WATKINS GLEN SOLAR ENERGY CENTER

Case No. 17-F-0595

1001.25 Exhibit 25

Effect on Transportation

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Exhibit 25: Effect on Transportation

This Exhibit will track the requirements of Stipulation 25, dated February 21, 2020, and therefore, the requirements of 16 New York Codes, Rules and Regulations (NYCRR) § 1001.25.

25(a) Conceptual Site Plan

Preliminary Design Drawings for the Project are included in Appendix 11-1. These plans identify the proposed solar panel locations, access road locations and widths, and other related Project plans and details.

Details specific to Project access roads and intersections showing horizontal and vertical geometry, number of approach lanes, lane widths, shoulder widths, and traffic control devices are included in Appendix 11-1. Intersection sight distances at the proposed access roads are also included in Appendix 25-1. According to the requirements of 16 NYCRR § 1001.25(2), characterization of public road intersection suitability is required for Projects that include wind turbines. Due to the nature of the Project, expected size of the material, and lack of turbines, characterization of the public road intersection suitability outside the Project Area is not applicable.

There are no identified bridge weight limits within the vicinity of the Project Area. However, the following roadways have posted truck weight limit restrictions within the Project Area. Haul routes exceeding these limits should avoid the roads and use an alternate route:

- NY-414 – 9-ton weight limit, 0.5 miles south of CR-16;
- Bronson Hill Road – 10-ton weight limit, along the entire route;
- CR-16 – 5-ton weight limit, east of NY-414 to Genesee Street; and
- CR-17 – 5-ton weight limit for northbound traffic from CR-16 to SR-329.

Additionally, based on conversations with the Town of Dix Highway Superintendent, most local roads in the Town have weight limit restrictions of 5, 8, or 10 tons. Specifically, in the Project Area, both Baker Hill Road and Kuhl Winner Way have 8-ton weight restrictions. Refer to Section 25(d)(5) for details regarding the Applicant's intention to enter into a road use agreement with the Town for use of these roads during construction.

Sight distance diagrams were developed for the proposed access roads at the entrance/exit for the permanent site entrance on the west side of Baker Hill Road (approximately 680 feet north of the intersection of Heddon Road/Baker Hill Road) and the permanent site entrance/exit on Heddon Road (approximately 1,250 feet east of the intersection of Heddon Road/Baker Hill Road), the temporary entrance/exit on the east side of Baker Hill Road (approximately 350 feet north of the intersection of Heddon Road/Baker Hill Road), a permanent site entrance/exit on Kuhl-Winner Way (approximately 1,160 feet north of the intersection of Hedden Road and Kuhl-Winner Way), and a driveway on Kuhl-Winner Way approximately 800 feet southeast of the intersection of Hedden Road and Kuhl-Winner Way to serve the Substation and Switchyard. The recommended setback for the decision point is 14.5 feet from the edge of the roadway, plus half the distance to the required travel lane. For all roadways without a posted speed limit on the roadway, it is to be assumed that the legal speed limit is 55 miles per hour (mph) according to the NYSDOT Highway Design Manual (HDM), which according to the NYSDOT HDM Chapter 5 Appendix 5C, Table 5C-3 and Table 5C-4, has a recommended sight distance of 610 feet for left-turning vehicles and 530 feet for right-turning vehicles for passenger cars and 930 feet for left-turning vehicles and 850 feet for right-turning vehicles for combination trucks. These recommended distances reduce significantly at lower speeds and it is likely that vehicles are traveling at lower speeds in this area. These tables are shown below.

Table 25-1. Design Intersection Sight Distance for Left-Turning Vehicles

Table 5C-3 Design Intersection Sight Distance (in feet) - Case B1 - Left Turn From Stop

Design speed (mph)	Passenger Car Lanes Crossed			Single-Unit Truck Lanes Crossed			Combination Truck Lanes Crossed		
	1	2	3	1	2	3	1	2	3
15	170	180	190	210	225	245	255	270	285
20	225	240	250	280	300	325	340	360	380
25	280	295	315	350	375	405	425	450	475
30	335	355	375	420	450	485	510	540	570
35	390	415	440	490	525	565	595	630	665
40	445	475	500	560	600	645	680	720	760
45	500	530	565	630	675	725	765	810	855
50	555	590	625	700	750	805	850	900	950
55	610	650	690	770	825	885	930	990	1045
60	665	710	750	840	900	965	1015	1080	1140
65	720	765	815	910	975	1045	1100	1170	1235
70	775	825	875	980	1050	1125	1185	1260	1330

Table 25-2. Design Intersection Sight Distance for Right-Turning Vehicles

Table 5C-4 Design Intersection Sight Distance (in feet) - Case B2 - Right Turn From Stop and - Case B3 - Crossing Maneuver

Design Speed (mph)	Passenger Car Case B2-- Lane Entered Case B3 – Lanes Crossed			Single-Unit Truck Case B2-- Lane Entered Case B3 – Lanes Crossed			Combination Truck Case B2-- Lane Entered Case B3 – Lanes Crossed		
	1	2	3	1	2	3	1	2	3
15	145	155	170	190	205	220	235	250	265
20	195	210	225	250	275	295	310	330	350
25	240	260	280	315	340	365	390	415	440
30	290	310	335	375	410	440	465	495	525
35	335	365	390	440	475	510	545	580	615
40	385	415	445	500	545	585	620	660	700
45	430	465	500	565	610	655	695	745	790
50	480	515	555	625	680	730	775	825	875
55	530	570	610	690	745	805	850	910	965
60	575	620	665	750	815	875	930	990	1050
65	625	670	720	815	880	950	1005	1075	1140
70	670	725	775	875	950	1020	1085	1155	1225

Additional Sight Distance Tables from the American Association of State Highway and Transportation Officials (AASHTO) – A Policy on Geometric Design off Highways and Streets, Seventh Edition, 2018, which forms the basis for the NYSDOT Sight Distances referenced above are contained in Appendix 25-1. The AASHTO Tables show the Stopping Sight Distances, which are the minimum Sight Distances. It is noted that some of the sight distances were determined based upon photos and aerials.

The only location where the minimum sight distance (Stopping Sight Distance) for 55 mph could not be met occurred at:

- The temporary Site Entrance/Exit on the east side of Baker Hill Road looking left (Left and Right-Turning Vehicles).

For the temporary Site Entrance/Exit on the east side of Baker Hill Road looking left, the sight distance is impacted by some slight curvature at the intersection of Baker Hill Road and Heddon Road (which is controlled by a Yield sign on Heddon Road). Traffic turning from Heddon Road onto Baker Hill Road will likely not be traveling at 55 mph. The Stopping Sight Distance along Baker Hill Road meets the requirement for 40–45 mph. In addition, because of the height of the seated truck driver and the height of the trucks, truck drivers can see a farther distance and trucks can be seen at a farther distance, thus further increasing the available standard Stopping Sight

Distance. Trimming vegetation will also improve the intersection sight distance at the proposed access location. Signage could be added if determined necessary during construction.

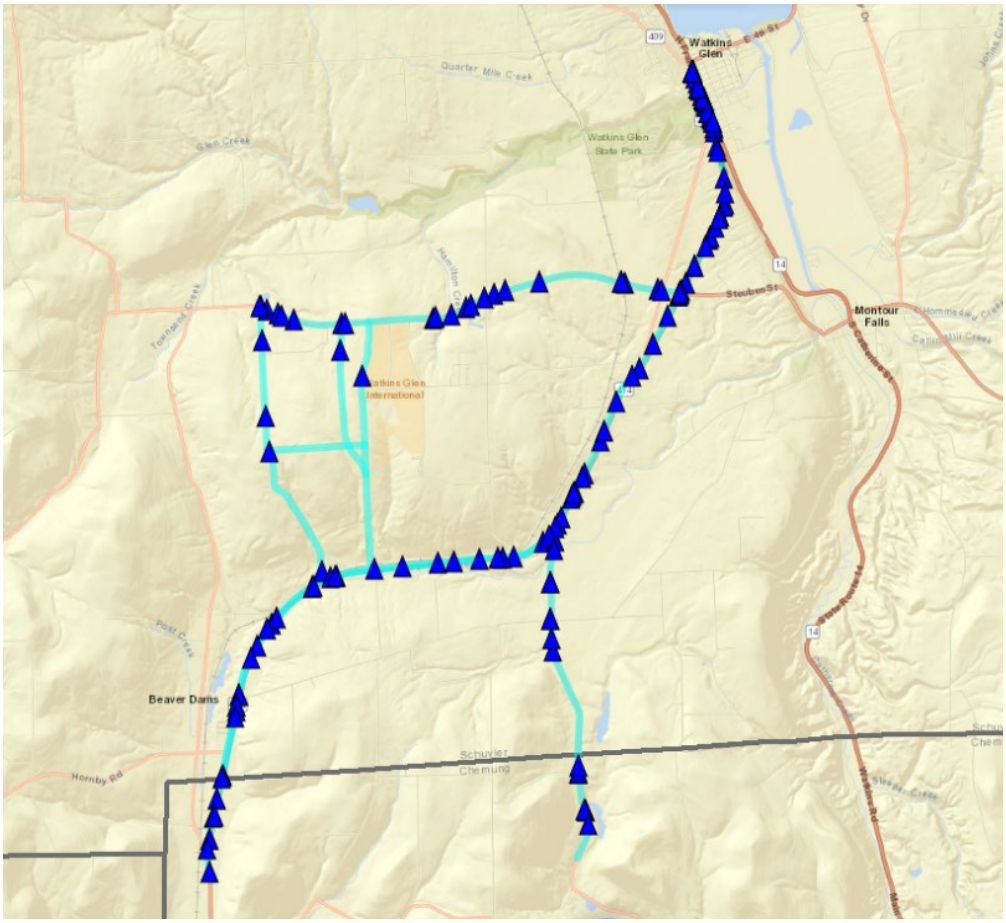
25(b) Description of the Pre-construction Characteristics of Roads in the Vicinity of the Project

(1) Traffic Volumes and Accident Data

Existing traffic volume data was obtained from the NYSDOT Traffic Data Viewer and NYSDOT Highway Data Services Bureau, where historical traffic count data is available online. Average Annual Daily Traffic (AADT) volumes for roads within the Project Area are provided by route in Appendix 25-3.

Existing accident data for the Project Area was obtained from NYSDOT through a Freedom of Information Law (FOIL) Request. Accident data was obtained for segments within a 5-mile radius to the Project Area (see Graphic 25-1) for a 3-year period from 2017–2019 and is summarized in Appendix 25-4 by case number. During that 3-year period, there were a total of 168 accidents, with 65 (39%) accident types involving a deer or other animal, 35 (21%) rear end, 27 (16%) fixed object, 18 (11%) angle, and 23 (13%) other. Of the 168 accidents, 118 (70%) accidents were listed as property damage only, 23 (14%) accidents involved some type of injury, and 27 (16%) accidents were non-reportable. The breakdown by year for the 3-year period is as follows: 56 accidents in 2017, 59 accidents in 2018, and 53 accidents in 2019. Nearly half the accidents occurred on NY 414 (71) with a majority involving animals.

Graphic 25-1. Project Area Accident Map



(2) Transit Facilities and School Bus Routes

Schuyler County Transit has limited routes within the Project Area. Transit routes and schedules are included in Appendix 25-5. While transit vehicles and construction-related vehicles will share some of the same roadways, transit stops are not located directly on roadways used by construction vehicles; therefore, the impacts to the local transit routes are expected to be minimal.

School bus routing and stop information was obtained from the Watkins Glen Central School District. Though road closures are not anticipated, should any local roadways need to be temporarily closed during construction for a short period of time, the contractor (or Applicant) will contact the appropriate local agencies to provide notifications. Construction of the Watkins Glen Solar Energy Center is not expected to impact school bus stop locations, but in the event that stops are impacted, the contractor (or Applicant) will provide safe accessible waiting areas. Additional information regarding the School Bus Routes is contained in Appendix 25-5.

(3) Emergency Service Approach and Departure Routes

Emergency services, if necessary, would be provided by various entities including, but not limited to:

- Beaver Dams Volunteer Fire Department
  1165 County Road 19
  Beaver Dams, New York
- Watkins Glen Fire Company
  201 North Perry Street
  Watkins Glen, New York
- Watkins Glen Police Department
  303 North Franklin Street
  Watkins Glen, New York
- Schuyler County Ambulance and Emergency Services
  909 South Decatur Street
  Watkins Glen, New York

In the event of an emergency, the local emergency service providers will take the most direct/fastest available route to the Project Area, depending upon current conditions and their starting locations as their origin points may change due to other emergencies or if a police vehicle is on patrol at the time, as well as the location at the Site. From the Beaver Dams Volunteer Fire Department, the likely route could be north on CR 19 to east on CR 16, while another possibility would be taking SR 414 north to the Site. For the Watkins Glen Fire Company, Watkins Glen Police Department, and the Schuyler County Ambulance and Emergency Services, the likely routes would be either SR 414 South or CR 17 South to CR West. Illustrations of these routes are contained in Appendix 25-2.

Discussions with Watkins Glen Fire Department indicated that they had no concerns, find acceptable a 12-foot-wide access road, and would prefer the use of a Knox box for access to the facility. The Applicant also consulted with other Emergency Service providers throughout the Application process. The Applicant will continue to reach out and coordinate with the local emergency service providers throughout the development and construction process, so that they

are aware of road closures (if necessary) that may impact their routing decisions. They will also be kept informed of expected site work and the number of workers so they can plan accordingly.

(4) Load Bearing Structural Rating Information

No bridges with weight restrictions were identified in the project area; however, the NYSDOT may issue weight and speed restrictions when weather conditions dictate. As described above in Section 25(a), there are some roadways in the area with weight restrictions.

(5) Urbanized Areas Traffic Volume Summary

The Project is not within a congested urbanized area, therefore 24-hour traffic volume counts and peak turning movement counts for typical weekday morning, weekday afternoon, and Saturday peaks, at representative critical intersections are not applicable and are not included in this Application.

25(c) Facility Trip Generation

(1) Number, Frequency and Timing of Vehicle Trips

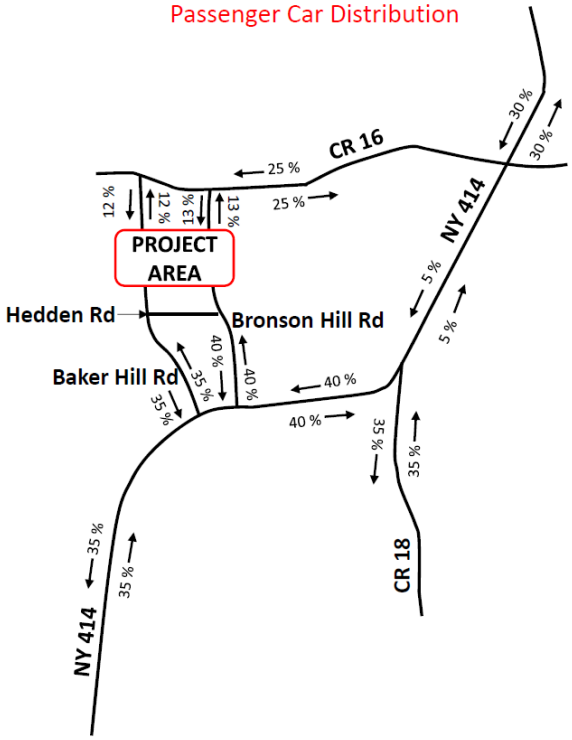
To better understand how the construction of the Watkins Glen Solar Energy Center will potentially impact the adjacent roadway system, trips were generated for the Project Area based on the peak construction workforce and construction equipment deliveries. Typically, these trips would be calculated using the Institute of Transportation Engineers (ITE) Trip Generation Manual, where data from similar sites has been collected and aggregated to provide estimates for peak hour and daily site traffic volumes. However, there are no published trip generation rates for solar facility construction or similar type construction. The peak construction workforce for this Project is expected to be approximately 100 workers, which was distributed to/from the Project Area, conservatively assuming one worker per vehicle per day. In addition to construction workforce trips, construction equipment delivery trips were included in the traffic analysis for the construction period. Table 25-3 provides a detailed summary of the expected construction and Project material delivery vehicles with a brief overview in the subsequent section. Load trips for the “Equipment and Installation” phase (69 trips) were added to the peak construction workforce to conservatively simulate the worst-case traffic operation scenario during the construction period. Graphic 25-2 shows the estimated distribution percentages used in calculating construction worker trips and construction equipment deliveries to and from the Project Area. Because of weight restrictions on certain roadways, a separate distribution is provided for passenger cars and trucks. There are

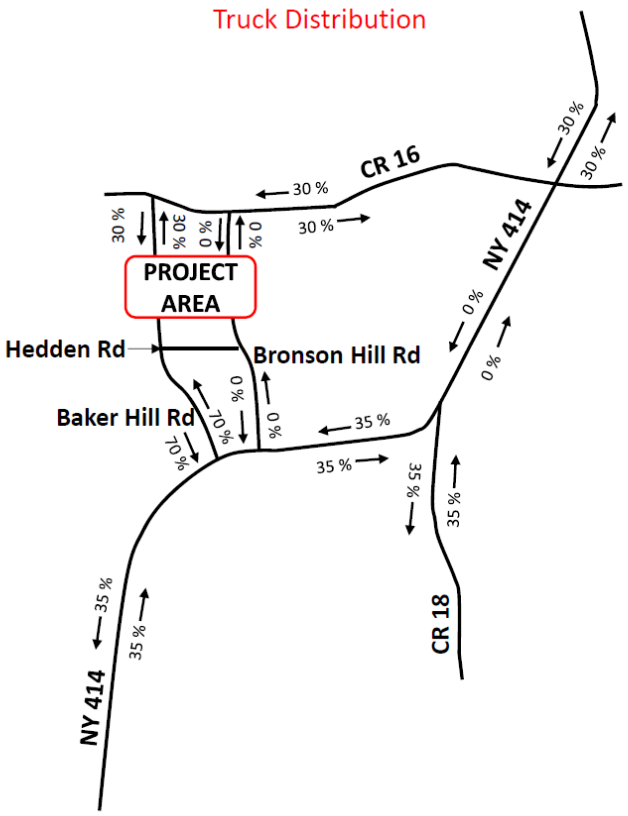
other potential routes that some vehicles may take such as CR 16 eastbound, but the routes illustrated were utilized to be conservative in the Traffic Analyses. Additional details regarding these routes are described in Section 4 below.

During the operational phase of the Project, two employees will be on site periodically for vegetation management and routine Project Component maintenance. Heavy vehicles/equipment will not be traveling to and from the site regularly. This workforce will not affect traffic around the Project Area and will have no impacts on adjacent roadways. Details on frequency of employee visits to the Project for operations and maintenance is provided in Appendix 5-3, Preliminary Operation and Maintenance (O&M) Plan.

Construction of the Watkins Glen Solar Energy Center will comply with the substantive requirements of the Town of Dix and Schuyler County local laws and ordinances as they relate to transportation and construction vehicle deliveries. The peak construction trips were combined with the roadway peak hours for analysis purposes to be conservative. Refer to Exhibit 31 for further analysis.

Graphic 25-2. Project Area Site Distribution Percentages





Site Preparation and Grading Equipment

Graders – It is expected that there will be two graders used for the site preparation and grading of the Project. Each grader will have a 174-horsepower (hp) engine and have an approximate weight of 43,000 pounds (lbs.) per vehicle.

Rubber-tired Loaders – It is expected that there will be two rubber-tired loaders in use. Each loader will have a bucket capacity of approximately 2.1 to 5.0 cubic meters and a maximum hp of 164. The weight of the rubber tired loader is approximately 31,000 lbs.

Scrapers – It is anticipated that there will be two scrapers used with approximately 313 hp each. The approximate operating weight is 80,000 lbs. for each scraper.

Water Trucks – It is expected that there will be two water trucks in use at the Project Area. Each truck will be equipped with a 189-hp engine. Depending on the size of the tank, the average weight can be 50,000 lbs. to 75,000 lbs. For every 2,500 gallons of liquid, the average approximate weight will be an additional 25,000 lbs. over the weight of the vehicle carrying the tank, which can range from 17,000 lbs. to 25,000 lbs.

Generator Sets – Two generator sets will be delivered and used for the construction of the Project.

Trenching and Road Construction Equipment

Excavators – Three excavators will be delivered and used for the construction of the Project. It is approximated that each excavator will weigh roughly 50,000 lbs. The net power for the excavator will be approximately 168 hp.

Trencher – There will be two trenchers used at the Project Area. These trenchers will have an operating power of approximately 63 hp.

Equipment Installation

Crane – It is expected that a Lattice Crawler Crane will be used to construct the Project. Typical transportation of these cranes requires disassembly and placement on a trailer. It is expected that each crane set up will require approximately seven trailer loads with the main transport load weighing approximately 80,000 lbs.

Forklifts – Eight forklifts will be in operation during construction of the Project. The weight of each forklift is approximately 25,000 lbs. Each forklift is approximately 145 hp.

Pile Drivers – It is estimated that ten pile drivers will be in use at the Project Area. Each pile driver will have an approximate weight of 30,000 lbs.

Pickup Trucks/ATVs – There will be approximately 45 pickup trucks and ATVs entering the Project Area during construction.

Construction Equipment and Materials

Aggregate Trucks – Temporary and permanent access road will be constructed at the Project Area to provide access from the existing roadways. The access roads will be constructed of approximately 5,277 cubic yards gravel aggregate material. A total of 240 dump trucks with an approximate carrying capacity of 22 cubic yards and a weight of 80,000 lbs. will be used to deliver the materials to the Project Area. Construction is expected to occur during the first 3 months, which equates to approximately 4 truck trips per day.

Based on the preliminary cut (approximately 170,904 cubic yards, excluding topsoil) and fill (approximately 159,709 cubic yards, excluding gravel) calculations performed in Exhibit 21, no

soil is expected to be removed during construction. There will be an excess of approximately 11,198 cubic yards of material, which will be distributed throughout the site.

Concrete Trucks – Concrete will be necessary for perimeter fencing and substation foundations associated with the Project. Approximately 1,900 cubic yards of concrete will be needed for fencing. Trucks with an approximate capacity of 8 cubic yards and a weight of 70,000 lbs. will be used to deliver the material to the Project Area. These vehicles will be of legal size and weight, not exceeding 80,000-lb. load limits. Construction is expected to occur during the last couple months of construction, which equates to approximately 6 truck trips per day.

Conventional Semi-Trailers – Semi-trailers will be used to transport the solar array components and construction equipment to the Project Area. These vehicles will be of legal size and weight, not exceeding 80,000-lb. load limits.

Based on the expected transportation methods and proposed construction work, Table 25-3 below, summarizes the expected number of loaded trips generated entering the Project Area.

Table 25-3. Expected Number of Loaded Trips

Equipment/Activity	Construction Equipment	Trips
Site Preparation and Grading	Graders (174 hp)	2
	Rubber Tired Loaders (164 hp)	2
	Scrapers (313 hp)	2
	Water Trucks (189 hp)	2
	Generator Sets	2
Trenching and Road Construction	Excavators (168 hp)	3
	Graders (174 hp)	2
	Water Trucks (189 hp)	2
	Trencher (63 hp)	2
	Rubber Tired Loader (164 hp)	2
	Generator Sets	2
Equipment and Installation	Crane (399 hp)	1
	Crane (165 hp)	1
	Forklifts (145 hp)	8
	Pile Drivers	10
	Pickup Trucks/ATVs	45
	Water Trucks (189 hp)	2

Table 25-3. Expected Number of Loaded Trips

Equipment/Activity	Construction Equipment	Trips
	Generator Sets	2
Commissioning	Pickup Trucks/ATVs	5
Access Roads	Dump Trucks (22 yd^3)	735
Fencing & Substation	Concrete Trucks	340
Total		1,037

Earthwork activity, construction of access roads, and fencing installation will not occur at the same time as the peak workforce and equipment installation construction period. Added trips for these activities are expected to be approximately 4 trips per day during the first 3 months and 6 trips per day during the final 2 months, which does not exceed the peak workforce of 100 trips per day and equipment/installation phase of 69 trips. Therefore, dump trucks for earthwork/access roads and concrete trucks for fencing was not factored into the traffic analysis, which only analyzed the peak construction traffic volumes.

(2) *Approach and Departure Routes for Trucks Carrying Water, Fuels, or Chemicals*

During Project construction, all trucks carrying water, fuels, or chemicals will utilize the same delivery routes used by other construction vehicles/Project Component delivery haulers. Section 25(c)(4) below provides detailed routes to the Project Area from every direction, which applies to the haul routes as well as construction worker commuter trips.

(3) Cut and Fill Activity

Estimates using the Preliminary Design Drawings (Appendix 11-1) indicate approximately 170,904 cubic yards of material will be excavated during the facility construction. In addition, approximately 159,706 cubic yards of fill will be placed, of which approximately 16,175 cubic yards is gravel fill that will be imported to the Project Area. The remainder of the fill is derived from excavations associated with Project construction. Excess material from excavations will be distributed across the disturbed areas and blended into existing topography to return each area to its approximate original condition. Please see Appendix 11-1 for the Preliminary Design Drawings and Exhibit 21 for additional information on cut-and-fill activity.

(4) Conceptual Haul Routes and Employee Approach and Departure Routes

To Watkins Glen – Interstate 86 runs along the south side of the Project Area. State Routes 14 and 414 run north-south east of the Watkins Glen project site. The routes have exits that will lead directly to the Watkins Glen site. Illustrations of some of the key routes are contained in Appendix 25-6.

From the Northeast: Southwest-bound traffic can take Exit 12 on I-81. Make a left onto RT-281, followed by a right onto RT-13. Continue straight onto RT-34 S and bear right onto RT-34 S. Continue straight onto RT-13 S and turn right onto RT-79 E. Keep left to stay on RT-79 and keep straight onto RT-414. Turn left onto RT-14, followed by another right onto RT-414. Turn right onto CR-16, followed by a left onto Baker Hill Road. Continue until the intersection with Old Joe Road.

From the North: Southbound traffic can take Exit 42 on I-90 and exit onto RT-14 and bear right to continue onto RT-14. Make a right onto RT-414, followed by another right onto CR-16 toward the intersection with Baker Hill Road.

From the Northwest: Southeast-bound traffic can take Exit 38 on I-86 for RT-54 toward Bath. Turn left onto RT-54 and keep left until a right turn onto CR-87. Turn right onto Birdseye Hollow Road, followed by a right turn onto CR-23. Turn right onto RT-226 and turn left onto Mud Lake Road. Turn right onto CR-21. Make a left turn onto CR-16 and turn right onto Baker Hill Road until the intersection with Old Joe Road.

From the South: Northbound traffic following I-99 can take Exit 13A-B for I-86 E toward Binghamton, followed by Exit 46. Make a left turn onto RT-414 and another left turn onto Cooley Road. Turn right into Baker Hill Road until the intersection with Hadden Road.

From the Southeast: Northwest-bound traffic on I-86 W can take Exit 52A for CR-64 toward Watkins Glen. Veer left onto CR-64 W and veer right onto RT-14 N. Make a left onto Johnson Hollow Road and veer left onto RT-414. Turn right onto Cooley Road and turn right onto Baker Hill Road until the intersection with Hedden Road.

25(d) Traffic and Transportation Impacts

(1) Analysis of Future Traffic Conditions

The majority of traffic impacts will be short-term and primarily due to the temporary influx of personnel and investment during construction. Long-term effects to maintain and operate the solar farm are anticipated to be minimal. As mentioned previously in Section 25(c)(1), two employees will be on site periodically for various management/maintenance work, which is significantly fewer trips than the peak construction period of 169 additional trips; therefore, no impacts on future traffic conditions are anticipated as a result of the operation of the Project. Refer to Appendix 5-3, Preliminary O&M Plan, for details on frequency of employee visits to the Project for operation and maintenance.

(2) Evaluation of the Road System to Accommodate the Projected Traffic

With additional trips generated by the construction of the solar facility, the level of service (LOS) will be evaluated for both the existing traffic volumes and construction level traffic volumes to express the performance of the existing roadway facilities.

Existing Traffic Data

Existing traffic volume data was obtained from the NYSDOT Traffic Viewer and NYSDOT Highway Data Services Bureau, where historical traffic count data is available for downloading. AADT volumes are provided by route for a majority of the County and State Routes in the area. Traffic count data was sporadically available for many of the local roads within the Project Area. Table 25-4 below summarizes the available traffic data within the Project Area:

Table 25-4. Available Traffic Data within the Project Area

Site No.	Route/ Road Name	From	To	AADT	Count Station	Count Year
A	NY 414	Chem/Schuy Co Line	CR 16	3,151	63_0008	2016
B	NY 414	Steub/Chem Co Line	Chem/Schuy Co Line	3,990	62_0148	2016
C	CR 18	Moreland Rd	NY 414	1,305	63_6359	2016
D	Bronson Hill Rd	NY 414	Hedden Rd	272	63_7113	2016
E	Baker Hill Rd	NY 414	Hedden Rd	300	NA	NA
F	Hedden Rd	Baker Hill Rd	Bronson Hill Rd	300	NA	NA
G	CR 16	Bronson Hill Rd	CR 17	1,839	63_8015	2016

No traffic data was available for Baker Hill Road and Hedden Road. For these two segments, the AADT was estimated based on similar roads in the area.

Roadway Characteristics

Existing roadways within the Project Area fall into three functional classifications as defined by the NYSDOT Office of Technical Services and Federal Highway Administration (FHWA).

Minor Arterial – There is one Minor Arterial roadway analyzed within the Project Area: NY 414. Minor Arterials are often moderate length and usually provide a connection to a higher-level roadway, such as a Principal Arterial. In rural areas, such as the Project Area, Minor Arterials provide high travel speeds with minimal disruption to the through-traveling vehicles.

Major Collector – There are two Major Collector roadways analyzed within the Project Area: CR 18 (Johnson Hollow Road) and CR 16 (Montour Townsend Road). Major Collectors generally have few driveways and also allow for minimal disruption to the through-traveling vehicles. Major Collectors can be shorter in length and has less daily traffic than Minor Arterials.

Local Road – There are three roadways identified as Local Roads analyzed within the Project Area: Bronson Hill Road, Baker Hill Road, and Hedden Road. These roads account for the largest percentage of total roadway miles. These roadways are short and are intended for specific local access. Local roads primarily facilitate direct access to adjacent property owners with many driveways and access points.

In addition to the classifications, roadways in the Project Area are rural in nature and generally provide one travel lane in each direction with limited shoulder and roadside treatments. A majority of the existing intersections are stop-controlled.

Performance Methodology

Based on the functional classifications of the roadways in the Project Area, roadway performance was analyzed by methods described in and Chapter 15 of the Highway Capacity Manual 6th edition (HCM). Chapter 15 of the HCM provides guidance for determining the performance of Two-Lane Highways, defined as roadways where passing maneuvers take place in the opposing lane of traffic and where segments are in excess of 2 miles from the nearest signalized intersection. Chapter 15 was recently amended by the National Cooperative Highway Research Program (NCHRP) and calculations for the LOS of two-lane highways were performed using the methodology from their findings.

Two-lane highway LOS calculations were recently updated within Highway Capacity Software (HCS) 7 based on new studies performed by the NCHRP and published in the *"Improved Analysis of Two-Lane Highway Capacity and Operational Performance (2018)"*. Calculating the LOS for a two-lane highway includes the analysis of the "Follower Density" (FD). FD is calculated by examining the percent follower in the analysis direction and multiplied by the ratio of the flow rate vs. average speed in the analysis direction. This formula can be seen below on Graphic 25-3. When calculated, the LOS can be determined by comparing the FD value received to the range of values for the LOS as seen in Table 25-5 below.

Graphic 25-3. Follower Density Equation

[Taken from "Improved Analysis of Two-Lane Highway Capacity and Operational Performance (2018)"]

Follower density, for use with Table F-35 is calculated as follows.

$$FD = \frac{PF}{100} \times \frac{v_d}{S} \qquad \text{(F-25)}$$

where:

FD = follower density in the analysis direction (followers/mi),
PF = percent follower in the analysis direction,
v_d = flow rate in the analysis direction (veh/h), and
S = average speed in the analysis direction (mi/h).

Table 25-5. FD Thresholds

[Taken from "Improved Analysis of Two-Lane Highway Capacity and Operational Performance (2018)"]

Table F-35. Follower Density Thresholds

LOS	Follower Density (followers/mi/ln)	
	High-Speed Highways Posted Speed Limit ≥ 50 mi/h	Low-Speed Highways Posted Speed Limit < 50 mi/h
A	≤ 2.0	≤ 2.5
B	> 2.0 – 4.0	> 2.5 – 5.0
C	> 4.0 – 8.0	> 5.0 – 10.0
D	> 8.0 – 12.0	> 10.0 – 15.0
E	> 12.0	> 15.0

Existing LOS

Based on the existing traffic volumes and existing roadway characteristics, the existing LOS was calculated. It was assumed that the design hour of the roadway accounts for 10% of the AADT and that the directional distribution is 60% of the combined two-way design hour volume.

As shown in Table 25-6 below, under base conditions all roadways within the Project Area are currently operating as LOS A during the design hour, which indicates there are no capacity problems.

Table 25-6. Existing Traffic Volumes & Characteristics for Two-Lane Highways

Site No.	Route/Road Name	Speed Limit (mph)	Design Hour Volume (V/H)	Opposing Direction Volume (V/H)	Follower Density (FOLLOWERS/MI/LN)	LOS
A	NY 414	55	189	126	0.9	A
B	NY 414	55	239	160	1.4	A
C	CR 18	55	79	52	0.2	A
D	Bronson Hill Rd	55	16	11	0.0	A
E	Baker Hill Rd	55	18	12	0.0	A
F	Hedden Rd	55	18	12	0.0	A
G	CR 16	55	110	74	0.4	A

Construction LOS

To evaluate the impacts that the construction of the solar facility will have on the roadway system, roadways within the Project Area were evaluated with the additional construction traffic, which can then be compared to the existing roadway traffic capacity analysis. The previously developed 100 peak hour construction worker trips and 69 equipment delivery trips were added to the existing design hour traffic volumes to develop the total traffic volumes during construction. Table 25-7 below summarizes the HCS outputs for two-lane highways. Refer to Appendix 25-7 for additional information on HCS outputs for two-lane highways.

Table 25-7. Traffic Volumes & Characteristics for Two-Lane Highways During Construction

Site No.	Route/Road Name	Speed Limit (MI/HR)	Design Hour Volume (V/H)	Opposing Direction Volume (V/H)	Follower Density (FOLLOWERS/MI/LN)	LOS
A	NY 414	55	206	139	1.0	A
B	NY 414	55	317	233	2.0	B
C	CR 18	55	147	118	0.6	A
D	Bronson Hill Rd	55	60	54	0.1	A
E	Baker Hill Rd	55	107	101	0.3	A
F	Hedden Rd	55	54	48	0.1	A
G	CR 16	55	166	128	0.7	A

It is expected that all roadways will operate at LOS B or better within the Project Area for the two-lane highways during the construction period. Additional construction-related vehicles traveling the roadways will have little impact on the roadways due to the minimal existing demand. Future traffic analysis for the operating condition was not performed since that period is expected to have significantly fewer daily trips than the construction period. The construction period represents the absolute worst case in terms of total traffic volumes. Given that the construction period is not expected to have any traffic impacts, with LOS B or better at each segment analyzed, the future operations will function with equal or fewer traffic operational impacts than the construction period.

(3) Route Evaluation – Over-size Load Deliveries and Roadway Restrictions

As mentioned at the beginning of this Exhibit, no bridge weight limits were identified within the vicinity of the Project Area. Weight limit restrictions of 9 tons, 10 tons, and 5 tons were identified on NY-414, Bronson Hill Road, and County Route 16, respectively, and weight limit restrictions of 8 tons for Baker Hill Road and Kuhl Winner Way. Given that there will be oversize/overweight deliveries for this Project, portions of these roadways should be avoided if possible by vehicles exceeding the maximum load capacity. If the proposed oversize/overweight detour route is not feasible, then the condition and load rating of the roadway will be checked during the haul route evaluation. Should the pre-construction review of the roadways find reason for concern, the bridge structure will be temporarily reinforced for the oversize/overweight Project Component delivery. No other improvements are necessary to accommodate oversize/overweight vehicles that will be

used. Refer to Section 25(d)(5) for details regarding the Applicant's intention to enter into a road use agreement with the Town for use of these roads during construction.

(4) Measures to Mitigate for Impacts to Traffic and Transportation

Transit and School Busing – The Applicant will coordinate with local school districts to avoid impacts and delays to bus routes throughout the construction process. Local school districts will be advised in advance of any road closures so that alternative routes can be developed. It is expected that overall impacts to the local school districts busing program will be minimal and no significant mitigation exceeding ongoing coordination is recommended.

Emergency Response – The Applicant will coordinate with local emergency service providers throughout the construction process, so that they are aware of any sporadic road closures that may impact their routing decisions during the duration of the closure. They will also be kept informed of expected site work and number of workers so that emergency response can be planned for in advance. It is expected that overall impacts to the local emergency service providers will be minimal and no significant mitigation exceeding ongoing coordination is recommended.

Traffic Impacts – It is expected that all roadways will operate at LOS B or better within the Project Area during the peak hour of the day. The results of the traffic analysis indicate that no new traffic control devices are required and that there will be minimal impacts to the traveling public during the peak construction period and virtually no impact to the traveling public during off-peak periods. No capacity improvements or roadway upgrades are required to accommodate the construction of the proposed facilities.

(5) Road Use and Restoration Agreements

The Applicant has met with local officials in the Project Area. During these meetings the Applicant has briefed the town and county representatives about the Project, construction operations, the application process, and discussed road use agreements/permits. No major road projects or future plans were identified by any of the representatives.

The Applicant anticipates that the large dimension and weight of several Project Components (switchyard control rooms, substation poles, GSU, etc.) will require special hauling permits and/or road use agreements along the project haul routes. The types of NYSDOT and County highway permits required depend on the characteristics of the vehicle and its cargo, number of trips,

distance traveled, and duration. NYSDOT defines oversize/overweight vehicles as those exceeding the dimensions provided in Table 25-8 below (e.g., overall, inclusive of load, bumpers, etc.).

Any vehicle exceeding 16 feet wide, 160 feet long, 15 feet, 11 inches high or 199,999 lbs. will require a superload permit. The application/permit process can be submitted online through the NYSDOT website. The fee structure for the superload permit is also published online and are cumulative based on load configuration and weight.

Table 25-8. NYSDOT Over-size/Over-weight Vehicle Dimensions

		State Highway	Qualifying or Access Highway
A.	Width of vehicle, inclusive of load	8 feet	8 feet, 6 inches
B.	Height of vehicle from underside of tire to top of vehicle, inclusive of load	13 feet, 6 inches	13 feet, 6 inches
C.	Length of single vehicle inclusive of load and bumpers	40 feet	40 feet
D.	Length of a combination of vehicles inclusive of load and bumpers	65 feet	Unlimited
E.	Length of a single trailer	48 feet	53 feet
F.	Length of a single twin trailer	28 feet, 6 inches	28 feet, 6 inches

Prior to construction, the Applicant and/or contractor will obtain all necessary highway permits from the NYSDOT and the County. The final transportation plan will be provided in the Compliance Filing prior to construction, and will specify the local, county, and state roads to be used as delivery routes (both within and outside the Project Area) by construction/transportation vehicles.

Additionally, Road Use Agreements with the Town of Dix and Schuyler County will be negotiated, as required. As indicated in Exhibit 32, the Applicant is requesting that the Siting Board not supplant the procedural requirements for any required NYSDOT highway work permits and instead authorize them to approve the required road or highway work permits. The Applicant plans to enter into road use agreements, easements, or any other required approval from the Town of Dix for the installation of collection lines along Town of Dix public roads. Exhibit 31 provides a further discussion of these approvals.

In accordance with the anticipated Road Use Agreements with the Town of Dix, directly prior to construction, a survey of the agreed delivery route along local roads will be carried out by appropriately qualified engineers (and Town Highway Department as available) to assess and document current existing road conditions. Any extraordinary damage or over-run caused by vehicles during the construction period is to be repaired to agreeable standards under a Road Use Agreement with the relevant authority (Town). The Applicant will repair damage to roads affected by construction, thereby restoring the affected roads to a condition equal to or better than documented by the pre-construction survey. Roads will also be maintained in good working order during construction. The Applicant will establish a road use reparation fund or purchase a reparation bond as financial assurance that the roads damaged by the activities of the Project's construction will be repaired to the standards required by the Road Use Agreement.

25(e) Public Transportation, School Bus Routes, Aeronautical, and Military Operations

The Project is designed to avoid impacts to mass transit, and aeronautical and military operations. Mass transit systems are not present within the Project Study Area; therefore, impacts are not anticipated and mitigation measures will not be required.

As noted above, the Applicant will coordinate with local school districts to avoid impacts and delays to bus routes throughout the construction process. The Federal Aviation Administration (FAA) evaluates potential impacts on air navigation for proposed structures that exceed certain criteria, such as heights greater than 200 feet above ground level and in close proximity to public use and military airports (14 CFR §77.9(a-e)). The proposed facility will not trigger notification to the FAA. Airports and heliports have not been identified within the Project Study Area.

25(f) Federal Aviation Administration Review

As part of the construction of the Watkins Glen Solar Energy Center, no construction or alteration is proposed that requires a Notice of Proposed Construction to be submitted to the administrator of the FAA in accordance with 14 Code of Federal Regulations, Part 77 pursuant to 49 United States Code, Section 44718.

25(g) Off-site Improvements

No off-site improvements are anticipated to be necessary for the Project.

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