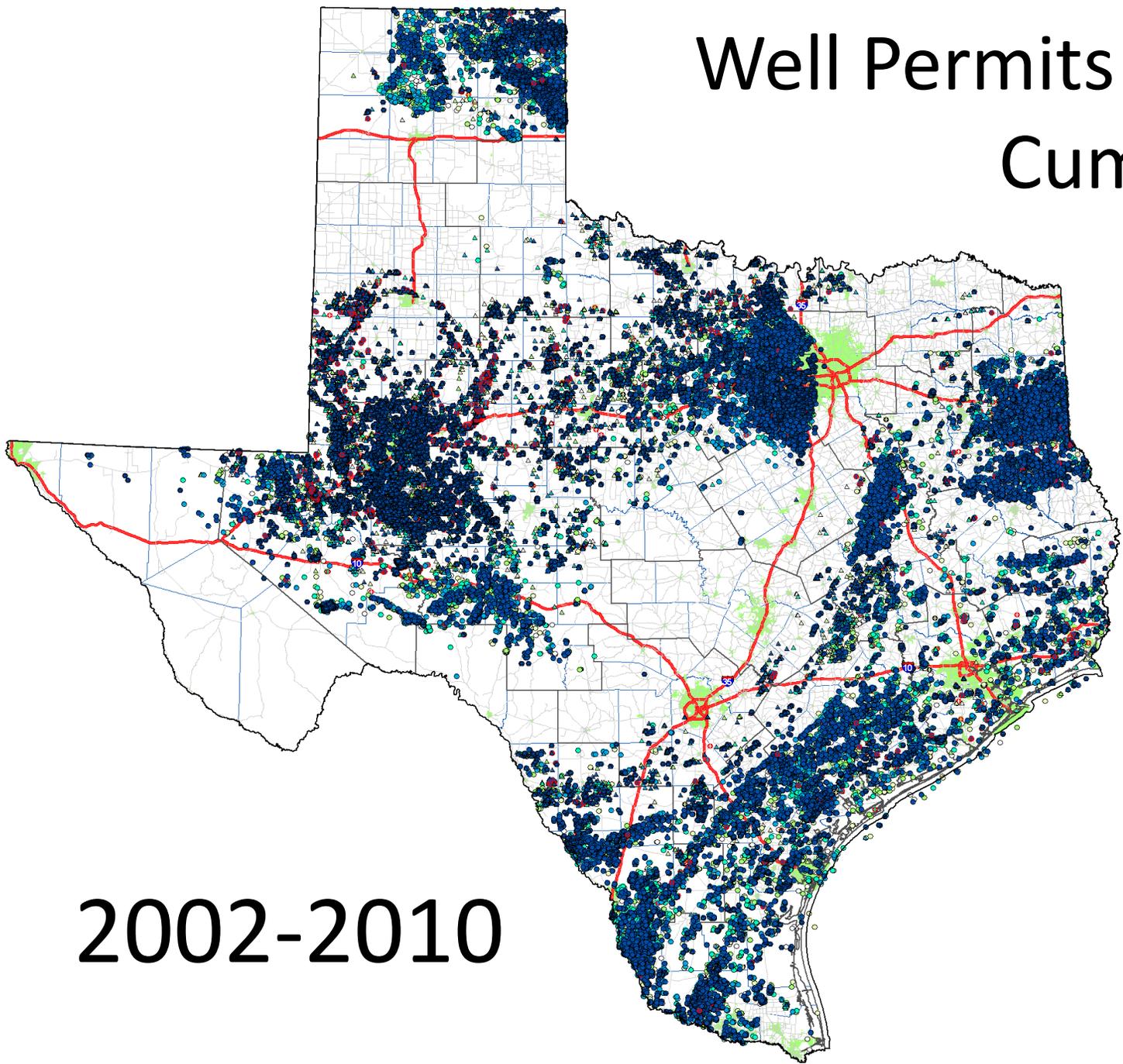




Presentation on TxDOT's Energy Sector Task Force

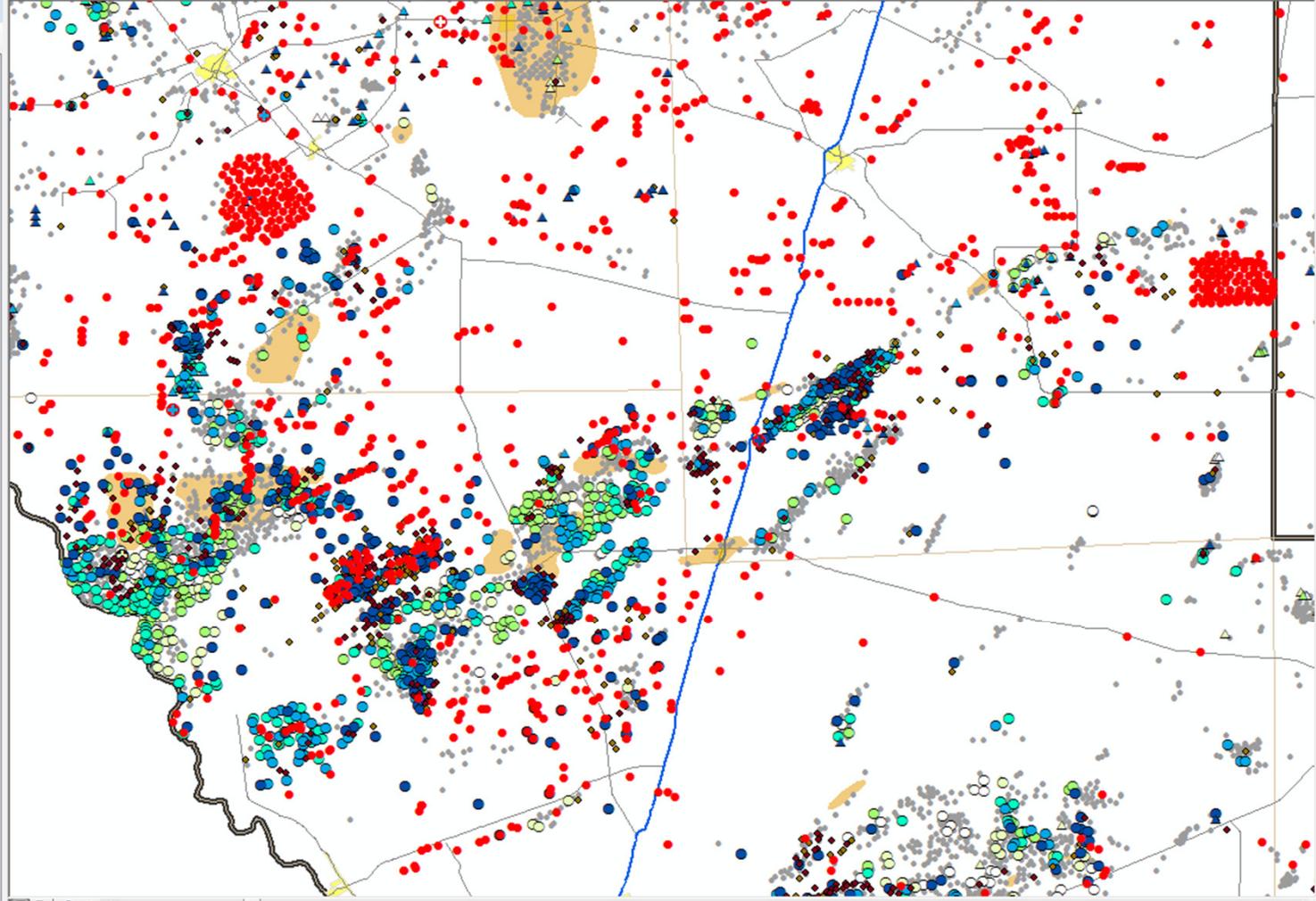
John A. Barton, P.E.
Deputy Executive Director
Texas Department of Transportation
October 23, 2012

Well Permits by Year Cumulative



2002-2010

- Layers
- Renewable Sources
- Nuclear and Coal
- Wells Not Completed
 - OIL_GAS_WELL_PT_EXPECTED
 - OIL_GAS_WELL_PT_NOT_COMPLET
- Completed Wells
 - OIL_GAS_REFINERY_POINT
 - INJECTION_DISPOSAL_WELL_POINT
 - OIL_GAS_WELL_POINT_2010
 - OIL_GAS_WELL_POINT_2009
 - OIL_GAS_WELL_POINT_2008
 - OIL_GAS_WELL_POINT_2007
 - OIL_GAS_WELL_POINT_2006
 - OIL_GAS_WELL_POINT_2005
 - OIL_GAS_WELL_POINT_2004
 - OIL_GAS_WELL_POINT_2003
 - OIL_GAS_WELL_POINT_2002
 - Saltwater Injection/Disposal
 - Oil and Gas
 - Gas Well
 - Oil Well
 - OIL_GAS_WELL_PT_77T01
 - OIL_GAS_FIELD_POLYGON
- Energy Use
- PHMSA_2004_NPMS_PIPE_LINE
- Sample Route
- Route Frequency
- Top_5P_Routes
- COMMERCIAL_VEHICLE_INSPECTION_I
- Traffic Safety
- Bridge
- Traffic_Volume





It's Not Just Oil & Gas





Texas Wind Farms

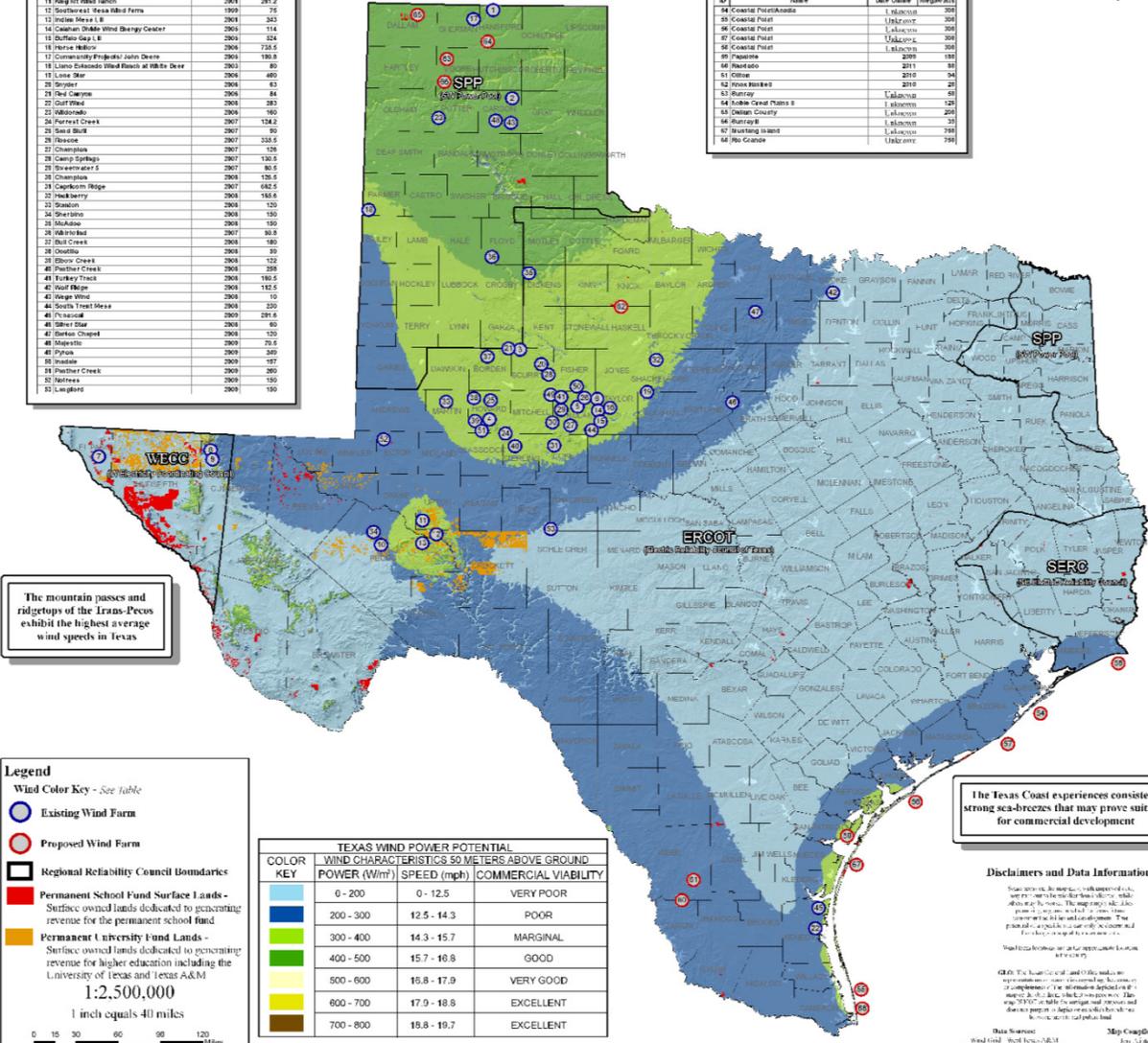
Jerry Patterson, Commissioner
Texas General Land Office
January 2010

Existing Wind Farms

ID	Name	Date Online	Megawatts
1	Crest Plains Windfarm	2002	3
2	Wills Deer	2003	80
3	Green Hill Wind Farm at Brazos	2003	160
4	Big Spring	1999	34.3
5	Spencerwater	2003	583.3
6	East Grove	2003	150
7	Hessco Mt. Wind Florida	2004	6.22
8	Texas Wind Power Project	1999	20.8
9	Delaware Mountain Wind Farm	1999	26.5
10	Woodward Mt. Wind Ranch I & II	2003	1037.2
11	Hwy 97 Wind Ranch	2004	281.3
12	Southeast Texas Wind Farms	1999	75
13	Indian Mesa I & II	2003	243
14	Canadian Shale Wind Energy Center	2006	114
15	Oldham Gap I & II	2003	324
16	Wedge Ridge	2006	120.5
17	Community Projects John Deere	2005	180.8
18	Llano Colorado Wind Ranch at Wills Deer	2003	80
19	Love Star	2006	490
20	Snyder	2006	63
21	Red Canyon	2006	84
22	Cliff Wind	2006	283
23	Wilberson	2006	160
24	Parish Creek	2007	124.2
25	Sand Bluff	2007	90
26	Weslow	2007	225.5
27	Champion	2007	128
28	Camp Springs	2007	130.5
29	Spencerwater 2	2007	80.5
30	Champion	2008	126.5
31	Cardigan Ridge	2007	142.5
32	Hawberry	2008	161.6
33	Stanon	2008	120
34	Seaview	2008	120
35	Mauihue	2008	100
36	Walden	2007	36.8
37	Ball Creek	2008	180
38	Osoyo	2008	80
39	Blow Creek	2008	122
40	Parish Creek	2008	359
41	Parish Creek	2008	182.5
42	Wolf Ridge	2008	182.5
43	Wedge Wind	2008	10
44	South Tread Mesa	2008	220
45	Pinhook	2009	281.6
46	Water Star	2008	60
47	Garson Creek	2008	120
48	Majestic	2009	75.4
49	Prize	2009	340
50	Invade	2009	157
51	Parish Creek	2009	260
52	Wedge	2009	150
53	Langford	2009	150

Proposed Wind Farms

ID	Name	Date Online	Megawatts
54	Coastal Point/Anahuac	1/2010	300
55	Coastal Point	1/2010	300
56	Coastal Point	1/2010	300
57	Coastal Point	1/2010	300
58	Coastal Point	1/2010	300
59	Passion	2010	180
60	Harbison	2011	80
61	Cloney	2010	34
62	Wedge Harbor	1/2010	27
63	Wedge Harbor	1/2010	60
64	Coastal Point 2	1/2010	120
65	Coastal Point	1/2010	200
66	Wedge	1/2010	30
67	Wedge Harbor	1/2010	780
68	Wedge Harbor	1/2010	780



The mountain passes and ridgetops of the Iruan-Pecos exhibit the highest average wind speeds in Texas

The Texas Coast experiences consistent, strong sea-breezes that may prove suitable for commercial development

Legend

- Wind Color Key - See table
- Existing Wind Farm
- Proposed Wind Farm
- Regional Reliability Council Boundaries
- Permanent School Fund Surface Lands - Surface owned lands dedicated to generating revenue for the permanent school fund
- Permanent University Fund Lands - Surface owned lands dedicated to generating revenue for higher education including the University of Texas and Texas A&M

1:2,500,000
1 inch equals 40 miles

TEXAS WIND POWER POTENTIAL

COLOR KEY	WIND CHARACTERISTICS 50 METERS ABOVE GROUND	POWER (W/m ²)	SPEED (mph)	COMMERCIAL VIABILITY
Light Blue	0 - 200	0 - 12.5		VERY POOR
Blue	200 - 300	12.5 - 14.3		POOR
Light Green	300 - 400	14.3 - 15.7		MARGINAL
Green	400 - 500	15.7 - 16.8		GOOD
Yellow-Green	500 - 600	16.8 - 17.9		VERY GOOD
Yellow	600 - 700	17.9 - 18.8		EXCELLENT
Dark Yellow	700 - 800	18.8 - 19.7		EXCELLENT

Disclaimers and Data Information:

This map is for general informational purposes only. It is not intended to be used for any specific project. The map is based on data provided by the Texas General Land Office and other sources. The map is not a guarantee of any specific results. The map is not a representation of any specific project. The map is not a representation of any specific project. The map is not a representation of any specific project.

Data Sources:
Wind Data: National Weather Service, Texas General Land Office
GIS: ENDA International, 2007

Map Created by:
Eni, LLC
Texas General Land Office



Roadway Damage





Traffic Impacts





Increased Traffic/Safety Concerns





Bridge Impacts/Restrictions



Unprecedented Traffic Generators





Responsibilities of this Task Force

- Coordination of efforts
- Support of agency activities
- Sharing of information
- Identify opportunities for innovation
- Identify opportunities for partnerships
- Identify potential solutions to common issues



Task Force Focus Areas

- Safety
- Public Awareness / Involvement
- Innovation
- Prevention
- Financial Solutions

Impacts of Energy Developments on the Transportation Infrastructure and Right- of-Way

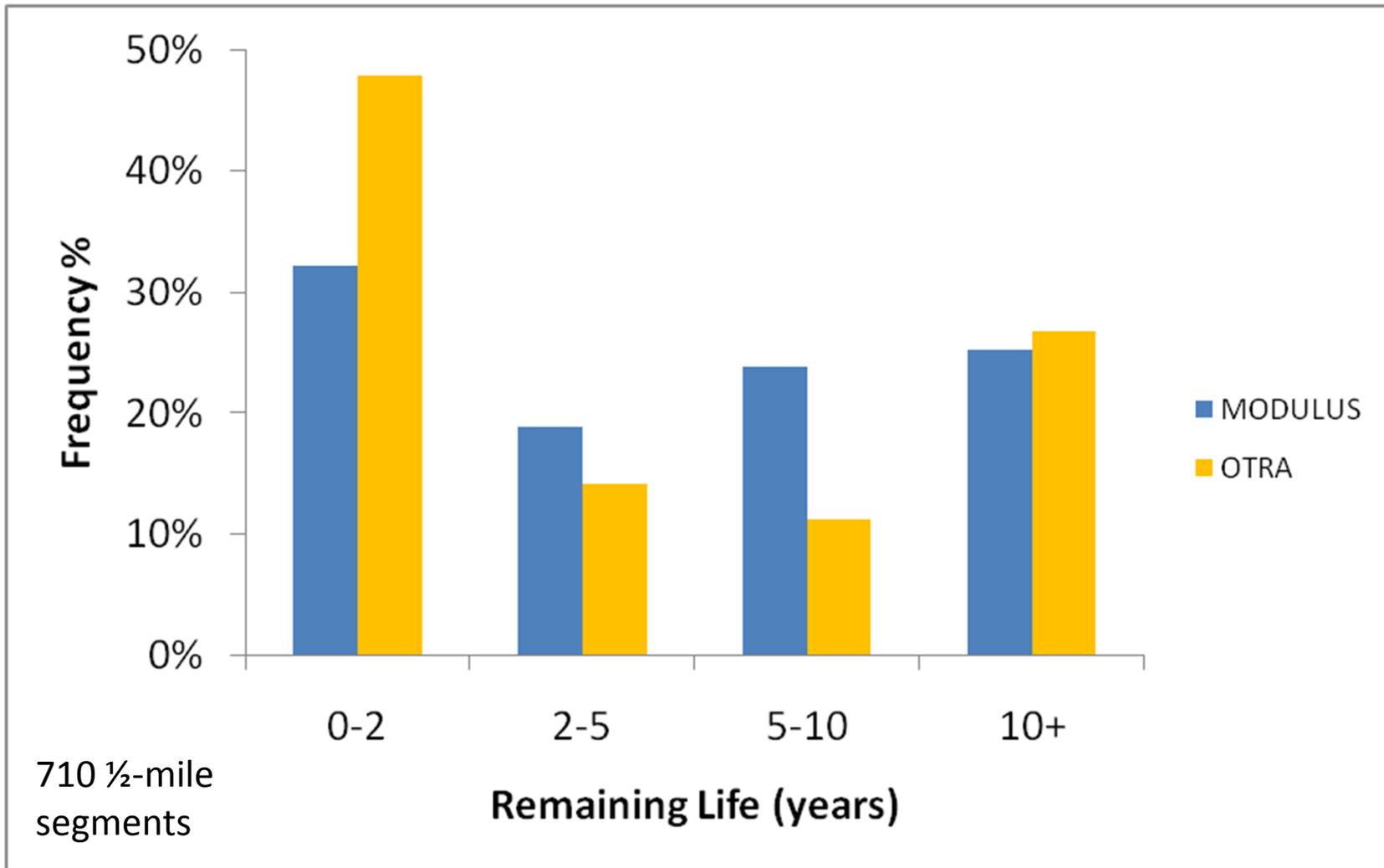
TxDOT Research Project 0-6498

Completed August 2012

Texas Transportation Institute

The Texas A&M University System

Remaining Life Analysis - Summary



Saltwater Disposal Facility Impact

Saltwater Disposal Facility				Pavement Life (Years) for No. of Design ESALs		
Capacity barrels/day	No. truck loads per day	No. truck loads per year	No. ESALs used per year	750,000	2,500,000	7,000,000
1,000	10	3,494	8,581	87.4	291.3	815.8
3,000	29	10,483	25,743	29.1	97.1	271.9
10,000	97	34,944	85,810	8.7	29.1	81.6
20,000	194	69,888	171,621	4.4	14.6	40.8
25,000	243	87,360	214,526	3.5	11.7	32.6
30,000	291	104,832	257,431	2.9	9.7	27.2
37,000	359	129,293	317,499	2.4	7.9	22.0

Impact on roads near the saltwater disposal facility is lower if energy developers recycle saltwater at the gas well location or use a pipeline to carry saltwater.

2CST 6-in flex 6-in LSS (FM 2095)	2CST 8-11 in flex 8-in LSS (SH 11)	3-in HMA 10-in CSB 8-in LSS (US 79)
--	---	--

2CST: Two-course surface treatment
HMA: Hot-mix asphalt
CSB: Cement-stabilized base
LSS: Lime-stabilized subgrade



Loaded Trucks Per Gas Well

(Based on Information from Fort Worth)

- 1,184 loaded trucks to bring one gas well into Production, plus
- 353 loaded trucks per year to maintain, plus
- 997 loaded trucks every 5 Years to re-frac the well

This is equivalent to roughly 8 Million cars plus an additional 2 Million cars per year to maintain



“Before and After” Oil & Gas Well Production

FY	ADT
2010	200
2012	3200

Estimated Annual Impacts

- Original Estimate for FM System: \$890 million
 - Additional 20% for heavier trucks
 - Additional 15% for higher road material prices
 - Very conservative: well over \$1 billion annually
- Extrapolating to local roads
 - Similar number of lane miles
 - Lower original design requirements
 - Estimated impacts well over \$1 billion annually



Case Study

- Dimmit County
 - FM 2688 (12.61 Miles)
- Reactive vs. Proactive
 - Reactive: roads are fixed or maintained after damage has occurred.
 - Proactive: maintains roads before damage is done to preserve the quality of the road.



FM 2688 : Reactive vs. Proactive in 20 Years

<u>Scenarios</u>	<u>Reactive Cost</u>	<u>Proactive Cost</u>
0 more	\$13,756,000	\$2,004,536
1 more	\$19,271,448	\$2,004,536
5 more	\$23,303,952	\$4,654,149
10 more	\$27,452,880	\$5,723,553

Note: Scenarios refer to the additional numbers of well permits assumed

FM Roadway Repairs



Failure, flushing



Full-depth reclamation

FM Roadway Repairs



FM Roadway Repairs



Weigh / Inspection Stations

- Working jointly with DPS to identify areas needing enforcement
- Developing new temporary sign standards for use
- Utilizing abandoned rest areas for temporary inspection stations
- Working with local entities to upgrade existing weigh stations

Recently Constructed Inspection Station



New Constructed Weigh Station



Intersection Safety Improvements



Intersection Safety Improvements



Intersection Safety Improvements



Immediate Improvement Needs

Type of Work

- Bridge Rehab: \$ 6,215,300
- Bridge Replace: \$ 16,385,000
- Bridge Widening: \$ 9,955,000
- Bridge Work: \$ 32,555,300
- Intersection Improvements: \$ 11,982,140
- Pavement/Edge Repair: \$ 73,941,095
- Pavement Repair & Resurface: \$ 85,508,982
- Pavement Rehab: \$ 77,518,865
- Pavement Widening: \$ 91,658,535

Total: \$373,164,917

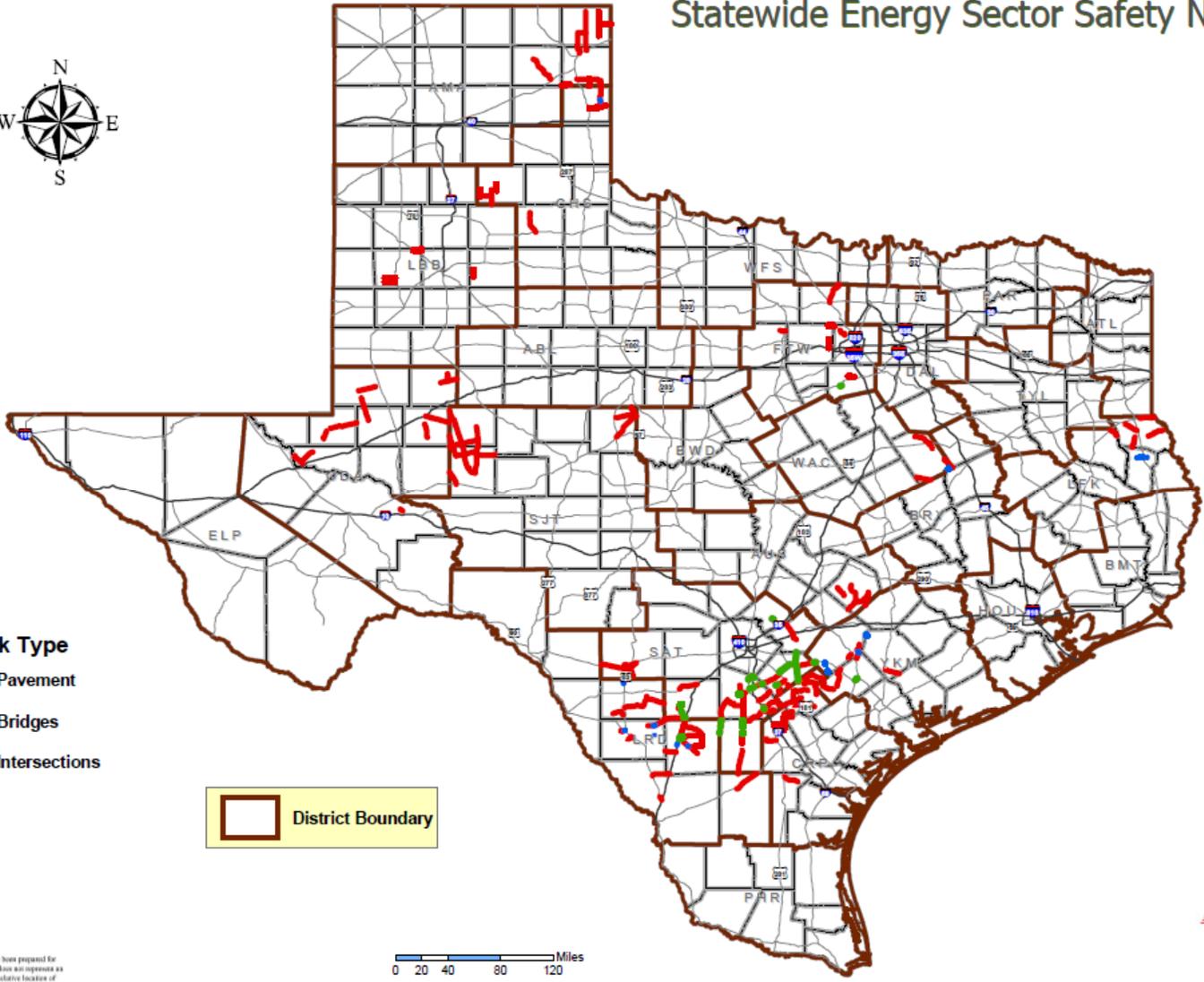
Statewide Energy Sector Safety Needs



- Work Type**
- Pavement
 - Bridges
 - Intersections



This product is for informational purposes and may not have been prepared for or be suitable for legal, engineering, or surveying purposes. It does not represent an on-the-ground survey and represents only the approximate relative location of property boundaries.



Energy Sector Improvements

- **Approximately \$3 million of in-house work in impacted areas**
 - Base repair, Level Up, Spot Seal, Pot-hole repair, edge repair
 - FM 1920 Lipscomb/Hemphill Counties over \$700,000 to restore roadway
- **Sharing resources (Districts & Divisions)**





*Texas
Department of
Transportation*

*Thank
You*