BOARD OF COUNTY COMMISSIONERS OF DOUGLAS COUNTY, KANSAS

WEDNESDAY, FEBRUARY 5, 2014

-3:00 p.m. Work Study on Fairgrounds Master Plan (Sarah Plinsky)

-4:00 p.m.

CONSENT AGENDA

(1) (a) Consider approval of Commission Orders;
(b) Approval to Solicit Bids for Supply of Asphaltic Concrete (Keith Browning); and
(c) Consider approval to renew 2014 Emergency Vehicle Permits (Sheriff's Office)

REGULAR AGENDA

(2) Consider an amendment to the Douglas County Purchasing Policy related to contracts for service and modify the procedures for the annual budget development process for county funded agencies. (Sarah Plinsky*) If the 3:00 p.m. study session completes before 4:00 p.m., this item will be discussed immediately following the Fairgrounds Study Session.*

(3) Work Study Session on Wind Towers

(4) (a) Consider approval of Accounts Payable (if necessary)
(b) Appointments
(c) Public Comment
(d) Miscellaneous

(5) Adjourn

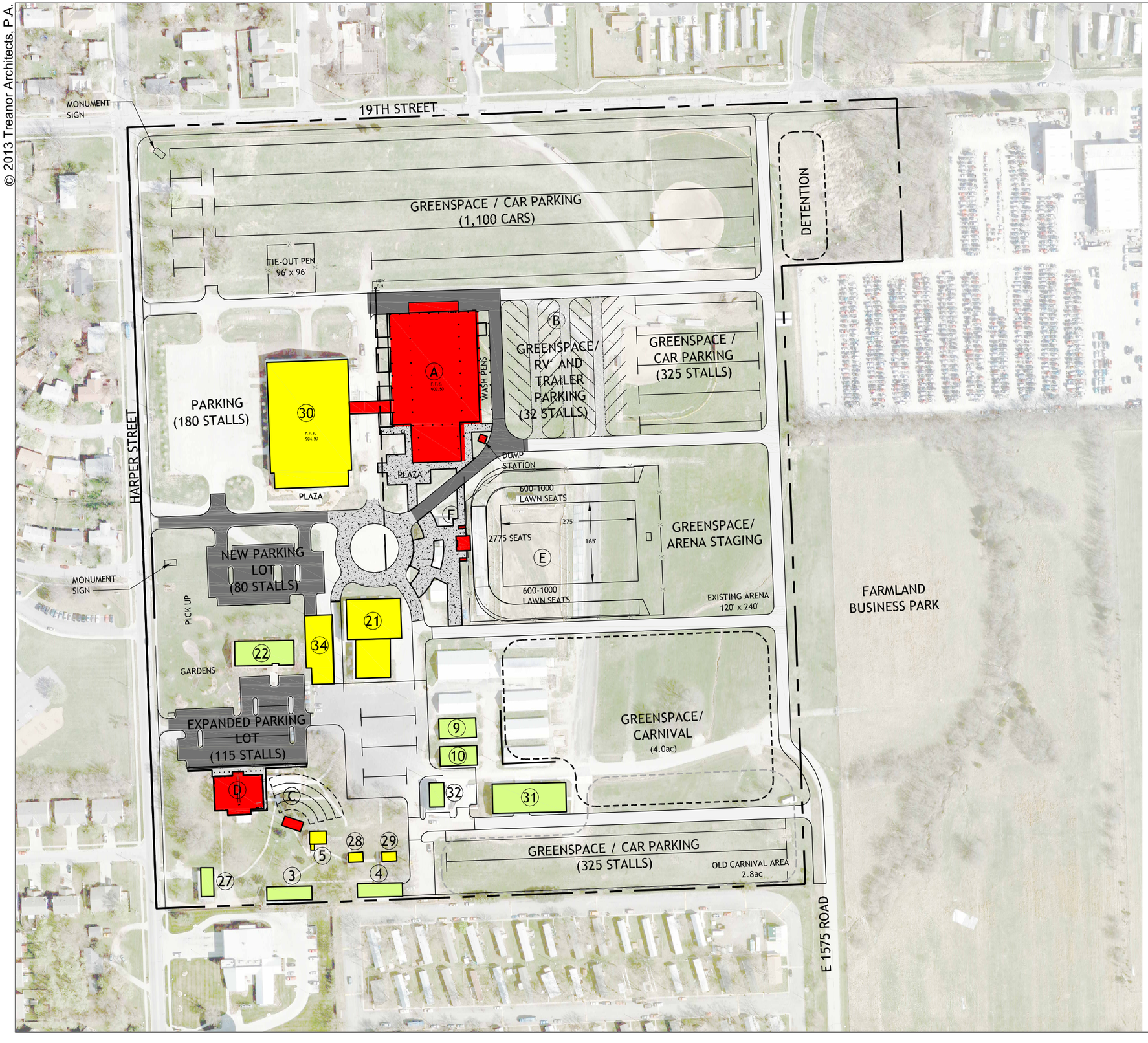
WEDNESDAY, FEBRUARY 12, 2014 -Canceled

WEDNESDAY, FEBRUARY 19, 2014

-CUP-13-00482: Consider a Conditional Use Permit for Good Earth Gatherings, a recreational facility including education, community outreach, and ancillary retail sales on approximately 10 acres located at 858 E 1500 Rd. Submitted by Tamara Fairbanks-Ishmael, property owner of record. (PC Item 4; approved 9-0 on 1/27/14) Mary Miller is the Planner.

WEDNESDAY, FEBRUARY 26, 2014

***Note**: The Douglas County Commission meets regularly on Wednesdays at 4:00 P.M. for administrative items and 6:35 P.M. for public items at the Douglas County Courthouse. Specific regular meeting dates that are not listed above have not been cancelled unless specifically noted on this schedule.*



ASPHALT

CONCRETE

PAVED GRAVEL

CHIP AND SEAL

EXISTING BUILDING TO REMAIN

EXISTING PUBLIC BUILDINGS

PROPOSED BUILDING

EXISTING BUILDINGS:

3. STORAGE
4. STORAGE
5. RESTROOM
9. EXISTING BARN
10. EXISTING BARN
11. EXISTING JUDGING PAVILLION
21. BUILDING #21
22. EXTENSION OFFICE
27. CARETAKER'S HOUSE
28. SHELTER HOUSE
29. SHELTER HOUSE
30. COMMUNITY INDOOR ARENA
31. COUNTY RECORD STOR. BLDG.
32. MAINTENANCE SHOP
34. DREHER 4-H BUILDING

PROPOSED BUILDINGS:

A. OPEN PAVILLION
B. EXHIBITOR PARKING
C. OUTDOOR MEETING AREA
D. MEETING HALL
E. OUTDOOR EVENT ARENA
F. RESTROOMS / CONCESSIONS / TICKETS

CAR PARKING

ON SITE PARKING FOR 2,125 CARS

N.

PROPOSED PLAN

SCALE : 1" = 200'

DOUGLAS COUNTY FAIRGROUNDS

Masterplan Study

11.21.2013

Landplan Engineering, P.A.

MAR LAN CONSTRUCTION

TREANOR ARCHITECTS P.A.

DV12.025.00B

Douglas County Fairgrounds Masterplan Documents

Open Pavilion OR Meeting Hall
Phase 1 Site Improvements

19th and Haskell
Lawrence, KS 66046

MAR LAN CONSTRUCTION

Indigo engineering

pkmr

TREANOR ARCHITECTS

19TH STREET

GREENSPACE / CAR PARKING
(1,100 CARS)

TIE-OUT PEN
96' x 96'

PROPOSED GRANULAR ROCK W/DOUBLE ASPHALTIC PRIME & SEAL PER SECTION 20-1217

NEW F.H.

266'

22'

1642 S.Y.
5" Asphalt

DETENTION AREA

DETENTION AREA

EXIST. LIGHT

EXISTING BALLFIELD

A

F.F.E.
902.50

575 L.F. 8" Waterline

WASH PENS

GRASS PAVERS PER SECTION 20-1217(B)(1)

30

BUILDING
42,081.50 SQ. FT.
F.F.E.
904.50

DED
ING
ALLS)

PLAZA

135 L.F. 4" Sewer Service

585 S.Y.
Conc. Paving

10'

SIDEWALK

PLAZA

25'

ASPHALT

985 S.Y.
5" Asphalt

DUMP STATION

EXISTING SANITARY SEWER EASEMENT

600-1000
LAWN SEATS

F

275'

20'

B

700 S.Y. Chip & Seal Road

GREENSPACE / RV AND TRAILER PARKING
(32 STALLS)

25'

GRAVEL

890

GREENSPACE / CAR PARKING
(325 STALLS)

EXISTING BALLFIELD

NOTE: THIS 30' STRIP WILL BE OPENED AS A PUBLIC STREET WHEN THE ADJACENT 30' STRIP TO THE EAST IS DEDICATED AND OPENED.

1450 S.Y.
Chip & Seal Road

55 S.Y. 8" Conc. Ent. W/ C & G

1920 S.Y.
Chip & Seal Road

1650 S.Y.
Chip & Seal Road

60'

30'

LEGEND:

- 5" ASPHALT #4, (24879 SF)
- CHIP AND SEAL, (42815 SF)
- GRAVEL PAVING, (18277 SF)

NORTH

Site Plan
1" = 40'

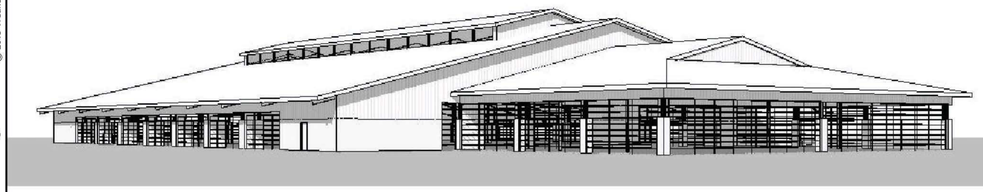
C101

REVISIONS	
1	Comment: — Date: —
	Comment: Date:
	Comment: Date:
	Comment: Date:
	Comment: Date:

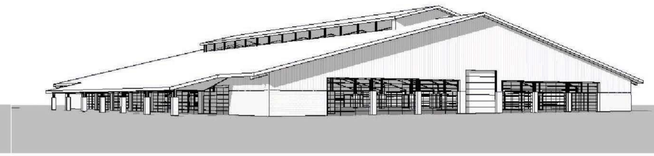
Date: 12.14.15

C101 - 0

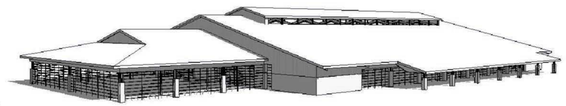
OPEN PAVILLION SITE PLAN



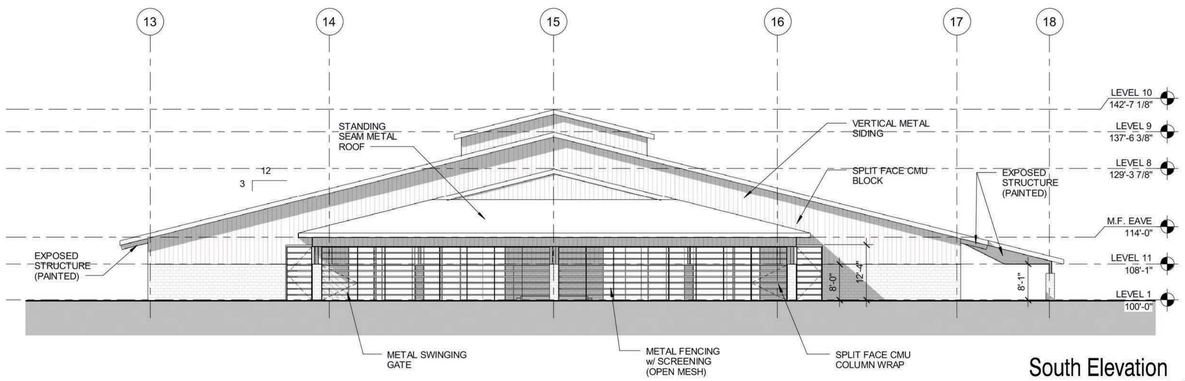
Perspective from SouthWest



Perspective from NorthEast

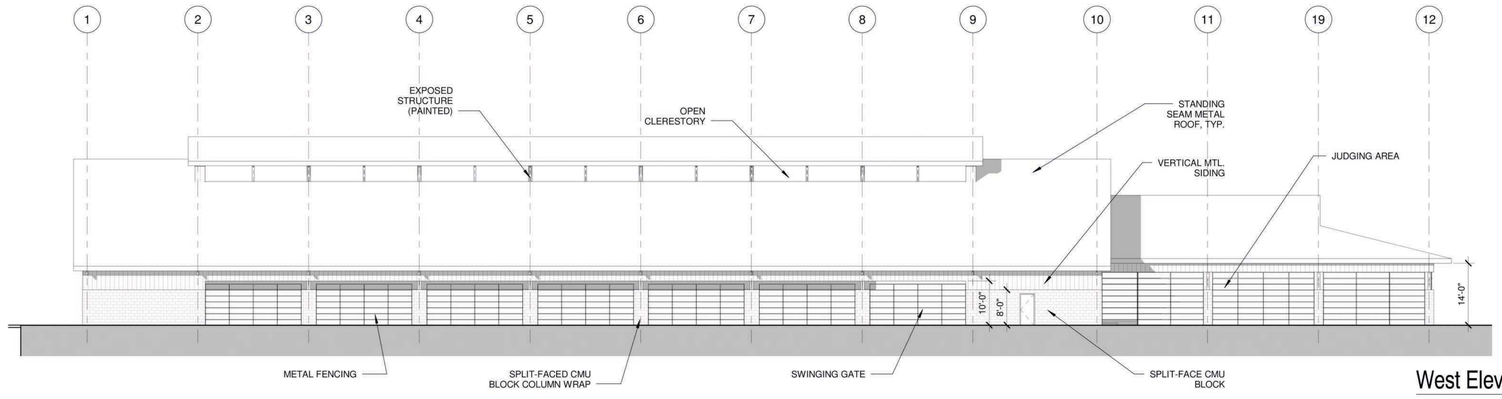


Perspective from NorthEast



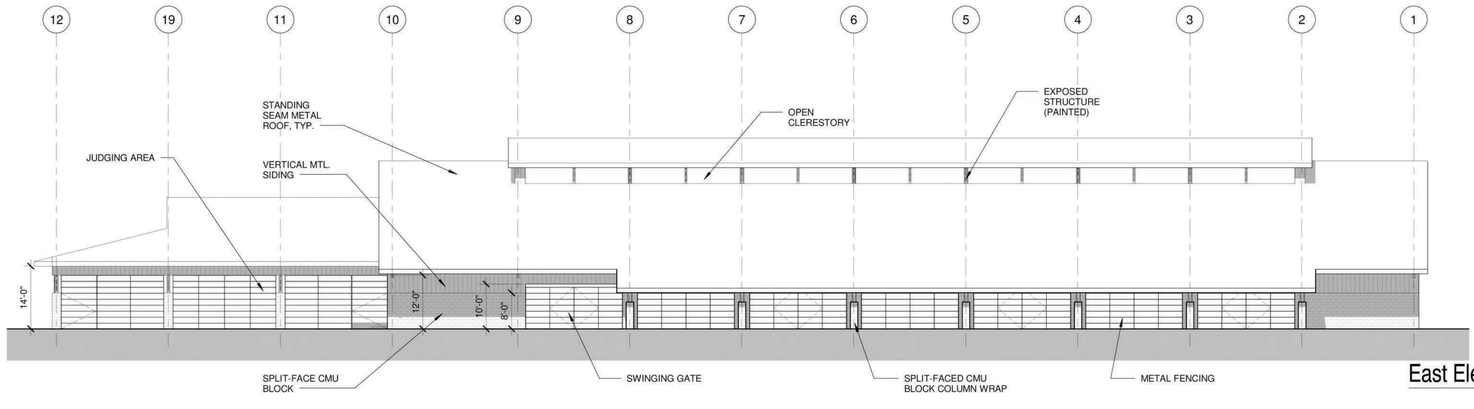
South Elevation **A3**

1/16" = 1'-0"



West Elevation **A2**

1/16" = 1'-0"



East Elevation **A1**

1/16" = 1'-0"

Open Pavilion

DATE PRINTED: Wednesday, November 21, 2013
LAST SAVED: Tuesday, November 26, 2013
PRINTED BY: Chris Cunningham

DV12.025.00B

Douglas County Fairgrounds Masterplan Documents

MAR LAN CONSTRUCTION

landplan engineering

19th and Haskell
Lawrence, KS 66046

pkmr ENGINEERS

TREANOR ARCHITECTS

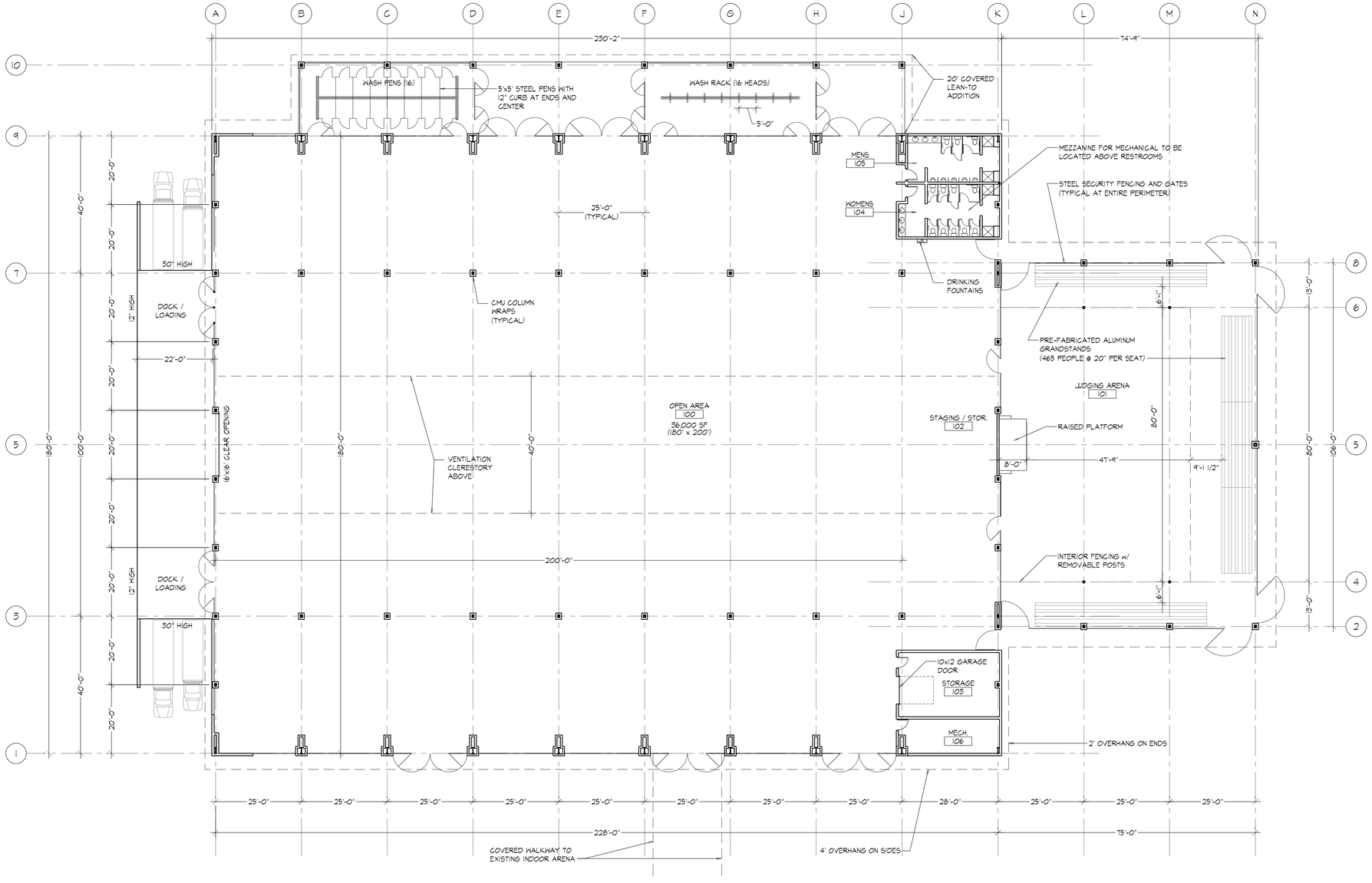
REVISIONS	
1	Comment: --
	Date: --
	Comment:
	Date:
	Comment:
	Date:
	Comment:
	Date:

Date: 12.19.13

A201 - 0

OPEN PAVILLION ELEVATIONS

PROGRAM NOTES:
- 12' CLEAR TO BOTTOM OF STUCTURE
- METAL ROOF
- MASONRY WRAP @ ALL COLUMNS
- AMPLE HOSE BIBBS (WATER)
- FLOOR DRAINS
- AMPLE LIGHTING
- AMPLE ELECTRICAL
- FANS FOR VENTILATION
- OPTION FOR HEATING
- CURTAINS AT EXTERIOR OPENINGS
- SEALED CONC. FLOOR
- LOUD SPEAKER SYSTEM
- RESTROOMS (HEATED)
  - DRINKING FOUNTAINS
  - PLASTIC TOILET PARTITIONS



NORTH

Building A - Open Pavilion Floor Plan - 49,797gsf **A1**

1/16" = 1'-0"

DATE PRINTED: Wednesday, November 27, 2013
LAST SAVED: Tuesday, November 26, 2013
PRINTED BY: Chris Cunningham

DV12.025.00B

Douglas County Fairgrounds Masterplan Documents

19th and Haskell
Lawrence, KS 66046

MAR LAN CONSTRUCTION
landplan engineering
pkmr ENGINEERS
TREANOR ARCHITECTS

Open Pavilion

REVISIONS		
1	Comment:	--
	Date:	--
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	Date:	
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	Date:	
	Comment:	
	Date:	

Date: 12.19.13

A101 - 0

OPEN PAVILLION FLOOR PLAN

DV12.025.00B

NEW PARKING LOT (80 STALLS)

EXPANDED PARKING LOT (115 STALLS)

MONUMENT SIGN

PICK UP

GARDENS

GREENSP

2775 SEATS

600-1000 LAWN SEATS

EXTENSION OFFICE 1,736 SQ. FT.

BUILDING NO.21

EXHIBIT BUILDING 2576 SQ. FT.

HOME ECONOMICS BUILDING 5500 SQ. FT.

CARETAKERS HOUSE 1736 S.F.

OFFICE 1,500 S.F. FFE 926.00 BE 915.00

F.F.E. 918.50

CP#3 ELEV.=904.84 N:5749.00 E:4843.00

1260.96'

1158 L.F. 24" C&G

3200 S.Y. 5" Asphalt

55 S.Y. 8" Conc. Ent. w/ C & G

230 L.F. 24" C&G

370 L.F. 24" C&G

1255.9'

1318.9'

LEGEND:

- 5" ASPHALT #1, (38369 SF)
- SIDEWALKS, (3008 SF)
- PLATFORM, (796 SF)
- SIDEWALK #2, (247 SF)

N/A CURBS #1, (1356 SF)

NORTH

Site Plan C103
1" = 40'

Douglas County Fairgrounds Masterplan Documents

19th and Haskell
Lawrence, KS 66046

MAR LAN CONSTRUCTION

Indigo Engineering

pkmr

TREANOR ARCHITECTS

Bldg D Parking Area Site Improvements

REVISIONS	
1	Comments: —
	Date: —
	Comments:
	Date:
	Comments:
	Date:
	Comments:
	Date:

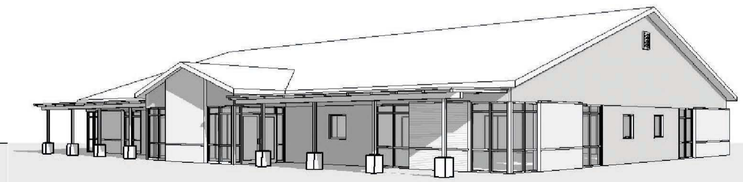
Date: 12.14.15

C103

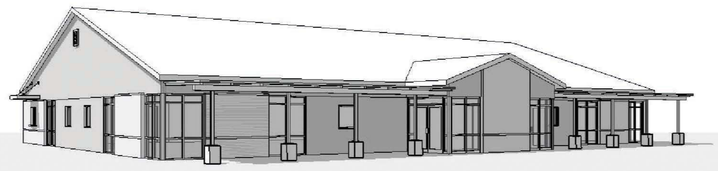
BLDG D PARKING AREA SITE PLAN

DV12.025.00B

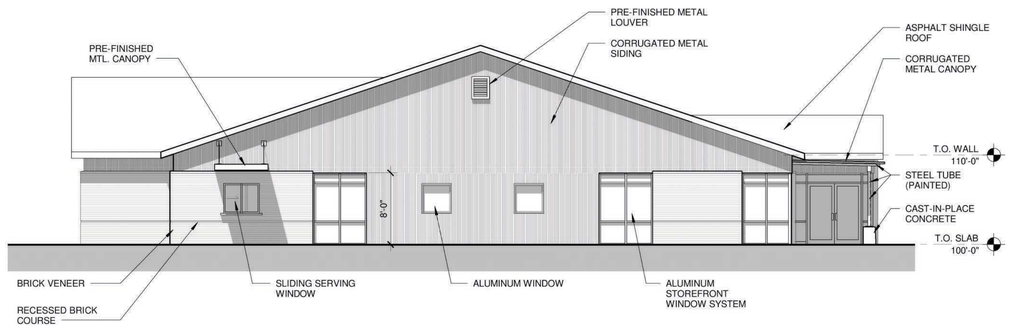
Perspective from SouthEast



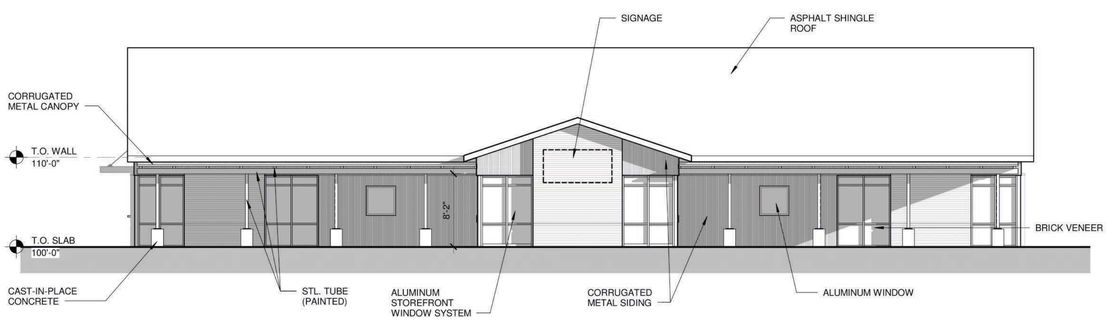
Perspective from NorthWest



Perspective from NorthEast

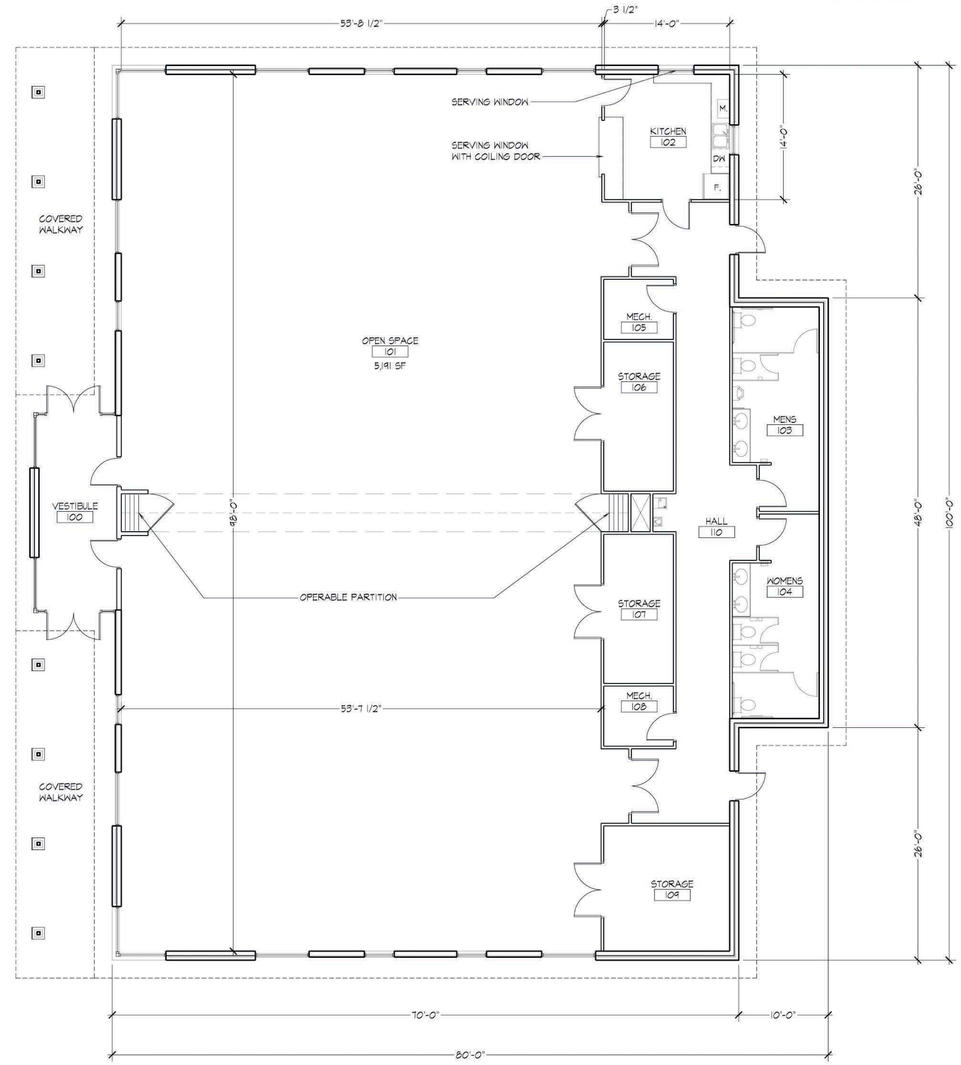


East Elevation **C3**
1/8" = 1'-0"



North Elevation **A3**
1/8" = 1'-0"

PROGRAM NOTES:
- WOOD CONSTRUCTION
- EXTERIOR WALLS TO BE METAL PANEL W/ BRICK
- ASPHALT SHINGLE ROOF
- EPOXY COATED FLOORS (MATCH DREHER)
- FULL KITCHEN W/ SERVING WINDOWS
- TABLE & CHAIR STORAGE
- RESTROOMS (PER SEX)
  - 2 LAVATORIES
  - 3 STALLS
  - DRINKING FOUNTAINS
  - PLASTIC TOILET PARTITIONS
-SOUND ABSORBING ACT



NORTH

Building D - Meeting Hall Floor Plan - 7,676 gsf **A1**
1/8" = 1'-0"

Douglas County Fairgrounds Masterplan Documents

19th and Haskell
Lawrence, KS 66046

MAR LAN CONSTRUCTION
landplan engineering
pkmr ENGINEERS
TREANOR ARCHITECTS

Meeting Hall

REVISIONS		
1	Comment:	--
	Date:	--
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	Comment:	
	Date:	
	Comment:	
	Date:	

Date: 12.19.13

A101 - M

MEETING HALL FLOOR PLAN

DATE PRINTED:Wednesday, November 27, 2013
LAST SAVED:Wednesday, November 27, 2013
PRINTED BY:Chris Cunningham

DV12.025.00B

Douglas County Fairgrounds Masterplan Documents

19th and Haskell
Lawrence, KS 66046

MAR LAN CONSTRUCTION

Indigo Landscape Engineering

pkmr

TREANOR ARCHITECTS

Arena Area Site Improvements

REVISIONS	
Comments:	---
Dates:	---
Comments:	
Dates:	
Comments:	
Dates:	
Comments:	
Dates:	

Date: 12.14.15

C104

ARENA AREA SITE PLAN

BUILDING
42,081.50 SQ. FT.
F.F.E.
904.50

PLAZA

DUMP STATION

EXISTING SANITARY SEWER EASEMENT

600-1000
LAWN SEATS

889.00

275'

165'

2775 SEATS

E

F

GREENSPACE/
ARENA STAGING

EXISTING ARENA
120' x 240'

1165 S.Y.
Chip & Seal Road

NOTE: THIS 30' STRIP WILL BE DEDICATED AS A PUBLIC STREET WHEN THE ADJACENT 30' STRIP TO THE EAST IS DEDICATED AND OPENED.

25'

2020 S.Y.
Chip & Seal Road

1565 S.Y.
Chip & Seal Road

GREENSPACE/
CARNIVAL
(4.0ac)

GRAVEL

ASPHALT

2110 S.Y.
Chip & Seal Road

230 L.F.
24" C&G

38'
3200 S.Y.
5" Asphalt

370 L.F.
24" C&G

OFFICE
11,500 S.F.
FFE 926.00
BFE 915.67

BUILDING NO.21

PARKING
APPROX.
SPACES

TRASH BIN

AIR COND.

EXIST. LIGHT

WATER OUTLETS

ACCESS DRIVE TENDS TO KHO

LEGEND:

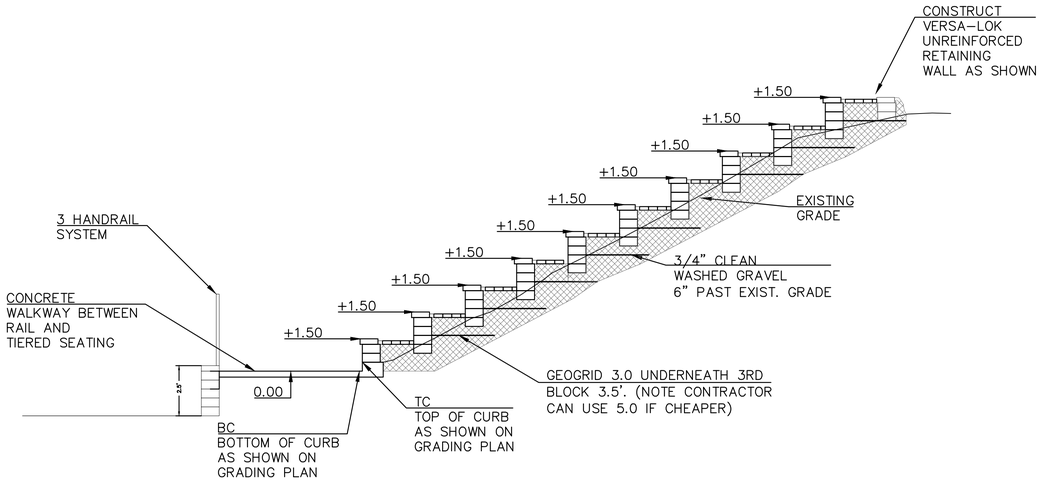
- CHIP AND SEAL, (50182 SF)
- SITE FENCING, (1367 SF)
- CONCRETE WALKS, (12827 SF)

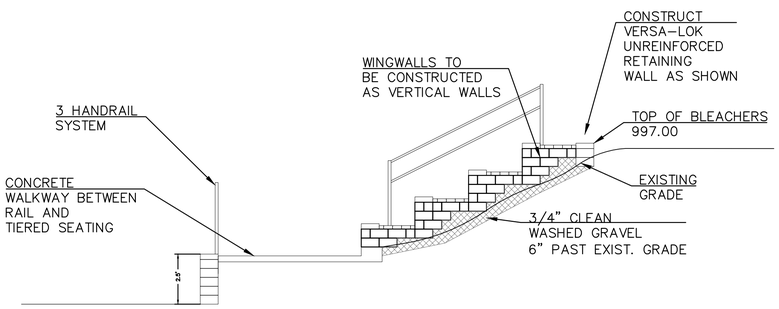
NOTE: FOR EXACT FENCE LOCATION, SEE SUBDIVISION PLAT OF "4-H FAIRGROUNDS ADDITION" FILED IN THE REGISTER OF DEEDS OFFICE, DOUGLAS COUNTY, KANSAS, (1960).

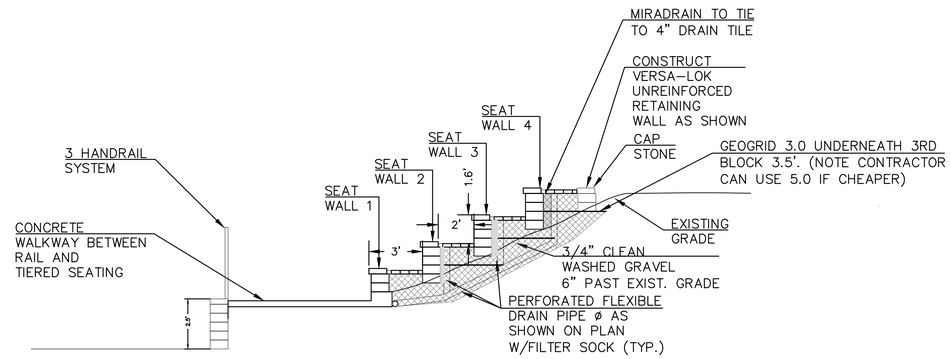
NORTH

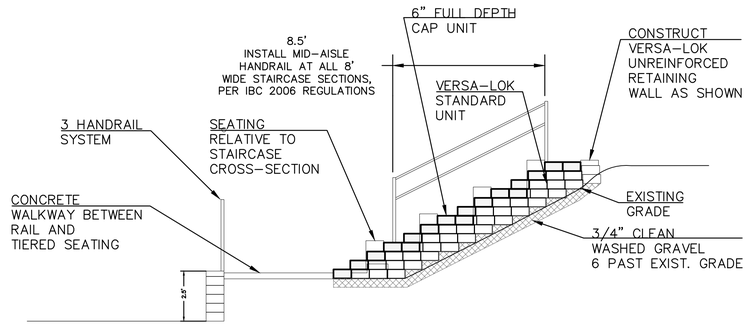
Site Plan 1" = 40'

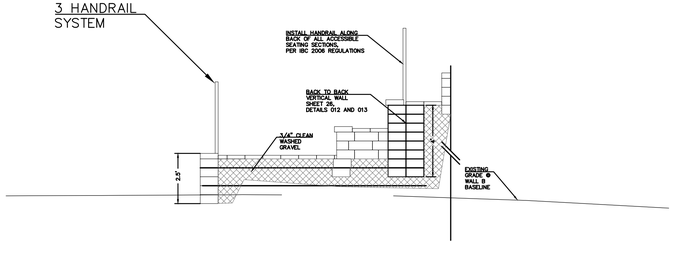
C104

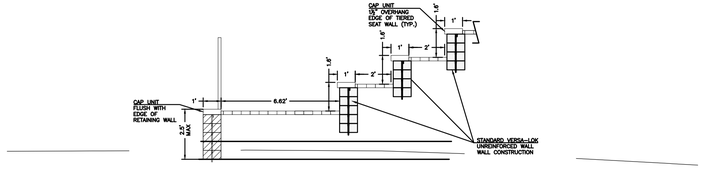












NORTH

Site Plan
No Scale

C105

Arena Area
Cross Section of Bleachers

DV12.025.00B

Douglas County Fairgrounds Masterplan Documents

19th and Haskell
Lawrence, KS 66046

MAR LAN CONSTRUCTION
lindahl engineering
pkmr ENGINEERING
TREANOR ARCHITECTS

REVISIONS		
1	Comment:	—
	Date:	—
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	Comment:	
	Date:	
	Comment:	
	Date:	

Date: 12.19.18

C105

ARENA AREA
SEATING DETAILS

DV12.025.00B

Douglas County Fairgrounds Masterplan Documents

19th and Haskell
Lawrence, KS 66046

MAR LAN CONSTRUCTION

Indigo engineering

pkmr

TREANOR ARCHITECTS

Central Parking Area Site Improvements

EXPANDED PARKING (180 STALLS)

HARPER STREET

30 BUILDING 42,081.50 SQ. FT. F.F.E. 904.50

EXISTING BALLFIELD

A F.F.E. 902.50

WASHPENS

GREENSI RV A TRAIL PARK (32 STAI

PLAZA

DUMP STATION

EXISTING SANITARY SEWER EASEMENT

600-1000 LAWN SEATS

889.00

275'

2775 SEATS

889.00

899.00

600-1000 LAWN SEATS

F

E

209 L.F. 24" C&G

150 L.F. 24" C&G

330 L.F. 24" C&G

1122 S.Y. 5" Asphalt

235 L.F. 24" C&G

55 S.Y. 8" Conc. Ent. w/ C & G

2050 S.Y. 6" Conc. Paving

NEW PARKING LOT (80 STALLS)

3200 S.Y. 5" Asphalt

MONUMENT SIGN

PICK UP

1158 L.F. 24" C&G

125 S.Y. 8" Conc. Dock

21 BUILDING NO.21 14,928 SQ.FT.

380 S.Y. 5" Asphalt

22 EXTENSION OF NO. 22 6,000 SQ.FT.

34

350 S.Y. 5" Asphalt

GARDENS

TRASH BIN

AIR COND.

9

EXPANDED PARKING LOT

LEGEND:

- 5" ASPHALT #3, (34185 SF)
- CURBS #3, (2155 SF)
- 6" SPECIAL CONCRETE, (20928 SF)
- 6" SPECIAL CONCRETE, (8652 SF)

NORTH

Site Plan 1" = 40' **C102**

REVISIONS

1	Comments: — Dates: —
	Comments: Dates:
	Comments: Dates:
	Comments: Dates:

Date: 12.14.15

C102

CENTRAL PARKING AREA SITE PLAN

DOUGLAS COUNTY PUBLIC WORKS
1242 Massachusetts Street
Lawrence, KS 66044-3350
(785) 832-5293 Fax (785) 841-0943
dgcopubw@douglas-county.com
www.douglas-county.com

Keith A. Browning, P.E.
Director of Public Works/County Engineer

MEMORANDUM

To : Board of County Commissioners

From : Keith A. Browning, P.E., Director of Public Works/County Engineer

Date : January 29, 2014

Re : Consent Agenda Approval to Solicit Bids for Supply of Asphaltic Concrete

Public Works department requests BOCC approval to solicit bids for asphaltic concrete material supply for the 2014 maintenance season. Road & Bridge Fund 201 has $550,000 allocated in the BM-2 line item.

As in the past, this year's supply contract will include a price adjustment factor tied to KDOT's Monthly Asphalt Price Index. The adjustment factor will increase/decrease the price for asphaltic concrete mix by $0.50/ton for each $10.00/ton increase/decrease in the Monthly Asphalt Price Index.

We plan to open bids in late February or early March. Contracts will be presented to the BOCC for approval thereafter.

Action Required: Consent Agenda approval to solicit bids for supply of asphaltic concrete mix for the 2014 maintenance season.

MAR LAN CONSTRUCTION

January 6, 2014

Douglas County Fairgrounds
Master Plan Budget

Item Description		Budget	Notes
Site and Infrastructure Costs			
1 RV and Trailer Parking		$ 200,783	Gravel drives, electrical pedestals, seeding
2 North Parking lot		$ 199,072	Curbs, asphalt, lighting
3 Expansion of South existing Parking Lot		$ 205,274	Demo of existing, curbs, asphalt, lighting
4 Outdoor Meeting area		$ 57,846	Platform, sidewalk, seeding, lighting
5 Miscellaneous site improvements and demolition		$ 436,515	Demolition of exhibitor buildings, tie-out pens, chip and seal roads, special paving, site lighting, general seeding
Subtotal Site and Infrastructure Costs		$1,099,490	
Building Costs			
1 Open Pavilion-Building A		$2,727,638	Asphalt on east and north drives, fire main and hydrant, covered walkway, fire line extension and hydrant
2 Meeting Hall-Building D		$858,934	Demo of buildings 1 and 2, sidewalks
3 Outdoor Arena		$1,259,728	Includes concession and restroom building, fencing, seating, lighting
Subtotal Building Costs:		$4,846,300	
Total Construction Budgets		$5,945,790	
Project Cost Adjustment	10%	$594,579	Professional & Legal fees, Contingency, Geotechnical, etc.
Total Project Budget		**$6,540,369**	

2014 Emergency Vehicle Permit Renewal

Name	Agency	Vehicle	Vehicle Yr	Licence Tag	Permit #	
Duane Filkins	Kanwaka Fire Department	Honda CR-V	2004	KS FF 613	007	Renewal
John E. Steele Jr.	Kanwaka Fire Department	Chevrolet Pickup	2002	KS FF 5436	008	Renewal
John E. Steele Jr.	Kanwaka Fire Department	Chevrolet Van	2008	PON 651	009	Renewal
Robert O. Rombach	Kanwaka Fire Department	Chevrolet Camaro	2013	KS FF 10965	010	Renewal
Robert O. Rombach	Kanwaka Fire Department	Jeep Grand Cheroke	2004	KS FF 5167	016	Renewal

Name	Agency	Vehicle	Vehicle Yr	Licence Tag	Permit #	
William M. Shockley	Lecompton Fire/EMS	GMC Flatbed truck	1984	KB0WDW	005	Renewal
Jonathon A Morris	Lecompton Fire/EMS	Dodge Dakota Pickup	2006	KS FF 111352	017	Renewal

Modification to the Budget Process for Agencies Receiving County Financial Support

Agencies and community organizations that are receiving County financial support through the Budget process and are outlined in the Agencies County Funded section.

Starting with the 2015 Budget Development Process, the departments will be divided as follows:

Community Partnerships (formerly Agencies County Funded)

Human Services:

- Bert Nash Mental Health Center
- Bert Nash Mental Health Center – Health Insurance
- CASA Court Appointed Special Advocates
- Cottonwood
- Douglas County Dental Clinic
- Emergency Services Council
- Health Care Access
- Heartland Community Health
- Independence Inc.
- Jayhawk Area on Aging Council
- Lawrence Douglas County Health Department
- Lawrence Douglas County Sanitary Code
- Lawrence Douglas County Screening
- Lawrence Douglas County Health Department Insurance
- Lawrence Community Shelter
- Legal Aid
- Senior Services
- The Shelter, Inc.
- Visiting Nurses Association
- Humane Society

Heritage and Land Management

- Conservation District
- Extension Council
- Extension Council Health Insurance
- Freedom's Frontier Heritage Area (administered by DMI)

Economic Development:

- Chamber of Commerce Economic Development Marketing

Community partners that receive funding through the Budget process will be subject to many of the same requirements for accountability and transparency as contractors for direct service provision.

Accountability

For each agency supported, an agreement will be prepared and approved that outlines the amount of support given and any obligations identified during the budget development process. The contract will outline any oversight and monitoring requirements related to the performance of the agency. A copy of the budget submittal, that includes the agency's financial reports and other related financial information, should also be included.

Any agreement will outline any restrictions on the use of the funds and any specific reporting requirements that are needed. Each year, the budget submittal will report on performance in specific performance criteria and an outline of actual costs incurred the year before. The agreement can be canceled if the agency fails to comply with the performance criteria and other requirements set out in the agreement and if annual costs exceed those established by the agreement.

Transparency:

Each agency that receives an annual appropriation from Douglas County must maintain a copy of the records and files related to the appropriation, and indicate that such records and files are subject to the Kansas Open Records Act and may be disclosed by Douglas County pursuant to the Freedom of Information Act. Specifically, any agency doing business with Douglas County shall:

- keep and maintain the public records that ordinarily and necessarily would be kept and maintained by the Douglas County in order to perform the service or activity;
- provide Douglas County with access to such public records on the same terms and conditions that the agency would provide the records and at a cost that does not exceed costs as defined in the Kansas Open Records Act or as otherwise provided by law.

Competition

Most agencies that receive financial support to provide community services in concert with Douglas County do not have competition in the community to provide services. If the Board of County Commissioners feels that a competitive process needs to be conducted, it can do so in advance of the annual budget development process each year. Nothing in the agreement or the annual budget process should be construed as providing an agency with guaranteed funding in a future budget year.

REVISED LANGUAGE for Purchasing Policy 3.5 Purchases of Services – starting on subsection D:

PURCHASES OF SERVICES

A. **Department Head Approval levels**: When the purchase price of the service acquisition is less than or equal to $7,500, the Department Head shall have the authority to make the acquisition without prior approval or the solicitation of quotes.

B. **Administration Approval Levels**: Approval for purchases of services may be made by the County Administrator or the Assistant County Administrator at the following levels:

1. Cooperative or State Contracts: When the purchase price of the service acquisition is between $7,501 and $20,000, and the service may be purchased through a cooperative or state contract for which bids/proposals were originally issued.

2. Sole Source: When the purchase price of the service acquisition is between $7,501 and $20,000, and the service may only be purchased through one vendor due to uniqueness of the service, quality or performance of the service, or need to maintain uniformity with past purchases.

3. Informal Bids/Proposals: When the purchase price of the service acquisition is between $7,501 and $20,000, and a cooperative or state contract is not available or is not being utilized, and informal bids/proposals have been solicited.

C. Board of County Commissioners Approval:

1. Approval from the Board of County Commissioners is required when the purchase price of a service is greater than $20,000. Cooperative or State Contracts, Sole Source, or Formal Bids may be utilized for such purchase.

2. Engineering Services. For engineering services greater than $20,000, but less than $100,000, and are part of an approved CIP project, the department head may invite proposals from at least three firms. Pursuant to an interview of at least one firm,

the department head shall request approval from the County Commissioners to negotiate a final contract and fee for the professional service; final approval of the contract must be requested from the Board of County Commissioners unless such approval authority has otherwise delegated by the Board. Engineering services greater than $100,000 will be subject to Sections 3.11 and/or Section 3.8.

D: **Administration of Contracts for Services**

When Douglas County has a statutory reason to provide a service and where there are alternatives for service provision in the community, Douglas County hereby in acts the following conditions to the selection and administration of the agreements.

Accountability

Before a contract is finalized, the department shall prepare a request to the Board of County Commissioners or an appropriation and any authority that is necessary to oversee and monitor performance of service contracts and enforce other conditions required by law. No procurement shall proceed unless the necessary appropriation and authority have been granted.

If a department procures services, the department shall:

- keep a record of the cost analysis and findings that the contracting agency makes for each procurement the agency conducts, along with the basis for the decision to proceed with the procurement;
- properly ensure that the contractor is providing services as required by the contract within the costs as established by the contract;
- enforce performance standards established by the contract;
- collect and provide copies of the records required by law; and
- ensure that any all aspects of the contract are properly enforced.

Any service contract shall incorporate specific performance criteria and cost parameters, and the contractor shall submit reports to the department on the contractor's compliance with the performance criteria and actual costs incurred, as outlined in the contract. The service contract may be canceled if the contractor fails to

comply with the performance criteria and other requirements set out in the contract and if annual costs exceed those established by the contract. The contract may be cancelled at any time if the contractor fails to comply with all applicable local, state and federal laws, regulations and statutes.

Any private entity that has a contract with Douglas County can have no adjudicated record of substantial or repeated willful noncompliance with any relevant federal, state or local statute or regulation, including payment of taxes or other payments owed to a public entity.

Transparency:

For each service contract in excess of $20,000, contractors shall (1) provide that the Douglas County is entitled to receive a copy of records and files related to the performance of the governmental function, and (2) indicate that such records and files are subject to the Kansas Open Records Act and may be disclosed by Douglas County pursuant to the Freedom of Information Act. Specifically, any contractor doing business with Douglas County shall:

- keep and maintain the public records that ordinarily and necessarily would be kept and maintained by the Douglas County in order to perform the service or activity;
- provide Douglas County with access to such public records on the same terms and conditions that the agency would provide the records and at a cost that does not exceed costs as defined in the Kansas Open Records Act or as otherwise provided by law.

Competition

No agency may enter into a contract that guarantees payment for services not provided. Service or asset contracts shall not unduly restrict the government from taking actions in the public interest and shall not unfairly place the burden of risk on taxpayers.

Contracts periods can be established for up to five year periods, with one year renewals inside the contract period. At the end of a contract period, a competitive bidding shall

be used. The Board of County Commissioners can waive the competitive bidding process.

Agenda

February 5, 2014

Study Session – Wind Energy Resources and Local Polices 101 (60-90 Minute Study Session)

1. **Wind as a Kansas Natural Resource** (15-20 Minutes) [Presenter **Eileen Horn**, Sustainability Coordinator]
    a. Kansas Resource
        i. Review of wind energy resources in Kansas.
        ii. Overview of current wind energy projects.
    b. What does a wind farm look like?
        i. Scale and size of wind energy structures.
    c. Wind Energy Facilities:
        i. Economic development.
        ii. Environmental impacts.

2. **Factors making Wind Energy a commodity** (15-20 Minutes) [Presenters **Neil W. Jones,** Kimley-Horn and Associates, Inc. and **Noah Hyte** NextEra's project developer]
        i. Wind resource
            1. How does industry process and use information from data collection?
        ii. Land for assembly
        iii. Available market (customer base)
        iv. Available transmission infrastructure from source to market
        v. Is there a breakeven point for facility size?
    b. How does industry see this use

3. **Where are We in Douglas County** (5-10 minutes) [Presenter **Sandy Day**, Planning Staff]
    a. Current applications
        i. Map of area
        ii. Met tower not wind farm
        iii. Processing as a Conditional Use Permit
        iv. Processing as CUP, deferred concurrently with moratorium

4. **Model Regulations Overview** (15-20 Minutes) [Presenter **Linda Finger**, Interim Director, Douglas County Zoning & Codes Department Planning Resource Coordinator and **John Bullock,** County Counselor's office]
    a. Policy issues
    b. Residential application versus Wind Energy Facilities.
        i. Making the distinction
    c. Model Regulations – for Wind Energy Facilities
        i. General design standards
            1. Options A – typical standards from other communities

2. Options B – standards that may be considered

5. **Questions and Answers** (10-20 Minutes)

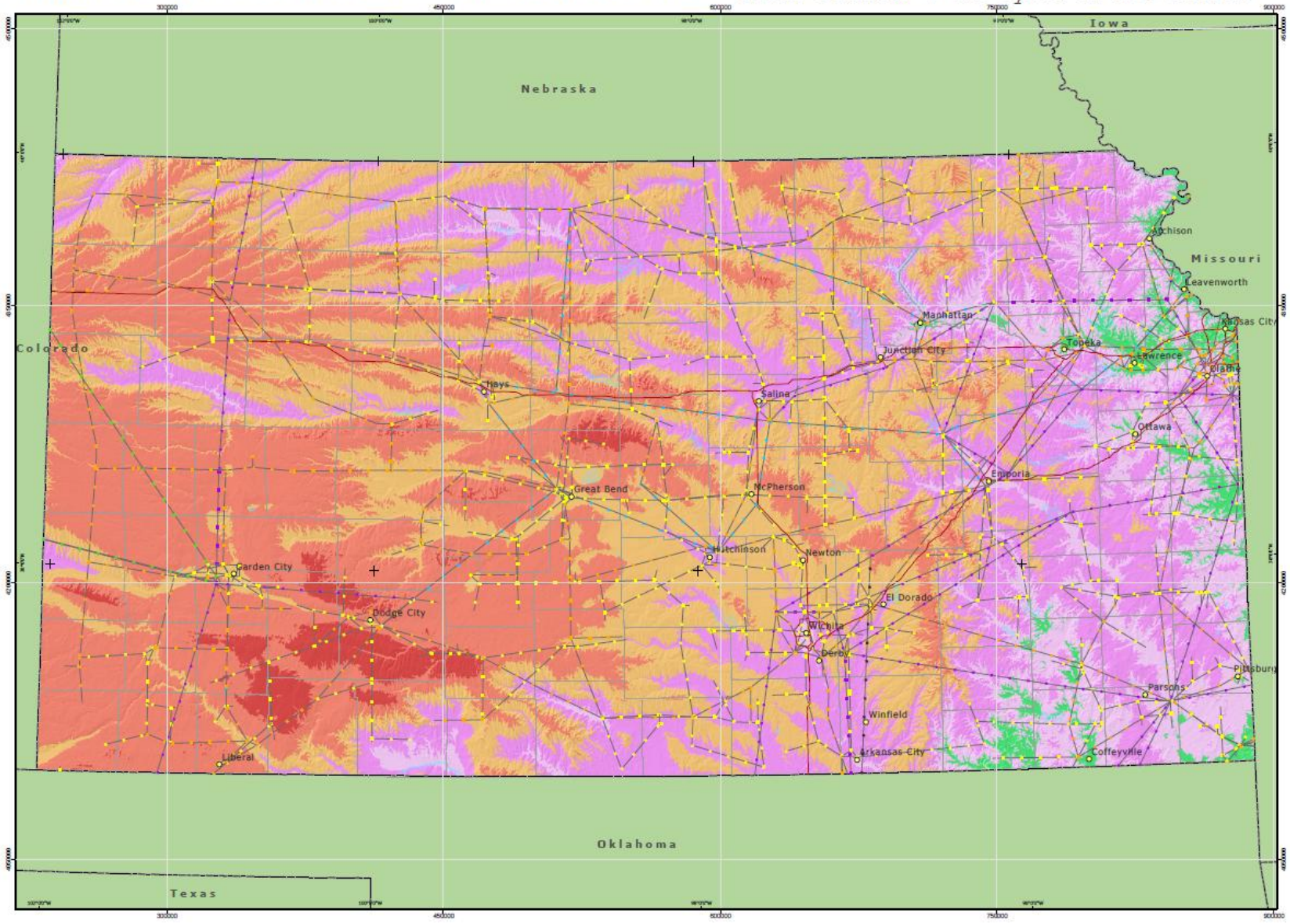
Wind Energy Study Session

Presented
to the
Douglas County
Board of
Commissioners

February 5, 2014

WIND RESOURCE OF KANSAS

Mean Annual Wind Speed at 100 Meters



MESOMAP

Inset

Legend

Mean Speed at 100 m

mph	m/s
< 12.3	< 5.5
12.3 - 13.4	5.5 - 6.0
13.4 - 14.5	6.0 - 6.5
14.5 - 15.7	6.5 - 7.0
15.7 - 16.8	7.0 - 7.5
16.8 - 17.9	7.5 - 8.0
17.9 - 19.0	8.0 - 8.5
19.0 - 20.1	8.5 - 9.0
20.1 - 21.3	9.0 - 9.5
> 21.3	> 9.5

City
Interstate Highway
State Boundary
County Boundary
Water Body

Transmission Lines

Category
Under 100 kV
100 kV-161 kV
230 kV-287 kV
345 kV
500 kV
735 kV +
Step-Up

Reference

Wind Data Resolution: 200 m
Coordinate System: UTM 14N
Datum: WGS84

Disclaimer

This map was created by AWS Truewind using the MesoMap system and historical weather data. Although it is believed to represent an accurate overall picture of the wind energy resource, estimates at any location should be confirmed by measurement.

The generalized transmission line information was obtained by AWS Truewind from the Global Energy Decisions Velocity Suite. AWS does not warrant the accuracy of the transmission line information. Source Date: July, 2008

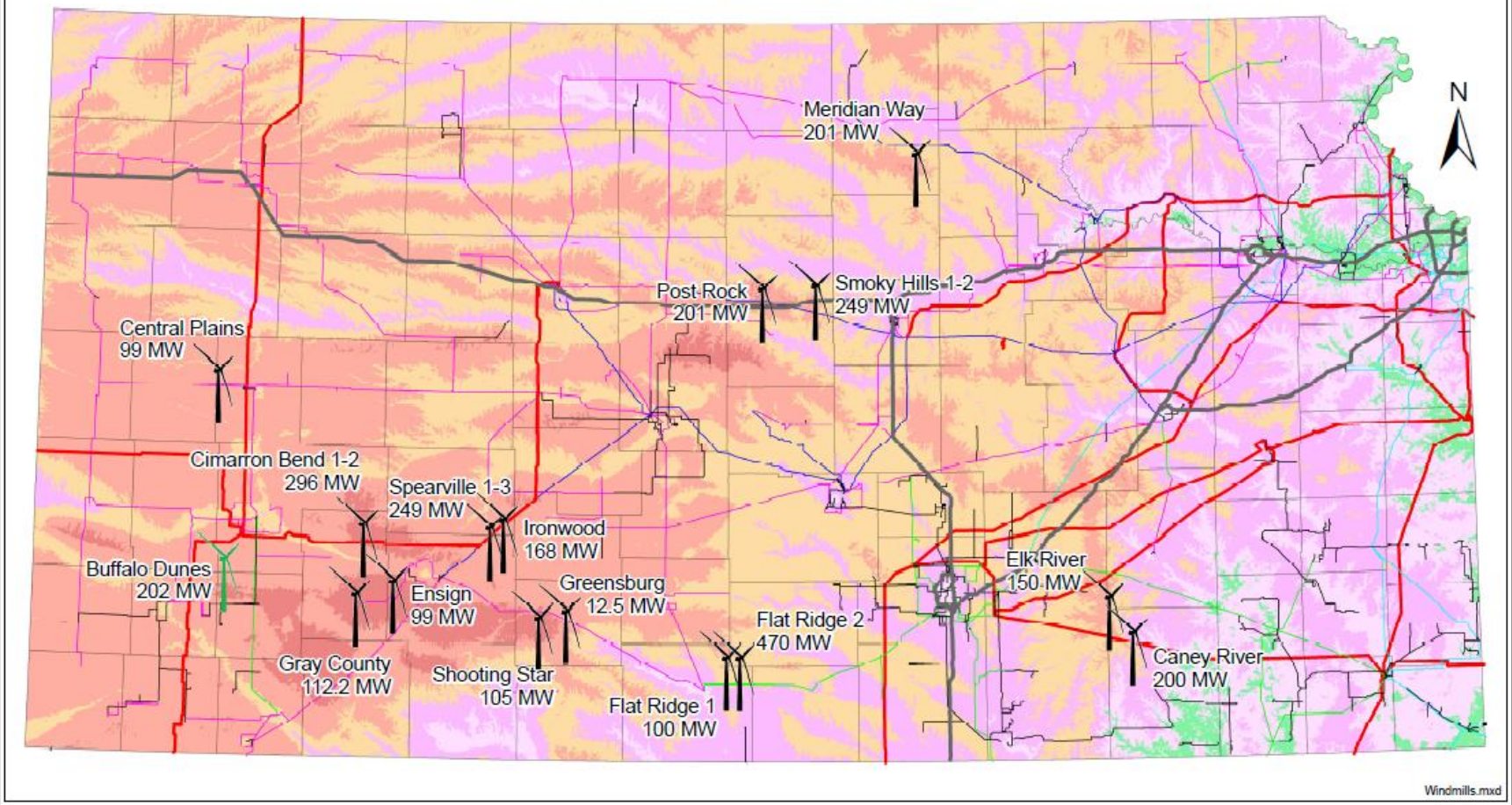
Originator

Date: 9/19/08
Department\Originator: Modeling\MPB
File Path: Kansas_SpdMaps..mxd
Map Class: FINAL, Confidential
Client: NREL

AWS Truewind
463 New Karner Rd. Albany, New York 12205
518. 213.0044 | www.awstruewind.com

http://www.kcc.state.ks.us/maps/Kansas_SPD100m_22Sept08.pdf

Kansas Wind Resources 2,712 MW Total



Existing

Under Construction

Transmission Lines

345 KV
138 KV
230 KV
115 KV
161 KV
69 KV

Roads

Interstate

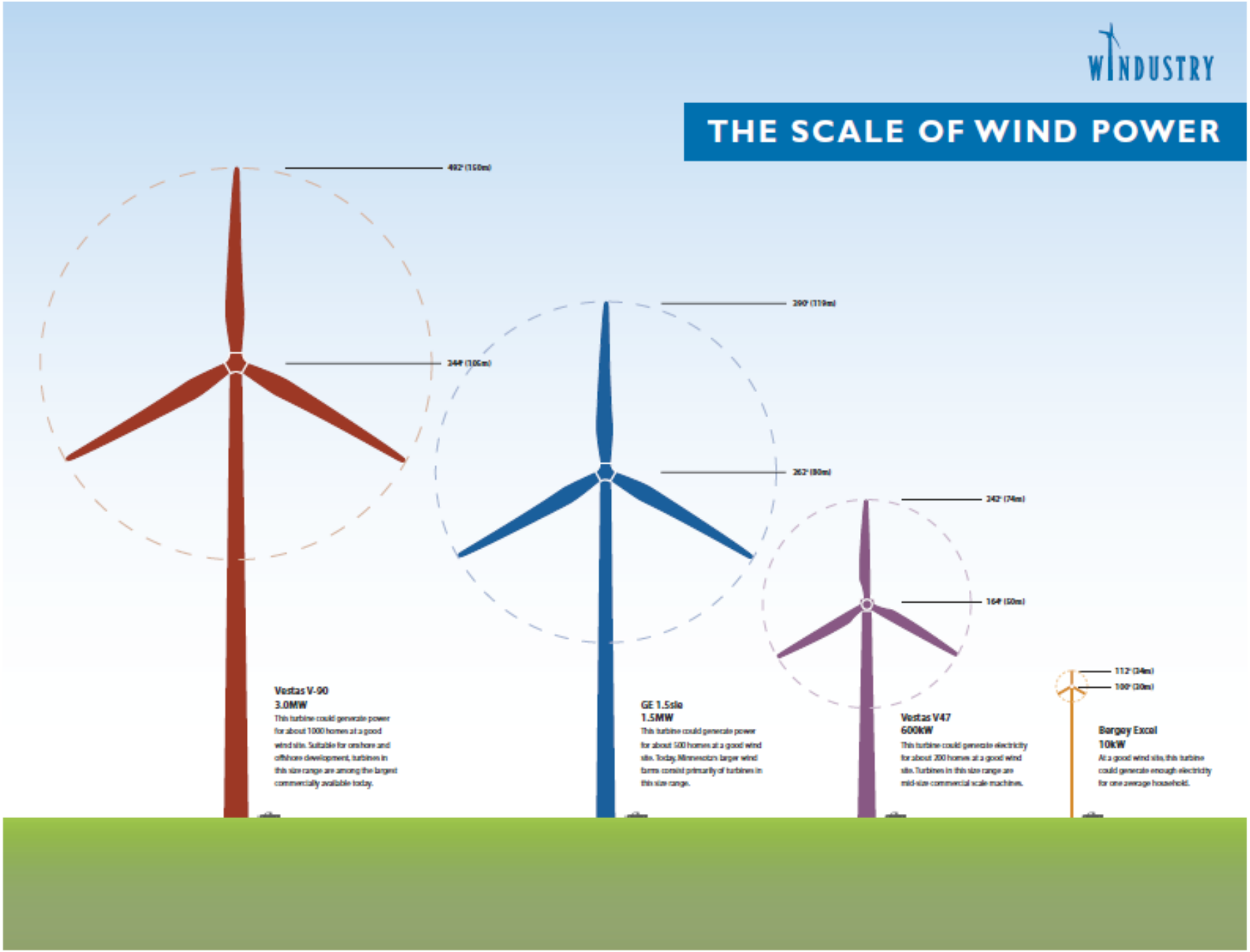
Wind Speed at 100 m

4.0 - 5.5	7.5 - 8
5.5 - 6	8.0 - 8.5
6.0 - 6.5	8.5 - 9
6.5 - 7	9.0 - 9.5
7.0 - 7.5	9.5 - 12

Wind speed at 100 meters data layer was created by AWS Truewind using the MesoMap system and historical weather data.
July 2008

Kansas
Corporation Commission
Information Technology
February 20, 2013

http://www.kcc.state.ks.us/energy/charts/Wind_WindFarmswithWindSpeeds.pdf



http://www.windustry.org/resources/how-big-are-wind-turbines

Kansas Wind Energy Statistics:

- **Installed Wind Capacity:** 2,712 megawatts (MW). *State Rank:* Kansas ranks 9th for total MW installed.
- **Number of Wind Turbines:** 1,592 turbines.
- **Wind Projects Online:** 23 wind projects.
- **Percentage of Kansas' electricity provided by wind in 2012**: 11.4 percent. *State Rank*: Kansas ranks 6th for percentage of electricity coming from wind energy.
- **Equivalent number of homes Kansas wind farms now power:** over 840,000 average American homes.

Economic Benefits of Wind Energy in Kansas:

- **Total direct and indirect jobs supported in 2012**: 4001-5000. *State Rank:* Kansas ranks 5th for number of wind-related jobs.
- **Capital investment:** over $5 billion dollars .
- **Annual land lease payments:** over $7,900,000.
- **Number of manufacturing facilities in Kansas:** 7 facilities.

Environmental Benefits of Wind Energy in Kansas:

- The **water consumption savings** from wind projects in Kansas total more than 2 billion gallons of water per year.
- The wind power installed in Kansas will **avoid over 5.6 metric tons of carbon dioxide** emissions annually, the equivalent of taking over 990,000 cars off the road.

Wind Energy Potential Impacts:

- Sound and visual impacts
- Wildlife and habitat
- Infrastructure and roads
- Aviation/FAA
- Soil erosion and water quality
- Public health and safety
- Land use and property values
- Public infrastructure
- Etc.

Siting Guidelines for Windpower Projects in Kansas

The Kansas Renewable Energy Working Group
Environmental and Siting Committee

Introduction

The Environmental and Siting Committee of the Kansas Renewable Energy Working Group (KREWG) has drafted these guidelines for use by windpower project stakeholders as they consider potential project sites in the State of Kansas. Wind energy siting and permitting requirements vary from county to county based largely whether or not a county is zoned. Currently, statewide regulations for siting wind projects do not exist.

Much of the material for these guidelines has been taken from the National Wind Coordinating Committee's (NWCC) *Permitting of Wind Energy Facilities* handbook[1]. The NWCC permitting handbook is an excellent resource for the siting process as well as the permitting process. Developers, regulators and other interested stakeholders are strongly encouraged to read the handbook and take its observations and suggestions under consideration.

The concept of siting is differentiated from permitting, as permitting pre-supposes an identified project site. However, the guidelines in this paper incorporate a continuum of activities and concerns that will occur during both the siting and permitting processes. It is not anticipated that all of the proposed guideline activities will occur exclusively in the siting process. The process of successfully siting a wind energy project often comes down to a matter of trade-offs between community acceptability and economic viability. This is the nature of a healthy interactive and reciprocal engagement and discussion.

NWCC identifies ten discrete categories or areas of consideration in the permitting process. Of these ten categories, eight are directly applicable to the siting process. Additionally, individual guidelines within these eight categories have been added or tailored to address a number of concerns and issues specific to the State of Kansas.

There are various regions of Kansas that have wind resources sufficient to support the currently required economics of wind energy development, including but not limited to the Flint Hills region of eastern Kansas and south central and western Kansas. Additional areas may be identified by ongoing studies or added as improvements in technology or transmission systems are made.

Because of the State's many suitable qualities for wind energy generation, these regions are currently experiencing a high level of interest in wind energy projects. Local regulators should anticipate that wind energy projects may be proposed in their area and address their preparedness to evaluate any projects proposed. Developers should anticipate the possibility of a saturation of proposed projects and assess whether the expense of a wind resource assessment is justified. All interested stakeholders should educate themselves on the facts of wind energy generation.

[1] The handbook can be found online at www.nationalwind.org/pubs/permit/permitting.htm.

Based on the discussions and conversations that have transpired in the Environmental and Siting Committee, wind energy issues in Kansas are similar to those in other states. Residents and other stakeholders feel protective of their local resources and environment, and are concerned that those resources not be exploited or degraded. Developers see an opportunity to establish new renewable energy generation facilities and may be surprised and/or defensive when their proposals are opposed by individuals citing concerns over the project's impact on the environment.

A critical element of a responsible approach to siting of windpower projects in Kansas is the recognition that projects must be evaluated and developed on their individual merits and on reasonably expected positive and negative impacts, collectively. Cumulative positive and negative impacts will undoubtedly accrue as development proceeds within regions and the State. It is reasonable to expect that these cumulative effects may differ both in type and in significance from those experienced at individual project sites. Cumulative effects on natural and biological resources, in particular, require consideration, but those in many other categories are also important. In the interest of long-term development and sustainability of the industry in a manner that considers the needs of all stakeholders, the context of the collective merits of projects should be evaluated.

There are numerous informational resources available to stakeholders in the wind energy siting process, many of which are readily available on the Internet. We have included a resource listing as Appendix A to this guidelines document in order to facilitate research and discovery by all parties. The listing is by no means comprehensive and inclusion, and the listing does not imply endorsement of the particular resources or the views they represent by the KREWG. Appendix A is intended to be a dynamic document that will hopefully be updated on a regular basis as resources evolve.

The principles outlined in this paper are neither mandates nor regulations. The goal of these guidelines is to encourage developers to select potential wind sites using a process that is acceptable to all stakeholders, to protect the State's natural beauty, to minimize deleterious effects to wildlife, to reduce suspicions, to facilitate the education and understanding of all those involved in the process, and to promote a responsible approach to the siting of windpower projects in Kansas.

1. Land Use Guidelines

a. Contact agencies, property-owners and other stakeholders early in the process to identify potentially sensitive land uses and issues;

b. Learn the rules that govern where and how a wind project may be developed in the project area;

c. Review and address land use compatibility issues before leasing the land;

d. In the spirit of interacting with all landowners in an equitable and fair fashion when proposing lease and option agreements, provide access or direction to objective background information that will allow the landowner to make a fully informed decision;

e. Recognize there are concerns specific to each region in the State. Consult with appropriate experts, and research and evaluate the implications of local issues prior to selecting a specific site within the respective region;

f. Because of the rarity and high conservation value of the tallgrass prairie it harbors, careful consideration should be given to the impact of windpower projects in the Flint Hills[2], particularly in the relatively unfragmented areas of the landscape[3]. In addition, care should be given to avoid damage to unfragmented landscapes and high quality remnants in the Sandsage, Mixed Grass, and Shortgrass prairies in central and western Kansas. When feasible, wind energy development should be located on already altered landscapes, such as extensively cultivated land and/or areas already developed. An undeveloped buffer adjacent to intact prairies is also desirable; and,

g. Plan for efficient use of the land, consolidate necessary infrastructure requirements wherever possible, and carefully evaluate current transmission and market access.

2. ***Noise Management Guidelines***

a. When evaluating prospective sites, consider whether there are adequate setbacks from residential areas and rural homes, especially where the residential unit is in a relatively less windy or quieter location than the turbines. Recognize that residents who support the wind system may some day be replaced by others who will object to the noise; and,

b. Where acoustic levels are critical because of nearby residences and/or natural surroundings, investigate the possibility of using sound reduction technology on appropriate turbines.

3. ***Natural and Biological Resources Guidelines***

a. Consider the biological setting early in the project evaluation and planning process. Use biological and environmental experts to conduct preliminary reconnaissance of the prospective site area. Communication with wildlife agency and university personnel is essential. If a site has a large potential for biological and/or environmental conflicts, it may not be worth the time and cost of conducting detailed wind resource evaluation work;

b. Contact appropriate resource management agencies early in the planning process to determine if there are any resources of special concern in the area under consideration;

c. Involve local environmental/natural resources groups as soon as practicable. They will be less likely to react negatively to a project if they understand its requirements and see their concerns are being seriously addressed;

d. A key tool for avoiding unnecessary negative ecological impacts of wind power development is planning. Landscape-level examinations of key wildlife habitats,

[2] Tallgrass Prairie is the most altered ecosystem in North American in terms of the number of acres lost, with only 3 to 5% remaining in any form. The Flint Hills landscape is the last expanse of tallgrass prairie, and contains approximately two-thirds of all the remaining tallgrass prairie in North America.
[3] See Appendix A under Web links.

migration corridors, staging/concentration areas, and breeding and brood-rearing areas should be used to develop general siting strategies;

e. Legally protected wildlife, such as threatened and endangered species, present or potentially present at a site should receive careful review. Recognize that other seriously declining or vulnerable species that have no legal protection may also be present. Research wildlife issues at each site and attempt to understand how a wind energy project might impact individual species of concern;

f. Sites where native vegetation is scarce or absent will have substantially fewer biological resource concerns. Where possible, avoid large, intact areas of native vegetation;

g. Power lines should be buried when feasible. In regions where grassland burning is practiced, infrastructure should be able to withstand periodic burning of vegetation. Roads and fences should be minimized;

h. No perches should be allowed on the nacelles of turbines. Towers should not utilize lattice-type construction or other designs that provide perches for avian predators. Potential adverse affects of turbine warning lights on migrating birds should be addressed;

i. Turbines should be situated in a way that does not interfere with important wildlife movement corridors and staging areas;

j. When it is impossible to avoid significant ecological damage in the siting of a wind power facility, mitigation for habitat loss should be considered. Appropriate actions may include ecological restoration, long-term management agreements, and conservation easements to enhance or protect sites with similar or higher ecological quality to that of the developed site; and,

k. Consider potential cumulative regional impacts from multiple wind energy projects when making environmental assessments and mitigation decisions. Failure to consider multiple projects will prevent analysis at a scale that could potentially yield a much different picture.

4. *Visual Impact Guidelines*

a. The visual impact of windpower projects[4] is an important consideration in siting deliberations. The impact on the quality of the surrounding landscape and viewsheds, especially in areas with high aesthetic qualities and where neighbors' property may be impacted by the siting, should be evaluated fully. Accurate visual representations of potential projects (including visual simulations and viewshed analyses) are useful ways of providing information to landowners, the general public and other key stakeholders regarding the visual impact of windpower projects;

b. Listen to the community(ies) and stakeholders in all project phases;

[4] The visual impact of wind turbines is subjective, in that there are a wide variety of views on the aesthetics of wind turbines, and those views are influenced by the site and surrounding landscape, land use practices, public attitudes, and individual perspectives.

c. Consider adapting the project design to minimize visual exposure from visually sensitive areas;

d. Plan the project to minimize the need for developed roads or cut-and-fill (refer to 5d);

e. Consider the possibilities and benefits of using road-less project designs or designs that rely on existing roads; and,

f. Identify designated scenic byways[5] and popular vistas, and avoid sites that are readily visible from those points.

5. *Soil Erosion and Water Quality*

a. Wherever possible, avoid sites that require construction activities on steep slopes;

b. In considering the appropriate erosion control measures required for a specific site, be aware that although some measures may require greater expense initially, significant savings will occur over the life of the project in reduced maintenance and replacement costs. A well-developed erosion and sediment control plan may also reduce regulatory delays in approving and monitoring the project;

c. Ideally, construction and maintenance should be done when the ground is frozen or when soils are dry and the native vegetation is dormant;

d. Improved roads and construction staging areas should be kept to a minimum, and care should be given to avoid sensitive habitats;

e. Ongoing operation and maintenance activities should be carried out as practical by use of light conveyances to minimize habitat disturbance and the need for improved roads; and,

f. Native vegetation of local ecotypes should be used when reseeding disturbed areas. Wildlife and plant composition should be considered in determining the frequency and timing of mowing near turbines.

6. *Safety Guidelines*

a. Include the need for safety setbacks when evaluating specific parcels for development. Sufficient spacing from public access ways, and particularly from residential areas and structures, can mitigate many siting issues.

7. *Cultural, Archaeological and Paleontological Guidelines*

a. Avoid selecting sites with potentially sensitive cultural or historical resources whenever possible, and always involve stakeholders early on;

b. Consult with the Kansas State Historical Society and qualified professional specialists familiar with cultural and fossil resources in the project development area;

---

[5] Kansas scenic byways are designated by the State through a grassroots nomination/evaluation process that focuses on the high visual aesthetic qualities of the route. Windpower projects should be sited to minimize adverse impacts on the visual quality of scenic byways as well as on the visual experiences of other popular vistas and scenic areas. In general, priority should be given to windpower projects where the natural landscape has already experienced significant change from human activity.

c. Some sensitive resources and sites may be confidential to Native Americans. Respect this confidentiality and plan to work closely with tribal representatives to avoid disruption of these resources;

d. Design project site layouts to avoid sensitive resources if possible;

e. Provide for monitoring and mitigation for protection of sensitive resources during construction and operation of the project; and,

f. Allow adequate time in the project schedule for data and specimen recovery, mapping analysis and reporting.

8. Socioeconomic, Public Service and Infrastructure Guidelines

a. Consult with the local agencies and service districts to determine if and how the project's requirements may affect community services, costs and infrastructure;

b. If possible, plan the project's operation and construction to avoid or minimize potential impacts on community services and infrastructure;

c. Recognize that the Kansas personal property tax exemption available to renewable energy projects affects the local community. Developers are encouraged to incorporate community and goodwill initiatives into the project's economic plan and work to be good neighbors;

d. Do not exploit the fact that some districts or counties do not yet have an established zoning permitting process applicable to wind energy projects. Work with the appropriate local officials to establish reasonable parameters and make the process as transparent and informative to the public as practicable;

e. Provide information related to possible future project expansions. Affected stakeholders should recognize that developers may not have precise information about future expansions, and developers should recognize that stakeholder issues and concerns may be dependant on project scale, and that expanded projects may involve impacts not specifically addressed during the initial project;

f. Anticipate and make provisions for future site decommissioning and restoration;

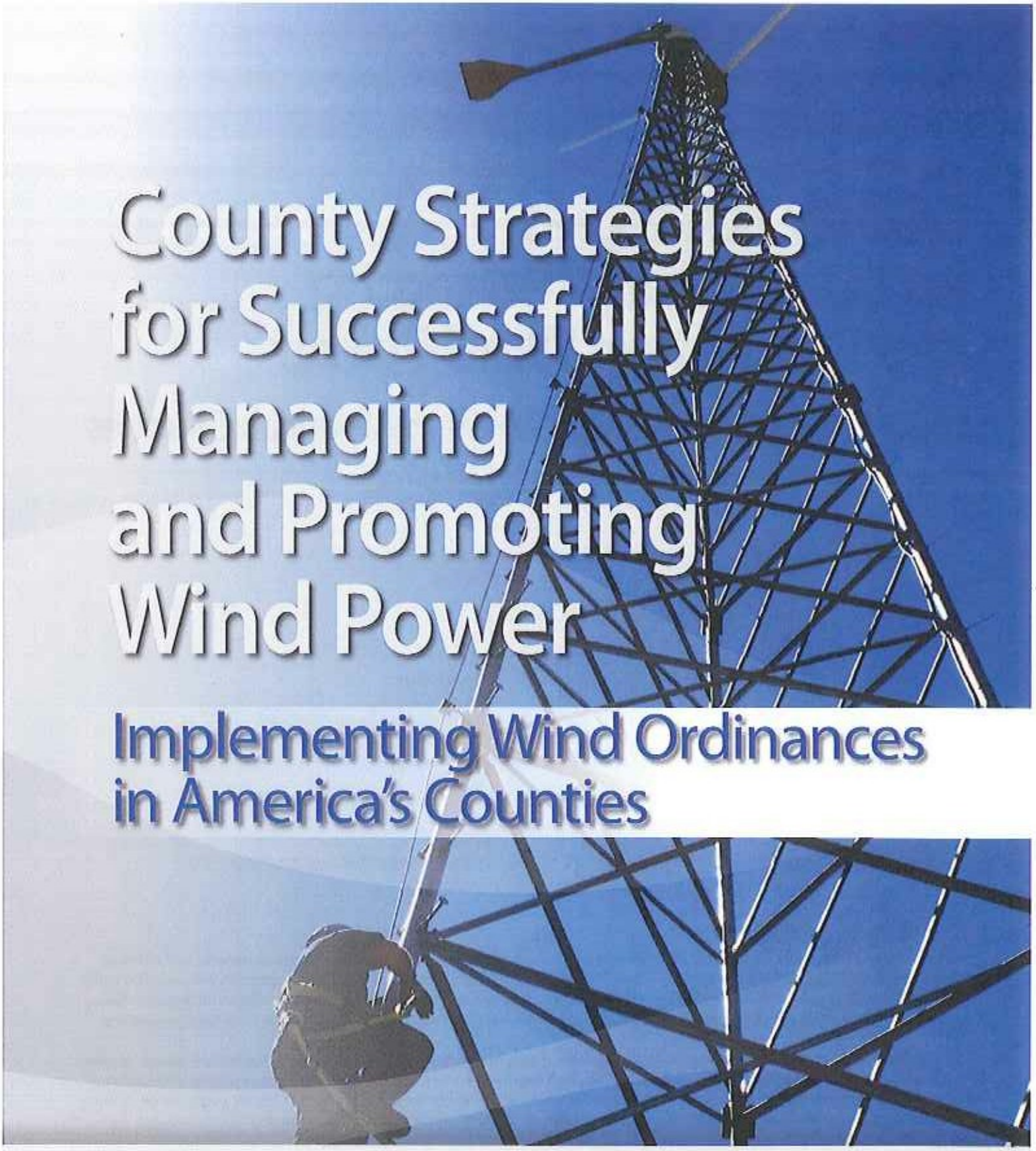
g. Utilize local contractors and providers for services, supplies, and equipment as much as possible during construction and operation of the project; and,

h. Recognize that the local community may not have a specific need for the electricity generated by the proposed project. There should be substantive public benefits beyond the greater good of hosting a renewable energy facility.

9. Public Interaction Guidelines

a. Prepare and implement a public outreach program on the benefits and trade-offs involved in wind generation; and,

b. Provide access or direction to objective background resources that will allow the interested parties to make fully informed decisions. Decision making by developers, landowners, elected officials and the general public will be enhanced when accurate and comprehensive information is shared and ample opportunity for two-way communication is available. Public involvement through meetings and public forums should be incorporated into the siting process.



County Strategies for Successfully Managing and Promoting Wind Power

Implementing Wind Ordinances in America's Counties

DWEA DISTRIBUTED WIND ENERGY ASSOCIATION

NACO National Association of Counties

County Strategies for Successfully Managing and Promoting Wind Power

Implementing Wind Ordinances in America's Counties

Jared Lang
Program Manager
National Association of Counties

Cindy Wasser
Program Associate
National Association of Counties

Jennifer Jenkins
Executive Director
Distributed Wind Energy Association

Lisa DiFrancisco
Co-Chair,
DWEA Planning and Zoning Committee

Members
DWEA Planning and Zoning Committee

About the Partnership

The National Association of Counties (NACo) is the only national organization that represents county governments in the United States. Founded in 1935, NACo provides essential services to the nation's 3,068 counties. NACo advances issues with a unified voice before the federal government, improves the public's understanding of county government, assists counties in finding and sharing innovative solutions through education and research, and provides value-added services to save counties and taxpayers money.

The Distributed Wind Energy Association (DWEA) is a collaborative group comprised of manufacturers, distributors, project developers, dealers, installers, and advocates, whose primary mission is to promote and foster all aspects of the American distributed wind energy industry. Distributed wind, commonly referred to as small and community wind, is the use of typically smaller wind turbines at homes, farms, businesses, and public facilities to off-set all or a portion of on-site energy consumption.

NACo and DWEA have formed a partnership to assist county leaders and the wind industry in working better together to protect public safety and property rights, while at the same time minimizing the cost and increasing the efficiency of implementing wind energy projects. This publication is one of several efforts to share best practices that work for both local communities and the wind industry. Over the next decade NACo and DWEA will produce numerous events and publications exploring the various challenges and opportunities associated with developing wind projects in America's counties.

Executive Summary

People have been generating electricity from wind energy for centuries. Yet, until recently, wind power has not been efficient or consistent enough to become a dominant power source. Today, more advanced technology and global circumstances are making wind power more competitive with other power supply options. As a result, many people across the country are becoming interested in installing their own small wind systems and accessing renewable energy from utility-scale wind farms for their businesses and residences.

Without question, supplying energy to a high-tech nation requires coordination among the private sector and all levels of government—federal, state, and local. Local governments, who are responsible for protecting the health, safety, and property rights of their community residents and businesses, play a crucial role in the implementation of wind power across the United States.

Local governments use zoning, building permitting, and public safety regulations to protect their community residents and businesses. These decisions have direct impacts on the cost, efficiency, and eventual success of wind energy projects. Local government decisions to delay or increase compliance requirements for wind energy projects can interfere with community demand for wind power and raise project costs. As a result, many county leaders interested in fostering wind power in their communities are thoughtfully considering how to protect community residents and businesses, while at the same time promoting wind power and reducing implementation costs.

In order to successfully regulate wind power, it is essential for local leaders to understand the different types of wind power technologies and the various ways in which the technologies can be regulated. The most significant difference in wind power technology exists between small-scale, distributed wind turbines designed for on-site energy generation; and large, utility-scale turbines designed for wind farms and generating energy to supply the power grid. There are many other differences in wind technology. Yet, scale is one that has the most significance to local leaders regulating wind energy.

Utility-scale and distributed wind energy have very different regulation requirements. Over the past several decades, much more attention has been given to utility-scale regulations. This is largely due to technology differences. Until recently, distributed wind did not make sense for many communities. Today, many more people are interested in installing wind energy.

Many counties have not yet included small wind systems in their zoning codes to allow their use. The permitting process can be the single most daunting obstacle for would-be consumers and wind developers. In some places, unfamiliarity with wind technology has kept county leaders from addressing wind development. And, in some places, unfamiliarity has resulted in a complete restriction of wind development to avoid setting a controversial precedent. Making the permitting process affordable, streamlined, and accountable is in the best interest of consumers, potential energy providers, the environment, and the community.

Modern Wind Turbines versus Windmills

Since the earliest recorded history, people have been harnessing energy from wind to propel boats, pump water, and much more. When the American West was settled, windmills were used to pump groundwater to communities and farms. Windmills transferred wind to mechanical energy for grinding grain and pumping water.[1]

Today, modern wind turbines are similar to windmills, but modern wind turbines operate by different physical principles. While windmills "scoop" large volumes of air to generate the physical forces needed for pumping water or turning millstones, wind turbines convert the mechanical energy of wind into electricity by turning a generator, and then use that electricity to operate other things. Informed county leaders recognize these differences and do not confuse modern wind turbines with windmills.

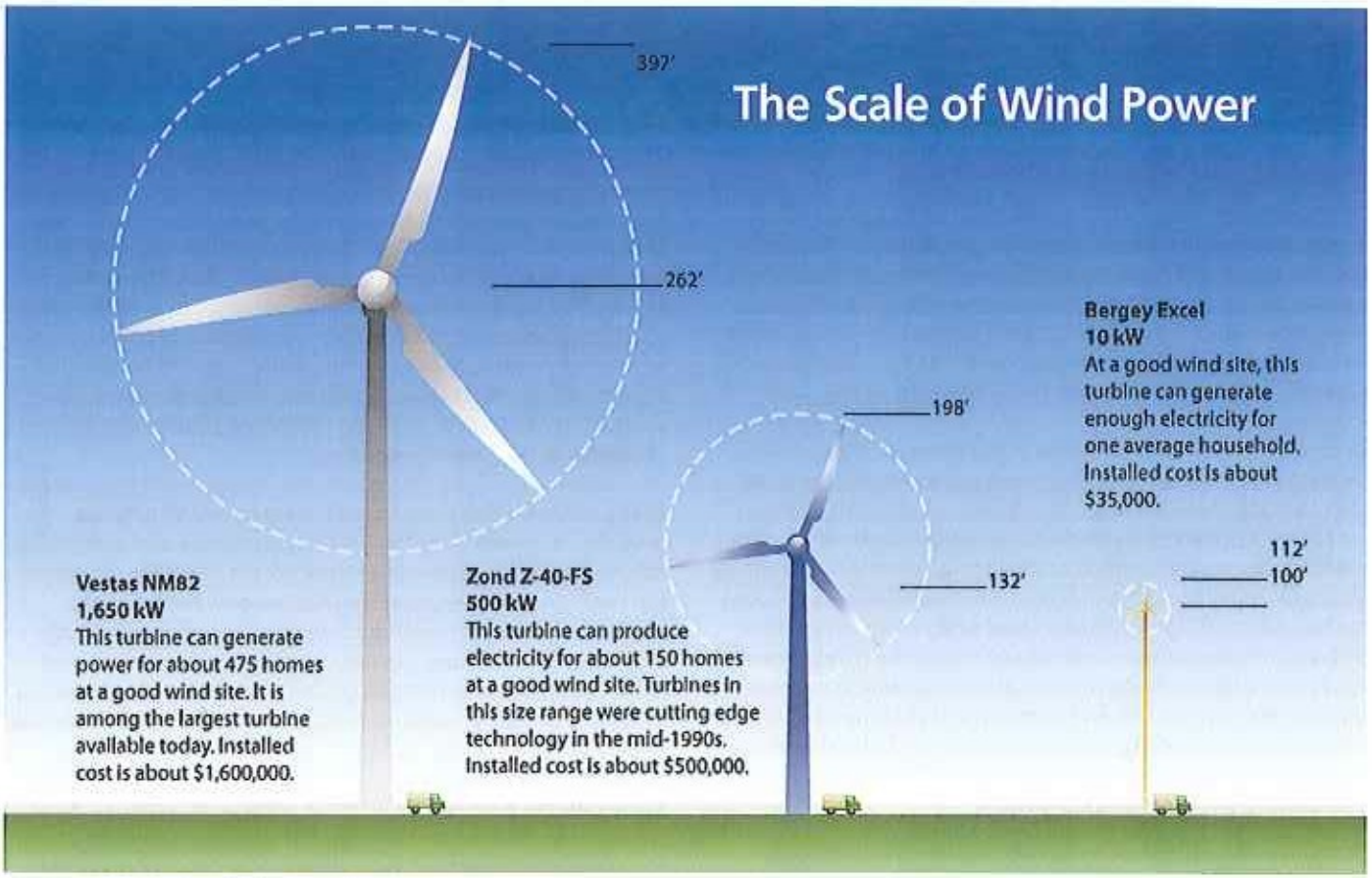
Modern Wind Turbines

Modern wind turbines can capture wind energy at a variety of different scales. They range in rotor size and generator capacity—from a few feet to over 125 feet in blade length, and from less than one

Community Benefits of Wind Technology

Whether the power generated by a wind system is used by a single residence or purchased by a large utility, the benefits of wind power extend to the entire community, including:

- Reduced pressure on the local electricity grid;
- Reduced fossil fuel burned by the local utility;
- Increased local energy independence;
- Increased property values of the wind turbine hosts;
- Local jobs in manufacturing and distribution, design, installation, and system maintenance;
- Revenue payments to the host community or landowners circulate in that community;
- Reduced air and water pollution from fossil fuel electricity generating facilities;
- Enhanced reliability and power quality of the power grid; and
- Increased security (small wind systems can provide back-up power to strategic police stations or hospitals for "hazard mitigation" purposes).



Graphic showing scale of different wind turbine sizes. Source: Windustry.

kilowatt to several megawatts of generating capacity.[2] Wind turbines can be used to power local homes or facilities, and multiple wind turbines can be clustered in wind farms, forming wind power plants that feed electricity into the utility grid.[3]

Wind System Scale

Wind turbine systems vary based on a number of factors—including size, generating capacity, and tower height.

Small Turbines

Small wind turbines are typically defined as turbine systems with a maximum name plate rating of 100kW. Small wind turbine towers are up to 160 feet tall. To help understand scale, a 100kW wind turbine produces enough energy to power 5-10 homes.[4] It is often viewed as the right amount of power for schools and university campuses, local government facilities, farms, and a variety of business applications. To power individual homes and small farms, wind turbines are typically between 1kW and 20kW.

Mid-sized Turbines

Mid-sized wind systems are commonly considered to have a capacity between 100kW and 1 MW and stand at 120 to 300 feet tall.[5] These turbines are most commonly used to power on-site facilities such as schools, farms, factories or local communities.

Large Turbines

Large wind systems typically have capacity over 1 MW and stand from 300 to 450 feet tall. These wind turbines are commonly clustered in wind farms and utilized to supply power to the grid.

Wind System Application

Different sizes of wind systems are appropriate for different applications.

Distributed Generation (DG)

Distributed Generation systems generate electricity near where energy is being consumed. The technology is called "distributed" because the wind turbine is placed at or near the point of energy consumption and the electricity is used on-site to off-set electric usage. In contrast, "centralized" power systems generate electricity remotely at large-scale power plants and then transmit the electricity down power lines to the consumer via the utility grid.[6]

Depending on location, excess energy produced by DG systems, beyond what is consumed on site, may be credited by the local utility through net metering. DG turbines (small and mid-sized) are typically smaller compared to utility-scale clusters of wind turbines. Yet, they carry significant benefits, including reduced energy loss by avoiding power transmission over long distances, reduced load on America's aging and overtaxed utility transmission lines and reduced dependence on fossil and nuclear fuels. Additionally, local communities benefit when residents and small businesses save money on utility bills and then spend that money within the community; distributed generation is good for the local economy.

Utility-Scale Generation

Utility-Scale Wind Generation systems do not directly provide energy for on-site or local facilities. Rather, they feed power to a sub-station and supply the large-scale utility electric grid. Utility-scale generation is not defined by any number of wind turbines. Economics typically encourages the development of multi-turbine wind farms—in interconnected groups of large turbines, sometimes even several hundred turbines in one location. Wind farms are built in locations with consistently high-quality wind resources, but can also be developed in locations with a load that needs powering.[7]

Community Wind

Community wind refers to small utility-scale generation projects with a specific ownership model. They must be locally owned and optimize local economic benefits. Locally owned means one or more members of the local community has a significant direct financial stake in the wind project other than through land lease payments, tax revenue, or other payments in lieu of taxes. Community wind project owners can include individuals, groups of farmers, cooperatives, municipal utilities, Native American tribes, schools, or local governments. By taking on project ownership, community wind is more risky than simply leasing land to developers. However, the economic rewards can also be proportionately greater.[8]

Governing Wind Development

Local governments use zoning, building permitting, and public safety regulations to protect their community residents and businesses. These decisions have direct impacts on the cost, efficiency, and eventual success of wind energy projects. For instance, local government decisions to delay or increase compliance requirements for wind energy projects can interfere with community demand for wind power and raise project costs. As a result, many county leaders interested in fostering wind power in their communities are thoughtfully considering how to consider the interests of community residents and businesses, while at the same time promoting wind power, reducing implementation costs and streamlining the permitting process.

Utility-scale and distributed wind energy have very different regulation requirements; this is largely due to size and technology differences. Over the past several decades, much more attention has been given to utility-scale regulations and, until recently, distributed wind often did not make sense for many individuals and communities. Today, however, energy costs, environmental concerns, advances in technology and other factors are driving an increased interest in -- and more installations of -- distributed wind energy systems.

Many counties have not yet included small wind systems in their zoning codes to allow for their use. The permitting process can be the single most daunting obstacle for would-be consumers and wind developers. In some places, unfamiliarity with wind technology has kept county leaders from addressing wind development. And, in some places, unfamiliarity has resulted in a complete restriction of wind development to avoid "setting a precedent". Making the permitting process affordable, streamlined, and accountable is in the best interest of consumers, potential energy providers, the environment and the community.

Limits to Local Governance

Local government authority over wind facility siting varies by state. Some local governments have complete authority over wind system siting, some share authority with state decision-makers, and others give up full authority to state-level decision-makers.

In 48 states, local governments exercise some authority over commercial wind facility siting, and in 34 states, local governments have substantial autonomy to regulate the siting of commercial-scale wind facilities. To learn more about how wind facility siting is governed in your state, visit www.elistore.org/data/products/d21-02.pdf.

By researching wind technology and adopting a wind energy engagement strategy prior to receiving public inquiries, counties can ensure that wind development projects move through government processes quickly and adhere to planning objectives. County governments have several options to manage the development of wind energy facilities in their communities.

Special/Conditional Use Permits

Special/Conditional Use Permits require each wind system project application to be reviewed on a case-by-case basis. Installations are permitted, provided certain conditions identified by statute or the local zoning ordinance are met. Until recently, wind development has been considered new and most local governments have found it difficult to regulate. For this reason, Special/Conditional Use Permits have been the most common permit type identified by the National Association of Counties. The special use permit typically requires detailed project descriptions from applicants and multiple public hearings—putting a significant burden on consumers and project developers. However, reasonable ordinances that also provide conditional use language can be developed, as was done in the state of Wisconsin.

Permitted Use Permits

Permitted Use Permits allow wind systems by default, provided that the installation meets design standards specified by statute. It indicates that justification has been established for the structures' eligibility, and, as such, no public hearings are required, and permits are issued quickly. Permitted use permits are clear and straight-forward for wind consumers and developers. They are typically enacted in rural areas where neighbors are far apart, reducing potential negative impacts and consequently neighbor concerns.[9] Download the following for more information:

- **DWEA Small Wind Model Zoning Ordinance**
http://distributedwind.org/assets/docs/Pand7Docs/dwea-model-zoning-ordinance-passed-01-07-12.pdf

- **Linn County Small Wind Innovation Zone designation**
https://efs.iowa.gov/efiling/groups/external/documents/docket/105873.pdf

While both Distributed Generation and Utility-scale wind projects are most typically regulated through Special Use permit, an emerging trend for local governments over the past decade has been to allow Distributed Generation wind projects "by-right," or as a permitted uses. As small wind systems become more commonplace and community residents' demand increases, local governments are learning to be more proactive about managing wind development projects. Permitted use permits are proving invaluable for promoting wind projects because they reduce the costly time and legal fees associated with project review.[10]

Accessory Uses

Labeling something an Accessory Use allows it "by right" through zoning law, but only in connection with principal uses established by zoning regulations. Establishing wind projects as Accessory Uses functions much like a permitted use, yet projects must be attached to specific zones enabled by statute. Labeling wind projects as Accessory Uses enables local governments to allow them "by right" in specific areas of communities. Wind projects are most commonly labeled an accessory use in agricultural, commercial, and industrial zones. Labeling wind projects as Accessory Uses, such as Pitt County (see page 36, Table 5-1) enables consumers and developers a significant amount of flexibility in specific areas.

For example, view Pitt County, NC's Zoning Ordinance at www.pittcountync.gov.

Overlay Zones

Overlay Zones indicate that specific areas within communities are appropriate for certain activities. They enable small wind systems essentially "by right," superseding prevailing zoning requirements. Often some basic project review is required, but minimal relative to communities that review wind systems under special use permits. Overlay Zones are effective in that they expedite the permitting process and reduce costs to consumers and developers.

For example, visit St. Lawrence County's Wind Farm Model Ordinance at www.co.st-lawrence.ny.us.

Master/Comprehensive Plans

Master/Comprehensive Plans are communities' most significant comprehensive land use regulatory tool. Their scale and influence make them challenging to revise. Incorporating guidelines for wind systems into Comprehensive Plans ensures the utmost consistency and "by right" opportunity of all the options available.

Incentivizing Renewable Energy

Beyond regulating wind energy projects, counties can offer incentives to promote renewable energy. Incentives include: property tax exemption for wind turbines (For example, Wisconsin does this with residential turbines by state statute 70.111 (18)) reducing, or waiving, permit and development impact fees; expedited review and permitting; and awarding density bonuses for developments that generate a portion of their energy demand on-site.

Counties can also provide support with the soft costs associated with wind project development—including ideal siting information, providing measurements of wind resources, and community education on wind projects. To learn more about local government incentives, see NACo's Green Incentives Handbook at www.naco.org/greencounties.

A recent trend has been to develop a Community Energy Plan and recognize wind energy systems and guidelines within it.

Developing Wind Ordinances

The National Association of Counties undertook an extensive research process, including numerous interviews with local government leaders, to learn and share the best practices from county governments on regulating wind energy systems. This publication was vetted by NACo and DWEA leadership for consistency with the recommendations that follow.

For counties, NACo finds that the most common method for regulating something new, such as wind energy systems, is to develop ordinances. County ordinances clearly establish specific standards and processes for developing wind energy systems. Depending on wind project size and application, ordinances will focus on different sizes. For example, Rockingham County, Virginia adopted separate Small and Large-Scale Wind Ordinances.

Many state agencies, university research centers, and wind energy trade associations have model ordinances available, which can be adapted by counties as needed. Here are several downloadable model wind ordinances of interest:

- Model Wind Ordinance - Distributed Wind Energy Association http://distributedwind.org

- Wisconsin Small Wind Model Ordinance
View the Small Wind System Model Ordinance available on the RenewWisconsin website http://renewwisconsin.org/wind.

Key Wind Ordinance Elements

No matter whether the ordinance is focused on small or large wind systems, all ordinances reviewed by the National Association of Counties addressed the following elements:

Setback distances and height

Setback distances are mandated distances that a wind turbine must be "set back" from a property line in a given zone. This mandated distance is designed to address concerns from abutting neighbors. Setbacks vary by community, but setback distances are typically equal to a tower's height plus the length of one blade.

Lot size

Some zoning rules limit turbines and/or their heights to a corresponding property size, such as limiting lot size to one acre or larger. Because lot sizes vary by area due to shape, requiring minimum lot sizes may essentially limit particular zones from developing wind projects.

A residential 10 kW turbine on 140-foot freestanding lattice tower.

Aesthetics

The NACo research finds that most of the controversy surrounding wind systems is related to aesthetics. To function best, wind turbines must be tall and unobstructed, well above the prevailing tree line and buildings. This means that they will likely be visible at some distance. Some residents object to their appearance. As a result, some communities will regulate the appearance of wind towers by prohibiting the use of commercial markings, messages or banners on turbines or towers. Regulating aesthetics by dictating which tower types are acceptable in order to ensure that only the most visually appealing designs are implemented, and dictating that towers "blend in" with their surroundings are not suggested. These restrictions invariably increase the cost of the system with little to no benefit, and in some cases can actually have a negative effect on the functionality of the wind turbine.

Sound

Sound is often also a concern for community residents. Yet, compared to their historic counterparts, modern wind turbines have better insulation, lower rotation speeds, fewer moving parts, and more efficient blades, making them much quieter. Typically, turbines emit sound that is barely discernible from ambient noise. Sound from traffic, rustling trees, air conditioning, and people often mask the low "white noise" of small turbines. During severe storms and utility outages, turbines make distinctive sounds, but in these instances, ambient sound levels increase as well. Of course, larger turbines have the potential to emit higher levels of sound and require stricter standards.

Best Practices:

Small/Mid-Sized Wind System

Height

Best practices for wind turbine siting dictate that turbine rotors should be at least 30 feet higher than any obstacle within 500 feet. Tower height is the most important aspect of a wind turbine installation as it affects productivity, sound, life-span of the equipment and project economics. Taller wind turbines have access to higher wind speeds and wind quality, allowing for greater energy production and longer equipment life. Therefore, it is important to consider how height restrictions will impact proposed wind projects' economics. Small wind turbines are commonly placed on towers 80 – 160 feet tall; even in ideal conditions (flat, coastline, etc.), towers under 60 feet tall are not typically recommended. Instead of implementing height restrictions, require that siting and minimum height best practices be followed. For example, view Nicollet County, MN's Wind Energy Conversion System Ordinance at www.co.nicollet.mn.us.

Setbacks

The goal of setbacks is to regulate the placement and spacing of structures on properties. Since wind turbines and towers are engineered structures, the standard setbacks used to regulate other structures on properties could be applied. Rather than specifying set-backs for wind systems that do not require specific height limits or minimum lot sizes, instead place restrictions on the proximity of turbines from neighboring occupied buildings, property lines, overhead utility lines, and public roads. Example: the North Carolina Model Wind Ordinance specifies setbacks for what it considers small (20kW or less), medium (20 kW-100kW), and large (100kW or more) turbines, based on tower heights. Under this type of ordinance, taller towers are allowed on larger parcels of land.

Lighting

Small wind turbines typically do not surpass the height requirements that require lighting towers according to Federal Aviation Agency (FAA) regulations. Beyond the FAA regulations, most counties find it unnecessary to impose stricter local regulations to ensure flight safety. For example, view Clinton County, IN's Wind Ordinance at www.in.gov.

Safety

In some counties, community residents have voiced concerns that wind systems could pose a temptation to unauthorized climbers and should be fenced off to prevent potential climbing-related injuries. Research indicates that this is not a valid issue. Of the hundreds of thousands of wind turbines installed in the US, only one civilian has ever been reported as injured or killed by their unauthorized climbing of a tower.[12] Requiring small wind owners to install fences is costly and can restrict emergency or utility personnel from accessing the tower should a need arise. Rather than require a fence, counties are requiring that owners remove climbing foot rungs on the lower 10-12 feet of a freestanding tower and/or display "Danger-High Voltage" or "Caution-Electrical Shock Hazard" signs on the sides of towers.[13]

Aesthetics

Some counties argue that concessions can be made to limit the visibility of wind systems. Many counties find that requiring wind systems to "blend in" with surroundings is subjective and can significantly burden small wind developers in terms of project development guidelines and cost. Many counties already accept water towers, buildings, billboards, cell phone towers, and grain silos in their communities.14 Counties should consider allowing any wind tower type, permitting the structure is installed safety and is free from advertising. A request for "original manufacturer's paint" is commonly used in ordinances to reduce visual eye-sores.[15] For example, view Section 431 — Wind Energy Systems of Wasco County, OR's Zoning Code at http://co.wasco.or.us.

Fees

Permit costs vary by region, but are typically influenced by population density. Predominantly rural states have substantially lower permitting costs than those with large urban centers.[16] This is because evaluating project impact is more complex in more compact communities. Regardless, large permitting fees can be prohibitive for small wind installers. The Distributed Wind Energy Association (DWEA) recommends that the building permit fee for a small wind system follow the existing fee structure for permits required of other structures. Charges for inspections would apply at the standard rate used for other structures. For example, view Polk County, WI's Small Wind Energy System Ordinance at www.co.polk.wi.us.

Utility-Scale Wind System

Map Wind Resources

Counties can identify preferred siting areas for wind projects prior to receiving permit applications. In doing so, county planners can guide development of these initial wind projects toward the least environmentally sensitive areas. Keep in mind that utility scale projects are accountable to a number of federal agencies, including the EPA (Clean Water Act relative to surface water resources) and US Fish and Wildlife Service requirements. For example, download Cascade County, MT's Wind Resource Maps at http://www.cascadecountymt.gov/doc/WindPowerMap.pdf.

Ensure Coordinated Permitting Processes

Permitting can be one of the most significant costs associated with developing wind projects. To reduce the time and expense, county leaders can do the groundwork to accept wind system projects "by right," or consider them as Accessory Uses or allow them in Overlays in specific zones. For example, view St. Lawrence County, NY's Wind Farm Model Ordinance at www.co.st-lawrence.ny.us.

Focus on the Issues

Good information is key to assessing proposed wind systems projects objectively and in a timely manner. As such, counties can be clear about information requirements and require all appropriate information from developers early in the permitting process. Often, issues arise that are not based in factual evidence—such as the perceived public health effects associated with magnetic fields, fear of possible changes in property values, so-called "wind turbine syndrome," and visual and sound impacts. A fact-based approach can help focus the conversation, educate the public, and ensure a fair basis for decision-making. For more factful information about wind, visit www.nationalwind.com/files/NationalWindTurbineFacts.pdf.

De-commissioning

Permit compliance extends throughout wind projects' lifetimes. Especially with privately operated wind farms, closure and decommissioning are critical elements of application review. To ensure that a non-operating project does not represent a health or safety risk once it is no longer in use and/or to ensure that it is disposed of properly, permitting agencies can (1) require wind developers to post bonds after permitting to ensure that decommissioning costs are covered; (2) rely on the project developer to contribute to a decommissioning fund as the project generates revenue; or (3) rely on the salvage value of the abandoned project.[17] Note that bonding and decommissioning requirements are considerably different for utility scale projects compared to individually-owned small turbines or community owned projects. For example, view Rockingham County, VA's Wind Ordinance at www.rockinghamcountyva.gov.

Sound

The operating sound produced by wind farms is considerably different in level than that generated by other types of energy facilities. Wind farms are typically located in rural or remote areas with low population densities and low ambient sound levels. Due to the nature of these windy locations and quiet modern wind turbines, sound generated naturally by the wind can be sufficient to mask sounds generated by wind systems. County agencies address potential sound concerns by requiring developers to predict and measure sound levels, establishing sound standards, requiring sound setbacks (based on dB, not distance) and restricting development to certain zoning districts. For example, visit www.dsireusa.org/documents/incentives/NC22R.htm.

Aesthetics

With large wind turbines, aesthetics are often a more significant issue for utility-scale projects than for small/mid-sized projects. Utility-scale wind farms often occupy large open areas, mountaintops, or cleared ridgelines to access higher wind speeds for greater energy production. Other elements that influence the visual impact of wind farms include the spacing, design and uniformity of the turbines, markings or lighting, roads built on slopes, and service buildings.

When wind turbines are arranged along a ridgeline to capture wind that flows over the ridges, the turbines are visible from greater distances. Newly exposed surfaces from construction of access roads may contrast sharply with existing soils and vegetation. To mitigate impacts, county staff can ensure that the public clearly understands the costs and benefits of developing wind systems. Staff can require developers to complete visual impact and environmental studies. Effective use of wind resources requires maintaining adequate spacing between individual turbines as well as between rows, banks, or tiers of turbines. Counties find that fewer and wider-spaced turbines present a more pleasing appearance than tightly-packed arrays. For example, download Tompkin County, NY's at www.tompkins-co.org/emc/docs/FINAL-windordinance2005.pdf.

Interconnection

Large arrays of wind turbines require an extensive power collection and electric interconnection system to transport the generated electricity to the utility power grid. Counties should review developer plans to ensure placement of transmission equipment is safe and complies with local planning goals. For example, view Fillmore County, MN's Wind Energy Conversion System Ordinance at www.co.fillmore.mn.us.

Lighting

When towers reach 200 feet or higher, they move into regulated airspace and must adhere to Federal Aviation Agency (FAA) regulations by installing lighting and other markings. More lights and markings are often required for installations near airports, where projects extend into flight paths. For example, view Clinton County, IN's County Wind Ordinance at www.in.gov.

Biological Resources

Wind turbine collision with birds has been the most controversial biological consideration affecting wind farm siting. However, through extensive study and observation, measures can be put in place to minimize or avoid collisions. The US Fish and Wildlife Service now requires mitigation plans to protect plants, animals and habitats. Counties can ask developers to share with them these mitigation plans.[18] For example, view Vermilion County, CA's Wind Energy Structure Ordinance at www.vercounty.org.

Clean Water Act

Like other construction projects, wind projects are subject to the Clean Water Act. If projects disturb more than five acres, developers must prepare Storm Water Pollution Prevention Plans in order to obtain a National Pollutant Discharge Elimination System (NPDES) compliance permit, which is issued by the state's environmental quality agency. Example: www.epa.gov/owow/NPS/ordinance/mol2.htm

If a wind system is installed and operating properly, its operating sound level is not expected to exceed a zoning policy's established "nuisance noise" level, except during short-term storms and/or utility outages. Rather than singling out wind turbines in sound regulations, some counties are finding that it's fairer and administratively easier to apply existing sound/noise regulations to wind turbines.

Shadow Flicker

Under certain circumstances, low sunlight passing through turbines' rotors can cast visible shadows on the ground and nearby structures. The phenomenon, known as "shadow flicker", occurs only a few hours per year, usually at sunrise or sunset. This issue pertains almost exclusively to large, utility-scale turbines, as their blades are much larger and move more slowly than small/mid-sized turbines. Wind developers include shadow flicker diagrams in their project proposals, minimizing shadows as requested by the neighbors. For small turbines, normal setback distances mitigate or eliminate this potential nuisance, so modeling is should not be a requirement as with large-scale turbines.

De-Commissioning

Counties typically require assurance that any non-functioning turbine be removed after a period of time to prevent unwanted clutter in a community. Although abandonment of wind systems is rare, due to today's improved technology, a community should be entitled to recourse if an abandoned turbine presents a nuisance.

Insurance bonds or security bonds may be required for large, utility-scale turbines, especially those that are installed by wind farm developers and situated on leased land from third-party property owners. Funding for bonds can be made possible through public financing, but this recourse is inappropriate, burdensome, and unnecessary for owners of small systems. If the owners fail to maintain wind systems properly, systems can be removed for safety reasons and managed under the community's Public Nuisance language in the zoning code.11

Ordinance Considerations for Different Applications

Beyond what is included in the previous section, elements included in ordinances vary depending on the different applications of wind systems. This section illustrates the best practices in promoting wind energy, while remaining cognizant of public safety and property rights. Depending on site location, system size, and design, wind ordinances can incorporate a variety of different elements.

Wind System Classification

Wind system classification during permitting process sets the stage for proper implementation of projects by impacting their feasibility and economics. Misclassification during permitting can result in prohibitive costs and unnecessary hoop-jumping for applicants and permitting authorities. For example, a small wind turbine should not be re-classified as a utility/commercial wind turbine simply because the utility service to the building it serves is listed in the "commercial utility service" categorized by a utility company. The classification of electric utility service does not affect the classification of wind turbine sizes. Misclassification of this nature can result in unnecessarily burdensome requirements for hearings, studies, reviews, and engineering services. In addition, eligibility for funding and net metering can be affected.

Small/Mid-Sized Wind Systems

NACo research finds that counties most commonly allow small and mid-sized wind systems "by-right" or through Conditional/Special Use Permits. Often consumers and small developers are the ones implementing small and medium-sized wind projects. These parties often have less funding, relative to large wind developers, for complex applications processes and extensive permitting fees. As a result, those counties interested in allowing small and medium-sized wind projects should be cognizant of small and medium-sized wind developer limitations.

Utility-Scale

The scope of utility-scale investment warrants unique regulatory considerations. Utility-scale wind farms can span several miles, often across multiple private properties through lease agreements, and include significantly larger turbines. Therefore, NACo research finds that the county permitting process for utility-scale regulation is stricter and more thorough, including multiple public hearings and environmental reviews. Most often, state agencies get involved in projects large enough.

County Case Studies: Implementing Wind Ordinances

The following section includes a series of case studies to help county leaders get started developing policies that safely facilitate wind development. These case studies have been identified by county leaders as highly effective at promoting wind development, while at the same time protecting the public from any unintended consequences of wind development.

County leaders recognize that regulating industry is challenging, and as industry changes, regulations need to keep up. As such, leaders from the Distributed Wind Energy Association were invited to comment on the case studies. The comments, included at the end of each case study, highlight the positive steps taken by each county, while also suggesting how the ordinances can be improved to continue to promote public safety and responsible installation and utilization of wind power.

"DWEA recognizes great potential in working cooperatively with counties to promote responsible wind development across the US. Together, DWEA and Counties – like those highlighted here – have the ability to streamline the bumpy and unpredictable permitting and zoning landscape that often accompanies distributed wind applications. DWEA thanks each County, and NACo, for their efforts."

- **Lisa DiFrancisco**
Distributed Wind Energy Association

✻ Linn County, Iowa

Establises a Small Wind Innovation Zone

County:	Linn County, Iowa
Population Size:	211,226
Adoption Date:	2006, with amendments in 2007 and 2012
Use Type:	Large wind regulated by Special Use Permit, Small Wind is Accessory Use in Most Districts
Link to Ordinance:	www.linncounty.org
Contact:	Bill Micheel, Planner Bill.Micheel@linncounty.org

History

Linn County, IA adopted regulations for large and small wind energy conversion systems in 2006. In 2009, by adopting Iowa Code Section 476.48, the Iowa State legislature directed the Iowa Utilities Board to establish and administer a Small Wind Innovation Zone program to optimize local, regional, and state benefits from wind energy and to expedite interconnection of small wind energy conversion systems (100 kilowatts or less) with electric utilities throughout the state. Around that time, the Iowa Utility Board worked with the Iowa State Association of Counties, the Iowa League of Cities, and utility representatives to release a model small wind ordinance for adoption by all levels of local government, including cities, counties, and school districts.

The county is currently working on amendments to the county's small wind ordinance, which would align the county's policy with a state model ordinance in order to receive designation as a Small Wind Innovation Zone (SWIZ). In doing so, the county would accomplish the following:

- ✻ Increase benefits from wind energy
- ✻ Facilitate and expedite interconnection with electric utilities
- ✻ Increase energy independence of Linn County
- ✻ Encourage small wind installation through incentives

Key Criteria

Setbacks

The original ordinance referred to set-back distances as the "Fall Zone" (area where the turbine would fall, given a natural disaster or other event). Realizing that this terminology subtly suggests that turbines are unsafe, the 2012 ordinance amendments will use the term "setback distance."

Maximum Tower Height

Ordinance amendments also increase the allowable height of the wind turbines to meet industry standards, an allowable 120 foot tower on a property greater than one acre.

Interconnection Policy

As part of Iowa's Small Wind Innovation Zone Program, the Iowa Utilities Board put out an interconnection policy, which regulated utilities are required to adopt to streamline the interconnection process for wind operators looking to set up net-metering or sell back unused energy to a utility. Although the interconnection policy will not be required until Linn County receives SWIZ designation, some utilities in Linn County have adopted the policy voluntarily.

Financial Incentives

By receiving the Small Wind Innovation Zone designation, small wind operators in Linn County are eligible to receive a State of Iowa Production Tax Credit through the state's Renewable Energy Tax Credit Program. The incentive, a 1.5 cent per kilowatt hour, is calculated as part of the property owner's state taxes. This incentive is additional to incentives offered by utilities.

Engaging Elected Officials and Industry Leaders in Policy Review

When the Planning staff first started pursuing ordinance amendments, they took a proposal to the County Board of Supervisors, who responded enthusiastically to the opportunity to provide incentives to residents.

As the amendment language was being crafted, Planning staff engaged wind system installers, the Executive Director of the Iowa Wind Energy Association, and local consultants for input. The industry leaders helped to ensure that the ordinance would truly encourage small wind installation. For example, Planning staff had considered including a requirement for a Shadow Flicker Analysis with permit application, but decided it was an insignificant issue and an undue burden on small wind installers.

Permitting Costs

For small wind, the Linn County Dept. of Planning & Development charges a $15.00 fee for the site plan to ensure that the towers meets all of the setback, height, and other requirements in the zoning code. The fee schedule for building permits is based on a percentage of the valuation of the tower.

Outcome

Linn County issued a total of three permits for small wind towers since 2005. County staff hopes that the available financial incentive will increase the number of permit applications in the near future.

Future

County planners anticipate the amendments to be adopted by the County's Board of Supervisors in late February 2012. At that time, Linn County will submit an application for designation to the state's utility board. Linn County anticipates being 1 of 3 counties receiving the Small Wind Innovation Zone designation.

After receiving designation, county staff will release information through multiple media outlets. People who come in to apply for zoning and building permits for small wind will be made aware that the county has done the work to receive the Innovation Zone designation and their eligibility to receive financial benefits and streamlined interconnection approval.

Bill Micheel, County Planner, said that the incentive program may not be enough to compel people to install, but will certainly help offset costs for those who are already pursuing small wind installation.

DWEA Comments

While DWEA was not able to review the actual ordinance for Linn County, Iowa, we found the summary of their amendments (and the process by which they arrived at those amendments) to be impressive and progressive. Of particular note was the County's effort to involve all stakeholders, including industry and community leaders, in the ordinance language amendments.

The County also went the extra mile to receive a designation that would allow Small Wind operators to qualify for certain State incentives that are often reserved for Utility Wind operators. Linn County is demonstrating tremendous leadership through its actions and through its continued efforts to develop and improve their own permitting and zoning policies as they learn more about wind technology and its benefits. DWEA looks forward to hearing more about the progress Linn County makes in the coming months and years.

* Tippecanoe County, Indiana

Prepares for Future Development

County:	Tippecanoe County, Indiana
Population Size:	172,780
Adoption Date:	2007
Use Type:	Overlay District
Link to Ordinance:	www.tippecanoe.in.gov
Contact:	John Burns Planner, Area Plan Commission of Tippecanoe County jburns@tippecanoe.in.gov

History

Tippecanoe County adopted the first version of its Wind ordinance in 2007. A neighboring county to the west, Benton, was establishing a large wind farm at that time, which spurred Tippecanoe to prepare a plan for future development. At that same time, 4 neighboring counties were also preparing ordinances.

The Area Plan Commission took the lead on drafting a wind ordinance for the county. Staff realized that very little could be adapted from Benton County's ordinance, which was tailored for a specific development. John Burns, Planner, researched examples from other parts of the country and prepared the ordinance with elements from other Midwestern states, particularly Wisconsin, Illinois, and Minnesota.

In 2010, the County updated the ordinance to collect Construction and Operating fees from large wind collection facilities and modified set-back and noise restrictions to address resident concerns.

A small group of residents also expressed concern about the possible effects of low-frequency sound waves emitted by the wind systems. When the ordinance was revised in 2010, the set-back requirement and noise restrictions were change slightly.

Policy Elements

The policy regulates 3 different types of wind installations:

* "Micro" installations are roof-mounted systems. Micro systems are allowed by right throughout the county.
* "Small" installations are free-standing turbines up to 140' tall with a nameplate capacity of less than or equal to 50kW and a swept area of 40' or less. These installations are only permitted in industrial, rural, and commercial zones through Special Exception/Conditional Use.
* "Large" installations are all other projects. There is no maximum height for these projects.

Key Criteria

By establishing a difference between roof-mounted micro-wind systems and wind energy conversion systems, Tippecanoe County allows greater flexibility for homeowners seeking to install a roof-mounted system.

Micro-wind Systems

Micro-wind systems are building-mounted wind systems that have nameplate capacity (manufacturer's ratings) of 10 kilowatts or less and projects no more than 15' above the highest point of the roof; such building-mounted wind systems shall not be considered wind energy conversion systems. Micro wind systems are subject to UZO section 4-11-11 but only numbers (1), (11), (17) and (18).

Wind Energy Conversion Systems (WECS)

Wind Energy Conversion Systems (WECS) convert and store or transfer energy from the wind into usable forms of energy. They include any base, blade, foundation, generator, nacelle, rotor, wind tower, transformer, turbine, vane, wind farm collection system, wire, or other component used in the system.

Fees

Applicants are required to pay a filing fee ($20), a minimum deposit for the permit application, and fees for the inspection certificate. If the costs of reviewing the processing the application exceed the minimum fee, the applicant will receive a bill for the additional amount.

Construction Permit Application Fee Deposits

Commercial:	$2,500, plus $200 per tower
Non-Commercial:	$2,500, plus $200 per tower
Micro:	$100
Meteorological Tower:	$500 per tower

Inspection Certificate Fees

Commercial:	$1,250, plus $100 per tower
Non-Commercial:	$1,250, plus $100 per tower
Meteorological Tower:	$500 per tower

Outcome

Mid-west regional wind energy companies have been active in the county's public hearing pertaining to the ordinance's adoption and have provided comments. Tippecanoe County has benefitted from having Purdue University as a local

resource. Purdue faculty members have helped the county develop the ordinance and educate residents and business owners about the opportunity in benefit from wind energy.

Currently, large wind turbines are being used to power the City of Lafayette's downtown bus station and each of the public schools. At this time, meteorological towers have been installed to measure the capacity for utility-scale wind farms, and some landowners in the southern part of the county have begun signing leases with utility wind developers, although no wind systems have been permitted to date.

Future

The county's three county commissioners, as well as leadership on Lafayette's City Board and other municipal boards, are very supportive of wind and clean energy options. As Tippecanoe's county leaders have embraced clean energy, it is assumed that Wind Resources would be incorporated into the next Master Plan update.

DWEA Comments

Tippecanoe County, Indiana, has taken an important first step toward the development of a good wind ordinance by recognizing that there are different size categories that require their own unique permitting and zoning guidelines. However, DWEA leadership recognizes several opportunities to make the ordinance more accurate in its designations and open toward wind development. The definition of the wind categories could be more clearly identified, and significant changes could be made to the recommendations and permitting allowances for roof-mounted systems. Other topics would include setbacks, tower requirements and fee structures.

For more technical information on building integrated wind and the recommended permitting & zoning requirements, see the Building Code section of DWEA's Small Wind Model Zoning Ordinance, section 4.7.2, and other fact sheets. DWEA does not recommend nor condone building integrated or building mounted wind turbines.

* St. Lawrence County, New York

Develops Model Ordinance for Local Townships

County:	St. Lawrence County, New York
Population Size:	111,994
Adoption Date:	2007
Use Type:	Special Use Permit, Overlay District
Link to Ordinance:	www.co.st-lawrence.ny.us/Departments/Planning/ModelWindEnergyFacility
Contact:	Keith Zimmerman, Director, Planning kzimmerman@stlawco.org
Contact:	Jason Pfotenhauer, Deputy Director, Planning jpfotenhauer@co.st-lawrence.ny.us

History

In 2005, Hammond, a township situated in St. Lawrence County's western corner, was approached by a utility-scale wind developer with a plan to develop a 75-turbine wind farm. At the time, the county's agricultural landscape was untouched by wind turbines.

Recognizing that the county could provide a regulatory framework for townships like Hammond, St. Lawrence County's Planning Board and Environmental Council researched and developed a Model Wind Ordinance between 2005 and 2007.

The Role of Federalism

In New York State, counties do not have direct authority over land use decisions. Especially in rural areas, counties serve an essential advisory role to the local townships that may have small or no formal staff.

St. Lawrence County recognized that the county, as a neutral third-party, could provide a fair regulatory framework, which could be utilized by the local municipalities. Keith Zimmerman, Planning Director, described that the county "had no horse in the race" and wouldn't neglect critical aspects of the wind ordinance out of spite or favoritism.

Members of St. Lawrence County's Planning Board and Environmental Commission met monthly for nearly two years to perform the research needed for the Model Ordinance. The committee examined numerous ordinances adopted by local governments in New York, and created regulations similar to those adopted in neighboring Clinton and Jefferson Counties. The committee felt that wind farm developers would benefit from a relative uniformity of development regulations.

The Model Ordinance outlines two different "tracks" for adoption by a municipality, and the county encourages customization of the law.

Key Criteria

The Model Ordinance outlines criteria and a procedure for permitting small and large wind turbines through a Special Use permit process with one public hearing.

Wind Overlay Zones

The Model Ordinance establishes Wind Overlay Zones, areas of a community where wind towers would be permitted to be built. Most often, these Zones would often correspond to areas of the community's existing zoning. If a community has not establishes zoning, the Model Ordinances outlines a step-by-step procedure for creating the Wind Overlay District.

Noise Regulations

The Model Ordinance requires that wind turbine noise not exceed 50dbA when measured from the nearest off-site building.

Setback Requirements

Setbacks include:

* 500 feet from nearest site boundary/roads
* 500 feet from nearest wetland/water body
* 1.5 times its height from any structure
* 1,000 feet from nearest existing residence

Outcome

About 10 townships have utilized the Model Law in some form. Since the majority land area of St. Lawrence County is not suitable for large wind, most municipalities have adopted the small wind component. A least three have adopted the regulations for large-scale wind. None of the townships that have adopted the ordinance are actively pursuing wind development as an economic development strategy, but all recognize its potential impact on future development and wanted to have a regulatory framework in place.

While public financing for large wind farm development may involve the county's Economic Development Administration (EDA), the county does not play a formal role in economic development or workforce training.

Future of Wind in New York

Recently, the New York State Assembly passed "The Power NY Act of 2011," which resurrected a public service law of 2008 which reduces the permitting power of local governments. Essentially, the legislation dictates that power plants, wind facilities included, greater than 25 megawatts, will be permitted through a 7-member multi-agency siting panel rather than local siting processes. Further, the Governor of New York has indicated that the state wants to move forward with improvements and expansion of the state power grid.

Future Changes to the Ordinance

St. Lawrence County will likely revise their Model Ordinance in their future to incorporate new information about wind turbines.

Since the adoption of the Model Ordinance, wind companies are beginning to see the need for greater set-backs. St. Lawrence may revise the current set-back standard, which is pretty conservative and small.

After conducting research for Hammond Township, county Planning staff recognized the need for stricter noise standards, as well to incorporate terms related to the measurement of sounds into the Model Ordinance.

DWEA Comments

St. Lawrence County recognized that they can play an important role as a neutral third-party for local municipalities and that there is benefit to having consistent permitting requirements in neighboring towns and counties. Their regular meetings and information-gathering efforts over a two-year period clearly demonstrate their dedication to promoting responsible wind installations.

The recommended fee structure and their clearly-outlined review procedures allow for a more predictable and affordable permitting process. Additionally, they have accurately differentiated between the size categories of wind turbines, lending to more clarity for the permitting authority and applicant throughout the permitting process.

The inclusion of a minimum tower height requirement (30' higher than obstacles within 250') was an excellent addition to this ordinance. DWEA believes that with a small tweak to reflect the current industry standard (the accepted industry standard is 30' higher than any obstacle within 500' or the area's tree height, whichever is higher) the ordinance would provide a stellar example regarding proper tower height.

There are a few key areas where minor changes to the existing recommendations could result in significant community benefits. These include modification of the setback requirement to reflect the industry standard 1 x system height; minor changes to the screening and access requirements (for example, access roads need to remain in place in order to facilitate proper maintenance of the system); and modification to the sound requirements to reflect levels over ambient instead of a flat dBA (which is difficult to both measure and enforce).

* Fillmore County, Minnesota

Reviews Permit Applications for Large Projects with State Input

County:	Fillmore County, Minnesota
Population Size:	20,866
Adoption Date:	2007
Use Type:	Conditional Use
Link to Ordinance:	www.co.fillmore.mn.us/zoning/documents/2010wind_energy_conversion_systems_ord.pdf
Contact:	Chris Graves, Zoning Administrator cgraves@co.fillmore.mn.us

History

Fillmore County established its Wind Energy Conversion Systems Ordinance in 2007 to address inquiries and concerns from residents about potential future developments.

Wind is a plentiful resource in southern Minnesota (especially below Interstate-90). In 2007, private companies had begun obtaining conditional use permits to establish meteorological towers to measure wind capacity for potential future developments. In addition, the State of Minnesota was heavily advocating for wind energy development.

Around the same time, neighboring counties had begun working on establishing similar ordinances. Within a six-month period, the majority of neighboring counties all adopted a wind ordinance.

Policy Elements

The Minnesota County Intergovernmental Trust (MCIT), a joint-power agency which provides Minnesota county governments and related organizations with risk management and loss control services, had developed a wind ordinance template. Fillmore County's wind ordinance is very similar to the ordinance template created by MCIT.

The wind ordinance is a conditional use permit. For installations generating up to 500kW, a county-led public input process is coordinated to ensure proper siting of the project.

As Minnesota state law dictates, applicants expecting to generate over 500kW must undergo state review of the siting permit. The state review ensures that residents with concerns have adequate time to participate in public hearings, and the process saves local staff time.

Key Criteria

Dwelling Set-Back

Installations must be at least 750' from neighbors' homes, not the owners.

Set-Back to Property Line

Towers must be set back 1.1 times the tower height from property lines.

Fees

The county's Conditional Use Permit is $450 per site for small wind towers. As small towers do not usually use a lot of concrete, building permits are typically $8 per site.

Large towers, which are permitted through the state, will have permit application fees that vary based on the size and type of the construction. Building permits for large wind towers will range between $100-200 per site.

Outcome

A few private homeowners have installed small, on-site turbines. As Minnesota offers significant tax incentives for renewable energy installations, the county sees a small rush of residents submitting applications for wind permits at the end of the calendar year.

About 10 mid-sized projects have been permitted over the last several years, the majority around 2009. On average, the towers are under 200' and generate approximately 39.9 kW.

Recently, Eco-Energy, a regional clean energy utility, began applying to install a large spread-out development across 3-5 townships in Fillmore County. Depending on turbine size, the several hundred towers will be installed. While the energy will be "fed" back into the grid for purchase and direct consumer energy costs will not be reduced, residents can receive rental income from leasing their land to Eco-Energy. The county estimates annual tax revenue from Eco-Energy to be approximately $680,000.

Future

Chris Graves, Zoning Administrator, said that if the county's ordinance were to be updated, the dwelling set-back condition may be extended. Graves occasionally hears complaints from residents about the distance between installations and residences. The county does not currently have any plans to incorporate wind resources in the county's Master Plan.

* Rockingham County, Virginia

Embraces Small Wind Technology, Later Expands to Invite Utility-Scale Wind Development

County:	Rockingham County, Virginia
Population Size:	76,314
Adoption Date:	2004
Use Type:	Small Wind was conditional, now "by right." Large wind is Special Use permit.
Link to Ordinance:	http://library.municode.com/index.aspx?clientId=12196
Contact:	John Meck Development Review Manager jmeck@rockinghamcountyva.gov

History

In 2004, residents of Rockingham County expressed interest in installing wind turbines in working farms. Rockingham County is home to James Madison University and the Virginia Wind Energy Collaborative, which had provided ample information about on-site wind options to local residents. Since Virginia is a "Dillon Rule" state, local zoning does not allow anything that is not expressly noted in the statutes, and the county was required to establish an ordinance specific to small, on-site wind installations.

Due to geography, Rockingham County is one of a few counties within Virginia that can support utility-scale wind developments. Around 2010, interest grew from clean energy providers to develop large wind systems on the county's ridgelines.

Policy Elements

With the support of James Madison University staff, Rockingham County organized a Wind Energy Working Group in 2004 to work through the community issues surrounding the introduction of wind installations of various scales. The county hosted various industry representatives to meet with county leadership, staff, and residents. John Meck, the county's Development Review Manager, said that the Supervisors' open-mindedness and willingness to explore issues contributed to a robust process.

The 2004 ordinance established a Special Use provision for small, on-site wind installations.

In 2010, Rockingham updated the ordinance to ease the permitting of small wind and address utility-scale wind. Now, small wind installations are allowed by-right. Meck explained that the review process for small wind permits was cumbersome for the citizens and was restricting the county from truly bringing wind resources into the county.

Similarly, a provision was added to allow energy sharing between property lines with an agreement between property owners. The ordinance's original language required energy to be used on-site, but residents expressed interest in distributed wind. No plans for energy-sharing have been seen by the county thus far.

Rockingham County now allows large wind developments through Special Use permitting. Rockingham decided to go back and address large wind after a wind developer in neighboring county, Highland, went through a state agency for permits when the county did not have an applicable statute in place. Rockingham leadership did not want to lose control of local siting decisions by neglecting to establish policy in a timely manner.

While large, utility-scale wind is an option to developers in the county, the county s geography and national forest land will limit wind from over-saturating the landscape, said Meck.

Key Criteria

Key Restrictions on Small Wind

* The applicant shall provide information demonstrating that the system will be used primarily to reduce on-site consumption of electricity.
* The wind energy tower height shall not exceed a maximum height of sixty-five (65) feet on a parcel of less than five (5) acres, or a maximum height of eighty (80) feet on a parcel of five acres or more.

Review Process for Small Wind

* The installation of a small wind energy system in prime agricultural district A-1, general agricultural A-2, and public service zoning district S-1, shall be considered provided that all requirements of these standards are met.
* Applications shall be permitted by-right and be reviewed and considered for approval by the director of community development or his designee.
* Upon receipt of an application for small wind energy systems, the county shall send written notification to all adjoining landowners. A decision on the application shall be made within thirty (30) days of the receipt of the application. Applications requiring a special use permit shall meet all state code requirements for public notification.

Key Restrictions on Large Wind Systems

* The applicant shall provide photo-simulations of proposed wind energy conversion system from at least three (3) different locations. The simulations shall show view of such simulated wind energy structures from such locations a property

lines, roadways, as deemed necessary by the county in order to assess the visual impact of the wind energy system.

* The county shall provide written notification to the office of a national or state forest, national or state park, wildlife management area, or known historic or cultural resource site, if a proposed wind energy conversion system is within five (5) miles of the boundary of said entity.
* The applicant shall conduct two (2) public information meetings to discuss their development plans and obtain community feedback. The first meeting shall be held prior to application submission. The second meeting shall be held after the application submission but prior to the special use permit public hearing. Both meetings shall be advertised in the local paper of record.

Rockingham County outlines much more extensive set-back distances and environmental criteria for the large wind systems, including:

* The wind energy conversion system shall be set back a distance at least equal to one hundred twenty-five (125) percent of the structure height from all adjoining non-participating property lines and a distance equal to one hundred sixty (160) percent of the structure height or eight hundred (800) feet, whichever is greater, from any residential or public use structure or neighboring property and any public use areas as determined by the board of supervisors. These setbacks may be reduced by notarized consent of the owner of the property on which the requested wind energy conversion system is to be erected and the adjoining landowner whose property line or dwelling falls within the specified distance.
* Noise: The wind energy conversion systems shall not exceed sixty (60) decibels, as measured at the closest nonparticipating property line. An analysis, prepared by a qualified acoustical engineer, shall be provided to demonstrate compliance with the standard for sound emission.
* Shadowing/flicker: Wind energy conversion system shall be sited in a manner that does not result in significant shadowing or flicker impacts. The applicant has the burden of proving that this effect does not have significant adverse impact on habitable structures through siting or mitigation.

Review Process for Large Wind Systems:

* The board of supervisors shall require a public hearing under the special use permit process for all applications for wind energy conversion systems regulated under this section.
* All state and federal requirements shall be met prior to application for construction of the wind energy structures with the exception of state approved pre-construction activity. Approval letters must be included with application.

Fees

Wind systems are assessed as any other building project within Rockingham.

Where the valuation of the total cost of the building or structure, including plumbing, electrical, and mechanical equipment is less than $19,000:

* For new construction and additions: $95
* Alterations, additions, and repairs: $0.19 per square foot and a minimum fee of $25

Where the valuation is between $19,000 and $30,000:

* Base fee of $95, plus $4.40 for every additional $1,000 over $19,000

Where the valuation is between $30,000 and $100,000:

* Base fee of $146, plus $3.80 for every $1,000 over $30,000

Where the valuation is between $100,000 and $500,000:

* Base fee of $412.75, plus $3.00 for every $1,000 over $30,000

Outcome

Since the 2010 policy update, 12 residents, mostly farmers, have installed on-site wind technology to their properties.

There are two potential utility-scale wind projects are being considered for the western side of the county, where a cleared ridgeline makes wind particularly attractive. A group of adjoining landowners have formed a land corporation to obtain permits and manage the planned wind installation. No information is available yet related to project benefits.

DWEA Comments

Rockingham County did an excellent job of recognizing and defining the different categories of wind turbines, and by allowing certain equipment that meets clearly outlined criteria to be installed by right. Additionally, the clearly defined review process, time line and fee structure provide a predictable, fair permitting environment for would-be system owners and for the local businesses that provide installation services.

Rockingham County could further improve their ordinance by modifying height restrictions. Wind is the turbine s fuel and the fuel (clean, laminar wind) is found up high. Small increases in wind speed (and decreases in turbulence) yield exponential increases in productivity and can improve system reliability. Higher productivity facilitates the economic viability of the system.

From DWEA's perspective, the golden rule for determining minimum appropriate tower height is that the bottom tip of the turbine's rotor, when fully extended downward, should

be at least 30 higher than any obstacle within 500 , or the tree line in the area, whichever is higher. This establishes the minimum tower height; any increases from there will further improve functionality of the system.

DWEA Tower Height Calculation Example

Using a common 10kW wind turbine with a 23 rotor diameter, at a site with 60 trees, and considering the 30/500 rule mentioned above, the bottom tip of the blade would need to be at a minimum height of 90 (60 tree height + 30 clearance to bottom tip of blade). The blade is approximately 11.5 long, so the height to the center of the rotor (hub height) would be a minimum of 101.5 (this is the approximate attachment point of the turbine to the tower). Most towers come in 10 or 20 sections, so this tower would need to be a minimum of 110 tall. The rotor on this turbine will top out at approximately 122 tall (different turbines have different rotor diameters, so one tower size does not fit all) and most ordinances consider total system height in their height restrictions.

It is reasonable to expect wind turbine towers to be 140 or even 160 tall, with total system heights of 125 to 180 . A total system height restriction of 65 or even 80 does not allow for proper function of the technology; but a total system height restriction consistent with FAA standards (max height less than 200) does facilitate proper function of the equipment and also allows for responsible installation. Additionally, when combined with reasonable setbacks equal to 1 X system height, counties can still achieve the desired level of control over wind turbine siting.

For more technical information on tower height, sound, productivity and other topics, visit www.distributedwind.org Under the Zoning Resource Center, click on Fact Sheets.

A 10 kW, 140 ft. freestanding lattice tower at a state park.

Additional Resources

Distributed Wind Energy Association
www.distributedwind.org

American Wind Energy Association
www.awea.org

Permitting of Wind Energy Facilities
www.nationalwind.org/assets/publications/permitting2002.pdf

Permitting Small Wind Turbines: A Handbook
www.rpd-mohesr.com/uploads/custompages/awea_permitting_small_wind%2012.pdf

RENEW Wisconsin's Small Wind Toolbox
http://renewwisconsin.org/wind/windtoolbox.htm

State Enabling Legislation for Commercial-Scale Wind Power Siting and the Local Government Role (publication includes links to all state model ordinances)
www.elistore.org/data/products/d21-02.pdf

Wind Powering America Ordinance Database
www.windpoweringamerica.gov/policy/ordinances.asp

U.S. DOE Wind and Water Program - Wind Energy Ordinances
www.windpoweringamerica.gov/pdfs/policy/2010/wind_energy_ordinances.pdf

Appendix

Appendix A: State of Wisconsin Small Wind Ordinance

In the State of Wisconsin, a full Small Wind ordinance was developed for permitted use applications. However, the ordinance was also designed to provide a conditional use permit function if needed. Listed below are the sections that can be inserted into a conditional use permit when such permitting is desired. For more information, the ordinance can be found at: http://renewwisconsin.org/wind/Toolbox-Zoning/Small%20Wind%20System%20Model%20Ordinance%2012-06.pdf.

Standards

A small wind energy system shall be a permitted use in all zoning districts subject to the following requirements:

(1) Setbacks. A wind tower for a small wind system shall be set back a distance equal to its total height from:
(a) any public road right of way, unless written permission is granted by the governmental entity with jurisdiction over the road;
(b) any overhead utility lines, unless written permission is granted by the affected utility;
(c) all property lines, unless written permission is granted from the affected land owner or neighbor.

(2) Access.
(a) All ground mounted electrical and control equipment shall be labeled or secured to prevent unauthorized access.
(b) The tower shall be designed and installed so as to not provide step bolts or a ladder readily accessible to the public for a minimum height of 8 feet above the ground.

(3) Electrical Wires. All electrical wires associated with a small wind energy system, other than wires necessary to connect the wind generator to the tower wiring, the tower wiring to the disconnect junction box, and the grounding wires shall be located underground.

(4) Lighting. A wind tower and generator shall not be artificially lighted unless such lighting is required by the Federal Aviation Administration.

(5) Appearance, Color, and Finish. The wind generator and tower shall remain painted or finished approved in the building permit.

(6) Signs. All signs, other than the manufacturer s or installer s identification, appropriate warning signs, or owner identification on a wind generator, tower, building, or other structure associated with a small wind energy system visible from any public road shall be prohibited.

(7) Code Compliance. A small wind energy system including tower shall comply with all applicable state construction and electrical codes, and the National Electrical Code.

(8) Utility notification and interconnection. Small wind energy systems that connect to the electric utility shall comply with the Public Service Commission of Wisconsin s Rule 119, Rules for Interconnecting Distributed Generation Facilities.

(9) Met towers shall be permitted under the same standards, permit requirements, restoration requirements and permit procedures as a small wind energy system.

Permit Requirements

(1) Building Permit. A building permit shall be required for the installation of a small wind energy system.
(2) Documents: The building permit application shall be accompanied by a plot plan which includes the following:
(a) Property lines and physical dimensions of the property
(b) Location, dimensions, and types of existing major structures on the property
(c) Location of the proposed wind system tower
(d) The right-of-way of any public road that is contiguous with the property;
(e) Any overhead utility lines;
(f) Wind system specifications, including manufacturer and model, rotor diameter, tower height, tower type (freestanding or guyed)
(g) Tower foundation blueprints or drawings
(h) Tower blueprint or drawing

(3) Fees. The application for a building permit for a small wind energy system must be accompanied by the fee required for a building permit for a Permitted Accessory Use.

(4) Expiration. A permit issued pursuant to this ordinance shall expire if:
(a) The small wind energy system is not installed and functioning within 24-months from the date the permit is issued; or,
(b) The small wind energy system is out of service or otherwise unused for a continuous 12-month period.

Abandonment

(1) A small wind energy system that is out-of-service for a continuous 12-month period will be deemed to have been abandoned. The Administrator may issue a Notice of Abandonment to the owner of a small wind energy system that is deemed to have been abandoned. The Owner shall have the right to respond to the Notice of Abandonment within 30 days from Notice receipt date. The Administrator shall withdraw the Notice of Abandonment and notify the owner that the Notice has been withdrawn if the owner provides information that demonstrates the small wind energy system has not been abandoned.

(2) If the small wind energy system is determined to be abandoned, the owner of a small wind energy system shall remove the wind generator from the tower at the Owner s sole expense within 3 months of receipt of Notice of Abandonment. If the owner fails to remove the wind generator from the tower, the Administrator may pursue a legal action to have the wind generator removed at the Owner s expense.

Endnotes

1 Wikipedia Entry Wind Turbine http://en.wikipedia.org/wiki/Wind_turbine
2 Virginia Renewables Siting Scoring System http://vrs3.clsat.jmu.edu/VRS3%20FINAL%20REPORT%20APRIL%2024%202009.pdf
3 Wikipedia Entry Wind Turbine http://en.wikipedia.org/wiki/Wind_turbine
4 www.northernpower.com/wind-power-basics/faq.php
5 DWEA Briefing Paper: What Is Distributed Wind? http://www.distributedwind.org/assets/docs/PandZDocs/what%20is%20distributed%20wind%20v.1%20submitted%2007%2012%2011.pdf
6 NREL Distributed Energy Basics - http://www.nrel.gov/learning/eds_distributed_energy.html
7 Permitting of Wind Energy Facilities - http://www.nationalwind.org/assets/publications/permitting2002.pdf
8 Windustry Decisions Tool - http://www.windustry.org/wind-basics/learn-about-wind-energy/wind-basics-know-your-options/know-your-options
9 In the Public Interest: How and Why to Permit for Small Wind Systems, A Guide for State and Local Governments http://www.awea.org/learnabout/smallwind/upload/InThePublicINterest.pdf
10 Interview with Lisa DiFrancisco, Co-chair, DWEA Permitting and Zoning Committee
11 In the Public Interest: How and Why to Permit for Small Wind Systems, A Guide for State and Local Governments http://www.awea.org/learnabout/smallwind/upload/InThePublicINterest.pdf
12 Interview with Lisa DiFrancisco, Co-chair, DWEA Permitting and Zoning Committee
13 www.awea.org/learnabout/smallwind/upload/Inthepublicinterest.pdf
14 NACo webinar www.naco.org/meetings/webinars/Pages/webinars.aspx
15 Interview with Lisa DiFrancisco, co-chair, DWEA Permitting and Zoning Committee
16 Permitting of Wind Energy Facilities http://www.nationalwind.org/assets/publications/permitting2002.pdf
17 Ibid
18 Ibid

In this Issue Brief...

This Issue Brief is designed to assist local leaders in better understanding wind technology and share best practices for developing local wind regulations. Inside you will find:

- The different types of wind installations and infrastructure requirements
- Specific aspects of county government that impact wind development
- Strategies for effectively regulating wind development with Wind Ordinances
- Criteria for managing on-site, distributed, and utility-scale wind developments
- Opportunities to incorporate wind resources into a county Master Plan
- Model policies and case studies from counties across the nation

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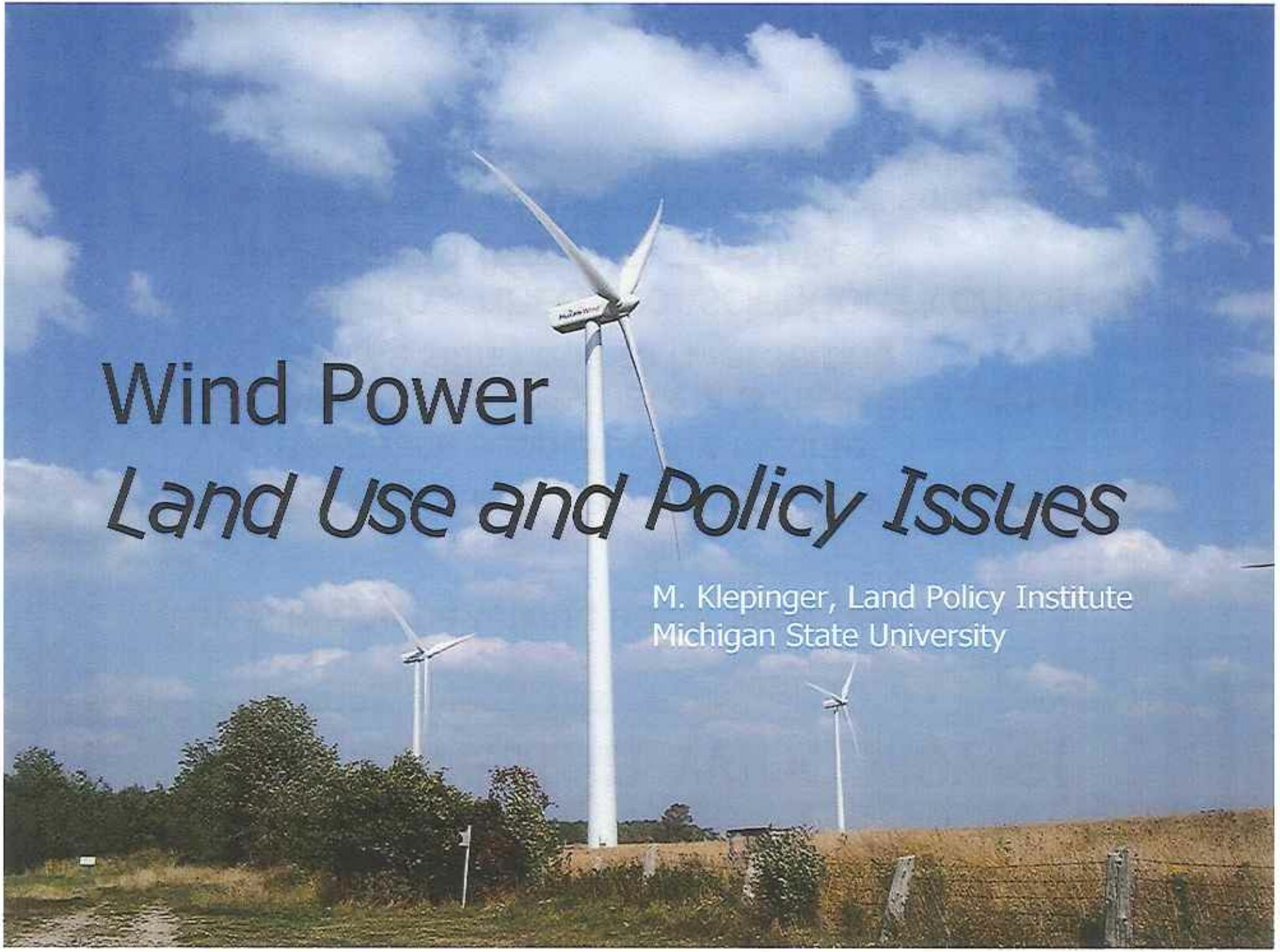

Wind Power
Land Use and Policy Issues
M. Klepinger, Land Policy Institute
Michigan State University

Interest in Wind Power

Why is everyone talking about wind power?

- 1. Farmers and large tract owners, because -
  - they seek supplemental income
  - they realize they have a competitive edge in turbine siting due to rural setting
- 2. Self-described "conscientious consumers" and "green lifestyle consumers"
  - because they seek products that support local, low-impact sustainable development

Interest in Wind Power

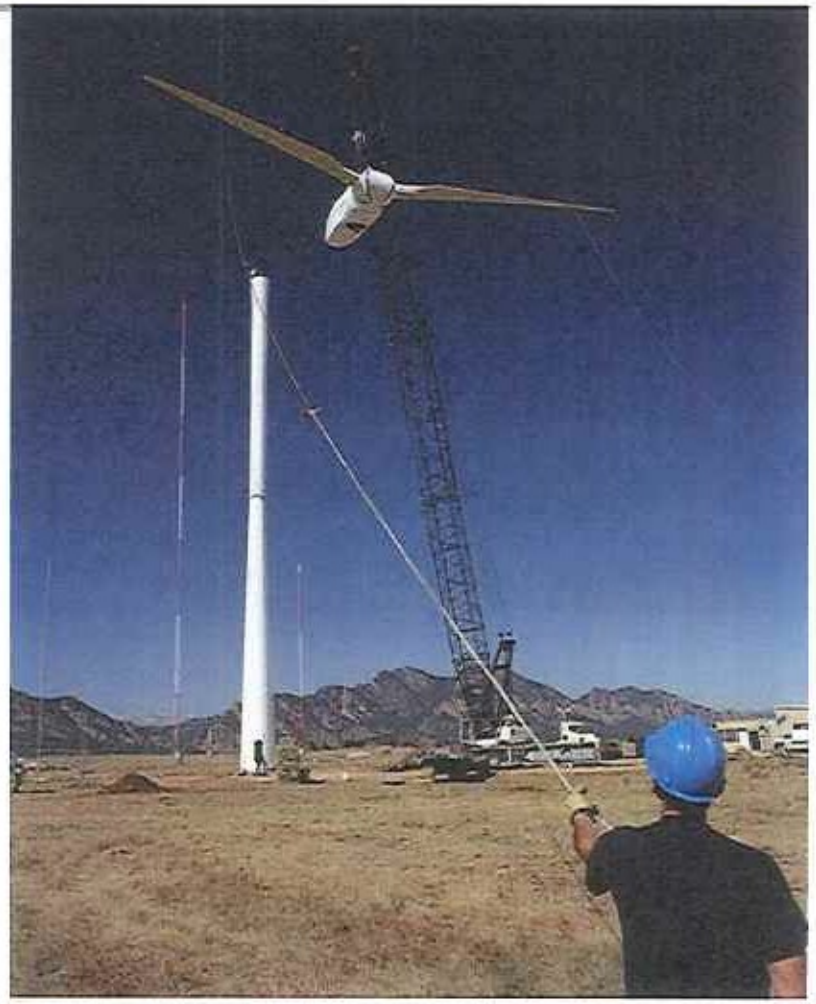
- 3. Public policy-makers, because they want to
  - improve local opportunities for employment
  - lower air pollution by reduced reliance on carbon-based energy sources
  - recycle capital locally by purchasing energy and equipment in-state
  - lower the cost of government by purchasing wind energy for their own facilities

Reducing Emissions

- Electric generation from fossil fuel-fired power plants
  - 39% of carbon dioxide (CO_2) emissions,
  - 22% of nitrogen oxide (NOx) emissions,
  - 69% of sulfur dioxide (SO_2) emissions, and
  - 40% of mercury emissions in the US.
    - Others include volatile organic compounds (e.g., benzene, dioxins) and heavy metals (e.g., arsenic, lead).

Wind Costs have Dropped, While Other Types are Rising

- Nuclear
- Solar PV
- Oil
- Biomass
- Natural gas
- Coal
- Wind



Wind Power in View

- Studies are showing support for wind power development is strong, especially "Not In My Back Yard" (NIMBY)
- Researchers are beginning to apply place theory models, criticizing studies that target just the points of opposition

Pasqualetti, Gipe & Righter. 2002

Public attitudes toward wind

- Danish survey:
  - Women prefer groups of 2-8 turbines
  - Men prefer parks of 10-50 turbines
  - Regarding Noise: Found that people without direct experience believe the noise is louder than is reported by those with direct experience (neighbors of wind)

Source: Holdningsundersogelse, 1993

Aesthetics

- *Beauty is in the eye of the beholder. Some find the sight of windmills **appealing** – they are symbols of energy independence – while others find them **appalling** – they are an industrial intrusion.*

Pros and Cons

- Proponents: wind power can supplement other sources, wind power is never going to rise in cost, wind power does not pollute the air or water, wind turbines are visually appealing, wind turbines are not too noisy, wind power increases national security

Pros and Cons

- Opponents: wind power is intermittent, wind turbines spoil the scenery, wind turbines are noisy, wind turbines are dangerous, wind turbines kill too many birds, wind power is too expensive

Issues for Local Officials

- Tower Height
- Tower Setbacks
- Climbing Hazards
- Noise Levels
- Shadow Flicker
- Decommissioning
- State Law? County Law?

Michigan Guidelines

- Michigan Siting Guidelines (DLEG 2007) provide local leaders with ordinance phrasing to handle several important issues
- The guidelines suggest that local governments should adopt different requirements for
  - On Site Use (accessory use - with towers up to 40 meters high) and larger
  - Utility Grid Systems (principle use - with towers up to 90 meters high).

DLEG Siting Guidelines

- On Site Use Wind Energy Systems
  - "An On Site Use wind energy system is intended to primarily serve the needs of the consumer. An On Site Use wind energy system with a tower higher than 20 meters shall be considered a Special Land Use. On Site Use wind energy systems with no towers or towers 20 meters or less shall be a Permitted Use in all zoning classifications"

DLEG Siting Guidelines

- Utility Grid Wind Energy Systems
  - "A Utility Grid wind energy system is designed and built to provide electricity to the electric utility grid. Utility Grid wind energy systems shall be considered a Special Land Use."

Decommissioning example

- "The plan shall include:
  - 1) anticipated life of project
  - 2) estimated decom costs
  - 3) assurance of long-term fund availability
  - 4) how site will be restored"

Michigan Land Use Guidelines for Siting Wind Energy Systems DLEG, 2007
Recommended language for local zoning ordinances http://www.michigan.gov

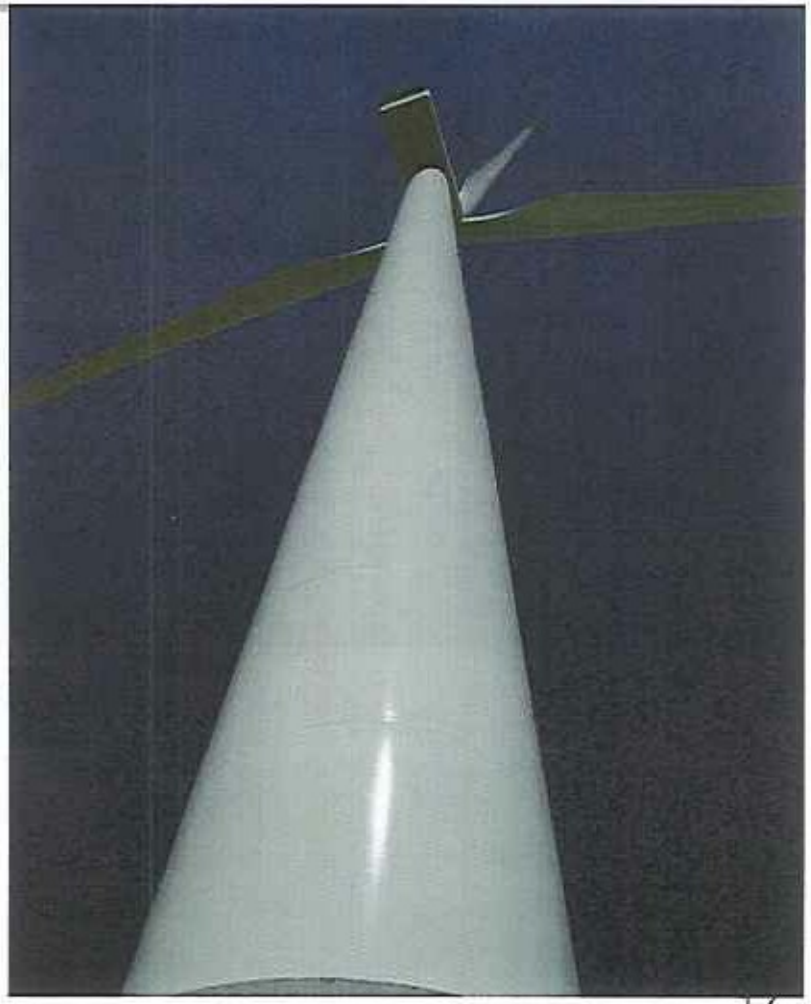
Shadow Flicker example

- "...applicant shall conduct an analysis of potential shadow flicker at occupied structures...over the course of a year...describe measures that shall be taken to eliminate or mitigate..."

Michigan Land Use Guidelines for Siting Wind Energy Systems DLEG, 2007
Recommended language for local zoning ordinances http://www.michigan.gov

Tower Heights

- *Most jurisdictions in Michigan have provisions about structure height in their ordinances, but they do <u>not specifically</u> provide for wind towers*



Tower Heights

- *The blades on many of the newest wind power generation facilities are quite large.*

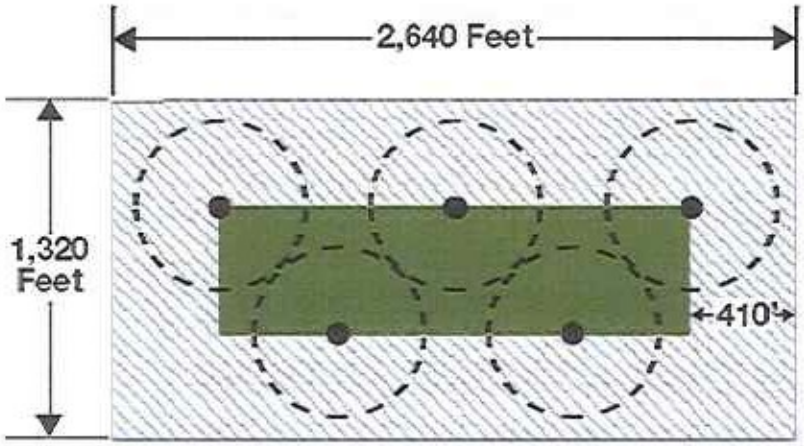
Tower Heights

- *This 40 meter blade is about to be installed on a 78 meter tubular tower as part of a 1.8 MW system.*

Tower Heights Related to Property Line Set Back

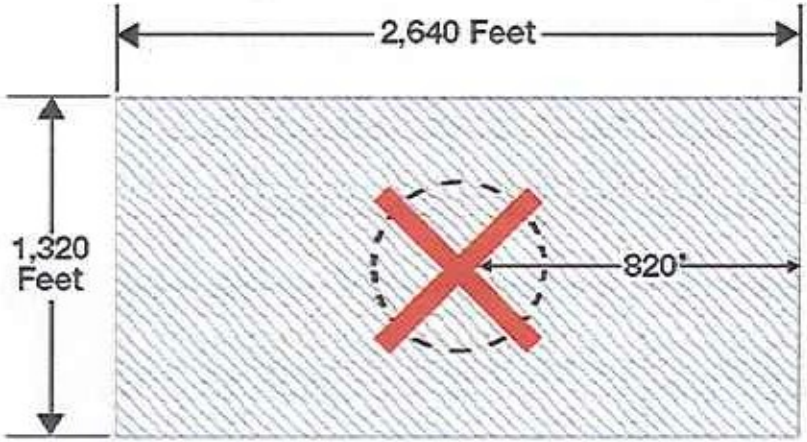
- Property Set-back: The distance between an On Site Use wind energy system and the owner's property lines shall be at least 1½ times the height of the wind energy system
  - Example: Setback = 125 meters x 150% = 187 meters

e.g. system height = 125 meters

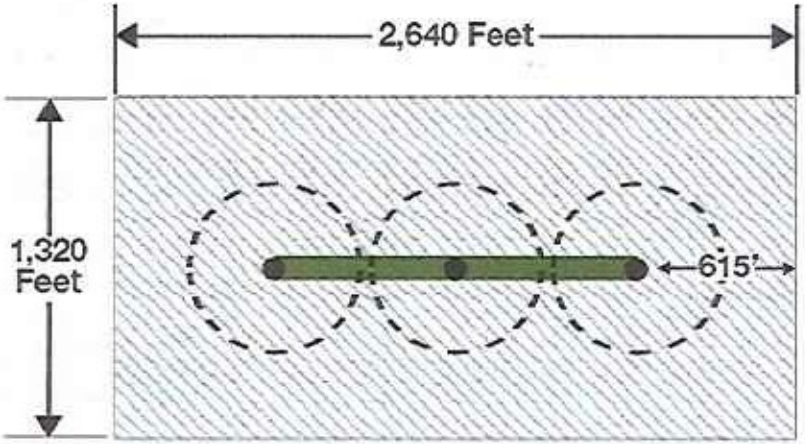


Five turbines on 80 acres with setback of 410 feet.
Setback = 125 meters

When local officials decide how large the yard setback must be, they indirectly determine the number of wind generators a landowner can install, and this affects the economic viability of developing wind power projects in the community.



No turbines on 80 acres with setback of 820 feet.
Setback = 125 meters x 200% = 250 meters



Three turbines on 80 acres with setback of 615 feet.
Setback = 125 meters x 150% = 187 meters

Setback Example

- D(2) The distance between a Utility Grid wind energy system and the property lines of adjacent non-leased properties including public rights of way shall at least equal the height of the wind energy system tower including the top of the blade in its vertical position.
- B(1) The distance between an On Site Use wind energy system and the owner's property lines shall be at least **1½** times the height of the wind energy system tower including the top of the blade in its vertical position.

Michigan Land Use Guidelines for Siting Wind Energy Systems DLEG, 2007
Recommended language for local zoning ordinances http://www.michigan.gov

Why is Setback Important?

Noise Levels

- Some older noise provisions in local ordinances simply use "in the ear of the complainant" - a reasonable standard
- Property line is the usual listening point
- What is noise?
  - Beautiful music in the "ear of the beholder"

Most indoor conversation is in the range of 55 to 60 dB(A)

COMMON SOUND LEVELS

	Sound pressure level dB(A)
Threshold of hearing	0
Broadcast studio or rustling leaves	10
Quiet house interior or rural evening	20
Quiet office interior or ticking watch	30
Quiet rural area or theater interior	40
Quiet suburban area	**50**
Office interior or ordinary conversation	**60**
Vacuum cleaner ten feet away	70
Passing car ten feet away	80
Passing bus or truck ten feet away	90
Passing subway train ten feet away	100
Night club with band playing	110
Threshold of pain	120

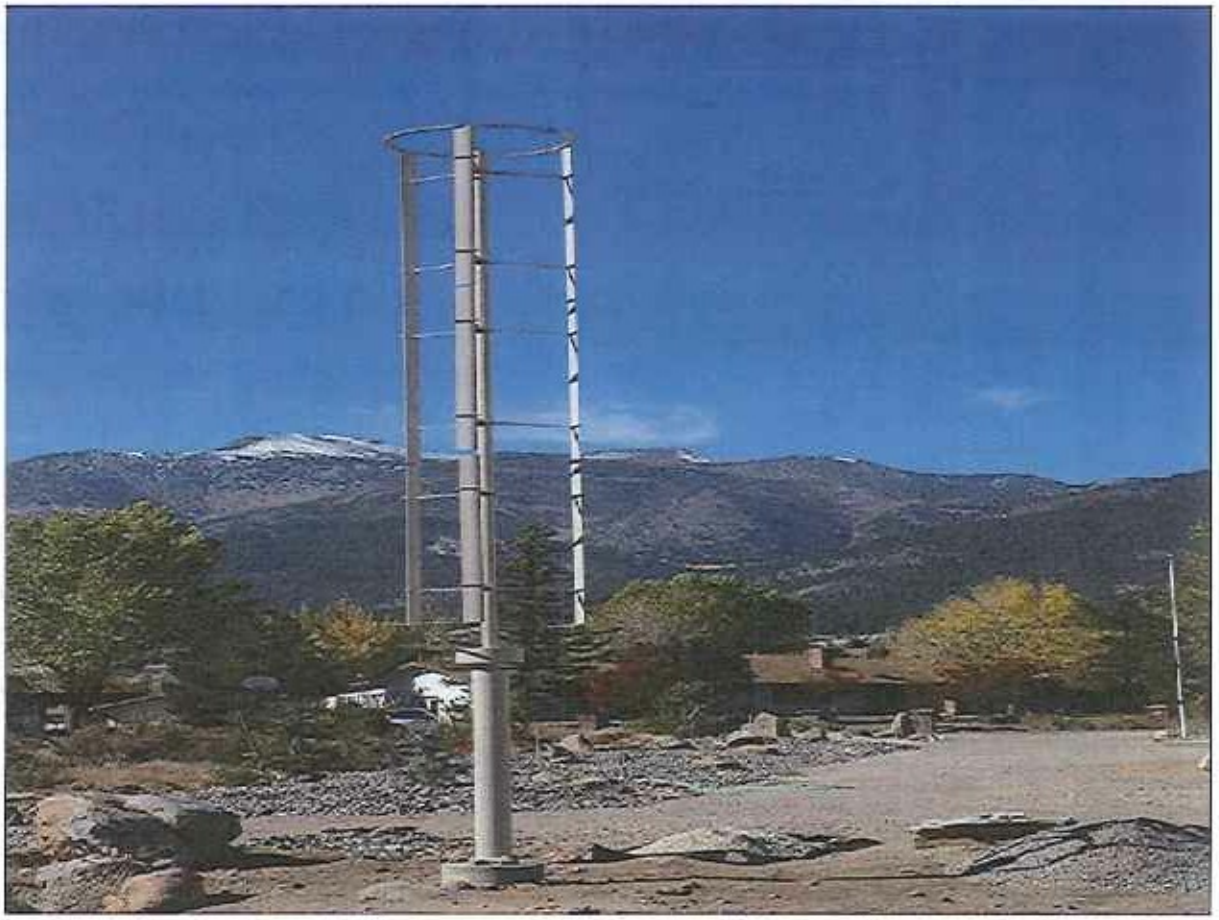
Noise Example

- On Site Use wind energy systems shall not exceed 55 dB(A) at the property line closest to the wind energy system....
  - This sound pressure level may be exceeded during short-term events such as utility outages and/or severe wind storms.
- If the ambient sound pressure level exceeds 55 dB(A), the standard shall be ambient dB(A) plus 5 dB(A).

Michigan Land Use Guidelines for Siting Wind Energy Systems DLEG, 2007
Recommended language for local zoning ordinances http://www.michigan.gov

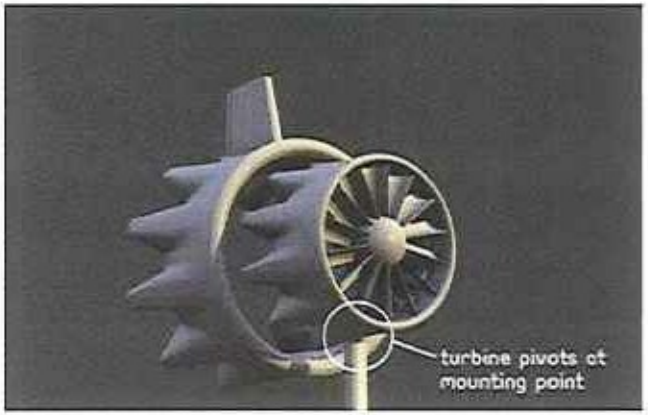
Don't Limit Technology

- This new vertical axis machine is about 30 feet tall, producing 2000 kWh



When You're Writing for Siting – Don't Mistakenly Limit Marketplace

- A small Massachusetts start-up, FloDesign Wind Turbine, recently received support for a "shrouded turbine" design that it says can generate 3 to 4 times more electricity than today's propeller wind turbines.



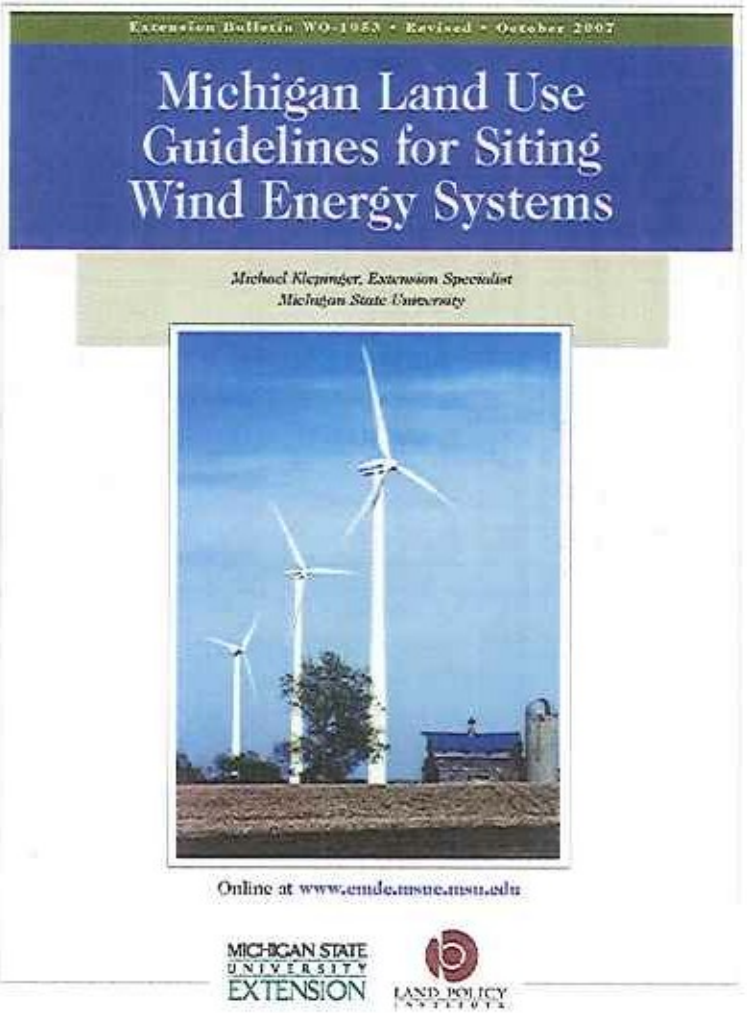
Local government ordinance language should anticipate change...

Additional help for local land use officials…

- MSU Extension Bulletin #WO-1053
- Industry - NACO Publication

Wind Energy Guide for County Commissioners

http://www.nrel.gov/docs/fy07osti/40403.pd

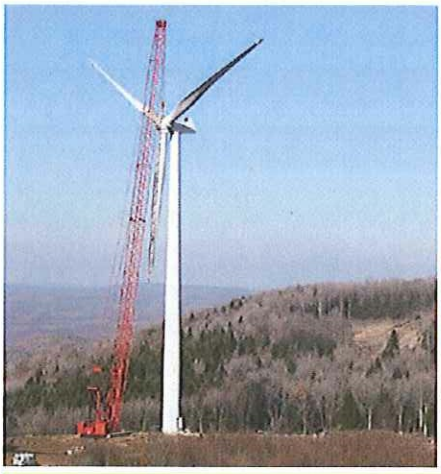


What About Bird Kill?

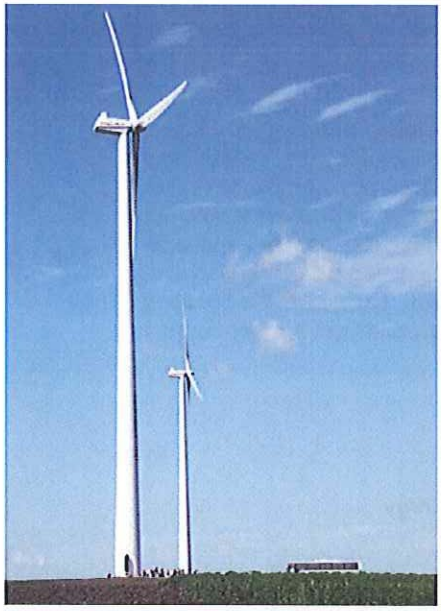
U.S. Annual Bird Mortality Comparison - Selected Causes

Causes of bird mortality	2005 estimated annual bird mortality range	2020 estimated annual bird mortality
Hunting by house cats	75 million to 100 million	More than 75 million
Collisions — vehicles	10 million to 60 million	More than 10 million
Collisions — buildings and structures	100 million to 500 million	More than 100 million
Wind power developments	20 thousand to 30 thousand	80 thousand to 120 thousand

Note: This chart, which draws on the latest bird mortality studies, assumes the number of wind turbines will rise fourfold between 2005 and 2020 (a possibility but by no means a certainty).



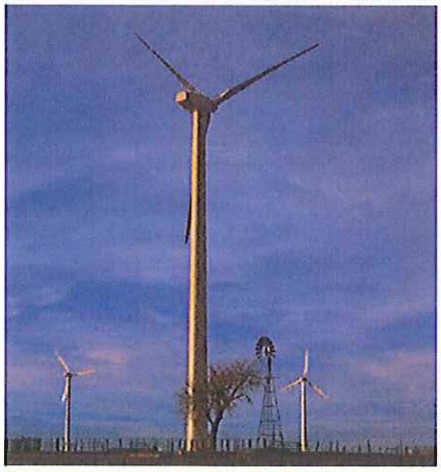
Wind Energy Guide for County Commissioners

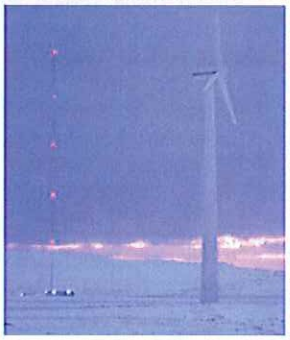


Project Team:

Mike Costanti
Peggy Beltrone
U.S. Department of Energy
National Renewable Energy Laboratory
Wind Powering America
National Association of Counties



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WIND POWERING AMERICA

NACO National Association of Counties
Counties Care for America

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CONTENTS

Abstract

One of the key stakeholders associated with economic development are local government officials, who are often required to evaluate and vote on commercial wind energy project permits, as well as to determine and articulate what wind energy benefits accrue to their counties. Often these local officials lack experience with large-scale wind energy and need to make important decisions concerning what may be a complicated and controversial issue. These decisions can be confounded with diverse perspectives from various stakeholders. This project is designed to provide county commissioners, planners, and other local county government officials with a practical overview of information required to successfully implement commercial wind energy projects in their county. The guidebook provides readers with information on the following 13 topics: Brief Wind Energy Overview; Environmental Benefits; Wind Energy Myths and Facts; Economic Development Benefits; Wind Economics; The Development Process; Public Outreach; Siting Issues; Property Tax Incentives; Power System Impacts; Permitting, Zoning, and Siting Processes; Case Studies; and Further Information. For each of the above topics, the guidebook provides an introduction that identifies the topic, why local government should care, a topic snapshot, how the topic will arise, and a list of resources that define and assess the topic.

Introduction

Background

Wind Powering America (WPA) is a U.S. Department of Energy (DOE) program to dramatically increase the use of wind energy in the United States. WPA's mission is to increase rural economic development, protect the environment, and increase energy security by engaging in state-based activities, rural economic development activities, the greening of federal loads, and collaborations with utilities.

WPA has established economic development as one of its primary thematic areas. A key stakeholder associated with economic development is local government officials, who often must evaluate and vote on commercial wind energy project permits, as well as determine and articulate the wind energy benefits that accrue to their county. These local officials often lack experience with large-scale wind energy but may need to make important decisions concerning projects. These decisions can be confounded with diverse perspectives from various stakeholders.

WPA is committed to providing the various stakeholders with valuable, accurate, and current information on wind energy. The use of stakeholder-tailored guidebooks has proven useful in this commitment, and accordingly the development of this guidebook will address many salient topics encountered by local government officials throughout the commercial wind development process.

Project Objective

This project is designed to provide county commissioners, planners, and other local county government officials with a practical overview of information required to successfully implement commercial, utility-scale wind energy projects (600 kilowatts or larger) in their counties.[1]

This guidebook provides a concise and practical resource for local government officials as they follow the steps to large-scale wind energy development. The guidebook is divided into the following 13 topics:

1. Brief Wind Energy Overview
2. Environmental Benefits
3. Wind Energy Myths and Facts
4. Economic Development Benefits
5. Wind Economics
6. The Development Process
7. Public Outreach
8. Siting Issues
9. Property Tax Incentives
10. Power System Impacts
11. Permitting, Zoning, and Siting Processes
12. Case Studies
13. Further Information.

[1] County commissioners are also actively involved with siting small (10 kilowatts or less) and medium-size (10 to 250 kilowatts) wind projects. Cultivating small projects and community wind projects can help build public support for a county's commercial wind marketing efforts. Visit http://www.windpoweringamerica.gov/small_wind.asp for more information on projects of this size.

For each of the topics listed above, the guidebook provides an introduction that identifies the topic, why local government should care, an issue snapshot, how the topic will arise, and a list of resources that define and assess the topic. The following table layout is used for each topic.

Table Layout and Content Descriptions

What Is It?		Concise summary of the topic
Why Should I Care?		Indicates why the topic is important to local government officials
Snapshot		Provides the reader with three to five key facts, recommendations, or opinions outlined in the guidebook's Essential Resource list • Snapshot #1 • Snapshot #2 • Snapshot #3
When Will It Come Up?		From a local government official's point of view, the wind development process can be broken down into seven distinctive phases, known as the "7 P's": 1. **Potential:** Investigating the basics of wind energy, as well as establishing your county's wind resource 2. **Promotion:** Promoting your county's wind resources to your constituents and project developers 3. **Public Outreach:** Engaging the public on wind energy topics facing your county 4. **Planning:** Creating and implementing an effective county plan to facilitate wind energy development 5. **Permitting:** Creating and implementing effective permitting, zoning, and siting processes for wind energy projects within your county 6. **Project Construction:** Construction of the project takes place 7. **Project O&M:** Operations and maintenance (O&M) of the project takes place. This section of the table will outline which of the 7 P's apply to the topic. (The Topic Matrix following this table summarizes all 13 topics and which of the 7 P's apply to each.)
Resource Lists	*Essential*	Provides a list of resources that capture the essence of each respective area. Resource title, location, brief summary
	Further Reading	Provides a list of resources for additional investigation. These resources are typically available via the Internet. Resource title, location

Topic Matrix

Topic	*Description*	*Potential*	*Promotion*	*Outreach*	*Planning*	*Permitting*	*Construction*	*O&M*
Brief Wind Energy Overview	Overview of wind energy basics, including resource characteristics and technology	X	X	X				
Environmental Benefits	Documentation of the environmental benefits of wind power versus other electricity generation alternatives		X	X	X	X	X	X
Wind Energy Myths and Facts	Description of key wind energy myths and facts	X	X	X	X	X		
Economic Development Benefits	Quantifies the economic development benefits associated with wind energy projects	X	X	X	X		X	X
Wind Economics	General information about the economics of wind energy versus other generation sources	X	X	X	X			
The Development Process	Discussion of the typical commercial wind project development steps			X	X	X	X	X
Public Outreach	Methods of facilitating public outreach with your constituents		X	X	X	X	X	X
Siting Issues	Overview of common siting impacts typically associated with wind projects		X	X	X	X	X	X
Property Tax Incentives	Discussion of what type of tax incentives are used in commercial wind projects, as well as how to effectively structure such incentives			X	X	X	X	X
Power System Impacts	Brief discussion of how wind projects are integrated into the power system, including integration with existing and future generation and the transmission grid			X	X	X	X	X
Permitting, Zoning, and Siting Processes	Strategies for developing effective commercial wind energy permitting processes and zoning ordinances			X	X	X	X	X
Case Studies	Description of successful wind project case studies		X	X				
Further Information	Additional information on topics not included in the guidebook		X	X				

Brief Wind Energy Overview

<table>
<tr><td>What Is It?</td><td colspan="2">Overview of wind energy basics, including resource characteristics and technology</td></tr>
<tr><td>Why Should I Care?</td><td colspan="2">A solid understanding of what wind energy is and how it works will enable you to better communicate with project stakeholders and to make better decisions in the public interest.</td></tr>
<tr><td>Snapshot</td><td colspan="2">• The United States has installed greater than 10,000 MW of wind energy to date.
• U.S. wind resources could meet 20% of the U.S. electricity demand.
• Today's commercial wind turbines are typically 150'to 300' tall, produce enough energy for 300 to 600 typical U.S. households per turbine, and are down for maintenance less than 2% of the time.</td></tr>
<tr><td>When Will It Come Up?</td><td colspan="2"><table><tr><th>Potential</th><th>Promotion</th><th>Public Outreach</th><th>Planning</th><th>Permitting</th><th>Project Construction</th><th>Project O&M</th></tr><tr><td>X</td><td>X</td><td>X</td><td></td><td></td><td></td><td></td></tr></table></td></tr>
<tr><td rowspan="2">Resource Lists</td><td>Essential</td><td>"Wind Web Tutorial," American Wind Energy Association Web site, http://www.awea.org/faq/index.html. A place to start learning about wind energy's basic features, costs, potential, operating impacts, environmental impacts, statistics, and policy.

"Guided Tour on Wind Energy," Danish Wind Energy Association Web site, http://www.windpower.org/composite-85.htm. Each one of the chapters in the guided tour is a self-contained unit. Topics include turbine siting, energy output, generators, turbine design, manufacturing, and the history of wind energy. The tour is available in a number of languages.

"Introduction to Wind Energy," Windustry, http://www.windustry.org/basics/03-introductiontowind.htm. Discusses wind's basic information and provides a portal to learning more about wind. Topics include turbine sizes, industry growth rates, environmental impacts, advantages/disadvantages of wind, and landowner guides.

"How Wind Turbines Work," U.S. Department of Energy's Wind and Hydropower Technologies Program, http://www1.eere.energy.gov/windandhydro/wind_how.html. Learn how wind turbines work, as well as how wind turbine sizes and designs differ.</td></tr>
<tr><td>Further Reading</td><td>"Wind Energy for Electric Power," Renewable Energy Policy Project, http://www.repp.org/articles/static/1/binaries/wind%20issue%20brief_FINAL.pdf

"Wind Energy Potential in the United States," National Renewable Energy Laboratory, http://www.nrel.gov/wind/wind_potential.html

"State Wind Resource Maps," Wind Powering America, http://www.eere.energy.gov/windandhydro/windpoweringamerica/wind_maps.asp

"Wind Resource Resources," Windustry, http://www.windustry.org/resources/windmaps.htm</td></tr>
</table>

Environmental Benefits

What Is It?		Documentation of the environmental benefits of wind power versus other electricity generation alternatives
Why Should I Care?		Power plant air emissions are responsible for approximately one-third of nitrogen oxide emissions, two-thirds of sulfur dioxide emissions, and one-third of carbon dioxide emissions nationally. Wind energy can avoid or reduce these air emissions, as well as reduce water consumption, thermal pollution, waste, noise, and adverse land-use impacts. Understanding wind energy's environmental benefits will enable you to better communicate with interested stakeholders.
Snapshot		Wind energy offers: • No air emissions • No fuel to mine, transport, or store • No water required for cooling (unlike conventional power plants) • No water pollution • No mercury emissions. A 1997 study ("Comparative Air Emissions of Wind and Other Generating Fuels" by the American Wind Energy Association) showed the following fuel types annually emitted the following quantities of carbon dioxide: • Coal: 3,807 billion lbs • Natural gas: 291 billion lbs • Oil: 122 billion lbs • Wind: 0 billion lbs.
When Will It Come Up?		Potential: ; Promotion: X; Public Outreach: X; Planning: X; Permitting: X; Project Construction: X; Project O&M: X
Resource Lists	*Essential*	"Comparative Air Emissions of Wind and Other Generating Fuels," American Wind Energy Association, http://www.awea.org/pubs/factsheets/EmissionKB.PDF. Quantifies wind energy's environmental impacts to that of other electricity generation sources. A single 750-kW wind turbine, operated for 1 year at a Class 4 wind site, can be expected to displace 2.7M lbs of CO2, 14,000 lbs of SO2, and 8,700 lbs of NO2. "Environmental Benefits of Renewable Energy," Union of Concerned Scientists, http://www.ucsusa.org/clean_energy/renewable_energy_basics/environmental-benefits-of-renewable-energy.html. A 1995 Intergovernmental Panel on Climate Change concluded that global temperatures have risen and that human activities are having a discernable effect on the climate system. Wind energy can be a key component of mitigating the climate change risks and represents virtually no net carbon emissions.
	Further Reading	"Coal vs. Wind Power: You be the Judge," Union of Concerned Scientists, http://www.ucsusa.org/clean_energy/renewable_energy_basics/coal-vs-wind-power-you-be-the-judge.html "Comparative Impacts of Wind and Other Energy Sources on Wildlife," American Wind Energy Association, http://www.awea.org/pubs/factsheets/wildlife.pdf

Wind Energy Myths and Facts

What Is It?		Description of key wind energy myths and facts
Why Should I Care?		Local government officials are typically an information source for a variety of stakeholders. This section provides you with accurate information to distribute to your stakeholders and to use for internal decision-making.
Snapshot		• An operating modern wind farm at a distance of 750'-1,000' is no louder than a kitchen refrigerator or moderately quiet room. • Wind projects and wildlife can and do coexist successfully. • Like all energy sources, wind energy receives federal and, in some cases, state subsidies. It would be unfair to expect wind energy to compete in the marketplace without the incentives enjoyed by traditional energy production methods. • Wind energy does not require one-to-one generation backup as it is considered primarily an energy resource.
When Will It Come Up?		Potential: X; Promotion: X; Public Outreach: X; Planning: X; Permitting: X; Project Construction: ; Project O&M:
Resource Lists	*Essential*	"Wind Power Myths vs. Facts," American Wind Energy Association, http://www.awea.org/pubs/factsheets/050629_Myths_vs_Facts_Fact_Sheet.pdf. As wind power generates more electricity in the United States and moves into new areas of the country, more people are introduced to wind turbines in their communities. Wind power is still a relatively new technology and a number of myths—some based on old technologies, some based on misunderstandings—are often repeated. This document uses facts from 25 years of utility experience to dispel some of the most common wind power myths. Topics include noise, turbine lighting, shadow flicker, communication signal interference, property values, tourism, tax base, safety, tower failure, blade throws, wildlife impact, reliability, cost, availability, inefficiency, and subsidization. "Wind Energy Myths," Wind Powering America, http://www.nrel.gov/docs/fy05osti/37657.pdf. Discusses the 10 most common wind energy myths. Topics include cost, federal tax incentives, local economic benefits, back-up generation, rate increases, system upgrades, power quality, small projects, birds, and noise.
	Further Reading	"If not wind… then what?", American Wind Energy Association, http://www.ifnotwind.org/default.shtml "Update of Avian and Bat Studies from Windpower Studies," Western EcoSystems Technology Inc., http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/workshops/2006_summit/kerns.pdf "Economic Impacts of Wind Power in Kittitas County," ECONorthwest, http://www.catenergy.com/pdf%20files/Kittitas%20Wind%20final.pdf

Economic Development Benefits

What Is It?		Quantifies the economic development benefits associated with wind energy projects
Why Should I Care?		Wind energy projects are proven economic development drivers in the areas where they are sited. This section will qualify and quantify the economic development benefits that can be expected.
Snapshot		• The main economic development benefits associated with wind projects are job creation, local project spending, annual property and sales taxes, and annual landowner easement payments. • Forty to 140 jobs are created during the construction phase for every 100 MW of installed capacity; 6 to 10 new jobs are created during the operations phase for every 100 MW of installed capacity. • $500,000-$1,000,000 in new annual property tax payments are generated for every 100 MW of installed capacity. • Annual landowner easement payments are typically $2,000-$5,000 per MW of installed capacity.
When Will It Come Up?		*Potential* | *Promotion* | *Public Outreach* | *Planning* | *Permitting* | *Project Construction* | *Project O&M* X | X | X | X | | X | X
Resource Lists	*Essential*	"Wind Energy for Rural Economic Development," Wind Powering America, http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/wpa/flowers_windpower_2005.pdf. PowerPoint presentation that discusses economic development basics, economic security, challenges, relationship with rural areas, and specific impacts, including job creation, property taxes, and landowner revenues. Several case studies portray the real impacts wind projects have had on local communities. "Job and Economic Development Impact (JEDI) Model," National Renewable Energy Laboratory, http://www.eere.energy.gov/windandhydro/windpoweringamerica/filter_detail.asp?itemid=707. The JEDI Model is an easy-to-use tool that analyzes the economic impacts of constructing and operating wind power plants. Users enter basic project information to determine the project cost and the income, economic activity, and number of jobs that will accrue to the state or local region. Using project-specific data and an accurate estimate of the share of spending that is expected to occur locally will result in a more accurate analysis of the localized impact.

Economic Development Benefits, cont.

Resource Lists	*Further Reading*	"Comparing Statewide Economic Impacts of New Generation of Wind, Coal, and Natural Gas in Arizona, Colorado, and Michigan," National Renewable Energy Laboratory, http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/38154_econdev_compare_statewide.pdf "Assessing the Economic Development Impacts of Wind Power," National Wind Coordinating Committee, http://nationalwind.org/publications/economic/econ_final_report.pdf "Quantifying the Economic Development Impacts of Wind Power in Six Rural Montana Counties Using NREL's JEDI Model," National Renewable Energy Laboratory, http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/36414_jedi_montana.pdf "Tax and Landowner Revenue from Wind Projects," National Conference for State Legislators, http://egov.oregon.gov/ENERGY/RENEW/Wind/docs/Windlandownerrevenueslegisbrief.pdf "What Landowners Should Know," Wind Powering America, http://www.windpoweringamerica.gov/docs/what_landowners_should_know.doc "Economic Development Impacts of Wind Power—Summary of Case Study Results," National Wind Coordinating Committee, http://nationalwind.org/publications/economic/casestudy_summary.pdf "Analysis: Economic Impacts of Wind Applications in Rural Counties," National Renewable Energy Laboratory, http://www.nrel.gov/docs/fy06osti/39099.pdf

Wind Economics

What Is It?		General information about the economics of wind energy versus other generation sources
Why Should I Care?		Understanding the production costs of wind energy and other energy types will enable you to provide accurate information to your stakeholders.
Snapshot		• Other energy generation types typically have an input fuel cost, whereas wind energy does not. • Conventional electricity generation options (excludes renewable sources) are often not required to directly account for the societal costs of their environmental impacts. • Wind energy's delivered cost has fallen 90% in the past 25 years and is now competitive with other new generation sources (contract prices are typically 4-6 cents per kWh). • Wind energy's economics are largely a function of the project's size, wind resource, policy incentives, and financing.
When Will It Come Up?		Potential: X Promotion: X Public Outreach: X Planning: X Permitting: Project Construction: Project O&M:
Resource Lists	*Essential*	"The Economics of Wind Energy," American Wind Energy Association, http://www.awea.org/pubs/factsheets/EconomicsofWind-March2002.pdf. The economics of wind energy have changed dramatically over the past 20 years, as the cost of wind power has fallen ~90% during that period. Despite that progress, the wind industry is still maturing, with production volumes increasing steadily. Thus, the factors affecting the cost of wind energy are still changing, and wind energy's costs are expected to continue to decline as the industry grows and matures. Several topics are discussed: cost and wind speed, improvements in turbine design, economies of scale, optimal configuration of turbines, cost of financing, energy policy, and ancillary economic benefits. "How Does Wind Compare to the Cost of Other Electricity Generation Options?", Wind Powering America, http://www.eere.energy.gov/windandhydro/windpoweringamerica/ne_economics_compare.asp. In terms of direct costs, larger wind farms in windier areas are considered to be economically competitive with new, conventional fossil fuel power plants. But to compare the costs of wind power to other types of electricity generation on an apples-to-apples basis, it is critical to consider both direct and indirect costs. Indirect costs are those that are imposed on society as a whole that are not paid for by generators and therefore are not reflected in the direct costs of electricity. In comparing the total costs of wind power with the costs of other alternatives, the costs of air, water, and land pollution, as well as fuel extraction, supply lines, and military intervention to ensure supply must be considered.

Wind Economics, cont.

Resource Lists	*Further Reading*	"Wind Energy Economics," Windustry, http://www.windustry.org/basics/07-economics.htm "What are the factors in the cost of electricity from wind turbines?", AWEA, http://www.awea.org/faq/cost.html "Wind Energy for Electric Power—A REPP Issue Brief," Renewable Energy Policy Project, http://www.repp.org/articles/static/1/binaries/wind%20issue%20brief_FINAL.pdf "Colorado Public Utility Commission's Xcel Wind Decision," National Renewable Energy Laboratory, http://www.nrel.gov/docs/fy01osti/30551.pdf "Federal Energy Subsidies—Not all Technologies are Created Equal," Renewable Energy Policy Project, http://www.crest.org/repp_pubs/pdf/subsidies.pdf "The Economics of Wind Energy," Clipper Wind, http://www.windpoweringamerica.gov/pdfs/workshops/2006_summit/vaughan.pdf

The Development Process

<table>
<tr><td>What Is It?</td><td colspan="2">Discussion of the typical commercial wind project development steps</td></tr>
<tr><td>Why Should I Care?</td><td colspan="2">This section will help you to better understand the specific development steps required during the course of planning, engineering, and constructing utility-scale wind projects.</td></tr>
<tr><td>Snapshot</td><td colspan="2">The 12 development steps for commercial wind projects are site selection, land agreements, wind assessment, environmental review, economic modeling, interconnection studies, permitting, sales agreement, financing, turbine procurement, construction contracting, and operations and maintenance.</td></tr>
<tr><td>When Will It Come Up?</td><td colspan="2">
<table>
<tr><th>Potential</th><th>Promotion</th><th>Public Outreach</th><th>Planning</th><th>Permitting</th><th>Project Construction</th><th>Project O&M</th></tr>
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</td></tr>
<tr><td rowspan="2">Resource Lists</td><td>Essential</td><td>"The Wind Project Development Process," Distributed Generation Systems, Inc., http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/wind_development_process.pdf. Overview of the specific steps and sub-steps that are required to plan, design, construct, and operate a typical wind project.

"10 Steps in Building a Wind Farm," American Wind Energy Association, http://www.awea.org/pubs/factsheets/10stwf_fs.PDF. An AWEA fact sheet that discusses the 10 steps to building a wind farm. The steps include understanding your wind resource, determining proximity to existing transmission lines, securing access to land, establishing access to capital, identifying reliable power purchaser or market, addressing siting and project feasibility considerations, understanding wind energy's economics, obtaining zoning and permitting expertise, establishing dialogue with turbine manufacturers and project developers, and securing agreement to meet O&M needs.</td></tr>
<tr><td>Further Reading</td><td>"Guidebooks to Wind Energy Development," Windustry, http://www.windustry.org/resources/guidebooks.htm

"Wind Energy Easements: A Guide for Rural Land Owners," Windustry, http://www.windustry.org/easements/default.htm

"Property Taxation of Wind Energy Assets," Windustry, http://www.windustry.org/resources/tax.htm

"Community Wind: An Oregon Guidebook," Northwest Sustainable Energy for Economic Development, http://www.nwseed.org/publications/Guidebook/oregon_wind_guidebook.pdf</td></tr>
</table>

Public Outreach

What Is It?		Methods of facilitating public outreach with your constituents
Why Should I Care?		As a local government official, communication during the development and operation of any project is critical. This section will provide you with effective strategies for communicating with project stakeholders during the planning, construction, and operation phases.
Snapshot		• Public involvement is always worthwhile and public workshops are crucial. • Listen carefully to community concerns and gather information as needed. • Effective messages contain three key topics: • Begin with the most important item first. • Talk in 30-second sound bites. • Avoid reading a script. • Be prompt when following up with media requests for information.
When Will It Come Up?		<table><tr><th>Potential</th><th>Promotion</th><th>Public Outreach</th><th>Planning</th><th>Permitting</th><th>Project Construction</th><th>Project O&M</th></tr><tr><td></td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td><td>X</td></tr></table>
Resource Lists	*Essential*	"Working with the Farm Broadcasters and the Broadcast Media," Michelle Rook, http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/workshops/2005_summit/rook.pdf. Presentation at the 2005 WPA State Summit that discusses general rules for working with broadcasters and reporters, how farm broadcasters differ from mainstream reporters, and tips for packaging your message. Rook also covers characteristics of good interviews and tips for handling tough interviews. "Wind Power Facility Siting Case Studies: Community Response," National Wind Coordinating Committee, http://nationalwind.org/publications/siting/Wind_Power_Facility_Siting_Case_Studies.pdf. The NWCC Siting Workgroup studied communities' reactions to local wind development projects, with the intent of identifying circumstances that distinguish welcomed projects from projects that were resisted by the communities. The NWCC Siting Workgroup was also interested in examining the changes in community perceptions before, during, and after project construction, as well as recognizing what wind project developers can do to address the common concerns that often occur at wind project sites. Case studies are presented from southwestern Minnesota, central New York, and south central/western Oklahoma. The interviews and background research identified many aspects of a successful partnership among wind developers, local communities, governments, and other concerned parties. The following approaches were used by developers to successfully deal with community concerns: listen carefully to community concerns, educate the public, communicate early and often, and remain open to unorthodox solutions.
	Further Reading	"Permitting of Wind Energy Facilities—a Handbook," National Wind Coordinating Committee, http://nationalwind.org/publications/siting/permitting2002.pdf "Sample Introductory Letter to Neighbors," American Wind Energy Association, http://www.awea.org/smallwind/toolbox/SAMPLE_LETTERS/default.asp

Siting Issues

What Is It?		Overview of common siting issues typically associated with wind projects
Why Should I Care?		Siting issues typically draw intense public scrutiny. This section provides accurate information and analysis of the most common wind energy siting issues.
Snapshot		• The large majority of wind energy siting issues can be mitigated via effective public communication by directly addressing pertinent siting issues raised by the public and implementing effective siting guidelines. • The following estimated annual avian collision mortalities occur in the United States: • Vehicles: 60 – 80 million • Buildings/windows: 98 – 980 million • Transmission lines: 174 million • Communication towers: 4 – 50 million • Wind turbines: 0.01 – 0.04 million • Research shows that wind projects do not have detrimental effects on tourism or property values and that turbine noise is minimal.
When Will It Come Up?		Potential: — Promotion: X Public Outreach: X Planning: X Permitting: X Project Construction: X Project O&M: X
Resource Lists	*Essential*	"The Effects of Wind Development on Local Property Values," Renewable Energy Policy Project http://www.repp.org/articles/static/1/binaries/wind_online_final.pdf. The report reviews data on property sales in the vicinity of wind projects and uses statistical analysis to determine whether and the extent to which the presence of a wind power project has influenced property prices. The hypothesis underlying this analysis is that if wind development can reasonably be claimed to hurt property values, then a careful review of the sales data should show a negative effect on property values with the viewshed of the projects. The results suggest that there is no support for the claim that wind development will harm property values. "Facts About Wind Energy and Noise," American Wind Energy Association, http://www.awea.org/pubs/factsheets/WE_Noise.pdf. The fact sheet discusses noise, the types of noise produced by wind turbines and wind farms, and how manufacturers reduce wind turbine noise. Additionally, a brief discussion on how to reduce the likelihood of a noise problem from a wind project is included. "Avian Collisions with Wind Turbines: A Summary of Existing Studies and Comparisons of Avian Collision Mortality in the United States," National Wind Coordinating Committee, http://www.nationalwind.org/publications/wildlife/avian_collisions.pdf. Reports the estimated number of avian collision mortality in the United States, typical causes of avian mortality, and risks to avian populations from wind projects. Based on current estimates, avian fatalities related to wind farms represent from 0.01% to 0.02% (i.e., 1 out of every 5,000 to 10,000 avian fatalities) of the annual avian collision fatalities in the United States.

Siting Issues, cont.

Resource Lists	*Further Reading*	
		"Wind Radar Interference," Idaho National Laboratory, http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/workshops/2006_summit/seifert.pdf "Tourist Attitudes Towards Wind Farms," British Wind Energy Association, http://www.bwea.com/pdf/MORI.pdf "Aesthetic Issues and Residential Wind Turbines," American Wind Energy Association, http://www.awea.org/faq/sagrillo/ms_aesthetics_0405.html

Property Tax Incentives

What Is It?	Discussion of what type of tax incentives are used in commercial wind projects, as well as how to effectively structure such incentives.
Why Should I Care?	Provides you with the methods, structures, and philosophy of local wind energy taxation. This section also briefly outlines what property/sales taxes do/fail to do.
Snapshot	• Property tax incentives are structured as exemptions, exclusions, or credits. • To date, 26 states have property tax incentives in place for wind projects, with the large majority of property taxes collected locally. • What property tax incentives do well: • Help with wind energy's high capital recovery costs • Bring wind development to areas with less robust wind resources • Offer an excellent negotiation item to developers. • What property tax incentives fail to do well: • Impact the value of the project's tax revenue to the local economy. • Some tax incentive options: • A property tax incentive that is phased in during the project's early years, when it is most needed, and then phased out, appears to provide the greatest benefit to wind developers. • County governments should consider the structure and magnitude of property tax incentives in nearby counties and states. • If your local government has not been given taxing authority over local wind projects by state law, consider developing a payment-in-lieu-of-taxes (PILT) system that will replace the lost tax revenue.
When Will It Come Up?	Potential: ; Promotion: ; Public Outreach: X; Planning: X; Permitting: X; Project Construction: X; Project O&M: X
Resource Lists — *Essential*	"Property Tax Incentives," National Conference of State Legislators, http://www.ncsl.org/programs/energy/propertytaxFS.htm. Discusses typical property tax structures (exemptions, exclusions, and credits), how taxes are collected, and which states have adopted some form of property tax incentive. The site also discusses what property taxes do well and fail to do well, as well as what they typically cost. "Tax Incentives," U.S. Department of Energy, http://www.eere.energy.gov/states/alternatives/tax_incentives.cfm. Tax incentive programs to encourage renewable energy are designed to facilitate the purchase, installation, or manufacture of renewable energy systems, equipment, and facilities. The goal of these programs is to reduce the investment costs of acquiring and installing these systems. The site discusses the various types of incentives, as well as arguments for and against tax incentives. "Property Taxation of Wind Energy Assets," Windustry, http://www.windustry.org/resources/tax.htm. A summary of the actual and potential local economic benefits of wind power, including a survey of the varieties of approaches throughout the United States to property tax treatment of wind energy generation facilities.

Property Tax Incentives, cont.

Resource Lists	*Further Reading*	
		"Taxing Wind Energy in Minnesota," Institute for Local Self-Reliance, http://www.me3.org/issues/wind/windtax.pdf "NYSERDA Community Resources for Wind Development," New York State Energy Research and Development Authority, http://www.powernaturally.org/Programs/Wind/toolkit.asp "Database of State Incentives for Renewable Energy (DSIRE)," http://www.dsireusa.org/index.cfm?EE=0&RE=1

Power System Impacts

What Is It?		Brief discussion of how wind projects are integrated into the power system, including integration with existing and future generation and the transmission grid
Why Should I Care?		Integrating wind energy with existing transmission and generation systems is a complex technical and procedural topic. This section provides you with the necessary information to discuss the topic with project stakeholders.
Snapshot		• In areas with limited penetration (less than 10%), system stabilities studies have shown that modern wind plants can be added without degrading system performance (and in many cases they increase system performance). • Utility planners traditionally view new generation primarily in terms of its capacity to serve peak demand. However, wind is primarily an energy resource, meaning that its value lies in its ability to displace more expensive energy and to serve as a hedge against future fuel price and emission risks. • The addition of a wind plant to a power system does not require the addition of a one-to-one backup, as wind is used primarily as an energy resource. • Functioning hour-ahead and day-ahead markets provide the best means of addressing wind plant variability, and few operating impacts occur when wind represents less than 15% of the system capacity. • Wind energy's variability is not a critical transmission integration issue, and many transmission service providers have adopted effective procedures for integrating wind energy into their existing transmission systems at operating impact costs of less than 0.5 cents per kWh. Currently, wheeling fees, imbalance penalties, and capacity valuations are control-area specific.
When Will It Come Up?		Potential: ; Promotion: ; Public Outreach: X; Planning: X; Permitting: X; Project Construction: X; Project O&M: X
Resource Lists	*Essential*	"Utility Wind Integration State of the Art," Utility Wind Integration Group, http://www.uwig.org/UWIGWindIntegration052006.pdf. Study summary showing system impact costs attributed to incorporating significant wind generation into the power system. Topics include interconnection, integration, transmission planning and market operation, and accommodating more wind in the future. Study performed in conjunction with Institute of Electrical and Electronic Engineers and the Power Engineering Society. "Distributed Wind Generation Study for Northeast Colorado," Colorado Governor's Office of Energy Management and Wind Powering America, http://www.eere.energy.gov/windandhydro/windpoweringamerica/filter_detail.asp?itemid=1099. The purpose of the study was to determine the ability to interconnect large wind turbines to a typical distribution system in northeastern Colorado. The Highline Electric Association's (HEA) distribution grid was used for the study, and the HEA provided the design and operating data on its electric system. Three scenarios were evaluated using the existing distribution system and were found to be practical if the amount of wind generation added was in the range of one to five wind turbines at a particular location or area, within 5 miles of an existing substation.

Power System Impacts, cont.

Resource Lists	*Further Reading*	
		"Wind Power Impacts on System Operation: A Summary of Results," Utility Wind Interest Group, https://www.nationalwind.org/events/business/31/presentations/smith.pdf "Utility Integration of Wind Power," Renewable Northwest Project, http://www.rnp.org/Resources/WindIntegration.html "Wind Energy Interconnection," National Wind Coordinating Committee, http://nationalwind.org/publications/transmission/transbriefs/Interconnection.pdf "Fair Transmission Access for Wind: A Brief Discussion of Priority Issues," American Wind Energy Association, http://www.awea.org/policy/documents/transmission.PDF "Analyses of Wind Energy Impact on WFEC System Operations," National Renewable Energy Laboratory, http://www.nrel.gov/docs/fy05osti/37851.pdf "The Effects of Integrating Wind Power on Transmission System Planning, Reliability, and Operations," New York State Energy Research and Developmental Authority, http://www.nyserda.org/publications/wind_integration_report.pdf

Permitting, Zoning, and Siting Processes

What Is It?	Strategies for developing effective commercial wind energy permitting processes and zoning ordinances
Why Should I Care?	It is critical for local government officials to have effective permitting, zoning, and siting processes in place prior to moving forward with large-scale wind energy development. This section outlines the proven strategies and methods of establishing these three critical processes.
Snapshot	Eight elements have been identified for commercial wind development that include effective agency review, meaningful public involvement, and timely and defensible decisions: • Significant public involvement • Issue-oriented process • Clear decision criteria • Coordinating permitting process • Reasonable time frames • Advance planning • Efficient administrative and judicial review • Active compliance monitoring. The above guidelines often seek to address land use, noise, avian, aesthetics, soil erosion, water quality, public health and safety, cultural and paleontological resources, socioeconomic/pubic services/infrastructure, solid and hazardous waste, and air quality/climate considerations with large wind farms. The following sections also discuss: • Information resources for county planners • Issues to consider while drafting effective zoning ordinances • An example of a successful permitting process • An example of an effective state wind energy permitting policy • Listing of counties that have developed actual zoning ordinances.
When Will It Come Up?	

Potential	*Promotion*	*Public Outreach*	*Planning*	*Permitting*	*Project Construction*	*Project O&M*
		X	X	X	X	X

Permitting, Zoning, and Siting Processes, cont.

Resource Lists	*Essential*	"Permitting of Wind Energy Facilities—a Handbook," National Wind Coordinating Committee, http://nationalwind.org/publications/siting/permitting2002.pdf. This document is the source for effective methods and strategies for permitting wind projects. The handbook is written for individuals and groups involved in evaluating wind projects, including decision-makers and agency staff at all levels of government, wind developers, interested parties, and the public. Its purpose it to assist stakeholders to be informed participates in the wind energy development decision-making process. Topics include an overview of wind development and permitting, guidelines for structuring the wind farm permitting process, specific permitting considerations and strategies, and case studies. "Planning and Zoning for Wind Power Facilities," American Planning Association Zoning News February 2003 article. A great resource for local planners, the article examines siting criteria and major impacts of wind turbines in the context of local planning and zoning. Unlike natural gas or coal-burning facilities, where regulation occurs at the state level, wind power facility regulation happens locally, and most states do not require permits. Any impacts that would need mitigation are generally confined to a local area because wind turbines generally have no impact beyond their circumference of visibility. However, state permits may be required when facilities impact wetlands, sand dunes, or other sensitive environments. As with all projects, review zoning ordinance and the master plan to ensure compatibility.
	Further Reading	"Wind Turbine Siting," Minnesota Environmental Quality Board," http://www.eqb.state.mn.us/EnergyFacilities/wind.html "MN Model Wind Energy Conversion Ordinance – 2005," Minnesota Association of County Planning and Zoning Administrators, et al., http://www.mncounties3.org/macpza/Dist%20D%20modelwindordinancefinal.pdf "Wind Turbines and Birds: Putting the Situation in Perspective in Wisconsin," Wisconsin Focus on Energy, http://www.focusonenergy.com

Case Studies

What Is It?		Description of successful wind project case studies
Why Should I Care?		This section provides an analysis of past wind energy projects to illuminate what worked or did not work and why.
Snapshot		• Listen carefully to community concerns and gather information as needed. • Educate the public using techniques that meaningfully communicate the results of developing the site. • Communicate early and often with landowners and other stakeholders. • Remain open to unorthodox solutions to potential concerns; many can be mitigated with effort and flexibility. • Many success stories are outlined in the "Wind Power for Rural Economic Development" Wind Powering America presentation.
When Will It Come Up?		Potential: ; Promotion: X; Public Outreach: X; Planning: ; Permitting: ; Project Construction: ; Project O&M:
Resource Lists	*Essential*	"Wind Power Facility Siting Case Studies: Community Response," National Wind Coordinating Committee, http://nationalwind.org/publications/siting/Wind_Power_Facility_Siting_Case_Studies.pdf. The NWCC Siting Workgroup studied communities' reactions to local wind development projects, with the intent of identifying circumstances that distinguish welcomed projects from projects that were not accepted by the communities. The NWCC Siting Workgroup was also interested in examining the changes in community perceptions before, during, and after project construction, as well as recognizing what wind project developers can do to address the concerns that often recur at wind project sites. Case studies are presented from southwestern Minnesota, central New York, and south-central/western Oklahoma. The interviews and background research identified many keys to molding a successful partnership among wind developers, local communities, governments, and other concerned parties. The following approaches were used by developers to successfully deal with community concerns: listen carefully to community concerns, educate the public, communicate early and often, and remain open to unorthodox solutions. "Community Owned Wind Projects: Case Studies," Windustry, http://www.windustry.org/community/projects.htm. Community ownership of wind projects has proven to be a powerful driver for rural economic development. When local groups own wind projects, energy dollars stay local and jobs are created. This page contains information of many successful projects and information about different and creative ways to structure them to maximize local benefit from clean renewable energy.
	Further Reading	"Wind Power for Rural Economic Development," Wind Powering America, http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/wpa/flowers_mt_2005.pdf "What Is Community Wind Energy?", Windustry, http://www.windustry.com/community/default.htm

Further Information

What Is It?	Additional information on topics not included in this guidebook
Why Should I Care?	If you have the time, you can learn more about wind energy projects.
When Will It Come Up?	Potential: Promotion: X; Public Outreach: X; Planning: ; Permitting: ; Project Construction: ; Project O&M:
Further Reading	Windustry Web site. Extensive information from the very basic to the very complex, www.windustry.org "Windustry's Wind Farmers Network." An online forum for wind energy development discussions where experts discuss many aspects of wind energy development, www.windfarmersnetwork.org "Federal Energy Subsidies: Not All Technologies are Created Equal," Renewable Energy Policy Project, http://www.repp.org/repp_pubs/pdf/subsidies.pdf "American Planning Association Policy Guide on Energy," American Planning Association, http://www.planning.org/policyguides/pdf/Energy.pdf "Bring Wind Energy up to Code," American Wind Energy Association, http://www.awea.org/pubs/documents/Perspective2.pdf Wind Powering America State Wind Working Group Summit, http://www.eere.energy.gov/windandhydro/windpoweringamerica/wkshp_2006_state_summit.asp "Balancing Cost & Risk: The Treatment of Wind Power in Western Utility Resource Plans," Lawrence Berkeley National Laboratory, http://www.eere.energy.gov/windandhydro/windpoweringamerica/pdfs/workshops/2006_summit/wiser.pdf

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14. ABSTRACT *(Maximum 200 Words)*

One of the key stakeholders associated with economic development are local government officials, who are often required to evaluate and vote on commercial wind energy project permits, as well as to determine and articulate what wind energy benefits accrue to their counties. Often these local officials lack experience with large-scale wind energy and need to make important decisions concerning what may be a complicated and controversial issue. These decisions can be confounded with diverse perspectives from various stakeholders. This project is designed to provide county commissioners, planners, and other local county government officials with a practical overview of information required to successfully implement commercial wind energy projects in their county. The guidebook provides readers with information on the following 13 topics: Brief Wind Energy Overview; Environmental Benefits; Wind Energy Myths and Facts; Economic Development Benefits; Wind Economics; The Development Process; Public Outreach; Siting Issues; Property Tax Incentives; Power System Impacts; Permitting, Zoning, and Siting Processes; Case Studies; and Further Information. For each of the above topics, the guidebook provides an introduction that identifies the topic, why local government should care, a topic snapshot, how the topic will arise, and a list of resources that define and assess the topic.

15. SUBJECT TERMS
wind energy; county commissioners; rural economic development; wind energy projects; wind projects; wind economics; wind project development; wind project siting; wind project zoning; wind project permitting; wind project case studies.

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A Strong Energy Portfolio for a Strong America

Energy efficiency and clean, renewable energy will mean a stronger economy, a cleaner environment, and greater energy independence for America. Working with a wide array of state, community, industry, and university partners, the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy invests in a diverse portfolio of energy technologies.

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