

TRAFFIC ANALYSIS REPORT

Introduction

The proposed Vantage Wind Power Project (project) in Kittitas County between Vantage and Ellensburg, Washington would consist of 69 wind turbines manufactured by General Electric (“GE”). Construction of the proposed project is expected to commence in 2008, last 6–8 months, and be completed in 2009. The project would have a service life of 25 years. This report describes the existing transportation network serving the project and evaluates the potential traffic volume impacts on level of service, pavement conditions, and the local transportation system. It also identifies mitigation measures to limit those impacts. The analysis in this section is based primarily on information provided by the applicant, Invenergy LLC. Where additional information has been used to evaluate the potential impacts associated with the proposal, that information has been referenced.

Existing state transportation plans and local comprehensive plans were reviewed to identify pertinent policies, impact evaluation criteria, and planned roadway improvements. Vehicle trip generation for the project was based on the anticipated construction material needs and employees. During operation trips were based on number of employees and daily material needs. Level-of-service (LOS) analyses were conducted consistent with methods presented in the Highway Capacity Manual (HCM) (Transportation Research Board 2000).

Affected Environment

The 5,000-acre project site is located in rural Kittitas County near Vantage, Washington, approximately 20 miles east of the city of Ellensburg. The project area is situated between Vantage Highway and Interstate 90, approximately two miles from Puget Sound Energy’s existing Wild Horse Wind Project, and contains land owned by three private landowners as well as the Washington State Department of Natural Resources (WSDNR). Roadways included in this transportation analysis are I-90 and Vantage Highway between the City of Kittitas and Vantage; Main Street and Patrick Avenue, maintained by the City of Kittitas; and No. 81 Road, maintained by Kittitas County. Most of the public roads in the region are paved County roads, with a few state routes traversing the area. Figure 1 illustrates the principal transportation routes that would serve the site.

Existing Road Network

The site is served by Vantage Highway, a County road, with access to I-90 through Vantage or Kittitas. The project has identified the I-90/Vantage route as the primary access for all turbines and turbine blades and any other material using I-90. Vantage Highway to the west of the site would provide the primary route for all other locally generated construction related material such as concrete or quarry rock. Site access roads would run from the site access location on Vantage Highway to and between the individual turbines. Construction material coming from the Puget Sound area will use I-90 to Vantage (Exit 136). The route passes through Vantage and continues on Vantage Highway to the west of the project site access location.

I-90 varies between two and five lanes with 4- to 10-foot-wide paved shoulders and is classified as a Rural-Interstate, with rolling terrain in the vicinity of the project, according to the Washington State Department of Transportation (WSDOT) road classification system. I-90 has posted speed limits of 60 miles per hour (mph) in urban areas and 70 mph in rural areas. The 70-mph designation begins east of Issaquah in King County.

Vantage Highway was once a state highway but has since become classified as a rural minor collector and is maintained by Kittitas County. This road has a posted speed limit of 35 mph within Vantage but 50 mph outside of Vantage and is a two-lane, east-west, undivided roadway with paved shoulders approximately 2 feet wide. There is no designated parking along Vantage Highway, and there is minimal access to the roadway. The grade from Vantage to the site access is approximately 3%.

The I-90/Kittitas route runs east along I-90 to the City of Kittitas (Exit 115). The route then continues north on Main Street through the city, east on Patrick Avenue, north on No. 81 Road, and east on Vantage Highway to the project site access location. Use of this route would be limited to construction workers and employees commuting to the project site in light-duty vehicles. Due to bridge weight limitations, Kittitas County will not permit the use of this route for the movement of large construction vehicles.

The I-90 segment of this access route has the same characteristics as mentioned above. Main Street is maintained by the City of Kittitas and has a posted speed limit of 35 mph immediately north of the I-90 ramps. This speed limit is reduced to 25 mph as the roadway enters the industrial and commercial areas of the city. Main Street is a level two-lane, north-south, undivided roadway with 2- to 5-foot-wide unpaved/dirt shoulders for most of the length. There is also a designated bicycle lane on either side of the road through the industrial section of Kittitas. There is no parking along Main Street through this industrial section, but there is angled pull-in parking along the next section of the roadway through the city's retail area. Access to Main Street is unrestricted as there are many driveways and minor cross streets through the city.

Patrick Avenue is maintained by the City of Kittitas and has a posted speed limit of 25 mph. This is a level two-lane, east-west, undivided roadway with designated paved bicycle lanes that are approximately 6 feet wide along either side of the road. There is no parking along Patrick Avenue, but access is fairly unrestricted as there are many driveways.

No. 81 Road is classified as a rural major collector by Kittitas County and has a posted speed limit of 35 mph. This is a level two-lane, north-south, undivided roadway with unpaved gravel shoulders approximately 1–2 feet wide. There is no designated parking along No. 81 Road, and access to the roadway is unrestricted as there are many residential driveways. The segment of

Vantage Highway west of the site has the same characteristics as the roadway east of the site with the exception of the 3% grade.

Roadway Limitations

The Kittitas County road network would comprise the primary public haul routes used in the construction of the project. The regulatory framework for transportation in Kittitas County consists of program and project planning, design standards related to roadway geometry and paving materials, load limits for bridges, and weight limits or closures under defined circumstances. Kittitas County roads are designed to sets of standards with respect to paving materials and methods and with respect to roadway geometry and design. The planning and programming of public roads is included in the Kittitas County Transportation Plan, the 6-year Transportation Improvement Program and Annual Road Program. Kittitas County Road Standards state the minimum requirements for public and private road construction in the County, as well as any exceptions to these standards. All new public road and bridge construction must also be in accordance with the current edition of WSDOT's "Standard Specifications for Road, Bridge, and Municipal Construction."

Roads serving the project site may have permanent or temporary roadway restrictions. These include height or weight restrictions. Kittitas County Code 10.28, "Seasonal Weight Restrictions," specifies load and weight restrictions on Kittitas County roads during load-sensitive periods. These include any weather conditions that could affect traffic on county roads, such as ice, snow, and fog. It also authorizes the County Engineer to issue emergency permits for the operation of vehicles exceeding the allowable gross load.

The following portions of the Revised Code of Washington limit the size of undivided and public roads.

- RCW 46.44.010 Outside width limit.
- RCW 46.44.020 Maximum height—Impaired clearance signs.
- RCW 46.44.030 Maximum lengths.
- RCW 46.44.034 Maximum lengths—Front and rear protrusions.
- RCW 46.44.041 Maximum gross weights—Wheelbase and axle factors.
- RCW 46.44.042 Maximum gross weights—Axle and tire factors.

The Revised Code of Washington (RCW) 46.44.090, "Special Permits for Oversize or Overweight Movements," allows special permits to be issued for vehicles exceeding the maximum size/weight/load limits, which are specified in the RCW sections listed above.

From RCW 46.44.041, the maximum legal load is specified as 105,500 lbs. Because some construction transport vehicles related to the project may exceed this weight limit, a special permit in accordance with RCW 46.44.090 would need to be obtained.

In addition, WSDOT requires permits for "superloads" (vehicles with a gross weight exceeding 200,000 lbs. and/or a total width or height exceeding 16 feet).

Existing Roadway Levels of Service

LOS is a qualitative measure describing operational conditions in a traffic stream and motorists' or passengers' perceptions of those conditions. It generally describes traffic conditions in terms of speed and travel time, freedom to maneuver, traffic interruptions, comfort, convenience, and safety. There are six LOS classifications, each given a letter designation from A to F. LOS A represents the best operating conditions and LOS F represents the worst.

To analyze traffic conditions, traffic counts were conducted on County and city roadways or data was obtained from WSDOT and Kittitas County. This data was used to determine the existing LOS for each of the roadways.

Existing Roadways LOS

The LOS for selected roadways in the study area was analyzed using the Highway Capacity Software (HCS) which is based on methods presented in the HCM. Table 1 summarizes the existing roadway traffic conditions in the project vicinity and includes existing roadway classification, number of lanes, daily volume, peak-hour volume, and LOS. The Average Daily Traffic Volume (ADT) represents both directions.

Table 1. 2007 LOS Conditions of Affected Roadways

Roadway	Classification	No. of Lanes	Average Daily Traffic Volume	PM Peak-Hour Traffic Volume ²	Existing Level of Service (LOS)
I-90 (west of Vantage)	Rural-Interstate	4	14,000 ^a	1400	A
Vantage Highway (east of site access)	Rural minor collector (County Road)	2	253	26	A
I-90 (west of Kittitas)	Rural-Interstate	4	14,000 ^a	928 ^b	B
Main Street	City road	2	2416	217	A
No. 81 Road	Rural major collector (County Road)	2	1565	235 ^c	A
Vantage Highway (west of site access)	Rural minor collector (County Road)	2	384	49	A

^a 2006 weekday ADT volume and truck percentage are based on the WSDOT 2006 Annual Traffic Report.

^b Freeway PM peak hour volume is directional. Based on the WSDOT Peak Hour Report, 17% of ADT is PM peak hour volume and 39% of PM peak hour volume is westbound.

^c Assumed that 15% of ADT is PM peak hour volume.

A 60/40 traffic volume directional split was assumed for LOS calculations for existing traffic. A conservative truck percentage of 10% was assumed for roadways when actual truck data was not available.

The existing LOS for roadways surrounding the project site is LOS B or better, which represents generally smooth traffic conditions. Under these conditions, individual users feel unrestricted by the presence of others in the traffic stream.

Roadway Hazards

Accidents are generally expressed in terms of accident rate, where accident occurrence is indexed to the amount of traffic using a given roadway. For roadway segments, accident rates are computed as the number of accidents per million vehicle miles (mvm) of travel.

Table 2 shows the most recent accident statistics provided by WSDOT from 2004 through 2006. These statistics were used to determine the existing accident rates along roadways serving the site.

Table 2. Traffic Accidents

Roadway Segment	Length (Miles)	3 Year Accidents (2004 – 2006)	2007 Average ADT	Accident Rate (acc/mvm)
I-90 between Ellensburg and Kittitas Exits	6	55 ^a	14,000	0.6
I-90 between Kittitas and Vantage Exits	21	154 ^a	12,000	0.6
Vantage Highway between No. 81 Road and Project Access Roads	13	7 ^b	880	0.6
Vantage Highway between Project Access Roads and I-90 Vantage Exit	9	6 ^b	850	0.7
No. 81 Road between Patrick Avenue and Vantage Highway	1	2 ^b	1,565	1.2

^a Collision data on I-90 is provided by WSDOT Collision Data & Analysis Office.

^b Collision data on Vantage Highway and No. 81 Road is provided by Kittitas County Public Works.

The 2005 WSDOT State Highway Accident Report (WSDOT 2005) indicates an average statewide accident rate of 0.78 accidents per mvm for rural interstate highways in the south center region. . The accident rates of both analysis I-90 segments are lower than the accident rate. The accident rate of the Vantage Highway is lower than the average statewide accident rate of 1.27 accidents per mvm for rural collectors in the south center region.

Sight distance could be of concern along a few stretches of Vantage Highway near milepost (MP) 25 due to the winding geography and steep side slopes. Field investigations revealed these areas are adequately signed to advise motorists to reduce their speed as they approach these areas; therefore, these locations are not considered to have safety issues.

Future Plans and Projects

There are currently no known construction projects planned on Kittitas County roads in the project area.

Table 3 identifies the WSDOT projects planned for I-90 in the project vicinity during 2008 and 2009.

Table 3. WSDOT I-90 Project List

PROJECT TITLE and TYPE OF WORK	LOCATION
I-90/2.0 Miles W of SR 906 Interchange - Stabilize Slope	MP 50.19 to MP 50.29
I-90/Denny Creek Viaduct Vicinity - Stabilize Slope	MP 50.34 to MP 50.46
I-90/West Nelson Siding Interchange - Electrical Light System Replace Illumination System	MP 73.64 to MP 74.38
I-90/Golf Course Road Interchange - Electrical Light System Replace Illumination System	MP 77.67 to MP 78.46
I-90/Yakima River Bridge - Deck Repair	MP 78.81 to MP 78.85
I-90/Cle Elum Vicinity - Install Barrier	MP 83.61 to MP 84.20
I-90/Yakima River to W Ellensburg - Paving	MP 102.61 to MP 106.34

Source: WSDOT 2007

Local Comprehensive Transportation Plans

There are currently no plans for major improvements to roadways providing access to the project site in Kittitas County. A review of the Kittitas County Comprehensive Plan identified no transportation goals, policies, or objectives that directly relate to the types of transportation impacts that may be caused by the project.

Public Transportation

Kittitas County is primarily a rural county with very limited public transportation. The City of Kittitas and the Vantage area, near the vicinity of the project site, currently do not have public transit systems. However, there is an accessible/special needs transportation program provided by the Kittitas County Action Council (KCAC) for citizens.

Air Traffic

There are no regional or municipal airports in the vicinity of the project site. The nearest airport is Kittitas County Airport (Bowers Field), approximately 1.5 miles north of the City of Ellensburg. The Kittitas County Airport (Bowers Field) does not have scheduled air service, though charter plane service is available. Small planes may use private runways at ranches or farms in the area, but none has been identified in the immediate vicinity of the project, and the frequency of this type of use is unknown.

Rail Traffic

Burlington Northern operates an active main line between Auburn and the Tri-Cities over Stampede Pass, passing through Ellensburg. Portions of the line had been inactive until 1996, when the pass portion reopened to freight traffic. Approximately 4–10 trains traverse the route daily.

Waterborne Traffic

More than 100 miles southeast of the project site, the Ports of Pasco, Benton, and Kennewick operate on the Columbia River. Grain is the major commodity using barge transportation on this stretch of the river. Priest Rapids and Wanapum Dams restrict access upstream of these ports.

Impacts of the Proposed Project

This section evaluates potential transportation impacts that could result from the project. It summarizes vehicle trip generation estimates associated with construction and operation of the project. Potential increases in traffic volumes are evaluated for roadways that would provide primary access to the project site.

Direct impacts would occur if predicted traffic levels associated with the proposed project would exceed applicable LOS standards. Other types of direct transportation impacts include the potential for vehicles hauling material to the project site to exceed legal roadway load and weight limits and accident or navigational hazards (for both motorists and aviators). For the project the primary concern would be the potential transportation-related impacts attributable to vehicle trips (both trucks and automobiles). These trips would be associated with construction, operations and maintenance, and decommissioning of the various project elements. Indirect impacts are not anticipated because the project is not expected to substantially induce regional growth to the extent that would result in significant changes to off-site traffic. Table 4 summarizes potential transportation impacts under the project scenario.

Table 4. Summary of Potential Transportation Impacts

Impacts	69 Turbines
Construction Impacts	
Construction trips	504 daily trips
Parking requirements	Approx. 10 acres
Hazardous materials transport	Diesel fuel and gasoline required for mobile construction equipment
Roadway limitations	Large number of trucks and trucks exceeding legal weight limits may cause pavement deterioration.
Roadway hazards	Increased risk of accidents.
Aviation hazards	FAA has conducted preliminary review and found no adverse impacts.
Operation and Maintenance Impacts	
Operational trips	20 daily trips
Parking requirements	Approx. 15 spaces and delivery vehicle parking
Hazardous materials transport	No adverse effect
Roadway limitations	No adverse effect
Road navigation hazards	No adverse effect
Aviation hazards	FAA has conducted preliminary review and found no adverse impacts.
Road maintenance and public access requirements	32 miles of roadways to maintain
Tourism-induced traffic	Unknown
Decommissioning Impacts	
	Similar to those described for construction. However, assuming that roadways would remain in place, the resulting workforce and corresponding vehicle trips would be smaller
Source: Invenergy LLC 2007	

Local policies are aimed at keeping the public road service at or above an accepted level of service determined by the County. Roadways that would experience heavy truck traffic can be assessed on an individual basis by the County during the project. All of the roadways in the study boundaries currently provide LOS B or better.

Construction Impacts

Construction of the proposed project is expected to commence in 2008, last 6–8 months, and be completed in 2009. The peak construction period would be from July to October 2008 for four months. Traffic volumes generated by project construction comprise truck delivery of

construction materials and equipment and construction workers. Construction activities would include constructing turbine foundations and widening turbine access roads to 20 feet.

The project access on the Vantage Highway would be located between MP (milepost) 19 and MP 20. The access road would provide for delivery trucks, construction works, and operation staffs after project is completed.

Construction Traffic

Truck Delivery Traffic

It is anticipated that truck deliveries would include the following:

- major equipment (e.g., tower sections, nacelles, blades) delivered by GE;
- water trucks for road wetting during compaction, mixing concrete, and for dust control;
- concrete trucks delivering concrete for turbine and building foundations;
- dump trucks delivering aggregate for road construction;
- fuel trucks for replenishing diesel and gasoline storage tanks;
- cement, sand, and aggregate for use in concrete foundations;
- construction equipment delivery and pickup;
- reinforcing steel;
- mechanical equipment;
- electrical equipment and material (e.g., transformers, cable);
- miscellaneous steel, roofing, and siding;
- construction consumables; and
- contractor mobilization and demobilization.

Invenergy LLC provided the estimated truck trips for construction of a similar project with 67-turbines (Table 5). The Vantage Wind Project is a 69-turbine project; therefore, the truck numbers are slightly factored up to reflect the construction of 69 turbines (Table 6).

The 6,490 road and turbine foundation truck trips will be bringing crushed rock for road construction and concrete for turbine foundations. These trips will primarily approach the site along Vantage Highway from Ellensburg and adjacent areas.

The 1,220 turbine delivery trucks include the turbine components, blades, cranes, electrical components, and O&M building materials. Most of the materials and equipment will be transported to the site using oversized or overweighted trucks, which will most likely travel east on I-90 from the Puget Sound area to the Vantage exit, north through Main Street in Vantage, and continue west on Vantage Highway to access the project site.

Table 5. Number of Trucks for Construction of a 67-Turbine Project

Purpose for truck load	Number of trucks
Road and turbine foundation construction	6,300
Deliver turbine components (assume 67 turbines)	1,100
Crane delivery and removal	20
Deliver substation and other electrical components	50
Deliver O&M building materials	20
Total large truck loads	7,490

Source: Invenergy LLC

Table 6. Number of Trucks for Construction of Vantage Wind Project

Purpose for truck load	Number of trucks
Road and turbine foundation construction	6,490
Deliver turbine components (assume 69 turbines)	1,130
Crane delivery and removal	20
Deliver substation and other electrical components	50
Deliver O&M building materials	20
Total heavy truck loads	7,710

Source: Jones & Stokes 2007

Truck deliveries are anticipated to occur 5–6 days per week between 7 am and 5 pm. It is assumed that construction truck traffic will occur over a 4-month period with 24 workdays per month for a total of 96 workdays.

Assuming 96 workdays, an average day would entail 68 heavy trucks (or 136 truck trips) to/from the west along Vantage Highway. About 13 heavy trucks (or 26 truck trips) would travel to/from the east along Vantage Highway. Assuming 25% of the daily truck trips would occur during the AM and PM peak hours, 17 heavy trucks (or 34 truck trips) would access the project site along Vantage Highway from the west and 3 heavy trucks (or 6 truck trips) would access the project site a from the east.

Construction Worker Traffic

It is anticipated that approximately 50% of the construction workforce would access the site from within 40 miles of the project. These local workers would most likely reside in Ellensburg,

Yakima, or the surrounding area. It is anticipated that the other half of the construction workers would be non-local, originating from Seattle area (approximately 125 miles to the west).

Workers from Seattle area would most likely travel east on I-90, north through the City of Kittitas, and continue east on Vantage Highway to access the project site. Workers from the Yakima area would travel north on US 82 and east on I-90 to the Kittitas exit where they would continue on the access route previously mentioned. Workers from the Ellensburg area would either use I-90 and the previously decided routes or use Vantage Highway as it leaves Ellensburg. These are the shortest and most direct routes from the surrounding major urban areas.

There would be an average of 200 workers on site per workday during the peak months of construction (Invenergy LLC 2007). During the peak construction period, construction workers would generate an estimated 340 daily trips (assuming 15% of the workforce would carpool to the site), 119 of which would occur during the AM and PM peak hours (assuming 70% of workforce commutes during peak traffic hours). It is assumed that most workers would travel east on I-90 to the Kittitas exit, north through the City of Kittitas on S. Main Street and Number 81 Road, and continue east on Vantage Highway to access the project site.

Table 7 summarizes the total construction related traffic for both worker and truck trips.

Table 7. Construction-Generated Traffic

Roadway Segment	Daily Construction Traffic (vehicles/day)	PM Peak Hour Construction Traffic (vehicles/hour)
I-90 west of Kittitas Exit	340 worker trips 26 heavy trucks	119 worker trips 6 heavy trucks (westbound)
S Main Street north of I-90 Kittitas Exit	340 worker trips	119 worker trips (southbound)
No. 81 Road south of Vantage Highway	340 worker trips	119 worker trips (southbound)
Vantage Highway between No. 81 Road and Project Access Roads	340 worker trips 136 heavy trucks	119 worker trips 34 heavy trucks (westbound)
I-90 between Kittitas and Vantage Exits	26 heavy trucks	6 heavy trucks (westbound)
Vantage Highway between I-90 Vantage Exit and Project Access Roads	26 heavy trucks	6 heavy trucks (eastbound)

Source: Invenergy and Jones & Stokes 2007

Table 8 provides a summary of PM peak-hour traffic and LOS during the construction time period of the project. A 60/40 directional split was assumed for LOS calculations. This split was updated accordingly in the HCS analysis, assuming that peak-hour construction traffic would be added in the peak direction. The truck percentage was also updated in the HCS analysis.

The LOS during the PM peak hour with construction worker traffic and delivery traffic causes some reduction in the LOS level; however, all routes would operate at LOS B or better.

Table 8. Roadway LOS with Construction Traffic

Roadway Segment	No of Lanes	2007 ADT	Heavy Truck %	2007 PM Peak	PM Peak Construction Traffic	Total PM Peak	LOS with Construction Traffic
I-90 west of Kittitas Exit	4	14,000 ^a	18 ^a	928 ^b	125	1,053	B
S Main Street north of I-90 Kittitas Exit	2	2,416	8	217	119	336	B
No. 81 Road between Patrick Avenue and Vantage Highway	2	1,565	-	235 ^c	119	354	B
Vantage Highway east of No. 81 Road	2	1,372	-	134	153	287	B
Vantage Highway west of Project Access Roads	2	384	12	49	153	202	B
I-90 between Kittitas and Vantage Exits	4	12,000 ^a	18 ^a	796 ^b	6	801	A
Vantage Highway north of I-90 Vantage Exit	2	1,452	8	93	6	99	A
Vantage Highway east of Project Access Roads	2	253	16	26	6	32	A

^a 2006 weekday ADT volume and truck percentage are based on the WSDOT 2006 Annual Traffic Report.

^b Freeway PM peak hour volume is directional. Based on the WSDOT Peak Hour Report, 17% of ADT is PM peak hour volume and 39% of PM peak hour volume is westbound.

^c Assumed that 15% of ADT is PM peak hour volume.

Table 8 was based on a scenario in which all gravel needed for construction would be transported to the project location from off-site. On-site gravel quarries would significantly reduce the number of heavy vehicles accessing the site, thereby improving traffic operations.

Parking

During construction, parking would be located at the site of the O&M facility and along the site access roads. The O&M facility site would also serve as a construction staging area. Personnel working on turbine foundations, electrical infrastructure, and turbine erection would park along turbine string roads. It is anticipated that roughly half of all construction worker vehicles would be parked at the O&M facility location, and the other half would be dispersed across the various turbine string roads. With a peak workforce of 200 people, the maximum number of worker vehicles anticipated at any one time is 170, assuming that efforts to encourage carpooling would result in about 15 percent of construction workers carpooling to and from the project site. The parking area at the O&M facility location would be approximately 10 acres.

Roadway Limitations

The construction of the project could be affected by seasonal roadway restrictions or cause roadway damage as a result of heavy or over-legal loads.

Winter snow at higher elevations and seasonal road restrictions imposed by the County will limit construction activities to the spring, summer, and fall. However, these restrictions are not anticipated to affect the construction schedule.

GE would be responsible for delivery of wind turbine components to the project site. Depending on these arrangements, it is possible that project equipment and components would be transported through the Port of Seattle, Tacoma, or other Puget Sound port authorities. Project equipment would likely be containerized, and components would likely be shipped as a project cargo. These arrangements would be finalized in consultations between Invenergy and GE. GE currently designs and produces wind turbines in Germany, Spain, and the United States.

The transport of wind turbine components along state highways is necessary because there is no source for these highly specialized components within close proximity to the project site. The required materials and equipment must be shipped into the region from a larger metro area such as Seattle. The proposed route for these super loads is along I-90, which is a state-maintained highway, and along Vantage Highway, which is a County-maintained road.

The largest type of transport vehicles used for the project would carry the nacelles and the turbine blades. The nacelle transport truck would be approximately 110 feet in length and weigh approximately 280,000 pounds. The blade transport truck would be approximately 160 feet in length and weigh approximately 155,000 pounds. It is estimated that 5–10 nacelles and 5–10 sets of turbine blades would arrive each week at the site via truck. All oversize or overweight vehicles will comply with local and state requirements.

The large number of trucks along the delivery route raises concerns regarding the deterioration of the roadway pavement. Existing pavement conditions on Vantage Highway will be videotaped as necessary prior to construction of the project. This video log will be compared with the condition of the roadways after construction. If significant degradation in pavement condition is noted, the applicant and Kittitas County will attempt to determine responsible parties and will develop a plan for restoring the pavement to pre-project conditions as recorded in the video log. The applicant will be responsible for restorative work made necessary by the project. The video log will be used to document pavement conditions in lieu of a pavement analysis.

Because the pavement near the project site along Vantage Highway is built to WSDOT standards and is of good bituminous or asphalt quality, the delivery of construction materials and equipment is not expected to degrade this roadway.

Along the segment of I-90 in which the delivery and commuter route overlap, there are two road restrictions in the westbound direction. There is a height-restricted bridge on I-90 (Cle Elum River Bridge) and a height-restricted snow shed west of Ellensburg. Because these are height restrictions in the westbound direction only, they are not anticipated to cause problems for loaded trucks carrying oversize equipment eastbound on I-90 to the project site. In the eastbound direction there is a height-restricted overpass at Exit 62, which is adequately signed. All loads over 14 feet are required to exit at the eastbound off-ramp and re-enter via the eastbound on-ramp. This is a standard diamond interchange and is not anticipated to cause any problems for

trucks. Vehicles can easily exit and re-enter I-90 to avoid the overpass. There are no other weight and load limits on any of the roads in the vicinity of the project site.

The project could also impact traffic operations on roadways leading to the site. Construction activities will be limited to periods of appropriate weather both because of access to the site and the ability to pour concrete and erect towers. Seasonal traffic volumes are likely to be unaffected by construction because of the low traffic volumes in the area and lack of tourist-oriented facilities along Vantage Highway. One special event that could potentially result in added traffic congestion would be concerts at the Gorge Amphitheater in Grant County.

Any potential conflicts between WSDOT projects on I-90 and the proposed project will be discussed specifically with WSDOT, and a Traffic Management Plan will be prepared. This Traffic Management Plan will address any other planned county or WSDOT road construction projects that affect project construction and operations and include the use of additional signage, flaggers, and/or alternate route designations.

Traffic Hazards

It is anticipated that the addition of construction-generated traffic by the project would have little effect on the existing accident rate or pattern. The largest potential change is along Vantage Highway west of the site access, which would increase 153 vehicle trips during peak hours. Along this segment of roadway the increase in truck traffic (35 truck trips in peak hours) may result in more motorists attempting to pass slow-moving vehicles. This could result in a slightly higher accident rate.

The project access point on Vantage Highway would be located between MP 19 and MP 20. Sight distance could be of concern for this access point because it is located along a horizontal curve and the dirt berm on the south side of Vantage Highway may restrict the sight of left turn vehicles entering and leaving the site. The applicant will work with the County to obtain a driveway permit for this access point, which would meet the driveway design and sight distance requirements. The applicant may need to remove the dirt berm on the south side of Vantage Highway in order to provide adequate sight distance.

The Kittitas School District surrounds the project site. School bus stops along Vantage Highway are few in number and are adequately signed, so conflicts are not anticipated. In addition, stops along Vantage Highway can be made where adequate shoulders or private driveways are located, providing safety for children should construction traffic coincide with pick-up/drop-off times. School bus stops along No. 81 Road are also few in number and adequately signed. Buses making stops along this road are able to pull off the main roadway, providing children safety from traffic and allowing vehicles to pass.

A Traffic Management Plan will be submitted to Kittitas County for review prior to the startup of construction, and that plan will include measures to minimize impacts of construction-related traffic and minimize hazards during construction.

Transportation of Hazardous Materials

Diesel fuel is the only potentially hazardous material that would be used in any significant quantity during construction of the project. During construction, fuel tanker trucks would be

used for the refueling of fuel storage tanks on-site. The fuel tanker trucks will be properly licensed and professionally driven and will incorporate appropriate design features such as overflow prevention devices and fixed couplings to prevent accidental spills. The project construction would not result in the generation of any hazardous wastes in quantities regulated by state or federal law.

Potentially small amounts of other hazardous materials that would be transported to the site during construction include lubricating oils, cleaners, and herbicides. Transportation of these materials will be conducted in a manner that is protective of human health and the environment and in accordance with applicable federal and WSDOT requirements.

Air Navigation Considerations

Construction equipment that might impact air navigation includes cranes used to assemble the towers. The Federal Aviation Administration has conducted a preliminary review and found no adverse impacts from this project provided that the equipment does not exceed the maximum height of the project.

Operation and Maintenance Impacts

Operational Traffic

Once constructed, the project would operate continuously (24 hours per day, 7 days per week) using an automated monitoring system. It would also employ an estimated 10 full-time workers who would staff the project during core operating hours. The operations crew would normally work 8-hour days Monday through Friday, with additional hours on weekends as required. This equates to a maximum of 20 trips a day or 10 trips during the peak hour. It is anticipated that nearly all of the operations workers would reside within 30 miles of the project site, most likely Ellensburg or the surrounding area. It is assumed that most operation crews would travel east on I-90 to the Kittitas exit, north through the City of Kittitas on S. Main Street and Number 81 Road, and continue east on Vantage Highway to access the project site. Table 9 shows the traffic volumes and LOS with the operations-generated traffic.

Traffic between the O&M facility and the individual turbines would be light. Besides day-to-day maintenance, there would be scheduled maintenance every 6 months.

Table 9 below describes the effect of the operational phase of the proposed action on traffic volumes and LOS. All roadways would operate at LOS B or better during evening peak conditions.

Maintenance trails for the transmission feeder line(s) would be privately owned and located on the project site and along the feeder line(s). Maintenance roads for turbines would be the same turbine string roads used for project construction. There would be no uncontrolled public access to project facilities on privately owned land during construction, operation, or decommissioning of the project.

Table 9. Roadway LOS with Operation Traffic

Roadway Segment	No of Lanes	2007 ADT	Heavy Truck %	2007 PM Peak	PM Peak Operation Traffic	Total PM Peak	LOS
I-90 west of Kittitas Exit	4	14,000 ^a	18 ^a	928 ^b	10	938	B
S Main Street north of I-90 Kittitas Exit	2	2,416	8	217	10	227	A
No. 81 Road between Patrick Avenue and Vantage Highway	2	1,565	-	235 ^c	10	245	A
Vantage Highway east of No. 81 Road	2	1,372	-	134	10	144	A
Vantage Highway west of Project Access Roads	2	384	12	49	10	59	A

^a 2006 weekday ADT volume and truck percentage are based on the WSDOT 2006 Annual Traffic Report.

^b Freeway PM peak hour volume is directional. Based on the WSDOT Peak Hour Report, 17% of ADT is PM peak hour volume and 39% of PM peak hour volume is westbound.

^c Assumed that 15% of ADT is PM peak hour volume.

Parking

During the operational phase, parking would be at the O&M facility parking lot. With an anticipated operations workforce of 6 to 10 people, plus occasional delivery vehicles, no more than 15 vehicles are expected to be parked at the facility at any one time. This would be a smaller area than required for the construction phase. The permanent parking area at the O&M facility will be graveled to reduce dust and soil erosion.

Roadway Limitation

The operation of the project would have little impact on the condition of the public road system. Heavy truckloads would not be required until replacement of turbines or nacelles, which would occur over time with scheduled maintenance.

Traffic Hazards

Traffic generated by the operation of the project is not anticipated to affect the accident rate or pattern on roadways that are part of the transporter routes because the operation-generated traffic would only increase 10 vehicle trips during peak hours. The project would not alter public roadways except for the project site access. The proposed site access would be the same access point for construction. Sight distance could be of concern for this access point because it is located along a horizontal curve and the dirt berm on the south side of Vantage Highway may restrict the sight of left turn vehicles entering and leaving the site. The applicant will require to work with the County to obtain a driveway permit for this access point, which include meet the driveway design and sight distance requirements. The applicant may need to remove the dirt berm on the south side of Vantage Highway in order to proved adequate sight distance.

Transportation of Hazardous Materials

Hazardous materials to be transported to the site during operation include lubricating and mineral oils, cleaners, and herbicides in quantities below state and federal regulatory thresholds.

Transportation of these materials will be conducted in a manner that is protective of human health and the environment and in accordance with applicable federal and WSDOT requirements.

No substantial quantities of industrial materials will be brought onto or removed from the project site during project operations. The only materials that would be brought onto the site would be those related to maintenance and/or replacement of the project facilities (e.g., nacelle or turbine components, electrical equipment). The only materials that would be removed from project facilities would be those parts or materials replaced during maintenance activities. Those materials removed or replaced would not constitute a significant amount.

Air Navigation Considerations

The installation of wind turbines on the site could potentially impact air navigation. The turbines will be a maximum of 389 feet above ground level (AGL) and 2,740 feet above mean sea level (AMSL). A portion of the turbines are located along a major VFR flyway (Hwy 10 and Hwy 90). To provide adequate air traffic safety, the wind turbines will meet FAA safety lighting requirements. At present, FAA guidelines for lighting of wind turbines call for lights that flash simultaneously red (at 2,000 candela) at night. Daytime lighting is currently not required, provided that the structures are painted bright white or light off-white. The exact number of turbines that would require nighttime lighting will be specified by the FAA after it has reviewed final project plans; however, typically, FAA has required that warning lights be mounted on the first and last turbines of each string and every 1,000 to 1,400 feet on the turbines in between.

Decommissioning Impacts

Decommissioning is assumed to include removal of wind turbine assemblies, grading and seeding roads to natural contours, while leaving wind turbine foundations in place. Heavy vehicle trips would primarily consist of trucks carrying wind turbines and transformers and be less than the number of trips required during construction. The resulting workforce and lightweight delivery vehicles trips would also be smaller. Mitigation would be determined at the time of decommissioning and would likely be similar to that recommended for construction.

Applicant Measures

Although it is not anticipated that the project would result in significant impacts to transportation in Kittitas County, there are several measures the applicant may take to minimize disruption during the construction and operation of the project. These include:

Construction:

- The applicant will prepare a Traffic Management Plan (to be submitted to the County and WSDOT prior to construction for review), with the construction contractor outlining steps for minimizing construction traffic impacts;
- The applicant will provide notice to adjacent landowners when construction takes place to help minimize access disruptions;
- The applicant will provide proper road signage and warnings of “Equipment on Road,” “Truck Access,” or “Road Crossings” along Vantage Highway;
- When slow or oversized wide loads are being hauled, appropriate vehicle and roadside signing and warning devices will be deployed per the Traffic Management Plan. Pilot cars will be used as WSDOT dictates, depending on load size and weight;
- The applicant will construct necessary site access roads and an entrance driveway that will be able to service truck movements of legal weight and provide adequate sight distance;
- The applicant will encourage carpooling for the construction workforce to reduce traffic volume;
- In consultation with Kittitas County, the applicant will provide detour plans and warning signs in advance of any traffic disturbances;
- The applicant will employ flaggers as necessary to direct traffic when large equipment is exiting or entering public roads to minimize risk of accidents;
- Where construction may occur near the roadway, one travel lane will be maintained at all times;
- The applicant will videotape the Vantage Highway from Vantage to the site access to document pavement conditions before and after construction and address changes in discussions with Kittitas County.

Operation:

Operation and maintenance of the project would not significantly affect traffic. However, the following measure is recommended:

- Follow FAA guidelines for a wind turbine lighting and warning system.