



Austin College and the Texoma Council of Governments

# 2011 Sherman- Denison Labor Shed Study

A report that identifies and analyzes where workers in Sherman and Denison reside

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**Table 1: Frequency of Employee Zip Code\***

<b>Denison, TX 75020</b>	2277	Madill, OK	73446	12	Farmersville, TX	75442	2	Roxton, TX	75477	1	Knoxville, TN	37922	1			
<b>Sherman, TX 75090</b>	1885	Kemp, OK	74747	11	Commerce, TX	75428	2	Quinlan, TX	75474	1	Boca Raton, FL	33433	1			
<b>Sherman, TX 75092</b>	1807	Wolfe City, TX	75496	10	Greenville, TX	75401	2	Paris, TX	75461	1	Merritt Island, FL	32952	1			
<b>Denison, TX 75021</b>	735	Plano, TX	75074	10	Dallas, TX	75287	2	<b>Ladonia, TX 75449</b>	<b>1</b>	Augusta, GA	30907	1				
<b>Pottsboro, TX 75076</b>	530	Little Elm, TX	75068	10	Dallas, TX	75249	2	Commerce, TX	75429	1	Acworth, GA	30102	1			
<b>Howe, TX 75459</b>	289	Plano, TX	75025	10	Dallas, TX	75244	2	Campbell, TX	75422	1	Hamptonville, NC	27020	1			
<b>Bells, TX 75414</b>	277	<b>Windom, TX 75492</b>	<b>9</b>	Dallas, TX	75243	2	Brashear, TX	75420	1	Wise, VA	24293	1				
<b>Bonham, TX 75418</b>	271	<b>Tioga, TX 76271</b>	<b>8</b>	Dallas, TX	75234	2	Arthur City TX	75411	1	New Castle, VA	24127	1				
<b>Durant, OK 74701</b>	226	Cleburne, TX	76033	8	Dallas, TX	75225	2	Greenville, TX	75402	1	Arlington, VA	22209	1			
<b>Whitesboro, TX 76273</b>	223	Paris, TX	75462	8	Dallas, TX	75219	2	Dallas, TX	75251	1	Mc Donald, PA	15057	1			
<b>Whitewright, TX 75491</b>	179	<b>Bailey, TX 75413</b>	<b>8</b>	Nevada, TX	75173	2	Dallas, TX	75233	1	Dallas, TX	75230	1	Rural Area, OK	74744	2	
Lewisville, TX	75067	Dallas, TX	75248	8	Wills Point, TX	75169	2	Dallas, TX	75220	1	Dallas, TX	75217	1	Rural Area, OR	97509	1
<b>Colbert, OK 74733</b>	167	Lexington, KY	40503	8	Lancaster, TX	75134	2	Dallas, TX	75220	1	Dallas, TX	75217	1	Rural Area, TX	76276	1
<b>Van Alstyne, TX 75495</b>	153	Aubrey, TX	76227	7	Corsicana, TX	75110	2	Dallas, TX	75217	1	Dallas, TX	75214	1	Rural Area, TX	76223	1
<b>Sherman, TX 75091</b>	125	<b>Gober, TX 75443</b>	<b>7</b>	Richardson, TX	75089	2	Rowlett, TX	75089	2	Dallas, TX	75214	1	Rural Area, TX	75730	1	
<b>Calera, OK 74730</b>	109	Wylie, TX	75098	7	Richardson, TX	75080	2	Richardson, TX	75080	2	Dallas, TX	75207	1	Rural Area, TX	75419	1
McKinney, TX	75070	Plano, TX	75024	7	Garland, TX	75042	2	Garland, TX	75042	2	Dallas, TX	75205	1	Rural Area, TX	75419	1
Dallas, TX	75231	<b>Randolph, TX 75475</b>	<b>6</b>	Garland, TX	75040	2	Garland, TX	75040	2	Lavon, TX	75166	1	Rural Area, MO	64273	1	
<b>Savoy, TX 75479</b>	89	Paris, TX	75460	6	Plano, TX	75026	2	Palmer, TX	75152	1	Rural Area, MO	64264	1			
Anna, TX	75409	Garland, TX	75044	6	Thackerville, OK	73459	2	Mesquite, TX	75149	1						
<b>Tom Bean, TX 75489</b>	82	Atoka, OK	74525	6	<b>Milburn, OK 73450</b>	<b>2</b>	Caddo Mills, TX	75135	1							
<b>Gainesville, TX 76240</b>	78	Celeste, TX	75423	5	Coleman, OK	73432	2	Ennis, TX	75119	1						
<b>Sadler, TX 76264</b>	74	Murphy, TX	75094	5	Portland, OR	97217	1	Cedar Hill, TX	75104	1						
<b>Collinsville, TX 76233</b>	67	<b>Platter, OK 74753</b>	<b>5</b>	Laguna Woods, CA	92637	1	Barry, TX	75102	1							
<b>Cartwright, OK 74731</b>	65	<b>Kenefic, OK 74748</b>	<b>5</b>	Round Rock, TX	78681	1	Rockwall, TX	75087	1							
McKinney, TX	75071	<b>Valley View, TX 76272</b>	<b>4</b>	Harlingen, TX	78550	1	Plano, TX	75086	1							
<b>Leonard, TX 75452</b>	51	Pilot Point, TX	76258	4	Spring, TX	77381	1	Lewisville, TX	75077	1						
<b>Gunter, TX 75058</b>	51	<b>Muenster, TX 76252</b>	<b>4</b>	Montgomery, TX	77356	1	Irving, TX	75062	1							
Dallas, TX	75238	<b>Gainesville, TX 76241</b>	<b>4</b>	Magnolia, TX	77354	1	Irving, TX	75061	1							
McKinney, TX	75069	Denton, TX	76201	4	Gouldbusk, TX	76845	1	Howe, TX	75059	1						
<b>Ravenna, TX 75476</b>	43	Richardson, TX	75082	4	Cameron, TX	76520	1	Grand Prairie, TX	75052	1						
<b>Ector, TX 75439</b>	40	Richardson, TX	75081	4	Temple, TX	76504	1	Grand Prairie, TX	75051	1						
Dallas, TX	75228	Carrollton, TX	75007	4	Dennis, TX	76439	1	Garland, TX	75043	1						
Allen, TX	75002	Ardmore, OK	73401	4	Iowa Park, TX	76367	1	Rockwall, TX	75032	1						
<b>Honey Grove, TX 75446</b>	39	Wichita Falls, TX	76308	3	Wichita Falls, TX	76310	1	Lewisville, TX	75029	1						
<b>Achille, OK 74720</b>	37	<b>Lindsay, TX 76250</b>	<b>3</b>	Sanger, TX	76266	1	Flower Mound, TX	75028	1							
<b>Hendrix, OK 74741</b>	35	Denton, TX	76210	3	Saint Jo, TX	76265	1	Flower Mound, TX	75022	1						
<b>Ivanhoe, TX 75447</b>	34	Denton, TX	76209	3	Myra, TX	76253	1	Coppell, TX	75019	1						
<b>Trenton, TX 75490</b>	33	Denton, TX	76205	3	Keller, TX	76248	1	Carrollton, TX	75006	1						
<b>Dallas, TX 76245</b>	31	Sulpher Springs, TX	75482	3	Keller, TX	76244	1	Stonewall, OK	74871	1						
<b>Southmayd, TX 76268</b>	30	Dallas, TX	75265	3	Era, TX	<b>76238</b>	1	Sasakwa, OK	74867	1						
<b>Mead, OK 73449</b>	26	Dallas, TX	75252	3	Decatur, TX	76234	1	Ada, OK	74820	1						
<b>Bokchito, OK 74726</b>	25	Dallas, TX	75206	3	Argyle, TX	76226	1	Wright City, OK	74766	1						
<b>Bennington, OK 74729</b>	22	Royce City, TX	75189	3	Alvord, TX	76225	1	Idabel, OK	74745	1						
Kingston, OK	73439	Weston, TX	75097	3	Fort Worth, TX	76123	1	Boswell, OK	74727	1						
<b>Dodd City, TX 75438</b>	21	Plano, TX	75093	3	Argyle, TX	76226	1	<b>Caney, OK 74533</b>	<b>1</b>							
Melissa, TX	75454	Plano, TX	75075	3	Alvord, TX	76225	1	Eufaula, OK	74432	1						
<b>Telephone, TX 75488</b>	17	Lewisville, TX	75056	3	Fort Worth, TX	76109	1	Catoosa, OK	74015	1						
Princeton, TX	75407	Grand Prairie, TX	75050	3	Weatherford, TX	76087	1	Goltry, OK	73739	1						
Allen, TX	75013	Carrollton, TX	75010	3	Springtown, TX	76082	1	Lone Grove, OK	73443	1						
<b>Bennington, OK 74723</b>	15	Albany, OK	74721	3	Arlington, TX	76018	1	Whittington, IL	62897	1						
Frisco, TX	75035	Tishomingo, OK	73460	3	Arlington, TX	76016	1	Thompsonville, IL	62890	1						
Celina, TX	75009	Nocona, TX	76255	2	Arlington, TX	76014	1	Benton, IL	62812	1						
Blue Ridge, TX	75424	Krum, TX	76249	2	Arlington, TX	76013	1	Sterling, IL	61081	1						
Sachse, TX	75048	Justin, TX	76247	2	Arlington, TX	76012	1	Sheridan, MT	59749	1						
Frisco, TX	75034	Denton, TX	76208	2	Lufkin, TX	75902	1	Chilton, WI	53014	1						
Plano, TX	75023	Yantis, TX	75497	2	Van, TX	75790	1	Urbandale, IA	50323	1						
<b>Durant, OK 74702</b>	12	Sumner, TX	75486	2	Gilmer, TX	75645	1	Batesville, IN	47006	1						

\*Communities in **bold** indicate a zip code in the Texoma region (See Table A1 in the appendix for a map of Texoma zip codes and Table A2 in the appendix for a map of zip code frequencies in this study)

## Overview of the Study

In the spring of 2011, the Texoma Council of Governments, with the assistance of the Robert L. Snyder Social Science Research Lab at Austin College, surveyed major employers in Sherman and Denison. Employers who were believed to have 100 or more employees were invited to participate in this study. The survey response included 30 local employers who supplied data on their combined 11,572 employees. This is the third study of its kind, with previous iterations conducted by the Denison Development Alliance in 2003 and 2005. This version of the study included a large amount of employer specific data, not previously analyzed.

The purpose of these surveys is to twofold:

- 1) This study helps determine and analyze the local “labor shed.” This information will be useful to both public and private decision-makers who need a general understanding of employment and workforce staffing patterns in the area.
- 2) This study can serve as a model for other cities attempting to analyze their sub-regional labor shed.

A cautionary note:

The data present is only representative of some major employers in Sherman and Denison. This is not a study of all employees, or all employers, in the area.

Method:

We identified local employers in Sherman and Denison who have workforces of over 100 employees (perhaps because of the timing of the study some would report below 100 employees). This resulted in the identification of 40 workplaces. We sent out, by mail, a request for information from the HR Directors and followed up this request by phone calls and emails. Thirty employers completed our survey.

### A First Look at the Distribution of Employees

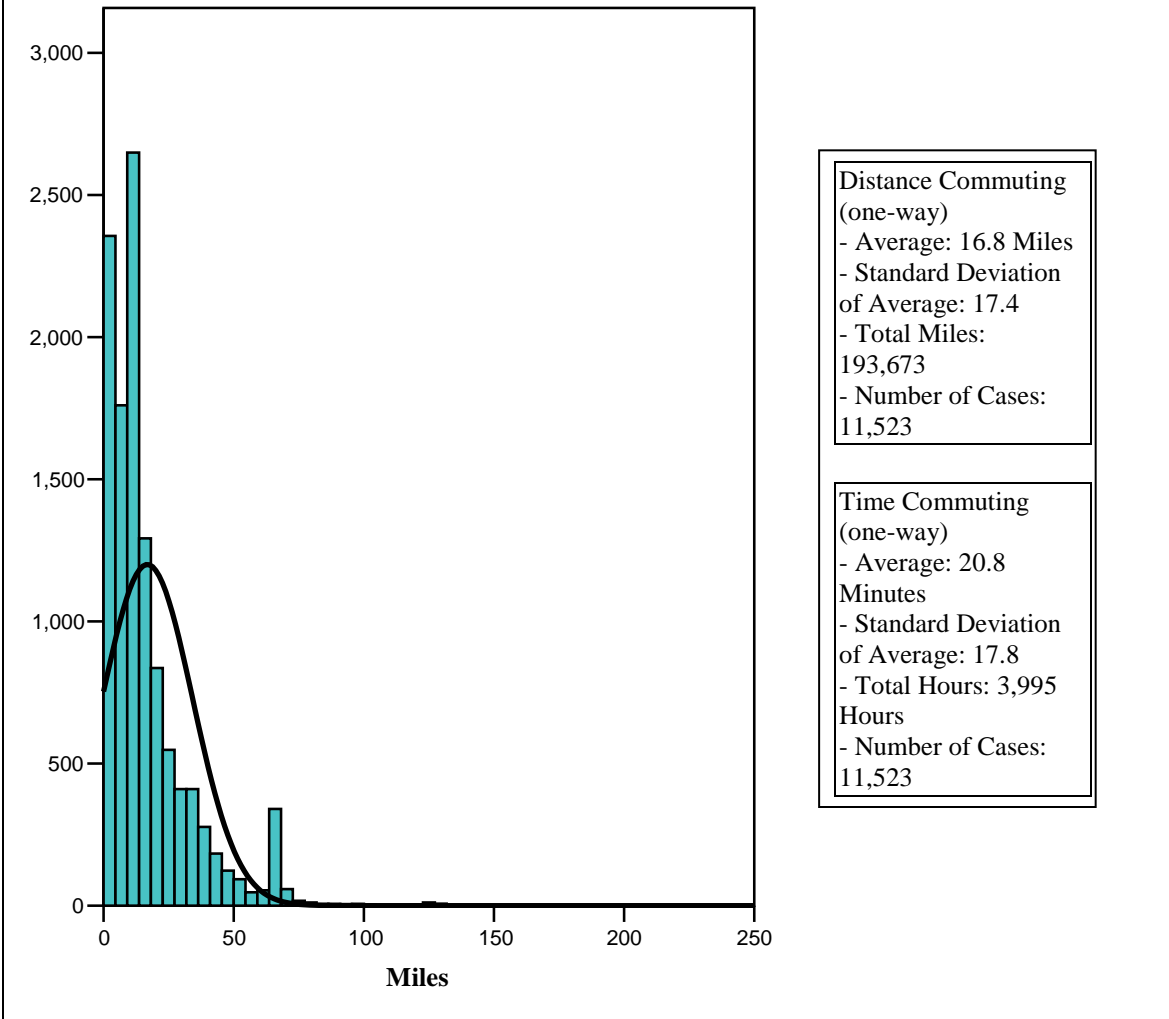
Table 1 presents the raw data collected from the local employers participating in our study. The Zip Codes making up the local ‘Texoma’<sup>1</sup> appear in bold.

As one would expect, local employers hire disproportionately from locally populated areas. The local nature of area employment is further specified below.

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<sup>1</sup> *Texoma comprises of the Gainesville, Bonham, Durant, Sherman-Denison Micro/Metropolitan Areas. A map of the zip codes included in this region is provided in Table A1 of the Appendix.*

**Figure 1: Estimated Employee Driving Distance (One-Way)**



*Note: Employees living more than 250 miles from their employer (49 such employees identified) are omitted as it is unlikely they commute regularly.*

*Since we could not ask employers for the exact address of their employees (out of a concern for privacy) we only received worker Zip Codes. Driving distance and time spent driving are estimations computed using the popular driving direction website MapQuest. We estimated driving distance by inputting a ‘start location’ of the home Zip Code (which identifies the central point of the Zip Code area that lies on a road) and specified an ‘end location’ as the precise employer address. MapQuest supplies a route and a precise distance, as well as a projected driving time (they actually offer many routes but we always used the first). We expect that this method overestimates some distances/times and underestimates others. It is our assumption that when aggregated, these estimates are not systematically biased.*

## **The Overall Distribution of the Labor Shed**

To understand the distribution of the labor shed, we analyzed the estimated distance between each employees home and their place of work. In addition we collected information on the estimated average drive time of each employee. These findings appear in Figure 1.

Because the histogram for distance is nearly identical to that of time, we present only distance. The distribution of employees driving distance is “right skewed,” suggesting that more employees live closer to work than farther away. An interesting blip in the histogram occurs around 70 miles out. A closer analysis of employees living between 60 and 70 miles from Sherman/Denison reveals that many of these workers come from the Dallas Metroplex (mostly North Dallas). The three most common Zip Codes in this specific range (60 to 70 Miles out) are 75067 (Lewisville, and all of these employees work at Tyson), 75231 (North Dallas) and 75238 (North Dallas). The rest are scattered around the Metroplex, with a smaller proportion coming from areas west (near Paris, TX) and north in Oklahoma. The percent of all employees in the 60-70 mile band is only 4 percent of all workers in the study, and as such should not distract from the overarching conclusion that the labor shed is locally centered.

The average driving distance of employees is 16.8 miles and that corresponds to an average commute time of 20.8 minute. Assuming all employees drive to work, we find a sum of 193,672 miles being driven to work (one-way) and a corresponding sum of 3,995 hours spent driving. Again, this is just a one-way commute.

**Table 2: Employee Driving Distance by Employer**

	Number of Employees	Estimated Average Driving Distance (Miles, One-Way)	Driving Distance Within Which 95 Percent of Employees Travel (Miles, One-Way)*
Acti Tech	28	21.74	40.92
American Bank of Texas	183	11.33	20.27
Austin College	298	12.32	37.40
Bucyrus	348	17.85	30.89
Champion Cooler	131	9.53	17.56
Cigna	706	15.20	26.20
City of Denison	337	9.08	19.21
City of Sherman	392	12.01	32.71
Consolidated Container Company	72	17.70	31.44
Denison Industries	124	14.32	21.13
Denison ISD	702	14.12	17.63
Douglass Distributing	112	18.53	34.10
Emerson	317	15.33	22.21
Globitech	146	15.26	38.70
Grayson County	541	12.13	20.48
Grayson County College	444	20.44	49.38
Home Hospice	54	10.77	19.84
Kwikset	220	14.24	23.82
Presco Polymer	105	11.69	30.26
Ruiz Foods	704	12.83	20.47
Sign Warehouse	102	10.81	24.99
Sodexo	64	11.80	24.13
Sunny Delight	70	20.82	30.40
Texas Health Presbyterian - WNJ	976	15.42	35.93
Texas Instruments	793	19.73	30.58
TMC	1317	15.92	35.07
Trailblazer	522	18.16	26.48
TXU/Oncor	41	17.41	20.14
Tyson	1417	29.36	50.95
West Asset Management	258	11.07	24.31

\* Interpretation Example: 95 percent of Acti Tech employees work within 41 miles of their home.

*Note: Employees' living more than 250 miles from their employer are omitted as it is unlikely they commute regularly.*

## A Closer Look at Distance and Time Traveled

Tables 2 and 3 show the same information as Figure 1, however here we break out the findings by employer. We see a fair amount of variation existing among employers. Tyson, in particular, stands out with workers driving a greater distance (29 miles, 33 minutes) to work. Additional information presented includes the distance within which 95 percent of an employers workers live. This we calculated by adding two standard deviations to the mean. For a direct interpretation consult the notes at the bottom of both tables.

	Number of Employees	Estimated Average Driving Time (Minutes, One-Way)	Driving Time Within Which 95 Percent of Employees Travel (Minutes, One-Way)*
Acti Tech	28	24.11	42.71
American Bank of Texas	183	15.73	19.23
Austin College	298	18.07	39.57
Bucyrus	348	21.36	32.69
Champion Cooler	131	17.01	18.54
Cigna	706	19.09	26.73
City of Denison	337	13.87	19.85
City of Sherman	392	16.04	33.54
Consolidated Container Company	72	22.51	33.66
Denison Industries	124	20.22	23.04
Denison ISD	702	17.49	18.03
Douglass Distributing	112	23.51	34.8
Emerson	317	17.64	23.18
Globitech	146	17.56	40.49
Grayson County	541	16.93	20.56
Grayson County College	444	23.82	51.37
Home Hospice	54	14.78	18.63
Kwikset	220	17.35	26.46
Presco Polymer	105	16.65	31.05
Ruiz Foods	704	16.88	21.42
Sign Warehouse	102	13.92	26.35
Sodexo	64	15.83	24.04
Sunny Delight	70	23.1	32.94
Texas Health Presbyterian - WNJ	976	19.64	35.24
Texas Instruments	793	23.59	32.39
TMC	1317	19.97	37.73
Trailblazer	522	21.89	25.7
TXU/Oncor	41	21.56	19.51
Tyson	1417	33.09	51.42
West Asset Management	258	15.84	23.49

\* Interpretation Example: 95 percent of Acti Tech employees travel 43 miles or less to work.

*Note: Employees' living more than 250 miles from their employer are omitted as it is unlikely they commute regularly.*

**Table 4: The Cost of Gasoline for Getting To and From Work**

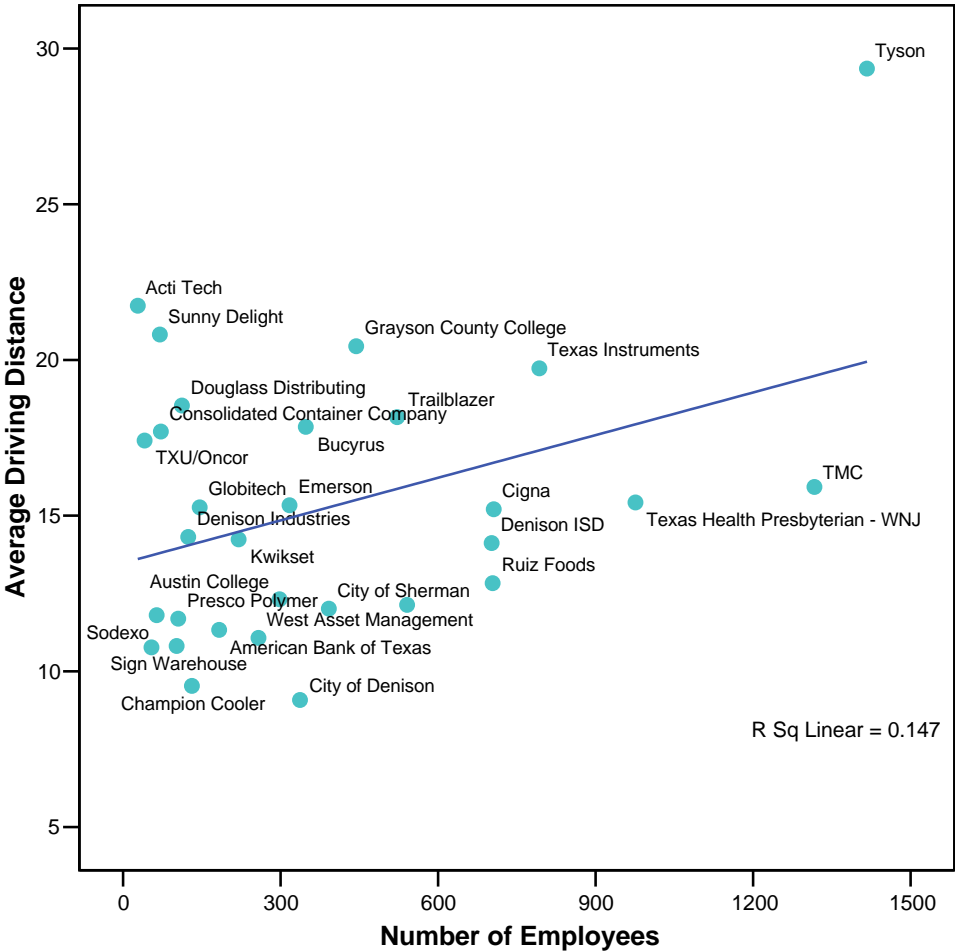
<b>Gas Usage</b>			
Average Gallons (one-way)	Average Gallons (per week)	One Standard Deviation Increase in Gallons (one-way)	One Standard Deviation Increase in Gallons (per week)
0.57	5.7	1.16	11.6
<b>Gas Price</b>			
Average Cost (one-way)	Average Cost (per week)	One Standard Deviation Increase in Cost (one-way)	One Standard Deviation Increase in Cost (per week)
\$1.90	\$19	\$3.90	\$39

*Note: Employees’ living more than 250 miles from their employer are omitted as it is unlikely they commute regularly.*

*Average gas price (\$3.39) is the September 18<sup>th</sup> price average for Dallas, TX listed on the U.S. Department of Energy website. The average MPG (29.4) is itself an average of new cars and new light duty trucks listed on the U.S. Bureau of Transportation Statistics website. Because MPG data is only available for new cars/trucks, the averages presented represent a conservative estimate. Per-week estimates assume a commute to and from work, five days a week.*

In an attempt to personalize these findings, we present gas usage and gas price in Table 4. Here we see that on average employees use 5.7 gallons of gas per-week commuting to work. This results in an average cost of \$19. For those a standard deviation above the mean we see an increase to 11.6 gallons of gas per-week at the cost of \$39. It is important to note that the data presented here represent conservative estimates because MPG information relates only to *new* cars and trucks.

**Figure 2: Average Driving Distance by Number of Employees**



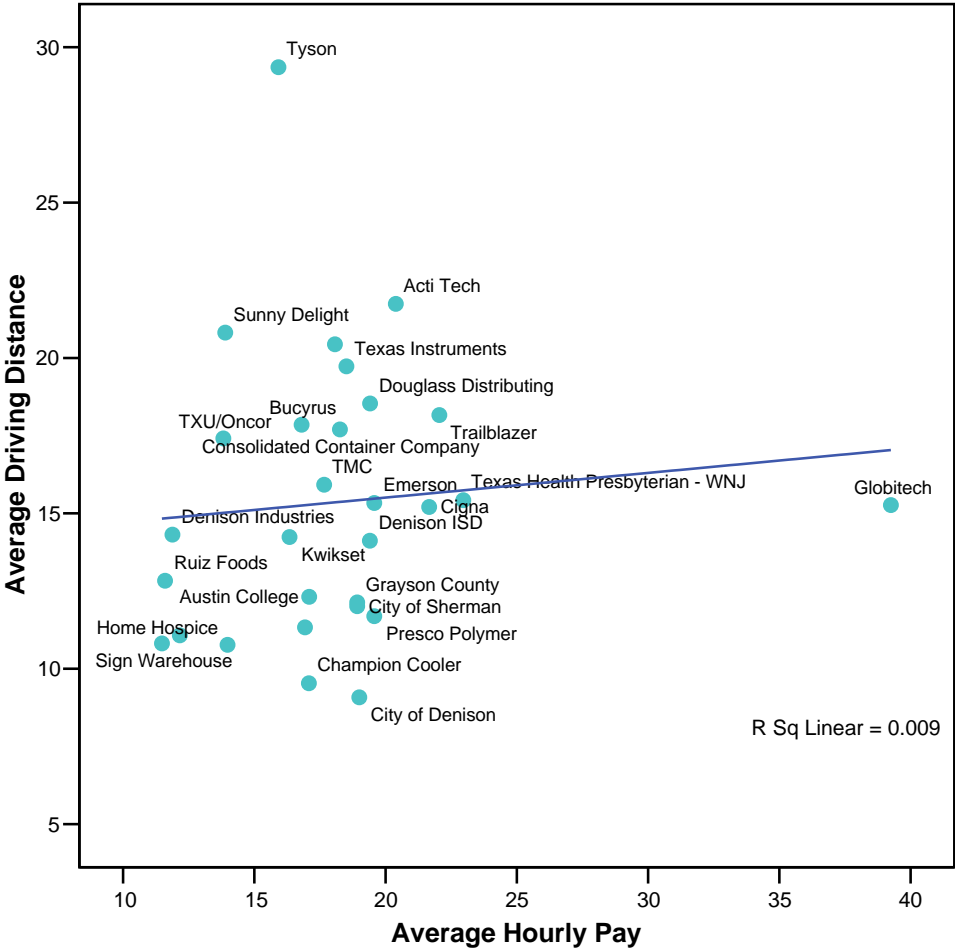
*Note: Employees' living more than 250 miles from their employer are omitted as it is unlikely they commute regularly.*

**Explaining Variation in Distance**

Aggregating the data from individual employee level (n=11,523) to the employer level (n=30), allows us to attempt an explanation of the variation in driving distance. The predictors include the number of employees in an organization, average salary, and occupation type.

Figure 2 explores the relationship between organization size and average driving distance. We see here that a positive relationship exists, with larger employers having workers who drive farther. However, it is important to note that Tyson exists as an outlier. When they are removed from the analysis the relationship is far less impressive.

**Figure 3: Average Driving Distance by Average Hourly Pay**



*Note: Employees' living more than 250 miles from their employer are omitted as it is unlikely they commute regularly. Average Hourly Pay is calculated using information from NAICS Occupational Data. For each employer, information exists on various occupational positions, the number of people in those positions, and their average salary. To compute a grand average for each employer, these salaries (by occupation code) were weighted based on how many employees worked in each occupation type and then averaged. Many occupational codes did not have complete information and as such **we recommend caution** when utilizing information from Figure 3.*

Average hourly pay is only modestly related to average driving distance. In Figure 3, we see a slightly positive relationship with higher paid jobs predicting longer driving distances.

**Table 5: Average Driving Distance by Employer Type**

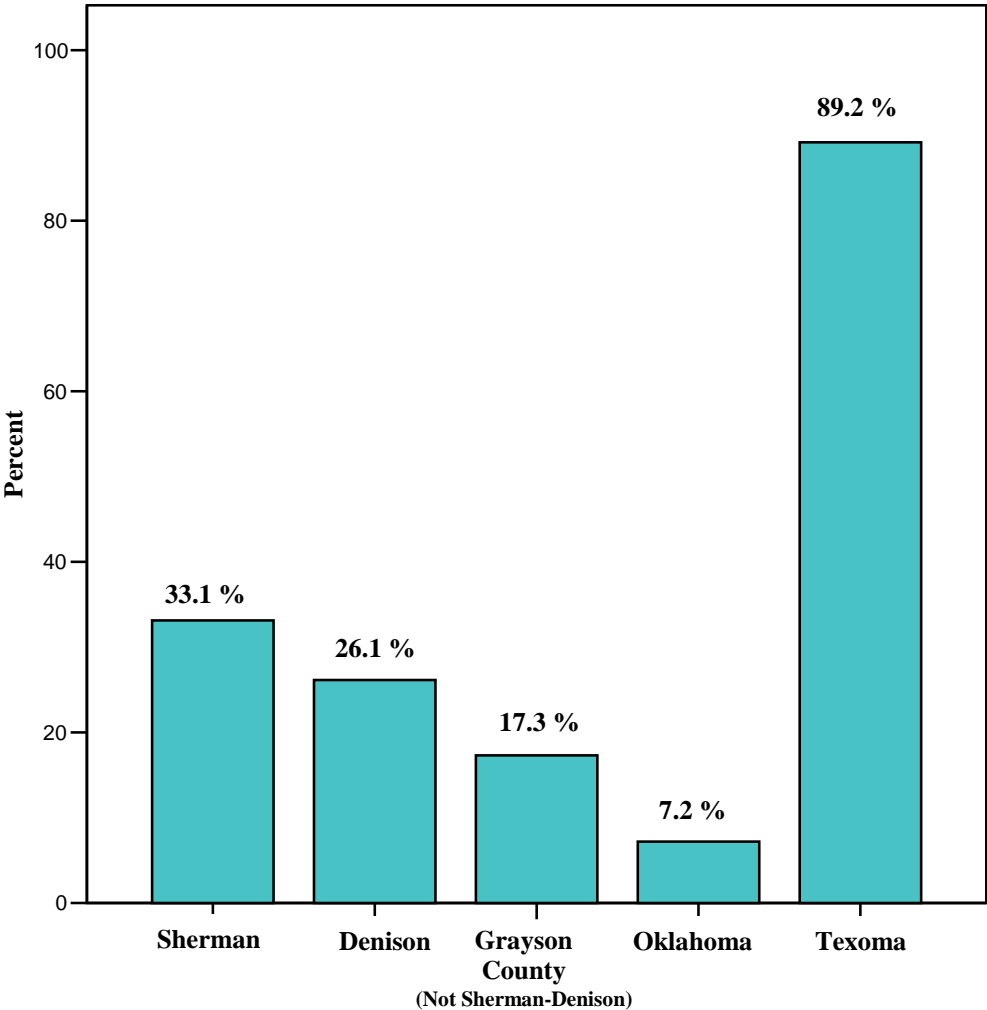
	Number of Employers	Average Distance (miles)	Standard Deviation
Manufacturing	13	16.95	5.17
Education	3	15.62	4.27
Finance/Insurance	3	14.90	3.43
Medical	3	14.04	2.84
Government	3	11.07	1.73

*Note: Employees' living more than 250 miles from their employer are omitted as it is unlikely they commute regularly.*

*Occupation type was assessed by looking at NAICS codes and identifying the most prominent occupation type for each employer. In every case it was overwhelmingly evident where the various employers fit in terms of occupation type. We only felt comfortable presenting averages when 3 or more businesses fit an occupation type. The remaining 5 employers have occupation types like 'whole sale trade,' but we didn't have enough of those workplaces to feel comfortable presenting averages.*

We also assess employee driving distance based on the occupation type of employers. We identified five clear occupation types among the participants in the study. We do not find much variation exists in terms of driving time across the various occupation types. The one occupation type where we do find employees driving significantly less is in government jobs.

**Figure 4: Location of Employee Residence**



**The Labor Shed in a Local Context**

An assessment of employee home location (aggregated to units larger than Zip Codes) adds a local context to the distribution of the labor shed. In Figure 4, we see that 33.1 percent of employees in the labor shed study reside in Sherman, 26.1 percent live in Denison, 7.2 percent live in Oklahoma, and an overwhelming 89.2 percent live in Texoma. This reinforces the local nature of our labor shed. Because Texoma includes Grayson County, Fannin County, Cooke County and parts of Oklahoma, these numbers do not add to 100 percent (for more information on these aggregate units see the note on methods following Table 7).

**Table 6: Employee Location by Employer Location**

Employer Location	
Sherman	42.4 Percent Live in Sherman
	18.5 Percent Live in Denison
	19.0 Percent Live in Grayson County (not Sherman/Denison)
	3.8 Percent Live in Oklahoma
	89.1 Percent Live in Texoma
Denison	24.9 Percent Live in Sherman
	37.5 Percent Live in Denison
	16.1 Percent Live in Grayson County (not Sherman/Denison)
	9.6 Percent Live in Oklahoma
	95.5 Percent Live in Texoma

A possible explanation for the distribution of the labor shed is based on the location of the employer. Even though Sherman and Denison are not far apart, we expected to find employers located in Sherman to hire disproportionately from Sherman, and the same for Denison. In Table 6, we see that for employers located in Sherman, 42.4 percent of workers reside in Sherman and 18.5 percent in Denison. Similarly Denison employers hire 37.4 percent of their workers from Denison and 24.9 percent from Sherman. These differences of means (using Independent Sample T Tests) are statistically significant ( $t=5.2, p<.001$ ;  $t=4.8, p<.001$ ).

Concerning Oklahoma workers, we see a significant difference in place of employment. Denison employers hire 9.5 percent of all workers from Oklahoma, while Sherman hires 3.8 percent ( $t=3.6, p<.001$ ).

No significant changes exist between Sherman and Denison employers when it comes to hiring from Grayson County outside Sherman and Denison ( $t=1.1, p<.278$ ).

In terms of hiring within greater Texoma, we see significant differences in place of employment. Denison employers hire 95.5 percent of all workers from Texoma as opposed to Sherman at 89.1 percent ( $t=2.7, p<.011$ ).

**Table 7: Percentage of Employees Living in Various Areas, By Employer\***

	Number of Employees	Percent of Employees living in Sherman	Percent of Employees living in Denison	Percent of Employees living in Grayson County (Not Sherman/Denison)	Percent of Employees living in Oklahoma	Percent of Employees living in Texoma*
Acti Tech	28	43	14	7	4	71
American Bank of Texas	183	42	29	19	5	97
Austin College	301	61	9	14	1	87
Bucyrus	358	34	22	15	9	89
Champion Cooler	133	34	44	7	11	97
Cigna	707	35	26	20	6	95
City of Denison	338	13	58	17	8	98
City of Sherman	393	54	12	17	5	92
Consolidated Container Company	73	42	24	15	3	85
Denison Industries	125	42	27	19	7	94
Denison ISD	704	11	65	10	12	97
Douglass Distributing	112	38	13	14	1	81
Emerson	317	40	19	21	7	94
Globitech	146	41	15	32	3	93
Grayson County	544	37	23	31	3	96
Grayson County College	448	31	20	24	7	86
Home Hospice	54	48	20	19	0	100
Kwikset	221	22	35	13	23	96
Presco Polymer	106	52	19	12	3	95
Ruiz Foods	705	40	34	10	11	97
Sign Warehouse	110	23	50	14	7	95
Sodexo	64	23	50	8	8	95
Sunny Delight	70	26	16	23	7	87
Texas Health Presbyterian - WNJ	979	39	17	23	4	90
Texas Instruments	794	37	15	20	5	79
TMC	1320	21	32	17	17	91
Trailblazer	522	22	26	14	9	97
TXU/Oncor	41	12	24	39	0	100
Tyson	1417	35	13	14	1	69
West Asset Management	259	47	22	16	3	93

\* Interpretation Example: 71 percent of Acti Tech employees live in Texoma. Rows do not add to 100 because Texoma includes Sherman, Denison, and parts of Oklahoma.

**Table 8: Change in Labor Shed Between 2005 and 2011**

Zip Code	Percent in 2005	Percent in 2011	Percent Change
75020	20.00	19.76	-0.24
75090	15.84	16.36	0.52
75092	17.6	15.68	-1.92
75021	7.06	6.38	-0.68
75076	4.95	4.60	-0.35
75459	2.59	2.51	-0.08
75414	2.26	2.40	0.14
75418	2.19	2.35	0.16
74701	2.50	1.96	-0.53
76273	2.20	1.94	-0.26
75491	1.84	1.55	-0.29
75067	0.01	1.48	1.47
74733	1.54	1.45	-0.09
75495	1.01	1.33	0.32
75091	1.65	1.08	-0.57
74730	1.15	0.95	-0.20

### A Comparison with Earlier Versions of the Study

Using the previous iteration of this study conducted in 2005, we compare percentage of employee home location to look for any significant changes in the labor force. Due to the increased cost of commuting over this period, we might find a more local labor shed.

Table 8 presents the percentage of employees coming from the most densely populated Zip Codes. For ease of presentation, we included in the table only Zip Codes where at least 1 percent of employees live, in either year. As we can see, only modest changes occurred. The most notable is 75067, Lewisville, TX. In 2005, Tyson had not yet opened their Sherman branch and it turns out that 167 of the 171 employees from 75067 (in 2011) work at Tyson.

Using a Paired Sample T-Test we analyzed percent in each Zip Code (not only the ones presented in Table 8) between 2005 and 2011 and found no statistically significant shift (Paired Sample T Test) ( $T=.999$ ,  $p<1.000$ ).



