TIP strategies

LABOR MARKET PROFILE

Prepared for Gregg County, Texas

JUNE 2013

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Contents

About this work

TIP Strategies would like to thank the Longview Economic Development Corporation and the Kilgore Economic Development Corporation for their time and guidance in the preparation of this labor market profile. We would also like to thank the many Gregg County businesses who participated in the survey conducted as part of this work. Their insights greatly contributed to our understanding of the area's workforce, its challenges and opportunities.

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Kilgore Economic Development Corporation

Kilgore Economic Development Corporation (KEDC) is a leading economic development organization in Texas. Since KEDC's inception in 1990, the industrial tax value in Kilgore has experienced an annualized increase of 38%, outpacing all other categories. The organization is funded by a dedicated local sales tax approved by voters. It is directed by a five-person board and managed by a staff of four with certifications in business retention and expansion, economic and community development, and economic development finance. KEDC has won international awards for excellence in economic development.

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Longview Economic Development Corporation

The Longview Economic Development Corporation (LEDCO) is one of Texas' major economic development groups managing economic development for the City of Longview, Texas. Created by voters in 1991, LEDCO works in cooperation with site selection consultants, facility managers, developers, realtors, and property owners to serve as a central information source for all development in the City of Longview, Gregg County and the surrounding region. Since its inception, LEDCO has assisted hundreds of firms resulting in over 8,000 new jobs in the region and $350 million in new investment.

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TIP Strategies, Inc.

TIP Strategies, Inc., is a privately held Austin-based economic development consulting firm committed to providing quality solutions for public and private-sector clients. Established in 1995, the firm's primary focus is strategic economic development planning. In addition, TIP has experience with entrepreneurship, target industry analysis, workforce, and redevelopment. TIP's methods establish a clear vision for economic growth. Community leaders across the country have embraced the TIP model of Talent, Innovation, and Place to achieve successful and sustainable economies.

I. Regional overview

A region's ability to demonstrate the availability of talented workers has become an increasingly essential component of a successful economic development program. This workforce profile, prepared by TIP Strategies, provides a comprehensive picture of the human capital assets of Gregg County, Texas. The study was funded jointly by the economic development corporations of Kilgore and Longview. It is divided into two sections: the first provides a detailed look at the characteristics of the labor shed while the second profiles the region's occupational structure and shows its relationship to industry. Additional details of these analyses are provided as appendices.

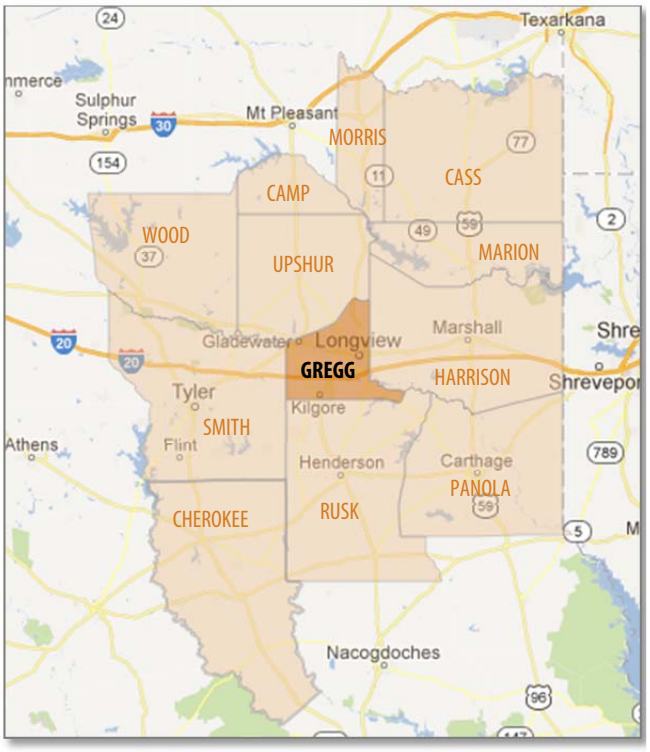
The following provides highlights for Gregg County and the regional labor shed. For this report, the Gregg County labor shed is defined as the 12 counties shown in Figure 1. This region was selected to mirror prior studies and was verified by a review of commuting patterns data.

Labor market & commuting

The combined 12-county labor shed boasts nearly 350,000 workers, with Smith and Gregg Counties together comprising roughly one-half of the region's total civilian labor force. Unemployment levels in Smith and Gregg Counties have remained below national levels throughout the recession and Gregg County's rates have remained below the state's rate as well. In addition, the county's labor force participation rate of 70.3 percent – a ratio showing the portion of the population age 16 years and over that is employed or looking for work – was well above that of the state (64.0 percent) and the US (62.4 percent).

Gregg County draws workers from across a wide area. The share of workers commuting to the county from more than 50 miles away has increased steadily over the decade. Neighboring counties comprise the largest sources of inbound commuters. Residents of Harrison, Upshur, Rusk, and Smith Counties hold more than one-quarter of Gregg County jobs (29 percent). Sectors showing the largest gains in net inbound commuting are retail and manufacturing. A sharp uptick in construction-related commuting was seen in 2010, the most recent year for which data were available at the time of analysis.

Figure 1. Gregg County labor shed



Demographics

With an estimated population of slightly more than 123,000, Gregg County accounted for 18 percent of the region's nearly 680,000 residents in 2011. The county's population has grown steadily since the 2000 Census, adding roughly 1,000 residents on average each year, a compound annual growth rate of nearly 1 percent. While this rate parallels that of the US, it lags behind that of the state, which has grown at nearly 2 percent annually. Within the 12-county labor shed, the highest annual growth rates between the 2000 and 2010 Census were seen in Smith County, which also accounted for one-half of the nearly 70,000 residents added to the labor shed during that time period.

With a median age of 35.4 years, Gregg County has the youngest population in the labor shed, followed closely by Smith County, with a median age of 35.9 years. At the other end of the spectrum, Marion and Wood Counties population is the oldest among the labor shed counties, with median ages of 48.6 and 47.3, respectively.

Smith, Harrison, and Gregg Counties have a slightly larger share of their population enrolled in school than the region as a whole. The higher enrollment reflects the age structure of these counties and their educational assets, as they are home to many of the region's higher education institutions (see Figure 44). Gregg County outperforms the region in terms of educational attainment, but lags the state and the US. Only 54 percent of the county's population age 25 years and over has educational experience beyond high school. By contrast, roughly 57 percent of the US population has pursued postsecondary education. Furthermore, nearly one in five adults (18 percent) in the 12-county labor shed lacks high school equivalency, compared with 15 percent nationally.

Income & mobility

After lagging the US for most of the last two decades, per capita personal income (PCPI) levels in Gregg County have improved dramatically. In 2011, the most recent year for which data are available, PCPI in Gregg County was estimated at $43,222 compared with $41,560 for the US. This represents $1.04 of income for each $1.00 of income at the national level. At the same time, home prices are more affordable – relative to income – than at the national level, though they are slightly less affordable than the state average by this measure.

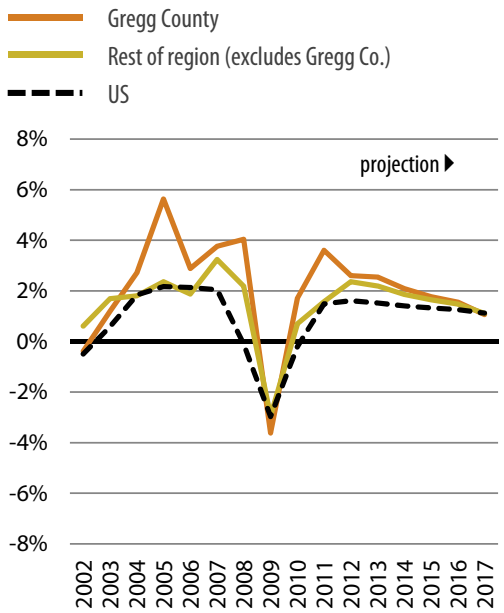
People moving into Gregg County are most likely to have come from another county in Texas; only about one in four in-migrants move to the area from another state or outside the US. Circulation is heaviest between Gregg County and neighboring counties: Harrison, Upshur, Rusk, and Smith, with Dallas County rounding out the top five. Historically, Gregg County loses slightly more residents to these counties than it gains, with the largest net outflows going to Upshur and Smith Counties.

Industry

Employment growth in Gregg County has consistently outpaced the US over the past decade (Figure 2). Like the state and the nation, healthcare & social assistance jobs comprise the largest share of the county's employment at roughly 12 percent of the total. After that, however, the composition of the county's employment differs sharply from the state and the US. The next largest components of employment in Gregg County are mining (which includes oil & gas) and manufacturing, which each account for roughly 10 percent of the county's job base. By contrast, retail trade and local government (which includes jobs in public education) take the number two and three positions at the state and national level.

A look at location quotients (LQs) provides another measure of the strength of a particular industry or sector. An LQ is a ratio illustrating the concentration of employment in a given industry relative to the nation. If the local industry and national industry are perfectly proportional, the LQ will be 1.00. LQs greater than 1.25 are presumed to indicate a comparative advantage. Gregg County's LQ of 12.36 in mining reveals the region's depth of employment in this industry relative to the US.

Figure 2. Employment trends, % change from prior year
Historic (2002-2012) and projected (2012-2017)



Source: EMSI Complete Employment - 2012.4

Other concentrations of employment were found in the construction (with an LQ of 1.88) and manufacturing sectors (LQ=1.44). At the regional level, the LQ analysis revealed employment concentrations in two additional sectors: utilities (LQ=1.86) and agriculture & forestry (LQ=2.32). Drilling down within the manufacturing sector, this analysis points to employment concentrations for both Gregg County and the 12-county region in four industries: machinery, chemicals, fabricated metal products, and primary metals. These strengths are evident in the region's major employers which include energy companies, such as Halliburton Services; chemical products manufacturers, like Eastman Chemical; and telecommunications equipment manufacturer, General Dynamics SATCOM Technologies.

Occupations

The region's occupational structure correlates with its industrial specializations. Occupations with high LQs include production workers (with an LQ of 1.48), which are associated with the manufacturing sector, and construction and extraction workers (LQ=2.18), which are associated with construction and oil & gas. Wage rates in the area are generally below national levels.

The majority of the region's largest occupations are closely tied to population, including retail salespersons, food service workers, and cashiers. The importance of agriculture to the region can be seen in the large number of farmers, ranchers, and other agricultural management occupations. Four occupations—financial advisors, heavy equipment mechanics, extraction workers, and industrial machinery mechanics—are among the ten fastest growing occupations both in terms of absolute numbers and percentage growth. Nine of the region's ten highest earning occupations are healthcare-related, although these occupations represent a relatively small fraction of the workforce.

In addition to looking at occupational growth rates and concentration, we used national industry staffing patterns and findings from a survey of Gregg County employers to identify occupations that are critical to major industries in the region. Several positions, such as truck drivers, unskilled laborers, material moving workers, and general and operations managers, are employed by a range of the area's largest industries, including manufacturing, mining (oil & gas production), and logistics & distribution. While others, like machinists and machine workers, are critical to a single sector: manufacturing.

Findings from the employer survey regarding "hard-to-fill" and demand occupations were used to refine the staffing patterns analysis and pinpoint key occupations:

- Machinist/machine operator
- Industrial mechanic/maintenance
- Engineers
- Truck drivers, CDL
- Quality control & inspection
- Welder/brazer

At the time of the survey, responding firms had nearly 420 unfilled positions. Of these, nearly one-half (44 percent) were for skilled production workers. Professional and technical positions accounted for an additional one-fifth (21 percent) of current openings. Findings from this work suggest a continued focus on developing, attracting, and retention of these occupations will be key to the region's future success.

II. General characteristics

This section provides a general overview of the Gregg County labor force. Topics addressed in this section include commuting patterns, demographic characteristics (such as age, race/ethnicity, and educational attainment), as well as migration patterns and labor market statistics.

The first step in this analysis was to define the regional labor shed. This was accomplished using data from the US Census Bureau's Local Employment Dynamics (LED) program, a state-federal partnership which combines data from state administrative records with federal data products, such as censuses and surveys, to provide a comprehensive picture of the labor force. The resulting 12-county labor shed is captured in the statistics throughout this section.

To supplement labor market data from state and federal sources, we conducted a survey of Gregg County employers. The purpose of the survey was to gauge their experience with the regional labor force. The results of the survey are presented as Appendix C. Findings regarding specific skillsets required by employers are included in Section III.

IN THIS SECTION

- ✓ Where do people who ***work*** in Gregg County live? Where do people who ***live*** in Gregg County work?
- ✓ How big is the labor shed? How many people live in the region?
- ✓ How fast is Gregg County's population growing? How does this rate compare with the region? The state? The US?
- ✓ What are the demographic characteristics of Gregg County's population? How does the county compare?
- ✓ What kind of education levels does the population have?
- ✓ What is the unemployment rate? How does it compare with past rates? With other counties in the region? The state? The US?

Figure 3. Regional overview

		Gregg County	Region	State	US
1	Population, 2011	123,081	679,723	25.7 M	311.6 M
2	Change (%) 2000-2011	+9.3%	+11.6%	+20.6%	+9.7%
3	CAGR (%), 2000-2011	+0.9%	+1.1%	+1.9%	+0.9%
4	% working age (20-64)	57.9%	57.0%	59.4%	60.1%
5	Median age	35.4	—	33.5	37.0
6	% without HS or GED	17.5%	17.7%	19.6%	14.6%
7	% with bachelor's or higher	20.5%	18.6%	26.1%	28.2%
8	Unemployment rate (10/12)	5.6%	6.4%	6.2%	7.5%
9	Median hourly wage (4Q 2012)	$17.58	$16.63	$18.66	$19.05
10	Mfg. as share of total employment (%)	10.0%	7.9%	6.0%	7.0%

Sources: US Census Bureau (rows 1-7); US Bureau of Labor Statistics (8); EMSI Complete Employment 2012.4 (9-10)

Notes (by row number):

1: 2011 population estimates. State and US figures are in millions

2: Percent change in total population from 2000 to 2011

3: Compound annual growth rate (CAGR) from 2000 to 2011

4: Share of the total population between the ages of 20 and 64

5. American Community Survey, five-year estimates (2007-2011)

6-7: Share of population age 25+ years with the specified levels of educational attainment

8: Regional rate calculated by dividing number unemployed by total civilian labor force

9: Median hourly wage across all occupations

10: Manufacturing (NAICS 31-33) as a share of total employment

Commuting patterns

Data from the US Census Bureau's LED program provide an understanding of commuting patterns for Gregg County. The LED data series includes "covered" workers—those positions covered by unemployment insurance—as well as most federal jobs. It excludes some types of employment, including self-employed workers or those whose earnings are not wage or salary based (for example, sales jobs that pay commission only). This data may differ from more familiar employment sources because it integrates data from state-supplied administrative records with existing censuses, surveys, and other administrative records.

Gregg County draws workers from across a wide area. The share of workers commuting to the county from more than 50 miles away has increased steadily over the decade. Most commuters live to the west and south of their place of employment. Only a small share commutes from the east, likely reflecting the county's proximity to the state line.

Figure 4. Commuting distances for Gregg County workers

Share of workers by distance traveled from home to work

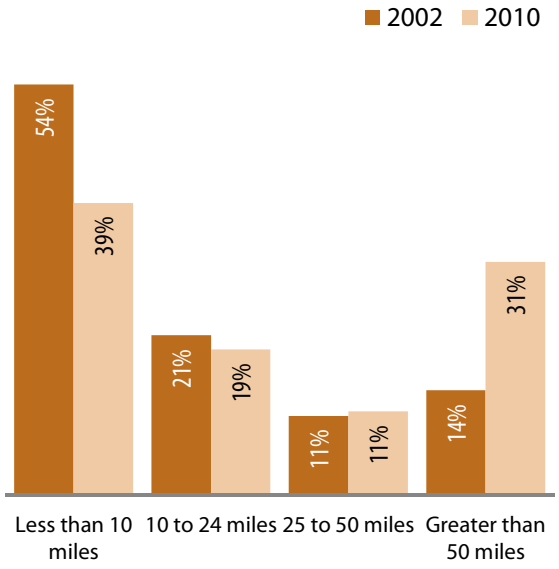
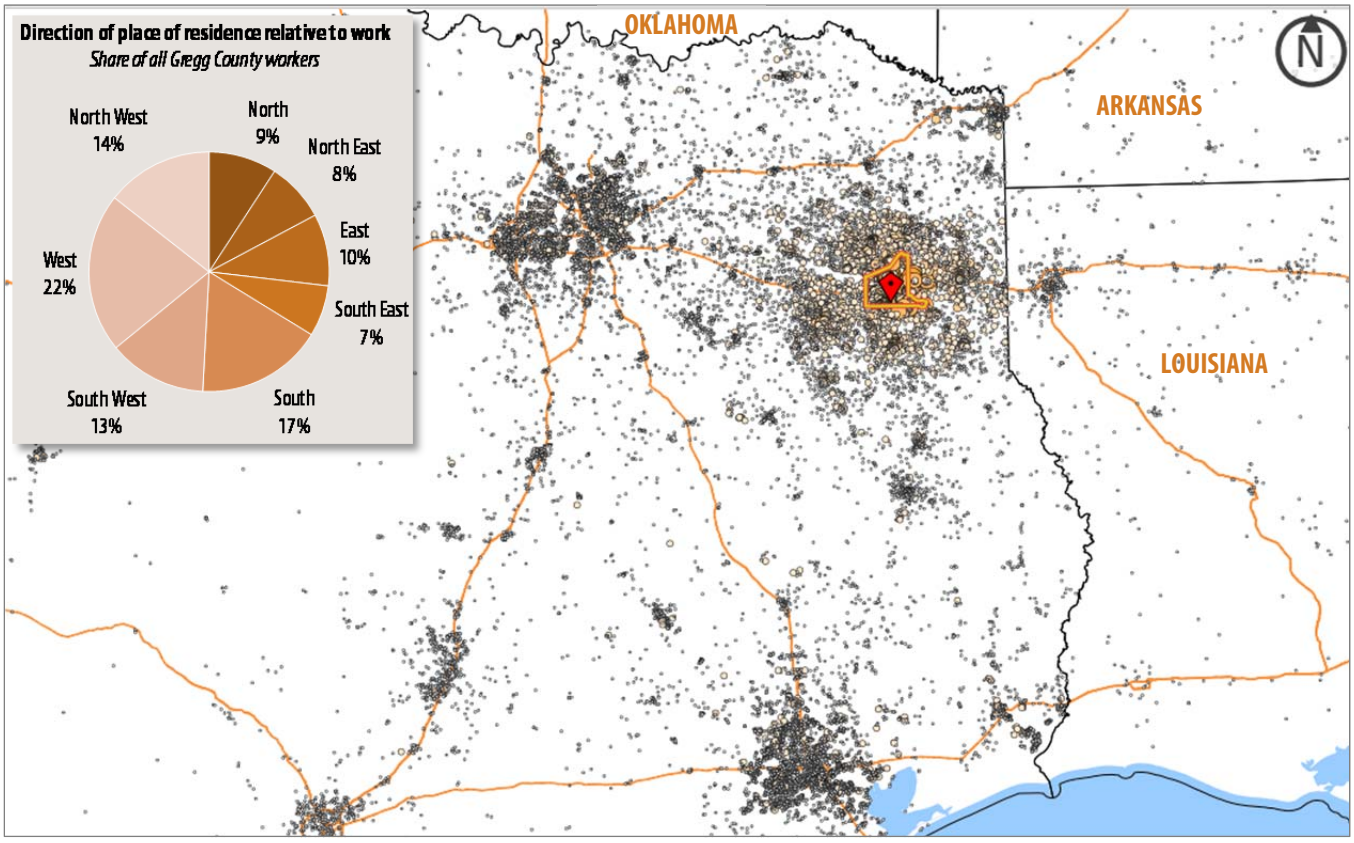


Figure 5. Place of residence for Gregg County workers, 2010

County draws workers from surrounding counties, as well as from state's major metro areas



Source: US Census Bureau, Local Employment Dynamics (all figures).

As the distance traveled has increased, likewise the share of Gregg County jobs being filled by nonresidents has also risen. In 2002, more than one-half (53 percent) of jobs included in the LED series were filled by residents. By 2010, this figure had dropped to just over one-third (38 percent).

Neighboring counties comprise the largest sources of inbound commuters. Residents of Harrison, Upshur, Rusk and Smith Counties hold more than one-quarter of Gregg County jobs (29 percent). Panola has the weakest connection of the neighboring counties, comprising just 1% of the county's employment.

Residents of Houston (Harris County), Dallas (Dallas and Collin Counties), and Fort Worth (Tarrant County) were also among the top ten sources of job holders in Gregg County. Commuters from more distant metro areas, such as Houston and San Antonio, are not likely to commute to the county on a daily basis, but may be based in the region for some portion of the year or commute between their work site and residence on a periodic (e.g., weekly) basis.

Figure 6. Distribution of workers holding Gregg County jobs

Share of jobs filled locally has decreased since 2002

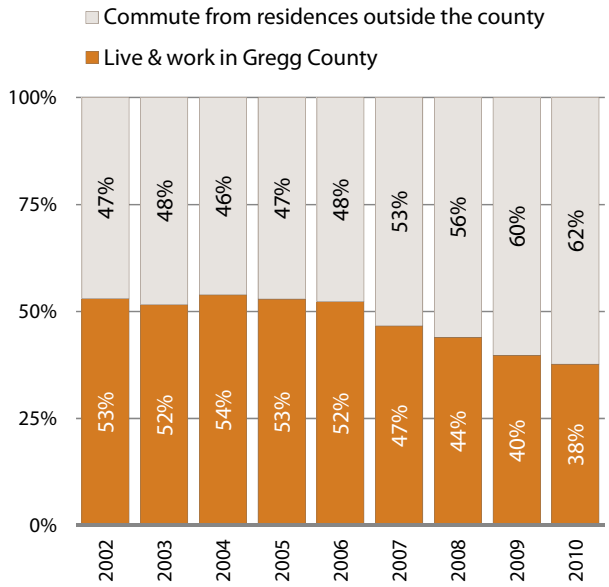
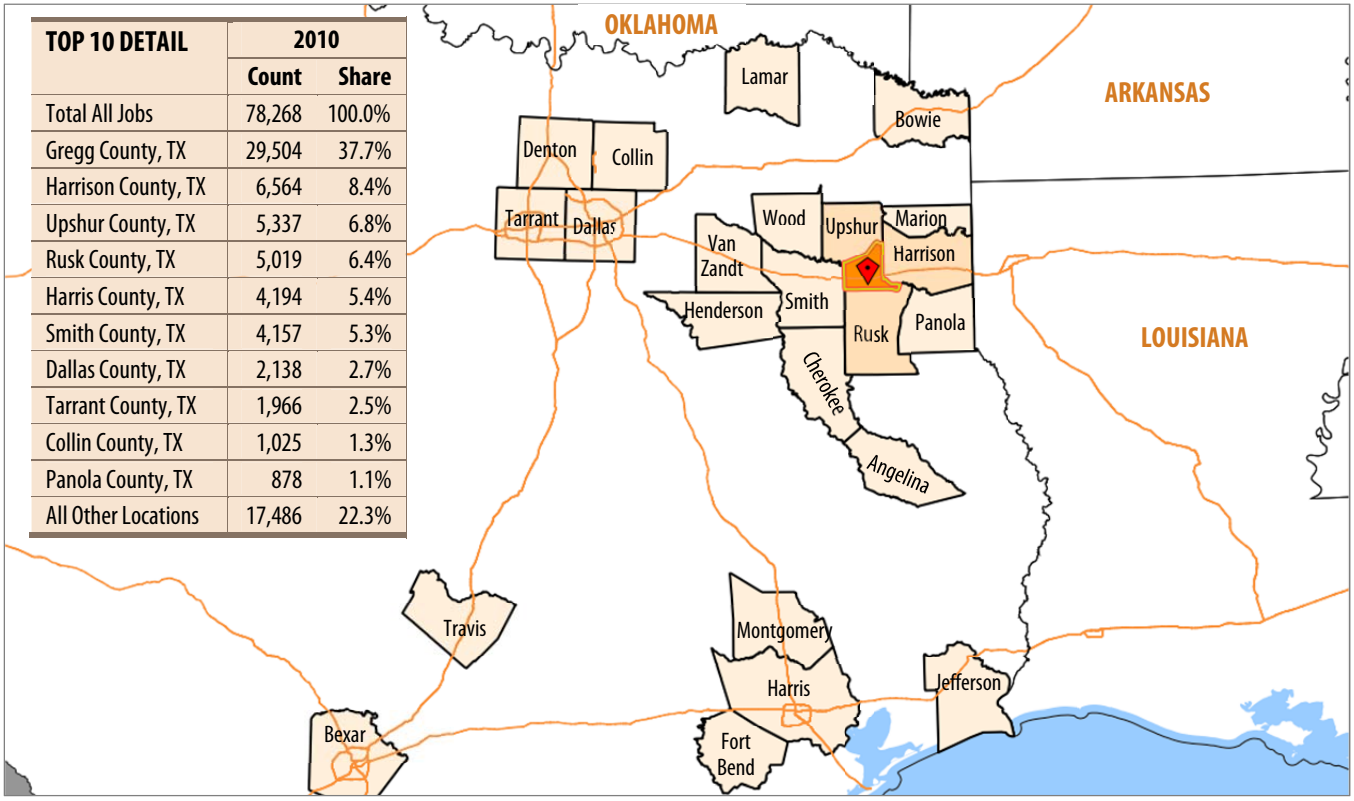


Figure 7. Top 25 counties of residence for Gregg County workers, 2010

County draws workers from surrounding counties, as well as from state's major metro areas

TOP 10 DETAIL	2010	
	Count	Share
Total All Jobs	78,268	100.0%
Gregg County, TX	29,504	37.7%
Harrison County, TX	6,564	8.4%
Upshur County, TX	5,337	6.8%
Rusk County, TX	5,019	6.4%
Harris County, TX	4,194	5.4%
Smith County, TX	4,157	5.3%
Dallas County, TX	2,138	2.7%
Tarrant County, TX	1,966	2.5%
Collin County, TX	1,025	1.3%
Panola County, TX	878	1.1%
All Other Locations	17,486	22.3%



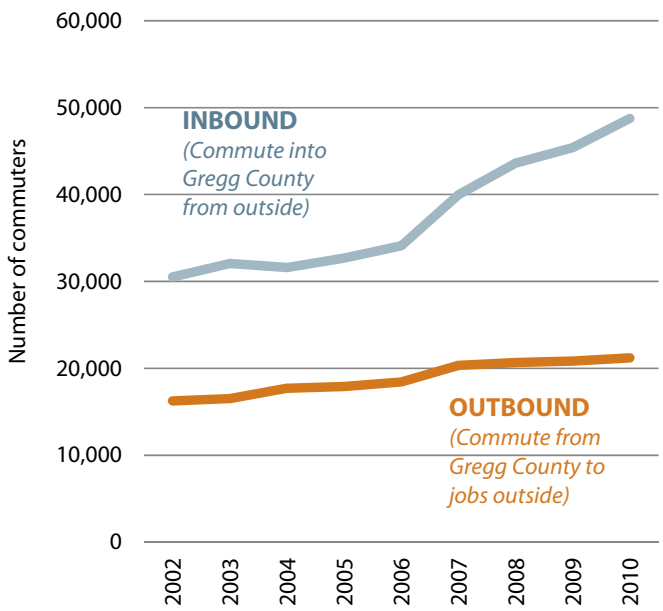
Source: US Census Bureau, Local Employment Dynamics (all figures) Note: Hidalgo County (not shown) is among the top 25.

A look at long-term trends (Figure 8) confirms the previous findings. The number of workers commuting into Gregg County has risen steadily in recent years, while the share of county residents commuting to jobs outside the county has increased more slowly. These trends correspond with trends in overall employment for Gregg County relative to the region. As shown in Figure 2 (page 2), employment growth in Gregg County has consistently outpaced the US over the past decade.

In 2010, the most recent year for which data are available, the number of inbound commuters was more than double the number leaving the county. Dallas and Harrison Counties are the most common job sites for Gregg County residents who commute to work outside the county, with the two counties combined capturing one in ten outbound commuters (10.7 percent) in 2010. Rounding out the top five were Smith, Harris, and Rusk Counties, which picked up roughly another 10 percent of Gregg County's outbound commuting flows.

Figure 8. Commuting flows, 2002 to 2010

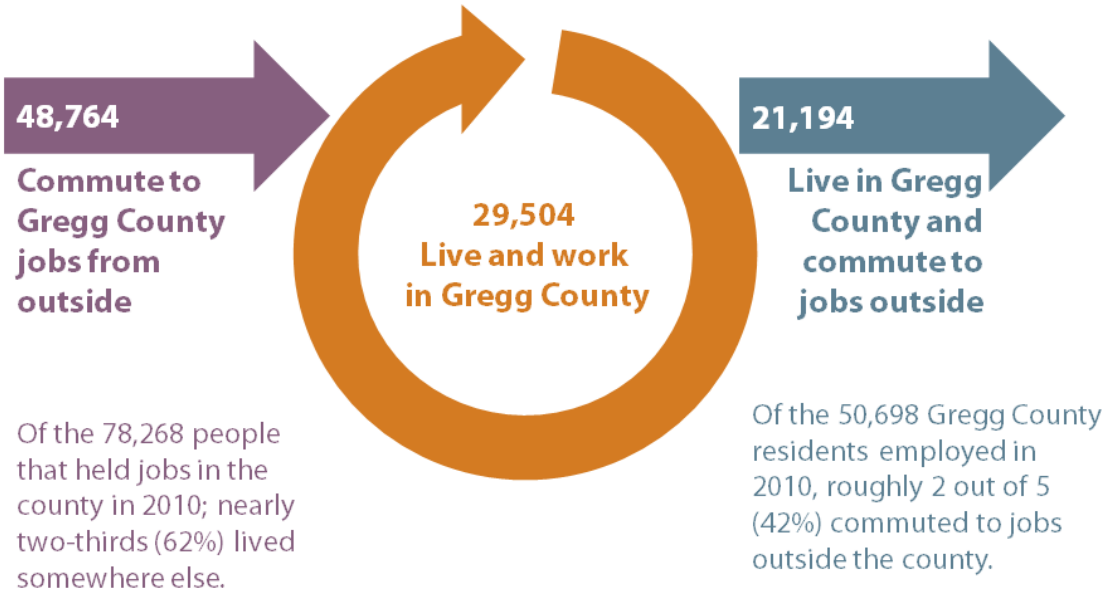
The county's share of inbound commuters has risen steadily while outbound commuting remains relatively flat



Source: US Census Bureau, Local Employment Dynamics

Figure 9. Inflow/outflow of workers to/from Gregg County, 2010

The county imports more workers than it exports



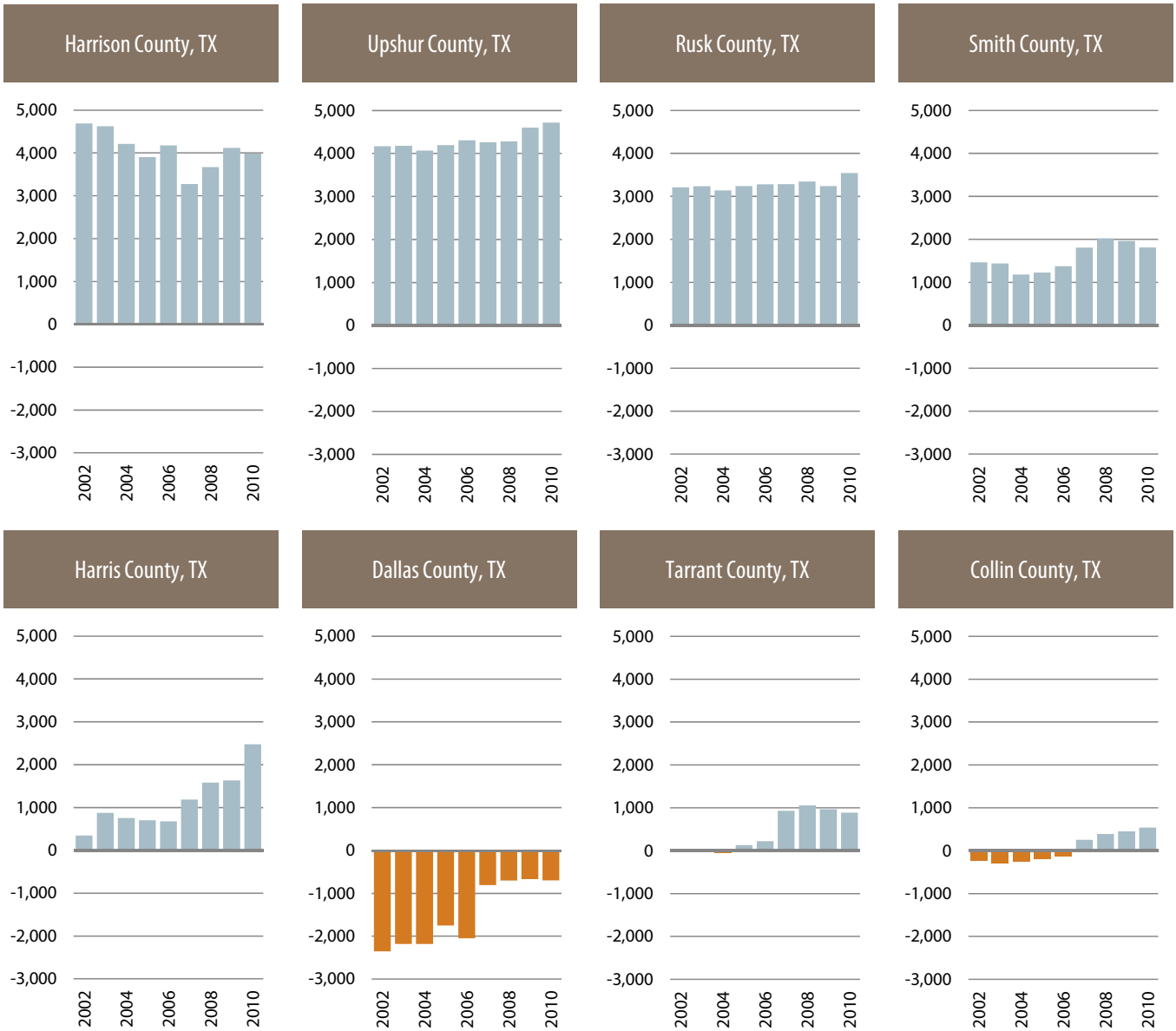
Source: US Census Bureau, Local Employment Dynamics. Note: Arrows are for illustrative purposes and do not indicate directionality of worker flow between home and employment locations.

The largest net flows of commuters occur with neighboring counties: Harrison, Upshur, Rusk, and Smith. Of these, the largest variations have been seen with flows between Gregg and Harrison. In each case, Gregg County has consistently drawn more workers into the county than it sends, resulting in a positive net flow.

The county also circulates a share of its workforce with counties in the Houston and Dallas-Fort Worth (Dallas, Tarrant, and Collin Counties) metropolitan areas. Flows with Harris County (Houston) are positive during the period analyzed and have been growing steadily. By contrast, Gregg County loses more workers to Dallas County than it draws in, however, the gap has been narrowing in recent years. Flows with two other significant D-FW area counties, Tarrant and Collin, have been mixed.

Figure 10. Net commuter flows for counties with more than 1,000 residents commuting to Gregg County, 2002 to 2010

*net **inbound** | **outbound** commuter flows*



Source: US Census Bureau, Local Employment Dynamics

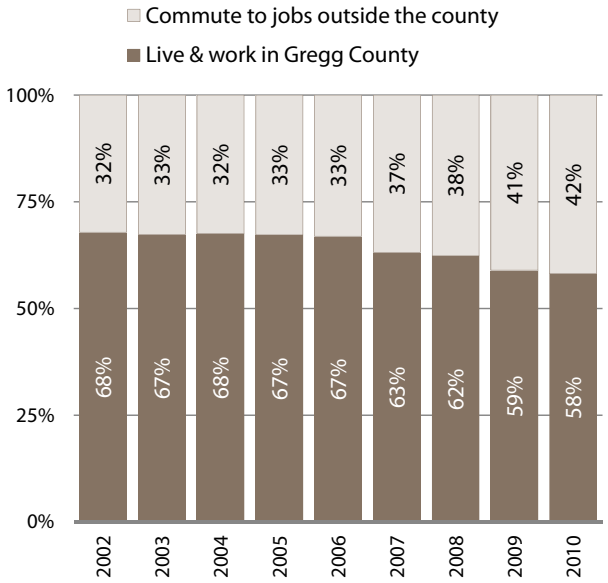
Figure 6 (page 6) revealed trends in the place of residence of workers employed in Gregg County. Figure 11 looks at trends in the place of *employment* for Gregg County *residents*. As in Figure 6, residents comprise a smaller share of the county's workforce than in the past. Correspondingly, a larger share of employed Gregg County residents hold jobs outside the county.

A look at selected economic and demographic characteristics (Figure 12) shows only modest differences between those who live and work in the county (internal job holders) and inbound and outbound commuters. Internal job holders were slightly more likely to be older, to earn between $1,251 and $3,333 per month, and to be employed in the service industry. Those residents leaving the county for work were slightly more likely to be younger, to earn less than $1,250 per month, and to be employed in the trade, transportation, and utilities sector. Inbound commuters were more likely to be younger, to work in good-producing industries, and to earn more than $3,333 per month.

Figure 13 (next page) shows net commuter flows for selected sectors of the Gregg County economy

Figure 11. Distribution of employed Gregg County residents

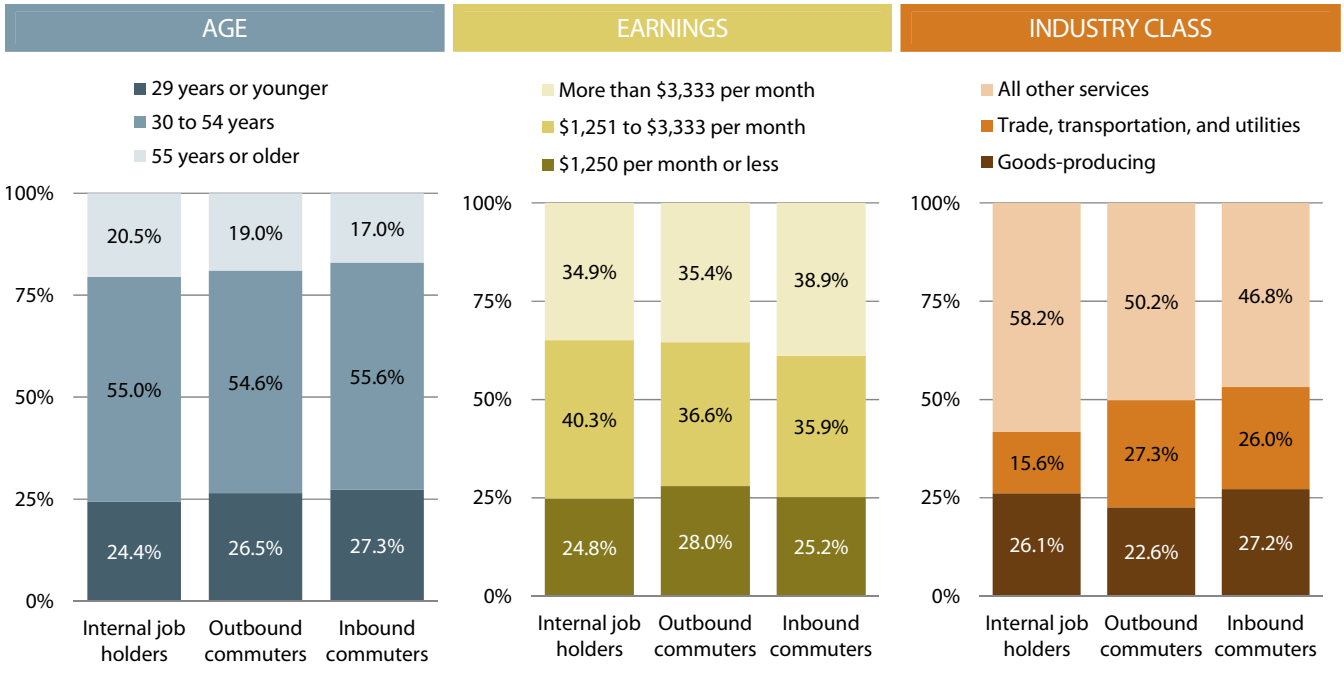
Share of employed residents that commute out of county has increased since 2002



Source: US Census Bureau, Local Employment Dynamics

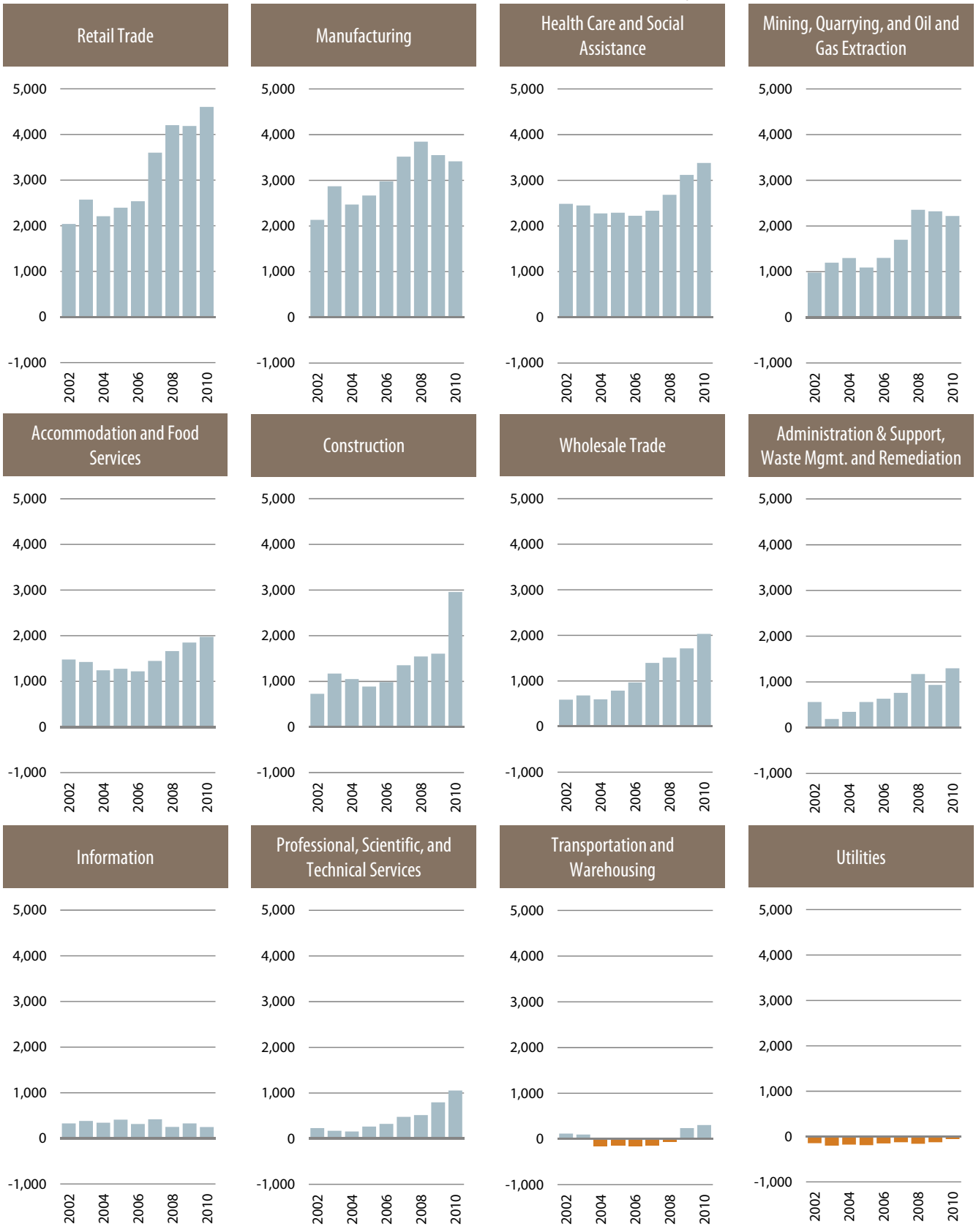
Figure 12. Selected jobholder characteristics, 2010

Modest differences in demographic characteristics



Source: US Census Bureau, Local Employment Dynamics. Internal job holders are those people who live and work in Gregg County. The term outbound commuters refers to Gregg County residents who are employed outside the county. Inbound commuters travel to work in Gregg County from their place of residence outside the county.

Figure 13. Net commuter flows for selected economic sectors, 2002 to 2010 inbound | outbound



Source: US Census Bureau, Local Employment Dynamics.

Demographics

Smith County accounted for one-half (50 percent) of the nearly 70,000 residents added to the labor shed between the 2000 and 2010 Census. The county also experienced the highest annual growth rate in the 12-county region, which, at 1.8 percent, was nearly on par with the state's rate.

By contrast, Gregg County's growth rate of 0.9 percent paralleled the nation. Gregg County added slightly more than 10,000 residents during the decade, accounting for 15 percent of total growth in the labor shed. With the exception of Wood County, growth rates in the six non-metropolitan counties were below the US, with three counties having no growth or net losses.

Figure 15. Distribution of population change by county

Share of total net population growth, 2000 to 2010

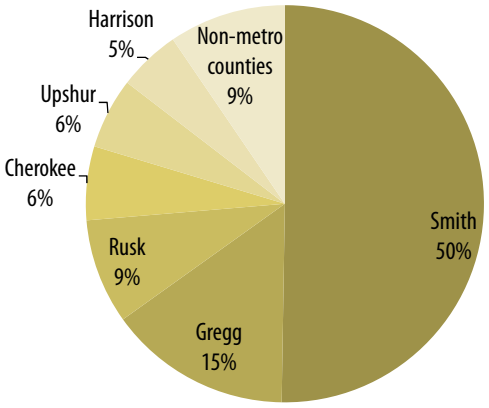


Figure 14. Compound annual growth rate (CAGR)

CAGR for selected areas, 2000 to 2010

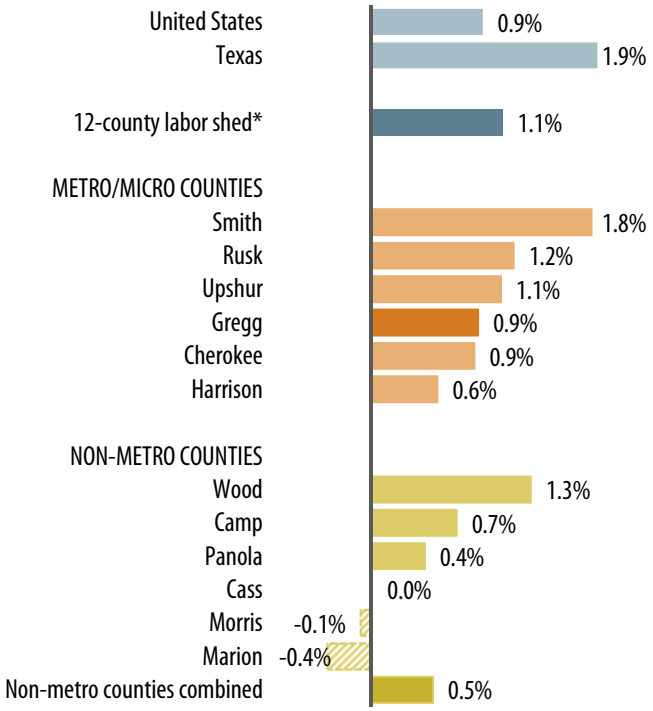


Figure 16. Population trends, 2000 to 2011 *(ranked by net change, 2000 to 2010)*

Geography	2000	2010	2011	Change 2000-2010			Change 2010-2011	
				net	*%*	*CAGR*	*net*	*%*
United States	281,421,906	308,745,538	311,591,917	+27,323,632	+9.7%	+0.9%	+2,846,379	+0.9%
Texas	20,851,820	25,145,561	25,674,681	+4,293,741	+20.6%	+1.9%	+529,120	+2.1%
12-county labor shed *(incl. Gregg County)*	603,001	672,664	679,723	+69,663	+11.6%	+1.1%	+7,059	+1.0%
Smith County, Texas	174,706	209,714	213,381	+35,008	+20.0%	+1.8%	+3,667	+1.7%
Gregg County, Texas	111,379	121,730	123,081	+10,351	+9.3%	+0.9%	+1,351	+1.1%
Rusk County, Texas	47,372	53,330	53,759	+5,958	+12.6%	+1.2%	+429	+0.8%
Wood County, Texas	36,752	41,964	42,164	+5,212	+14.2%	+1.3%	+200	+0.5%
Cherokee County, Texas	46,659	50,845	51,140	+4,186	+9.0%	+0.9%	+295	+0.6%
Upshur County, Texas	35,291	39,309	39,826	+4,018	+11.4%	+1.1%	+517	+1.3%
Harrison County, Texas	62,110	65,631	66,296	+3,521	+5.7%	+0.6%	+665	+1.0%
Panola County, Texas	22,756	23,796	24,058	+1,040	+4.6%	+0.4%	+262	+1.1%
Camp County, Texas	11,549	12,401	12,407	+852	+7.4%	+0.7%	+6	+0.0%
Cass County, Texas	30,438	30,464	30,256	+26	+0.1%	+0.0%	-208	-0.7%
Morris County, Texas	13,048	12,934	12,848	-114	-0.9%	-0.1%	-86	-0.7%
Marion County, Texas	10,941	10,546	10,507	-395	-3.6%	-0.4%	-39	-0.4%

Source: US Census Bureau, Decennial census (2000 and 2010); Population Estimates Program (2011).

As the core counties of their respective metropolitan areas, Gregg and Smith Counties tend to have a larger share of their population concentrated in the youth and young adult age groups. Age structures vary among the six counties not associated with a metropolitan area. For Camp County, a larger-than-average share of the population is school-age, while Marion County has a higher share of its population in their prime earning years, with nearly 45 percent of the county's population estimated to be between the ages of 35 and 64. Wood County had the highest share of older residents, with nearly one-quarter of the population age 65 years and older.

The racial and ethnic composition of the 12-county region as a whole mirrors that of the nation, with roughly one-third of residents estimated to be of Hispanic origin or some race other than Caucasian. None of the counties are as diverse as Texas, where non-whites comprise a majority of the state's population. Cherokee and Camp Counties had the largest Hispanic population as a share of the total population, with this group accounting for slightly more than one in five residents in each county (roughly 22 percent).

Figure 17. Race and Hispanic origin, 2011

As a share of total population

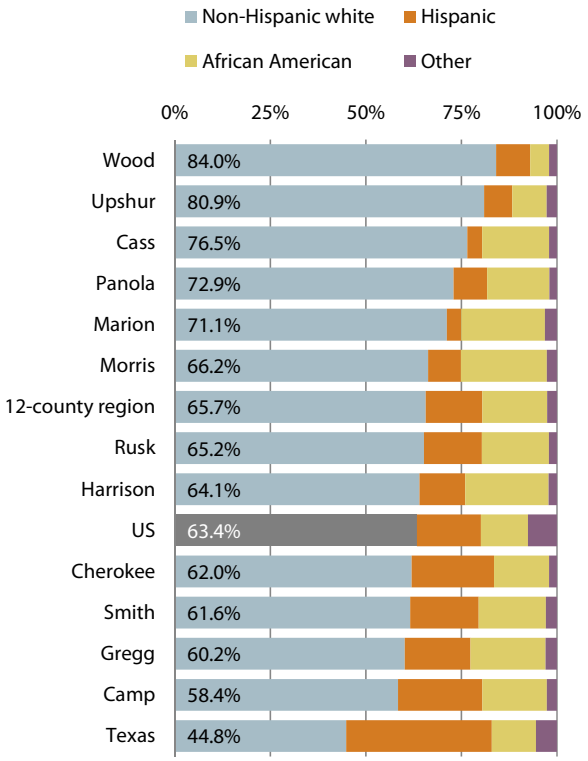


Figure 18. Age distribution, 2011

*Darker shading indicates higher share of age group; **bolded** figure is highest share among the 12 counties*

		CORE MSA COUNTIES		MSA COMPONENT COUNTIES					NON-METROPOLITAN COUNTIES								
		Gregg	Smith	Cherokee	Harrison	Rusk	Upshur	Camp	Cass	Marion	Morris	Panola	Wood	12-county region	Texas	US
Youth	0 to 4	**7.6%**	7.1%	7.1%	7.1%	6.6%	6.5%	6.9%	5.8%	4.9%	6.5%	6.3%	5.2%	6.9%	7.6%	6.5%
	5 to 9	7.2%	7.1%	**7.4%**	7.4%	6.4%	7.0%	7.4%	6.4%	4.8%	5.9%	7.2%	5.4%	6.9%	7.6%	6.5%
	10 to 14	6.7%	7.1%	7.3%	7.3%	6.5%	7.0%	**7.6%**	6.6%	5.5%	6.3%	6.9%	5.9%	6.9%	7.5%	6.6%
	15 to 19	7.0%	7.2%	**7.3%**	7.0%	6.3%	6.8%	7.0%	6.5%	5.7%	6.8%	6.7%	5.8%	6.9%	7.3%	6.9%
Young adult	20 to 24	7.4%	**7.7%**	6.5%	6.4%	6.6%	5.4%	5.9%	4.9%	4.5%	5.2%	6.1%	5.0%	6.7%	7.3%	7.1%
	25 to 34	**13.8%**	13.0%	11.6%	12.3%	13.5%	11.1%	11.5%	10.5%	8.7%	10.9%	12.3%	9.0%	12.4%	14.4%	13.4%
Experienced working age	35 to 44	11.9%	12.0%	12.0%	12.0%	**12.7%**	11.7%	10.6%	11.4%	10.4%	10.8%	11.4%	9.9%	11.8%	13.6%	13.0%
	45 to 54	13.3%	12.8%	13.3%	14.4%	14.6%	14.9%	13.2%	14.3%	**16.5%**	13.9%	13.6%	13.4%	13.6%	13.5%	14.4%
	55 to 64	11.5%	11.6%	12.4%	12.9%	12.7%	13.9%	13.6%	14.1%	**17.2%**	14.1%	13.7%	15.5%	12.6%	10.7%	12.2%
Retirement age	65 to 74	7.0%	7.7%	8.5%	7.6%	7.7%	9.2%	9.3%	11.0%	12.8%	10.7%	9.0%	**14.8%**	8.5%	6.0%	7.2%
	75 to 84	4.7%	4.8%	4.7%	4.2%	4.6%	5.0%	5.2%	6.1%	6.9%	6.6%	5.0%	**7.6%**	5.0%	3.3%	4.2%
	85 or older	2.0%	1.9%	1.9%	1.5%	1.8%	1.7%	2.0%	2.3%	2.1%	2.3%	1.7%	**2.4%**	1.9%	1.3%	1.8%
TOTAL		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
MEDIAN AGE *(in years)*		35.4	35.9	37.8	37.4	39.1	40.5	38.2	43.7	48.6	43.3	40.0	47.3	—	33.5	37.0

Sources (all figures): US Census Bureau, Population Estimates Program, July 1 estimates, except median age which comes from the 2007-2011 American Community Survey.
MSA = metropolitan statistical area

The composition of the region's enrollment status reflects the demographics and educational assets of the individual counties. The three counties with the largest share of the population enrolled in school – Smith, Harrison, and Gregg – are home to many of the region's higher education institutions (see Figure 44). Only Smith County had an above-average share of its population enrolled in school relative to the US. None of the 12 counties' enrollment levels exceeded the state average. However, Texas's large enrollment reflects its relatively young population, with the largest share of enrollment attributable to K-12.

Not surprisingly, enrollment levels are lowest in those counties with a greater proportion of older residents, such as Marion and Wood Counties. Enrollment in Cherokee and Camp Counties is not too far off the national mark, driven by relatively high levels of K-12 enrollment (19.4 percent of the population of each county is enrolled at this level, compared with17.7 percent of the US population), a reflection of the relative youth of the population of these counties.

A look at educational attainment reveals that only 50 percent of the region's population age 25 years and over has educational experience beyond high school. By contrast, roughly 57 percent of the US population has pursued postsecondary education. Furthermore, nearly one in five adults (18 percent) in the 12-county labor shed lacks high school equivalency, compared with 15 percent nationally.

Area residents are more likely than adults in Texas or the US to have attended some college without attaining a formal degree. One-quarter of the region's population age 25 years and older falls into this category, which includes those who may have completed postsecondary awards of less than two years. The region also outperforms the state in the share of the adult population with an associate's degree. However, the region as a whole, and Gregg and Smith Counties individually, lag the state and the US in the share of residents holding a four-year degree or higher.

Figure 19. School enrollment

Share of the total population enrolled

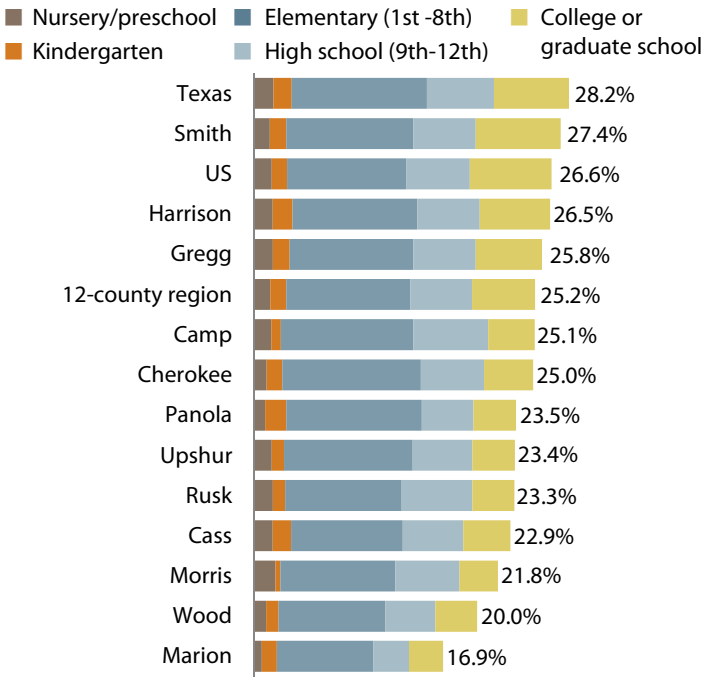
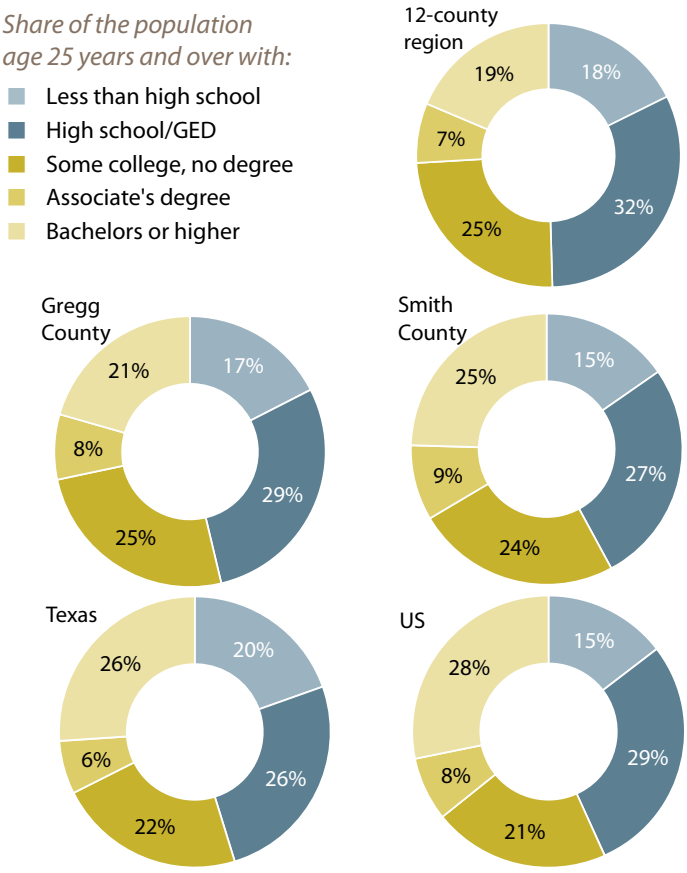


Figure 20. Educational attainment

Share of the population age 25 years and over with:



Source (all figures): US Census Bureau, 2007-2011 American Community Survey

Income & mobility

After lagging the US for most of the last two decades, per capita personal income (PCPI) levels in Gregg County have improved dramatically (Figure 21). In 2011, the most recent year for which data are available, PCPI in Gregg County was estimated at $43,222 compared with $41,560 for the US. This represents $1.04 of income for each $1.00 of income at the national level.

By contrast, residents of the 12-county region (which includes Gregg County) had roughly 90¢ for each $1.00 of income nationally. While this represents a marked improvement from prior decades, the region remains consistently below state and US incomes. Regional volatility in the region's PCPI relative to the US is likely attributable to volatility in energy prices, reflecting the importance of the sector to Gregg County and the state as a whole.

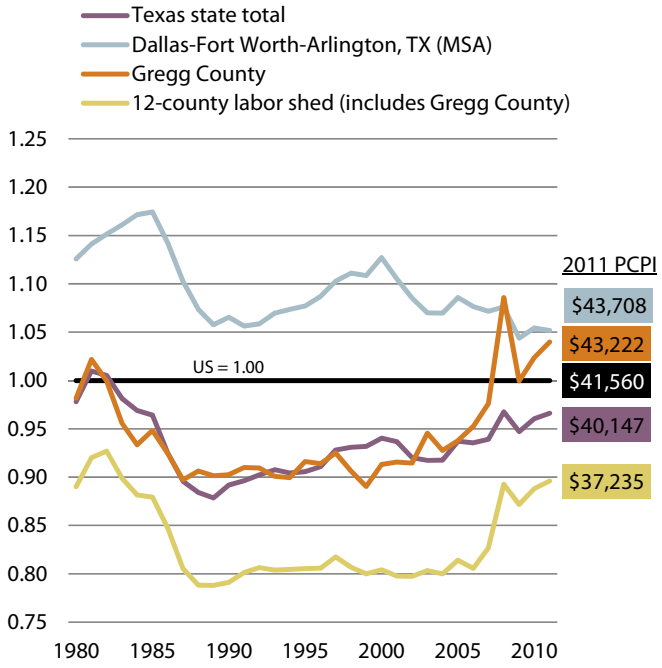
Figure 22 illustrates the region's relative housing affordability using a simple index. The index compares median home prices to median household incomes, with the US ratio equal to 100. Anything above 100 is less affordable than the US average; anything below is more affordable.

The results of these calculations reveal that housing affordability throughout the region is more affordable than at the national level. All 12 counties have scores well below that of the US, with Panola County being the most affordable by this measure.

However, relative to the state as a whole, housing is somewhat less affordable in Camp, Smith, and Gregg Counties. This is not to suggest that home prices in these counties are higher than the state average, simply that the relationship between home prices and income makes housing less affordable for residents.

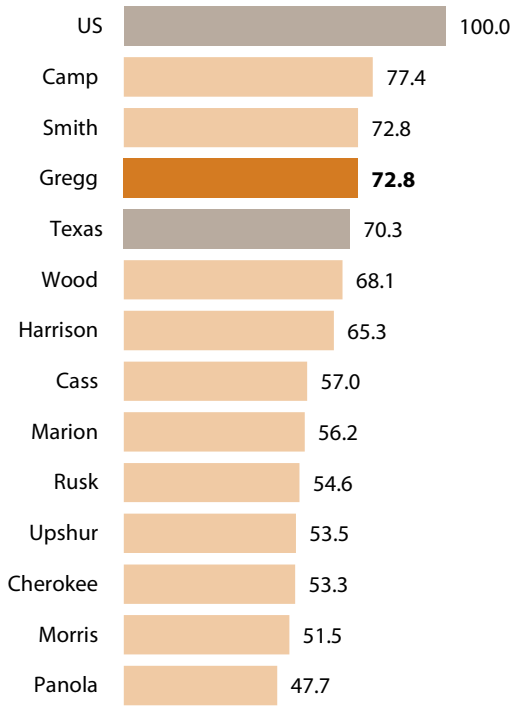
Figure 21. Per capita personal income (PCPI) relative to US

PCPI for selected geographies indexed to the US



Source: US Bureau of Economic Analysis

Figure 22. Housing affordability index



Source: US Census Bureau, 2007-2011 American Community Survey

Unlike demographic trends—which tend to shift in long waves, with only incremental changes from one year to the next—domestic migration tends to be much more volatile, often correlating with activities that are cyclical in nature, such as job growth and housing construction. One of the most effective ways to understand migration patterns is the County-to-County Migration data collected as a bi-product of the US Internal Revenue Service's tax filings. Through this massive dataset, year-over-year comparisons of address changes by tax filers provide a basis for illustrating domestic population movements. Although not an exact match, tax returns are used to represent households; the number of exemptions filed is typically used as a proxy for population.

Figure 23 shows migration flows for Gregg County for the most recent five years for which data are available. During this period, migration patterns have been relatively balanced, with the flow of people and households moving out of the county roughly equal to the number coming in. Income levels of inbound and outbound movers have also been fairly evenly matched based on a comparison of aggregated adjusted gross income (AGI) per return. In other words, on average, the taxable income level of those leaving the county has not differed significantly in recent years from those coming in.

Figure 23. Gregg County migration flows, 2006 to 2010

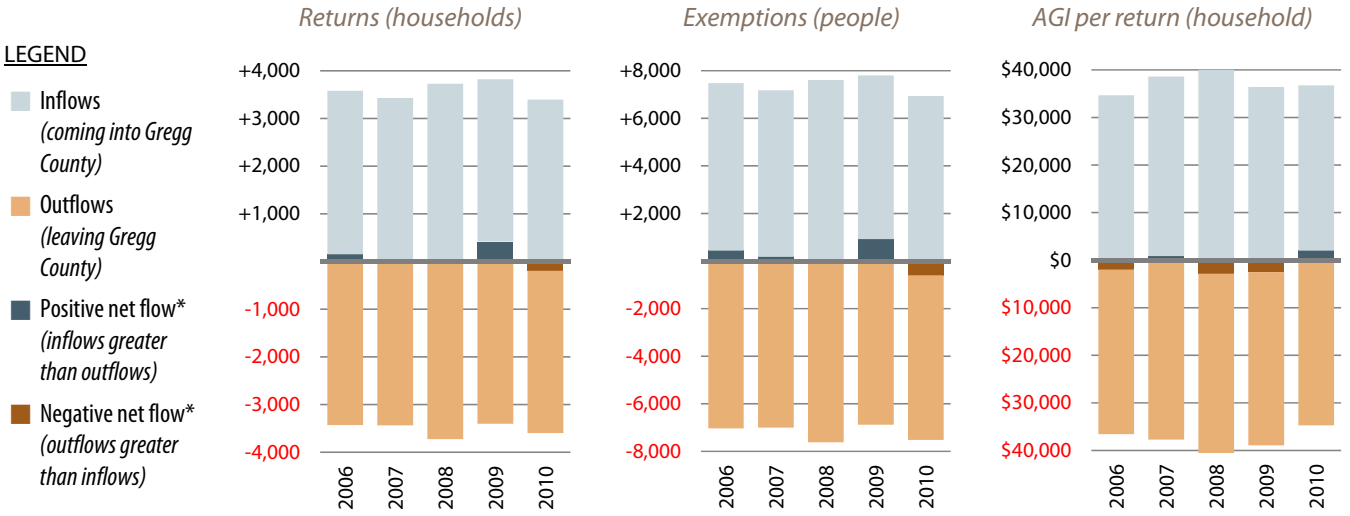
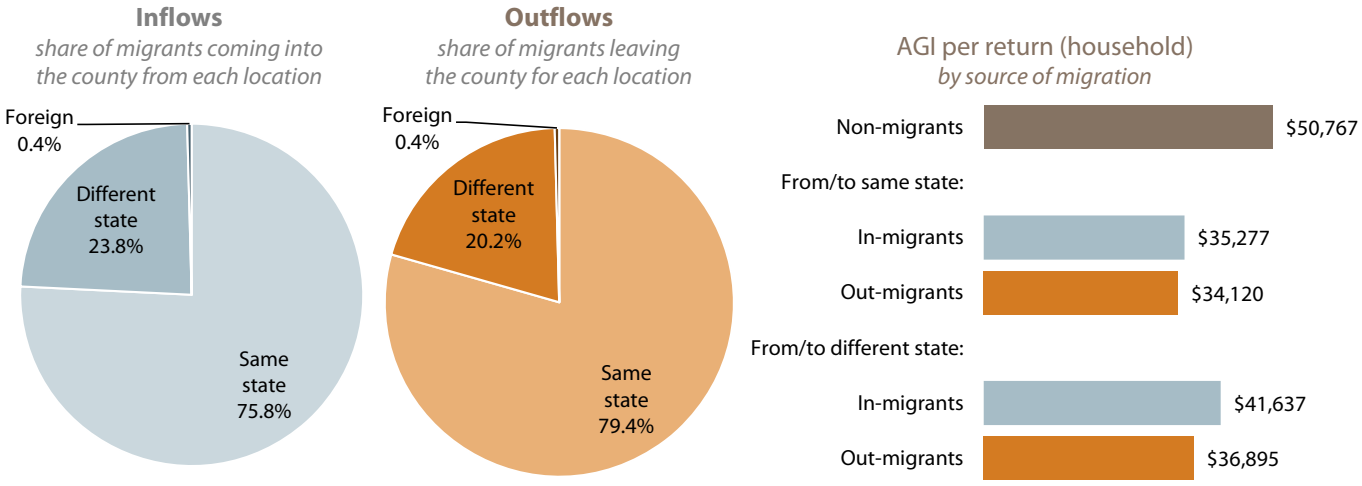


Figure 24. Sources of Gregg County migration flows, 2010



Source: Internal Revenue Service, Statistical Information Office. Based on year-over-year changes in address on federal tax returns. 2006 data reflect address changes from 2005 filing; 2010 data show changes from 2009. *Net flows in Figure 23 are shown as a portion of the applicable migration flow (i.e., positive net flows are shown as a portion of inbound migration, negative net flows are shown as portion of outbound migration).

Figure 24 (previous page) provides more detail about migration flows in a single year, 2010. The vast majority of migration flows (both inbound and outbound) were between Gregg County and another Texas county. Just one in four movers came into Gregg County from or left Gregg County for a different state. Those moving between Gregg County and another county in Texas had similar income levels. By contrast, those coming into the county from another state had slightly higher taxable incomes on average than those moving from Gregg County to a non-Texas county.

As illustrated in Figure 25, circulation is heaviest between Gregg County and neighboring counties: Harrison, Upshur, Rusk, and Smith, with Dallas County rounding out the top five. However, over the past five years, Gregg County has been the net loser in these exchanges, with the highest net outflow to Upshur and Smith Counties. Though the volume of flows has been significantly smaller, Gregg County has been a net gainer in exchanges with several Northeast Texas counties (Titus, Cass, and Wood); as well as with Los Angeles County, CA; and Orleans Parish, LA.

Figure 26 shows net migration levels by year between Gregg County and the other 11 counties in the regional labor shed.

Figure 25. Largest migration flows (based on number of exemptions), combined totals for 2006 to 2010

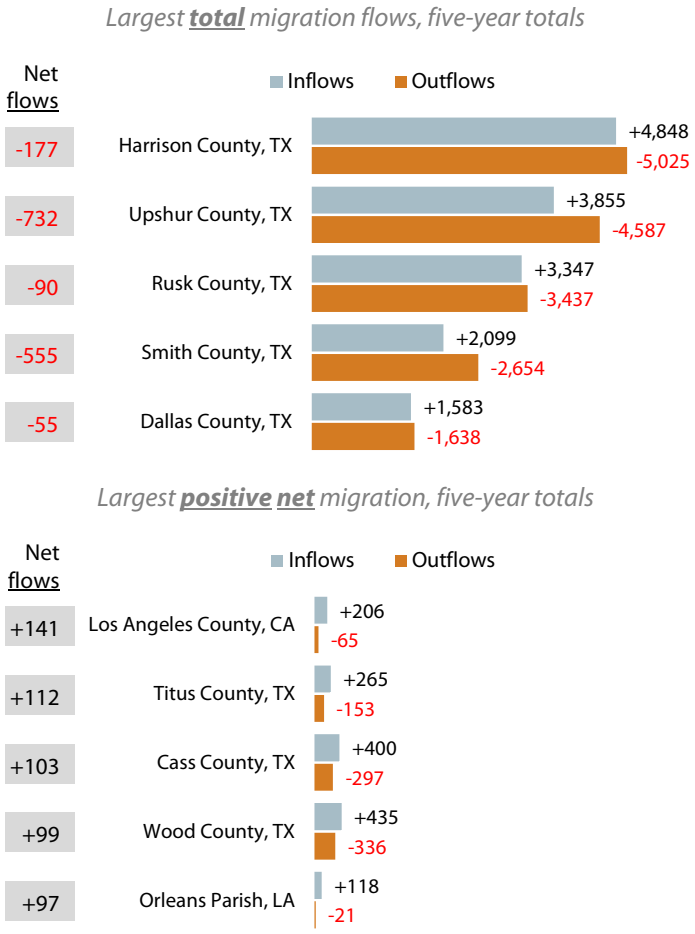
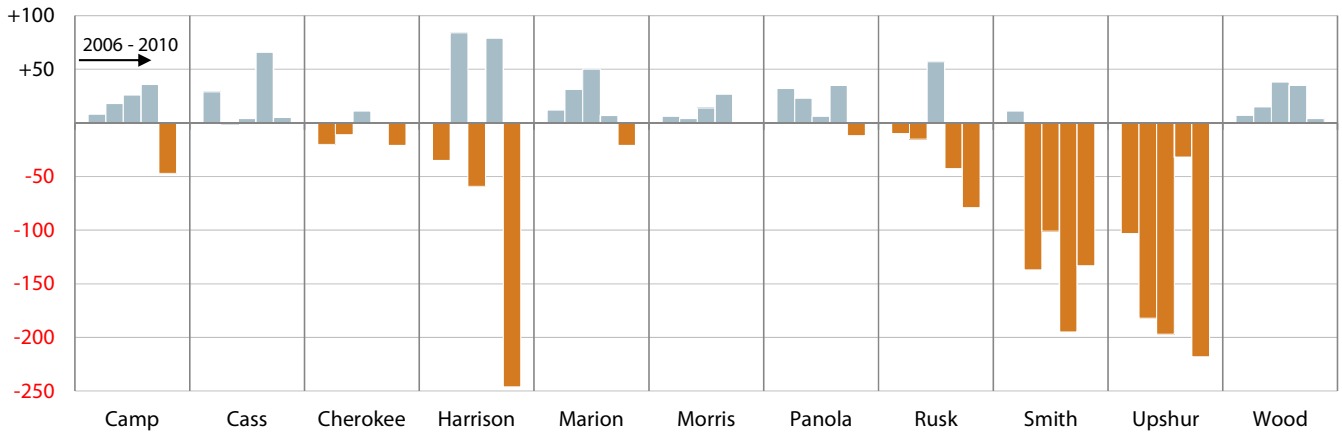


Figure 26. Net migration flows (based on number of exemptions) within 12-county labor shed by year, 2006 to 2010



Source: Internal Revenue Service, Statistical Information Office. Based on year-over-year changes in address on federal tax returns. 2006 data reflect address changes from 2005 filing; 2010 data show changes from 2009. Exemptions are typically used as a proxy for population.

Labor market overview

The combined 12-county labor shed boasts nearly 350,000 workers, with Smith and Gregg Counties together comprising roughly one-half of the total civilian labor force.

After experiencing a significant rise in unemployment, rates in the 12 counties that comprise the labor shed have fallen back to the mid-point of their historic ranges. At 5.3 percent, Panola County had the lowest level of unemployment in October 2012, the most recent period for which county-level rates were available.

Over the past decade, unemployment rates in most counties fluctuated within a range comparable to the state and the nation – roughly five to six percentage points. However, the spread was much greater for a handful of counties, most notably Morris County, where unadjusted rates peaked at 17.3 percent in July 2009. Unemployment levels in Smith and Gregg Counties have remained below national levels throughout the recession. (See Figure 29, next page)

Labor force participation rates compare the portion of the labor force that is employed or looking for work with the population that is labor force eligible (defined here as those who are 16 years or older). Much has been made of the US civilian labor force participation rate during the recent economic cycle. The rate rose steadily in over the last quarter of the 20th century as women entered the workforce in greater numbers. More recently, the prolonged US economic recession has discouraged workers and pushed the national participation rate down. This has been a major topic of concern for labor economists.

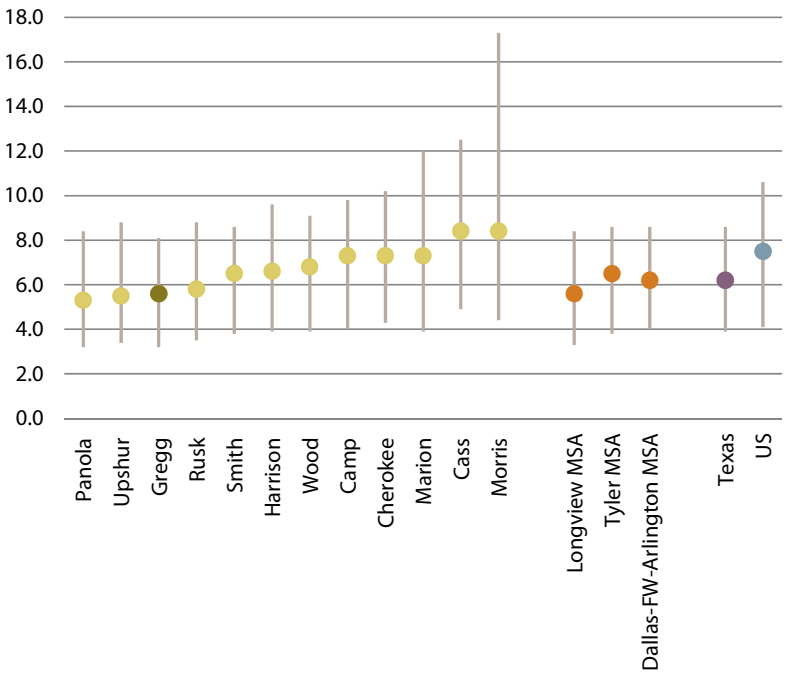
Figure 27. Labor market overview, October 2012 *(preliminary)*

Smith and Gregg Counties comprise one-half of the regional labor force

County	Civilian labor force (CLF)	Change in CLF from Oct. 2002	Employed	Unemployed	UE rate
Camp	5,714	-72	5,297	417	7.3
Cass	13,145	-633	12,047	1,098	8.4
Cherokee	21,523	+48	19,944	1,579	7.3
Gregg	67,971	+10,484	64,172	3,799	5.6
Harrison	34,496	+3,837	32,223	2,273	6.6
Marion	5,045	+314	4,679	366	7.3
Morris	6,463	+431	5,920	543	8.4
Panola	14,885	+4,018	14,102	783	5.3
Rusk	26,916	+5,242	25,349	1,567	5.8
Smith	107,032	+16,026	100,085	6,947	6.5
Upshur	20,748	+3,350	19,598	1,150	5.5
Wood	18,315	+1,040	17,064	1,251	6.8
12-county region	**342,253**	**+44,085**	**320,480**	**21,773**	**6.4**

Figure 28. Unemployment rate trends, 2002 to present *(not seasonally adjusted)*

*Line shows historic range; point shows rate as of Oct. 2012, preliminary**



SOURCE (all figures): US Bureau of Labor Statistics

*Except state and US figures; MSA = metropolitan statistical area

Less discussed, however, are the wide geographic differences in participation rates across the country. (These geographic variations existed both before and after the recent recession.) Several counties in the region, including Gregg County, exceeded average participation rates for both the state and the US in 2011. Of the six non-metro counties, only Panola County exceeded state and national rates, with three-quarters (75.5 percent) of working age residents in the labor force last year.

This statistic often reflects the demographics of an area. For example, a community with a high number of retirees would have lower labor force participation rates since these individuals would still be considered labor force eligible. This factor may explain Wood County's very low participation rate, with only about one-half of residents age 16 years and older employed or actively seeking employment on average in 2011.

High levels of unemployment can also influence labor force participation, as chronic unemployment can result in the growth in the number of discouraged workers, (those who are labor force eligible but who have stopped actively looking for work). This offers a likely explanation for low participation rates in Morris, Marion, and Cass Counties, which have experienced relatively high levels of unemployment, as illustrated in Figure 31 (next page).

Figure 29. Annual average unemployment rates, 2002 to present

Gregg County rates have outperformed state and US during recession

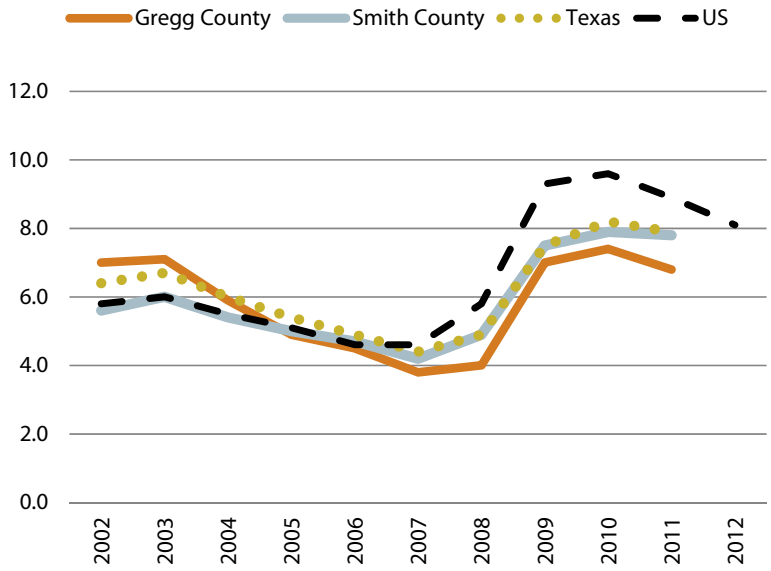
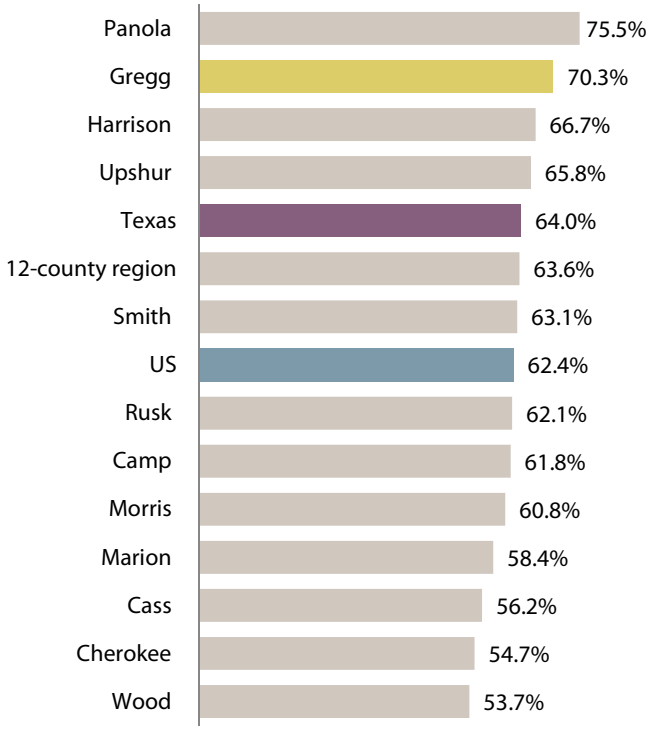


Figure 30. Labor force participation rates, 2011

Share of population age 16 years and over in the civilian labor force

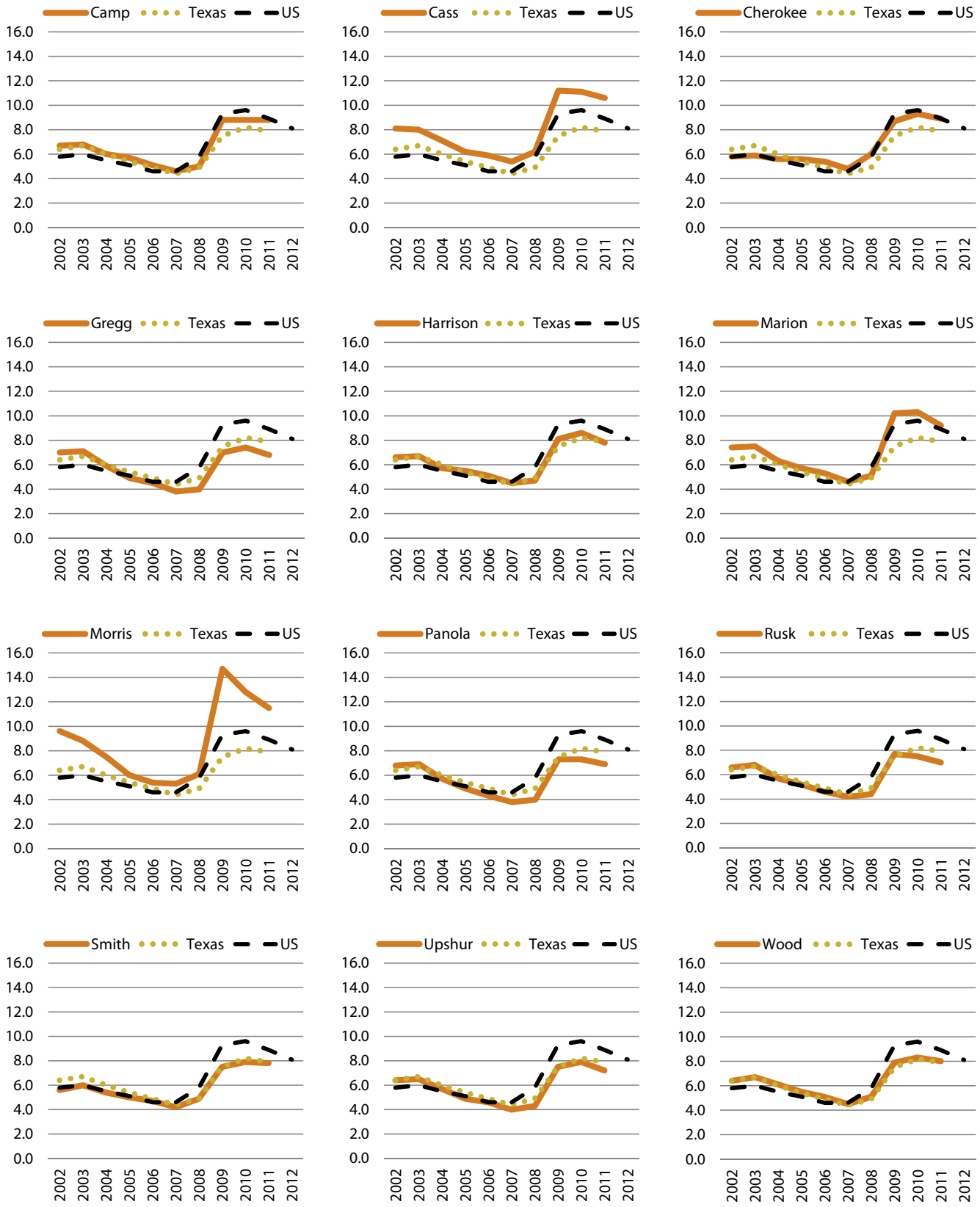


Sources:

Figure 29: US Bureau of Labor Statistics. Annual average figures 2002 through 2011 (counties and Texas), 2002 through 2012 (US only)

Figure 30: US Census Bureau, Population Estimates Program July 1, 2011 estimates; US Bureau of Labor Statistics; TIP Strategies

Figure 31. Unemployment trends by county, 2002 to present



Source: US Bureau of Labor Statistics. Annual average figures 2002 through 2011 (counties and Texas), 2002 through 2012 (US only)

III. Occupations and industry

The prior section examined characteristics of the labor force in general. In this section, we look at the occupational and industrial composition of the Gregg County economy. Where possible, comparisons are made to the 12-county labor shed, the state, and the nation. An overview of "for-credit" degrees and awards conferred by regional higher education is also included.

Unless otherwise indicated, employment data presented in this report were prepared using Analyst, a suite of web-based analysis tools created by EMSI. The product integrates economic, labor market, demographic, and education data from over 90 government and private-sector sources, creating a database that is comprehensive, accurate, and timely. The figures presented in this report are "complete" employment, rather than the "covered" employment typically produced by state and federal workforce agencies. Unlike covered employment, which includes only those industries covered by unemployment insurance, complete employment includes estimates of all industries.

IN THIS SECTION

- ✓ What industries provide the largest source of employment in the region?
- ✓ Which occupations is the region most specialized in? What are the typical wages?
- ✓ Which occupations and industries are growing the fastest?
- ✓ What skills are difficult to find? What occupations might have transferable skills?
- ✓ What kind of postsecondary training is important to these occupations? How many "completions" are there in these programs in the region?

Industry composition

A look at employment by industry (Figure 32) illustrates the unique composition of the Gregg County economy relative to the regional, state, and national economies. **Healthcare** tops the list for all four geographies,

Figure 32. Distribution of employment by industry, 2012

Share of total employment by major sectors (✓ indicates three largest sectors by share of total employment)

NAICS CODE	DESCRIPTION	GREGG COUNTY		12-COUNTY LABOR SHED		TEXAS		US	
62	Healthcare & social assistance	✓	11.6%	✓	11.7%	✓	9.7%	✓	11.0%
21	Mining (incl. oil & gas)	✓	10.1%		8.0%		3.2%		0.8%
31-33	Manufacturing	✓	10.1%		7.9%		6.0%		7.0%
44-45	Retail trade		10.0%	✓	9.8%	✓	9.6%	✓	9.9%
23	Construction		9.2%		7.0%		6.4%		4.9%
903	Local govt. (incl. public ed. & hospitals)		6.6%	✓	8.2%	✓	8.2%	✓	7.8%
72	Lodging, restaurants, & bars		6.5%		6.1%		7.1%		7.0%
81	Personal & other services		5.6%		6.5%		5.9%		6.1%
56	Administrative & support services		5.4%		4.8%		6.7%		6.2%
54	Professional services		4.3%		4.1%		6.5%		6.9%
53	Property sales & leasing		4.1%		3.2%		4.1%		4.5%
42	Wholesale trade		4.0%		2.8%		3.9%		3.5%
52	Finance & insurance		3.9%		4.7%		6.1%		5.5%
48-49	Transportation & warehousing		2.7%		3.1%		3.6%		3.2%
61	Educational services (private)		1.9%		1.5%		1.6%		2.5%
51	Information		0.9%		1.2%		1.5%		1.8%
71	Arts, entertainment, & recreation		0.8%		1.0%		1.6%		2.2%
11	Agriculture & forestry		0.6%		4.5%		2.1%		2.0%
55	Corporate & regional offices		0.6%		0.5%		0.8%		1.2%
9011	Federal government (civilian)		0.5%		0.5%		1.4%		1.6%
902	State government (incl. higher ed.)		0.4%		1.8%		2.4%		2.9%
9012	Federal government (military)		0.3%		0.4%		1.2%		1.2%
22	Utilities		0.3%		0.6%		0.4%		0.3%

Source: EMSI Complete Employment - 2012.4

accounting for roughly ten to 12 percent of total employment. However, this is where Gregg County's employment patterns diverge. The next largest industries in terms of the county's job base—**mining** (including oil & gas) and **manufacturing**—are part of the goods-producing sector. Each accounts for approximately 10 percent of the county's total employment, well above employment levels in these key sectors at either the state or national level.

By contrast, the next largest industries by employment in the US, Texas, and the 12-county region are service-sector industries: **retail trade** and **local government** (which includes employment at publicly owned hospitals and local school districts). Even though retail trade is not one of Gregg County's three largest sources of employment, the sector actually accounts for a very similar share of the job base (roughly 10 percent) as it does in the other geographies. Local government, on the other hand, represents a slightly smaller share of the county's total. The county also lags the state and the nation in professional services and finance & insurance employment, two service-producing sectors that can be a source of well-paying employment.

ABOUT LOCATION QUOTIENTS (LQS)

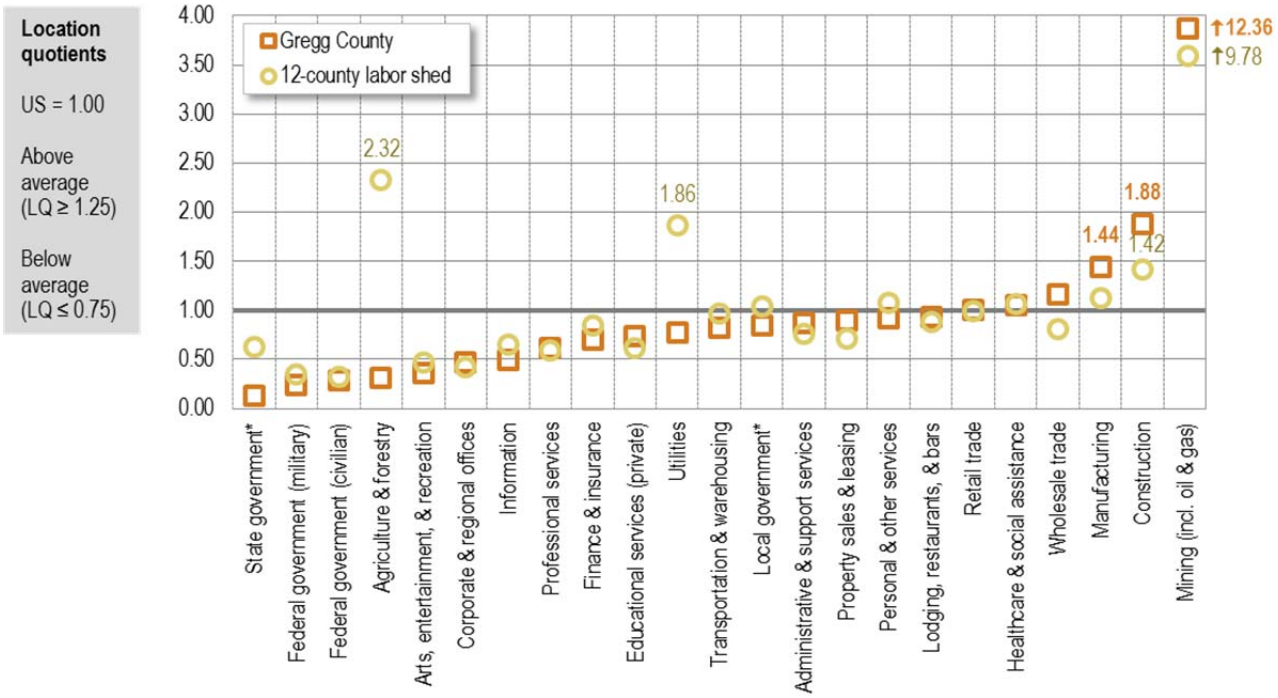
Location quotient analysis is a statistical technique used to suggest areas of relative advantage based on a region's employment base. LQs are calculated as an industry's share of total local employment divided by the same industry's share of employment at the national level:

(local employment in industry x /
total local employment -all industries)
(national employment in industry x /
total national employment-all industries)

If the local industry and national industry are perfectly proportional, the LQ will be 1.00. LQs greater than 1.25 are presumed to indicate a comparative advantage; those below 0.75 suggest areas of weakness but also point to opportunities for expansion or attraction.

The county's strengths in mining, construction, and manufacturing can also be seen in an analysis of location quotients (LQs) presented in Figure 33. These ratios show the concentration of employment in a given industry relative to the nation. LQs for industries that tend to be population-driven—for example, healthcare, retail, personal services, and local government—are at, or are approaching, the national average (1.00). This finding suggests these industries in Gregg

Figure 33. Gregg County employment concentration by industry sector relative to US, 2012 *(with comparison to 12-county labor shed)*



Source: EMSI Complete Employment - 2012.4. *State and local government figures include employment in public education and publicly owned healthcare facilities (e.g., hospitals).

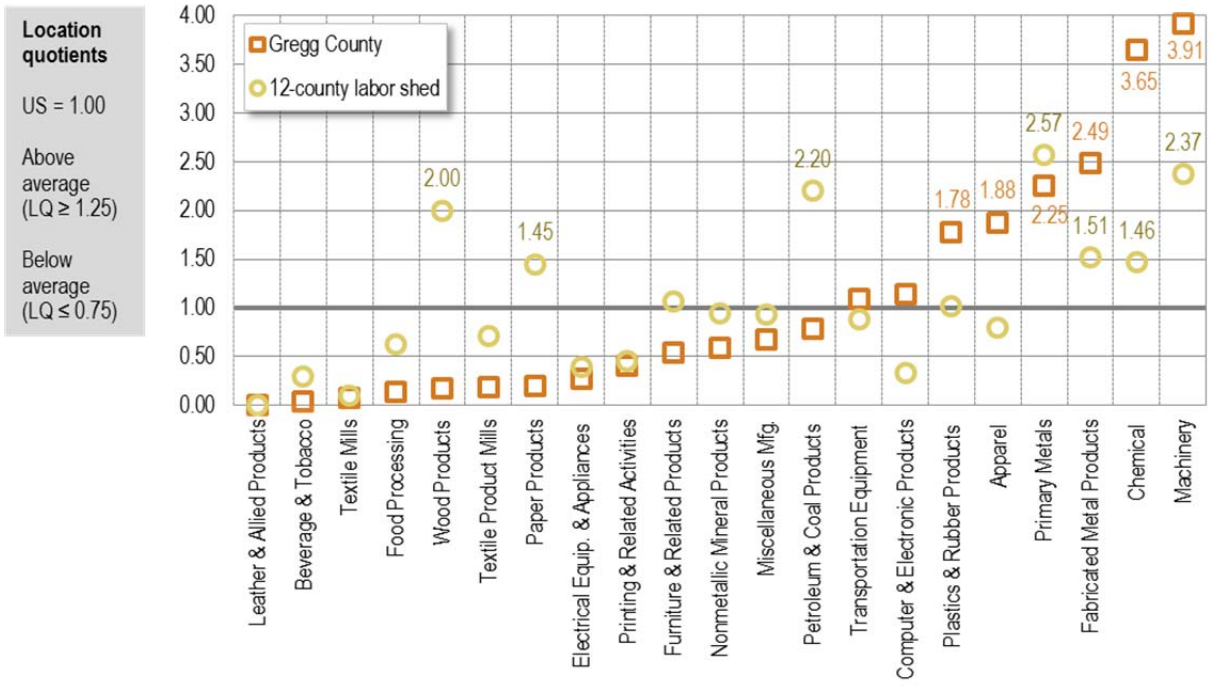
County generally serve a local population. By contrast, those industries with a larger than expected concentration of employment (typically defined as having an LQ of 1.25 or greater) are assumed to serve a larger market.

LQs for the 12-county labor shed largely mirror those of Gregg County, with shared strengths in mining, construction, and, to a lesser extent, manufacturing. The region exhibits strengths in two industry sectors that are not highly concentrated in Gregg County: **utilities** and **agriculture & forestry**. The region's LQ of 1.86 in utilities reflects a broad base of employment in electric power (generation and transmission), as well as a concentration of employment in water-related utilities (particularly in Smith County) and natural gas distribution (Gregg, Harrison, and Smith Counties). The concentration in agriculture, evidenced by an LQ of 2.32, is typical of a region that encompasses several nonmetropolitan counties. Both the county and the region have lower-than-expected concentrations of a number of key service-providing industries relative to the size of their employment base , including professional services, information, and corporate headquarter operations.

Figure 34 drills down within a single industry sector – manufacturing – to illustrate regional strengths at the 3-digit NAICS industry level. (See Appendix F for a discussion of classification systems used in this report, including the North American Industry Classification System, or NAICS.) This analysis points to employment concentrations for both Gregg County and the 12-county region in four industries: **machinery, chemicals, fabricated metal products,** and **primary metals**. Two additional industries (apparel manufacturing and plastics and rubber products manufacturing) have an above-average concentration of workers at the county level which is not seen at the regional level. Likewise, there are three industries that exhibit strong LQs at the regional level – petroleum and coal products, paper manufacturing, and wood products manufacturing – that are average or below at the county level.

These strengths are evident in the region's major employers which include energy companies, such as Halliburton Services; chemical products manufacturers, like Eastman Chemical; and telecommunications equipment manufacturer, General Dynamics SATCOM Technologies. A complete list of major employers is provided as Appendix A.

Figure 34. Gregg County manufacturing employment concentration relative to US, 2012 (with comparison to 12-county labor shed)

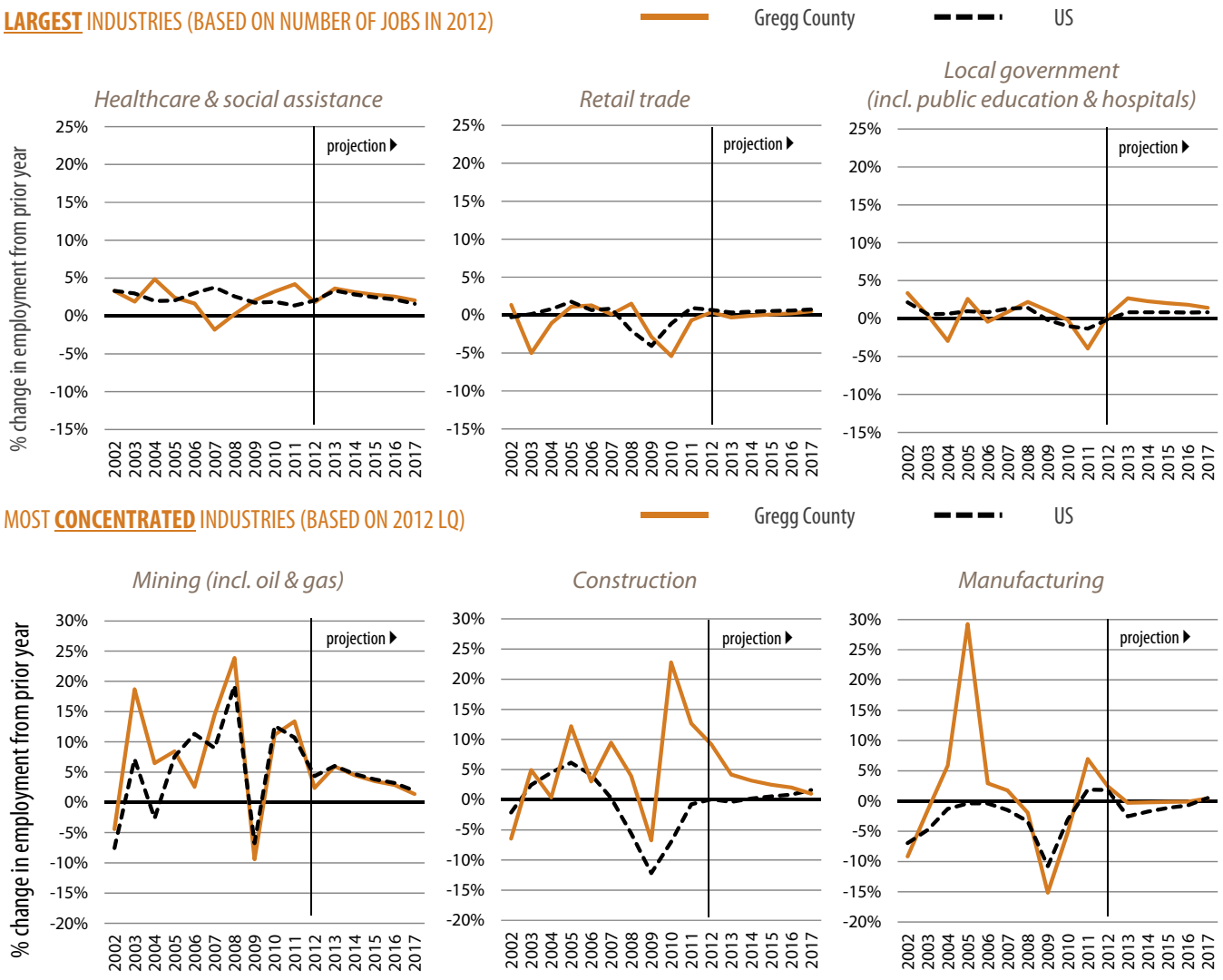


Source: EMSI Complete Employment - 2012.4

Employment gains and losses in the county's three **largest** industry sectors have been relatively modest in percentage terms, averaging a few percentage points per year over the past decade (Figure 35, top row). Local trends have generally followed national patterns, with only slight variations. The relative stability in these industries reflects two things. First, employment in these sectors is typically closely tied to population growth. Gregg County's population growth rate between the 2000 and 2010 census was identical to the US.

Second, the large base of employment in these sectors is not easily shifted. The fluctuations seen in Gregg County employment levels across these three sectors actually represented hundreds of job losses in one of the component industries. In the case of healthcare, for example, the sharp decline in employment between 2006 and 2007 was almost exclusively attributable to job losses in general medical and surgical hospitals. The sharp decline in retail trade employment between 2002 and 2003 was primarily a reflection of a drop in department store employment, which rebounded somewhat the following year. Local government declines in recent years and at the start of the last decade represent job losses in public education.

Figure 35. Historic (2002 to 2012) and projected (2012 to 2017) employment trends for selected industries, Gregg County versus US
Percent change in employment from prior year



Source: EMSI Complete Employment - 2012.4

By contrast, industry sectors with the highest **concentration** in employment (Figure 35, bottom row) showed much more volatility and were more likely to deviate significantly from national trends. As in the previous discussion, each sector also represents a large base of employment in the county. However, these sectors are much more cyclical in nature than the population-driven sectors described earlier. The impact of the economic downturn can be clearly seen in the sharp decline in employment growth seen in each sector around the trough of the recession, which was experienced nationally in June 2009.

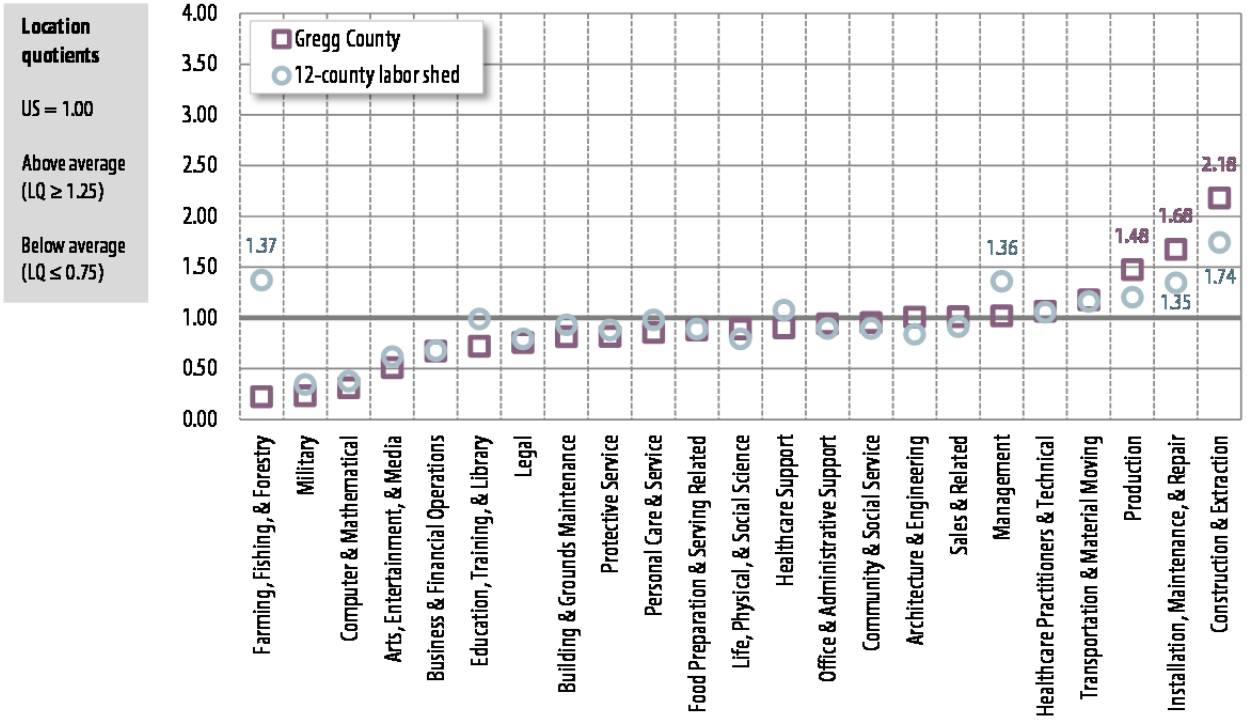
Oil and gas production employment (which is classified within the mining sector) is doubly impacted by economic cycles, since prices are affected by industrial and consumer demand. The sharp uptick in manufacturing employment in the county between 2004 and 2005 was largely driven by substantial growth in chemical manufacturing employment, which experienced a gain of roughly 1,700 jobs. Significant gains in construction employment reflect the sector's rebound nationally, as well as local factors including an increase in school construction and a rise in multi-family construction.

Occupational strengths

The prior section examined regional industry strengths for Gregg County using employment share and LQs. In this section we look at occupational strengths. In addition to analyzing their share and relative concentration, this analysis will also consider wage rates and training needs. Because the labor pool extends beyond Gregg County, data in this section are more focused on the 12-county labor shed.

Figure 36 shows LQs for Gregg County and the 12-county labor shed by major occupational group. Employment in both the region and the county is concentrated in occupations that correlate with its industrial specializations, including production workers (which are tied to manufacturing) and construction and extraction workers (associated with construction and oil & gas). The concentration in installation, maintenance, and repair workers reflects the fact that these

Figure 36. Gregg County employment concentration by occupational group relative to US, 2012 *(with comparison to 12-county labor shed)*



Source: EMSI Complete Employment - 2012.4.

jobs are employed during the construction phase, as well as in the repair and maintenance of existing residential and commercial structures. At the regional level, the concentration of occupations associated with agriculture can be seen.

In addition to understanding regional concentrations, we also analyzed the region's leading occupations based on size (number of jobs in 2012), growth rate (in both numeric and percentage terms), and wages paid. Figure 38 (next page) shows the top ten occupations in each category (among occupations employing 25 or more workers in the 12-county region).

- The majority of the region's **largest** occupations have hourly earnings well below the county and regional average ($17.58 and $16.63, respectively). As is often the case, many are closely tied to population, such as retail salespersons, food service workers, and cashiers. The importance of agriculture to the region can be seen in the large number of farmers, ranchers, and other agricultural management occupations. Truck drivers are employed by a range of the area's largest industries, including manufacturing, mining (oil & gas production), and logistics.

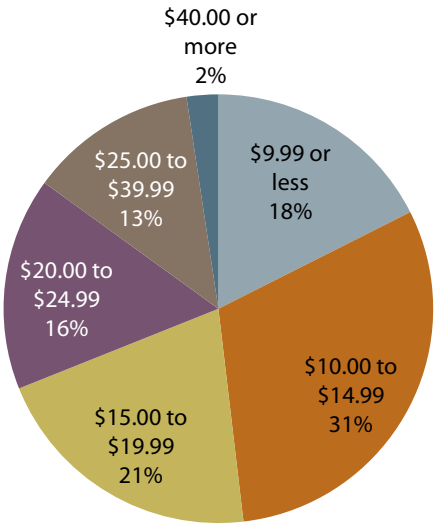
- Four occupations—financial advisors, heavy equipment mechanics, extraction workers, and industrial machinery mechanics—are among the ten **fastest growing** occupations both in terms of absolute numbers and percentage growth. All four have median hourly earnings above local and regional averages. Likewise, only two of the top ten occupations with the largest numbers of jobs added in the past five years fall well below the average wage rate: personal care aides and janitorial and cleaning workers. The remainder, with the exception of heavy equipment mechanics, had median wage rates in excess of $20 per hour.

- Nine of the region's top 10 highest earning occupations are healthcare-related. These occupations represent a small fraction of the workforce, with relatively low levels of demand anticipated in the next five years. High-earning occupations outside the healthcare industry (with median hourly earnings in parentheses) include airline pilots and related occupations ($52.26), geoscientists ($50.93); petroleum engineers ($48.77); and lawyers ($46.96).

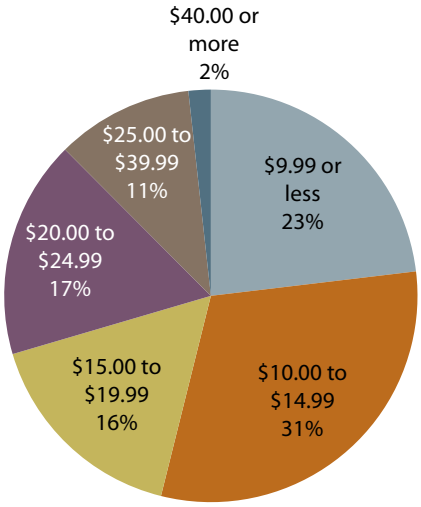
Figure 37. Earnings distribution of workforce

Share of workers by median hourly earnings

Gregg County



12-county labor shed



Source: EMSI Complete Employment - 2012.4. Excludes occupations employing fewer than 10 workers where median hourly earnings were not disclosed.

Figure 38. Top occupations in the 12-county labor shed, as ranked by key indicators

Rank	Employment in 2012	◀ LARGEST	Median hourly earnings
1	12,156	Farmers, Ranchers, and Other Agricultural Mgrs.	$9.24
2	10,715	Retail Salespersons	$9.62
3	7,778	Food Prepartion and Service Workers (Incl. Fast Food)	$8.48
4	7,314	Cashiers	$8.78
5	7,311	Heavy and Tractor-Trailer Truck Drivers	$16.26
6	7,304	Office Clerks, General	$11.67
7	6,559	Secretaries and Admin. Assistants (Except Legal, Medical, & Executive)	$13.14
8	6,279	Registered Nurses	$27.52
9	5,972	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$10.61
10	5,664	General and Operations Managers	$35.49

Rank	Net change (projected)	◀ FASTEST-GROWING, 2012-2017 (#)	Median hourly earnings
1	1,125	Combined Food Preparation and Serving Workers, Including Fast Food	$8.48
2	1,118	Registered Nurses	$27.52
3	1,103	Personal Financial Advisors	$22.72
4	1,090	First-Line Supervisors of Construction Trades and Extraction Workers	$20.62
5	1,016	Personal Care Aides	$8.73
6	915	Home Health Aides	$9.11
7	827	Helpers--Extraction Workers	$21.45
8	827	Real Estate Sales Agents	$11.63
9	802	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	$10.61
10	791	Property, Real Estate, and Community Association Managers	$21.79

Rank	% change (projected)	◀ FASTEST-GROWING, 2012-2017 (%)	Median hourly earnings
1	+55%	Helpers-Extraction Workers	$21.45
2	+48%	Commercial Divers	$19.14
3	+45%	Marketing Managers	$37.96
4	+44%	Mobile Heavy Equipment Mechanics, Except Engines	$15.97
5	+42%	Financial Specialists, All Other	$22.10
6	+40%	Helpers-Brick/Block/Stonemasons and Tile and Marble Setters	$11.21
7	+34%	Purchasing Agents, Except Wholesale, Retail, and Farm Products	$31.24
8	+33%	Extraction Workers, All Other	$21.81
9	+33%	Personal Financial Advisors	$22.72
10	+31%	Home Health Aides	$9.11

Employment in 2012	HIGHEST-PAYING ▶	Median hourly earnings	Rank
145	Surgeons	$114.28	1
85	Anesthesiologists	$91.73	2
546	Physicians and Surgeons, All Other	$90.79	3
117	Internists, General	$89.55	4
70	Obstetricians and Gynecologists	$88.13	5
46	Psychiatrists	$82.89	6
88	Pediatricians, General	$77.63	7
219	Dentists, General	$70.84	8
238	Family and General Practitioners	$60.23	9
181	Architectural and Engineering Managers	$55.20	10

Source: EMSI Complete Employment - 2012.4. Note: Figures exclude occupations with fewer than 25 jobs in the region in 2012.

The fastest-growing jobs shown in Figure 38 looked at detailed occupations projected to experience employment gains from new sources. Figure 39 shows occupations estimated to have the highest total demand—a combination of projected new jobs and those openings created by workers exiting the occupation. This view provides a different picture of employers' near-term needs.

For example, while food service workers remain at the top of the list, when replacement needs are accounted for, the projected demand of roughly 225 per year shown in Figure 38 nearly doubles. The top three high-demand occupations are rounded out by two additional service-sector jobs which were not in the top ten in the prior figure – cashiers and retail salespersons – reflecting the high turnover experienced in these occupations. The effect of an aging population is apparent in occupations such as agricultural workers in which demand is exclusively driven by replacement needs. The majority of occupations shown below typically require little or no preparation and have hourly earnings well below the regional median.

Figure 39. Top 25 detailed occupations projected to have the largest number of annual openings, 2012 to 2017

With median hourly earnings and typical entry-level requirements for educational attainment

EDUCATIONAL ATTAINMENT LEGEND:

■□□□□ High school or less ■■□□□ Some college, but no degree (includes certificate-level) ■■■□□ Associate's degree ■■■■□ Bachelor's degree ■■■■■ Advanced degree

	SOC CODE	DESCRIPTION	EST. ANNUAL OPENINGS	EST. ANNUAL OPENINGS DUE (NET CHANGE / REPLACEMENT; -100 0 100 200 300 400 500)	MEDIAN HOURLY EARNINGS*	RELATIVE HOURLY EARNINGS* (US = 1.00)	TYPICAL ENTRY-LEVEL EDUCATION
1	35-3021	Combined Food Preparation and Servers, Incl. Fast Food	442		$8.48	0.97	■□□□□
2	41-2011	Cashiers	408		$8.78	0.97	■□□□□
3	41-2031	Retail Salespersons	361		$9.62	0.93	■□□□□
4	29-1111	Registered Nurses	337		**$27.52**	0.87	■■■□□
5	47-1011	First-Line Supervisors of Construction and Extraction Workers	323		$20.62	0.90	■□□□□
6	35-3031	Waiters and Waitresses	315		$8.58	0.96	■□□□□
7	41-9022	Real Estate Sales Agents	286		$11.63	0.82	■□□□□
8	37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners	273		$10.61	0.97	■□□□□
9	13-2052	Personal Financial Advisors	259		$22.72	0.75	■■■■□
10	43-9061	Office Clerks, General	248		$11.67	0.89	■□□□□
11	11-9013	Farmers, Ranchers, and Other Agricultural Managers	245		$9.24	0.87	■□□□□
12	39-9021	Personal Care Aides	243		$8.73	0.92	■□□□□
13	11-9141	Property, Real Estate, and Community Association Managers	238		$21.79	**1.22**	■□□□□
14	53-3032	Heavy and Tractor-Trailer Truck Drivers	226		$16.26	0.93	■□□□□
15	31-1011	Home Health Aides	221		$9.11	0.91	■□□□□
16	53-7062	Laborers and Freight, Stock, and Material Movers, Hand	209		$12.10	**1.04**	■□□□□
17	11-9199	Managers, All Other	207		$22.18	0.93	■□□□□
18	41-3031	Securities, Commodities, and Financial Services Sales Agents	199		$20.18	0.76	■■■■□
19	47-5081	Helpers-Extraction Workers	197		$21.45	**1.05**	■□□□□
20	49-3042	Mobile Heavy Equipment Mechanics, Except Engines	197		$15.97	0.81	■□□□□
21	25-2021	Elementary School Teachers, Except Special Education	196		$21.38	0.84	■■■■□
22	39-9011	Childcare Workers	181		$7.25	0.95	■□□□□
23	43-6014	Secretaries and Admin. Assistants, Except Legal, Medical, & Exec.	176		$13.14	0.86	■□□□□
24	37-2012	Maids and Housekeeping Cleaners	167		$8.46	0.94	■□□□□
25	41-4012	Sales Reps., Wholesale and Mfg. Except Tech. & Scientific Products	165		$21.95	0.88	■□□□□

Source: EMSI Complete Employment - 2012.4. *Lightly shaded occupations have median hourly earnings that are 1) below the regional median of $16.63 or 2) are less than three-quarters (.75) of national earnings for the occupation. Bolded and highlighted occupations have earnings that are 1) 1.5 times the regional median or 2) above the national level (1.00) for the occupation. Note: Replacement needs are estimated by the US Bureau of Labor Statistics using historical data on net change in occupational employment for 13 different age cohorts over a five-year period from the Current Population Survey. In most occupations, net separations occur mainly in cohorts above age 40. However, large numbers of net separations of young workers may occur in occupations that have relatively low entrance requirements and pay relatively low wages (e.g., waiters and waitresses). Young workers may take jobs in such occupations while obtaining additional education or training and then leave when they qualify for higher paying occupations.

Critical occupations

In this section, we use national industry staffing patterns and findings from a survey of Gregg County employers to identify occupations that are critical to key industries in the region.

STAFFING PATTERNS. Industry staffing patterns were used to understand the occupational needs of the county's major industries. The following sectors were chosen for analysis based on 1) growth patterns revealed in the analyses presented previously in this report, 2) target industries identified by Gregg County economic development organizations, and 3) a recent study, *Gregg County Value Proposition – Kilgore and Longview,* prepared by Texas A&M University's Global Supply Chain Laboratory:

- Manufacturing (specifically metal products, chemicals, plastics, and food and beverages)
- Distribution and wholesaling
- Construction
- Mining (which includes oil and gas)
- Aviation-related companies

The top 25 occupations for these industry clusters (based on the occupation's average share of total employment across all industries) are presented in Figure 40. Additional details regarding this analysis are provided in Appendix B.

Figure 40: Leading occupations for key Gregg County industries

Occupation's share of total employment in selected industry: Less than 2.0% | 2.0% to 2.9% | 3.0% to 4.9% | 5.0% or greater

	SOC Code	Occupation	OCCUPATION'S SHARE OF TOTAL EMPLOYMENT BY INDUSTRY SECTOR: Ag & food processing	Aviation-related	Chemicals & plastics	Construction	Distribution	Fabricated metals	Mining (ind. O&G)	Primary metals	Average share of employment among these sectors
1	53-3032	Heavy and Tractor-Trailer Truck Drivers									7.48%
2	53-7062	Laborers and Freight, Stock, and Material Movers, Hand									3.30%
3	11-1021	General and Operations Managers									2.35%
4	47-2061	Construction Laborers									2.09%
5	51-1011	First-Line Supvs. of Production and Operating Workers									1.98%
6	11-9199	Managers, All Other									1.98%
7	51-4121	Welders, Cutters, Solderers, and Brazers									1.95%
8	47-1011	First-Line Supvs. of Construction Trades and Extraction Workers									1.88%
9	49-9071	Maintenance and Repair Workers, General									1.85%
10	41-4012	Sales Reps., Wholesale & Mfg., Except Tech. & Scientific Products									1.75%
11	43-9061	Office Clerks, General									1.58%
12	51-4041	Machinists									1.48%
13	49-9041	Industrial Machinery Mechanics									1.48%
14	51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers									1.35%
15	51-9198	Helpers-Production Workers									1.33%
16	45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse									1.31%
17	43-6014	Secretaries & Admin. Assistants, Except Legal, Medical, & Exec.									1.20%
18	47-2031	Carpenters									1.16%
19	53-3033	Light Truck or Delivery Services Drivers									1.04%
20	43-3031	Bookkeeping, Accounting, and Auditing Clerks									1.00%
21	53-7051	Industrial Truck and Tractor Operators									0.99%
22	51-9111	Packaging and Filling Machine Operators and Tenders									0.94%
23	51-4023	Rolling Machine Workers, Metal and Plastic									0.88%
24	51-4072	Molding, Coremaking, & Casting Machine Workers, Metal & Plastic									0.81%
25	11-9141	Property, Real Estate, and Community Association Managers									0.76%

Sources: US Bureau of Labor Statistics; EMSI Complete Employment - 2012.4; TIP Strategies

EMPLOYER SURVEY. To identify specific issues with regard to hiring, TIP facilitated a web-based survey of Gregg County employers. A link to the survey was emailed in January 2013 to employers identified by the Longview and Kilgore Economic Development Corporations. A total of 225 unique employers were identified; 53 completed the survey for a response rate of 24 percent. Additional details are provided in Appendix C.

At the time of the survey, responding firms had nearly 420 unfilled positions. Of these, nearly one-half (44 percent) were for skilled production workers. Professional and technical positions accounted for an additional one-fifth (21 percent) of current openings. When asked which skills or occupations they found "persistently" difficult to recruit, many of the occupations or skills aligned with national shortages, including machinists, engineers, and industrial maintenance mechanics. Others were particular to a given industry (for example, industrial coating and painting workers). In addition to current shortages, respondents were asked to identify the skills they anticipated needing in the future Figure 41 summarizes current occupational challenges and future skills reported by respondents.

Coupled with findings from the staffing patterns analysis, the following critical occupations emerge:

- Machinist/machine operator
- Industrial mechanic/maintenance
- Engineers
- Truck drivers, CDL
- Quality control & inspection
- Welder/brazer

These occupations 1) are an integral component of the region's industry sectors, 2) have wage rates above the median hourly wage rate, and 3) are highly sought by employers and are anticipated to remain in demand in the coming years. The results of these analyses, along with findings from the postsecondary education analysis and transferrable skills analysis, can be used to help guide regional training offerings and talent recruitment efforts in support of these occupations.

Figure 41: Hard-to-fill occupations and future skills needs, based on survey of Gregg County employers

Q. 18 Which occupations are persistently difficult to recruit in your industry?	Q. 19 What types of skills do you anticipate needing in the future?
Machinist/machine operator	Industrial mechanic/maintenance
Industrial mechanic/maintenance	Machinist/machine operator
Engineers	Welder/brazer
Drivers (truck drivers, CDL)	Engineers
Quality control & inspection	Soft skills/work ethic
Welder/brazer	STEM/analytical/technology skills
Soft skills/work ethic	Quality control, safety, & inspection
Sales & marketing	Drivers (truck drivers, CDL)
Public safety (law enforcement, firefighter)	Unskilled
Other (blueprint reading, GIS, customer service, estimator, production workers)	Other (includes various production workers, customer service, estimators)

Sources: Survey of Gregg County employers overseen by TIP Strategies in January-March 2013. Additional survey results are provided in the appendices.

TRANSFERRABLE SKILLS. Using findings from the staffing patterns analysis and the employer survey, we selected several of the region's critical occupations to conduct an analysis of transferrable skills. This approach is used to suggest possible pools of workers with compatible skills that could be transitioned from their current occupation (the "source" occupation) into one of the high-demand or critical occupations outlined above (the "target" occupation). The goal of this type of analysis is to identify compatible occupations whose workers would likely find better earnings and employability by transitioning into the target occupation.

In an ideal worker transition scenario, the target occupation will have good earnings and strong job growth, while proposed source occupations should have a sufficiently large pool of workers to draw from and should be projected to grow more slowly and have lower earnings than the target. Conversely, occupations with stronger growth and earnings than the target occupation are probably not good source occupations because workers in those occupations would sacrifice earnings and employability to move into the target occupation. Furthermore, transitioning workers from occupations that are in high-demand would not be practical.

Compatible occupations were identified based on shared skills, knowledge, and abilities using EMSI's Analyst tool. Figure 42 provides an example of this analysis for **truck drivers**, an occupation that a) is one of the largest in the region (see Figure 38, page 26), b) is a significant occupation in several of the region's key industry sectors, and c) was identified by Gregg County employers as a hard-to-fill position. From the range of compatible occupations, we selected those which had lower median wages than truck drivers and were projected to grow relatively slowly. Only occupations that had at least 50 jobs in Gregg County were considered. Tables for the remaining critical occupations are presented in Appendix D. A matrix of common "source" occupations is provided in Figure 43, next page.

Figure 42: Top compatible occupations for heavy and tractor trailer truck drivers

	O-NET Code	Occupation	2012 Median Hourly Earnings *(Must be less than or equal to target)*	2012 Jobs *(Must have at least 50 jobs in Gregg County)*	Est. Annual Openings, 2012-2017 *(25 or fewer openings projected per year)*
—	**53-3032**	**Heavy and Tractor-Trailer Truck Drivers**	**$16.90**	**2,102**	**72**
1	51-9023.00	Mixing and Blending Machine Setters, Operators, and Tenders	$16.70	120	3
2	49-3021.00	Automotive Body and Related Repairers	$16.64	114	2
3	51-4033.00	Grinding, Lapping, & Polishing Machine Tool Workers, Metal & Plastic	$15.57	130	2
4	51-9121.00	Coating, Painting, and Spraying Machine Workers	$15.39	87	2
5	51-4031.00	Cutting, Punching, and Press Machine Workers, Metal & Plastic	$15.33	247	3
6	47-2151.00	Pipelayers	$14.41	62	3
7	53-7051.00	Industrial Truck and Tractor Operators	$14.23	332	11
8	51-9111.00	Packaging and Filling Machine Operators and Tenders	$14.22	241	6
9	37-3013.00	Tree Trimmers and Pruners	$14.08	60	1
10	47-2131.00	Insulation Workers, Floor, Ceiling, and Wall	$13.86	115	4
11	51-9199.01	Recycling and Reclamation Workers	$13.34	65	3
12	51-4021.00	Extruding and Drawing Machine Workers, Metal and Plastic	$12.85	113	3
13	49-9098.00	Helpers--Installation, Maintenance, and Repair Workers	$12.69	154	8
14	53-3033.00	Light Truck or Delivery Services Drivers	$12.04	574	10
15	51-7011.00	Cabinetmakers and Bench Carpenters	$11.33	88	5
16	47-4031.00	Fence Erectors	$11.19	92	6
17	47-2071.00	Paving, Surfacing, and Tamping Equipment Operators	$10.84	94	6
18	37-3011.00	Landscaping and Groundskeeping Workers	$9.50	595	17
19	53-6031.00	Automotive and Watercraft Service Attendants	$9.07	115	4
20	53-3041.00	Taxi Drivers and Chauffeurs	$9.00	64	1

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET to SOC codes can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

Figure 43: Top compatible occupations matrix

Source occupations that are compatible with three or more target occupations

O-NET Code	Occupation	Industrial Production Managers (11-3051)	Chemical Engineers (17-2041)	Industrial Engineers (17-2112)	Industrial Machinery Mechanics (49-9041)	Maintenance Workers, Machinery (49-9043)	Machinists (51-4041)	Multiple Machine Tool Workers, Metal &Plastic (51-4081)	Welders, Cutters, Solderers, and Brazers (51-4121)	Inspectors, Testers, Sorters, Samplers, and Weighers (51-9061)	Heavy and Tractor-Trailer Truck Drivers (53-3052)
49-9098.00	Helpers--Installation, Maintenance, and Repair Workers					■	■	■	■		■
51-4031.00	Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic					■	■		■	■	■
51-7011.00	Cabinetmakers and Bench Carpenters				■		■	■	■		■
51-9111.00	Packaging and Filling Machine Operators and Tenders					■	■	■	■		■
47-2071.00	Paving, Surfacing, and Tamping Equipment Operators					■		■	■		■
47-2151.00	Pipelayers					■		■	■		■
49-3051.00	Motorboat Mechanics and Service Technicians				■	■	■	■			
51-4034.00	Lathe and Turning Machine Tool Setters, Operators, and Tenders, Metal and Plastic					■	■		■	■	
51-4081.00	Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic				■	■	■		■		
17-3029.05	Industrial Engineering Technologists	■	■	■							
37-3011.00	Landscaping and Groundskeeping Workers							■	■		■
47-2231.00	Solar Photovoltaic Installers				■	■	■				
47-4031.00	Fence Erectors							■	■		■
49-3021.00	Automotive Body and Related Repairers					■	■				■
49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists				■	■	■				
49-3043.00	Rail Car Repairers				■	■	■				
49-9099.01	Geothermal Technicians				■	■	■				
51-2022.00	Electrical and Electronic Equipment Assemblers							■	■	■	
51-2092.00	Team Assemblers							■	■	■	
51-4033.00	Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic					■	■				■
51-5112.00	Printing Press Operators					■	■			■	
51-6031.00	Sewing Machine Operators							■	■	■	
51-9023.00	Mixing and Blending Machine Setters, Operators, and Tenders					■	■				■
51-9121.00	Coating, Painting, and Spraying Machine Setters, Operators, and Tenders					■	■				■
51-9198.00	Helpers--Production Workers							■	■	■	

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET codes to the SOC system can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

Postsecondary education

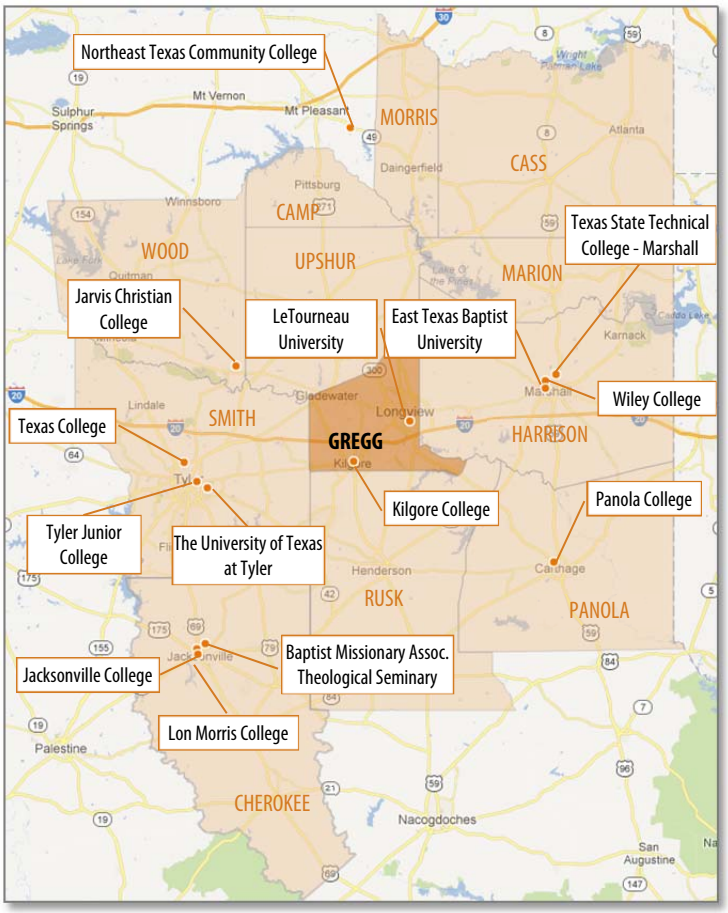
Under the Higher Education Act of 1965, every college, university, and vocational or technical institution that participates in federal financial student aid programs (such as Pell grants or federally backed student loans) is required to report annually to the US Department of Education on a range of indicators. Data are collected through a system of interrelated surveys and are made available through the Integrated Postsecondary Education Data System (IPEDS).

Each fall, institutions report on the number of awards conferred for credit by program (as defined by Classification of Instructional Programs or CIP code), by level (associate's, bachelor's, master's, doctor's, and postsecondary certificates), and by the race or ethnicity and gender of the recipient. These data are referred to as "completions."

Data on completions for the three most recent academic years available (2008-2009, 2009-2010, and 2010-2011) were downloaded from the IPEDS Data Center for all schools in the 12-county region that participate in IPEDS surveys. The analysis presented in this section includes data for the 14 schools shown in Figure 44. Northeast Texas Community College was included in the analysis since it serves portions of the labor-shed, including Camp and Morris Counties.

Figure 44. Higher education institutions

Schools located within 50-mile radius of 75606 ZIP Code



IPEDS ID	Institution *(ranked by size of student population)*	City	Type	Students	% Undergraduate
229355	Tyler Junior College	Tyler	2-year, Public	11,540	100.0%
228802	The University of Texas at Tyler	Tyler	4-year, Public	6,696	76.4%
226019	Kilgore College	Kilgore	2-year, Public	6,391	100.0%
227225	Northeast Texas Community College	Mt. Pleasant	2-year, Public	3,311	100.0%
226231	LeTourneau University	Longview	4-year, Private not-for-profit	2,950	87.8%
227386	Panola College	Carthage	2-year, Public	2,562	100.0%
229887	Wiley College	Marshall	4-year, Private not-for-profit	1,356	98.5%
224527	East Texas Baptist University	Marshall	4-year, Private not-for-profit	1,214	97.9%
228884	Texas College	Tyler	4-year, Private not-for-profit	878	97.4%
408394	Texas State Technical College-Marshall	Marshall	2-year, Public	831	100.0%
226329	Lon Morris College	Jacksonville	2-year, Private not-for-profit	609	100.0%
225885	Jarvis Christian College	Hawkins	4-year, Private not-for-profit	511	100.0%
225876	Jacksonville College-Main Campus	Jacksonville	2-year, Private not-for-profit	457	100.0%
223117	Baptist Missionary Assoc. Theological Seminary	Jacksonville	4-year, Private not-for-profit	125	55.2%

Source: National Center for Education Statistics. Notes: Student population figures as of Fall 2011. Analysis excludes cosmetology schools. Additional details on the CIP system are provided in Appendix F.

Over the past three academic years, the regional institutions shown in Figure 44 conferred an average of slightly more than 7,100 degrees/awards at all levels. Figure 46 shows the 25 largest CIP codes, as measured by the average annual number of completions. Courses related to business (CIP 52) and healthcare (CIP 51) each account for roughly 1,000 of the degrees/awards conferred each year on average. The number of liberal arts/general studies (CIP 24) completions is similar, averaging roughly 900 degrees/awards annually. With the exception of general business (CIP 52.0101), most awards in CIP 52 are made at the bachelor's level. By contrast, the majority of healthcare-related degrees and awards conferred in the region are at the associates-level or below. Likewise, nearly 100 percent of general studies/liberal arts awards were made at the two-year level or below.

Figure 45: Completions by year and award level, 2009-2011

Share of awards/degrees conferred by regional institutions

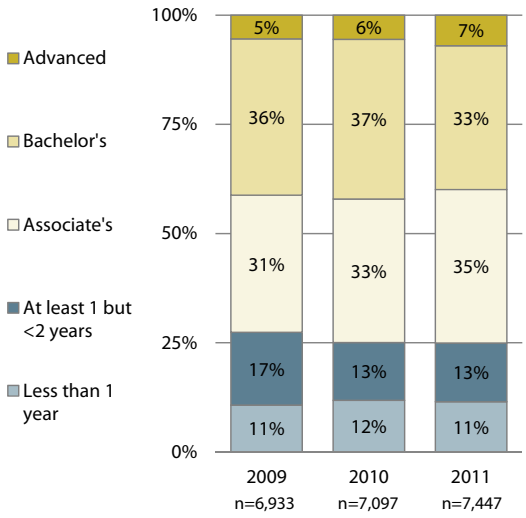


Figure 46. Top 25 courses of study (CIP codes) among regional institutions, including distribution by award level

Ranked by average number of completions (degrees/awards conferred for credit), 2009 through 2011

Award of less than 1 academic year | Award of at least 1 but < 2 academic years | Associate's degree | Bachelor's degree | Master's degree

	CIP Code	CIP Description	Average annual completions (2009-2011)	Distribution by award level (0% 50% 100%)
1	52.0201	Business Administration and Management, General	662	
2	51.3801	Registered Nursing/Registered Nurse	574	
3	24.0102	General Studies	526	
4	24.0101	Liberal Arts and Sciences/Liberal Studies	376	
5	51.3901	Licensed Practical/Vocational Nurse Training	301	
6	30.9999	Multi-/Interdisciplinary Studies, Other	250	
7	13.1202	Elementary Education and Teaching	247	
8	43.0107	Criminal Justice/Police Science	242	
9	51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	165	
10	42.0101	Psychology, General	154	
11	43.0203	Fire Science/Fire-fighting	151	
12	52.0101	Business/Commerce, General	132	
13	15.0612	Industrial Technology/Technician	100	
14	47.0201	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician	95	
15	12.0401	Cosmetology/Cosmetologist, General	82	
16	26.0101	Biology/Biological Sciences, General	78	
17	43.0104	Criminal Justice/Safety Studies	75	
18	52.0301	Accounting	72	
19	13.0401	Educational Leadership and Administration, General	72	
20	48.0508	Welding Technology/Welder	70	
21	52.1401	Marketing/Marketing Management, General	67	
22	52.0801	Finance, General	64	
23	14.1901	Mechanical Engineering	62	
24	31.0505	Kinesiology and Exercise Science	62	
25	54.0101	History, General	61	

Source (both figures): National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys. Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. Associate's-degree-level completions shown in Figure 45contain a small number of awards categorized by IPEDS as "Award of at least 2 but less than 4 academic years." Advanced-level completions represent all awards above the bachelor's-degree level.

Figure 47 and Figure 48 (next page) profile regional occupational demand for selected occupations based on the typical educational attainment required for entry-level positions. For example, Figure 47 shows occupations that typically require at least an associate's degree for entry. Occupations are ranked by the number of estimated annual openings (a figure which reflects anticipated demand from new job growth, as well as expected demand to replace workers who leave the occupation due to retirement or other reasons. Along with estimated demand for the occupation, we provide current median hourly earnings and how those earnings compare with the occupation nationally. Hourly earnings that exceed the overall median wage for the region of $16.63 by 150 percent (i.e., median hourly wages of $24.95 or above) or exceed US level (a score of 1.00 or above) are heavily shaded and bolded. Those with earnings below the regional median or indexed at less than three-quarters of national earnings (scores below 0.75) are lightly shaded and in red. Figure 48 presents the same information for occupations that typically require a minimum of a four-year degree for entry-level.

Finally, to help understand how education and training programs in the region align with the needs of local industry, we also matched completions data to relevant occupations. This analysis was accomplished using a crosswalk from the National Crosswalk Service Center that aligns occupational classifications with subject matter (indicated by Classification of Instructional Programs or CIP codes). The results for selected subject areas are provided as Appendix E.

Figure 47. Occupations in the labor shed requiring an ASSOCIATE'S degree for entry, with median hourly earnings

Top 25, ranked by estimated annual openings in the 12-county labor shed, 2012 to 2017

	SOC CODE	DESCRIPTION	EST. ANNUAL OPENINGS	EST. ANNUAL OPENINGS DUE TO: NET CHANGE / REPLACEMENT (-50, 0, 50, 100, 150, 200, 250)	MEDIAN HOURLY EARNINGS*	RELATIVE HOURLY EARNINGS* (US = 1.00)
1	29-1111	Registered Nurses	337	337	**$27.52**	0.87
2	11-1021	General and Operations Managers	103		**$35.49**	0.80
3	25-2011	Preschool Teachers, Except Special Education	34		$16.72	**1.34**
4	29-2037	Radiologic Technologists and Technicians	28		$24.45	0.91
5	29-2021	Dental Hygienists	18		**$35.53**	**1.04**
6	23-2011	Paralegals and Legal Assistants	17		$19.54	0.86
7	29-1126	Respiratory Therapists	17		$22.95	0.86
8	17-3022	Civil Engineering Technicians	11		$17.63	0.78
9	31-2021	Physical Therapist Assistants	11		**$31.63**	**1.29**
10	29-2012	Medical and Clinical Laboratory Technicians	10		$15.55	0.88
11	29-2032	Diagnostic Medical Sonographers	9		**$29.65**	0.94
12	29-2031	Cardiovascular Technologists and Technicians	9		**$25.61**	**1.03**
13	17-3023	Electrical and Electronics Engineering Technicians	8		**$26.13**	0.95
14	19-4099	Life, Physical, and Social Science Technicians, All Other	8		$19.20	0.88
15	19-4091	Environmental Science and Protection Technicians, Including Health	7		$23.20	**1.08**
16	29-2056	Veterinary Technologists and Technicians	7		$14.61	0.99
17	39-4831	Funeral Service Managers, Directors, Morticians, and Undertakers	6		$18.61	0.78
18	43-4061	Eligibility Interviewers, Government Programs	5		$17.10	0.87
19	17-3011	Architectural and Civil Drafters	5		$19.81	0.87
20	31-2011	Occupational Therapy Assistants	4		**$29.93**	**1.20**
21	19-4031	Chemical Technicians	4		**$26.57**	**1.31**
22	19-4011	Agricultural and Food Science Technicians	3		$11.58	0.72
23	17-3012	Electrical and Electronics Drafters	3		$23.29	0.89
24	29-2054	Respiratory Therapy Technicians	2		$20.71	0.93
25	17-3029	Engineering Technicians, Except Drafters, All Other	2		$23.97	0.85

Source: EMSI Complete Employment - 2012.4; US Bureau of Labor Statistics. *Lightly shaded occupations with red text have median hourly earnings that are 1) below the regional median of $16.63 or 2) are less than three-quarters (.75) of national earnings for the occupation. Bolded and highlighted occupations have earnings that are 1) 1.5 times the regional median or 2) above the national level (1.00) for the occupation.

Figure 48. Occupations in the labor shed requiring a BACHELOR'S degree for entry, with median hourly earnings

Top 50, ranked by estimated annual openings in the 12-county labor shed, 2011to 2021

	SOC CODE	DESCRIPTION	EST. ANNUAL OPENINGS	EST. ANNUAL OPENINGS DUE TO: NET CHANGE / REPLACEMENT (-50 0 50 100 150 200 250 300)	MEDIAN HOURLY EARNINGS*	RELATIVE HOURLY EARNINGS* (US = 1.00)
1	13-2052	Personal Financial Advisors	259		$22.72	0.75
2	41-3031	Securities, Commodities, and Financial Services Sales Agents	199		$20.18	0.76
3	25-2021	Elementary School Teachers, Except Special Education	196		$21.38	0.84
4	25-2031	Secondary School Teachers, Except Special and Career/Tech. Ed.	142		$22.20	0.85
5	25-2022	Middle School Teachers, Except Special and Career/Tech. Ed.	105		$21.73	0.85
6	13-2011	Accountants and Auditors	93		**$26.21**	0.90
7	25-3999	Teachers and Instructors, All Other	68		$9.98	0.70
8	11-3031	Financial Managers	59		**$33.24**	0.76
9	13-1111	Management Analysts	54		**$27.66**	0.84
10	41-4011	Sales Reps., Wholesale and Mfg., Technical/Scientific Products	47		**$33.39**	0.95
11	13-2099	Financial Specialists, All Other	45		$22.10	0.87
12	11-2022	Sales Managers	43		**$34.16**	0.79
13	11-2021	Marketing Managers	39		**$37.96**	0.80
14	13-2051	Financial Analysts	33		$23.26	0.72
15	13-1161	Market Research Analysts and Marketing Specialists	31		**$25.32**	0.89
16	11-9111	Medical and Health Services Managers	31		**$34.24**	0.85
17	39-9032	Recreation Workers	26		$9.87	0.90
18	11-1011	Chief Executives	25		**$38.03**	0.67
19	13-1078	Human Resources, Training, & Labor Relations Specialists, All Other	25		$21.57	0.81
20	25-2041	Special Ed. Teachers, Preschool, Kindergarten, and Elementary	24		$22.11	0.86
21	21-2011	Clergy	23		$19.53	0.92
22	25-2012	Kindergarten Teachers, Except Special Education	23		$20.93	0.88
23	15-1121	Computer Systems Analysts	22		**$29.02**	0.80
24	15-1142	Network and Computer Systems Administrators	22		**$25.12**	0.74
25	27-3091	Interpreters and Translators	21		$20.11	**1.01**
26	27-1024	Graphic Designers	20		$16.98	0.87
27	21-1021	Child, Family, and School Social Workers	20		$17.08	0.87
28	27-3043	Writers and Authors	20		$15.79	0.90
29	19-2042	Geoscientists, Except Hydrologists and Geographers	20		**$50.93**	**1.20**
30	13-1051	Cost Estimators	19		$23.65	0.86
31	27-3031	Public Relations Specialists	18		$23.51	0.92
32	13-1151	Training and Development Specialists	18		$20.37	0.76
33	17-2051	Civil Engineers	18		**$36.03**	1.00
34	13-1121	Meeting, Convention, and Event Planners	16		$21.28	0.88
35	13-1041	Compliance Officers	13		$21.97	0.75
36	21-2021	Directors, Religious Activities and Education	13		$16.15	0.92
37	15-1179	Info. Security Analysts, Web Developers, and Computer Networking	13		$23.95	0.74
38	17-2141	Mechanical Engineers	12		**$35.84**	0.94
39	25-2054	Special Education Teachers, Secondary School	12		$22.91	0.85
40	15-1131	Computer Programmers	11		**$27.30**	0.83
41	17-1022	Surveyors	11		$20.73	0.78
42	25-2032	Career/Technical Education Teachers, Secondary School	11		$24.14	0.92
43	25-2053	Special Education Teachers, Middle School	10		$22.73	0.86
44	29-9011	Occupational Health and Safety Specialists	10		**$29.13**	0.92
45	27-2041	Music Directors and Composers	10		$21.17	**1.11**
46	15-1132	Software Developers, Applications	10		**$36.47**	0.87
47	15-1133	Software Developers, Systems Software	10		**$41.87**	0.92
48	11-3051	Industrial Production Managers	9		**$42.56**	**1.02**
49	11-9151	Social and Community Service Managers	9		$23.87	0.87
50	29-1031	Dietitians and Nutritionists	9		**$26.95**	0.97

Source: EMSI Complete Employment - 2012.4; US Bureau of Labor Statistics. *Lightly shaded occupations with red text have median hourly earnings that are 1) below the regional median of $16.63 or 2) are less than three-quarters (.75) of national earnings for the occupation. Bolded and highlighted occupations have earnings that are 1) 1.5 times the regional median or 2) above the national level (1.00) for the occupation.

IV. Appendices

A. Major employers

Figure 49: Major employers in Gregg County

Company Name	Category	Employment
Good Shepherd Medical Center	Medical Services	2,423
Trinity Rail, LLC	Railway Cars	1,741
Eastman Chemical	Chemicals	1,516
Longview Independent School District	Public Education (K-12)	1,226
Wal-Mart	Retail	1,209
Joy Global	Heavy Equipment	1,048
City of Longview	Government	828
Longview Regional Medical Center	Medical Services	817
Diagnostic Clinic of Longview	Medical Services	715
Halliburton Services	Oilfield Services	705
Pine Tree Independent School District	Public Education (K-12)	676
Gregg Industrial Insulators	Special Trade Contractor	600
Kilgore Independent School District	Public Education (K-12)	600
Gregg County	Local Government	550
General Dynamics SATCOM Technologies	Satellite & Communications Equipment	550
Crosby Group/Lebus Manufacturing Co.	Forged Load Binders	417
LeTourneau University	Higher Education	407
AAON Coil Products, Inc.	Heat Transfer Coils	350
Neiman Marcus National Service Center	Distribution	325
Kilgore College	Higher Education	320
Stemco, LLC	Truck Equipment	300
Region VII Education Service Center	Public Education (Regional Service Provider)	290
Capacity of Texas	Machinery Manufacturing	260
Martin Midstream Partners, LP	Mkt. & Transporting of Petroleum/Chemicals Corporate Headquarters	241
Flextronics	Telecommunication Equipment	229
Southwest Steel Casting Company	Steel Castings	229
Closure Systems International, Inc., (member of Reynolds Packaging Group)	Plastic Closures	227
Cudd Pressure Control	Oilfield Services	225
Convergys	Telecommunications	220
Sysco Distribution of East Texas	Distribution	218
Exterran	Compression Services	197
Orgill, Inc.	Warehouse Distribution	185
Caterpillar	Mining Equipment	184
Genpak, LLC	Plastics & Rubber Products Mfg.	180
Holt CAT	Heavy Equipment	180
Pak-Sher Company	Plastic Bags	160
City of Kilgore	Local Government	160
BJ Services	Oilfield Services	155
Norris Cylinder	Manufacturing	152
Yamaha/Skeeter Products, Inc.	Recreational	151
Triumph Group, Inc.	Machined Aircraft Parts, Misc. Trans. Equip.	117
Weatherford International	Oil & Gas Services	112
Baker Petrolite	Specialty Polymers	105
Allied Waste Services	Solid Waste Management	92
Permian Tank	Steel & fiberglass oil storage tanks, gunbarrels, heater treaters, separator	85
Frank's Casing Crew & Rental Tools, Inc.	Oilfield Services	83
Surface Equipment Corporation	Design and Fabrication of Pressure Vessels	70
Ana-Lab Corp.	Analytical Services	68
Progressive Waste Solutions	District Headquarters, Waste Collection, Transportation and Disposal	63

Source: Kilgore EDC and Longview EDC websites

B. Staffing patterns analysis details

APPROACH. Industry staffing patterns were used to understand the occupational needs of the county's major industries. These data are created by EMSI from the Bureau of Labor Statistic's National Employment Matrix. The matrix is prepared by the BLS every other year as part of its ongoing Employment Projections program. The most recent matrix shows US employment levels for 2010 and projected employment for 2020 for approximately 300 detailed industries and 750 occupations. Users can conduct analyses by occupation (i.e., identify all industries in which plumbers are employed) or by industry (i.e., identify the detailed occupations employed in the construction industry).

The following sectors were chosen for analysis based on 1) growth patterns revealed in the analyses presented previously in this report, 2) target industries identified by Gregg County economic development organizations, and 3) a recent study, *Gregg County Value Proposition – Kilgore and Longview,* prepared by Texas A&M University's Global Supply Chain Laboratory:

- Manufacturing (specifically metal products, chemicals, plastics, and food and beverages)
- Distribution and wholesaling
- Construction
- Mining (which includes oil and gas)
- Aviation-related companies

Major sectors were defined using the appropriate 2-digit NAICS category: construction (NAICS 23), mining (NAICS 21), and transportation and warehousing (NAICS 48-49). The remaining industries were defined using custom industry clusters in order to account for relationships among individual industries (for example, between agriculture and food processing).

ADDITIONAL DETAILS. For each of the identified industries, we selected all occupations that comprised at least 1 percent of total employment in the industry based on national patterns. These 110 occupations were then crosstabbed by industry and sorted based on their average share of employment across industries. For each occupation, we identified typical entry-level education and experience requirements, as well as any additional on-the-job training typically required to gain competency in the occupation, using data produced by the US Bureau of Labor Statistics (BLS). The resulting matrix is presented in Figure 50.

The matrix can be used to identify occupations that are common to multiple sectors, as well as to see which occupations are critical in terms of the average share of employment they comprise of a particular industry. For example, truck drivers (SOC Code 53-3032) comprise a measurable share of employment in six of the eight industry sectors, ranging from a relatively low share of employment in food processing and agriculture (representing less than 2 percent of total employment) to a much higher presence in aviation-related manufacturing, chemicals & plastics, and distribution (representing 5 percent or more of total employment for each these three industries). On average, truck drivers represent nearly 8 percent of total employment, though this figure is skewed by the fact that they comprise a major share of the workforce within the transportation and warehousing (distribution) sector.

The addition of information about education and training requirements can help identify critical occupations that may require a training response. According to BLS education & training categories, the vast majority of occupations that staff the eight industries require only a high school diploma or GED for entry, along with some level of experience and/or on-the-job training. Management positions are an exception, with several requiring some form of postsecondary education. For example, entry-level jobs for general and operations managers (SOC Code 11-1021) typically require an Associate's degree, along with between one and five years of experience. Other examples include production supervisors (SOC 51-1011), construction managers (11-9021) and industrial production managers (11-3051), each of which requires education beyond high school, combined with some level of experience. Ensuring that regional offerings align with these education requirements could benefit local employers.

Figure 50: Staffing patterns detail for key Gregg County industries *(based on average share of employment across identified industries)*

LEGEND:

Occupation's share of total employment in selected industry: Less than 2.0% | 2.0% to 2.9% | 3.0% to 4.9% | 5.0% or greater

Educational attainment levels typically needed for entry-level:

■□□□□ High school or less ■■□□□ Some college, but no degree *(includes certificate-level)* ■■■□□ Associate's ■■■■□ Bachelor's ■■■■■ Advanced degree

	SOC Code	Occupation	Ag & food processing	Aviation-related	Chemicals & plastics	Construction	Distribution	Fabricated metals	Mining (ind. O&G)	Primary metals	Average share of employment among these sectors	Typical entry-level requirements: Education	Typical entry-level requirements: Experience	Additional on-the-job (OTJ) training required to attain competency
			OCCUPATION'S SHARE OF TOTAL EMPLOYMENT BY INDUSTRY SECTOR:									EDUCATION & TRAINING		
1	53-3032	Heavy and Tractor-Trailer Truck Drivers	●	●	●	●	●		●		7.48%	■□□□□	1 -5 years	Short-term OTJ
2	53-7062	Laborers and Freight, Stock, and Material Movers, Hand	●	●	●		●	●		●	3.30%	■□□□□	None	Short-term OTJ
3	11-1021	General and Operations Managers	●	●	●	●	●	●	●	●	2.35%	■■■□□	1 -5 years	None
4	47-2061	Construction Laborers				●					2.09%	■□□□□	None	Short-term OTJ
5	51-1011	First-Line Supvs. of Production and Operating Workers	●		●			●		●	1.98%	■■□□□	1 -5 years	None
6	11-9199	Managers, All Other	●	●		●	●	●	●		1.98%	■□□□□	1 -5 years	None
7	51-4121	Welders, Cutters, Solderers, and Brazers				●		●		●	1.95%	■□□□□	< 1 year	Moderate OTJ
8	47-1011	First-Line Supvs. of Construction Trades and Extraction Workers				●			●		1.88%	■□□□□	> 5 years	None
9	49-9071	Maintenance and Repair Workers, General	●	●	●			●		●	1.85%	■□□□□	None	Moderate OTJ
10	41-4012	Sales Reps., Wholesale & Mfg., Except Tech. & Scientific Products	●	●	●			●	●		1.75%	■□□□□	None	Moderate OTJ
11	43-9061	Office Clerks, General	●	●	●	●	●	●			1.58%	■□□□□	None	Short-term OTJ
12	51-4041	Machinists						●		●	1.48%	■□□□□	None	Long-term OTJ
13	49-9041	Industrial Machinery Mechanics	●		●			●	●	●	1.48%	■□□□□	None	Long-term OTJ
14	51-9061	Inspectors, Testers, Sorters, Samplers, and Weighers	●		●			●	●	●	1.35%	■□□□□	None	Moderate OTJ
15	51-9198	Helpers-Production Workers	●		●			●		●	1.33%	■□□□□	None	Short-term OTJ
16	45-2092	Farmworkers and Laborers, Crop, Nursery, and Greenhouse	●								1.31%	■□□□□	None	Short-term OTJ
17	43-6014	Secretaries & Admin. Assistants, Except Legal, Medical, & Exec.		●	●	●		●	●		1.20%	■□□□□	None	Short-term OTJ
18	47-2031	Carpenters				●					1.16%	■□□□□	None	Apprenticeship
19	53-3033	Light Truck or Delivery Services Drivers		●	●		●				1.04%	■□□□□	None	Short-term OTJ
20	43-3031	Bookkeeping, Accounting, and Auditing Clerks		●	●	●		●	●		1.00%	■□□□□	None	Moderate OTJ
21	53-7051	Industrial Truck and Tractor Operators	●		●		●	●		●	0.99%	■□□□□	< 1 year	Short-term OTJ
22	51-9111	Packaging and Filling Machine Operators and Tenders	●		●						0.94%	■□□□□	None	Moderate OTJ
23	51-4023	Rolling Machine Workers, Metal and Plastic								●	0.88%	■□□□□	None	Moderate OTJ
24	51-4072	Molding, Coremaking, & Casting Machine Workers, Metal & Plastic			●					●	0.81%	■□□□□	None	Moderate OTJ
25	11-9141	Property, Real Estate, and Community Association Managers							●		0.76%	■□□□□	1 -5 years	None
26	47-5013	Service Unit Operators, Oil, Gas, and Mining							●		0.75%	■□□□□	None	Moderate OTJ
27	53-7064	Packers and Packagers, Hand	●		●		●				0.74%	■□□□□	None	Short-term OTJ
28	53-7073	Wellhead Pumpers							●		0.71%	■□□□□	< 1 year	Moderate OTJ
29	47-5071	Roustabouts, Oil and Gas							●		0.66%	■□□□□	None	Moderate OTJ
30	51-3023	Slaughterers and Meat Packers	●								0.65%	■□□□□	None	Moderate OTJ
31	51-3022	Meat, Poultry, and Fish Cutters and Trimmers	●								0.64%	■□□□□	None	Short-term OTJ
32	47-2111	Electricians				●				●	0.63%	■□□□□	None	Apprenticeship
33	51-4031	Cutting, Punching, and Press Machine Workers, Metal and Plastic						●		●	0.63%	■□□□□	None	Moderate OTJ
34	51-4011	Computer-Controlled Machine Tool Operators, Metal and Plastic						●		●	0.61%	■□□□□	None	Moderate OTJ
35	43-5071	Shipping, Receiving, and Traffic Clerks			●		●	●		●	0.61%	■□□□□	None	Short-term OTJ
36	47-5081	Helpers-Extraction Workers							●		0.60%	■□□□□	None	Short-term OTJ
37	51-4033	Grinding and Polishing Machine Tool Workers, Metal & Plastic						●		●	0.58%	■□□□□	None	Moderate OTJ
38	47-2141	Painters, Construction and Maintenance				●					0.56%	■□□□□	None	Moderate OTJ
39	51-2092	Team Assemblers			●			●			0.56%	■□□□□	None	Moderate OTJ
40	11-9021	Construction Managers				●					0.54%	■■■□□	> 5 years	None

Continued, next page

CONT.: Figure 50: Leading occupations typically employed by key Gregg County industries *(based on share of employment across identified industries)*

LEGEND:

Occupation's share of total employment in selected industry: Less than 2.0% | 2.0% to 2.9% | 3.0% to 4.9% | 5.0% or greater

Educational attainment levels typically needed for entry-level:

■□□□□ High school or less ■■□□□ Some college, but no degree *(includes certificate-level)* ■■■□□ Associate's ■■■■□ Bachelor's ■■■■■ Advanced degree

	SOC Code	Occupation	OCCUPATION'S SHARE OF TOTAL EMPLOYMENT BY INDUSTRY SECTOR: Ag & food processing	Aviation-related	Chemicals & plastics	Construction	Distribution	Fabricated metals	Mining (ind. O&G)	Primary metals	Average share of employment among these sectors	EDUCATION & TRAINING: Typical entry-level requirements: Education	Experience	Additional on-the-job (OTJ) training required to attain competency
41	47-2073	Operating Engineers and Other Construction Equipment Operators				●					0.54%	■□□□□	None	Moderate OTJ
42	51-4071	Foundry Mold and Coremakers								●	0.53%	■□□□□	None	Moderate OTJ
43	53-7063	Machine Feeders and Offbearers	○		○					○	0.49%	■□□□□	None	Short-term OTJ
44	49-3042	Mobile Heavy Equipment Mechanics, Except Engines							●		0.46%	■□□□□	None	Long-term OTJ
45	41-1011	First-Line Supvs. of Retail Sales Workers		●							0.46%	■□□□□	1 -5 years	None
46	11-3051	Industrial Production Managers			○			○		○	0.45%	■■■■□	1 -5 years	None
47	51-2041	Structural Metal Fabricators and Fitters						●			0.44%	■□□□□	None	Moderate OTJ
48	51-4191	Heat Treating Equipment Workers, Metal and Plastic						○		●	0.44%	■□□□□	None	Moderate OTJ
49	49-3011	Aircraft Mechanics and Service Technicians		●							0.44%	■■□□□	None	None
50	49-1011	First-Line Supervisors of Mechanics, Installers, and Repairers		○	○					○	0.44%	■□□□□	1 -5 years	None
51	51-4021	Extruding and Drawing Machine Workers, Metal and Plastic			●					○	0.41%	■□□□□	None	Moderate OTJ
52	51-9023	Mixing and Blending Machine Workers			●						0.41%	■□□□□	None	Moderate OTJ
53	53-7072	Pump Operators, Except Wellhead Pumpers		○					●		0.41%	■□□□□	None	Moderate OTJ
54	51-9011	Chemical Equipment Operators and Tenders			●						0.41%	■□□□□	None	Moderate OTJ
55	51-3092	Food Batchmakers	●								0.40%	■□□□□	< 1 year	Short-term OTJ
56	43-4051	Customer Service Representatives		●	○						0.39%	■□□□□	None	Short-term OTJ
57	41-2031	Retail Salespersons		●							0.39%	■□□□□	None	Short-term OTJ
58	51-8091	Chemical Plant and System Operators			●						0.38%	■□□□□	None	Long-term OTJ
59	41-2011	Cashiers		●							0.36%	■□□□□	None	Short-term OTJ
60	47-2152	Plumbers, Pipefitters, and Steamfitters				●					0.36%	■□□□□	None	Apprenticeship
61	43-5021	Couriers and Messengers					●				0.36%	■□□□□	None	Short-term OTJ
62	51-4081	Multiple Machine Tool Workers, Metal and Plastic						○		○	0.36%	■□□□□	None	Moderate OTJ
63	51-4022	Forging Machine Workers, Metal and Plastic						○		○	0.36%	■□□□□	None	Moderate OTJ
64	25-1099	Postsecondary Teachers		●							0.33%	■■■■■	None	None
65	51-4051	Metal-Refining Furnace Operators and Tenders								●	0.31%	■□□□□	None	Moderate OTJ
66	47-2211	Sheet Metal Workers				○		○			0.31%	■□□□□	None	Apprenticeship
67	45-2041	Graders and Sorters, Agricultural Products	●								0.29%	■□□□□	None	Short-term OTJ
68	51-4052	Pourers and Casters, Metal								●	0.29%	■□□□□	None	Moderate OTJ
69	53-2012	Commercial Pilots		●							0.29%	■■□□□	None	None
70	51-3091	Food Roasting, Baking, and Drying Machine Workers	●								0.29%	■□□□□	None	Moderate OTJ
71	51-3011	Bakers	●								0.28%	■□□□□	None	Long-term OTJ
72	19-2042	Geoscientists, Except Hydrologists and Geographers							○		0.23%	■■■■□	None	None
73	47-2051	Cement Masons and Concrete Finishers				○					0.23%	■□□□□	None	Moderate OTJ
74	51-9022	Grinding and Polishing Workers, Hand								○	0.23%	■□□□□	None	Moderate OTJ
75	49-3043	Rail Car Repairers					○				0.23%	■□□□□	None	Long-term OTJ
76	51-9121	Coating, Painting, and Spraying Machine Workers						○			0.21%	■□□□□	None	Moderate OTJ
77	53-6061	Transportation Attendants, Except Flight Attendants		○							0.20%	■□□□□	None	Short-term OTJ
78	11-9013	Farmers, Ranchers, and Other Agricultural Managers	○								0.20%	■□□□□	> 5 years	None
79	41-1012	First-Line Supervisors of Non-Retail Sales Workers		○							0.20%	■□□□□	> 5 years	None
80	49-9021	Heating/AC/Refrigeration Mechanics and Installers				○					0.20%	■■□□□	None	Long-term OTJ

Continued, next page

CONT.: Figure 50: Leading occupations typically employed by key Gregg County industries *(based on share of employment across identified industries)*

LEGEND:

Occupation's share of total employment in selected industry: Less than 2.0% | 2.0% to 2.9% | 3.0% to 4.9% | 5.0% or greater

Educational attainment levels typically needed for entry-level:

■□□□□ High school or less | ■■□□□ Some college, but no degree *(includes certificate-level)* | ■■■□□ Associate's | ■■■■□ Bachelor's | ■■■■■ Advanced degree

	SOC Code	Occupation	OCCUPATION'S SHARE OF TOTAL EMPLOYMENT BY INDUSTRY SECTOR: Ag & food processing	Aviation-related	Chemicals & plastics	Construction	Distribution	Fabricated metals	Mining (ind. O&G)	Primary metals	Average share of employment among these sectors	EDUCATION & TRAINING: Typical entry-level requirements — Education	Experience	Additional on-the-job (OTJ) training required to attain competency
81	47-5011	Derrick Operators, Oil and Gas							●		0.19%	■□□□□	None	Short-term OTJ
82	53-1031	First-Line Supvs. of Transp. and Material-Moving Workers					●				0.19%	■□□□□	1 -5 years	None
83	43-5032	Dispatchers, Except Police, Fire, and Ambulance					●				0.19%	■□□□□	None	Moderate OTJ
84	43-5081	Stock Clerks and Order Fillers					●				0.18%	■□□□□	None	Short-term OTJ
85	47-5012	Rotary Drill Operators, Oil and Gas							●		0.18%	■□□□□	None	Moderate OTJ
86	53-6099	Transportation Workers, All Other		●							0.18%	■□□□□	None	Short-term OTJ
87	23-2093	Title Examiners, Abstractors, and Searchers							●		0.18%	■□□□□	None	Short-term OTJ
88	47-2181	Roofers				●					0.18%	■□□□□	None	Moderate OTJ
89	51-3021	Butchers and Meat Cutters	●								0.16%	■□□□□	None	Long-term OTJ
90	13-1023	Purchasing Agents, Except Wholesale, Retail, and Farm Products							●		0.16%	■□□□□	None	Long-term OTJ
91	37-2011	Janitors and Cleaners, Except Maids and Housekeeping Cleaners							●		0.16%	■□□□□	None	Short-term OTJ
92	43-5061	Production, Planning, and Expediting Clerks								●	0.16%	■□□□□	None	Moderate OTJ
93	25-3021	Self-Enrichment Education Teachers		●							0.16%	■□□□□	1 -5 years	None
94	53-2011	Airline Pilots, Copilots, and Flight Engineers		●							0.16%	■■■□□	1 -5 years	Moderate OTJ
95	43-6011	Executive Secretaries and Executive Administrative Assistants							●		0.16%	■□□□□	1 -5 years	None
96	51-9051	Furnace, Kiln, Oven, Drier, and Kettle Operators and Tenders								●	0.15%	■□□□□	None	Moderate OTJ
97	51-4062	Patternmakers, Metal and Plastic								●	0.15%	■□□□□	None	Long-term OTJ
98	47-3015	Helpers-Pipelayers, Plumbers, Pipefitters, and Steamfitters				●					0.14%	■□□□□	None	Short-term OTJ
99	43-1011	First-Line Supvs. of Office and Administrative Support Workers		●							0.14%	■□□□□	1 -5 years	None
100	47-2081	Drywall and Ceiling Tile Installers				●					0.14%	■□□□□	None	Moderate OTJ
101	53-7032	Excavating and Loading Machine and Dragline Operators				●					0.14%	■□□□□	1 -5 years	Moderate OTJ
102	45-2091	Agricultural Equipment Operators	●								0.14%	■□□□□	None	Moderate OTJ
103	49-3031	Bus and Truck Mechanics and Diesel Engine Specialists					●				0.14%	■□□□□	None	Long-term OTJ
104	51-9195	Molders, Shapers, and Casters, Except Metal and Plastic			●						0.14%	■□□□□	None	Long-term OTJ
105	49-3041	Farm Equipment Mechanics and Service Technicians	●								0.14%	■□□□□	None	Long-term OTJ
106	47-2021	Brickmasons and Blockmasons				●					0.13%	■□□□□	None	Apprenticeship
107	51-9399	Production Workers, All Other	●								0.13%	■□□□□	None	Moderate OTJ
108	45-2093	Farmworkers, Farm, Ranch, and Aquacultural Animals	●								0.13%	■□□□□	None	Short-term OTJ
109	51-4034	Lathe and Turning Machine Tool Workers, Metal and Plastic						●			0.13%	■□□□□	None	Moderate OTJ
110	19-4031	Chemical Technicians			●						0.13%	■■■□□	None	Moderate OTJ
		Occupations share of employment in specified industry	**69.1%**	**64.4%**	**65.4%**	**75.8%**	**72.0%**	**73.8%**	**78.2%**	**76.6%**				

Sources: US Bureau of Labor Statistics; EMSI Complete Employment - 2012.4; TIP Strategies

C. Employer survey

To identify specific issues with regard to hiring, TIP facilitated a web-based survey of Gregg County employers. A link to the survey was emailed in January 2013 to employers identified by the Longview and Kilgore economic development organizations. A total of 225 employers were identified; 53 firms completed at least some portion of the survey.

Respondent profile. Respondents to the survey represented employers from a range of industries, including manufacturing and oil and gas services. The county's largest employers participated, with firms ranging in size from as few as four employees to more than 1,000 (Figure 51). In terms of the employment base, the responding firms represented 7,596 employees (7,043 full-time; 100 part-time; and 453 contract workers). Slightly less than one-half (46 percent) of these employees were characterized as skilled workers. The remainder were distributed among unskilled (23 percent), management (13 percent), professional/ technical (11 percent), clerical/administrative (9 percent), sales/marketing (9 percent), and "other" (5 percent).

In order to place employer's responses in context, participants were asked to indicate the average hourly wage rate paid to workers with varying levels of experience (Figure 52). Management positions were most likely to command the highest wages, with the majority of responding firms paying $20 or more per hour, regardless of experience. Wage rates for entry- and mid-level workers varied more for those in professional or technical fields and in sales and marketing positions.

Average hourly wage rates for skilled production workers were more clearly tied to experience among responding firms. Entry-level wages for skilled production workers of between $10.00 and $14.99 per hour were reported by roughly one-half (52 percent) of responding firms. A similar share of firms indicated that workers in this occupational category with some experience received between $15.00 and $19.99 per hour. The most experienced skilled production workers exceeded $20.00 per hour at the majority of responding firms (52 percent).

Figure 51: Number of employees reported by category

	Full-time	Part-time	Contract/ temporary
Total number of employees reported in category	7,043	100	453
Share of firms reporting employment in category	100%	34%	47%
Minimum value	4	1	1
Maximum value	1,000	45	100
Average value	133	6	18

Figure 52: Average hourly wages paid by category and experience

Share of firms reporting wages for workers at specified level

	$7.00 to $9.99	$10.00 to $14.99	$15.00 to $19.99	$20.00 and up	
Management					
Entry-level		3%	24%	72%	100%
Mid-level experience			10%	90%	100%
High-level experience				100%	100%
Professional/Technical					
Entry-level		17%	48%	35%	100%
Mid-level experience			39%	61%	100%
High-level experience			13%	88%	100%
Sales/Marketing					
Entry-level		10%	38%	52%	100%
Mid-level experience			36%	64%	100%
High-level experience			14%	86%	100%
Skilled Production					
Entry-level	7%	52%	38%	3%	100%
Mid-level experience		32%	50%	18%	100%
High-level experience		11%	37%	52%	100%
Unskilled/Laborers					
Entry-level	26%	68%	6%		100%
Mid-level experience	7%	66%	28%		100%
High-level experience	7%	59%	31%	3%	100%
Clerical/Administrative					
Entry-level	14%	57%	25%	4%	100%
Mid-level experience		55%	38%	7%	100%
High-level experience		15%	59%	26%	100%

Source: Survey of Gregg County employers administered by TIP Strategies, January - March 2013

Roughly one in four firms (26 percent) indicated that administrative employees with high levels of experience received hourly wages above $20.00 per hour. However, the majority of firms (59 percent) paid hourly wages between $15.00 and $19.99 for this group. Only a small percentage of entry-level workers in production and clerical positions earned less than $10.00 per hour. Unskilled laborers were least likely to fall into the higher wage categories, regardless of experience level. When asked directly, the vast majority of participating companies (81 percent) state that their wage rates were generally competitive with other employers in the area. The remaining 19 percent were not sure. None of the respondents were of the opinion that wage rates paid at their firm were not competitive.

Respondents were generally positive with regard to the job outlook in Gregg County. Nearly one-half (47 percent) reported that employment at their firms had increased over the past 12 months (Figure 53). Looking forward, a similar share of firms (43 percent) expected job increases during the next year, with some expecting to add as many as 20 to 40 full-time positions (Figure 54). While one in five firms (21 percent) had experienced job losses in the prior year, only a handful (6 percent) were expecting decreases in employment in the coming 12 months.

Turnover rates of participating firms varied widely as shown in Figure 55. Roughly three out of five responding firms (61 percent) reported turnover rates of 10 percent or above, with a small percentage indicating turnover rates of 50 percent or greater. For comparison, the average rate of employee turnover for all industries in the Longview metropolitan statistical area in the first quarter of 2012 was 10.5 percent according to Quarterly Workforce Indicators produced by the US Census Bureau. This figure was slightly higher than the state average of 8.8 percent for the same time period.

Worker quality. Respondents were asked a number of questions to gauge their experience with the regional workforce. For example, respondents with operations in other parts of the US were asked to compare the

Figure 53: Change in total employment, past 12 months

Share of responding firms by change in employment

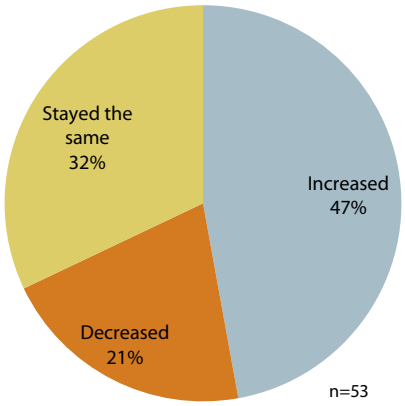


Figure 54: Anticipated change, next 12 months

Share of responding firms by anticipated change in employment

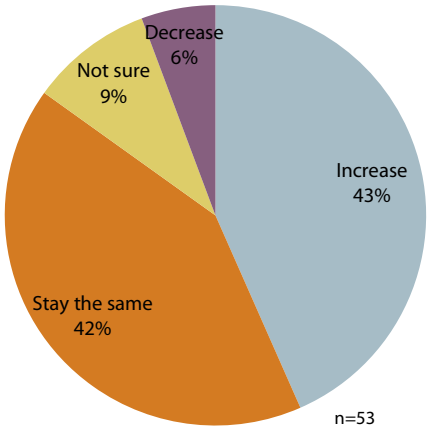
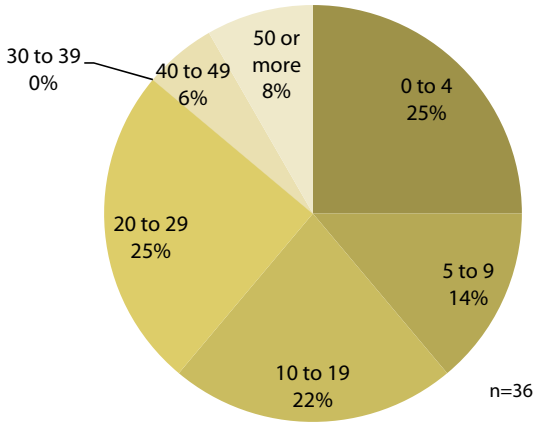


Figure 55: Average annual turnover (as a share of total)

Share of responding firms by level of turnover reported



Source: Survey of Gregg County employers administered by TIP Strategies, January - March 2013. Note: Turnover is defined here as the number of total workers who leave employment in a given year (voluntarily or involuntarily) divided by average annual employment.

regional workforce to other locations in terms of profitably or productivity. The vast majority of those responding indicated that the regional workforce was on par with their other US locations (Figure 56). One in five firms with operations outside Gregg County characterized the regional workforce as being "better" than their other operations.

Figure 57 shows the results of employers' ratings of the regional workforce on selected characteristics using a 4-point scale, with 4 being "excellent" and 1 being "poor." Average ratings among those expressing an opinion were highest for reading skills (with an average score of 2.80), English proficiency (2.79) and trainability (2.74). Job readiness scored lowest, with an average rating of 2.21. When viewed on a percentage basis (rather than as an average rating), at least one-half of respondents rated the regional workforce as "good" on each of the indicated characteristics, with the exception of employee attitudes and job readiness, which were rated as "good" by 46 percent and 41 percent of respondents, respectively.

Participants were also asked to rate their experience with four workforce challenges – absenteeism, tardiness, turnover, and substance abuse – as either "low," "moderate," or "high" (Figure 58) Only a handful of firms characterized their experience with the regional workforce on these issues as "high." Turnover was viewed as a "moderate" issue by one-half of responding firms, the highest percentage of the four challenges, with absenteeism and tardiness receiving similar marks. Experience with substance abuse among the regional workforce was characterized as "low by the majority (70 percent) of respondents.

Availability and hiring. Respondents were asked to rate the availability of workers in a number of broad occupational categories using a 4-point scale, with 4 being "excellent" and 1 being "poor" (Figure 59) Unskilled workers were deemed to be

Figure 56: Comparison to other US operations, if any

Share of firms ranking regional workforce in terms of profitability or productivity relative to other US locations

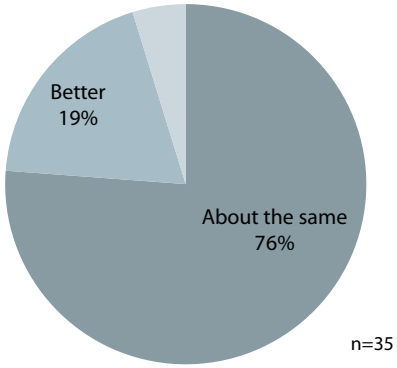


Figure 57: Employers' rating of the regional workforce

Share of firms selecting rating, as well as average rating among those respondents expressing an opinion

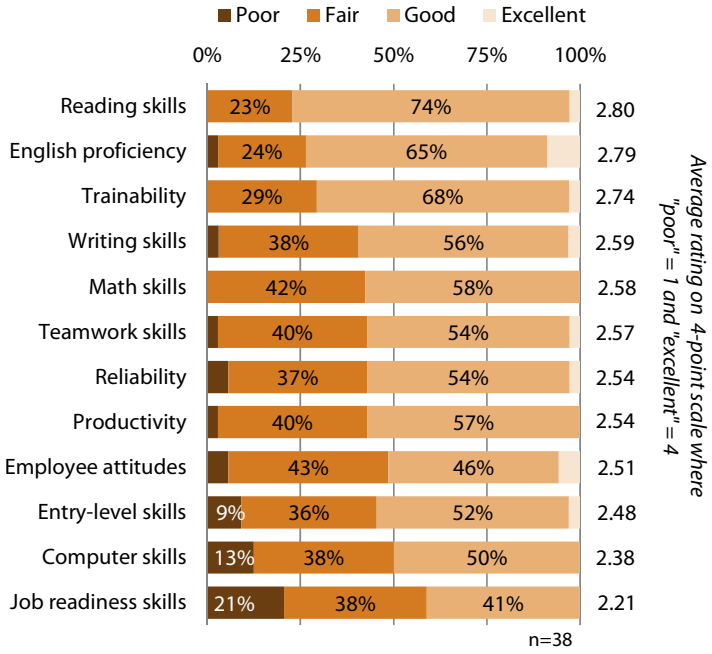
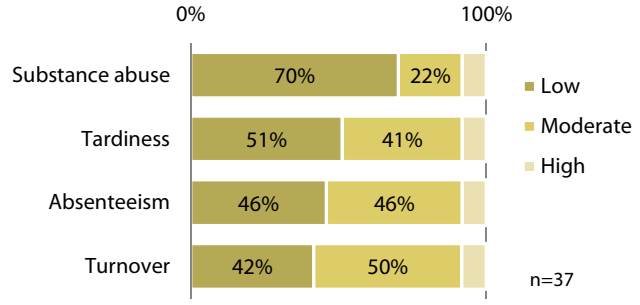


Figure 58: Experience with selected workforce challenges

Share of firms reporting "low" or "moderate" experience



Source: Survey of Gregg County employers administered by TIP Strategies, January - March 2013. Note: Regional workforce characteristics and workforce challenges modeled after a September 2012 study prepared by The Pathfinders in order to facilitate comparison.

the most widely available, with an average rating of 3.2 on the four-point scale. Professional and technical workers were the category rated least available, with an average score of 2.2, which corresponds with a "fair" rating. The remaining categories, which included clerical, management, and skilled production, received scores between 2.5 and 2.9.

To further assess the availability of workers, respondents were asked how many positions they currently had open and how long it typically takes to fill positions for each type of worker. White collar jobs, including management, professional & technical workers, clerical positions, and sales & marketing jobs, represent slightly more than one-third (34 percent) of the more than 400 positions available at responding firms (Figure 60). These jobs, with the exception of clerical and administrative workers, were also among those taking the longest to fill (Figure 61). The most common length of time to fill these types of positions was one to three months, though some firms reported searching for six months or more for management and professional & technical workers.

At the other end of the spectrum, skilled production workers accounted for a much larger share of unfilled positions among responding firms – 44 percent – but were generally easier to fill. Most respondents indicated these positions could be filled within one month's time or less. A small number, however, searched for 6 months or more to fill these openings. Jobs for unskilled workers comprised just under one in five available jobs among responding firms (18 percent) and were most likely to be filled quickly, with the most common timeframe reported for these workers being one to two weeks.

Referrals and word-of-mouth advertising were the most commonly used form of recruiting, with 85 percent of respondents indicating they use this approach to find workers. The use of a staffing or temporary employment agency was the next most common, with 70 percent. Approximately one-half of responding firms indicated they recruit employees using one or more of the following: newspaper

Figure 59: Availability of workers by broad occupational category

Average rating for selected positions on a 4-point scale

Figure 60: Approximate number of unfilled positions by category

Estimated distribution of roughly 420 unfilled positions

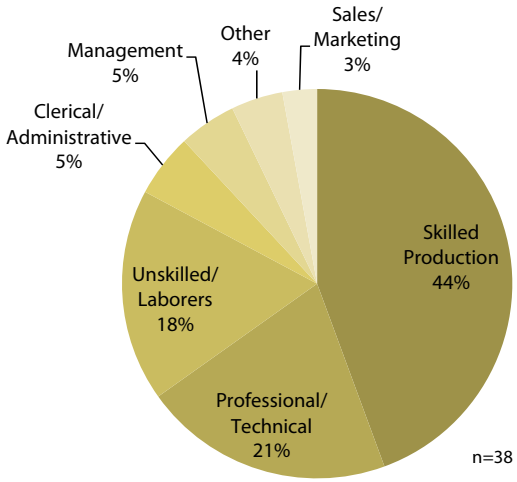


Figure 61: Estimated length of time to fill positions

Share of firms responding by estimated timeframe and category

	1-2 weeks	2-4 weeks	1-3 months	3-6 months	> 6 months
Management	0%	7%	56%	22%	15%
Professional/Technical	4%	16%	48%	16%	16%
Sales/Marketing	0%	18%	65%	18%	0%
Skilled Production	17%	38%	28%	7%	10%
Unskilled/Laborers	52%	33%	9%	6%	0%
Clerical/Administrative	24%	41%	28%	7%	0%

Source: Survey of Gregg County employers administered by TIP Strategies, January - March 2013

advertising (55 percent), internet (53 percent), or the local workforce center (53 percent). Posting positions with local colleges and trade schools (40 percent) or in professional publications (10 percent) were the least common methods used by respondents.

Skills and training. Lack of specific technical skills was the most commonly cited reason new applicants failed to meet requirements for employment (Figure 62). Three out of four respondents indicated this was an issue at least "sometimes," with nearly one-third of respondents citing a lack of skills as "frequently" being a reason applicants were not selected.

Employers were asked to identify which skills or occupations they found "persistently" difficult to recruit, as well as those that will be needed in the future. For those who identified recruitment challenges and future needs, many of the occupations or skills matched up with national shortages, including machinists, engineers, and industrial maintenance mechanics. These "hard-to-fill" positions reflect the importance of technology in today's work environment (see Figure 41, page 29). Once predicted to decline in numbers, the US Bureau of Labor Statistics now projects a modest increase in demand for machinists through 2020. A number of factors are expected to influence demand for skilled machinists, including the retirement of the baby boom generation and the need to re-tool rapidly in order to remain competitive. Engineers and industrial maintenance workers are essential in keeping expensive machinery and equipment operational.

Respondents were asked what steps, if any, they were taking to address skills shortages (Figure 63). Of the range of options presented, recruiting workers from outside the area was the most common response, selected by 57 percent of firms. Roughly two out of five respondents (43 percent) indicated they were working with local training providers to increase the supply. Only 17 percent indicated they were reducing demand for such positions through automation.

Figure 62: Reasons applicants fail to gain employment

Share of firms who reported new applicants "frequently" or "sometimes" failed to meet selected requirements

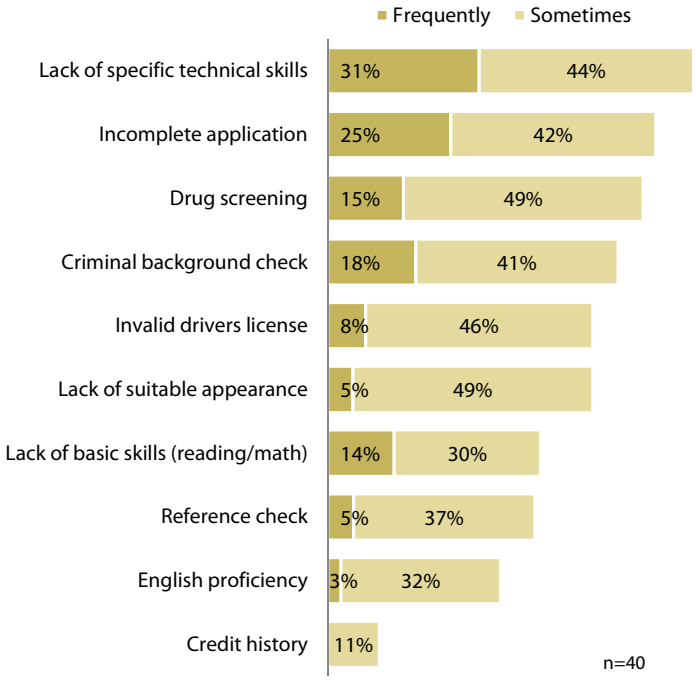


Figure 63: Steps taken to reduce skills shortages

Share of responding firms

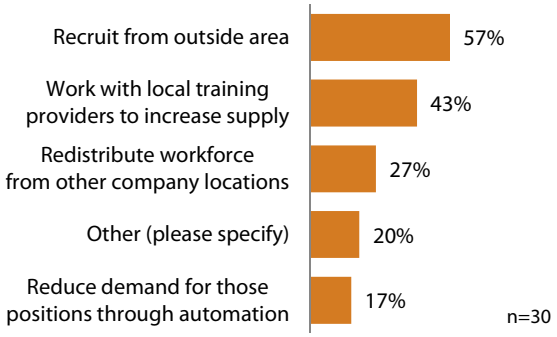
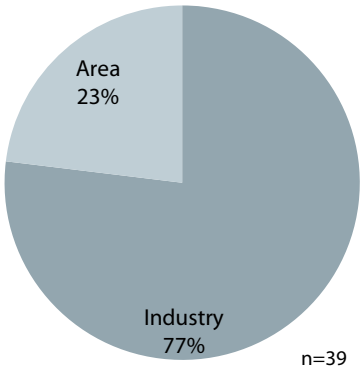


Figure 64: Factor most affecting ability to recruit talent to Gregg County

Share of firms indicating whether issues related to the area (e.g., quality of life, image, cost of living) or their industry have highest impact



Source: Survey of Gregg County employers administered by TIP Strategies, January - March 2013

To learn more about what issues most directly affected their ability to recruit workers, respondents were asked whether any recruiting challenges they faced were related to the area (for example, concerns about quality of life factors such as image, housing availability, cost of living) or if their challenges were specific to their industry (Figure 64, page 45). Of those who indicated they faced recruiting challenges, more than three-quarters (77 percent) indicated these challenges stemmed from issues specific to their industry. Only 23 percent felt that local issues were a factor.

In addition to asking about occupations and skill sets, employers were asked about current training practices (Figure 65). In-house or on-the-job training was the most commonly reported method, with 95 percent of responding firms indicating their training needs were currently addressed through this means. Other training approaches used include training from vendors and equipment suppliers (37 percent), private training providers (34 percent), Kilgore College (29 percent), Texas State Technical College (8 percent), and the local Workforce Solutions office (5 percent). About one in ten respondents (11 percent) indicated they currently do not offer any specific training to their employees. Respondents were also asked to estimate what percentage of the company's training was supplied by each of these various methods. On average, in-house or on-the-job training accounted for 80 percent of total training resources.

Respondents were not probed about why they did not make use of training resources beyond in-house training or private providers, so it is not clear whether the minimal use of public training is due to lack of awareness or lack of need. However, a possible answer may be found in respondents' view of current training programs. When asked if they felt critical training programs were lacking in the region (Figure 67), the majority of respondents (61 percent) said no. Firms that indicated a critical lack of training programs were asked to expand on their answer.

Figure 65: Training resources used

Share of responding firms that reporting using resource, as well as average share of training supplied by each

	Share that use this resource	Average share of training
In-house / on-the-job	94.7%	79.8%
Equipment supplier/vendor	36.8%	14.8%
Private training provider	34.2%	14.7%
Kilgore College	28.9%	9.6%
No specific training offered	10.5%	n/a
Texas State Technical College	7.9%	1.2%
Local workforce center (Workforce Solutions)	5.3%	1.0%
Other	2.6%	2.5%
		n=38

Figure 66: Respondent opinion of local educational institutions

Share of responding firms

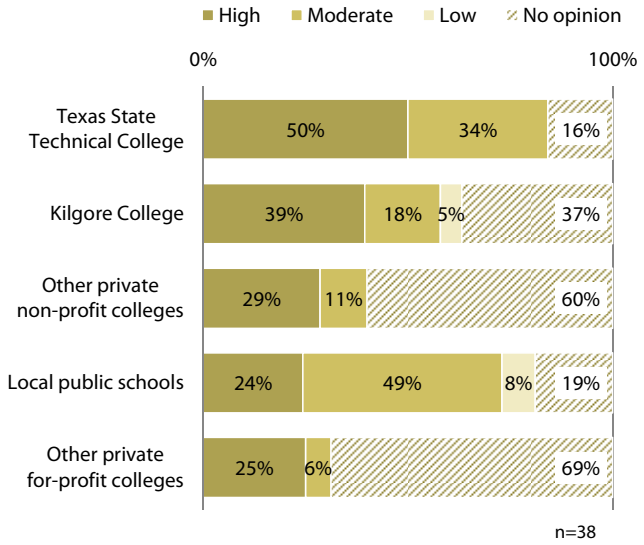
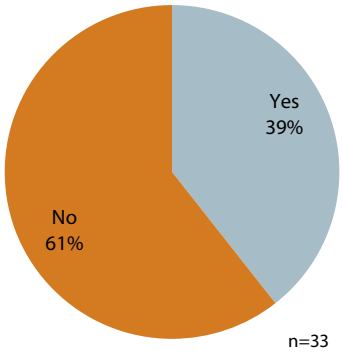


Figure 67: Opinions on critical training in area

Share of firms indicating whether or not the area lacks programs "critical" to their training needs



Source: Survey of Gregg County employers administered by TIP Strategies, January - March 2013

The following specific training needs were mentioned:

- 3D mechanical CAD (computer-aided design) program, such as SolidWork
- Advanced level welding and machining training
- Basic employability skills (that could form a foundation for company-specific training)
- CDL drivers
- Computer proficiency
- Diesel mechanics
- Expanded coverage of manual machining as part of industrial maintenance courses (currently has extensive focus on CNC relative to manual machining)
- GIS program (rather than just a class)
- Mechanical and manual machinist training
- More local TCEQ classes (currently only available through Texas A&M extension)
- Pump mechanic training

Respondents also placed an emphasis on technical training when asked what actions could be taken to improve the quality of the regional workforce. While some firms listed needs specific to their industry, such as increasing training for mechanics, truck drivers, and machining, others spoke more generally of the need to increase computer proficiency and to introduce mechanical and industrial technology training at the high school level. The need for basic employability skills, including writing and interviewing skills, was also a common theme. Other issues raised include a lack of awareness among parents and students about manufacturing careers, a lack of quality mid-level housing in the area, and competition from other high-paying industries in the region (including oil & gas, mining, and chemicals).

When asked in what ways, if any, their firm worked with local schools, the most common response was participating in job fairs (57 percent) and providing company tours (48 percent). Slightly less than one-half of responding firms indicated that their staff serve on curriculum advisory committees (43 percent) and offer internships (43 percent). Other responses include making in-school presentations (38 percent) and providing scholarships (19 percent).

State of the industry. Finally, respondents were asked a series of primarily open-ended questions about the current state of their respective industry. Virtually all firms characterized their industry as either stable (76 percent) or expanding (16 percent). Respondents listed a number of factors that had transformed their individual industries in recent years. While some items listed were specific to a given industry or company, nearly one-third of those providing a response listed the influence of the oil and gas industry (pricing volatility and the introduction of hydraulic fracturing) as the most transformative influence. Other responses focused on changes in the economy, including the recession, increased environmental regulation, and the role of new applications, including social media and GIS.

Looking forward, respondents were asked about innovations they felt would affect the future of their industry. Again, the influence of the oil and gas industry was the most common response. Other themes included the role of technological advances in business equipment and machinery and the impact of growing demand for "green" products. When asked about challenges they faced in the next five years, the economic situation, foreign competition and government regulation were common responses. Workforce concerns were also apparent, with a number of firms voicing concern about finding and retaining skilled workers in the future.

D. Transferrable skills analysis details

One approach to addressing talent shortages is to look for pools of available labor that could transition into demand occupations based on the presence of compatible or transferrable skillsets. The goal of this type of analysis is to identify compatible occupations whose workers would likely find better earnings and employability by transitioning into the target occupation.

Findings from the staffing patterns analysis and the employer survey were used to define a list of critical occupations:

- Machinist/machine operator
- Industrial mechanic/maintenance
- Engineers
- Truck drivers, CDL
- Quality control & inspection
- Welder/brazer

The following table presents transferable skills analysis for these occupations. Additional details regarding this analysis are presented on pages 28 through 30.

Figure 68: Top compatible occupations for heavy and tractor trailer truck drivers

	O-NET Code	Occupation	2012 Median Hourly Earnings *(Must be less than or equal to target)*	2012 Jobs *(Must have at least 50 jobs in Gregg County)*	Est. Annual Openings, 2012-2017 *(25 or fewer openings projected per year)*
—	**53-3032**	**Heavy and Tractor-Trailer Truck Drivers**	**$16.90**	**2,102**	**72**
1	51-9023.00	Mixing and Blending Machine Setters, Operators, and Tenders	$16.70	120	3
2	47-2031.02	Rough Carpenters	$16.66	564	15
3	49-3021.00	Automotive Body and Related Repairers	$16.64	114	2
4	47-2181.00	Roofers	$15.71	102	2
5	51-4033.00	Grinding and Polishing Machine Tool Workers, Metal and Plastic	$15.57	130	2
6	51-4031.00	Cutting, Punching, and Press Machine Workers, Metal and Plastic	$15.33	247	3
7	51-4081.00	Multiple Machine Tool Workers, Metal and Plastic	$14.45	134	3
8	53-7051.00	Industrial Truck and Tractor Operators	$14.23	332	11
9	51-9111.00	Packaging and Filling Machine Operators and Tenders	$14.22	241	6
10	47-2131.00	Insulation Workers, Floor, Ceiling, and Wall	$13.86	115	4
11	47-2051.00	Cement Masons and Concrete Finishers	$13.57	207	7
12	51-4072.00	Molding, Coremaking, & Casting Machine Workers, Metal & Plastic	$13.46	110	2
13	51-4021.00	Extruding and Drawing Machine Workers, Metal and Plastic	$12.85	113	3
14	49-9098.00	Helpers-Installation, Maintenance, and Repair Workers	$12.69	154	8
15	53-3033.00	Light Truck or Delivery Services Drivers	$12.04	574	10
16	53-3031.00	Driver/Sales Workers	$11.94	147	5
17	43-5021.00	Couriers and Messengers	$10.67	140	3
18	53-3022.00	Bus Drivers, School or Special Client	$10.48	172	5
19	37-3011.00	Landscaping and Groundskeeping Workers	$9.50	595	17
20	53-6031.00	Automotive and Watercraft Service Attendants	$9.07	115	4

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET codes to the SOC system can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

Figure 69: Top compatible occupations for chemical engineers and industrial engineers

	O-NET Code	Occupation	2012 Median Hourly Earnings *(Must be less than or equal to target)*	2012 Jobs *(Must have at least 50 jobs in Gregg County)*	Est. Annual Openings, 2012-2017 *(25 or fewer openings projected per year)*
—	**17-2041**	**Chemical Engineers**	**$45.07**	**37**	**1**
1	17-2011.00	Aerospace Engineers	$44.36	97	3
2	17-2051.00	Civil Engineers	$38.26	101	4
3	17-2051.01	Transportation Engineers	$38.26	101	4
4	17-2071.00	Electrical Engineers	$35.10	67	2
5	17-2141.00	Mechanical Engineers	$34.89	140	5
6	17-2171.00	Petroleum Engineers	$34.81	103	2
7	17-2112.01	Human Factors Engineers and Ergonomists	$34.38	78	2
8	17-2112.00	Industrial Engineers	$34.38	78	2
9	11-9021.00	Construction Managers	$30.55	311	5
10	25-1032.00	Engineering Teachers, Postsecondary	$30.20	686	19
11	25-1052.00	Chemistry Teachers, Postsecondary	$30.20	686	19
12	25-1051.00	Atmospheric, Earth, Marine, & Space Sciences Teachers, Postsecondary	$30.20	686	19
13	15-1121.00	Computer Systems Analysts	$30.01	91	3
14	15-1121.01	Informatics Nurse Specialists	$30.01	91	3
15	29-9011.00	Occupational Health and Safety Specialists	$27.59	113	4
16	13-1051.00	Cost Estimators	$27.16	96	6
17	13-1199.04	Business Continuity Planners	$26.90	187	6
18	17-3029.05	Industrial Engineering Technologists	$20.77	85	2
19	17-3029.02	Electrical Engineering Technologists	$20.77	85	2
20	19-2041.00	Environmental Scientists and Specialists, Including Health	$20.20	76	4
—	**17-2112**	**Industrial Engineers**	**$34.38**	**78**	**2**
1	11-9021.00	Construction Managers	$30.55	311	5
2	41-4011.07	Solar Sales Representatives and Assessors	$29.34	193	12
3	13-1051.00	Cost Estimators	$27.16	96	6
4	13-1199.04	Business Continuity Planners	$26.90	187	6
5	51-1011.00	First-Line Supervisors of Production and Operating Workers	$26.65	617	7
6	15-1122.00	Information Security Analysts	$24.22	77	2
7	19-4041.01	Geophysical Data Technicians	$23.32	96	3
8	13-2099.02	Risk Management Specialists	$23.24	93	10
9	17-3011.02	Civil Drafters	$22.95	69	1
10	17-3011.01	Architectural Drafters	$22.95	69	1
11	17-3029.05	Industrial Engineering Technologists	$20.77	85	2
12	17-3029.02	Electrical Engineering Technologists	$20.77	85	2
13	17-3012.01	Electronic Drafters	$20.74	51	1
14	17-3012.02	Electrical Drafters	$20.74	51	1
15	17-3022.00	Civil Engineering Technicians	$19.61	74	2
16	13-1031.01	Claims Examiners, Property and Casualty Insurance	$19.26	75	2
17	17-3013.00	Mechanical Drafters	$18.61	65	1
18	17-3031.02	Mapping Technicians	$17.45	70	2
19	13-1022.00	Wholesale and Retail Buyers, Except Farm Products	$17.43	71	2
20	29-2081.00	Opticians, Dispensing	$13.51	53	2

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET codes to the SOC system can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

Figure 70: Top compatible occupations for industrial machinery mechanics and maintenance workers, machinery

	O-NET Code	Occupation	2012 Median Hourly Earnings *(Must be less than or equal to target)*	2012 Jobs *(Must have at least 50 jobs in Gregg County)*	Est. Annual Openings, 2012-2017 *(25 or fewer openings projected per year)*
—	**49-9041**	**Industrial Machinery Mechanics**	**$20.73**	**879**	**48**
1	49-9044.00	Millwrights	$20.49	86	2
2	49-9051.00	Electrical Power-Line Installers and Repairers	$20.34	52	3
3	47-5011.00	Derrick Operators, Oil and Gas	$19.93	206	9
4	47-2152.01	Pipe Fitters and Steamfitters	$19.03	262	14
5	47-2152.02	Plumbers	$19.03	262	14
6	49-9021.01	Heating and Air Conditioning Mechanics and Installers	$18.68	196	11
7	49-9021.02	Refrigeration Mechanics and Installers	$18.68	196	11
8	53-7072.00	Pump Operators, Except Wellhead Pumpers	$18.64	396	14
9	51-4191.00	Heat Treating Equipment Workers, Metal and Plastic	$18.21	60	4
10	51-4041.00	Machinists	$18.15	510	8
11	49-9043.00	Maintenance Workers, Machinery	$18.12	98	2
12	49-3043.00	Rail Car Repairers	$18.01	223	8
13	49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	$17.52	177	5
14	47-2231.00	Solar Photovoltaic Installers	$17.24	58	3
15	51-4011.00	Computer-Controlled Machine Tool Operators, Metal and Plastic	$16.97	169	5
16	49-9099.01	Geothermal Technicians	$15.90	187	7
17	49-3023.01	Automotive Master Mechanics	$14.64	548	12
18	51-4081.00	Multiple Machine Tool Workers, Metal and Plastic	$14.45	134	3
19	49-3051.00	Motorboat Mechanics and Service Technicians	$14.06	53	2
20	51-7011.00	Cabinetmakers and Bench Carpenters	$11.33	88	5
—	**49-9043**	**Maintenance Workers, Machinery**	**$18.12**	**98**	**2**
1	49-3043.00	Rail Car Repairers	$18.01	223	8
2	49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	$17.52	177	5
3	47-2231.00	Solar Photovoltaic Installers	$17.24	58	3
4	47-4041.00	Hazardous Materials Removal Workers	$17.13	54	2
5	51-9023.00	Mixing and Blending Machine Setters, Operators, and Tenders	$16.70	120	3
6	49-3021.00	Automotive Body and Related Repairers	$16.64	114	2
7	49-9099.01	Geothermal Technicians	$15.90	187	7
8	51-4033.00	Grinding, Lapping, & Polishing Machine Tool Workers, Metal & Plastic	$15.57	130	2
9	51-5112.00	Printing Press Operators	$15.49	72	1
10	51-4032.00	Drilling and Boring Machine Tool Workers, Metal and Plastic	$15.39	72	0
11	51-9121.00	Coating, Painting, and Spraying Machine Workers	$15.39	87	2
12	51-4031.00	Cutting, Punching, and Press Machine Workers, Metal and Plastic	$15.33	247	3
13	51-4034.00	Lathe and Turning Machine Tool Workers, Metal and Plastic	$14.66	56	2
14	51-4081.00	Multiple Machine Tool Workers, Metal and Plastic	$14.45	134	3
15	47-2151.00	Pipelayers	$14.41	62	3
16	51-9111.00	Packaging and Filling Machine Operators and Tenders	$14.22	241	6
17	49-3051.00	Motorboat Mechanics and Service Technicians	$14.06	53	2
18	47-3013.00	Helpers--Electricians	$13.42	80	4
19	49-9098.00	Helpers--Installation, Maintenance, and Repair Workers	$12.69	154	8
20	47-2071.00	Paving, Surfacing, and Tamping Equipment Operators	$10.84	94	6

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET codes to the SOC system can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

Figure 71: Top compatible occupations for machinists and multiple machine workers, metal & plastic

	O-NET Code	Occupation	2012 Median Hourly Earnings *(Must be less than or equal to target)*	2012 Jobs *(Must have at least 50 jobs in Gregg County)*	Est. Annual Openings, 2012-2017 *(25 or fewer openings projected per year)*
—	**51-4041**	**Machinists**	**$18.15**	**510**	**8**
1	49-9043.00	Maintenance Workers, Machinery	$18.12	98	2
2	49-3043.00	Rail Car Repairers	$18.01	223	8
3	49-3031.00	Bus and Truck Mechanics and Diesel Engine Specialists	$17.52	177	5
4	47-2231.00	Solar Photovoltaic Installers	$17.24	58	3
5	51-4011.00	Computer-Controlled Machine Tool Operators, Metal and Plastic	$16.97	169	5
6	51-9023.00	Mixing and Blending Machine Setters, Operators, and Tenders	$16.70	120	3
7	49-3021.00	Automotive Body and Related Repairers	$16.64	114	2
8	49-9099.01	Geothermal Technicians	$15.90	187	7
9	47-2211.00	Sheet Metal Workers	$15.60	265	4
10	51-4033.00	Grinding, Lapping, & Polishing, Machine Tool Workers, Metal & Plastic	$15.57	130	2
11	51-5112.00	Printing Press Operators	$15.49	72	1
12	51-4032.00	Drilling and Boring Machine Tool Workers, Metal and Plastic	$15.39	72	0
13	51-9121.00	Coating, Painting, and Spraying Machine Workers	$15.39	87	2
14	51-4031.00	Cutting, Punching, and Press Machine Workers, Metal and Plastic	$15.33	247	3
15	51-4034.00	Lathe and Turning Machine Tool Workers, Metal and Plastic	$14.66	56	2
16	51-4081.00	Multiple Machine Tool Workers, Metal and Plastic	$14.45	134	3
17	51-9111.00	Packaging and Filling Machine Operators and Tenders	$14.22	241	6
18	49-3051.00	Motorboat Mechanics and Service Technicians	$14.06	53	2
19	49-9098.00	Helpers--Installation, Maintenance, and Repair Workers	$12.69	154	8
20	51-7011.00	Cabinetmakers and Bench Carpenters	$11.33	88	5
—	**51-4081**	**Multiple Machine Tool Workers, Metal & Plastic**	**$14.45**	**134**	**3**
1	47-2151.00	Pipelayers	$14.41	62	3
2	53-7051.00	Industrial Truck and Tractor Operators	$14.23	332	11
3	51-9111.00	Packaging and Filling Machine Operators and Tenders	$14.22	241	6
4	37-3013.00	Tree Trimmers and Pruners	$14.08	60	1
5	49-3051.00	Motorboat Mechanics and Service Technicians	$14.06	53	2
6	47-2132.00	Insulation Workers, Mechanical	$13.81	83	4
7	51-4072.00	Molding, Coremaking, and Casting Machine Workers, Metal & Plastic	$13.46	110	2
8	47-3013.00	Helpers--Electricians	$13.42	80	4
9	51-9199.01	Recycling and Reclamation Workers	$13.34	65	3
10	51-4021.00	Extruding and Drawing Machine Workers, Metal and Plastic	$12.85	113	3
11	49-9098.00	Helpers--Installation, Maintenance, and Repair Workers	$12.69	154	8
12	51-2092.00	Team Assemblers	$12.01	436	16
13	51-2022.00	Electrical and Electronic Equipment Assemblers	$11.79	87	3
14	51-7011.00	Cabinetmakers and Bench Carpenters	$11.33	88	5
15	47-4031.00	Fence Erectors	$11.19	92	6
16	51-9198.00	Helpers--Production Workers	$10.90	245	6
17	47-2071.00	Paving, Surfacing, and Tamping Equipment Operators	$10.84	94	6
18	51-6031.00	Sewing Machine Operators	$10.37	91	0
19	37-3011.00	Landscaping and Groundskeeping Workers	$9.50	595	17
20	53-6031.00	Automotive and Watercraft Service Attendants	$9.07	115	4

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET codes to the SOC system can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

Figure 72: Top compatible occupations for inspectors & testers and industrial production managers

	O-NET Code	Occupation	2012 Median Hourly Earnings *(Must be less than or equal to target)*	2012 Jobs *(Must have at least 50 jobs in Gregg County)*	Est. Annual Openings, 2012-2017 *(25 or fewer openings projected per year)*
—	**51-9061**	**Inspectors, Testers, Sorters, Samplers, and Weighers**	**$20.71**	**570**	**30**
1	51-4022.00	Forging Machine Setters, Operators, and Tenders, Metal and Plastic	$18.94	92	1
2	51-2041.00	Structural Metal Fabricators and Fitters	$15.63	222	4
3	51-5112.00	Printing Press Operators	$15.49	72	1
4	51-4031.00	Cutting, Punching, and Press Machine Workers, Metal and Plastic	$15.33	247	3
5	51-2023.00	Electromechanical Equipment Assemblers	$14.81	124	2
6	51-4034.00	Lathe and Turning Machine Tool Workers, Metal and Plastic	$14.66	56	2
7	43-5071.00	Shipping, Receiving, and Traffic Clerks	$13.23	367	8
8	51-6052.00	Tailors, Dressmakers, and Custom Sewers	$13.06	59	1
9	51-2092.00	Team Assemblers	$12.01	436	16
10	51-2022.00	Electrical and Electronic Equipment Assemblers	$11.79	87	3
11	43-5081.02	Marking Clerks	$10.98	1,025	25
12	39-2021.00	Nonfarm Animal Caretakers	$10.95	332	6
13	51-9198.00	Helpers--Production Workers	$10.90	245	6
14	51-6031.00	Sewing Machine Operators	$10.37	91	0
15	41-2021.00	Counter and Rental Clerks	$9.78	428	12
16	51-3011.00	Bakers	$9.74	80	2
17	51-3021.00	Butchers and Meat Cutters	$9.74	124	3
18	51-6011.00	Laundry and Dry-Cleaning Workers	$9.44	163	4
19	35-2012.00	Cooks, Institution and Cafeteria	$9.00	304	8
20	35-3022.00	Counter Attendants, Cafeteria, Food Concession, and Coffee Shop	$8.50	234	16
—	**11-3051**	**Industrial Production Managers**	**$45.06**	**133**	**4**
1	11-3051.04	Biomass Power Plant Managers	$45.06	133	4
2	11-3051.00	Industrial Production Managers	$45.06	133	4
3	11-3051.02	Geothermal Production Managers	$45.06	133	4
4	11-3021.00	Computer and Information Systems Managers	$42.66	76	1
5	17-2112.00	Industrial Engineers	$34.38	78	2
6	19-4031.00	Chemical Technicians	$28.57	60	1
7	29-9011.00	Occupational Health and Safety Specialists	$27.59	113	4
8	51-1011.00	First-Line Supervisors of Production and Operating Workers	$26.65	617	7
9	53-1031.00	First-Line Supvs. of Transp/Material-Moving Machine & Vehicle Operators	$25.79	163	4
10	13-1041.01	Environmental Compliance Inspectors	$22.18	81	3
11	13-1041.07	Regulatory Affairs Specialists	$22.18	81	3
12	29-2099.01	Neurodiagnostic Technologists	$21.71	52	2
13	17-3029.05	Industrial Engineering Technologists	$20.77	85	2
14	17-3029.03	Electromechanical Engineering Technologists	$20.77	85	2
15	15-1151.00	Computer User Support Specialists	$20.77	217	7
16	17-3029.01	Non-Destructive Testing Specialists	$20.77	85	2
17	11-9081.00	Lodging Managers	$18.15	50	1
18	11-9051.00	Food Service Managers	$15.78	280	4
19	29-2081.00	Opticians, Dispensing	$13.51	53	2
20	11-9013.01	Nursery and Greenhouse Managers	$11.38	423	10

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET codes to the SOC system can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

Figure 73: Top compatible occupations for welders, cutters, solderers, and brazers

	O-NET Code	Occupation	2012 Median Hourly Earnings *(Must be less than or equal to target)*	2012 Jobs *(Must have at least 50 jobs in Gregg County)*	Est. Annual Openings, 2012-2017 *(25 or fewer openings projected per year)*
—	**51-4121**	**Welders, Cutters, Solderers, and Brazers**	**$15.37**	**1223**	**27**
1	51-4031.00	Cutting, Punching, and Press Machine Workers, Metal and Plastic	$15.33	247	3
2	51-2023.00	Electromechanical Equipment Assemblers	$14.81	124	2
3	51-4034.00	Lathe and Turning Machine Tool Workers, Metal and Plastic	$14.66	56	2
4	51-4081.00	Multiple Machine Tool Workers, Metal and Plastic	$14.45	134	3
5	47-2151.00	Pipelayers	$14.41	62	3
6	51-9111.00	Packaging and Filling Machine Operators and Tenders	$14.22	241	6
7	47-2131.00	Insulation Workers, Floor, Ceiling, and Wall	$13.86	115	4
8	47-2132.00	Insulation Workers, Mechanical	$13.81	83	4
9	47-2051.00	Cement Masons and Concrete Finishers	$13.57	207	7
10	51-4072.00	Molding, Coremaking, and Casting Machine Workers, Metal and Plastic	$13.46	110	2
11	49-9098.00	Helpers--Installation, Maintenance, and Repair Workers	$12.69	154	8
12	51-2092.00	Team Assemblers	$12.01	436	16
13	51-2022.00	Electrical and Electronic Equipment Assemblers	$11.79	87	3
14	51-7011.00	Cabinetmakers and Bench Carpenters	$11.33	88	5
15	47-4031.00	Fence Erectors	$11.19	92	6
16	51-9198.00	Helpers--Production Workers	$10.90	245	6
17	47-2071.00	Paving, Surfacing, and Tamping Equipment Operators	$10.84	94	6
18	51-6031.00	Sewing Machine Operators	$10.37	91	0
19	37-3011.00	Landscaping and Groundskeeping Workers	$9.50	595	17
20	51-6011.00	Laundry and Dry-Cleaning Workers	$9.44	163	4

SOURCE: EMSI Complete Employment - 2012.4. O-NET Codes are based on the Standard Occupational Classification (SOC) system and are the basis of EMSI's compatible occupations analysis. Additional details, including a crosswalk of O-NET codes to the SOC system can be found here: http://www.onetcenter.org/taxonomy.html. A brief overview of the SOC system is provided in Appendix F.

E. Postsecondary analysis details

To help understand how education and training programs in the region align with the needs of local industry, we matched published data on the number of degrees and awards conferred for credit by regional institutions (commonly known as "completions"), with relevant occupations. Data on completions for the three most recent academic years available (2008-2009, 2009-2010, and 2010-2011) were downloaded from the National Center for Education Statistics through the Integrated Postsecondary Education Data System, or IPEDS.

Completions data were compiled for all schools in the 12-county labor shed that participate in IPEDS surveys (any institution that participates in federal financial aid programs). A list of institutions is provided in Figure 44. To help eliminate irregularities from year-to-year, we calculated a three-year average of completions. Completions were then matched to occupations using a crosswalk from the National Crosswalk Service Center that aligns occupational classifications with subject matter (indicated by Classification of Instructional Programs or CIP codes). The results of this analysis are presented below for three subject areas: business & management (CIP 52); healthcare (CIP 51); and skilled trades (CIP 47 and CIP 48).

Each figure shows the average annual number of completions (degrees or awards conferred for credit) made by regional institutions for a selected CIP or group of CIPs. This information provides a sense of the pool of potential job seekers that receive relevant training in the region. Under each, we present an overview of related occupations in order to provide a sense of the magnitude of demand. For each occupation we provide an estimate of the number of annual job openings – resulting from both new growth and replacement demand – anticipated for the occupation in the region through 2017, as well as an estimate of the share of demand attributable to replacement. The current median hourly wage for the occupation is also provided, along with data on education and training needs prepared by the US Bureau of Labor Statistics.

This type of analysis has several technical limitations. First, because of the large number of occupations analyzed, we relied on data from federal sources. This approach has the advantage of providing uniform and consistent data across educational institutions. Second, the analysis relies on the use of a crosswalk to link occupations (SOC codes) with programs of study (CIP codes). This is an imperfect tool as it may not capture the actual relationship between an individual's educational coursework and their intended occupation.

One of the most critical limitations on the "supply" side stems from the lack of data on non-credit completions (i.e. awards conferred within the professional development or continuing education arm of the institutions). The IPEDS dataset typically used for this purpose only includes awards and degrees conferred for credit, meaning as part of an academic course of study. Depending on the occupation, the lack of data on non-credit offerings can affect the ability to gain a full picture of the supply of graduates.

There are limitations on the "demand" side of the equation. Demand for workers is based on an estimate of 1) the projected need for workers due to new growth in the occupation, and 2) the demand for replacement workers (those likely to exit the profession for retirement or other personal reasons, to advance within their occupation, or to change occupations). Projections of new workers are based on historic trends and so are not really able to account for emerging industries or occupations or to incorporate knowledge about local trends. Likewise, estimates of replacement demand are created by the US Bureau of Labor Statistics using data from the Current Population Survey (CPS) on historical net change in occupational employment for 13 different age cohorts over a five-year period. This approach may not capture near-term trends, such as the delaying of retirement age by the baby boom generation.

Finally, in thinking about gaps between the pool of graduates and the demands of employers, it is important to remember that education and workforce are not closed systems. As a result, even if we had perfect knowledge on both the supply and demand sides of the equation, the ability to predict gaps and highlight areas of oversupply is limited. Students may attend college outside the region and return for employment; others may attend college locally and take a job elsewhere.

Postsecondary education systems are also not closed in terms of time. While data collection efforts are designed to measure completion within a set period of time (2 years, 4 years, 6 years), the path to graduation for individual students often does not fit these norms. This is particularly true of community colleges which are sometimes used by students to sample courses and "try out" career choices prior to making a larger investment.

As a result, the information presented here, coupled with findings from the employer survey, should be viewed as a starting point for discussions about training in the region.

Figure 74: Comparison of completions in HEALTHCARE-RELATED fields of study with demand in related occupations

Average annual for-credit completions (2009-2011) for selected courses of study

ENTRY-LEVEL EDUCATION LEGEND:

■□□□□ High school or less ■■□□□ Some college (including certificate-level), but no degree ■■■□□ Associate's degree ■■■■□ Bachelor's degree ■■■■■ Advanced degree

51.3801	**Registered Nursing/Registered Nurse**	**574**
51.3901	**Licensed Practical/Vocational Nurse Training**	**301**
51.0000	**Health Services/Allied Health/Health Sciences, General**	**2**
51.0001	**Health and Wellness, General**	**11**

SOC CODE	DESCRIPTION	ANNUAL OPENINGS	% REPLACEMENT NEEDS	MEDIAN EARNINGS	TYPICAL ENTRY-LEVEL REQUIREMENTS: Education	Experience	ADDTL. OTJ TRAINING
29-1111	Registered Nurses	337	34%	$27.52	■■■□□	None	None
29-2061	Licensed Practical and Licensed Vocational Nurses	157	55%	$19.30	■■□□□	None	None
▶ 25-1099	Postsecondary Teachers	102	43%	$27.53	■■■■■	None	None
11-9111	Medical and Health Services Managers	31	42%	$34.24	■■■■□	None	None
	Total estimated annual openings in related occupations	627					

51.0904	**Emergency Medical Technology/Technician (EMT Paramedic)**	**165**
51.0908	**Respiratory Care Therapy/Therapist**	**19**
51.0909	**Surgical Technology/Technologist**	**23**
51.0910	**Diagnostic Medical Sonography/Sonographer and Ultrasound Technician**	**20**
51.0911	**Radiologic Technology/Science - Radiographer**	**48**

SOC CODE	DESCRIPTION	ANNUAL OPENINGS	% REPLACEMENT NEEDS	MEDIAN EARNINGS	TYPICAL ENTRY-LEVEL REQUIREMENTS: Education	Experience	ADDTL. OTJ TRAINING
▶ 25-1099	Postsecondary Teachers	102	43%	$27.53	■■■■■	None	None
29-2041	Emergency Medical Technicians and Paramedics	37	33%	$12.69	■■□□□	None	None
29-2037	Radiologic Technologists	28	31%	$24.45	■■■□□	None	None
29-1126	Respiratory Therapists	17	34%	$22.95	■■■□□	None	None
29-2055	Surgical Technologists	12	46%	$17.37	■■□□□	None	None
29-2032	Diagnostic Medical Sonographers	<10		$29.65	■■■□□	None	None
29-2054	Respiratory Therapy Technicians	<10		$20.71	■■■□□	None	Moderate OTJ
	Total estimated annual openings in related occupations	206					

Continued, next page

CONT.: Figure 74: Comparison of completions in HEALTHCARE-RELATED fields of study with demand in related occupations

ENTRY-LEVEL EDUCATION LEGEND:

■□□□□ High school or less ■■□□□ Some college, but no degree (includes certificate-level) ■■■□□ Associate's degree ■■■■□ Bachelor's degree ■■■■■ Advanced degree

51.0602	**Dental Hygiene/Hygienist**							**33**
	SOC CODE	**DESCRIPTION**	**ANNUAL OPENINGS**	**% REPLACEMENT NEEDS**	**MEDIAN EARNINGS**	**TYPICAL ENTRY-LEVEL REQUIREMENTS: *Education***	***Experience***	**ADDTL. OTJ TRAINING**
▶	25-1099	Postsecondary Teachers	102	43%	$27.53	■■■■■	None	None
	29-2021	Dental Hygienists	18	34%	$35.53	■■■□□	None	None
		Total estimated annual openings in related occupations	120					

51.0801	**Medical/Clinical Assistant**							**9**
51.0803	**Occupational Therapist Assistant**							**21**
51.0806	**Physical Therapy Technician/Assistant**							**27**
	SOC CODE	**DESCRIPTION**	**ANNUAL OPENINGS**	**% REPLACEMENT NEEDS**	**MEDIAN EARNINGS**	**TYPICAL ENTRY-LEVEL REQUIREMENTS: *Education***	***Experience***	**ADDTL. OTJ TRAINING**
▶	25-1099	Postsecondary Teachers	102	43%	$27.53	■■■■■	None	None
▶	31-9092	Medical Assistants	54	30%	$12.20	■□□□□	None	Moderate OTJ
	31-2011	Occupational Therapy Assistants	<10		$29.93	■■■□□	None	None
	31-2021	Physical Therapist Assistants	<10		$31.63	■■■□□	None	None
		Total estimated annual openings in related occupations	156					

51.0705	**Medical Office Management/Administration**							**1**
51.0707	**Health Information/Medical Records Technology/Technician**							**9**
51.0708	**Medical Transcription/Transcriptionist**							**5**
51.0713	**Medical Insurance Coding Specialist/Coder**							**24**
51.0716	**Medical Administrative/Executive Assistant and Medical Secretary**							**43**
	SOC CODE	**DESCRIPTION**	**ANNUAL OPENINGS**	**% REPLACEMENT NEEDS**	**MEDIAN EARNINGS**	**TYPICAL ENTRY-LEVEL REQUIREMENTS: *Education***	***Experience***	**ADDTL. OTJ TRAINING**
	43-1011	First-Line Supvs. of Office/Admin. Support Workers	130	63%	$20.08	■□□□□	1 -5 years	None
	43-6013	Medical Secretaries	102	26%	$12.57	■□□□□	None	Moderate OTJ
▶	31-9092	Medical Assistants	54	30%	$12.20	■□□□□	None	Moderate OTJ
	29-2071	Medical Records and Health Information Technicians	23	40%	$13.16	■■□□□	None	None
	31-9094	Medical Transcriptionists	7	48%	$13.11	■■□□□	None	None
		Total estimated annual openings in related occupations	315					

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys (completions data); EMSI Complete Employment - 2012.4 (occupational demand); US Bureau of Labor Statistics (education and training requirements); TIP Strategies. Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. Flagged occupations (▶)appear in more than one of the CIPs shown here.

Figure 75: Comparison of completions in BUSINESS/MANAGEMENT-RELATED fields of study with demand in related occupations

Average annual for-credit completions (2009-2011) for selected courses of study

ENTRY-LEVEL EDUCATION LEGEND:

■□□□□ High school or less ■■□□□ Some college, but no degree (includes certificate-level) ■■■□□ Associate's degree ■■■■□ Bachelor's degree ■■■■■ Advanced degree

52.0101 Business/Commerce, General — **132**

52.0201 Business Administration and Management, General — **662**

SOC CODE	DESCRIPTION	ANNUAL OPENINGS	% REPLACEMENT NEEDS	MEDIAN EARNINGS	TYPICAL ENTRY-LEVEL REQUIREMENTS: Education	Experience	ADDTL. OTJ TRAINING
11-9199	Managers, All Other	207	57%	$22.18	■□□□□	1 -5 years	None
▶ 25-1099	Postsecondary Teachers	102	43%	$27.53	■■■■■	None	None
▶ 11-1021	General and Operations Managers	103	102%	$35.49	■■■□□	1 -5 years	None
13-1111	Management Analysts	54	37%	$27.66	■■■■□	1 -5 years	None
▶ 11-2022	Sales Managers	43	42%	$34.16	■■■■□	1 -5 years	None
▶ 11-1011	Chief Executives	25	93%	$38.03	■■■■□	> 5 years	None
11-3011	Administrative Services Managers	25	58%	$35.14	■□□□□	1 -5 years	None
13-1051	Cost Estimators	19	35%	$23.65	■■■■□	None	None
11-3051	Industrial Production Managers	<10		$42.56	■■■■□	1 -5 years	None
11-9151	Social and Community Service Managers	<10		$23.87	■■■■□	1 -5 years	None
11-3071	Transportation, Storage, and Distribution Managers	<10		$34.70	■□□□□	> 5 years	None
11-9021	Construction Managers	<10		$25.64	■■■□□	> 5 years	None
	Total estimated annual openings in related occupations	618					

52.0301 Accounting — **72**

52.0801 Finance, General — **64**

SOC CODE	DESCRIPTION	ANNUAL OPENINGS	% REPLACEMENT NEEDS	MEDIAN EARNINGS	TYPICAL ENTRY-LEVEL REQUIREMENTS: Education	Experience	ADDTL. OTJ TRAINING
13-2052	Personal Financial Advisors	259	15%	$22.72	■■■■□	None	None
▶ 25-1099	Postsecondary Teachers	102	43%	$27.53	■■■■■	None	None
▶ 11-1021	General and Operations Managers	103	102%	$35.49	■■■□□	1 -5 years	None
13-2011	Accountants and Auditors	93	64%	$26.21	■■■■□	None	None
11-3031	Financial Managers	59	33%	$33.24	■■■■□	> 5 years	None
13-2099	Financial Specialists, All Other	45	20%	$22.10	■■■■□	None	Moderate OTJ
13-2051	Financial Analysts	33	46%	$23.26	■■■■□	None	None
13-2072	Loan Officers	32	51%	$26.29	■□□□□	None	Moderate OTJ
▶ 11-1011	Chief Executives	25	93%	$38.03	■■■■□	> 5 years	None
13-2041	Credit Analysts	<10		$32.87	■■■■□	None	None
13-2031	Budget Analysts	<10		$23.83	■■■■□	None	None
13-2061	Financial Examiners	<10		$31.54	■■■■□	None	Moderate OTJ
13-2081	Tax Examiners and Collectors, and Revenue Agents	<10		$18.72	■■■■□	None	Moderate OTJ
	Total estimated annual openings in related occupations	776					

52.1401 Marketing/Marketing Management, General — **67**

SOC CODE	DESCRIPTION	ANNUAL OPENINGS	% REPLACEMENT NEEDS	MEDIAN EARNINGS	TYPICAL ENTRY-LEVEL REQUIREMENTS: Education	Experience	ADDTL. OTJ TRAINING
▶ 25-1099	Postsecondary Teachers	102	43%	$27.53	■■■■■	None	None
▶ 11-2022	Sales Managers	43	42%	$34.16	■■■■□	1 -5 years	None
11-2021	Marketing Managers	39	24%	$37.96	■■■■□	1 -5 years	None
13-1161	Market Research Analysts and Marketing Specialists	31	34%	$25.32	■■■■□	None	None
11-2011	Advertising and Promotions Managers	<10		$27.80	■■■■□	1 -5 years	None
	Total estimated annual openings in related occupations	233					

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys (completions data); EMSI Complete Employment - 2012.4 (occupational demand); US Bureau of Labor Statistics (education and training requirements); TIP Strategies. Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. Flagged occupations (▶)appear in more than one of the CIPs shown here.

Figure 76: Comparison of completions in selected SKILLED TRADES fields of study with demand in related occupations

Average annual for-credit completions (2009-2011) for selected courses of study

ENTRY-LEVEL EDUCATION LEGEND:

■□□□□ High school or less ■■□□□ Some college, but no degree (includes certificate-level) ■■■□□ Associate's degree ■■■■□ Bachelor's degree ■■■■■ Advanced degree

47.0603	**Autobody/Collision and Repair Technology/Technician**	**12**
47.0604	**Automobile/Automotive Mechanics Technology/Technician**	**53**
47.0605	**Diesel Mechanics Technology/Technician**	**27**

SOC CODE	DESCRIPTION	ANNUAL OPENINGS	% REPLACEMENT NEEDS	MEDIAN EARNINGS	TYPICAL ENTRY-LEVEL REQUIREMENTS: Education	Experience	ADDTL. OTJ TRAINING
49-3023	Automotive Service Technicians and Mechanics	36	136%	$13.70	■□□□□	None	Long-term OTJ
49-3031	Bus/Truck Mechanics and Diesel Engine Specialists	17	69%	$16.88	■□□□□	None	Long-term OTJ
49-3021	Automotive Body and Related Repairers	<10		$14.86	■□□□□	None	Moderate OTJ
49-3022	Automotive Glass Installers and Repairers	<10		$13.20	■□□□□	None	Moderate OTJ
51-9122	Painters, Transportation Equipment	<10		$18.06	■□□□□	None	Moderate OTJ
49-2093	Electrical/Electronics Install & Repair, Transp. Equip.	<10		$18.60	■■□□□	None	Long-term OTJ
49-2096	Electronic Equip. Install & Repair, Motor Vehicles	<10		$11.19	■■□□□	None	Short-term OTJ
	Total estimated annual openings in related occupations	63					

47.0201	**HVAC Maintenance Technology/Technician**	**95**
48.0508	**Welding Technology/Welder**	**70**

SOC CODE	DESCRIPTION	ANNUAL OPENINGS	% REPLACEMENT NEEDS	MEDIAN EARNINGS	TYPICAL ENTRY-LEVEL REQUIREMENTS: Education	Experience	ADDTL. OTJ TRAINING
51-4121	Welders, Cutters, Solderers, and Brazers	55	125%	$15.39	■□□□□	< 1 year	Moderate OTJ
49-9021	HVAC Mechanics and Installers	26	41%	$17.04	■■□□□	None	Long-term OTJ
51-4122	Welding, Soldering, and Brazing Machine Workers	<10		$17.42	■□□□□	None	Moderate OTJ
	Total estimated annual openings in related occupations	82					

Source: National Center for Education Statistics, Integrated Postsecondary Education Data System (IPEDS) surveys (completions data); EMSI Complete Employment - 2012.4 (occupational demand); US Bureau of Labor Statistics (education and training requirements); TIP Strategies. Note: IPEDS data include only schools eligible to participate in federal financial aid programs. Figures shown include first and second majors. Flagged occupations (▶)appear in more than one of the CIPs shown here.

F. Classification systems

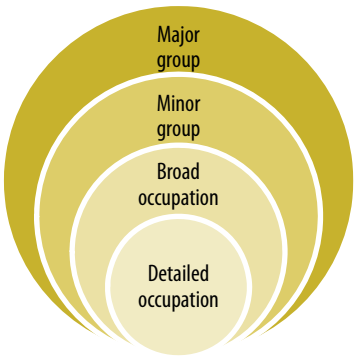
Much of the analysis presented in this report relies on three separate classification systems: A brief overview of each is presented below.

The **Standard Occupational Classification** (SOC) system is used by federal statistical agencies to classify workers into categories for the purpose of collecting, calculating, or disseminating data. This system groups all occupations in which work is performed for pay or profit according to the type of work performed and, in some cases, on the skills, education, or training needed to perform the work at a competent level. Under the 2010 SOC system, workers are classified into one of 840 detailed occupations, which are combined to form 461 broad occupations, 97 minor groups, and 23 major groups.

The **North American Industry Classification System** (NAICS, pronounced Nakes) was developed under the direction and guidance of the Office of Management and Budget (OMB) as the standard for use by Federal statistical agencies in classifying business establishments for the collection, tabulation, presentation, and analysis of statistical data describing the US economy. The classification system was developed jointly with government agencies in Canada and Mexico to allow for a high level of comparability in business statistics among the North American countries. The version of NAICS currently in wide use was released in 2007 and classifies industries into 20 sectors based on production processes. These sectors are broken into subsectors, industry groups, and individual industries. An additional level of detail is provided to accommodate industry codes that are specific to the three countries. The classification system is updated every five years. The 2012 NAICS structure was finalized in August 2011. Federal statistical agencies were directed to begin using the new system for data published for reference years beginning on or after January 1, 2012.

Figure 77: Standard Occupational Classification (SOC) System

SOC system structure



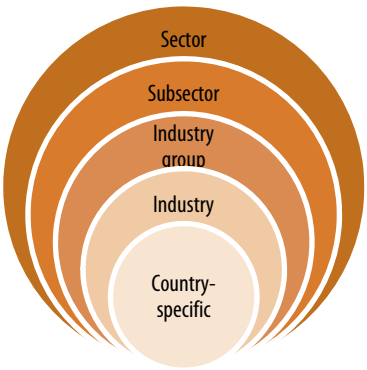
SOC system example

- **Major group** 51-0000 Production occupations
  - **Minor group** 51-2000 Assemblers and fabricators
    - **Broad occupation** 51-2090 Miscellaneous assemblers and fabricators
      - **Detailed occupation** 51-2092 Team assemblers

SOURCE: US Bureau of Labor Statistics; TIP Strategies

Figure 78: North American Industry Classification System (NAICS)

NAICS structure



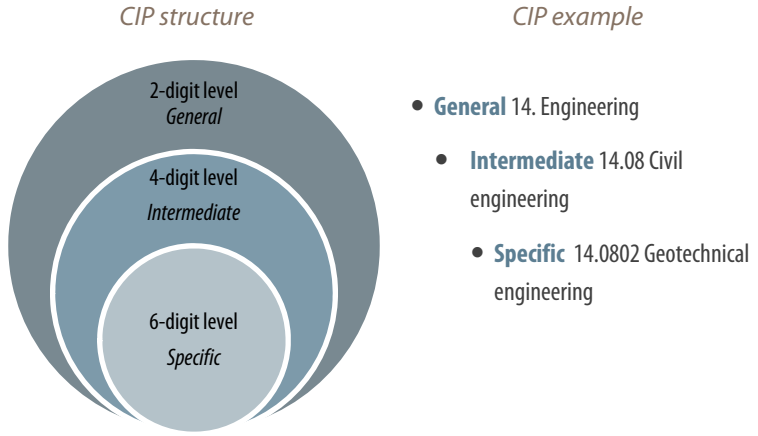
NAICS example

- **Sector** 31-33 Manufacturing
  - **Subsector** 336 Transportation equipment manufacturing
    - **Industry group** 3361 Motor vehicle manufacturing
      - **Industry** 33611 Automobiles and light duty motor vehicles, including chassis
        - **Country-specific** 336111 Automobiles and light duty motor vehicles, incl chassis

SOURCE: US Census Bureau; TIP Strategies

The **Classification of Instructional Programs** (CIP) is the accepted federal government statistical standard on instructional program classifications. Developed in 1980 by the National Center for Education Statistics, the CIP is used by state agencies, national associations, academic institutions, and employment counseling services for collecting, reporting, and analyzing instructional program data.

Figure 79: Classification of Instructional Programs (CIP)



SOURCE: US Census Bureau; TIP Strategies

The CIP titles and program descriptions are intended to be generic categories into which program completions data can be placed, and are not exact duplicates of a specific major or field of study titles used by individual institutions. The vast majority of CIP titles correspond to academic and occupational instructional programs offered for credit at the postsecondary level. These programs result in recognized completion points and awards, including degrees, certificates, and other formal awards. The CIP also includes other types of instructional programs, such as residency programs in various dental, medical, podiatric, and veterinary specialties that may lead to advanced professional certification; personal improvement and leisure programs; and instructional programs that lead to diplomas and certificates at the secondary level only.