



# TRANSPORTATION RESEARCH SYNTHESIS

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## Effects of Major Traffic Generators on Local Highway Systems

### Introduction

The Minnesota Department of Transportation initiated a study focused on the effects of major traffic generators on local highway systems. Minnesota State University and SRF Consulting Group, Inc. will conduct a major research study on the topic. To assist in that research CTC & Associates was asked to conduct a preliminary investigation focused on large wind farm developments, an increasingly common type of major traffic generators in Minnesota. The development of large wind farms necessarily includes the movement of very large, oversize trucks carrying wind turbines over county roads. This construction raises several concerns, including pavement damage; indirect impact to the immediate area surrounding the roads; and related costs to local governments to repair and maintain the roads and to mitigate other effects. The preliminary investigation focused on gathering information related to the two main areas of inquiry in the research project: calculating pavement damage and secondary impacts due to large vehicle traffic; and policy options for local governments to recapture the costs of roadway maintenance caused by wind farm development.

### Summary

Our findings are presented in seven sections under the major areas of inquiry, followed by descriptions of seven Web sites that provide resources related to wind farm development.

- Calculating impacts
  - Pavement damage and utility cuts
  - Secondary impacts
- Policy options
  - Background
  - Impact fees for natural resource development
  - Local ordinances
  - Road agreements
  - Interviews with county engineers
- Web resources

## Calculating Impacts

### *Pavement Damage and Utility Cuts*

In this section we reference nine studies, articles and academic research papers that present a variety of approaches to calculating pavement damage related to heavy vehicle traffic. We also include four studies on the effects of utility cuts on pavement performance and ways to plan for, evaluate and deal with utility cuts.

The studies include detailed descriptions of traditional mathematical models used to calculate pavement damage in situations analogous to those presented by wind farm development. A summary of different software applications, including Mathematical Model of Pavement Performance, Highway Design and Maintenance Standards Model and PAVESIM, can be found in **Infrastructure Costs Attributable to Commercial Vehicles** (New Jersey Department of Transportation 2001).

### *Secondary Impacts*

Two NCHRP guidebooks referenced in this section present detailed methodologies for measuring the social, economic and environmental effects of transportation projects. Topics covered include air quality, hazardous materials, water quality and drainage, safety, user effects, community cohesion, economic development, noise, visual quality, land prices and property value, and cultural resources.

## Policy Options

### *Background*

Impact fees have historically been used to recover infrastructure costs associated with new development. The use of overweight vehicle permits has also been used by counties to mitigate damage done by large vehicle traffic. With respect to wind farm development, the current trend seems to be for counties to use road agreements with developers to recover the costs of road damage associated with the development. This section provides background on the development of impact fees and truck user fees. The use of road agreements as a new method to recover road damage costs associated with wind farm development is presented in the next two sections.

### *Impact Fees for Natural Resource Development*

Impact fees are used by counties across the country to recover the public infrastructure costs associated with new development. This section highlights the efforts of Rio Blanco County, Colo., to impose impact fees on oil and gas drilling development, and outlines Montana's statute allowing impact fees on wind farms.

### *Local Ordinances*

Counties across the country are beginning to use wind energy ordinances that dictate the requirements for building wind farms in a particular county. Substantial portions of the ordinances deal with zoning and building requirements. These ordinances often reference the need for road agreements between developers and local government road agencies and require that the road agreements result in a "developer pays" situation with regard to road damage and rehabilitation. The following example comes from a Logan County, Ill., zoning ordinance:

"Any road damage caused by the transport of the facility's equipment, the installation, maintenance, or removal, must be completely repaired to the satisfaction of the Township Road Commissioner and the County Engineer."

### *Road Agreements*

This section includes several examples of implemented county road agreements addressing the following issues:

- Road upgrades to handle the heavy vehicle traffic associated with wind farm development
- Evaluation of road conditions before and after construction
- Developer responsibility for repairing roads to their pre-construction condition
- Traffic plans and moving of traffic signs and utilities
- Drainage issues
- Security bonds to ensure performance of obligations

The following example from McLean County, Ill., is representative of provisions dealing with road rehabilitation. It requires the developer to:

“Pay for the cost of all repairs to all County Highways that are damaged by Developers or the Developers’ Representative(s) during the construction of the Project and restore such roads to the condition they were in at the time of the pre-construction inventory.”

*Interviews with County Engineers*

When faced with the prospect of wind farm development, county engineers strive to protect and improve their county road systems. The engineers who have used comprehensive road agreements as an integral part of wind farm development are satisfied that those goals have been met. Each engineer expressed concerns about road damage and the rehabilitation costs associated with wind farm development. Engineers interviewed for this research were.

- Bret Aukamp, county engineer for Logan County, Ill., (217) 732-3059
- Randy Groves, county engineer for Murray County, Minn., (507) 836-6327
- Tim Lichtenwalter, deputy county engineer for Richland County, Ohio, (419) 774-5808
- Eric Schmitt, county engineer for McLean County, Ill., (309) 663-9445

## **Calculating Impacts**

### **Pavement Damage and Utility Cuts**

**Effects of Overweight Vehicles on NYSDOT's Infrastructure**, Michel Ghosn, Neville A. Parker, Kolluru Subramaniam, City College of New York, New York Department of Transportation.

Abstract: <http://rip.trb.org/browse/dproject.asp?n=23799>

This is a major (\$500,000) research project recently undertaken by City College of New York, sponsored by the New York State DOT. Although the study is not expected to be completed until September 2011, the investigators may have insights that will be helpful to the Minnesota effort. According to the abstract:

“Overweight trucks also cause a significant and disproportionate amount of damage to pavements. Although legal truck traffic accounts for a large percentage of damage to highway pavement, the percentage of damage caused by overweight permit and illegal trucks is much greater than the expected damage from legal trucks.” (Strauss and Semmens, 2006; Roberts et al. 2005).

The research will include a review of recent methods used in calculating the cost of pavement damage to roads and bridges and will look to apply those to New York state. The final goal is to “develop models for assessing the cost of damage caused by overweight vehicles to New York state’s highway pavements and bridges.”

### **Method for Assessing Heavy Traffic Impacts on Gravel Roads Serving Oil- and Gas-Drilling Operations**,

George Huntington, Khaled Ksaibati, *Transportation Research Record: Journal of the Transportation Research Board*, No. 2101, 2009: 17-24.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01123122.html>

The paper discusses a three-year asset management project looking at three county road systems in Wyoming experiencing significant impact from oil and natural gas drilling activities. One of the goals of the project was to determine the impact of heavy drilling trucks associated with those activities on local county roads. From the abstract:

“Clearly, the heavy traffic associated with drilling activities has significantly damaged these three counties’ roads beyond what would be anticipated from typical traffic loads. The proposed method could easily be adapted to other road systems experiencing a significant influx of heavy truck traffic to assess the impact of the additional traffic.”

### **Impact of Commercial Vehicle Weight Change on Highway Bridge Infrastructure**, G. Fu, J. Feng,

W. Dekelbab, F. Moses, H. Cohen, D. Mertz, *Journal of Bridge Engineers*, Vol. 13, No. 6, 2008: 556-564.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01115319.html>

From the abstract:

“Truck weight in this paper not only refers to the truck gross weight but also to the axle weights and spacings that affect load effects. This paper presents the concepts of a new methodology for estimating cost effects of truck weight limit changes on bridges in a transportation infrastructure network. The methodology can serve as a tool for studying impacts of such changes. The resulting knowledge is needed when examining new truck weight limits, several of which have been and are still being debated at both the state and federal levels in the United States. The development of this estimation method has considered maximizing the use of available data (such as the bridge inventory) at the state infrastructure system level.”

**Modeling the Response of Paved Low-Volume Roads Under Various Traffic and Seasonal Conditions**, Nabil Suleiman, Amiy Varma, *Transportation Research Record: Journal of the Transportation Research Board*, No. 1989, 2007: 230-236.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01051242.html>

This paper discusses the deterioration of paved low-volume roads in North Dakota due to increased truck traffic. According to the authors, “[t]he traditional empirical methods—use of the soil factor and R-value designs and the use of visual inspection and ride quality—to assess pavement performance are not adequate.” To obtain a better understanding of the impact of increased truck traffic on the low volume roads, “[a] three-dimensional finite element program is used to model the pavement response in the form of total permanent deformation (TPD) and to calculate axle and truck damage factors.” Using the TPD response the authors are able to analyze pavement responses under different vehicle weights and seasonal conditions.

**Analyzing Highway Damage Costs Attributed to Truck Traffic of Processed Meat and Related Industries in Southwest Kansas**, Chunxiao Liu, University of Kansas Masters Thesis, 2007.

[http://kuscholarworks.ku.edu/dspace/bitstream/1808/1956/1/umi-ku-2274\\_1.pdf](http://kuscholarworks.ku.edu/dspace/bitstream/1808/1956/1/umi-ku-2274_1.pdf)

This is a master's thesis analyzing ways to estimate the highway damage costs attributed to truck traffic associated with the processed meat and related industries in southwest Kansas. Chapter 5 discusses the highway damage costs, damage models and calculation of maintenance costs associated with truck traffic. The following excerpt from Chapter 5 is an example of the type of analysis found in this paper:

“Unit costs per ESAL were computed by multiplying the average resurfacing or reconstruction costs per mile by the percent of PSR loss due to traffic and dividing by the ESAL lives of the pavement segments. To illustrate the process, assume that a pavement segment has an ESAL life of 500,000, rehabilitation and reconstruction cost of \$300,000 per mile, and 40 percent of the pavement deterioration is due to environmental factors. In this example, the rehabilitation cost due to traffic is  $\$300,000 \times (1-40\%)/500,000 = \$0.36$  per ESAL.” (page 103)

**Economic Impacts of Railroad Abandonment on Rural Kansas Communities**, Michael W. Babcock, James L. Bunch, James Sanderson, Jay Witt, Kansas State University, Report No. KS-03-4, 2003.

[http://ntl.bts.gov/lib/24000/24500/24597/KS034\\_Report.pdf](http://ntl.bts.gov/lib/24000/24500/24597/KS034_Report.pdf)

This report discusses the potential impact of the increased heavy truck traffic on Kansas county roads due to increasing abandonment of rail lines. In Chapter 2, Section 2, beginning on page 31, the authors discuss different road damage cost studies and detail the different stages involved in each study. For example:

“Stage IV: The above collected information was utilized with road damage to calculate the physical deterioration of each road segment caused by the increased truck traffic resulting from railroad abandonment. The measured road deterioration was translated into road damage costs based on road reconstruction and maintenance cost estimates provided by the state Department of Transportation and county engineers.”

Chapter 5 contains a road damage cost analysis of the situation in Kansas:

“This chapter will discuss the truck and pavement characteristics which relate to pavement deterioration. The methodology used for estimating costs associated with pavement deterioration will be presented, and the data input requirements will be identified. Finally, the road damage impacts resulting from study area shortline abandonment will be discussed including a discussion of how pavement and vehicle types fit into the road damage cost methodology.” (page 87)

**Estimating Heavy Vehicle Road Wear Costs for Bituminous-Surfaced Arterial Roads**, T.C. Martin, *Journal of Transportation Engineering*, Vol. 128, No. 5, March/April 2002: 103-110.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/00920971.html>

This paper is based on a study of the heavy vehicle road wear costs for bituminous-surfaced roads in Australia. From the abstract:

“This paper gives the latest estimates of the attributable heavy vehicle road wear cost—an approximation for the marginal cost of road wear—for thin bituminous-surfaced arterial roads in Australia. These estimates are based on: 1) a statistical relationship between road maintenance costs and a heavy vehicle road use variable; and 2) a pavement deterioration model that forms the basis of a load-related road wear model.”

**Infrastructure Costs Attributable to Commercial Vehicles**, Maria Boile, Kaan Ozbay, Preethi Narayanan, Edward S. Kondrath, New Jersey Department of Transportation, 2001.

Abstract: <http://cait.rutgers.edu/research-reports/infrastructure-costs-attributable-commercial-vehicles>

This report summarizes a comprehensive study of the infrastructure impacts of heavy vehicles. The report reviews a federal highway cost allocation study along with studies from Arizona, Oregon, Indiana, Georgia and Minnesota. Beginning on page 20, the report discusses five traditional deterioration models: statistical, subjective, empirical, mechanistic/empirical and mechanized.

The authors also describe different computer software models used to evaluate pavement deterioration, including the Mathematical Model of Pavement Performance, Highway Design and Maintenance Standards Model (HDM IV) and PAVESIM. The different input requirements and measurement outputs are discussed for each model.

**Allocation of Pavement Damage Due to Trucks Using a Marginal Cost Method**, J. J. Hajek, S. L. Tighe, B. G. Hutchinson, *Transportation Research Record: Journal of the Transportation Research Board*, No. 1613, 1998: 50-56.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/00755053.html>

This research deals with assessing pavement cost allocation using the marginal cost method. The paper discusses how this method “can be used to quantify pavement damage due to any axle load combination for both new and existing, in-service pavements.” For example, this method could be used to “quantify the pavement costs associated with increasing allowable truck weights of logging trucks on a specific segment of the highway network.”

**City Combats Damage to City Streets Caused by Utility Cuts**, T. Peters, *Public Works Journal*, Vol. 133, No. 4, April 2002: 54-56.

This article discusses the impact of utility cuts on the streets of Salt Lake City, Utah. The results of the study led the city to change some of its requirements regarding trench restoration.

**Impact of Utility Cuts on Pavement Performance in the City of Seattle**, Margot Yapp, James Lundy, Susan Chu, Fifth International Conference on Managing Pavement, CD-ROM, 2001.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01037837.html>

This is a panel discussion of a report submitted to the City of Seattle regarding the impact of utility cuts on city streets. The report deals with pavement degradation, maintenance and rehabilitation costs associated with utility cuts.

**Impact of Utility Cuts on Performance of Seattle Streets**, Nichols Vallegra & Associates, Pavement and Materials Engineers, 2000.

[http://www.seattle.gov/transportation/pdf/final-rpt\\_Jan31.PDF](http://www.seattle.gov/transportation/pdf/final-rpt_Jan31.PDF)

This report was commissioned by the City of Seattle to determine the extent of pavement degradation and costs associated with maintenance, repair and rehabilitation due to the presence of utility cuts. The appendix includes summaries of 11 prior utility cut impact studies and the fee schedules other localities have developed to capture the costs of the damage.

**Planning and Implementation of a Management System for Utility Cuts**, R. Arudi, B. Pickering, J. Flading, *Transportation Research Record: Journal of the Transportation Research Board*, No. 1699, 2000: 42-48.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/00798873.html>

This paper discusses the results of a study on the development of a utility cuts management systems (UCMS). A UCMS would provide guidelines for municipalities dealing with the effect utility cuts have on pavement performance. It presents a synthesis of evaluation methods, cost management and policy issues related to utility cuts.

### **Secondary Impacts**

**Effective Methods for Environmental Justice Assessments**, David J. Forkenbrock, Jason Sheeley, *NCHRP Report 532*, 2004.

[http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_532.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_532.pdf)

This report is presented as a guide to the methods for assessing and calculating the effects of transportation projects across a wide range of environmental and community resources. The goal of the report is to present processes, procedures and techniques to incorporate environmental justice considerations into the transportation planning and project development process. Each chapter includes an overview of the topic, review of assessment methods, and listings of resources and references. For example, the following chapters may offer guidance to communities dealing with wind farm development:

- Chapter 3 Air Quality
- Chapter 4 Hazardous Materials
- Chapter 5 Water Quality and Drainage
- Chapter 6 Safety
- Chapter 7 Transportation User Effects
- Chapter 8 Community Cohesion
- Chapter 9 Economic Development

Chapter 10 Noise  
Chapter 11 Visual Quality  
Chapter 12 Land Prices and Property Value  
Chapter 13 Cultural Resources

**Guidebook for Assessing the Social and Economic Effects of Transportation Projects**, David J. Forkenbrock and Glen E. Weisbrod, *NCHRP Report 456*, 2001.  
[http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp\\_rpt\\_456-a.pdf](http://onlinepubs.trb.org/onlinepubs/nchrp/nchrp_rpt_456-a.pdf)

Similar to NCHRP Report 532 above, this guide presents best practices, methods, tools and techniques to evaluate social and economic impacts of transportation projects. Pertinent sections discuss the issues of traffic noise, visual quality and property values related to new construction projects.

## **Policy Options**

### **Background**

**Taxing Development: The Law and Economics of Traffic Impact Fees**, Jack Estill, Benjamin Powell, Edward Stringham, *Public Interest Law Journal*, Vol. 16, 2006: 1-37.

<http://www.bu.edu/law/central/jd/organizations/journals/pilj/vol16no1/documents/16-1EstillPowellStringhamArticle.pdf>

This article discusses the history, theory and legality of charging developers a fee based upon the impact their development has on public infrastructure and services. Section II, beginning on page 3, discusses the legal history of impact fees. The analysis provides a detailed history of the legal precedents allowing governments to use such fees. The article is focused on the legal issues surrounding impact fees and gives a broad outline of the history and policy behind their use.

**Policy Options for Truck User Charging**, Alison J. Conway, Michael C. Walton, TRB Annual Meeting, DVD, 2009.

Abstract: <http://ntlsearch.bts.gov/tris/record/tris/01122180.html>

From the abstract:

“This paper provides a review of truck road user charging mechanisms employed worldwide. The purpose of this study is to identify the variables currently considered in determining user charge rates for heavy trucks within different tolling structures, and to determine the relationship of these variables to policy goals.”

### **Impact Fees for Natural Resource Development**

#### **Rio Blanco County, Colorado**

<http://www.co.rio-blanco.co.us/development/>

The impact fees assessed on oil and gas development by Rio Blanco County, Colo., were described in news articles as unique in the nation, and we were unable to locate any similar ordinances. These impact fees were challenged in court by ExxonMobil, and on Dec. 14, 2009, the Colorado Supreme Court upheld an appeals court ruling that appeared to put an end to this specific form of impact fee. See a news article at

[http://www.gjsentinel.com/hp/content/news/stories/2009/12/15/121609\\_3A\\_Use\\_tax\\_appeal.html](http://www.gjsentinel.com/hp/content/news/stories/2009/12/15/121609_3A_Use_tax_appeal.html) for more details.

In 2007, a draft bill that addresses assessing impact fees on the development of natural resources was proposed for inclusion in Colorado state statutes:

**A Bill for an Act Concerning the Authority of Local Governments to Impose Impact Fees to Defray Projected Impacts Required to Support the Expanded Development of Natural Resources**, Interim Committee Bill, Draft, October 4, 2007.

<http://www.colorado.gov/cs/Satellite?blobcol=urldata&blobheader=application%2Fpdf&blobkey=id&blobtable=MungoBlobs&blobwhere=1231572741706&ssbinary=true>

This bill does not appear to have become part of the state statutes. An excerpt:

As a condition of issuance of a conditional or special use permit or similar application authorizing mining or oil and gas operations within the territorial boundaries of a county or municipality (local government), authorizes local governments to impose an impact fee or other similar development charge to fund expenditures by the local government on capital facilities or social services necessary to support such expanded oil and gas operations. Prohibits an impact fee or other similar development charge from being imposed except pursuant to a schedule that is:

- Legislatively adopted;
- Generally applied on a uniform and nondiscriminatory basis among types or kinds of mining or oil and gas operations; and
- Intended to defray the projected impacts on capital facilities or social services necessary to support the proposed expanded mining or oil and gas operations.

Requires a local government to quantify the reasonable impacts of expanded mining or oil and gas operations on existing capital expenditures or social services within its territorial boundaries.

## **Montana**

Montana state statutes allow the assessment of impact fees on wind farms of up to 0.5 percent of the facility's total construction cost. The fees may be collected for the first three years after construction. The statute below provides the authority to collect these fees.

**Wind Generation Facility Impact Fee for Local Governmental Units and School Districts**, Montana Annotated Code 2009, section 15-24-3004.

<http://data.opi.mt.gov/bills/mca/15/24/15-24-3004.htm>

Excerpt:

(1) An owner or operator of a wind generation facility used for a commercial purpose is subject to an initial local governmental and local school impact fee for the first 3 years after construction of the wind generation facility begins. The impact fee may not exceed 0.5% of the total cost of constructing the wind generation facility.

Two news articles provide details on how these fees have been implemented:

**“County Road Dept. to Receive \$100,000 from Wind Farm Impact Fees Payment,”** August 19, 2008.

[http://www.impactfees.com/pdfs\\_all/County%20Road%20Dept.%20to%20receive%20\\$100,000.pdf](http://www.impactfees.com/pdfs_all/County%20Road%20Dept.%20to%20receive%20$100,000.pdf)

**“Giant Shelby-Area Wind Farm Gears Up,”** July 18, 2008.

[http://commerce.mt.gov/energy/Includes/NewsArticles/2008Articles/071808\\_Giant\\_Shelby-Area\\_Wind\\_Farm\\_Gears\\_Up.pdf](http://commerce.mt.gov/energy/Includes/NewsArticles/2008Articles/071808_Giant_Shelby-Area_Wind_Farm_Gears_Up.pdf)

Excerpt: “Toole County Commissioner Allan Underdal said tax revenue in that county from the Glacier Wind Farm will be \$2.1 million its first year of operation. This year, the county will charge NaturEner a \$437,000 impact fee to cover services the county supplies for the project, such as roadwork and public safety.”

A few other jurisdictions have explored the idea of assessing impact fees on wind farms. For example:

**Morrison, Wisconsin: Large and Small Wind Energy Facility Ordinance**, adopted May 13, 2008.

[http://www.townofmorrison.org/OrdinancesZoning/XXIV\\_Wind\\_Energy\\_Facility\\_Ordinance\\_final.pdf](http://www.townofmorrison.org/OrdinancesZoning/XXIV_Wind_Energy_Facility_Ordinance_final.pdf)

Excerpt from page 10 of the PDF:

### V. Impact Fees

- a. The Town of Morrison retains the right to negotiate an Impact Fee on wind turbines with the owner/operator of a large wind energy facility.



**Kittitas County, Washington: Staff Report, Vantage Wind Power Project (WSA-07-01)**, March 12, 2008.  
[http://www.co.kittitas.wa.us/cds/current/landuse%5CWind%20Farm%5CWSA-07-01%20Vantage%20Wind%20Power%20Project%20Notices\\_Staff%20Report%5C3-12-08\\_Staff%20Report\\_Joint-Hearing%20PC%20and%20BOCC.pdf](http://www.co.kittitas.wa.us/cds/current/landuse%5CWind%20Farm%5CWSA-07-01%20Vantage%20Wind%20Power%20Project%20Notices_Staff%20Report%5C3-12-08_Staff%20Report_Joint-Hearing%20PC%20and%20BOCC.pdf)  
Excerpt from pages 7 to 8 of the PDF:

Development standards addressed in the agreement may include:

(b) The amount and payment of impact fees imposed or agreed to in accordance with any applicable provisions of state law, any reimbursement provisions, other financial contributions by the property owner, inspection fees, or dedications;

### **Local Ordinances**

**Examples of NY Local Government Laws/Zoning Provisions on Wind**, NYS Energy Research and Development Authority, October 2005.

[http://www.powernaturally.org/programs/wind/toolkit/3\\_revised.pdf](http://www.powernaturally.org/programs/wind/toolkit/3_revised.pdf)

This toolkit provides an overview of existing local laws and zoning ordinances in New York state dealing with the siting of wind energy facilities. Some examples include sections dealing with existing roads, the requirement for road repair or construction, and the impact of wind farm construction on local infrastructure. For example:

“The applicant is responsible for remediation of damaged roads upon completion of the installation or maintenance of a WECS. A public improvement bond shall be posted prior to the issuance of any building permit in an amount determined by the Town Board, sufficient to compensate the Town for any damage to local roads.” (pages 45-46)

**Nicollet County Wind Energy Conversion Systems Ordinance**, Nicollet County, Minnesota, August 2009.

<http://www.co.nicollet.mn.us/File.aspx?Id=DFB35A84-4A86-412F-9F21-8ED41B455105>

This is an ordinance recently passed in Nicollet County, Minn., dealing with the siting of wind farms. Section 909.1, “Avoidance and Mitigation of Damages to Public Infrastructure,” and Section 909.2, “Roads,” include provisions dealing with the impact on local roads, sign relocation, drainage system impact and traffic plans. The following provision addresses developers’ responsibility for identifying roads to be used to haul materials and equipment:

“Identify all public roads to be used for the purpose of transporting [wind energy conversion systems], substation parts, materials and/or equipment for construction, operation or maintenance of the WECS and obtain applicable weight and size permits from the impacted road authority(ies) prior to construction.” (page 17)

A related provision addresses road restoration requirements:

“Provide a bond, in an amount determined by the road authority, to be held by the County until the Township and/or County road authority(ies) have provided the County Auditor-Treasurer with a written release that all haul routes within their jurisdiction in Nicollet County have been returned to preconstruction condition.” (page 18)

**Logan County Zoning Ordinance, Appendix E, Wind Energy Conversion Systems**, Logan County, Illinois.

[http://www.co.logan.il.us/zoning/ordinance/appendix\\_e.pdf](http://www.co.logan.il.us/zoning/ordinance/appendix_e.pdf)

This zoning ordinance details the requirements for wind farm development in Logan County, Ill. Section V.L., “Use of Public Roads,” describes the duties of developers in relation to the use of local roads and infrastructure, and details the requirements regarding road identification:

“Any proposed public roads that will be used for construction purposes shall be identified and approved by the respective Township Road Commissioner and the County Engineer prior to the granting of the Conditional Use Permit. Traffic for construction purposes shall be limited to these roads. All overweight and/or oversized loads to be transported on public roads will require a permit from the respective highway authority.” (page 5)

The ordinance also addresses developers’ responsibility for repairs to any road damage that may occur.

**Riley County, Kansas, Zoning Ordinance**, Section 22, Special Uses

<http://www.rileycountyks.gov/documents/Planning%20and%20Development/Zoning%20Regulations/y%29%20Section%2022%20-%20Special%20Uses.pdf>

This zoning ordinance from Riley County uses language acknowledging a concern for road damage while not specifically requiring the developer to pay for such damage. The pertinent language is found in Subsection 14 (page 8). Details about designated traffic routes, anticipated traffic volume and road maintenance during construction are given in Subsection 13 (page 8).

**A Model Ordinance for Energy Projects**, Oregon Department of Energy, July 2005.

<http://www.oregon.gov/ENERGY/SITING/docs/ModelEnergyOrdinance.pdf>

The Oregon Department of Energy prepared this document to assist local communities in dealing with siting all types of energy projects, including wind farm development. It contains model language dealing with all aspects of new energy facilities, including a short section on the use of local roads. Pages 20-23 include examples that deal with the use of and damage to public roads, erosion and sediment control, and wetland protection.

**Wind Power: Turning a Breeze into Cash for Your Community**, Wind Energy Conversion System Ordinance Development in Clinton County, Indiana, Curt Emanuel, Purdue University Cooperative Extension Service, November 3, 2008.

[http://www.naco.org/cffiles/ggi/webinars/pdfs/ClintonCountyIN\\_CurtEmanuel.pdf](http://www.naco.org/cffiles/ggi/webinars/pdfs/ClintonCountyIN_CurtEmanuel.pdf)

This presentation outlines the range of issues counties should address when creating a local wind ordinance. Page 9 includes a list of concerns to be addressed, including roads, drainage and noise. On page 12 the author discusses what counties should do to protect their roads and ensure they are repaired after construction of a wind energy conversion system.

**Town of New Scotland, Albany County, New York**, proposed Wind Energy Facility Law.

<http://www.townofnewscotland.com/townreporter/docs/proposed%20wind%20energy%20facility%20law.pdf>

Section 7, Subsection E, of this proposed ordinance explains the application requirements for a wind energy facility permit, which include a construction schedule and traffic analysis that describes the routes that construction and delivery vehicles will use. Section 13 has additional provisions for traffic routes and road maintenance required to build a wind energy facility. It calls for a performance bond to insure proper road maintenance and for pre- and post-development photographic evidence of the condition of the roads.

**An Overview of Existing Wind Ordinances**, F. Oteri, National Renewable Energy Laboratory, Technical Report, NREL/TP-500-44439, December 2008.

[http://www.windpoweringamerica.gov/pdfs/policy/2008/ordinances\\_overview.pdf](http://www.windpoweringamerica.gov/pdfs/policy/2008/ordinances_overview.pdf)

This report contains a survey of existing wind energy ordinances throughout the country. The report identifies common issues dealt with by each ordinance and also includes a summary and link to each ordinance. Issues of importance include restoration requirements, signage, and noise issues.

**Road Agreements**

**Logan County, Illinois, Road Agreement**

This is a comprehensive road agreement that contains provisions requiring the developer to provide a traffic plan and to pay for road upgrades, damage to roads during construction, emergency repairs and the movement of signs and utilities. The agreement is attached as [Appendix A](#) to this report. Section 3 details the use of pre- and post-construction surveys to determine the impact of construction traffic on county roads. The agreement calls for a joint survey to include videotaping all roads to be used during construction. Section 3 also references two exhibits: Exhibit A, which is attached to this report as [Appendix B](#), includes provisions for a transportation plan that identifies project access roads. Exhibit B, which is attached as [Appendix C](#), lists access roads that will be used and improved during wind farm construction.

**Dekalb County, Illinois, Road Agreement**

[http://www.dekalbcounty.org/Planning/Exhibit\\_T\\_AppA.pdf](http://www.dekalbcounty.org/Planning/Exhibit_T_AppA.pdf)

This agreement contains provisions requiring the developer to provide a site layout plan and to pay for any road damage caused by construction traffic. Section 1 references the approval of a site layout plan, which includes project site access roads. Section 4 details the developer's obligation to repair county roads. This agreement calls for an independent road survey to be conducted before and after construction to determine the condition of the roads and to calculate any damage.

## **McLean County, Illinois, Road Upgrade and Maintenance Agreement**

<http://co.mclean.il.us/boardnotes/>

Click on Past Agenda and Minutes 2005; Scroll down to Transportation Committee and click on Attachments for September. The road agreement is found on pages 3-31.

This agreement contains provisions requiring the developer to pay for the cost of any damage caused by construction traffic. It also contains the requirement for a pre- and post-construction joint survey to determine the damage to the roads. The method in this agreement is both joint inspection and videotaping the roads to be used. Exhibit B includes provisions requiring the developer to make improvements to existing county roads before and after construction (pages 23-31). Details about specific improvements and the costs associated with these improvements are also given.

## **Richland County, Ohio, Road Agreement**

Richland County is negotiating a road agreement in connection with a new wind farm development. According to Tim Lichtenwalter, deputy county engineer (see Interviews with County Engineers), the agreement will include provisions for road improvements, repair costs and a security bond. The agreement is expected to be completed in four weeks.

## **Interviews with County Engineers**

### **Logan County, Illinois**

Bret Aukamp, County Engineer: (217) 732-3059

Logan County has one operating wind farm, and the county secured a road agreement with the developer prior to construction. The agreement covered road upgrades prior to construction, road surveys and a requirement to return the roads to their pre-construction condition after development.

### **McLean County, Illinois**

Eric Schmitt, County Engineer: (309) 663-9445

McLean County currently has one wind farm operating and one planned for next year. The county's zoning ordinance requires the engineer to obtain a road agreement with wind farm developers. The requirement is part of the process to obtain a special use permit. The road agreement that McLean County made with the wind developer includes provisions for repairing any damage to the roads caused by the construction of the wind farm and also contains provisions that require the developer to improve roads before they begin construction. Mr. Schmitt said that he thought the development of the wind farm was a net positive for the county road system because the county was able to negotiate significant improvements to the road system that it would not otherwise have been able to accomplish.

### **Murray County, Minnesota**

Randy Groves, County Engineer: (507) 836-6327

Murray County has several wind farms. According to Mr. Groves, initially the counties did not find out about a wind farm development until the county received requests for heavy vehicle permits. The fees the county receives for the issuance of heavy vehicle permits have historically been the only way the county recovered any costs of road damage caused by heavy vehicles used in connection with the development of wind farms. None of the wind farms built in Murray County had a road agreement associated with it that would require the developer to rebuild damaged roads. This is of great concern to Mr. Groves. He is concerned about widening intersections for passage of the vehicles and the damage overweight vehicles can do to the road. The concerns he expressed have been dealt with in other counties by requiring a road agreement between the developer and the county before construction of the wind farm is permitted. Mr. Groves would like to see a more uniform way the counties can deal with wind developers in order to protect local interests.

### **Richland County, Ohio**

Tim Lichtenwalter, Deputy County Engineer: (419) 774-5808

Richland County is currently drafting a road agreement pertaining to the development of a local wind farm. Mr. Lichtenwalter described how his county looked to several counties in Indiana to figure out how to deal with wind farm development and the resulting impact on the local road system. According to Mr. Lichtenwalter, the agreement the county reached with the developer will include provisions for road upgrades prior to construction, pre-construction road assessments and cost recovery for any damage done to the local roads. The goal of the road agreement is to require the developer to be responsible for all costs associated with the development of the wind farm.

## **Web Resources**

### **Windustry**

<http://windustry.org/>

Windustry is a nonprofit organization based in Minnesota. Originally developed as a project of the nonprofit Sustainable Resources Center and funded by the Legislative Commission on Minnesota Resources, it is now partnered with the Institute for Agricultural and Trade Policy. The organization's focus is to "promote progressive renewable energy solutions and empower communities to develop and own wind energy as an environmentally sustainable asset." The site includes a policy information section dedicated to federal, state and local policy issues involving wind power and a searchable resource library.

### **National Renewable Energy Laboratory**

<http://www.nrel.gov/wind/>

This is the site of the National Renewable Energy Laboratory wind research section. It contains an extensive list of publications relating to wind energy development and contact information for its research staff.

### **Power...Naturally**

<http://www.powernaturally.org/>

This is one of the sites for the New York State Energy Research and Development Authority. NYSERDA is primarily funded by the state of New York. Its goal is to "help New York meet its energy goals: reducing energy consumption, promoting the use of renewable energy sources and protecting the environment." Its library contains resources for all types of renewable energy, including wind power.

### **National Organization of Counties**

<http://naco.org/>

This is the site of the National Organization of Counties. NACO organizes conferences and seminars, and provides resources to counties across the country. This site may be useful when looking at the policy issues facing counties with wind energy developments.

### **National Wind Coordinating Collaborative**

<http://www.nationalwind.org/>

The National Wind Coordinating Collaborative claims to "provide a neutral forum for a wide range of stakeholders to pursue the shared objective of developing environmentally, economically and politically sustainable commercial markets for wind power in the United States." It has links to other wind energy resources, including national, state and regional research programs and periodicals.

### **Industrial Wind Action Group**

<http://www.windaction.org/>

The Wind Action Group comes from a "not in my backyard" perspective. For instance, the group "advises officials at the federal, state and local levels regarding wind energy policy to counteract misleading information from the wind energy industry and some environmental groups." The site has a collection of news stories, editorials and some research papers from around the country primarily focused on the negative impact of wind energy facilities.

### **National Wind Watch**

<http://www.wind-watch.org/>

This site claims to "present the facts about industrial wind power." The organization has an explicitly anti-wind power perspective. The site provides links to some studies focused on the negative impact of industrial wind power and also has a "latest news" section that contains links to news stories around the country involving wind energy development. The news section can be helpful to get a flavor for what negative issues local communities can face when dealing with wind energy development.

## COUNTY ROAD UPGRADE AND MAINTENANCE AGREEMENT

This COUNTY ROAD UPGRADE AND MAINTENANCE AGREEMENT (this “Agreement”) is made and entered into this \_\_\_\_\_ day of \_\_\_\_\_, 2008 by and between Logan County, an Illinois County (the “County”), and Rail Splitter Wind Farm, LLC (the “Developer”). Each of the Developer and the County are sometimes referred to herein individually as a “Party” and collectively as the “Parties”. The term “Developer’s Representatives” shall include Developer’s contractors, sub-contractors, agents, employees, suppliers and designees.

### RECITALS

WHEREAS, Developer is in the process of developing a wind-powered electric energy generating facility (the “Project”) in Logan County, Illinois and has submitted application for a Special Use Permit for the Project with the Zoning Office in accordance with the Zoning Ordinance of Logan County, and

WHEREAS, Developer proposes to construct the Project in one phase and the Project will be constructed and owned by Rail Splitter, and

WHEREAS, in connection with the construction, operation and maintenance of the Project, the Parties desire to address certain issues relating to the roads owned, operated and maintained by the County (collectively, the “County Roads”) over which it will be necessary for the Developer and Developer’s Representatives to, among other things, (i) transport heavy equipment and materials over certain County Roads, which may in certain cases be in excess of the design limits of the County Roads; (ii) transport certain locally sourced materials, such as concrete and gravel, on such County Roads; (iii) widen certain County Roads and make certain modifications and improvements (both temporary and permanent) to such County Roads (including to certain culverts, bridges, road shoulders and other related fixtures) to permit such equipment and materials to pass; and (iv) place certain electrical and communications cables (collectively “Cables”) for the Project, under or across certain County Roads, and

WHEREAS, 605 ILCS 5/9-113 grants to the County, authority to impose reasonable rules, regulations and specifications for the use of County roads by public and private utilities, and

WHEREAS, 605 ILCS 5/9 113.01 imposes a liability on public or private utilities for any damage to County highways, and

WHEREAS, under 605 ILCS 5/5 et seq. the County has broad power regarding the opening, construction, maintenance, relocation, access to or repair of highways in the County Highway system, and

WHEREAS, it is in the best interest of the public health, safety and welfare that Developer and the County reach an agreement to address the majority of issues that will arise in a project of this size, and

WHEREAS, Developer has provided to the County Engineer of Logan County a site layout plan for the Project that shows the tower sites, the access road entrances, the underground collection system and the power transformer site, a copy of which is attached as Exhibit A (the "Plan"), and

WHEREAS, Developer and the County of Logan wish to set forth their understanding and agreement as to the road issues relating to the construction and operation of the Project, and

WHEREAS, this Agreement shall apply to those County Roads listed on the Principal Road Upgrade Schedule attached as Exhibit B and, subject to Section 3C herein, any other County Highway used by Developer or Developer's Representatives in direct support of the construction and operation of the Project.

## **AGREEMENT**

NOW, THEREFORE, in consideration of the mutual promise and covenants herein set forth, the parties, intending to be legally bound, agree as follows:

- Section 1. Developer, in respect of the project owned, developed and constructed by it, agrees to undertake the following activities in accordance with the terms of this Agreement:
- A. Prior to the commencement of construction of the Project, make improvements to the County Highways in accordance with Section 5 and Exhibit B for such phase for purposes of this Agreement, "commencement of construction" shall mean construction of access roads and wind turbines on the Project site has begun and does not include testing or surveying (including geotechnical drilling and meteorological testing) to determine the adequacy of the site for construction.
  - B. Build the Project substantially as depicted on the Plan and obtain County Highway Department approval of any material alteration of

the Plan insofar as it involves the use of County Highways; provide copies of all construction documentation to the County.

- C. Present Access Permit applications and required plans for all access points to the County Highway system;
- D. Erect permanent markers indicating the presence of the Cables;
- E. Install all cables at least 10 feet from any existing County Highway right-of-way, unless otherwise mutually agreed to in writing by Developer and the County. All proposed cable crossings shall be indicated on the plans and appropriate permits shall be submitted to the County Engineer.
- F. Become a member of the Illinois State-Wide One-Call Notice System (otherwise known as the Joint Utility Locating Information for Excavators or "J.U.L.I.E.") and provide J.U.L.I.E. with all of the information necessary to update its records;
- G. Use directional boring equipment to make all crossings of County Highways for the cable collection system;
- H. Provide plans for the widening of any corner radius necessary to facilitate the turning movements of the transport trucks used by the Developer or Developer's Representatives;
- I. Make the necessary improvements for these widened radii and once these widened radii are no longer needed to return the corners substantially to their original lines and grades unless the County Engineer requests that the widened radii remain as improved;
- J. Notify the County Engineer in advance of all oversize moves and crane crossings;
- K. Transport the tower segments and other oversize loads so as to minimize adverse impact on the local traffic;
- L. Provide as much advance notice as is commercially reasonable to obtain approval of the Logan County Highway Department when it is necessary for a road to be closed due to a crane crossing or for any other reason. Notwithstanding the generality of the aforementioned, Developer will provide 48 hours notice to the extent reasonably practicable;

- M. Sign all highway closures and work zones in accordance with the Illinois Department of Transportation Manual On Uniform Traffic Control Devices;
- N. Pay for the cost of, or alternatively perform, all repairs to all County Highways that are damaged by Developer or the Developer's Representatives during the construction of the Project and restore such roads at the completion of Project construction to the condition they were in at the time of the pre-construction inventory;
- O. Reimburse Logan County Highway Department or its designated contractors for all reasonable fees and expenses incurred by third party contractors engaged by County in connection with construction, observation and testing of the road upgrades under the terms of this Agreement, including the completion of post-construction improvements.
- P. Establish a single escrow account in accordance with Section 6 for the Project that will be used for the repair and improvements of the County Highways;
- Q. Notify all relevant parties identified under Section 4 of any temporary road closures.
- R. At the start of construction of the Project and on the first, second, third and fourth anniversaries thereafter, pay to the Logan County Highway Department, the amount of \$12,500.00.
- S. Obtain easements and other land rights needed to fulfill Developer's obligations under this Agreement.
- T. Provide Notice to Proceed for roads to be upgraded. Notice to Proceed is hereby given for the proposed pre-construction improvement on County Highways, as described in Exhibit B.
- U. Acknowledge that the estimates provided in Exhibit B are good faith estimates, but actual costs may vary.
- V. Provide dust control and grading work to the reasonable satisfaction of the County Engineer on County roads covered by this agreement that become aggregate surface roads.



- W. Design all road upgrades in reference to IDOT Bureau of Local Roads and Streets Manual – 2005 edition with updates in effect January 1, 2008.
- X. Maintain all private access road entrances to County Highways including maintenance of pipe culverts to allow for proper drainage.
- Y. Implement road upgrades as agreed to in Exhibit B.

Section 2. The County, in accordance with the terms of this Agreement, agrees to:

- A. Review for approval all access points to the County Highway system by giving consideration to sight distances, drainage and proximity to other entrances, in a reasonable manner and in accordance with accepted engineering practices;
- B. Review for approval, permits for all utility encroachments on County rights-of-way; in a reasonable manner in accordance with accepted engineering practices;
- C. Review for approval all crane crossings across the County Highway system by giving consideration of road damage and traffic safety in a reasonable manner based on accepted engineering practices;
- D. Issue master overweight and oversize permits in a timely manner for the roads scheduled on Exhibit B after completion of pre-construction improvements, and individual permits, as appropriate, in each case upon the filing of such applications by Developer. Issue permits during the spring posting period, between January 20<sup>th</sup> and April 18<sup>th</sup> when conditions warrant;
- E. Coordinate with Developer and Developer's Representatives so as to minimize the impact of their use of the County Highway system;
- F. Waive all individual work permit fees.
- G. Perform all routine maintenance on the County Highways used for the construction of the towers in accordance with Section 5 of this Agreement, and as described in Exhibit B.

- H. Consent to the use of the County Highway's rights-of-way for utility encroachments, limited to Cable crossings for the Project as provided under this Agreement. Consent granted herein shall be effective only to the extent of the property interest of the County of Logan. Such consent shall not be binding on any owner of a fee over or under which the highway is located and shall not relieve Developer from obtaining by purchase, condemnation or otherwise the necessary approval of any owner of the fee over or under which the highway is located if such approval is legally required.
- I. Authorize County Engineer to agree on behalf of County to revisions to Exhibits A and B and to determine appropriate improvements.
- J. Implement post-construction improvements as agreed to in Exhibit B.

### Section 3 Planning Inventory

#### A. Road Inventory

##### 1. Pre-Construction Inventory

The Parties, prior to the commencement of construction of any phase, shall jointly perform a survey to record the condition of the pavement surface of the County Highways listed in Exhibit 'B'. For County Highways this survey shall be performed no later than ten (10) days prior to the start of any pre-construction upgrade. During this survey the entire length of the road as listed in Exhibit B shall be video taped and if necessary photographs may be taken. In addition the County will provide the Developer or his agent copies of any plans, cross-sections and specifications relevant to the existing road structure.

For any structures on the proposed routes that the County feels may not carry the loads proposed by the Developer, the County shall have the right to hire a consultant to make a study of the structure to determine the load carrying capacity. The Developer shall furnish the consultant with drawings depicting the axle numbers, spacing and loading for the trucks moving the oversized loads. If it is determined that a structure will not carry the loads that are proposed, the Developer may propose a plan to strengthen the structure. The County will then furnish the Developer with all

available plans. Should the Developer present a plan to strengthen a structure the County will then have their consultant review these plans to determine if the improvements will carry the proposed loads. All costs incurred by the County for these services shall be paid by the Developer or from the escrow account.

Copies of all pre-construction documentation shall be provided to each of the Parties.

## 2. Post-Construction Inventory

Upon completion of the Project, representatives of the County and Developer will perform a post-construction inventory, the methods of which shall be similar to those of the pre-construction survey. The two sets of data will be compared and if there is any wheel lane rutting, cracking, or other damage, in excess of the original survey Logan County will determine the extent of the repairs or improvements needed to return the roads and structures to a pre-construction condition. The design of these repairs or improvements shall be in reference to IDOT Bureau of Local Roads & Streets Manual – 2005 edition with updates in effect January 1, 2008. The cost of these repairs or improvements to be paid by the Developer or from the escrow account .

### B. Routing and Access Approval

As soon as practical and as necessary throughout the construction of the Project, Developer and County shall meet and by mutual agreement revise the Plan (Exhibit A) in so far as it affects the County Highways and make it more definitive. By mutual agreement, County Highways may be added to or deleted from the Principal Road Upgrade Schedule attached as Exhibit B, specific timing for upgrades shall be established, access points to public roads may be approved, preferred traffic routes shall be established and utility encroachments, including Cable, finalized. The Principal Road Upgrade Schedule (Exhibit B) has two parts. The first part is an estimate of the cost of improvements that are to be made before construction commences to give the road sufficient structural strength to handle the traffic anticipated during the construction of the Project. The second part is an estimate of the improvement that may need to be completed at the completion of the construction of the Project to return the roads identified in Exhibit B as amended from time to time to the same or better

condition than those roads were in during the pre-construction inspection.

As the Principal Road Upgrade Schedule (Exhibit B) is revised and roads are added or removed, pre-construction and post-construction improvement details shall be prepared and added to the Exhibit B using the same methodology as was used to establish the improvement descriptions and cost estimates included in Exhibit B.

C. Incidental Use

The Parties recognize that the Project traffic may, either through mistake or with the consent of the County, use roads other than those listed on the Principal Road Upgrade Schedule (Exhibit B). Repairs for damage caused by Developer or the Developer's Representatives during such mistaken or permitted use shall be paid as provided in Section 6 C of this Agreement.

Section 4. Construction Cooperation:

A. With Others:

Prior to the commencement of construction of any phase, Developer shall hold a meeting and shall invite all public or semi-public entities that may be affected by the Project including, but not limited to, schools and fire protection districts. At said meeting, Developer will discuss its plans for the construction of the Project and compile a list of contact persons that will need to be notified of any temporary road closures that may have an effect on the daily routine or routing of those agencies. Should all of the parties contacted not be represented, Developer shall attempt to make contact with these entities in an effort to obtain the contact information. A copy of this list shall be furnished to the Highway Department.

B. With the County:

During construction, the County and Developer shall meet regularly to disclose and discuss Project activities, including anticipated material and equipment deliveries and traffic movement – which may be reflected as changes in the Plan (Exhibit A) and/or the Principal Road Upgrade Schedule (Exhibit B).

Section 5. Upgrades and Maintenance of the County Highways

- A. In order to minimize the adverse effect of the construction traffic on the County Highways, certain upgrades will be required on certain roads as described below the cost of which shall be paid by Developer.

See the Principal Road Upgrade Schedule attached as Exhibit B, as amended from time to time.

- B. The daily routine maintenance of the County Highways affected by the Project including snow removal, striping, and routine signage and regularly scheduled maintenance or repair shall be the responsibility of the Logan County Highway Department. If repairs or maintenance, other than daily routine maintenance, are deemed necessary because of activity of Developer or Developer's Representatives, the County will use the Escrow Disbursement Procedure set forth in Section 6-C.

Section 6. Escrow Account

- A. Thirty days prior to the start of any road upgrades subject to this Agreement, the Developer shall establish an escrow account in the amount of \$150,000.00 (the "Escrow Account"). The Escrow Account shall be used to pay to be used for expenses incurred for the upgrade and/or repair of the County Highways in accordance with this Agreement in the event Developer does not otherwise pay the costs thereof. The Escrow Account shall be established at a bank doing business within Logan County selected by Developer. Within forty-five days of the execution of this Agreement, the Parties shall execute a mutually agreeable form of escrow agreement (the "Escrow Agreement"), which agreement shall, among other things, appoint the escrow agent and set forth the disbursement provisions in detail. Developer shall be responsible for making additional deposits in this escrow account in order to maintain the original minimum balance provided however, that the aggregate amount (including the initial balance) Developer shall be required to deposit shall not in any event exceed \$300,000.00. Developer shall also provide to the County thirty (30) days prior to the start of any road upgrades subject to this Agreement a performance bond or letter of credit reasonably acceptable to the County (the "Performance Assurance") in the aggregate amount equal to 150% of the estimate set forth in Exhibit B upon which

the County may draw against in the event and only to the extent that Developer does not otherwise pay such costs and sufficient funds are not available in the Escrow Account for the upgrade and/or repair of the County Highways in accordance with this Agreement.

- B. The Escrow Account and Performance Assurance shall remain in place from the date the initial deposit is made until a date two years after the commencement of commercial operations of the Project. For avoidance of doubt the commencement of commercial operation date shall be the date that the entire Project is placed into service. The County agrees to deliver any certification required for any permitted withdrawal from the Escrow Account and Performance Assurance, including any final withdrawal and/or surrender when Developer is no longer required to fund the Escrow Account or maintain the Performance Assurance pursuant to the terms hereof, or the terms of the Escrow Agreement. Developer shall be entitled to withdraw from the Escrow Account any and all amounts in the Escrow Account (including any interest accrued thereon) two years after the commencement of commercial operations of the last phase of the Project, provided, the remaining balance in the Escrow Account may not be withdrawn prior to such time as all post-construction repairs identified within two years after commencement of commercial operations of the last phase of the Project have been completed, approved by the County Engineer and paid for.
- C. The Escrow Agreement shall set forth, among other things, the disbursement procedures for the Escrow Account and shall include:
  - 1. For the pre and post construction improvements listed on the Principal Road Improvement Schedule attached as Exhibit B, as such Exhibit may be amended by the Parties from time to time:
    - a. The Developer shall notify the County in writing of the work to be done.
    - b. The County shall approve the work in a timely manner. Payment shall be made by the Developer or from the Escrow Account, upon authorization by the County Engineer, for pre and post construction road improvements.

2. For Damage during Construction to the roads listed on the Principal Road Upgrade Summary, as amended from time to time:
  - a. The County shall notify Developer of the work to be done.
  - b. The work shall be performed by the Developer or Developer's contractor. Payment for such work shall be made by the Developer or from the Escrow Account, upon authorization by the County Engineer.
3. For damages on roads other than those listed on the Principal Road Upgrade Summary attached as Exhibit B, as amended from time to time:
  - a. The County notifies Developer of the location and nature of the repair or maintenance required and a suggested time framework for completion.
  - b. If Developer agrees, Developer will perform the repair in the time framework specified or the County or County's contractor shall perform the work and recover its costs from the Developer or the Escrow Account, upon authorization by the County Engineer.
  - c. If Developer disagrees, the County and Developer will in good faith attempt to resolve the dispute and shall involve a licensed engineering firm to be mutually agreed upon by County and Developer to serve as a neutral intermediary to help resolve the dispute within a 5-day period. The costs of the intermediary will be paid equally by the Parties if a mutually agreeable solution is proposed, or if not, by the Party rejecting the intermediary proposed solution. Either Party may reject the intermediary solution by written notice to the other party within 2 days from the date it is rendered.
  - d. If the Parties cannot agree and the County rejects the intermediary's proposed solution, the County may take unilateral action to prevent harm or protect public safety, the cost of which shall be paid from the Escrow Account. County shall send notice of any such payment to Developer. If the appropriateness of the County action is ultimately determined not to be justified either by

agreement or adjudication, County shall promptly refund applicable cost of repairs to the Developer.

- e. If the Parties agree and/or don't reject the intermediary's proposed solution, then the Developer or Developer's contractor may make the repair and shall pay for the costs directly or from the Escrow Account, upon authorization by the County Engineer.
- f. For all road upgrades and repairs performed by the County's contractors and approved by the County in accordance with this Agreement, the County Engineer will promptly review the contractors' invoices and send a copy of such invoices to Developer. If Developer does not pay such contractors' invoices within the payment cycle and as otherwise contemplated under this Agreement, the County may pay the Contractor from the Escrow Account or draw upon the Performance Assurance, as appropriate, and in accordance with the terms set forth in this Section 6.
- g. The County charges shall be based on County maintained time and material cost records, which shall be made available to Developer for review. County billing rates shall be those established by the County and shall be uniformly applied to all consumers.

D. Emergency Repairs.

Notwithstanding the foregoing, in the event Developer or the Developer's Representatives are reasonably believed by the County to have caused damage to County roads of a magnitude sufficiently great to create a hazard to the motoring public, which in the County's opinion warrants an immediate repair or road closing, the County may unilaterally make or authorize repair, with the reasonable, documented costs thereof paid from the Escrow Account. The County shall photograph, videotape and otherwise document the conditions and make all such documentation available to Developer. Any such emergency repair shall be subject to post-repair negotiations by the Parties, involvement of the intermediary and, if necessary, adjudication. If such post-repair proceedings favor Developer, the County will reimburse the Escrow Account for amounts withdrawn to fund the repair.



Section 7. Mutual Indemnification/Hold Harmless and Liability Insurance Provisions.

- A. Indemnification by Developer. The Developer hereby releases and agrees to indemnify and hold harmless the County and their respective officers, employees, elected or appointed officials, and agents, and their respective heirs, executors, administrators, successors and assigns (hereinafter collectively “County Releasees”) from any and all actions, causes of action, suits, claims, expenses (including reasonable attorney’s fees) and demands against the County Releasees arising out of or relating to the performance by Developer of its obligations under this Agreement. More particularly, but without in any way limiting the foregoing, the Developer hereby releases the County Releasees and agree to indemnify and hold harmless the County Releasees from any and all actions, causes of action, suits, claims, expenses (including reasonable attorney’s fees) and demands arising directly or indirectly from any personal injury, death or property damage arising out of the use, construction, modifications, repair or improvement of any road subject to this agreement by the Developer, its employees, agents, representatives, suppliers or contractors, or their respective employees, agents or representatives.
- B. Indemnification by the County. The County hereby releases and agrees to indemnify and hold harmless the Developer and its members, officers, directors, contractors, subcontractors, employees and agents, and their respective employees, heirs, executors, administrators, successors and assigns (hereinafter collectively “Developer Releasees”) from any and all actions, causes of action, suits, claims, expenses (including reasonable attorney’s fees) and demands against the Developer Releasees arising out of or relating to the performance by the County of its obligations under this Agreement. More particularly, but without in any way limiting the foregoing, the County hereby releases the Developer Releasees and agrees to indemnify and hold harmless the Developer Releasees from any and all actions, causes of action, suits, claims, expenses (including reasonable attorney’s fees) and demands arising directly or indirectly from any personal injury, death or property damage arising out of the use, construction, modifications, repair or improvement of any road subject to this agreement by the County, their respective employees, agents, representatives, suppliers or contractors, or their respective employees, agents or representatives.

1. Limitations of Liability. In no event shall the Developer or any of its members, officers, directors or employees or the County or any of its Board, officers or employees be liable (in contract or in tort, involving negligence, strict liability, or otherwise) to any other party or their contractors, suppliers, employees, members and shareholders for indirect, incidental, consequential or punitive damages resulting from the performance, non-performance or delay in performance under this Agreement.
2. Required Insurance. The Developer shall at all times throughout the term of this Agreement maintain in full force and effect commercial general liability insurance, naming Logan County, its Board, officers and employees as an additional insured, in the aggregate amount equal to Ten Million Dollars (\$10,000,000). The Developer may utilize any combination of primary and/or excess insurance to satisfy this requirement.

Section 8. Miscellaneous

- A. Remedies and Enforcement. Each of the parties hereto covenant and agree that in the event of default of any of the terms, provisions or conditions of this Agreement by any party (the “Defaulting Party”), which default is not caused by the party seeking to enforce said provisions (the “Non-Defaulting Party”) and after notice and reasonable opportunity to cure has been provided to the Defaulting Party, then in such an event, the Non-Defaulting Party shall have the right of specific performance. The remedy of specific performance and injunctive relief shall not be exclusive of any other remedy available at law or in equity.
- B. Due Authorization. Developer hereby represents and warrants that this Agreement has been duly authorized, executed and delivered on behalf of Developer. The County hereby represents and warrants that this Agreement has been duly authorized, executed and delivered on behalf of the County.
- C. Severability. If any provision of this Agreement is held invalid under any applicable law, such invalidity shall not affect any other provision of this Agreement that can be given effect without the invalid provision and, to this end, the provisions hereof are severable.

- D. Amendments. No amendment or modification to this Agreement or waiver of a Party's rights hereunder shall be binding unless it shall be in writing and signed by the Party against whom enforcement is sought.
- E. Notices. All notices shall be in writing and sent (including via facsimile transmission) to the parties hereto at their respective addresses or fax numbers (or to such other address or fax number as any such party shall designate in writing to the other parties from time to time).

Developer

Rail Splitter Wind Farm, LLC  
c/o Horizon Wind Energy, LLC  
808 Travis Street, Suite 700  
Houston, TX 77002  
Office: 713/265-0350; fax: 713/265-0365

with a copy to:

Rail Splitter Wind Farm, LLC  
Project Manager  
716 E. Empire, Suite C  
Bloomington, IL 61701  
Office: 309/829-8211; fax: 309/829-8611

Logan County

Logan County Engineer  
529 S McLean St  
Lincoln, IL 62656  
Ph. (217) 732-3059  
Fax (217) -732-7138

- F. This Agreement may not be assigned without the written consent of the other Party, provided, however, that Developer may assign this Agreement or any right or obligation contained herein to (i) any party acquiring a direct or indirect ownership in Developer and providing financing to Developer in connection with the Project, (ii) to the purchaser of the Project, or (iii) to an affiliate of Developer. Developer shall notify the County of any such assignment.
- G. Counterparts. This Agreement may be executed in any number of counterparts, each of which shall be deemed an original, with the

same effect as if the signatures thereto and hereto were upon the instrument. Delivery of an executed counterpart of a signature page to this Agreement by telecopier shall be as effective as delivery of a manually signed counterpart to this Agreement.

- H. Governing Law. This Agreement shall be governed by and interpreted in accordance with the laws of the state of Illinois, irrespective of any conflict of laws provisions.
- I. Successors and Assigns. This Agreement shall inure to the benefit of and shall be binding upon the Parties hereto, their respective successors, assignees and legal representatives.
- J. Cooperation. The Parties agree to cooperate with each other in addressing any unforeseen or extraordinary events caused by Developer's activity that would result in significant impacts to the County roads similar in its magnitude to the original construction of the Project.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement the day and year first written above.

RAIL SPLITTER WIND FARM, LLC

By \_\_\_\_\_

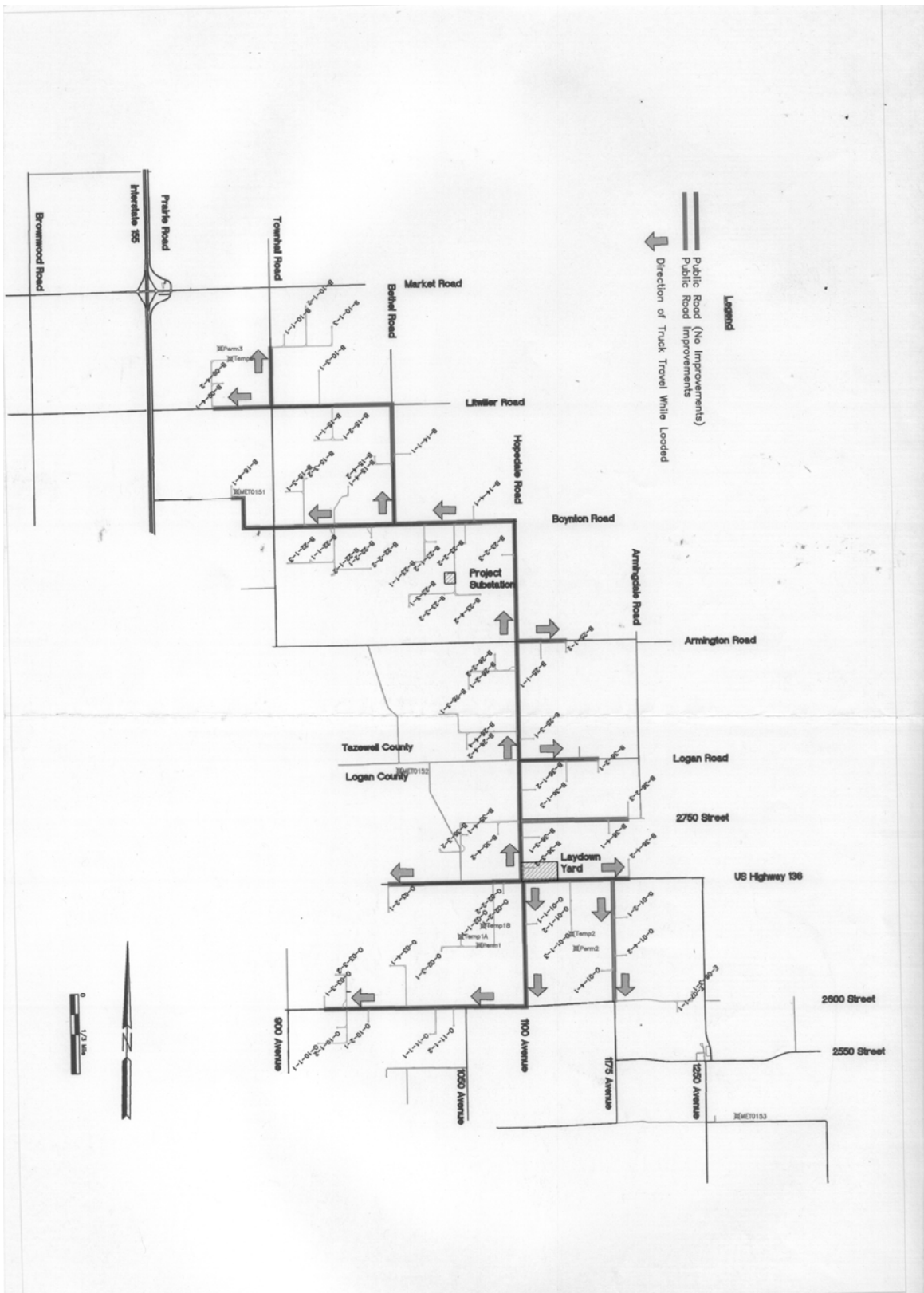
Its \_\_\_\_\_

THE COUNTY OF LOGAN

\_\_\_\_\_  
By: Richard Logan  
Chairman, Logan County Board

ATTEST:

\_\_\_\_\_  
Sally J. Litterly, Logan County Clerk



**Transportation Plan**

**JUNG ENGINEERING**  
Alvin R. Jung, P.E.

4806 N.E. Warfield Circle  
Lawton, OK 73507  
(580)301-0271  
OK CA# 4571  
TX CA# 7810  
L. CA# 154-004485

**Rail Splitter Wind Farm**  
Tazewell and Logan Counties, IL

FILE NAME: Plan Views      REVISION:      DATE: 01-04-08  
PROJ #/LAYOUT: 0720      SHEET # OF: 43

**RAIL SPLITTER WIND FARM  
LOGAN COUNTY HIGHWAYS**

**Exhibit B**

| <u>Highway Number</u> | <u>Highway Name</u> | <u>From</u>                 | <u>TO</u>   | <u>Mileage</u> | <u>Pre-Construction Improvements</u> |                  |                        |                         | <u>Post Construction-Improvements</u> | <u>Estimated Cost of Construction</u> |
|-----------------------|---------------------|-----------------------------|-------------|----------------|--------------------------------------|------------------|------------------------|-------------------------|---------------------------------------|---------------------------------------|
|                       |                     |                             |             |                | <u>Pavement Width</u>                | <u>Shoulders</u> | <u>Roadway Ditches</u> | <u>Roadway Easement</u> |                                       |                                       |
| CH 17                 | 1100th Ave          | CH 20                       | US Rte. 136 | 1.05           | 20.5'                                | 2' Turf          | Clean & Shape          | Existing                | A-3 Surface**                         |                                       |
| CH 17                 | 1100th Ave*         | US Rte. 136                 | 2800th Ave  | 1.00           | 21'                                  | 2' Turf          | Clean & Shape          | Existing                | A-3 Surface**                         |                                       |
| CH 20                 | 2600th St           | ~1500' East of<br>900th Ave | 1050th Ave  | 1.20           | 21'                                  | 2' Turf          | Clean & Shape          | Existing                | A-3 Surface**                         |                                       |
| CH 20                 | 2600th St           | 1050th Ave                  | CH 17       | 0.55           | 20'                                  | 2' Turf          | Clean & Shape          | Existing                | A-3 Surface**                         |                                       |
|                       |                     |                             |             | <b>3.80</b>    |                                      |                  |                        |                         |                                       |                                       |
| <b>County Total</b>   |                     |                             |             | <b>3.80</b>    |                                      |                  |                        |                         |                                       | <b>\$950,000</b>                      |

\* Developer shall not proceed with the road upgrades for the roads set forth in this Exhibit B until the Conditional Use Permit appeal period expires without an appeal filed or unless otherwise mutually agreed by the County and Developer except for the one (1) mile of 1100th Avenue North from U.S.Rte. 136 to 2800th Avenue (Tazewell County Line). Developer may implement the road upgrades on the one (1) mile of 1100th Avenue North from U.S.Rte. 136 to 2800th Avenue (Tazewell County Line) prior to the Conditional Use Permit appeal period expiration provided Developer complies with the terms of this agreement and applies an intermediate A-3 surface after the Tazewell County construction is substantially completed. After the Logan County construction is substantially completed, Developer shall re-scarify the intermediate A-3 surface, re-grade, re-compact and apply the final A-3 surface.

\*\*A-3 Surface to be completed by Logan County