

Accommodating Oversize and Overweight Loads



Source: Trailblazer Pilot Car

Research Motivation

- **MCD experiencing increase in permit activity**
FY07:
 - **554,000 permits (6% over FY06 and 33% over FY03)**
 - **821 superheavy permits (6% over FY06 and 337% over FY04)**
 - **Weight of loads increasing**
- **Related issues**
 - **Promote commerce**
 - **Ports are often load origins**
 - **Roads with low volume, often thin pavements**
- **Automated routing program (TxPROS)**

Research Objectives

- Identify a set of OS/OW dimension and weight groups and O-D routing needs
- Identify criteria for assigning these OS/OW groups to road networks as they currently exist
- Identify criteria for assigning these OS/OW groups to road networks upgraded to meet projected OS/OW freight demand

Conduct Literature and Internet Review

- Related projects
 - “LCVs and Road Trains...”
 - “Texas Energy Development...”
 - “Overweight Load Routing on Buried Utility...”



Evaluate MCD Historical Data and Gather Stakeholder Input

- Identify OS/OW dimension groups & routing needs
 - a. Analyze MCD historical permitting data
 - b. Stakeholder estimates of future loads/O-Ds
 - c. Gather information from districts, divisions, local govt. and enforcement

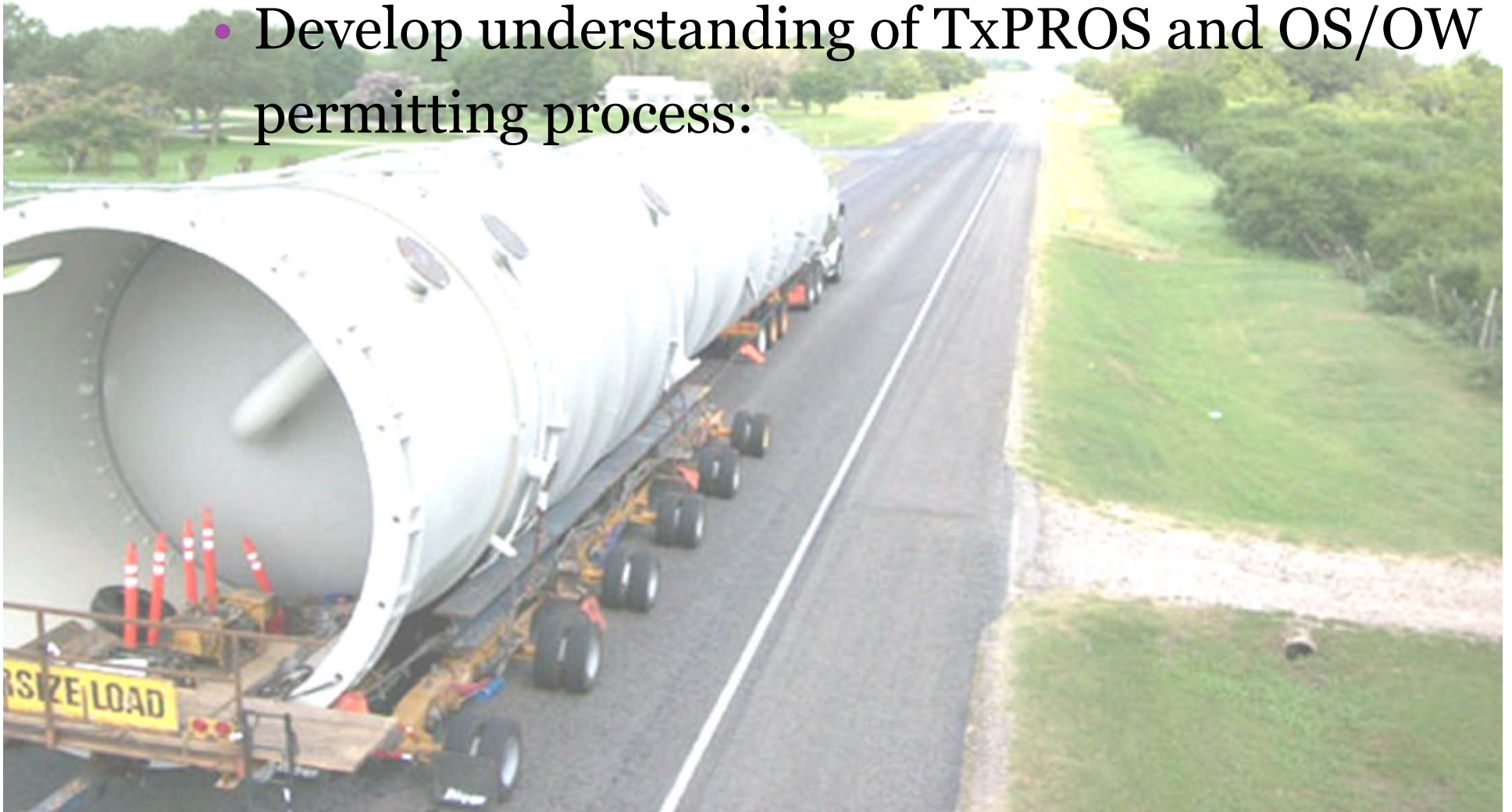


Status of Route Processing

Year	Original Tabular Permit Data			Processed GIS Permit Routes		
	Total Permits	Permits with Valid Route Descriptions	Permits with Processed Routes	No. of Complete Routes	No. of Permits for these Routes	Percent of Total Permits
2004	444,326	385,912	225,083	99,739	225,077	50.7%
2005	447,876	417,263	238,772	79,723	170,464	38.1%
2006	522,696	445,976	240,399	83,440	181,152	34.7%
2007	554,198	463,621	233,653	86,123	186,024	33.6%
2008	580,410	483,136	268,240	109,051	210,776	36.3%
2009	527,447	428,920	255,490	134,011	254,452	48.2%

Review TxPROS

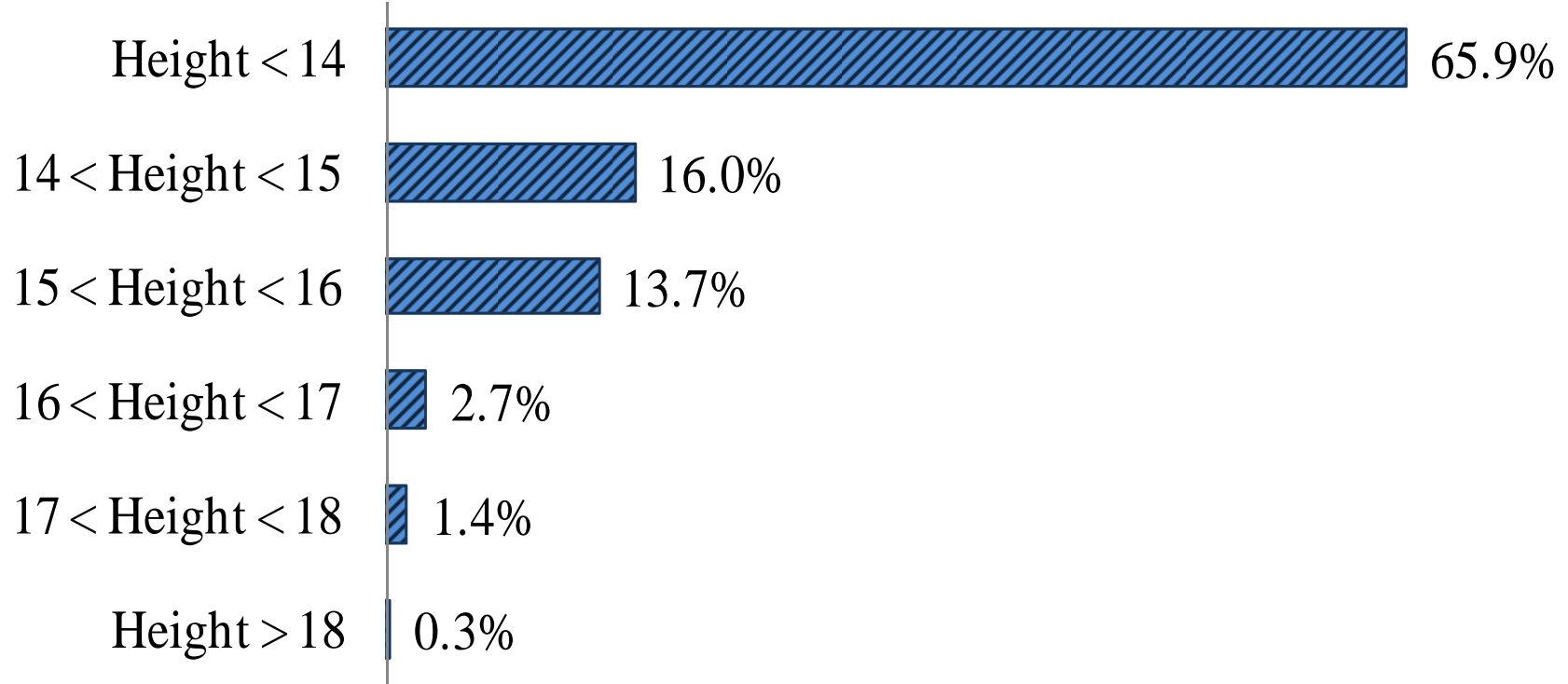
- Develop understanding of TxPROS and OS/OW permitting process:



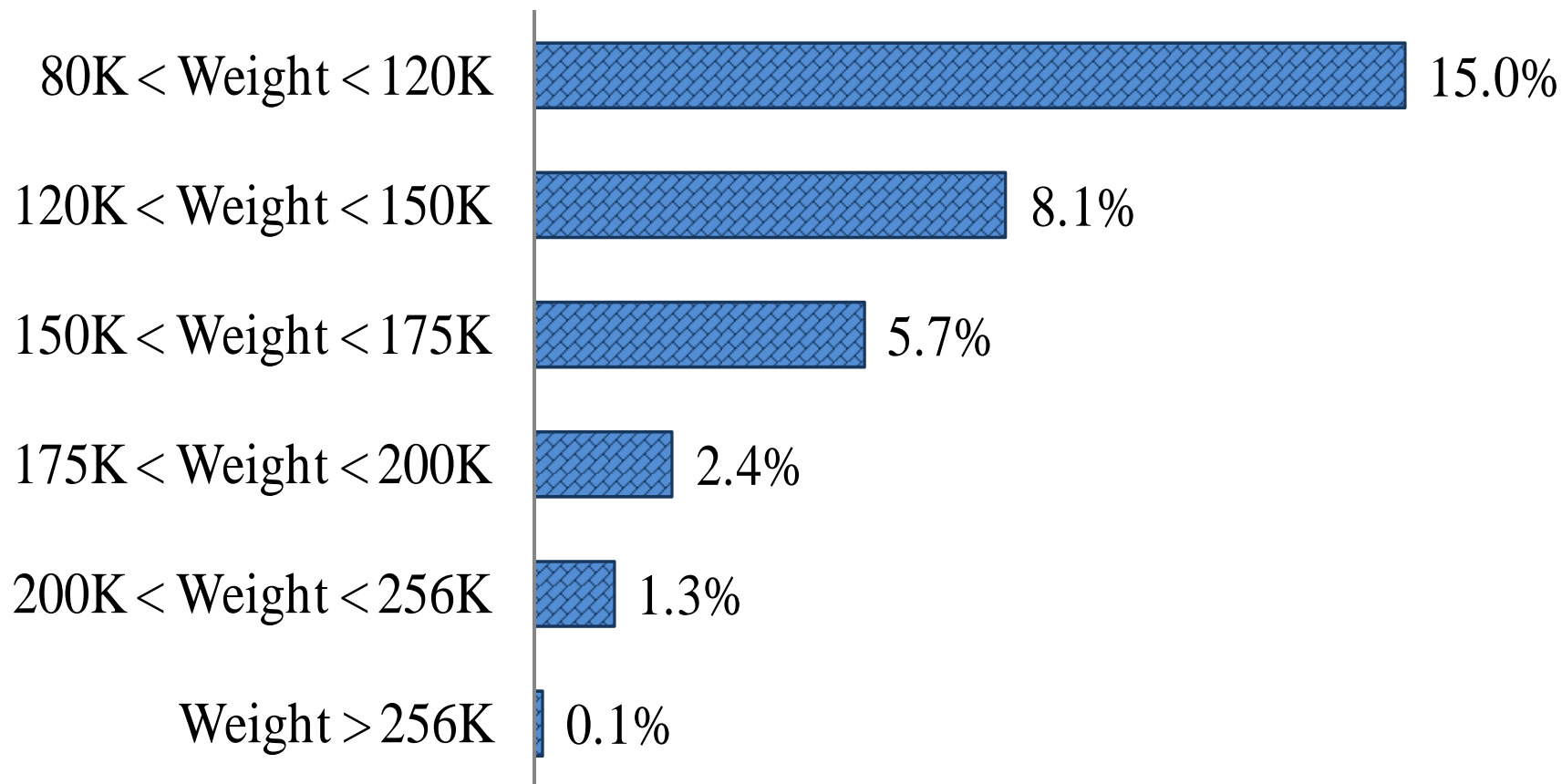
Identify Criteria for Assigning OS/OW Groups to Existing Road Network

- Develop means of rating each road segment against each OS/OW group
- Candidate criteria
 - Historical data
 - Heights
 - Weights: Axle load spectra or GVW
 - Widths
 - Lengths
 - Stakeholder and PMC input

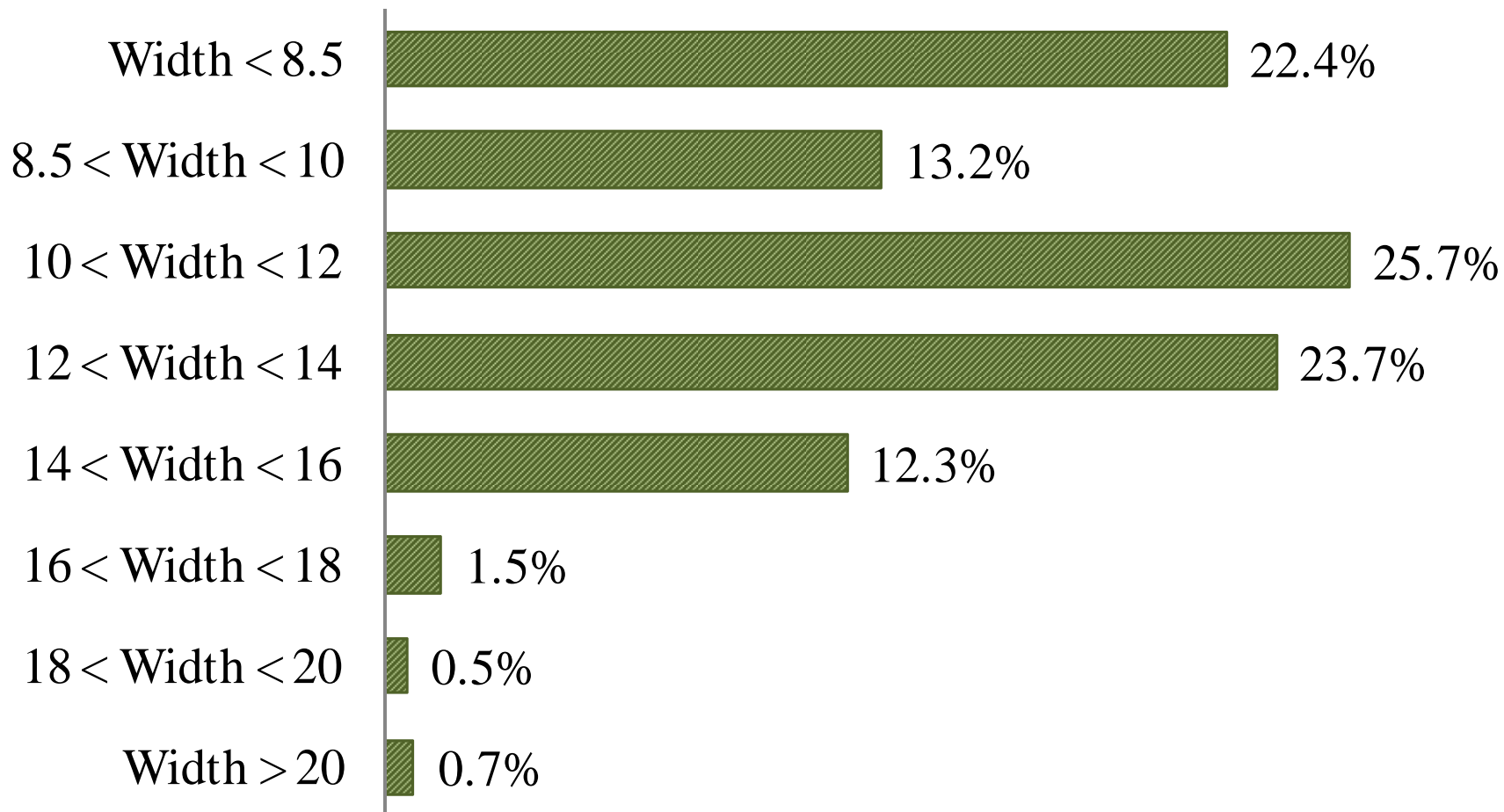
Vehicle Height Ranges (ft)



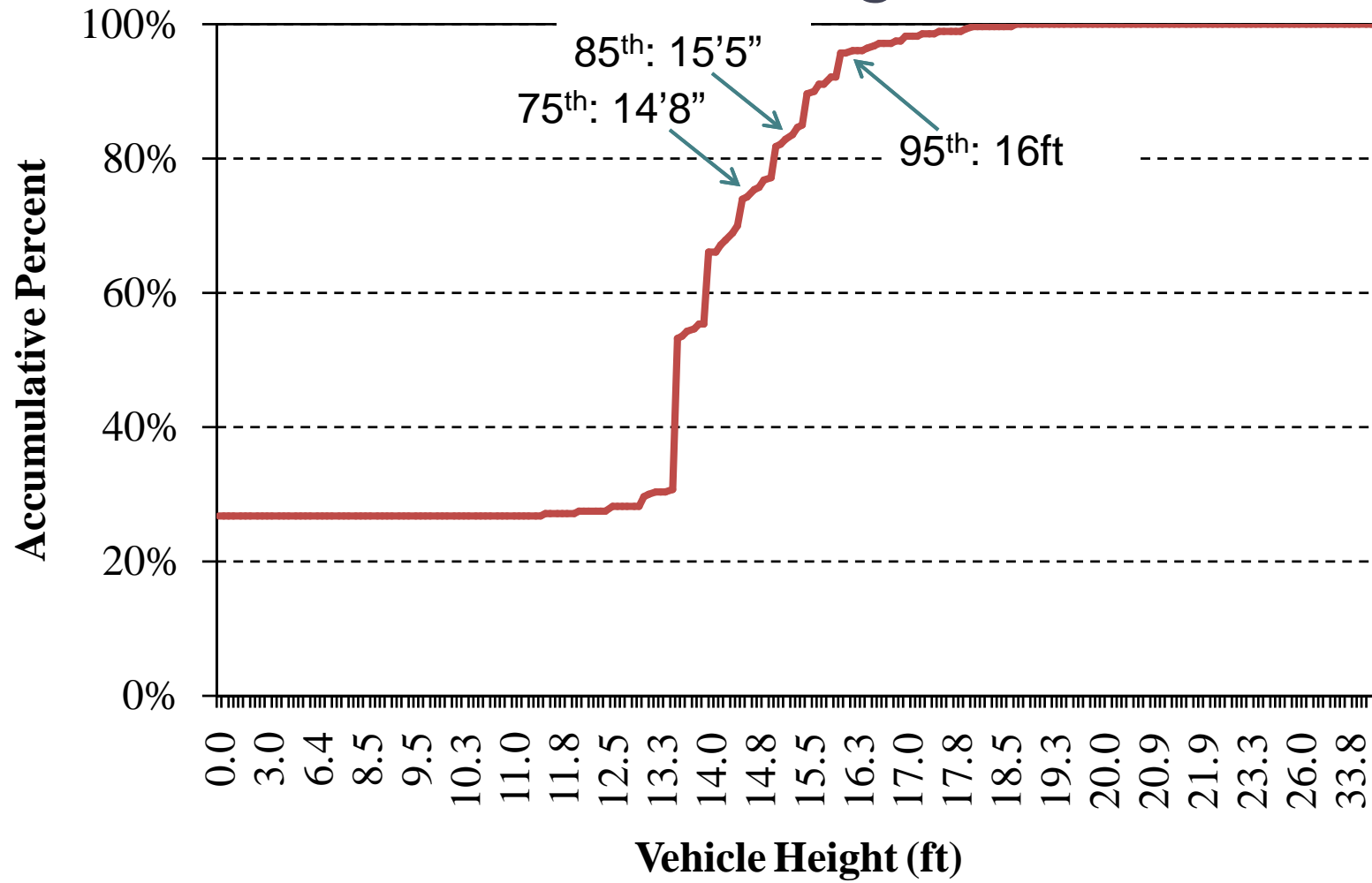
Vehicle Weight Ranges (lb)



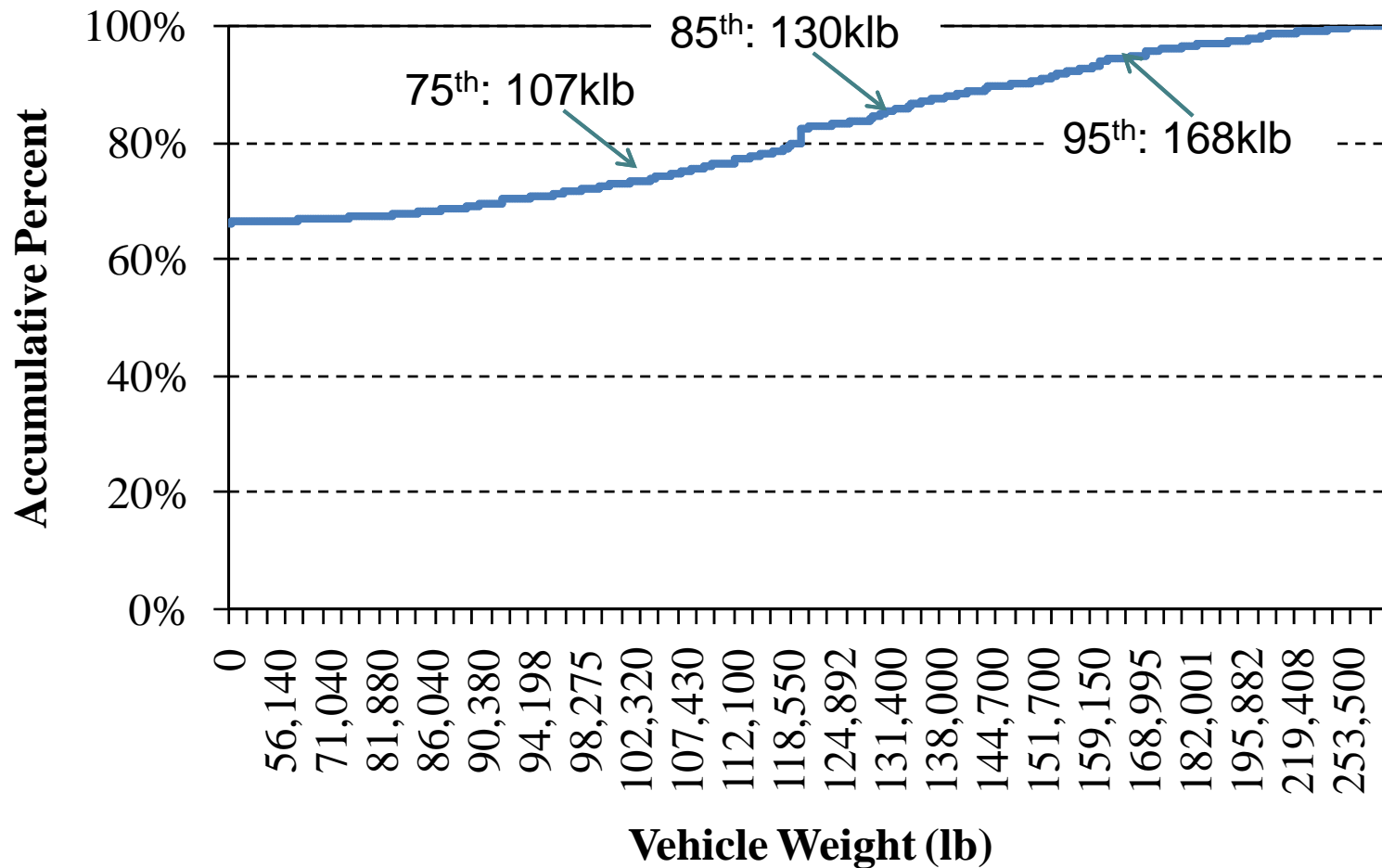
Vehicle Width Ranges (ft)



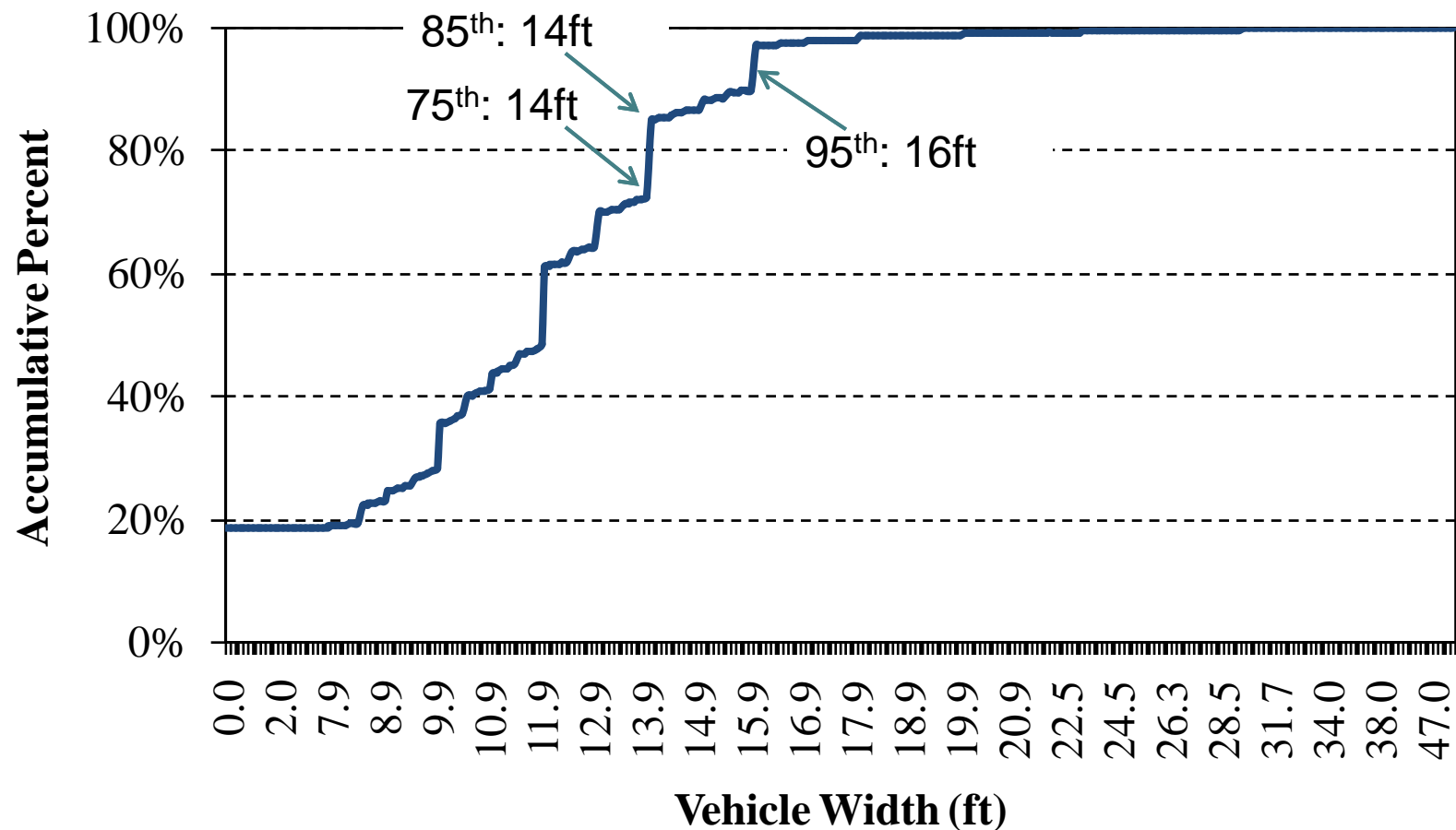
Cumulative Distribution - Vehicle Height



Cumulative Distribution - Vehicle Weight



Cumulative Distribution - Vehicle Width



Vehicle Percentiles by Year

Year	Vehicle Height			Vehicle Width			Gross Weight (lb)			Vehicle Length		
	75 th	85 th	95 th	75 th	85 th	95 th	75 th	85 th	95 th	75 th	85 th	95 th
2004	14'8"	15'2"	16.0'	14'	14'6"	16'	96,000	120,000	160,000	95'	100'	110'
2005	14'8"	15'3"	16'	14'	14'6"	16'	100,000	120,000	160,000	95'	100'	110'
2006	14'8"	15'3"	16'	14'	14'5"	16'	98,000	120,000	160,000	95'	103'	110'
2007	14'10"	15'6"	16'	14'	14'2"	16'	105,000	128,000	164,000	95'	105'	112'
2008	14'10"	15'6"	16'	14'	14'5"	16'	106,000	130,000	169,175	97'	110'	120'
2009	14'8"	15'5"	16'	14'	14'	16'	107,000	130,300	168,000	95'	110'	120'

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 120	120,001 to 150k
3	16.1 to 17	12.1 to 14	120.1 to 150	150,001 to 175k
4	17.1 to 18	14.1 to 16	150.1 to 180	175,001 to 200k
5	18.1 to 19	16.1 to 18	>180	200,001 to 256k
6	19.1 to 20	18.1 to 20	N/A	>256k
7	N/A	>20	N/A	N/A

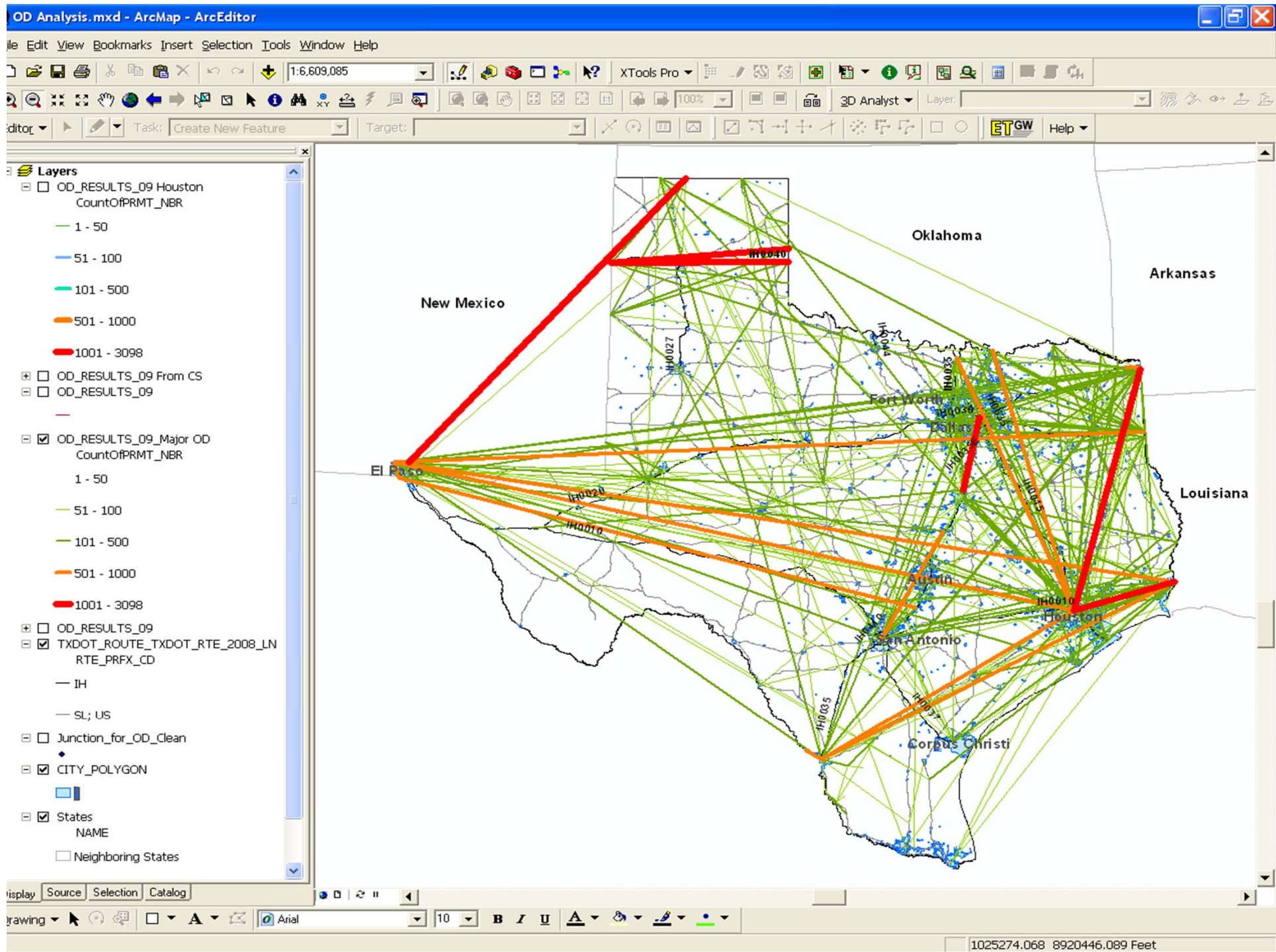
Shaded cells reach maximum at 95th percentile.

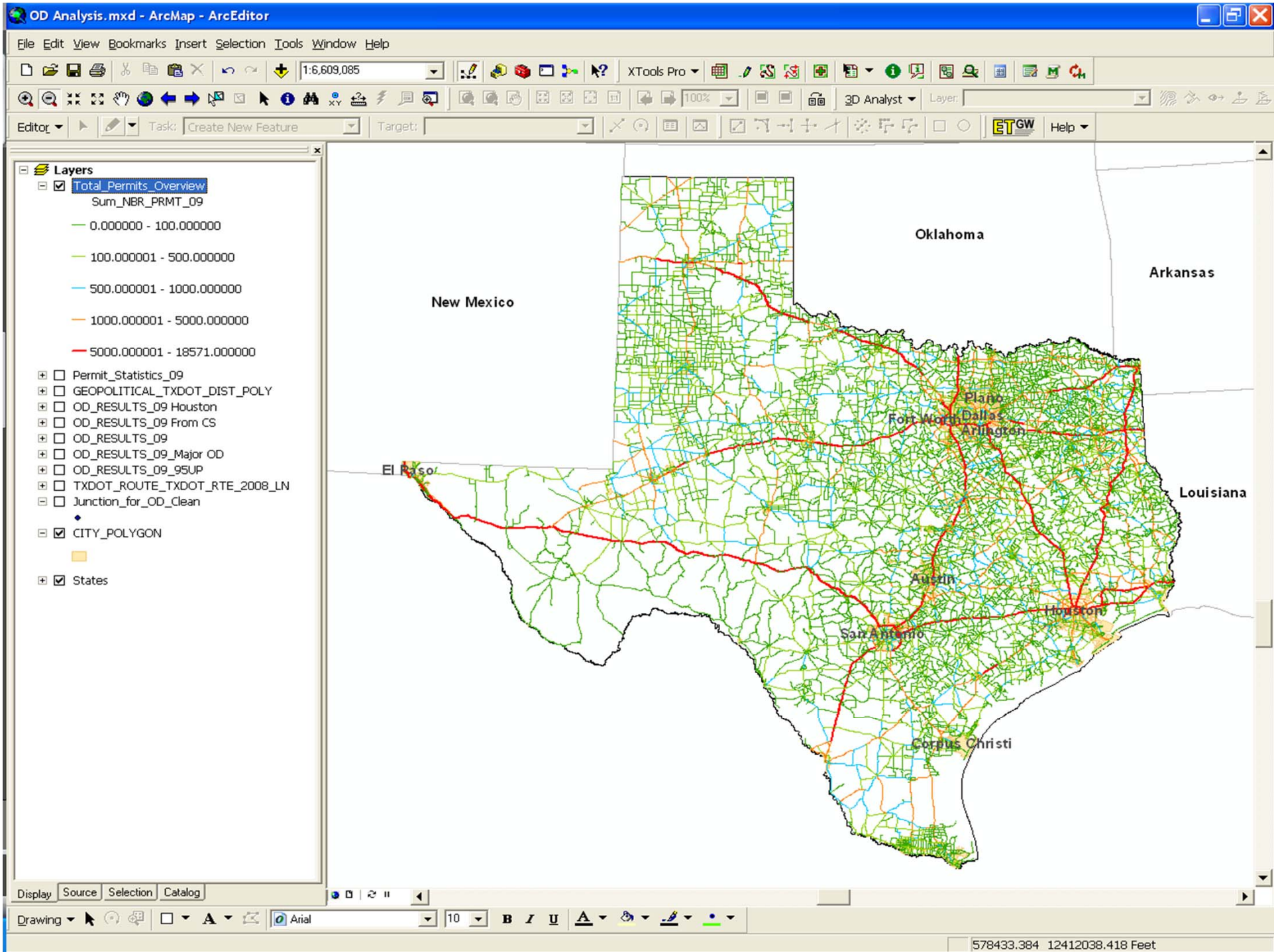
Steps Remaining

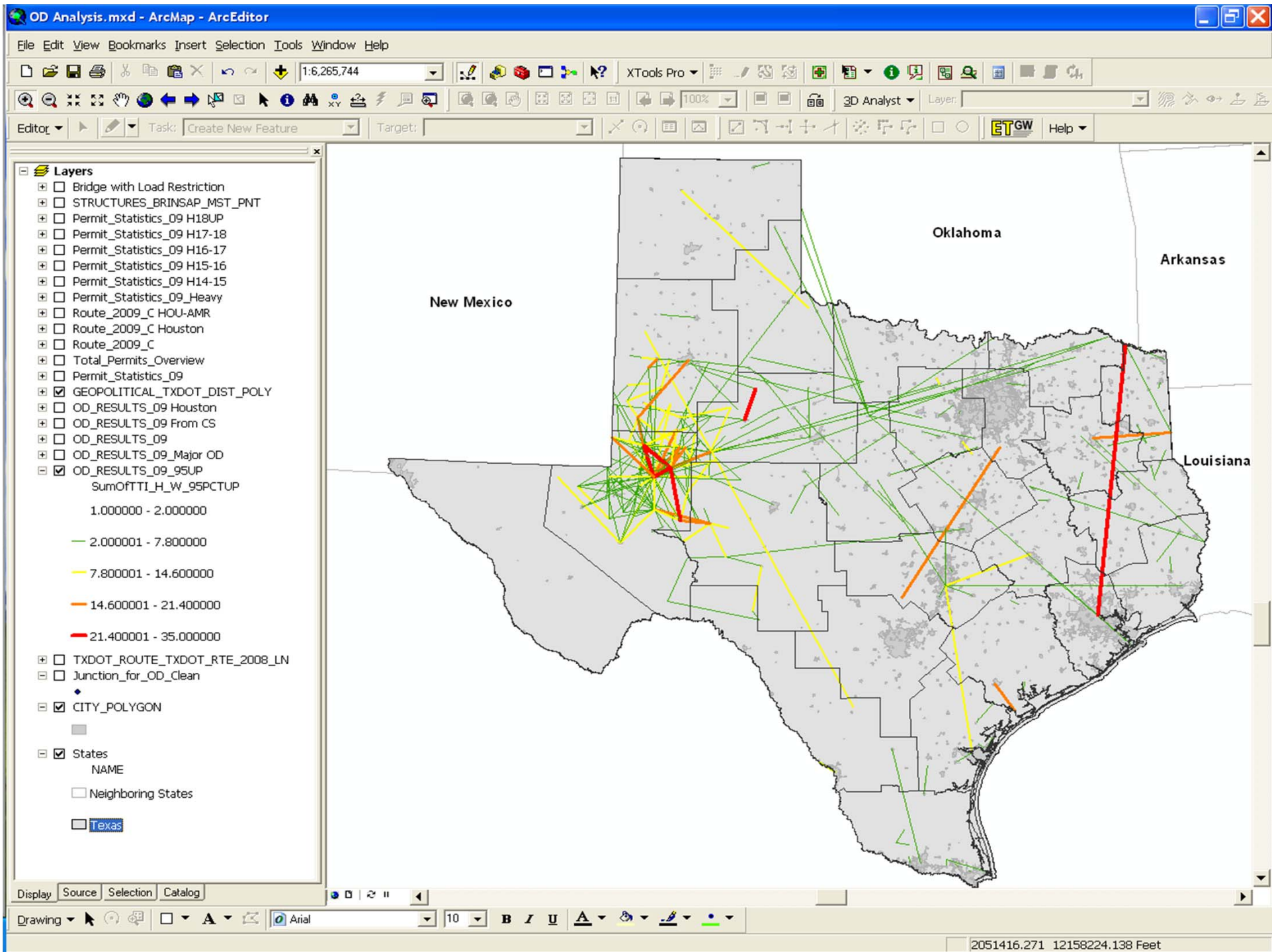
- Associate load groups with route segments
- Request “restrictions” from TxDOT in GIS format
- Compare subset of routes optimum vs. actual
- Determine criteria for determining improvements (“future road network”)
 - No. loads bypassing per unit time
 - Cost of fixing the problem
 - Length of bypass route
 - Cost of detour (adjacent to obstruction)
 - Other construction being planned nearby
 - Age of obstruction

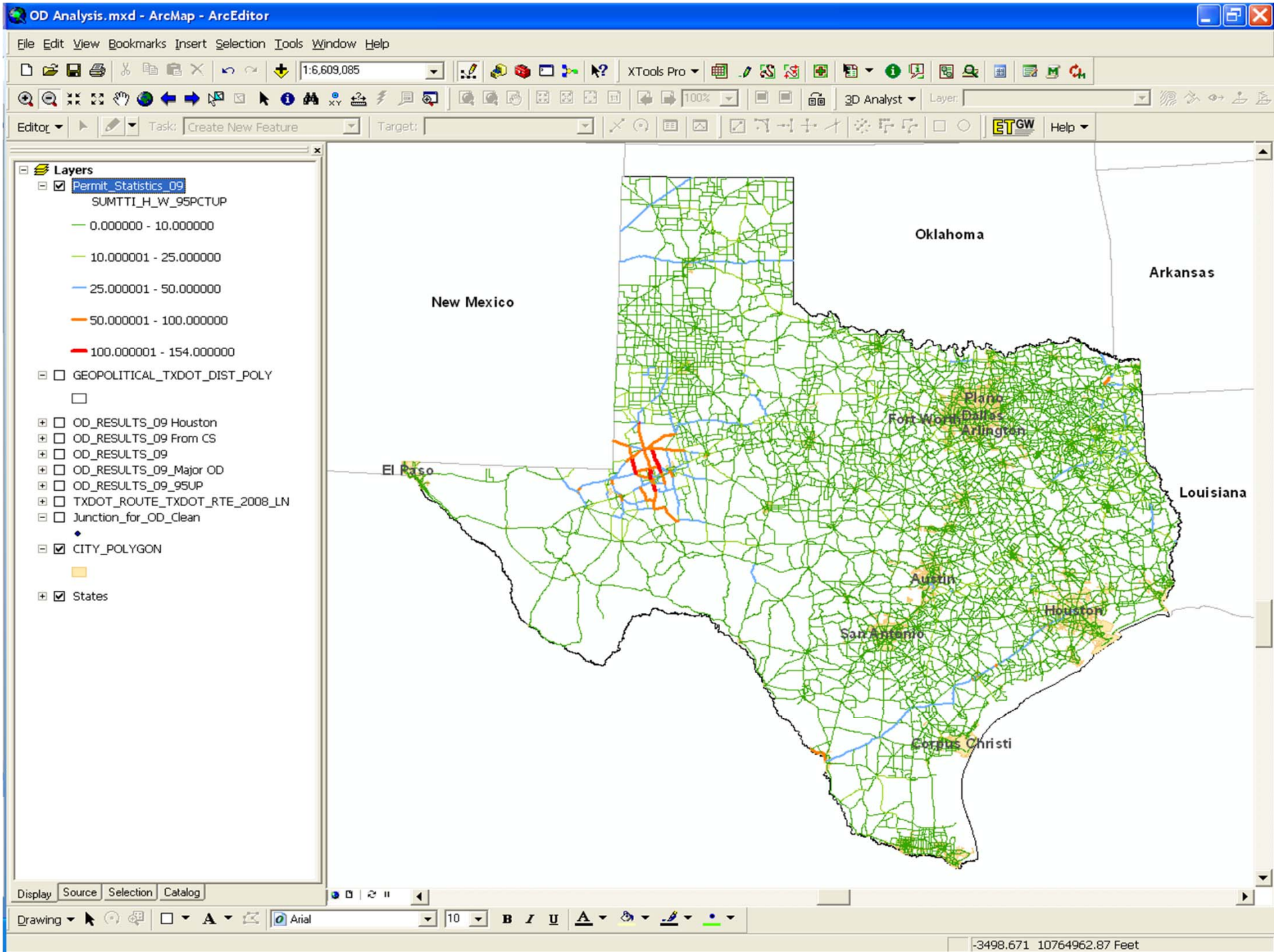


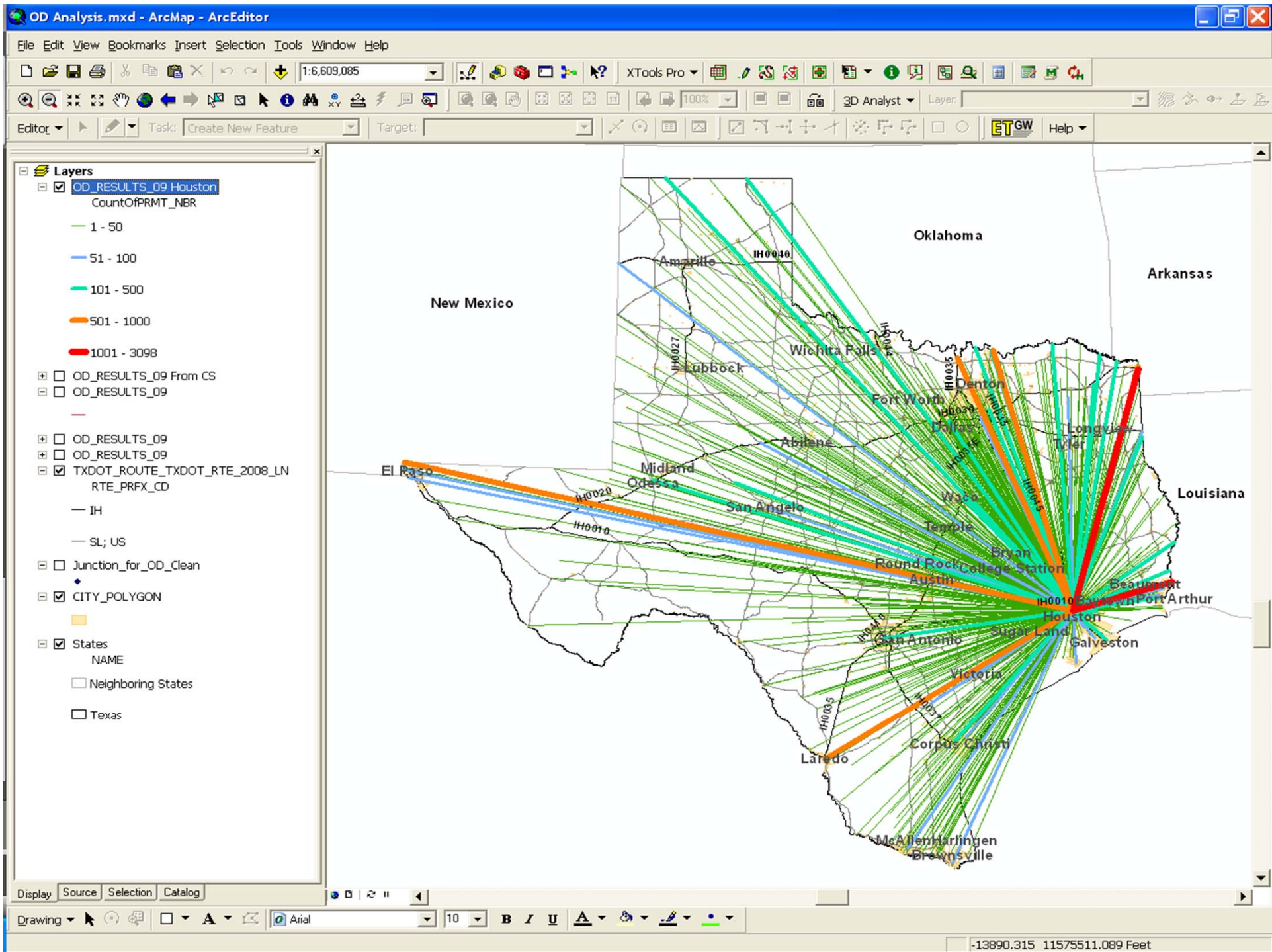
ArcGIS Analysis Results

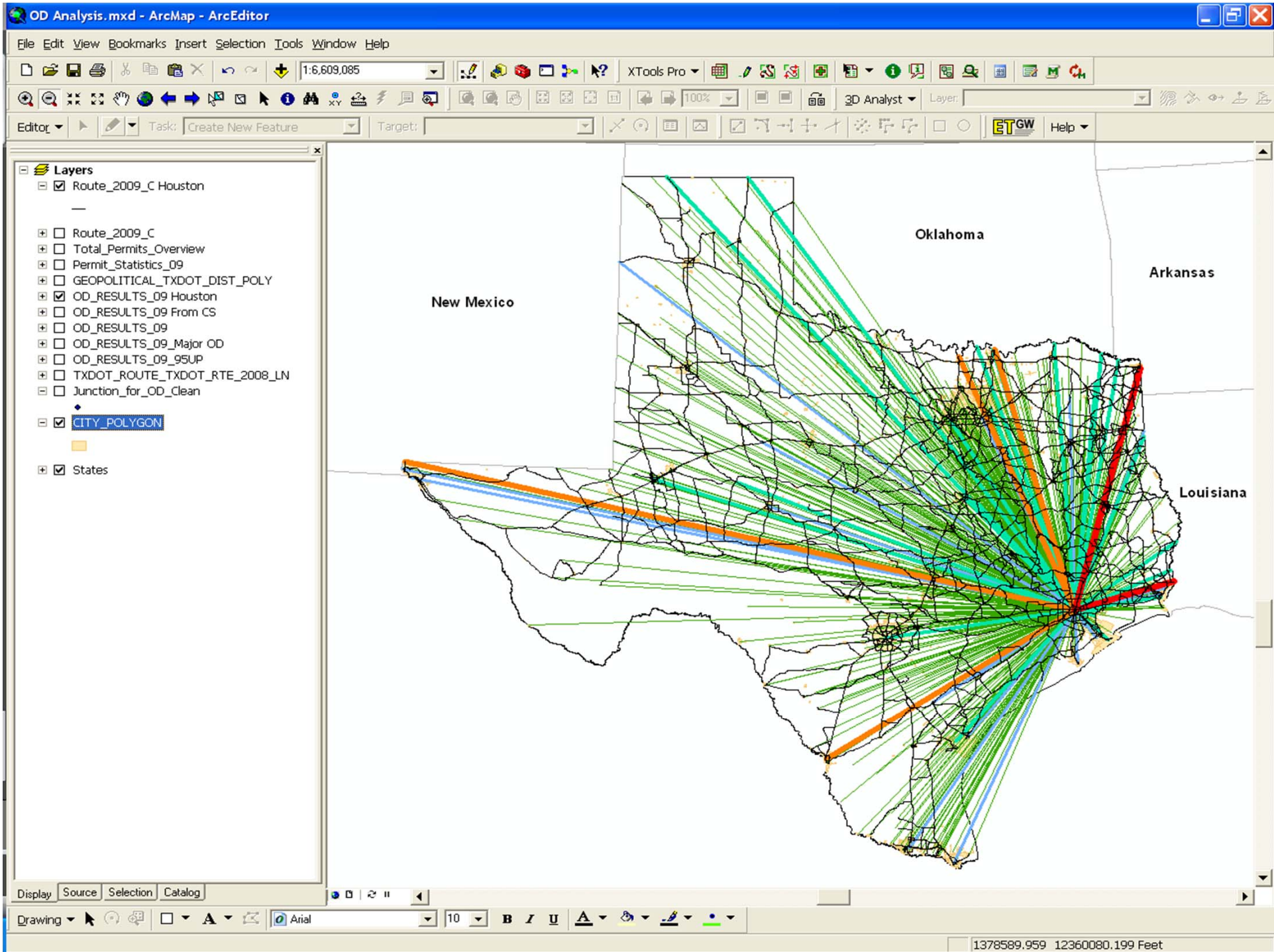


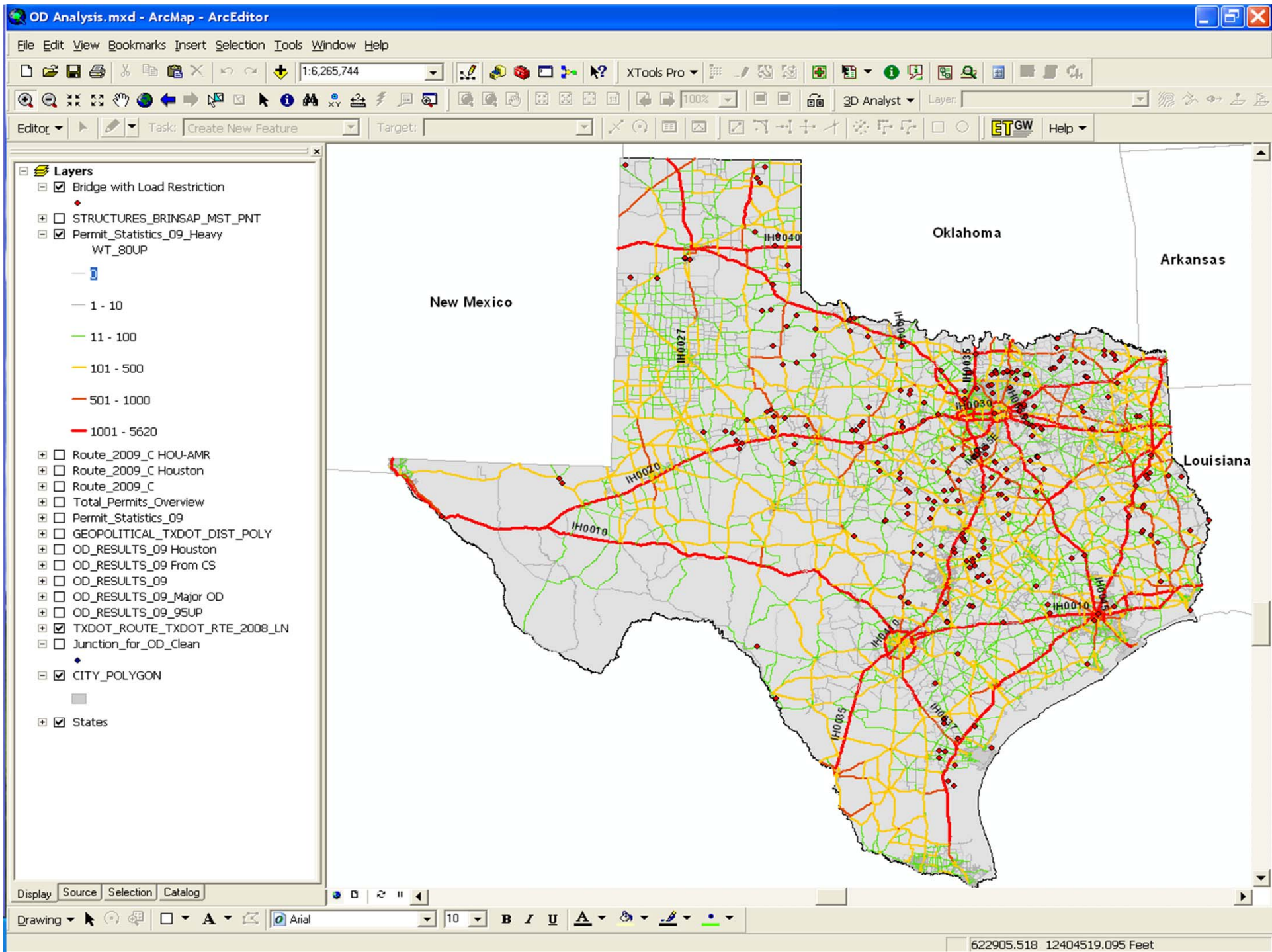


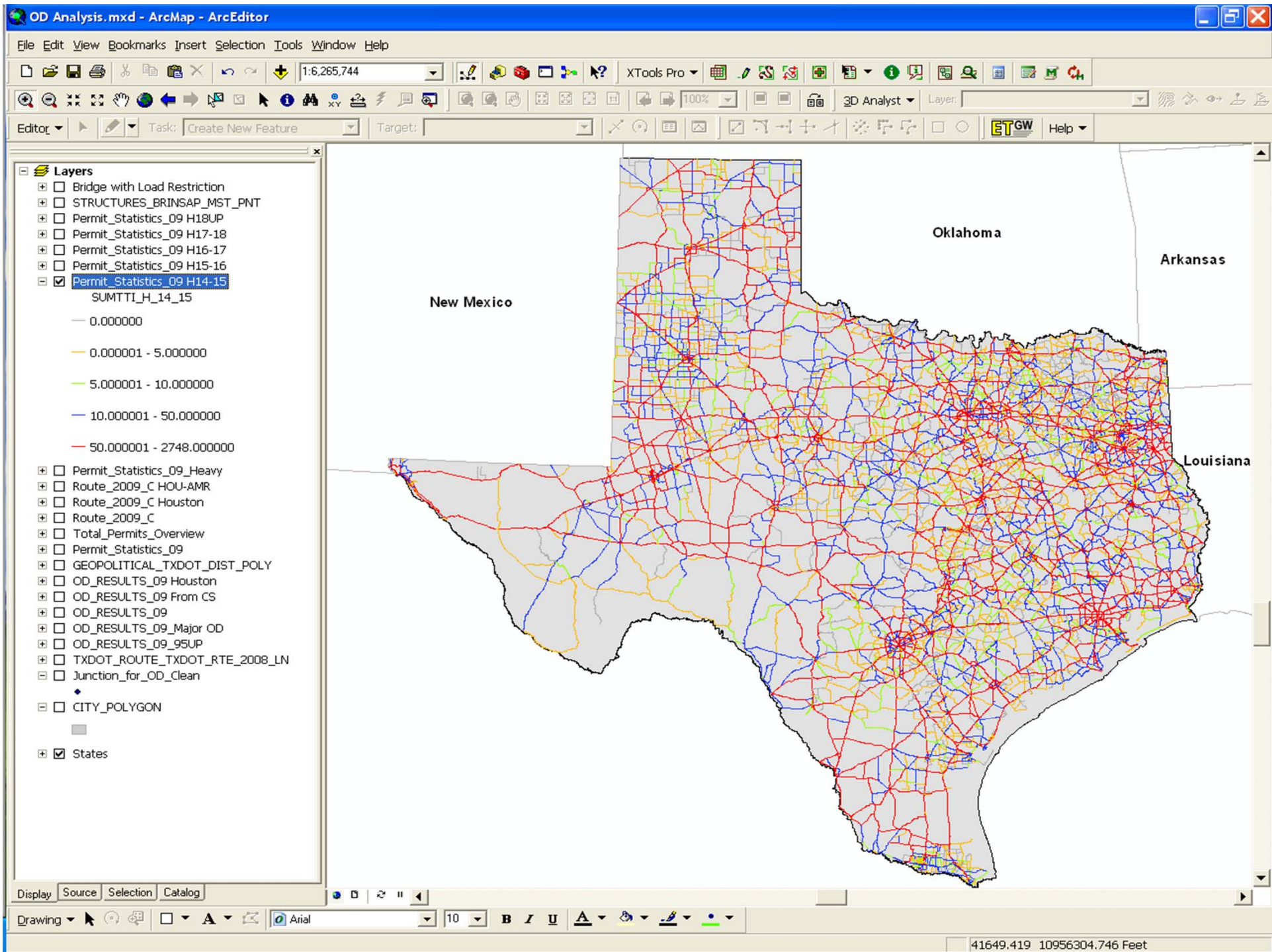


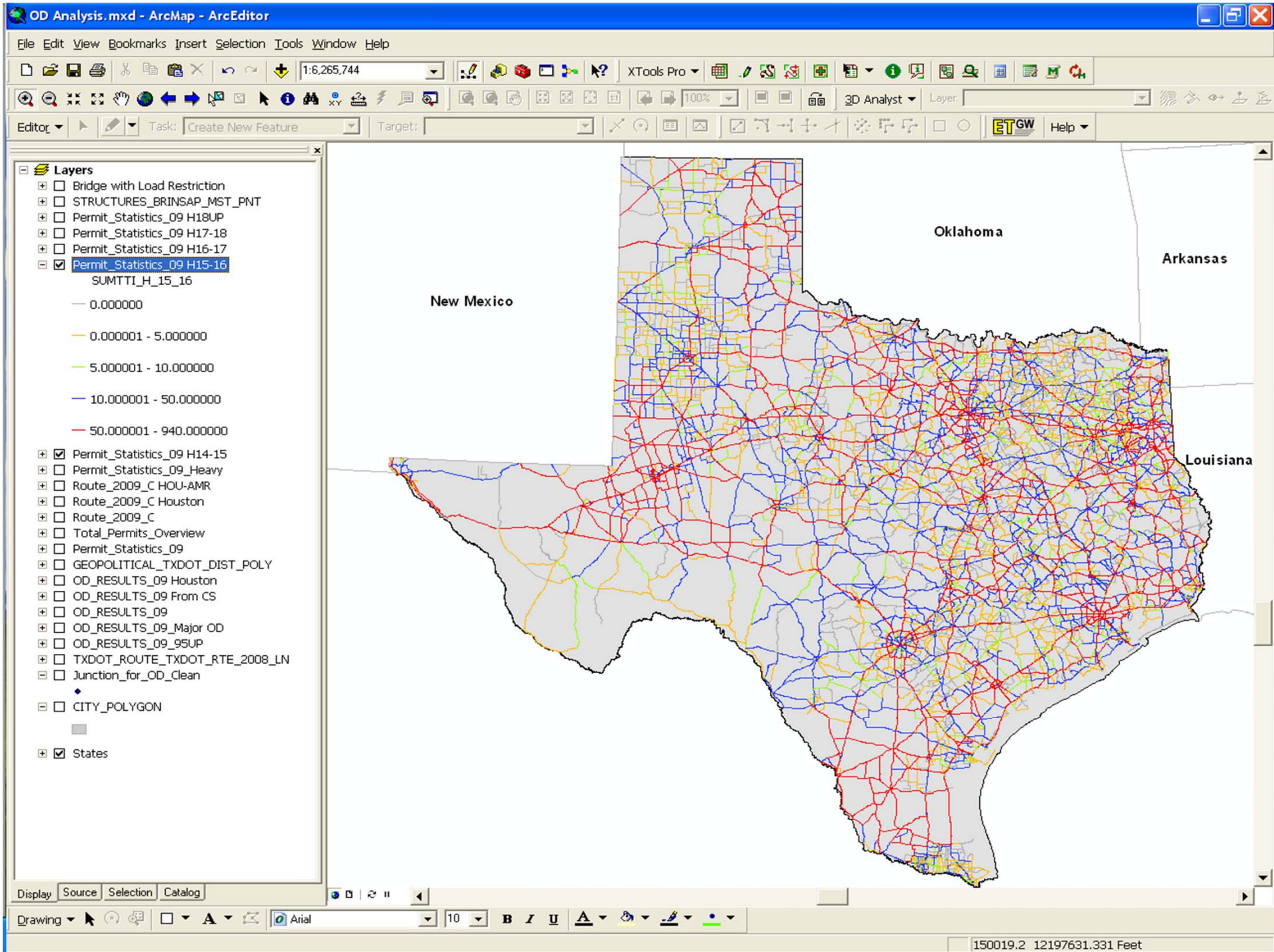


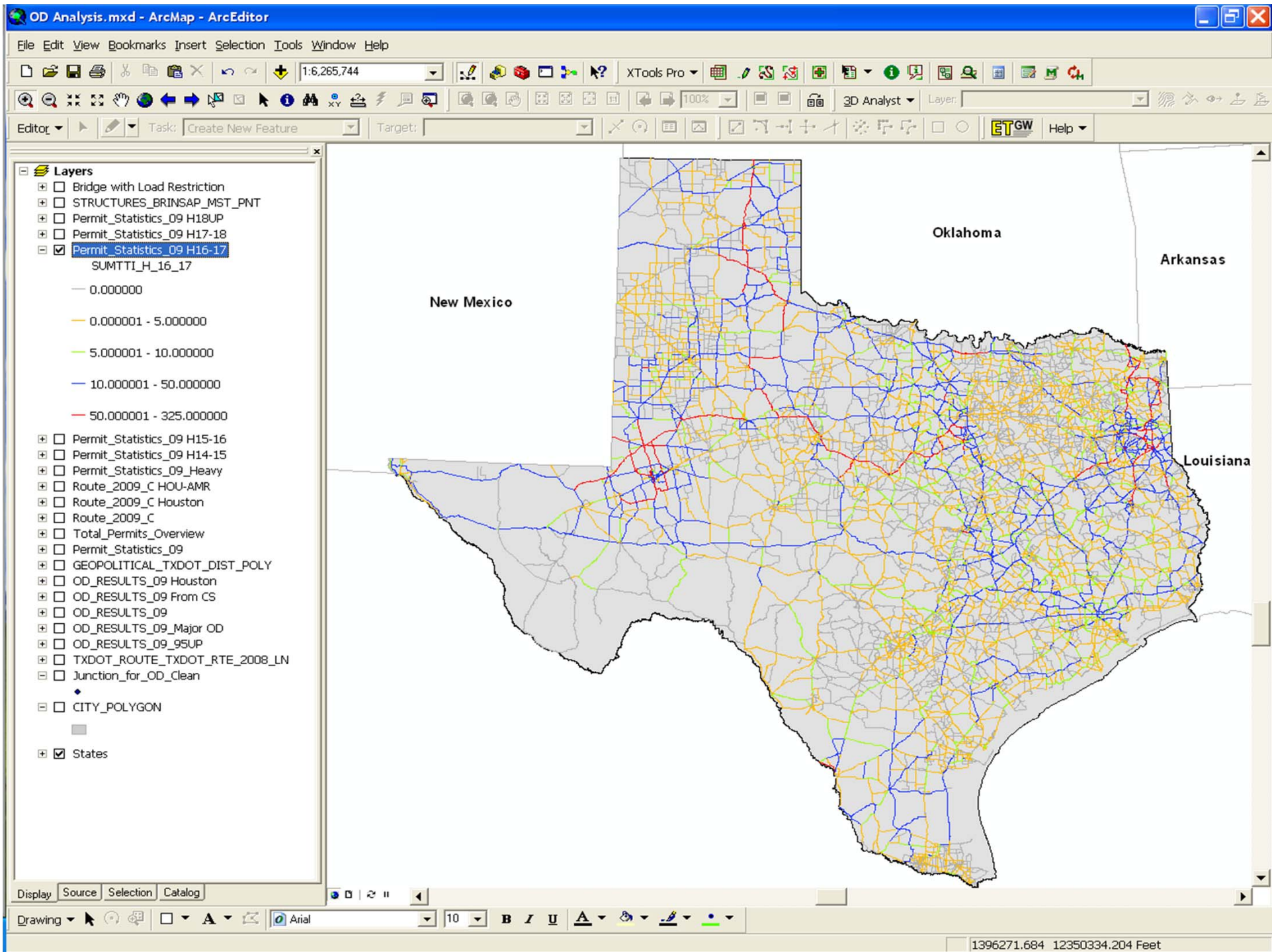


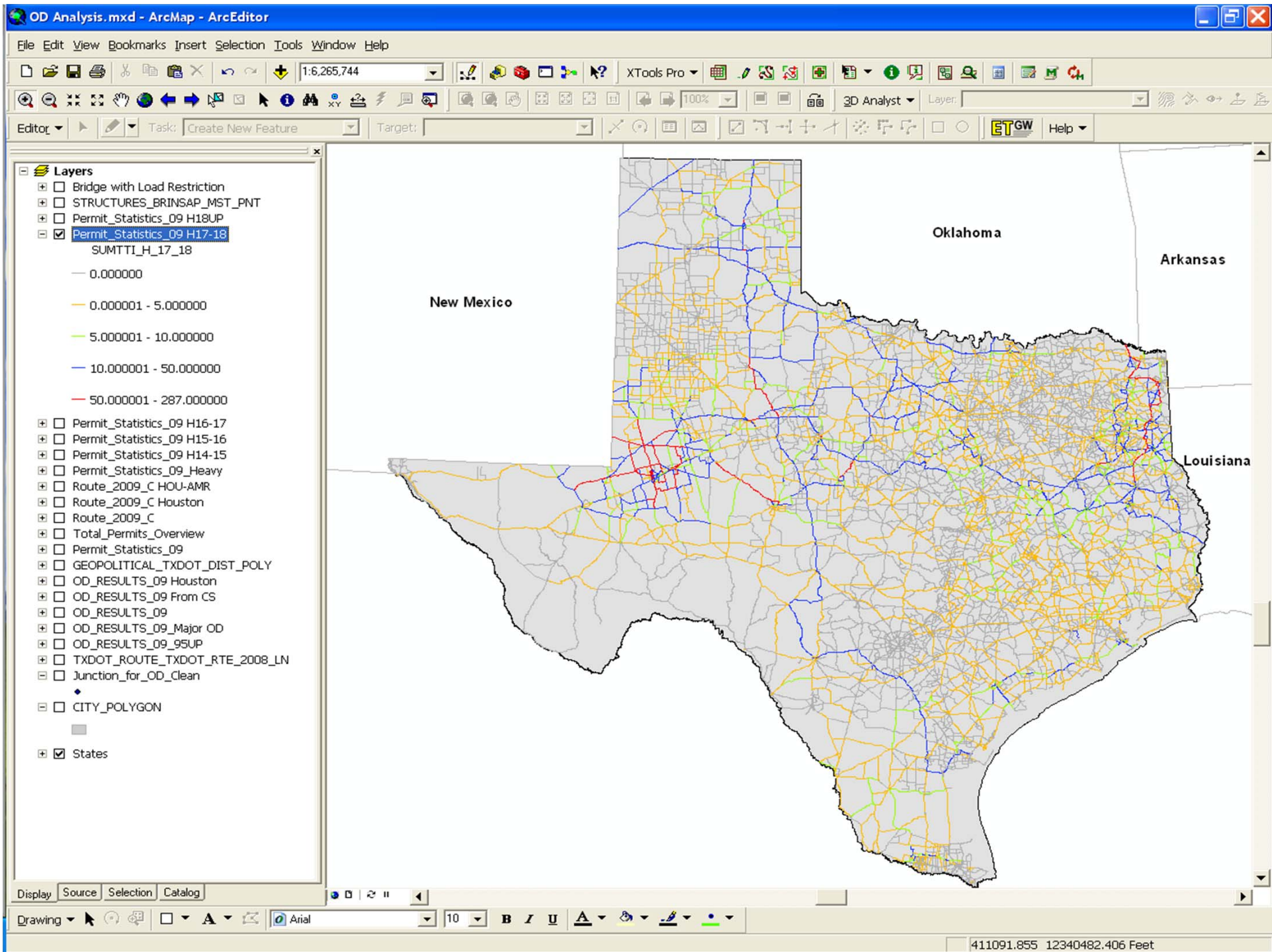


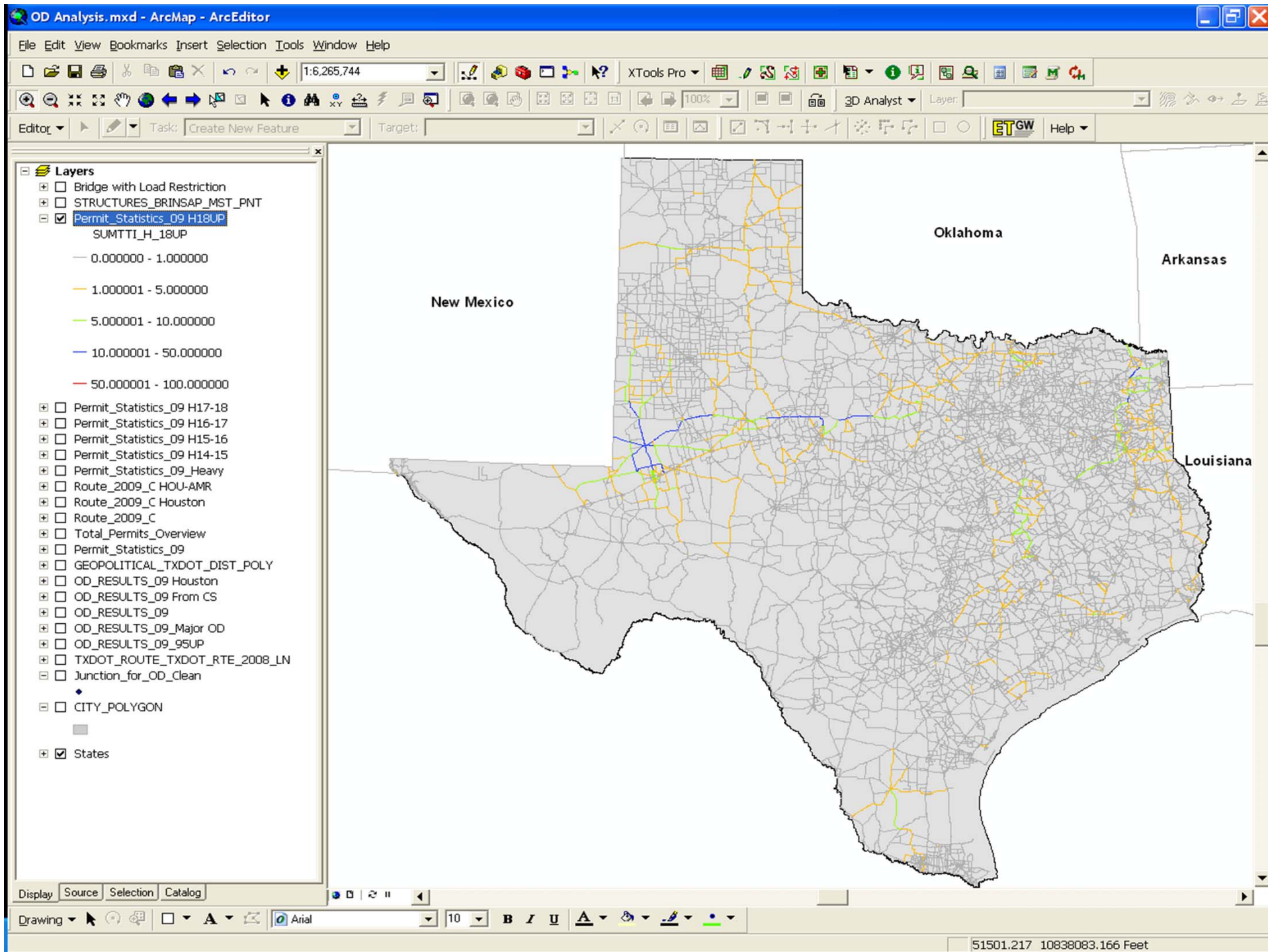


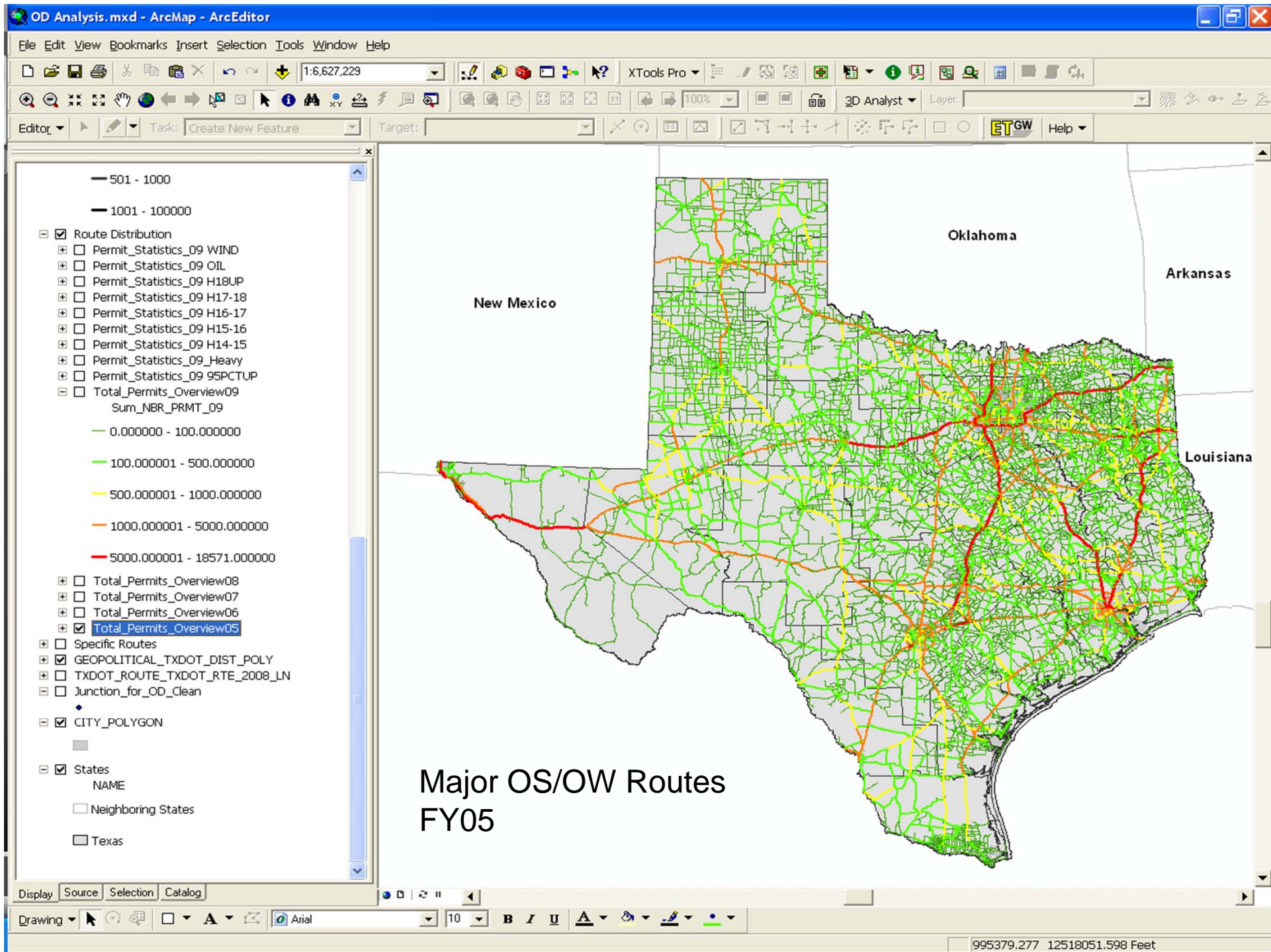


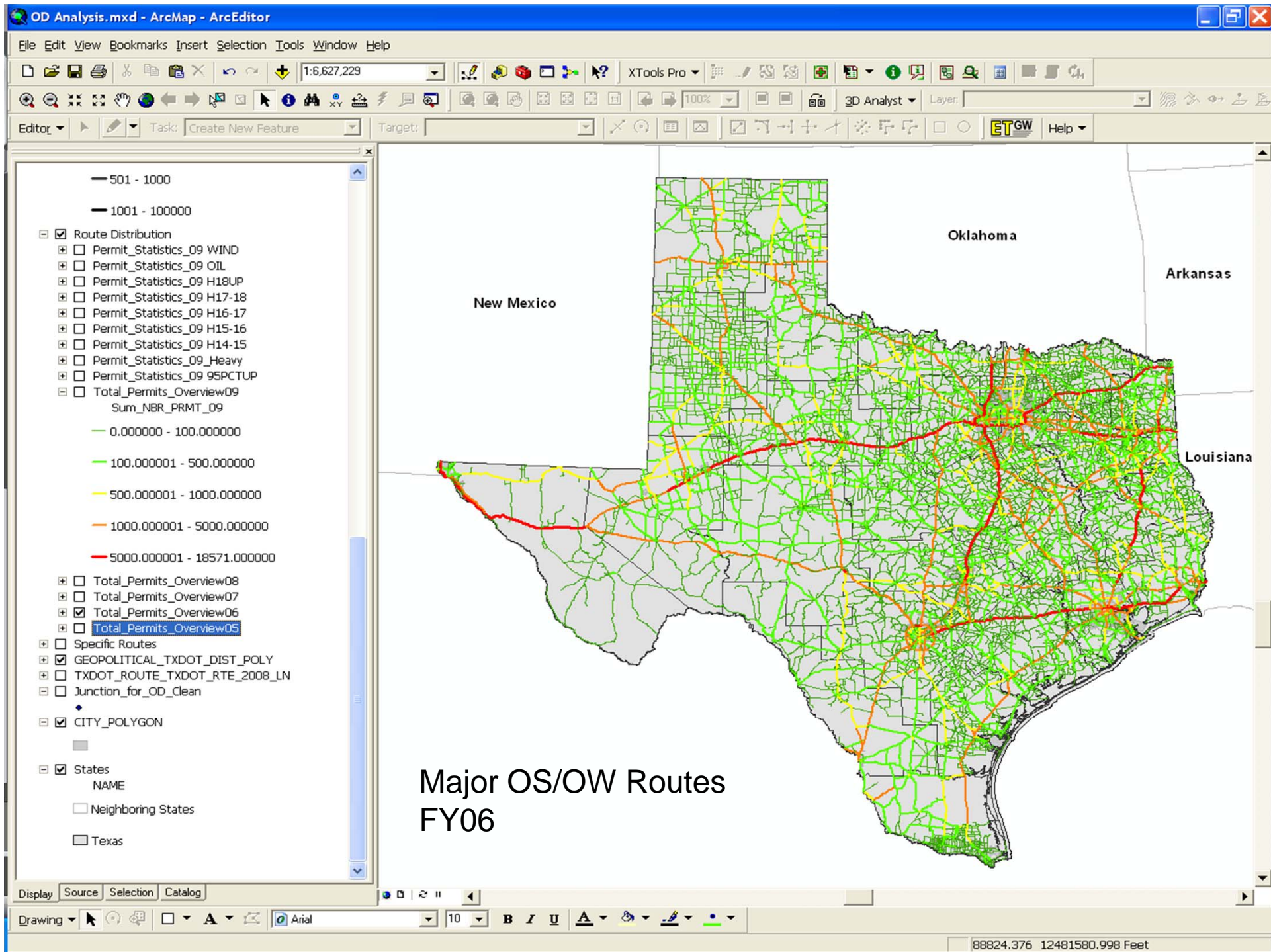


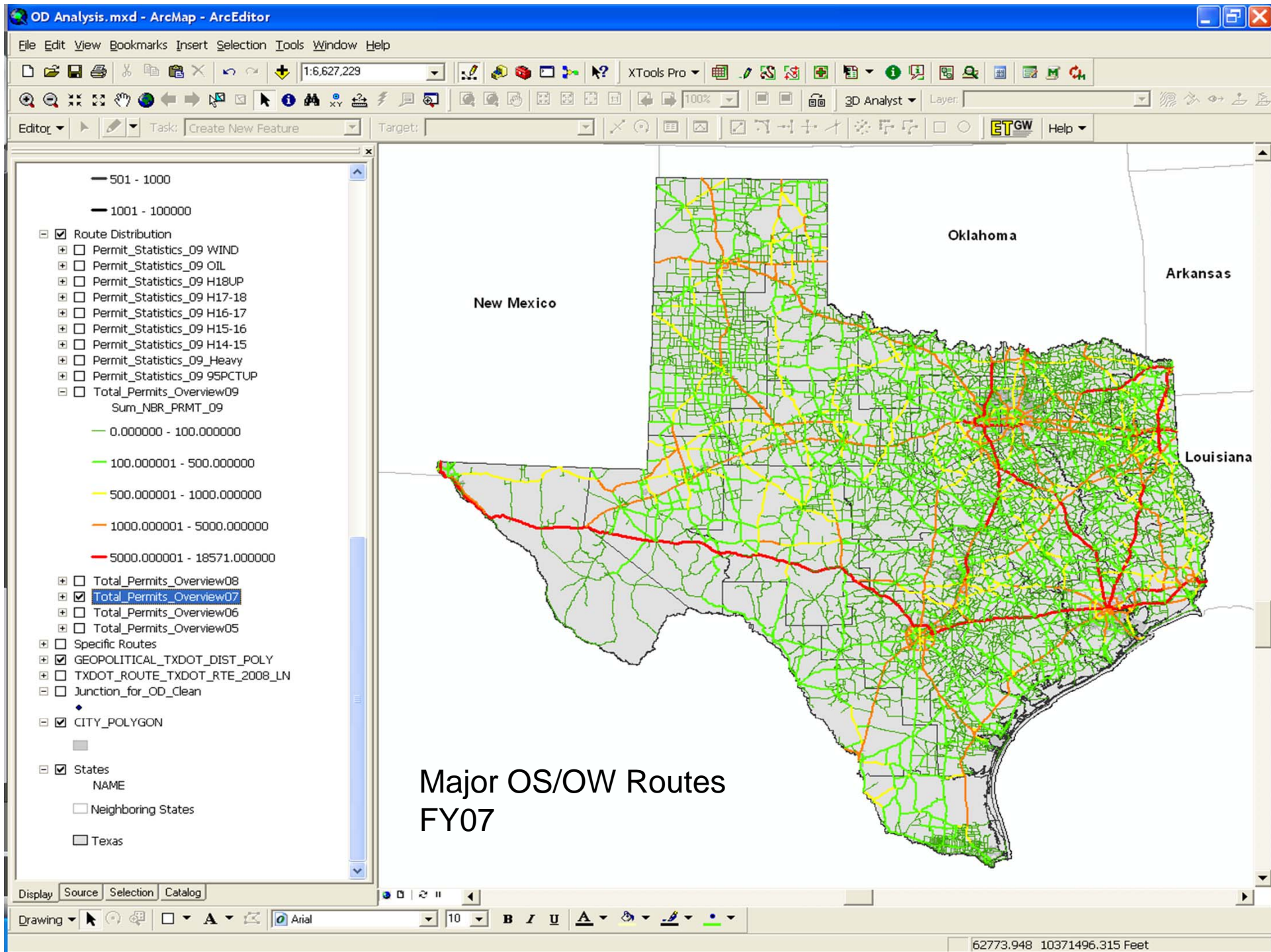


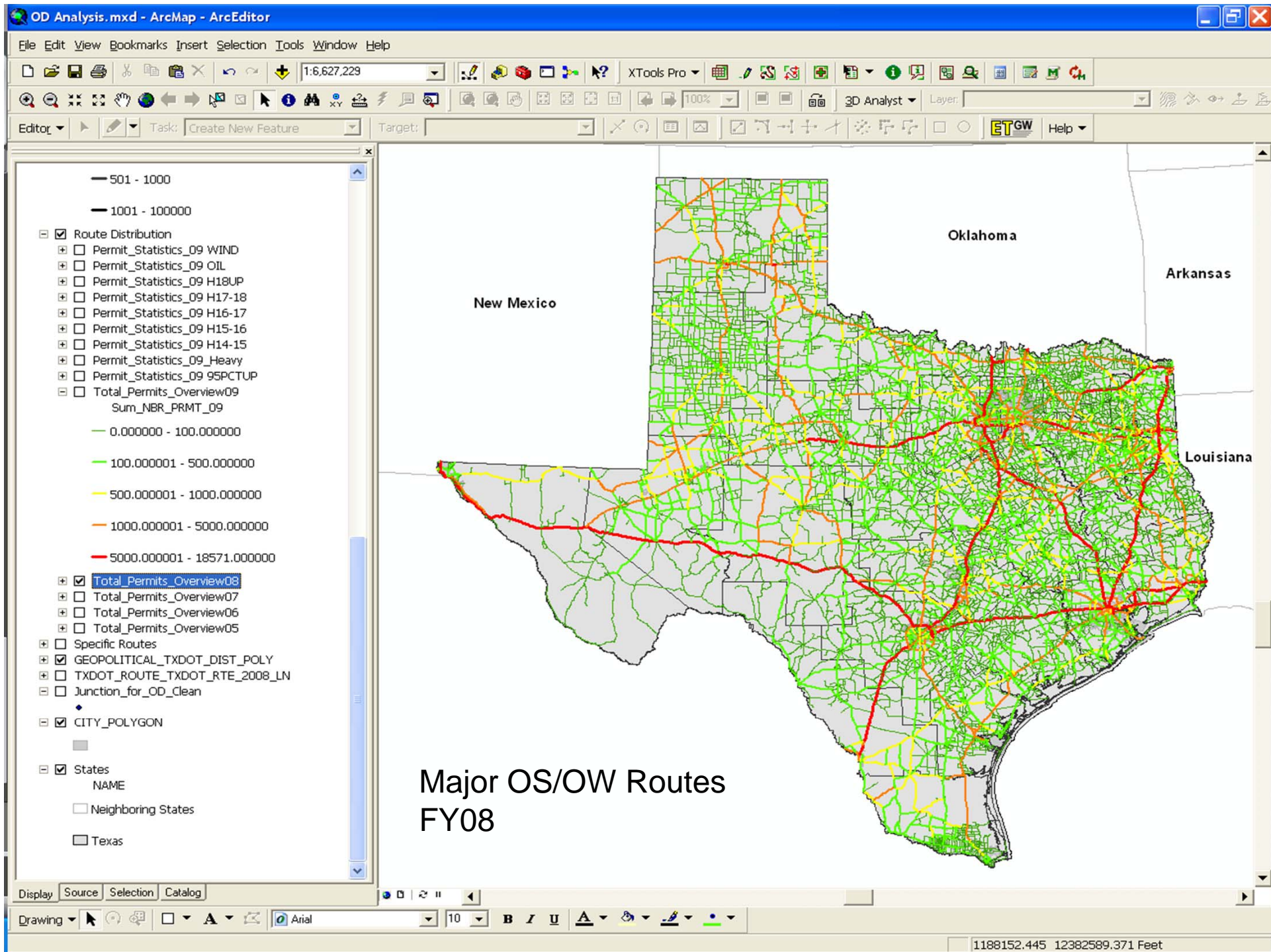


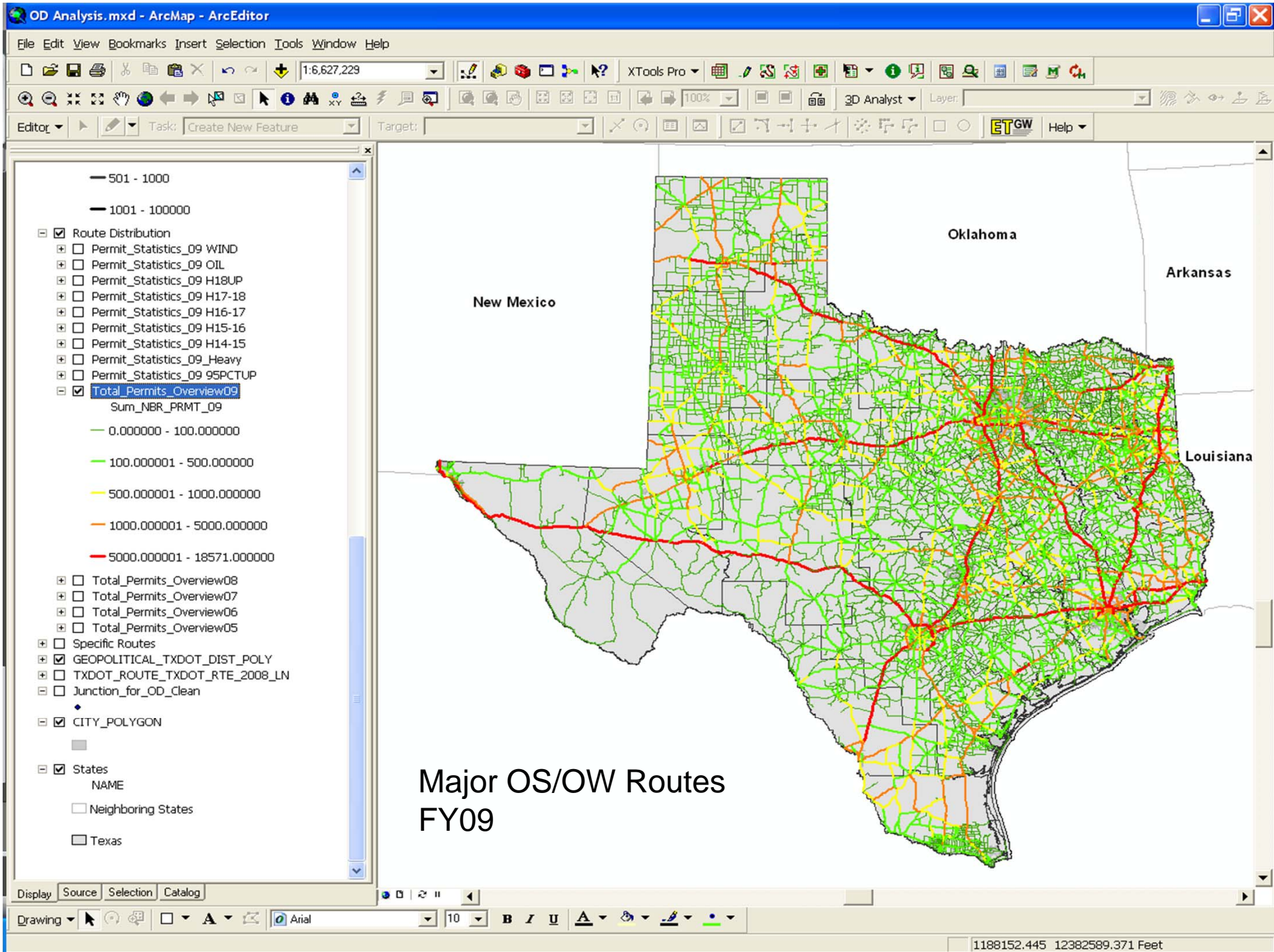


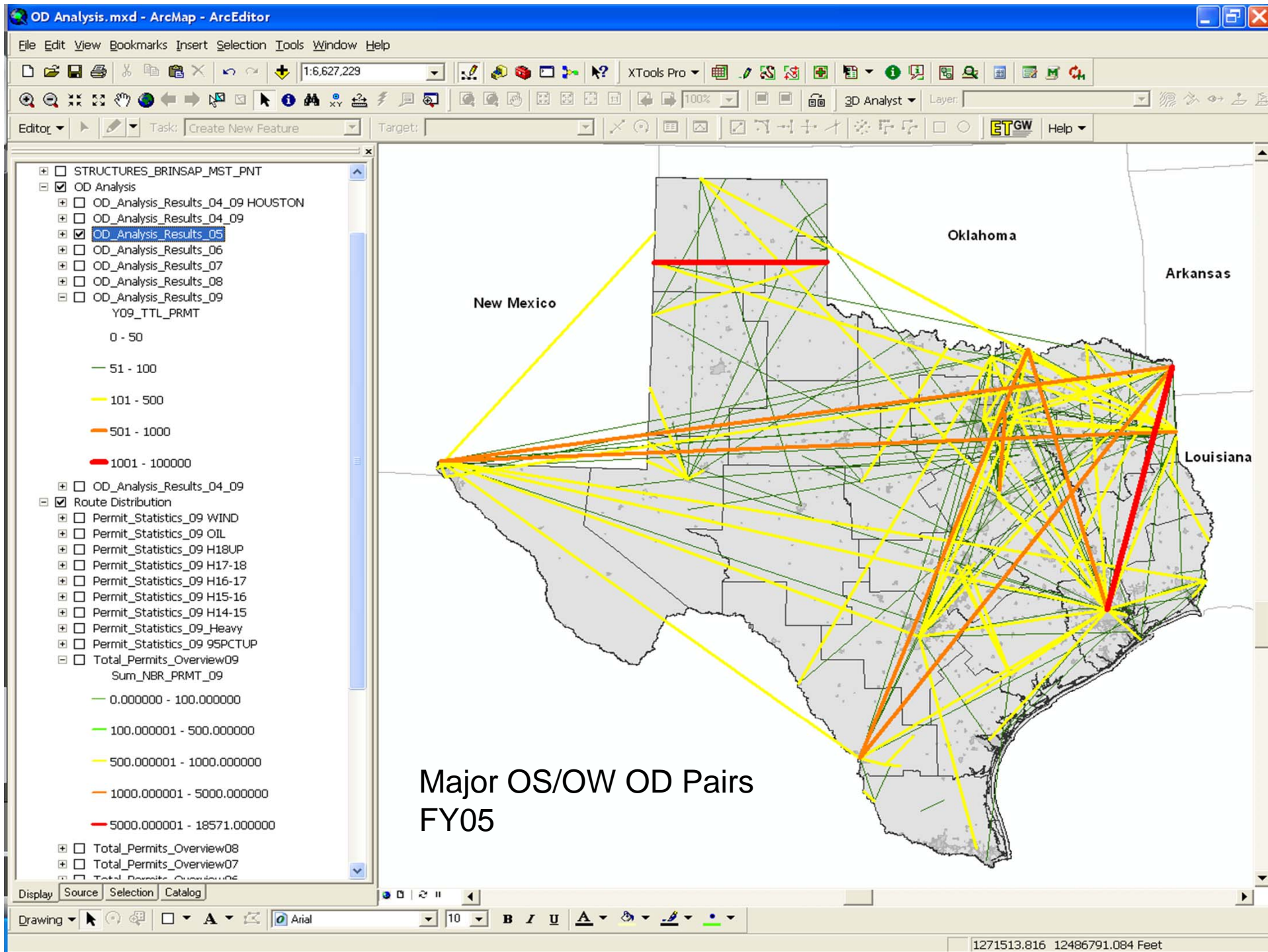


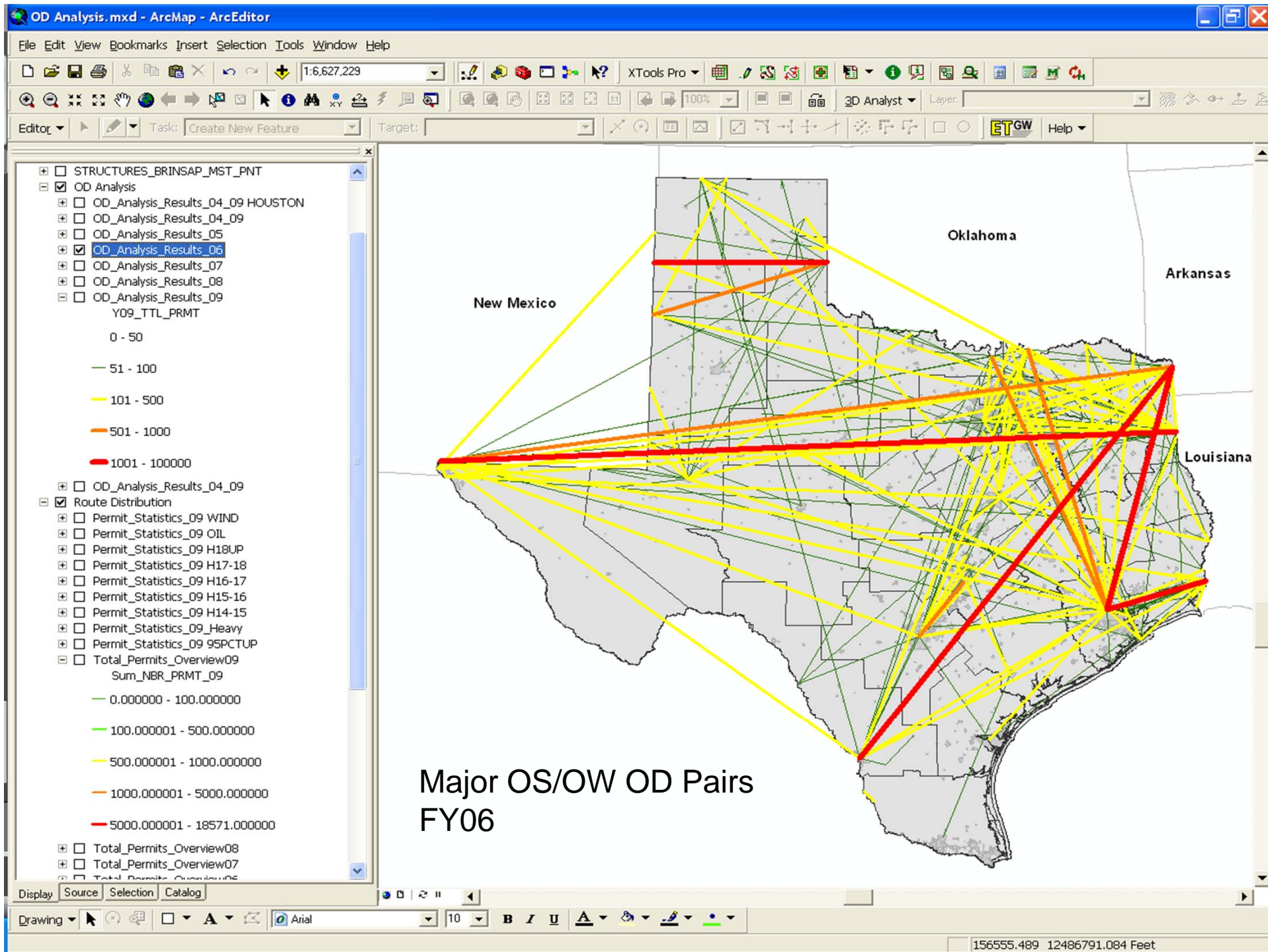


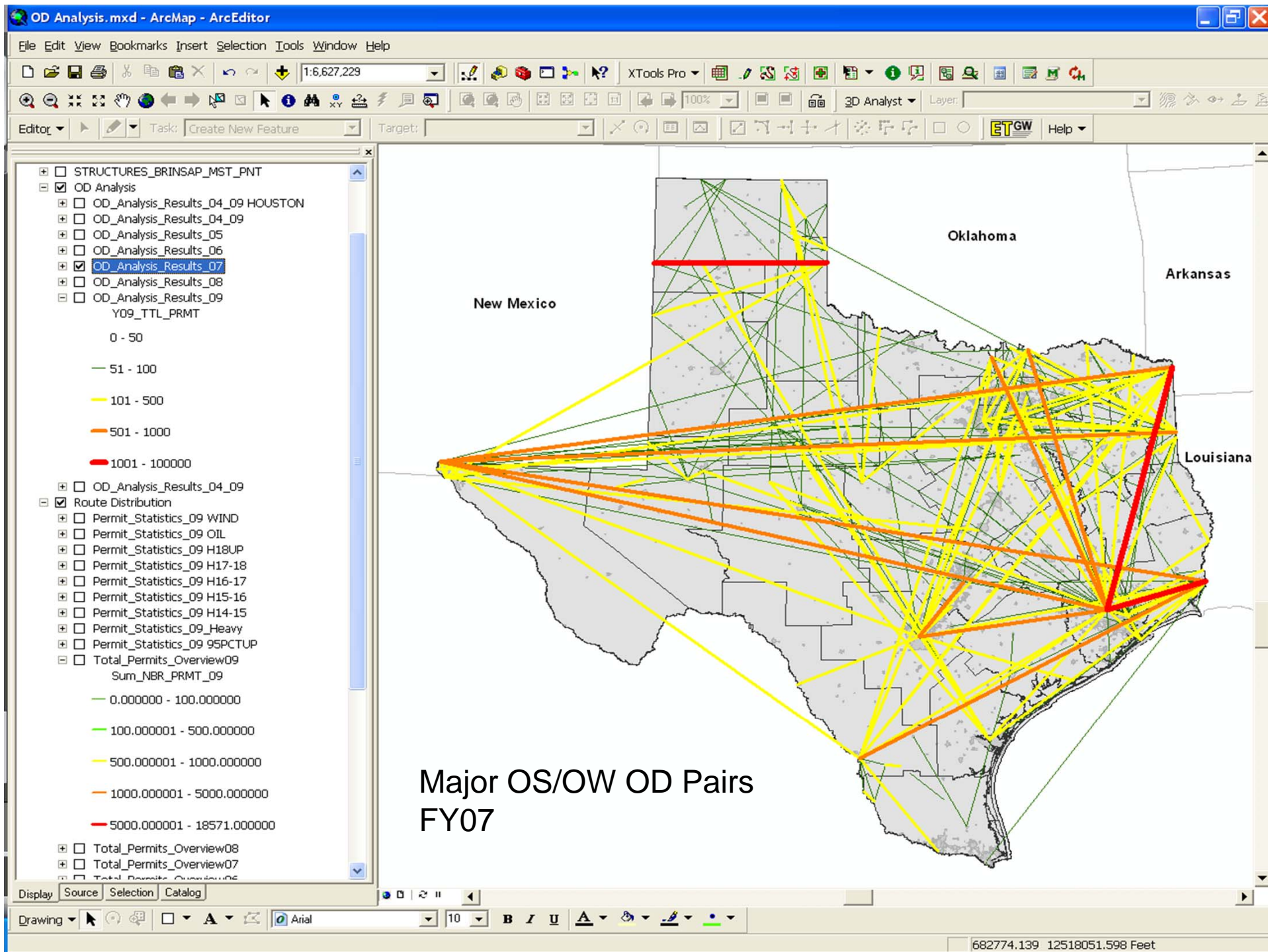


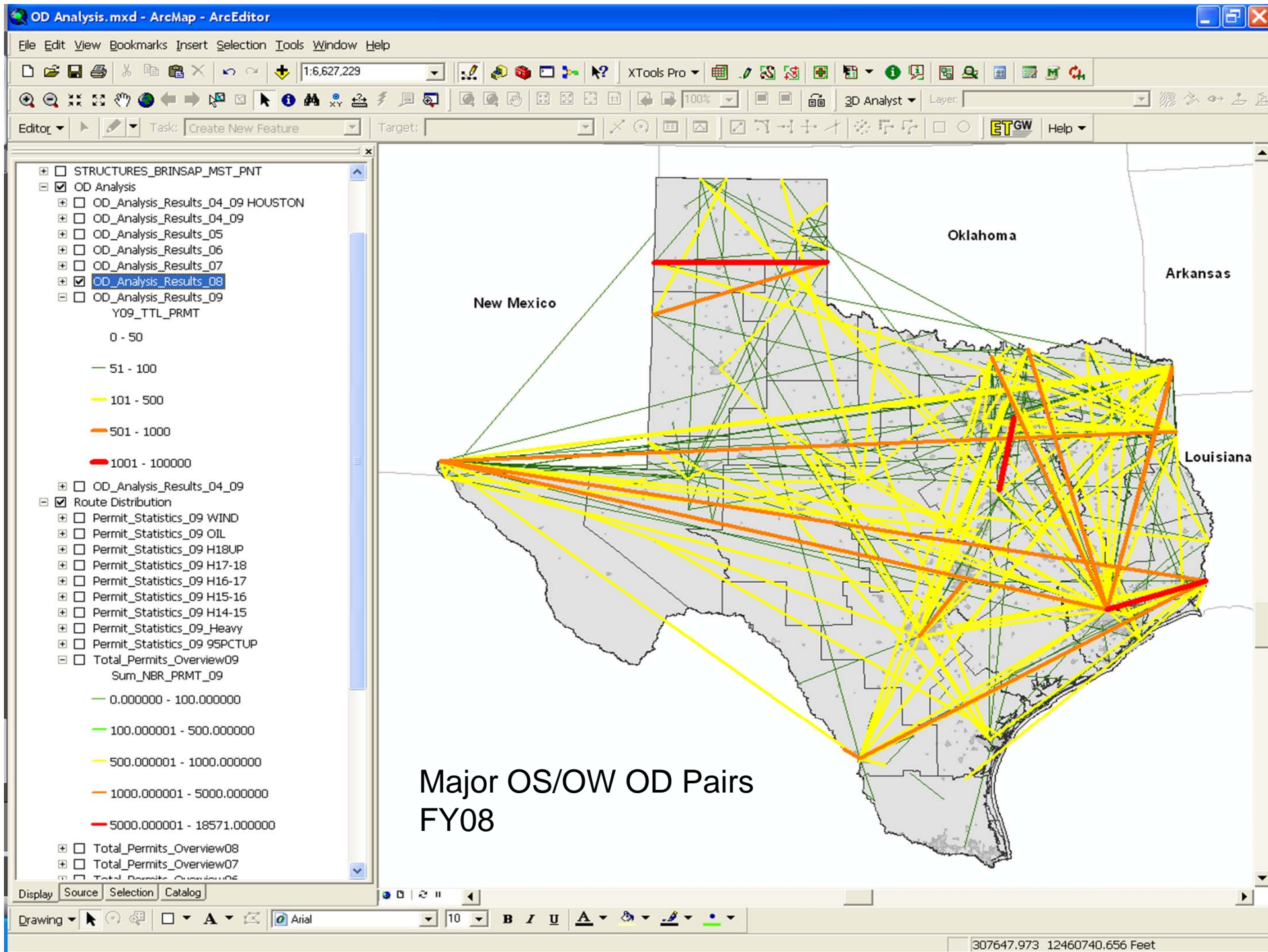


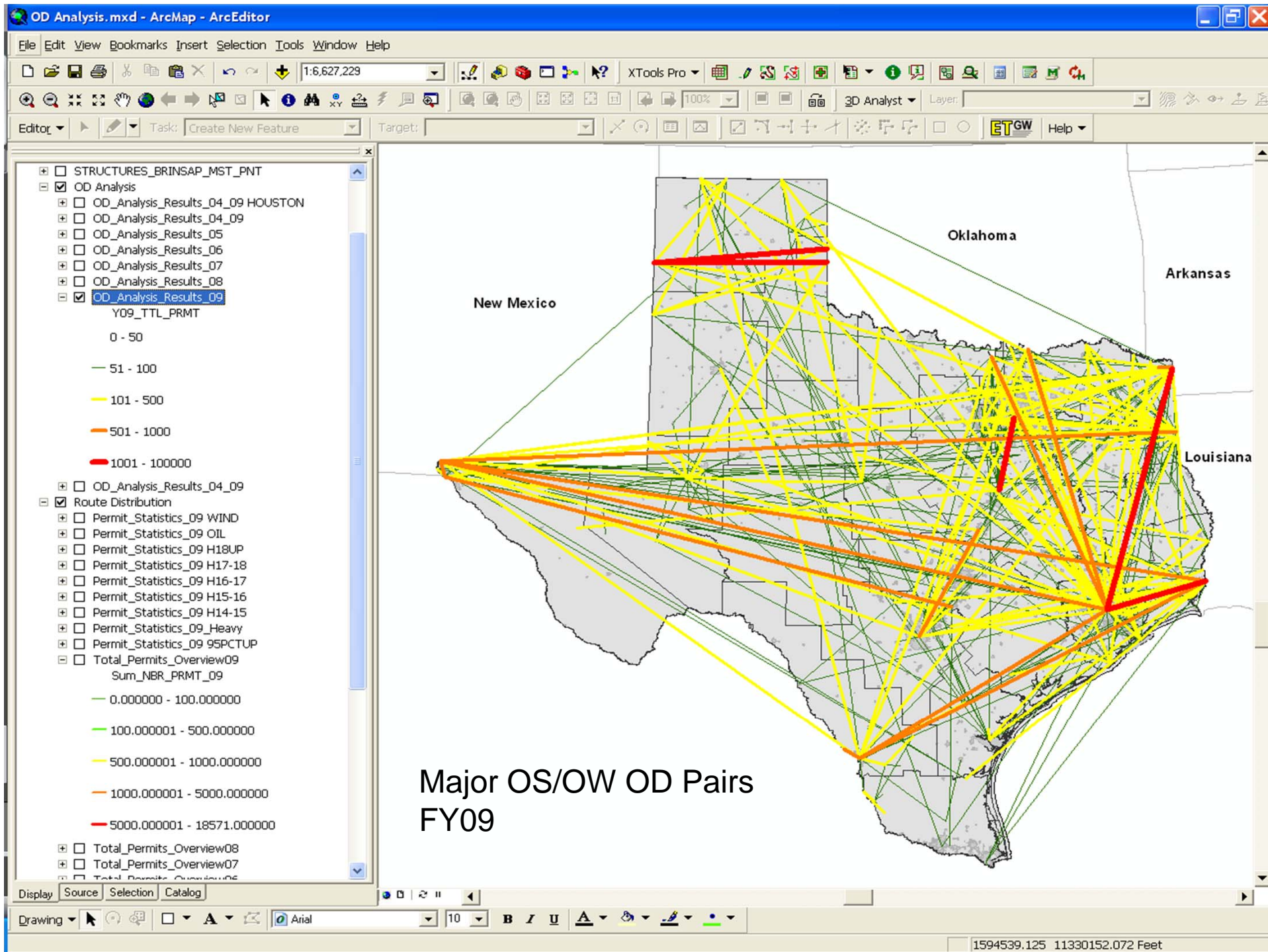






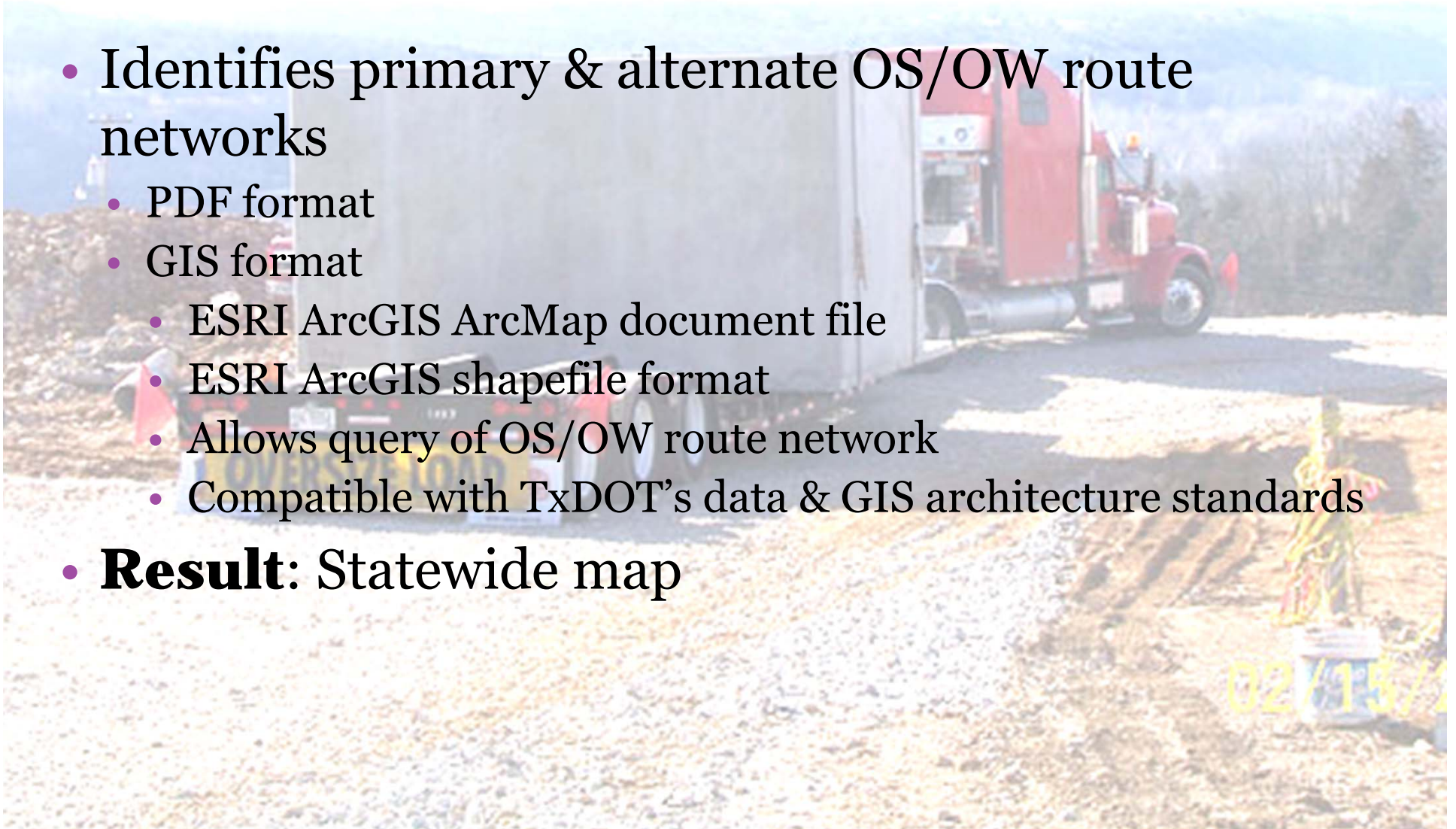






Develop Statewide Map

- Identifies primary & alternate OS/OW route networks
 - PDF format
 - GIS format
 - ESRI ArcGIS ArcMap document file
 - ESRI ArcGIS shapefile format
 - Allows query of OS/OW route network
 - Compatible with TxDOT's data & GIS architecture standards
- **Result:** Statewide map



02/15/2

What's Left?

- **Modification**
 - Request restrictions from ProMiles
 - Complete Task 5
- **Workshop for districts**
- **New research project**
 - o-6736 “Rider 36 OS/OW Vehicle Frees Study”



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