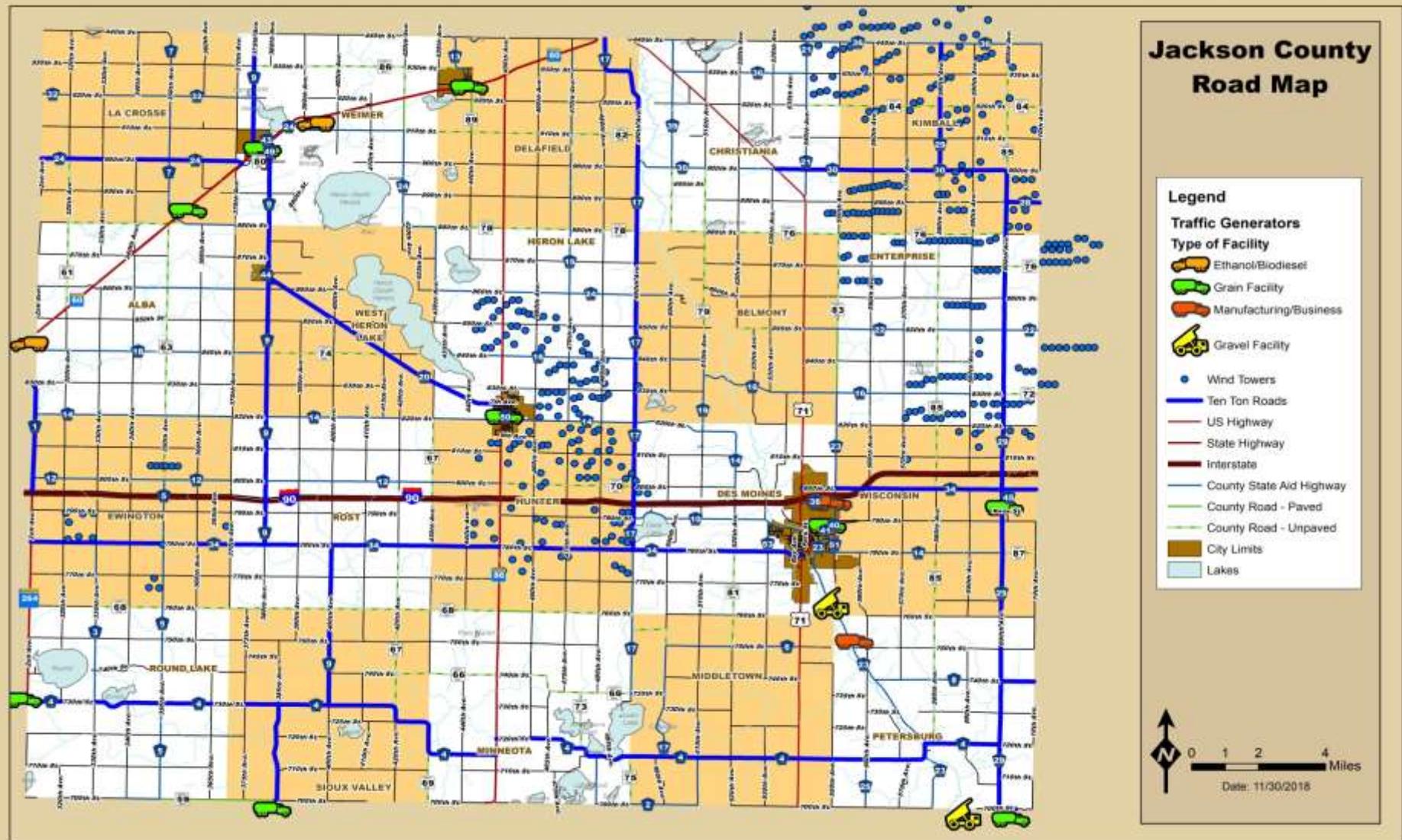


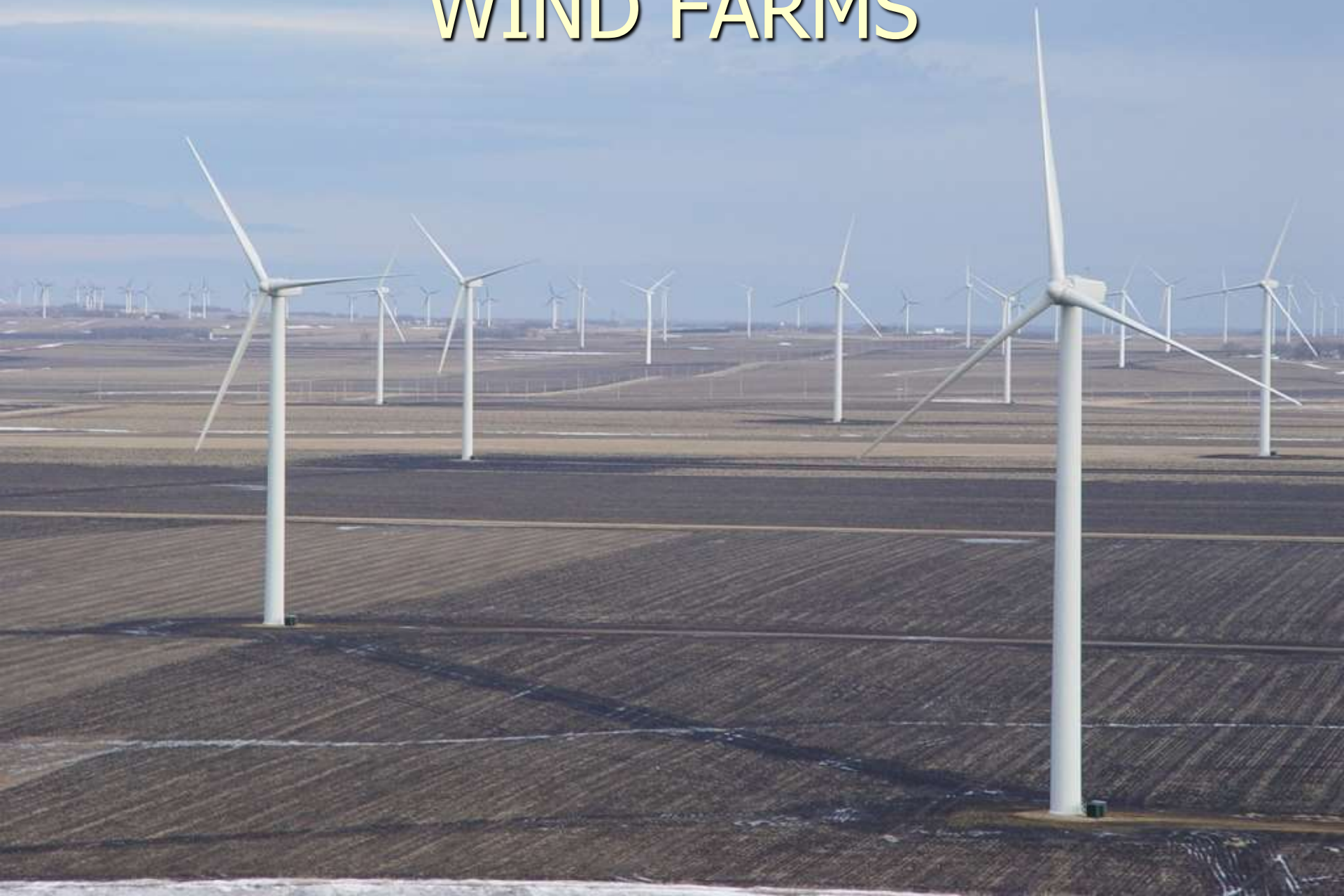
Minnesota Rural County Perspective



Jackson County

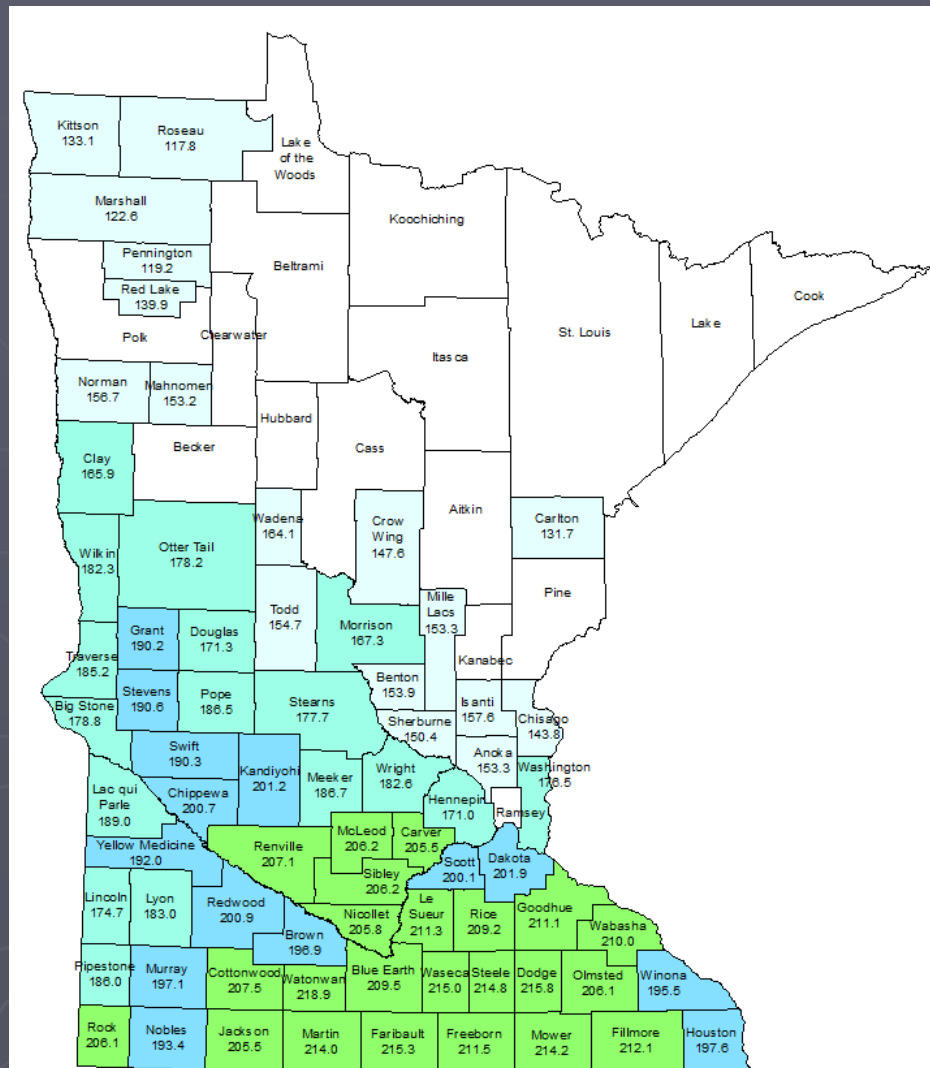


WIND FARMS



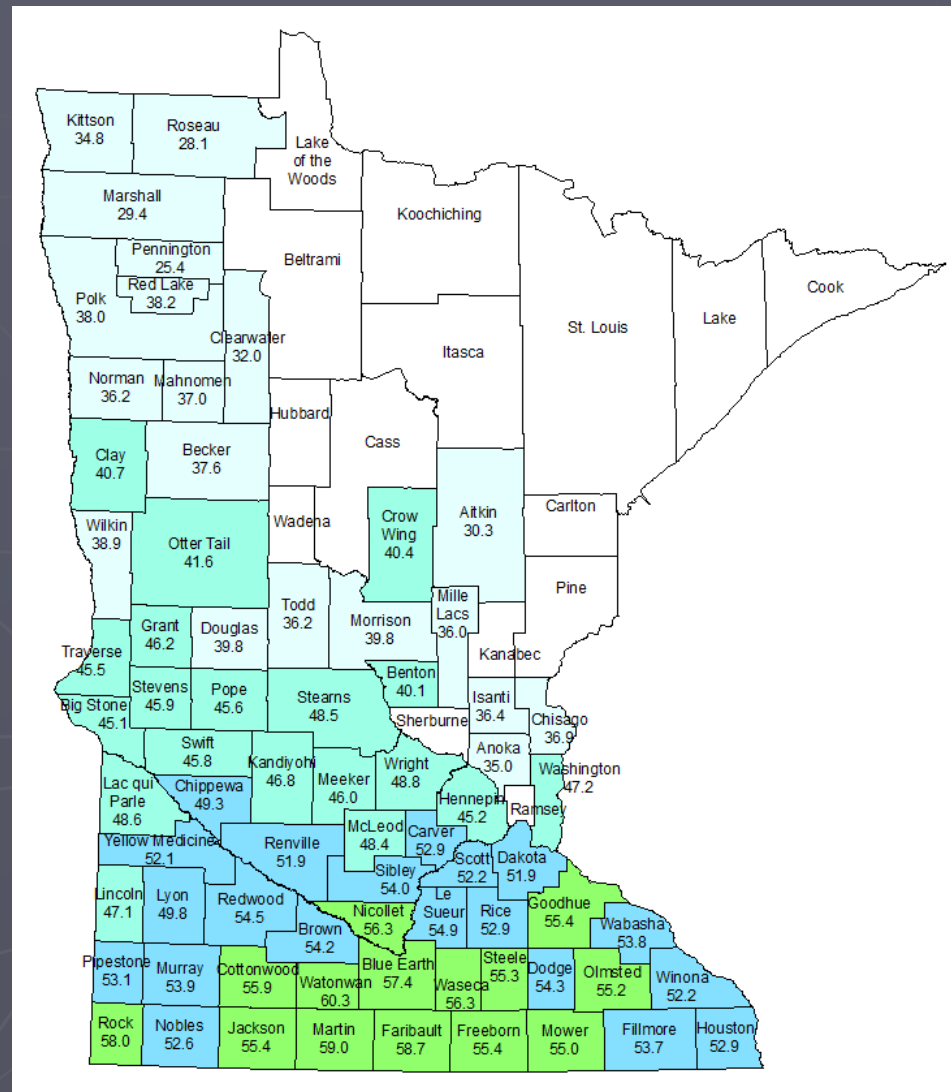
Corn Yield – Minnesota 2017

State Average: 194.0 Bushels per Acre (Source USDA)



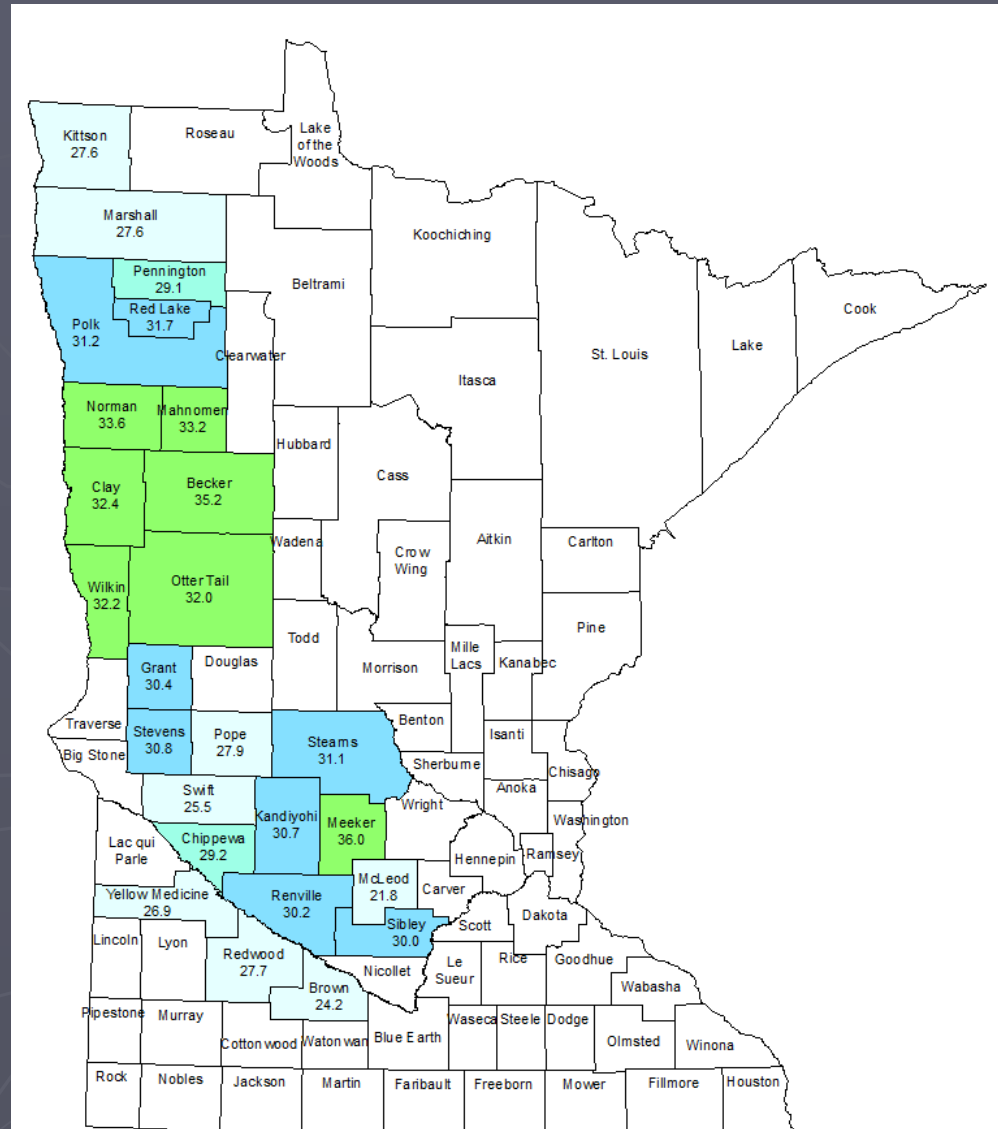
Soybean Yield – Minnesota 2017

State Average: 47.0 Bushels per Acre (Source USDA)



Sugarbeet Yield – Minnesota 2017

State Average: 30.6 Tons per Acre (Source USDA)



Jackson Ag Production

Bushels

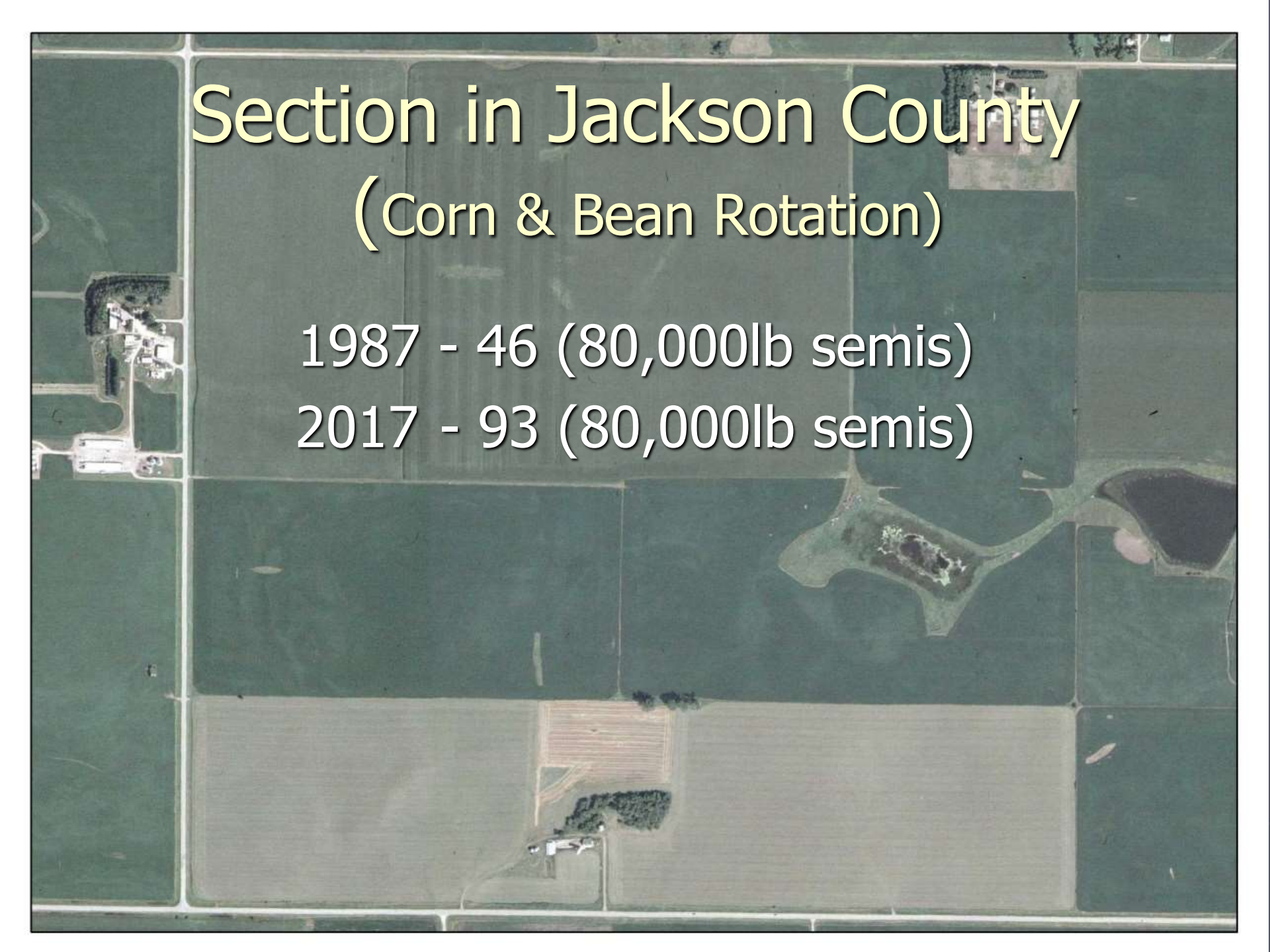
	1987	2017	Increase
Corn	16,764,663	37,495,000	124%
Beans	6,564,137	9,433,000	44%

Additional Loads

Corn 23,034

Beans 3,375

~ 253,526,400 cars



Section in Jackson County (Corn & Bean Rotation)

1987 - 46 (80,000lb semis)

2017 - 93 (80,000lb semis)

ETHANOL PLANT



HOG FACILITY

(Feeder to Finish 1,100 head barn)

2 Loads In/Barn/Turn

18 Tons of Feed/Barn/Week

6 Loads Out/Barn/Turn

X 2 ½ Turns per year

+ 300,000 gallons of manure/barn/year

1 Barn = 133 Legal 80,000lb Loads

An aerial photograph of a large agricultural field, likely a cornfield, with a grid-like pattern of rows. In the upper left, there is a small cluster of buildings, identified as a hog facility. Several dark, irregularly shaped ponds or wet areas are scattered throughout the field, particularly in the lower half. The text is overlaid on the top half of the image.

Section with Hog Facility (C&B Rotation w/10 acre Facility)

1987 - 46 Loads

2017 – 90 Loads + 3 x 133 Loads = 489 Loads

Feed Truck Road Damage





BASE



NACELLE



BLADE



CRANE





RT CRANE

THE CALCULATIONS

Generalized Fourth Power Law

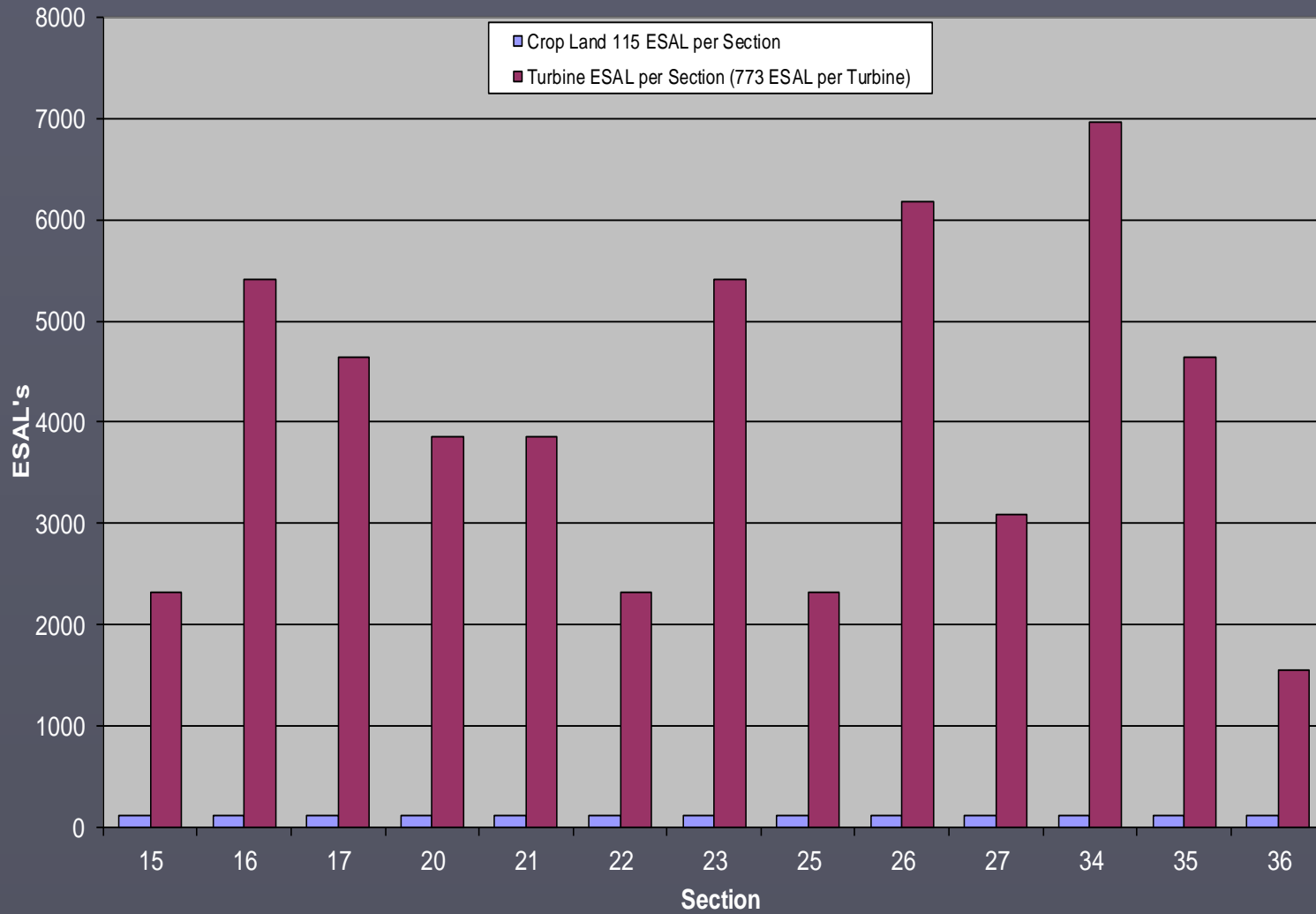
$$\left(\frac{30,000 \text{ lb}}{18,000 \text{ lb}} \right)^4 = 7.7$$

Flexible Pavement ESAL Equation

$$\frac{W_x}{W_{18}} = \left[\frac{L_{18} + L_{2s}}{L_x + L_{2x}} \right]^{4.79} \left[\frac{10^{G/\beta_x}}{10^{G/\beta_{18}}} \right] [L_{2x}]^{4.33}$$

http://training.ce.washington.edu/WSDOT/Modules/04_design_parameters/04-3_body.htm#esal

Heron Lake Township Wind Turbine ESAL Increase



Major Collector
2= Lanes
0= Parking Lanes

Index Of Sheets

Sheet 1 Title Sheet
Sheet 2 Estimated Quantities
Sheet 3 Typical Section

MINN PROJECT NO.
MINNESOTA DEPARTMENT OF TRANSPORTATION
CONSTRUCTION PLAN FOR Plant Mixed Bituminous
Pavement & Agg. Shoulders

COUNTY STATE AID HIGHWAY NO. 14
LOCATION Lakefield to C.S.A.H. No. 17

From SW. Corner Sec. 19-103-35
To SE. Corner Sec. 20-103-35

STATE AID PROJECT NO. 32-614-33

GROSS LENGTH 18300.0 FEET 3.466 MILES
BRIDGES LENGTH 0.0 FEET 0.000 MILES
EXCEPTIONS LENGTH 0.0 FEET 0.000 MILES
NET LENGTH 18300.0 FEET 3.466 MILES

BEGIN PROJECT SAP. 32-614-33
STA. 0+00



END PROJECT SAP. 32-614-33
STA. 183+00

DESIGN DESIGNATION

ADT (19 93) 950

ADT (20 15) 950

9 TON DESIGN

DESIGN SPEED 55 MPH.

SOIL FACTOR 130%

ZN18 130,000

R Value 10

Shoulder Width 6'

SPECIFICATIONS REFERENCE

The 1988 Edition of The Minnesota Department
of Transportation "Standard Specifications
for Construction" As Amended
May 2, 1994, Shall Govern.

STATE PROJECT
STATE AID PROJECT 32-614-33

Stopping Sight Distance Based On
3.5' Height of Eye
0.5' Height of Object

Constructed Under SP. 32-614-26

ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS AND ORDINANCES WILL BE COMPLIED WITH
IN THE CONSTRUCTION OF THIS PROJECT.
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION
AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE
OF MINNESOTA.

Gay E. Stitzky DATE 12/13/94
COUNTY ENGINEER

JACKSON COUNTY REG. NO. 19816

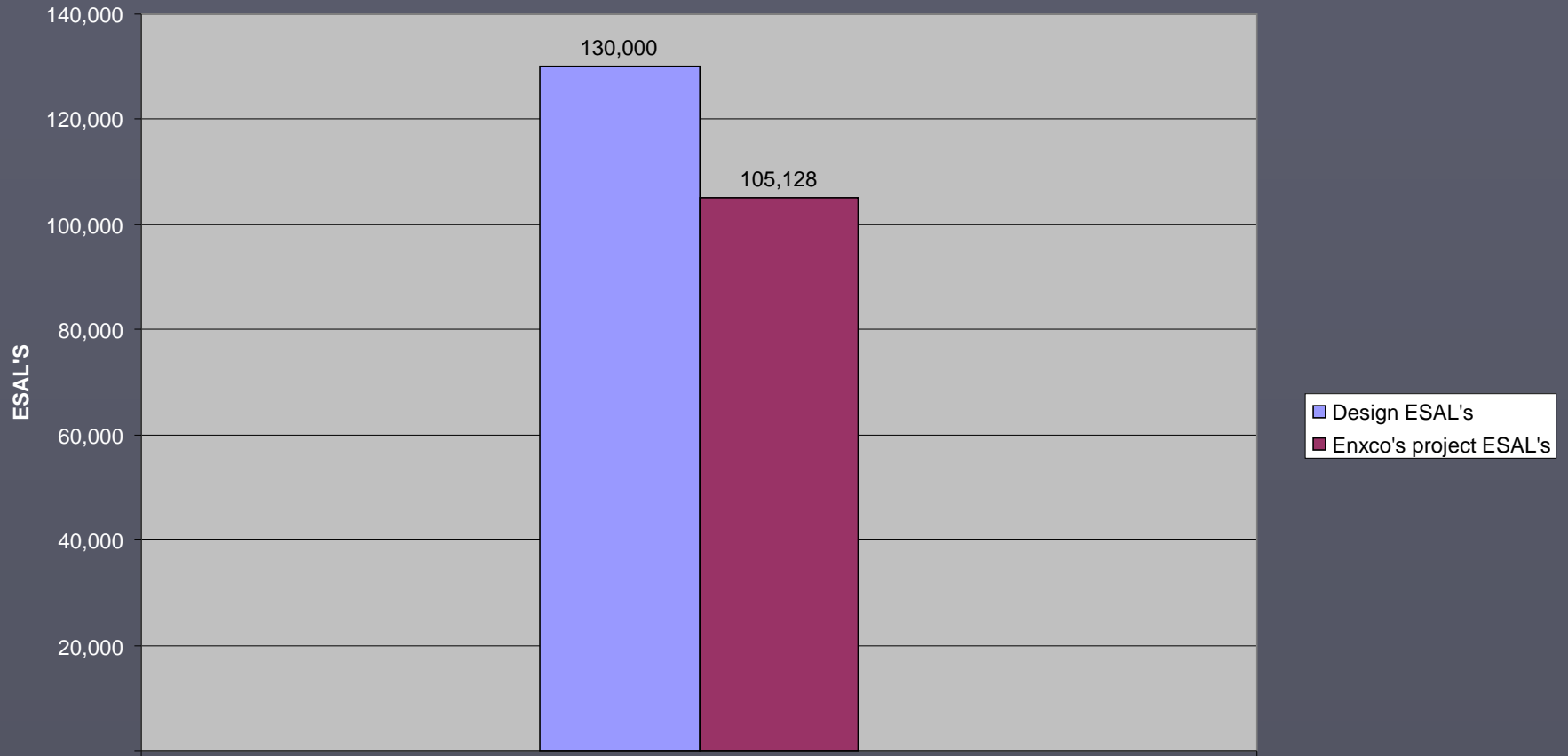
RECOMMENDED FOR APPROVAL *M. E. Blodgett* 1/6 1995
DISTRICT STATE AID ENGINEER

RECOMMENDED FOR APPROVAL *W. J. W. 1-17 1995*
STATE AID PLANS & SPECS ENGINEER

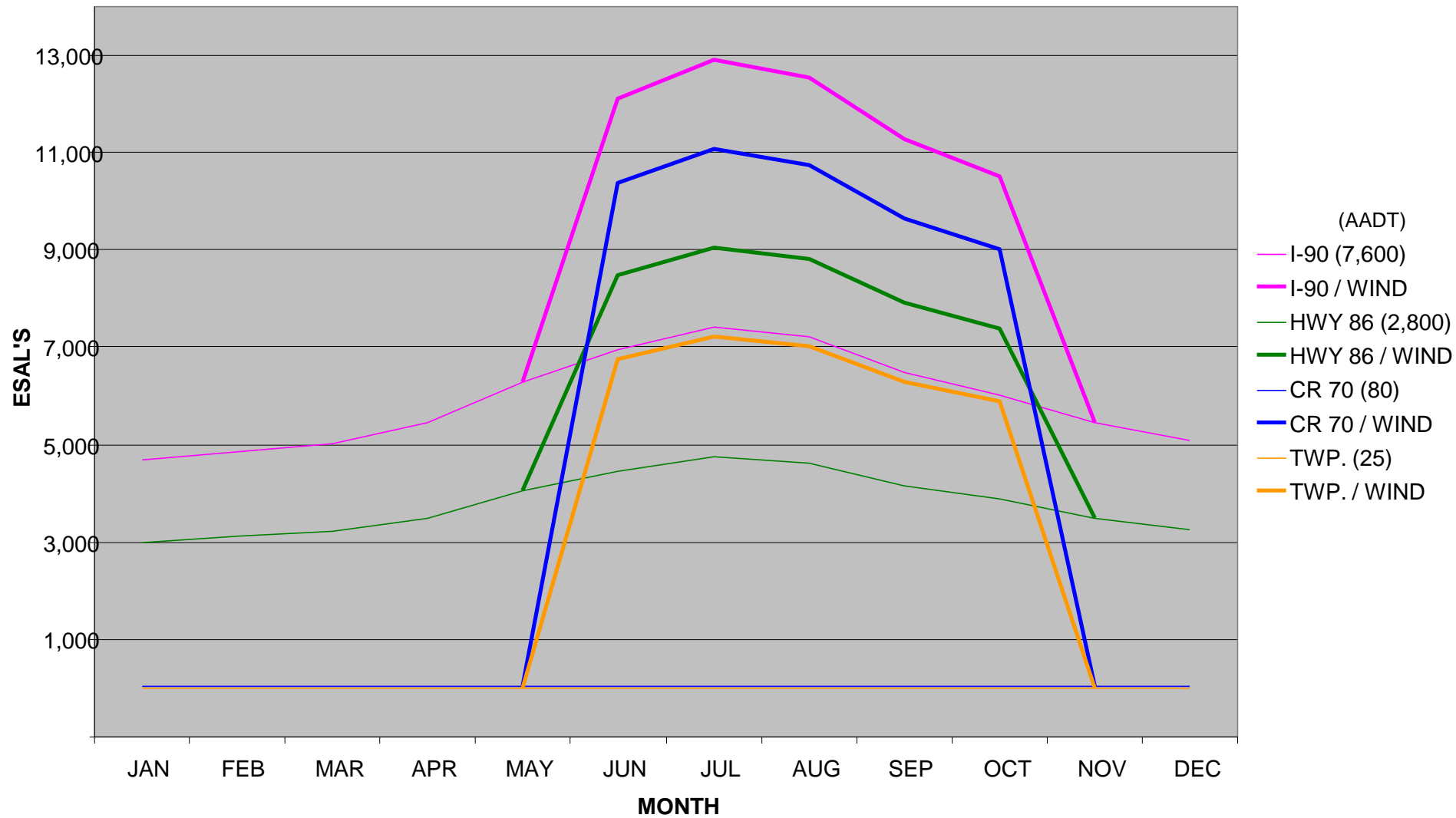
APPROVED *W. J. W. 1-17 1995*
STATE AID ENGINEER

(C.S.A.H. 14) SHEET 1 OF 3 SHEETS

CSAH 14 Design ESALS compared to the ESALS generated by the Enxco project



ROADWAY & WIND TURBINE ESAL'S PER MONTH



When things go bad?



+ of WIND FARMS

Wind Production tax 0.0012 cent per KWh

Tax/tower/year \$5,000 to \$6,500

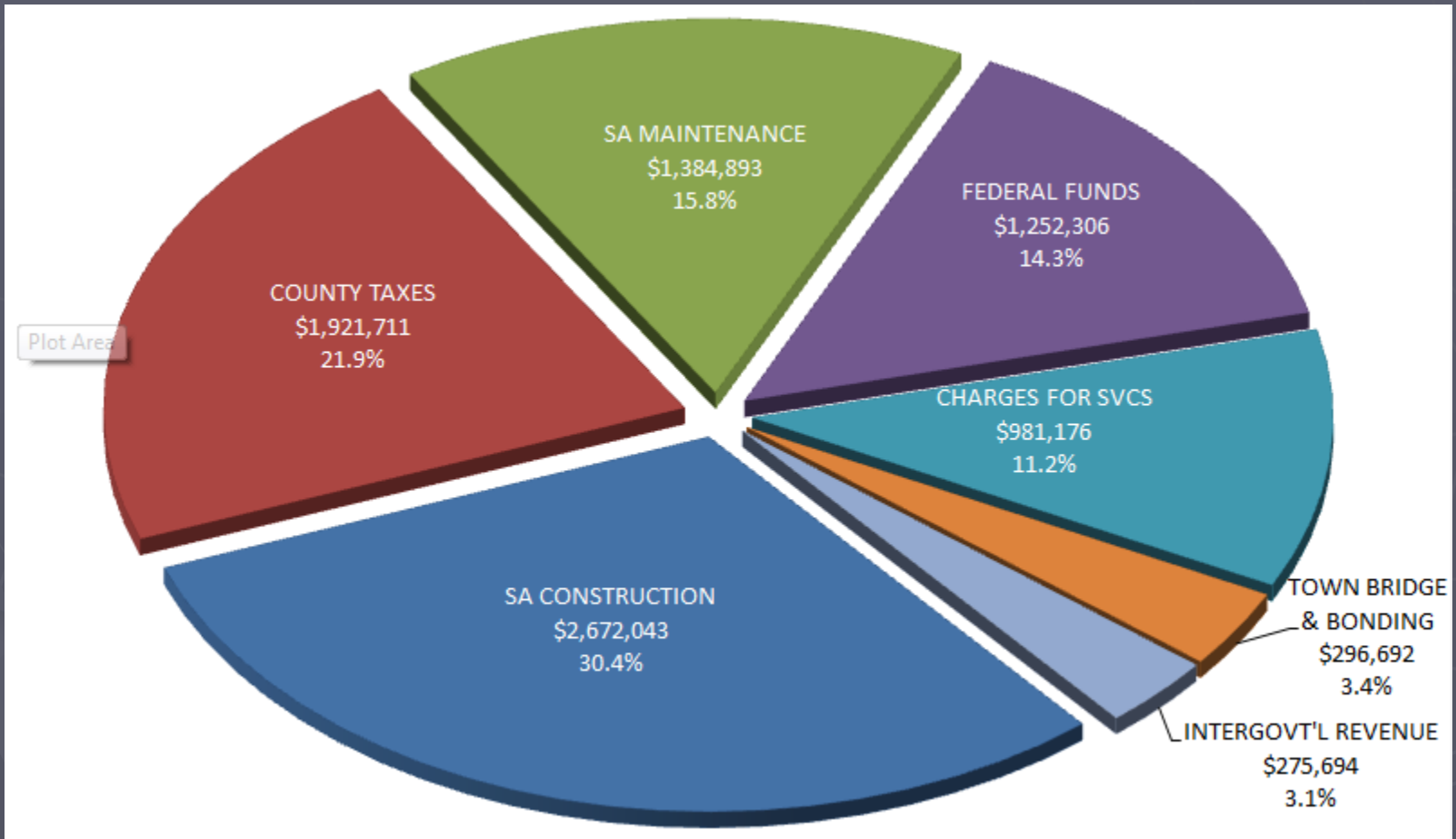
County 80% = \$1,152,000

Townships 20% = \$288,000

New Highway Facilities



JCHD Revenue



SW Rural County Funding

	Local Levy \$ million	SA \$ million	% Local	Wheelage	Local Option
Blue Earth	\$4.176	\$9.227	31%	-	1/2¢
Brown	\$1.391	\$5.751	19%	\$20	1/2¢
Cottonwood	\$1.824	\$4.141	31%	\$10	
Faribault	\$1.290	\$5.939	18%	\$10	
Jackson	\$1.983	\$5.412	27%	\$10	
Le Sueur	\$2.827	\$5.461	34%	\$10	
Martin	\$2.398	\$6.636	27%	\$10	
Murray	\$1.332	\$4.586	23%	\$10	
Nicollet	\$1.548	\$4.831	24%	\$10	
Nobles	\$1.251	\$5.981	17%	\$10	
Pipestone	\$1.192	\$3.676	24%	\$15	
Rock	\$0.930	\$4.027	19%	\$10	

EASLS PRODUCED VERSES GAS AND VEHICLE TAX GENERATED



1¢/bushel ~ Wheelage+Property Tax

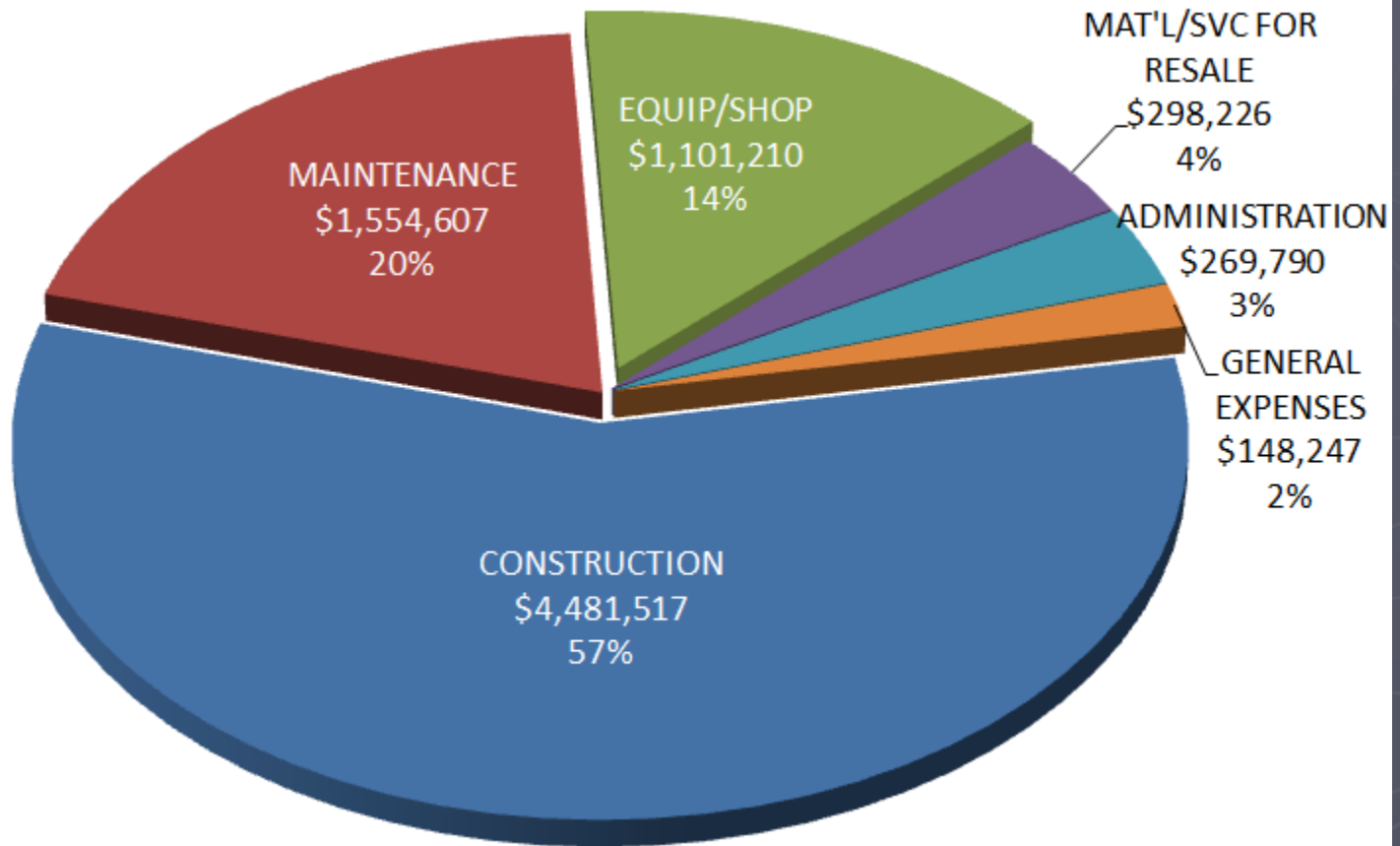
► 1¢ per bushel = \$469,280

► Wheelage = \$120,000

► Increase in Property Tax = \$300,000

= \$420,000

JCHD Expenditures



JCHD Const. Last 10 Years

▶ Urban Construction	\$5.3 m
▶ Rural Construction	\$6.4 m
▶ Grading & FDR	\$7.7 m
▶ Mill & Overlay	\$0.3 m
▶ Notch & Widen	\$1.8 m
▶ Overlays	\$8.6 m
▶ Seal Coat	\$1.6 m
▶ Micro Surfacing	\$3.3 m
■ TOTAL	\$34 Million

Only Civil Engineer on TV

- ▶ Wealthy bachelor
- ▶ Lived in most affluent neighborhood in NY
- ▶ Had a valet
- ▶ Mr. French
- ▶ Had two nieces and nephew living with him
- ▶ Jody, Buffy, & Cissy
- ▶ Mrs. Beasley
 - Family Affair – Bill Davis – Brian Keith

If you have any Questions

Tim.stahl@co.Jackson.mn.us

(507) 849-7252