Heritage Wind Project

Case No. 16-F-0546

1001.25 Exhibit 25

Effect on Transportation

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EXHIBIT 25 EFFECT ON TRANSPORTATION

(a) Conceptual Site Plan

The Preliminary Design Drawings prepared in association with Exhibit 11 function as the conceptual site plan. These drawings identify access road locations and widths, the approximate number of turbines to be accessed per road, and other access roads associated with staging yards, the operation and maintenance (O&M) facility, concrete batch plant, and substation/switchyard locations. The Route Evaluation Study (see Appendix 25-A) established the Local Road Study Area, which encompasses all routes from Quaker Hill Road (State Route [SR] 98) at the town border of Elba and Barre, north to the delivery routes. The Route Evaluation Study identifies feasible delivery routes, documents existing road conditions, assesses overhead transmission lines or tree overhang to evaluate clearance, identifies intersections requiring modification to allow the delivery of components, describes trip generation characteristics specifically on oversized/overweight (OS/OW) deliveries, assesses traffic and transportation impacts, proposes mitigation measure for impacts, and analyzes traffic and accident data along proposed transportation routes. Maps detailing the route characteristics outlined above are provided in the Route Evaluation Study. The final haul routes for the turbines and necessary components will be reviewed in consultation with the Town and County Highway Superintendents, finalized in coordination with the selected turbine manufacturer, and used in the preparation of the final construction drawings.

(b) Description of the Pre-construction Characteristics of Roads in the Area

The Route Evaluation Study includes an extensive analysis of existing road and traffic conditions near the Facility Site. Data on traffic volumes, accident frequency, school bus routes, emergency service responder information, and load-restricted bridges/culverts are presented in Sections IV, IX, and X of the Route Evaluation Study and are summarized below.

(1) Traffic Volume and Accident Data

Traffic volume data within the Local Road Study Area were obtained from the New York State Department of Transportation (NYSDOT) Traffic Data Online Viewer and the Highway Data Services Website. Traffic volume data is available for all state roads and some county roads. Three state roads and one county road are present in the Local Road Study Area including, SR 98, West and East Lee Road (collectively referred to as SR 31A), and Oak Orchard Road (County Road [CR] 98). Of these roads, East Lee Road has the highest Annual Average Daily Traffic (AADT), with 4,455 vehicles per day. SR 98 has the second highest AADT count with 4,443 vehicles per day. West Lee Road and Oak Orchard Road have AADT values of 2,797 and 472 vehicles per day, respectively. Most local town roads do not have traffic data; however, based on field reconnaissance, town roads in the Local

Road Study Area appear to operate below vehicle capacity. Section IX of the Route Evaluation Study provides additional detail concerning traffic volumes on the state and county routes within the Local Road Study Area.

Accident data in the Town of Barre was requested on January 15, 2019 from the NYSDOT Region 4 office. Data received from the NYSDOT spanned from October 2013 to September 2018 and was specifically analyzed along the proposed transport routes, at distinct sections of each road.

Accident data was obtained along the following roads: SR 98, West and East Lee Road, and Oak Orchard Road. Accident data along the proposed transport routes were then compared to the statewide average (2.10 accidents/million vehicle miles). Along SR 98, the average accident rate was slightly higher than the statewide average, totaling 2.23 accidents/million vehicle miles. Additionally, Oak Orchard Road experienced an accident rate substantially higher than the state average, totaling 16.73 accidents/million vehicle miles. Local road studies within Appendix 25-A, indicate higher accident rates on this stretch of road were due to wildlife collisions, precipitation conditions or driver negligence, and not a result of existing road or intersection conditions that would otherwise impact its viability as a transport route. The accident rates along West Lee Road and East Lee Road were under the state average, with rates totaling 1.43 and 1.83 accidents/million vehicle miles, respectively. Additional details regarding accident rates can be found in Appendix B of the Route Evaluation Study.

(2) Transit Facilities and School District Bus Routes

Two school districts are located within the Local Road Study Area including the Albion Central School District and the Oakfield-Alabama Central School District. As per information provided by the Albion School District, the District has four buses operating on Oak Orchard Road, two buses on Johnny Cake Lane, Maple Street, and Mathes Road, and one bus operating on West Lee Road, Root Road, Gillette Road, Puzzey Road, and Cushing Road. These buses run between 6:30-8:30 AM and 3:00-5:00 PM, with a late bus that runs between 5:00 PM and 6:00 PM. The Oakfield-Alabama Central School District has one bus that operates in the Local Road Study Area along Eagle Harbor Road. This bus operates around 8:00 AM and 3:00 PM.

(3) Emergency Service Providers

Emergency service provider stations near the Facility include: Barre Fire Company, Clarendon Fire Company, Elba Fire Department, East Shelby Volunteer Fire Company, Oakfield Fire Department, and Alabama Fire Department. These facilities are mapped on Figure 8 of the Route Evaluation Study, which shows the approximate distances between these facilities and turbine locations. A final map of emergency service provider locations will

be posted in the Facility's O&M building (and provided to the emergency service providers) and all turbines will have a unique 911 ID/address.

On October 8, 2019, the Applicant met with the Barre Fire Company to review the Project layout and general safety practices. The Applicant will coordinate more fully with Barre Fire Company and other area emergency responders as the transportation plan becomes final after turbine selection and prior to construction.

(4) Available Load Bearing and Structural Rating Information

Load restricted bridge data within the Local Road Study Area were acquired from the NYSDOT Posted Bridges website on January 21, 2019. In addition, the Applicant's transportation consultant drove all potential haul routes to identify load-restricted bridges and/or roadways within the study area. Posted bridges have a specific weight limit, in tons, that is posted on a sign, whereas R-Posted bridges do not have a specified weight but cannot safely carry vehicles over legal weight limits. According to the NYSDOT's Highway Data Services website, there are no Posted or R-Posted bridges in the Local Road Study Area.

Maps of existing bridges are included as Figure 5 in the Route Evaluation Study. Information on these bridges is included in Section IV of the Route Evaluation Study. Roadway restrictions and deficient intersection radius locations were observed in the field and researched using NYSDOT resources. These restrictions and deficiencies are discussed in Section VI of the Route Evaluation Study. The Erie Canalway Heritage Corridor is located to the north of the Facility Site, and includes historic bridge structures. However, transportation of turbine components will generally occur south of Interstate 90. Therefore, historic bridges are not anticipated to be impacted.

Figures 4 and 5 of the Route Evaluation Study depict culverts in the Local Road Study Area. Within the Local Road Study Area, there are 110 small culverts (less than 36-inch diameter) and 13 large culverts (36-inch diameter or greater). Based on the Route Evaluation Study, approximately 21 of these culverts have less than 2 feet of cover over them. It is assumed that any culvert with less than 2 feet of cover may be susceptible to damage from transportation of heavy loads during construction. Culvert inspections do not include load ratings or sufficiency ratings, which are typically only available for bridges. These locations will be further analyzed during final engineering to determine if improvements are necessary prior to using the routes for delivery of construction materials. Any necessary improvements as well as restoration of damaged culverts will be addressed in Road

Use Agreements (RUAs)[1] with Orleans County and the Town of Barre. A preliminary version of a RUA is filed as Appendix 25-B.

The Applicant has consulted with Town and County Highway Departments to identify additional load bearing or structural hazards along proposed routes (see Section (d)(5) below). Such consultations will continue throughout the Article 10 process and prior to construction. It is anticipated that Highway Department officials will provide information on the type, thickness, widths, and restrictions of roads within the Town, as well as conditions of town road culverts. All bridges on town roads are under the jurisdiction of the County.

(5) Traffic Volume Counts

The Facility is not within a congested urbanized area. Therefore, 24-hour traffic counts are not applicable and are not included in this Application.

(c) Project Trip Generation Characteristics

(1) Number, Frequency, and Timing of Vehicle Trips

The construction of each wind turbine will require the use of approximately 10 OS/OW trucks. For the purposes of impact calculations, it is assumed that up to 33 wind turbines will be constructed. The exact construction vehicles have not yet been determined; however, it is known that the transportation of turbine components and associated construction material involves numerous conventional and specialized transportation vehicles. A summary of the types of construction vehicles that will be used to transport the turbine components and construction materials/equipment is provided below.

Wind Turbine Equipment

- Blade Sections – Blades are typically transported on trailers with one blade per vehicle. Blades typically control the length of the design vehicle, and the radius of the curve along the travel route to the site. Specialized transport vehicles are designed with articulating (manual or self-steering) rear axles to allow maneuverability through the curves.

[1] For purposes of this Exhibit, the term "Road Use Agreement" (RUA) is intended to refer to proposed agreements with the municipalities regarding the use and restoration of local roads. As discussed below, these agreements may be included in the Host Community Agreement (HCA) or in a separate RUA. A fully executed RUA between Orleans County and the Town of Barre is forthcoming; however, a preliminary RUA is included as Appendix 25-B to this Application.

- Tower Sections – Towers are typically transported in three to five sections, depending on the supplier. Towers generally control the height and width of the design vehicle dimensions.
- Nacelle – The nacelle and related elements are generally the heaviest components transported. Typically, one nacelle is transported per truck.
- Hub and Nose Cone – The hub and nose cone are typically transported with one or more of the same elements on a vehicle. These elements are not critical elements related to design vehicle dimensions.
- Escort Vehicles – Typically a car or pick-up truck.

Construction Equipment and Materials

- Gravel trucks with a capacity of approximately 10 cubic yards (cy) per truck and estimated gross weight of 75,000 pounds (lbs.) (including anticipated truck weight) will be utilized for access road construction. Currently, the access routes are approximately 68,300 feet long (12.9 miles), a minimum of 16-feet wide, and have a gravel thickness of 12 inches.
- For assembly of the wind towers, cranes are transported in sections utilizing up to 16 trucks, resulting in numerous trips to the site. Assembled cranes may be crawled between tower sites or disassembled to travel along the local roads to the next site.
- Concrete trucks for construction of turbine foundations and transformer pads with a capacity of approximately 10 cy per truck and an estimated gross weight of 96,000 lbs. (including anticipated truck weight). The total amount of concrete required at each turbine location will be approximately 1,280 cy depending on model and size of turbine selected.
- Variety of conventional semi-trailers for delivery of reinforcing steel (two per turbine foundation) and small substation components and interconnection project material.
- Variety of conventional vehicles carrying water, fuels or other equipment and materials for construction of the Facility.

Trucks and cars for transporting construction workers, small equipment, and tools are not included in the above list because of their minimal impact on traffic volume and road integrity.

The following table provides estimates of the total number of trips for all heavy vehicles entering the Facility Site associated with construction of Facility turbines and access roads.

Table 25-1. Estimated Total Number of Heavy Vehicle Trips Required for the Construction of Facility Turbines and Access Roads.

Component/Truck Type	Assumption	Trips

Blades	3 blades per turbine, 1 blade per truck	99
Towers	5 tower sections per turbine, 1 section per truck	165
Nacelle and Hub	4 trucks per Nacelle and Hub combination	132
Road Construction	Gravel trucks, 10 cubic yards per truck, plus other construction equipment	5,000
Crane	Several trips per access point depending on the degree of disassembly	288
Concrete	Concrete trucks, 1,280 cubic yards per turbine foundation, 10 cubic yards per truck. Approximately 128 trips per turbine.	4,290
Total Heavy Vehicle Trips		9,974

Note: A trip is defined as entry and exit from the Facility Site.

While OS/OW vehicles are traveling along delivery routes within the Facility Site, the existing traffic may experience minor delays as escort vehicles and/or flag persons stop traffic to allow safe passage. The Applicant has identified 17 routes for OS/OW vehicles transporting turbine components and supplies to the Facility Site identified as Access Routes 1 through 17. Maps of the OS/OW access routes can be found in Figure 2 of the Route Evaluation Study. A table of construction vehicle routes/volumes is presented below.

Table 25-2. Construction Vehicle Volumes

Construction Routes	Gravel (cy)	Number of Gravel Trucks	Concrete Mix (cy)*	Number of Concrete Trucks	Number of Turbines per Access Route	Number of Turbine Delivery Flatbed Trucks	Number of Crane Trucks**
Access Route 1	3,650	365	3,840	384	3	36	48
Access Route 2	4,322	432	5,120	512	4	48	64
Access Route 3	1,631	163	1,280	128	1	12	16
Access Route 4	1,933	193	1,280	128	1	12	16
Access Route 5	1,309	131	1,280	128	1	12	16
Access Route 6	3,516	352	3,840	384	3	36	48
Access Route 7	1,881	188	2,560	256	2	24	32
Access Route 8	908	91	1,280	128	1	12	16
Access Route 9	983	98	1,280	128	1	12	16
Access Route 10	1,796	180	1,280	128	1	12	16
Access Route 11	2,103	210	1,280	128	1	12	16

Construction Routes	Gravel (cy)	Number of Gravel Trucks	Concrete Mix (cy)*	Number of Concrete Trucks	Number of Turbines per Access Route	Number of Turbine Delivery Flatbed Trucks	Number of Crane Trucks**
Access Route 12	1,091	109	1,280	128	1	12	16
Access Route 13	6,164	616	7,680	768	6	72	96
Access Route 14	1,139	114	1,280	128	1	12	16
Access Route 15	2,468	247	2,560	256	2	24	32
Access Route 16	1,229	123	1,280	128	1	12	16
Access Route 17	3,404	340	3,840	384	3	36	48
Volume Totals	**39,526**	**3,953**	**42,2240**	**4,224**	**33**	**396**	**528**

* Concrete volume per foundation was determined as an average value of 1,280 cubic yards per turbine
** Number of crane trucks are 16 per assembly. In some instances, crane walks traverse multiple access roads. These totals have been split between each associated access road.

Exact scheduling of construction work and required vehicles will be determined by the Applicant's contractor. In general terms, the construction process and vehicles required would include the following on a per turbine basis:

1. Clearing and grubbing of access roads, turbine sites, and electrical collection lines – Several flatbed trailers would be used to mobilize equipment. All subsequent work would be off-road, i.e., construction traffic increases would be limited to the mobilization and de-mobilization of the trailers. This would continue throughout the Project, as necessary.
2. Grading of access roads and turbine sites – Several flatbed trailers would be used to mobilize equipment. All subsequent work would be off-road, i.e., construction traffic increases would be limited to the mobilization and de-mobilization of the trailers. This would continue throughout the Project, as necessary.
3. Access road gravel placement – The number of gravel trucks used for access road gravel placement would vary by road (see Table 25-2). Public roads would likely see a traffic increase of approximately 2-3 vehicles per hour per road during construction.
4. Foundation construction – One hundred twenty-eight concrete trucks and 10 flatbed trailers carrying reinforcing steel would be used per turbine. This would result in a public road traffic increase of approximately 6 vehicles per hour during construction.
5. Crane pad construction – The delivery of gravel for crane pad construction would result in a public road traffic increase of approximately 2-3 per hour.
6. Delivery of turbine components – A total of 10 trucks will be needed for the delivery of the components of a single turbine. These deliveries will likely be spread out over weeks. The maximum impact possible to public roads would be 10 OS/OW vehicles per day per turbine.

7. Crane delivery – Up to 16 flatbed trucks will be needed to deliver the various parts of the crane assembly. This would result in a public road traffic increase of up to 16 vehicles for each mobilization demobilization needed.

Overlap of the tasks above due to concurrent construction activities would compound these construction traffic increases. In order to inform stakeholders and the public regarding specific construction schedules, activities, routes and other details, the Applicant will maintain a website that includes a weekly update of construction activities, including a description of upcoming activities and when and where those activities will occur.

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

Facility construction will involve relatively few trucks carrying fuel, water, chemicals, or other materials. All trucks carrying water, fuels, or chemicals during Facility construction will utilize the same haul routes used by other construction vehicles/component delivery haulers.

Facility operation will not require any significant regular deliveries of fuel, water, chemicals, or other materials.

(3) Hauling for Major Cut and Fill Activities

During the preliminary design process, every effort has been made to attempt to balance the earthwork on a per access road basis so that all materials removed during construction are reused on-site and do not need to be transported. As a result, it is not anticipated that the grading to be performed would result in the transport of significant quantities of removed or imported material over roads within the Local Road Study Area.

(4) Conceptual Haul Routes and Approach and Departure Routes for Workers and Employees

Any workers and employees in regular vehicles (pick-up truck size and smaller) will access the construction site and worker parking areas through use of whichever public road route is most logical and efficient for the respective individual/vehicle. Employees entering the site with heavy haul or construction equipment (i.e., dump trucks or larger), or anything that exceeds the posted weight limits on public roads, will follow the final haul routes.

Final haul routes cannot be determined until the turbine manufacturer has been selected and has been reviewed and approved or amended. Final haul routes will be provided to the Siting Board, Town of Barre and Orleans County Highway Departments prior to Facility construction but will be filed later as a compliance filing and/or to

fulfill certificate condition obligations. When evaluating viable haul routes for delivery of turbine components and construction materials/equipment to the site, several items were considered. These items are:

- The roadway characteristics and condition;
- The number of bridges along a designated route;
- The condition of the bridges and culverts along the route;
- The number of intersections needing turning movements;
- The number of sharp curves; and
- Various potential restrictions such as narrow bridges, low overhead clearances and impacts from small intersection radii affecting the turning movements.

Based on this assessment, the recommended access routes to the various Facility locations are described below and are depicted in Appendix A of the Route Evaluation Study (see Section (d)(2) below for a description of the delivery routes).

Access Route to T10 – This access route is from SR 31A to Johnny Cake Lane to Maple Street to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas.

Access Route to T28, T29, T31, T32, and T33 – All of these turbines are off access roads off of SR 177, which was the most efficient routing. This routing needs minimal improvements to function as a viable haul route. With different access roads, the turbines could have been accessed off Powerline Road or Hindsburg Road, but additional intersection improvements would have been necessary.

Access Route to T27 – This access route is from SR 31A to Mathes Road to the access road for the turbine. This routing needs minimal improvements to function as a viable haul route, mainly the addition of a temporary turn area. This turbine could have been accessed off CR 69, but additional property coordination would have been necessary.

Access Route to T20 – This access route is from SR 31A to SR 98 to Puzzey Road and across Oak Orchard Road to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas.

Access Route to T21, T22, T23, T24, T25, T26 – This access route is from SR 31A to Angevine Road to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This routing limits the intersection improvements necessary.

Access Route to T30 – This access route is from SR 31A to Angevine Road to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This is the most efficient routing to the turbine.

Access Route to T17 and T18 – This access route is from SR 31A to SR 98 to Puzzey Road to the access roads. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This routing limits the intersection improvements necessary.

Access Route to T14, T15, and T16 – This access route is from SR 31A to SR 98 to Oak Orchard Road to Cushing Road to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This routing limits the intersection improvements necessary.

Access Route to T19 – This access route is from SR 31A to SR 98 to Oak Orchard Road to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This routing limits the intersection improvements necessary.

Access Route to T11, T12, and T13 – This access route is from SR 31A to SR 98 to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This routing limits the intersection improvements necessary.

Access Route to T1, T2, and T3 – This access route is from SR 31A to SR 98 to Root Road to Hill Road to Gillette Road to CR 25 to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This is the most efficient routing to the turbine.

Access Route to T4, T5, T6, and T7 – This access route is from SR 31A to SR 98 to Root Road to Hill Road to Gillette Road to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This is the most efficient routing to the turbine.

Access Route to T8 and T9 – This access route is from SR 31A to SR 98 to Root Road to the access road. This routing needs minimal improvements to function as a viable haul route, mainly the addition of temporary turn areas. This is the most efficient routing to the turbine.

(d) Traffic and Transportation Impacts

(1) Comparison of Traffic with and without the Project

Traffic Without the Project

Roads within the Local Road Study Area carry relatively low levels of traffic. SR 98, East Lee and West Lee Roads experience the most traffic with 4,443, 4,455, and 2,797 AADT, respectively. Town roads in the Local Road Study Area experience lower traffic volumes. If the Facility were not built, traffic levels could be expected to remain at current levels.

Traffic During Project Construction

The Applicant estimates that during Facility construction the peak traffic level will occur in late spring, when deliveries for access road aggregate, foundation concrete, turbine components, and main erection crane components are occurring simultaneously. During these peak periods, the Applicant estimates that these deliveries could result in approximately 250 trucks entering and exiting the Facility Site in a given day. Traffic associated with these deliveries and connected construction activities will occur throughout the roads within the Local Road Study Area but will be concentrated in areas where access roads or foundations are being installed.

Traffic Increases from Project Construction

During the peak construction traffic weeks, traffic levels could increase by approximately 9% on West Lee Road, 6% on East Lee Road, and 6% on SR 98 (see Figure 2 of the Route Evaluation Study). While this would be a noticeable change on these roads, it would be temporary and should not cause significant delays for drivers that normally use these roads.

Traffic Increases from Project Operation

There will be a negligible increase in traffic associated with the operation of the Facility. See the Route Evaluation Study for further details.

Increased Collision Risk

During Facility construction, the increased truck traffic from aggregate trucks, equipment delivery trucks, concrete trucks, and turbine delivery vehicles will present an additional collision risk on the roads within the Local Road Study Area. To minimize the risk of accidents, the Applicant will require contractors to drive at safe speeds and install warning signs for oncoming traffic in areas where construction or local traffic is particularly high (e.g., the entrance to the construction laydown yard). In addition, it may be necessary to provide traffic control (i.e., a contracted flag person or local police) for OS/OW delivery vehicles.

(2) Route Evaluation Study

As previously noted, the Applicant's transportation consultant drove all potential haul routes within the Local Road Study Area to identify road conditions and potential obstacles to delivery of turbine components during construction (e.g., road width, turning radii, overhead clearance, presence of bridges and culverts, presence of steep slopes, etc.). Sections I through V of the Route Evaluation Study detail the field evaluation results, conducted January 7 and 8, 2019, of potential delivery and construction vehicle haul routes. The condition of the roads was noted by visual inspection. Additionally, roadside features, bridge and roadway horizontal/vertical restrictions, bridge/culvert locations, and possible restricted intersection radii locations were also included in the evaluation. A final study will be conducted prior to construction consistent with the agreement coordinated with the local municipalities to determine if roads can handle construction traffic. The Applicant provided to the Town of Barre a draft RUA that encompasses both Town and County roads. The Town highway superintendent has been in communication with County officials regarding the RUA. The Applicant will continue to work with the Town and County throughout the Article 10 process.

SR 98 and SR 31A are two-lane, asphalt roads approximately 38 feet wide with shoulder widths of 8 feet and 9 feet, respectively. The roadway terrain is primarily flat, with minimal rolling hills. Currently, there are no load postings on the state routes, so it is assumed that these roadways can handle the heavy loads associated with the delivery of turbine components and other materials for constructing the Facility.

County roads identified in the Local Road Study Area vary in width from 18 feet to 23 feet and have shoulders ranging from 0 foot to 1 foot wide. These roadways are relatively flat and are surrounded by agricultural fields, wetlands, and residential areas. Culverts and bridges were identified along all county roads and were deemed suitable for delivery of turbine components and other materials for constructing the Facility. All county roads evaluated in the Local Road Study Area were determined to be in good condition.

Town roads evaluated in the Local Road Study Area are made of asphalt and range in width from 20 feet to 23 feet. The shoulders observed along these roads range from 0 feet to 3 feet and consist of asphalt, gravel, or dirt. Town roads in the Local Road Study Area are generally flat with some gentle rolling hills. Minimal roadside hazards were identified during the evaluation of town roads; however, local repairs, minor road widening, and tree clearing may be necessary in certain circumstances.

State and county roads will be utilized as much as possible for construction traffic within the Local Road Study Area. Where necessary, town roads will be used as the last point of access to the wind turbine locations.

Below is a description of the condition of specific road segments analyzed in the Route Evaluation Study.

State Route 98, SR 31A to W Muck Road – The length of this segment is 4.1 miles. The speed limit along this segment is 55 miles per hour (mph). The road width is approximately 38 feet and shoulder widths are approximately 8 feet. There are no large culverts along this route, and there are no culverts that have been given a poor rating indicating serious deterioration. There is one flashing yellow traffic signal along this segment of SR 98 at the intersection with SR 31A.

State Route 31A, Eagle Harbor Road to Angevine Road – The length of this segment is 7.59 miles. The speed limit along this segment is 55 mph. The road width is approximately 38 feet and shoulder widths are approximately 9 feet. There are no large culverts along this route; however, there is a 24" culvert that has been given a poor rating indicating serious deterioration. Most of the largest culverts along this route have conforming bridge/culvert rails. There is one flashing yellow traffic signal along this segment of SR 31A at the intersection with SR 98.

CR 5, 15, 25 and 45B (Eagle Harbor Road), W Lee Road to Albion Road (CR 9) – The length of this segment is 5.25 miles. The speed limit along this segment is 55 mph. The width of this asphalt road is between 21 to 22 feet, and shoulder widths are 4 feet. Most large culverts along this route have conforming bridge/culvert rails. There are three large culverts on this segment of road and twenty-three small culverts. Culvert condition ratings of fair (having minor deterioration but functioning as originally designed) to good have been assigned to these culverts, and the culverts have sufficient cover over them to withstand construction traffic.

CR 99 (West Barre Road to Root Road), Eagle Harbor Rd (CR 5) to SR 98 – The length of this segment is 3.2 miles. The speed limit for this segment is unknown, but is assumed to be generally 55 mph. The width of this asphalt road is 18 to 22 feet, and it has no shoulders. There are no bridges on this segment of CR 99. There is one large culvert along this route, and there are no culverts with shallow cover.

CR 98 (Oak Orchard Road), SR 98 to Sheelar Rd – The length of this segment is 3.4 miles. The speed limit for this segment is unknown, but is assumed to be generally 55 mph. The width of this asphalt road is 21-23 feet with shoulder width of 2 feet. There is one bridge on this segment of CR 98, which has a safety railing. There are two large culverts along this route, and they are rated as good, indicating they have only minor deterioration and are functioning as originally designed. However, there is one small (18") HDPE culvert with shallow cover.

CR 69 (East Barre Road), SR 98 to Angevine Rd – The length of this segment is 3.4 miles. The speed limit for this segment is unknown, but is assumed to be generally 55 mph. The width of this asphalt road is 21-23 feet with shoulder width of 2 feet. There is one bridge on this segment of CR 98. There are two large culverts along this route, and they are rated as good, indicating they have only minor deterioration and are functioning as originally designed. However, there is one 18" HDPE culvert with shallow cover.

Information for local roads is summarized in Figures 3 through 6 of the Route Evaluation Study, Appendix 25-A.

Once the Facility is commissioned and construction activities are officially concluded, traffic will be negligible. All traffic will be associated with Facility employees traveling to and from the O&M building and the individual turbines. Each turbine typically requires routine maintenance visits once every three months. Turbines or other Facility components will require periods of more frequent service if maintenance issue arise. Service visits typically involve one to two pick-up trucks. However, because all turbines and associated access road are located on and accessed from private land, public road use associated with routine maintenance will be limited. If major maintenance is needed (e.g., maintenance involving a crane), the language in the RUA between the Applicant and the host communities will dictate the procedures followed by the Applicant to ensure that any impacts to public roads are avoided or mitigated.

(3) Over-sized Deliveries

Existing roadway restrictions (height, width, weight) and deficient intersection radius locations were observed in the field and researched using NYSDOT resources during the preparation of the Route Evaluation Study (see Figures 7 and 9 of the Route Evaluation Study). As previously noted, the Applicant's transportation consultant drove all potentially impacted roads to identify physical restrictions/hazards. The results of this field evaluation are summarized in Section (d)(2) above. In addition, the consultant used aerial imagery to analyze 200-foot radius impacts at various intersections along haul routes. Detailed maps of intersection turning movements on aerial imagery are included in Figure 9 of the Route Evaluation Study.

Transportation of the turbine blades will require use of a 155-foot trailer. Several general concerns relating to the transportation of this and other OS/OW loads were identified during the above-referenced field evaluation. Tight curves exist along various roadways which require widening in order to accommodate the 200-foot turning radius of the OS/OW vehicles. Additionally, culverts were identified along routes in the Local Road Study Area. While

these culverts appear to be of sufficient width to accommodate OS/OW vehicles, a Special Hauling Permit Application will be required to verify suitability.

Although there are no weight restrictions along state and county roads, the Town of Barre may have local roads with load postings. Specific local concerns will be addressed with the Town Highway Department at the time the road is needed as a haul route.

For deficient intersections, the path of the 155-foot turbine blade delivery vehicle, which has a 200-foot turning radius, was evaluated along the potential travel routes to the wind turbine sites to identify temporary intersection improvements that may be required. The turbine blades extend beyond the rear trailer of the delivery vehicle and may require additional mitigation (e.g., tree removal, sign relocation, utility pole/box relocation, or removal/relocation of other tall objects).

Figure 9 of the Route Evaluation Study provides tables of proposed roadway and intersection improvements, a map showing the location of these improvements, and detailed figures showing anticipated intersection turning movements. All improvements identified in this Exhibit will require verification and/or update after a Certificate has been issued by the Siting Board, when the final turbine supplier is identified, and the delivery routes finalized.

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

Measures to mitigate impacts to traffic and transportation are presented in the Route Evaluation Study and are summarized below.

(i) Roads

As previously noted, construction of the Facility may necessitate road improvements to accommodate OS/OW vehicles. Along the potential access routes, pavement widths vary from approximately 18 feet to 25 feet. All state and county roads are rated in "good" condition and will not require significant repairs. Radii of typical intersections (to the edge of pavement) along the potential access routes vary from approximately 25 to 200 feet. A radius of approximately 200 feet is typically necessary to accommodate the wheel paths of turbine delivery vehicles; 200 feet or more may be needed for the load clearance of these vehicles. Temporary widening of the road with an aggregate roadway surface will be required to accommodate the turning movements of turbine delivery vehicles in some locations. Further mitigation may be needed if the turbine blade extends beyond the outer trailer of the delivery vehicle. Figures 3 through 7 of the Route Evaluation

Study identify locations where these road improvements, turning improvements, and other mitigation measures will likely be necessary.

These road improvements will be made at the Applicant's expense prior to the arrival of OS/OW vehicles. Final transportation routing will not be determined until after a Certificate has been issued by the Siting Board, which will allow the Applicant to determine which of the 33 turbine locations (and associated access routes) will be constructed and thus which mitigation measures, if any, must be implemented. Final transportation routing will ultimately be designed in consultation with the Town's Highway Department to avoid/minimize, to the extent practical, safety issues associated with the use of the approved haul routes, which will confine the heavy truck travel to a few select roads.

The Applicant will repair damage done to roads affected by construction within the approved haul route at no expense to the town, county, or state, thereby restoring the affected roads to equal to or better than pre-construction conditions. Asphalt and gravel roads rated "Fair" to "Good" will be monitored during construction for pot-holing and pavement deterioration to ensure safety for general construction and local traffic. The volume and weight of both the general construction traffic and turbine delivery (OS/OW) vehicles may cause accelerated distress that could require temporary repair. These temporary repairs/improvements could include repaving with asphalt, adding gravel stone, and/or temporary traffic signs, and may be stipulated as a condition of a RUA with the Town.

After completion of construction activities, permanent road improvements may be needed to address damage caused by the heavy construction vehicle traffic; roads needing temporary repairs during construction are most likely to need permanent repairs. RUAs may require contractors to repair the roadways to pre-construction conditions using appropriate treatments (e.g., oil and stone, hot or cold mix asphalt, and/or additional gravel). Once a formal study is conducted, details regarding the temporary repairs, permanent road improvements, and/or mitigation measures anticipated for specific road segments will be provided in order to complete this agreement.

The Applicant anticipates complying with the substantive requirements of the local laws related to road use. Any time restrictions on delivery of Facility components will be addressed in the HCA and/or RUA between the Applicant and Town or County during construction based on input from the Town or County Highway Superintendents.

No damage to roads due to normal operation of the built Facility is expected to occur. If any damage to local, county, or state roads is caused by operation of the Facility, repairs will be made at the Applicant's expense consistent with the RUA.

(ii) Culverts and Bridges

As discussed in Section (d)(2) above, a preliminary assessment of culverts, including the amount of cover under the roadway and over the culvert, was conducted as part of the review of all potentially impacted roadways. In addition to this preliminary review, each culvert/drainage pipe will be analyzed during the final design of roadway improvements to determine whether the amount of cover over the pipe is adequate and to identify any improvements needed to accommodate construction traffic. Necessary improvements will be addressed in the final RUA with the Town and County.

Preferred access routes have been selected to bypass deficient bridges and large culverts where possible to avoid additional mitigation. During the Special Hauling Permit application process, the NYSDOT and Orleans County Public Works Department will be required to review and approve all bridges and culverts to be traversed along the access routes in the construction phase.

(iii) Utilities and Traffic Control Devices

Along construction access routes, there are low overhead wires present that will likely need to be raised to accommodate the heights of OS/OW delivery vehicles. If necessary, permits to raise the wires will be obtained through coordination with local utility companies.

No new traffic control devices are anticipated to be necessary. As previously noted, it may be necessary to provide traffic control (i.e., a contracted flag person or a local police agency) for OS/OW delivery vehicles.

(5) Road Use and Restoration Agreements

In conjunction with this Application, the Applicant has worked with the Highway Superintendent from the Town of Barre who has in turn met with the Highway Superintendent from Orleans County. The Town of Barre has been provided with a draft copy of the HCA, which contains road use and restoration language, and with a draft RUA. The Town has shared and discussed the draft RUA with the County. The Applicant is working with the Town to finalize the HCA and the RUA.

A variety of special hauling permits will be required due to the large dimensions of the wind turbine components and construction cranes. The types of permits required will depend on the characteristics of the vehicle and its cargo, number of trips, distance traveled, and duration. The NYSDOT Central Permit Office stipulates that when any vehicle exceeds 16 feet in width, 15'-11" in height, 160 feet in length, or 200,000 pounds in gross weight, or any combination of those, a Type 1S – Superload Trip Permit is required from NYSDOT. As some of the OS/OW vehicles used in the installation of the Facility will likely exceed these metrics, the Applicant will fill out and submit a PERM 12 Form – Special Hauling Pre-Approval Form for a future Type 1S – Superload Trip Permit. The NYSDOT website, www.dot.ny.gov/nypermits, outlines the guidelines, types and fees for various special hauling permits. Referring to the website, additional Permit Forms include the Type 1S – Superload Trip Permit such as PERM 39 – Application for Special Hauling Permit, PERM 39-1VC – Vehicle Configuration Attachment, PERM 39-4 – Additional Trailer Attachment (Option 1), PERM 99 – Additional Trailer Attachment (Option 2), and PERM 85 – Special Hauling Route Survey. A Special Hauling Customer Guide is available under the PERM 30 form. The Applicant or other responsible party, such as the BOP Contractor or turbine supplier, will need to set up an account to complete the permit process. Highway Work Permits will be required from the Town and County for intersection and roadway improvements within the NYSDOT (PERM 33 Form) county and town rights-of-way.

Table 25-3 lists roadway agreements and permits required by the Town of Barre, Orleans County, and NYSDOT. The Applicant is requesting that the Siting Board not preempt these requirements, and allow the State, County, and Town to approve the listed road or highway work permits. See Exhibits 31 and 32 for additional information about local/State transportation-related permit requirements.

Table 25-3. Roadway Agreement and Permit Requirements for the Town of Barre, Orleans County, and the New York State Department of Transportation.

Agency	Road Use Agreement	Highway Work Permit to Work Within ROW	Highway Utility Permit to Work Within ROW	Special Haul Permit for Oversized/ Overweight Vehicles	Permit to Exceed Posted Weight Limit Roads	Divisible Load Overweight Permit	Contact Information
Town of Barre	✓	✓					Dale Brooks Highway Superintendent (585) 589-5100 ext. 103 dbrooks@townofbarreny.com
Orleans County	✓	✓	✓	✓			Peter Houseknecht Deputy Highway Superintendent (585) 589-6145

Agency	Road Use Agreement	Highway Work Permit to Work Within ROW	Highway Utility Permit to Work Within ROW	Special Haul Permit for Oversized/ Overweight Vehicles	Permit to Exceed Posted Weight Limit Roads	Divisible Load Overweight Permit	Contact Information
							Peter.Houseknecht @orleans county.ny.gov
NYSDOT		✓	✓	✓	✓	✓	Kevin Bush Regional Director 1530 Jefferson Road Rochester, NY 14623 (585) 272-3310

The Applicant has not entered into any private road use and/or restoration agreements with landowners. All use of private property adjacent to public roads will be allowed through its standard lease or similar easement agreement with the landowner, as opposed to a RUA.

(e) Impact of the Project on Mass Transit Systems

No rail or bus mass transit systems are expected to be impacted by the proposed Facility. There are several airports, airstrips and heliports located within a 30-mile radius of the Facility Site. Pine Hill Airport, Knowlesville Airport (private), Dawn Patrol Aviation Field (private), and Maxon Field (private) are respectively 3, 6, 8 and 9 miles from the Local Road Study Area. The nearest heliport, at Medina Memorial Hospital, is located 11 miles from the Local Road Study Area. This heliport has a 40-foot by 40-foot pad for vertical takeoff and landing. All turbines are within 15 miles of the heliport landing pad.

As discussed in Section (f) below, the impact of the Facility on military and civilian air space, including military training and operations and other airport/heliport operations, is addressed by the Federal Aviation Administration (FAA) as part of its hazard review process. This process includes outreach through the U.S. Department of Defense's Siting Clearinghouse to evaluate the impact of potential aviation obstructions on military readiness.

(f) Federal Aviation Administration Review

The FAA is responsible for air traffic control and for evaluating and issuing determinations on petitions for objects that encroach on the nation's airspace. The submission of a project to the FAA for review initiates aeronautical

studies of the location of each proposed turbine and permanent meteorological tower that include outreach to other agencies. These studies are conducted under the provisions of 49 USC § 44718. The FAA can issue two types of determinations, one that identifies a potential hazard and another that identifies no hazard. If the proposed structure is over 499 feet or if a potential hazard to air navigation is identified based on the structure's location and/or height, then a Notice of Presumed Hazard (NPH) is issued. Structures over 499 feet automatically receive an NPH and must be publicly circulated prior to a final FAA determination. This notification identifies the potential hazard that must be further studied and potentially mitigated. After completing the necessary aeronautical study, a Determination of No Hazard (DNH) will be issued if the FAA determines that the planned project will not pose a risk to aviation, including a review of potential aviation impacts to local airports.

The Applicant filed the final Project turbine locations with the FAA's Obstacle Evaluation Group on October 7, 2019 (ASN#s 2019-WTE-8226-OE through 2019-WTE-8258-OE). The Applicant received DNHs for an earlier array in the same location as the Project on December 1, 2017 (ASN#s 2017-WTE-3287-OE through 2017 WTE-3344-OE).

Lighting of the turbine nacelles will be implemented as per the requirements and determinations of the FAA. Specifications for anticipated turbine lights will be in accordance with the FAA's December 4, 2015 Advisory Circular 70/7460-1L, specifically Chapter 13 (Marking and Lighting Wind Turbines), filed as Appendix 25-C. See Exhibit 18(b) for additional information about Facility lighting.

(1) Department of Defense Review

The Department of Defense (DoD) review of a wind turbine project's potential impact upon military readiness occurs within the FAA Obstacle Evaluation process. In other words, if a project receives DNHs for its turbine locations, it means that both the FAA and the DoD have determined that the project does not present a substantial adverse impact upon air navigation or military readiness. In particular, upon receiving a notice under 49 USC § 44718, the FAA disperses information about the project to various offices within FAA as well as to outside agencies, including the DoD Siting Clearinghouse, which is responsible for evaluating the "mission compatibility" of proposed energy projects—a concept that encompasses all types of military facilities and activities, including interference with flight paths, other aviation operations, and radar function. The mission compatibility evaluation process is addressed in 32 CFR Part 211, which establishes procedures for both formal and informal reviews of projects subject to the FAA review process. The formal DoD review of the previous Project array was concluded on December 1, 2017 with the issuance of FAA DNHs. The formal DoD review of the final Project array is currently underway. If the NPH letters do not list any DoD concerns,

that is de facto evidence that the DoD has determined that the Project does not present an unacceptable risk to national security, which is defined as a significant adverse impact to military readiness that cannot be mitigated.

The Applicant submitted a request for review to the National Telecommunications and Information Administration (NTIA). The NTIA oversees administration of the nation's radio frequency spectrum. Sponsors of projects that could interfere with radio signals, including radar, can submit a request to the NTIA to review the projects to determine whether such interference may, in fact, occur and, if so, whether the interference poses a hazard. The request is submitted to the NTIA, which circulates the project information to the many agencies that are part of the Interdepartmental Radio Advisory Committee (IRAC). The IRAC includes the FAA and various DoD entities, among numerous other agencies. The NTIA assembles the responses from these agencies and informs the sponsor of the result. See Exhibit 26(a)(9), (11) and (12) for a description of the Applicant's consultation with the NTIA. Copies of correspondence with the NTIA are found in Appendix 25-D.

(2) Consultation with Nearby Airports/Heliports

The regulations require the Applicant to consult with: 1) the operators of airports within 12 miles that have runways exceeding 3,200 feet; 2) the operators of airports within 6 miles with runways less than 3,200 feet; and 3) the operators of heliports within 3 miles. There are three airports or heliports that meet those criteria including: Pine Hill Airport (2.7 miles from nearest turbine), Genesee County Airport (8 miles from nearest turbine), and Ledgedale Airpark (10.5 miles from nearest turbine)

In accordance with the Public Involvement Program (PIP), the Applicant has initiated outreach to these airports as outlined in Table 25-4 below.

Table 25-4. Consultation with Airports

Airport	Distance from Closest Turbine (Nautical Miles)	Status
Pine Hill Airport	2.7	Applicant met with owners in May 2016, and sent Project information to the airport by certified mail on November 8, 2019.
Genesee County Airport	8.1	The Genesee County Highway Department manages the airport. Attempts to reach the manager in early November were unsuccessful, but Applicant will make additional attempts. Project information was sent to the airport by certified mail on November 8, 2019.

Ledgedale Airpark	10.5	The manager of the airpark, Gretchen Pennington, declined an invitation to meet on November 9, 2019 but verbally indicated she did not object to the Project. Project information was sent to Ms. Pennington by certified mail on November 8, 2019.

The nearest military airport is located approximately 130 miles from the Facility, well outside the 12-mile threshold for outreach set forth in the applicable regulations. As a result, the Applicant did not reach out directly to any military airports/heliports. As previously noted, however, an assessment of the impact of the Facility on military readiness (including aviation operations) will be made as part of the FAA review process through outreach to the DoD Siting Clearinghouse.

(3) Responses from the FAA and DoD

See Section (f) and (f)(1) above for a discussion of the responses to date from the FAA and DoD.