## 2.8 Transportation

URS Corporation completed an assessment of the local transportation system in order to identify transportation routes for equipment and materials; identify conditions and geometry of local roads and intersections; and to recommend in general terms anticipated improvements necessary to construct the Project. The complete *Transportation Assessment* for the New Grange Wind Farm Project is located in Appendix J of this DEIS. Existing conditions, potential impacts, and possible mitigation measures are summarized in this section.

### *2.8.1 Existing Conditions*

The Project Site is predominantly located within the Town of Arkwright as illustrated in Figure 1-1 of the *Transportation Assessment*. The Project Site is generally bounded by Straight Road to the north; Putnam and Farrington Hollow Roads to the east; Park and Miller Roads to the west; and Ruttenbur Road to the south.

The main transportation route in the vicinity of the Project Site is Interstate 90 (approximately 3 miles away), which is a high volume west-east thoroughfare. The primary transportation route to access the Project Area will be New York State Route 83 (Route 83), which has an annual average daily traffic volume (AADT) of fewer than 2,000 vehicles per day (NYSDOT 2006).

The Project Site is served by an existing network of local, county, and state roads. The existing road network consists of asphalt roads, dirt/gravel roads, and gravel roads. It is assumed that WTG components will reach the Project Site from New York State Route 60 traveling eastbound on Route 83. Table 2.8-1 lists the roads within the Project Area, as well as the town in which they are located, and the owner/jurisdiction.

**Table 2.8-1: Road System Within the Project Area**

| Roadway | Location | Ownership/ Jurisdiction |
|---|---|---|
| Route 83 | Town of Arkwright | State |
| Straight Road | Town of Arkwright | Town |
| Center Road (County Route 79) | Town of Arkwright | County |
| Meadows Road | Town of Arkwright | Town |
| Creek Road (County Route 85) | Town of Arkwright | County |
| Livermore Road | Town of Arkwright | Town |
| Weaver Road | Town of Arkwright | Town |
| Farrington Hollow (County Route 85) | Town of Arkwright | County |
| Cassadaga Hamlet Road (County Route 72) | Town of Arkwright | County |
| Dibble Hill Road | Town of Arkwright | Town |
| Ruttenbur Road | Town of Arkwright | Town |

Within the Project Area, construction and delivery vehicles are anticipated to travel over select public roadways, as well as new, private access roads specifically constructed to access turbine locations.

A visual inspection of the Project road network was conducted as part of the *Transportation Assessment*. Route 83, the only state road within the Project road network, has an approximate travel width of 24 feet. Town and county road widths range from 18 to 20 feet. All roads in the Project network are two lane roads. Table 5-1 in the *Transportation Assessment* outlines the road materials, number of lanes, and proposed haul routes.

In general, Route 83 is a viable route into and out of the Project Area that will accommodate the over-sized (length, height or weight) delivery vehicles/loads required for delivery of WTG components. Using this delivery route will require special hauling permits from the New York State Department of Transportation (NYSDOT), which will be obtained prior to construction. Upon selection of a construction contractor and turbine delivery company for the Project, the Project Area access routes will be re-evaluated to confirm these routes to minimize the impact to the community.

The Project will be constructed in one continuous phase currently anticipated to commence no earlier than spring 2009 and to finish by the end of 2009, with some preliminary clearing potentially occurring in the fall of 2008. It is possible, however, that construction will not commence until 2010 or later.

The physical characteristics assessment completed as part of the *Transportation Assessment* included a review of the roadway widths, drainage structures, bridges, intersection geometry, and roadway alignments. Table 2.8-2 provides a summary of the existing road conditions in the study area. There are no bridges or overpasses within the Project Area.

**Table 2.8-2. Summary of Road Conditions in Project Area**

| | |
|---|---|
| Road Capacity | No existing traffic capacity or congestion problems |
| Road Width | Roads are a mix of paved and dirt/gravel with widths up to 20 feet for dirt/gravel and 24 feet for paved roads |
| Bridges/Overpasses | No bridges or overpasses in the Project Area |

Haul routes designed to transport wind turbine components and other construction materials were derived from a variety of factors, including intersection geometry, road conditions/ construction, road horizontal and vertical alignment, location of proposed access roads, overhead restrictions, and load limits on local bridges. For this analysis, the intersection of Route 83 and Center Road was designated as the haul route point of origin. A total of seven haul routes were identified in the *Transportation Assessment* to deliver equipment and materials

to the WTG access roads. Figures 5-2 through 5-8 in the *Transportation Assessment* illustrate the location of the proposed haul routes and the WTG access roads.

Culverts and other drainage structures located along the recommended haul routes were inspected during the *Transportation Assessment*. Culverts located along the haul routes varied in size, from approximately 12 to 72 inches in diameter. The culverts were constructed of corrugated metal pipe (CMP), smooth interior corrugated polyethylene pipe (SICPP), reinforced concrete, or steel pipe. In addition, two concrete box culverts were located at the intersection of Cassadaga Hamlet and Farrington Hollow Roads and at the intersection of Creek and Livermore Roads.

Most pipe manufacturers of CMP and SICPP recommend a minimum soil/pavement cover of 24 inches to provide strength through the interaction of the pipe and surrounding soils. Insufficient cover combined with use of the roads by a large number of heavy construction vehicles may cause a drainage structure to fail. In most cases, culvert pipes were found to have adequate cover. Some of the large diameter CMPs along Ruttenbur Road had less than 12 inches of cover.

### *2.8.2 Potential Impacts*

The discussion of potential impacts to the local transportation infrastructure and traffic is presented for temporary impacts (short-term construction) followed by permanent impacts (long-term operation and maintenance of the Project).

#### *2.8.2.1 Construction*

Although roads within and adjacent to the Project Area are operating well under capacity, some temporary impacts to transportation in and around the Project Area will result from the construction vehicles. The exact turbine component delivery vehicles have not yet been determined and therefore estimates of the truck dimensions and weights are provided:

- Gravel trucks with capacity of approximately 10 cubic yards per truck and an estimated gross weight of 75,000 pounds (lbs), for access road construction (assuming the average access road is 3,000 feet long, 21 access roads, 34 feet wide with gravel 12-inches deep, results in a total of approximately 7,500 to 8,000 trips).
- Concrete trucks for construction of turbine foundations and transformer pads with capacity of approximately 10 cubic yards per truck and an estimated gross weight of 96,000 lbs (total of approximately 40 trips per foundation depending on final design, 47 foundations, results in approximately 1,880 trips).
- Specialized flatbed trucks (up to 14 axle configurations) for transporting turbine and substation components (tower sections, blades, nacelles, hubs—approximately 10 trucks per turbine); these trucks may have gross weights up to 200,000 lbs, with

lengths (from front of cabin to end of trailer) up to 160 feet, widths to 16 feet, and heights to 16 feet (estimated 470 trips).

- A variety of conventional tractor trailers for delivery of reinforcing steel (two per turbine foundation) and small substation components and interconnection facility material (approximately 100 to 150 trucks).
- Pickup trucks for equipment and tools.
- Trucks and cars for transporting construction workers.

The vehicles used to transport turbine components are larger and heavier than typical tractor-trailer combinations. In order for the component delivery vehicles to turn corners at the Project intersections, it is assumed all turning radii will need to accommodate a large horizontal centerline radius. In general, it is assumed that a minimum 24-foot width for the combined roadway and shoulder will be necessary to accommodate construction of the Project. Based on the existing road conditions, the delivery and construction of the turbines should require roadway widening at limited locations. Section 6 and Figure 6-1 of the *Transportation Assessment* contains a preliminary identification of the intersections that will require improvement.

Movement of Project construction and delivery vehicles on the local road network has the potential to result in adverse impacts to the road surface and periodic traffic delays. An internal network of private access roads has been configured to connect turbine locations, where possible, to minimize construction and delivery vehicles on the local road network.

During construction activities, local traffic may experience minor delays due to slow moving vehicles. Oversize construction vehicles could cause minor delays on Project Area roads, but these are unlikely to be significant given the relatively low traffic volume through the area. Most of the impacts will be to transportation infrastructure due to the existing road system's likely inability to accommodate construction vehicles. Improvements to public roads will be included among the initial stages of Project construction.

The following construction activities will likely be required at the locations of road width and turning radii improvements and will have temporary impacts:

- Clearing and grubbing of existing vegetation;
- Relocation of traffic signs, fences, and utility poles;
- Grading of the terrain to accommodate the improvement;
- Extension of existing drainage pipes and/or culverts;
- Re-establishment of ditch line (if necessary); and
- Construction of a suitable roadway surface to carry the construction traffic (based on geotechnical testing results).

A pipe, culvert, and bridge inventory was also completed to locate and document the structures crossing underneath local roads of the proposed haul routes. The inventory documented a variety of drainage structures along the haul routes, but no bridges or overpasses. Typical improvements related to drainage structures will have temporary impacts and may include:

- Placement of additional cover over structures;
- Replacement of structure prior to construction;
- Replacement of structure during or after construction if damaged by construction activities; and
- Re-route construction traffic to avoid structures.

The required improvements will be submitted to the appropriate state, county, and local highway departments. Improvements will be constructed at the Applicant's expense prior to the arrival of oversize/overweight (OS/OW) vehicles on-site. In addition, these improvements may create potential Project-related impacts to wetlands, drainage, and grading that will be addressed in detail during the final Project design, and reviewed/approved during all Project permitting subsequent to this DEIS (i.e., SPDES General Permit, USACE/NYSDEC wetland permits, highway work permits). Additionally, although much of construction is likely to occur when school is not in session, transportation planning for construction will take into account school bus routes and schedules. No component deliveries shall be conducted during school bus pick-up and drop-off times. Intersections proposed to be improved are identified on Figure 6-1 of the *Transportation Assessment*.

#### *2.8.2.2 Operation*

Once the Project is commissioned and construction activities are concluded, permanent transportation impacts will likely be concentrated around the O&M building. The Project will employ up to approximately 10 to 15 full-time individuals, all of whom may drive separately to the O&M building. Some of these personnel will need to visit each turbine location and return to the O&M building. In the first few months of operation, turbines will require "tuning" that will likely increase the number of visits required to each turbine. After that, each turbine typically requires routine maintenance visits once every three months, but certain turbines or other Project improvements may require periods of more frequent service visits should a problem arise. Such service visits typically involve one to two pick-up trucks. In addition, weekly or monthly visual inspections of each turbine will likely be required by the Spill Prevention, Control, and Countermeasures (SPCC) Plan that will be prepared for the facility. Project personnel may also need to service the Project substation. Such servicing would likely be carried out on a similar quarterly basis (unless a problem arose) and would involve a similar number of maintenance vehicles.

In addition to maintenance activity, the operation of a wind power project typically increases traffic from interested passers-by on certain roadways within the Project Area. It is anticipated

that increased traffic from operations and interested motorists traveling to see the turbines will not result in a significant adverse impact to the local transportation system.

The Applicant will be responsible for the maintenance of all access roads on private properties leading to the turbine sites. It may be necessary to use snowmobiles or some other small track driven vehicles to service turbines in winter months. All access roads will be designed to provide safe access of emergency vehicles. The Applicant will ensure emergency vehicles will be able to access turbine sites while technicians are working.

### *2.8.3 Mitigation Measures*

The following summarizes potential impacts to the local transportation and traffic system and possible mitigation measures to eliminate or minimize those potential impacts.

#### *2.8.3.1 Construction*

Prior to construction, the Applicant will obtain all necessary permits from the town, county, and state highway departments for activities including new access points to public roads, improving existing roadways, crossing roads/highways with buried collection lines, and operating oversize vehicles on the highways (as stated in the *Transportation Assessment*). The final transportation route documentation will be provided to the Town of Arkwright, Chautauqua County, and the NYSDOT. This documentation will specify the local, county, and state roads to be used as haul routes (both within and outside of the Project Area) by construction/transportation vehicles. The required improvements will be coordinated with state, county, and local highway departments (at no expense to these departments) prior to the arrival of the OS/OW vehicles on-site.

All public road upgrades that may be required to accommodate construction vehicles will be identified, including placement of steel plates or gravel to road surfaces, widening roadways, reconfiguring intersection geometry to accommodate the turning radius of over-sized vehicles, and identifying the drainage structures, pipes, and culverts that require improvement to accommodate the construction related traffic.

The following outlines the proposed protocol for responding to traffic/transportation issues that arise during Project construction:

- Prior to construction, the Applicant will identify one or more construction managers as the primary traffic contact(s) for traffic/transportation concerns that may arise during the construction of the Project.
- The town, county, and state highway departments will be notified of the primary traffic contact(s).
- The Applicant will consult with all town, county, and state highway departments prior to construction to identify potential traffic congestion areas and to develop potential detours.

- If construction-related congestion occurs, the primary traffic contact will call the appropriate town, county, or state highway department immediately and discuss the implementation of pre-determined detour routes.
- All construction personnel will be instructed to watch for traffic/transportation concerns and to contact the primary traffic contact immediately following identification of a traffic/transportation issue.

Final transportation routing will be designed to avoid/minimize safety issues associated with the use of the approved haul route, which will confine the heavy truck travel to a few selected roads. The Applicant will repair any adverse impacts to roads resulting from construction-related transportation within the approved haul route, at no expense to the town, county, or state. Prior to construction, the specific terms of road use and reconstruction will be negotiated and memorialized in a Road Agreement between the Applicant and road owner.

Delivery/haul routes may change during the design and pre-construction phase; however, the municipalities will be notified of the changes prior to construction of the Project. Additionally, design plans will be completed for all public road improvements, and will be made available for the affected local towns (and to the owner/operator of the respective road) to review prior to construction activities.

Prior to construction, the Applicant will video-document the existing roadways to verify the pre-construction roadway conditions. Upon completion of the construction activities, the Applicant will, at a minimum, return all roadways to their pre-construction conditions and video-document the post construction conditions.

*Traffic Flow and Capacity*

Impact – During construction activities, local traffic may experience minor delays due to slow moving vehicles.

Mitigation – No areas appear to warrant immediate installation of measures to mitigate the minor delays that will be experienced by local traffic. School bus pick-up and drop-off routes and times will be avoided. The Applicant, in conjunction with the NYSDOT and local highway departments, will establish a traffic/transportation notification protocol to respond to any locations that experience significant traffic flow or capacity issues. Electronic Vehicle Message Systems (VMS) may be used as a tool in notifying drivers of the construction activities.

*Roadway Type*

Impact – The existing road surface conditions appear adequate to accommodate construction vehicles. The quantity, type, and weight of both general construction traffic and OS/OW vehicles, however, will likely impact the surface condition of the roadways within the Project Area.

Mitigation – Prior to, during, and following construction, road improvements will be made according to the Road Agreement. After construction is complete, the civil construction contractor will restore the roads to the conditions negotiated in the Road Agreement. Subsequent to these restoration activities, the town will inspect and approve the restored roads.

*Roadway Width*

Impact – The existing roadway width is adequate to accommodate the construction activities. No general roadway widening will be required for the Project.

Mitigation – None required.

*Intersections*

Impact – All intersections used by OS/OW vehicles will need radius improvements to accommodate construction activities (as noted on Figure 6-1 of the *Transportation Assessment*). The intersection impacts include:

- Clearing and grubbing of existing vegetation
- Relocating traffic signs, fences, and utility poles
- Grading of the terrain to accommodate the improvement
- Extension of existing drainage pipes and/or culverts
- Re-establishment of ditch line (if necessary)
- Construction of a suitable roadway surface to carry the construction traffic (based on the existing geotechnical conditions)

Mitigation – Each public road intersection will require a detailed engineering plan to quantify and provide a solution for the impacts listed above. The *Transportation Assessment* provides preliminary engineering solutions that can be implemented, based on observed field conditions, to accommodate the OS/OW vehicles. After construction of the Project, the Applicant will coordinate with the NYSDOT, the local highway department, and the adjacent landowners to determine if the radii improvements will need to be returned to pre-construction conditions or left for future use by the town.

*Weight*

No bridges or roads were posted with weight limits within the Project Area. Therefore, no mitigation is necessary.

*Vertical Curvature*

Impact – There are existing vertical curves along Project Area roadways that OS/OW trucks may not be able to traverse without modifications as indicated in Section 6 of the *Transportation Assessment*.

Mitigation – Each vertical curve will be analyzed during final design of the roadway improvements (using topographic survey information) to determine if OS/OW vehicles will be able to traverse the existing roadways. If the vehicles cannot traverse a vertical curve, the following mitigation measures may be used to accommodate construction traffic:

- Re-route OS/OW vehicles to roadway that can accommodate construction traffic;
- Modification of access road locations to avoid vertical curves; and/or
- Reconstruct vertical curves to accommodate OS/OW vehicles, which may involve additional grading, and drainage improvements to re-establish the roadside features.

*Height*

Impact – Overhead wires that do not meet OS/OW vehicle clearances as indicated in the *Transportation Assessment* will need to be raised to accommodate OS/OW vehicles.

Mitigation – The Applicant will be required to coordinate with appropriate entity such as New York State Electric and Gas Corporation (NYSEG), the telephone company, the cable company, and NYSDOT to obtain the necessary permits to raise the wires. The utility companies and the NYSDOT will assist in the final solution at each location once final engineering plans and permit applications have been submitted. Solutions include permanently raising wires, temporarily raising wires for the duration of construction, or temporarily raising each wire as a vehicle passes underneath.

Upon completion of the construction, the following additional mitigation steps may be taken to minimize impacts to the transportation infrastructure and traffic.

- Removal of temporary road widening to support the Project construction. In other words to bring back the road to the pre-construction conditions, hence reducing the impact to a minimum.
- Removal of road widenings at roadway intersections where improvements were made to the intersections to accommodate the wide turning radius.
- Leave culverts extensions as constructed, or else bring back to original lengths, if as required by the landowner, town, county or NYSDOT.

*Operations*

No long-term impacts related to operations of the wind farm are anticipated to traffic or the local transportation system. Therefore, no mitigation measures for long-term operational impacts are proposed.