

# Accommodating Oversize and Overweight Loads



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Source: TxDOT

# Project Motivation

- **NETx Working Group Recommendations**

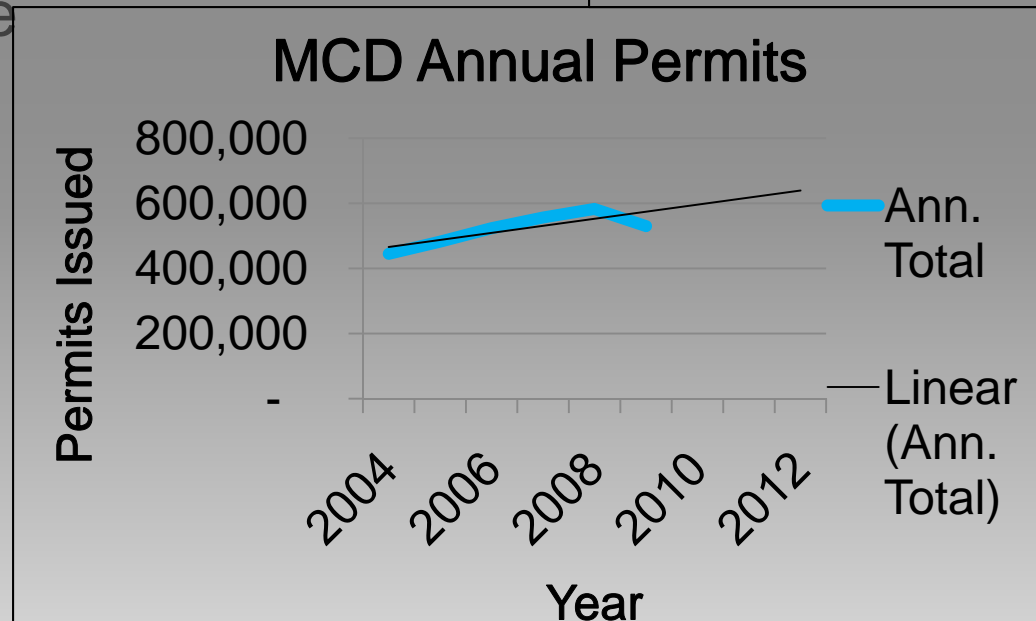
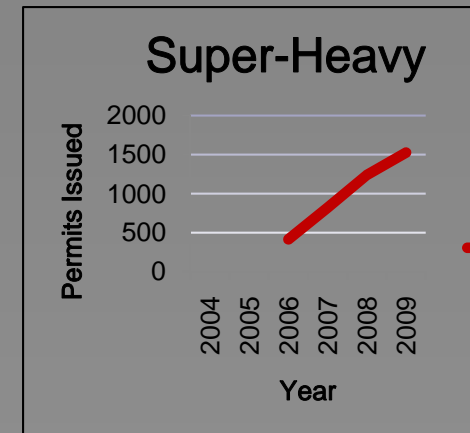
- Improve communications
- Improve route options for OS/OW loads
- Reduce seal coat damage

- **MCD permit trends**

- Wts & sizes increasing

- **Promote commerce**

- Keep routes open



# Research Objectives

- Identify a set of OS/OW dimension and weight groups and O-D routing needs
- Identify restrictions impacting the movement of OS/OW and quantify their impacts

# Research Activities

- Literature review
- Acquire historical data from MCD
- Gather stakeholder input
- Review TxPROS
- Develop deliverables



# Research Findings



Source: Trailblazer Pilot Car

# Major Permit Types (2009)

Permit Type	Percent
General (single trip permits)	62.3%
Manufactured housing	12.5%
Over-axle weight tolerance (1547)	5.8%
Portable buildings	3.9%
30/60/90 day width	3.6%
HUB	3.5%
Temporary Registration	2.9%
30/60/90 day length	1.5%
Concrete Beam/Girder (HB2093)	1.1%
All others	<1% each

# Description of Loads – Heights

FY	Truck Height (ft.)				
	<12	≥12 but <14	≥14 but <16	≥16 but <18	>18
2004	358 (0.2%)	64,326 (39.7%)	91,672 (56.6%)	5,051 (3.1%)	697 (0.4%)
2005	418 (0.2%)	67,704 (39.9%)	95,352 (56.2%)	5,463 (3.2%)	647 (0.4%)
2006	373 (0.2%)	76,940 (41.2%)	100,252 (53.7%)	8,407 (4.5%)	713 (0.4%)
2007	282 (0.1%)	71,310 (36.7%)	111,778 (57.5%)	<b>10,220 (5.3%)</b>	646 (0.3%)
2008	427 (0.2%)	71,772 (35.7%)	115,929 (57.7%)	<b>12,114 (6.0%)</b>	821 (0.4%)
2009	537 (0.3%)	66,482 (37.7%)	97,412 (55.3%)	<b>10,976 (6.2%)</b>	792 (0.4%)

# Description of Loads – Widths

FY	Truck Width (ft.)					
	<9	≥9 but <11	≥11 but <13	≥13 but <15	≥15 but <17	>17
2004	3,173 (2.0%)	12,498 (7.7%)	36,369 (22.4%)	64,962 (40.1%)	39,091 (24.1%)	<b>6,011</b> (3.7%)
2005	2,878 (1.7%)	12,368 (7.3%)	40,039 (23.6%)	66,798 (39.4%)	41,122 (24.2%)	<b>6,379</b> (3.8%)
2006	4,374 (2.3%)	14,376 (7.7%)	42,456 (22.7%)	76,361 (40.9%)	42,135 (22.6%)	<b>6,983</b> (3.7%)
2007	4,523 (2.3%)	16,768 (8.6%)	46,622 (24.0%)	78,193 (40.3%)	41,066 (21.1%)	<b>7,064</b> (3.6%)
2008	5,733 (2.9%)	17,860 (8.9%)	47,926 (23.8%)	78,114 (38.9%)	43,851 (21.8%)	<b>7,579</b> (3.8%)
2009	7,573 (4.3%)	16,714 (9.5%)	41,097 (23.3%)	66,021 (37.5%)	37,771 (21.4%)	7,023 (4.0%)



# Description of Loads – Lengths

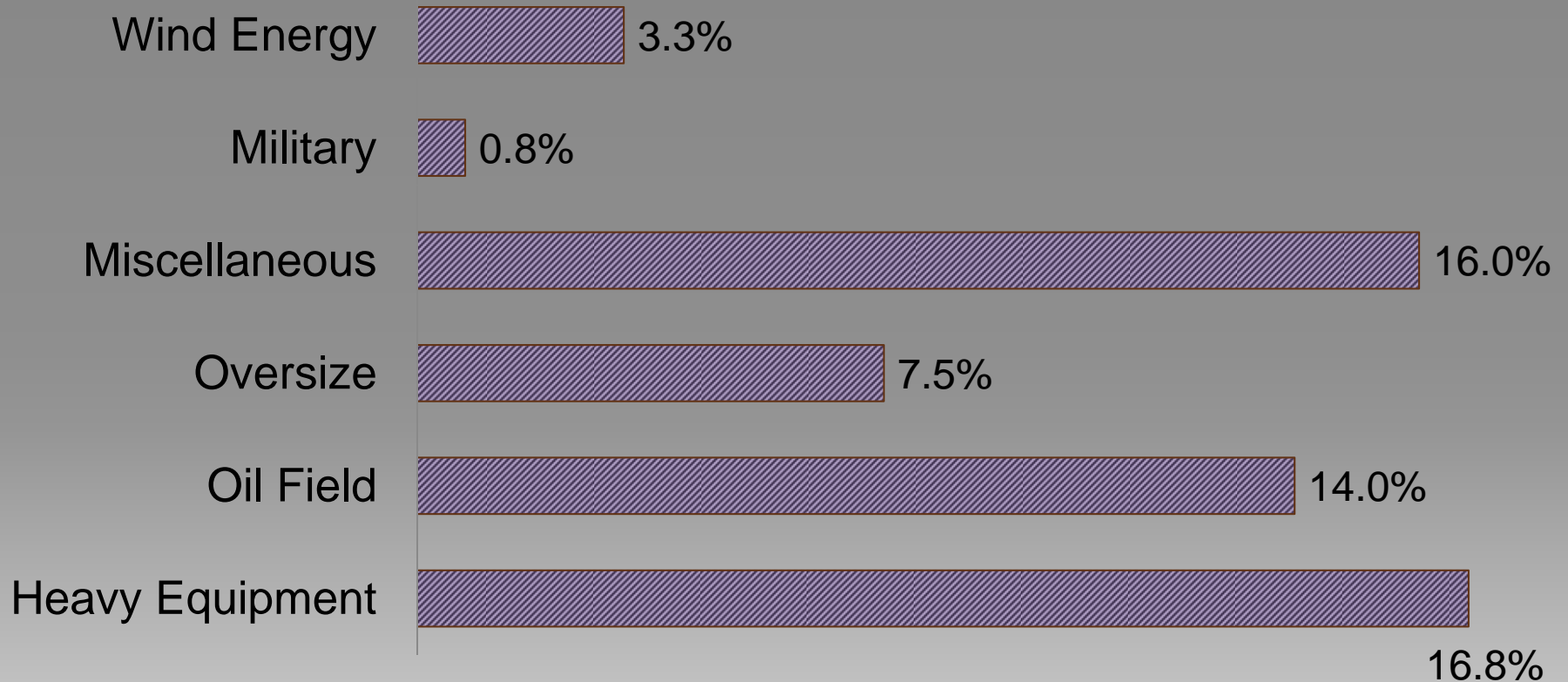
FY	Truck Length (ft.)				
	<80	≥80 but <100	≥100 but <120	≥120 but <140	>140
2004	20,105 (12.4%)	99,463 (61.4%)	39,659 (24.5%)	2,151 (1.3%)	726 (0.4%)
2005	21,068 (12.4%)	105,157 (62.0%)	39,500 (23.3%)	2,881 (1.7%)	978 (0.6%)
2006	21,693 (11.6%)	109,899 (58.9%)	48,896 (26.2%)	3,879 (2.1%)	2,318 (1.2%)
2007	20,896 (10.8%)	109,271 (56.3%)	56,076 (28.9%)	3,944 (2.0%)	<b>4,049 (2.1%)</b>
2008	20,723 (10.3%)	108,464 (53.9%)	61,036 (30.4%)	4,976 (2.5%)	<b>5,864 (2.9%)</b>
2009	19,029 (10.8%)	94,503 (53.6%)	52,055 (29.5%)	4,269 (2.4%)	<b>6,343 (3.6%)</b>

# Identify OS/OW Groups

Category	Height (ft)	Width (ft)	Length (ft)	Gross Wt. (lb)
1	14.1 to 15	8.1 to 10	60 to 90	80k to 120k
2	15.1 to 16	10.1 to 12	90.1 to ( <b>120</b> )	120,001 to 150k
3	16.1 to 17	12.1 to 14	120.1 to 150	150 to 175k ( <b>168k</b> )
4	17.1 to ( <b>18</b> )	14.1 to 16	150.1 to 180	175,001 to 200k
5	18.1 to 19	16.1 to 18 ( <b>17</b> )	>180	200,001 to 254k
6	19.1 to 20	18.1 to 20	N/A	>254,300
7	N/A	>20	N/A	N/A

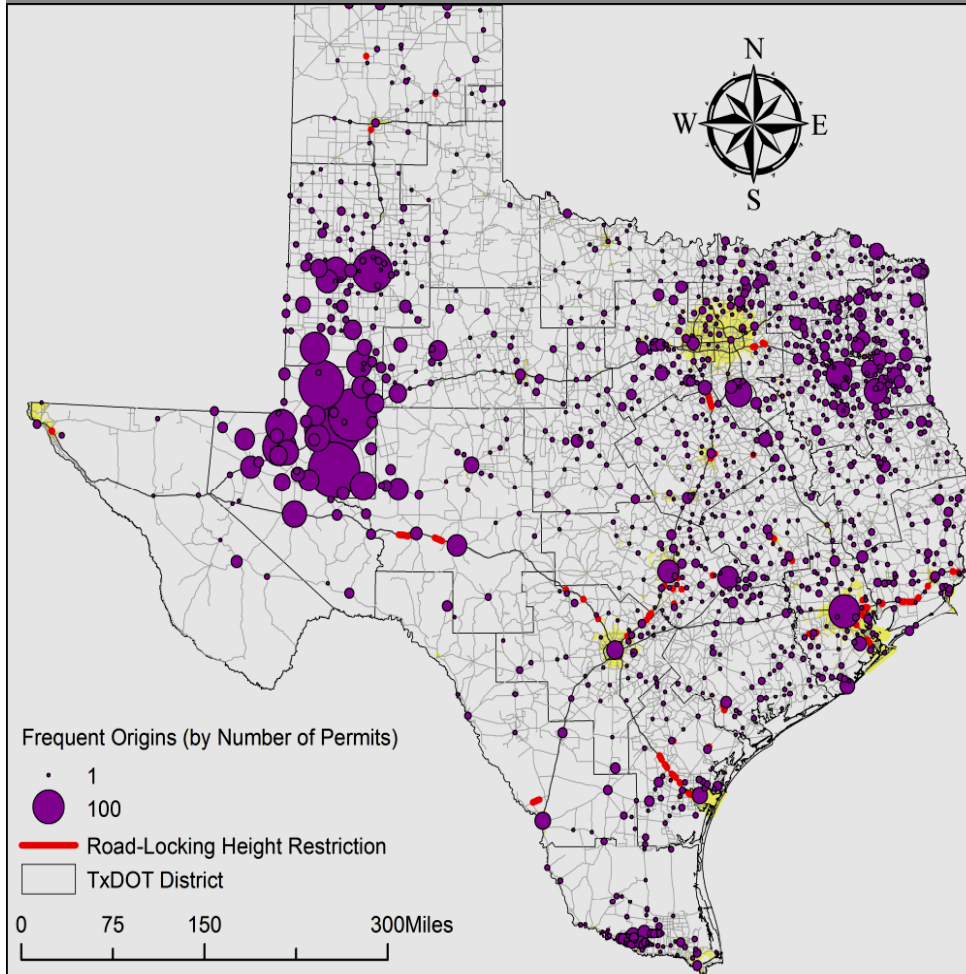
Shaded cells reach maximum at 95<sup>th</sup> percentile. (indicated in red)

# Load Categories

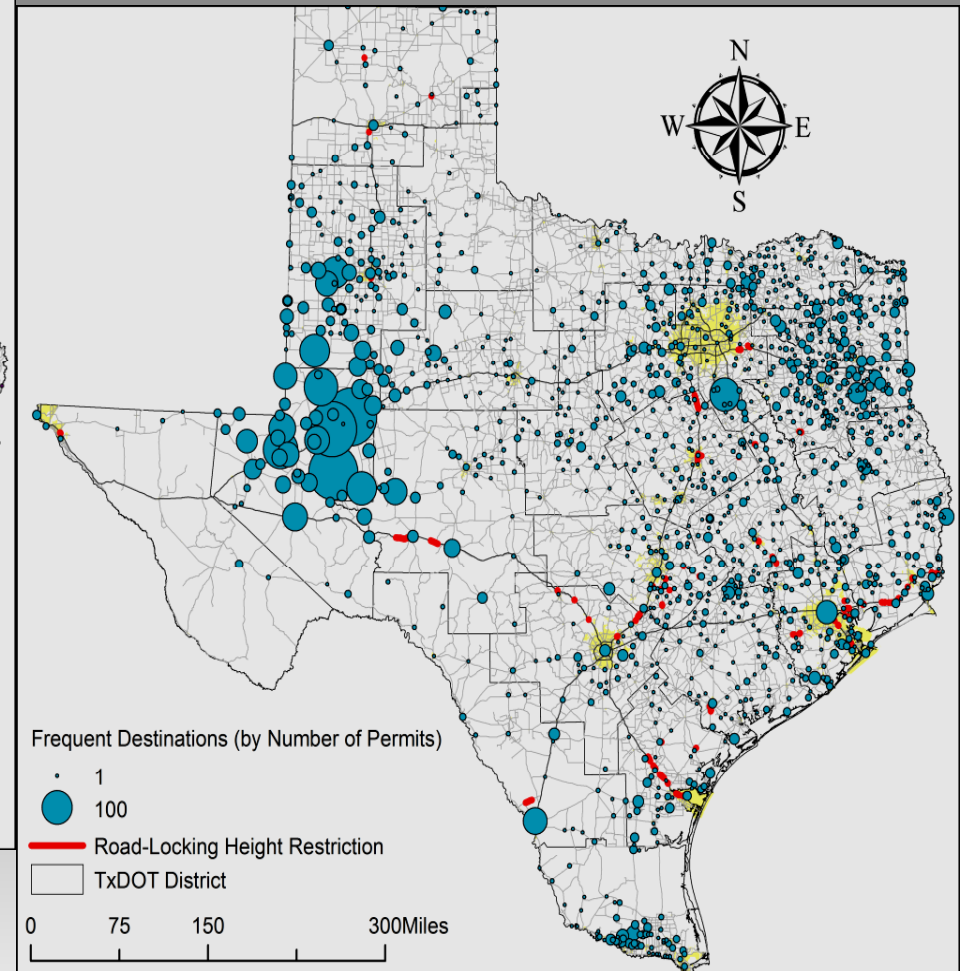


# The Rest of the Challenge

## Origins for Top 5% OS Loads (FY09)



## Destinations for Top 5% OS Loads (FY09)





# Most Common Commercial Vehicle vs. 95% Vehicle vs. “Super-Heavy”



8.5 ft W, 14 ft H, 65 ft L, 80,000 lb

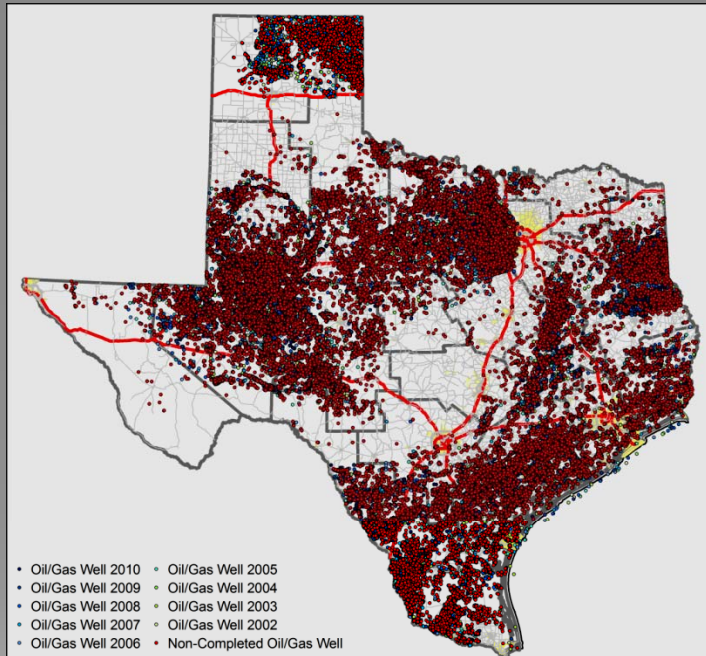
VS.

17 ft W, 18 ft H, 120 ft L, 168,000 lb

VS.

33.5 ft W, 45 ft H, 256 ft L, 1.8 M lb

# Planned Energy Production in Texas



## Oil and Gas Production

Source: TxDOT  
Research Project 0-6498

Siemens 2.3 MW	Quantity	Truck Hauls
Concrete for Pad	600–710 T	35
Base Material for Pad	5,000 T	223
Service Road	1,000–2,250 T	78

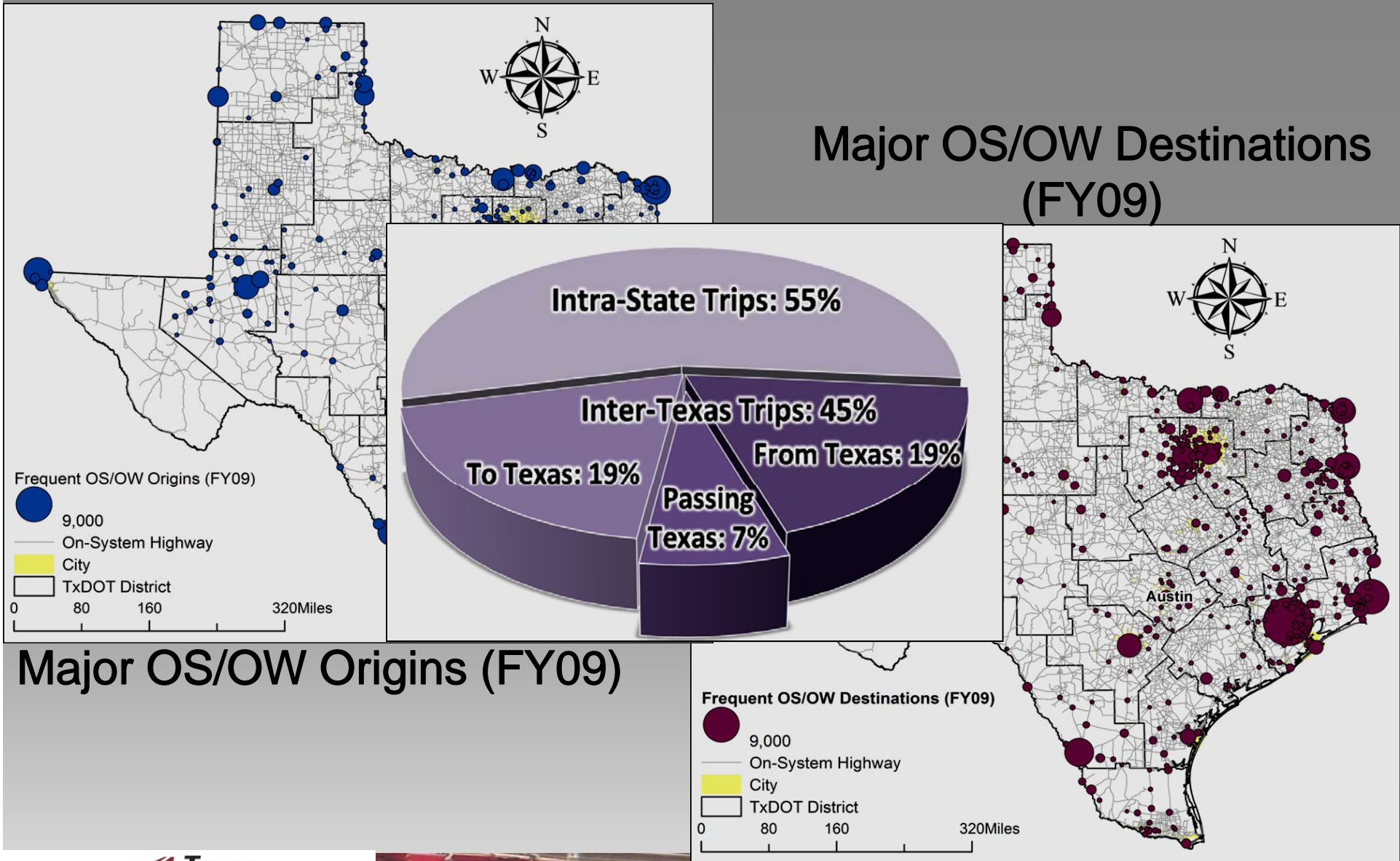
## Wind Energy Production

Source: TxDOT  
Research Project 0-6513

# Spatial Analysis Using ArcGIS

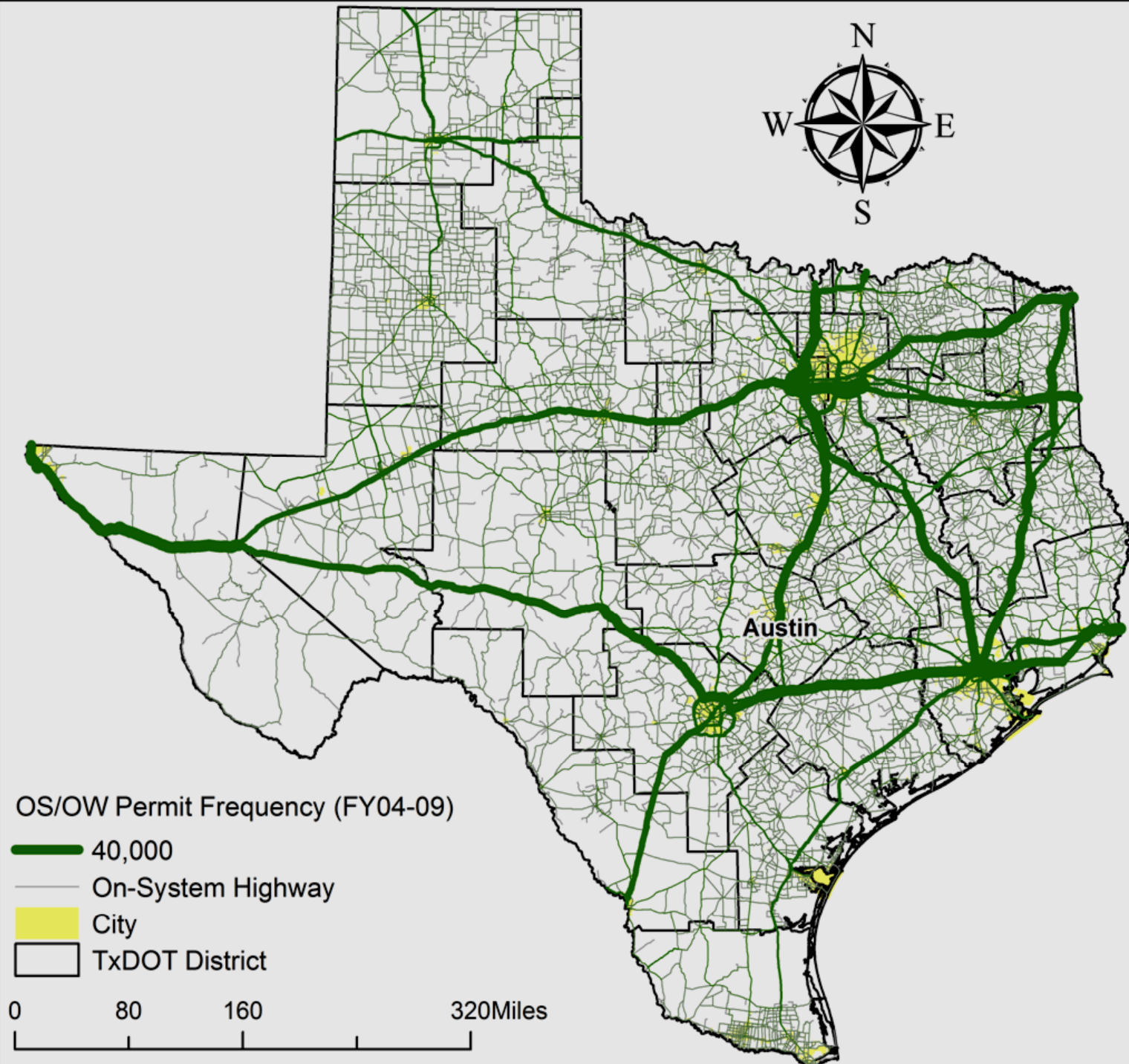
*Source:* Trailblazer Pilot Car

## Major OS/OW Destinations (FY09)

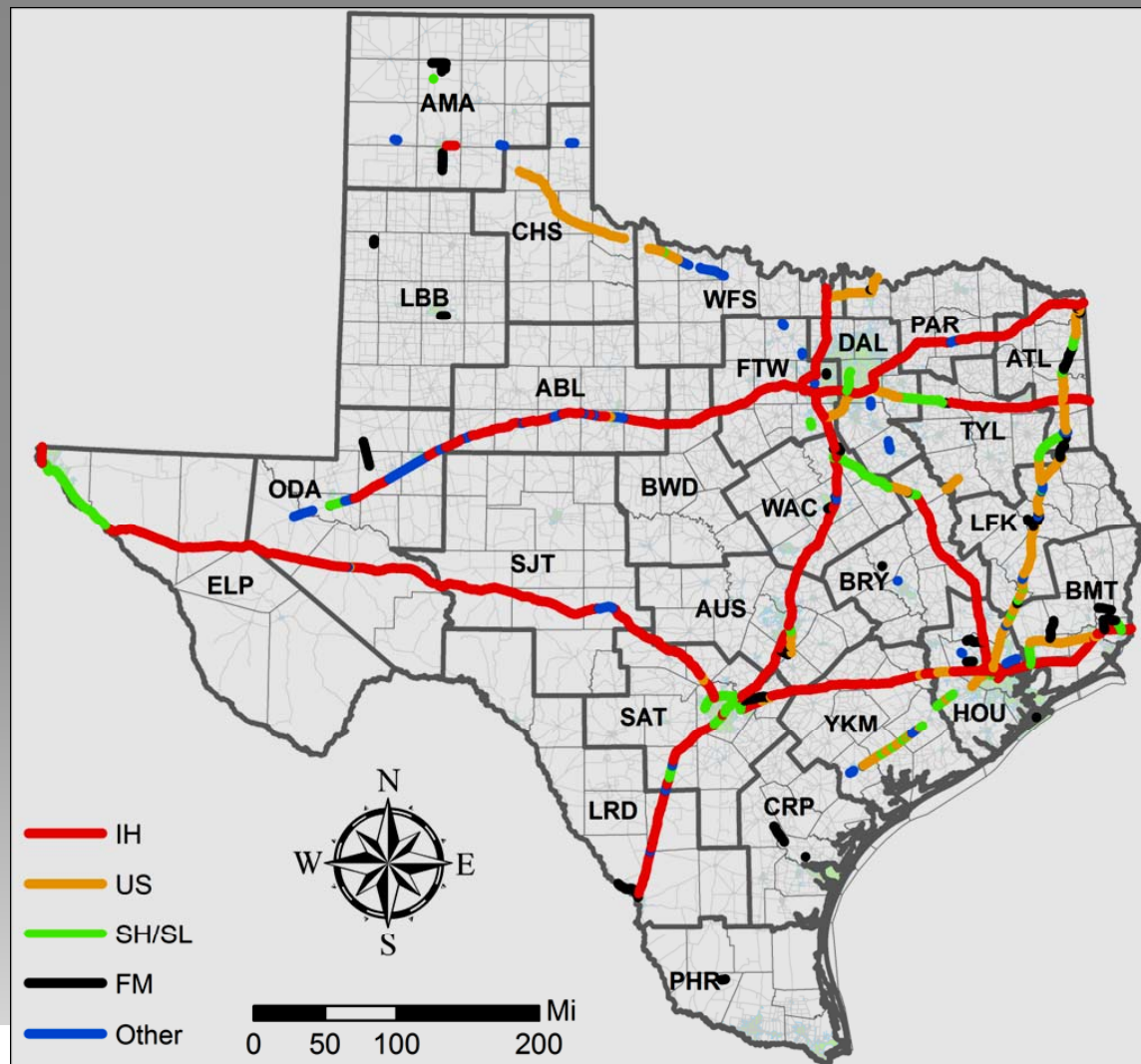


## Major OS/OW Origins (FY09)





# Top 50 OS/OW Corridors by Hwy Type

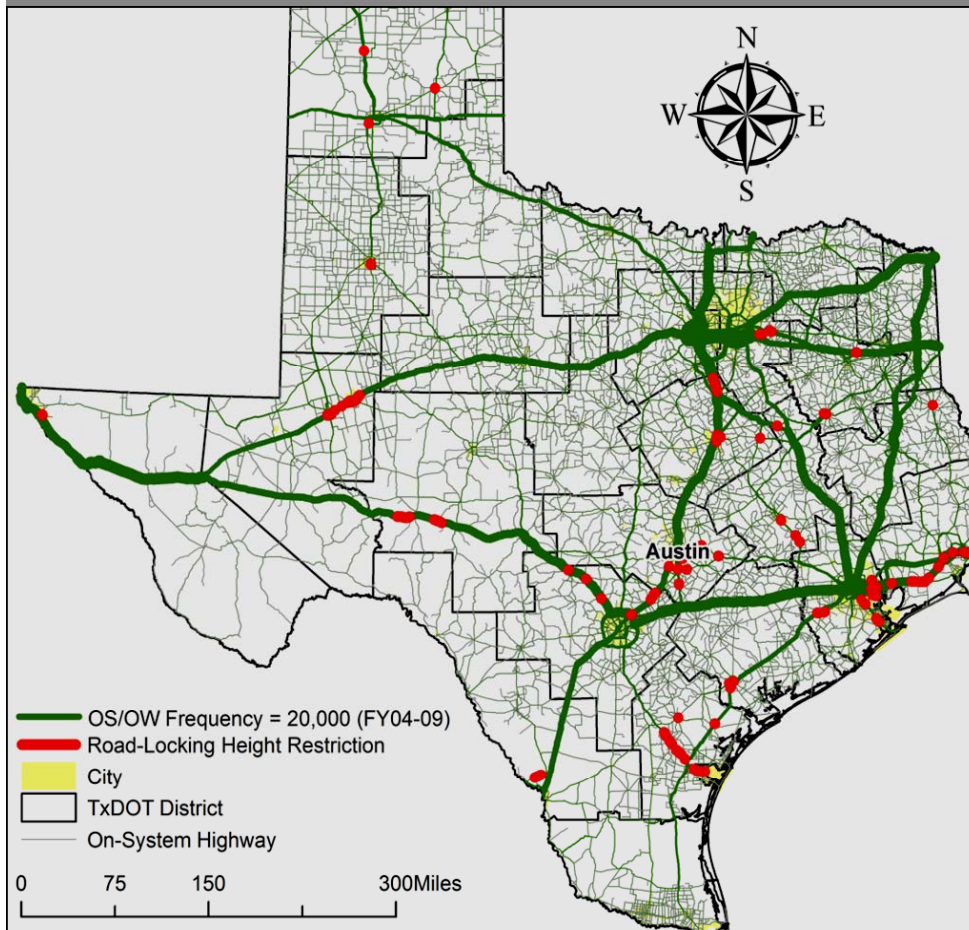


# Restriction Analysis

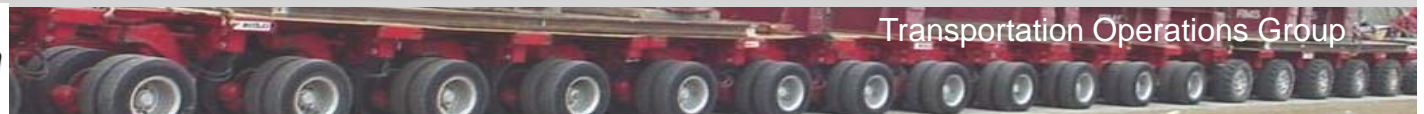
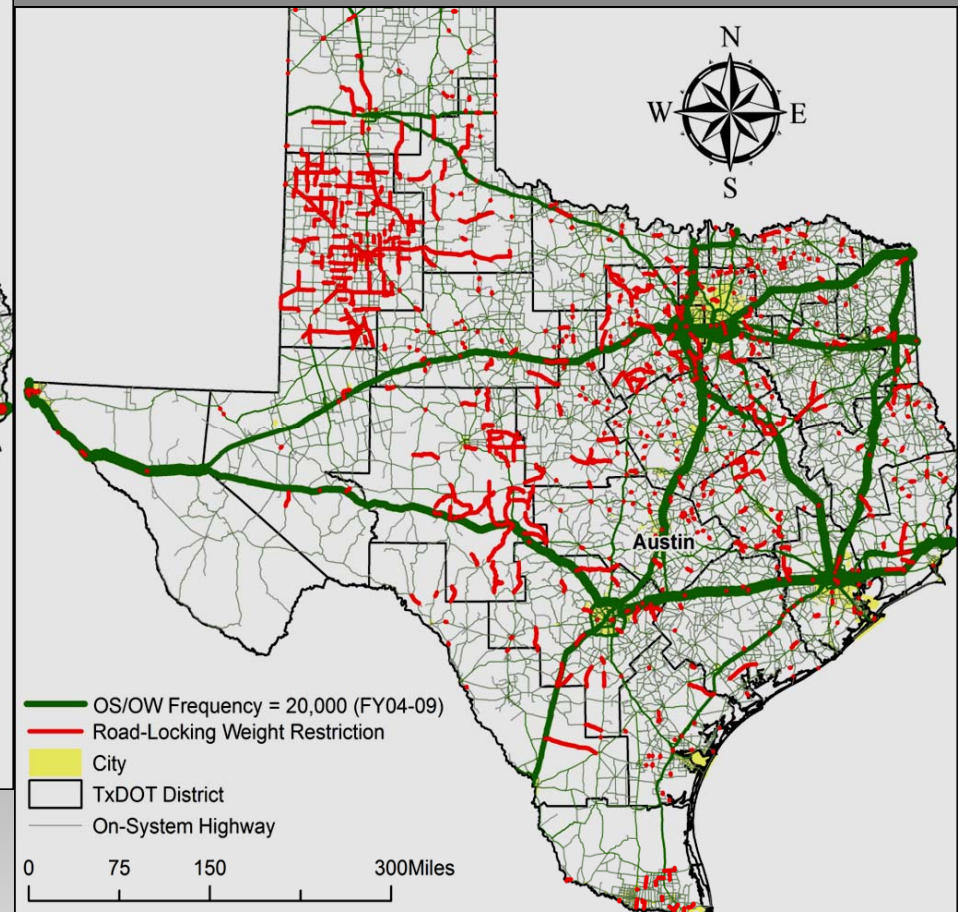
- Apply “restrictions” from ProMiles
  - Compare actual vs. optimum routes
- Criteria for determining improvements
  - Number of loads bypassing per unit time
  - Difference in optimal route and actual route
  - Cost to motor carriers for extra mileage



## Major “Road-Locking” Height Restrictions

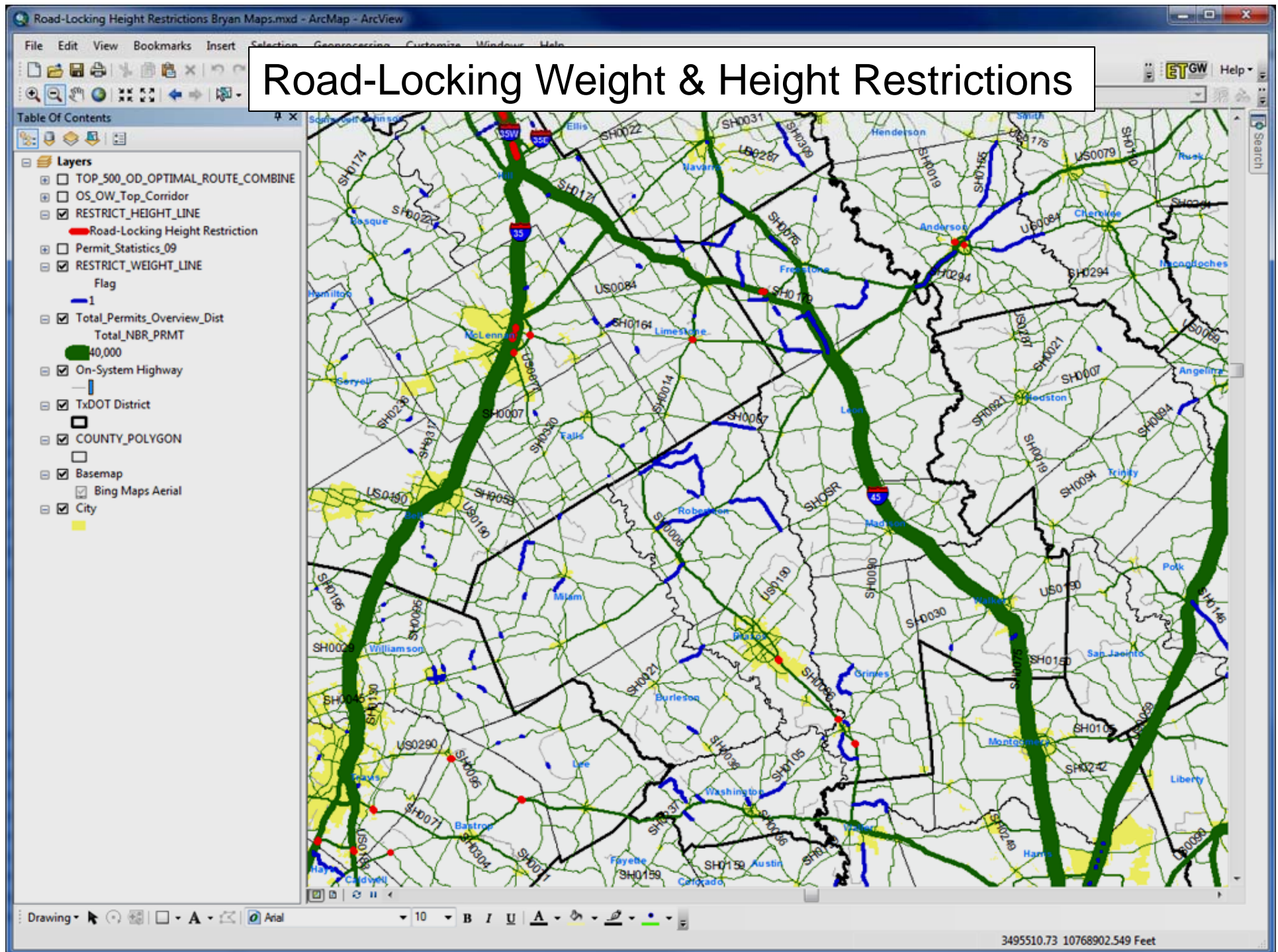


## Major “Road-Locking” Weight Restrictions





# Road-Locking Weight & Height Restrictions







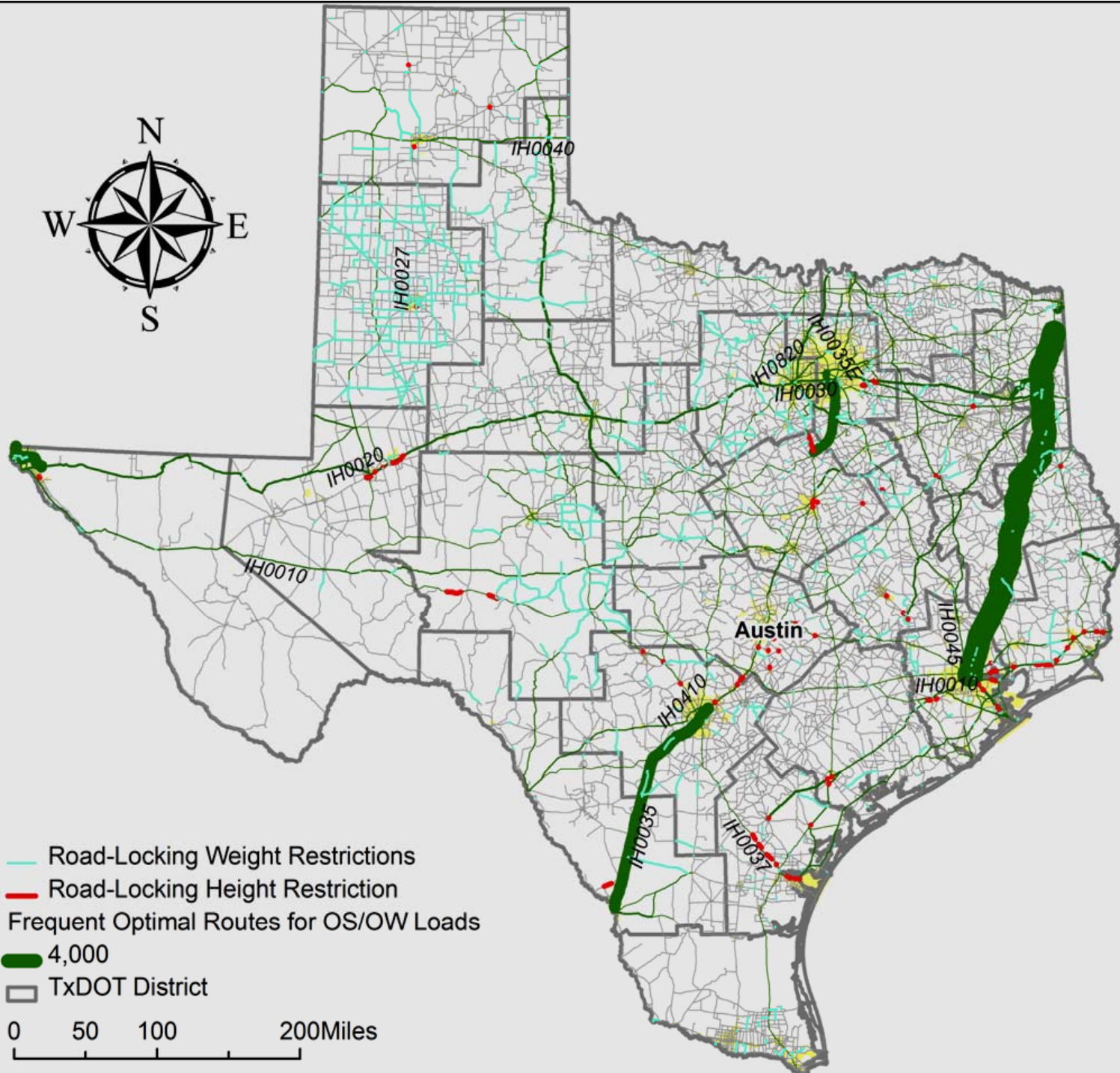
# Actual vs. Optimal Routes

Fiscal Year	Average Actual Route Distance (Miles)	Average Optimal Route Distance (Miles)	Average Difference		Median Difference	
			Miles	Percent	Miles	Percent
2004	58.8	41.5	17.2	29.3%	5.7	9.7%
2005	84.3	60.0	24.3	28.8%	8.8	10.4%
2006	82.1	61.7	20.5	25.0%	9.3	11.3%
2007	80.3	53.5	26.8	33.4%	10.5	13.1%
2008	73.1	49.9	23.2	31.7%	11.3	15.5%
2009	70.3	50.1	20.2	28.7%	9.2	13.1%
Total	74.0	52.2	21.8	29.5%	8.5	11.5%

# Summary: Actual vs. Optimal Routes

- Average difference of about 24 miles per trip
- OS/OW loads traveled about 504 million ton-miles more per year
- Additional cost of about \$73 million per year
- Additional CO<sub>2</sub> Emission of about 75,000 tons





# Continued Analysis Using TxPROS Digital Data

- Vehicle-Miles Traveled
- Pavement and bridge construction schedules
- Evolving corridors of choice

# Contact Information

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