

# MEMORANDUM



ENGINEERS  
PLANNERS  
SURVEYORS

Date: January 9, 2023

To: Lydia Lake, P.E. – New Leaf Energy  
From: Dan Berkowsky, P.E. – Creighton Manning Engineering  
cc: Matt Van Wie, P.E., Don Adams, P.E. – Creighton Manning Engineering

Project: Wind Transport Study – 489 Sickler Road, Stark, New York (CM# 121-310)  
Re: Preferred Delivery Routes and Temporary Roadway Improvements

Creighton Manning Engineering (CM) was retained by New Leaf Energy (New Leaf) to assess road conditions to facilitate construction of a two-turbine wind plant project located in Herkimer County, New York. The address of record for the turbine is listed as 489 Sickler Road, Stark NY. The purpose of this assessment was to develop and recommend a feasible delivery route for oversized turbine blades and other heavy construction components. The delivery route alternatives were developed and selected, to the extent possible, to prioritize NY State roadways over county and local roads, avoid underpasses and overhead obstructions, avoid weight limited bridges, and minimize acute angle turns. Two potential delivery route alternatives were identified for this project.

A field visit was conducted by CM staff Engineers on December 19, 2022 to confirm route feasibility, identify potential road obstructions or features not readily apparent on satellite imagery, and identify and document potential temporary roadway improvements and/or widening required to accommodate large delivery vehicles. The observations and data collected was then used to further analyze and refine the routing alternatives, confirm vehicle maneuverability, and provide New Leaf with further insight into potential temporary improvements that would be required along the preferred delivery route.

## Delivery Vehicles

New Leaf provided CM the dimensions of the various delivery vehicles to be used to transport turbine components to the site. The dimensions of the largest of these delivery vehicles which carry the turbine blades are described and illustrated in Figure 1 below.

- Maximum Length – 267'
- Maximum Height – 15'-6"
- Maximum Width – 14'

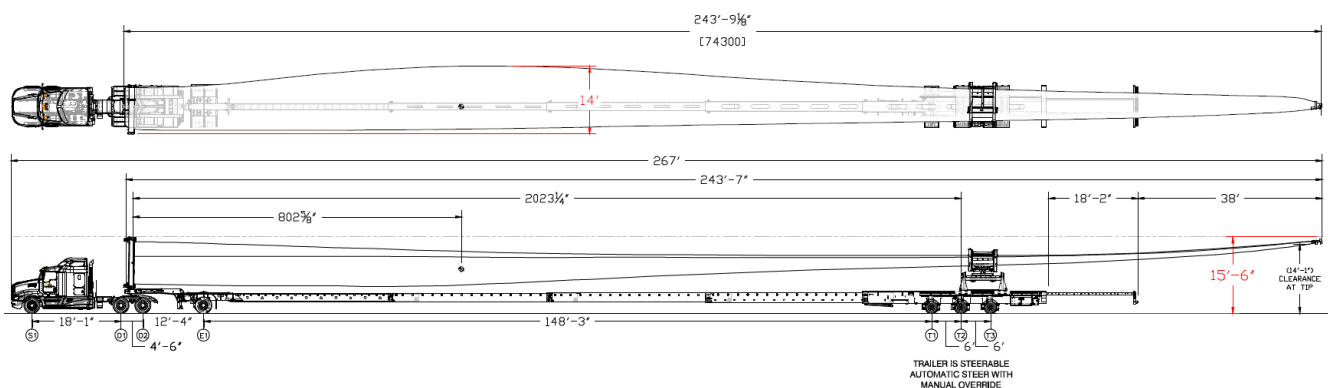


Figure 1 - Preliminary Delivery Vehicle and Largest Anticipated Delivery Load

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Figure 2 illustrates the turning template for a 90-degree turn provided by the vendor. This analysis assumes use of the largest turbines (V150) for which dimensions are provided.

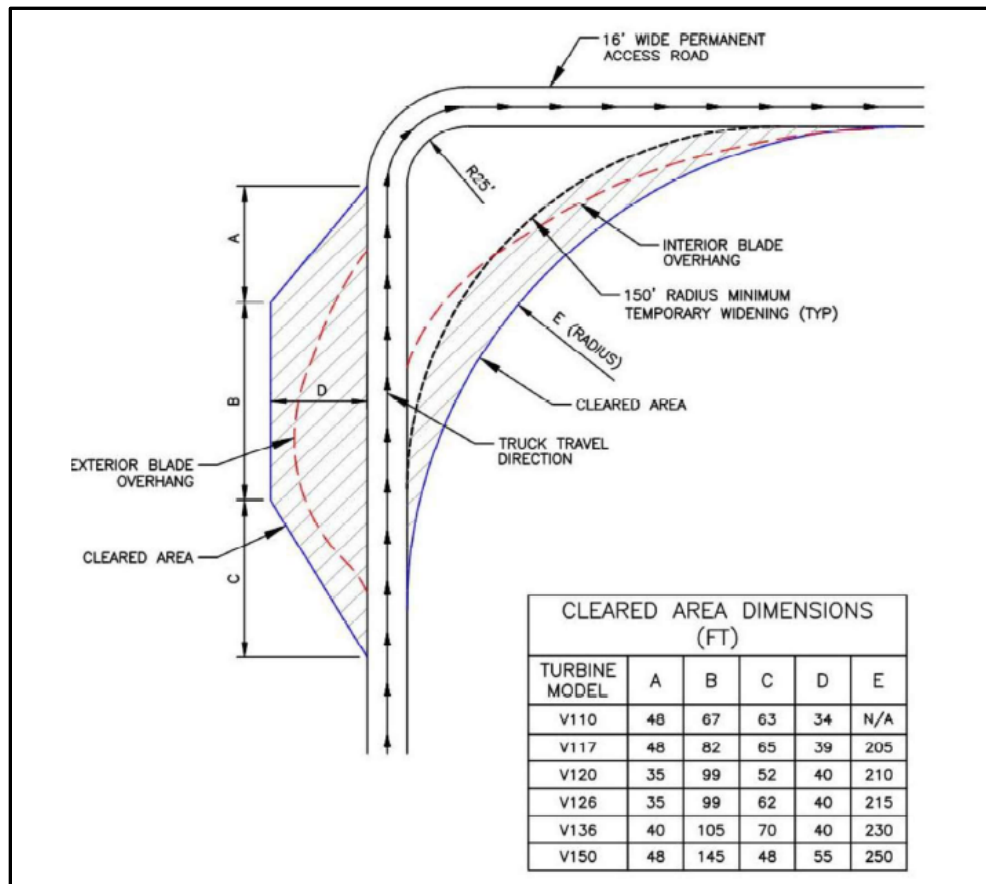


Figure 2 - Vendor Supplied Turning Template Quantifying Dimensions for Roadway Widening and Vertical Clearance Requirements

Based on the above delivery vehicle dimensions and CM’s previous experience with turbine delivery vehicles, an assumed 165’ inside turning radius and a 290’ outside overhang radius was utilized to verify intersection geometry and any potential improvements needed. Above-ground street furniture and other obstructions more than 10 feet tall located within the 290’ radius on the inside of turns and the area indicated on the outside of turns may require temporary removal or relocation to provide necessary clearance of rigid-body payloads as the vehicle navigates through turns at intersections.

The turbine blade delivery vehicles are used as the design vehicle for this exercise as they are by far the largest, tallest, and longest of the construction equipment and delivery vehicles required for the project. It is noted, as it may be relevant to the remainder of this discussion, that other delivery vehicles and payloads are typically significantly smaller but may carry heavier loads. An example of such is the nacelle which utilizes a more conventionally sized delivery vehicle but applies over twice the load weight as does the turbine blades.

### Vehicle Routing Alternatives Evaluated

A route for delivery vehicles with turbine blade loads with heights of 15’-6” was developed for access to the project site from Interstate I-88. This route was screened against the New York State Department of

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Transportation (NYSDOT) database for weight restricted crossings, during which no restrictions were found. However, during the December field visit, CM staff engineers discovered roadway signs suggesting weight limitations on a bridge across the Herkimer Creek on NY Route 28. This restriction does not appear on the online database of restricted crossings. An image of the posted signs is shown in Figure 3. However, upon further



Figure 3 – Old Weight Restriction Postings on NY-28, South of Herkimer Creek.

investigation, it was determined that the bridge was replaced entirely in 2016 and there are no longer weight restrictions on the new structure. It is likely that the roadway signs which exist currently on northbound NY-28 were missed for removal after completion of the bridge replacement. An excerpt from the bridge inventory report from the NYSDOT Bridge Data Information System (BDIS) regarding this crossing and removal of weight restrictions is attached to this memorandum for reference. The full report on the bridge was transmitted to New Leaf as a separate attachment.

Due to the prevalence of streams, culverts, and the general topography of the area, developing an alternate route suitable for turbine blade delivery vehicles and overweight nacelle deliveries is challenging. As the 2016 replacement of the Herkimer Creek bridge appears to have removed all weight restrictions on that crossing, only a single delivery route is proposed and presented in this report. Although unlikely, if structural other concerns are raised during the permitting of this action, mitigation measures such as structural reinforcement or the construction of a temporary steel bridge to span the crossing entirely could be considered.

The preferred delivery route (depicted on Red on the attached map) begins at Exit 13 on I-88. Vehicles would travel northbound on NY-205/NY-23 until the intersection with NY-80. Upon reaching NY-80, delivery vehicles would turn right, traveling eastbound until turning left on NY-28. Delivery vehicles would continue northbound on NY-28 until reaching the Town of Richfield Springs. Passing through Richfield Springs, delivery vehicles would turn onto northbound CR-25A (Honestville Road) and continue until it transitions back into northbound NY-28 at the intersection with US-20/W Main Street. Vehicles would continue northbound until turning right onto eastbound CR-183/Cullen Road, then continue as it transitions to CR-183/Hogsback Road, then to CR-71/Chyle Road, and finally turning slight left on to Sickler Road and continuing until reaching the project site.

### Field Visit Findings

Prior to the field visit, figures of each intersection along the proposed delivery route were created which overlaid the inside and outside turn radii of the large turbine delivery vehicles. These figures were then referenced by staff engineers in the field to identify potential improvements necessary to accommodate large vehicles and/or physical obstructions that would need to be temporarily or permanently relocated or removed, such as utility poles, roadway signage, trees, and vegetation. The general roadway condition along each route was also evaluated to identify and avoid segments with significant asphalt deterioration, culverts, or other conditions that may be unfavorable to oversized and overheight vehicles. Existing utilities, roadside drainage, and other

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potential conflicts visible during the field visit were noted. As shown in the attached delivery route map and described below, some physical roadway modifications and temporary or permanent removals of obstructions will be required at several intersections along both alternatives.

### *Preferred Delivery Vehicle Route (Red):*

The preferred delivery route for all components and vehicle types was analyzed for compatibility using the turbine blade delivery vehicles as the design vehicle. The field observations collected and the results of the turning movement analysis at intersections along this delivery route are shown in the attached figures. Roadway improvements and temporary street furniture to be relocated to facilitate this routing is described as follows:

- **Intersection of I-88 Westbound Off-Ramp and NY-205 – (Figure R1)** – This intersection will require the clearance of above grade obstructions along both the east and west sides of the off-ramp, just north of NY-205. All elements within the clearance area comprise highway roadway signs that will require temporary removal during turbine blade deliveries. Coordination and permitting for these removals will be subject to routine NYSDOT coordination and permit.
- **Intersection of NY-205 and NY-80 – (Figure R2)** – At this intersection, turbine blade delivery vehicles will run right to travel on eastbound NY-80. Due to the existing channelized right turn, no roadway widening is required to accommodate this turn. The clearance of vertical obstructions will be required within the inside radius of the turn, as well as on the west side of NY-205, south of NY-80 to accommodate the back swing of the turbine blades. There is one utility pole on the west side of NY-205 that will require removal or relocation to accommodate this turn. It is likely the overhead wire that spans from this utility pole to the north side of NY-80 will also need to be modified to provide sufficient vertical clearance to accommodate deliveries. Other street furniture to be temporarily relocated includes standard roadway signs which can typically be relocated with minimal difficulty.
- **Intersection of NY-205 and NY-28 – (Figure R3)** – Due to the existing channelized left turn lane, no roadway widening is required to accommodate the turbine blade delivery vehicles. Areas indicated on the figure as requiring clearance of obstructions are clear of vegetation and street furniture, except for a single roadway sign in the central grassy area that will need to be temporarily relocated during deliveries. There are several overhead wires that span the roadways through this intersection, including wires serving a substation at the north. It is likely that the vertical clearance of these wires will need to be raised to accommodate the passage of turbine blade deliveries beneath the wires. These efforts will need to be coordinated with National Grid prior to delivery activities.
- **Intersection of NY-28 & CR-25A (Honestville Road) – (Figure R4)** – Turbine blade delivery vehicles will turn left onto CR-25A after crossing Mink Creek. This maneuver will not require any temporary roadway widening. However, clearance of obstructions to accommodate the rear swing of the payload will be required on the south side of NY-28, including the removal of several trees on both sides of the creek. An overhead wire spans CR-25A just north of NY-28 which will need to be raised temporarily to accommodate the passage of turbine blades beneath it.
- **Intersection of CR-25A/NY-28 & US-20/W Main Street – (Figure R5)** – Construction and delivery vehicles will travel through this intersection in the northbound direction. No roadway widening or clearance is

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required. However, several overhead wires span this intersection including a span-wire mounted traffic signal with three signal heads. All overhead wires will need to be temporarily raised during deliveries in coordination with National Grid. It is likely the traffic signal will need to be temporarily disabled and either raised manually or removed to accommodate turbine blade deliveries beneath it. This will require coordination with NYSDOT, the Town of Richfield Springs, as well as local law enforcement to manage traffic for the period during which the traffic signal is disabled. A maintenance of traffic plan will need to be developed and be approved prior to delivery of materials through this intersection.

- **Intersection of NY-28 & CR-183 (Cullen Road) – (Figure R6)** – The right turn onto eastbound CR-183 will require temporary roadway widening at the southeast corner of this intersection. Accommodating the swing of the payload will also require the temporary removal of roadway signs along the east side of NY-28 as well as the removal of several existing trees along the south side of CR-183. A culvert runs beneath NY-28, south of CR-183. This culvert should be examined for structural integrity and reinforcement may be required to accommodate vehicle loads. An existing overhead wire spans CR-183 just east of the intersection which will need to be temporarily raised to accommodate the passage of turbine blade deliveries beneath the span. This will need to be coordinated with National Grid prior to delivery activities.
- **Intersection of CR-71 (Chyle Road) & CR-29 (Chyle Road) – (Figure R7)** – This roadway segment requires no temporary roading improvements. Clearance of vertical obstructions would be required within the areas indicted on the north and south sides of CR-29. Besides for shrubbery, there exists a guard rail along the north side if CR-71/CR-29 within the area indicated for clearance. The height of this guard rail should be confirmed against the required clearance to the underside of the turbine blade payload to determine sufficiency. If required, this guard rail may need to be temporarily removed during delivery activities.
- **Intersection of CR-29 (Chyle Road) & Sickler Road – (Figure R8)** – No roadway widening or area clearance is required at this intersection. An overhead wire spans Sickler Road just north of CR-29 which will likely need to be temporarily raised to accommodate turbine blade deliveries. Sickler Road itself, which leads to the project site, is a seasonal road. It is anticipated that roadway improvements to Sickler Road between CR-29 and the project site, including roadway widening, roadway stabilization, and/or paving will be required to accommodate overweight and oversized loads.

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### Permitting and Coordination

The proposed delivery vehicle route utilizes roadways owned and maintained by variety of agencies. The table below provides a summary of roadways utilized for the route and the agencies that own and maintain each roadway segment. The work required to facilitate delivery will require agreements, permitting, and coordination with agencies and public utilities. Further coordination and discussions will be required to determine the permitting requirements of each agency, county, and municipality along the route.

<u>Road Name</u>	<u>Start Point</u>	<u>End Point</u>	<u>Maintenance Jurisdiction</u>
NY-205	I-88 Exit 13	NY-80	NYS Dept. of Transportation
NY-80	NY-205	NY-28	NYS Dept. of Transportation
NY-28	NY-80	CR-25A/Honestville Road	NYS Dept. of Transportation
CR-25A/Honestville Road	NY-28	NY-28	Ostego County/Town of Richfield Springs
NY-28	CR-25A/Honestville Road	CR-183/Cullen Road	NYS Dept. of Transportation
CR-183/Cullen Road	NY-28	CR-183/Hogsback Road	Herkimer County
CR-183/Hogsback Road	CR-183/Cullen Road	CR-71/Chyle Road	Herkimer County
CR-71/Chyle Road	CR-183/Hogsback Road	CR-29/Chyle Road	Herkimer County
CR-29/Chyle Road	CR-71/Chyle Road	Sickler Road	Herkimer County
Sickler Road	CR-71/Chyle Road	Project Site	Town of Stark/Town of Richfield Springs

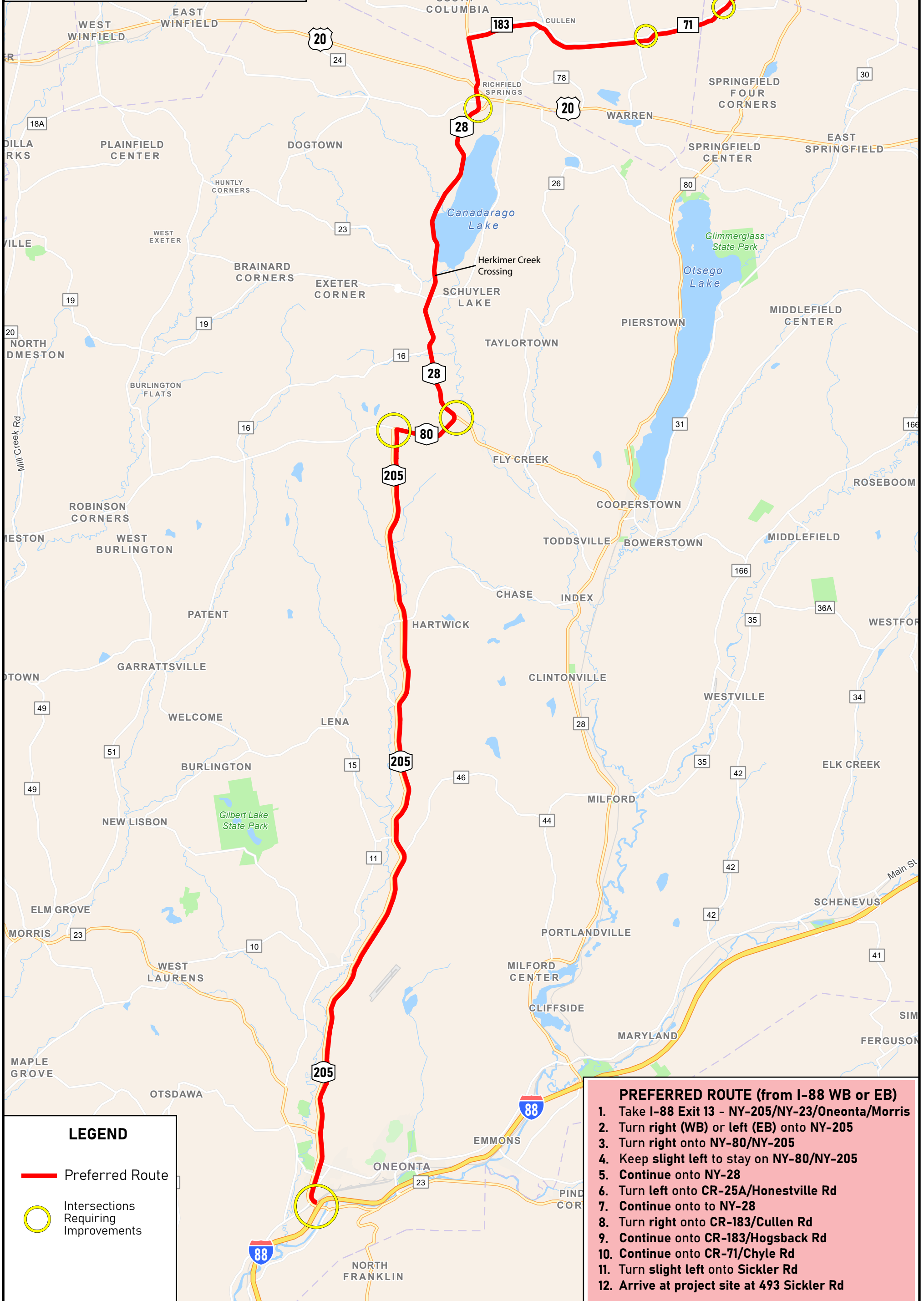
# Truck Routing Exhibit

FOR OVERSIZED DELIVERY &  
CONSTRUCTION VEHICLES

**489 Sickler Rd, Stark, NY**


January 2023

Wind Transport Study  
New Leaf Energy  
CM Project No. 121-310



## LEGEND


















 Preferred Route

 Intersections Requiring Improvements

### PREFERRED ROUTE (from I-88 WB or EB)

1. Take I-88 Exit 13 - NY-205/NY-23/Oneonta/Morris
2. Turn right (WB) or left (EB) onto NY-205
3. Turn right onto NY-80/NY-205
4. Keep slight left to stay on NY-80/NY-205
5. Continue onto NY-28
6. Turn left onto CR-25A/Honestville Rd
7. Continue onto NY-28
8. Turn right onto CR-183/Cullen Rd
9. Continue onto CR-183/Hogsback Rd
10. Continue onto CR-71/Chyle Rd
11. Turn slight left onto Sickler Rd
12. Arrive at project site at 489 Sickler Rd

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LEGEND		
	LTD	TREE, DECIDUOUS
	LSHD	SHRUB, DECIDUOUS
	LMB	MAILBOX
	S	SIGN, SINGLE POST
	TCSP	SIGNAL POLE
	UGLM	GAS, LINE MARKER
	ULP	LIGHTING, POLE
	UP	POLE, WITH UTILITY
	UTP	TELEPHONE, PEDESTAL
	UWFH	WATER, FIRE HYDRANT
	DCP	CULVERT PIPE
	RGB	GUIDE RAIL, BOX BEAM
	UEO	ELECTRIC LINE, OVERHEAD
	UPGW	POLE, GUY WIRE
	LWS	WALL, STONE
	TCSW	SIGNAL, SPAN WIRE
	DD	DRAINAGE DITCH

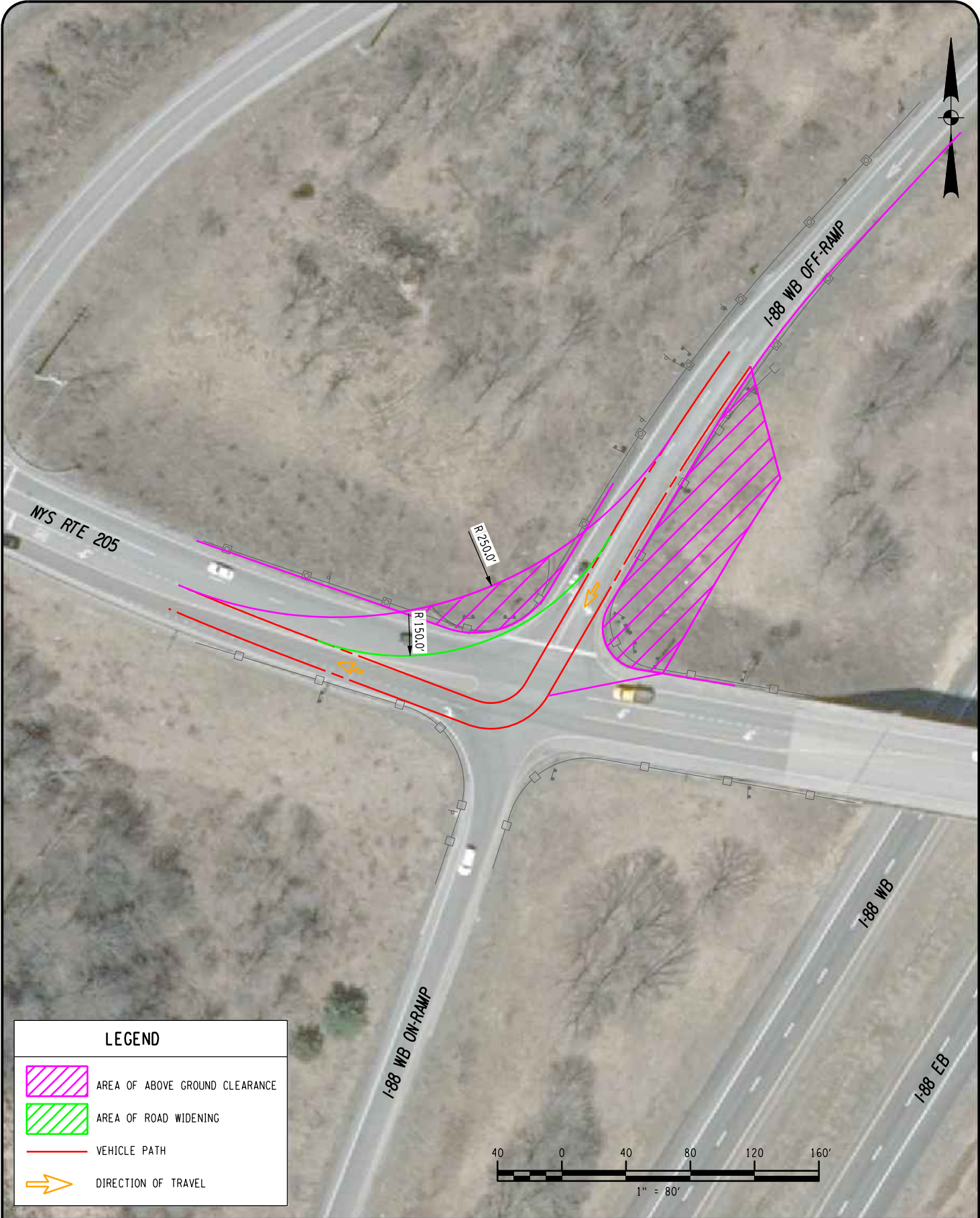
LEGEND





NEW LEAF - WIND TURBINE ROUTING STUDY  
489 SICKLER RD, STARK, NY 13361

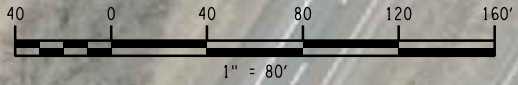




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LEGEND	
	AREA OF ABOVE GROUND CLEARANCE
	AREA OF ROAD WIDENING
	VEHICLE PATH
	DIRECTION OF TRAVEL



NYS RTE 205 AT I-88 WB OFF-RAMP

NEW LEAF - WIND TURBINE ROUTING STUDY  
489 SICKLER RD, STARK, NY 13361



PROJECT:

121-310

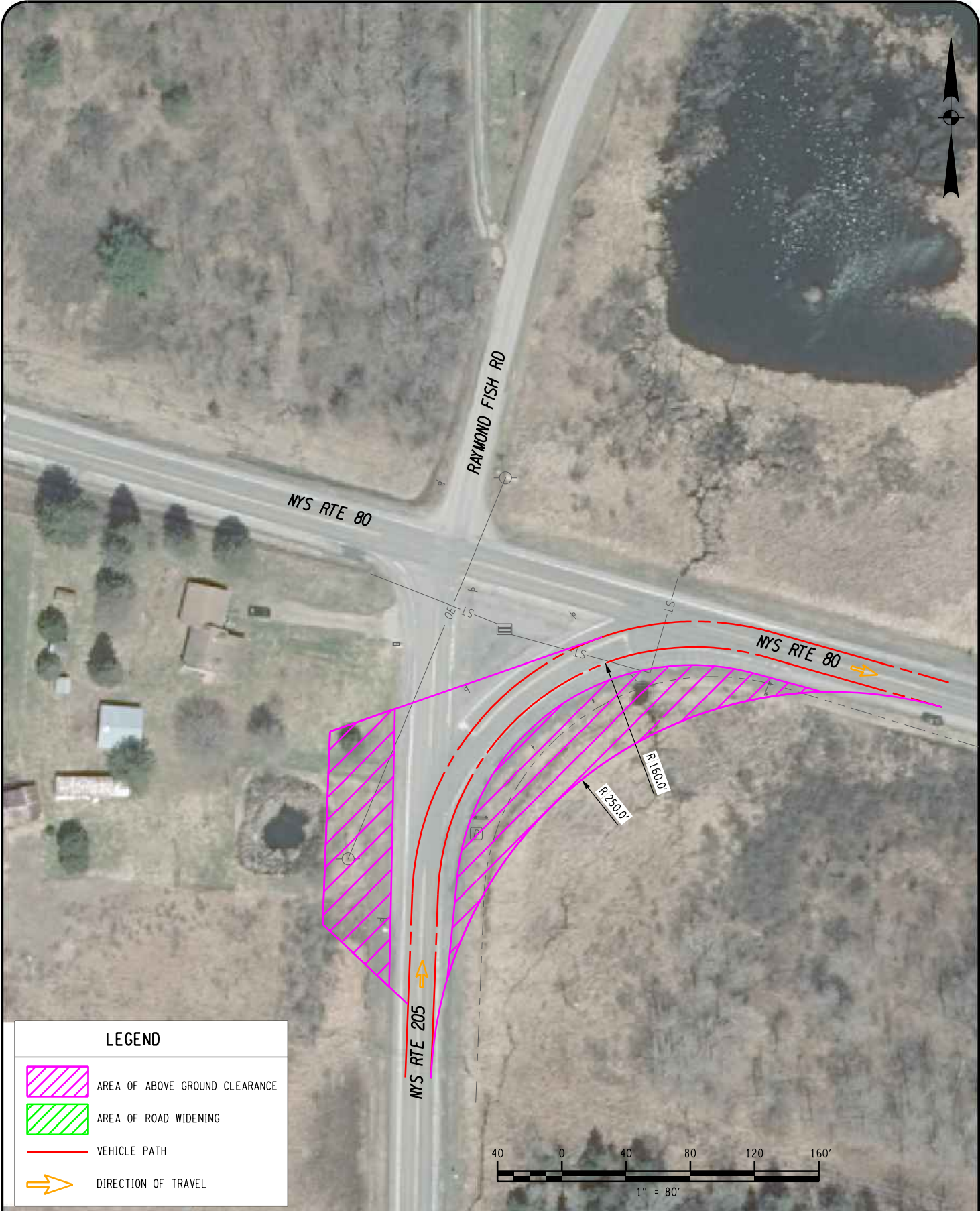
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01/2023





FIGURE:

R1

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-  AREA OF ABOVE GROUND CLEARANCE
-  AREA OF ROAD WIDENING
-  VEHICLE PATH
-  DIRECTION OF TRAVEL

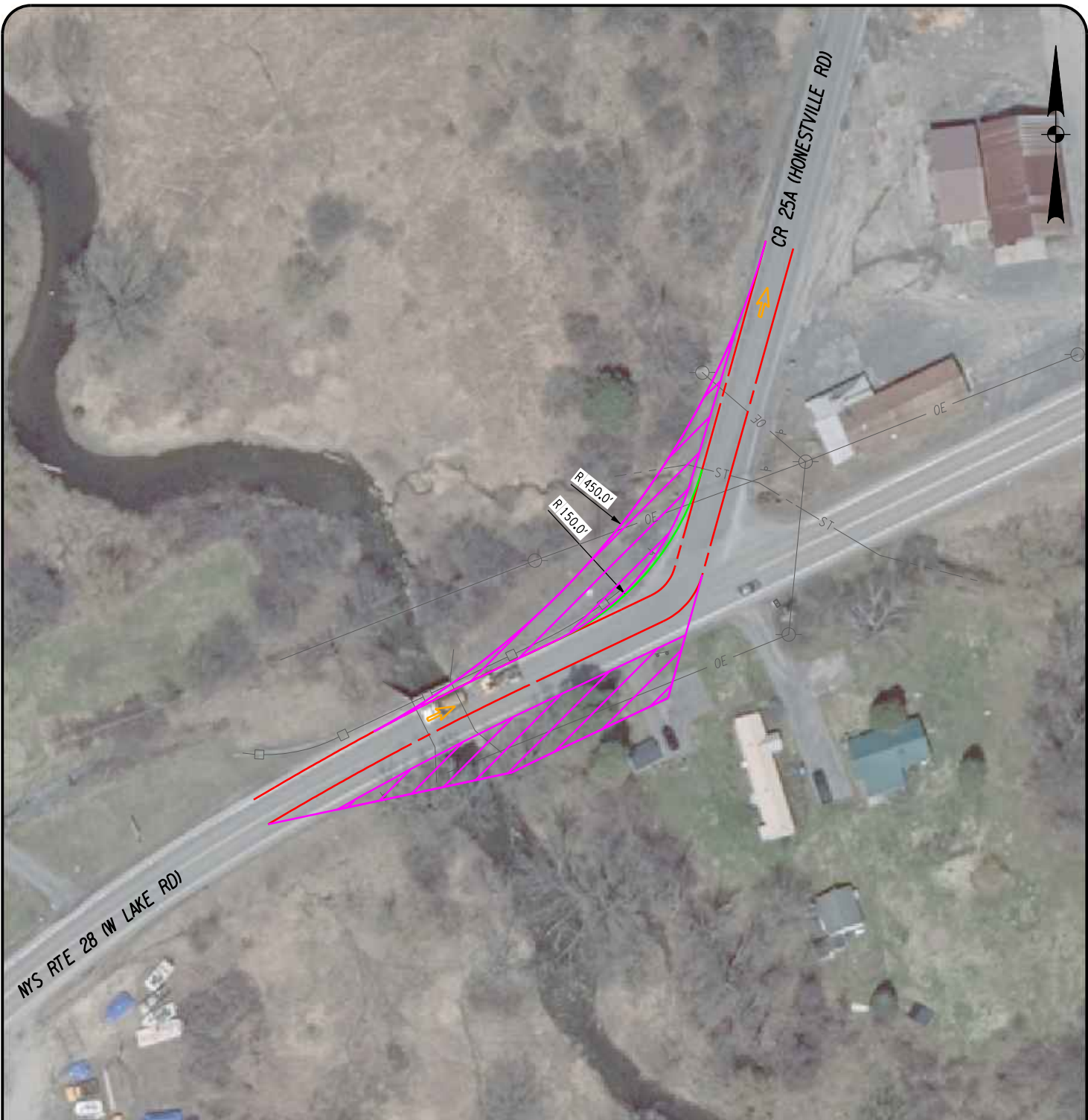
NYS RTE 80/NYS RTE 205 AT RAYMOND FISH RD





NEW LEAF - WIND TURBINE ROUTING STUDY  
489 SICKLER RD, STARK, NY 13361

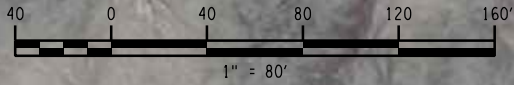




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LEGEND	
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	VEHICLE PATH
	DIRECTION OF TRAVEL

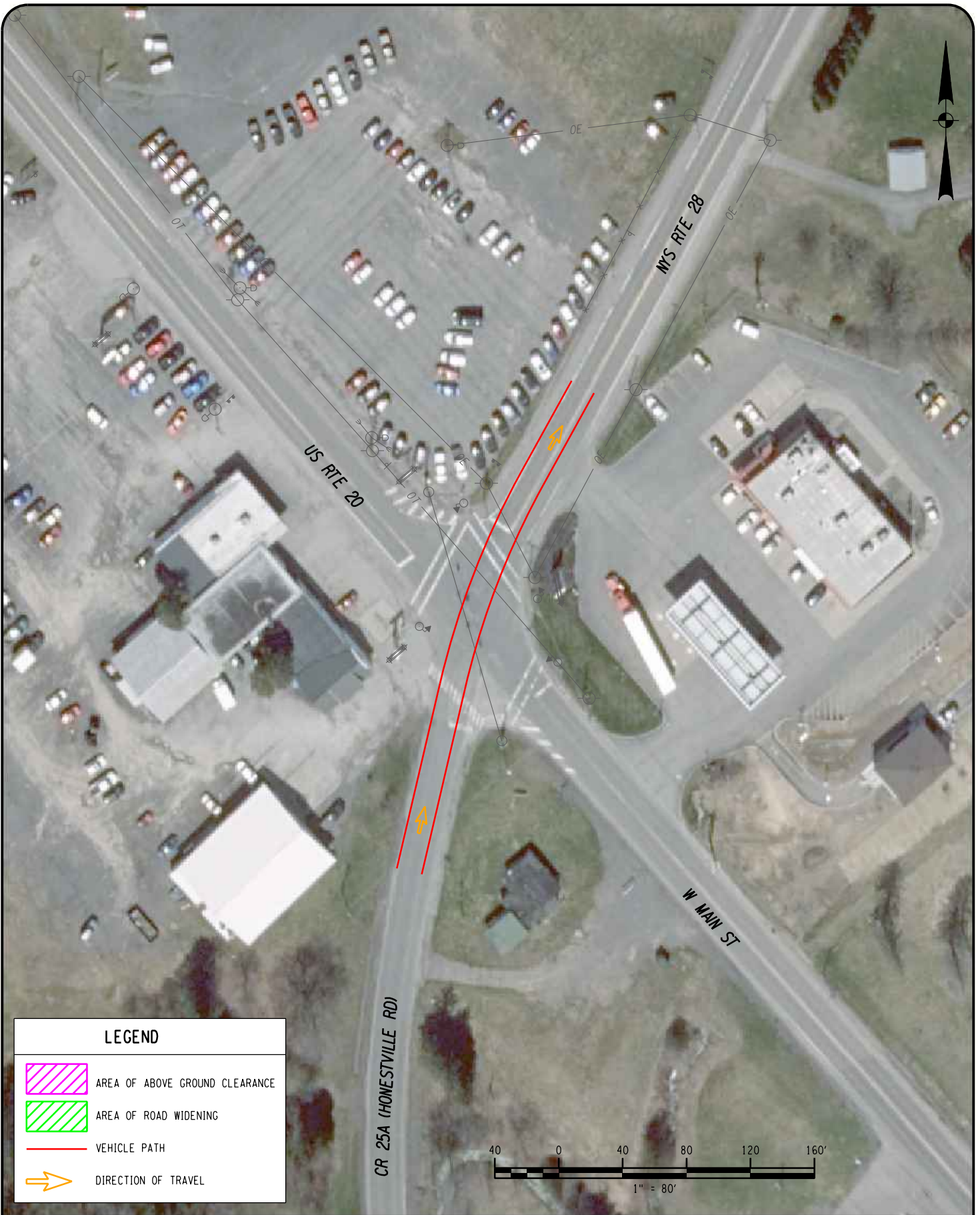






NYS RTE 28 (W LAKE RD)  
AT CR 25A (HONESTVILLE RD)

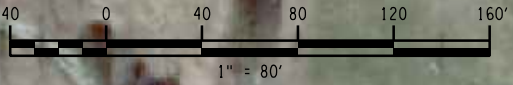
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489 SICKLER RD, STARK, NY 13361

		
PROJECT: 121-310	DATE: 01/2023	FIGURE: R4

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LEGEND	
	AREA OF ABOVE GROUND CLEARANCE
	AREA OF ROAD WIDENING
	VEHICLE PATH
	DIRECTION OF TRAVEL



US RTE 20/NYS RTE 28/CR 25A/ AT W MAIN ST

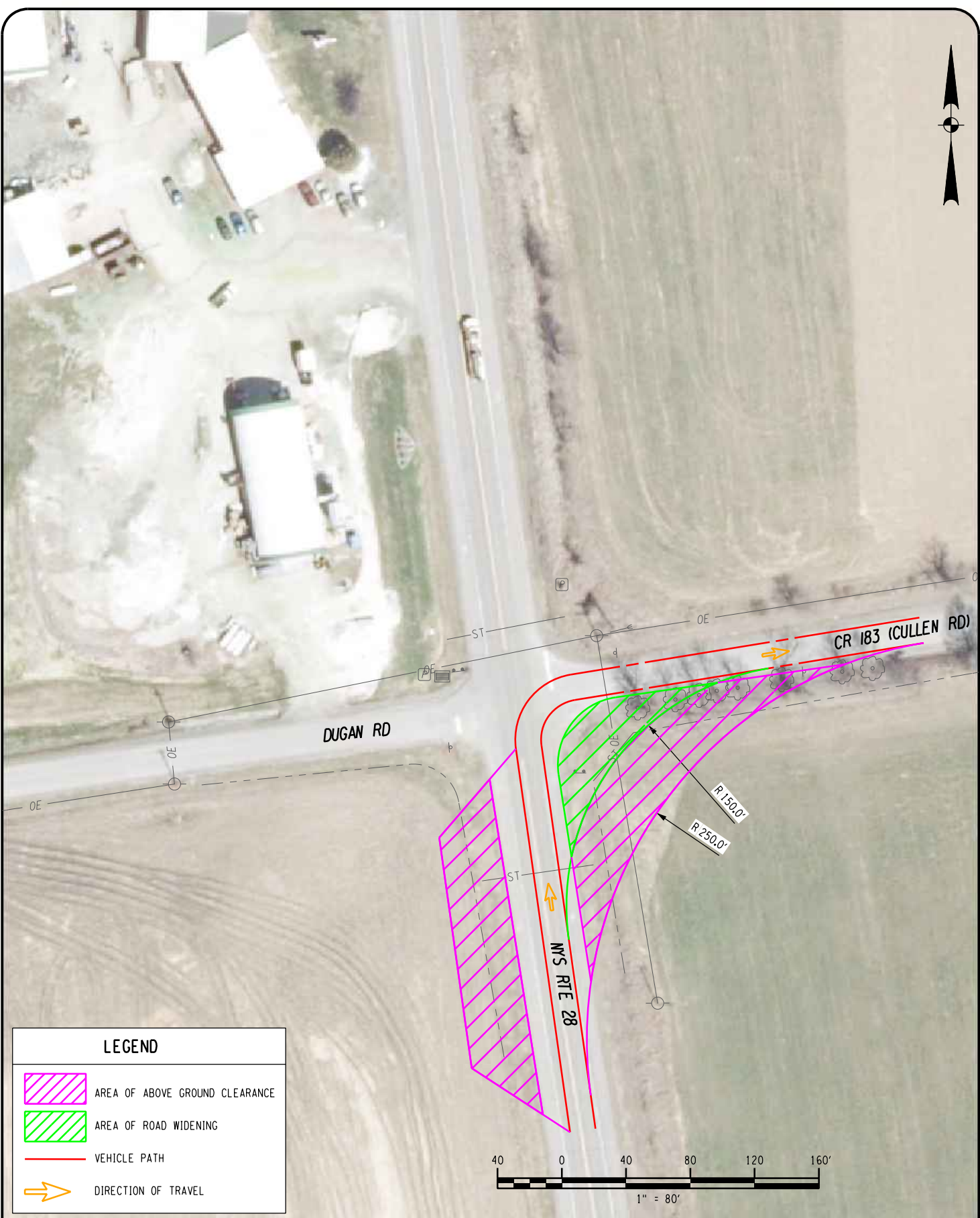
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489 SICKLER RD, STARK, NY 13361







PROJECT: 121-310
DATE: 01/2023
FIGURE: R5



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LEGEND	
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	AREA OF ROAD WIDENING
	VEHICLE PATH
	DIRECTION OF TRAVEL

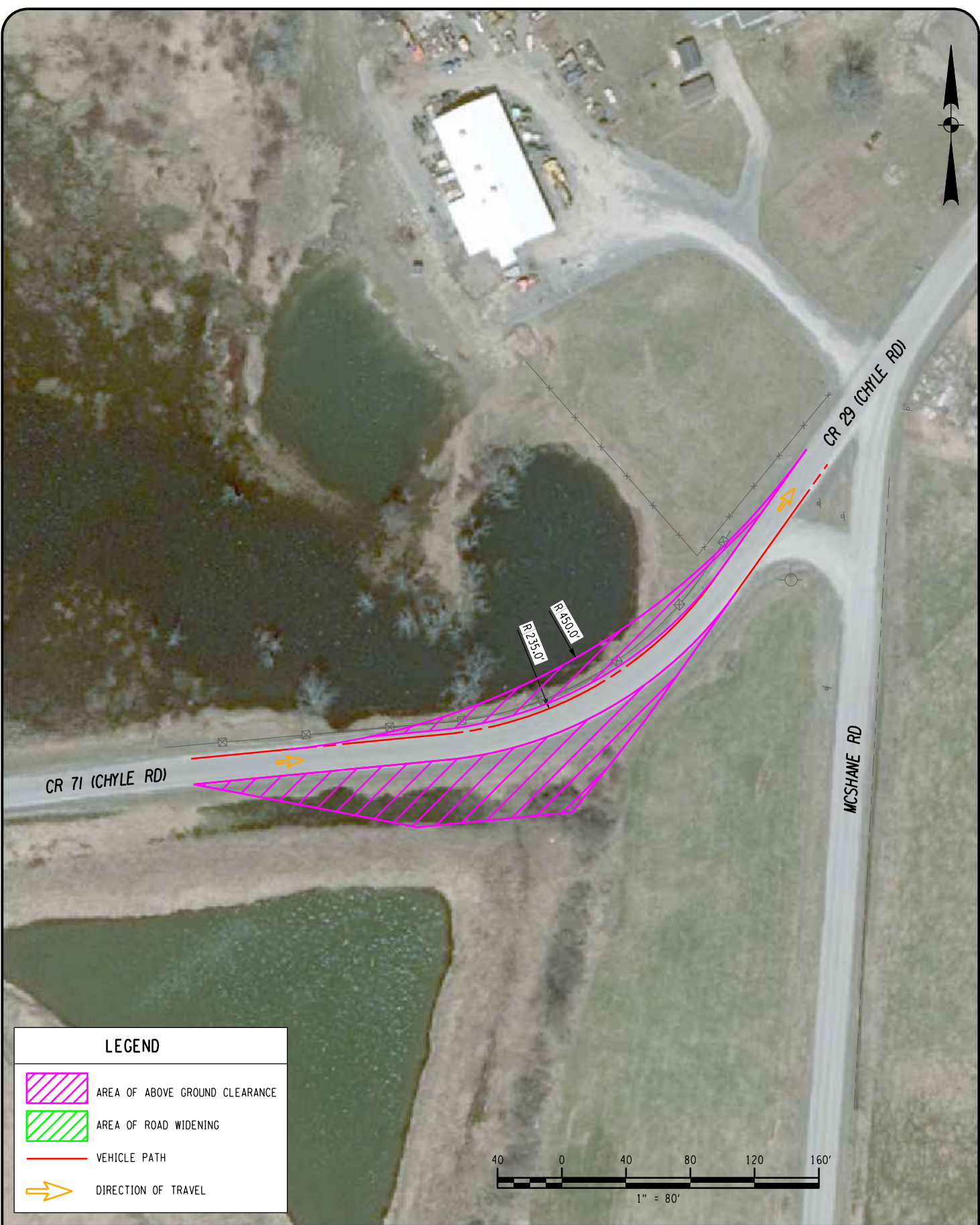
DUGAN RD AT NYS RTE 28/CR 183 (CULLEN RD)





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489 SICKLER RD, STARK, NY 13361

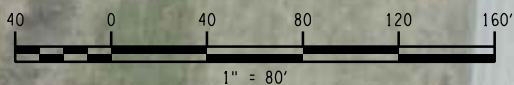




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LEGEND	
	AREA OF ABOVE GROUND CLEARANCE
	AREA OF ROAD WIDENING
	VEHICLE PATH
	DIRECTION OF TRAVEL



CR 29 (CHYLE RD)/CR 71 (CHYLE RD) AT MCSHANE RD





NEW LEAF - WIND TURBINE ROUTING STUDY  
489 SICKLER RD, STARK, NY 13361

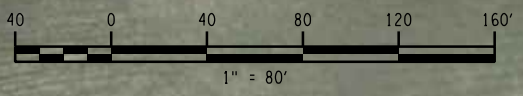




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LEGEND	
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	AREA OF ROAD WIDENING
	VEHICLE PATH
	DIRECTION OF TRAVEL



CR 29 (CHYLE RD) AT SICKLER RD

NEW LEAF - WIND TURBINE ROUTING STUDY  
489 SICKLER RD, STARK, NY 13361



PROJECT: 121-310	DATE: 01/2023	FIGURE: R8
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**New York State Department of Transportation  
General Bridge Inventory Report**

BIN: 1019990    Feature Carried: 28 28 94033298    Feature Crossed: HERKIMER CREEK  
Date Updated: 10/11/22

***Posting***

Posting Recording Date: 12/07/16

Posted VC On (ft):

Posted VC On (in):

Posted VC Under (ft):

Posted VC Under (in):

Posted Load (Tons): 0

Posted Load Date: 12/07/16

Comment: R posting removed - New Structure