



TEXAS DEPARTMENT OF TRANSPORTATION



LUBBOCK

TRAVEL DEMAND MODEL UPDATE

Presented to Lubbock MPO

Presented by TxDOT

Transportation Planning and Programming Division

May 2014



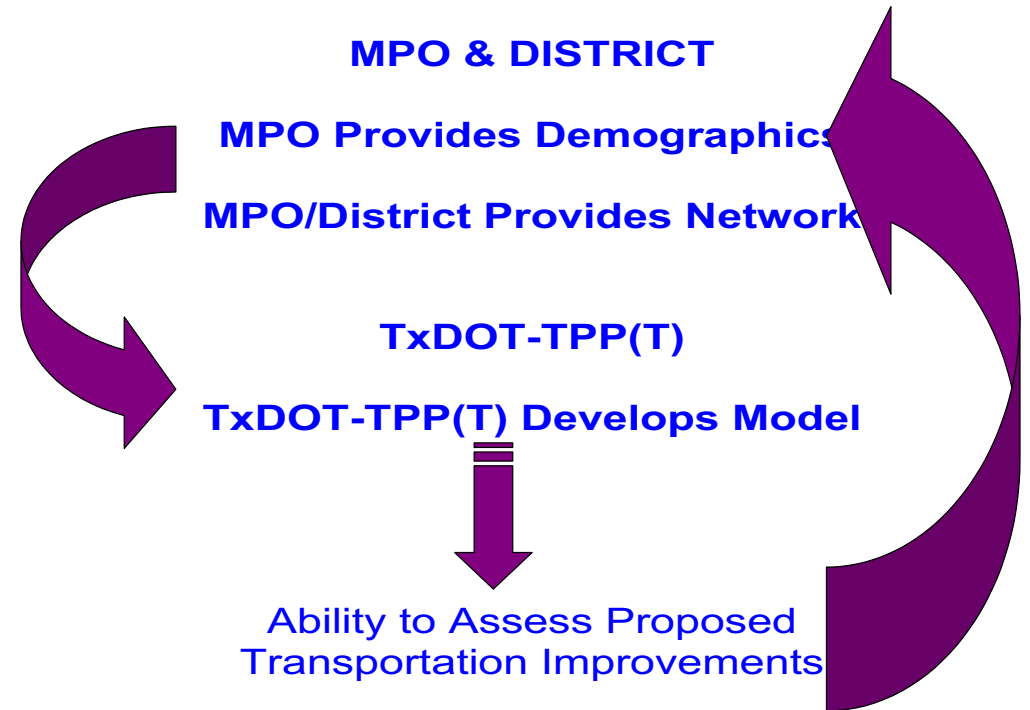
- **2040 forecast application development**
 - What changed between the 2006 base and the 2040 application?
 - Network
 - Demographics
 - External station/travel growth
- **2040 forecast application results**
- **Next steps**
 - Travel survey/count data
 - Validation year
 - Interim forecasts



Cooperative Process

- MPO
- TxDOT-Lubbock
- TxDOT-TPP

Model Development A Cooperative Process



Network Development



Google earth

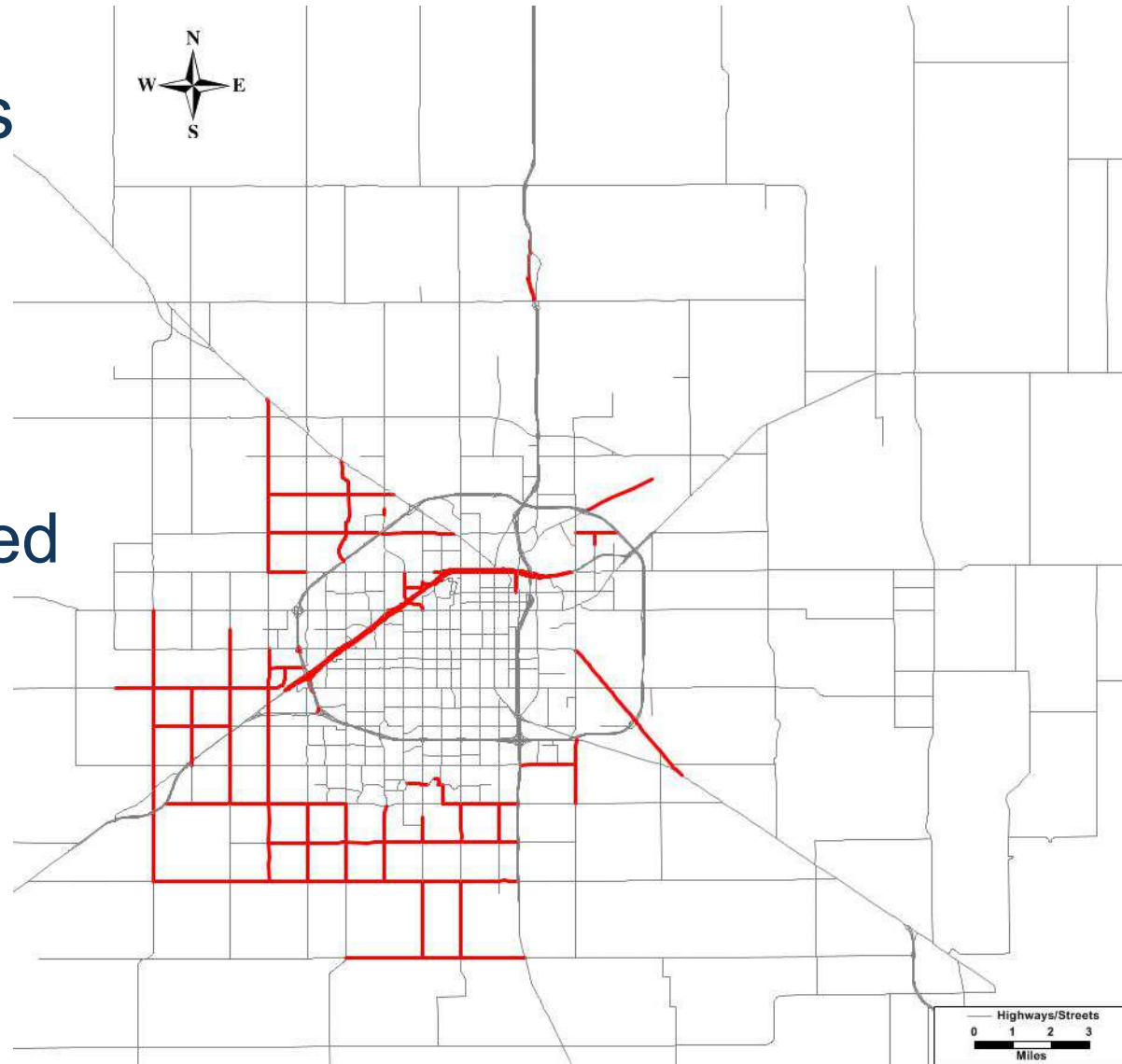
1995

Imagery Date: 2/9/2013 33°35'30.75"N 101°52'21.56" W elev 3280 ft eye alt 7143 ft



Network Changes (2006 to 2040)

- Lanes
- Facility type
 - divided/undivided
- New links





Marsha Sharpe Freeway



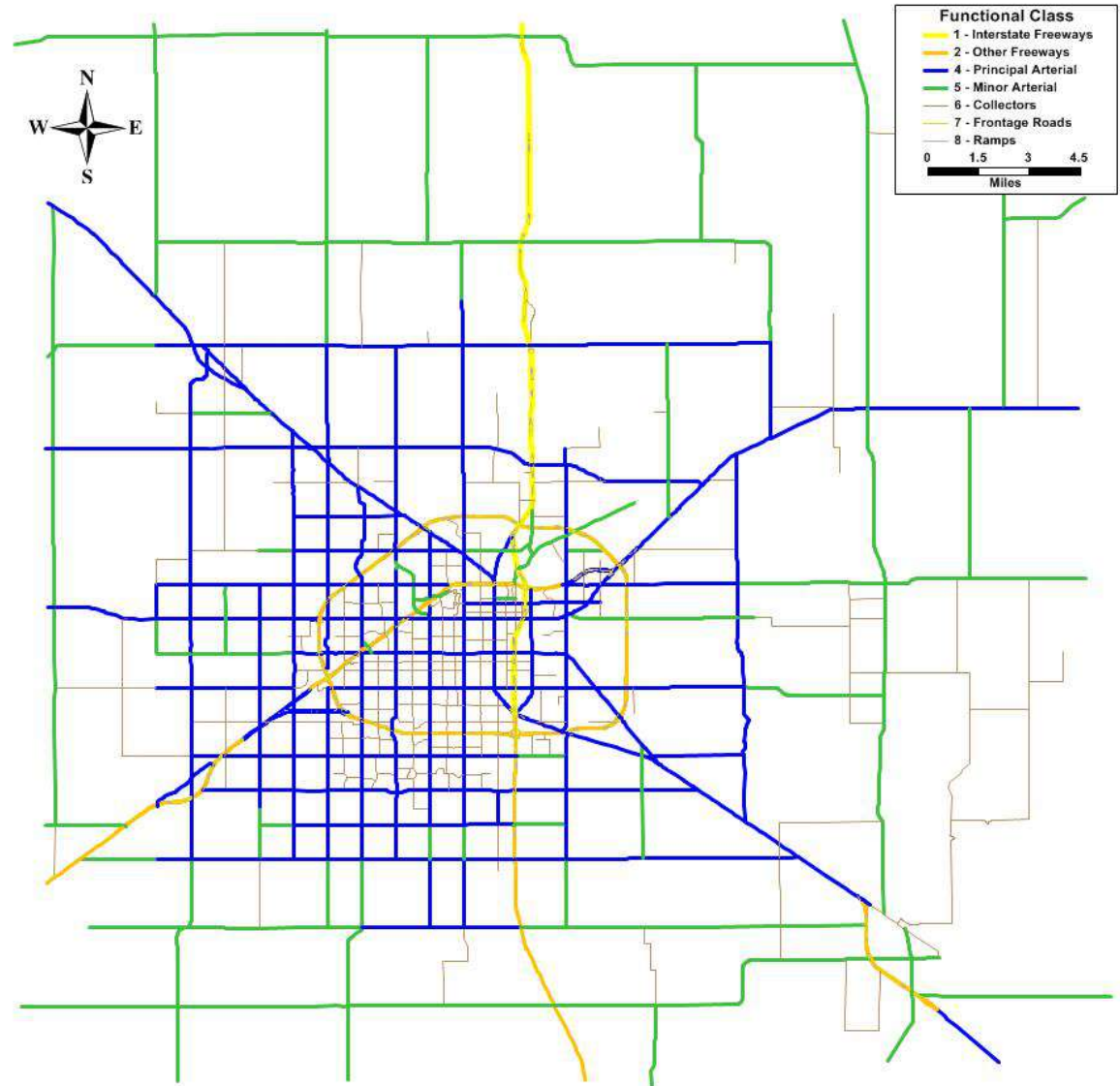


Network edits performed.

Functional Class	Number Of Links	Center-line Miles	Lane Miles
1	0	0.00	-0.01
2	43	16.95	35.31
3	0	0.00	0.00
4	73	34.58	345.40
5	-35	-20.78	-27.35
6	10	0.49	7.08
7	125	14.92	29.08
8	31	9.84	9.75
TOTAL	247	55.98	399.26

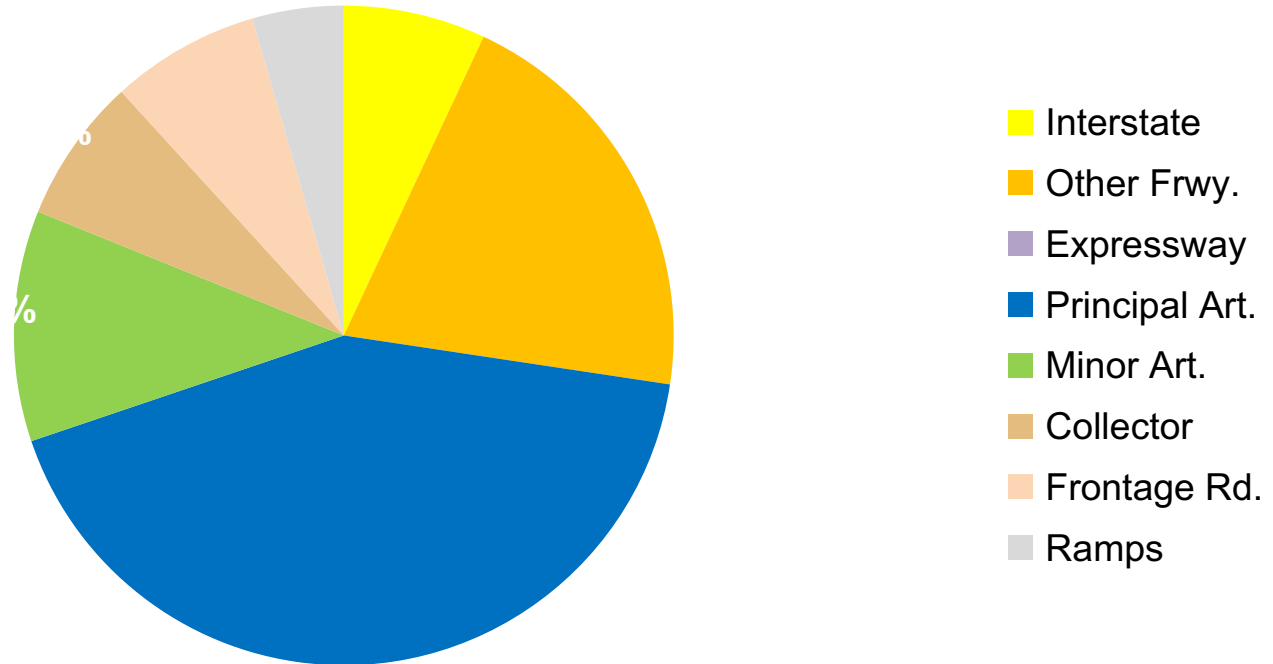


2040 Functional Classification Map



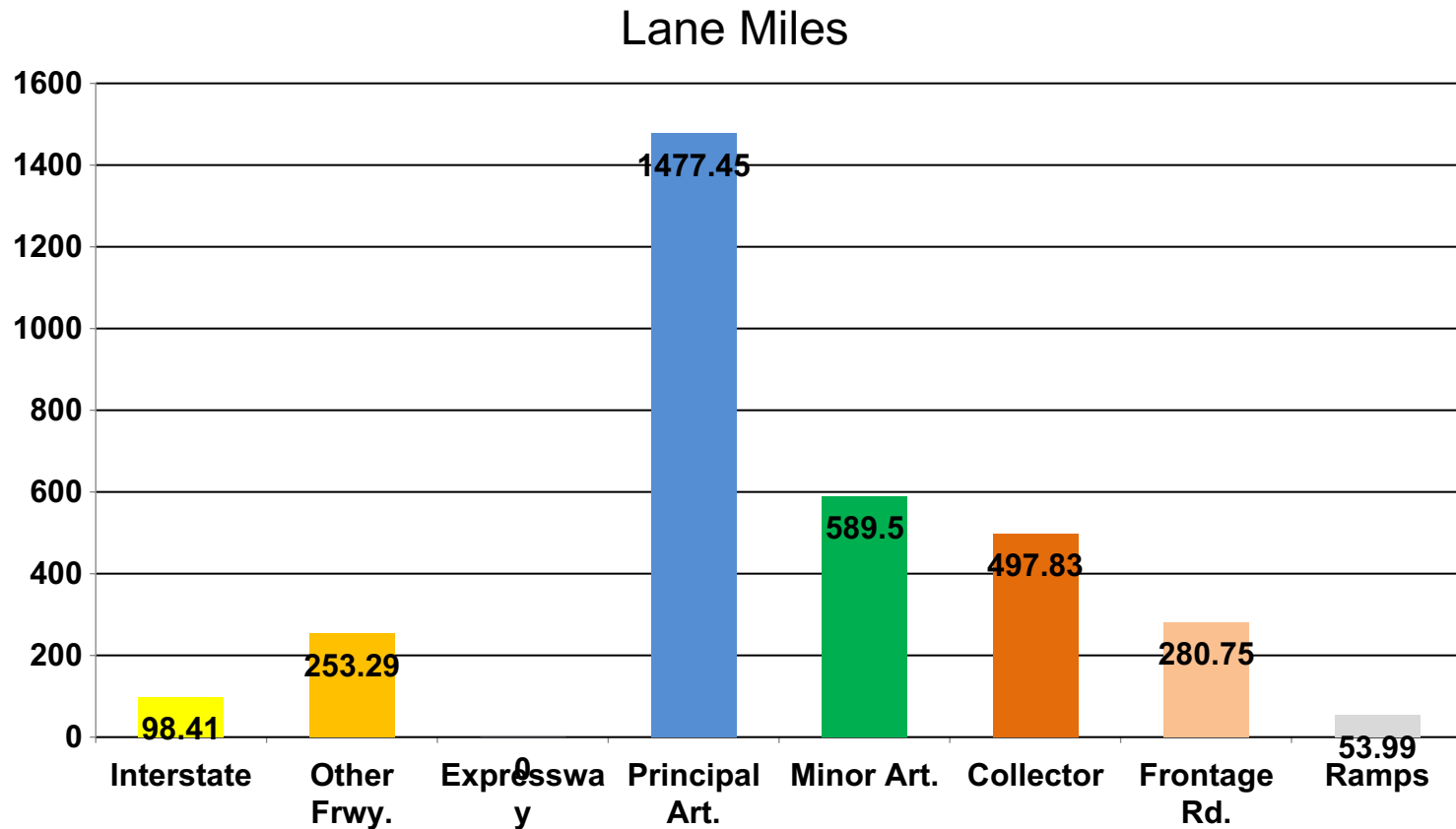


Distribution of 2040 Available Capacity VMT by Functional Classification





Distribution of 2040 Lane Miles by Functional Classification



Demographic Development



3367 barre



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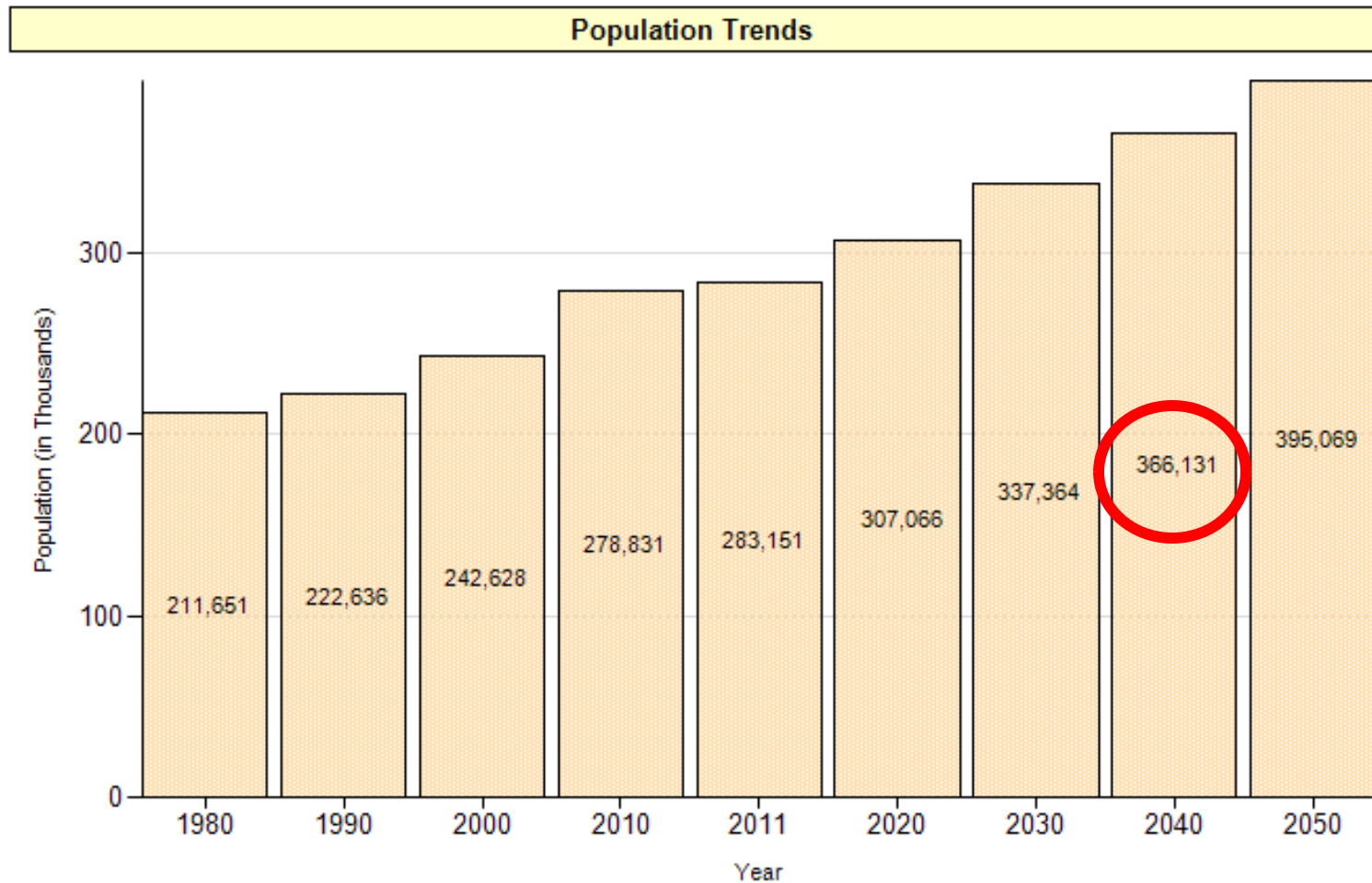
Demographics (2040)

Demographics Summary					
	TOTAL	General	Special Gen	%	
Population	366,434	363,242	13,192		
Households	140,694	140,694	0		
Population/Households	2.60				
Median HH Income	42,401				
Employment	169,328				
	Basic	42,808	39,118	3,690	25%
	Retail	43,354	40,619	2,735	26%
	Service	71,685	56,800	14,885	42%
	Education	11,401	5,966	5,515	7%
Employment/Population	0.46				
Population/Employment	2.16				
Employees/Household	1.20				

Demographic Development



Lubbock County 0.5 Trend





Comparison of 2006 and 2040 Demographics

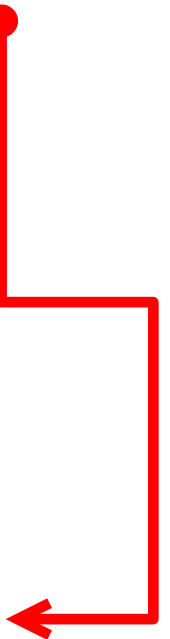
Demographics Summary	2006	2040	Absolute 06 to 40	% Growth
Population	260,199	366,434	106,235	40.83%
Households	103,873	140,694	36,821	35.45%
Population/Households	2.50	2.60	0.10	3.97%
Median HH Income	38,144	42,401	4,257	11.16%
Employment	125,174	169,328	44,154	35.27%
Basic	26,154	42,808	16,654	63.68%
Retail	30,134	43,354	13,220	43.87%
Service	53,146	71,685	18,539	34.88%
Education	15,740	11,481	-4,259	-27.06%
Employment/Population	0.48	0.46	-0.02	-3.94%
Population/Employment	2.08	2.16	0.09	4.11%
Employees/Household	1.21	1.20	0.00	-0.13%



Comparison of 2006 and 2040 Demographics

			Per Yr. Growth Rate
Demographics Summary	2006	2040	
Population	260,199	366,434	1.20%
Households	103,873	140,694	1.04%
Population/Households	2.50	2.60	0.12%
Median HH Income	38,144	42,401	0.33%
Employment	125,174	169,328	1.04%
	Basic	42,808	1.87%
	Retail	43,354	1.29%
	Service	71,685	1.03%
	Education	11,481	-0.80%

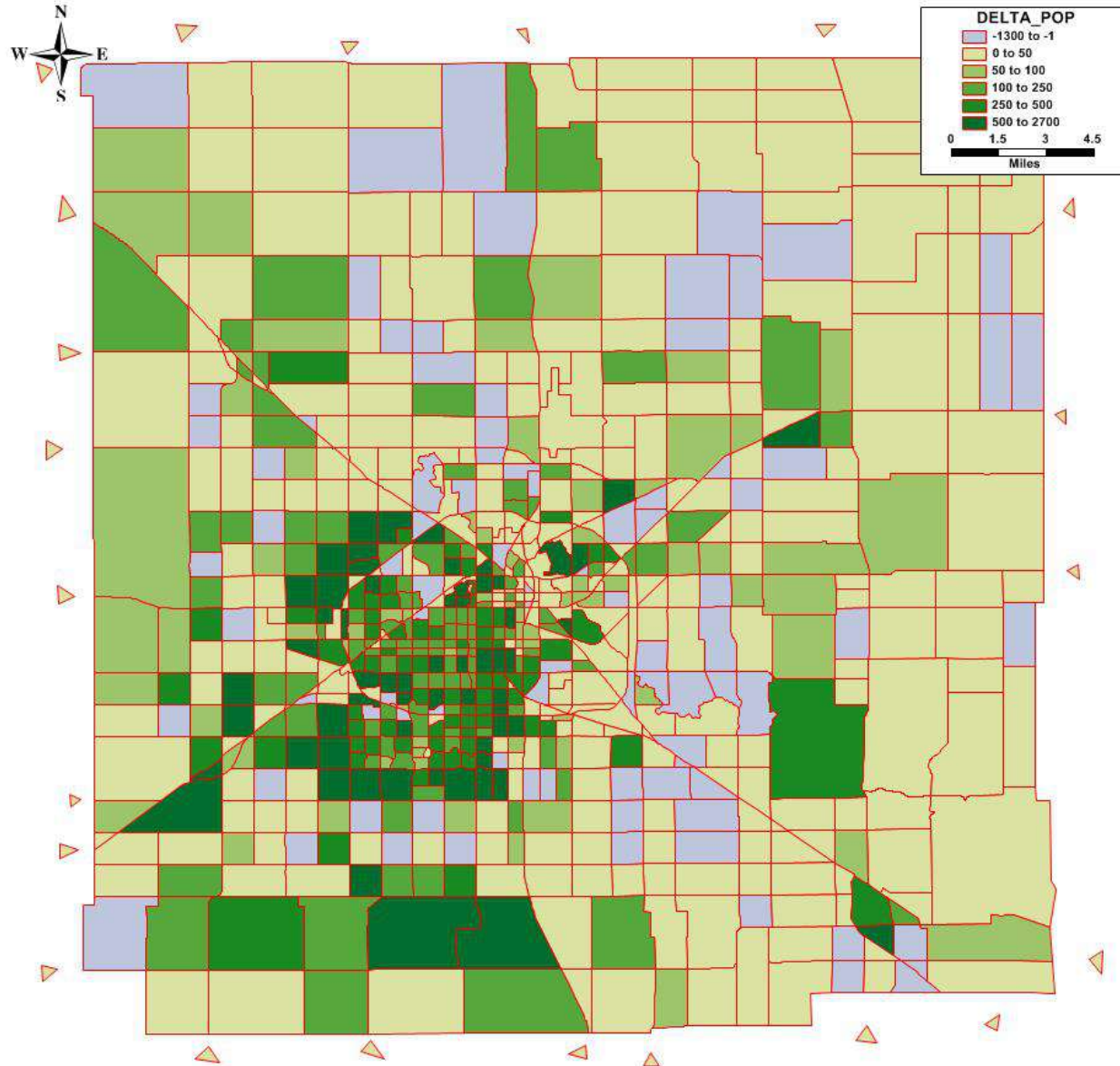
It would take approximately 60 years to double at this rate



Demographic Development



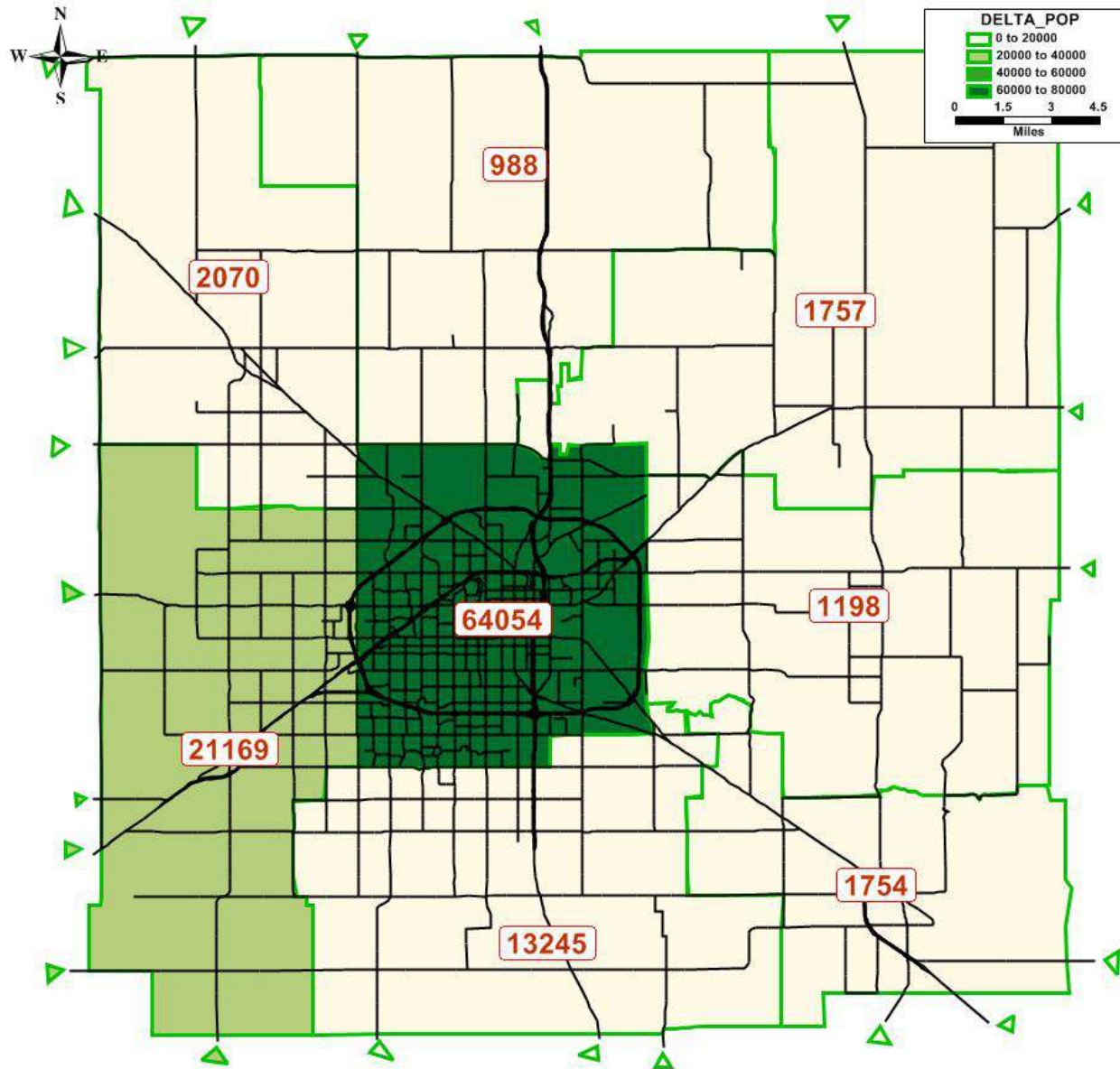
Population Change
(2006 to 2040)



Demographic Development



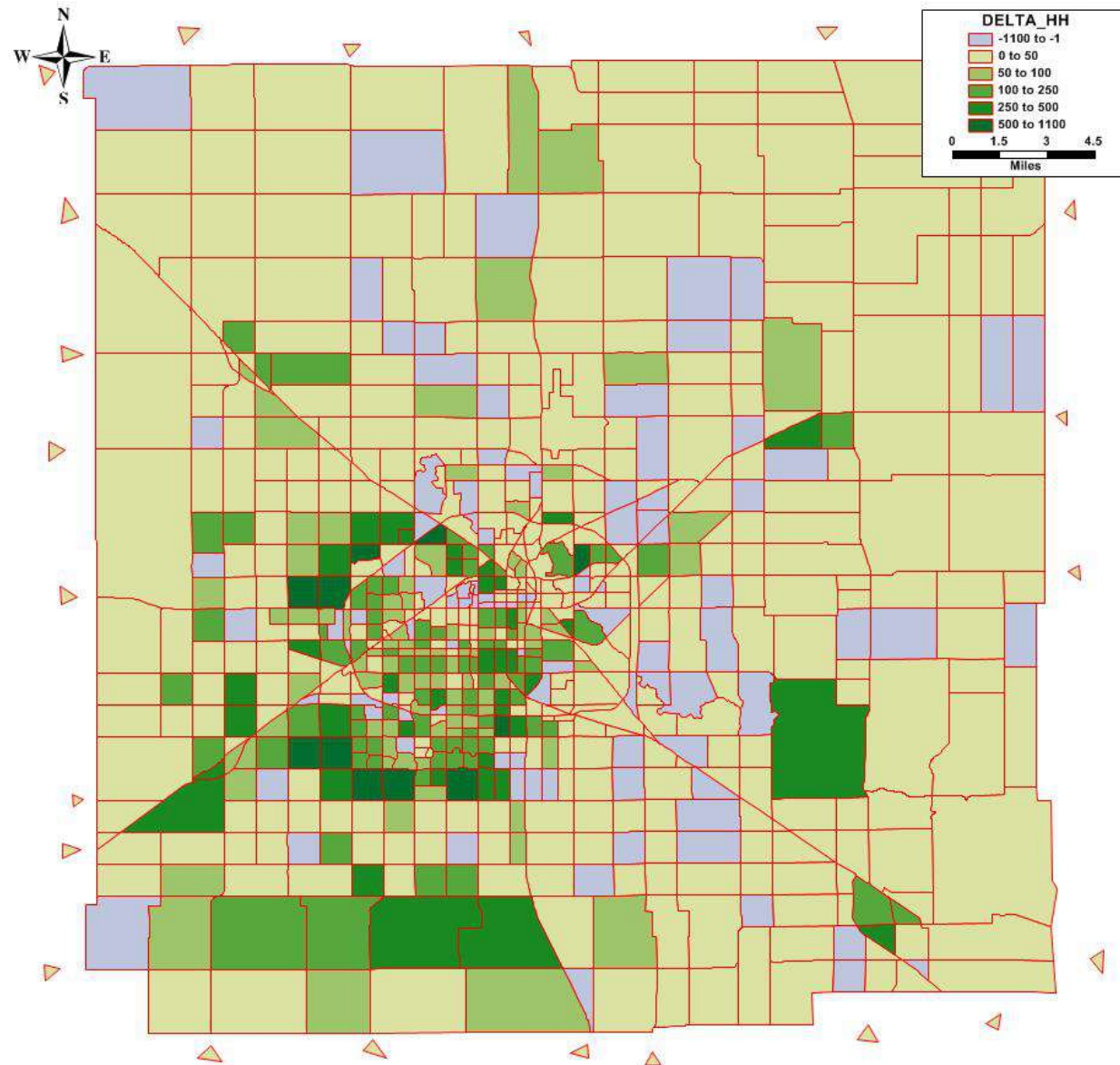
Population Change
(2006 to 2040) by
Sector



Demographic Development



Household Change
(2006 to 2040)

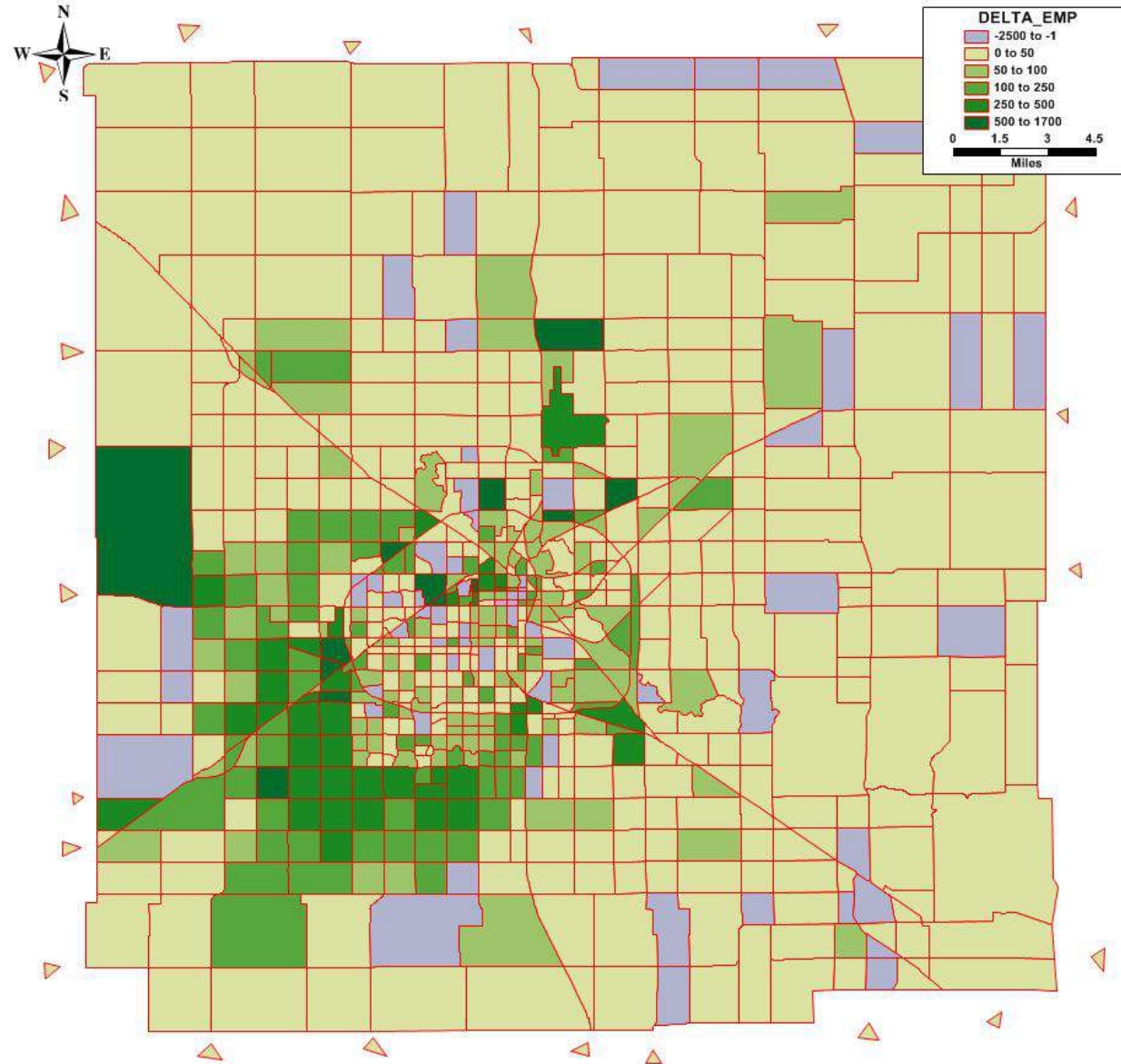


Demographic Development



Employment Change (2006 to 2040)

- 2 of 3 largest declines associated with Texas Tech University

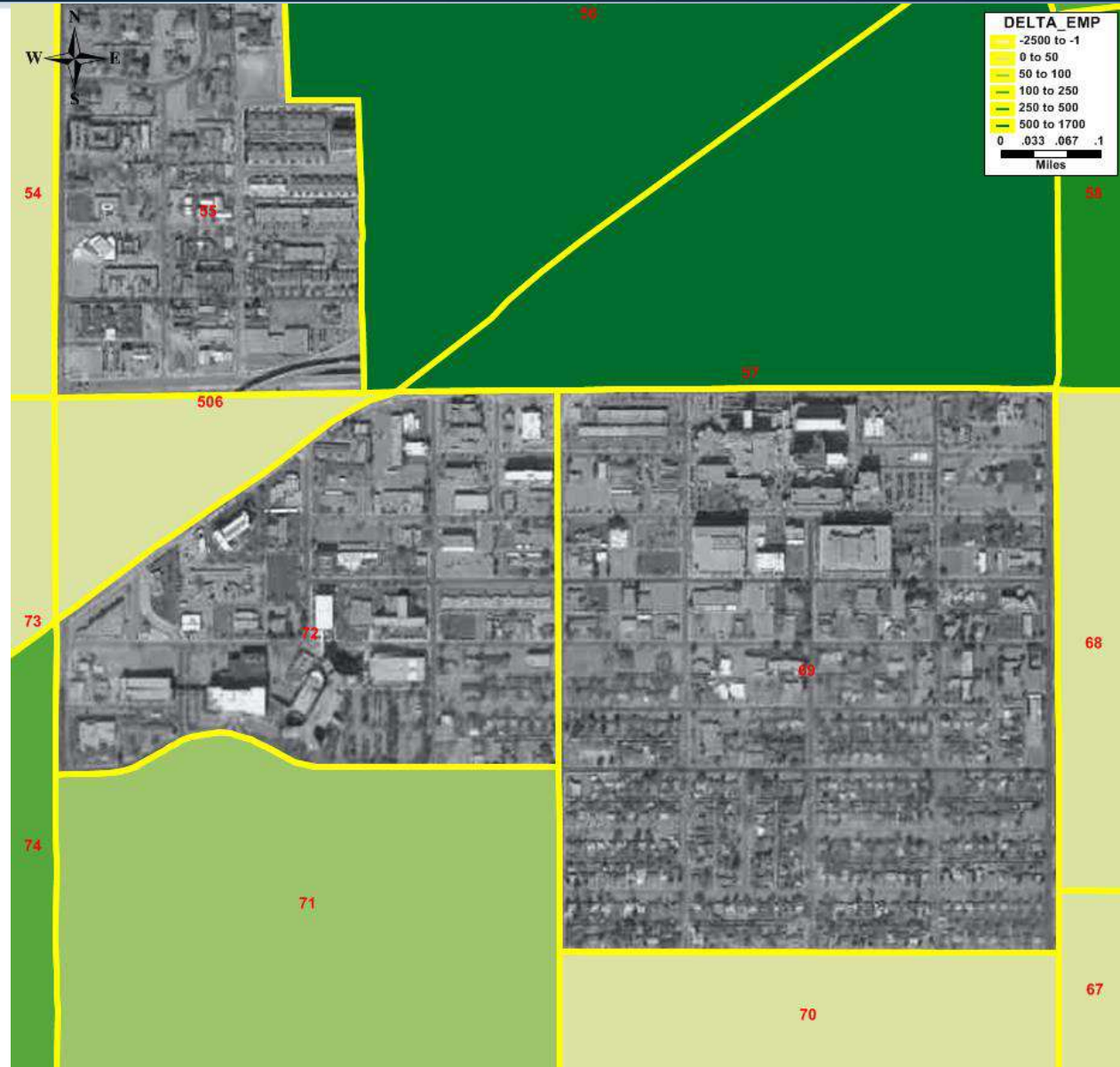


Demographic Development



Employment Change (2006 to 2040)

- TAZ 69 and 72 declined 2,329 and 946 total employees respectively

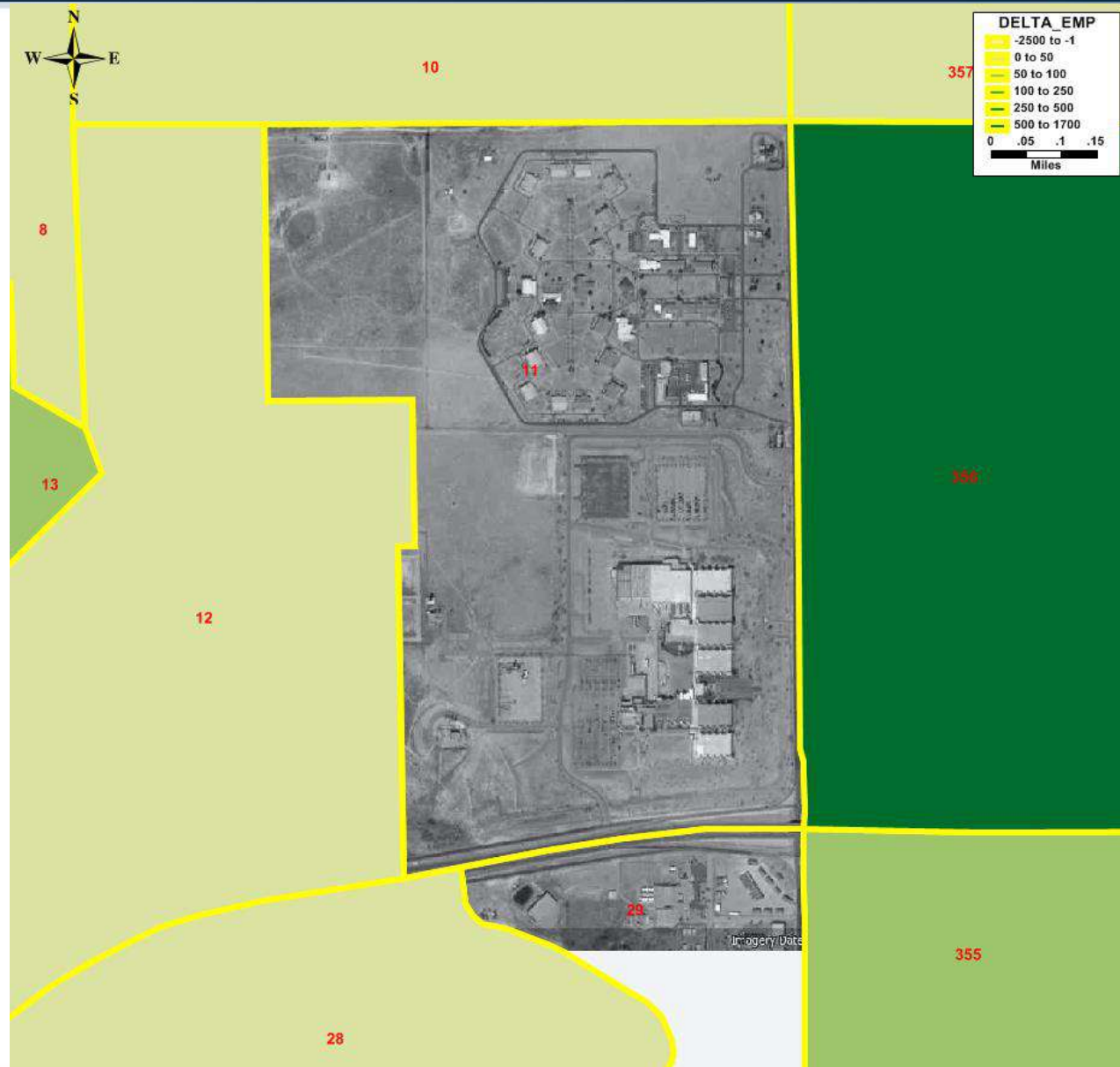


Demographic Development



Employment Change (2006 to 2040)

- TAZ 11 declined 1,513 total employees

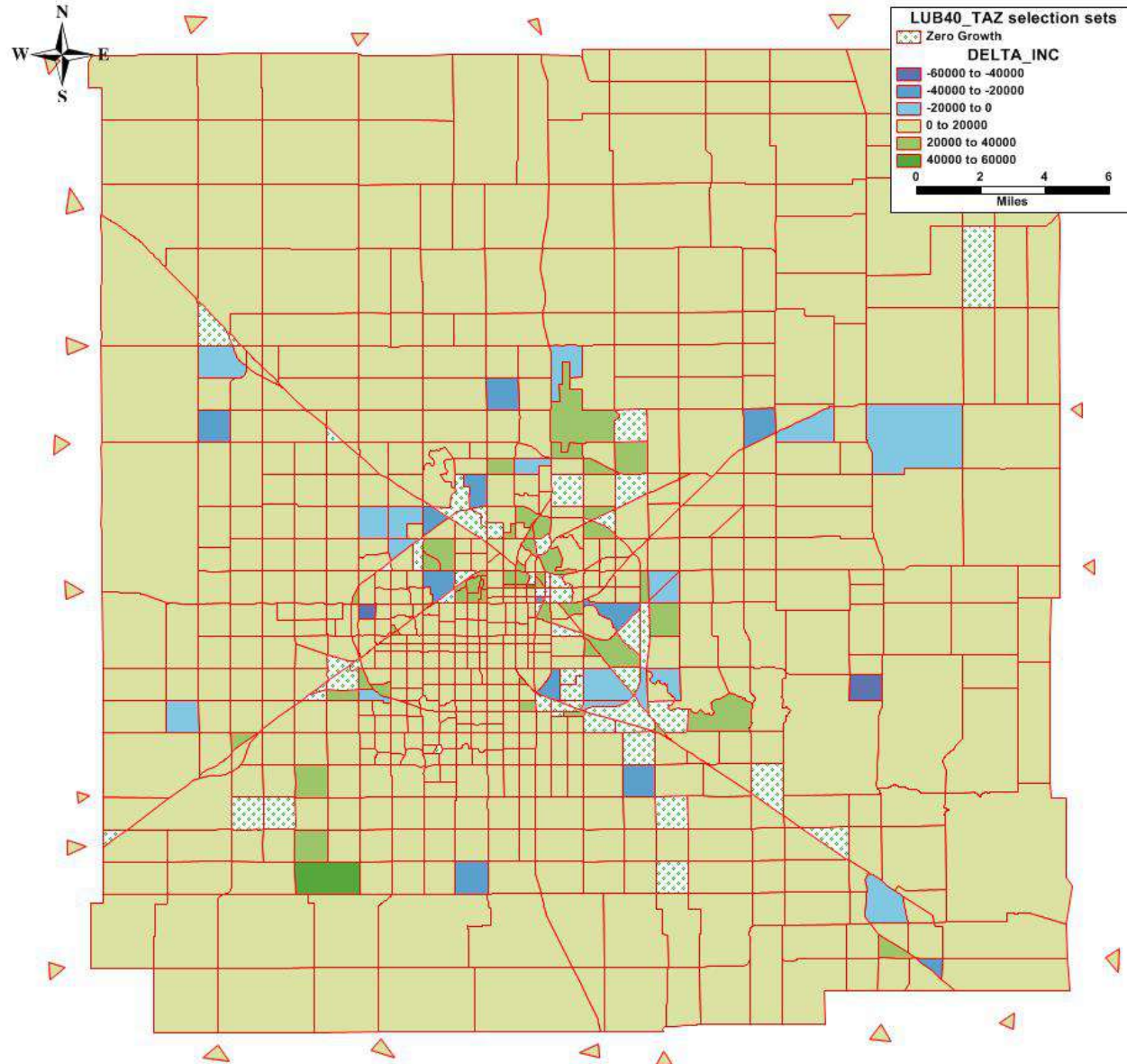


Demographic Development



Median Income Change (2006 to 2040)

- Only 58 of the total 720 internal zones did not experience a decline or increase





Unintended Consequences of Inflating \$'s v. Using Constant \$'s

Household Size

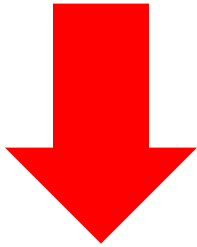
	1	2	3	4	5+
Household Income 1	2.095	2.961	3.578	4.459	4.907
Household Income 2	2.281	3.229	3.907	4.826	5.534
Household Income 3	2.363	3.348	3.982	5.004	5.805
Household Income 4	2.436	3.448	4.084	5.075	6.084
Household Income 5	2.644	3.792	4.539	5.668	6.835

External Station Volume Development



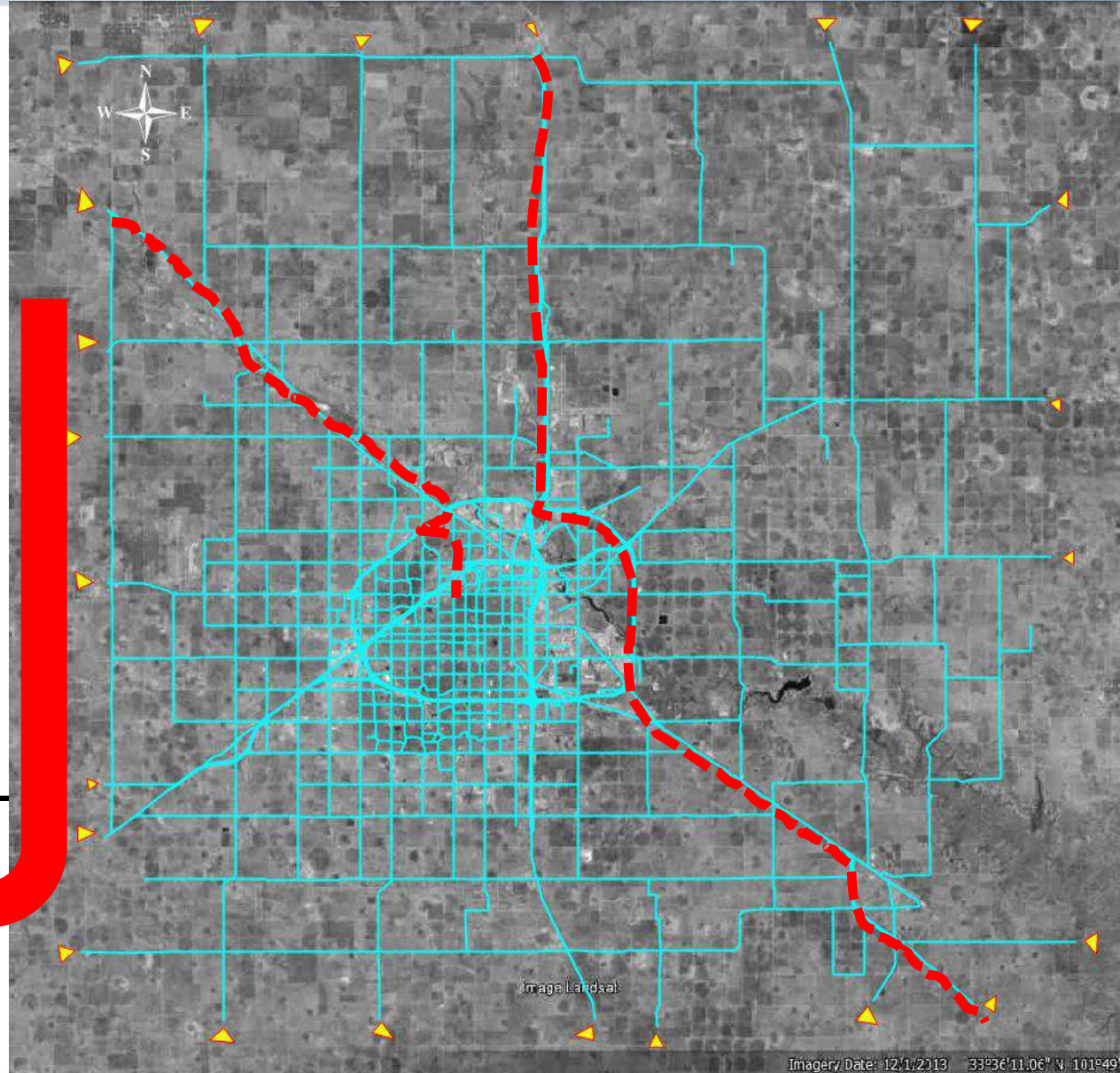
Two Trip Purposes

- External-Thru
- External-Local



- Truck
- Auto

Additional trips by non-residents



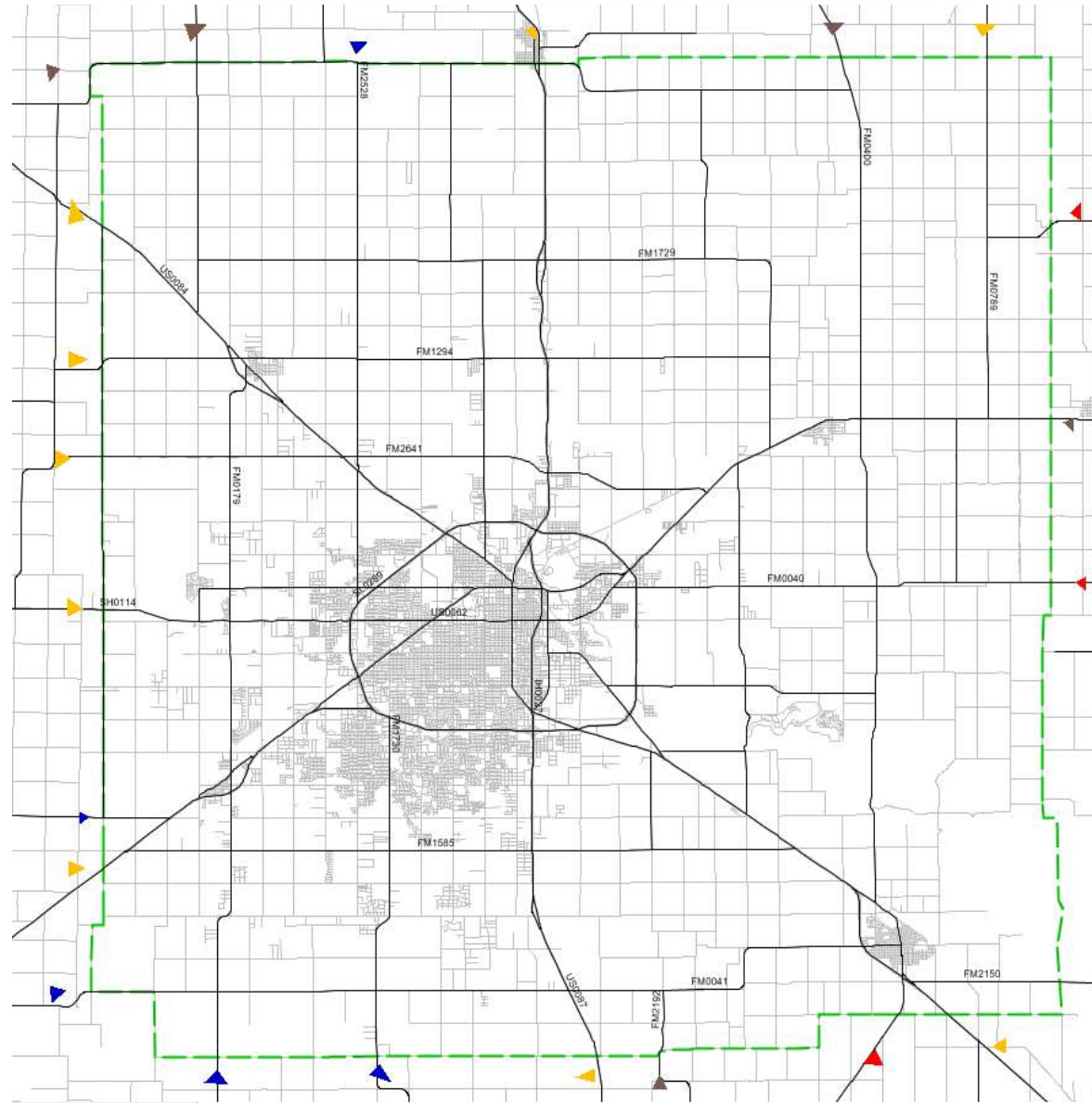
External Station Volume Development



External Station Forecast

- Used latest available planning data (2011 counts)
- Negative or extremely low growth at some external stations

	≤ 0% Growth
	0.1 – 1.0% Growth
	1.1 – 2.0% Growth
	>2% Growth



External Station Volume Development



External Station Forecast

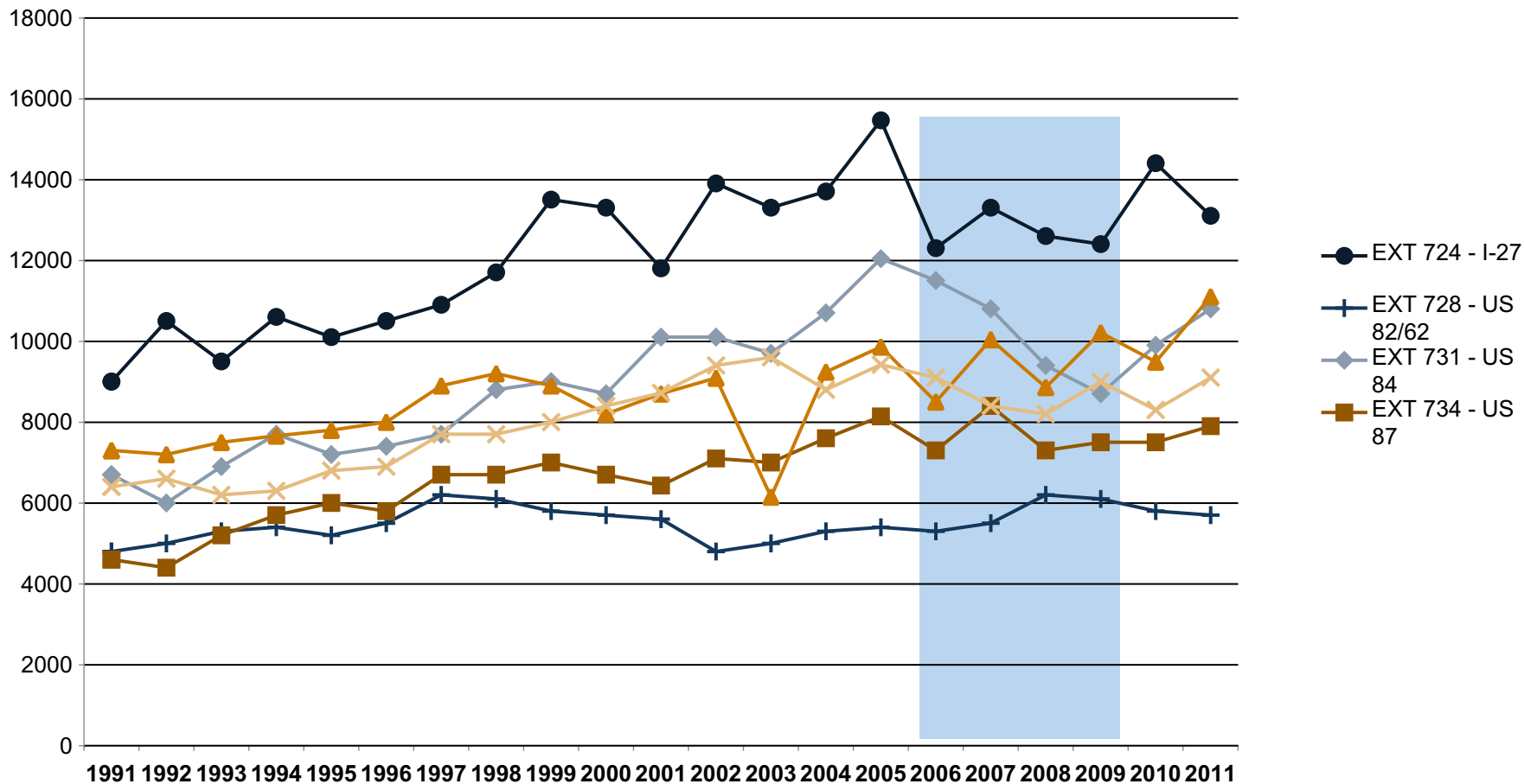
- Used latest available planning data (2011 counts)
- Some negative and low growth at select external stations

Highway Number	External Station	Historic Growth Rate
FM 400	732	-1.00%
FM 40	729	-0.80%
FM 1527	727	-0.50%
FM 789	726	0.40%
US 82/62	728	0.50%
FM 179	745	0.80%
FM 597	744	0.80%
FM 2150	730	0.90%
FM 2192	733	1.10%
FM 400	725	1.20%
FM 1294	742	1.20%
US 82/62	738	1.30%
I-27	724	1.50%
US 84	743	1.50%
SH 114	740	1.60%
FM 2641	741	1.60%
US 87	734	1.90%
US 84	731	2.00%
FM 41	737	2.20%
FM 1585	739	2.30%
FM 179	736	2.40%
FM 2528	746	3.30%
FM 1730	735	3.30%

External Station Volume Development



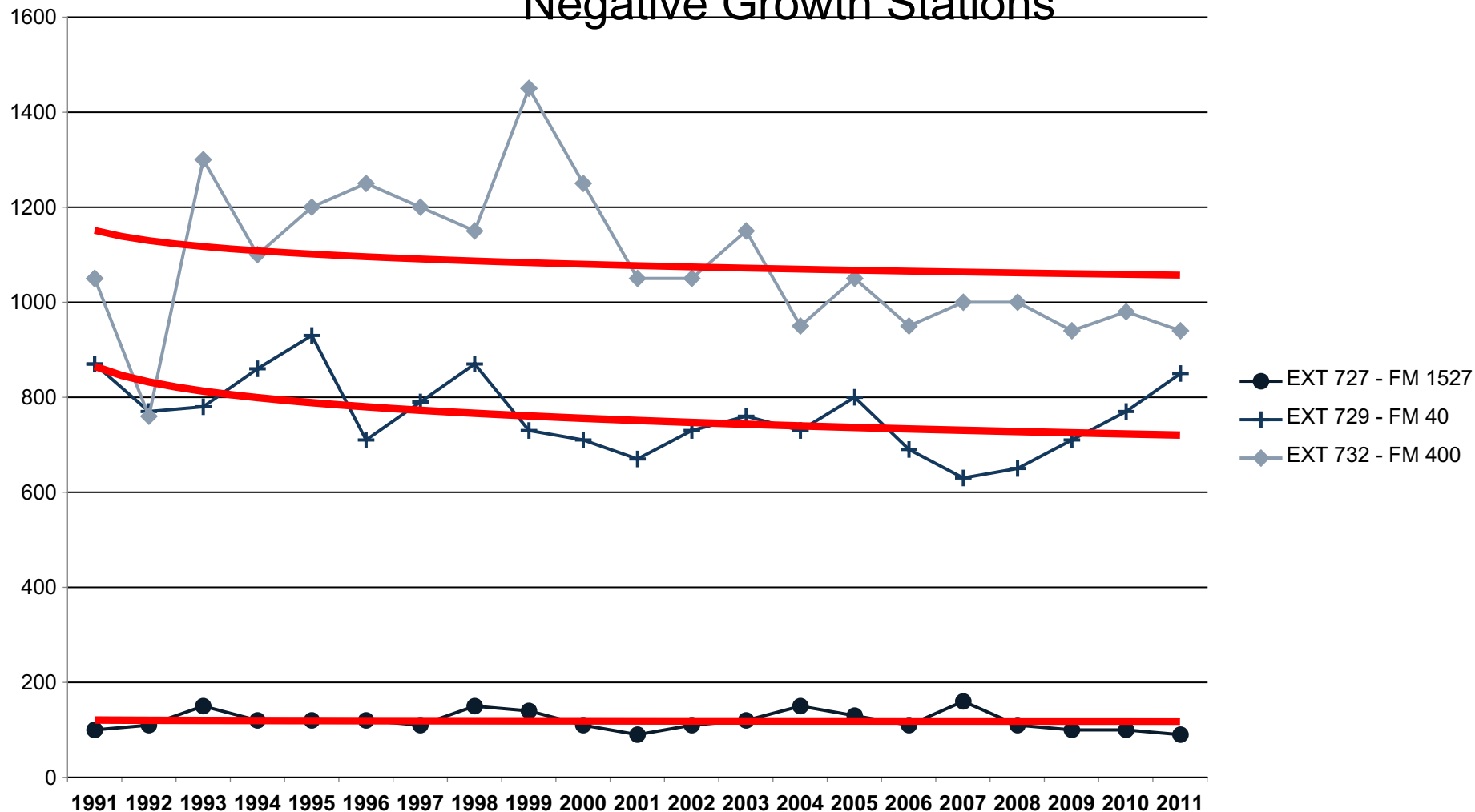
External Station 20-yr. Trend Analysis Interstate-27 and U.S. Highways



External Station Volume Development



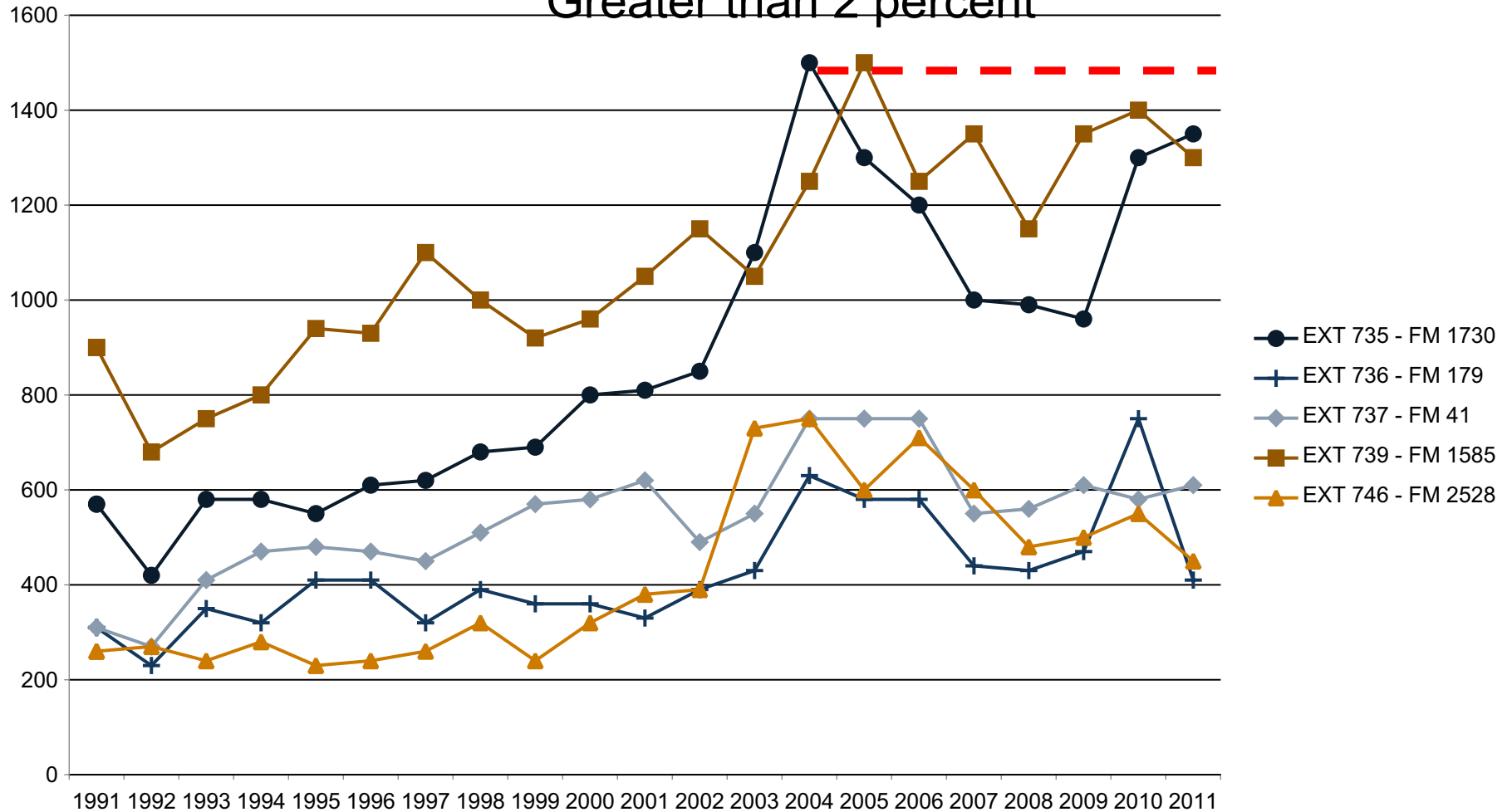
External Station 20-yr. Trend Analysis Negative Growth Stations



External Station Volume Development



External Station 20-yr. Trend Analysis Greater than 2 percent





2040 external travel results

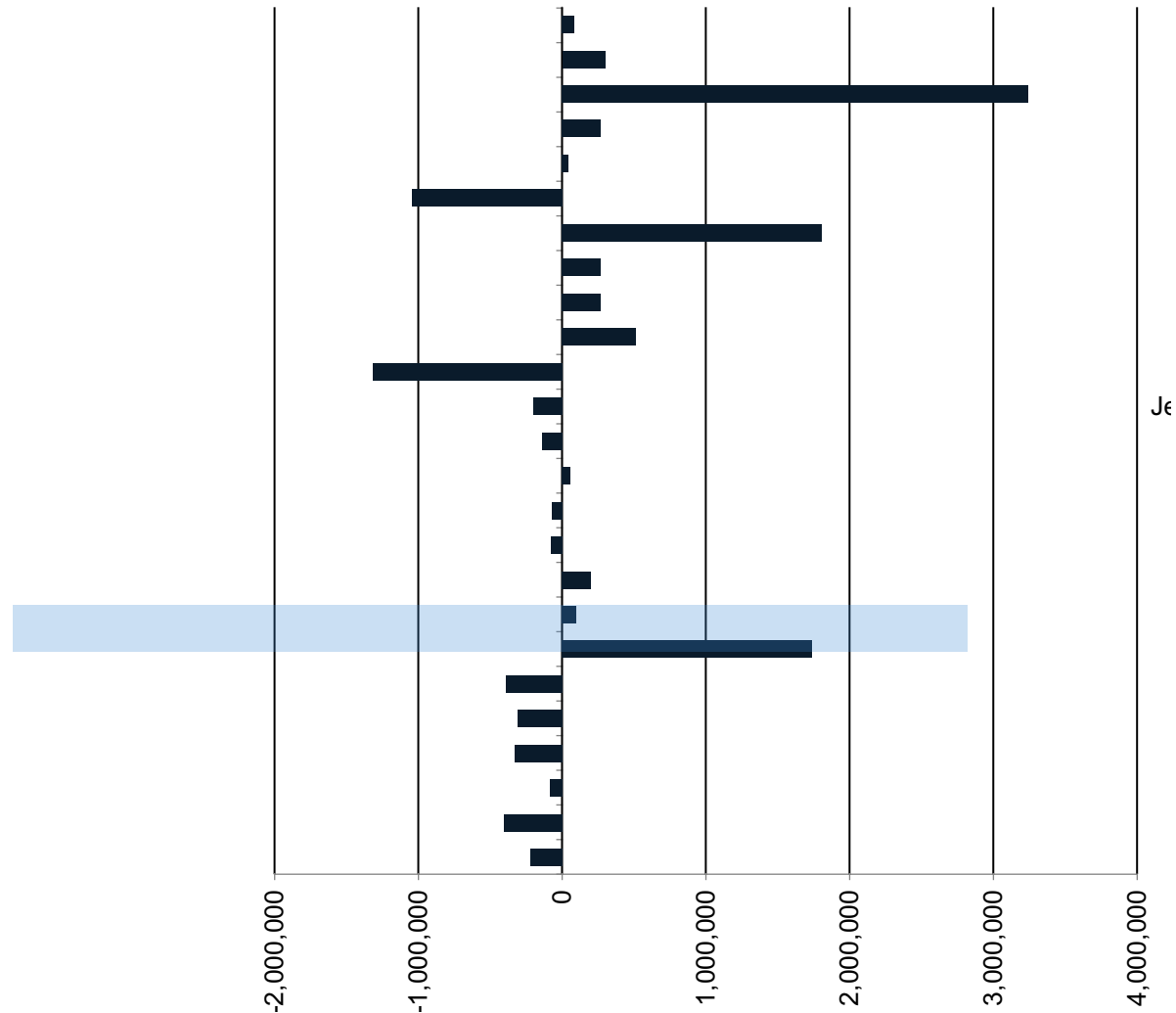
Trip Purpose	2006	2040	Delta
NHB-EXLO	107,200	177,446	70,166
EXLO-Auto	68,005	118,006	49,101
EXLO-Truck	10,909	18,155	7,246
EXTHRU-Auto	1,310	2,198	888
EXTHRU-Truck	1,138	1,900	762
Total	189,632	317,795	130,105

Internal Trips Increased by 39.83% (including NEXLO as well)

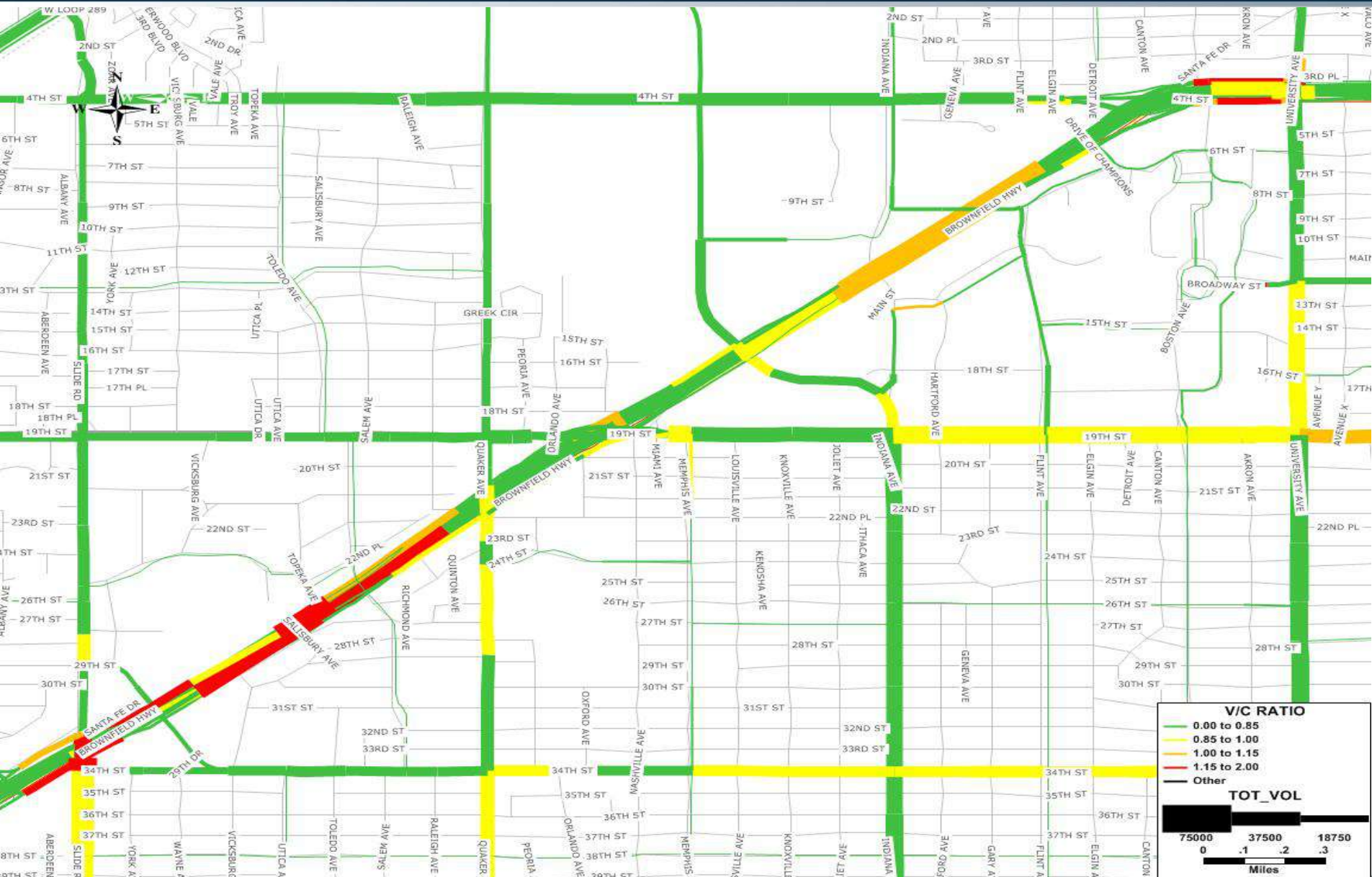
67.59% increase



2005 to 2010 HPMS On-System VMT Delta



Forecast Application Results

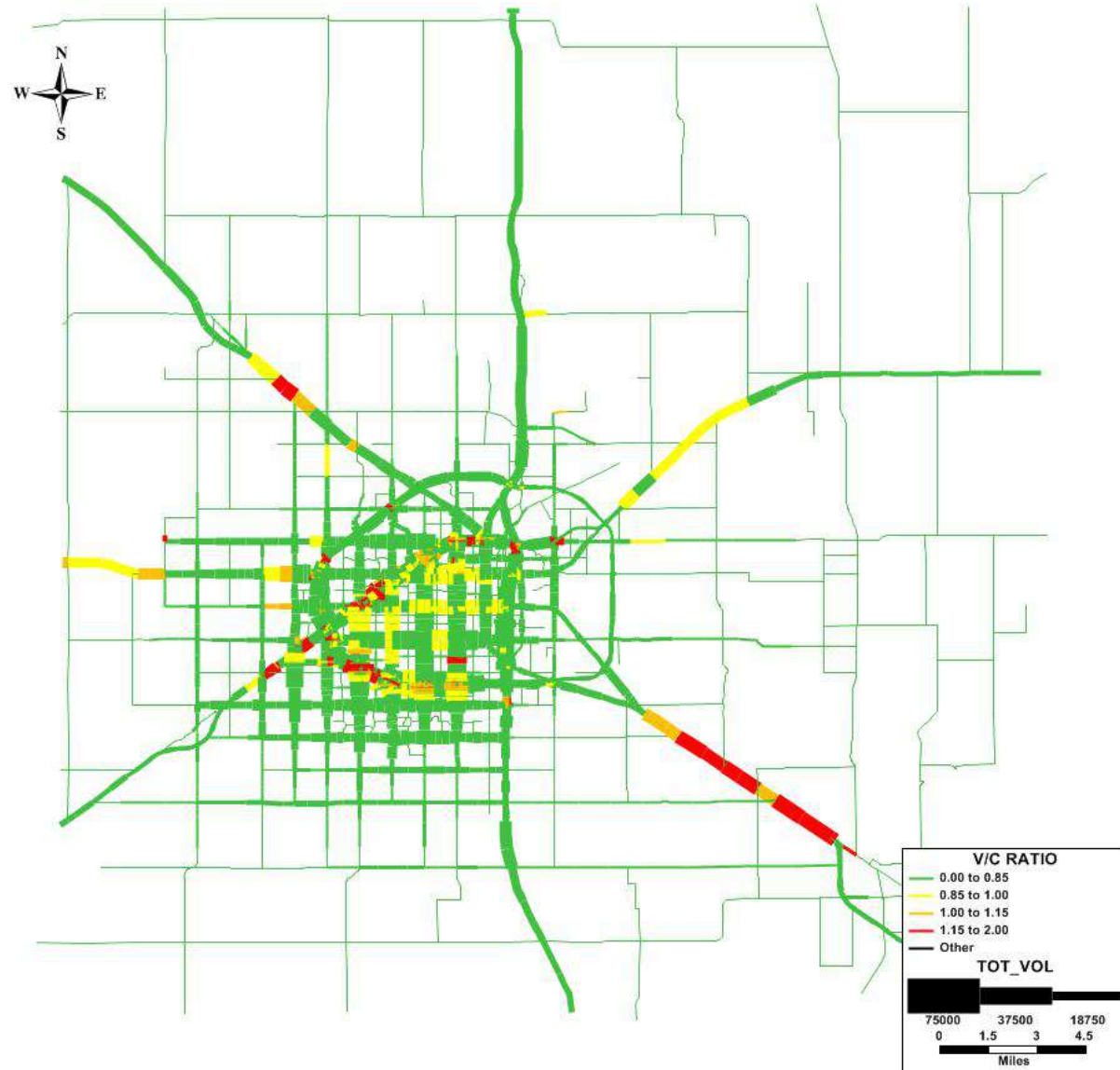
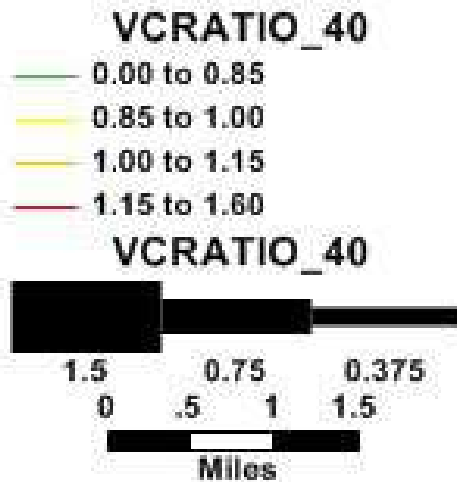


Forecast Application Results



2040 Volume-to-capacity ratio results

- Volume bandwidth with V/C color them



Forecast Application Results



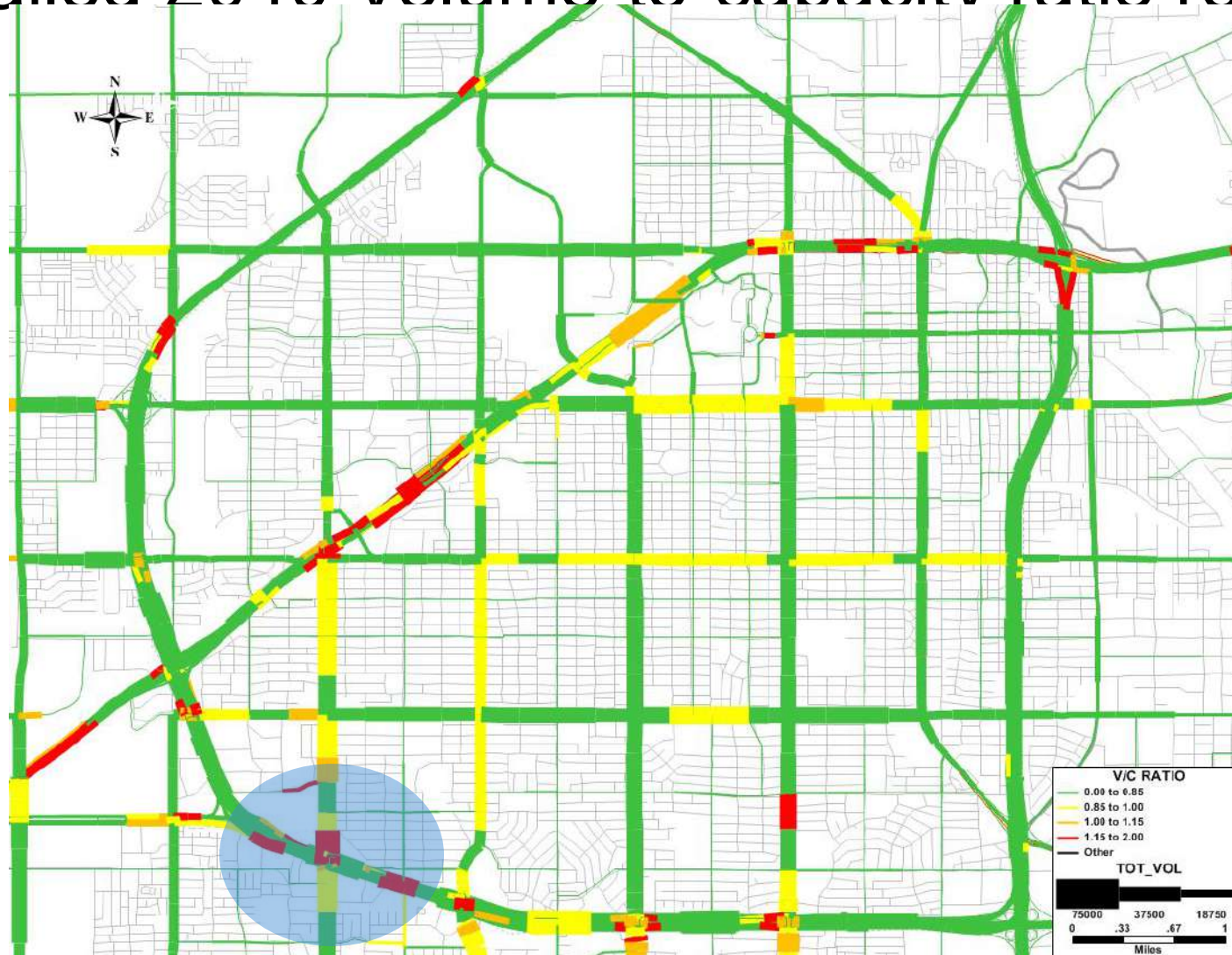
2040 Assignment Results (Daily Model)

Functional Classification	% of Capacity VMT	Number Of Links	Center-Line Miles	Lane Miles	Avg. Link Dist.	Avg. Lanes Per Mile	Capacity VMT	Modeled VMT
<i>Interstate</i>	47.88%	71	41.24	98.41	0.58	2.39	1,729,804	828,304
<i>Other Frwy.</i>	39.52%	209	105.5	253.29	0.5	2.4	5,064,160	2,001,407
<i>Expressway</i>	0.00%	0	0	0	0	0	0	0
<i>Principal Art.</i>	46.59%	1096	369.58	1477.45	0.34	4	10,532,528	4,907,056
<i>Minor Art.</i>	19.62%	361	282.52	589.5	0.78	2.09	2,807,619	550,821
<i>Collector</i>	17.41%	735	239.83	497.83	0.33	2.08	1,763,096	306,986
<i>Frontage Rd.</i>	28.43%	777	142.12	280.75	0.18	1.98	1,811,393	515,045
<i>Ramps</i>	26.05%	276	50.79	53.99	0.18	1.06	1,110,214	289,168
ALL	37.87%	3,525.00	1,231.57	3,251.22	0.35	2.64	24,818,814	9,398,787

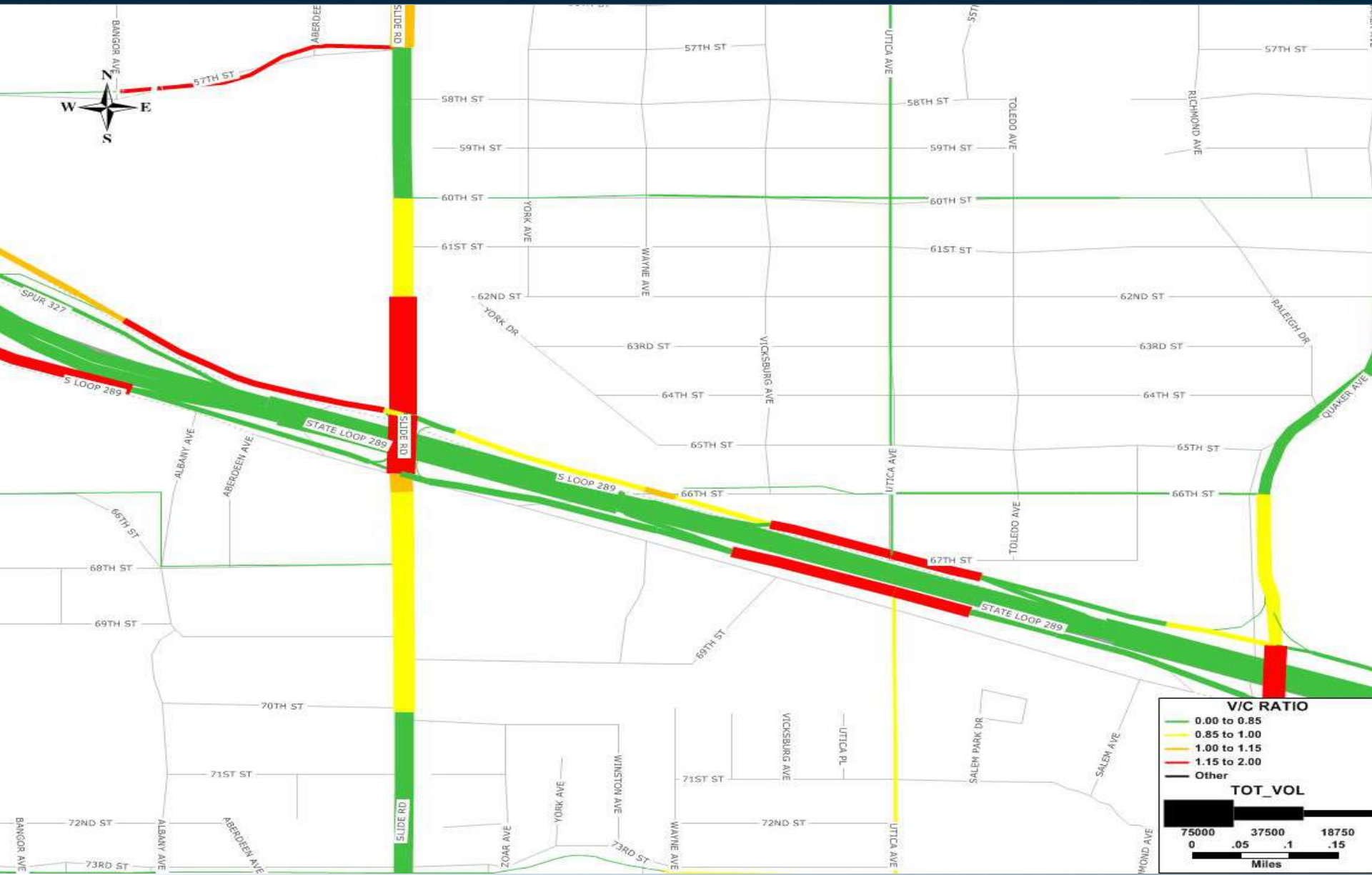
Forecast Application Results



Detailed 2040 Volume-to-capacity ratio results



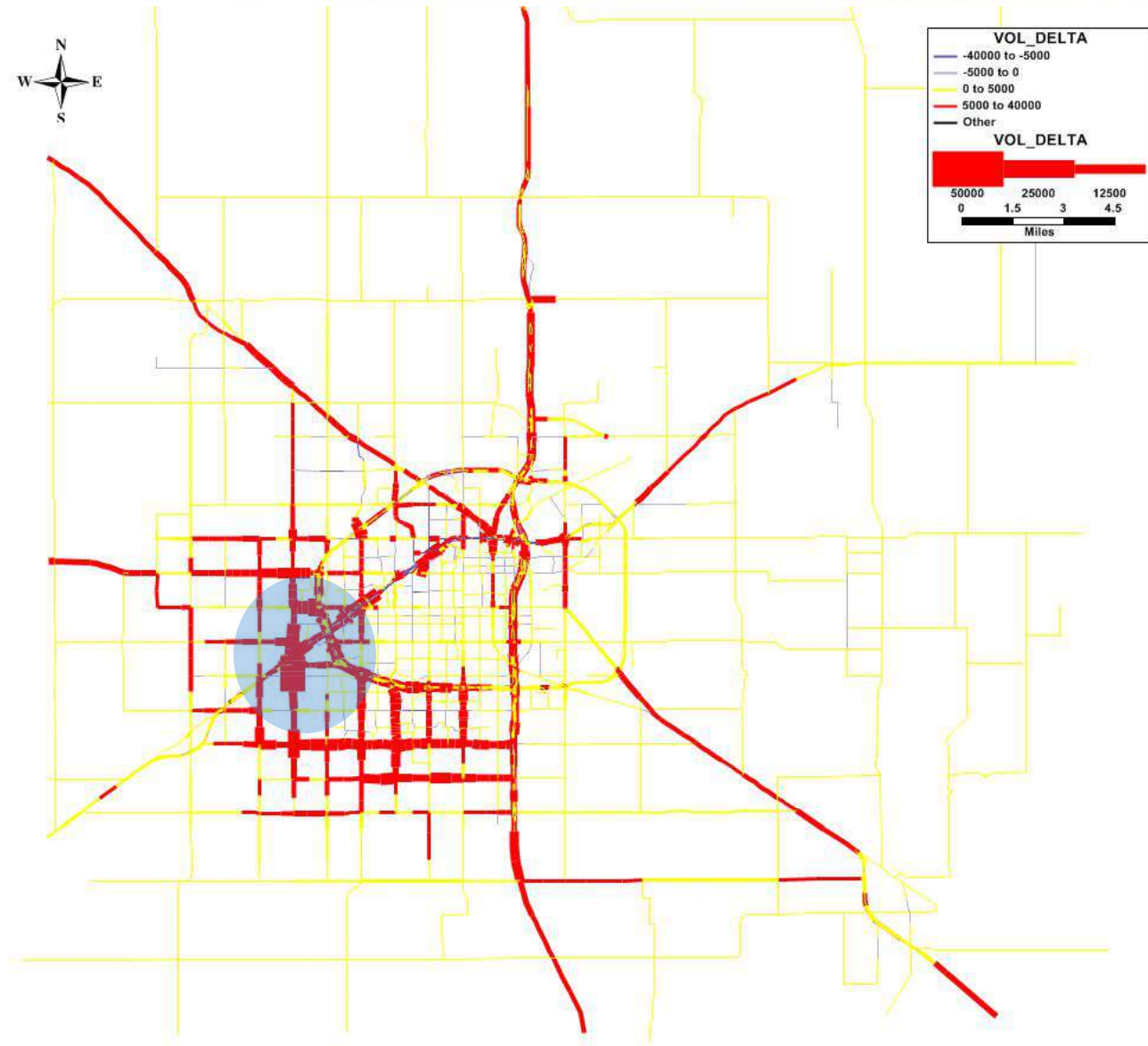
Forecast Application Results



Forecast Application Results



Differences
between
previous 2006
assignment
versus current
2040
assignment





2006 versus 2040 Assignment Results

Functional Classification	2006 VMT	2040 VMT	06 to 40 Delta	% Growth	Growth Per Year
Interstate	491,177	836,574	345,397	70.32%	2.07%
Other Freeways	1,014,365	2,001,407	987,042	97.31%	2.86%
Expressways	0	0	0	0.00%	0.00%
Principal Arterials	3,490,117	4,907,056	1,416,939	40.60%	1.19%
Minor Arterials	335,873	550,821	214,948	64.00%	1.88%
Collectors	226,674	306,985	80,311	35.43%	1.04%
Frontage Roads	283,712	506,775	223,063	78.62%	2.31%
Ramps	149,622	289,168	139,546	93.27%	2.74%
Sum	5,991,540	9,398,786	3,407,246	56.87%	1.67%



- Network alternative analysis
 - Score and rank projects for MTP
 - Attend training

- Support MTP documentation

- Begin planning for next model update
 - Consistent with **2016** urban saturation counts
 - Consider developing incremental network and demographic inventories for base and forecast applications
 - Limit 34 year horizon between base and forecast
 - Utilize existing travel survey data



TPP offers additional on-site assistance

- Help Desk: 512-486-5177 or,
- Email: TPP_TRANSCAD-HELPDESK@txdot.gov

THANK YOU