERS

280 East Broad Street, Suite 200
Rochester, NY 14604
585.232.5135
www.bergmannpc.com

Project Approval Sheet

<u>Milestones</u>	<u>Signatures</u>	<u>Date</u>
A. IPP Approval:	The project cost and schedule are consistent with the Regional Capital Program. The IPP was approved by: Kevin C. Bush, P.E.	8/28/2018
	_____ Regional Director, NYSDOT Region 4	_____ Date
B. Recommendation for Scoping & Design Approval: Environmental Determination & Federal Aid Process Concurrence:	The project cost and schedule are consistent with the Regional Capital Program. <input checked="" type="checkbox"/> The NYSDOT on behalf of FHWA (based on the Federal Environmental Approval Worksheet) concurs with the classification of this project as a NEPA Class II, Categorical Exclusion (d list) as described in this document.	
	_____ Christopher T. Reeve Regional Planning & Program Manager, NYSDOT Region 4	_____ Date
C. Recommendation for Scoping, Design, & Nonstandard Feature Approval:	Procedurally, this project was progressed using the NYSDOT Local Projects Manual. All requirements requisite to these actions and approvals have been met, the required independent quality control review separate from the functional group reviews have been accomplished, and the work is consistent with established standards, policies, regulations, and procedures, except as otherwise noted and explained. No nonstandard features have been identified, created, or retained.	
	_____ Michael T. Croce, P.E. Senior Project Manager, Bergmann	_____ Date
D. Public Hearing Certification (23 USC 128):	<input type="checkbox"/> A public hearing was held on _____ in accordance with 23 USC 128. <input type="checkbox"/> OR, A Notice of Opportunity was published in accordance with 23 CFR 771. A public hearing was not held. <input checked="" type="checkbox"/> OR, A public hearing was not required. A public information comment period will be held in April 2020.	
Nonstandard Feature Approval	<input type="checkbox"/> The non-standard features have been adequately justified and it is not prudent to eliminate them as part of this project. <input checked="" type="checkbox"/> OR, No nonstandard features have been identified, created, or retained.	
Scope & Design Approval	The required environmental determinations have been made, and the preferred alternative for this project is ready for final design.	
	_____ William C. Wright, P.E. Commissioner, Ontario County Department of Public Works	_____ Date

List of Preparers

Consultant Project Manager Responsible for Production of the Design Approval Document:

Michael T. Croce, P.E., Senior Project Manager, Bergmann Associates

Description of Work Performed by Firm: Directed the preparation of the Design Approval Document in accordance with established standards, policies, regulations and procedures, except as otherwise explained in this document.



Note: *It is a violation of law for any person, unless they are acting under the direction of a licensed professional engineer, architect, landscape architect, or land surveyor, to alter an item in any way. If an item bearing the stamp of a licensed professional is altered, the altering engineer, architect, landscape architect, or land surveyor shall stamp the document and include the notation "altered by" followed by their signature, the date of such alteration, and a specific description of the alteration.*

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CHAPTER 1 – PROJECT DEVELOPMENT

This report identifies the purpose and need for work at the intersection of County Road (CR) 46 and Smith Road along with its objectives and how they will be addressed. It also provides an assessment of the social, economic, and environmental impacts of the proposed action. The proposed project is located in the Town of Hopewell, Ontario County, New York. The Project Identification Number (PIN) is 4ON0.04.

1.1. Introduction

This report was prepared in accordance with the NYSDOT Project Development Manual, the NYSDOT Local Projects Manual, 6 NYCRR (New York Codes, Rules and Regulations) Part 617, and 23 CFR (Code of Federal Regulations) 771. Transportation needs have been identified (Section 1.2.2), objectives established (1.2.3) to address the needs, and cost-effective alternatives developed (1.3). This project is federally funded.

1.1.1. Project Location

A Project Location Map is included as **Exhibit 1.2.1, Appendix A**. The following is a project location summary.

- (1) Route number: County Road (CR) 46
- (2) Route name(s): CR 46 and Smith Road
- (3) Municipality: Town of Hopewell
- (4) County: Ontario
- (5) Limits: 1,000 feet east, 500 feet west, 500 feet south, and 1,200 feet north of the intersection.

1.2. Purpose and Need and Objectives

1.2.1. Project Need

The intersection of CR 46 and Smith Road sits at the edge of the City of Canandaigua's urbanized boundary. Both roads are straight and meet at a 90° angle. The northbound and southbound (Smith Road) approaches are offset by approximately 2 feet. The west, south, and north approach roadways are generally level; however, there is a crest vertical curve on the east (CR 46) approach that adversely impacts sight distance. A large tree in the southwest corner of the intersection obstructs intersection sight lines. The intersection serves numerous passenger cars, agricultural vehicles, trucks, and buses. The Ontario County Complex and other government service buildings, located less than one mile to the east, generate substantial traffic through the intersection. The effect of these factors is amplified by approach speeds near or in excess of the 55 mile per hour speed limit.

The intersection of CR 46 and Smith Road has experienced a high frequency of crashes. Past studies have ranked this intersection among the top 10 poorest safety performing unsignalized intersections across Ontario County. The crash rate is over 3 times the statewide average for a rural, two-way stop controlled intersection. It was the site of a formal Safety Assessment in 2017 which resulted in the application of several signing, marking, and flashing beacon treatments, yet crashes have continued to occur. Crash severity is also a concern, with 4 of 18 crashes recorded during a six-year and eleven-month study period involving injuries. The intersection also experienced one fatal crash during that time. The predominant crash type is right-angle. Contributing factors typically include failure to yield the right of way and failure to stop. As a result, this intersection presents a substantial ongoing safety concern.

1.2.2. Project Purpose

The purpose of this project is to enhance safety performance at the intersection of CR 46 and Smith Road.

1.2.3. Project Objectives

The objectives of the project are as follows:

- (1) Implement a design that incorporates effective crash reduction measures capable of eliminating identified collision patterns and reducing the average annual crash rate to a level at or below the expected rate for similar locations throughout Ontario County and New York State.
- (2) Implement a treatment that encourages motorists to lower their travel speed on approach to the intersection, thereby decreasing the potential for a high severity crash.

1.3. Project Alternatives

The following alternatives were considered:

Alternative 1: No Action/Maintenance

Alternative 2: Incremental Signing and Pavement Marking Enhancements

Alternative 3: Multi-Way Stop Intersection Control

Alternative 4: Signalized Intersection Control

Alternative 5: Roundabout

Alternative 1, The No Action / Maintenance Alternative or “null”, would retain two-way stop control at the intersection of CR 46 and Smith Road. No activities other than routine maintenance would be carried out. This alternative would not improve safety at the intersection. The null is retained only as a baseline for comparison and will not be discarded until a final decision is made regarding the selection of a build alternative.

Alternatives 2 through 4 were considered but eliminated from further study because they would not fully satisfy the project’s purpose and need nor meet the project objectives. Refer to **Section 3.1** for a discussion of these alternatives.

The feasible alternative is Alternative 5, which would convert the existing, four-legged, two-way stop-controlled intersection of CR 46 and Smith Road into a roundabout. The roundabout would feature an 18-foot wide circulatory roadway (striped to 16 feet wide) with an inscribed circle diameter of 140 feet. The roundabout would also feature a truck apron to accommodate the rear wheels of turning tractor trailers and a landscaped central island. All approaches would feature an elongated splitter island with a set of curves, each successively smaller as one approaches the circle. The purpose of curvature is to reduce vehicle speeds as they approach the roundabout from free flow conditions (higher than 55 miles per hour) to approximately 20 miles per hour or less by the time they reach circle.

The roundabout would physically eliminate left turns and crossing maneuvers; therefore, mitigating documented crash patterns. A reduction in intersection approach speeds would also lower the severity of any collisions that do occur. The crest vertical curve on CR 46 east of the intersection would be lowered to provide additional stopping sight distance on approach to the new roundabout. The design would provide adequate capacity to meet projected motor vehicle demand for at least 20 years after completion. It would also accommodate turning tractor trailers, buses, passenger cars, bicyclists, and the occasional pedestrian.

Drainage patterns around the intersection would remain consistent with those found today; however, improvements would be made to encourage more efficient flow and to prevent salt laden runoff from entering nearby agricultural parcels. All pavement within the project limits would be fully reconstructed. All signs and markings would be upgraded to meet current standards. Several temporary and permanent easements would be required to construct and maintain the new intersection.

Refer to **Section 1.6** of this document for additional information on the anticipated cost and schedule. For a more in-depth discussion of the proposed improvements and detailed design criteria see **Section 3.2**. See Section **3.3.3.2 (1)** for a summary of critical design elements that would not meet standards.

1.4 Project Effects

1.4.1 Environmental Classification

Exhibit 1.4.1 Environmental Classification Summary			
NEPA Classification	Type II Categorical Exclusion	BY	NYSDOT
SEQR Type:	Type II	BY	Ontario County

NEPA: National Environmental Policy Act
 FHWA: Federal Highway Administration
 SEQR: State Environmental Quality Review

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1.4.2 Comparison of Considered Alternatives

Exhibit 1.4.2 Comparison of Alternatives		
Category	Alternatives Evaluated	
	Null	Alternative 5: Roundabout
Environmental Impacts		
Wetlands	None	0.018 acres
Cultural Resources (Section 106)	None	No Potential to Cause Effects
Section 4(f)	None	None
Endangered/ Threatened Species	None	None
Noise	None	None
Social Impacts		
Property/Relocations	None	1.360 Acres PE 0.124 Acres TE
Visual	None	Negligible
Mobility (Pedestrian, bicycle, transit, etc.)	No Effect	Improved pedestrian and bicycle mobility
Environmental Justice	No Effect	No disproportionate high and adverse effects to minority or low-income populations
General Social Groups (elderly, disabled, children, transit dependent, etc.)	No Effect	No Effect
Crash Costs	High	Low
Economic and/or Operational Impacts		
Economic Impacts	No Effect	No change to vehicular access to businesses
Temporary Detours	No Effect	Travelers affected for 3 months
Intersection Control	Two-Way Stop	Roundabout
Operation at ETC+20	LOS C or Better	LOS A (all approaches)
Pavement Condition	No Change	20 Year Surface Life 50 Year Overall Life
Drainage	No Change	Improved Flow
Utilities	None	Relocation required \$0.343M (Water)
Safety	No Effect	Reduced potential for high speed, high severity right angle crashes
Construction Cost	None	\$2.557M

There are no mitigation measures proposed for this project (see **Chapter 4**).

1.4.3 Anticipated Permits/Certifications/Coordination

Exhibit 1.4.3 Anticipated Permits/Certifications/Coordination	
<u>Permits</u>	
NYS Department of Environmental Conservation (NYSDEC):	
•	State Pollutant Discharge Elimination System (SPDES) General Permit
•	Blanket Water Quality Certification (Section 401) of the FWPCA
Army Corps of Engineers (USACE):	
•	Nationwide Permit #14 – Linear Transportation Projects
New York State Department of Transportation (NYSDOT):	
•	Highway Work Permit
New York State Department of Health (NYSDOH):	
•	Application for Approval of Plans for Public Water Supply Improvement (DOH 348)
<u>Coordination</u>	
Federal Highway Administration (via NYSDOT)	
New York State Historic Preservation Officer (SHPO) (via NYSDOT)	
US Fish and Wildlife Service	
New York Natural Heritage Program	
Municipality(ies) – Town of Hopewell	
Metropolitan Planning Organization – Genesee Transportation Council	
Utilities – Town of Hopewell Water Districts, RG&E Electric, NYSEG Gas, Charter Communications, Frontier Corporation, Empire Access, FirstLight	

1.5. Preferred Alternative

The reasonable and prudent alternative that best meets the project objectives is Alternative 5: Roundabout. The decision to enter final design will not be made until after the environmental determination is finalized and a thorough evaluation of public and agency comments on the draft design approval document has been completed. See **Section 3.2.2** for a discussion of this alternative.

Design Approval is scheduled for May of 2020 with construction scheduled to last 7 months beginning in April of 2021.

For more detail on costs for each alternative refer to **Section 3.2.1**.

1.6. Project Schedule and Cost

Exhibit 1.6 - 1 Project Schedule	
Activity	Date Occurred/Tentative
Scoping Approval	September 2018
Public Information Comment Period	March 30, 2020 to April 10, 2020
Design Approval	May 2020
Property Acquisition	Summer-Fall 2020
Letting (Bid Opening)	February 2021
Construction Start	April 2021
Construction Complete	October 2021

Exhibit 1.6 - 2 Project Costs – Design Bid Build		
Potential Alternative		Alternative 5: Roundabout ¹
Highway		
Earthwork		\$137,400
Stormwater Management		\$24,200
Pavement and Subbase		\$1,244,675
Drainage		\$250,650
Landscape		\$118,750
Lighting		\$60,800
Water Main		\$342,625
Signs & Pavement Markings		\$49,180
Work Zone Traffic Control		\$60,000
Survey & Miscellaneous		\$53,000
Subtotal		\$2,341,280.00
Incidentals	0%	\$0
Contingency	5% ²	\$117,064.00
Subtotal		\$2,458,344.00
Field Change	0% ³	\$0
Subtotal		\$2,458,344.00
Mobilization	4%	\$98,333.76
Subtotal		\$2,556,677.76
Inflation/Escalation to Midpoint of Construction	0%	\$0
CONSTRUCTION COST^{4,5}		\$2,556,677.76
Final Design ⁶		\$132,000
QC & Administration of Final Design and Contract ⁶		\$395,000
Construction Inspection ⁷		\$22,000
Right-of-Way ⁸		
TOTAL PROJECT COST		\$3,105,677.76
ROUNDED TO NEAREST \$10,000		\$3,110,000

Notes:

- Unit prices are in 2020 dollars.
- For unforeseen and untabulated items like restoration sawcutting, milling, joint adhesive, test pits, erosion & sediment control, subbase daylighting, detectable warning units, miscellaneous landscaping, roadside ditching outside of cut/fill, mailboxes, locations of undercut, incidental PCC pavement materials, abandoning existing water main, temporary asphalt and asphalt/fuel price adjustments.
- Field Change Order would be 5% per the HDM Chapter 21 Section 21.4.3.3. Assume Field Change Order is included in the contingencies.
- Costs do not include any private utility relocations including overhead electric, cable TV, telephone, and fiber optic relocations; and underground gas and telephone relocations. Reimbursable utility costs not anticipated for this project.
- Construction funding programmed in 2020-2024 GTC TIP at \$2,393,000. Ontario County is requesting additional funding or will be expected to cover project construction costs in excess of the GTC TIP value.
- Final design budget in the GTC TIP is \$132,000. Actual cost to be negotiated during scoping for final design phase service agreement.
- Construction inspection and support budget given in the GTC TIP is \$395,000. Actual cost to be negotiated during scoping for construction phase services agreement.
- ROW acquisition budget given in the GTC TIP is \$22,000. Actual cost pending appraisals.

1.7. Public Involvement

The intersection CR 46 and Smith Road has been the site of numerous right-angle crashes resulting in personal injury. One crash in the last 7 years resulted in a fatality.

With the intent to improve safety at the intersection, an Initial Project Proposal (IPP) was drafted and approved in August 2018. The project was subsequently added to the Genesee Transportation Council (GTC) Transportation Improvement Program (TIP). Ontario County then began coordination with the Town of Hopewell, who participated in the selection of a design team. Preliminary design began in the late spring of 2019. Utility coordination also began at that time and will continue throughout design. Coordination with the NYSDOT and other agencies is ongoing.

A series of one-on-one stakeholder meetings were held by Ontario County in March 2020. Ontario County representatives specifically reached out to local elected officials and affected property owners. A public information comment period will be from Monday, March 30, 2020 through Friday, April 10, 2020. Project information including written and graphical documentation and narrated video presentation will be made available for inspection by the public on the County's project website - <https://www.co.ontario.ny.us/1798/County-Road-46-Smith-Road-Improvements>. Comments or questions may be directed to the County's project manager or by submitting a written comment sheet. Comments received during the public comment period will be considered and addressed. Information from the public meeting and a summary of all comments received will be made available in **Appendix G**.

Exhibit 1.7 Public Involvement Plan Schedule of Milestone Dates	
Activity	Date Occurred/Tentative
Meetings with Stakeholders	February 2020 to April 2020
Meeting with Town of Hopewell	March 2020
Public Information Comment Period	March 30, 2020 to April 10, 2020
Current Project Letting	January 2021 (tentative)

For additional information or to provide comments, please contact:

Mailing Address: Mr. Timothy McElligott, P.E.
Professional Engineer
Ontario County Department of Public Works
2962 County Road 48
Canandaigua, New York 14424

Email Address: Timothy.McElligott@co.ontario.ny.us

Telephone: (585) 396-4000

Please include the six-digit Project Identification Number (PIN) 4ON0.04 in any correspondence.

The deadline for submitting comments on this report circulation is April 10, 2020.

The remainder of this report is a detailed technical evaluation of existing conditions, anticipated impacts of the one reasonable/preferred alternative and comparison to the null alternative, copies of technical reports and plans and other supporting information.

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CHAPTER 2 - PROJECT CONTEXT: HISTORY, TRANSPORTATION PLANS, CONDITIONS AND NEEDS

This chapter addresses the history and existing context of the project site, including the existing conditions, deficiencies, and needs at the intersection of CR 46 and Smith Road.

2.1. Project History

In 2017, Ontario County Public Works updated its network screening of unsignalized, two-way stop-controlled intersections using the methods described in the American Association of State Highway and Transportation Officials (AASHTO) Highway Safety Manual (HSM). Data utilized covered a period from January 2008 to December 2016. At that time, the crash experience at the intersection of CR 46 and Smith Road was flagged as significant in comparison to other locations countywide.

A subsequent safety benefit evaluation completed for the period from January 2013 through February 2018 per New York State Department of Transportation (NYSDOT) procedures also suggested a significant crash experience. The calculated crash rate of 1.38 crashes per million entering vehicles (mev) was about 4 times higher than the average crash rate for similar locations statewide. Just over 67% of the crashes involved a right-angle collision. There was one fatal crash and 3 injury crashes.

These crashes came despite tangent approaches, signs, and markings. Drivers reportedly failed to stop or yield the right of way at the four-way intersection. The existing geometry includes a small hill just east of the intersection, trees, houses, and planted agricultural fields that limit available intersection sight distance on all approaches. The intersection has a tendency to blend into its surroundings when viewed from any approach. The intersection has also been the site of one fatal crash.

With a desire to improve safety at the CR 46 and Smith Road intersection by reducing the number and severity of crashes, Ontario County sought and secured Highway Safety Improvement Program (HSIP) funding in 2018. The project was approved and added to the Genesee Transportation Council (GTC) 2020-2024 Transportation Improvement Plan (TIP). Design Phase Authorization was issued in fall 2018 and preliminary design activities began in 2019.

Ontario County completed interim signing and striping improvements in summer 2018 using county forces and funding. This was done to satisfy public concerns and enhance short-term safety at the intersection while waiting for the larger project to be approved, designed, and constructed.

2.2. Transportation Plans and Land Use

2.2.1. Local Plans for the Project Area

2.2.1.1. Local Comprehensive Plans (“Master Plan”)

This project is consistent with the Town of Hopewell’s local comprehensive plan as amended in 2013.

2.2.1.2. Local Private Development Plans

There are no planned or approved developments within the project area that would impact traffic operations at the intersection of CR 46 and Smith Road.

2.2.2. Transportation Corridor

2.2.2.1. Importance of the Project Route Segment

CR 46 travels east and west, connecting NY Route 21/NY Route 332 in the City of Canandaigua with CR 47 in the Town of Hopewell. East of CR 47 this route becomes Booth Road, a local road owned and maintained by the Town of Hopewell. Smith Road travels north and south, connecting US Route 20/NY Route 5 in the Town of Hopewell with Stoddard Road and East Avenue (near NY Route 488). CR 46 and Smith Road collect traffic from intersecting local roads and adjoining private properties and feed it to the connecting network of arterial roadways. Both roadways also accommodate commuter, residential, recreational, and agricultural traffic. The Ontario County Complex is located on CR 46 less than $\frac{3}{4}$ mile east of Smith Road. Significant commercial development is also located to the southwest on US Route 20/NY Route 5, less than 2 miles from this intersection.

2.2.2.2. Alternate Routes

CR 10 (1.0 mile to the west), Freshour Road (1.0 mile to the east), and CR 47 (2.4 miles to the east) are potential alternate routes for Smith Road. Both connect US Route 20/NY Route 5 and CR 4 (i.e. the next county road north of CR 46).

US Route 20/NY Route 5 (1.3 miles to the south) could serve as a southern alternative to CR 46 and CR 4 (1.0 miles to the north) could serve as a northern alternative. Both routes connect CR 10, Freshour Road, and CR 47.

2.2.2.3. Corridor Deficiencies and Needs

There are no elements within the corridor that limit mobility through the area. Intersection safety improvements are necessary to reduce the number and severity of crashes as outlined in **Section 2.3.1.8**.

2.2.2.4. Transportation Plans

This project is on the approved GTC (2020-2024) TIP under PIN 4ON0.04. It is described as the CR 46 at Smith Road Intersection Improvement. Project funding has been fully allocated on the TIP. Highway Safety Improvement Program (HSIP) funds have been programmed for design, construction, and property acquisition activities.

2.2.2.5. Abutting Highway Segments and Future Plans for Abutting Highway Segments

CR 46 is owned by Ontario County. The road originates in the City of Canandaigua at NY Route 21/NY Route 332 as Phelps Street and then Saltonstall Street, a local road owned and maintained by the City. At the City line, it transitions to CR 46, crosses CR 10 at a roundabout, and continues easterly to CR 47, where it becomes Booth Road, a local road owned and maintained by the Town of Hopewell. It is a two-way, two-lane urban minor collector asphalt roadway with a combination of asphalt and gravel shoulders. The New York State statutory speed limit of 55 miles per hour applies. Travel lane and paved shoulder widths are typically 11 feet and 4 feet, respectively.

Smith Road is owned by the Town of Hopewell. It begins at US Route 20/NY Route 5 in the south and extends north until it terminates at its intersection with Stoddard Road and East Avenue. It is a two-way, two-lane asphalt roadway classified as an urban local road south of CR 46 and a rural local road north of CR 46. The roadway has a combination of asphalt and gravel shoulders. The New York State statutory speed limit of 55 miles per hour applies. Lane and paved shoulder widths are typically 10.5 feet and 2 feet, respectively.

Ontario County Public Works and the Town of Hopewell Highway Department have each confirmed that there are no plans to reconstruct or widen these roadways within the next 20 years.

2.3. Transportation Conditions, Deficiencies and Engineering Considerations

2.3.1. Operations (Traffic and Safety) & Maintenance

2.3.1.1. Functional Classification and National Highway System (NHS)

Classification data for the roadways approaching the subject intersection are summarized in **Exhibit 2.3.1.1.**

Exhibit 2.3.1.1 CR 46 and Smith Road Classification Data		
Street Name	CR 46	Smith Road
Functional Classification	Urban Minor Collector	Urban Local Road (south) Rural Local Road (north)
National Highway System (NHS)	No	No
Designated Truck Access Route	No	No
Qualifying Highway	No	No
Within 1 mile of a Qualifying Highway	No	No
Within the 16-foot vertical clearance network	No	No

2.3.1.2. Access Control

There is no control of access along any approach roadways. Refer to **Section 2.3.3.1 (6)** for information on driveways within the project limits.

2.3.1.3. Traffic Control Devices

The intersection of CR 46 and Smith Road operates as a two-way stop. Stop signs (R1-1) are posted on both the northbound and southbound (Smith Road) approaches. A stop sign is present on either side of the road on both approaches. Ontario County upgraded the stop signs with right-side, solar-powered, red, dual-flashing beacon assemblies and left-side, standard signs with red retro-reflective strips on the posts to enhance visibility in 2018 using County forces and funds. Additionally, stop ahead (W3-1) signs were upgraded on the northbound and southbound approaches with right-side, solar-powered, amber, dual-flashing beacons and left side standard signs with yellow retro-reflective strips on the posts. These were dual posted as part of the interim safety improvements. On CR 46, intersection warning (W2-1) signs were upgraded on the eastbound and westbound approaches with right-side, solar-powered, amber, dual-flashing beacons and left side standard signs with yellow retro-reflective strips on the posts. There are street name signs (D3-1) for CR 46 and Smith Road in the southeast corner of the intersection.

Signs and sign posts within the project limits are in good condition based upon field inspection. Signs are also generally compliant with the National Manual on Uniform Traffic Control Devices, New York State Supplement, and applicable revisions (MUTCD), except as follows: The northbound stop ahead signs on

Smith Road are located approximately 800 feet in advance of the stop line which exceeds the guidelines presented in the New York State Supplement. The advance intersection warning signs on CR 46 are located between 670 and 800 feet upstream of the intersection, also exceeding the guidelines presented in the New York State Supplement.

Pavement markings on CR 46 are in good condition based on field inspection. A double yellow (full barrier) line (prohibiting passing) separates traffic west of the intersection for approximately 780 feet. Passing is allowed in the westbound direction just west of the double yellow line. A double yellow line also prohibits passing in both directions for approximately 515 feet east of the intersection. Passing is allowed in the eastbound direction just east of the double yellow line.

Pavement markings on Smith Road are in good condition based on field inspection. A double yellow (full barrier) line (prohibiting passing) separates traffic south of the intersection for approximately 400 feet. Passing is allowed in the northbound direction just south of the double yellow line. A yellow partial barrier line allows passing as one travels away from the intersection in the northbound direction for approximately 300 feet. Passing is allowed in both directions north of the yellow partial barrier line. There are also white stop lines on each Smith Road approach to CR 46. Stop lines (24-inch wide) were recently installed as part of the interim safety improvements.

2.3.1.4. Intelligent Transportation Systems (ITS)

There are no ITS systems in operation or planned for the project area.

2.3.1.5. Speeds and Delay

There are no speed limit signs within the project limits; therefore, New York State’s statutory speed limit of 55 mph applies to all approach roadways as shown in **Exhibit 2.3.1.5**. Speed studies were conducted by Ontario County on all intersection approaches in May 2019. Speed data summaries are available in **Appendix C**. The 85th percentile speed is that speed at which or below 85 percent of all vehicles travel. The measured 85th percentile speed is higher than the posted speed limit of 55 mph on all approach roadways except northbound Smith Road. The results are summarized in **Exhibit 2.3.1.5**.

Exhibit 2.3.1.5 Speed Data				
Roadway (Approach)	CR 46 (West)	CR 46 (East)	Smith Road (South)	Smith Road (North)
Existing Speed Limit	55 mph	55 mph	55 mph	55 mph
85 th Percentile Speed	57 mph	60 mph	50 mph	60 mph

Note: Speed information given in the direction of travel approaching the intersection

2.3.1.6. Traffic Volumes

2.3.1.6. (1) Existing traffic volumes – Continuous 24-hour traffic volume counts were collected by Ontario County in May 2019. Two-way Average Daily Traffic (ADT) volumes for an average weekday (Tuesday through Thursday) were calculated from the data. Existing ADT volumes appear in **Exhibit 2.3.1.6 (1)-1**. Additional statistics are provided in **Exhibit 2.3.1.6 (1)-2**. Based upon field observation, no significant delays are currently experienced within the project limits; therefore, travel delay studies were not performed.

Exhibit 2.3.1.6 (1)-1 CR 46 and Smith Road Existing and Future Traffic Volumes				
Roadway (Approach)	CR 46 (West)	CR 46 (East)	Smith Road (South)	Smith Road (North)
Year	ADT	ADT	ADT	ADT
Existing (2019)	4150	4600	2200	2200
ETC (2021)	4280	4740	2270	2270
ETC+20 (2041)	5760	6390	3060	3060

Notes: 1. Refer to **Section 2.3.1.6. (2)** for growth rates.
 2. ETC is the Estimated Time of Completion

Exhibit 2.3.1.6 (1)-2 Traffic Composition Data				
Roadway (Approach)	CR 46 (West)	CR 46 (East)	Smith Road (South)	Smith Road (North)
Directional Split	49/51	50/50	49/51	49/51
% Trucks	11	13	17	14

Notes: 1. Splits and percentages are based on daily traffic
 2. Order of splits = EB/WB, SB/NB

Additionally, Ontario County conducted manual turning movement counts at the intersection of CR 46 and Smith Road. The traffic counts were collected on Tuesday June 4, 2019 from 7:00 AM to 9:00 AM, 11:30 AM to 1:30 PM, and 3:00 PM to 6:00 PM. The weekday AM, midday, and PM peak hours at the intersection occurred from 7:30 AM to 8:30 AM, 12:00 PM to 1:00 PM, and 3:15 PM to 4:15 PM, respectively. Count data and peak hour volume diagrams are contained in **Appendix C, Exhibit 2.3.1.6 (1)-3** through **Exhibit 2.3.1.6 (1)-5**.

2.3.1.6. (2) Forecast no-build design year traffic volumes – The Estimated Time of Completion (ETC) is 2021. A design year of 2041 (ETC+20) was selected per Appendix 5 of the NYSDOT Project Development Manual. Traffic volume projections were completed for ETC (2021) and the design year ETC+20 (2041). A growth rate of 1.5% was calculated based on historic count information. This growth factor (annually compounded) was used to forecast ADT volumes for the years 2021 and 2041 which appear in **Exhibit 2.3.1.6 (1)-1**. ETC+30 projections were not required as this project does not involve a bridge or large culvert.

The growth rate described above was also applied to the weekday morning, midday, and evening peak hour volumes for ETC (2020) and ETC+20 (2041). Peak hour volume diagrams illustrating the ETC and ETC+20 projections are contained in **Appendix C**.

2.3.1.7. Level of Service and Mobility

2.3.1.7. (1) Existing level of service and capacity analysis – Level of Service (LOS) is a qualitative measure describing traveler satisfaction with various factors influencing the degree of traffic congestion including travel time, speed, maneuverability, and delay. The methodology for performing capacity analyses and determining level of service is documented in the Highway Capacity Manual, Sixth Edition: A Guide for Multimodal Mobility Analysis (HCM) (Transportation Research Board, 2016). Levels of service range from A to F. LOS A describes traffic operations with little or no delay while LOS F describes highly congested conditions with substantial delays. LOS D or better is generally considered acceptable for vehicular operations during peak traffic hours in urban areas. LOS C or better is desirable within Ontario County. Analyses of the unsignalized intersection of CR 46 and Smith Road (motor vehicle mode of

travel) were completed using the Highway Capacity Software (HCS). Copies of the analysis reports are provided in **Appendix C**.

Results of the level of service analyses for existing conditions during the weekday morning, midday, and evening peak hour periods are summarized in **Exhibit 2.3.1.7 (1)-1**, **Exhibit 2.3.1.7 (1)-2**, and **Exhibit 2.3.1.7 (1)-3**. As shown, all stop controlled and critical movements (moves that must yield to oncoming traffic) currently operate at LOS C or better. The intersection is currently operating acceptably and has adequate capacity to serve all peak hour motor vehicle demand.

Exhibit 2.3.1.7 (1)-1 Morning Peak Hour Level of Service and Delay Existing and No Build Conditions									
Intersection	Approach	Movement	Control	2019 Existing		2021 No-Build		2041 No-Build	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CR 46 / Smith Road	Northbound	Left/Thru/Right	STOP	12.3	B	12.4	B	15.0	C
	Southbound	Left/Thru/Right	STOP	13.7	B	14.0	B	20.1	C
	Eastbound	Left	YIELD*	7.4	A	7.4	A	7.5	A
	Westbound	Left	YIELD*	7.9	A	7.9	A	8.2	A

* - Movement has no sign control, however, left turns must yield to oncoming traffic when present.

Exhibit 2.3.1.7 (1)-2 Midday Peak Hour Level of Service and Delay Existing and No Build Conditions									
Intersection	Approach	Movement	Control	2019 Existing		2021 No-Build		2041 No-Build	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CR 46 / Smith Road	Northbound	Left/Thru/Right	STOP	12.4	B	12.6	B	15.7	C
	Southbound	Left/Thru/Right	STOP	14.0	B	14.4	B	20.2	C
	Eastbound	Left	YIELD*	7.8	A	7.8	A	8.0	A
	Westbound	Left	YIELD*	7.7	A	7.8	A	8.0	A

* - Movement has no sign control, however, left turns must yield to oncoming traffic when present.

Exhibit 2.3.1.7 (1)-3 Evening Peak Hour Level of Service and Delay Existing and No Build Conditions									
Intersection	Approach	Movement	Control	2019 Existing		2021 No-Build		2041 No-Build	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CR 46 / Smith Road	Northbound	Left/Thru/Right	STOP	14.3	B	14.6	B	20.8	C
	Southbound	Left/Thru/Right	STOP	15.2	C	15.7	C	23.9	C
	Eastbound	Left	YIELD*	7.8	A	7.8	A	8.0	A
	Westbound	Left	YIELD*	7.7	A	7.7	A	7.9	A

* - Movement has no sign control, however, left turns must yield to oncoming traffic when present.

2.3.1.7. (2) Future no-build design year level of service – Level of service analyses were also completed for future no-build conditions at ETC (2021) and ETC+20 (2041). They are summarized in **Exhibit 2.3.1.7 (1)-1**, **Exhibit 2.3.1.7 (1)-2**, and **Exhibit 2.3.1.7 (1)-3**. According to the projected future

no-action analyses, most intersection approaches would experience minimal, if any, increases in delay, although the northbound and southbound Smith Road approaches are projected to see 6 to 7 second per vehicle increases in delay by 2041. In summary, the intersection is projected to have adequate capacity to meet the anticipated demand with acceptable levels of service throughout the design year (2041).

2.3.1.8. Safety Considerations, Crash History and Analysis

An crash analysis was performed in accordance with the NYSDOT Highway Design Manual Chapter 5, Section 5.3.

For this project, crash reports were compiled from New York State Accident Location Information System (ALIS) data. New York State Department of Motor Vehicles (NYSDMV) Police Accident Reports (MV-104A forms) were also obtained by Ontario County covering a six-year and 11-month period from January 1, 2013 to November 30, 2019. There are no high accident locations (HALs), no Priority Investigation Locations (PILs), Safety Deficient Locations (SDLs), or Priority Investigation Intersections (PIIs) within the study area as those designations are made by the NYSDOT for state highways.

A total of 17 intersection-related crashes occurred over the six-year and 11-month period from January 2013 to November 2019. Injuries resulted from 4 of the 17 crashes. One crash resulted in a fatality. The predominant crash pattern (12 of 17) was right angle. The calculated average annual crash rate per million entering vehicles (CRASH/MEV) is 1.08 CRASH/MEV, which is over 3 times higher than the average statewide crash rate, 0.35 CRASH/MEV.

As stated above, 71% of the crashes were right angle collisions. Contributing factors typically included failure to yield the right of way and failure to stop. Six of the twelve crashes involved a northbound vehicle colliding with an eastbound vehicle, three involved a northbound vehicle colliding with a westbound vehicle, two involved a southbound vehicle colliding with an eastbound vehicle, two involved a southbound vehicle colliding with a westbound vehicle, and two involved a westbound vehicle colliding with a westbound vehicle. The fatal collision was a right-angle crash between a northbound and westbound vehicle. Time of day and roadway surface conditions did not appear to be contributing factors. The vertical crest curve on CR 46, observed to limit stopping sight distance, may have been a contributing factor to crashes involving westbound vehicles.

A table summarizing all intersection crashes is included in **Appendix C**. A crash diagram is also included in **Appendix C**.

2.3.1.9. Existing Police, Fire Protection and Ambulance Access

The Ontario County Sheriff's Office routinely passes through the project area. Their headquarters and the Ontario County Jail are located at the County Complex on CR 46, which is approximately 0.5 miles east of the intersection. New York State Police, Troop E, also uses roadways within the project area. Their headquarters is located approximately 10 miles away on NY Route 332, north of Canandaigua.

The Hopewell Fire Department and the Canandaigua Emergency Squad provide primary coverage to properties at the subject intersection. The Hopewell Fire Department has two stations: one located on US Route 20/NY Route 5 approximately 2 miles south of the intersection and the other located on CR 4 approximately 3.5 miles northeast of the intersection. Canandaigua Emergency Squad is also located nearby on North Pearl Street approximately 4 miles west of the site in the City of Canandaigua.

2.3.1.10. Parking Regulations and Parking Related Conditions

There are no areas regulated by parking restrictions within the project limits.

2.3.1.11. Lighting

The existing intersection is lit by a single truss arm with cobra head luminaire mounted on a wooden utility pole in the northeast corner of the intersection.

2.3.1.12. Ownership and Maintenance Jurisdiction

Ontario County owns and maintains CR 46. The County has a contract with the Town of Hopewell for snow and ice control services. Smith Road is owned and maintained (including snow and ice control) by the Town of Hopewell. Winter maintenance involves plowing and salting to a bare pavement surface, winging back snowbanks, and stacking excess snow outside of the intersection sight triangles. The existing maintenance jurisdiction within the project limits is summarized in **Exhibit 2.3.1.12**.

Exhibit 2.3.1.12 Existing Maintenance Jurisdiction							
Part No.	Highway	Limits	Feature(s) being Maintained	Centerline (mile)	Lane (mile)	Agency	Authority
1	CR 46	750 feet west of Smith	Pavement, drainage, landscaping, signs, and pavement markings	0.14	0.28	Ontario County	Highway Law Section 129
2	CR 46	1600 feet east of Smith Road	Pavement, drainage, landscaping, signs, and pavement markings	0.30	0.60	Ontario County	Highway Law Section 129
3	Smith Road	750 feet south of CR 46	Pavement, drainage, landscaping, signs, and pavement markings	0.14	0.28	Town of Hopewell	Highway Law Section 10 Subdivision 25
4	Smith Road	1200 feet north of CR 46	Pavement, drainage, landscaping, signs, and pavement markings	0.23	0.46	Town of Hopewell	Highway Law Section 10 Subdivision 25

2.3.2. Multimodal

2.3.2.1. Pedestrians

There are no separate pedestrian facilities or provisions within the project limits and no signs of frequent pedestrian activity. There is low-density residential development in the project area that generates infrequent pedestrian travel. Pedestrian trips that do exist are anticipated to be primarily recreational in nature without a specific destination. There may also be some residence to residence travel. There are no plans for substantial generators of pedestrian traffic within or adjacent to the project limits. The occasional pedestrian may legally use the paved shoulder per the provisions of NYS Vehicle and Traffic Law Section 1156(b). A Capital Projects Complete Streets Checklist is contained in **Appendix C**.

2.3.2.2. Bicyclists

There are no separate provisions for bicyclists along any of the roadways within the project limits. Bicyclists share the road with motor vehicles or may legally use the paved shoulder where available. The existing level of and potential for bicycling is characterized as low due to the rural nature of the project area. There are generators of infrequent bicycle traffic within and near the project limits, including residential homes. The route is not a designated bicycle route.

2.3.2.3. Transit

Regional Transit Service (RTS) Ontario County provides and operates transit services through the project area and greater Ontario County. Additionally, the main storage and maintenance garage for their local fleet is located along CR 48, just east of the intersection.

RTS Ontario County operates two bus routes through the CR 46 and Smith Road intersection. Route 254 provides services between Canandaigua and Geneva, along US Route 20/NY Route 5. Route 252 provides services throughout Canandaigua. Both routes stop at the County Complex.

The Canandaigua City School District provides bus services for students. Each school has multiple routes through the project site.

2.3.2.4. Airports, Railroad Stations, and Ports

There are no airports, railroad stations or port entrances within or in the vicinity of the project limits. No conflicts exist with the flight paths of aircraft.

2.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, State Lands)

There are no entrances to recreation areas within the project limits. The Ontario Pathways trail crosses CR 46 approximately 0.6 miles west of the intersection and Smith Road approximately 0.7 miles south of the intersection. No change in access to the trail would occur as a result of this project.

2.3.3. Infrastructure

2.3.3.1. Existing Highway Section

Existing features within the project corridor appear on the typical sections, plan, and profile sheets contained in **Appendix A**.

2.3.3.1.(1) Lane and Shoulder Widths -

Travel lane and shoulder widths along CR 46 and Smith Road are summarized in **Exhibit 2.3.3.1 (1)**. Shoulders are paved with asphalt. The presence, condition, and width of stabilized shoulder backup material (e.g. crushed stone or compacted millings) varies throughout the project limits and in some areas, is missing. Shoulder edge drop-offs exist along portions of CR 46 and within the intersection. Shoulders are generally flush with the backup material along Smith Road adjacent to the intersection.

Exhibit 2.3.3.1 (1) Lane and Shoulder Widths		
Street Name	CR 46	Smith Road
Travel Lane Width	11 feet typical	10.5 feet
Shoulder Width	4 feet typical	Varies, 2 feet to 3 feet

2.3.3.1.(2) Horizontal Alignment -

Intersection approach roadways are generally straight (on a tangent alignment) within the project limits. There is a horizontal curve on CR 46 approximately 0.6 miles west of the intersection.

2.3.3.1.(3) Vertical Profiles -

All approach roadway profiles generally follow the level terrain found throughout the project limits. On CR 46, from the west, an approximate 0.6% upgrade continues east, through the intersection with Smith Road. Then, there is a 185-foot long vertical crest curve on CR 46 located approximately 650 feet east of the intersection with a 2.81% upgrade and 2.94% downgrade to the east. The approximate safe operating speed for the curve based on available stopping sight distance is 40 mph.

On Smith Road, starting at the southern project limits, there is an approximate 1.9% downgrade, which flattens slightly leading into the intersection with CR 46. North of CR 46, an approximate 1.0% downgrade continues north into a sag vertical curve approximately 1,100 ft north of CR 46.

2.3.3.1.(4) Intersection Geometry -

CR 46 and Smith Road intersect at an approximately 90° angle. All intersection approaches consist of a single inbound lane and a single departure lane. There are no exclusive turn lanes.

2.3.3.1.(5) Roadside Elements -

Roadside elements include wooden utility poles, drainage ditches, and roadside embankments. The existing clearance from the edge of the travel lane to the face of utility poles is generally 14 feet or more. The locations of utility poles are shown on the plans in **Appendix A**. There are mature trees located on the private property along the south side of CR 46 / west side of Smith Road throughout the project limits. Other roadside areas are typically bordered by agricultural fields that are planted and rotated seasonally. The crash analysis summarized in **Section 2.3.1.8** revealed no patterns of crashes involving fixed objects along the roadside.

2.3.3.1.(6) Driveways -

Driveways within the project limits include the following:

Exhibit 2.3.3.1 (6) Driveway Summary				
Address / Location	Side	Apron Material	Function	Comments
4139 CR 46	South	Gravel	Residential	
4139 CR 46	South	Gravel	Residential	
4123 CR 46	South	Grass	Residential	
CR 46	North	Gravel	Agricultural Access	
4080 CR 46	North	Gravel	Residential	
3020 Smith Road	West	Gravel	Residential	
4123 CR 46	West Side of Smith Road	Asphalt	Residential	
Smith Road	West	Gravel	Agricultural Access	~900' north of intersection
2950 Smith Road	West	Gravel	Residential	

Most driveways are generally in conformance with the written requirements specified in the NYS DOT Policy and Standards for the Design of Entrances to State Highways. Based on field observations, local farmers also access properties north of CR 46, west of Smith Road, directly from the shoulder.

2.3.3.2. Geometric Design Elements Not Meeting Minimum Standards

Existing geometric elements were compared with the minimum standards used by the NYSDOT to make capital infrastructure improvements. This review helps ensure that project objectives and feasible alternatives consider key deficiencies. The relationship of features not meeting standards to the crash history is noted in **Section 2.3.3.2 (1)**.

2.3.3.2.(1) Critical Design Elements – Critical design elements are compared with the minimum design criteria for capital improvements. Any critical design element that fails to meet the minimum design standards is considered a “non-standard” feature and should be evaluated for remediation and mitigation. Non-standard features were identified based on the maximum allowable design speed for the roadway’s functional class and are summarized in **Exhibit 2.3.3.2 (1)**. This is supported by studies summarized in **Section 2.3.1.5**, which show that current operating speeds generally exceed the speed limit.

Exhibit 2.3.3.2 (1) Existing Nonstandard Features					
Critical Design Element	Operating Speed(s) ²	Standard ¹	Existing Condition	Adverse Crash History? (Yes/No)	Remarks
Lane Width: CR 46	57 to 60 mph	12 ft	11 ft	No	Crash rate is greater than statewide average. Lane width is not related to the crash experience.
Shoulder Width: CR 46	57 to 60 mph	6 ft	4 ft	No	
Lane Width: Smith Road	50 to 60 mph	12 ft	10.5 ft	No	
Shoulder Width: Smith Road	50 to 60 mph	6 ft	2 ft min. / 3 ft max.	No	
Stopping Sight Distance: CR 46	57 to 60 mph	305 ft	280 ft	No	No negative crash history at the vertical curve; however, possible contributing factor to intersection crashes.
Lane Cross Slope: CR 46	57 to 60 mph	1.5 min. / 3% max.	Varies from 1.5% to 4.0% max	No	
Lane Cross Slope: Smith Road	50 to 60 mph	1.5 min. / 3% max.	Varies from 1.5% to 4.0% max	No	

Notes: 1. Minimum standards based on NYSDOT HDM Chapter 7, Rural, Non-Freeway 3R standards.

2. Design speed of 60 miles per hour (mph) for CR 46 and Smith Road was selected for determination of non-standard features based on operating speeds / 85th percentile speed. Refer to **Section 2.3.1.5**.

2.3.3.2.(2) Other Design Parameters - Parameters that are not critical design elements but depart from typical practice are identified as non-conforming features. These features can have a considerable effect on operational efficiency and safety. Existing non-conforming features within the project limits are described below.

Crest Vertical Curve Length – Based upon survey records, the crest vertical curve to the east of Smith Road on CR 46 has a length less than that recommended for minimum stopping sight distance. Stopping sight distance is limited on this approach, restricting westbound sight lines to the intersection with Smith Road, and reducing the available intersection sight distance as well. The minimum stopping sight distance is desired for appearance and comfort. A non-conforming value is not atypical on rural roads.

Intersection Sight Distance – Based on visual inspection, northbound and southbound intersection sight distance is limited to the east by the crest vertical curve on CR 46. Additionally, based upon visual inspection, southbound intersection sight distance is momentarily blocked by the line of existing utility poles along the north side of CR 46. Southbound drivers must position themselves past the poles to maximize sight lines to the east. Northbound drivers may have their sight lines to the west blocked by mailboxes and foliage.

Clear Zone – Based upon a field review, utility pole offsets from the edge of traveled way vary throughout the project limits and define the operational clear zone. Utility pole offsets from the edge of the traveled way are as follows:

- CR 46 - Approximately 14 feet
- Smith Road – Approximately 15 feet

Roadside Foreslope – The existing roadside foreslope on Smith Road, north of CR 46, east side, is approximately 1:2 with the ditch bottom about 5 ft below the edge of pavement. There are no documented crashes related to this roadside feature.

Centerline Audible Roadway Delineators (CARDS) – CR 46 and Smith Road do not have CARDS installed along the roadway centerline. CR 46 and Smith Road are of sufficient width and traffic volume per the guidance provided in NYSDOT Engineering Instruction EI 13-021 to have CARDS installed. It is not standard practice for Ontario County to install CARDS along its roadways.

2.3.3.3. Pavement and Shoulder

CR 46, along with the intersection at Smith Road, was originally constructed in its current form in 1976. The pavement was last surface treated in 2014 and at periodic intervals before that according to Ontario County's pavement history maintenance reports. The pavement surface is generally in good condition based on field observation, showing some signs of longitudinal and transverse cracking along the shoulder and minor rutting in the travel lanes.

Smith Road was shimmed in 2017 prior to a microsurfacing treatment completed in 2018. Smith Road's pavement surface is also in good condition based on field observation.

A series of ten test borings were taken by Ontario County at the intersection of CR 46 and Smith Road in 2019. Seven of the ten borings included roadway cores to examine the existing pavement structure.

Pavement thicknesses in CR 46's travel lanes range from 12.5 inches to 14 inches. The original 1976 record plans indicate that an existing 20 ft wide traveled way was overlaid with a 1" top course, 2" binder course, and a varying lift of truing and leveling course for cross slope adjustments. Cores taken from Smith Road, north and south of CR 46, revealed 5.4 to 6.7 inches of asphalt pavement, with signs of periodic oil and stone surface treatments. All core samples showed the existing pavement structure to be in relatively good condition, with adequate bonding between the individual asphalt layers. There is 7 inches to 10 inches of subbase material beneath the pavement along CR 46 and 14 inches to 18.5 of subbase beneath the pavement along Smith Road.

A Pavement Evaluation and Treatment Selection Report (PETSRS) is included in **Appendix D**. Pavement core logs are included in **Appendix E**.

2.3.3.4. Drainage Systems

The existing drainage system primarily involves sheet flow that drains into open roadside ditches and underground cross culverts of varying sizes and materials. Based upon visual inspection, the existing ditches and pipes are in fair to good condition. Flow in open ditches is typically impeded by relatively flat grades. Several existing driveway pipes are buried, collapsed, and/or in poor condition based on field observation.

South of the intersection, sheet flow from Smith Road is collected by drainage ditches on either side of the road that flow north to the intersection. The runoff and ditch flow in the southwest quadrant, including runoff and sheet flow from the south side of CR 46 and west side of Smith Road, heads west in the southern roadside ditch to an unnamed tributary creek that crosses CR 46 outside the project limits. Runoff north of CR 46 and west of Smith Road sheet flows off the roadway and is directly deposited into the adjacent agricultural property. There are no ditches to accommodate runoff in the northwest quadrant of the intersection.

CR 46 runoff, east of Smith Road, is collected by roadside ditches. From the crest vertical curve approximately 650 feet east of the intersection, it is carried west, toward the intersection. East of the crest vertical curve, it is directed to an unnamed tributary creek that crosses CR 46 outside the project limits.

Sheet flow captured in the east side Smith Road (south) ditch and south side CR 46 (east) ditch is conveyed across CR 46 by a combination of closed and open systems to the northeast quadrant. From the northeast corner of the intersection, along with the CR 46 north side ditch flow and the east side Smith Road sheet flow, runoff is conveyed in a roadside ditch to an unnamed tributary creek crossing Smith Road at the project area's northern limit. The closed system mentioned above consists of a single 18-inch corrugated metal pipe (CMP) under CR 46 just east of Smith Road. The cross culvert at the northern project limits (under Smith Road) is a 36-inch high density polyethylene (HDPE) pipe, carrying flow in the unnamed tributary creek from the east to the west.

Water has been known to pond in front of the residential properties in the southwest quadrant of the intersection. Ponding also occurs in the adjacent agricultural fields, particularly those in the northwest quadrant.

2.3.3.5. Geotechnical

A series of ten test borings were taken by Ontario County at the intersection of CR 46 and Smith Road in 2019. The geotechnical evaluation report and boring logs are included in **Appendix E**. Topsoil depths ranged from 4 inches to 10 inches. Subgrade soils generally consisted of sandy and gravelly silty clay. The soils were generally found to be moist to wet, indicating the potential presence of perched or trapped groundwater. This is typical for these soil types, which have good to very poor drainage characteristics. Ground water was not encountered within the boring depths of 6 feet. No bedrock was encountered. The estimated soil resilient modulus averaged 5,000 PSI throughout the project site, ranging from 4,000 PSI to 6,500 PSI. This is based upon the Standard Penetration Test (SPT) data and California Bearing Ratio (CBR) test results. The underlying soils in select areas may require undercut or geogrid stabilization to be deemed suitable for roadway construction. Additional consideration will be given to subgrade design and treatment methods during detailed design.

2.3.3.6. Structure

There are no bridges within the project limits.

2.3.3.7. Hydraulics of Bridges and Culverts

There are no bridges or culverts over waterways within the project limits. There are no dams in the vicinity of the project that would be adversely affected.

2.3.3.8. Guide Railing, Median Barriers and Impact Attenuators

There is no existing guide railing within the project limits.

2.3.3.9. Utilities

Utilities within the project limits include underground water mains, gas, telephone, cable, and fiber optics. There are also overhead telephone, cable, fiber optics, and electric suspended from utility poles. The existing utilities within the vicinity of the project limits are described in **Exhibit 2.3.3.9**. There are several service drops, both underground and overhead, going to residential structures throughout the project limits which are not included in the table below.

Exhibit 2.3.3.9 Existing Utilities		
Owner	Type	Location/Side
Town of Hopewell	Water	North side of CR 46, west of Smith Road. South side of CR 46, east of Smith Road. East side of Smith Road throughout the project limits. Crossing of CR 46 along the east side of Smith Road. Crossing of Smith Road along the north side of CR 46.
NYSEG	Gas	<u>Underground</u> – South side of CR 46 throughout the project limits. West side of Smith Road, south of CR 46. Crossing of Smith Road along the south side of CR 46.
Frontier Communications	Telephone	<u>Underground</u> – South side of CR 46 throughout the project limits. North side of CR 46, east of Smith Road. East side of Smith Road throughout the project limits. Crossing of CR 46 approximately 90 feet east of intersection / Smith Road. Crossing of Smith Road along south side of CR 46 at intersection. Several above ground pedestals / junction boxes throughout the project limits. <u>Overhead</u> - North side of CR 46 throughout the project limits. Underground to overhead starting at crossing from east side to west side of Smith Road about 975 feet north of CR 46, and west side of Smith Road to the north.
Charter Communications	Cable	<u>Overhead</u> – North side of CR 46 throughout the project limits. East side of Smith Road throughout the project limits.
Empire Telephone Corporation / Empire Access	Fiber Optics	<u>Overhead</u> – North side of CR 46 throughout the project limits.
FirstLight	Fiber Optics	<u>Overhead</u> – East side of Smith Road, south of CR 46. <u>Underground</u> – South side of CR 46, east of Smith Road.
RG&E	Electric	<u>Overhead Transmission and Distribution</u> – North side of CR 46 throughout the project limits. East side of Smith Road throughout the project limits.

2.3.3.10. Railroad Facilities

There are no railroads within the project limits and no at-grade crossings within ½ mile that could impact traffic conditions.

2.3.4. Potential Enhancement Opportunities

This section focuses on existing features to identify potential enhancement opportunities related to the project and to help avoid and minimize impacts. **Chapter 4** focuses on the impacts, enhancements, and mitigation.

2.3.4.1. Landscape

2.3.4.1. (1) Terrain - The terrain within the project limits is classified as level per Section 2.5.2 of the NYSDOT [Highway Design Manual](#).

2.3.4.1. (2) Unusual Weather Conditions - There are no unusual weather conditions within the project area that would affect the design and construction of this project. Snow and ice events experienced within the project limits during the winter months are typical of New York State.

2.3.4.1. (3) Visual Resources - Land uses within and around the project limits are residential and agricultural. There are residential properties located along the south side of CR 46, west of Smith Road, and the west side of Smith Road, south of CR 46. The southwest quadrant is occupied by a residential structure. Additionally, there is one residential structure located along the north side of CR 46, approximately 600 feet east of Smith Road. There are large mature trees around residential properties in the southwest quadrant. The remaining properties within and around the project limits are open fields used for agriculture. The surrounding terrain can be characterized as primarily level to rolling, therefore sight lines are generally open between all surrounding land uses except as blocked by trees.

2.3.4.2. Opportunities for Environmental Enhancements

Practical opportunities for environmental initiative actions that could be considered in conjunction with this project are limited to landscape enhancement.

2.3.5. Miscellaneous

None.

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CHAPTER 3 – ALTERNATIVES

This chapter discusses the alternatives considered for the CR 46 and Smith Road Intersection Improvement project (hereafter “the project”) and examines the engineering aspects for alternatives that were determined to be feasible and practical to address the project objectives in **Chapter 1** of this report.

3.1. Alternatives Considered and Eliminated from Further Study

Alternative 1: No Action/Maintenance

The No Action/Maintenance or “null” alternative would retain the existing conditions at the intersection of CR 46 and Smith Road with no improvements other than routine maintenance activities. This would not improve vehicular safety at the intersection. This alternative does not satisfy the purpose and need of the project; however, it has been retained as a baseline for comparison to the feasible alternative(s).

Alternative 2: Incremental Signing and Pavement Marking Enhancements

A set of incremental signing and pavement marking enhancements (described below) were considered for the intersection of CR 46 and Smith Road. The intent of this progression would be to enhance the conspicuity of existing traffic control devices, highlight the intersection’s location, and reinforce the message to drivers on Smith Road that traffic on CR 46 is not required to stop.

- A. Add supplementary panels to the Smith Road stop signs with the text “Cross Traffic Does Not Stop”. One sign would be placed below the near right stop sign and the other on the far left; and
- B. Install a lane narrowing treatment on CR 46 at Smith Road consistent with guidance contained in the Federal Highway Administration (FHWA) report Two Low-Cost Safety Concepts for Two-Way Stop-Controlled, Rural Intersections on High-Speed Two-Lane, Two-Way Roadways. This would consist of a painted yellow median on the CR 46 approaches preceded by a no passing zone, centerline rumble strips within the painted median, and rumble strips on the outside shoulders. Smaller painted islands could also be added to each Smith Road approach. Refer to **Appendix A** for a graphic illustrating this concept.

As described in **Section 2.3.1.8**, most crashes at the intersection involve a right-angle collision. Many vehicles stop on Smith Road but fail to perceive and/or react to an approaching vehicle, ultimately pulling out into the intersection and causing a crash. Additionally, there is a high proportion of vehicles that fail to stop approaching CR 46, which have continued despite the County’s recent improvements. Therefore, it is believed that these minor additional measures highlighting the need to stop will also be ineffective at reducing the number of crashes. Incremental treatments along CR 46 would improve the intersection’s conspicuity. While initial studies of the FHWA concept have demonstrated some ability to reduce approach speeds and overall crash rates, long-term effectiveness remains unproven and further analysis is needed. While milled in audible roadway delineator strips (MIARDS) within the median and along the shoulders of CR 46 would encourage drivers to remain within the narrower lanes, they could also result in nuisance noise and vibration concerns for adjacent residents. This would be of concern given the substantial volume of heavy truck traffic on CR 46. In either case, vehicles on Smith Road would still need to select adequate gaps in CR 46 traffic to complete a crossing or turning maneuver. Sight distance limitations between intersection approaches would not be addressed.

While incremental signing and pavement marking enhancements may improve intersection safety performance in the near term, they may lose their effectiveness over time, particularly at an intersection that is frequented by familiar, local drivers. More importantly, these features do not have the potential to physically prevent high-speed, right-angle collisions from occurring. Ontario County is committed to implementing a proven long-term safety improvement that will address the pattern of right-angle collisions

and maximize use of the available Highway Safety Improvement Program (HSIP) funding. This alternative would not accomplish either of those goals; therefore, it was dismissed from further consideration.

Alternative 3: Multi-Way Stop Intersection Control

Multi-way stop control was evaluated as a potential alternative for the intersection of CR 46 and Smith Road. This alternative would add stop signs on the CR 46 (eastbound and westbound) approaches resulting in a four way stop. All vehicles approaching the intersection would be directed to stop by the regulatory signs. Detailed calculations and a summary document related to the evaluation of this alternative are included in **Appendix C**.

Assuming vehicles would obey the new regulations, this treatment would have the potential to reduce the frequency of right-angle crashes and mitigate the effects of poor intersection sight distance. It would also eliminate the need for drivers at the stop signs on Smith Road to identify adequate gaps to complete a crossing or turning maneuver. The relatively low anticipated initial cost of this alternative (estimated at \$18,000) would yield an anticipated safety cost-benefit ratio of 32.84. The multi-way stop alternative would require no easement acquisitions as opposed to 1.485 acres of easements for the proposed roundabout.

The FHWA offers guidance in the MUTCD to assess the applicability of multi-way stops (refer to Section 2B.07 of the MUTCD). Based upon an engineering study (see **Appendix C**), 2 of the 5 criteria contained in the MUTCD would not be satisfied at the intersection of CR 46 and Smith Road throughout the design year, 2041. Only the crash experience and major street volume warrant would be met. Companion minor street volume and intersection delay warrants would not be met.

The multi-way stop alternative would involve placing warning signs, regulatory signs, and markings on the relatively high-speed CR 46 (eastbound and westbound) approaches. In comparison, the roundabout alternative would change the geometry of these approaches to encourage motorists to lower their travel speed, thereby decreasing the potential for an injury or fatal crash. The “geometric intervention” proposed under Alternative 5 would have greater potential to result in lower approach speeds in comparison to the signs and markings of Alternative 3.

The FHWA, in their document Toolbox of Countermeasures and Their Potential Effectiveness for Intersection Crashes, suggests that converting a rural two-way stop-controlled intersection could result in up to a 48% reduction in total crashes. The potential for high-speed, rear-end crashes would be of concern at the new stop signs on CR 46 particularly during the adjustment period (immediately after the new regulation is put into effect). By way of comparison, the same FHWA document suggests that converting the two-way stop to a roundabout could result in up to an 72% reduction in total crashes, making it superior in that regard. The potential for high-speed rear-end crashes would be mitigated under Alternative 5 by the curvilinear approach geometry. The potential for high-speed, right angle crashes would also be eliminated under Alternative 5 by design.

All vehicles would be required to stop under Alternative 3, including trucks. Potential negative effects from the installation of a multi-way stop could include additional air pollution, noise impacts, and fuel consumption associated with vehicles stopping, idling, and accelerating. In comparison, Alternative 5 (roundabout) would not require vehicles to fully stop when conflicting traffic is absent. Furthermore, capacity analyses suggest that multi-way stop control at the CR 46 and Smith Road intersection would result in at least 4 seconds more delay per vehicle in comparison to the roundabout alternative.

While the multi-way stop would initially be less costly and require less property, it does not surpass the roundabout alternative with respect to its potential to reduce the frequency of crashes or meet the objective of encouraging motorists to lower their travel speed on approach to the intersection, thereby decreasing the potential for an injury or fatal crash. This coupled with the fact that 2 of 5 MUTCD warrant criteria for the multi-way stop would not be satisfied, and the fact that all vehicles, including trucks, must stop at a multi-way stop intersection even in the absence of conflicting traffic, led to the multi-way stop alternative being dismissed from further consideration.

Alternative 4: Signalized Intersection Control

The Signalized Intersection Control alternative would install an actuated, two-phase traffic signal at the intersection of CR 46 and Smith Road. Applicable traffic signal warrants in accordance with the MUTCD were analyzed. Copies of the analyses are included in **Appendix C**. The criteria of Warrant 7, Crash Experience, is met, however criteria related to volumes (Warrants 1 thru 3, and the volume criteria of Warrant 7) are not satisfied today based on 2019 data. At the design year (2041) Warrants 1, 2, and 7 are projected to be met considering the 70% reduction factor for speeds over 40 miles per hour with the 8-hour and 4-hour warrants. The installation of a traffic signal would present similar safety and environmental concerns to Alternative 3. An increase in the probability of rear end crashes would also be expected. This would be of concern on the high-speed CR 46 approaches; therefore, this alternative was dismissed from further consideration.

3.2. Reasonable Build Alternatives

Based on the project purpose, objectives, needs and a comparison of all alternatives considered, a single reasonable (feasible and practical) alternative was identified and developed for further study in this Draft Design Report.

3.2.1. Description of Reasonable Alternatives

Alternative 5: Roundabout

This alternative would reconstruct the intersection of CR 46 and Smith Road as a roundabout. A roundabout would physically eliminate the potential for high-speed, right angle collisions by prohibiting left turns and crossing movements. Crashes at roundabouts are less likely to result in a serious injury as they typically involve low speeds and low angles of impact. A roundabout at this location would also be consistent with changes made along the CR 10 corridor at the intersections of CR 46 and CR 4 in 2012. Key elements of Alternative 5 are as follows:

- | | |
|-------------|--|
| Geometry | <ul style="list-style-type: none"> • Reconfigure the existing four-legged, two-way stop-controlled intersection of CR 46 and Smith Road into a roundabout. • Construct extended splitter islands with successive entry curves on each approach to “step down” vehicular speeds prior to reaching the yield line. • Lower the crest vertical curve on CR 46 east of the intersection with Smith Road to improve stopping sight distance, meeting standards for the prevailing approach speeds. • Ensure tractor trailers and farm equipment are accommodated by design. |
| Operational | <ul style="list-style-type: none"> • Require entering vehicles to yield to traffic within the circulating roadway as typical of roundabout control. • Provide adequate capacity to meet the projected traffic demand throughout the design year, 2041. |
| Pavement | <ul style="list-style-type: none"> • Full-depth pavement reconstruction at the intersection of CR 46 with Smith Road and on all immediate approaches. |
| Curb | <ul style="list-style-type: none"> • Install mountable and/or traversable curb, where appropriate, along the proposed roundabout’s central island, truck apron, and splitter islands. • Install traversable curb along the shoulders of the circulatory roadway and approaches immediately adjacent to the roundabout to facilitate drainage, maintain a stable roadside, and encourage drivers to remain on the pavement. Shoulders outside of the circulatory roadway and the immediate roundabout approaches would remain uncurbed. |

Pedestrian & Bicyclist	<ul style="list-style-type: none">• Continue to accommodate occasional pedestrians on paved shoulders.• Construct 10-foot wide crossings through the splitter island on each approach to accommodate the occasional crossing pedestrian.• Continue shared accommodation for bicyclists within the travel lanes. Bicyclists may also choose to dismount and walk their bicycle across the roundabout using the accessible crossings.
Drainage	<ul style="list-style-type: none">• Replace existing storm sewer pipe crossings and driveway pipes where in poor condition or alterations are needed to drain the proposed design.• Install toe ditches to prevent roadway runoff from sheeting into adjacent agricultural properties.• Redirect the intersection's primary drainage outlet from an open ditch to a closed drainage system along the west side of CR 46. Both the existing and proposed drainage paths would end at the same unnamed tributary.
Signing and Pavement Marking	<ul style="list-style-type: none">• Install new signage and pavement markings in accordance with MUTCD standards.
Landscaping and Enhancements	<ul style="list-style-type: none">• Reestablish turf beyond the shoulders.• Install new roadway lighting at the roundabout• Install appropriately scaled landscaping in the roundabout's central island and strategically placed landscaping at its edges to promote proper sight lines and improve aesthetics.
Right of Way	<ul style="list-style-type: none">• Five property acquisitions (3 permanent easements (PE) and 2 temporary easements) to accommodate construction of the roundabout; approach roadway realignment; and associated drainage improvements.
Construction Cost and Phasing	<ul style="list-style-type: none">• The opinion of probable construction cost for Alternative 5 is \$2.557 million (M).
Project Goals	<ul style="list-style-type: none">• These improvements satisfy the purpose, need, and objectives stated in Chapter 1 of this document.

3.2.2 Preferred Alternative

Alternative 5 has been identified as the preferred alternative because it best satisfies the project's purpose and need and objectives. Selection of the preferred alternative will not be finalized until the alternatives' impacts, comments on the draft design approval document, and comments from the public have been fully evaluated.

3.2.3. Design Criteria for Reasonable Alternative(s)

3.2.3.1. Design Standards

The following design standards and resources were consulted to develop the critical design element and other design element parameters for this project:

- NYSDOT *Highway Design Manual* (HDM)
- *National Manual on Uniform Traffic Control Devices for Streets and Highways*, Current Edition (MUTCD)
- *New York State Supplement to the National Manual on Uniform Traffic Control Devices for Streets and Highways*, 2009 Edition (2011)
- AASHTO *A Policy on Geometric Design of Highways and Streets* (Green Book) 2018
- NCHRP Report 672 *Roundabouts: An Informational Guide*, Second Edition

3.2.3.2. Critical Design Elements

The design criteria applicable to this project consist of critical elements as described in the NYSDOT HDM (Chapter 2). Other design parameters, such as design vehicle, are found either in the NYSDOT HDM, the AASHTO Green Book, or other references. A list of the typical critical design elements that apply to this project is included in **Exhibit 3.2.3.2-1**.

Exhibit 3.2.3.2-1 Critical Design Elements Summary	
1. Design Speed	9. Vertical Clearance
2. Lane Width	10. Structural Capacity
3. Shoulder Width	11. ADA Compliance
4. Horizontal Curve Radius	
5. Superelevation	
6. Stopping Sight Distance	
7. Maximum Grade	
8. Cross Slope	

Notes:

1. Rollover is the change of grade between the cross slope of adjacent lanes or between travel lanes and the shoulder.

Exhibit 3.2.3.2-2 and **Exhibit 3.2.3.2-3** summarize the critical design elements for CR 46 and Smith Road beyond the approaches to the proposed roundabout. Refer to **Section 3.2.3.3** for the Design Parameters associated with the proposed roundabout.

Exhibit 3.2.3.2-2 Critical Design Elements for CR 46			
PIN:	4ON0.04	NHS (Y/N):	No
Route No. & Name:	CR 46	Functional Classification:	Urban Minor Collector
Project Type:	Safety Improvement	Design Classification:	Rural Collector
% Trucks (Max) ¹ :	13%	Terrain:	Level
ADT (2041) ¹ :	6,390	Truck Access/Qualifying Hwy.	No / No
Element	Standard	Existing Condition	Proposed Condition
1 Design Speed	60 mph ² <i>HDM Section 2.7.3.1.A.</i>	60 mph	60 mph
2 Lane Width	11 ft <i>HDM Section 2.7.3.1.B. Exhibit 2-5</i>	11 ft	11 ft
3 Shoulder Width	4 ft Minimum, 5 ft Desirable <i>HDM Section 2.7.3.1.C. Exhibit 2-5, Note 7</i>	4 ft	4 ft
4 Horizontal Curve Radius	800 ft Minimum (at e _{max} =8%) <i>HDM Section 2.7.3.1.D. Exhibit 2-5</i>	None	None
5 Superelevation	8% Maximum <i>HDM Section 2.7.3.1.E. Exhibit 2-1b</i>	Normal Crown	Normal Crown
6 Stopping Sight Distance (Horizontal and Vertical)	522 ft Minimum <i>HDM Section 2.7.3.1.F. Exhibit 2-5</i>	±280 ft	>522 ft
7 Maximum Grade	5% <i>HDM Section 2.7.3.1.G. Exhibit 2-5</i>	±2.9% Maximum	2.72%
8 Cross Slope	1.5% Min. to 3% Max. <i>HDM Section 2.7.3.1.H.</i>	±4.0% Maximum	2% Maximum
9 Vertical Clearance	14 ft Minimum 14 ft – 6 in Desirable <i>HDM Section 2.7.3.1.I. & BM Section 2.3.1. Table 2-2</i>	14 ft Minimum (to utilities)	14 ft Minimum (to utilities)
10 Design Loading Structural Capacity	<u>New and Replacement Bridges</u> NYSDOT LRFD Specifications AASHTO HL-93 Design Live Load with LRFR 1.2 or higher <i>BM Section 1.3</i> <u>Buried Structures</u> (Box Culverts, 3-sided Frames and Pipes) NYSDOT LRFD Specifications AASHTO HL-93 Design Live Load and NYSDOT Design Permit Vehicle <i>BM Section 2.6, HDM 19.5.3</i>	NA	NA
11 Americans with Disabilities Act Compliance	Shoulder <i>HDM Section 2.7.4.1.K., HDM Chapter 18, and PROWAG</i>	Shoulder ³	Shoulder ³
<p>(1) Conditions for the critical segment of CR 46 shown. All design elements based upon this critical segment. (2) Ontario County has concurred that the use of a Design Speed of 60 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume. (3) Given the project's surrounding area has a low population and there are no significant pedestrian generators, the occasional pedestrian may legally use the shoulder. See Section 3.3.2.1 for more information.</p> <p>**Denotes non-standard feature. NA – Not Applicable</p>			

Exhibit 3.2.3.2-3 Critical Design Elements for Smith Road			
PIN:	4ON0.04	NHS (Y/N):	No
Route No. & Name:	Smith Road	Functional Classification:	Urban Local (South) Rural Local (North)
Project Type:	Safety Improvement	Design Classification:	Rural Local
% Trucks (Max) ¹ :	17%	Terrain:	Level
ADT (2049) ¹ :	3,060	Truck Access/Qualifying Hwy.	No / No
Element	Standard	Existing Condition	Proposed Condition
1 Design Speed	55 mph ² <i>HDM Section 2.7.4.1.A.</i>	55 mph	55 mph
2 Lane Width	11 ft <i>HDM Section 2.7.4.1.B. Exhibit 2-7</i>	10.5 ft	11 ft
3 Shoulder Width	4 ft Minimum, 5 ft Desirable <i>HDM Section 2.7.4.1.C. Exhibit 2-7, Note 6</i>	Varies 2 ft to 3 ft	4 ft
4 Horizontal Curve Radius	651 ft Minimum (at e _{max} =8%) <i>HDM Section 2.7.4.1.D. Exhibit 2-7</i>	None	None
5 Superelevation	8% Maximum <i>HDM Section 2.7.4.1.E. Exhibit 2-1b</i>	Normal Crown	Normal Crown
6 Stopping Sight Distance (Horizontal and Vertical)	452 ft Minimum <i>HDM Section 2.7.4.1.F. Exhibit 2-7</i>	>452 ft	>452 ft
7 Maximum Grade	6% <i>HDM Section 2.7.4.1.G. Exhibit 2-7</i>	±2.5% Maximum	2.83%
8 Cross Slope	1.5% Min. to 3% Max. <i>HDM Section 2.7.4.1.H.</i>	±3.5% Maximum	2% Maximum
9 Vertical Clearance	14 ft Minimum 14 ft – 6 in Desirable <i>HDM Section 2.7.3.1.I. & BM Section 2.3.1. Table 2-2</i>	14 ft Minimum (to utilities)	14 ft Minimum (to utilities)
10 Design Loading Structural Capacity	<u>New and Replacement Bridges</u> NYSDOT LRFD Specifications AASHTO HL-93 Design Live Load with LRFR 1.2 or higher <i>BM Section 1.3</i> <u>Buried Structures</u> (Box Culverts, 3-sided Frames and Pipes) NYSDOT LRFD Specifications AASHTO HL-93 Design Live Load and NYSDOT Design Permit Vehicle <i>BM Section 2.6, HDM 19.5.3</i>	NA	NA
11 Americans with Disabilities Act Compliance	Shoulder <i>HDM Section 2.7.4.1.K., HDM Chapter 18, and PROWAG</i>	Shoulder ³	Shoulder ³
<p>(1) Conditions for the critical segment of Smith Road shown. All design elements based upon this critical segment.</p> <p>(2) Ontario County has concurred that the use of a Design Speed of 55 mph is consistent with the anticipated off-peak 85th percentile speed within the range of functional class speeds for the terrain and volume.</p> <p>(3) Given the project's surrounding area has a low population there are no significant pedestrian generators, the occasional pedestrian may legally use the shoulder. See the Complete Streets Checklist, Appendix C, for more information.</p> <p>**Denotes non-standard feature.</p> <p>NA – Not Applicable</p>			

3.2.3.3. Other Design Parameters

In addition to the critical design elements described in **Section 3.2.3.2**, other design parameters established by the NYSDOT and AASHTO that are typically used to design roadway projects include guidelines for roundabouts, design vehicles, rainfall amounts for drainage facilities, and others. **Exhibit 3.2.3.3-1** provides the design parameters for roundabouts.

Exhibit 3.2.3.3-1 Roundabout Controlling Features						
Element	Parameter ¹	Proposed Condition				
		North Leg	West Leg	South Leg	East Leg	
1	Design Vehicle	Largest Expected Vehicle	Refer to Exhibit 3.2.3.3-3			
2	Maximum Entry Speed	30 mph NYSDOT EI 00-021 3.1.2.a	22 mph	21 mph	23 mph	23 mph
3	Entry Width	10 ft Minimum NYSDOT EI 00-021 3.1.2.d 14 ft to 18 ft typical Maximum 35 ft Single Lane Approach NCHRP 672 6.4.2 & NYSDOT EI 00-021 3.1.2.e	16.4 ft	16.3 ft	16.2 ft	16.4 ft
4	Entry Radius	33 ft minimum, 328 ft maximum 65 ft desirable NYSDOT EI 00-021 3.1.2.f and NYSDOT Intersection Design Unit Guidance 90'-110' typ.	110 ft	110 ft	110 ft	110 ft
5	Entry Angle	20° minimum, 60° maximum 30° to 40° desirable NYSDOT EI 00-021 3.1.2.g	18.0°	22.5°	17.87°	13.05°
6	Entry Angle of Visibility	≥75° NCHRP 672 6.7.4	~130°	~130°	~120°	~130°
7	Splitter Island Length	≥ 50 ft minimum, ≥ 100' desirable	225 ft	195 ft	170 ft	220 ft
8	Approach Stopping Sight Distance	112.4 ft @ 20 mph 197.8 ft @ 30 mph 362.5 ft @ 45 mph 496.7 ft @ 55 mph NCHRP 672 6.2.6 & 6.7.3.1	>112.4 ft >197.8 ft >362.5 ft >496.7 ft			
9	Circulating Roadway Sight Distance	77.0 ft @ 15 mph NCHRP 672 6.2.6 & 6.7.3.1	77.0 ft minimum	77.0 ft minimum	77.0 ft minimum	77.0 ft minimum
10	Intersection Sight Distance	146.8 ft @ 20 mph Conflicting Approach Speed NCHRP 672 6.2.6 & 6.7.3.4	146.8 ft minimum	146.8 ft minimum	146.8 ft minimum	146.8 ft minimum
11	Sight Distance to Crosswalk	146.8 ft @ 20 mph Conflicting Approach Speed NCHRP 672 6.2.6 & 6.7.3.4	146.8 ft minimum	146.8 ft minimum	146.8 ft minimum	146.8 ft minimum
12	Inscribed Circle Diameter	50 ft minimum, 328 ft maximum 130 ft to 150 ft typ, single lane, WB-67 NYSDOT EI 00-021 3.1.2.k & NCHRP 672	140 ft			

Exhibit 3.2.3.3-1 Roundabout Controlling Features						
Element		Parameter ¹	Proposed Condition			
			North Leg	West Leg	South Leg	East Leg
13	Circulatory Roadway Width	16 ft to 20 ft desirable ≥ Maximum Entry Width ≤ Maximum Entry Width x 1.2 Design Vehicle + 3 ft Horizontal Clearance NYSDOT EI 00-021 3.1.2.m	18 ft			
14	Minimum Exit Radius	65 ft minimum, 328 ft to 394 ft typical 656 ft desirable NYSDOT EI 00-021 3.1.2.p and NYSDOT Intersection Design Unit Guidance	296 ft	296 ft	296 ft	296 ft
15	Americans with Disabilities Act Compliance	Meet PROWAG NYSDOT EI 00-021 3.1.2.q, NYSDOT HDM Chapter 18, and PROWAG	Shoulder			
16	Control of Access	No Access within 80 ft of Yield Line Desirable NYSDOT EI 00-021 3.1.2.n	80 ft minimum			
17	Circulating Roadway Cross Slope	0.5% minimum, 2.5% maximum NYSDOT EI 00-021 3.1.2.l	2%			
18	Maximum Circulating Speed	25 mph NYSDOT EI 00-021 3.1.2.a & NCHRP 672	16 mph			
19	Maximum Entry Superelevation	5% NYSDOT EI 00-021 3.1.2.b	Normal Crown, 2%			
20	Horizontal Clearance - From Edge of Traveled Way (Splitter Islands)	Left (curbed): 0 ft minimum 1 ft to 2 ft desirable Right (uncurbed): 10 ft. without rail Along rail, use larger of 4 ft. or actual shoulder width <i>HDM Chapter 5</i>	1 ft (left) 4 ft (right, curbed)			
21	Approach Alignment	Radial Acceptable, Offset Left Desirable NYSDOT Intersection Design Unit Guidance	Offset Left			

- Parameters per NCHRP Report 672, "Roundabouts: An Informational Guide (Second Edition)" and/or Main Office Intersection Design Squad, as applicable.
- Not typical, desired or preferred, but within the general range of acceptance.
- Not typical, desired, or preferred and outside the general range of acceptance. These are nonconforming features.

Exhibit 3.2.3.3-2 Other Design Parameters: General			
	Element	Standard Criteria	Proposed Condition
1	Level of Service	LOS D Minimum LOS C Desirable	LOS A
2	Drainage Design Storm	10 Year Storm	10 Year Storm

Vehicle Turning Paths at Intersections (i.e. Design Vehicle) - Vehicle turning paths were analyzed for the proposed roundabout based on the ability of the design vehicle to complete various movements. All turning movements would accommodate the design turning paths as indicated in **Exhibit 3.2.3.3-3**. Ontario County’s low-boy tractor-trailer combination was also tested and found to operate similarly as a WB-67/62, needing to circle the roundabout and then exit appropriately to complete a right turn movement.

Exhibit 3.2.3.3-3 Other Controlling Parameters: Design Vehicle			
Location	Turning Movement	Design Vehicle	Vehicle Accommodated
Roundabout	Northbound right	WB-40	WB-50 ²
	Northbound through	WB-67	WB-67
	Northbound left	WB-67	WB-67
	Southbound right	WB-40	WB-50 ²
	Southbound through	WB-67	WB-67
	Southbound left	WB-67	WB-67
	Eastbound right	WB-40	WB-40/WB-50 ¹
	Eastbound through	WB-67	WB-67
	Eastbound left	WB-50	WB-67
	Westbound right	WB-40	WB-50 ²
	Westbound through	WB-67	WB-67
	Westbound left	WB-50	WB-67

Notes:

1. WB-67/62 vehicles do not typically make an eastbound right turn. The existing intersection accommodates a WB-40 single unit truck within the travel lanes and shoulder. Ontario County has elected to provide accommodation up to a WB-40 design vehicle within the proposed concrete pavement, and an infrequent WB-50 on the asphalt apron beyond the proposed traversable curb (utilized for rear wheel tracking during the movement). The WB-50 is representative of the typical “crop hauler” used for agricultural activity around the intersection. Should an infrequent WB-67/62 approach the intersection and need to make an eastbound right turn, it would need to circle the roundabout and then exit appropriately to complete its movement.
2. WB-67/62 vehicles do not typically make the northbound, southbound, or westbound right turn. The existing intersection accommodates a WB-40 within the travel lanes and shoulder. Ontario County has elected to provide accommodation for a WB-50 design vehicle. This is representative of the typical “crop hauler” used for agricultural activity around the intersection. Should an infrequent WB-67/62 approach the intersection and need to make a northbound / southbound / westbound right turn, it would need to circle the roundabout and then exit appropriately to complete its movement.

3.3. Engineering Considerations

3.3.1. Operations (Traffic and Safety) & Maintenance

3.3.1.1. Functional Classification and National Highway System

This project will not change the functional classification of any approach roadways.

3.3.1.2. Control of Access

All highway boundaries will remain “with access”.

3.3.1.3. Traffic Control Devices

3.3.1.3. (1) Traffic Signals - No new traffic signals are proposed.

3.3.1.3. (2) Signs - Existing signs including but not limited to stop, regulatory, warning, and street name signs would be removed and replaced with new signs meeting current MUTCD and New York State Supplement standards. All entries into the roundabout would be signed with yield signs. Appropriate signage would be installed on each approach to and within the roundabout.

3.3.1.3. (2) Pavement Markings - New pavement markings would be installed throughout the project limits in accordance with current MUTCD and New York State Supplement. Applicable NYSDOT standard details would be followed.

3.3.1.4. Intelligent Transportation Systems (ITS)

No ITS measures are proposed.

3.3.1.5. Speeds and Delay

3.3.1.5. (1) Proposed Speed Limit - The existing (statutory) speed limit of 55 mph would be retained on CR 46 and Smith Road upon completion of the project. An advisory speed for negotiating the roundabout would be posted in advance of the reconfigured intersection.

3.3.1.5. (2) Travel Time Estimates – The feasible alternative would not significantly impact travel distances or capacity, therefore travel time estimates were not calculated.

3.3.1.6. Traffic Volumes

There would be no modifications to overall traffic patterns (i.e. movements allowed or travel routes at the intersection) under Alternative 5; therefore, the projected average daily traffic (ADT) volumes for Alternative 5 would be the same as those experienced under no-build conditions. Refer to **Section 2.3.1.6 (1)** for information on the design year and development of ADT and volumes. Turning movement diagrams are presented in **Appendix C**.

3.3.1.7. Level of Service and Mobility

Refer to **Section 2.3.1.7 (1)** for a discussion of Level of Service (LOS).

3.3.1.7 (1) At Project Completion & Design Year – Level of service analyses were completed using SIDRA software (HCM 7 roundabout capacity model) for future build conditions at ETC (2021) and the design year ETC+20 (2042). **Exhibit 3.3.1.7 (1)-1**, **Exhibit 3.3.1.7 (1)-2** and **Exhibit 3.3.1.7 (1)-3** summarize the results of morning, midday, and evening peak hour analyses, respectively. Detailed reports are contained in **Appendix C**. As shown, all approaches are projected to operate at LOS A throughout the design year. Overall, the roundabout would have adequate capacity to meet the projected demand with an acceptable level of service throughout the design year, ETC+20 (2041).

On average, the roundabout would result in about 3 seconds less delay per vehicle on CR 46 and approximately 9 to 17 seconds less delay per vehicle on Smith Road in comparison to the no-build (two-way stop control) alternative. It also represents about 6 to 11 seconds less delay per vehicle on CR 46 and 4 to 6 seconds less delay per vehicle on Smith Road in comparison to the all-way stop control scenario (Alternative 3).

Exhibit 3.3.1.7 (1)-1 Morning Peak Hour Level of Service and Delay Proposed Roundabout							
Intersection	Approach	Movement	Control	2021 Build		2041 Build	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CR 46 and Smith Road	Eastbound	Left/Thru/Right	YIELD	4.9	A	5.3	A
	Westbound	Left/Thru/Right	YIELD	5.0	A	5.1	A
	Northbound	Left/Thru/Right	YIELD	5.7	A	6.3	A
	Southbound	Left/Thru/Right	YIELD	6.8	A	7.1	A
	Overall			5.5	A	5.8	A

Exhibit 3.3.1.7 (1)-2 Midday Peak Hour Level of Service and Delay Proposed Roundabout							
Intersection	Approach	Movement	Control	2021 Build		2041 Build	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CR 46 and Smith Road	Eastbound	Left/Thru/Right	YIELD	4.8	A	5.1	A
	Westbound	Left/Thru/Right	YIELD	5.1	A	5.3	A
	Northbound	Left/Thru/Right	YIELD	5.4	A	5.9	A
	Southbound	Left/Thru/Right	YIELD	7.0	A	7.4	A
	Overall			5.3	A	5.6	A

Exhibit 3.3.1.7 (1)-3 Evening Peak Hour Level of Service and Delay Proposed Roundabout							
Intersection	Approach	Movement	Control	2021 Build		2041 Build	
				Delay (sec/veh)	LOS	Delay (sec/veh)	LOS
CR 46 and Smith Road	Eastbound	Left/Thru/Right	YIELD	5.1	A	5.4	A
	Westbound	Left/Thru/Right	YIELD	5.1	A	5.4	A
	Northbound	Left/Thru/Right	YIELD	5.2	A	5.4	A
	Southbound	Left/Thru/Right	YIELD	6.1	A	6.7	A
	Overall			5.3	A	5.6	A

3.3.1.7 (2) – Work Zone Safety & Mobility –

A. Work Zone Traffic Control Plan - All work zones and detours would be set up in conformance with the MUTCD and New York State Supplement. A clearly marked travel way would be delineated with temporary pavement markings, traffic signage, barricades, drums, cones, etc. as applicable while traffic is maintained through the project area. Flaggers would be utilized to direct traffic where required.

Conceptual work zone traffic control schemes would allow the contractor to initially utilize one-way alternating traffic with flagging control while maintaining vehicular traffic through the project area to accomplish underground utility and drainage work along with the initial stages of approach reconstruction. Following the underground and approach work, the intersection of CR 46 and Smith Road would be fully closed to all traffic allowing for lowering of the vertical curve on CR 46 and construction of the roundabout. This plan would minimize the overall construction schedule (reducing the duration of

disturbance to the traveling public) and improve the quality of the finished product. The following offsite detours would be posted and maintained for up to 3 months:

- CR 46: CR 10, CR 4, and CR 47 (5.2 miles)
- Smith Road: US Route 20/NY Route 5, CR 10, and CR 4 (3.6 miles)

This would allow traffic to get from one side of the closed intersection to the other. Refer to detour routing diagrams in **Appendix C**. The detours have the necessary geometry, width, and condition (based upon field inspection) to safely accommodate detoured traffic.

Upon completion of the roundabout, its truck apron, and approaches up to the asphalt top course, the intersection would be reopened to traffic. The contractor would be required to have pavement markings, signing, and lighting (permanent or temporary) in place prior to opening. Remaining finish activities including any remaining signing, final grading, landscaping, and turf establishment would be completed using short term temporary shoulder closures.

There are no significant generators of pedestrian traffic within the project limits, therefore, special accommodations would not be necessary during construction. Through bicyclists would be expected to use the posted detour routes.

B. Special Provisions – Nighttime construction is not anticipated. Work zone traffic control would be coordinated with local officials, residents, transit providers, utility owners, school districts, police, and local emergency service providers. Access to affected residential properties would be maintained throughout construction or alternate accommodations provided. Ontario County would coordinate with local farmers to accommodate their operations during construction to the greatest reasonable extent.

C. Significant Projects (per 23 CFR 630.1010) - This project is not classified as a Significant Project, therefore its Transportation Management Plan (TMP) would consist of a Temporary Traffic Control (TTC) plan consistent with 23 CFR 630.1012. To satisfy this requirement, the construction documents would include Work Zone Traffic Control notes, plans, and details. The requirements of Section 619 of the New York State Standard Specifications would apply to the contract.

3.3.1.8. Safety Considerations, Crash History and Analysis

The proposed roundabout at the intersection of CR 46 and Smith Road would improve safety by reducing the number of possible conflict points from 32 to 8 and eliminating the potential for high speed, right-angle collisions. The use of successive curvature on entry would also mitigate the potential for high speed, rear-end collisions at the yield line. Roundabouts are proven to reduce the rate of all crashes, but particularly injuries and fatalities. As documented in NCHRP Report 672, experience in the United States has shown that where roundabouts have replaced a rural two-way stop-controlled intersection, the rate of all crashes has declined by 72%. The combined rate of injury and fatal crashes has declined by 87%. The roundabout would be of particular benefit at this intersection given the frequency of injury and fatal crashes. Lowering the profile of the vertical curve, east of Smith Road on CR 46, would enhance safety by improving advance visibility of the roundabout on approach from the east.

3.3.1.9. Impacts on Police, Fire Protection and Ambulance Access

Refer to **Section 3.3.1.7 (2)** for a discussion of anticipated impacts during construction. Alternative 5 would have no significant long-term impacts on police, fire protection, or ambulance access. Any full-size (40-foot) buses or fire protection equipment (40-foot) passing through the roundabout would be accommodated on the circulatory roadway (i.e. they would not need to mount the truck apron).

3.3.1.10. Parking Regulations and Parking Related Issues

No changes are proposed.

3.3.1.11. Lighting

New lighting would be installed at the proposed roundabout. At this time, it is anticipated that overhead lighting would be supported on arms mounted to poles located around the perimeter of the circle; however, final locations would be determined during detailed design. Poles and lights would be chosen considering Ontario County's preferences. Lighting levels would be consistent with guidelines from the Illuminating Engineering Society's (IES) *Design Guide for Roundabout Lighting* and/or current best practices for roundabout design. The up-lighting of landscape features within the central island would also be considered during detailed design.

3.3.1.12. Ownership and Maintenance Jurisdiction

Ownership and Maintenance Jurisdiction would not be altered by Alternative 5. Refer to **Section 2.3.1.12** for discussion of Ownership and Maintenance Jurisdiction. Ontario County would assume maintenance jurisdiction for the proposed roundabout to the limit of each splitter island.

3.3.1.13. Constructability Review

There are no unique circumstances or design features that would negatively impact the constructability of Alternative 5. Overall the anticipated level of construction complexity would be considered routine. The anticipated use of Portland Cement Concrete (PCC) pavement for the roundabout would add an element of specialty work to the project; however, the local contracting community is capable of the work based on past construction experience at other recent roundabouts built across Ontario County and NYSDOT Region 4. Closing the intersection to all traffic during construction of the roundabout would accelerate that portion of the schedule (given a lack of interference with the contractor's operations). The lack of interference with construction activities is also anticipated to enhance the quality of the final product.

3.3.2. Multimodal Considerations

3.3.2.1. Pedestrians

No separate pedestrian facilities are planned or warranted based upon the low-density residential development and infrequent pedestrian travel. This is consistent with the NYSDOT Highway Design Manual Chapter 18 and the Capital Projects Complete Streets Checklist in **Appendix C**. The occasional pedestrian may legally use the shoulder per the provisions of NYS Vehicle and Traffic Law Section 1156(b). Accessible crossings, compliant with ADA standards, would be constructed at each splitter island to accommodate the occasional pedestrian. Each crossing would be longer than 6 feet to act as a pedestrian refuge.

3.3.2.2. Bicyclists

No special provisions are proposed to accommodate bicyclists. The shoulder is the primary location for accommodating bicyclists given the rural nature of the roadway. Bicyclists would share the travel lanes with motor vehicles and should ride along the outer edge of the circulatory roadway. Bicyclists may legally use the paved shoulder and roadway, which is consistent with the NYS Vehicle and Traffic Law Section 1234. Typical on-road bicycle speeds are between 12 and 20 mph. The geometry of the proposed roundabout would constrain motor vehicle speeds to 15 to 20 mph, therefore relative speed differences would be kept to a minimum which would thereby improve safety and usability for bicyclists.

3.3.2.3. Transit

The proposed alternative would not affect the operations of RTS Ontario County. It is anticipated that the buses would follow the posted detour route during construction.

3.3.2.4. Airports, Railroad Stations, and Ports

No changes are proposed that would affect airports, railroad stations, or port entrances.

3.3.2.5. Access to Recreation Areas (Parks, Trails, Waterways, and State Lands) –

No changes are proposed that would affect access to recreation areas.

3.3.3. Infrastructure

3.3.3.1. Proposed Highway Section

Refer to **Appendix A** for a plans, profiles, and typical sections illustrating the approach roadways, circulatory roadway, and all other roadways within the project limits. Additional details regarding **Alternative 5** are summarized in the following sections.

3.3.3.1. (1) Right of Way - Anticipated property acquisitions are summarized in **Exhibit 3.3.3.1 (1)**. They are also shown on the plans in **Appendix A**. In summary, the project would require three (3) permanent easements and two (2) temporary easements. All takings would be de minimis.

Exhibit 3.3.3.1 (1) Anticipated Right-of-Way Acquisitions					
Number	Address	Reputed Owner Tax Map No.	Type of Take	Estimated Acquisition Area (SF / Acres)	Remarks
TE 01	4123 COUNTY ROAD 46	MICHELE WISTNER 85.00-1-65.200	TEMPORARY EASEMENT	1506.42 / 0.035	GRADING / DRAINAGE
PE 02	2920 SMITH ROAD	MORGAN SAMUELS REAL ESTATE, LLC 85.00-1-5.000	PERMANENT EASEMENT	16825.41 / 0.386	ROADWAY REALIGNMENT / GRADING / DRAINAGE / UTILITIES
PE 03	COUNTY ROAD 46	J KEVIN & BARBARA NEDROW 85.00-1-11.100	PERMANENT EASEMENT	28023.48 / 0.643	ROADWAY REALIGNMENT / GRADING / DRAINAGE / UTILITIES
PE 04	SMITH ROAD	RODMAN LOTT & SON FARMS LLC 85.00-1-91.100	PERMANENT EASEMENT	14439.37 / 0.331	ROADWAY REALIGNMENT / GRADING / DRAINAGE / UTILITIES
TE 05	SMITH ROAD	RODMAN LOTT & SON FARMS LLC 85.00-1-91.100	TEMPORARY EASEMENT	3889.25 / 0.089	GRADING / DRAINAGE

3.3.3.1. (2) Curb – Granite barrier curb would be installed around the central island of the roundabout. Cast in place concrete truck apron curb would be installed at the inside edge of the circulatory roadway. Sloped granite curb would be installed along each splitter island. Additionally, sloped granite curb would be installed along the shoulders of the circulatory roadway and portions of the approaches immediately adjacent to the roundabout to facilitate drainage and maintain a stable roadside. This curb would also provide a “traffic calming” effect, encouraging slower vehicle entry speeds and preventing the distribution of shoulder backup across the pavement. Shoulders outside the circulatory roadway, immediate roundabout approaches, and outside the limits above would remain uncurbed with one exception: Sloped granite curb would be installed in the cut section of the eastern approach, along both the north side and south side of CR 46 to reduce impacts to adjacent properties and underground utilities.

3.3.3.1. (3) Grades – All maximum grades throughout the project limits would be in accordance with the standards contained in **Section 3.2.3.2**. Refer to the profiles in **Appendix A** for detailed grade information.

3.3.3.1. (4) Intersection Geometry and Conditions – Refer to plans in **Appendix A** for an illustration of the project's proposed intersection geometry.

Under Alternative 5, the 4-legged two-way stop-controlled intersection of CR 46 and Smith Road would be replaced with a roundabout. The roundabout would have an inscribed circle diameter of 140 feet, elongated splitter islands, a truck apron, and a landscaped central island. The roundabout would have a single approach lane in each direction, single departure lane in each direction, and a single circulating lane. Refer to **Exhibit 3.2.3.3-3** for a list of design vehicle turns that would be accommodated at the roundabout. Refer to the plans contained in **Appendix A** for the proposed intersection geometry.

As noted, all four approaches to the proposed roundabout would feature an elongated, raised splitter island. Each of these approaches would also feature a set of curves, each successively smaller in radius. The purpose of this feature, designed in accordance with guidance in NCHRP Report 672, would be to reduce vehicle speeds as they approach the roundabout from free flow (higher than 55 mph) to approximately 20 mph or less by the time they reach the roundabout's entry.

The existing crest vertical curve on CR 46 approximately 650 ft east of Smith Road would be lowered to improve stopping sight distance along CR 46. A maximum roadway cut of 4 foot would provide a stopping sight distance meeting standards.

3.3.3.1. (5) Roadside Elements:

A. Sidewalks – There are no proposed sidewalks or shared use paths within the project limits.

B. Bikeways – There are no proposed bikeways or shared use paths within the project limits.

C. Snow Storage – Snow storage would be accommodated beyond the paved shoulders on all approach roadways. If possible, a 2-foot wide, relatively flat “bench” would be constructed along the back edge of curb along the north and south sides of the eastern approach. This would facilitate snow storage and reduce the chance of melting snow refreezing on the pavement surface. Consideration was also given to winter conditions along to roadside slopes, particularly in cut sections, where it is desirable to minimize the potential for drifting snow to the greatest extent feasible. The proposed treatment includes relatively flat back slopes on ditches (1:4 instead of 1:3) in select locations.

D. Utility Strips – No new utility strips are anticipated within the project limits.

E. Bus Stops – There are no bus stops within the project limits.

F. Driveways – All driveways within the project limits would be replaced in kind, extended, or relocated as necessary to tie into the proposed work. This includes the existing asphalt and gravel driveways to the residential properties on the south side of CR 46, west side of Smith Road, the north side of CR 46, and all field access drives. The first asphalt residential driveway on Smith Road, south of CR 46, would have a segment of the splitter island depressed in the vicinity of the driveway to permit two-way access. Though flush, the same median treatment would be carried through that area. This would provide full driveway access to the affected property owner while discouraging others from utilizing the physical break in the raised median.

Additional field access drives may be added during detailed design subsequent to discussion with individual property owners. Refer to the plans in **Appendix A** for proposed driveway locations and layout. Driveway culverts would be installed where necessary to facilitate drainage patterns.

G. Clear Zone – The target clear zone for all roadways within the project limits is 30 feet maximum from the edge of travel lane and varies depending on the design speed and foreslope. Existing horizontal clearances from the edge of travel lane to the line of fixed objects is generally set by the line of utility poles along the roadway. The utility poles along the north side of CR 46 and the east side of Smith Road would be relocated as a result of the project. Ontario County would work with affected utility owners to ensure utility poles are located outside the desired clear zone for the roadway, considering the design speed of the adjacent curve, foreslope, and location on the curve. Horizontal clearances would remain or be increased as part of the project. Existing (typical) horizontal clearances to utility poles on the approach roadways are listed below for reference.

- CR 46 - Approximately 14 feet
- Smith Road – Approximately 15 feet

3.3.3.2. Special Geometric Design Elements

3.3.3.2. (1) Nonstandard Features – No critical design elements that would not comply with the geometric features and cross section elements listed in **Section 3.2.3.2** are proposed within the study limits. For the purposes of this project, roundabout design parameters apply from the tips of the splitter islands through the central island on each approach.

3.3.3.2. (2) Non-Conforming Features – Other design features were taken into consideration in addition to the critical design elements contained in Chapter 2 of the NYSDOT HDM during the development of Alternative 5. Non-critical design elements with the project limits are presented in **Section 3.2.3.3**. Non-conforming features are design elements that depart from typical design practice but are not related to designated design criteria. Additionally, refer to the Non-Conforming Features Checklist in **Appendix F**.

Entry Angle – Roundabout: Based on the preliminary design presented in **Appendix A**, three of the approaches to the proposed roundabout would have lower than desirable angles of entry into the roundabout, less than the minimum of 20 degrees recommended in NYSDOT EI 00-021. NCHRP Report 672, *Roundabouts: An Informational Guide, Second Edition*, also suggests that entry angles should typically fall between 20 degrees and 40 degrees. In general, entry angles that are too severe produce poor angles of visibility to the left, requiring drivers to look over their shoulders. The proposed values, a maximum of 7 degrees below on the east leg, were thoroughly reviewed. It is anticipated that the differences in entry angle will not negatively impact operations or overall safety at the proposed roundabout.

3.3.3.3. Pavement and Shoulder

A full depth pavement section is recommended given the proposed intersection improvements and roadway realignments as discussed in the Pavement Evaluation and Treatment Selection Report (PETSr) in **Appendix D**. A Portland Cement Concrete (PCC) pavement section was developed for the circulatory roadway and approaches to the roundabout under Alternative 5. It was generated per the Equivalent Single Axle Loading (ESAL) pavement design procedure as outlined in the NYSDOT Comprehensive Pavement Design Manual. The expected pavement service life would be 50 years. The recommended full depth PCC pavement reconstruction section for the CR 46 and Smith Road roundabout is as follows:

- 9-inch Portland Cement Concrete Pavement
- 12.0-inch Granular Subbase Course

A hot mix asphalt (HMA) pavement section was developed for Alternative 5, generated per the Equivalent Single Axle Loading (ESAL) pavement design procedure as outlined in the NYSDOT Comprehensive Pavement Design Manual, for approaches to the roundabout, outside the limits of the splitter islands, and other reconstruction segments throughout the project limits. The expected pavement surface life would be 20 years with an expected total pavement service life of 50 years. The recommended full depth asphalt

pavement reconstruction section for CR 46 is as follows, for consistency with the adjacent pavement section:

- 1.5-inch HMA Top Course
- 2.5-inch HMA Binder Course
- 8.0-inch HMA Base Course
- 12.0-inch Granular Subbase Course

The recommended full depth asphalt pavement reconstruction section for Smith Road is as follows:

- 1.5-inch HMA Top Course
- 2.5-inch HMA Binder Course
- 6.0-inch HMA Base Course
- 12.0-inch Granular Subbase Course

The proposed pavement design would be reviewed further during detailed design in conjunction with additional subgrade soil and geotechnical discussions (Refer to **Section 3.3.3.5**). All shoulders would be constructed to full depth and edges supported with a minimum of 2 ft of shoulder backup material or traversable curb. Asphalt backup material would be placed, as necessary, to accommodate occasional WB-50 tracking in the southeast quadrant of the proposed roundabout.

3.3.3.4. Drainage Systems

The overall drainage pattern throughout the project limits would be changed with the proposed roundabout. Curbing along the outside of the circulatory roadway and on its immediate approaches would direct runoff to adjacent roadside ditches or the proposed closed drainage system. New low points on the south roundabout approach would be located at just outside the limits of the proposed curbing or at a proposed drainage inlet. Short breaks in the traversable curb to facilitate shoulder drainage and to prevent the chance for ponding would be considered during detailed design. Curb would be introduced along the north and south sides of the eastern approach, at the profile high point, to help reduce adjacent impacts. Proposed grading would establish toe ditches at the bottom of roadway embankments to collect roadway runoff, preventing sheet flow from entering adjacent residential and agricultural properties to the greatest extent feasible. This would help limit crop damage due to salty winter and spring runoff as well as flooding of fields during heavy rain events.

Where possible, the roadway subbase would be daylighted to drain the roadbed. Underdrain would be installed in locations where the adjacent ditch bottom could not be made low enough to daylight the subbase. Each underdrain would be designed to outlet at a low point in the approach profile. The truck apron and circulating roadway would both be banked outward toward the edge of the roundabout. The proposed drainage design is summarized in **Exhibit 3.3.3.4** and also shown on the plans in **Appendix A**.

All existing pipes under the road would be replaced. The proposed closed drainage system would capture ditch flow and roadway surface flow at low points and consist of a series of end sections, drainage structures, pipes, and manholes. Proposed drainage pipes beneath the road would be appropriately sized reinforced concrete pipe (RCP). Additionally, new pipes outside the roadway would be smooth interior corrugated plastic pipe made of high-density polyethylene (SICPP, HDPE), all with appropriately sized drainage structures or manholes. All existing driveway pipes in poor condition would be replaced as part of the project.

The proposed closed drainage system would be installed throughout the project limits as summarized in **Exhibit 3.3.3.4**. The system would flow from the northwest corner of the proposed intersection, along the west side of Smith Road, to its end point approximately 950 feet north of the intersection at an unnamed tributary of Flint Creek.

Exhibit 3.3.3.4 Proposed Drainage Design Summary			
Leg / Roadway	Side	Ditch Section Slopes	Comments
West (CR 46)	North	1:4 Foreslope 1:3 or Flatter Backslope 2 ft Bottom	Ditch would carry flow from approximately 100 feet east of the project limits toward the east and outlet to the ditch along the west side of Smith Road. The remaining 100 feet of roadway adjacent to the project limits would continue to sheet flow to the adjacent agricultural property.
	South	1:4 or Flatter Foreslope 1:3 or Flatter Backslope 2 ft Bottom	Ditch would drain westerly to proposed catch basin (adjacent to residential driveway) and outlet to a cross culvert heading north under CR 46. West of the driveway, ditch would drain to the west, connecting into the existing ditch at the work limit.
South (Smith Road)	West	1:4 or Flatter Foreslope 1:3 or Flatter Backslope 2 ft Bottom	Ditch would carry flow from the project limits to the approach low point / proposed catch basin and outlet to the closed drainage system headed east / north.
	East	1:4 Foreslope 1:4 Backslope 2 ft Bottom	Ditch would carry flow from the project limits to the north, be picked up by the closed drainage system, and outlet to the closed drainage system headed north. A catch basin would be placed in the shoulder at the approach low point and outlet into the closed drainage system headed north.
East (CR 46)	North	1:8 from Top of Curb or 1:4 Foreslope 1:4 Backslope 2 ft Bottom	High point in road: Initially drain along face of curb in both directions, connecting to ditches that start at the ends of the curb. Ditch would drain to the east, connecting into the existing ditch at the work limits. Ditch would drain to the west and outlet to the ditch along the east side of Smith Road.
	South	1:3 or Flatter from Top of Curb Or 1:4 Foreslope 1:4 Backslope 2 ft Bottom	High point in road: Initially drain along face of curb in both directions, connecting to ditches that start at the ends of the curb. Ditch would drain to the east, connecting to the existing ditch at the work limits. Ditch would drain to the west and outlet into the closed drainage system headed north.
North (Smith Road)	West	1:4 Foreslope 1:4 Backslope 2 ft Bottom	Ditch would drain to the north from the intersection and south from the project limits to an artificial low point at ~Sta. NA 12+15 LT, outletting to the closed drainage system headed to the north.
	East	1:4 Foreslope 1:4 Backslope 2 ft Bottom	Ditch would drain to the north, connecting into the existing ditch at the work limit.

3.3.3.5. Geotechnical

Additional consideration would be given to the poor subgrade soils throughout the project limits in relation to the proposed pavement design, the need for subsurface stabilization (undercut), or other improvements to ensure a stable roadbed. No other special geotechnical considerations exist, and no other special geotechnical construction techniques are anticipated within the project limits that would affect design or construction. At minimum, a geotextile stabilization product would be installed between the prepared subgrade and new granular subbase in accordance with Ontario County design standards.

3.3.3.6. Structures

There are no proposed bridges within the project limits.

3.3.3.7. Hydraulics of Bridges and Culverts

There are no proposed bridges or culverts within the project limits. There are no dams in the vicinity of the project that would be adversely affected.

3.3.3.8. Guide Railing, Median Barriers and Impact Attenuators

No guide rail is proposed as part of this project.

3.3.3.9. Utilities

Public utility relocations would be required in order to complete the proposed construction. Potential utility impacts are summarized in **Exhibit 3.3.3.9**.

Exhibit 3.3.3.9 Location of Potential Utility Impacts			
Owner	Type	Location/Side	Proposed Modifications
Town of Hopewell	Water	North side of CR 46, west of Smith Road. South side of CR 46, immediately adjacent to intersection. East side of Smith Road throughout the project limits. Crossing of CR 46 along the east side of Smith Road. Crossing of Smith Road along the north side of CR 46.	Relocate / replace water main in conflict with the proposed roundabout and approach roadways.
NYSEG	Gas	<u>Underground</u> – South side of CR 46 throughout the project limits. West side of Smith Road, south of CR 46. Crossing of Smith Road along the south side of CR 46.	Relocate underground gas main in conflict with proposed roundabout and approach roadways (extents pending test pit results).

Exhibit 3.3.3.9 Location of Potential Utility Impacts			
Owner	Type	Location/Side	Proposed Modifications
Frontier Communications	Telephone	<p><u>Underground</u> – South side of CR 46 throughout the project limits. North side of CR 46, east of Smith Road. East side of Smith Road throughout the project limits. Crossing of CR 46 about 90 feet east of intersection / Smith Road. Crossing of Smith Road along south side of CR 46 at intersection.</p> <p>Several above ground pedestals / junction boxes throughout project limits.</p> <p><u>Overhead</u> - North side of CR 46 throughout the project limits.</p> <p>Underground to overhead starting at crossing from east side to west side of Smith Road about 975 feet north of CR 46, and west side of Smith Road to the north.</p>	<p>Relocate underground telephone and pedestals / junction boxes in conflict with proposed roundabout and approach roadways.</p> <p>Relocate (5) utility poles and overhead wires in conflict with the proposed roundabout approach roadways and to accommodate clear zone requirements.</p>
Charter Communications	Cable	<p><u>Overhead</u> – North side of CR 46 throughout the project limits. East side of Smith Road throughout the project limits.</p>	<p>Relocate (11) utility poles and overhead wires in conflict with the proposed roundabout approach roadways and to accommodate clear zone requirements.</p>
Empire Telephone Corporation / Empire Access	Fiber Optics	<p><u>Overhead</u> – North side of CR 46 throughout the project limits.</p>	<p>Relocate (5) utility poles and overhead wires in conflict with the proposed roundabout approach roadways and to accommodate clear zone requirements.</p>
FirstLight	Fiber Optics	<p><u>Overhead</u> – East side of Smith Road, south of CR 46.</p> <p><u>Underground</u> – South side of CR 46, east of Smith Road.</p>	<p>Relocate underground fiber optic in conflict with proposed roundabout and approach roadways.</p> <p>Relocate (3) utility poles and overhead wires in conflict with the proposed roundabout approach roadways and to accommodate clear zone requirements.</p>
RG&E	Electric	<p><u>Overhead Transmission and Distribution</u> – North side of CR 46 throughout the project limits. East side of Smith Road throughout the project limits.</p>	<p>Relocate (10) utility poles and overhead wires in conflict with the proposed roundabout approach roadways and to accommodate clear zone requirements.</p>

Note: Additional service drops / poles may be impacted pending final relocation plan by RG&E.

3.3.3.10. Railroad Facilities

There are no railroad facilities within the project limits.

3.3.4. Landscape and Environmental Enhancements

Refer to Chapter 4 for complete discussion of environmental considerations.

3.3.4.1. Landscape Development and Other Aesthetics Improvements

Low maintenance, salt tolerant landscaping would be provided in the central island of the proposed roundabout to enhance its conspicuity, control sight lines, and enhance aesthetics. Ontario County specifies stone mulch for the interior of its roundabouts.

All plantings would be of a self-sufficient and of a low maintenance variety. Although plantings would be considered low-maintenance, some maintenance would need to be performed, particularly in the roundabout's central island, 1 to 2 times a year beyond the period of establishment.

No tree removals are anticipated as part of the project. The proposed design intends to avoid impacts to mature trees located along the frontage of the residential properties in the southwest quadrant. Temporary vegetation protection fencing would be installed during construction to protect the existing plantings in this corner. Any other plantings disturbed by the project would be replaced in-kind. Turf would also be reestablished upon completion of the project.

The surfaces of the splitter islands would be standard, colored concrete. The surface of the truck apron would also have an aesthetic treatment to visually offset it from the circulatory roadway pavement. This would both enhance aesthetics and discourage motorists from improperly using the splitter islands and apron.

3.3.4.2. Environmental Enhancements

None anticipated.

3.3.5. Miscellaneous

NYS Smart Growth Public Infrastructure Policy Act (SGPIPA)

Pursuant to ECL Article 6, this project is compliant with the New York State Smart Growth Public Infrastructure Policy Act (SGPIPA).

To the extent practicable this project has met the relevant criteria as described in ECL § 6-0107. The Smart Growth Screening Tool was used to assess the project's consistency and alignment with relevant Smart Growth criteria and reflects the current project scope. A copy of the Smart Growth Screening Checklist is provided in **Appendix I**.

Other Miscellaneous Information

None.

CHAPTER 4 - SOCIAL, ECONOMIC and ENVIRONMENTAL CONDITIONS and CONSEQUENCES

4.1 Introduction

4.1.1 Environmental Classification

4.1.1.1 NEPA Classification

This project is being progressed as a Class II action (Categorical Exclusion) because it does not individually or cumulatively have a significant environmental impact and is excluded from the requirement to prepare an Environmental Impact Statement (EIS) or an Environmental Assessment (EA) as documented in the Federal Environmental Approvals Worksheet (FEAW) and following discussion in this chapter.

Specifically, in accordance with the Federal Highway Administration's regulations in 23 CFR 771.117(d) this project is one of the project types described in the 'D' list as primarily a Modernization of a highway by resurfacing, restoration, rehabilitation, reconstruction, adding shoulders, or adding auxiliary lanes (including parking, weaving, turning, and climbing lanes) and does not significantly impact the environment. Refer to **Appendix B** for the FEAW and the Environmental Checklist.

4.1.1.2 SEQR Classification

Ontario County is the SEQR Lead Agency. In accordance with 6 NYCRR, Part 617.5, "State Environmental Quality Review," Ontario County has determined that this project is a SEQR Type II Action. No further SEQR processing is required.

4.1.2 Coordination with Agencies

4.1.2.1 NEPA Cooperating and Participating Agencies

The following agencies are Cooperating Agencies in accordance with 23 CFR 771.111(d):

- Federal Highway Administration (FHWA)
- US Army Corps of Engineers (USACE)
- New York State Department of Environmental Conservation (NYSDEC)

4.2 Social

The preferred alternative is not anticipated to change or impact the land use, neighborhoods, community cohesion, elderly or disabled persons, or environmental justice populations in the vicinity of the project. This project involves the improvement of the intersection of County Road 46 and Smith Road which is in a rural, lightly developed section of the Town of Hopewell. This preferred alternative would not result in any residential relocations. A short detour is planned to construct the project and is anticipated to be a minor inconvenience for a short duration. Prior to the Final Design Report, representatives of schools and emergency services providers will be asked to review the proposed detour.

4.3 Economic

The project would improve safety for all persons who travel through the intersection and is therefore anticipated to benefit the regional and local economies. Additionally, there are no existing business districts in or surrounding the project study area; therefore, impacts to business districts are not anticipated.

4.4 Environmental

4.4.1 Wetlands

4.4.1.1 State Freshwater Wetlands

There are no NYSDEC regulated freshwater wetlands or regulated adjacent areas (100 feet) within the project area, as per the NYSDEC Freshwater Wetlands Maps for Ontario County (NYSDEC Environmental Resource Mapper) as shown in **Appendix B**. A site visit was performed on September 27, 2019 to verify this. No further investigation is required and Environmental Conservation Law, Article 24 is satisfied.

A Blanket Section 401 Water Quality Certification would likely apply to this project since the work required would meet the requirements of a Section 404 Nationwide Permit # 14-Linear Transportation Projects.

4.4.1.2 State Tidal Wetlands

A review of the NYSDEC geographic information systems (GIS) wetland data files indicates that there are no NYSDEC jurisdictional tidal wetlands or regulated adjacent areas within or near the project limits, and ECL Article 25 does not apply.

4.4.1.3 Federal Jurisdiction Wetlands

Federal jurisdictional wetlands exist within the project limits as shown in the wetland delineation report in **Appendix B**. It is anticipated that the proposed project would require impacts to wetlands as noted in **Exhibit 4.4.1.3**. There is no alternative to construction in wetlands and avoidance is not practicable; however, all practicable measures to minimize impacts to wetlands would be utilized. Efforts to minimize and avoid wetland impacts were made during the design of the proposed roundabout, but the requirement to meet current design standards resulted in minor impacts. Impacts to delineated wetlands were minimized where possible and mitigation for these impacts is not anticipated, as total wetland impact area is less than 0.10 acre. It is expected that this work would be authorized under Nationwide Permit # 14-Linear Transportation Projects. Work would not commence until coverage under the permit is confirmed and work would adhere to all permit conditions.

A Blanket Section 401 Water Quality Certification (WQC) would likely apply since the work required would meet the requirements of Nationwide Permit 14- Linear Transportation Projects and it would comply with the NYSDEC General WQC Conditions. Permits would be obtained once the location and the extent of the impacts are finalized.

Exhibit 4.4.1.3 Wetland Impacts					
Wetland		Identified Functional Values	Total Size (acre)	Impacts (acre)	
ID	Type			Temporary	Permanent
A	Tributary/ Emergent Area	<ul style="list-style-type: none"> • Unnamed Tributary • Storm water drainage/storage 	0.041	0	0
B	Emergent Field	<ul style="list-style-type: none"> • Highway & Roadside drainage/filtering • Storm water drainage/storage 	0.092	0	0.018
Total Impacts				0	0.018

4.4.1.4 Executive Order 11990

A programmatic Executive Order 11990 would likely apply to this project, based on its classification as a Categorical Exclusion under 23 CFR 771.117 and its qualification for U.S. Army Corps of Engineers Section 404 Nationwide Permit. Minor impacts to federal jurisdictional wetlands are proposed; however, there is no practicable alternative to construction in the wetlands and all practicable measures to minimize harm to the wetland would be incorporated. The project satisfies the requirements of EO 11990. No further approval from the FHWA is required.

4.4.1.5 Mitigation Summary

No wetland mitigation/monitoring plan is required for this project since impacts to wetlands are anticipated to be 1/10 of an acre or less and a Nationwide Permit applies to the proposed activities.

4.4.2 Surface Waterbodies and Watercourses

4.4.2.1 Surface Waters

One tributary was identified within the area of potential effect (APE) for the project, an unnamed tributary to Flint Creek. The Ordinary High-Water mark (OHWM) of this tributary was delineated during the Wetland Delineation and is included on the wetland mapping. The preferred alternative may require the placement of a negligible amount of fill below the OHWM of the tributary and impacts to this tributary would be determined during final design.

4.4.2.2 Surface Water Classification and Standards

The unnamed tributary is rated Class C and is not a 303(d) segment based upon a review of the NYSDEC GIS data maps for regulated streams. The best usage for Class/Standard “C” waters is fishing. Water quality is suitable for fish propagation and survival. The water quality shall be suitable for primary and secondary contact recreation, although other factors may limit the use for these purposes.

4.4.2.3 Stream Bed and Bank Protection

Based upon a review of the NYSDEC GIS database, and as verified by a site visit, there are no protected streams nor 50-foot regulated stream banks (on either side of a regulated stream) in the project area.

4.4.3 Wild, Scenic, and Recreational Rivers

4.4.3.1 State Wild, Scenic and Recreational Rivers

There are no NYSDEC Designated, Study or Inventory State Wild, Scenic or Recreational Rivers within or adjacent to the proposed project site. No further review is required.

4.4.3.2 National Wild and Scenic Rivers

The project does not involve a National Wild and Scenic River as shown by the Nationwide Rivers Inventory List of National Wild and Scenic Rivers. No further review is required.

4.4.3.3 Section 4(f) Involvement

The proposed project does not involve work in or adjacent to a wildlife or waterfowl refuge. No further consideration is required.

4.4.3.4 Mitigation Summary

Mitigation is not anticipated for this project.

4.4.4 Navigable Waters

There are no state or federally regulated navigable waters located within the project area.

4.4.5 Floodplains

The project is not located within a regulated floodplain as shown on FEMA floodplain mapping.

4.4.6 Coastal Resources

4.4.6.1 State Coastal Zone Management Program

The proposed project is not located in a State Coastal Zone Management (CZM) area according to the Coastal Zone Area Map from the NYS Department of State's Coastal Zone Management Unit.

The proposed project is not located in or near a Coastal Erosion Hazard Area.

According to the NYS Department of State (DOS) "List of Approved Coastal Local Waterfront Revitalization Programs (LWRPs)," dated March 2007, the proposed project is not located in a Local Waterfront Revitalization Area. No further action is required.

The proposed project is not located in or near a coastal area under the jurisdiction of the Coastal Barrier Resources Act (CBRA) or the Coastal Barrier Improvement Act (CBIA).

4.4.7 Groundwater Resources, Aquifers, and Reservoirs

EPA Region 2 Sole Source Aquifer Mapping and NYSDEC Mapping of Primary Aquifers in NY State have been reviewed and it has been determined that the proposed project is not located in an identified Primary Water Supply or principal aquifer. Refer to **Appendix B** for the documentation.

There are no municipal drinking water wells, wellhead influence zones, or reservoirs within or near the project area.

4.4.8 Stormwater Management

A NYSDEC SPDES General Permit for Stormwater Discharges from Construction Activity (GP-0-20-001) would be required because the project is anticipated to have more than one acre of soil disturbance. Based on the preliminary design, it is anticipated that permanent stormwater features would be required to treat the water quality volume for the project site. This project is a redevelopment project that proposes an increase in impervious area, resulting in 0.084 acre-feet of water quality volume required for treatment. The project plans to meet this requirement through the construction of dry swales within the project corridor. While the project would result in a small increase in impervious area, downstream analyses show there would be negligible increase in discharge at the confluence with the nearest stream; therefore, no water quantity treatment is required.

A Stormwater Pollution Prevention Plan (SWPPP) with the appropriate sediment and erosion control measures would be developed. Based on the SWPPP, permanent stormwater management practices would be developed during detailed design.

4.4.9 General Ecology and Wildlife Resources

4.4.9.1 Fish, Wildlife, and Waterfowl

A cursory review of the project's APE indicates that there is not a special habitat or breeding area within the project area. Potential impacts to federal listed species are discussed below.

4.4.9.2 Habitat Areas, Wildlife Refuges, and Wildfowl Refuges

The proposed project does not involve work in, or adjacent to, a wildlife or waterfowl refuge. No further consideration is required.

4.4.9.3 Endangered and Threatened Species

There are no state-protected, threatened, or endangered species located in or near the proposed project area according to the NYSDEC Environmental Resource Mapper. No further screening for state listed species is required.

There are no Federally protected, threatened, or endangered species located in or near (within ½ mile) the proposed project area according to the USFWS IPaC database.

The USFWS IPaC Resource List and Transmittal Sheet for the project is included in **Appendix B**.

4.4.9.4 Invasive Species

A review of the existing corridor did not indicate any significant presence of known invasive species within the right-of-way.

4.4.9.5 Roadside Vegetation Management

Existing roadside vegetation consists primarily of maintained lawn areas, farmland, and wetland areas. Efforts would be made to replace wildlife-supporting vegetation that is removed during the course of construction.

4.4.10 Critical Environmental Areas

4.4.10.1 State Critical Environmental Areas

According to information obtained from NYSDEC, the proposed project does not involve work in or near a Critical Environmental Area.

4.4.11 Historic and Cultural Resources

A Project Submittal Package (PSP) was submitted to the NYSDOT Regional Cultural Resource Coordinator (RCRC). In a memorandum dated September 25, 2019, the RCRC concluded that “the project activities have no potential to cause effects on historic properties in accordance with 36 CFR 800.3(a)(1) therefore, there are no further obligations for compliance with Section 106 of the National Historic Preservation Act.” A copy of this memorandum is included in **Appendix B**.

4.4.12 Parks and Recreational Resources

The proposed project would not impact areas identified as National or State Heritage Areas.

4.4.12.1 Section 4(f) Involvement

There are no publicly owned parks or recreational facilities, protected under Section 4(f) of the USDOT Act, in or adjacent to the project area. No further action is required under this section.

4.4.12.2 Section 6(f) Involvement

The project does not impact parklands or facilities that have been partially or fully federally funded through the Land and Water Conservation Act. No further consideration under Section 6(f) is required.

4.4.13 Visual Resources

The proposed project, which would involve intersection reconstruction converting a four-legged, two-way stop-controlled intersection to a roundabout, is adjacent to and surrounded by rural agricultural and residential properties.

Negative impacts to visual resources are not anticipated. There would be three primary viewer groups of the proposed project: roadway users, residential occupants, and pedestrians.

The streetscape is rural in nature with no street trees, sidewalks, or other man-made visual elements typical of a developed roadside. The viewshed consists almost entirely of flat agricultural fields with isolated hedgerows delineating fields and residential areas. There are several residential properties within the project limits. The southwest quadrant is lined with residential properties. The northeast quadrant has a single residential property. To date, all residential properties are single family residences.

The project is expected to have minimal impact to the existing view shed. While the alignment of the intersection approaches would be altered, the overall result of the alterations would not change the function or the large-scale appearance of the project area to the residential users. Roadway users would find the intersection easier to maneuver with appropriate signage directing motorists through the roundabout. Additional signage and lighting may be considered a negative impact on the visual corridor but would substantially increase overall safety during both daytime and nighttime hours.

4.4.14 Farmlands

4.4.14.1 State Farmland and Agricultural Districts

The proposed project is located within a portion of NYS Agricultural Districts for Ontario County based on a review of the NYS Agricultural District Maps; however, since the proposed project would not acquire more than one acre from an actively operated farm within any of the Agricultural Districts, or more than ten acres within any of the individual Agricultural Districts, the notification requirements of the NYS Agriculture and Markets Law do not apply.

4.4.14.2 Federal Prime and Unique Farmland

Acquisition of prime or unique farmland, or farmland of state or local significance, would be required for this project. It has been determined that this project would qualify for a 'small acreage exemption' and is exempt from the requirements of the Federal Farmland Protection Act, as the project proposes to convert less than 3-acres of land classified as United States Farmland. Completion of the US Department of Agriculture Farmland Conversion Rating (Form AD 1006) would not be required.

4.4.15 Air Quality

This project is located in Ontario County which is considered an ozone attainment area. The project is considered an exempt project per Table 2 in Section 93.126 of 40 CFR. In addition, this project is also exempt from Regional Emissions Analysis as per Table 3 in Section 93.127 of 40 CFR. No additional analysis is required for this project.

4.4.16 Energy

An energy assessment is not required for the proposed project since it is not expected to:

- a. Increase or decrease VMT;
- b. Generate additional vehicle trips;
- c. Significantly affect land use development patterns;
- d. Result in a shift in travel patterns; or
- e. Significantly increase or decrease vehicle operating speeds.

The project would not significantly affect energy consumption.

4.4.17 Noise

The project would not decrease the distance between the roadway and the closest receptors by more than 50%. The project would not significantly change either the horizontal or vertical alignment or

increase the number of through-traffic lanes. Therefore, this project is not a Type I project and does not require a traffic noise analysis as per 23 CFR 772.

4.4.18 Asbestos

A screening was performed to identify potential sources of asbestos containing materials. The full report is included in **Appendix B**. Suspect materials impacted by the project include an 8-inch water main on the north and south sides of CR 46 and the east side of Smith Road as identified during a review of record plans. There is also a cementitious culvert on the west side of Smith Road, south of CR 46 in a drainage ditch which was identified by visual observation. While suspect, that culvert is outside the anticipated limit of disturbance. Suspect asbestos containing materials impacted by the project would be handled and removed in accordance with applicable regulations.

4.4.19 Hazardous Waste and Contaminated Materials

A Hazardous Waste/Contaminated Materials Site Screening has been conducted in accordance with NYS DOT Environmental Procedures Manual, Chapter 5, in order to document the likely presence or absence of hazardous/contaminated environmental conditions. A hazardous/contaminated environmental condition is the presence or likely presence of any hazardous substances or petroleum products (including products currently in compliance with applicable regulations) on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property.

The Hazardous Waste/Contaminated Materials Site Screening included a review of NYSDEC regulatory data files and a site 'walkover' on July 5, 2019.

No hazardous waste/contaminated materials were identified within or adjacent to the project area during the course of the Hazardous Waste/Contaminated Materials Site Screening. The potential risk for involvement with documented or undocumented inactive hazardous waste/contaminated materials is low.

The results of the full screening are included in **Appendix B**.