

# An Economic Strategy for the Lower Rio Grande Valley

Prepared for the Rio South Texas Regional Cooperation Project | January 2011



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Workforce Solutions is the workforce development board serving the Texas Rio Grande Valley counties of Hidalgo, Starr and Willacy. The agency delivers publicly funded employment and training services through a network of partners located throughout the region. Workforce Solution’s goal is to provide businesses, employers, job seekers and employees with the resources needed to succeed in an ever-changing world.

## Acknowledgements

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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 economic development strategic planning.

## 1: Executive Summary

The Lower Rio Grande Valley (LRGV) has fared better than much of the country during the recent recession. However, that does not mean the region has been immune to the downturn. The peak of the job recession came in 2009 as the four-county region added 18,000 unemployed workers on top of the thousands it already had. Construction, manufacturing, transportation, and farming jobs were among the hardest hit. The number of unemployed workers continued to rise in 2010 in all four counties, but the pace has slowed significantly.

In 2009, leaders in the four-county LRGV region (Cameron, Hidalgo, Starr, and Willacy) came together to pursue a Regional Cooperation Capacity Building for Targeted Industries Program grant from the Texas Workforce Commission. The purpose of the grant was to bring regional partners together to produce a regional plan that identifies available resources, including those available through the federal stimulus program, and a coordinated action plan to access these funds. TIP Strategies (TIP), an economic strategy firm based in Austin, was engaged in the spring of 2010 to assist in this process.

### About this work

The planning process was guided by an advisory group, led by Workforce Solutions Lower Rio Grande Valley. Throughout the course of this work TIP met with representatives of the regional partner organizations, both individually and as a group, to obtain relevant background information and review project expectations. In addition, we conducted focus groups with local economic development organizations and businesses, and created an on-line survey to gather input from area employers. The results of the survey are presented as Appendix A of this report.

To understand current conditions, we conducted a demographic and economic assessment of the Lower Rio Grande Valley. This market-based assessment, presented as Section 2 of this report, documents the region's economic and labor market conditions. The assessment formed the foundation for our analysis of expected changes in the industries and occupations that are driving the regional economy. The results of this cluster analysis are shown in Section 3, with an additional analysis of the region's workforce relative to the State of Texas industry clusters presented as Appendix E. Based on this analysis and input obtained from the Regional Partners and other stakeholders we identified target industries and occupations that should be considered for training (Section 4). Using data compiled on the curricula offered by regional training providers, we compared the occupational demands of the target sectors with the available training programs to identify any potential gaps. This analysis was performed using a curricula inventory tool which was specifically designed for this work. The results of this analysis are outlined in Section 5. Section 6 provides our recommendations on joint activities that could be undertaken to meet the needs of the region's target industries, including suggested sources for funding.

### Regional Cooperation Grant Partners

- Workforce Solutions (LRGV)
- Workforce Solutions Cameron
- Rio South Texas Economic Council
- South Texas College
- Texas State Technical College
- University of Texas Brownsville/Texas Southmost College

## Key Findings

Workers are not constrained by political jurisdictions, as one look at commuting patterns for any community in the country will attest. Employers pull in workers from throughout the Lower Rio Grande Valley, as do area training institutions. As a result, taking a regional approach to workforce development and training makes sense. The economic ties between the two workforce board areas – Workforce Solutions Lower Rio Grande Valley (encompassing Hidalgo, Starr, and Willacy Counties) and Workforce Solutions Cameron (serving Cameron County) – mean that many of the workforce challenges and needs are the same.

### Target industries and occupations

For this work, we revisited the target sectors identified in the 2005 cluster analysis. Despite significant changes in the national and regional picture since that time, the majority of the sectors remain appropriate for the region. The following recommendations build on the current list by offering some refinements, as well as suggesting new areas of interest. One sector – Retail & Hospitality – has been removed from our recommended sectors. While this sector is still projected to account for a large share of the region's future job growth, most of the occupations do not present good targets for training either due to the low wages or the minimal preparation that is required. Customer service training should continue to be available on a custom basis as requested by area employers.

- **Healthcare.** Healthcare will continue to be a significant driver of employment growth in the region. Because of the region's demographics, most notably the large share of low-income residents and the persistence of chronic conditions such as diabetes, much of this growth is expected to be in home health occupations, which are covered by federal health care programs. Demand is also expected to continue for technician-level workers — those that provide diagnostic and therapeutic services. The push for electronic medical records is also expected to create demand for health information technology workers. Although training exists for aspects of this occupation in isolation – there are a number of medical coding and computer programming offerings in the region – there is no curricula that effectively brings these areas together in the way the industry will now require. The inclusion of social assistance occupations, such as case managers and counselors, should also be considered given the overlap between these two areas.
- **Energy.** We recommend that alternative energy be added to the region's target list in light of proposed investments in the area and federal priorities. Two of the partners in this grant – Baryonyx (wind) and SOL Technologies (solar) – are renewable energy companies planning to add alternative energy facilities in the region. In addition to demand for workers to construct and service solar arrays and wind turbines, employment growth related to this sector includes transmission line workers, telecommunications installers, and programming occupations (related to remote operations of these facilities, particularly off-shore wind farms). Demand for this sector, however, is strongly correlated with energy prices and has been largely driven by federal subsidies. As a result, timing of demand for workers in this sector remains a question.

- **Construction/Skilled Trades.** Construction employment was hard-hit during the recession. While it will take some time for demand to return to prior levels, the Valley has seen a resurgence of activity in recent months, with a number of major projects on the horizon. Ensuring that the region has the supply of construction workers and skilled trades people needed to meet this demand should continue to be a focus of training. The projected retirement of a large share of workers in the trades – plumbers, electricians, heating and air conditioning technicians – makes this need even greater.
- **Advanced Manufacturing.** Although manufacturing experienced significant job losses both regionally and nationally, it remains a valid target for workforce and training activities. Slight gains are projected in the coming years, with a small number of expansions and locations already in the works. In addition, manufacturing still provides one of the best opportunities for high wage jobs and career development. This is particularly true of advanced manufacturing, which is not a specific sector or product, but rather refers to firms that use high-tech processes, such as robotics and other “intelligent” systems, in the production process. Industries which are classified as part of the State of Texas’s advanced manufacturing cluster and which have a substantial presence in the Valley include Ship and Boat Building and Aerospace Product and Parts Manufacturing. Logistics is a related sector.
- **Criminal Justice/Homeland Security.** This sector should also remain a high priority for a number of reasons, not the least of which is the demand for public safety workers – police officers, fire fighters, and other first responders – required to serve the region’s growing population. Along with this basic need, the LRGV faces several distinct issues. National security issues continue to dominate headlines, as drug violence endures along the Texas-Mexico border, concerns about the impact of illegal immigration remain, and fears of a terrorist threat linger. In addition, the presence of a state prison in Willacy County creates a constant demand for correctional officers.
- **Education.** In addition to growth in public safety employees, the region’s projected population growth and its relatively young population will create continued demand for educators at all levels. In our review of growth occupations, teachers held a number of the top spots. Because teaching requires relatively high levels of educational attainment, the demand for this occupation cannot be met quickly. Ensuring that there is a sufficient number of teachers in the pipeline will require a continuous effort. A sufficient supply of quality teachers is doubly important to the region’s economy because of the role teachers play in preparing others for entry in the workforce.
- **Business Services.** The Valley still lags in business services and related employment. These firms provide a range of support activities, such as marketing, accounting, and information technology (IT) services, to local companies. IT jobs were identified as an important sub-cluster in the 2005 report. Yet, the colleges report a flattening in IT-related enrollment, despite the fact that computers are now an integral part of virtually every workplace. This trend could be a reflection of new tools that make some computer-related tasks simpler (like website development). More likely, the slow growth in enrollment reflects the fact that technology training is now

embedded in almost every course. High school students, most of whom have been exposed to information technology for years, graduate with a basic level of knowledge that prior generations lacked. From a training standpoint, accounting occupations are likely to have the highest demand in the area short-term. However, the region's growing border-related employment could drive demand for additional IT and communications needs to support increasing sophistication in surveillance and inspection operations. The alternative energy investments described above could create similar types of needs, as investments like off-shore wind farms are operated remotely.

### Border literacy

The human resource challenges identified in our earlier work also remain relevant. (See page 6.) Along with persistent low levels of literacy and educational attainment, the recent restructuring of the economy has exacerbated the skills gap identified in 2005. In fact, the economic recession has heightened the challenges in some respects. The growing gap between skilled and unskilled workers has created what one person interviewed for this work referred to as “two parallel economies.” One economy is represented by the growing number of professionals drawn to the region’s affordable lifestyle and dynamic economy; the other is comprised of workers who lack the skills and language proficiency to gain meaningful employment. Even as the number of workers in the latter category continues to expand, funding levels for essential programs, such as adult basic education, high school equivalency (GED) certification, and English as a Second Language (ESL) continue to decline. Addressing the needs of this group will be essential to the region’s success. The newly created Border Workforce Alliance, comprised of the five workforce development boards along the Texas/Mexico border, is an important first step.

### Entrepreneurship

The economic downturn has also created renewed interest in entrepreneurship. As talent becomes more mobile and fewer employment options are available for some workers, starting a business has become more viable than finding traditional employment. Creating an entrepreneurial track for workforce and training activities can provide an alternative mechanism for economic growth. At minimum, this strategy would mean providing support to existing entrepreneurship organizations in the region. A more aggressive approach would include offering customized entrepreneurship trainings, adding entrepreneurship-related occupations to the region’s target occupations list, or helping to create a network of entrepreneurial coaches in the region.

### Vocational training

According to a 2008 publication by the Texas Comptroller of Public Accounts, the number of academic contact hours taken at the state’s two-year colleges continues to rise while vocational-technical instructional hours at these institutions remain flat. At the same time, roughly two-thirds of the 30 occupations projected to have the largest job growth over the next decade by the U.S. Bureau of Labor Statistics, require less than a four-year degree. (See Figure 5.4.) At least in part, this divergence may reflect misconceptions about employment opportunities associated with postsecondary programs other than a four-year degree. Helping to raise awareness about employment opportunities, wage rates, and working conditions in technical fields could help draw more students into these areas. Texas State Technical Institute’s mechatronics program is one example of a program that could

“Mechatronics is another way of saying ‘intelligent mechanical systems’ and it is the foundation of many 21st century enabling technologies. Mechatronics involves the integration of mechanical and electrical systems with control systems and information technology.”

Texas State Technical College website



benefit from this type of marketing both to help educate area residents about what mechatronics entails and to identify the types of career ladders such training would open up. Given the impending retirement of the baby boom generation, a regional effort to change perceptions around skilled trades should also be considered.

### Creative approaches

The Valley's challenges are formidable. But so is the determination of the regional leadership to address them. A number of past and current initiatives are evidence of this fact, including the 2005 Industry Cluster Analysis (Workforce Solutions LRGV), the Rio Grande Valley Allied Health Training Alliance (Valley Interfaith Development Alliance, or VIDA), the Breaking Through career pathways (South Texas College, VIDA, and Jobs for the Future), and more recently, the Partners for Postsecondary Success planning process (consortium of partners in Cameron County, including Workforce Solutions Cameron, Brownsville Economic Development and UT-Brownsville). Developing a framework for sustaining and expanding these initiatives throughout the region should be explored. This strategy could be part of a formal "State of the Workforce" event or could entail creating a regional clearinghouse for sharing curriculum and other lessons learned.

Whatever course of action the Regional Partners undertake, identifying potential funding sources will be paramount in light of federal and state budget issues. One important component of this funding strategy will be aligning regional initiatives with government and foundation priorities. Our recommendations provide a starting point in that most can be aligned with existing initiatives. For example, increasing educational attainment and literacy dovetails with priorities of groups such as the Hispanic Scholarship Fund, the Gates Foundation (sponsor of Partners for Postsecondary Success), and with President Obama's pledge to make the U.S. the world leader in college attainment by 2020 by calling for 8 million college graduates by 2020.

### Conclusion

Opportunities abound for the Lower Rio Grande Valley. Local communities often appear on "best of" lists that tout the region's strong economic growth, business friendly environment, and affordable lifestyle. The region can claim a number of assets, including a network of quality educational institutions, two regional airports, a growing medical cluster, and proximity to an international border. Creating regional strategies around these kinds of assets can be challenging, as political jurisdictions often compete with one another for capital investment, jobs, and tax revenues.

Collaborating on workforce and education strategies should be viewed differently. In an economic region like the four-county LRGV, everyone shares the same workforce. The Valley is home to a relatively young population, many of whom are bi-lingual. In today's global economy, these characteristics could make the workforce very appealing to employers. Yet, this important differentiator has yet to be

fully realized. Addressing workforce challenges and leveraging opportunities as a region can help everyone succeed; failure to do so will prevent the Valley from realizing its full potential.

### Human Resource Challenges in the Lower Rio Grande Valley

- 1: A young workforce. Although a young workforce can be seen as an advantage relative to regions facing an aging population, it does present specific challenges from a human resource standpoint. High dropout rates and a lack of basic skills (such as reading, writing, and mathematics) make it difficult to find qualified applicants even for entry-level jobs. This problem can be confounded by the fact that younger workers often lack a career mindset, which can prohibit them from developing the skills they need to move up when they are able to find employment.
- 2: Employability skills. The implications of the region's dropout rate are not limited to its youth. Nearly half of the Valley's existing labor force lacked a high school diploma or general equivalency degree (GED) in 2000. Other general employability skills affect both youth and adult workers. Attendance, attitude, and customer service skills are barriers to recruitment and advancement across all age groups. Limited English proficiency also presents a significant challenge in hiring. Data from the 2000 U.S. Census show that roughly one in four working-age people (24 percent) in the three-county region speak English "not well" or "not at all." Even where English was not cited as a problem, poor communication skills were frequently mentioned as an issue in the region.
- 3: Leadership and supervisory skills. Finding qualified applicants for management positions represents another challenge for human resource managers. In addition to the lack of communication skills among the applicant pool mentioned previously, those we interviewed indicated that critical thinking skills and cultural awareness were also a problem. Management ethics or fraud was also cited as an issue, both for rank-and-file and managerial positions. The "Peter Principle," which contends that people tend to be promoted up to their level of incompetence, was also mentioned as a factor.
- 4: Lack of advanced technical skills. Recruiting and retaining workers with advanced technical skills was cited as a problem across industries from a lack of industrial maintenance mechanics to a shortage of qualified information technology workers. The effects of this shortage will only intensify as manufacturing and service work becomes increasingly technical in nature. However, specific initiatives designed to address this issue, such as the South Texas Manufacturers Association apprenticeship program, reportedly suffer from a lack of interest.
- 5: Lack of knowledge of skill levels of local workforce. Human resource managers cited a lack of knowledge about the skills of the local workforce and the growing burden created by assessment and screening tools as challenges in hiring. Employers in virtually every industry are faced with assessing potential applicants on basic job skills, customer service skills, computer literacy, as well as an array of specialized screening tools, such as background checks, credit checks, drug test, lie-detector screenings, and even personality profiling. The lack of a labor pool database was cited by economic development professionals as specific impediment to job growth in the region.
- 6: Professional labor skills shortage. Finding qualified professionals was another obstacle identified during the course of our work.

## 2: Economic Assessment

Unless otherwise indicated, data presented in this section encompasses the service territory of Workforce Solutions Lower Rio Grande Valley (Hidalgo, Starr, and Willacy Counties) as well as that of Workforce Solutions Cameron (Cameron County). Use of this four-county region reflects the strong economic ties among the counties and provides consistency with prior economic analyses conducted by TIP Strategies (including the 2005 *Industry Cluster Analysis* and the 2009 *Business Intelligence Survey*).

### Population

The four-county LRGV region is home to an estimated 1.3 million people (Figure 2.1). When neighboring regions of Mexico are included, this figure rises to more than 2.5 million. By 2030, the combined population is expected to surpass 3.6 million. Over time, the U.S. share of the combined regional population is increasing. In 2000, the four-county LRGV region accounted for 51 percent of the total bi-national population. By 2030, the U.S. side is expected to comprise 55 percent of the total (Figure 2.2).

Much of the region's population growth is expected to occur in Hidalgo County, with the county projected to add more than one-half million residents in the next two decades. Reynosa is expected to see the next largest increase, with an estimated gain of nearly 350,000 residents during the same period (Figures 2.3 and 2.5, *next page*).

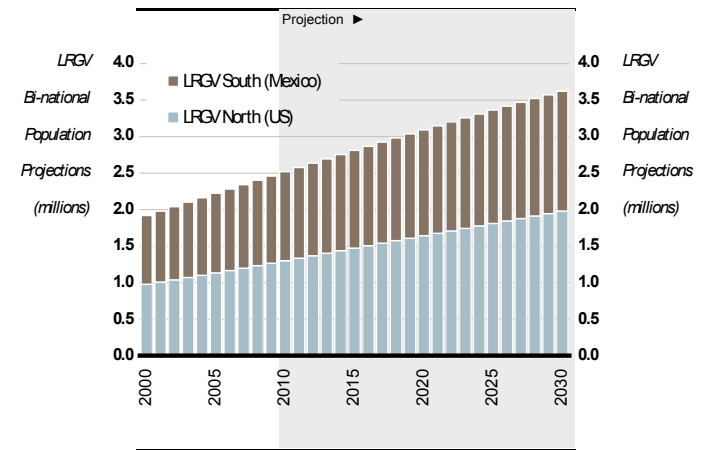
A look at the components of population growth reveals that natural increase (i.e., more births than deaths) has been the primary driver of population growth for the U.S. side of the region (Figure 2.4). Immigration has accounted for a decreasing share of the region's growth over the last two decades. The least stable component has been domestic migration (the movement of people from other parts of the U.S.

Lower Rio Grande Valley

Figure 2.1

LOWER RIO GRANDE VALLEY

LRGV projected population growth on both sides of the border



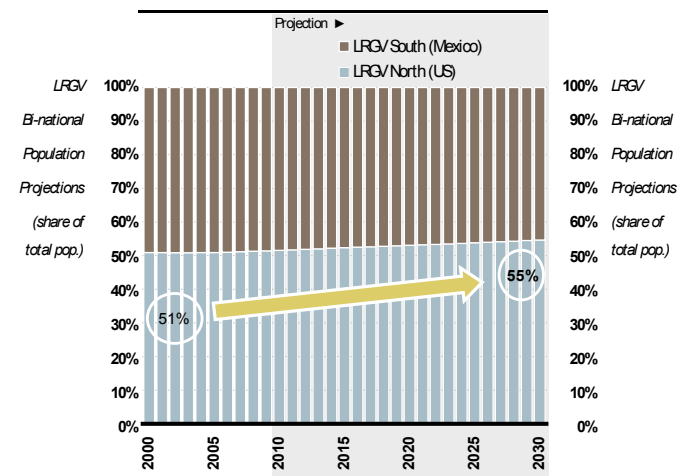
SOURCE: Texas State Data Center (3.0 scenario); CONAPO, Consejo Nacional de Población (Delimitación de zonas metropolitanas de México)

US side = Hidalgo, Cameron, Starr, & Willacy counties  
 Mexican side = Matamoros, Rio Bravo, & Reynosa

Figure 2.2

LOWER RIO GRANDE VALLEY

LRGV distribution of population

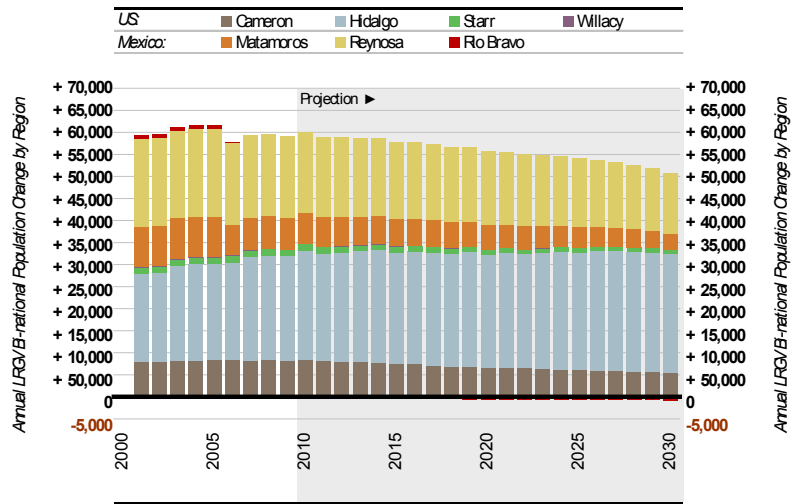


SOURCE: Texas State Data Center (3.0 scenario); CONAPO, Consejo Nacional de Población (Delimitación de zonas metropolitanas de México)

US side = Hidalgo, Cameron, Starr, & Willacy counties  
 Mexican side = Matamoros, Rio Bravo, & Reynosa

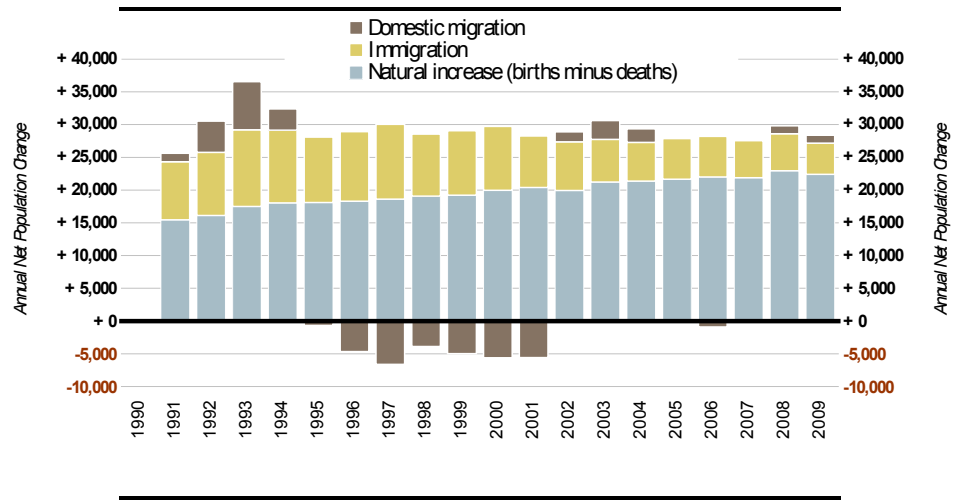
During economic downturns, the Valley has seen increased domestic migration as people return home. This pattern appears to have held during the most recent recession, however, with smaller gains than seen during prior downturns. This may be a reflection of Texas's late entrance into the recession and relatively minor job losses.

Figure 2.3 LOWER RIO GRANDE VALLEY  
Annual net population change



SOURCE: Texas State Data Center (3.0 scenario); CONAPO, Consejo Nacional de Población (Delimitación de zonas metropolitanas de México)

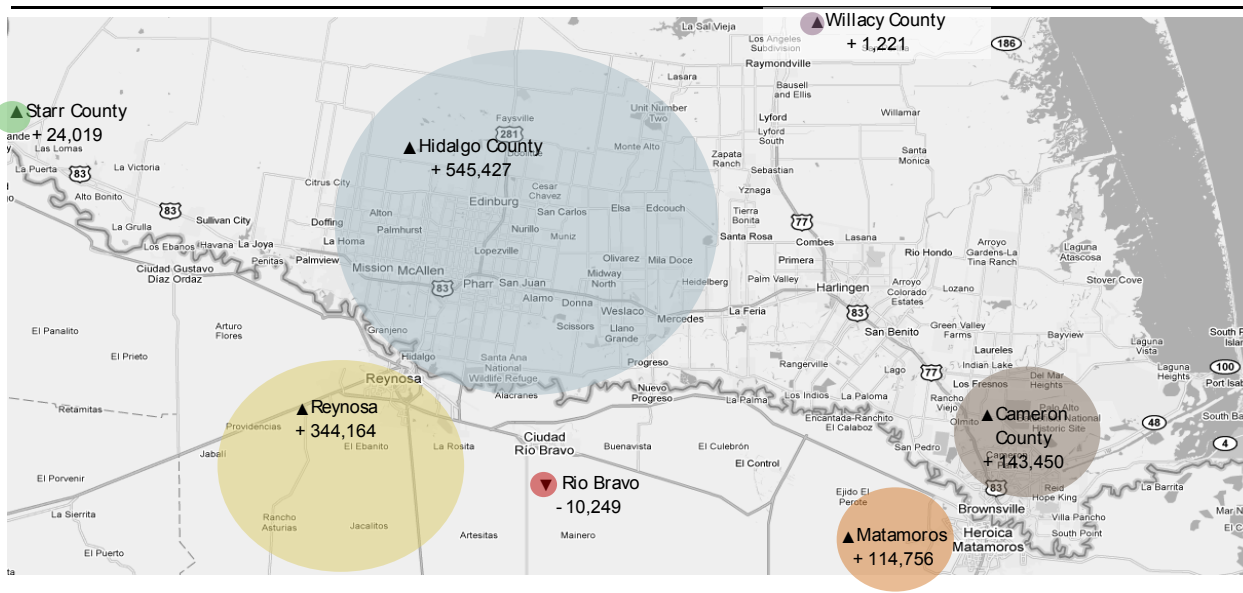
Figure 2.4 LOWER RIO GRANDE VALLEY  
Net annual components of population change for U.S. counties



SOURCE: U.S. Census Bureau; Moody's Analytics

NOTE: Figures are for U.S. side of region only (i.e., Cameron County, Hidalgo County, Starr County, and Willacy County)

Figure 2.5 LOWER RIO GRANDE VALLEY  
Projected population change by region, 2010-2030



SOURCE: Texas State Data Center (3.0 scenario); CONAPO, Consejo Nacional de Población (Delimitación de zonas metropolitanas de México)

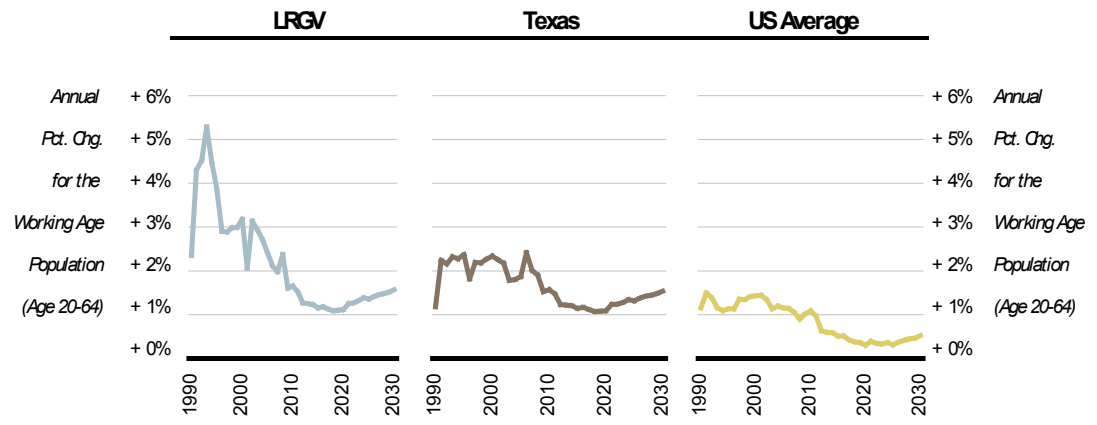
### Age structure

A look at the region's age structure (Figures 2.6 and 2.7) reveals a young population relative to the U.S. Although the percentage of the population under 18 years is expected to decline steadily over the coming decades, this group will still represent a greater share of the Valley's overall population than the national average.

Conversely, the number of retirement-age individuals (those 65 years or older) is expected to increase during the period, but at levels well below that of the nation. As a result, the Valley is expected to continue to have a greater share of its population in the traditional working age range (16 to 64 years old) than the U.S. as a whole.

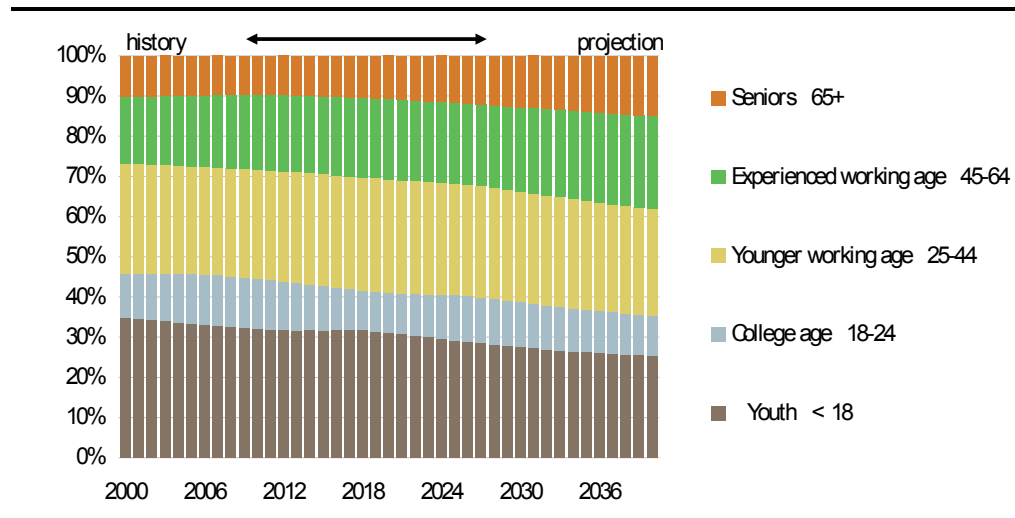
From the perspective of local employers, having a young population presents both an opportunity and a challenge. Employers in the region are less likely to be faced with the en masse retirement of aging workers than those in other parts of the country. The trade-off is a steady influx of inexperienced workers, many of whom have different expectations about work than previous generations.

Figure 2.6 LOWER RIO GRANDE VALLEY  
Annual growth rate of the working age population (age 20-64), 1990-2030



SOURCE: U.S. Census Bureau (history) Moody's Analytics (projections)

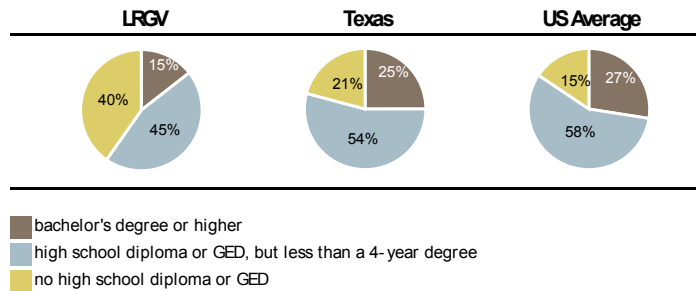
Figure 2.7 LOWER RIO GRANDE VALLEY  
Population by age in the 4-county region



SOURCE: Texas State Data Center (3.0 scenario)

Figure 2.8

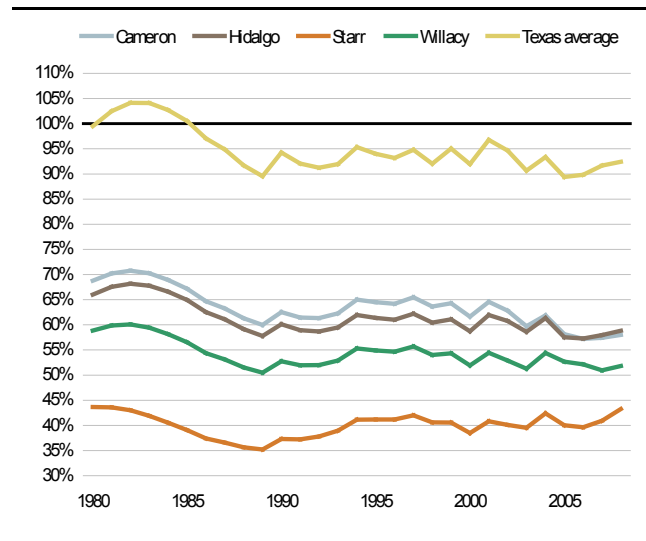
LOWER RIO GRANDE VALLEY  
Highest educational attainment for the population age 25 or older



SOURCE: U.S. Census Bureau's American Community Survey, 2006-2008 average; TIP Strategies

Figure 2.9

LOWER RIO GRANDE VALLEY  
Median household income relative to the US (US = 100%)



SOURCE: U.S. Census Bureau's Current Population Survey (CPS); Moody's Analytics

### Education and income

The regional assessment presented as part of the 2005 industry cluster analysis revealed that roughly one-half of adult residents in the four-county region lacked a high school diploma or equivalency compared with roughly 20 percent of adults nationwide. Data for the four-county region compiled from the American Community Survey show some improvement, although educational attainment continues to be a problem for the Valley (Figure 2.8). Based on ACS data 2 out of every 5 residents (40 percent) did not finish high school or obtain an equivalency. By comparison, only 21 percent of adults in Texas and 15 percent of adults nationwide fail to meet this standard. The region also lags the state and the U.S. in the percentage of adults with a Bachelor's degree or higher. Just 15 percent of LRGV residents age 25 years and older have at least a 4-year degree, compared with 25 percent of Texans and 27 percent of adults nationally.

Income levels in the region also lag significantly behind state and national figures (Figure 2.9), illustrating the link between education and earning power. Median household income was lowest in Starr County at just 43 percent of the national average in 2008. Income levels were similar in Cameron and Hidalgo Counties, with each county having median household incomes approaching 60 percent of national levels.

#### Understanding medians

The median represents the middle value in an ordered set of data. In other words, 50 percent of the values are above the median and 50 percent are below it. By contrast, the mean, or average, is calculated by adding all the values together and dividing by the number of elements. For statistics of income, in particular, use of the median is preferable to the mean, since the mean is more easily skewed by outliers (values that are either much higher or much lower than the majority of the data).

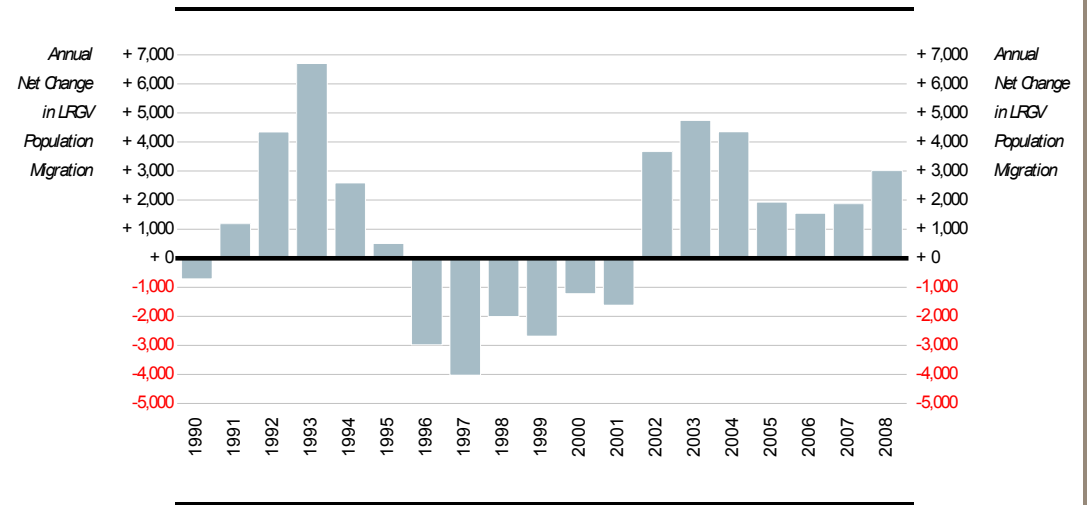


### Migration

The components of change data presented previously are based on estimates prepared by the U.S. Census Bureau using sample data. Figure 2.10 represents actual data on the movement of people between counties based on federal tax returns. These data are compiled by the Internal Revenue Service based on year-over-year address changes on tax filing. They are compiled for every county in the U.S. and can be used to illustrate the flow of people between different parts of the country. While not an exact match, the number exemptions can be used as a proxy for residents. As mentioned above, migration patterns in the 4-county LRGV are heavily tied to economic conditions, with the region experiencing an ebb and flow as people return to the region when jobs are scarce and head out to look for work when the economy rebounds.

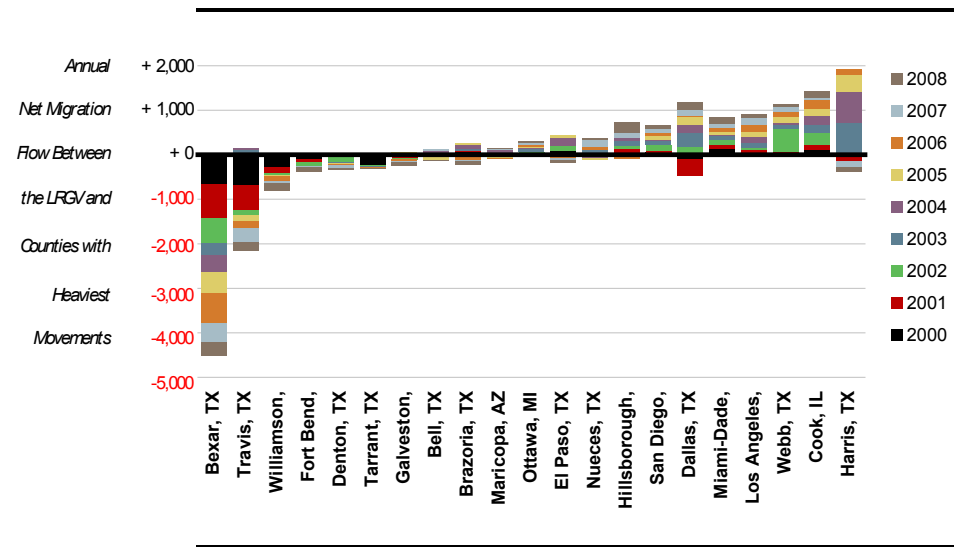
A look at these numbers in greater detail (Figure 2.11) shows the LRGV region consistently loses more residents to Bexar County than to any other county. Over the nine year period analyzed, Bexar County has picked up more than 4,000 residents from the Valley counties. By contrast, the net flow between the Valley and Harris County has been positive during this same period. The 4-county LRGV netted roughly 2,000 residents from Harris

Figure 2.10 LOWER RIO GRANDE VALLEY\*  
Net annual migration patterns



SOURCE: TIP Strategies; U.S. Internal Revenue Service; Moody's Analytics  
\* Unless indicated otherwise, the Lower Rio Grande Valley is defined in all charts shown as the four-county region of Hidalgo, Cameron, Starr, and Willacy.

Figure 2.11 LOWER RIO GRANDE VALLEY  
U.S. counties with heavy migration flows to/ from the LRGV



SOURCE: TIP Strategies; U.S. Internal Revenue Service; Moody's Analytics

County, though much of the gains were experienced in the middle of the decade (2003-2005).

Figure 2.12 (*next page*) provides additional detail on migration flows during the last three years for which data are available.

Commuting

A look at the most recent commuting data from the Census Bureau's Local Employment Dynamics (LED) series shows an imbalance in much of the region between where people live and where jobs are located (Figure 2.12).

Brownsville has the highest number of residents who live and work in the same city with nearly 39,000 residents holding jobs within the city limits (Figure 2.13). At the other end of the spectrum, South Padre Island has the smallest number of residents working on the island (180). Even some residents of the Valley's two largest employment centers – McAllen and Edinburg – commute to other parts of the region. McAllen sends roughly 7,600 residents to work in Edinburg, while Edinburg sends just under 6,000 to McAllen. Mission also has a substantial interchange of workers with McAllen. Roughly 7,200 workers head from Mission to McAllen for work, while another 5,700 go in the opposite direction.

A graphic representation of the Valley's commuting patterns is provided in Figures 2.14

About the data  
Historically, data on commuting patterns has been available only through the decennial census. In an effort to provide more timely information, relevant federal agencies have partnered to create the Longitudinal Employer-Household Dynamics TIP Strategies, Inc. Program. This program includes the Local Employment Dynamic (LED) series which provides

Figure 2.12

LOWER RIO GRANDE VALLEY  
Major migration patterns with the LRGV in the past 3 years

US County	2006	2007	2008
Hillsborough, FL (Tampa)	-26	112	226
Dallas, TX	25	133	174
Miami-Dade, FL	94	88	159
Cook, IL (Chicago)	197	60	145
San Diego, CA	81	79	88
Los Angeles, CA	180	143	85
Webb, TX (Laredo)	111	121	52
Nueces, TX (Corpus Christi)	72	168	31
Ottawa, MI (western Michigan agricultural region)	57	29	29
Mariocopa, AZ (Phoenix)	-13	26	6
Tarrant, TX (Fort Worth)	-12	26	-13
Bell, TX (Temple)	21	26	-20
Denton, TX (suburban Dallas)	-30	-74	-30
El Paso, TX	-54	-39	-55
Galveston, TX (suburban Houston)	-34	-34	-69
Brazoria, TX (suburban Houston)	-110	-35	-77
Fort Bend, TX (suburban Houston)	-2	-16	-102
Harris, TX (Houston)	130	-140	-111
Williamson, TX (suburban Austin)	-96	-68	-172
Travis, TX (Austin)	-157	-317	-193
Bexar, TX (San Antonio)	-660	-437	-302

SOURCE: TIP Strategies; U.S. Internal Revenue Service; Moody's Analytics

Figure 2.13

LOWER RIO GRANDE VALLEY  
Commuting patterns in selected LRGV cities, 2008

# = number of residents who live and work in the same city

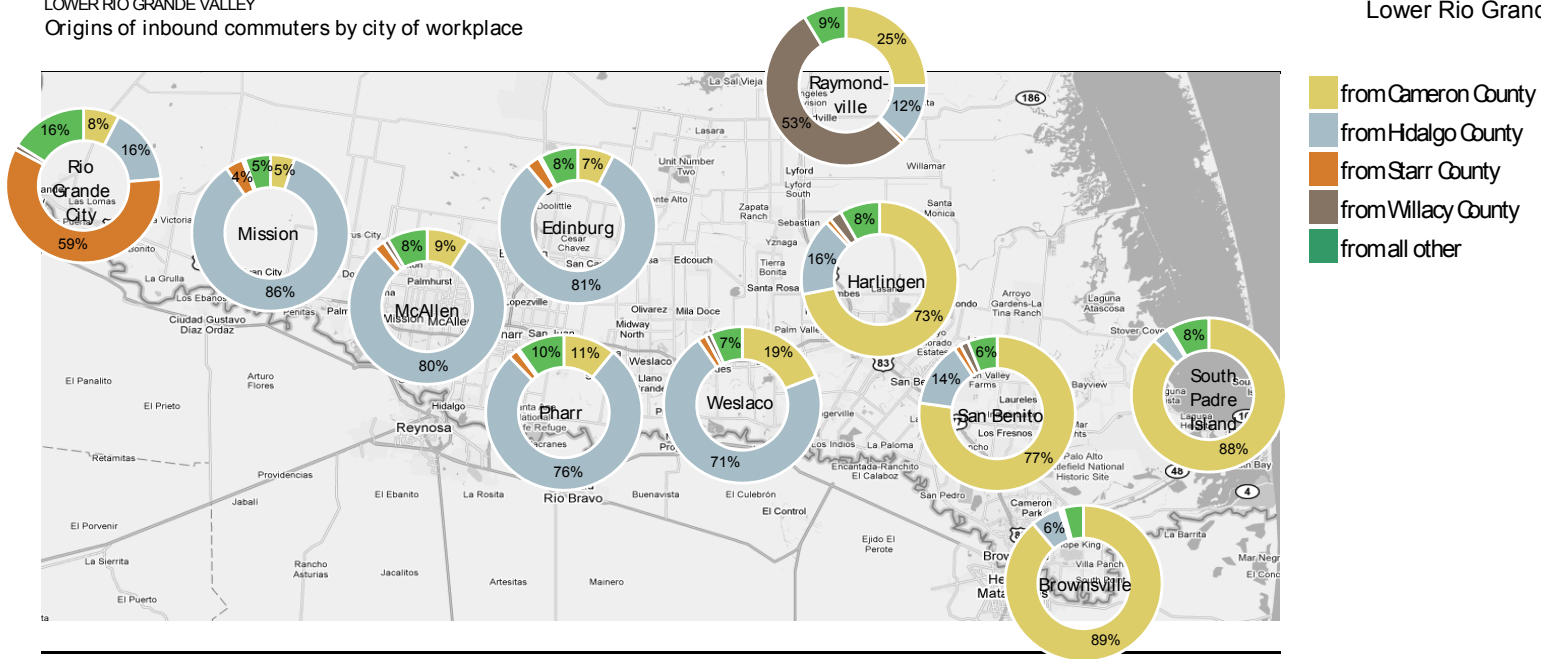
		Commuting to...										
		McAllen	Brownsville	Harlingen	Edinburg	Mission	Pharr	Weslaco	San Benito	Rio Grande City	South Padre Island	Raymondville
Commuting from...	McAllen	25,739	906	1,114	7,624	5,721	3,620	1,149	121	152	46	43
	Brownsville	3,092	38,655	3,090	872	530	1,167	608	880	114	1,020	68
	Harlingen	1,318	1,856	11,891	548	—	327	982	949	—	89	233
	Edinburg	5,695	269	463	6,874	1,305	1,318	511	103	—	—	29
	Mission	7,198	242	290	2,171	6,943	1,186	—	—	71	—	—
	Pharr	6,974	322	432	2,295	1,327	3,555	613	57	—	—	—
	Weslaco	2,019	191	766	756	505	618	3,312	—	—	—	—
	San Benito	529	1,052	3,387	225	—	133	366	1,120	—	53	62
	Rio Grande City	641	118	123	291	284	152	85	—	1,141	—	—
	South Padre Island	55	40	13	12	12	8	—	—	—	180	—
Raymondville	521	165	527	154	70	74	79	—	—	—	891	

SOURCE: U.S. Bureau of the Census, Local Employment Dynamics (LED) database, 2008

and 2.15 (*next page*).

Figure 2.14

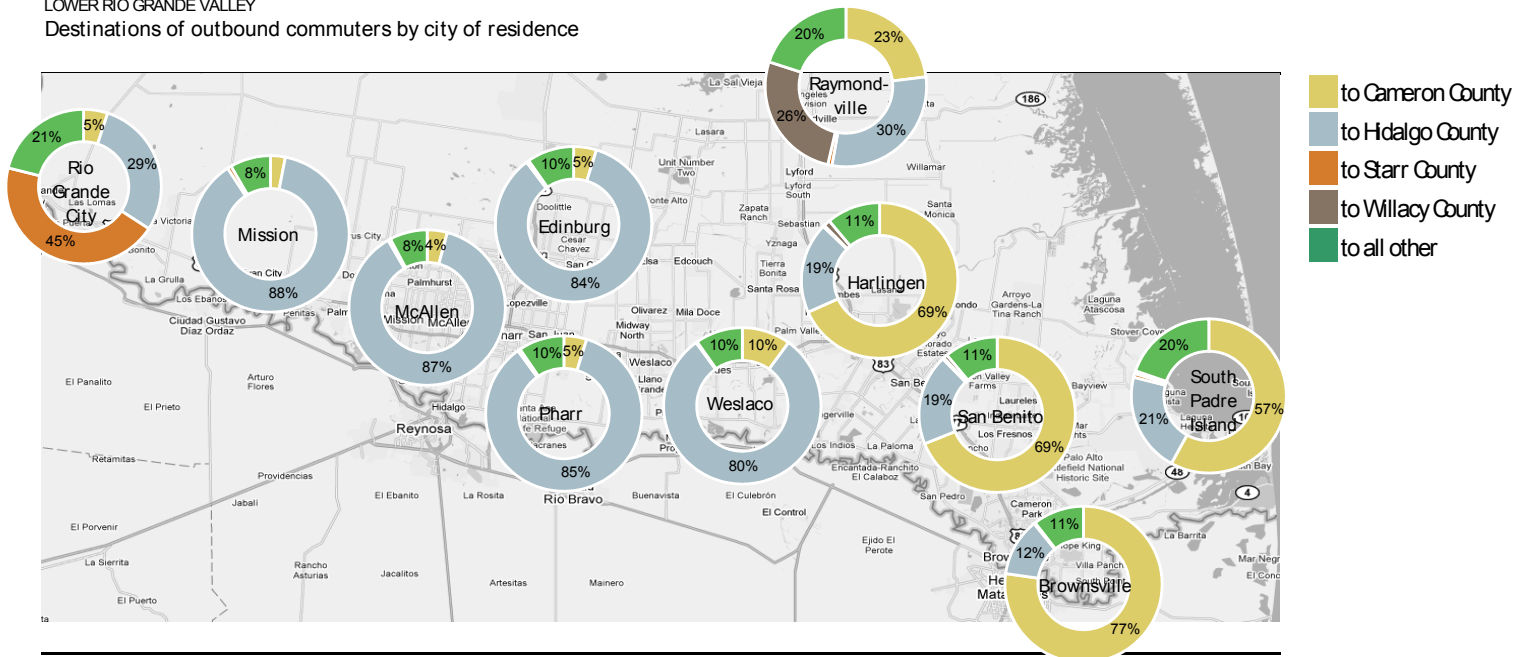
LOWER RIO GRANDE VALLEY  
Origins of inbound commuters by city of workplace



SOURCE: U.S. Census Bureau's Local Employment Dynamics (LED) database, 2002-2008

Figure 2.15

LOWER RIO GRANDE VALLEY  
Destinations of outbound commuters by city of residence



SOURCE: U.S. Census Bureau's Local Employment Dynamics (LED) database, 2002-2008

### Job distribution

As revealed by the commuting patterns data, jobs are not evenly distributed across the LRGV region. Mission, Pharr, and Brownsville had a near equal number of residents and jobs, indicated by a ratio at or near 1.0 in Figure 2.16. South Padre Island's ratio was 7.3 – seven jobs for every employed resident – reflecting the island's unique economy.

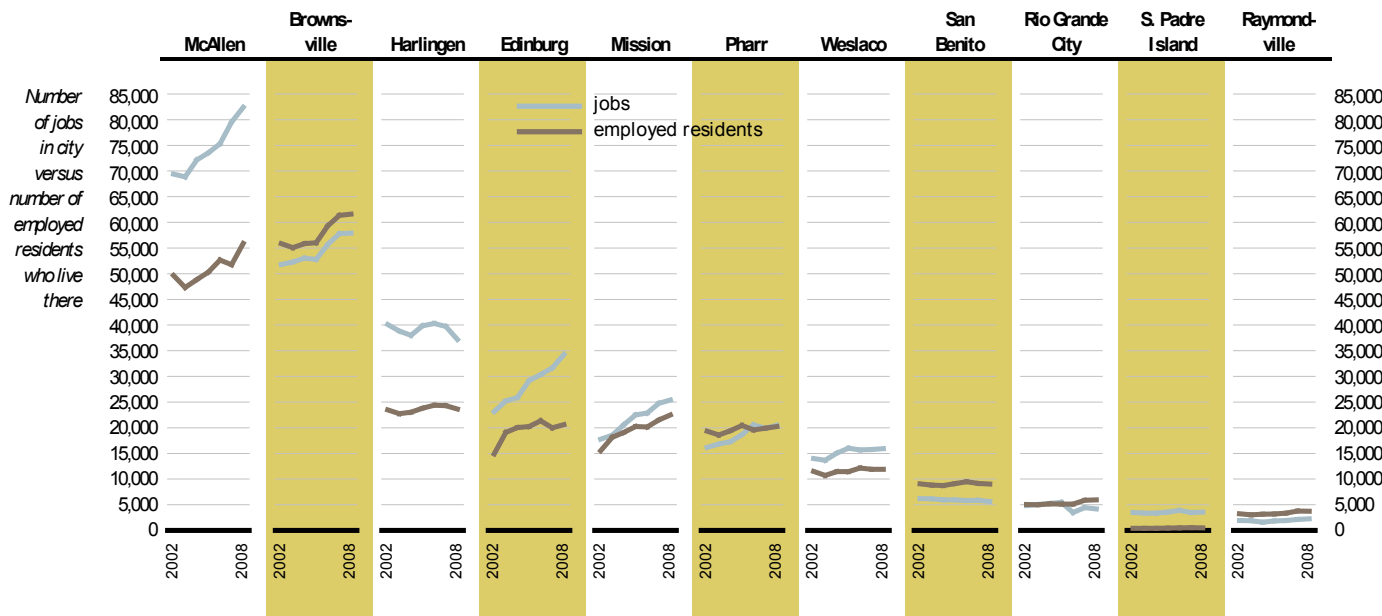
By contrast, San Benito and many of the smaller locations had more residents than jobs, suggesting a higher number of outbound commuters than other communities. Edinburg had the highest ratio, with 1.7 jobs for every employed resident. Figure 2.17 shows the job-resident population over time.

Figure 2.16: Ratio of jobs per employed resident, 2008

	Jobs/Employed Resident
Edinburg, TX	1.7
Harlingen, TX	1.6
McAllen, TX	1.5
Weslaco, TX	1.3
Mission, TX	1.1
Pharr, TX	1.0
Brownsville, TX	0.9
Rio Grande City, TX	0.7
San Benito, TX	0.6
Raymondville, TX	0.6

SOURCE: U.S. Bureau of the Census, Local Employment Dynamics (LED)

Figure 2.17 LOWER RIO GRANDE VALLEY  
Number of jobs vs jobholding residents by city



SOURCE: U.S. Bureau of the Census, Local Employment Dynamics (LED) database, 2002-2008

### Unemployment

Unemployment rates also vary in the region, with Starr and Willacy Counties having the highest rates (Figure 2.18).

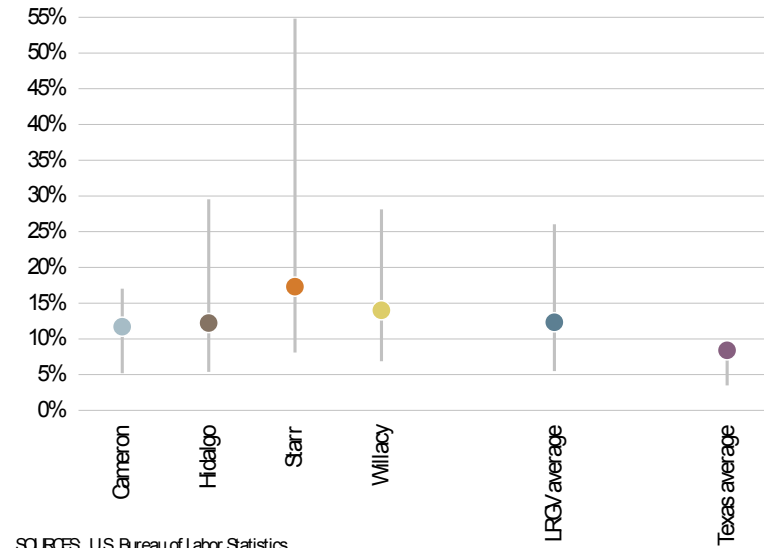
Unemployment rates in the LRGV's four counties have soared well into the double-digits in the past. Although jobless rates are currently quite high, they are nowhere near the top of the historical range in any of the four counties.

The actual (i.e., seasonally unadjusted) jobless rate for the four-county LRGV region was 12.3 percent in August 2010 compared to 8.4 percent statewide. Given the current state of the economy, this shows a remarkably low differential between the LRGV region and the statewide average.

Figure 2.19 shows annual average unemployment rates as a time-series. Despite the Valley's relatively strong performance during the recession, a large share of the region's workers is still unable to find employment.

Figure 2.18

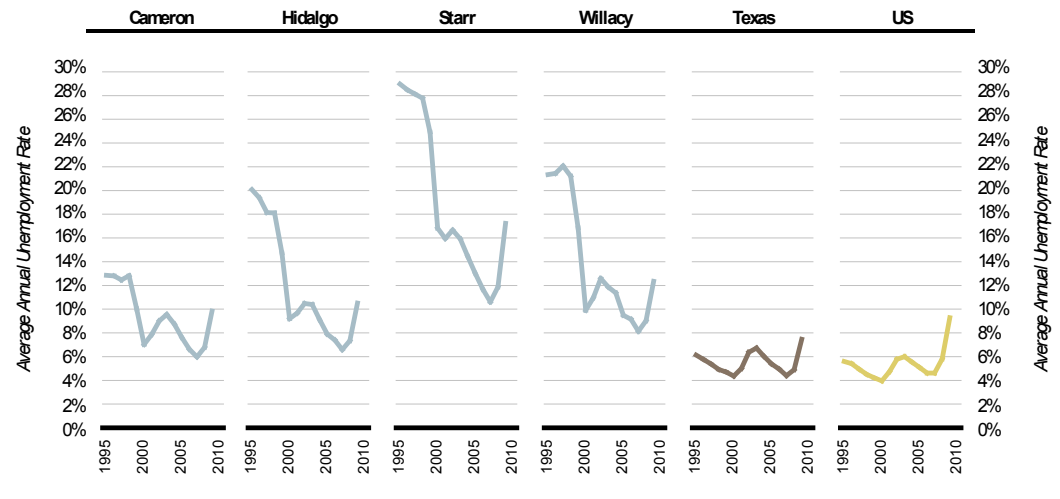
LOWER RIO GRANDE VALLEY  
 Latest unemployment rate in the context of 20-year historical range  
 Current unemployment rate compared to maximum and minimum between 1990 and 2010



SOURCES: U.S. Bureau of Labor Statistics  
 \* All data from January 1990 through August 2010, not seasonally adjusted

Figure 2.19

LOWER RIO GRANDE VALLEY  
 Average annual unemployment rate through 2009



SOURCE: TIP Strategies; U.S. Bureau of Labor Statistics, LAUS annual averages; Moody's Analytics

Figure 2.20

The unemployment rolls

*Five-year rolling changes in the number of unemployed workers in each county*

*Monthly numbers are LAUS survey-based and not seasonally adjusted*

Cameron County				
Year ending August	Number Unemployed	12-month net change	rising	falling
2006	9,474	-761		
2007	8,321	-1,153		
2008	10,970	+ 2,649		
2009	15,655	+ 4,685		
2010	18,400	+ 2,745		

Hidalgo County				
Year ending August	Number Unemployed	12-month net change	rising	falling
2006	19,178	-582		
2007	17,339	-1,839		
2008	22,187	+ 4,848		
2009	33,449	+ 11,262		
2010	37,341	+ 3,892		

Starr County				
Year ending August	Number Unemployed	12-month net change	rising	falling
2006	2,062	-71		
2007	1,733	-329		
2008	2,418	+ 685		
2009	4,100	+ 1,682		
2010	4,301	+ 201		

Willacy County				
Year ending August	Number Unemployed	12-month net change	rising	falling
2006	658	-10		
2007	577	-81		
2008	726	+ 149		
2009	1,081	+ 355		
2010	1,178	+ 97		

SOURCES: U.S. Bureau of Labor Statistics, LAUS program

The region's employment growth was strong in the middle of the decade. All four counties saw their unemployment rolls fall in 2006 and 2007 as jobs were still being added faster than the labor force was growing.

This situation changed in 2008 as the number of unemployed began to rise in all four counties. The peak of the job recession came in 2009 as Hidalgo counted an additional 11,300 unemployed workers for the year on top of the 22,000 it already had. Cameron tacked on nearly 4,700 to its unemployment rolls in 2009, with Starr and Willacy counties together adding another 2,000 to the region's jobless ranks.

The number of unemployed workers continues to rise in 2010 in all four counties, but the pace has slowed significantly.



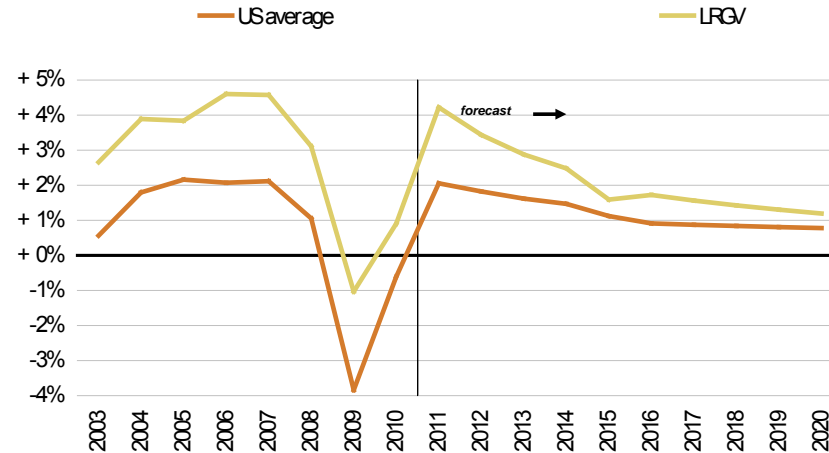
### Employment trends

The four-county LRGV has consistently outpaced U.S. employment growth. This pattern was clear during the expansion of the past decade, when job growth in the region averaged 4 percent or more annually compared to a national rate of near 2 percent (Figure 2.21). The recession in the Valley also proved much milder relative to the U.S. As we head into the first phases of economic recovery, the region is predicted to get an initial bounce in job growth. Over the longer term, however, most national forecasts show sluggish job growth ahead. As this occurs, the LRGV's growth rate is expected to lose steam, falling more in line with national patterns.

Despite the downturn, total employment in the four-county LRGV region – including covered, part-time, and the self-employed – has recovered to near 490,000, or about the same as the peak level in 2008. Current trends should push total employment above a half-million for the first time during 2011.

Figure 2.21

LOWER RIO GRANDE VALLEY  
 Job growth trends, past and future  
 Employment growth history (2003-2009) and forecast (2010-2020)



SOURCES: EMSI Complete Employment - 3rd Quarter 2010

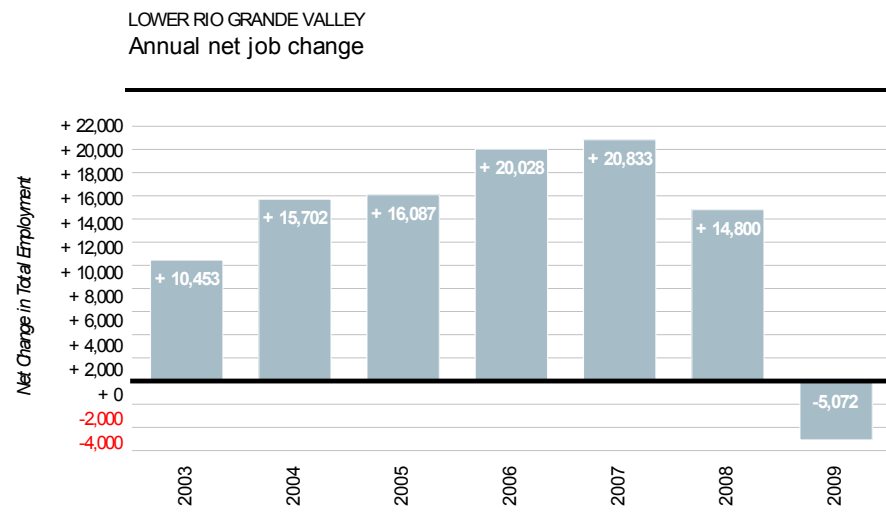
About the data

Unless otherwise indicated, employment data used in this report were prepared using Analyst 2.5, a suite of web-based analysis tools created by Economic Modeling Specialists Inc. (EMSI). EMSI integrates economic, labor market, demographic, and education data from over 80 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.

Figures 2.22 and 2.23 show that the 4-county region was still gaining jobs in 2008, even as the rest of the country was headed into recession. Jobs were added in virtually every sector, with the largest gains in Healthcare & social assistance, followed by Government. Manufacturing and agricultural establishments were hardest hit, with each sector losing nearly 600 jobs in 2008. As the country moved deeper into recession, even gains in healthcare and government could not offset losses as the region shed just over 5,000 jobs in 2009. Figure 2.24 (next page) provides year-over-year changes in employment for selected sectors.

Figure 2.22



SOURCE: TIP Strategies; EMSI, Complete Employment - 3rd Quarter 2010 (preliminary)

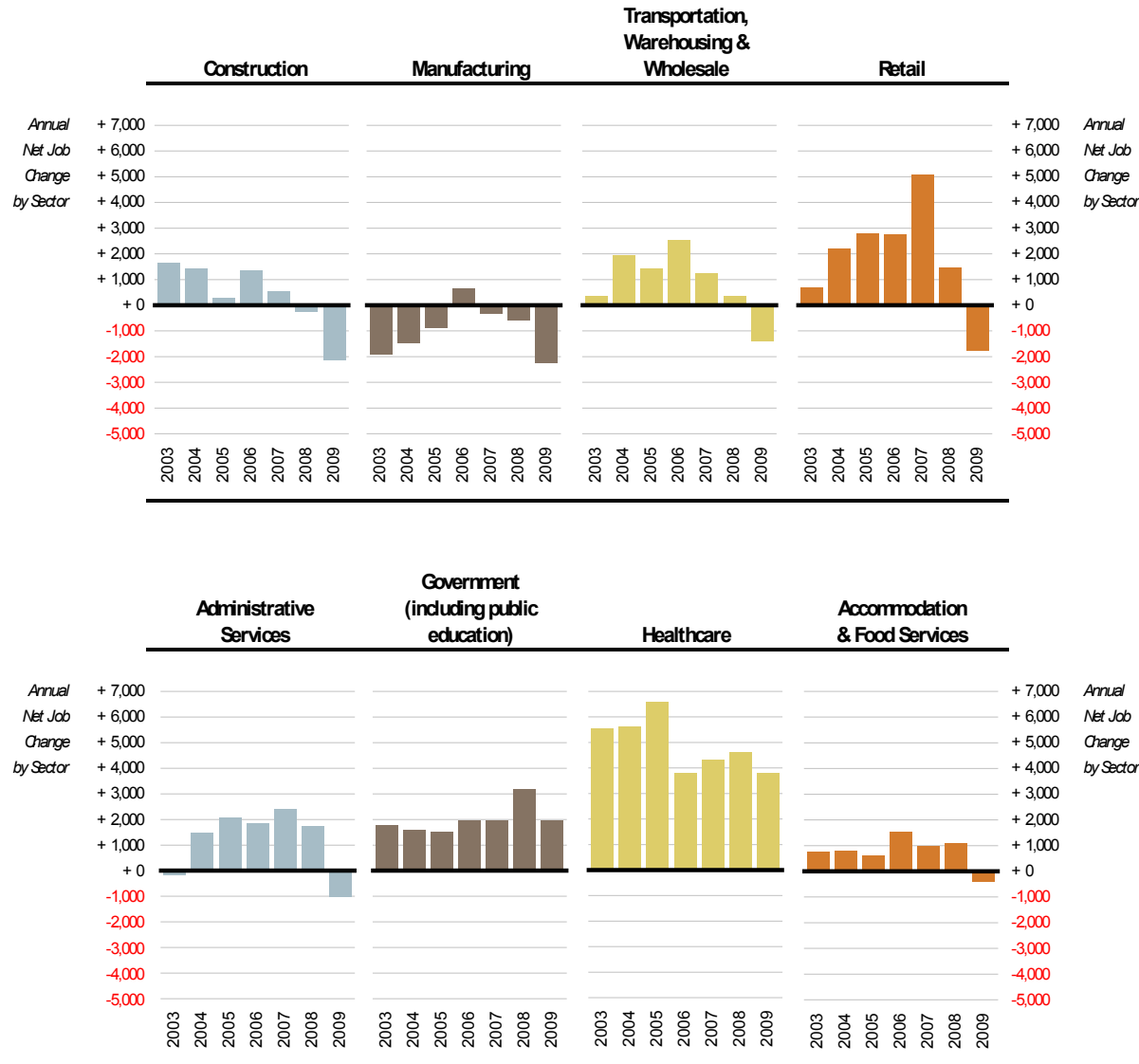
Figure 2.23 LOWER RIO GRANDE VALLEY 2007 employment shown with the changes from 2008 and 2009

	2007 balance +	2008 net chg +	2009 net chg
Healthcare & social assistance	86,997	4,644	3,803
Government (including public education)	85,919	3,157	1,937
Retail trade	65,334	1,461	(1,761)
Accommodation & food services	33,066	1,081	(400)
Construction	31,898	(239)	(2,130)
Administrative services	28,996	1,718	(998)
Transportation & warehousing	20,309	134	(715)
Personal & other services	19,792	881	(277)
Manufacturing	17,928	(567)	(2,229)
Finance & insurance	14,795	344	(500)
Agriculture, forestry, & fishing	13,814	(578)	(473)
Professional & technical services	13,026	125	(105)
Wholesale trade	12,834	234	(691)
Real estate	11,834	1,151	(390)
Information	5,344	(363)	185
Arts, entertainment, & recreation	4,832	30	(184)
Educational services (excl. public ed.)	4,528	930	318
Oil, gas, & mining	3,150	492	(584)
Utilities	1,255	54	(14)
Corporate HQs & regional offices	514	111	136
<b>Total</b>	<b>476,165</b>	<b>14,800</b>	<b>(5,072)</b>

TIP Strategies, Inc. SOURCE: TIP Strategies; EMSI, Complete Employment - 3rd Quarter 2010 (preliminary)

Theory Into Practice

Figure 2.24 LOWER RIO GRANDE VALLEY  
Annual net job change in selected economic sectors



SOURCE: TIP Strategies; EMSI, Complete Employment - 3rd Quarter 2010 (preliminary)

### Occupational structure

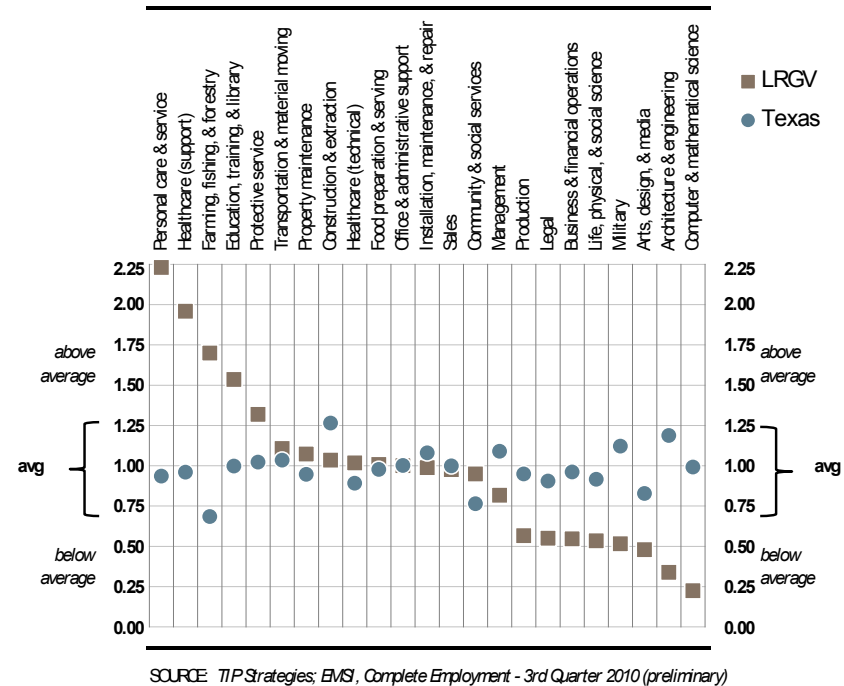
Despite the region's relatively strong showing in terms of employment, the Valley's occupational structure points to challenges. Relative to the U.S., the LRGV has high concentrations of employment in personal services, support services related to healthcare, and agricultural work (Figure 2.25). While a few positions within these occupational groups offer the potential for above-average wages, the majority are on the low-end of the wage scale.

By the same token, the region lags the state in higher-end service occupations. Concentrations of employment are low relative to the U.S. for a number of occupational groups that support business growth. These include Legal, Business & financial operations, and Architecture & engineering.

A review of job losses by occupation (Figure 2.26, next page) shows occupational groups which have fared best through the recession years include education, healthcare, and some types of services workers. These occupational groups have consistently added jobs in 2007, 2008, and 2009 even as the rest of the economy suffered. In a few fields like sales and admin support, the job losses came steeply in 2008, and then prospects rebounded in 2009. Those working in fields like construction, production, transportation, agriculture, or installation/repair services have experienced more persistent job losses over the past three years.

The patterns of local occupational job gains and losses over the past few years are especially notable when compared with national staffing patterns by gender. Occupational fields with consistent job gains are most likely to be staffed by women, while

Figure 2.25 LOWER RIO GRANDE VALLEY  
Location quotients by occupational group (as of 2009)



#### Understanding LQs

A location quotient (LQ) is calculated as a local industry's share of total local employment divided by the same industry's share of employment at the national level:

$$LQ = \frac{\text{Local jobs in industry} / \text{Total local jobs}}{\text{U.S. jobs in industry} / \text{Total U.S. jobs}}$$

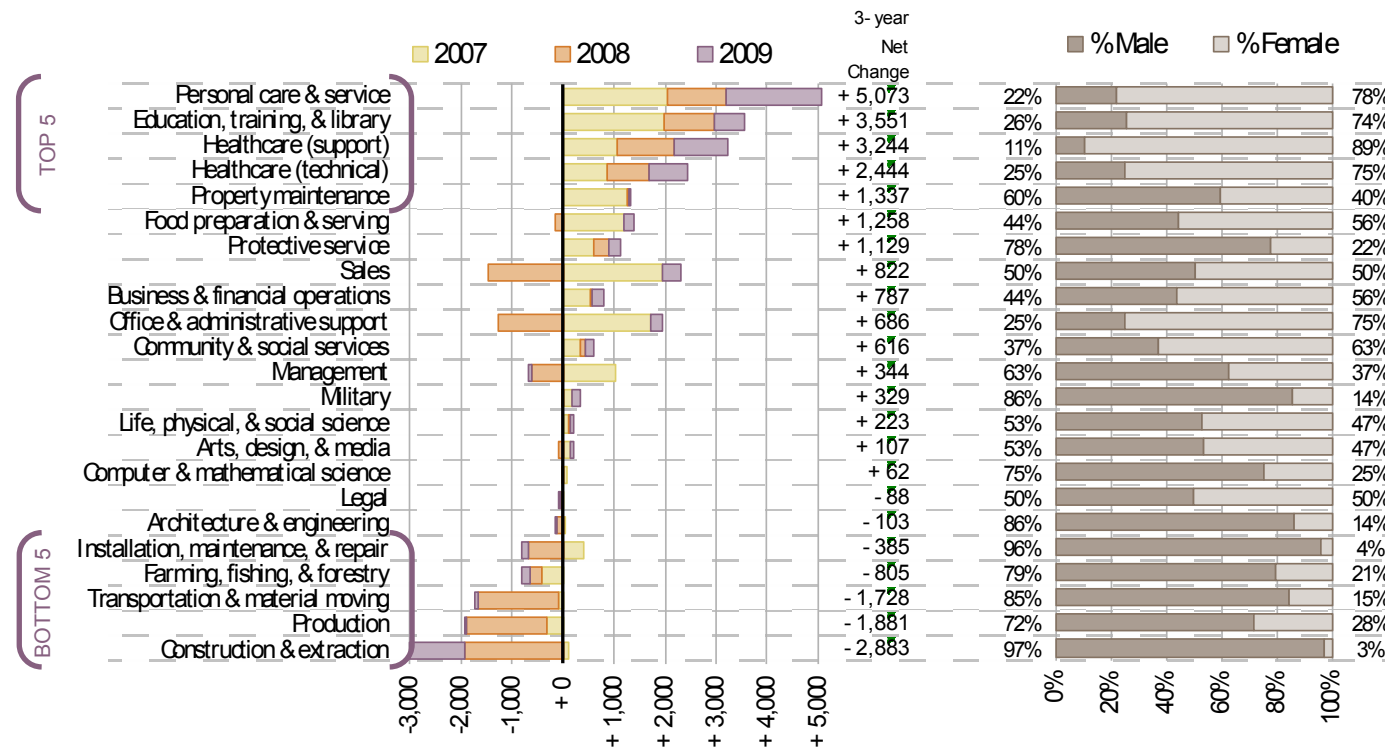
If the local industry and national industry are perfectly proportional, the LQ will be 1.0. If an industry is heavily concentrated at the local level, the LQ will be higher than 1.0. Conversely, if the industry is sparsely concentrated at

those fields with the most persistent losses tend to be male-dominated. The result is that – in general terms – male and female workers have been apt to experience the recession in different ways.

When the LRGV's top five job-gaining occupational groups (mostly female) are compared directly with the bottom five job-losing occupational groups (mostly male), the differences are stark. In the three-year period from 2007 through 2009, the top five occupational groups gained more than 15,000 jobs while the bottom five lost more than 7,000. This finding is underscored by Texas Workforce Commission statistics which show that the number of women in the workforce exceeded the number of men in February 2009 for the first time in the state's history. Women are also outpacing men in educational attainment. According to figures released by the U.S. Census Bureau in 2010, nearly six out of ten advanced degree holders between the ages of 25 and 29 are women.

Further analysis of the region's hardest-hit occupations is provided as Appendix B of this report. Section 3 presents an analysis of the region's growth clusters and provides greater detail on employment by industry and occupation.

Figure 2.26 Job gains and losses by occupation in the 4-county LRGV region, 2007 through 2009



SOURCES: EMSI Complete Employment - 3rd Quarter 2010; US Bureau of Labor Statistics, Consumer Population Survey; US Department of Defense, Deputy Under Secretary for Military Community and Family Policy, "2008 Demographics Report"

Entrepreneurship indicators

The distribution of businesses by firm size (number of employees) largely mirrors that of the state and the nation. The vast majority of establishments in the four counties are micro businesses – those with less than 10 employees. All but a handful of establishments employ less than 100 people (Figure 2.27).

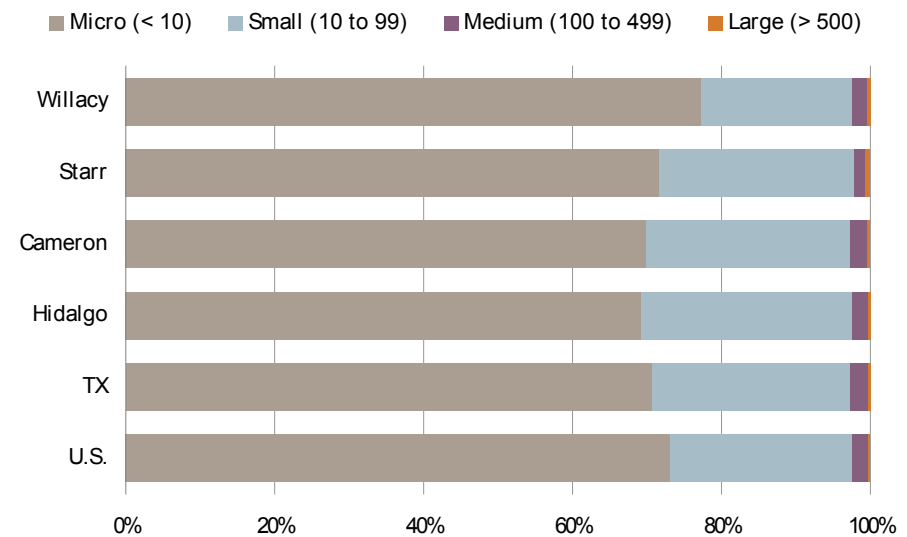
Hidalgo County had the greatest number of establishments in 2008, with more than 10,000. Cameron County was second with nearly 6,400.

The U.S. Census Bureau provides data on changes in employment through its Statistics of U.S. Businesses (SUSB) program. The data cover all U.S. business establishments with paid employees except for those employed in a handful of industries (crop and animal production, rail transportation, most government employees, postal service workers, and those employed in private households). Figure 2.28 (next page) shows a snapshot of the business churn in the region based on this data set.

Figure 2.27

**LOWER RIO GRANDE VALLEY**

Establishments by firm size (number of employees), 2008



	Willacy	Starr	Cameron	Hidalgo	Texas	U.S.
# of Establishments	211	464	6,368	10,625	522,336	7,601,169
% of total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Micro (less than 10)	163	333	4,460	7,355	369,656	5,555,961
% of total	77.3%	71.8%	70.0%	69.2%	70.8%	73.1%
Small (10 to 99)	43	122	1,738	3,019	138,537	1,862,287
% of total	20.4%	26.3%	27.3%	28.4%	26.5%	24.5%
Medium (100 to 499)	4	7	150	222	12,573	163,747
% of total	1.9%	1.5%	2.4%	2.1%	2.4%	2.2%
Large (more than 500)	1	3	24	36	1,570	19,174
% of total	0.5%	0.6%	0.4%	0.3%	0.3%	0.3%

SOURCE: U.S. Census Bureau, County Business Patterns

Glossary of terms

An establishment is a single physical location where business transactions take place and for which payroll and employment records are kept.

Births are establishments that have zero employment in the first quarter of the initial year and positive employment in the first quarter of the subsequent year.

Deaths are establishments that have positive employment in the first quarter of the initial year and zero employment in the first quarter of the subsequent year.

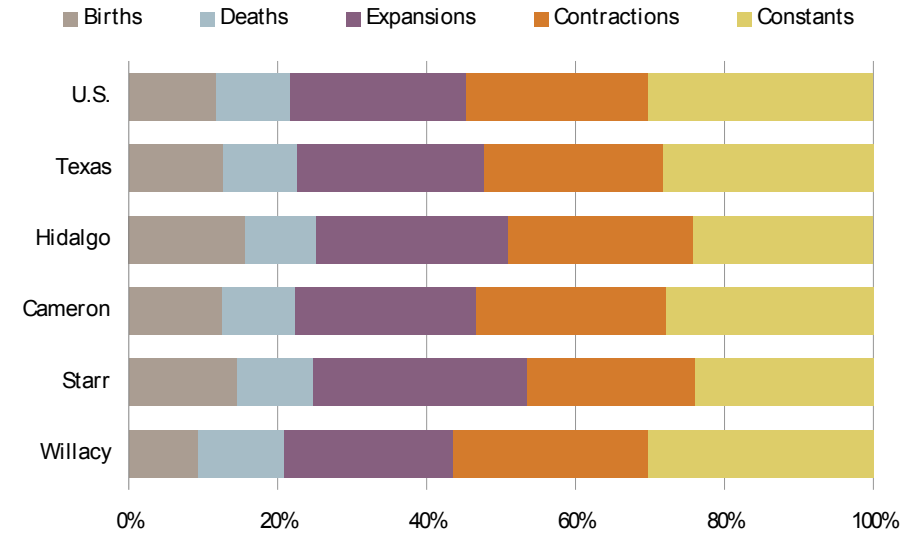
Expansions are establishments that have positive first quarter employment in both the initial and subsequent years and increase employment during the time period between the first quarter of the initial year and the first quarter of the subsequent year.

Contractions are establishments that have positive first quarter employment in both the initial and subsequent years and decrease employment during the time period between the first quarter of the initial year and the first quarter of the subsequent year.

Figure 2.28

**LOWER RIO GRANDE VALLEY**

Establishment births, deaths, expansions, contractions, & constants, 2006-07



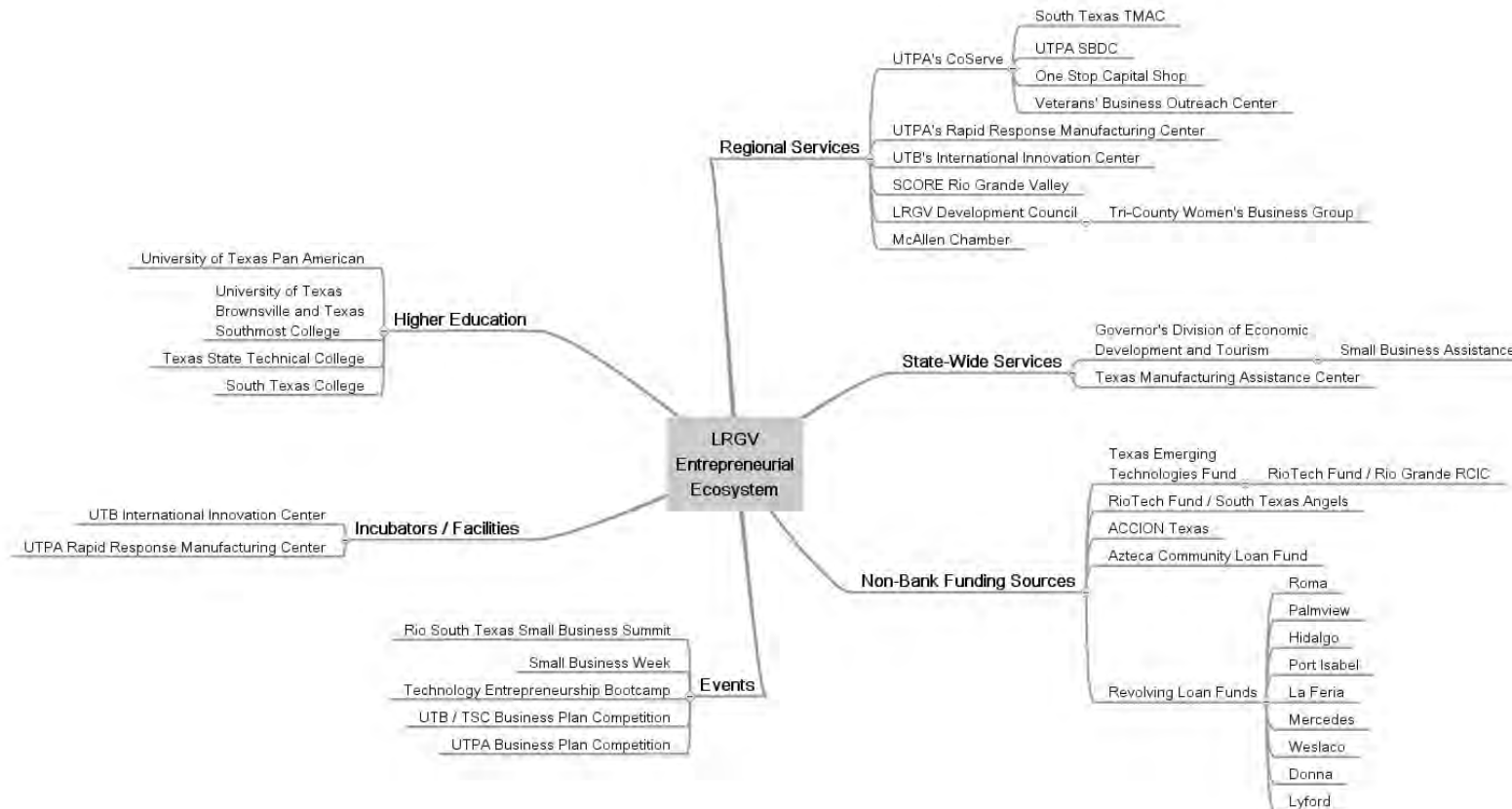
	Willacy	Starr	Cameron	Hidalgo	Texas	U.S.
Total	225	476	6,588	10,553	525,375	7,667,825
% of total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
Births	21	69	828	1,647	66,939	905,761
% of total	9.3%	14.5%	12.6%	15.6%	12.7%	11.8%
Deaths	26	49	643	1,019	51,816	753,330
% of total	11.6%	10.3%	9.8%	9.7%	9.9%	9.8%
Expansions	51	137	1,598	2,708	132,119	1,809,999
% of total	22.7%	28.8%	24.3%	25.7%	25.1%	23.6%
Contractions	59	107	1,687	2,630	125,767	1,884,218
% of total	26.2%	22.5%	25.6%	24.9%	23.9%	24.6%
Constants	68	114	1,832	2,549	148,734	2,314,517
% of total	30.2%	23.9%	27.8%	24.2%	28.3%	30.2%



## Entrepreneurship resources

As part of our assessment, we compiled information on resources available to entrepreneurs in the region using Mindmeister, an online mapping program. The resulting asset map is depicted in Figure 2.29. The regional partners can continue to update and expand this map as part of the entrepreneurship strategy outlined in Section 6. Location and service area is shown for selected resources in Figure 2.30 (next page).

Figure 2.29: LRGV entrepreneurship asset map



The SBDC and the program at UTB are the most active in the region. SCORE is only as active as its volunteer corps – which likely means some of the locations listed are inactive while others may be very active. UTPA has a number of programs under its Co-Serve program, including the SBDC, Texas Manufacturing Assistance Center, One Stop Capital Shop, and Veteran’s Business Outreach Center. The SBDC is Co-Serve’s primary small business program. The UTB program includes a business incubator as well (incubator space in both Brownsville & Raymondville).

In addition to the resources listed below, the McAllen Chamber of Commerce recently established an Inventors & Entrepreneurship Network. The group meets monthly and is intended to help facilitate connections between inventors and entrepreneurs.

Figure 2.30: Selected LRGV entrepreneurship resources

Resource	Locations	Service Area			
		Willacy	Hidalgo	Starr	Cameron
UT Pan Am – Small Business Development Center	Edinburg, Brownsville, San Benito	✓	✓	✓	✓
UT Brownsville - IIC	Brownsville, Raymondville	✓			✓
SCORE Rio Grande Valley	S. Padre Island, Brownsville, Harlingen, Weslaco, Edinburg, Pharr, Mission, Rio Grande City	✓	✓	✓	✓
LRGV Development Council Tri-County Women's Business Group	McAllen	✓	✓		✓
TMAC South Texas	Edinburg	✓	✓	✓	✓
RioTech Fund (Rio Grande RCIC)	Edinburg, Harlingen	✓	✓	✓	✓
ACCION Texas	Edinburg, Brownsville	✓	✓	✓	✓

SOURCE: Compiled by TIP Strategies.

### 3: Cluster Analysis

As part of our work, TIP is charged with identifying industry clusters and occupations that represent the greatest potential for contributing to the regional economy. In selecting target industries and occupations for the region, we employed a three-phase approach. We began by conducting an in-depth quantitative analysis of employment and occupational data for the four-county region. This analysis expands on the occupation and industry data presented in Section 2 and considers a range of factors, including industry size (in terms of employment), rate of growth (historical and projected), concentration in the region, and competitiveness.

Our analysis was supplemented by qualitative information gleaned from interviews with area businesses, economic development organizations, and education and workforce professionals. In addition, we considered strategic issues at the state and national level that could affect the potential for economic growth in the region. Examples include the implication of demographic trends (such as the continued retirement of the baby boomers), policy-related effects (such as healthcare reform), and programmatic activities (such as industrial targeting conducted at the state-level).

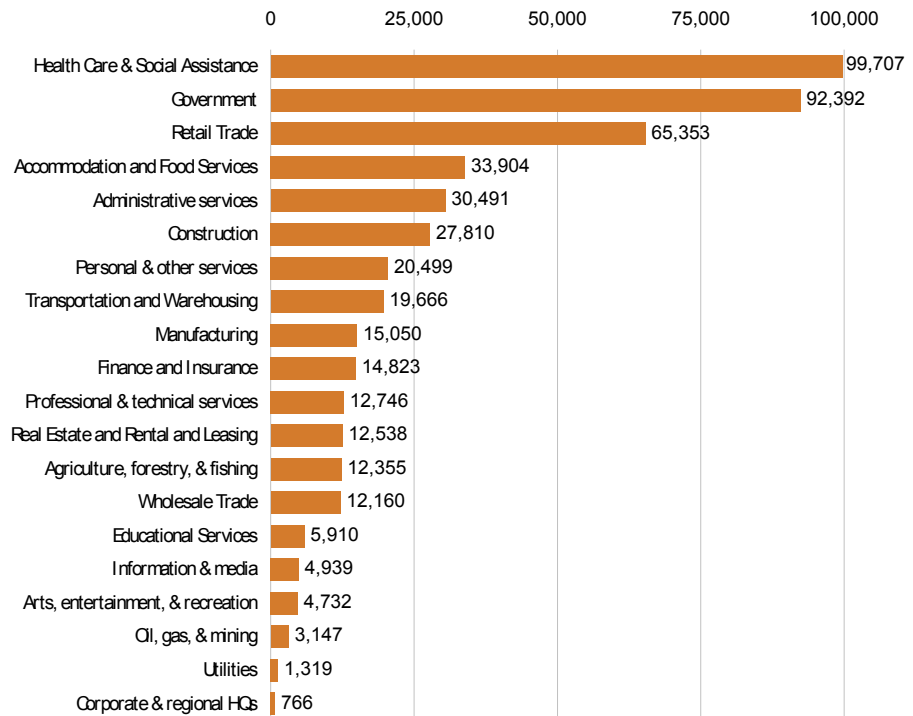
#### Industry trends

A look at employment data by industry reveals that more than half of the region’s jobs fall into three sectors: Health care & social assistance, Government, and Retail trade (Figure 3.1). These sectors are strongly correlated with population growth. At the other end of the spectrum, the

Figure 3.1

4- county LRGV region's 2010 job base by major industry

*Three industries account for slightly more than one-half of total employment*



NOTE: Educational Services includes only private-sector jobs; public education employment is included in Government.  
 SOURCES: EMSI Complete Employment - 3rd Quarter 2010

#### What is NAICS?

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 U.S. economy.

Valley still has little employment in key sectors, such as Information & media which includes software publishing, data processing, Internet service providers, and other technology-based establishments.

Figure 3.2 provides both historic and projected employment for the same major sectors. In addition to being the largest in terms of existing employment, healthcare, government, and retail are also expected to see the largest employment gains over the next five years, adding roughly 25,000, 14,000, and 8,000 jobs, respectively. Other sectors projected to have significant increases during the period include Administrative services (+6,616), Construction (+4,359), and Accommodation and food services (+3,958).

An analysis of 2010 location quotients provided in Figure 3.3 (*next page*) shows that employment in the Valley is concentrated in a handful of major sectors relative to the U.S. (*See page 20 for a description of location quotients.*) In addition to the three sectors mentioned previously – healthcare, government, and retail – agriculture makes up a larger share of the Valley's job base than the national average. Manufacturing employment levels in the four counties are also well below national levels, however, the impact of maquiladora employment is not captured in these statistics. The LQ analysis also points to weaknesses in important business support sectors, including professional services.

Figure 3.2: Employment by major industry sector in the 4-county LRGV region, 2005-2009 (history); 2010 – 2015 (projected)  
*Ranked by employment in 2010*

NAICS Code	Description	2005	2006	2007	2008	2009	2010	2015	Change 2010-2015		2010 LQ (US = 1.00)	2009 Establishments
									Number	Percent		
62	Health Care & Social Assistance	78,869	82,664	86,997	91,641	95,444	99,707	124,445	+24,738	24.8%	1.27	592
90	Government	81,978	83,949	85,919	89,076	91,013	92,392	106,339	+13,947	15.1%	1.00	102
44-45	Retail Trade	57,499	60,251	65,334	66,795	65,034	65,353	73,002	+7,649	11.7%	0.79	52
72	Accommodation & Food Services	30,555	32,075	33,066	34,147	33,747	33,904	37,862	+3,958	11.7%	1.06	1,198
56	Administrative Services	24,754	26,613	28,996	30,714	29,716	30,491	37,107	+6,616	21.7%	0.43	563
23	Construction	30,010	31,372	31,898	31,659	29,529	27,810	32,169	+4,359	15.7%	0.70	1,244
81	Personal & Other Services	19,276	19,804	19,792	20,673	20,396	20,499	22,170	+1,671	8.2%	1.30	3,080
48-49	Transportation & Warehousing	16,871	18,650	20,309	20,443	19,728	19,666	22,495	+2,829	14.4%	1.09	826
31-33	Manufacturing	17,626	18,257	17,928	17,361	15,132	15,050	15,501	+451	3.0%	0.54	262
52	Finance & Insurance	12,338	13,336	14,795	15,139	14,639	14,823	17,152	+2,329	15.7%	0.60	1,058
54	Professional & Technical Services	11,550	12,364	13,026	13,151	13,046	12,746	15,076	+2,330	18.3%	0.55	766
53	Real Estate And Rental & Leasing	10,255	10,878	11,834	12,985	12,595	12,538	15,337	+2,799	22.3%	0.38	1,363

11	Agriculture, Forestry, & Fishing	13,947	12,986	13,814	13,236	12,763	12,355	11,554	-801	-6.5%	0.14	39
42	Wholesale Trade	12,512	13,248	12,834	13,068	12,377	12,160	12,884	+724	6.0%	1.04	662
61	Educational Services	3,886	4,385	4,528	5,458	5,776	5,910	6,939	+1,029	17.4%	0.51	135
51	Information & Media	4,928	5,367	5,344	4,981	5,166	4,939	5,244	+305	6.2%	1.83	2,707
71	Arts, Entertainment, & Recreation	4,225	4,534	4,832	4,862	4,678	4,732	5,365	+633	13.4%	0.45	154
21	Oil, Gas, & Mining	2,596	2,818	3,150	3,642	3,058	3,147	3,288	+141	4.5%	1.01	1,564
22	Utilities	1,165	1,219	1,255	1,309	1,295	1,319	1,419	+100	7.6%	0.78	1,396
55	Corporate & Regional HQs	464	562	514	625	761	766	785	+19	2.5%	1.36	624
	Total	435,304	455,332	476,165	490,966	485,891	490,306	566,133	+75,827	15.5%		18,386

Source: EMSI Complete Employment - 3rd Quarter 2010.

Figures 3.1 through 3.3 show employment data at the major sector level (also called the 2-digit level in reference to the industry classification system used by the federal government). To arrive at target industries for the region, we analyzed data at the sub-sector, or 3-digit level, for the four-county region. Industries were analyzed using a number of statistical techniques to identify those that represent the best opportunity for future growth in the region. Specifically, industries were analyzed on five dimensions: size (employment), growth, wages, concentration (location quotients), and competitiveness (shift-share analysis). Each of these factors is discussed in more detail below.

Size (employment)

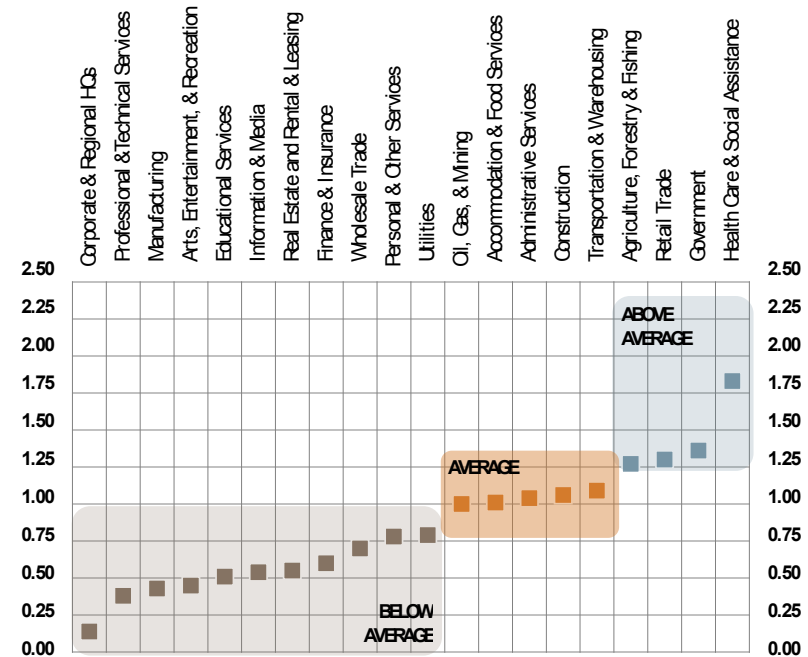
Figure 3.4 (next page) shows the top 25 industry subsectors ranked by employment in 2010. As in Figure 3.1, the largest employing industries in the region are largely driven by population growth – government, retail, food service, construction, and healthcare services. Most of the region’s large industry subsectors are expected to continue to experience growth in the coming years. However, durable goods wholesalers are projected to grow slowly, adding less than 200 jobs over the next five years. Crop and animal production employment is expected to lose more than 500 jobs during the same period.

Of greater concern is the relatively low earnings that are typical of many of the largest subsectors. A look at earnings per worker (EPW) shows that 10 of the 25 largest subsectors have an EPW below \$25,000. This figure should not be confused with wages. It represents the sum of industry earnings (wages, salaries, profits, benefits, and other

Figure 3.3

Industry group concentrations in the 4-county LRGV region

*Location quotient analysis*  
 US average for each industry = 1.00  
 Regional strength > 1.25  
 Regional weakness < 0.75



NOTE: Educational services includes only private-sector jobs; public education employment is included in Government.  
 SOURCES: EMSI Complete Employment - 3rd Quarter 2010

**What is SOC?**  
 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. Under the 2010 SOC system, all workers are classified into one of 840 detailed occupations, which are combined to form 461 broad occupations, 97

compensation) divided by the number of workers in the industry. It is intended to provide an indicator of the industry's importance to the economy. As a result, actual average earnings paid to workers in these industries are likely to be even lower. Federal government employment has the highest EPW, a reflection of the generous benefits, including pension plans, typically provided to these workers. Among the private sector industries on this list, hospitals have the highest EPW at roughly \$60,000.

Figure 3.4: Largest industries in the 4-county Lower Rio Grande Valley (3-digit NAICS level)  
Ranked by employment in 2010

NAICS Code	Description	2010	2015	Net Change 2010-2015	% Change 2010-2015	2010 LQ (US = 1.00)	EPW <sup>(1)</sup>	2009 Establishments
930	Local Government	72,949	84,455	+11,506	16.0%	2.88	\$45,884	1,865
621	Ambulatory Health Care Services	60,669	77,620	+16,951	28.0%	1.80	\$30,983	398
722	Food Services and Drinking Places	30,370	34,116	+3,746	12.0%	1.06	\$15,114	616
561	Administrative and Support Services	29,758	36,237	+6,479	22.0%	1.72	\$17,350	630
624	Social Assistance	19,053	23,684	+4,631	24.0%	1.08	\$13,933	1,330
238	Specialty Trade Contractors	18,873	22,058	+3,185	17.0%	1.07	\$25,341	712
622	Hospitals	14,030	16,342	+2,312	16.0%	0.53	\$59,723	599
452	General Merchandise Stores	12,758	14,860	+2,102	16.0%	1.06	\$22,947	58
541	Professional, Scientific, and Technical Services	12,746	15,076	+2,330	18.0%	0.38	\$32,864	1,347
484	Truck Transportation	11,600	13,449	+1,849	16.0%	0.71	\$30,601	103
531	Real Estate	10,857	13,476	+2,619	24.0%	1.50	\$19,789	254
920	State Government	10,595	12,563	+1,968	19.0%	2.12	\$45,996	382
445	Food and Beverage Stores	10,314	10,909	+595	6.0%	0.49	\$26,193	143
448	Clothing and Clothing Accessories Stores	8,446	9,567	+1,121	13.0%	1.86	\$15,135	509
441	Motor Vehicle and Parts Dealers	7,749	8,260	+511	7.0%	0.46	\$38,400	131
522	Credit Intermediation and Related Activities	7,530	8,359	+829	11.0%	0.66	\$41,198	105
811	Repair and Maintenance	7,139	7,643	+504	7.0%	1.25	\$25,249	267
11A	Crop and Animal Production	6,729	6,170	-559	-8.0%	1.24	\$19,285	355
813	Religious, Grantmaking, Civic, Professional, and Similar Organizations	6,118	6,553	+435	7.0%	0.96	\$18,034	503
623	Nursing and Residential Care Facilities	5,955	6,799	+844	14.0%	1.04	\$28,936	350
611	Educational Services	5,910	6,939	+1,029	17.0%	1.22	\$23,310	344
423	Merchant Wholesalers, Durable Goods	5,758	5,943	+185	3.0%	1.52	\$45,626	469
911	Federal Government, Civilian, Except Postal Service	5,750	6,302	+552	10.0%	1.58	\$117,035	215
236	Construction of Buildings	5,727	6,433	+706	12.0%	0.90	\$39,090	121
453	Miscellaneous Store Retailers	5,374	6,211	+837	16.0%	0.52	\$14,408	395

Source: EMSI Complete Employment – 3rd Quarter 2010. <sup>(1)</sup> Earnings per worker (EPW) does not reflect wages paid to individuals. It is the sum of industry earnings (wages, salaries, profits, benefits, and other compensation) divided by the number of workers in the industry. It is intended to provide an indicator of the industry's importance to the economy.

### Growth 2010 to 2015

We also looked at which industry subsectors are likely to experience significant levels of growth over the next five years (Figure 3.5, *next page*). Projections developed by private data provider EMSI point to continued growth in the region's largest sectors. The largest growth in terms of raw numbers is expected in Ambulatory health care services. This subsector is expected to add nearly 17,000 jobs – more than 3,000 jobs annually – between 2010 and 2015. In percentage terms, the region is expected to see a strong increase in employment related to financial investment products, with a 33 percent increase in the number of workers in securities and commodities projected for 2010 to 2015.

The region's continued growth in Ambulatory health care services merits a closer look. This subsector includes a variety of industries that provide services on an outpatient basis, such as offices of doctors and dentists, outpatient clinics, medical and diagnostic laboratories, and home health care providers. Growth in health care employment is anticipated across the U.S. and reflects both a rise in the use of the healthcare system generally (as more people require services like diagnostic imaging or laboratory testing) and an increase in demand created by the aging of the baby boom generation. However, nearly two-thirds of employment growth in this subsector in the four-county LRGV can be attributed to continued expansion in home health care employment. According to a 2008 article by the Dallas Federal Reserve, the prominence of home health care along the Texas-Mexico border can be attributed, in part, to the large number of residents who are eligible for government-sponsored health insurance. Another factor not mentioned by the Dallas Fed article is the relatively large share of the population with chronic conditions, particularly diabetes, which can often require home care. In addition to these “push” factors, the fact that barriers to entry in this field are relatively low creates a “pull” factor, drawing workers and small business owners into the field.

### Industry earnings

With the exception of government employment and hospitals, the top 25 subsectors in terms of earnings per workers (Figure 3.6, *page 32*) represent a very small slice of the region's employment base, with little or no growth expected for the majority of these subsectors in the next several years. Extraction-related industries such as pipeline transportation (\$126,816), oil and gas extraction (\$106,254), petroleum and coal products manufacturing (\$73,184), and support activities for mining (\$63,918) are among the highest-earning private sector jobs. This reflects both the hazards associated with the work and the high profit margins. Transportation industries associated with all modes of travel also score highly on this factor — rail (\$108,435), air (\$58,794), and water (\$55,366) — as do heavy industries like chemicals manufacturing (\$64,845), utilities (\$61,777), and transportation equipment manufacturing (\$55,271).



Figure 3.5: Fastest growing industries in the 4-county Lower Rio Grande Valley (3-digit NAICS level)  
 Ranked by net change 2010 - 2015

NAICS Code	Description	2010	2015	Net Change 2010-2015	% Change 2010-2015	2010 LQ (US = 1.00)	EPW <sup>(1)</sup>	2009 Establishments
621	Ambulatory Health Care Services	60,669	77,620	+16,951	28.0%	2.90	\$30,983	1,901
930	Local Government	72,949	84,455	+11,506	16.0%	1.80	\$45,884	399
561	Administrative and Support Services	29,758	36,237	+6,479	22.0%	1.06	\$17,350	617
624	Social Assistance	19,053	23,684	+4,631	24.0%	1.73	\$13,933	641
722	Food Services and Drinking Places	30,370	34,116	+3,746	12.0%	1.07	\$15,114	1,348
238	Specialty Trade Contractors	18,873	22,058	+3,185	17.0%	1.07	\$25,341	710
531	Real Estate	10,857	13,476	+2,619	24.0%	0.53	\$19,789	599
541	Professional, Scientific, and Technical Services	12,746	15,076	+2,330	18.0%	0.38	\$32,864	1,363
622	Hospitals	14,030	16,342	+2,312	16.0%	1.05	\$59,723	60
452	General Merchandise Stores	12,758	14,860	+2,102	16.0%	1.48	\$22,947	256
920	State Government	10,595	12,563	+1,968	19.0%	0.71	\$45,996	103
484	Truck Transportation	11,600	13,449	+1,849	16.0%	2.10	\$30,601	376
448	Clothing and Clothing Accessories Stores	8,446	9,567	+1,121	13.0%	1.87	\$15,135	510
523	Securities & Commodity Contracts, and Other Related Financial Activities	3,167	4,211	+1,044	33.0%	0.43	\$51,074	144
611	Educational Services	5,910	6,939	+1,029	17.0%	0.51	\$23,310	135
446	Health and Personal Care Stores	4,221	5,109	+888	21.0%	1.26	\$30,177	363
623	Nursing and Residential Care Facilities	5,955	6,799	+844	14.0%	0.65	\$28,936	106
453	Miscellaneous Store Retailers	5,374	6,211	+837	16.0%	1.22	\$14,408	265
522	Credit Intermediation and Related Activities	7,530	8,359	+829	11.0%	0.94	\$41,198	503
236	Construction of Buildings	5,727	6,433	+706	12.0%	1.02	\$39,090	345
454	Nonstore Retailers	4,223	4,860	+637	15.0%	0.87	\$8,959	55
445	Food and Beverage Stores	10,314	10,909	+595	6.0%	1.23	\$26,193	349
488	Support Activities for Transportation	2,764	3,317	+553	20.0%	1.59	\$38,548	217
911	Federal Government, Civilian, Except Postal Service	5,750	6,302	+552	10.0%	0.89	\$117,035	122
441	Motor Vehicle and Parts Dealers	7,749	8,260	+511	7.0%	1.49	\$38,400	468

Source: EMSI Complete Employment – 3rd Quarter 2010. <sup>(1)</sup> Earnings per worker (EPW) does not reflect wages paid to individuals. It is the sum of industry earnings (wages, salaries, profits, benefits, and other compensation) divided by the number of workers in the industry. It is intended to provide an indicator of the industry's importance to the economy.

Figure 3.6: Highest earning industries in the 4-county Lower Rio Grande Valley (3-digit NAICS level)  
 Ranked by earnings per worker in 2010

NAICS Code	Description	2010	2015	Net Change 2010-2015	% Change 2010-2015	2010 LQ (US = 1.00)	EPW <sup>(1)</sup>	2009 Establishments
486	Pipeline Transportation	77	78	+1	1.0%	0.66	\$126,816	7
911	Federal Government, Civilian, Except Postal Service	5,750	6,302	+552	10.0%	0.89	\$117,035	122
482	Rail Transportation	218	257	+39	18.0%	0.30	\$108,435	1
211	Oil and Gas Extraction	995	1,154	+159	16.0%	0.70	\$106,254	25
324	Petroleum and Coal Products Manufacturing	127	104	-23	-18.0%	0.38	\$73,184	5
491	Postal Service	1,155	1,109	-46	-4.0%	0.56	\$65,271	51
213	Support Activities for Mining	1,884	1,804	-80	-4.0%	1.98	\$63,918	68
325	Chemical Manufacturing	359	372	+13	4.0%	0.16	\$63,845	21
221	Utilities	1,319	1,419	+100	8.0%	0.79	\$61,777	52
334	Computer and Electronic Product Manufacturing	155	135	-20	-13.0%	0.05	\$60,245	12
622	Hospitals	14,030	16,342	+2,312	16.0%	1.05	\$59,723	60
481	Air Transportation	228	230	+2	1.0%	0.17	\$58,794	16
515	Broadcasting (except Internet)	1,062	1,176	+114	11.0%	1.09	\$56,674	34
483	Water Transportation	34	38	+4	12.0%	0.17	\$55,366	2
336	Transportation Equipment Manufacturing	2,966	2,989	+23	1.0%	0.77	\$55,271	36
519	Other Information Services	31	29	-2	-6.0%	0.07	\$54,556	5
312	Beverage and Tobacco Product Manufacturing	271	269	-2	-1.0%	0.48	\$53,633	11
113	Forestry and Logging	49	40	-9	-18.0%	0.14	\$52,356	2
322	Paper Manufacturing	796	772	-24	-3.0%	0.70	\$51,845	14
523	Securities & Commodity Contracts, and Other Related Financial Activities	3,167	4,211	+1,044	33.0%	0.43	\$51,074	144
551	Management of Companies and Enterprises	766	785	+19	2.0%	0.14	\$46,324	39
920	State Government	10,595	12,563	+1,968	19.0%	0.71	\$45,996	103
930	Local Government	72,949	84,455	+11,506	16.0%	1.80	\$45,884	399
423	Merchant Wholesalers, Durable Goods	5,758	5,943	+185	3.0%	0.67	\$45,626	626
425	Wholesale Electronic Markets and Agents and Brokers	1,572	1,908	+336	21.0%	0.62	\$44,509	273

Source: EMSI Complete Employment – 3rd Quarter 2010. <sup>(1)</sup> Earnings per worker (EPW) does not reflect wages paid to individuals. It is the sum of industry earnings (wages, salaries, profits, benefits, and other compensation) divided by the number of workers in the industry. It is intended to provide an indicator of the industry's importance to the economy.

### Location quotients (LQs)

As discussed earlier, LQs can highlight those industries in which regional employment is more concentrated than would be expected based on national patterns. A high location quotient suggests areas where the region has a comparative advantage. Figure 3.7 (*next page*) shows the region's concentration of employment in healthcare, transportation, and natural resource-based subsectors relative to

the U.S., as well as its relatively high levels of local government and social assistance employment. Unfortunately, several subsectors with strong LQs are likely to offer little in the way of employment growth over the next five years. And others that are expected to have some employment gains, such as social assistance establishments and general merchandise stores, have poor earnings prospects.

Figure 3.7: Most concentrated industries in the 4-county Lower Rio Grande Valley (3-digit NAICS level)  
*Ranked by 2010 location quotients (LQs); Includes only those industry subsectors with an LQ ≥ 1.25*

NAICS Code	Description	2010	2015	Net Change 2010-2015	% Change 2010-2015	2010 LQ (US = 1.00)	EPW <sup>(1)</sup>	2009 Establishments
621	Ambulatory Health Care Services	60,669	77,620	+16,951	28.0%	2.90	\$30,983	1,901
115	Support Activities for Agriculture and Forestry	4,945	4,936	-9	0.0%	2.79	\$23,640	167
114	Fishing, Hunting and Trapping	633	408	-225	-36.0%	2.38	\$27,704	32
484	Truck Transportation	11,600	13,449	+1,849	16.0%	2.10	\$30,601	376
213	Support Activities for Mining	1,884	1,804	-80	-4.0%	1.98	\$63,918	68
448	Clothing and Clothing Accessories Stores	8,446	9,567	+1,121	13.0%	1.87	\$15,135	510
930	Local Government	72,949	84,455	+11,506	16.0%	1.80	\$45,884	399
624	Social Assistance	19,053	23,684	+4,631	24.0%	1.73	\$13,933	641
488	Support Activities for Transportation	2,764	3,317	+553	20.0%	1.59	\$38,548	217
447	Gasoline Stations	3,721	3,773	+52	1.0%	1.53	\$20,863	284
441	Motor Vehicle and Parts Dealers	7,749	8,260	+511	7.0%	1.49	\$38,400	468
452	General Merchandise Stores	12,758	14,860	+2,102	16.0%	1.48	\$22,947	256
316	Leather and Allied Product Manufacturing	132	68	-64	-48.0%	1.43	\$31,249	7
442	Furniture and Home Furnishings Stores	1,903	2,164	+261	14.0%	1.31	\$27,069	106
446	Health and Personal Care Stores	4,221	5,109	+888	21.0%	1.26	\$30,177	363

Source: EMSI Complete Employment – 3rd Quarter 2010. <sup>(1)</sup> Earnings per worker (EPW) does not reflect wages paid to individuals. It is the sum of industry earnings (wages, salaries, profits, benefits, and other compensation) divided by the number of workers in the industry. It is intended to provide an indicator of the industry's importance to the economy.

### Most competitive (shift-share analysis)

Industry sectors were also assessed for their overall performance and growth potential using a shift-share analysis (Figure 3.8, *next page*). Shift-share is a comparative tool used to measure changes in the structure of a local economy with that of the U.S. economy, or to broad changes in an industry at the national level. This statistical technique identifies the source of changes in a given industry in the local economy by allocating shifts in employment among three components: national, industry mix, and regional competitive share:

- The national share looks at the change in employment in the region resulting from growth or decline in the parent economy. If the local industry in question had grown at exactly the same growth rate as the national economy, how many jobs would have been added?
- The industry mix share shows the degree of change within a local industry resulting from changes in the same industry on a national basis. How did the industry's national growth rate differ from the overall U.S. economic growth rate? The difference between the two is attributed to the industry's relative performance on a national scale.
- The regional competitive share measures the extent to which the unique economic circumstances of a locale contribute to employment growth or decline in a specific industry. How did the industry's local growth rate differ from its national growth rate? The difference between the two is attributed to local or regional factors. Factors can include the availability of natural resources or other materials, the quality of the local workforce, business climate issues, cost considerations, or infrastructure, as well as several others. The idea is simply if local industry growth exceeds that of its peers around the country, it is likely that some competitive advantage is being reflected. If it lags, there is likely a negative pattern. A negative regional competitive share would indicate that the industry within the region has not kept pace with growth in the industry at the macro level.

The Administrative and support services sector tops the list in terms of the number of jobs added on the strength of regional factors from 2005 to 2010 with a competitive effect of 6,284 jobs. This figure represents the culmination of the shift-share analysis which can be described as follows:

- If Administrative and support services employment in the region had followed national industry patterns, 714 jobs would have been lost over the period.
- If the industry had grown at the same pace as the national economy, 161 jobs would have been added.
- Therefore the "expected change," based on industry trends and overall growth of the national economy, would have been a loss of 553 jobs.

- Yet, in the four-county region, an estimated 5,731 jobs were added to the Administrative and support services industry during the period. This translates to a competitive effect of 6,284 (the number that would be required to offset the expected loss of 553 jobs and arrive at the actual change of 5,731).

A high competitive share suggests a comparative advantage in a given industry.

Figure 3.8: Most competitive industries in the 4-county Lower Rio Grande Valley (3-digit NAICS level)  
 Ranked by competitive effect, 2005-2010

NAICS Code	Description	Job Change 2005-2009	Industrial Mix Effect	National Growth Effect	Expected Change	Competitive Effect	Current EPW <sup>(1)</sup>
561	Administrative and Support Services	5,731	(714)	161	(553)	6,284	\$17,350
930	Local Government	7,511	1,055	438	1,493	6,017	\$45,884
621	Ambulatory Health Care Services	13,704	7,807	315	8,122	5,582	\$30,983
448	Clothing and Clothing Accessories Stores	2,655	(46)	39	(7)	2,662	\$15,135
722	Food Services and Drinking Places	3,582	773	179	952	2,630	\$15,114
238	Specialty Trade Contractors	(625)	(3,360)	131	(3,229)	2,604	\$25,341
484	Truck Transportation	1,707	(398)	66	(332)	2,039	\$30,601
611	Educational Services	2,024	465	26	491	1,533	\$23,310
622	Hospitals	2,343	856	78	934	1,408	\$59,723
522	Credit Intermediation and Related Activities	798	(644)	45	(599)	1,398	\$41,198
452	General Merchandise Stores	1,459	30	76	106	1,353	\$22,947
445	Food and Beverage Stores	1,136	(123)	61	(62)	1,197	\$26,193
441	Motor Vehicle and Parts Dealers	71	(1,163)	51	(1,112)	1,183	\$38,400
531	Real Estate	2,444	1,205	56	1,261	1,182	\$19,789
336	Transportation Equipment Manufacturing	323	(649)	18	(631)	954	\$55,271
920	State Government	1,135	133	63	196	938	\$45,996
454	Nonstore Retailers	618	(304)	24	(280)	898	\$8,959
624	Social Assistance	4,034	3,057	101	3,158	875	\$13,933
446	Health and Personal Care Stores	961	105	22	127	834	\$30,177
911	Federal Government, Civilian, Except Postal Service	1,335	533	30	563	773	\$117,035
453	Miscellaneous Store Retailers	624	(105)	32	(73)	697	\$14,408
523	Securities & Commodity Contracts, and Other Related Financial Activities	1,246	553	13	566	680	\$51,074
442	Furniture and Home Furnishings Stores	130	(392)	12	(380)	509	\$27,069
814	Private Households	905	396	11	407	497	\$6,546
524	Insurance Carriers and Related Activities	428	(60)	24	(36)	464	\$35,751

Source: EMSI Complete Employment – 3rd Quarter 2010. <sup>(1)</sup> Earnings per worker (EPW) does not reflect wages paid to individuals. It is the sum of industry earnings (wages, salaries, profits, benefits, and other compensation) divided by the number of workers in the industry. It is intended to provide an indicator of the industry's importance to the economy.

## Occupational analysis

Figures 3.9 through 3.11 provide data on employment by major occupational group. High-paying, highly educated occupational groups like science, engineering, computers, and law, each have fewer than 3,000 jobs in the LRGV region despite an employment base pushing 500,000. Five of the six largest occupational groups tend toward lower skilled occupations. The exception in this group is the education and training sector, where skill and job preparation levels generally tend to be higher. The Valley has occupational concentrations in two sectors – education and healthcare – that survived the recent recession with minimal damage. Other above-average job concentrations can be found in personal services, farming, and protective services. Below average LQs include highly skilled occupational groups like computer technology, media/design, engineering, science, law, and finance.

Figure 3.9: Employment by major occupational group in the 4-county LRGV region, 2005-2009 (history), 2010 (estimated), and 2015 (projected)  
*Ranked by employment in 2010*

SOC Code	Description	2005	2006	2007	2008	2009	2010	2015	Change 2010-2015		2010 LQ (US = 1.00)	Median Hourly Earnings
									Number	Percent		
43-0000	Office & administrative support	62,491	65,205	67,718	69,426	68,164	68,404	77,581	+9,177	13.4%	1.00	\$10.85
41-0000	Sales	53,354	56,723	61,232	63,174	61,697	62,054	70,782	+8,728	14.1%	0.98	\$9.76
25-0000	Education, training, & library	37,122	38,397	39,410	41,408	42,366	42,961	50,282	+7,321	17.0%	1.53	\$26.65
39-0000	Personal care & service	32,656	34,443	36,261	38,302	39,460	41,334	51,650	+10,316	25.0%	2.28	\$7.84
35-0000	Food preparation & serving	28,882	30,189	31,204	32,392	32,247	32,462	36,388	+3,926	12.1%	1.00	\$8.10
53-0000	Transportation & material moving	29,798	31,475	33,068	32,976	31,415	31,340	34,897	+3,557	11.3%	1.10	\$10.67
11-0000	Management	27,288	28,665	29,934	30,965	30,344	30,278	33,888	+3,610	11.9%	0.81	\$18.20
31-0000	Healthcare (support)	19,099	20,111	21,058	22,113	23,248	24,302	30,887	+6,585	27.1%	1.98	\$8.80
47-0000	Construction & extraction	24,681	25,877	26,441	26,547	24,642	23,558	26,933	+3,375	14.3%	1.02	\$11.52
29-0000	Healthcare (technical)	19,010	19,621	20,841	21,702	22,544	23,285	28,258	+4,973	21.4%	1.02	\$30.91
37-0000	Property maintenance	18,185	18,975	19,894	21,143	21,201	21,231	24,779	+3,548	16.7%	1.06	\$8.19
49-0000	Installation, maintenance, & repair	15,802	16,447	16,781	17,185	16,520	16,396	18,137	+1,741	10.6%	0.98	\$11.80
51-0000	Production	16,145	16,801	16,811	16,507	14,938	14,930	16,007	+1,077	7.2%	0.56	\$10.31
13-0000	Business & financial	11,373	12,012	13,193	13,737	13,758	13,980	16,701	+2,721	19.5%	0.55	\$18.25

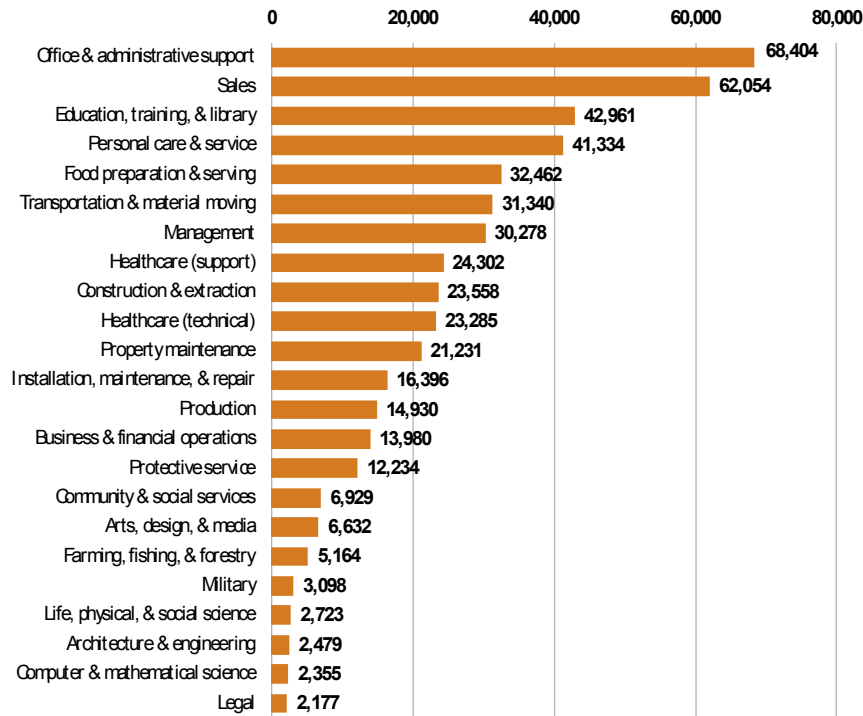
0000	operations											
33-0000	Protective service	10,130	10,562	11,105	11,714	12,019	12,234	14,180	+1,946	15.9%	1.32	\$17.45
21-0000	Community & social services	5,868	6,075	6,313	6,641	6,768	6,929	8,080	+1,151	16.6%	0.95	\$17.80
27-0000	Arts, design, & media	5,804	6,206	6,525	6,673	6,583	6,632	7,500	+868	13.1%	0.47	\$10.64
45-0000	Farming, fishing, & forestry	6,223	5,705	5,969	5,567	5,328	5,164	4,914	-250	-4.8%	1.63	\$7.91
55-0000	Military	2,665	2,679	2,769	2,941	2,913	3,098	3,018	-80	-2.6%	0.51	\$9.50
19-0000	Life, physical, & social science	2,176	2,235	2,500	2,616	2,643	2,723	3,227	+504	18.5%	0.54	\$17.53
17-0000	Architecture & engineering	2,388	2,571	2,582	2,618	2,517	2,479	2,840	+361	14.6%	0.33	\$19.13
15-0000	Computer & mathematical science	2,061	2,191	2,293	2,364	2,355	2,355	2,723	+368	15.6%	0.22	\$18.11
23-0000	Legal	2,101	2,167	2,265	2,256	2,219	2,177	2,481	+304	14.0%	0.54	\$21.87
		<b>435,304</b>	<b>455,332</b>	<b>476,165</b>	<b>490,966</b>	<b>485,891</b>	<b>490,306</b>	<b>566,133</b>	<b>75,827</b>	<b>15.5%</b>		

Source: EMSI Complete Employment - 3rd Quarter 2010



Figure 3.10

4- county LRGV region's 2010 job base by occupational group  
*The region's job base now approaches one-half million*



NOTE: Under the federal occupational classification system, farmers and ranchers are included as part of the management occupational group, not under the farming, fishing and forestry occupational group.

SOURCES: EMSI Complete Employment - 3rd Quarter 2010

Figure 3.11

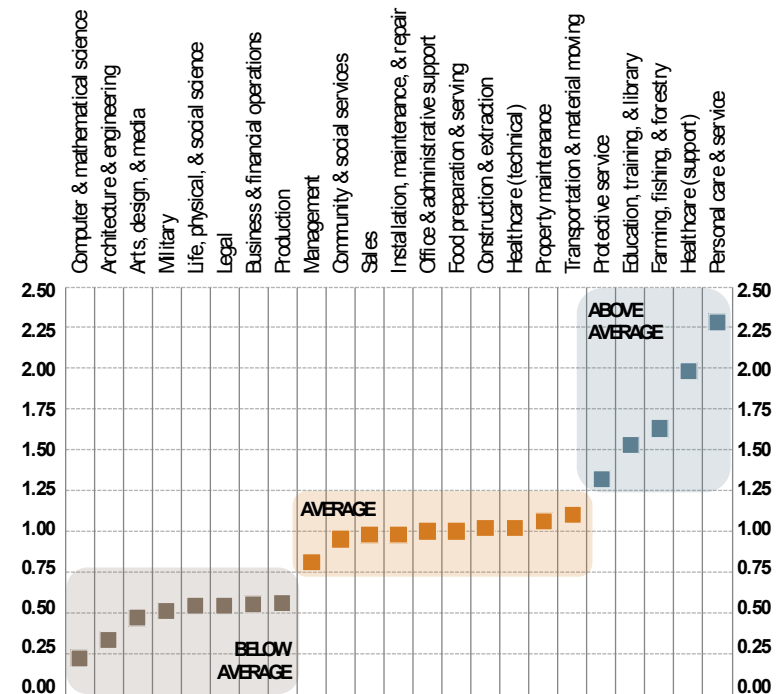
Occupational group concentrations in the 4- county LRGV region

*Location quotient analysis*

US average for each industry = 1.00

Regional strength > 1.25

Regional weakness < 0.75



SOURCES: EMSI Complete Employment - 3rd Quarter 2010

To arrive at target occupations, we analyzed occupational data on a range of factors similar to those used to assess target industries. Since the occupational data are derived from employment data, this approach yields occupations that correspond to industries identified above. There are slight variations, however, as some occupations are common to a number of industries. For example, a nurse can be employed in a doctor's office or hospital, an educational institution, or even a manufacturing company.

Figure 3.12: Largest occupations in the Lower Rio Grande Valley  
Ranked by employment in 2010

SOC Code	Description	Employment						Change 2010-2015		Current Median Hourly Earnings	Education/training <sup>(1)</sup>
		2010	2011	2012	2013	2014	2015	Net	%		
39-9021	Personal and home care aides	25,901	28,016	29,835	31,447	32,907	33,927	+8,026	31%	\$7.59	Short-term OTJ
41-2031	Retail salespersons	17,267	17,932	18,475	18,935	19,334	19,571	+2,304	13%	\$8.06	Short-term OTJ
31-1011	Home health aides	12,031	13,005	13,859	14,628	15,336	15,858	+3,827	32%	\$7.68	Short-term OTJ
41-2011	Cashiers, except gaming	11,245	11,527	11,754	11,943	12,104	12,194	+949	8%	\$7.57	Short-term OTJ
35-3021	Combined food preparation and serving workers, incl. fast food	11,062	11,499	11,861	12,170	12,439	12,606	+1,544	14%	\$7.47	Short-term OTJ
43-9061	Office clerks, general	10,488	10,921	11,288	11,607	11,891	12,080	+1,592	15%	\$9.10	Short-term OTJ
25-2021	Elementary school teachers, except special education	10,307	10,812	11,244	11,626	11,970	12,216	+1,909	19%	\$31.06	Bachelor's degree
41-1011	First-line supervisors/managers of retail sales workers	10,102	10,568	10,948	11,270	11,547	11,712	+1,610	16%	\$10.60	Work experience
39-9011	Child care workers	8,471	8,920	9,289	9,602	9,874	10,038	+1,567	18%	\$7.45	Short-term OTJ
43-4051	Customer service representatives	8,432	8,843	9,173	9,449	9,684	9,809	+1,377	16%	\$9.12	Moderate-term OTJ
43-6014	Secretaries, except legal, medical, and executive	7,748	8,026	8,258	8,453	8,622	8,722	+974	13%	\$10.93	Moderate-term OTJ
29-1111	Registered nurses	7,027	7,430	7,777	8,081	8,354	8,544	+1,517	22%	\$31.24	Associate's degree
53-3032	Truck drivers, heavy and tractor-trailer	6,912	7,209	7,462	7,686	7,888	8,019	+1,107	16%	\$12.72	Moderate-term OTJ
37-2011	Janitors and cleaners, except maids and housekeeping	6,801	7,003	7,159	7,281	7,376	7,412	+611	9%	\$9.17	Short-term OTJ
25-	Teacher assistants	6,691	6,978	7,214	7,415	7,588	7,695	+1,004	15%	\$12.09	Short-term OTJ

9041											
31-1012	Nursing aides, orderlies, and attendants	6,473	6,823	7,119	7,376	7,604	7,755	+1,282	20%	\$8.45	PS vocational award
53-7062	Laborers and freight, stock, and material movers, hand	6,364	6,506	6,624	6,725	6,814	6,867	+503	8%	\$7.91	Short-term OTJ
25-2031	Secondary school teachers, except special and vocational	6,025	6,282	6,494	6,673	6,829	6,927	+902	15%	\$33.29	Bachelor's degree
35-3031	Waiters and waitresses	5,851	6,041	6,195	6,322	6,430	6,489	+638	11%	\$7.56	Short-term OTJ
43-5081	Stock clerks and order fillers	5,457	5,639	5,791	5,922	6,038	6,115	+658	12%	\$8.48	Short-term OTJ
25-2022	Middle school teachers, except special and vocational	5,371	5,631	5,853	6,049	6,226	6,351	+980	18%	\$32.00	Bachelor's degree
37-2012	Maids and housekeeping cleaners	5,026	5,237	5,407	5,547	5,666	5,731	+705	14%	\$7.39	Short-term OTJ
47-2061	Construction laborers	4,617	4,814	4,995	5,165	5,329	5,467	+850	18%	\$9.56	Moderate-term OTJ
43-1011	First-line supvs/mgrs of office and admin support workers	4,582	4,781	4,944	5,083	5,203	5,276	+694	15%	\$16.11	Work experience
43-3031	Bookkeeping, accounting, and auditing clerks	4,576	4,746	4,888	5,010	5,118	5,185	+609	13%	\$11.50	Moderate-term OTJ

Source: EMSI Complete Employment – 3rd Quarter 2010. (1) Education and training levels identified by the U.S. Bureau of Labor Statistics. The BLS uses 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.

### Size (number of jobs)

As in the industry analysis, many of the Valley's largest occupations — retail sales people, cashiers, food service workers, construction workers, and housekeepers — are jobs that are closely tied with population growth (Figure 3.12, *previous page*). The large number of teachers and child care workers is also a reflection of the size of the region's population, as well as its relative youth. Four of the 25 largest occupations in the LRGV are healthcare-related, including the largest: Personal and home care aides. The prevalence of healthcare occupations, particularly those related to home health, may reflect both the large population and the prevalence of government-sponsored healthcare recipients (Medicaid and Medicare).

### Growth 2010 to 2015

Likewise, many of the occupations where growth is expected over the next five years (Figure 3.13, *next page*) are also population-driven. The fastest growing occupations include teachers, child care workers, food services workers, and retail salespersons. Growth also influences the construction sector, translating to demand for construction laborers and occupations related to real estate and building

services. With few exceptions, the region's fastest-growing jobs are relatively low paying with many of the top 10 falling below the current self-sufficiency wage of \$8.42 for Lower Rio and \$9.32 for Cameron.

#### Median hourly earnings

When earnings are considered, the mix of occupations changes considerably (Figure 3.14, *page 41*), although healthcare and education related professions still top the list. Not surprisingly, there is a strong correlation between educational attainment and earnings. Many of the top-ranked occupations require advanced degrees and all but a handful require some formal postsecondary award. Several of the high-earning occupations also have solid growth prospects, with elementary school teachers (+1,909), registered nurses (+1,517), middle school teachers (+980), and secondary school teachers (+902) expecting the biggest gains.

#### Location quotients (LQs)

As in the industry analysis, identifying concentrations of employment by occupation can provide clues to regional strengths. (Figure 3.15, *page 42*). For the reasons stated above, location quotients are high for occupations related to healthcare and education when compared to national averages. The concentration of detectives and criminal investigators is likely to be related to federal border control activities, since the public sector (federal, state, and local government) is the largest employer of this occupation nationally. The presence of an international border is also likely to be a factor in the concentration of compliance officers, as workers in this occupation typically examine whether the actions of individuals or businesses conform to relevant contract requirements or government policies and regulations, which would include customs and immigration.

Figure 3.13: Fastest-growing occupations in the Lower Rio Grande Valley  
 Ranked by net change 2010 to 2015

SOC Code	Description	Employment						Change 2010-2015		Current Median Hourly Earnings	Education/training <sup>(1)</sup>
		2010	2011	2012	2013	2014	2015	Net	%		
39-9021	Personal and home care aides	25,901	28,016	29,835	31,447	32,907	33,927	+8,026	31%	\$7.59	Short-term OTJ
31-1011	Home health aides	12,031	13,005	13,859	14,628	15,336	15,858	+3,827	32%	\$7.68	Short-term OTJ
41-2031	Retail salespersons	17,267	17,932	18,475	18,935	19,334	19,571	+2,304	13%	\$8.06	Short-term OTJ
25-2021	Elementary school teachers, except special education	10,307	10,812	11,244	11,626	11,970	12,216	+1,909	19%	\$31.06	Bachelor's degree
41-1011	First-line supervisors/managers of retail sales workers	10,102	10,568	10,948	11,270	11,547	11,712	+1,610	16%	\$10.60	Work experience
43-9061	Office clerks, general	10,488	10,921	11,288	11,607	11,891	12,080	+1,592	15%	\$9.10	Short-term OTJ
39-9011	Child care workers	8,471	8,920	9,289	9,602	9,874	10,038	+1,567	18%	\$7.45	Short-term OTJ
35-3021	Combined food preparation and serving workers, incl fast food	11,062	11,499	11,861	12,170	12,439	12,606	+1,544	14%	\$7.47	Short-term OTJ
29-1111	Registered nurses	7,027	7,430	7,777	8,081	8,354	8,544	+1,517	22%	\$31.24	Associate's degree
43-4051	Customer service representatives	8,432	8,843	9,173	9,449	9,684	9,809	+1,377	16%	\$9.12	Moderate-term OTJ
31-1012	Nursing aides, orderlies, and attendants	6,473	6,823	7,119	7,376	7,604	7,755	+1,282	20%	\$8.45	PS vocational award
53-3032	Truck drivers, heavy and tractor-trailer	6,912	7,209	7,462	7,686	7,888	8,019	+1,107	16%	\$12.72	Moderate-term OTJ
25-9041	Teacher assistants	6,691	6,978	7,214	7,415	7,588	7,695	+1,004	15%	\$12.09	Short-term OTJ
25-2022	Middle school teachers, except special and vocational	5,371	5,631	5,853	6,049	6,226	6,351	+980	18%	\$32.00	Bachelor's degree
43-6014	Secretaries, except legal, medical, and executive	7,748	8,026	8,258	8,453	8,622	8,722	+974	13%	\$10.93	Moderate-term OTJ
41-2011	Cashiers, except gaming	11,245	11,527	11,754	11,943	12,104	12,194	+949	8%	\$7.57	Short-term OTJ
25-2031	Secondary school teachers, except special and vocational	6,025	6,282	6,494	6,673	6,829	6,927	+902	15%	\$33.29	Bachelor's degree
47-	Construction laborers	4,617	4,814	4,995	5,165	5,329	5,467	+850	18%	\$9.56	Moderate-term

2061												OTJ
41-9022	Real estate sales agents	2,859	3,076	3,256	3,410	3,544	3,626	+767	27%	\$8.17		PS vocational award
25-1099	Postsecondary teachers	3,922	4,120	4,289	4,439	4,575	4,673	+751	19%	\$39.23		Doctoral degree
11-9199	Managers, all other	4,220	4,430	4,606	4,756	4,887	4,966	+746	18%	\$12.39		Work experience
41-9021	Real estate brokers	2,679	2,889	3,062	3,210	3,338	3,416	+737	28%	\$7.52		Work experience
37-2019	Building cleaning workers, all other	2,552	2,758	2,928	3,072	3,198	3,274	+722	28%	\$7.25		Short-term OTJ
37-2012	Maids and housekeeping cleaners	5,026	5,237	5,407	5,547	5,666	5,731	+705	14%	\$7.39		Short-term OTJ
43-1011	First-line supvs/mgrs of office and admin support workers	4,582	4,781	4,944	5,083	5,203	5,276	+694	15%	\$16.11		Work experience

Source: EMSI Complete Employment – 3rd Quarter 2010.

- (1) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.

Figure 3.14: Highest-earning occupations in the Lower Rio Grande Valley  
 Ranked by current median hourly earnings (2010)

SOC Code	Description	Employment						Change 2010-2015		Current Median Hourly Earnings	Education/training <sup>(1)</sup>
		2010	2011	2012	2013	2014	2015	Net	%		
29-1069	Physicians and surgeons	2,132	2,246	2,345	2,433	2,512	2,568	+436	20%	\$83.40	First prof. degree
29-1051	Pharmacists	775	816	850	881	908	925	+150	19%	\$56.87	First prof. degree
11-9032	Education administrators, elementary and secondary school	1,244	1,297	1,340	1,377	1,408	1,428	+184	15%	\$44.50	Degree + work exp.
25-1099	Postsecondary teachers	3,922	4,120	4,289	4,439	4,575	4,673	+751	19%	\$39.23	Doctoral degree
29-1123	Physical therapists	701	758	806	847	884	908	+207	30%	\$35.14	Master's degree
25-2031	Secondary school teachers, except special and vocational	6,025	6,282	6,494	6,673	6,829	6,927	+902	15%	\$33.29	Bachelor's degree
25-2032	Vocational education teachers, secondary school	727	759	785	807	827	839	+112	15%	\$33.05	Degree + work exp.
11-9111	Medical and health services managers	885	935	977	1,013	1,044	1,062	+177	20%	\$32.37	Degree + work exp.
25-2022	Middle school teachers, except special and vocational	5,371	5,631	5,853	6,049	6,226	6,351	+980	18%	\$32.00	Bachelor's degree
25-2041	Special education teachers, preschool, kindergarten, and elem.	802	844	880	912	942	964	+162	20%	\$31.98	Bachelor's degree
11-1021	General and operations managers	4,142	4,261	4,354	4,425	4,481	4,500	+358	9%	\$31.64	Degree + work exp.
29-1111	Registered nurses	7,027	7,430	7,777	8,081	8,354	8,544	+1,517	22%	\$31.24	Associate's degree
25-2021	Elementary school teachers, except special education	10,307	10,812	11,244	11,626	11,970	12,216	+1,909	19%	\$31.06	Bachelor's degree
25-9031	Instructional coordinators	778	822	861	896	929	955	+177	23%	\$29.44	Master's degree
13-1041	Compliance officers <sup>(2)</sup>	1,817	1,871	1,961	2,048	2,131	2,205	+388	21%	\$28.20	Long-term OTJ
29-1127	Speech-language pathologists	648	693	731	763	792	810	+162	25%	\$27.78	Master's degree
29-1126	Respiratory therapists	495	523	548	569	590	604	+109	22%	\$27.23	Associate's degree
21-	Educational, vocational, and school counselors	1,528	1,600	1,661	1,714	1,761	1,792	+264	17%	\$27.20	Master's degree

1012												
25-2012	Kindergarten teachers, except special education	908	951	987	1,019	1,047	1,067	+159	18%	\$27.06	Bachelor's degree	
33-3021	Detectives and criminal investigators	2,259	2,318	2,406	2,487	2,562	2,625	+366	16%	\$26.72	Work experience	
13-1199	Business operation specialists, all other	1,115	1,146	1,181	1,212	1,239	1,258	+143	13%	\$26.27	Bachelor's degree	
23-1011	Lawyers	1,084	1,113	1,140	1,165	1,187	1,204	+120	11%	\$25.76	First prof. degree	
29-2034	Radiologic technologists and technicians	639	673	703	729	752	769	+130	20%	\$25.18	Associate's degree	
11-3031	Financial managers	889	935	973	1,005	1,032	1,047	+158	18%	\$24.04	Degree + work exp.	
41-4011	Sales reps, wholesale and mfg, technical & scientific products	1,095	1,140	1,176	1,207	1,233	1,249	+154	14%	\$22.12	Moderate-term OTJ	

Source: EMSI Complete Employment – 3rd Quarter 2010. Excludes occupations with less than 100 jobs in 2010 and those projected to add less than 100 jobs between 2010 and 2015.

- (1) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.
- (2) Excludes compliance officers in agriculture, construction, health and safety, and transportation



Figure 3.15: Most concentrated occupations in the Lower Rio Grande Valley  
 Ranked by location quotient (LQ)

SOC Code	Description	Employment						Change 2010-2015	LQ (US=1.00)	Current Median Hourly Earnings	Education/training <sup>(1)</sup>
		2010	2011	2012	2013	2014	2015				
39-9021	Personal and home care aides	25,901	28,016	29,835	31,447	32,907	33,927	+8,026	8.51	\$7.59	Short-term OTJ
33-3021	Detectives and criminal investigators	2,259	2,318	2,406	2,487	2,562	2,625	+366	7.06	\$26.72	Work experience
31-1011	Home health aides	12,031	13,005	13,859	14,628	15,336	15,858	+3,827	3.92	\$7.68	Short-term OTJ
31-2022	Physical therapist aides	411	450	483	512	537	554	+143	3.22	\$9.59	Short-term OTJ
25-2022	Middle school teachers, except special and vocational	5,371	5,631	5,853	6,049	6,226	6,351	+980	2.62	\$32.00	Bachelor's degree
13-1041	Compliance officers <sup>(2)</sup>	1,817	1,871	1,961	2,048	2,131	2,205	+388	2.49	\$28.20	Long-term OTJ
25-2032	Vocational education teachers, secondary school	727	759	785	807	827	839	+112	2.46	\$33.05	Degree + work exp.
25-2021	Elementary school teachers, except special education	10,307	10,812	11,244	11,626	11,970	12,216	+1,909	2.19	\$31.06	Bachelor's degree
37-3019	Grounds maintenance workers, all other	667	719	761	797	828	847	+180	2.13	\$7.29	Short-term OTJ
53-3031	Driver/sales workers	3,649	3,779	3,886	3,976	4,054	4,102	+453	2.10	\$8.81	Short-term OTJ
25-9031	Instructional coordinators	778	822	861	896	929	955	+177	1.99	\$29.44	Master's degree
37-3012	Pesticide handlers, sprayers, and applicators, vegetation	669	720	763	799	830	849	+180	1.95	\$7.32	Moderate-term OTJ
21-1012	Educational, vocational, and school counselors	1,528	1,600	1,661	1,714	1,761	1,792	+264	1.92	\$27.20	Master's degree
25-2031	Secondary school teachers, except special and vocational	6,025	6,282	6,494	6,673	6,829	6,927	+902	1.84	\$33.29	Bachelor's degree
11-9051	Food service managers	2,441	2,575	2,685	2,777	2,857	2,904	+463	1.81	\$10.06	Work experience
11-9032	Education administrators, elem. and secondary school	1,244	1,297	1,340	1,377	1,408	1,428	+184	1.75	\$44.50	Degree + work exp.
37-3013	Tree trimmers and pruners	667	719	761	797	829	848	+181	1.74	\$7.30	Short-term OTJ

31-9092	Medical assistants	2,487	2,658	2,809	2,947	3,076	3,176	+689	1.73	\$10.13	Moderate-term OTJ
29-2041	Emergency medical technicians and paramedics	1,057	1,116	1,162	1,200	1,232	1,248	+191	1.72	\$12.62	PS vocational award
51-3011	Bakers	726	757	783	806	825	838	+112	1.69	\$8.91	Long-term OTJ
51-8031	Water and liquid waste treatment plant / system ops	538	568	595	619	643	661	+123	1.69	\$12.05	Long-term OTJ
25-9041	Teacher assistants	6,691	6,978	7,214	7,415	7,588	7,695	+1,004	1.66	\$12.09	Short-term OTJ
29-1126	Respiratory therapists	495	523	548	569	590	604	+109	1.63	\$27.23	Associate's degree
41-1011	First-line supervisors/managers of retail sales workers	10,102	10,568	10,948	11,270	11,547	11,712	+1,610	1.55	\$10.60	Work experience
49-9021	Heating, A/C, and refrigeration mechanics and installers	1,328	1,395	1,455	1,510	1,561	1,600	+272	1.52	\$12.03	Long-term OTJ

Source: EMSI Complete Employment – 3rd Quarter 2010. Excludes occupations with less than 100 jobs in 2010 and those projected to add less than 100 jobs between 2010 and 2015.

(1) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.

(2) Excludes compliance officers in agriculture, construction, health and safety, and transportation

## Emerging occupations

Because they are based on historical patterns, industry and occupational projections do not always capture emerging occupations. In this section, we will incorporate available information regarding today's emerging occupations, particularly "green" occupations related to clean technologies, alternative energy, and energy efficiency.

To help understand emerging occupations, we compiled a list of more than 500 occupations identified by O-NET<sup>1</sup> in one of the following categories:

- (1) In demand. This list includes occupations designated as "bright outlook" occupations. It includes both existing and emerging occupations that are expected to be in high demand by employers.

<sup>1</sup> The Occupational Information Network (O\*NET) is a partnership of public and private-sector organizations developed under the sponsorship of the US Department of Labor/Employment and Training Administration (USDOL/ETA). The initiative is administered through a grant to the North Carolina Employment Security Commission which operates the National Center for O\*NET Development. Under the direction of USDOL/ETA, the Center manages projects and contracts and provides technical support and customer service to O\*NET users.

(2) Green economy. In its February 2009 report entitled Greening of the World of Work: Implications for O\*NET-SOC and New and Emerging Occupations, O-NET identified occupational implications resulting from the continued growth of the “green” economy. The O-NET report identifies occupations that are:

- a. existing but expected to have *increased demand* due to growth in the green economy,
- b. existing but will require some kind of *enhanced skill* because of the green economy, or
- c. a *new and emerging* occupation related to the green economy

(3) New & emerging. In addition to its “bright outlook” and “green economy” research, O-NET also identified a number of new and emerging occupations in fields ranging from transportation to healthcare to advanced manufacturing. In many cases, these new & emerging occupations are really a refinement of existing occupations. However, some represent a substantive change in the way the work is performed.

From this list, we selected a number of occupations that we feel merit attention by the workforce system (Figure 3.16). These occupations were based on our knowledge of the region, discussion with area employers and education providers, and insight gained from talking with employers throughout the country. The entire list of new and emerging occupations is presented as Appendix D of this report.

Figure 3.16: New & Emerging Occupations for Consideration  
*Selected from a compilation of occupations identified by ONET; Arranged by industry*

ONET CODE	Occupation Description (from ONET)	Related Industry (2)	Bright outlook	Green Economy	O*NET-SOC 2009 Description (where provided) (2)
17-3029.09	Manufacturing Production Technicians	Advanced Manufacturing	✓	✓	Apply knowledge of manufacturing engineering systems and tools to set up, test, and adjust manufacturing machinery and equipment, using any combination of electrical, electronic, mechanical, hydraulic, pneumatic and computer technologies.
17-3029.07	Mechanical Engineering Technologists	Advanced Manufacturing	✓	✓	Apply engineering theory and technical skills to support mechanical engineering activities such as generation, transmission and use of mechanical and fluid energy. Prepare layouts of machinery and equipment and plan the flow of work. May conduct statistical studies and analyze production costs.
17-3029.06	Manufacturing Engineering Technologists	Advanced Manufacturing	✓	✓	Apply engineering theory and technical skills to support manufacturing engineering activities. Develop tools, implement designs and integrate machinery, equipment and computer technologies to ensure effective manufacturing processes.
17-3029.05	Industrial Engineering Technologists	Advanced Manufacturing	✓	✓	Apply engineering theory and technical skills to support industrial engineering activities such as quality control, inventory control and material flow methods. May conduct statistical studies and analyze production costs.
17-2199.04	Manufacturing Engineers	Advanced Manufacturing	✓	✓	Apply knowledge of materials and engineering theory and methods to design, integrate, and improve manufacturing systems or related processes. May work with commercial or industrial designers to refine product designs to increase producibility and decrease costs.
13-1199.01	Energy Auditors	Energy	✓	✓	Conduct energy audits of buildings, building systems and process systems. May also conduct investment grade audits of buildings or systems.
15-1099.07	Geographic Information Systems Technicians	Geospatial	✓	✓	Assist scientists, technologists, and related professionals in building, maintaining, modifying, and using geographic information systems (GIS) databases. May also perform some custom application development and provide user support.
49-9099.02	Wind Turbine Service Technicians	Green	✓	✓	Inspect, diagnose, adjust, or repair wind turbines. Perform maintenance on wind turbine equipment including resolving electrical, mechanical, and hydraulic malfunctions.
47-4099.03	Weatherization Installers and Technicians	Green	✓	✓	Perform a variety of activities to weatherize homes and make them more energy efficient. Duties include repairing windows, insulating ducts, and performing heating, ventilating, and air-conditioning (HVAC) work. May perform energy audits and advise clients on energy conservation measures.
13-1199.05	Sustainability Specialists	Green	✓	✓	Address organizational sustainability issues, such as waste stream management, green building practices, and green procurement plans.
11-9111.01	Clinical Nurse Specialists	Health Care	✓		Plan, direct, or coordinate the daily patient care activities in a clinical practice. Ensure adherence to established clinical policies, protocols, regulations, and standards.
43-4051.03	Patient Representatives	Health Care	✓		Assist patients in obtaining services, understanding policies and making health care decisions.
29-	Nurse Practitioners	Health Care	✓		Provide advanced nursing care and treatment to patients. Perform physical

ONET CODE	Occupation Description (from ONET)	Related Industry (2)	Bright outlook	Green Economy	O*NET-SOC 2009 Description (where provided) (2)
1199.03					examinations, order diagnostic tests, develop treatment plans and prescribe drugs or other therapies.

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Figure 3.16: New &amp; Emerging Occupations for Consideration (CONTINUED)

ONET CODE	Occupation Description (from ONET)	Related Industry (2)	Bright outlook	Green Economy	O*NET-SOC 2009 Description (where provided) (2)
15-1099.14	Document Management Specialists	Information Tech	✓		Implement and administer enterprise-wide document management procedures for the capture, storage, retrieval, sharing, and destruction of electronic records and documents.
15-1099.10	Business Intelligence Analysts	Information Tech	✓		Produce financial and market intelligence by querying data repositories and generating periodic reports. Devise methods for identifying data patterns and trends in available information sources.
15-1099.09	Data Warehousing Specialists	Information Tech	✓		Design, model, or implement corporate data warehousing activities. Program and configure warehouses of database information and provide support to warehouse users.
15-1099.08	Database Architects	Information Tech	✓		Design strategies for enterprise database systems and set standards for operations, programming, and security. Design and construct large relational databases. Integrate new systems with existing warehouse structure and refine system performance and functionality.
15-1099.05	Web Administrators	Information Tech	✓		Manage web environment design, deployment, development and maintenance activities. Perform testing and quality assurance of web sites and web applications.
15-1099.04	Web Developers	Information Tech	✓		Develop and design web applications and web sites. Create and specify architectural and technical parameters. Direct web site content creation, enhancement and maintenance.
15-1099.03	Network Designers	Information Tech	✓		Determine user requirements and design specifications for computer networks. Plan and implement network upgrades.
15-1099.02	Computer Systems Engineers/Architects	Information Tech	✓		Design and develop solutions to complex applications problems, system administration issues, or network concerns. Perform systems management and integration functions.
11-9199.04	Supply Chain Managers	Transportation	✓	✓	Direct, or coordinate production, purchasing, warehousing, distribution, or financial forecasting services and activities to limit costs and improve accuracy, customer service and safety. Examine existing procedures and opportunities for streamlining activities to meet product distribution needs. Direct the movement, storage, and processing of inventory.

SOURCE: Compiled by TIP Strategies from publications available on the ONET website (<http://online.onetcenter.org/>).

## 4: Target Sectors

In this section, we outline the region's target sectors. These targets reflect findings from the quantitative analysis conducted above, as well as our understanding of local, state, and national trends. This work represents a refinement of the sectors identified in the cluster study we prepared for Workforce Solutions Lower Rio Grande Valley in 2005. It is not intended to supplant the efforts of local economic development organizations, but rather to serve as a guide for workforce and training practitioners about industries that are likely to grow and that offer opportunities for meaningful employment. The sectors include a mix of occupations, including some that may not be appropriate for training.

Our recommended targets exclude three significant sectors of the local economy—government (other than education and criminal justice occupations), retail, and hospitality. This decision was made, not because these are not important contributors to local economic growth, but because they are dominated by occupations which either require very low levels of on-the-job training (cashiers, food servers) or are likely to be filled by workers with academic degrees or office training (administrative assistants, planners, managers).

### Relevant trends

There are a number of trends driving private investment decisions across the target sectors. The most important of these is current economic conditions. Businesses crave certainty. The recent recession resulted in the steepest job losses in recent memory. While signs of recovery have begun to appear, lingering uncertainty about the pace and extent of that recovery are still affecting investment trends.

One oft-discussed trend is the aging of the baby boomers. This major demographic shift is creating market opportunities — the rising demand for healthcare and related products chief among them — and workforce challenges as skilled workers retire. The expansion of healthcare goods and services that will be required to meet the demands of the aging populations in the U.S. and other developed countries suggests opportunities for new projects. The personalization of medicine — treatments and devices which are customized to the individual in a way never before possible — will also create opportunities for this sector.

Growth of the “green economy” is another broad trend that will continue to have a transformative role across a number of sectors. Concerns about carbon emissions and national security issues associated with the use of fossil fuels has created demand among consumers and businesses for products that are more fuel-efficient and less harmful to the environment. The impact of this trend can be seen in virtually every product or service — from changes in the amount and type of packaging materials used, to the inputs used in the production of motor vehicles, and, of course, the surge in interest in renewable energy. Sustainability initiatives introduced by global giants like Wal-Mart and, more recently, Procter & Gamble, continue to provide momentum for change.

Federal spending and government policies are always drivers of private sector investment. However, in the current economic downturn, federal spending has been the defining driver in a number of areas, most notably renewable energy. Legislative priorities at all levels of government have also had a tremendous influence on investments in energy and other industries. The expansion of the federal Renewable Fuels Standard (RFS) in 2007 raised the required volume of renewable fuels to be blended into transportation fuel from 9 billion gallons in 2008 to 36 billion gallons by 2022 and set goals for renewable energy capacity. Many states have set their own renewable portfolio standards mandating the share of energy that must be derived by renewable sources. Local bans on shopping bags have created markets for canvas bags and provided momentum to the creation of materials like bioplastics (plastics derived from renewable biomass sources, some of which are biodegradable). The prospect of more stringent regulations on carbon emissions continues to propel innovation in energy efficiency technologies and pollution control equipment.

Industrial production and the corresponding capital investment — once concentrated in North America and Europe — has spread out across the globe. These changing patterns of investment have expanded the global workforce and raised the standard of living for many people around the world. The creation of large and growing middle classes in places like India and China, has opened up new markets for U.S. products, including food products and agricultural equipment. While the global economic crisis has slowed the pace, the rapid growth in demand is also likely to produce shortages of a wide range of basic commodities, with implications for both domestic and foreign production.

The term “advanced manufacturing” has gained prominence among economic developers and public officials. In truth, there are fewer and fewer manufacturing operations in this country that do not employ some kind of advanced technology in their production process. While the use of technologies like programmable logic controllers, wireless communications, and modeling and simulation techniques has become the norm, the number of workers with these skill sets has not kept pace. The technology demands of the service sector have also exploded. There is virtually no workplace left that does not have some information technology requirements associated with it. The massive restructuring of the skills needed in today’s workplace has resulted in a skills mismatch between the needs of employers and the skills of the available workforce.

In the following pages, we focus on those industry sectors and related occupational strengths that merit consideration for workforce and training activities. For each, we provide an overview of the sector, our rationale for its selection, and a snapshot of the leading occupations in the field. NAICS and SOC codes have been identified where possible. However, some emerging industries and occupations cut across industries or are not readily classifiable. Training availability for key occupations is discussed in Section 5.



### Healthcare

As mentioned above, demand for healthcare is expected to increase in the coming decades as the population continues to age and new technologies become available. The Valley is likely to continue to exceed national growth rates due to its growing population, the prevalence of chronic conditions (such as diabetes), and the region’s location along an international border. Implementation of the healthcare reform act is also likely to create change in this sector, with employment declines in some areas and job creation in others. The adoption of electronic medical records is an example of a reform that is likely to result in new employment opportunities. Unlike our 2005 analysis, we recommend that consideration be given to expanding the occupations in this sector to include both healthcare and social assistance jobs. This recommendation is a reflection of the fact that it is sometimes difficult to distinguish between the boundaries of these two activities. In addition, the increasing complexity of the healthcare system is likely to increase the need for case management activities and coordination among resources.

The industries in this sector are classified on a continuum starting with those establishments providing medical care exclusively (Ambulatory Health Care Services, NAICS 621, and Hospitals, NAICS 622), continuing with those providing health care and social assistance ( Nursing and Residential Care Facilities, NAICS 623), and finally finishing with those providing only social assistance (Social Assistance, NAICS 624). The services provided by establishments in this sector are delivered by trained professionals. All industries in the sector share a commonality of process, namely, they rely on health practitioners or social workers with the requisite expertise. Many of the industries in the sector are defined based on the educational degree held by the practitioners included in the industry.

Figure 4.1a provides statistics for occupations typically found in establishments that provide services on an outpatient, or ambulatory, basis (such as the offices of physicians, dentists, or other health practitioners) and in hospitals. Figure 4.1b covers occupations that are typically found in residential care facilities (like nursing homes) or in social assistance settings (such as vocational rehabilitation centers, child care providers, and community housing and food services).

Figure 4.1a: Key Occupations in the Ambulatory Health Care Services and Hospitals Sectors (ranked on % of industry employment)  
*Includes occupations typically found in the sector (based on national staffing patterns) with hourly earnings above the region’s self-sufficiency level<sup>(1)</sup>*

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
29-1111	Registered nurses	8.0%	7,027	8,544	1,517	22%	17.47	\$31.24	Associate's degree
31-1012	Nursing aides, orderlies, and attendants	5.0%	6,473	7,755	1,282	20%	9.96	\$8.45	PS vocational award
29-1069	Physicians and surgeons	3.0%	2,132	2,568	436	20%	17.59	\$83.40	First prof degree

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
29-2061	Licensed practical / licensed vocational nurses	3.0%	2,946	3,531	585	20%	31.28	\$20.85	PS vocational award
31-9092	Medical assistants	3.0%	2,487	3,176	689	28%	11.14	\$10.13	Moderate-term OTJ
43-6013	Medical secretaries	3.0%	2,375	2,939	564	24%	13.47	\$10.14	PS vocational award
43-9061	Office clerks, general	3.0%	10,488	12,080	1,592	15%	13.63	\$9.10	Short-term OTJ
43-3021	Billing / posting clerks and machine operators	2.0%	1,824	2,143	319	17%	16.41	\$11.07	Moderate-term OTJ
43-4171	Receptionists and information clerks	2.0%	2,765	3,230	465	17%	26.98	\$8.88	Short-term OTJ
43-6014	Secretaries, except legal, medical, and exec.	2.0%	7,748	8,722	974	13%	13.47	\$10.93	Moderate-term OTJ
11-1021	General and operations managers	1.0%	4,142	4,500	358	9%	28.98	\$31.64	Degree + work exp.
11-9111	Medical and health services managers	1.0%	885	1,062	177	20%	19.05	\$32.37	Degree + work exp.
29-1123	Physical therapists	1.0%	701	908	207	30%	12.08	\$35.14	Master's degree
29-1126	Respiratory therapists	1.0%	495	604	109	22%	18.21	\$27.23	Associate's degree
29-2034	Radiologic technologists and technicians	1.0%	639	769	130	20%	14.46	\$25.18	Associate's degree
29-2041	Emergency medical technicians and paramedics	1.0%	1,057	1,248	191	18%	20.40	\$12.62	PS vocational award

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Figure 4.1a: Key Occupations in the Ambulatory Health Care Services and Hospitals Sectors (CONTINUED)

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
29-2071	Medical records and health information techs	1.0%	727	883	156	21%	20.40	\$10.81	Associate's degree
31-9091	Dental assistants	1.0%	633	802	169	27%	18.78	\$12.07	Moderate-term OTJ
37-2011	Janitors & cleaners, except maids / housekpng	1.0%	6,801	7,412	611	9%	18.90	\$9.17	Short-term OTJ

43-1011	First-line sups/mgrs. office & admin. support	1.0%	4,582	5,276	694	15%	22.56	\$16.11	Work experience
43-3031	Bookkeeping, accounting, and auditing clerks	1.0%	4,576	5,185	609	13%	12.02	\$11.50	Moderate-term OTJ
43-4051	Customer service representatives	1.0%	8,432	9,809	1,377	16%	31.47	\$9.12	Moderate-term OTJ

Sources: EMSI Complete Employment – 3rd Quarter 2010; U.S. Bureau of Labor Statistics (estimated replacement rate).

- (1) Excludes occupations with fewer than 25 employees in 2010 or which are projected to add fewer than 25 jobs between 2010 and 2015. Refers to current self-sufficiency wage for Workforce Solutions LRGV (\$8.42).
- (2) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work competed in a related field.

Figure 4.1b: Key Occupations in the Nursing and Residential Care Facilities and Social Assistance Sectors (ranked on % of industry employment) <sup>(1)</sup>  
*Includes occupations typically found in the sector (based on national staffing patterns) with hourly earnings above the region's self-sufficiency level*

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
31-1012	Nursing aides, orderlies, and attendants	8.0%	6,473	7,755	1,282	20%	9.96	\$8.45	PS vocational award
25-2011	Preschool teachers, except special education	5.0%	1,716	2,010	294	17%	20.05	\$17.03	PS vocational award
25-9041	Teacher assistants	3.0%	6,691	7,695	1,004	15%	21.16	\$12.09	Short-term OTJ
21-1093	Social and human service assistants	2.0%	1,255	1,485	230	18%	21.16	\$13.79	Moderate-term OTJ
29-2061	Licensed practical / licensed vocational nurses	2.0%	2,946	3,531	585	20%	31.28	\$20.85	PS vocational award
35-2012	Cooks, institution and cafeteria	2.0%	1,696	1,901	205	12%	25.59	\$9.16	Moderate-term OTJ
11-1021	General and operations managers	1.0%	4,142	4,500	358	9%	28.98	\$31.64	Degree + work exp.
11-9031	Education administrators, preschool / child care	1.0%	228	259	31	14%	29.93	\$13.01	Degree + work exp.
11-9151	Social and community service managers	1.0%	397	455	58	15%	23.10	\$14.69	Bachelor's degree
21-1012	Educational, vocational, and school counselors	1.0%	1,528	1,792	264	17%	20.22	\$27.20	Master's degree
21-1021	Child, family, and school social workers	1.0%	1,098	1,277	179	16%	25.12	\$16.83	Bachelor's degree

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Figure 4.1b: Key Occupations in the Nursing and Residential Care Facilities and Social Assistance Sectors (CONTINUED)

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
25-2012	Kindergarten teachers, except special ed	1.0%	908	1,067	159	18%	20.05	\$27.06	Bachelor's degree
29-1111	Registered nurses	1.0%	7,027	8,544	1,517	22%	17.47	\$31.24	Associate's degree
37-2011	Janitors & cleaners, except maids / housepng	1.0%	6,801	7,412	611	9%	18.90	\$9.17	Short-term OTJ
43-6014	Secretaries, except legal, medical, and exec.	1.0%	7,748	8,722	974	13%	13.47	\$10.93	Moderate-term OTJ
43-9061	Office clerks, general	1.0%	10,488	12,080	1,592	15%	13.63	\$9.10	Short-term OTJ
49-9042	Maintenance and repair workers, general	1.0%	4,043	4,597	554	14%	15.39	\$9.80	Moderate-term OTJ
53-3022	Bus drivers, school	1.0%	1,905	2,109	204	11%	17.47	\$10.86	Short-term OTJ

Sources: EMSI Complete Employment – 3rd Quarter 2010; U.S. Bureau of Labor Statistics (estimated replacement rate). Excludes occupations with fewer than 25 employees in 2010.

- (1) Excludes occupations with fewer than 25 employees in 2010 or which are projected to add fewer than 25 jobs between 2010 and 2015. Refers to current self-sufficiency wage for Workforce Solutions LRGV (\$8.42).
- (2) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.

### Alternative Energy / Utilities

Investment patterns for alternative energy are tied to energy costs. Alternative energy experienced a wave of investment in the late 1970s, and this pattern re-emerged three decades later. As energy prices spiked, private investment into renewables picked up, heavily influenced by federal subsidies. In the 1980s, waning energy prices and the removal of subsidies led to a collapse of the nascent renewable energy sector. History may not repeat itself in this decade, but nonetheless, an awareness of these past patterns can be instructive. While it is impossible to predict with any certainty where energy prices will go over the next 10 years, new demand from emerging countries (especially China) is likely to keep energy prices more elevated than in the past. If so, these market forces will benefit alternative energy producers. The more certain trend to watch is the expiration of federal subsidies. Stimulus spending to energy projects was programmed for just a few, short years, and fiscal realities may preclude further allocations, at least to the same degree.

Data providers and researchers have attempted to create a workable definition of the alternative energy industry under the existing industrial classification codes. For example, the Massachusetts Technology Collaborative (MTC) attempted a definition of alternative energy in 2005. Their definition drilled down to 8-digit industry codes, many of which did not match up well with more commonly used NAICS codes. The MTC definition stretched across 25 different micro-industries ranging from utilities to construction to manufacturing to

engineering service. EMSI offers a definition of the cluster that includes fossil fuels and convenience stores (as part of the distribution chain for petroleum products). O-NET is also redefining its occupational structure to capture “green” jobs. However, a number of these occupations either overlap with existing classification (and are simply a recognition of “enhanced skills” that are needed for green economy jobs) or they are new and emerging occupations (for which no statistics are available). As a result, the data presented in Figure 4.2 represent the utility sector as a whole. Industries in the Utilities subsector provide electric power, natural gas, steam supply, water supply, and sewage removal through a permanent infrastructure of lines, mains, and pipes. Establishments are grouped together based on the utility service provided and the particular system or facilities required to perform the service.

Figure 4.2: Key Occupations in the Utilities Sector (ranked on % of industry employment)

*Includes occupations typically found in the sector (based on national staffing patterns) with hourly earnings above the region's self-sufficiency level<sup>(1)</sup>*

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
49-9051	Electrical power-line installers and repairers	9.0%	270	300	30	11%	35.51	\$13.67	Long-term OTJ
51-8031	Water/ liquid waste treatment plant and system ops	8.0%	538	661	123	23%	21.51	\$12.05	Long-term OTJ
43-4051	Customer service representatives	7.0%	8,432	9,809	1,377	16%	31.47	\$9.12	Moderate-term OTJ
43-9061	Office clerks, general	3.0%	10,488	12,080	1,592	15%	13.63	\$9.10	Short-term OTJ
43-6014	Secretaries, except legal, medical, and executive	3.0%	7,748	8,722	974	13%	13.47	\$10.93	Moderate-term OTJ
49-9042	Maintenance and repair workers, general	3.0%	4,043	4,597	554	14%	15.39	\$9.80	Moderate-term OTJ
51-1011	First-line sups/mgrs. of production & operating workers	3.0%	896	947	51	6%	13.49	\$17.29	Work experience
43-1011	First-line sups/mgrs. of office & admin support workers	2.0%	4,582	5,276	694	15%	22.56	\$16.11	Work experience
43-3031	Bookkeeping, accounting, and auditing clerks	2.0%	4,576	5,185	609	13%	12.02	\$11.50	Moderate-term OTJ
11-1021	General and operations managers	2.0%	4,142	4,500	358	9%	28.98	\$31.64	Degree + work exp.
49-1011	First-line sups/mgrs. of mechanics, installers, & repairers	2.0%	901	973	72	8%	26.19	\$19.36	Work experience
47-2061	Construction laborers	1.0%	4,617	5,467	850	18%	6.69	\$9.56	Moderate-term OTJ
13-	Accountants and auditors	1.0%	2,852	3,342	490	17%	16.90	\$15.30	Bachelor's degree

2011									
43-6011	Executive secretaries and administrative assistants	1.0%	2,644	3,039	395	15%	13.47	\$14.56	Moderate-term OTJ
43-3021	Billing and posting clerks and machine operators	1.0%	1,824	2,143	319	17%	16.41	\$11.07	Moderate-term OTJ
47-2111	Electricians	1.0%	1,400	1,548	148	11%	24.17	\$12.59	Long-term OTJ
47-2073	Operating engineers/other construction equipment operators	1.0%	1,142	1,296	154	13%	17.17	\$11.52	Moderate-term OTJ
47-2152	Plumbers, pipefitters, and steamfitters	1.0%	742	859	117	16%	20.16	\$12.36	Long-term OTJ
49-9041	Industrial machinery mechanics	1.0%	389	419	30	8%	14.39	\$17.05	Long-term OTJ

Sources: EMSI Complete Employment – 3rd Quarter 2010; U.S. Bureau of Labor Statistics (estimated replacement rate). Excludes occupations with fewer than 25 employees in 2010.

- (1) Excludes occupations with fewer than 25 employees in 2010 or which are projected to add fewer than 25 jobs between 2010 and 2015. Refers to current self-sufficiency wage for Workforce Solutions LRGV (\$8.42).
- (2) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.

## Construction/Skilled Trades

Construction employment was hard-hit during the recession, as a precipitous drop in demand and a lack of financing brought a number of projects to a standstill. As the economy improves, there are signs of a rebound in construction activity. The Construction sector includes both residential and non-residential construction, including heavy construction, such as roads and bridges. In addition to the laborers and engineering talent required by the sector, there is likely to be increased demand for workers in the skilled trades – plumbers, electricians, and carpenters. Along with demand resulting from increased construction activity, these professions are also likely to experience growth as a result of the aging of the baby boom generation and a lack of new workers going into these fields.

Figure 4.3: Key Occupations in the Construction Sector (ranked on % of industry employment)  
Includes occupations typically found in the sector (based on national staffing patterns) with hourly earnings above the region's self-sufficiency level<sup>(1)</sup>

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
47-2061	Construction laborers	14.0%	4,617	5,467	850	18%	6.69	\$9.56	Moderate-term OTJ
47-2031	Carpenters	13.0%	4,002	4,589	587	15%	12.45	\$11.22	Long-term OTJ
47-1011	First-line sups/mgrs. construction trades & extraction	9.0%	2,950	3,380	430	15%	19.33	\$14.35	Work experience
11-9021	Construction managers	9.0%	2,830	3,245	415	15%	7.78	\$12.32	Bachelor's degree
47-2141	Painters, construction and maintenance	5.0%	1,685	1,891	206	12%	17.08	\$10.94	Moderate-term OTJ
47-2111	Electricians	4.0%	1,400	1,548	148	11%	24.17	\$12.59	Long-term OTJ
49-9021	Heating, A/C, and refrigeration mechanics and installers	3.0%	1,328	1,600	272	20%	16.10	\$12.03	Long-term OTJ
43-6014	Secretaries, except legal, medical, and executive	2.0%	7,748	8,722	974	13%	13.47	\$10.93	Moderate-term OTJ
47-2073	Operating engineers and other construction equip operators	2.0%	1,142	1,296	154	13%	17.17	\$11.52	Moderate-term OTJ
47-2152	Plumbers, pipefitters, and steamfitters	2.0%	742	859	117	16%	20.16	\$12.36	Long-term OTJ
47-2051	Cement masons and concrete finishers	2.0%	502	592	90	18%	25.16	\$11.16	Moderate-term OTJ
47-2181	Roofers	2.0%	481	526	45	9%	16.43	\$11.47	Moderate-term OTJ
43-9061	Office clerks, general	1.0%	10,488	12,080	1,592	15%	13.63	\$9.10	Short-term OTJ
53-3032	Truck drivers, heavy and tractor-trailer	1.0%	6,912	8,019	1,107	16%	17.89	\$12.72	Moderate-term OTJ

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
43-3031	Bookkeeping, accounting, and auditing clerks	1.0%	4,576	5,185	609	13%	12.02	\$11.50	Moderate-term OTJ
11-9199	Managers, all other	1.0%	4,220	4,966	746	18%	25.80	\$12.39	Work experience
11-1021	General and operations managers	1.0%	4,142	4,500	358	9%	28.98	\$31.64	Degree + work exp.
11-1011	Chief executives	1.0%	3,049	3,593	544	18%	28.11	\$16.35	Degree + work exp.

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Figure 4.3: Key Occupations in the Construction Sector (CONTINUED)

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
43-6011	Executive secretaries and administrative assistants	1.0%	2,644	3,039	395	15%	13.47	\$14.56	Moderate-term OTJ
51-4121	Welders, cutters, solderers, and brazers	1.0%	1,371	1,449	78	6%	30.63	\$12.08	Long-term OTJ
47-2151	Pipelayers	1.0%	400	456	56	14%	20.16	\$10.63	Moderate-term OTJ
47-3013	Helpers, electricians	1.0%	369	426	57	15%	20.82	\$8.73	Short-term OTJ
13-1051	Cost estimators	1.0%	319	381	62	19%	22.21	\$18.74	Work experience
47-2081	Drywall and ceiling tile installers	1.0%	278	323	45	16%	10.96	\$10.23	Moderate-term OTJ
47-2021	Brickmasons and blockmasons	1.0%	270	296	26	10%	25.29	\$11.43	Long-term OTJ
47-3015	Helpers, pipelayers, plumbers, pipefitters, and steamfitters	1.0%	223	275	52	23%	20.82	\$8.78	Short-term OTJ
47-2221	Structural iron and steel workers	1.0%	169	208	39	23%	16.43	\$11.10	Long-term OTJ

Sources: EMSI Complete Employment – 3rd Quarter 2010; U.S. Bureau of Labor Statistics (estimated replacement rate). Excludes occupations with fewer than 25 employees in 2010.

(1) Excludes occupations with fewer than 25 employees in 2010 or which are projected to add fewer than 25 jobs between 2010 and 2015. Refers to current self-sufficiency wage for Workforce Solutions LRGV (\$8.42).

(2) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.



## Advanced Manufacturing

The Manufacturing sector continues to experience declines in employment nationwide. Yet, it remains an important part of the economy and a pathway for higher wage employment. The planned North American Research and Education World Premier Park could help support growth in this sector. The proposed facility would be located in McAllen on 80 acres owned by the city, with an additional 200 acres available for corporate research and development activities. The park is an outgrowth of the North American Advanced Manufacturing Research and Education Initiative or NAAMREI. The NAAMREI partnership evolved from one originally developed to implement a regional apprenticeship program for selected manufacturing occupations. NAAMREI is an alliance of 47 private and public sector groups, including representatives from education, workforce, and economic development focused on increasing manufacturing competitiveness. The purpose of NAAMREI is to develop a world-class advanced manufacturing industry in the LRGV region.

The existing classification system categorizes manufacturers by the broad processes they have in common – smelting, stamping, molding, etc. This approach does not necessarily capture the level of advanced technology employed by an individual company or industry. As part of the Texas Target Industry Cluster Initiative, the Governor’s Office has identified a mix of manufacturing and service industries that form the Advanced Technologies and Manufacturing cluster (see Appendix E). Within this cluster, the four-county region has an estimated 100 or more employees in the following industries:

- Architectural, Engineering, and Related Services (NAICS 5413)
- Ship and Boat Building (NAICS 3336)
- Aerospace Product and Parts Manufacturing (NAICS 3364)
- Computer Systems Design and Related Services (NAICS 5415)
- Motor Vehicle Parts Manufacturing (NAICS 3363)
- Electrical Equipment Manufacturing (NAICS 3353)
- Specialized Design Services (NAICS 5414)
- Other General Purpose Machinery Manufacturing (NAICS 3339)
- Ag, Construction, Mining Machinery Manufacturing (NAICS 3331)
- Medical Equipment and Supplies Manufacturing (NAICS 3391)
- Paint, Coating, and Adhesive Manufacturing (NAICS 3255)
- Navigation, Measuring, Instruments Manufacturing (NAICS 3345)

The inclusion of industries such as Computer Systems Design and Related Services (NAICS 5415) in the State of Texas cluster reflects the growing role of technical services in manufacturing. Local economic development organizations report some success in attracting firms in this sector, which will help strengthen the region’s manufacturing opportunities. However, to better isolate production-related

occupations, the table below is based on staffing patterns in the Manufacturing sector only. Key occupations for the Professional, Scientific, and Technical Services industries (NAICS 54) are included in the Business Services sector.

Figure 4.4: Key Occupations in the Manufacturing Sector (ranked on % of industry employment)

*Includes occupations typically found in the sector (based on national staffing patterns) with hourly earnings above the region's self-sufficiency level<sup>(1)</sup>*

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
11-9199	Managers, all other	4.0%	4,220	4,966	746	18%	25.80	\$12.39	Work experience
51-4121	Welders, cutters, solderers, and brazers	4.0%	1,371	1,449	78	6%	30.63	\$12.08	Long-term OTJ
53-3032	Truck drivers, heavy and tractor-trailer	3.0%	6,912	8,019	1,107	16%	17.89	\$12.72	Moderate-term OTJ
51-1011	First-line sups/mgrs. of production & operating workers	3.0%	896	947	51	6%	13.49	\$17.29	Work experience
49-9042	Maintenance and repair workers, general	2.0%	4,043	4,597	554	14%	15.39	\$9.80	Moderate-term OTJ
11-1011	Chief executives	2.0%	3,049	3,593	544	18%	28.11	\$16.35	Degree + work exp.
41-4012	Sales reps, wholesale & mfg, excpt tech & scientific products	2.0%	2,674	2,917	243	9%	23.16	\$17.14	Moderate-term OTJ
43-5071	Shipping, receiving, and traffic clerks	2.0%	1,786	1,845	59	3%	24.81	\$9.50	Short-term OTJ
53-7051	Industrial truck and tractor operators	2.0%	1,287	1,384	97	8%	29.80	\$8.55	Short-term OTJ
51-3011	Bakers	2.0%	726	838	112	15%	25.65	\$8.91	Long-term OTJ
51-9061	Inspectors, testers, sorters, samplers, and weighers	2.0%	652	689	37	6%	16.76	\$8.97	Moderate-term OTJ

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Figure 4.4: Key Occupations in the Manufacturing Sector (CONTINUED)

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
51-2041	Structural metal fabricators and fitters	2.0%	504	519	15	3%	21.01	\$12.40	Moderate-term OTJ
51-3022	Meat, poultry, and fish cutters and trimmers	2.0%	439	471	32	7%	32.02	\$9.96	Short-term OTJ
51-4041	Machinists	2.0%	373	386	13	3%	13.19	\$12.74	Long-term OTJ
51-7011	Cabinetmakers and bench carpenters	2.0%	327	414	87	27%	22.51	\$8.91	Long-term OTJ
51-9196	Paper goods machine setters, operators, and tenders	2.0%	253	246	(7)	(3%)	20.91	\$13.22	Moderate-term

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
									OTJ
43-9061	Office clerks, general	1.0%	10,488	12,080	1,592	15%	13.63	\$9.10	Short-term OTJ
43-4051	Customer service representatives	1.0%	8,432	9,809	1,377	16%	31.47	\$9.12	Moderate-term OTJ
43-6014	Secretaries, except legal, medical, and executive	1.0%	7,748	8,722	974	13%	13.47	\$10.93	Moderate-term OTJ
37-2011	Janitors & cleaners, except maids / housekpng	1.0%	6,801	7,412	611	9%	18.90	\$9.17	Short-term OTJ
43-5081	Stock clerks and order fillers	1.0%	5,457	6,115	658	12%	23.03	\$8.48	Short-term OTJ
43-3031	Bookkeeping, accounting, and auditing clerks	1.0%	4,576	5,185	609	13%	12.02	\$11.50	Moderate-term OTJ
11-1021	General and operations managers	1.0%	4,142	4,500	358	9%	28.98	\$31.64	Degree + work exp.
53-3033	Truck drivers, light or delivery services	1.0%	4,003	4,511	508	13%	17.89	\$10.09	Short-term OTJ
47-2111	Electricians	1.0%	1,400	1,548	148	11%	24.17	\$12.59	Long-term OTJ
41-4011	Sales reps, wholesale & mfg, tech & scientific products	1.0%	1,095	1,249	154	14%	23.16	\$22.12	Moderate-term OTJ
43-5061	Production, planning, and expediting clerks	1.0%	475	515	40	8%	24.63	\$14.61	Short-term OTJ
49-9041	Industrial machinery mechanics	1.0%	389	419	30	8%	14.39	\$17.05	Long-term OTJ
51-2099	Assemblers and fabricators, all other	1.0%	225	253	28	12%	22.52	\$9.49	Moderate-term OTJ

Sources: EMSI Complete Employment – 3rd Quarter 2010; U.S. Bureau of Labor Statistics (estimated replacement rate).

- (1) Excludes occupations with fewer than 25 employees in 2010 or which are projected to add fewer than 25 jobs between 2010 and 2015. Refers to current self-sufficiency wage for Workforce Solutions LRGV (\$8.42).
- (2) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work competed in a related field.

## Business Services

Businesses that provide services to other businesses cut across a number of industries, from those that offer professional services (such as legal, accounting, and marketing) to those providing routine activities like janitorial services and trash collection. Having a strong business services sector not only provides employment opportunities directly, it can play an important role in the retention and recruitment of other businesses.

The four-county region has seen growth in some business-service-related sectors, particularly Administrative and Support and Waste Management and Remediation Services (NAICS 56), which has added an average of more than 1,000 jobs per year since 2005. This sector, often shortened to Administrative Services, includes establishments that provide routine services ranging from office administration and human resource management to security and surveillance or cleaning, and waste disposal. The region has also seen growth in Professional, Scientific, and Technical Services (NAICS 54) and Real Estate and Rental and Leasing (NAICS 53) since 2005, despite job losses in recent years.

One area in which local employment growth has lagged national trends is the Information sector (NAICS 51), which includes establishments engaged in publishing, telecommunications, and data processing services. Companies involved in the planning and design of computer systems; the development of software applications; or on-site management of computer networks or data processing facilities are classified under Professional, Scientific, and Technical Services.

Figure 4-5 includes key occupations in a business-related sectors identified by TIP Strategies.

Figure 4.5: Key Occupations in Business Services<sup>(1)</sup> (ranked on % of industry employment)  
Includes occupations typically found in the sector (based on national staffing patterns) with hourly earnings above the region's self-sufficiency level<sup>(2)</sup>

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(3)</sup>
43-4051	Customer service representatives	7.0%	8,432	9,809	1,377	16%	31.47	\$9.12	Moderate-term OTJ
43-9061	Office clerks, general	3.0%	10,488	12,080	1,592	15%	13.63	\$9.10	Short-term OTJ
49-3023	Automotive service technicians and mechanics	3.0%	2,718	2,848	130	5%	19.08	\$11.36	PS vocational award
41-3021	Insurance sales agents	3.0%	1,797	2,043	246	14%	23.21	\$11.56	Bachelor's degree
43-6014	Secretaries, except legal, medical, and executive	2.0%	7,748	8,722	974	13%	13.47	\$10.93	Moderate-term OTJ
37-2011	Janitors and cleaners, except maids and housekeeping cleaners	2.0%	6,801	7,412	611	9%	18.90	\$9.17	Short-term OTJ
43-3031	Bookkeeping, accounting, and auditing clerks	2.0%	4,576	5,185	609	13%	12.02	\$11.50	Moderate-term OTJ
11-9199	Managers, all other	2.0%	4,220	4,966	746	18%	25.80	\$12.39	Work experience
33-9032	Security guards	2.0%	2,925	3,299	374	13%	20.57	\$9.87	Short-term OTJ
13-2011	Accountants and auditors	2.0%	2,852	3,342	490	17%	16.90	\$15.30	Bachelor's degree
41-1012	First-line supervisors/managers of non-retail sales workers	2.0%	2,764	3,116	352	13%	20.73	\$15.77	Work experience
37-1011	First-line sups/mgrs. of housekeeping and janitorial	2.0%	1,590	1,958	368	23%	10.40	\$8.53	Work experience

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(3)</sup>
	workers								
23-1011	Lawyers	2.0%	1,084	1,204	120	11%	18.68	\$25.76	First prof. degree
47-2061	Construction laborers	1.0%	4,617	5,467	850	18%	6.69	\$9.56	Moderate-term OTJ
43-1011	First-line sups/mgrs. of office and administrative support workers	1.0%	4,582	5,276	694	15%	22.56	\$16.11	Work experience

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Figure 4.5: Key Occupations in Business Services<sup>(1)</sup> (CONTINUED)

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
11-1021	General and operations managers	1.0%	4,142	4,500	358	9%	28.98	\$31.64	Degree + work exp.
49-9042	Maintenance and repair workers, general	1.0%	4,043	4,597	554	14%	15.39	\$9.80	Moderate-term OTJ
11-1011	Chief executives	1.0%	3,049	3,593	544	18%	28.11	\$16.35	Degree + work exp.
43-4171	Receptionists and information clerks	1.0%	2,765	3,230	465	17%	26.98	\$8.88	Short-term OTJ
43-6011	Executive secretaries and administrative assistants	1.0%	2,644	3,039	395	15%	13.47	\$14.56	Moderate-term OTJ
41-3099	Sales representatives, services, all other	1.0%	1,432	1,662	230	16%	24.80	\$14.94	Moderate-term OTJ
13-1111	Management analysts	1.0%	1,217	1,499	282	23%	17.16	\$16.04	Degree + work exp.
43-9021	Data entry keyers	1.0%	987	1,073	86	9%	20.82	\$9.97	Moderate-term OTJ
27-4021	Photographers	1.0%	920	993	73	8%	20.01	\$9.40	Long-term OTJ
43-6012	Legal secretaries	1.0%	787	906	119	15%	13.47	\$12.67	PS vocational award
41-9099	Sales and related workers, all other	1.0%	749	851	102	14%	22.31	\$9.35	Moderate-term OTJ
37-1012	First-line sups/mgrs, landscaping, lawn service, & groundskeeping	1.0%	498	612	114	23%	10.84	\$9.57	Work experience
49-3021	Automotive body and related repairers	1.0%	465	496	31	7%	25.85	\$11.89	Long-term OTJ
23-2011	Paralegals and legal assistants	1.0%	413	489	76	18%	11.35	\$20.26	Associate's degree

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
37-2021	Pest control workers	1.0%	311	364	53	17%	35.06	\$8.43	Moderate-term OTJ

Sources: EMSI Complete Employment – 3rd Quarter 2010; U.S. Bureau of Labor Statistics (estimated replacement rate).

- (1) As defined for this report, Business Services occupations are based on staffing patterns for the following industry sectors: Information; Finance and insurance; Real estate and rental and leasing; Professional and technical services; Administrative and waste services; and Other services, except public administration.
- (2) Excludes occupations with fewer than 25 employees in 2010 or which are projected to add fewer than 25 jobs between 2010 and 2015 (except those that comprise more than one percent of industry employment). Refers to current self-sufficiency wage for Workforce Solutions LRGV (\$8.42).
- (3) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work competed in a related field.

### Homeland Security & Criminal Justice

Interest in homeland security has skyrocketed since 9/11. Given the LRGV’s border location, a continued focus on this area makes sense. This sector does not fall neatly into the federal industrial classification system, but rather cuts across many sectors of the economy, including government. Examples of activities that are most typically associated with this sector are Transportation Safety Administration screeners at the local airport, border patrol agents, and border crossing personnel. In addition to these public-sector activities, the presence of an international border presents a variety of private-sector opportunities, including cargo-handling services, software application development, telecommunications, and surveillance systems.

Although there is likely to be some private-sector employment associated with this sector, the occupational analysis presented Figure 4.6 is based on staffing patterns for government employment. The analysis was limited to government employment because the demonstrated training need is for public safety and criminal justice employment. Furthermore, those private-sector industries for which demand is most likely to grow – namely communications and IT – are addressed in Business Services.

EMSI, the data provider used for this analysis, categorizes all publicly funded activity under either Local, State, or Federal Government. In light of this fact, there is no way to parse out publicly funded criminal justice activities from publicly funded education. For this reason, Figure 4.6 contains occupational data for both the Homeland Security & Criminal Justice sector and the Education sector.

### Education

The Valley’s young age structure and steady population growth has created strong demand for teachers and education professionals at all levels. This demand is not likely to wane in the foreseeable future. Ensuring that the region’s educational institutions have a supply of qualified professionals will be essential to its economic future. In addition to providing relatively high-wage employment and career

advancement opportunities, the education sector is the lynchpin in the preparation of a workforce with the knowledge, skills, and abilities demanded by current and future employers.

Figure 4.6: Key Occupations in the Public Sector (ranked on % of industry employment)  
*Includes occupations typically found in the sector (based on national staffing patterns) with hourly earnings above the region's self-sufficiency level<sup>(1)</sup>*

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
25-2021	Elementary school teachers, except special education	11.0%	10,307	12,216	1,909	19%	22.74	\$31.06	Bachelor's degree
25-9041	Teacher assistants	6.0%	6,691	7,695	1,004	15%	21.16	\$12.09	Short-term OTJ
25-2031	Secondary school teachers, except special and vocational ed	6.0%	6,025	6,927	902	15%	29.06	\$33.29	Bachelor's degree
25-2022	Middle school teachers, except special and vocational education	6.0%	5,371	6,351	980	18%	22.74	\$32.00	Bachelor's degree
43-9061	Office clerks, general	4.0%	10,488	12,080	1,592	15%	13.63	\$9.10	Short-term OTJ
25-1099	Postsecondary teachers	4.0%	3,922	4,673	751	19%		\$39.23	Doctoral degree Moderate-term OTJ
43-6014	Secretaries, except legal, medical, and executive	3.0%	7,748	8,722	974	13%	13.47	\$10.93	OTJ
37-2011	Janitors and cleaners, except maids and housekeeping cleaners	3.0%	6,801	7,412	611	9%	18.90	\$9.17	Short-term OTJ
33-3051	Police and sheriff's patrol officers	3.0%	2,343	2,720	377	16%	25.79	\$19.23	Long-term OTJ
25-3099	Teachers and instructors, all other	2.0%	2,428	2,832	404	17%	15.38	\$11.08	Bachelor's degree

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Figure 4.6: Key Occupations in the Public Sector (CONTINUED)

SOC Code	Description	% of Industry Empl.	2010 Jobs	2015 Jobs	Change	% Change	Estimated Replacement Rate (2008-2018)	Current Median Hourly Earnings	Education Level <sup>(2)</sup>
33-3021	Detectives and criminal investigators	2.0%	2,259	2,625	366	16%	20.47	\$26.72	Work experience
53-3022	Bus drivers, school	2.0%	1,905	2,109	204	11%	17.47	\$10.86	Short-term OTJ Moderate-term
33-3012	Correctional officers and jailers	2.0%	1,725	2,017	292	17%	22.16	\$14.86	OTJ
29-1111	Registered nurses	1.0%	7,027	8,544	1,517	22%	17.47	\$31.24	Associate's degree PS vocational award
31-1012	Nursing aides, orderlies, and attendants	1.0%	6,473	7,755	1,282	20%	9.96	\$8.45	

43-1011	First-line sups/mgrs of office and administrative support workers	1.0%	4,582	5,276	694	15%	22.56	\$16.11	Work experience
43-3031	Bookkeeping, accounting, and auditing clerks	1.0%	4,576	5,185	609	13%	12.02	\$11.50	Moderate-term OTJ
11-1021	General and operations managers	1.0%	4,142	4,500	358	9%	28.98	\$31.64	Degree + work exp. Moderate-term
49-9042	Maintenance and repair workers, general	1.0%	4,043	4,597	554	14%	15.39	\$9.80	OTJ
43-6011	Executive secretaries and administrative assistants	1.0%	2,644	3,039	395	15%	13.47	\$14.56	Moderate-term OTJ
13-1041	Compliance officers <sup>(3)</sup>	1.0%	1,817	2,205	388	21%	10.65	\$28.20	Long-term OTJ
35-2012	Cooks, institution and cafeteria	1.0%	1,696	1,901	205	12%	25.59	\$9.16	Moderate-term OTJ
21-1012	Educational, vocational, and school counselors	1.0%	1,528	1,792	264	17%	20.22	\$27.20	Master's degree
11-9032	Education administrators, elementary and secondary school	1.0%	1,244	1,428	184	15%	29.93	\$44.50	Degree + work exp.
13-1199	Business operation specialists, all other	1.0%	1,115	1,258	143	13%	22.21	\$26.27	Bachelor's degree
21-1021	Child, family, and school social workers	1.0%	1,098	1,277	179	16%	25.12	\$16.83	Bachelor's degree
25-2012	Kindergarten teachers, except special education	1.0%	908	1,067	159	18%	20.05	\$27.06	Bachelor's degree
25-2041	Special ed teachers, preschool, kindergarten, and elementary	1.0%	802	964	162	20%	25.93	\$31.98	Bachelor's degree
25-9031	Instructional coordinators	1.0%	778	955	177	23%	22.03	\$29.44	Master's degree
33-2011	Fire fighters	1.0%	758	911	153	20%	30.71	\$14.56	Long-term OTJ
25-2032	Vocational education teachers, secondary school	1.0%	727	839	112	15%	29.06	\$33.05	Degree + work exp.
25-4021	Librarians	1.0%	572	654	82	14%	26.29	\$26.71	Master's degree
33-1012	First-line supervisors/managers of police and detectives	1.0%	552	637	85	15%	43.80	\$33.61	Work experience

Sources: EMSI Complete Employment – 3rd Quarter 2010; U.S. Bureau of Labor Statistics (estimated replacement rate).

- (1) Excludes occupations with fewer than 25 employees in 2010 or which are projected to add fewer than 25 jobs between 2010 and 2015. Refers to current self-sufficiency wage for Workforce Solutions LRGV (\$8.42).
- (2) The U.S. Bureau of Labor Statistics BLS has identified 11 education or training categories to describe the most significant education or training pathway to employment for each occupation. OTJ = on-the-job training; PS = postsecondary; "Work experience" refers to work completed in a related field.
- (3) Except agriculture, construction, health and safety, and transportation



## 5: Education & Training

This section provides information on the Lower Rio Grande Valley's education and training system. It includes an analysis of workforce-related offerings for the postsecondary institutions serving the area, as well as a discussion of selected trends.

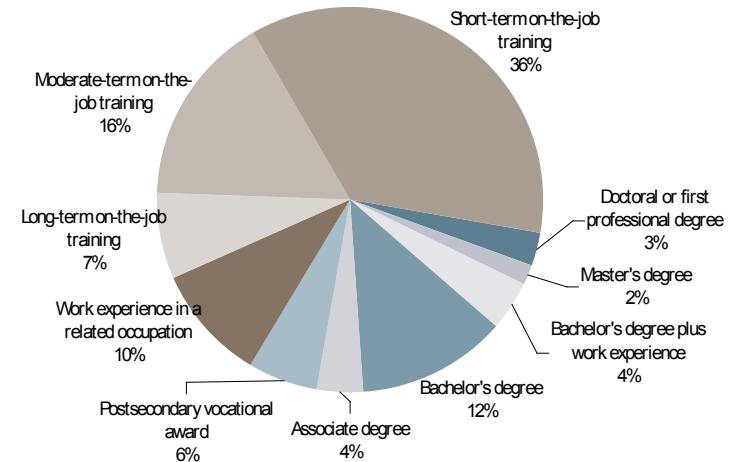
### Relevant trends

The survey of employers conducted in connection with this work and presented as Appendix A of this report found that the vast majority of firms conduct their training in-house. This finding is in keeping with national figures on the subject and with our experience talking to employers across the U.S.

In its June 2010 report, *Help Wanted: Projections of Jobs and Education Requirements through 2018*, Georgetown University's Center on Education and the Workforce estimated that only 35 percent of the \$772 billion spent on training each year was supplied by colleges and universities (Figure 5.3, *next page*). According to the study, nearly 60 percent of annual expenditures (\$454 million) were for employer-provided training, either formal or informal.

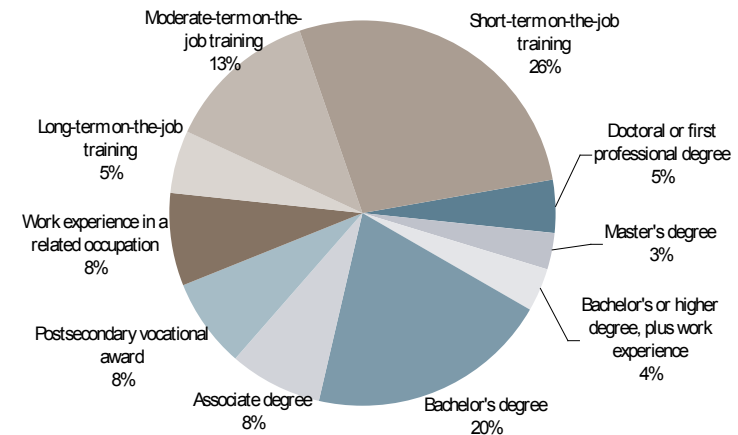
The prevalence of on-the-job training is also evident in national data on education and training by occupation compiled by the U.S. Bureau of Labor Statistics (BLS) as part of its Occupational Employment Statistics program. According to the agency's most recent analysis, on-the-job training or work experience was the most common education or training required for workers to become

Figure 5.1 Employment in the U.S. by education and training category for existing jobs, 2008



SOURCE U.S. Bureau of Labor Statistics. The BLS identifies 11 education or training categories that describe the most significant education or training pathway to employment for each occupation. First professional degree and Doctoral degree have been combined for this chart.

Figure 5.2 Employment in the U.S. by education and training category for projected new jobs, 2008-2018



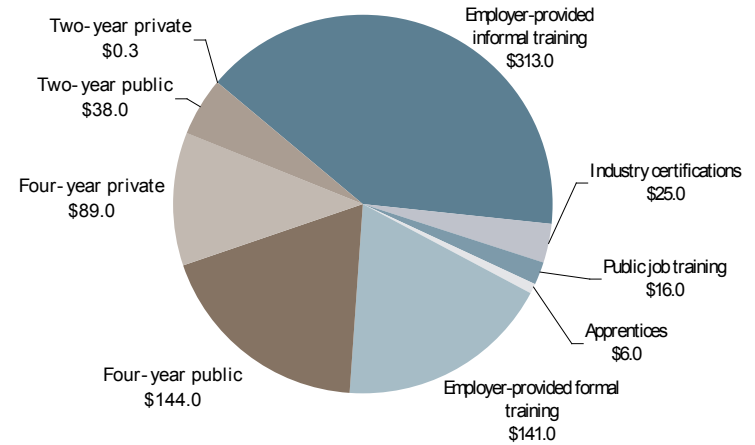
SOURCE U.S. Bureau of Labor Statistics. The BLS identifies 11 education or training categories that describe the most significant education or training pathway to employment for each occupation. First professional degree and Doctoral degree have been combined for this chart.

“fully qualified” in more than two-thirds of existing occupations in 2008 (Figure 5.1).

The distribution of education and skills needed for new jobs looks quite different, however (Figure 5.2). Occupations that typically require short-term on-the-job training still account for the largest share of new jobs projected by the BLS between 2008 and 2018, with 26 percent of new jobs expected to fall into this category. But the percentage of new jobs that can be filled by people with minimal skills drops significantly. Of the 15.2 million new jobs anticipated during this time period, the BLS estimates that on-the-job training and prior work experience are the likely education and skill level for just 52 percent. The remainder — 48 percent of new jobs — will require some form of postsecondary education. In terms of raw numbers, occupations requiring bachelor’s degrees will comprise the next largest share of new jobs at 20 percent. But in percentage terms, occupations requiring associates degrees are projected to see the largest gain, with jobs in this education category increasing by nearly 19 percent.

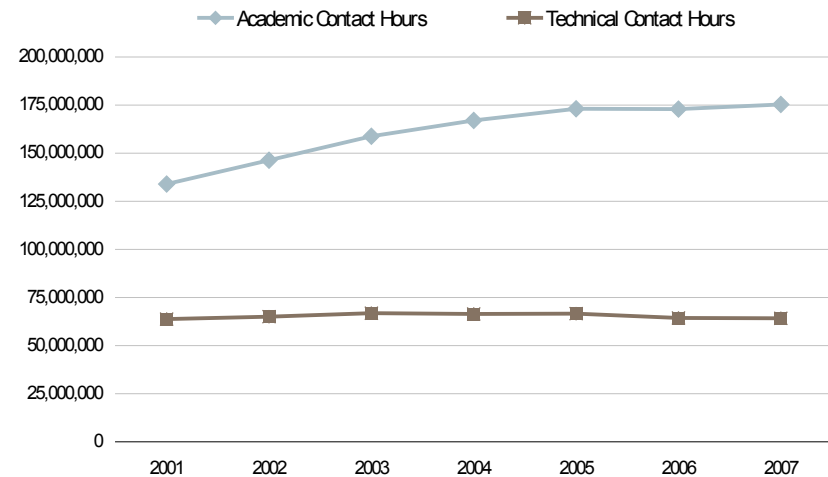
Even as the share of jobs requiring vocational training is rising, Texas has seen a shift away from this type of training. An analysis of contact hours at the state’s 50 community colleges shows a trend away from technical contact hours in recent years (Figure 5.4). Although the total number of contact hours continues to increase, technical contact hours have remained flat. The national emphasis on increasing educational attainment levels may be one explanation for this trend. The push by government agencies, nonprofit organizations, and community groups to increase the number of bachelor

Figure 5.3 Estimated spending on postsecondary education and training in the U.S. in billions of dollars



SOURCE Help Wanted: Projections of Jobs and Education Requirements through 2018, June 2010.

Figure 5.4 Technical and academic contact hours taken at Texas 2-year colleges, 2001-07



SOURCE Texas Higher Education Coordinating Board, as published by the Texas Comptroller of Public Accounts in *Texas Works: Training and Education for All Texans*, 2008.

degrees awarded — exemplified by the federal government’s recent goal for the U.S. to have the highest proportion of college graduates in the world by 2020 — may have the unintended consequence of siphoning students from vocational/technical training.

## Regional institutions

The LRGV is home to a strong network of training providers, including two components of the University of Texas System (The University of Texas at Brownsville and The University of Texas-Pan American in Edinburg) and two community colleges (South Texas College and Texas Southmost College). The presence of these public institutions helps ensure access to both academic and technical offerings, providing benefit from a workforce development standpoint as well as providing an amenity for residents.

In addition to these institutions, the Valley is fortunate to have two unique education and training assets. First, the region is home to one of only four campuses of the Texas State Technical College (TSTC). The presence of the TSTC Harlingen campus is a significant asset. Second, the establishment of the Regional Academic Health Center (RAHC) in 2002 has the potential to catalyze development in healthcare in the region, both from the standpoint of medical education and research. As a “geographically separated” campus of The University of Texas Health Science Center at San Antonio, the RAHC has facilities located throughout the region: two in Harlingen for medical education and clinical research, one in Edinburg for medical research, and one in Brownsville for public health education.

To provide a comprehensive picture of the region’s postsecondary offerings, we compiled data by Classification of Instructional Programs, or CIP, codes from three separate sources:

- National Center for Education Statistics (NCES). 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 data on enrollments, program completions, graduation rates, faculty and staff, finances, institutional prices, and student financial aid. These data are collected through a system of interrelated surveys conducted annually by the U.S. Department of Education’s National Center for Education Statistics (NCES). Data are made available to researchers through the Integrated Postsecondary Education Data System, or IPEDS. Each fall, institutions are required to report data on the number of awards conferred by program (at the 6-digit CIP code), by level (associate’s, bachelor’s, master’s, doctor’s, certificates), and by the race or ethnicity and gender of the recipient. These data are referred to as “completions.”<sup>2</sup> Data on completions for the three most recent

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<sup>2</sup> Similar data are published for public institutions in Texas by the Texas Higher Education Coordinating Board, through their Profile Reports Electronically Prepared (PREP) system. However, we found the NCES data to be more comprehensive. This may be due to the fact that under the IPEDS system, we were able to pull completions for both first and second majors. It may also be function of the reporting timeframe used. Institutions completing the IPEDS surveys can be defined as either academic reporters (following standard academic semesters), hybrid reporters (those that offer a combination of continuous and block enrollments), or program reporters (those that offer continuous enrollment or for whom enrollment times vary by program).

academic years available (2006-2007, 2007-2008, and 2008-2009) were downloaded from the IPEDS Data Center for all schools in the four-county region that participate in IPEDS surveys (any institution that participates in federal financial aid programs).<sup>3</sup>

- Texas Higher Education Coordinating Board (THECB). The THECB is charged with overseeing the performance of public institutions of higher education in Texas. As part of this charge, the THECB collects data for public colleges and universities, two-year colleges, public technical colleges (namely, the Texas State Technical System and Lamar State Colleges), and public health-related institutions. These data are collected through Coordinating Board Management (CBM) reports and are published via several mechanisms, including the Profile Reports Electronically Prepared, or PREP system. Private colleges and technical institutions have recently been invited to participate in these data collection efforts, but they are not mandated to do so. Because we obtained information on “for credit” offerings through the NCES system (see footnote 2), our review of THECB data focused on the availability of non-credit offerings, also referred to as continuing education. These data are important because workforce-related courses are often taken on a continuing education or non-credit basis. However, reporting requirements for non-credit courses are not the same as those for credit coursework, making data comparisons difficult. While we were able to obtain completions for credit offerings, we were limited to enrollment data for our analysis of non-credit offerings. This is because institutions are only required to report completions for those courses that exceed 360 contact hours. This threshold would exclude all institutional certificates or marketable skills awards, which by definition cannot exceed 360 contact hours. At the time of our analysis, non-credit data were not posted on the THECB website. We obtained enrollment data (defined as the enrollment on the census date, or third class day) for the following public institutions through a direct request to the THECB: South Texas College, Texas Southmost College, and TSTC –Harlingen.<sup>4</sup> Data were provided for calendar years 2007, 2008, 2009, and 2010.
- Texas Workforce Commission (TWC). The TWC maintains data on training institutions that are eligible to receive Workforce Investment Act (WIA) funds as part of its Eligible Training Provider System (ETPS). The ETPS includes both public and private entities. Automatic eligibility for inclusion on the ETPS is extended to any postsecondary institution that 1) is eligible to receive federal funds under Title IV of the Higher Education Act of 1965 and 2) provides a program that leads to an associate degree, baccalaureate degree or certificate. However, these institutions must still apply to be included in the list of eligible providers. We requested data from the TWC for all completions reported by ETPS providers in both workforce development board areas (Lower Rio and Cameron) by CIP code for the three most recent academic years available (2006-2007, 2007-2008, and 2008-2009).

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<sup>3</sup> <http://nces.ed.gov/ipeds/datacenter/DataFiles.aspx>.

<sup>4</sup> Data on non-credit/continuing education courses is not collected for private institutions (because they are not required to report) or four-year institutions (because such offerings are typically limited to professional development or personal enrichment). (Source: Email correspondence with D. Hiller, THECB, Fall 2010.)

The data were used to create a custom inventory of curricula in the region. Provided as an Excel file, the curricula inventory allowed us to identify available training programs – by school and year – using the associated CIP code for an individual occupation. The tool was used to identify potential gaps in training for key occupations. Findings from this analysis are provided below. Because of the lack of comparability between *completions* and *enrollments*, the focus of this analysis is on the completions data obtained from TWC and NCES. More detailed data from all three sources are provided as Appendices G through I.

### Training demands & gaps

In thinking about training “gaps,” it is important to remember that education and workforce training is not a closed system. 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.

Based on our analysis of the available curricula and our discussions with colleges in the region, we have highlighted issues regarding supply and demand of training for key occupations in the target sectors. Like the occupational analysis presented previously, capturing information on training programs for emerging occupations is complicated by the available classification systems. While the CIP system is highly detailed and covers every major academic and technical topic area, it is not intended to capture nuances regarding training content, such as today’s movement towards “green” or sustainable occupations. For example, much of the training related to energy efficiency is being conducted in connection with existing trades like heating, ventilating, and air conditioning (HVAC). Using CIP codes, there is no way to indicate whether a specific course offering goes beyond standard HVAC training to focus on energy efficiency topics. Where new curricula are required, based on our conversations with area colleges, we have indicated as much.

Beyond the difficulties of capturing new and emerging occupations or accounting for the open nature of the education and training system, this analysis has several technical limitations. First, because of the large number of occupations analyzed, we relied on data from state and federal sources. This approach had the advantage of providing uniform and consistent data across educational institutions. Second, the analysis relies on the use of a crosswalk obtained from the National Crosswalk Service Center (NCSC) to link occupations (Standard Occupational Classification codes) with programs of study (Classification of Instructional Programs codes). This is an imperfect tool as it may not capture the actual relationship between an individual’s educational course work and their intended occupation. Furthermore, the crosswalk used for this analysis links occupations from the 2000 SOC system with courses classified under the 2000 CIP system. Although more recent versions of both the SOC and CIP classification systems exist, there is no more recent

concordance between the two systems available from the NCSC. As a result, the analysis presented below should be viewed as a starting point for discussion.

### Healthcare

Healthcare, particularly allied health occupations, was identified as a demand area for training by local training providers. This is also an area in which a large share of the region's job growth is projected to occur. Relevant training is provided by a number of public and private institutions in the region (Figure 5.6). However, private career and technical colleges train three students in healthcare-related courses for every one student trained at public institutions. In fact, healthcare-related training accounts for more than three-quarters of all completions reported to TWC in the last three years by eligible training providers in the Cameron and Lower Rio workforce areas.

Private-sector completions are largely in training programs for entry-level positions, such as nursing aides and medical assistants, with area providers reporting between 1,000 and 1,400 completions in these areas in each of the last three years (CIP codes 51.1614 and 51.0801). These CIP codes can be crosswalked to three individual occupations, namely Nursing Aides, Orderlies, and Attendants (SOC 31-1012); Medical Assistants (SOC 31-9092); and Medical Equipment Preparers (SOC 31-9093). *(A full crosswalk for healthcare-related CIP codes is provided as Appendix F.)* A comparison with the forecast for health-related occupations in the region (Figure 5.5) suggests this figure is well-beyond the number of workers needed in the related occupations, which combined are expected to add less than 450 occupations annually between 2010 and 2015 through both growth and replacement.

A similar finding can be made for physical therapy assistants and aides. Two to three hundred students have completed training in this field (CIP 51.0806) for each of the last three years. However, the projected need for new workers suggest that only 51 workers will be needed annually in the four-county region between now and 2015, including demand from growth and replacement in both occupations.

By contrast, public school completions tend to be concentrated in nursing occupations and other more advanced positions, such as speech pathologists, audiologists, physical therapists, and physicians assistants. Training for many of these occupations is not keeping pace with demand. And even for those occupations where the two seem in balance, the production of credentialed workers may still not be sufficient. A slight "cushion" is actually required since not everyone who completes a particular program of study will ultimately look for work in that field. In addition, even those who remain in the profession – and who do not leave the region for work – may not be eligible for hire for other reasons or may not pass required state licensing exams.

Occupations where our analysis suggests a shortage of trained healthcare workers include:

**DEFINITION:** Allied health occupations provide support to professionals in medicine, nursing, and dentistry. Workers in this area provide a range of diagnostic, technical, therapeutic and direct patient



- Registered nurses (RN). The region's public colleges and universities reported roughly 350 to 400 registered nursing (RN) completions in each of the three years analyzed. This is more than the estimated growth of new jobs in this profession (estimated at 253 per year). However, when replacement needs are considered, the demand for new RNs is nearly 400 workers annually.
- Licensed vocational nurses (LVNs). The balance is somewhat less tight between the number of LVN completions and projected demand. The number of LPN/LVN completions reported annually by public institutions (to NCES) and private career and technical colleges (to TWC) is between 200 and 300 combined, compared with an estimated annual demand of roughly 200 per year based on projections for growth and estimates of replacement. Even with some seeming overproduction of LVNs, the supply of nursing graduates may not be sufficient to meet demand given the reasons cited above.
- Pharmacists. There does not appear to be any pharmacy training offered in the Valley currently; this is not surprising, as very limited training is available for this occupation in general. Demand for pharmacists is expected to average 44 additional jobs annually to match growth and replacement needs. By contrast, the number of completions reported for pharmacy technicians appears to be roughly twice the number of workers needed.
- Physical therapists. Training for physical therapists also appears to be limited in the region. Private colleges reported roughly 25 to 35 completions for CIP 51.2308 in the first two years analyzed and none in the third year. No completions were reported by public schools in the region in any of the three years reviewed. Average annual demand (growth and replacement) for physical therapists is estimated at 44.
- Other. Training for occupational therapists (17 completions annually) is also not likely to match up with demand (22 annually due to new job growth and replacement workers). Nor does the supply of respiratory therapist training (18 completions in each of the last three years) appear to be sufficient to meet projected demand (28 per year). Counseling occupations were identified as a need by respondents to the employer survey and limited training appears to exist in this field as well. Similar results are found when comparing reported completions with demand for speech pathologists (75 completions in 2009 versus an estimated annual need of 40 workers), dental hygienists (27 completions in 2009 versus annual estimated demand of 20), and emergency medical technicians (86 completions in 2009 versus estimated annual demand of 56). However, approximately 100 students enroll each year in EMT training on a continuing education basis, which could translate to an oversupply.

One area that is not captured in the data is the emergence of the health information technology (HIT) profession. The federal push for use of electronic medical records is expected to create demand for HIT professionals. Some training is currently available for Medical records and health information technicians (SOC 29-2071), with 40 completions reported in 2009. However, this figure is just barely on par with the current demand for workers in this field, estimated at 43 annually due to growth and replacement – an amount which is likely

to rise as policies affecting EMR implementation come into play. In addition, the current training may not adequately prepare workers for the new field of HIT, which merges medical coding and record keeping with a much greater understanding of programming and software than is currently required. One barrier to the development of such training programs is the lack of standardization in the industry. Providers that have already implemented an electronic record keeping system have developed a variety of custom software solutions, complicating the development of a standard curriculum.

The findings of this analysis confirm other indicators which point to a shortage of healthcare professionals, not the least of which is the fact that three of the region's four counties have been completely (Starr and Willacy) or partially (Cameron) designated as Primary Care Health Professional Shortage Areas by the Texas Department of State Health Services. It also meshes with findings from the employer survey, which reported a need for several of the professions discussed above. In addition, college officials interviewed in the course of this work reported continued strong demand for training in healthcare-related occupations. Across the board, we were told that if more instructional personnel were available or accreditation ratios were not a factor, each of the colleges could easily fill additional courses based on student demand. TSTC has recently expanded its nursing programs and now offers a Vocational Nursing Program (which results in a certificate and eligibility to sit for the state licensing exam) and an Associates of Science (AS) degree in nursing preparatory designed to transfer to a four-year degree program. The latter was developed in partnership with UT-Brownsville.

Understanding how many graduates of the region's healthcare training programs actually become fully licensed and find employment in their field of study could help clarify whether, in fact, local training providers are producing more graduates than the region can absorb or whether current projections understate regional need. For example, the expected demand for physician's assistants – as more medical practices use these skilled professionals to meet basic patient needs— may not be accurately captured in projections which are based on historical staffing patterns. An additional possibility is that people are completing their training in the Valley but are then lured to other metropolitan areas in Texas and elsewhere where pay scales are higher.

Figure 5.5 Projected employment in healthcare-related occupations across all industries in the LRGV  
Includes occupations classified under SOC 29 and 31; Ranked by total estimated annual change in employment (new and replacement jobs)

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
29-1111	Registered nurses	7,027	7,430	7,777	8,081	8,354	8,544	253	137	390
31-1012	Nursing aides, orderlies, and attendants	6,473	6,823	7,119	7,376	7,604	7,755	214	72	285
29-2061	Licensed practical and licensed vocational nurses	2,946	3,110	3,248	3,365	3,467	3,531	98	103	200
31-9092	Medical assistants	2,487	2,658	2,809	2,947	3,076	3,176	115	32	147
29-1069	Physicians and surgeons	2,132	2,246	2,345	2,433	2,512	2,568	73	42	114
29-2052	Pharmacy technicians	1,238	1,310	1,375	1,433	1,487	1,527	48	35	83

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replacement	Growth + Replacement
29-2041	Emergency medical technicians and paramedics	1,057	1,116	1,162	1,200	1,232	1,248	32	24	56
29-1123	Physical therapists	701	758	806	847	884	908	35	10	44
29-1051	Pharmacists	775	816	850	881	908	925	25	19	44
29-2071	Medical records and health information technicians	727	768	804	835	863	883	26	17	43
31-9091	Dental assistants	633	675	713	747	779	802	28	14	42
29-1127	Speech-language pathologists	648	693	731	763	792	810	27	13	40
29-2034	Radiologic technologists and technicians	639	673	703	729	752	769	22	10	32
31-2022	Physical therapist aides	411	450	483	512	537	554	24	7	31
29-1126	Respiratory therapists	495	523	548	569	590	604	18	10	28
29-2055	Surgical technologists	340	360	378	394	409	421	14	10	23
29-2012	Medical and clinical laboratory technicians	417	439	458	474	489	499	14	9	22
29-1122	Occupational therapists	331	356	377	396	412	423	15	7	22
31-9099	Healthcare support workers, all other	423	447	469	489	506	518	16	5	21
29-2021	Dental hygienists	293	313	331	347	362	373	13	7	20
31-2021	Physical therapist assistants	287	311	331	349	365	376	15	5	20
29-2011	Medical and clinical laboratory technologists	377	395	409	422	434	441	11	8	19
29-2081	Opticians, dispensing	283	298	310	320	328	332	8	6	15
29-1031	Dietitians and nutritionists	209	220	229	236	243	247	6	8	14
29-2099	Healthcare technologists and technicians, all other	219	232	244	254	262	268	8	5	13
29-1071	Physician assistants	180	193	205	216	226	235	9	4	13
29-1129	Therapists, all other	205	219	230	240	248	254	8	5	13

Source: EMSI Complete Employment - 3rd Quarter 2010. Estimated annual change calculated by TIP Strategies based on EMSI projections (Growth column) and U.S. Bureau of Labor Statistics replacement estimates (Replacement column). Excludes occupations projected to add <10 employees annually (new and replacement jobs) between 2010 and 2015 and those with current median hourly wages <\$8.42.

Figure 5.6: Healthcare-related completions reported to NCES and TWC (public data are for students enrolled in credit courses only)  
Ranked by combined total in 2008/2009

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private) <sup>(1)</sup>			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
51.1614	Nurse/Nursing Assistant/Aide and Patient Care Assistant	44	47	62	1,346	1,272	1,403	1,390	1,319	1,465
51.0801	Medical/Clinical Assistant	30	37	37	961	1,134	1,322	991	1,171	1,359
51.0716	Medical Admin/Executive Assistant/Secretary	33	19	10	360	463	594	393	482	604

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private) <sup>(1)</sup>			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
51.1601	Nursing/Registered Nurse (RN, ASN, BSN, MSN)	336	351	413				336	351	413
51.0806	Physical Therapist Assistant	10	6	12	204	263	325	214	269	337
51.1613	Nursing, Practical (LPN /LVN Training)	163	219	205	61	100	104	224	319	309
51.0710	Medical Office Assistant / Specialist				205	187	192	205	187	192
51.0805	Pharmacy Technician/Assistant	12	16	4	168	156	163	180	172	167
51.0601	Dental Assisting/Assistant	22	21	20	90	93	131	112	114	151
51.0912	Physician Assistant	29	28	110				29	28	110
51.2399	Rehabilitation and Therapeutic Professions, Other	41	58	105				41	58	105
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	80	143	86				80	143	86
51.0204	Audiology/Audiologist & Speech-Language Pathology/Pathologist	101	103	75				101	103	75
51.1004	Clinical/Medical Laboratory Technician	13	5	9	36	46	55	49	51	64
51.0907	Medical Radiologic Technol. / Tech.				120	48	54	120	48	54
51.0707	Health Information/Medical Records Technology/Technician	19	36	40				19	36	40
51.0713	Medical Insurance Coding Specialist/Coder	22	5	18	63	6	20	85	11	38
51.1009	Phlebotomy Technician				45	24	35	45	24	35
51.0602	Dental Hygiene/Hygienist	15	27	27				15	27	27
51.2602	Home Health Aide / Home Attendant				45	27	25	45	27	25
51.2310	Vocational Rehabilitation Counseling/Counselor	19	17	23				19	17	23
51.0000	Health Services/Allied Health/Health Sciences, General	27	17	21				27	17	21
51.0908	Respiratory Care Therapy/Therapist	18	18	18				18	18	18

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private) <sup>(1)</sup>			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
51.091 1	Radiologic Technology/Science - Radiographer	29	29	18				29	29	18
51.230 6	Occupational Therapy/Therapist	17	16	17				17	16	17
51.090 9	Surgical Technology/Technologist	23	15	16				23	15	16
51.310 1	Dietetics/Dietitian (RD)	19	12	16				19	12	16
51.070 8	Medical Transcription/Transcriptionist	27	20	14				27	20	14

Continued next page

Figure 5.6: Healthcare-related completions reported to NCES and TWC (CONTINUED)

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
51.160 5	Family Practice Nurse/Nurse Practitioner	14	17	14				14	17	14
51.080 3	Occupational Therapist Assistant	12	26	13				12	26	13
51.100 5	Clinical Laboratory Science/Medical Technology/Technologist	10	10	13				10	10	13
51.060 3	Dental Laboratory Technology/Technician	16	8	8				16	8	8
51.091 0	Diagnostic Med. Sonography/Sonographer & Ultrasound Tech	6	7	8				6	7	8
51.150 1	Alcohol / Drug Abuse Counseling				5	12	3	5	12	3
51.160 2	Nursing Administration (MSN, MS, PhD)			2						2
51.169 9	Nursing, Other		1	2					1	2
51.161 1	Public Health/Community Nurse/Nursing	1	6	1				1	6	1
51.230 8	Physical Therapy				36	22		36	22	
TOTAL		1,208	1,340	1,437	3,745	3,853	4,426	4,953	5,193	5,863

SOURCES: National Center for Education Statistics (NCES), Texas Workforce Commission (TWC), TIP Strategies Note: NCES data include first and second majors and include only students enrolled for credit.

- (1) Completions were reported to NCES by the Valley Grande Institute for Academic Studies for the following healthcare-related CIP codes which were not captured in the data received from TWC: Medical Radiologic Technology/Science - Radiation Therapist – CIP 51.0907 (227 completions in 2009, 400 each in 2008 and 2007); Clinical/Medical Laboratory Assistant – 51.0802 (70 in 2009, 75 in 2008); Health Professions and Related Clinical Sciences, Other – 51.9999 (63 in 2009, 60 in 2008), Allied Health and Medical Assisting Services, Other – 51.0899 (50 in 2009, 44 in 2008)

## Energy/Utilities

Although renewable energy technologies have been around for decades, they are not well represented in the NAICS or SOC coding systems. The Utility sector staffing patterns presented in Figure 4.2 (*page 51*) include only a handful of occupations that are relevant to this educational analysis. Employment projections for the occupations considered in this section are provided in Figure 5.7. Some of the sector's most common occupations, such as customer service representatives, require very little formal training. Others, like secretaries or bookkeepers, play a more prominent role in the Business Services sector. New and emerging occupations, like wind turbine mechanics or solar panel installers, are not represented in the data at all yet, but are likely to require training in the future.

Based on our review of traditional utility occupations, very limited training is available in the region (Figure 5.8). The most common occupation required for the existing Utilities sector is Electrical power-line installers and repairers (SOC 49-9051). This occupation can be crosswalked to three CIP codes: Electrical and Power Transmission Installation/Installer General (CIP 46.0301); Lineworker (CIP 46.0303); and Electrical and Power Transmission Installers, Other (CIP 46.0399). Completions were only reported for one of these CIP codes (Electrical and Power Transmission Installation/Installer General), with 13 completions reported in 2009 (all from South Texas College). In addition, STC and TSTC reported roughly 40 to 50 noncredit enrollments in this program over each of the last three years. The other two CIP codes were not reported in either of the three data sources we reviewed. Depending on the rate of completion and the content of the continuing education program, this level of training appears insufficient to keep up with projected demand (estimated at 15 jobs per year when both new and replacement jobs are considered). Furthermore, an uptick in energy-related investment could spur additional demand.

Electricians are another key occupation for the Utility sector where supply may not meet demand. Our analysis suggests that Valley employers will need 60 electricians per year to fill new jobs and replace workers exiting the profession. Figure 5.8 shows only a handful of completions for the related CIP code in 2009. However, the NCES data shown are for public schools only (in order to avoid double-counting private school completions reported to TWC). A look at private school figures reported to NCES shows additional completions for Kaplan College (85 completions in 2009) and San Antonio College of Medical and Dental Assistants (68 in 2007 and 27 in 2008). These data were not reported to the TWC, and as such do not appear in the analysis. These additional private sector completions would suggest a reasonable balance between supply and demand. However, the supply of workers in skilled trades, such as electricians, is

also affected by licensing requirements, so a straightforward analysis of completions is not a sufficient indicator of the pool available to employers.

Of the Utility sector occupations reviewed, the only other job for which training was identified was Maintenance and Repair Workers, General (SOC 49-9042). This occupation corresponds to a single CIP code, Building/Construction Site Management/Manager (46.0412). As with the other training areas, the number of completions (averaging roughly 30 per year) does not line up well with projected demand for this occupation in the region (estimated at 159 workers to fill both new and replacement jobs). This occupation is common to a number of the target sectors.

The following CIP codes correspond with other Utility sector occupations, but do not appear in any of the completions data we reviewed, suggesting a gap in training availability for the sector:

	Construction/Heavy Operation	Equipment/Earthmoving Equipment	Equipment	
49.0202			47.0303	Industrial Mechanics and Maintenance Technology Heavy/Industrial Equipment Maintenance Technologies, Other
49.0206	Mobil Crane Operation/Operator		47.0399	
46.0502	Pipefitting/Pipefitter and Sprinkler Fitter		46.0303	Lineworker
46.0503	Plumbing Technology/Plumber		46.0399	Electrical and Power Transmission Installers, Other
46.0599	Plumbing and Related Water Supply Services, Other		52.0205	Operations Management and Supervision Customer Service Support/Call Center/Teleservice Operation
52.0205	Operations Management and Supervision		52.0411	

Of these, a minimal level of noncredit enrollment was reported by STC for Plumbing Technology/Plumber (CIP 46.0503) and Construction/Heavy Equipment/ Earthmoving Equipment Operation (CIP 49.0202).

Planned investments in wind and solar are likely to create demand for a number of new and emerging occupations. TSTC-Harlingen has already developed a new Wind Technology Program; the first cohort of 12 graduated in December 2010. Training for solar occupations is currently only offered at TSTC's Waco and West Texas campuses. As stated previously, however, the timing of demand for these jobs locally is unclear. Currently, graduates of the program are likely to be employed outside the region, primarily in Corpus Christi. The California Community Colleges system has done a comprehensive study of the green economy in the state. Appendix K provides occupational-training crosswalks for the California's renewable energy and green building/energy efficiency sectors. This work could provide additional insights for training needs as the Valley's green economy matures.

Figure 5.7 Projected employment in selected utilities-related occupations across all industries in the LRGV  
*Occupations based on U.S. staffing patterns; Ranked by total estimated annual change in employment (new and replacement jobs)*

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
43-4051	Customer service representatives	8,432	8,843	9,173	9,449	9,684	9,809	230	291	520
43-9061	Office clerks, general	10,488	10,921	11,288	11,607	11,891	12,080	265	155	420
43-6014	Secretaries, except legal, medical, and executive	7,748	8,026	8,258	8,453	8,622	8,722	162	112	274
43-1011	First-line sups/mgrs of office and admin support workers	4,582	4,781	4,944	5,083	5,203	5,276	116	112	228
11-1021	General and operations managers	4,142	4,261	4,354	4,425	4,481	4,500	60	126	186
47-2061	Construction laborers	4,617	4,814	4,995	5,165	5,329	5,467	142	34	176
43-3031	Bookkeeping, accounting, and auditing clerks	4,576	4,746	4,888	5,010	5,118	5,185	102	59	161
49-9042	Maintenance and repair workers, general	4,043	4,186	4,311	4,422	4,523	4,597	92	67	159
13-2011	Accountants and auditors	2,852	2,984	3,098	3,197	3,285	3,342	82	53	135
43-6011	Executive secretaries and administrative assistants	2,644	2,753	2,845	2,924	2,994	3,039	66	39	104
43-3021	Billing and posting clerks and machine operators	1,824	1,915	1,990	2,054	2,109	2,143	53	33	86
47-2111	Electricians	1,400	1,437	1,471	1,500	1,527	1,548	25	36	60
47-2073	Operating engineers and other construction equip operators	1,142	1,183	1,218	1,249	1,277	1,296	26	21	47
49-1011	First-line sups/mgrs. of mechanics, installers, and repairers	901	920	937	952	964	973	12	25	37
47-2152	Plumbers, pipefitters, and steamfitters	742	773	800	824	845	859	20	16	36
51-8031	Water and liquid waste treatment plant and system ops	538	568	595	619	643	661	21	13	33
51-1011	First-line sups/mgrs of production and operating workers	896	909	920	930	940	947	9	12	21
49-9051	Electrical power-line installers and repairers	270	278	284	291	296	300	5	10	15
49-9041	Industrial machinery mechanics	389	393	399	405	411	419	5	6	11

Source: EMSI Complete Employment - 3rd Quarter 2010. Estimated annual change calculated by TIP Strategies based on EMSI projections (Growth column) and U.S. Bureau of Labor Statistics replacement estimates (Replacement column). Excludes occupations projected to add <10 employees annually (new and replacement jobs) between 2010 and 2015 and those with current median hourly wages <\$8.42.



Figure 5.8: Utility-related completions reported to NCES and TWC (public data are for students enrolled in credit courses only)  
 Ranked by combined total in 2008/2009

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
46.030 1	Electrical and Power Transmission Installation/Installer, General			13						13
46.030 2	Electrician <sup>(1)</sup>		9	4		7 <sup>(1)</sup>			16	4
46.041 2	Building/Construction Site Management/Manager	39	40	14				39	40	14

SOURCES: National Center for Education Statistics (NCES), Texas Workforce Commission (TWC), TIP Strategies Note: NCES data include first and second majors and include only students enrolled for credit.

(1) Completions for CIP 46.0302 were reported to NCES for Kaplan College (85 completions in 2009) and San Antonio College of Medical and Dental Assistants (68 in 2007 and 27 in 2008) which were not captured in the data received from TWC.

### Construction/Skilled Trades

Despite job losses in recent years, construction-related employment is projected to increase slowly over the next several years in response to both business and population growth in the region. Along with demand created from residential and nonresidential building, the need for new workers in construction and in the skilled trades occupations is also expected to rise as a result of the baby boom generation leaving the workforce.

A review of education and training data reveals only a handful of programs in construction and the skill trades. The lack of completions probably reflects the fact that many construction occupations require little formal training. When office workers, managers, and truck drivers are excluded, the occupations in highest demand are expected to be construction laborers, carpenters, and general maintenance workers, none of which are typically trained in the postsecondary system. The training programs listed in Figure 5.10 are largely related to management positions in construction (cost estimators, supervisors) or are for specific skilled trades, such as HVAC technicians, welders, and electricians (addressed in the Utilities section above).

HVAC technician training appears to be reasonably well matched with demand, with the region projected to add an average of 69 HVAC mechanics per year until 2015 (new and replacement jobs). There are two separate CIP codes associated with this occupation (47.0201 Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician and 15.0501 Heating, Air Conditioning and Refrigeration Technology/Technician) graduating between 100 and 150 students combined in each of the last three years.

Based on the available data, the supply of welders would appear to be in excess of demand. EMSI projections translate to an average annual change of 13 welders through 2015; if replacement needs are considered, this figure rises to 56 workers. Data reported to NCES and TWC for the past three years shows that between 100 and 150 people completed credit courses in welding technology in each of the past three years. The bulk of this training was conducted by the private colleges. A review of continuing education enrollment at local public colleges suggests even more people in this field of study, with an average of 70 people enrolling in the past three years.

One occupation for which demand appears likely to significantly outstrip supply is plumbing. Our analysis suggests 36 workers will be needed annually through 2015 in Plumbers, Pipefitters, and Steamfitters (SOC 47-2152) to fill demand from new growth and replacement. Based on the data we compiled, there does not appear to be any significant training being completed in this area. Of the three CIP codes related to this occupation only one showed any training activity at all. South Texas College reported approximately 10 enrollments in noncredit (continuing education) courses in each of the three years analyzed. This finding merits attention in light of estimates of replacement workers prepared by the U.S. Bureau of Labor Statistics which suggest that nearly one in five plumbers is expected to leave the profession by 2018. Plumbers, like a number of the skilled trades, are required to complete a lengthy apprenticeship program, which may deter some people from entering the profession.

The following are construction-related CIP codes for which little or no training was reported in the last three years:

46.0503	Plumbing Technology/Plumber* Construction/Heavy Equipment/Earthmoving Equipment	46.0504	Well Drilling/Driller
49.0202	Operation	46.0505	Blasting/Blaster
52.0205	Operations Management and Supervision Hazardous Materials Management and Waste	46.0599	Plumbing and Related Water Supply Services, Other
15.0508	Technology/Technician	46.9999	Construction Trades, Other
15.0901	Mining Technology/Technician	47.0303	Industrial Mechanics and Maintenance Technology
46.0101	Mason/Masonry	47.0399	Heavy/Industrial Equipment Maintenance Technologies, Other
46.0201	Carpentry/Carpenter	47.9999	Mechanic and Repair Technologies/Technicians, Other
46.0303	Lineworker	48.0506	Sheet Metal Technology/Sheetworking
46.0399	Electrical and Power Transmission Installers, Other	48.0801	Boilermaking/Boilermaker
46.0401	Building/Property Maintenance and Management	49.0206	Mobil Crane Operation/Operator
46.0402	Concrete Finishing/Concrete Finisher	14.1801	Materials Engineering
46.0403	Building/Home/Construction Inspection/Inspector	14.1901	Mechanical Engineering
46.0404	Drywall Installation/Drywaller	14.3301	Construction Engineering
46.0406	Glazier	14.3601	Manufacturing Engineering

46.0408	Painting/Painter and Wall Coverer	15.1001	Construction Engineering Technology/Technician
46.0410	Roofer	48.0508	Welding Technology/Welder
46.0411	Metal Building Assembly/Assembler	52.0101	Business/Commerce, General
46.0499	Building/Construction Finishing, Management, and Inspection, Other	52.0201	Business Administration and Management, General
46.0502	Pipefitting/Pipefitter and Sprinkler Fitter	52.0205	Operations Management and Supervision

\*11 noncredit enrollments were reported to the THECB in 2007 for Plumbing Technology/Plumber (CIP 46.0503).

Figure 5.9 Projected employment in selected construction-related occupations across all industries in the LRGV  
Occupations based on U.S. staffing patterns; Ranked by total estimated annual change in employment (new and replacement jobs)

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
43-9061	Office clerks, general	10,488	10,921	11,288	11,607	11,891	12,080	265	155	420
53-3032	Truck drivers, heavy and tractor-trailer	6,912	7,209	7,462	7,686	7,888	8,019	185	135	319
43-6014	Secretaries, except legal, medical, and executive	7,748	8,026	8,258	8,453	8,622	8,722	162	112	274
11-9199	Managers, all other	4,220	4,430	4,606	4,756	4,887	4,966	124	120	244
43-1011	First-line sups/mgrs of office and admin support workers	4,582	4,781	4,944	5,083	5,203	5,276	116	112	228
11-1021	General and operations managers	4,142	4,261	4,354	4,425	4,481	4,500	60	126	186
11-1011	Chief executives	3,049	3,205	3,334	3,442	3,537	3,593	91	94	185
47-2061	Construction laborers	4,617	4,814	4,995	5,165	5,329	5,467	142	34	176
43-3031	Bookkeeping, accounting, and auditing clerks	4,576	4,746	4,888	5,010	5,118	5,185	102	59	161
49-9042	Maintenance and repair workers, general	4,043	4,186	4,311	4,422	4,523	4,597	92	67	159
47-2031	Carpenters	4,002	4,158	4,292	4,409	4,515	4,589	98	54	152
13-2011	Accountants and auditors	2,852	2,984	3,098	3,197	3,285	3,342	82	53	135
47-1011	First-line sups/mgrs of construction trades & extraction wrkrs	2,950	3,066	3,164	3,251	3,328	3,380	72	62	133
43-6011	Executive secretaries and administrative assistants	2,644	2,753	2,845	2,924	2,994	3,039	66	39	104
11-9021	Construction managers	2,830	2,941	3,035	3,118	3,193	3,245	69	24	93
41-3099	Sales representatives, services, all other	1,432	1,498	1,552	1,598	1,638	1,662	38	39	77
49-9021	Heating, A/C, and refrigeration mechanics and installers	1,328	1,395	1,455	1,510	1,561	1,600	45	24	69
47-2141	Painters, construction and maintenance	1,685	1,740	1,787	1,829	1,866	1,891	34	31	65

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replacement	Growth + Replacement
47-2111	Electricians	1,400	1,437	1,471	1,500	1,527	1,548	25	36	60
51-4121	Welders, cutters, solderers, and brazers	1,371	1,396	1,416	1,431	1,444	1,449	13	43	56
47-2073	Operating engineers and other construction equip operators	1,142	1,183	1,218	1,249	1,277	1,296	26	21	47
47-2152	Plumbers, pipefitters, and steamfitters	742	773	800	824	845	859	20	16	36
47-2051	Cement masons and concrete finishers	502	522	540	558	576	592	15	14	29
13-1051	Cost estimators	319	333	346	359	370	381	10	8	18
47-2151	Pipelayers	400	415	428	439	450	456	9	9	18
47-3013	Helpers, electricians	369	380	391	403	414	426	10	8	18
47-2181	Roofers	481	493	503	512	520	526	8	8	16
47-3015	Helpers, pipelayers, plumbers, pipefitters, and steamfitters	223	236	247	258	267	275	9	5	14
47-2121	Glaziers	152	160	168	175	181	186	6	6	12

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Figure 5.9 Projected employment in selected construction-related occupations across all industries in the LRGV (CONTINUED)

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replacement	Growth + Replacement
47-2021	Brickmasons and blockmasons	270	276	282	287	291	296	4	7	12
53-7032	Excavating and loading machine and dragline operators	219	227	233	238	243	246	5	7	11
47-2081	Drywall and ceiling tile installers	278	288	297	306	314	323	8	3	11
47-4051	Highway maintenance workers	187	195	203	209	214	218	5	6	11
47-4011	Construction and building inspectors	207	215	223	230	236	240	6	5	10
47-2221	Structural iron and steel workers	169	178	187	194	202	208	7	3	10

Source: EMSI Complete Employment - 3rd Quarter 2010. Estimated annual change calculated by TIP Strategies based on EMSI projections (Growth column) and U.S. Bureau of Labor Statistics replacement estimates (Replacement column). Excludes occupations projected to add <10 employees annually (new and replacement jobs) between 2010 and 2015 and those with current median hourly wages <\$8.42.

Figure 5.10: Construction-related completions reported to NCES and TWC (public data are for students enrolled in credit courses only)  
 Ranked by combined total in 2008/2009

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
52.020 1	Business Administration and Management, General	288	332	341				288	332	341
52.010 1	Business/Commerce, General	305	355	291				305	355	291
48.050 8	Welding Technology/Welder	19	34	36	81	122	128	100	156	164
47.020 1	Heating, Air Conditioning, Ventilation and Refrigeration Maintenance Technology/Technician (HAC, HACR, HVAC, HVACR)	53	72	60			34	53	72	94
14.190 1	Mechanical Engineering	55	67	69				55	67	69
15.050 1	Heating, Air Conditioning and Refrigeration Technology/Technician (ACH/ACR/ACHR/HRAC/HVAC/AC Technology)				52	45	56	52	45	56
46.041 2	Building/Construction Site Management/Manager	39	40	14				39	40	14
46.030 1	Electrical and Power Transmission Installation/Installer, General			13						13
15.100 1	Construction Engineering Technology/Technician	18	14	8				18	14	8
46.030 2	Electrician <sup>(1)</sup>		9	4		7 <sup>(1)</sup>			16	4
14.360 1	Manufacturing Engineering	7	3	4				7	3	4

SOURCES: National Center for Education Statistics (NCES), Texas Workforce Commission (TWC), TIP Strategies. Note: NCES data include first and second majors and include only students enrolled for credit.

(1) Completions for CIP 46.0302 were reported to NCES for Kaplan College (85 completions in 2009) and San Antonio College of Medical and Dental Assistants (68 in 2007 and 27 in 2008) which were not captured in the data received from TWC.

## Advanced Manufacturing

Like construction, training for many production jobs is typically done by the employer. Although there are some areas where postsecondary training is increasing, the specialized nature of today's manufacturing operations makes formal training programs difficult to establish. Production processes are usually tailored to the specific machinery and equipment used (and vice versa). In many cases,

this high degree of specificity makes on-the-job training from the supplier of the machinery the only viable option. In addition, such training is often part of the purchase package. Even if that were not the case, public and private training institutions are typically not in a position to purchase and accommodate the range of equipment that would be required.

The challenge in assessing the availability of training for advanced manufacturing jobs is the fact that neither the SOC nor CIP classification system provides an indication of the level of sophistication or complexity involved. In other words, there is no meaningful way to identify the “advancedness” of a given occupation or training program. For this reason, Figures 5.11 and 5.12 provide employment projections and training data for staffing patterns for the Manufacturing sector generally. Few production occupations are expected to show significant gains based on current trends. As a result, the majority of the occupations in the top spots in Figure 5.11 are administration or material-moving workers. Training for these jobs is not analyzed in this section. Several of the production and repair occupations with growth and replacement needs have already been discussed (general maintenance workers, electricians, and welders).

Very few of the completions reported by public schools and universities to NCES or by private career and technical colleges to TWC were in CIP codes associated with production jobs. Figure 5.12 lists fewer than 15 completions in any given year in Machine Tool Technology/Machinist (CIP 48.0501) and Machine Shop Technology/Assistant (48.0503). These programs provide training for a variety of machine setting, operating, and tending occupations (SOC 402, 403, and 404). With the exception of Machinists (SOC 51-4041), annual estimated demand for machining occupations fell below the threshold of 5 workers (new and replacement jobs) set for this particular analysis. Demand for Machinists was estimated at just 7 workers per year, suggesting that current production may be sufficient. In addition, an average of 15 enrollments in noncredit offerings in CIP 48.0501 were reported to the THECB over the three years analyzed.

The following are manufacturing-related CIP codes for which little or no training was reported in the last three years:

01.0401	Agricultural and Food Products Processing	47.0399	Heavy/Industrial Equipment Maintenance Technologies, Other Marine Maintenance/Fitter and Ship Repair Technology/Technician
10.0302	Printing Management	47.0616	
	Graphic and Printing Equipment Operator, General		
10.0305	Production	48.0703	Cabinetmaking and Millwork/Millwright
10.0307	Printing Press Operator	49.0299	Ground Transportation, Other
10.0399	Graphic Communications, Other	52.0205	Operations Management and Supervision
12.0506	Meat Cutting/Meat Cutter	52.0402	Executive Assistant/Executive Secretary
47.0303	Industrial Mechanics and Maintenance Technology	52.0409	Parts, Warehousing, and Inventory Management Operations
	Communications Systems Installation and Repair		
47.0103	Technology	52.0410	Traffic, Customs, and Transportation Clerk/Technician

No completions data were reported for CIP 15.0702 Quality Control Technology/Technician, which corresponds with SOC 51-9061 Inspectors, Testers, Sorters, Samplers, and Weighers. However, THECB recorded noncredit enrollments of between 4 and 33 students over the three year period, the majority of which were reported by South Texas College.

While Electromechanical Equipment Assemblers (SOC 51-2023) were not included in this analysis due to relatively flat demand projections, this occupation corresponds with TSTC's "Mechatronics" program. Classified as Electromechanical Technology/Electromechanical Engineering (CIP 15.0403), this program provides basic understanding of mechanical and electrical systems that can be transferred to a variety of occupations. In addition to the completions reported below, the THECB recorded noncredit enrollments of approximately 15 students per year.

Figure 5.11 Projected employment in manufacturing-related occupations across all industries in the LRGV  
*Occupations based on U.S. staffing patterns and production occupations SOC 51; Ranked by total estimated annual change in employment (new and replacement jobs)*

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
43-4051	Customer service representatives	8,432	8,843	9,173	9,449	9,684	9,809	230	291	520
43-9061	Office clerks, general	10,488	10,921	11,288	11,607	11,891	12,080	265	155	420
53-3032	Truck drivers, heavy and tractor-trailer	6,912	7,209	7,462	7,686	7,888	8,019	185	135	319
43-6014	Secretaries, except legal, medical, and executive	7,748	8,026	8,258	8,453	8,622	8,722	162	112	274
11-9199	Managers, all other	4,220	4,430	4,606	4,756	4,887	4,966	124	120	244
43-5081	Stock clerks and order fillers	5,457	5,639	5,791	5,922	6,038	6,115	110	134	244
37-2011	Janitors and cleaners, except maids and housekeeping	6,801	7,003	7,159	7,281	7,376	7,412	102	136	237
11-1021	General and operations managers	4,142	4,261	4,354	4,425	4,481	4,500	60	126	186
11-1011	Chief executives	3,049	3,205	3,334	3,442	3,537	3,593	91	94	185
53-3033	Truck drivers, light or delivery services	4,003	4,149	4,268	4,370	4,459	4,511	85	77	161
43-3031	Bookkeeping, accounting, and auditing clerks	4,576	4,746	4,888	5,010	5,118	5,185	102	59	161
49-9042	Maintenance and repair workers, general	4,043	4,186	4,311	4,422	4,523	4,597	92	67	159
41-4012	Sales reps, wholesale & mfg, except tech & scientific products	2,674	2,744	2,801	2,849	2,891	2,917	41	65	106
47-2111	Electricians	1,400	1,437	1,471	1,500	1,527	1,548	25	36	60
51-4121	Welders, cutters, solderers, and brazers	1,371	1,396	1,416	1,431	1,444	1,449	13	43	56
53-7051	Industrial truck and tractor operators	1,287	1,309	1,329	1,348	1,368	1,384	16	40	56

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
43-5071	Shipping, receiving, and traffic clerks	1,786	1,806	1,822	1,834	1,843	1,845	10	45	55
41-4011	Sales reps, wholesale & mfg, technical & scientific products	1,095	1,140	1,176	1,207	1,233	1,249	26	27	53
51-3011	Bakers	726	757	783	806	825	838	19	20	39
51-8031	Water / liquid waste treatment plant and system operators	538	568	595	619	643	661	21	13	33

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Figure 5.11 Projected employment in manufacturing-related occupations across all industries in the LRGV (CONTINUED)

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
51-7011	Cabinetmakers and bench carpenters	327	346	364	382	399	414	15	8	23
51-1011	First-line sups/mgrs of production and operating workers	896	909	920	930	940	947	9	12	21
51-3021	Butchers and meat cutters	482	490	497	503	508	511	5	16	21
51-3022	Meat, poultry, and fish cutters and trimmers	439	441	445	451	459	471	5	14	20
43-5061	Production, planning, and expediting clerks	475	487	496	504	511	515	7	12	19
51-9061	Inspectors, testers, sorters, samplers, and weighers	652	661	668	676	683	689	6	11	17
51-2041	Structural metal fabricators and fitters	504	512	517	520	522	519	3	11	13
49-9041	Industrial machinery mechanics	389	393	399	405	411	419	5	6	11
51-2099	Assemblers and fabricators, all other	225	232	237	243	249	253	5	5	10
51-2091	Fiberglass laminators and fabricators	195	200	204	207	210	211	3	5	7
51-4041	Machinists	373	376	379	382	385	386	2	5	7
51-7042	Woodworking machine setters, ops, & tenders, excpt sawing	161	163	167	172	177	183	4	3	7
51-9195	Molders, shapers, and casters, except metal and plastic	72	75	78	80	82	84	2	4	6
51-9121	Coating, painting, spraying machine setters, ops, & tenders	130	133	135	137	140	142	2	4	6
51-4122	Welding, soldering, brazing machine setters, ops, & tenders	105	109	112	114	116	117	2	3	5
51-9122	Painters, transportation equipment	114	117	119	121	122	124	2	3	5



SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
51-5023	Printing machine operators	153	154	156	158	160	162	2	3	5
51-9123	Painting, coating, and decorating workers	85	89	91	94	96	98	2	2	5

Source: EMSI Complete Employment - 3rd Quarter 2010. Estimated annual change calculated by TIP Strategies based on EMSI projections (Growth column) and U.S. Bureau of Labor Statistics replacement estimates (Replacement column). Excludes occupations projected to add <5 employees annually (new and replacement jobs) between 2010 and 2015 and those with current median hourly wages <\$8.42.

Figure 5.12: Manufacturing-related completions reported to NCES and TWC (public data are for students enrolled in credit courses only)  
 Ranked by combined total in 2008/2009

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
48.050 8	Welding Technology/Welder	19	34	36	81	122	128	100	156	164
49.020 5	Truck and Bus Driver/Commercial Vehicle Operation				122	124	75	122	124	75
52.040 1	Administrative Assistant and Secretarial Science, General	46	36	41	13	17	16	59	53	57
52.040 8	General Office Occupations and Clerical Services	32	30	26				32	30	26
48.050 7	Tool and Die Technology/Technician	16	24	18				16	24	18
15.040 3	Electromechanical Technology/Electromechanical Engineering	5	9	15				5	9	15
46.041 2	Building/Construction Site Management/Manager	39	40	14				39	40	14
48.050 1	Machine Tool Technology/Machinist	4	12	8				4	12	8
48.050 3	Machine Shop Technology/Assistant	5						5		

SOURCES: National Center for Education Statistics (NCES), Texas Workforce Commission (TWC), TIP Strategies. Note: NCES data include first and second majors and include only students enrolled for credit.

## Business Services

For this analysis, we have defined the Business Services sector by combining occupations from several sectors, including Professional and Technical Services (NAICS 54) and Administrative and Support Services (NAICS 56). These sectors, and others, include a range of professions that provide essential services to other business, including accounting and legal advice, marketing and teleservices, and routine maintenance activities such as groundskeeping and janitorial services. Like the industries that comprise it, the Business Services sector is a mixed bag of occupations. With occupations ranging from CEOs to janitors, training needs for this sector vary widely.

Customer service representatives (SOC 43-4051) is the occupation with the highest estimated demand for new workers. It is also an occupation common to a number of the target industry sectors. Customer service representatives can be crosswalked to two CIP codes (52.0406 Receptionist and 52.0411 Customer Service Support/Call Center/Teleservice Operation), neither of which appears to be

offered in the region. However, the most frequent form of training for this occupation is moderate on-the-job training, suggesting that little formal training is required.

Many of the occupations in this group fall into general business categories – CEOs, secretaries, managers – making a one-to-one comparison more difficult. Accounting occupations are different in that they can be more easily connected with relevant training. Demand for accountants is expected to average 135 workers per year, with the majority coming from new growth. Regional completions of Accounting (CIP 52.0301) at the region’s public colleges and universities totaled 151 in 2009, resulting in a rather narrow margin between supply and demand. Bookkeeping, accounting, and auditing clerks (SOC 43-3031) are expected to be in even higher demand, with an estimated annual need of 159 workers for both new and replacement jobs. This is just slightly below the 170 completions of CIP 52.0302 (Accounting Technology/Technician and Bookkeeping) reported in 2009, with the vast majority of these being awarded by the region’s private career and technical colleges.

Automotive positions show up in this sector primarily because of the inclusion of Other Services, Except Public Administration (NAICS 81), but also because automotive workers are required for fleet maintenance by some agencies or corporations. Annual estimated demand for Automotive Service Technicians and Mechanics (SOC 49-3023) is 75 workers per year, well above the 57 completions reported in Automobile/Automotive Mechanics Technology/Technician (CIP 47.0604).

One area where new programs may be required related to this sector is in professional development. As the number of professionals in the Valley rises and travel budgets decline, people are looking for alternative ways to keep their certifications current without having to travel to conferences or events. This is a role that the region’s colleges may be able to fill.

Figure 5.13 Projected employment in business services-related occupations across all industries in the LRGV  
*Occupations based on U.S. staffing patterns for selected industries<sup>(1)</sup>; Ranked by total estimated annual change in employment (new and replacement jobs)*

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
43-4051	Customer service representatives	8,432	8,843	9,173	9,449	9,684	9,809	230	291	520
43-9061	Office clerks, general	10,488	10,921	11,288	11,607	11,891	12,080	265	155	420
53-3032	Truck drivers, heavy and tractor-trailer	6,912	7,209	7,462	7,686	7,888	8,019	185	135	319
43-6014	Secretaries, except legal, medical, and executive	7,748	8,026	8,258	8,453	8,622	8,722	162	112	274
11-9199	Managers, all other	4,220	4,430	4,606	4,756	4,887	4,966	124	120	244
43-5081	Stock clerks and order fillers	5,457	5,639	5,791	5,922	6,038	6,115	110	134	244
37-2011	Janitors and cleaners, except maids and housekeeping	6,801	7,003	7,159	7,281	7,376	7,412	102	136	237

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
43-1011	First-line sups/mgrs of office and admin support workers	4,582	4,781	4,944	5,083	5,203	5,276	116	112	228
11-1021	General and operations managers	4,142	4,261	4,354	4,425	4,481	4,500	60	126	186
11-1011	Chief executives	3,049	3,205	3,334	3,442	3,537	3,593	91	94	185
47-2061	Construction laborers	4,617	4,814	4,995	5,165	5,329	5,467	142	34	176
43-3031	Bookkeeping, accounting, and auditing clerks	4,576	4,746	4,888	5,010	5,118	5,185	102	59	161
43-4171	Receptionists and information clerks	2,765	2,896	3,005	3,098	3,179	3,230	78	82	159
49-9042	Maintenance and repair workers, general	4,043	4,186	4,311	4,422	4,523	4,597	92	67	159
13-2011	Accountants and auditors	2,852	2,984	3,098	3,197	3,285	3,342	82	53	135
33-9032	Security guards	2,925	3,045	3,138	3,213	3,274	3,299	62	65	127
41-1012	First-line supervisors/managers of non-retail sales workers	2,764	2,865	2,948	3,019	3,080	3,116	59	61	120
43-6011	Executive secretaries and administrative assistants	2,644	2,753	2,845	2,924	2,994	3,039	66	39	104

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Figure 5.13 Projected employment in business services-related occupations across all industries in the LRGV (CONTINUED)

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
41-3021	Insurance sales agents	1,797	1,865	1,921	1,971	2,015	2,043	41	45	86
43-3021	Billing and posting clerks and machine operators	1,824	1,915	1,990	2,054	2,109	2,143	53	33	86
37-1011	First-line sups/mgrs of housekeeping and janitorial workers	1,590	1,697	1,784	1,858	1,921	1,958	61	19	80
41-3099	Sales representatives, services, all other	1,432	1,498	1,552	1,598	1,638	1,662	38	39	77
49-3023	Automotive service technicians and mechanics	2,718	2,753	2,783	2,809	2,832	2,848	22	53	75
13-1111	Management analysts	1,217	1,292	1,358	1,415	1,466	1,499	47	24	71
23-1011	Lawyers	1,084	1,113	1,140	1,165	1,187	1,204	20	21	41
43-9021	Data entry keyers	987	1,018	1,042	1,059	1,071	1,073	14	22	36
41-9099	Sales and related workers, all other	749	778	802	822	840	851	17	18	35
43-3011	Bill and account collectors	670	706	736	761	783	796	21	14	35
27-4021	Photographers	920	938	954	969	982	993	12	19	31
43-6012	Legal secretaries	787	818	844	868	890	906	20	11	31

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replacement	Growth + Rplcmnt
49-3031	Bus and truck mechanics and diesel engine specialists	762	782	799	813	825	832	12	18	30
37-1012	First-line sups/mgrs of landscaping, lawn svc, & groundskeeping	498	530	556	579	599	612	19	6	25
37-2021	Pest control workers	311	326	339	350	359	364	9	12	21
23-2011	Paralegals and legal assistants	413	429	445	460	475	489	13	5	18
49-3021	Automotive body and related repairers	465	473	480	486	492	496	5	12	18
49-2011	Computer, automated teller, and office machine repairers	509	524	534	541	545	544	6	9	15

Source: EMSI Complete Employment - 3rd Quarter 2010. Estimated annual change calculated by TIP Strategies based on EMSI projections (Growth column) and U.S. Bureau of Labor Statistics replacement estimates (Replacement column). Excludes occupations projected to add <10 employees annually (new and replacement jobs) between 2010 and 2015 and those with current median hourly wages <\$8.42.

- (1) As defined for this report, Business Services occupations are based on staffing patterns for the following industry sectors: Information; Finance and insurance; Real estate and rental and leasing; Professional and technical services; Administrative and waste services; and Other services, except public administration.

Figure 5.14: Business services-related completions reported to NCES and TWC (public data are for students enrolled in credit courses only)  
 Ranked by combined total in 2008/2009

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
52.020 1	Business Administration and Management, General	288	332	341				288	332	341
52.010 1	Business/Commerce, General	305	355	291				305	355	291
52.030 2	Accounting Technology/Technician and Bookkeeping	22	14	7	72	145	163	94	159	170
52.030 1	Accounting	116	134	151				116	134	151
52.110 1	International Business/Trade/Commerce	50	62	83				50	62	83
49.020 5	Truck and Bus Driver/Commercial Vehicle Operation				122	124	75	122	124	75
22.030 2	Legal Assistant/Paralegal	14	14	19	29	44	50	43	58	69
52.040 1	Administrative Assistant and Secretarial Science, General	46	36	41	13	17	16	59	53	57
47.060 4	Automobile/Automotive Mechanics Technology/Technician	57	92	57				57	92	57
52.040 7	Business/Office Automation/Technology/Data Entry	2	1	3	80	67	34	82	68	37
47.060 3	Autobody/Collision and Repair Technology/Technician	18	26	34				18	26	34
47.060 5	Diesel Mechanics Technology/Technician	12	32	29				12	32	29
52.040 8	General Office Occupations and Clerical Services	32	30	26				32	30	26
46.041 2	Building/Construction Site Management/Manager	39	40	14				39	40	14
44.040 1	Public Administration	9	17	13				9	17	13
22.030 1	Legal Administrative Assistant/Secretary	16	17	10	9	2		25	19	10
01.010	Agricultural Business Technology	5	3	5				5	3	5

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
6										
47.0104	Computer Installation and Repair Technology/Technician				26			26		

SOURCES: National Center for Education Statistics (NCES), Texas Workforce Commission (TWC), TIP Strategies. Note: NCES data include first and second majors and include only students enrolled for credit.

### Criminal Justice/Homeland Security

As mentioned in Section 5, much of the employment related to Criminal Justice & Homeland Security is classified under local, state, and federal government. For this reason, our overview of occupations in the previous section was limited to staffing patterns typical to public employers. Because these staffing patterns include a mix of occupations, for this analysis we worked backwards by selecting CIP codes related to law enforcement and public safety and then drawing out the related occupations. Employment projections for these occupations are presented in Figure 5.15.

Generally speaking, the driver for employment in this section is twofold. First, the region's growing population requires service levels to match. Second, this sector includes a number of occupations with high replacement rates. In other words, a number of these occupations will require a large share of new workers just to keep up current levels of service as workers leave their respective professions to retire or change careers.

Police offers are a case in point. New job growth suggests an annual need for 63 new patrol officers (police and sheriff). However, when replacement positions are considered, this figure doubles to 129 officers. A review of the available training data suggests that current training is not sufficient to meet this demand. No completions of credit courses were reported in the three-year period analyzed (Figure 5.16). However, a combined total of 70 to 85 enrollments in noncredit Criminal Justice/Police Science (CIP 43.0107) programs were reported to the Texas Higher Education Coordinating Board by Texas Southmost College and TSTC-Harlingen.

The presence of a state prison in Willacy County also creates demand for correctional officers, estimated at 91 officers annually. And, like police officers, roughly half of the workers that will be required each year are to replace existing workers. Slightly more than 30 completions were reported under CIP 43.0102 (Corrections) in each of the three years analyzed, roughly one-third the annual demand.

The need for firefighters also appears to outstrip available supply. TSTC-Harlingen reported roughly 10 to 15 noncredit enrollments in Fire Science/Fire Fighting (CIP 43.0203) and a handful in other related courses (CIP 43.0201 and 43.0202). No other credit completions or noncredit enrollments were included in the data we reviewed. Yet, the estimated demand is 51 new firefighters each year – half of which are required just to keep up with existing levels.

According to education officials interviewed in connection with this work, local communities are considering ways to standardize training for criminal justice and public safety workers. This step could help increase the supply and quality of candidates.

The following are criminal justice-related CIP codes for which little or no training was reported in the last three years:

43.0106	Forensic Science and Technology	43.0299	Fire Protection, Other
43.0109	Security and Loss Prevention Services	43.9999	Security and Protective Services, Other
43.0110	Juvenile Corrections	44.0000	Human Services, General
43.0111	Criminalistics and Criminal Science	44.0201	Community Organization and Advocacy
43.0112	Securities Services Administration/Management	44.0501	Public Policy Analysis
43.0113	Corrections Administration	44.0702	Youth Services/Administration
43.0199	Corrections and Criminal Justice, Other	44.0799	Social Work, Other
43.0201	Fire Protection and Safety Technology/Technician		



Figure 5.15 Projected employment in criminal justice and public safety related occupations across all industries in the LRGV  
*Includes occupations that correspond to CIP 43 and 44; Ranked by total estimated annual change in employment (new and replacement jobs)*

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
33-3051	Police and sheriff's patrol officers	2,343	2,444	2,531	2,607	2,674	2,720	63	66	129
33-9032	Security guards	2,925	3,045	3,138	3,213	3,274	3,299	62	65	127
33-3021	Detectives and criminal investigators	2,259	2,318	2,406	2,487	2,562	2,625	61	50	111
33-3012	Correctional officers and jailers	1,725	1,804	1,873	1,932	1,983	2,017	49	42	91
21-1012	Educational, vocational, and school counselors	1,528	1,600	1,661	1,714	1,761	1,792	44	34	78
21-1093	Social and human service assistants	1,255	1,322	1,377	1,422	1,462	1,485	38	29	68
21-1021	Child, family, and school social workers	1,098	1,149	1,192	1,227	1,258	1,277	30	30	60
33-2011	Fire fighters	758	795	828	859	888	911	26	26	51
33-1012	First-line supervisors/managers of police and detectives	552	574	594	611	626	637	14	26	40
21-1022	Medical and public health social workers	499	531	558	581	602	615	19	14	34
21-1019	Counselors, all other	442	463	481	496	509	516	12	10	22
19-3039	Psychologists, all other	252	270	285	298	309	316	11	8	19
33-9021	Private detectives and investigators	283	303	319	332	344	351	11	7	18
33-9099	Protective service workers, all other	181	188	195	201	206	210	5	13	18
33-1011	First-line supervisors/managers of correctional officers	239	250	259	267	274	279	7	9	16
33-9092	Lifeguards, ski patrol, and other recreational prot. svc wrks	145	151	155	160	164	166	4	11	14
21-1014	Mental health counselors	192	205	216	225	233	238	8	4	12
33-1021	First-line sups/mgrs of firefighting and prevention workers	137	143	148	152	156	159	4	8	11
43-4061	Eligibility interviewers, government programs	232	239	247	255	261	266	6	6	11
21-1015	Rehabilitation counselors	189	199	208	215	221	225	6	4	10
33-9091	Crossing guards	175	182	189	194	199	203	5	5	10

Source: EMSI Complete Employment - 3rd Quarter 2010. Estimated annual change calculated by TIP Strategies based on EMSI projections (Growth column) and U.S. Bureau of Labor Statistics replacement estimates (Replacement column). Excludes occupations projected to add <10 employees annually (new and replacement jobs) between 2010 and 2015 and those with current median hourly wages <\$8.42.

Figure 5.16: Criminal justice and related completions reported to NCES and TWC (public data are for students enrolled in credit courses only)  
 Ranked by combined total in 2008/2009

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public)			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
43.0103	Criminal Justice/Law Enforcement Administration	199	196	195				199	196	195
44.0701	Social Work	197	194	186				197	194	186
43.0104	Criminal Justice/Safety Studies	124	162	114				124	162	114
43.0102	Corrections	35	33	34				35	33	34
44.0401	Public Administration	9	17	13				9	17	13

SOURCES: National Center for Education Statistics (NCES), Texas Workforce Commission (TWC), TIP Strategies, Note: NCES data include first and second majors and include only students enrolled for credit.

Some noncredit enrollments were reported to THECB in Criminal Justice/Police Science (CIP 43.0107), Fire Protection and Safety Technology/Technician (43.0201), Fire Services Administration (43.0202), and Fire Science/Firefighting (43.0203).

## Education

The Valley's relatively young population and strong forecasts for growth will continue to spur demand for teachers at all levels. Like the analysis of criminal justice and public safety training discussed above, the occupations presented in Section 5 were not used as the basis for this analysis of education and training gaps. Instead, we selected teaching occupations (SOC 25) and then refined this list based on projected demand for these and other related occupations, such as counseling and administration. We then compiled data on teaching-related CIP codes (CIP 13).

Also like criminal justice and public safety occupations, demand for teachers is driven almost equally by growth and by replacement needs, with elementary school teachers topping the list. Our analysis suggests a need for nearly 600 elementary school teachers annually to maintain current service levels and meet the needs of the region's growing population. Given the current economic situation and state budget issues, it seems unlikely that actual hiring will reach these levels. However, this finding suggests that attention be given to ensuring that adequate training is available, as well as to strategies for the retention and attraction of teachers.

Unlike prior sectors, it is difficult to estimate what the current production of teacher candidates actually is from the data we have compiled. The wide range of curricula assigned to teaching occupations complicates this type of matching analysis. For example,

postsecondary teachers are reported below as a single occupation, but they are crosswalked to their specialty areas (biology, engineering, health sciences, etc.) leaving no meaningful way to analyze supply. Elementary Education and Teaching (CIP 13.1202) shows just 7 completions, suggesting that some training of elementary school teachers may occur under the more general classification of Education, Other (CIP 13.9999).

As a result, we have reported completion data for all Education CIP codes reported in the region in Figure 5.18, but have not attempted to match this data against occupational demand as we have in other sections. The estimates of demand in Figure 5.17 can serve as a starting point for quantifying these gaps with area school districts and education and training institutions.

Figure 5.17 Projected employment in selected education-related occupations across all industries in the LRGV  
Includes occupations classified under SOC 25 as well as those in education administration; Ranked by total estimated annual change in employment (new and replacement jobs)

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replace-ment	Growth +Rplcmnt
25-2021	Elementary school teachers, except special education	10,307	10,812	11,244	11,626	11,970	12,216	318	258	577
25-2031	Secondary school teachers, except special and vocational ed	6,025	6,282	6,494	6,673	6,829	6,927	150	190	340
25-9041	Teacher assistants	6,691	6,978	7,214	7,415	7,588	7,695	167	154	321
25-2022	Middle school teachers, except special and vocational ed	5,371	5,631	5,853	6,049	6,226	6,351	163	134	298
25-1099	Postsecondary teachers	3,922	4,120	4,289	4,439	4,575	4,673	125	66	191
25-3099	Teachers and instructors, all other	2,428	2,531	2,622	2,703	2,777	2,832	67	41	108
25-2011	Preschool teachers, except special education	1,716	1,801	1,870	1,928	1,979	2,010	49	38	87
11-9032	Education administrators, elementary and secondary school	1,244	1,297	1,340	1,377	1,408	1,428	31	40	71
53-3022	Bus drivers, school	1,905	1,971	2,023	2,063	2,095	2,109	34	35	69
25-2041	Special ed teachers, preschool, kindergarten, and elem	802	844	880	912	942	964	27	23	50
25-9031	Instructional coordinators	778	822	861	896	929	955	30	19	49
25-2012	Kindergarten teachers, except special education	908	951	987	1,019	1,047	1,067	27	20	46
25-2032	Vocational education teachers, secondary school	727	759	785	807	827	839	19	23	42
25-4021	Librarians	572	595	615	631	645	654	14	16	30
25-3021	Self-enrichment education teachers	686	710	731	751	770	785	17	11	28
25-2042	Special education teachers, middle school	440	461	479	496	511	522	14	13	26

SOC Code	Description	2010 Jobs	2011 Jobs	2012 Jobs	2013 Jobs	2014 Jobs	2015 Jobs	Estimated Annual Change Due to:		
								Growth	Replacement	Growth + Rplcmnt
25-2043	Special education teachers, secondary school	427	446	461	475	487	495	11	12	23
25-3011	Adult literacy, remedial ed, & GED teachers/instructors	523	537	550	560	570	576	9	9	17
25-4031	Library technicians	200	208	215	221	227	230	5	10	15
11-9033	Education administrators, postsecondary	240	249	256	262	267	270	5	8	13
11-9031	Ed administrators, preschool and child care center/program	228	238	245	252	257	259	5	7	13

Source: EMSI Complete Employment - 3rd Quarter 2010. Estimated annual change calculated by TIP Strategies based on EMSI projections (Growth column) and U.S. Bureau of Labor Statistics replacement estimates (Replacement column). Excludes occupations projected to add <10 employees annually (new and replacement jobs) between 2010 and 2015 and those with current median hourly wages <\$8.42.

Figure 5.18: Education-related completions reported to NCES and TWC (public data are for students enrolled in credit courses only)  
 Ranked by combined total in 2008/2009

CIP Code	Description	NCES 2-Year Colleges, Technical Colleges & Universities (public) <sup>(1)</sup>			TWC Career Schools & Technical Colleges (private)			Combined Total		
		2006-07	2007-08	2008-09	2006-07	2007-08	2008-09	2006-07	2007-08	2008-09
13.040 1	Educational Leadership and Administration, General	167	126	152				167	126	152
13.999 9	Education, Other				90	70	115	90	70	115
13.110 1	Counselor Education/School Counseling and Guidance Services	117	105	110				117	105	110
13.150 1	Teacher Assistant/Aide	25	40	38				25	40	38
13.020 1	Bilingual and Multilingual Education	23	29	27				23	29	27
13.030 1	Curriculum and Instruction	12	15	27				12	15	27
13.100 1	Special Education and Teaching, General	37	32	22				37	32	22
13.050 1	Educational/Instructional Media Design	36	30	21				36	30	21
13.131 5	Reading Teacher Education	27	21	14				27	21	14
13.121 0	Early Childhood Education and Teaching	18	9	8				18	9	8
13.100 4	Education/Teaching of the Gifted and Talented	1	3	7				1	3	7
13.120 2	Elementary Education and Teaching	9	8	7				9	8	7
13.120 5	Secondary Education and Teaching	13	7	7				13	7	7
13.140 1	Teaching English as Foreign Language/ESL Language Instructor	5	7	5				5	7	5
13.131 2	Music Teacher Education		1	2					1	2
13.131 1	Mathematics Teacher Education	1		1				1		1

SOURCES: National Center for Education Statistics (NCES), Texas Workforce Commission (TWC), TIP Strategies. Note: NCES data include first and second majors and include only students enrolled for credit.

(1) In addition to the completions shown above, slightly more than 50 noncredit enrollments were reported to THECB for teaching assistants (CIP 13.1501 Teacher Assistant/Aide).



## 6: Recommendations

The following recommendations provide a framework for regional collaboration around the workforce issues identified during this planning process. For each recommendation we provide examples of potential strategies and funding sources that could be pursued by the Regional Cooperation Partners and other stakeholders in the region, such as the Valley Initiative for Development and Advancement (VIDA).

### 6.1: Expand industry-driven approaches to curricula development throughout the region.

The LRGV has already made significant strides in using an industry-driven, regional approach to the development of workforce curriculum. The industry task forces established to validate the 2005 cluster analysis are an example of private sector involvement, as are VIDA's work on mapping career ladders for healthcare occupations, and the Breakthrough Collaborative initiative undertaken by VIDA and South Texas College.

The Regional Cooperation Grant Partners could provide a mechanism for tying existing initiatives together and incorporating "lessons learned" from other similar models across the country. Emphasis should be placed on increasing private-sector involvement, with the goal of creating more "employer-driven" initiatives. The National Governors Association Center for Best Practices' June 2010 report on the Automotive Manufacturing Technical Education Collaborative (originated as a partnership between Toyota and the Kentucky Community & Technical College System), can provide a starting point for these kinds of sector-based strategies.

**DEFINITION:** Sector-based strategies are regional, industry-specific approaches to workforce needs, implemented by an employer-driven partnership of relevant

Potential strategies:

- Convene regionwide industry councils to verify industry and education data and stay attuned to workforce needs.
  - The industry task forces established during the 2005 Industry Cluster initiative could serve as a model.
  - Involve relevant state and regional trade associations as a means for broadening input.
  - Coordinate with state-level target sector initiatives where applicable.
  - Identify the "value proposition" for private sector participants – *What benefit will they get from participating?* – and stick to it.

- The Lumina Foundation’s interactive web-based tool *Engaging Business Partners in Education Programs* can be a resource in this regard (<http://www.bizedkit.org/>).
- Conduct workforce-mapping initiatives for key occupations in target sectors – starting with potential gaps identified in this planning process – in order to:
  - confirm knowledge, skills, and abilities with employers and share this information with educators;
  - identify non-traditional sources for recruitment or advancement into the occupations; and
  - identify and address barriers to entry, such as needed reciprocity agreements or articulation issues.
- Create a formal mechanism for sharing best practices and curriculum in the region.
  - A web-based application, such as Mindmeister or Wikispaces, could be used to point educators and economic development and workforce professionals to on-line resources and to store relevant documents.
  - An annual “State of the Workforce,” or other similar event, could provide an opportunity to bring education, workforce, and economic development professionals together to network and exchange ideas.
  - Bring in outside presenters and experts to introduce new ideas and concepts to the region.
- Help identify relevant resources to help sustain resulting initiatives.
  - Emphasize direct business impacts whenever possible to encourage private-sector matching.
  - Promote successes to help build support among private and public organizations in the region.

**EXAMPLE: Advanced Manufacturing/CNC Consortium**

Organized by Workforce Solutions of Tarrant County in late 2008 at the request of five local companies, this partnership of advanced manufacturing companies, education providers, and economic development entities was designed to address the critical shortage of CNC machinists in Tarrant County. The partnership, which has grown to over 15 companies, has created a curriculum designed to prepare individuals for entry level jobs as machinists, and to upgrade skills of CNC machinists. Tarrant County College used existing funds to purchase the equipment needed to simulate the desired work environment. Employers have donated the time, equipment and expertise, including marketing expertise used to produce a video, “Gotta Make It” which was funded through a \$50,000





Potential funding sources:

- The U.S. Department of Labor Employment and Training Administration (ETA) has a number of initiatives that could support this recommendation:
  - The *Trade Adjustment Assistance Community College and Career Training (TAACCCT)* Grants Program will provide community colleges and other eligible institutions of higher education with funds to expand and improve their ability to deliver education and career training programs that: 1) can be completed in two years or less, 2) are suited for workers who are eligible for training under the Trade Adjustment Assistance for Workers program, and 3) prepare program participants for employment in high-wage, high-skill occupations. The Department intends to fund grants ranging from \$2.5 million to \$5 million for individual applicants and from \$2.5 million to \$20 million for consortium applicants. ETA just released a Notice of Availability of Funds and Solicitation for Grant Applications for this program.
  - The *Career Pathways Innovation Fund* replaces the Community-Based Job Training Grants (CBJTG). The program will continue the support for community colleges provided by the CBJTG, but will focus on career pathway programs. Grants will be awarded to community colleges and consortia of community colleges that are developing or expanding career pathway programs in partnership with education and training providers, employers, and the workforce investment system. Grants may also be awarded to two-year colleges that meet these criteria and have been designated as Hispanic-Serving Institutions or Historically Black Colleges. \$65 million of the total funding will go toward programs that focus on training for health care fields.
  - The *Green Jobs Innovation Fund* will allow ETA to build upon the lessons learned from the green job investments provided under the American Recovery and Reinvestment Act. Through competitive grant opportunities, the fund will help workers receive job training in green industry sectors and occupations and access green career pathways. Green industries supported by this program include the energy efficiency and renewable energy industries, as well as sectors that impact the environment such as transportation, green construction, environmental protection, sustainable agriculture, forestry, and recycling and waste reduction.
- The National Fund for Workforce Solutions is a collaboration between the nation's top foundations and a nationwide network of companies, workforce intermediaries, and government agencies. In December 2010, the organization provided \$5.5 million in grants to 10 communities to expand innovative approaches to job training and career support.

- The Ford Foundation promotes economic fairness through programs that promote the next generation of workforce strategies. The foundation supports four main strategies to improve opportunities for low-wage workers: 1) working with stakeholders in the workforce development system, 2) supporting innovations that increase the effectiveness and ability of training programs, 3) helping to increase the capacity of worker centers, and 4) supporting research and policy analysis. Examples of projects funded by the Ford Foundation include the National Governor’s Association *Accelerating State Adoption of Sector Strategies* project. Other funders of the NGA project include the Charles Stewart Mott Foundation and the Joyce Foundation. The Joyce Foundation focuses on the Great Lakes region and does not offer additional grants in Texas. The Charles Stewart Mott Foundation is described in recommendation 6.2 below.
- The WK Kellogg Foundation offers grants for programs that create new employment pathways in the emerging green-collar economy. As such, the foundation could be a source of funding for curriculum development costs related to this sector. (*Additional information about the WK Kellogg Foundation focus is provided under recommendation 6.2.*)

6.2: Create a regional plan to address literacy issues and skills gaps along the Texas-Mexico border.

The success of any economic or workforce initiatives in the LRGV will continue to be affected by the human resource challenges identified during the original cluster analysis conducted by TIP Strategies in 2005 (see page 6). The most pressing of these challenges relate to literacy and skills. The number of workers in the region that lack proficiency in English (and may be illiterate in their native language) and who are unequipped to meet the demands of today’s employers continues to grow. While this population is a challenge for many communities, the issue is particularly acute along the Texas-Mexico border.

The five workforce boards located along the Texas-Mexico border came together in December 2010 to propose a plan of action around Border literacy and skills training. As a result of the December event, a strategic

SPOTLIGHT: Breaking Through

South Texas College was invited to join Jobs for the Future’s *Breaking Through* initiative. Breaking Through promotes and strengthens the efforts of 35 community colleges in 18 states to help low-skilled adults prepare for and succeed in occupational and technical degree programs. The program rests on four strategies:

- ✓ Accelerated learning. Through the innovative use of assessment tools, restructured curricula, targeted instruction, contextualization, and other strategies, change delivery methods and content so that students can meet their goals faster.
- ✓ Comprehensive support services. Make academic, economic, and social support services easily accessible to students whose life challenges put them at risk of not completing their education.
- ✓ Labor market payoffs. Restructure both pre-college and college-level instruction to connect course content with the workplace and to connect students with actual employers and workplaces.
- ✓ Aligning programs for low-skilled adults. Reorganize college programs and link them with external programs to provide students with a better understanding of how they can

coalition, the Border Workforce Alliance (BWA), was formed to provide a unified voice for addressing this challenge. The purpose of the BWA will be to identify effective strategies for engaging these disenfranchised workers in the education and training system in order to bring them into the labor pool as quickly as possible. If the BWA is successful, this population of bi-lingual workers could be transformed into a competitive economic advantage for the Texas/Mexico border region. Failing to act and address these critical shortfalls will serve to severely inhibit the region's economic future.

#### Potential strategies:

- Provide support to existing initiatives that address the needs of this population.
  - Focus on programs that facilitate rapid entry into the workforce, such as the use of stackable credentials. STC's Breaking Through program is an example of this approach. (*See text box, previous page.*)
  - Look for mechanisms than can help scale these initiatives to serve larger populations.
- Link these efforts to an entrepreneurship strategy.
  - Capitalize on upward trend in small business ownership among Hispanic population.
    - The number of Hispanic-owned businesses in the U.S. increased by 43.7 percent to 2.3 million, more than twice the national rate of 18.0 percent between 2002 and 2007, according to a September 2010 release by the U.S. Census Bureau.

#### Potential funding sources:

- The Gates Foundation has funded a number of projects addressing the needs of this group. For example, in May 2009, the Gates Foundation awarded \$1.5 million to the Manufacturing Institute (a nonprofit affiliate of the National Association of Manufacturers) to integrate NAM's Manufacturing Skills Certification System with postsecondary credentials. The Gates Foundation has also funded pilot projects in eight states aimed at placing low-income young adults into energy jobs.
- The ETA also has ongoing funding opportunities under its Employment and Training Administration Pilots, Demonstrations, and Research Projects fund. Current priorities include demonstration projects to fund and evaluate transitional jobs models focused on the needs of low-income non-custodial parents (primarily fathers) in connection with President Obama's Fatherhood Initiative. Through the Consolidated Appropriations Act, Congress appropriated \$30 million of the Employment and Training Administration's

(ETA) Pilots, Demonstration and Research fund and \$15 million of the Reintegration of ExOffenders fund to support new competitive grant programs to provide and evaluate transitional jobs activities.

- Applicable U.S. Department of Education programs include:
  - The *Adult Education and Literacy Program* provides grants to states to fund local programs of adult education and literacy services, including workplace literacy services, family literacy services, English literacy programs, and integrated English literacy-civics education programs. Participation in these programs is limited to adults and out-of-school youths age 16 and older who are not enrolled or required to be enrolled in secondary school under state law.
  - The Institutional Development and Undergraduate Education Service (IDUES) administers programs as part of the College Cost Reduction and Access Act (CCRAA) of 2007. Relevant IDUES grant opportunities include the *Developing Hispanic-Serving Institutions (HSI)* program (which can be used for a variety of initiatives including academic tutoring or counseling programs) and the *Strengthening Institutions* program (which can be used to fund innovative programs to move students rapidly into core courses and through program completion, which may include remedial education and English language instruction).
- The Economic Development Administration (EDA) provides planning assistance grants through its Planning Program. While these grants are typically used to support the development of a Comprehensive Economic Development Strategy or CEDS, they can also be used to provide support for related short-term planning investments and State plans designed to create and retain higher-skill, higher-wage jobs, particularly for the unemployed and underemployed in the nation's most economically distressed regions. Eligible grantees include institution of higher education or a consortium of institutions of higher education. Broad representation in the process, particularly the involvement of the region's business leadership, is among the criteria considered for funding. Requests must demonstrate the relationship to the region's existing CEDS. *Ignite Hidalgo County (2011-2015)* is the region's most recent completed CEDS effort.
- The Charles Stewart Mott Foundation funds the *Pathways Out of Poverty* program. Its mission is to identify, test, and help sustain pathways out of poverty for low-income people and communities. The program is organized into four grant-making areas: Improving Community Education, Expanding Economic Opportunity, Building Organized Communities, and Special Initiatives.
- The Sundt Foundation is a non-profit organization focused on the needs of disadvantaged children and adults. The Foundation receives most of its funding through employee contributions, which are matched by the company. To date, it has provided more than

\$3.5 million in aid to community organizations in Arizona, California and Texas. Grants range from \$1,000 to \$10,000 and are typically made to community service organizations.

- The Dollar General Literacy Foundation's *Adult Literacy Grants* award funding to nonprofit organizations that provide direct service to adults in need of literacy assistance through Adult Basic Education, GED, or ESL programs. Funding organizations must be within 20 miles of a store location and must be listed in Dollar General's National Literacy Directory (both Workforce Solutions LRGV and South Texas College are listed). The current funding cycle grant deadline is February 24, 2011.
- The Annie E. Casey Foundation makes grants that help states, cities and neighborhoods fashion more innovative, cost-effective responses to the needs of vulnerable children and families. The Foundation's *Center for Family Economic Success* supports efforts aimed at linking economic opportunity and the creation of mixed-income communities in ways to alleviate poverty. One of the center's three focus areas is creating successful working families. This strategy incubates and takes to scale models combining workforce training and asset-building for families and communities.
- The WK Kellogg Foundation supports programs that increase family stability; foster quality jobs, careers and entrepreneurship; and promote secondary achievement and financial independence through its *Secure Families* strategy. One of the three primary areas of focus under this strategy is supporting pathways that lead to economic mobility and quality job opportunities. The organization provides funding nationwide, however, its priority places for grantmaking are Michigan, Mississippi, and New Mexico – with a stated goal of awarding 60 percent of its funds in these states.

### 6.3 Strengthen entrepreneurship in the region.

Entrepreneurship has become an essential tool in the economic development toolbox. Especially in rural areas, communities are recognizing that a “grow your own” strategy has a higher probability of success than recruiting a major employer to the area. In addition, entrepreneurship strategies that foster new business and job creation are often more cost effective than incentives paid to recruit businesses to a community. A recent study of the Appalachian Regional Commission's Entrepreneurship Initiative published by the Rural Policy Research Institute's (RUPRI) Center for Entrepreneurship found the public cost of the initiative per job created ranged from \$579 to \$3,994 (*Creating an Entrepreneurial Appalachian Region*, RUPRI, April 2008). In addition, fostering entrepreneurship can help stabilize and support micro- and small businesses, which comprise the majority of firms in the Valley, as illustrated in Figure 2.27 (page 22).

Figure 6.1 presents a framework for thinking about the types of entrepreneurial talent – entrepreneurs, business owners, potential entrepreneurs, and those with limited potential – and the timeframe for intervention. Each type of talent differs in terms of its needs and motivations, but each is an important part of a regional strategy. Targeting potential entrepreneurs encourages a more entrepreneurial culture and can lead to more start-ups in the future. Business owners account for the large majority of businesses. At the top of the pyramid, true entrepreneurs are not very common, but their ventures have the highest economic impact potential.

Our review of entrepreneurship indicators and resources (Section 2) suggests that access to technical assistance and support services is lacking in some parts of the region. And like most areas of the country, entrepreneurs in the LRGV need greater access to capital other than debt. In terms of industries, we found services for high-growth entrepreneurs in sectors other than advanced manufacturing to be lacking. Our discussions with area providers indicate that the local culture embraces the concept of starting small or micro businesses, but is less supportive of starting a high-growth venture.

Potential strategies:

#### GUIDANCE: Entrepreneurship

In November 2010, the US Department of Labor ETA issued Training and Employment Guidance Letter 12-10. Entitled *Supporting Entrepreneurial and Self-Employment Training through the Workforce Investment System*, the letter states that workforce investment boards are “strongly encouraged to examine existing strategies for promoting entrepreneurship as an employment strategy, establish parameters for funding entrepreneurial and self-employment training, and explore further opportunities for supporting entrepreneurship.”

The letter included the following examples of role the workforce investment system can play in support of entrepreneurship:

- ✓ Engaging with partners to develop an entrepreneurial environment and strategies to leverage workforce system resources to identify and support potential entrepreneurs;
- ✓ Informing One-Stop customers about opportunities for self-employment and entrepreneurship and working with customers to assess whether self-employment is a good fit;
- ✓ Helping One-Stop customers understand the range of resources available and referring them to counseling and training that best meet their needs;
- ✓ Partnering with organizations that support entrepreneurship and co-locating small business development resources within One-Stop Career Centers as partners;
- ✓ Seeking out opportunities to add entrepreneurship training programs to the eligible training provider list;
- ✓ Encouraging recipients of Individual Training Accounts to pursue entrepreneurship training where appropriate;
- ✓ Integrating entrepreneurship strategies into overall youth education

ship.

- Continue to explore ways to add entrepreneurship to the region's target occupations lists. The Entrepreneurship Competency Model created by ETA and the Consortium for Entrepreneurship Education could be a starting point.
- Organize industry-specific entrepreneurship groups to support high growth entrepreneurs in target industry sectors.
- Train entrepreneurial coaches / concierges in low access areas to help connect entrepreneurs with service providers and support that they need.
  - See Appendix K for an overview of the Kentucky Entrepreneurial Coaches Institute and other best practices in entrepreneurship.
- Assemble a network of mentors to support entrepreneurs.
- Assemble a capital network to help entrepreneurs identify their capital needs and raise funds through optimal avenues.
- Support initiatives to promote youth entrepreneurship to enhance the entrepreneurial culture of the region. Examples include:
  - Organize a contest to teach students how to start and run a business. Could be modeled after the Apprentice TV show or Lemonade Day.
  - Explore ways to incorporate concepts of entrepreneurship in school curriculum.
  - Support initiatives that promote youth entrepreneurship (such as Junior Achievement).
- Organize an institute or training workshop for representatives from around the region.
- Organize capital workshops (both virtual and in-person) that cover topics such as:
  - Assessing how much capital the business needs.
  - Pros and cons of debt and equity financing.
  - How to secure the appropriate type of financing.
  - Once entrepreneurs are ready to approach financiers, introduce them to network participants that could help them secure the financing.



### Potential funding sources:

- The Kauffman Foundation partners with organizations to advance promising national programs and to leverage additional funding and resources for their two areas of interest: education and entrepreneurship. Their focus is on funding programs and initiatives that have significant potential to demonstrate innovative service delivery. Kauffman provides funding, consultation, and technical assistance throughout the U.S., however, the majority of the foundation's education grants go to organizations within the Kansas City metropolitan area.
- The Harry and Jeanette Weinberg Foundation distributes approximately \$100 million each year to a wide range of charitable organizations that provide direct services to poor and vulnerable individuals. The Foundation supports economically disadvantaged persons' entry into, and long-term attachment to, the workforce and the mainstream economy by providing "life-tools" needed to lift people from poverty and advance them into solid self-support. In addition to their job-readiness grants (which support training initiatives that result in job placement in partnership with employers), the foundation supports grants for adult entrepreneurship and financial literacy.
- As part of its focus on quality jobs, WK Kellogg Foundation's *Secure Families* includes entrepreneurship as an area of interest. *(Additional information about the WK Kellogg Foundation is provided under recommendation 6.2.)*
- The federal Minority Business Development Administration recently announced funding for the operation of Minority Business Centers to provide technical assistance. Eligible applicants under this announcement include nonprofit organizations, for-profit firms, state and local governments, and educational institutions, with funding typically provided for a five-year period. The current funding cycle has closed, however, funding for similar projects has been issued in the past, suggesting that additional funding opportunities could be available in future budget years.

#### 6.4: Work with the colleges to change perceptions about careers requiring vocational-technical training.

The national emphasis on increasing educational attainment levels — exemplified by the federal government's recent goal for the U.S. to have the highest proportion of college graduates in the world by 2020 — may have the unintended consequence of siphoning students from vocational/technical training. Figure 5.4 (*page 61*) provides data on this point for Texas's community colleges. Although the total number of contact hours taken statewide at two-year colleges continues to increase, technical contact hours at these institutions have remained flat. The push by government agencies, nonprofit organizations, and community groups to increase the number of "college graduates" may be interpreted as promoting (and is sometimes specifically geared towards) the attainment of a four-year degree. Yet, many of the nation's fastest growing occupations require less training and offer higher earnings potential. Workforce and education professionals should continue to emphasize the importance of this alternative path to success.

TSTC's "mechatronics" program is a case in point. This program provides training in a number of mechanical, electronic, and electrical systems that are integral to many of today's business and consumer products. Created in 2006 as part of a \$1 million Community Based Job Training Grant from the U.S. Department of Labor, enrollment in the program has not kept pace with expectations. The Regional Cooperation Grant Partners could support the mechatronics program by helping raise awareness about mechatronics as a career. This effort should emphasize earnings potential of related occupations and the connection between mechatronics and other career opportunities.

Skilled trades is another area around which perceptions could be influenced. The aging of the workforce in occupations such as plumbing, electrical, and HVAC will leave a tremendous shortage in these areas as baby boomers retire. Although some aspects of these jobs can be unpleasant (working in hot attics, dealing with clogged pipes) the jobs can appeal to workers looking for solid earnings potential or who may not want to work in an office environment.

Potential strategies:

- Identify state and national initiatives that could be a model or that could be leveraged.
  - Examples such as the "Gotta Make It" DVD produced by Workforce Solutions of Tarrant County to encourage people to enter manufacturing fields can be a model. (See text box, page 89.)
  - Host "Skilled Trades Days" in connection with youth-focused events, such as sporting events.
- Explore the feasibility of creating a state-level campaign (e.g., public service announcements) to encourage people to go into vocational and technical training.
  - These efforts should focus on career opportunities and earnings potential for these fields.
- Link mechatronics and skilled trade occupations to creativity.



- While these jobs are sometimes viewed as “dirty jobs,” they often involve problem-solving and other aspects of creative thought.
- Connecting vocational training to events such as Maker Faire can help make the link between craft and technology. Created by *Make* magazine, Maker Faire events take place in a limited number of cities annually. The events celebrate arts, crafts, engineering, science projects and the “do-it-yourself” mindset.
- Make sure school guidance counselors and teachers are armed with the best possible information about career options in these areas.
  - Having current information about mechatronics and skilled trades careers can help counselors guide students who are not interested in pursuing a traditional academic track into these occupations.
  - Link career information to the classroom. For example, the Rochester (NY) Education Alliance of Labor, or REAL helps teachers become better informed about career-related issues by developing an occupational safety and health curriculum module for high school students, preparing work-related exercises for pre-K to 8th grade students, and producing professional development activities for teachers.
  - Host summer “internship” opportunities for area school teachers with firms that hire people in mechatronics and skilled trades. These programs allow teachers to learn first-hand about career options so they can better inform their students.
- Identify creative solutions for providing training in work settings to encourage incumbent workers to move into technical fields.
  - Florida Gateway College (formerly Lake City Community College) worked with state and local partners to create a distance learning, satellite-provided training program that could be delivered in the workplace to address a critical shortage of trained and certified RV technicians.

#### Potential funding sources:

- ETA’s *Trade Adjustment Assistance Community College and Career Training (TAACCCT)* Grants Program could fit within this strategy due to its focus on education and career training programs that can be completed in two years or less, and that prepare participants for high-wage, high-skill occupations. (See *recommendation 6.1 for additional details.*)

- The Greater Texas Foundation's primary focus is related to post-secondary education access, preparation, persistence and completion. GTF invests in activities which help facilitate successful transition to postsecondary education, focusing on student planning and preparation, improved developmental education programs and better alignment of education systems. GTF is also focused on increasing the rate of post-secondary completion through investments in support for students and system reform. Proposals requesting funds to match federal, state, or other foundation grants for programs related to the Greater Texas Foundation's focus areas are encouraged.

#### 6.5: Explore potential funding sources for strategies 6.1 through 6.4

For each of the above recommendations, we have provided specific suggestions for funding sources. However, given the continued tightening of resources available for workforce development, an ongoing funding strategy should be pursued. An essential element of this strategy will be aligning funding requests with national education priorities.

The strategies outlined in this document dovetail with the national mandate for increasing educational attainment rates, especially for higher education. The President's goal of returning the U.S. to number one in the world in higher education attainment (the U.S. is currently ranked 12th) has prompted a number of organizations to focus their efforts. Among the organizations relevant to the Rio Grande Valley are the Bill & Melinda Gates Foundation, the Lumina Foundation, Excelencia in Education, and the Hispanic Scholarship Fund. Each of these groups recognizes that the national goals will go unmet without addressing this issue among the nation's Latino population (the fastest growing population, while at the same time the population that participates in higher education at among the lowest rates).

#### STATISTIC: Lumina's "Big Goal"

The Lumina Foundation's "Big Goal" is to increase the percentage of Americans with high-quality, two- or four-year college degrees and credentials from 39 percent to 60 percent by 2025. Attainment of this goal would regain America's position as number one in educational attainment and would represent an increase of 23 million graduates above current rates.

More than 30 percent of white, non-Hispanic American adults have at least four years of college, but only 18 percent of African Americans and 12 percent of Hispanics have reached the same level of attainment.

These organizations, along with a number of corporate partners, have formed a coalition to pool resources and influence to create a national movement. This initiative is in its embryonic stage but is growing rapidly. If organizations in the Valley can align part of their initiatives behind this movement, there may be opportunities to pursue grant funding from several of the partners. Specifically, the Hispanic Scholarship Fund is planning to conduct pilot studies to better understand the impact of higher education on the Latino community and regional economic development. The Valley should position itself as one of the regions for the pilot phase of the HSF's work.

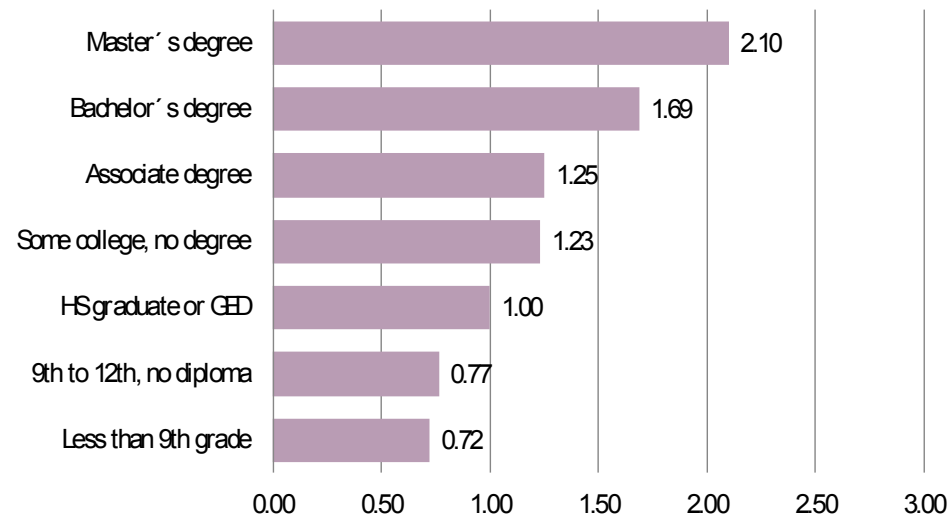
Potential strategies:

- Use the partnerships formed under this grant to create a regional funding collaborative for the Valley.
  - From the National Fund for Workforce Solutions: “Regional funding collaboratives bring together government agencies, foundations, and other philanthropic organizations to target financial resources and strategic thinking on creating jobs and careers.”

Figure 6.3

**Hispanic earning power increases with educational attainment**

*Median earnings for a Hispanic individual age 25 or older with a high school diploma or GED alone indexed to 1.00*



SOURCE: U.S. Census Bureau, CPS 2009 Annual Social and Economic Supplement, PIN03

Earning power rises as educational attainment increases. This is true for the overall US workforce and it is true for the Hispanic workforce as well.

The average Hispanic worker without a high school diploma earns about a quarter less than someone who finished high school.

The rewards are high for those who go beyond high school. Earnings can rise by a quarter with an associate degree and by as much as two-thirds with a bachelor's degree. For those who go on to get advanced degrees, they can expect to earn more than double the average worker with only a high school diploma.

- Identify contacts with relevant organizations, including the Bill & Melinda Gates Foundation, the Lumina Foundation, Excelencia in Education, and the Hispanic Scholarship Fund. Use networking opportunities with these groups to better understand their specific priorities.
- Explore the feasibility of making the Valley one of the Hispanic Scholarship Fund's pilot regions.
- Establish the Regional Partners as a technical resource for these groups by providing relevant data and expertise.

## Appendix A: Employer Survey

To identify specific issues with regard to hiring, TIP facilitated a web-based survey of employers in the region. A link to the survey was emailed to economic development and industry-related organizations in the four-county region to distribute to their membership. Thirty-two (32) employers responded to the survey. While this number represents a fraction of employers in the region, the responding firms employ more than 18,000 workers. Results of the survey are presented below.

**Respondent profile.** Respondents to the survey represented a range of employers. Many of the region’s largest employers participated, including 9 establishments with more than 500 workers. Overall, respondents ranged in size from a lawn-care service with 1 employee to a logistics company with nearly 8,500 workers. In terms of the employment base, the responding firms represented 18,672 employees (16,136 full-time; 703 part-time; and 1,833 contract). One in four respondents had operations in Mexico. Of these firms, Reynosa was the most commonly cited location.

**Current and future skills.** Respondents were asked to identify occupations that were “persistently” difficult to recruit in their industry, as well as to identify skills that would be needed in the future. These responses are provided as Figure A.3.

Figure A.1

Q: Approximately how many people are currently employed by your firm/ organization in the Valley?  
Please provide a number for each category. Enter zero if the category is not applicable.

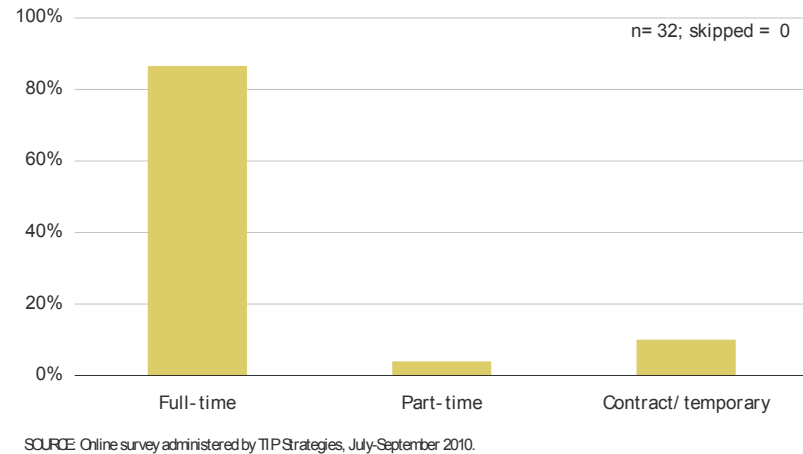


Figure A.2

Q: Does your firm have operations in Mexico?

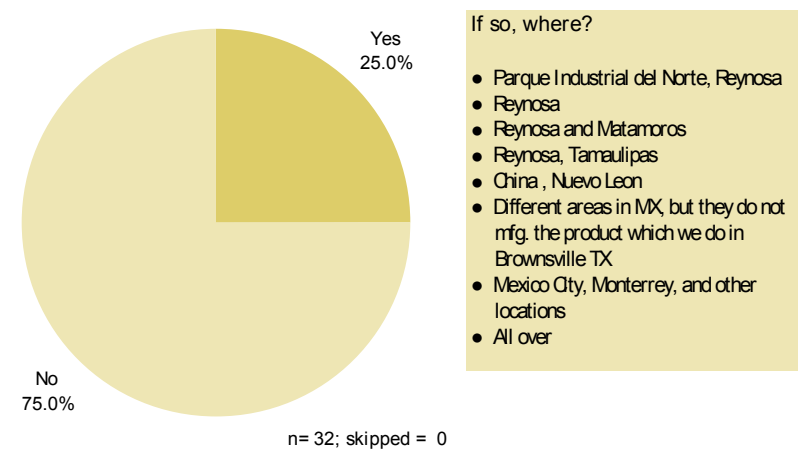


Figure A.3 Current and future skills

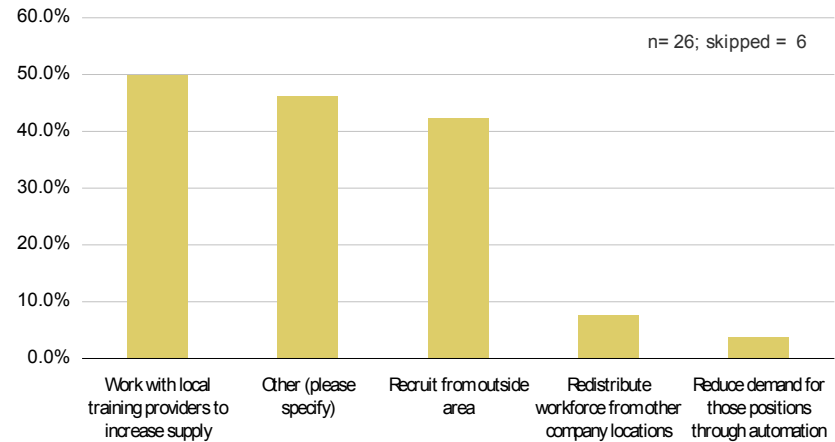
CURRENT SKILLS: Which occupations (or skills) are persistently difficult to recruit in your industry? n=26; skipped = 6		FUTURE SKILLS: What types of skills do you anticipate needing in the future? n=24; skipped = 8	
Accountant [3]	Licensed Professional Counselor (LPC)	ability to communicate effectively with decisionmakers	OT Therapists
Administrative Assistant	Licensed Vocational Nurse	ability to make presentations to small & large audiences	plc programmer
Advanced Nurse Practitioner	Machinists [3]	Accounting [2]	Process Technicians
CDL Drivers	Maint. personnel	Advanced Nurse Practitioner	Product & Process costing
Certified Occupational Therapist Assistant	Maintenance Electrical Mechanics	attention to detail	Psychiatrist
Child Psychiatrist	Maintenance Industrial Mechanics	Bookkeeping	Quality Control
Computer Knowledge	Maintenance Refrigeration Mechanics	certifications in their fields	reading and writing - better quality writing
commission only producers	manufacturing experience	Child Psychiatrist	religious ministry
Credit / Loan Review Analyst	Math Teachers	Computer Skills [4]	RN
Customer Service Representatives	Mechanics [3]	Customer Service [3]	sales people
Data Entry	Mid-level IE	delivery personnel	skilled machine operators
Drivers with CDL	Mold Makers	Engineering [2]	supervisors
Electricians	Music Teachers	Equipment Operators w/License & Certifications	Technician
Engineer [2]	Occupational Therapy	Fire Alarm System Install & Service Technician	Technician Helper
Equipment Operators w/License & Certifications	Process Technicians	Fork Lift [2]	time management
Experience Bookkeepers	Product & Process costing	furniture technician	Utilities Foreman
experienced food production line managers	Psychiatrist	Inspector	Written and spoken language skills
Fire Alarm System Install & Service Technician	QA lab technicians	is coordinator [Inspection & Safety Coordinator?]	
Fitter/ layout	Registered Nurse	lab testing and microbiology	
Fluent reading English skills	religious ministry	Licensed Chemical Dependency Counselor (LCDC)	
food safety program coordinators	sales & marketing rep.	Licensed Clinical Social Worker (LCSW)	
Fork Lift Operator [3]	sanitation/3rd shift	Librarian	
Front Office - Medical	Science Teachers	Licensed Professional Counselor (LPC)	
furniture technician	Shipping Coordinator [2]	LVN	
High School Diploma/GED	Speech Language Pathologist	Machinist	
Information Technology personnel [3]	Supervisors	management, reporting, and coordinating skills	
Legal Secretaries	Technician	Mechanic [2]	
Librarian	tool & die	Mid-level IE	
Licensed Chemical Dependency Counselor (LCDC)	Utilities Foreman	Multi-tasking	
Licensed Clinical Social Worker (LCSW)	Warehouse personnel [3]	no major demand at this time	

SOURCE: Online survey administered by TIP Strategies, July-September 2010. Brackets show number of respondents that indicated a particular skill or occupation.



Figure A.4 Q: What steps, if any, do you currently take or are you planning to take to address current shortages or future skills requirements?

Respondents were asked to select all that apply



SOURCE: Online survey administered by TIP Strategies, July-September 2010.

Respondents were asked what steps, if any, they were taking to address skills shortages (Figure A.4). Of the range of options presented, working with local training providers to increase the supply of workers was the most common response selected by one-half of responding firms. A similar percentage of respondents indicated they were taking “other” steps to fill these positions. Strategies listed include job fairs, working with temporary agencies, offering higher wages or incentives (e.g., signing bonuses, tuition reimbursements), and training existing employees.

Training practices. In addition to asking about occupations and skill sets, employers were asked about current training practices (Figure A.5). All but a handful of respondents (89.3 percent) reported using in-house training to meet their training needs. After employer-provided training, the next highest response was private training providers with slightly more than one in three respondents (35.7 percent) indicating they use this source. This finding is in keeping with national data that suggest employer training needs tend to be met outside of the postsecondary system, as well as data on education and skills levels published by the U.S. Bureau of Labor Statistics (see Chapter 4).

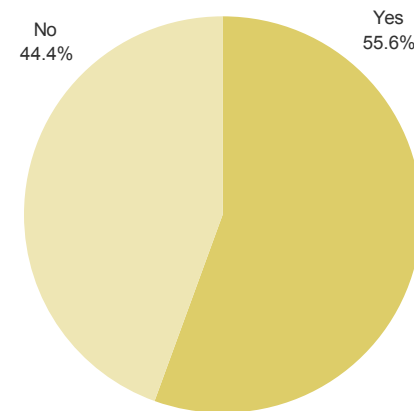
Of the colleges in the region, South Texas College was cited as a source of training slightly more frequently

Figure A.5: Training sources used and percent of training supplied by each

Training source	Q: Which of the following training sources do you currently use?		Q: If you indicated more than one training resource approximately what percentage of your training is supplied by each?
	Percent of Respondents	Number	Average % of training supplied
In-house / on-the-job	89.3%	25	74.2%
Private training provider	35.7%	10	24.7%
South Texas College	32.1%	9	24.8%
University of Texas Pan Am	21.4%	6	17.7%
Equipment supplier/vendor	17.9%	5	12.2%
University of Texas Brownsville	17.9%	5	24.5%
Texas State Technical College	14.3%	4	7.0%
Texas Southmost College	14.3%	4	10.5%
Other	14.3%	4	44.7%

than the others. When asked what percentage of training was supplied by each resource, in-house or on-the-job training again represented the largest share. In addition to being the most commonly used source, in-house or OTJ also represented the largest share of training, with respondents who used this approach reporting that three-quarters of their training needs were met in this manner. In other words, in-house or on-the-job training is by far the most common source of training among survey respondents (used by 9 out of 10 respondents) and it accounts for the greatest share of training (74.3 percent). By contrast, “other” sources of training were not commonly reported (only 4 respondents or 13.3 percent), but for those few who did use this source, it comprised a significant share of training (nearly 45 percent). When asked to specify what other sources were used, respondents listed industry-related associations and the Texas Association of Counties.

Figure A.6 Q: Are there training programs lacking in the area that are critical to your training needs?



n = 27; skipped = 5

SOURCE Online survey administered by TIP Strategies, July-September 2010.

**If so, please specify**

- Basic communication, reading, writing skills
- Tutorial- for our internal systems
- Leadership programs
- Certified trainers needed
- Skilled and educated supervision
- Mainly in the specific equipment or manufacturing processes we utilize - food manufacturing.
- Basic English
- It's a skill hard to obtain schools don't teach on this subject [ skill not specified]
- Fork lift, and computer training and appearance.
- Religious ministry training is not locally available
- Psychiatric specialties
- Quality [ no program specified]
- Places to receive CEU credits for different licenses
- Entry level computer skill in Quick Books, Outlook, Word, Excel
- No adequate programs provided on a regular basis.
- Basic Electronics

Respondents were not probed about why they did not make use of public training resources, so it is not clear whether the relatively minimal use of the colleges and universities is due to lack of awareness or lack of need. However, when asked if they felt training programs were lacking in the region, the majority of respondents (55.6 percent) indicated there were critical programs missing in the region (Figure A.6). Firms that indicated a lack of training programs were asked to expand on their answer. Some of the programs listed – such as basic computer skills and English language proficiency – are offered in the area, suggesting that additional outreach may be warranted to ensure employers are aware of available services.

State of the industry. Survey respondents were asked a series of open-ended questions about the current state of their respective industry. 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, a number of respondents cited increased competition, continued technological advances, and the effects of growing regulation.

Looking forward, respondents were asked about innovations they felt would affect the future of their industry. Technology was the common theme among the majority of responses. The ability to transfer data, make purchases, and communicate with vendors and customers has had a revolutionary impact across industries. Technology has provided a way to speed up production time, improve product quality, provide training, and mitigate talent shortages. As an example of the latter, one firm cited the use of telemedicine as a factor in relieving the shortage of psychiatrists in the region.

When asked about challenges they faced in the next five years, foreign competition, government regulation, economic recovery, and state and federal budget cuts were common responses. Workforce concerns were also apparent, with a number of firms voicing concern about finding and retaining skilled workers in the future. For some industries, an aging workforce was cited as a concern. For others, improving productivity and basic employability skills were top of mind.

State of the Valley. Finally, respondents were asked how they viewed their ability to succeed in the Valley and what steps, if any, the region could take to help them attract, develop and retain the talent they need. Responses were varied, although competition remained a constant theme. Some respondents saw their location in the Lower Rio as an asset (*“We are better positioned here to face the challenges than we would be elsewhere”*), while others found it difficult to remain competitive due to transportation costs, competition for workers among Valley employers, and difficulty finding the workforce they need. The issue of security for firms with Mexican operations was also raised.

When asked what communities could do to help, the most common answer was to better prepare the area’s young people. “High school aged kids need to be taught and learn the importance and value of being able to multi-task, time management, customer service, etc. Regardless of what vocation they choose, these skills will serve them well.” Developing a “culture of education and achievement in the Valley,” improving English proficiency, and taking a results-oriented approach to workforce services (rather than a quota-driven one) were related ideas. Although some respondents saw little connection between the community itself and competitiveness, most comments suggested that making the region a more attractive place for young people and families would help them in their recruitment efforts. Ideas included promoting the Valley more aggressively, providing more cultural activities and entertainment options, and creating a “green” image for the region.

## Appendix B: High impact job loss analysis

This analysis goes into greater detail regarding to the five occupational groups with the greatest job losses identified in Section 2.

Job losses. From the five occupational groups identified in Figure 2.26 (page 21), we focus on the 26 individual occupations in which at least 50 local jobs were lost in the past three years. We then sorted these occupations into two groups.

The first group includes 23 occupations in which jobs lost in 2007-2009 are not expected to be fully regained within a five-year timeframe, according to EMSI's employment projections for the 4-county region.

The second group includes the remaining three occupations which should be better positioned for recovery within five years or less based on EMSI's projections.

Figure B.1: High impact job losses with slow recoveries

*Job losses for occupations within the 5 hardest hit sectors in 2007, 2008, and 2009 combined*

Code	Occupations unlikely to recover fully in 5 year	Cumulative 3-yr job losses in the LRGV
53-7062	Laborers & freight, stock, & material movers, hand	-515
51-4121	Welders, cutters, solderers, & brazers	-236
51-2092	Team assemblers	-210
49-3023	Automotive service technicians & mechanics	-184
53-7051	Industrial truck & tractor operators	-154
53-7064	Packers & packagers, hand	-135
45-3011	Fishers & related fishing workers	-132
47-2051	Cement masons & concrete finishers	-132
45-209A	Miscellaneous agricultural workers	-126
51-9111	Packaging & filling machine operators & tenders	-120
45-2041	Graders & sorters, agricultural products	-110
51-1011	Managers of production & operating workers	-109
51-9061	Inspectors, testers, sorters, samplers, & weighers	-108
51-2099	Assemblers & fabricators, all other	-95
51-6031	Sewing machine operators	-93
51-9198	Helpers—Production workers	-91
51-4041	Machinists	-83
51-4031	Cutting, punching, & press machine operators, metal & plat	-72
51-2041	Structural metal fabricators & fitters	-64
51-9192	Cleaning, washing, & metal pickling equipment operators	-60
51-3023	Slaughterers & meat packers	-54
47-2221	Structural iron & steel workers	-54
51-3022	Meat, poultry, & fish cutters & trimmers	-50
Code	Modest chance of recovery within 5 years	Cumulative 3-yr job losses in the LRGV
47-2061	Construction laborers	-455
47-2031	Carpenters	-245
47-1011	Managers of construction trades & extraction workers	-53

SOURCES: EMSI Complete Employment - 3rd Quarter 2010

Regional concentration. Of the 23 most at-risk occupations we identified, most of the above-average LQs are in agriculture and production work. The remainder are spread across the occupational groups.

Of the three occupations with the best chance of recovery within five years, all are in the construction field with location quotients that are average or slightly above average.

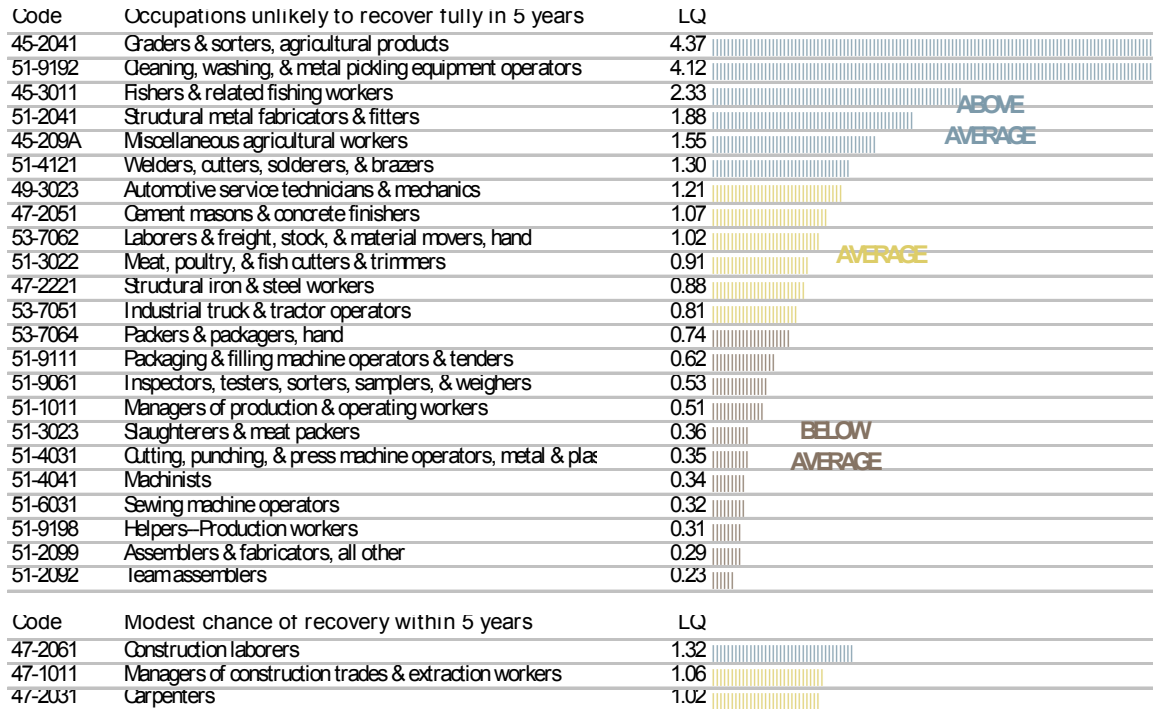
Figure B.2: Relative job concentrations for the hardest hit occupations

*Location quotient analysis applied to individual occupations*

US average for each occupation = 1.00

Regional strength > 1.25

Regional weakness < 0.75



SOURCES: EMSI Complete Employment - 3rd Quarter 2010

Median wages. The majority of the at-risk occupations pay a median wage of less than \$10/hour. Many of these positions involve either heavy manual labor in agriculture and construction or assembly-line work in manufacturing, especially food processing and apparel.

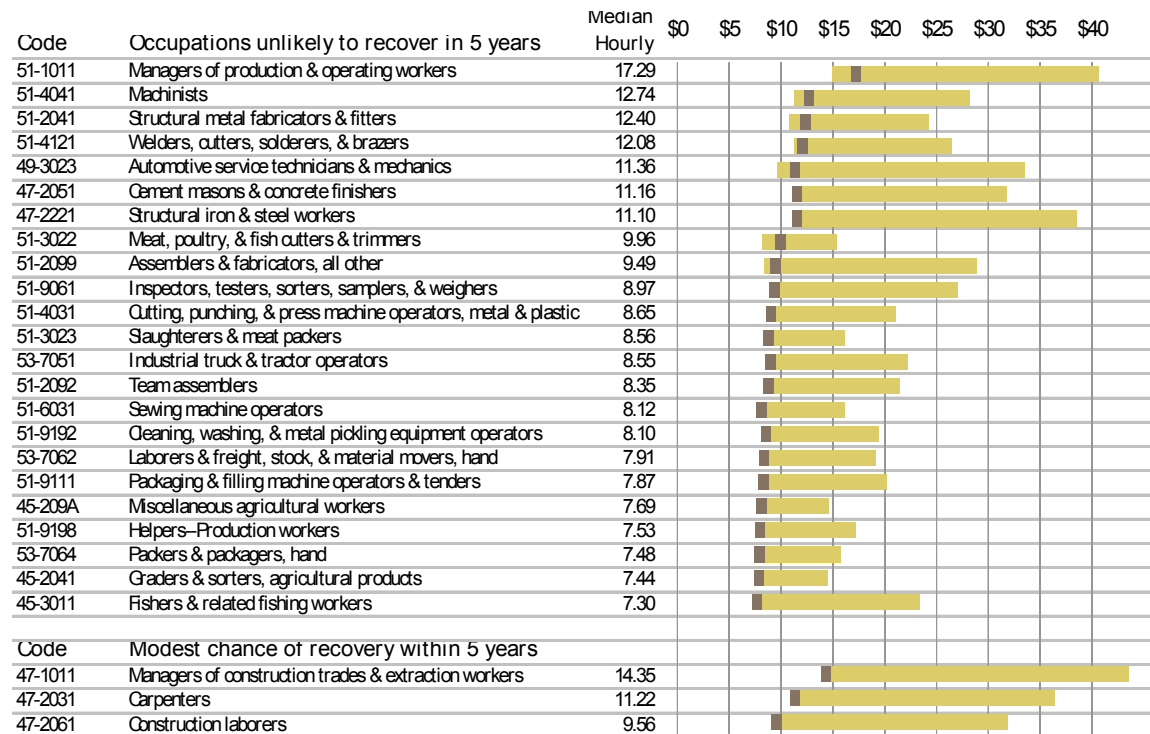
The at-risk occupations with a median wage exceeding \$10/hour tend to be either managerial jobs or skilled production workers like machinists, welders, or metal fabricators.

Across most of the at-risk occupations, local median wages fall at the base of the national wage range.

Figure B.3: Median wages for LRGV at-risk occupations

*Local median wage presented in the context of the national wage range*

*Dark shading represents the local median; yellow bar represents the national range between the 10th and 90th percentiles*



SOURCES: EMSI Complete Employment - 3rd Quarter 2010

Education and training. The U.S. Bureau of Labor Statistics classifies occupations across 11 broad levels which reflect the education, training, and overall preparation needed for a job. The 26 at-risk occupations fall heavily within the lower range of skill levels, with only one job description requiring at least some level of vocational preparation.

At least two of the occupations – welders and machinists – are often cited by industrial employers as being difficult to find in some areas of the U.S.

Figure B.4: Education and training levels for at-risk LRGV occupations

*The hardest hit occupations encompass a wide range of skill levels*

*Squares represent the 11 levels of standard skills/ training as defined by the U.S Bureau of Labor Statistics*

Code	Occupation name	Minimum required Training/ skill level	Low ← → High
49-3023	Automotive service technicians & mechanics	■ ■ ■ ■ ■ □ □ □ □ □	Postsecondary vocational award
45-2041	Graders & sorters, agricultural products	■ ■ ■ ■ □ □ □ □ □ □	Work experience in a related field
51-1011	Managers of production & operating workers	■ ■ ■ ■ □ □ □ □ □ □	Work experience in a related field
47-1011	Managers of construction trades & extraction workers	■ ■ ■ ■ □ □ □ □ □ □	Work experience in a related field
51-4121	Welders, cutters, solderers, & brazers	■ ■ ■ □ □ □ □ □ □ □	Long-term on-the-job training
51-4041	Machinists	■ ■ ■ □ □ □ □ □ □ □	Long-term on-the-job training
47-2221	Structural iron & steel workers	■ ■ ■ □ □ □ □ □ □ □	Long-term on-the-job training
47-2031	Carpenters	■ ■ ■ □ □ □ □ □ □ □	Long-term on-the-job training
51-2092	Team assemblers	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
45-3011	Fishers & related fishing workers	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
47-2051	Cement masons & concrete finishers	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
51-9061	Inspectors, testers, sorters, samplers, & weighers	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
51-2099	Assemblers & fabricators, all other	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
51-6031	Sewing machine operators	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
51-4031	Cutting, punching, & press machine operators, metal & plastic	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
51-2041	Structural metal fabricators & fitters	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
51-9192	Cleaning, washing, & metal pickling equipment operators	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
51-3023	Slaughterers & meat packers	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
47-2061	Construction laborers	■ ■ □ □ □ □ □ □ □ □	Moderate-term on-the-job training
53-7062	Laborers & freight, stock, & material movers, hand	■ □ □ □ □ □ □ □ □ □	Short-term on-the-job training
53-7051	Industrial truck & tractor operators	■ □ □ □ □ □ □ □ □ □	Short-term on-the-job training
53-7064	Packers & packagers, hand	■ □ □ □ □ □ □ □ □ □	Short-term on-the-job training
45-209A	Miscellaneous agricultural workers	■ □ □ □ □ □ □ □ □ □	Short-term on-the-job training
51-9111	Packaging & filling machine operators & tenders	■ □ □ □ □ □ □ □ □ □	Short-term on-the-job training
51-9198	Helpers—Production workers	■ □ □ □ □ □ □ □ □ □	Short-term on-the-job training
51-3022	Meat, poultry, & fish cutters & trimmers	■ □ □ □ □ □ □ □ □ □	Short-term on-the-job training

SOURCES: EMSI Complete Employment - 3rd Quarter 2010

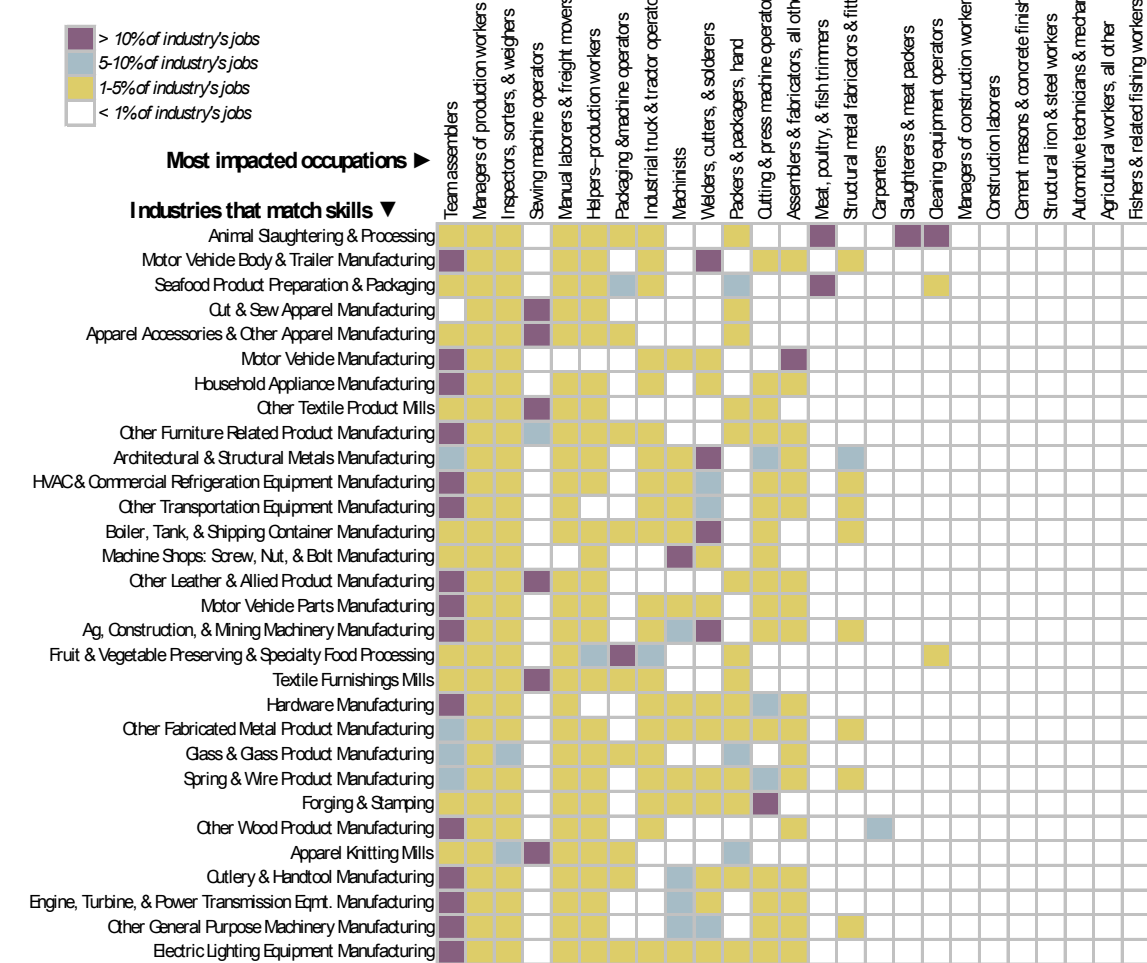
Staffing patterns. For the at-risk occupations, we have identified the specific industries which most often employ them. We have separated this "best fit" analysis into two groups. The first (shown on this page) looks at manufacturing industries only. The second (next page) focuses on non-manufacturing industries.

Some of these cross-referenced industries may seem redundant in that they point right back to the same industries in which the jobs were lost. Some occupations, however, may have more flexibility for wider job placement. In some cases where direct replacement is unlikely, then retraining or career counseling may prove a better option.

Figure B.5: Connecting surplus labor to "best fit" industries - Part 1

**Manufacturing industries most likely to need the LRGV's surplus talent**

Industries by row, occupations in columns



SOURCES: EMSI Complete Employment - 3rd Quarter 2010



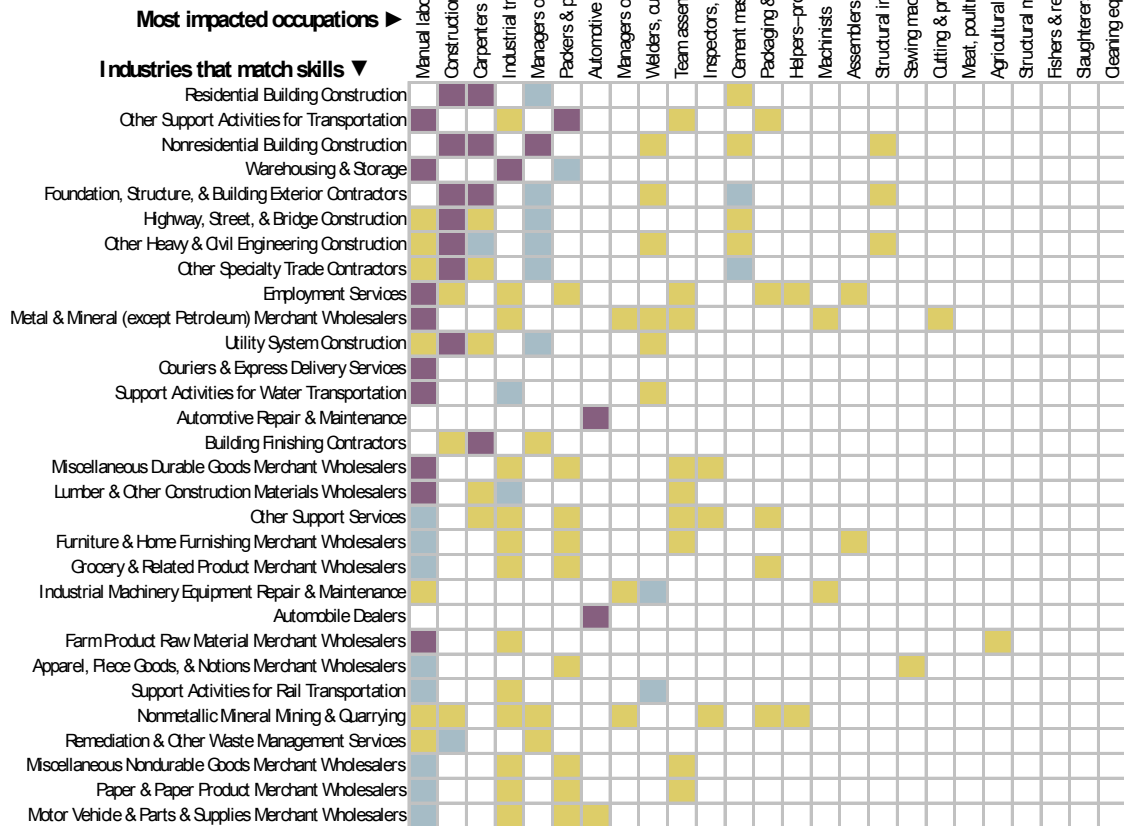
The analysis of at-risk occupational opportunities continues here with non-manufacturing industries. While many of the occupations recently lost do not transfer as easily to non-manufacturing, there are in fact a wider mix of various industries where their skills may fit.

One industry that pops up on this list is industrial machinery equipment repair and maintenance. It is worth noting that during past field interviews, LRGV manufacturers have pointed out a gap in the availability of local repair services for computerized manufacturing equipment. Repair and maintenance staff frequently have to be consulted or brought in from other, larger metropolitan areas.

Figure B.6: Connecting surplus labor to "best fit" industries - Part 2

**Non-manufacturing industries most likely to need the LRGV's surplus talent**

Industries by row; occupations in columns



SOURCES: EMSI Complete Employment - 3rd Quarter 2010

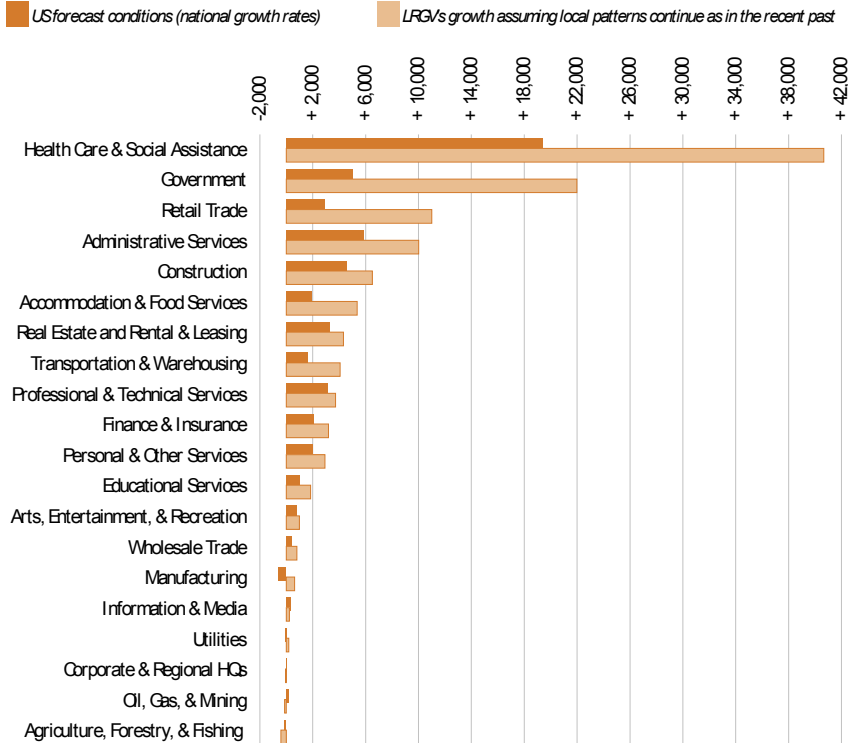
## Appendix C: Industry and occupation scenarios

The industry cluster analysis and target occupation analysis present in Section 3 is based on growth projections prepared by private data provider, EMSI. These projections assume the region's growth will continue as in the recent past. For selecting target occupations, this approach makes sense. To help regional leaders understand how patterns may differ, however, we prepared an scenarios of industry and employment growth based on national growth patterns. This U.S.-based scenario was prepared by applying national growth rates from EMSI's projections to employment in the Valley on a sector-by-sector basis. The results of these scenarios by industry sector and major occupational group are provided as Figures C.1 and C.2, respectively. An illustration of the U.S. forecasts by industry sector and by major occupational group are provided in as Figures C.3 and C.4.

Figure C.1

### Industry sector scenarios, 2010 to 2020

4-county LRGV region's growth under two different assumptions



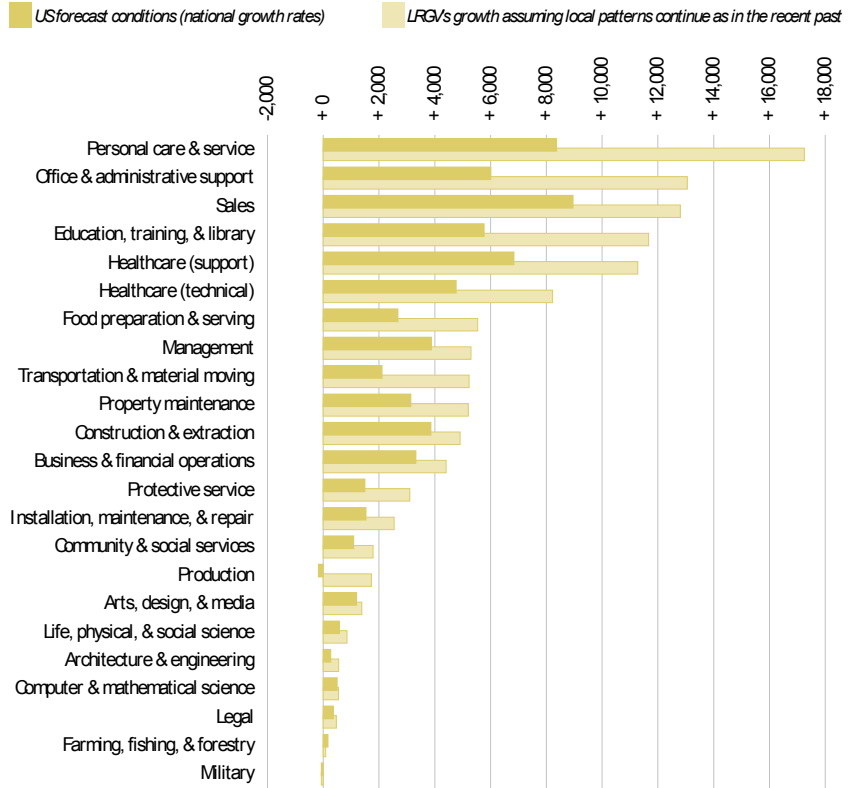
NOTE: Educational services includes only private-sector jobs; public education employment is included in Government.

SOURCES: EMSI Complete Employment - 3rd Quarter 2010

Figure C.2

### Occupational group scenarios, 2010 to 2020

4-county LRGV region's growth under two different assumptions

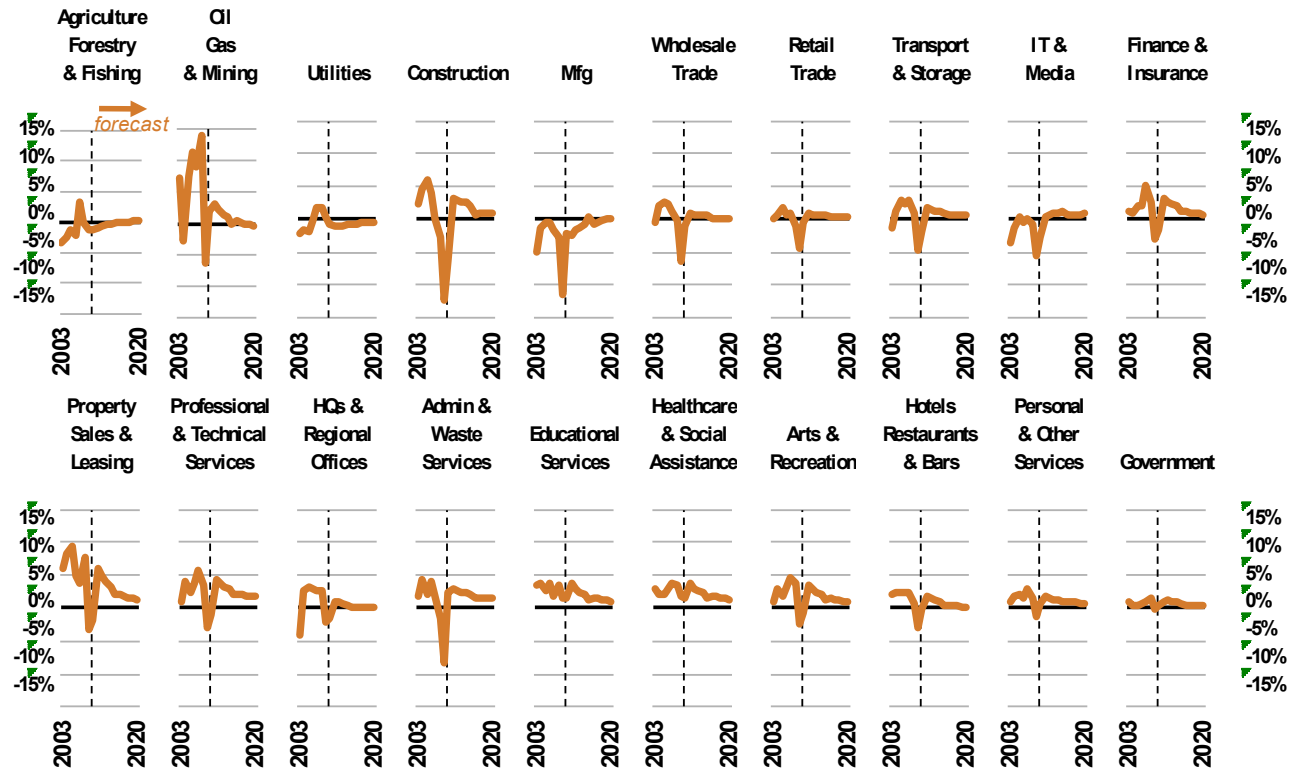


SOURCES: EMSI Complete Employment - 3rd Quarter 2010

Figure C.3

### US outlook by economic sector

National job growth history (2003-2009) and forecast (2010-2020)



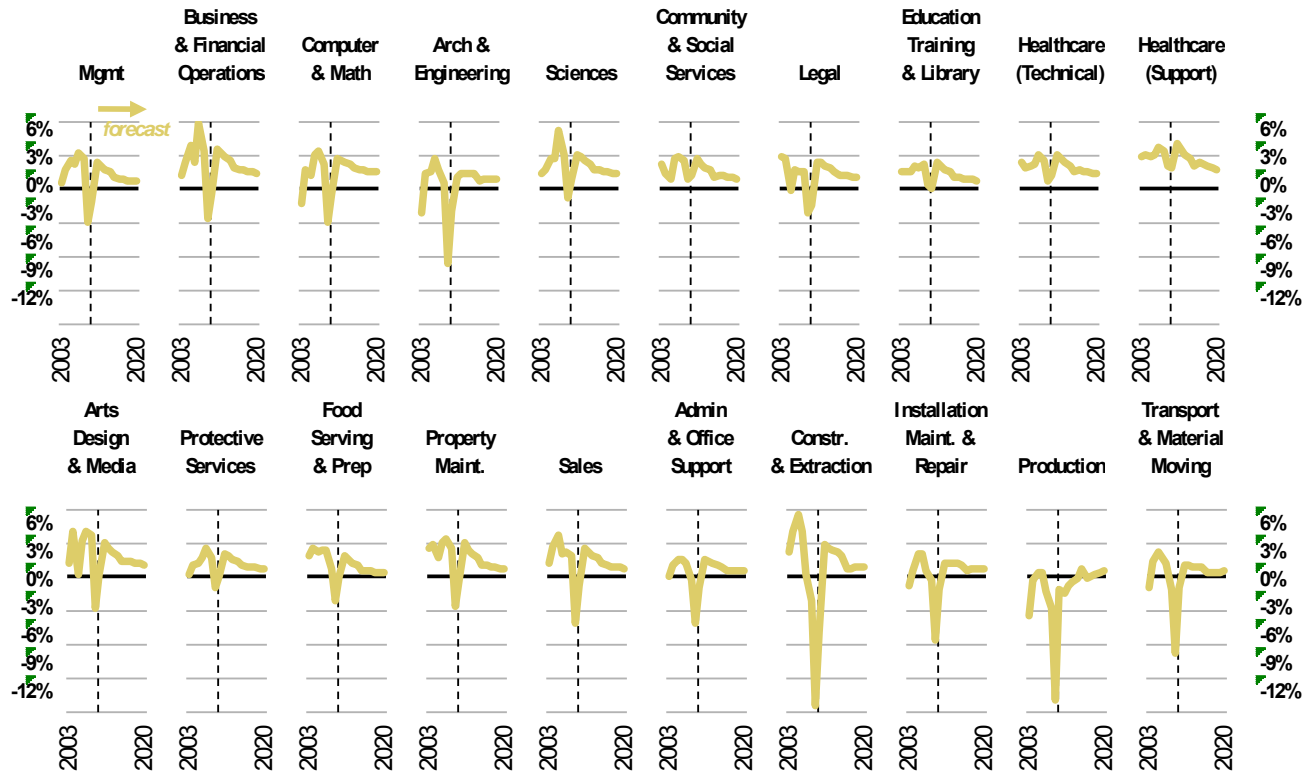
NOTE: Educational services includes only private-sector jobs; public education employment is included in Government.

SOURCES: EMSI Complete Employment - 3rd Quarter 2010

Figure C.4

U.S. outlook by occupational group

National job growth history (2003-2009) and forecast (2010-2020)



SOURCES: EMSI Complete Employment - 3rd Quarter 2010

## Appendix D: New and Emerging Occupations

Figure D.1: O-NET New and Emerging Occupations

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
11-1011.03	Chief Sustainability Officers	Green	Communicate and coordinate with management, shareholders, customers, and employees to address sustainability issues. Enact or oversee a corporate sustainability strategy.
11-2011.01	Green Marketers	Green	Create and implement methods to market green products and services.
11-3051.01	Quality Control Systems Managers	Biotechnology	Plan, direct, or coordinate quality assurance programs. Formulate quality control policies and control quality of laboratory and production efforts.
11-3051.02	Geothermal Production Managers	Green	Manage operations at geothermal power generation facilities. Maintain and monitor geothermal plant equipment for efficient and safe plant operations.
11-3051.03	Biofuels Production Managers	Green	Manage operations at biofuels power generation facilities. Collect and process information on plant performance, diagnose problems, and design corrective procedures.
11-3051.04	Biomass Production Managers	Green	Manage operations at biomass power generation facilities. Direct work activities at plant, including supervision of operations and maintenance staff.
11-3051.05	Methane/Landfill Gas Collection System Operators	Green	Direct daily operations, maintenance, or repair of landfill gas projects, including maintenance of daily logs, determination of service priorities, and compliance with reporting requirements.
11-3051.06	Hydroelectric Production Managers	Green	Manage operations at hydroelectric power generation facilities. Maintain and monitor hydroelectric plant equipment for efficient and safe plant operations.
11-9039.01	Distance Learning Coordinators	Education	Coordinate day-to-day operations of distance learning programs and schedule courses.
11-9039.02	Fitness and Wellness Coordinators	Education	Manage fitness and wellness programs and services. Direct and train staff of health educators, fitness instructors, or recreation workers.
11-9041.01	Biofuels/Biodiesel Technology and Product Development Managers	Green	Define, plan, or execute biofuels/biodiesel research programs that evaluate alternative feedstock and process technologies with near-term commercial potential.
11-9111.01	Clinical Nurse Specialists	Health Care	Plan, direct, or coordinate the daily patient care activities in a clinical practice. Ensure adherence to established clinical policies, protocols, regulations, and standards.
11-9121.01	Clinical Research Coordinators	Biotechnology	Plan, direct, or coordinate clinical research projects. Direct the activities of workers engaged in clinical research projects to ensure compliance with protocols and overall clinical objectives. May evaluate and analyze clinical data.
11-9121.02	Water Resource Specialists	Green	Design or implement programs and strategies related to water resource issues such as supply, quality, and regulatory compliance issues.
11-9199.01	Regulatory Affairs Managers	Biotechnology	Plan, direct, or coordinate production activities of an organization to ensure compliance with regulations and standard operating procedures.
11-9199.02	Compliance Managers	Energy	Plan, direct, or coordinate activities of an organization to ensure compliance with ethical or regulatory standards.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
11-9199.03	Investment Fund Managers	Financial	Plan, direct, or coordinate investment strategy or operations for a large pool of liquid assets supplied by institutional investors or individual investors.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
11-9199.04	Supply Chain Managers	Transportation	Direct, or coordinate production, purchasing, warehousing, distribution, or financial forecasting services and activities to limit costs and improve accuracy, customer service and safety. Examine existing procedures and opportunities for streamlining activities to meet product distribution needs. Direct the movement, storage, and processing of inventory.
11-9199.05	Online Merchants	Retail	Plan, direct, or coordinate retail activities of businesses operating online. May perform duties such as preparing business strategies, buying merchandise, managing inventory, implementing marketing activities, fulfilling and shipping online orders, and balancing financial records.
11-9199.06	Logistics Managers	Transportation	Plan, direct, or coordinate purchasing, warehousing, distribution, forecasting, customer service, or planning services. Manage logistics personnel and logistics systems and direct daily operations.
11-9199.07	Security Managers	Homeland Security	Direct an organization's security functions, including physical security and safety of employees, facilities, and assets.
11-9199.08	Loss Prevention Managers	Retail	Plan and direct policies, procedures, or systems to prevent the loss of assets. Determine risk exposure or potential liability, and develop risk control measures.
11-9199.09	Wind Energy Operations Managers	Green	Manage wind field operations, including personnel, maintenance activities, financial activities, and planning.
11-9199.10	Wind Energy Project Managers	Green	Lead or manage the development and evaluation of potential wind energy business opportunities, including environmental studies, permitting, and proposals. May also manage construction of projects.
11-9199.11	Brownfield Redevelopment Specialists and Site Managers	Green	Participate in planning and directing cleanup and redevelopment of contaminated properties for reuse. Does not include properties sufficiently contaminated to qualify as Superfund sites.
13-1041.07	Regulatory Affairs Specialists	Biotechnology	Coordinate and document internal regulatory processes, such as internal audits, inspections, license renewals or registrations. May compile and prepare materials for submission to regulatory agencies.
13-1081.01	Logistics Engineers	Transportation	Design and analyze operational solutions for projects such as transportation optimization, network modeling, process and methods analysis, cost containment, capacity enhancement, routing and shipment optimization, and information management.
13-1081.02	Logistics Analysts	Transportation	Analyze product delivery or supply chain processes to identify or recommend changes. May manage route activity including invoicing, electronic bills, and shipment tracing.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
13-1199.01	Energy Auditors	Energy	Conduct energy audits of buildings, building systems and process systems. May also conduct investment grade audits of buildings or systems.
13-1199.02	Security Management Specialists	Construction	Conduct security assessments for organizations, and design security systems and processes. May specialize in areas such as physical security, personnel security, and information security. May work in fields such as health care, banking, gaming, security engineering, or manufacturing.
13-1199.03	Customs Brokers	Transportation	Prepare customs documentation and ensure that shipments meet all applicable laws to facilitate the import and export of goods. Determine and track duties and taxes payable and process payments on behalf of client. Sign documents under a power of attorney. Represent clients in meetings with customs officials and apply for duty refunds and tariff reclassifications. Coordinate transportation and storage of imported goods.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
13-1199.04	Business Continuity Planners	Homeland Security	Develop, maintain and implement business continuity and disaster recovery strategies and solutions. Perform risk analyses. Act as a coordinator for recovery efforts in emergency situations.
13-1199.05	Sustainability Specialists	Green	Address organizational sustainability issues, such as waste stream management, green building practices, and green procurement plans.
13-2099.01	Financial Quantitative Analysts	Financial	Develop quantitative financial products used to inform individuals and financial institutions engaged in saving, lending, investing, borrowing, or managing risk. Investigate methods for financial analysis to create mathematical models used to develop improved analytical tools and advanced financial investment instruments.
13-2099.02	Risk Management Specialists	Financial	Analyze and make decisions on risk management issues by identifying, measuring and managing operational and enterprise risks for an organization.
13-2099.03	Investment Underwriters	Financial	Intermediate between corporate issuers of securities and clients regarding private equity investments. Underwrite the issuance of securities to provide capital for client growth. Negotiate and structure the terms of mergers and acquisitions.
13-2099.04	Fraud Examiners, Investigators and Analysts	Financial	Obtain evidence, take statements, produce reports, and testify to findings regarding resolution of fraud allegations. May coordinate fraud detection and prevention activities.
15-1051.01	Informatics Nurse Specialists	Health Care	Apply knowledge of nursing and informatics to assist in the design, development, and ongoing modification of computerized health care systems. May educate staff and assist in problem solving to promote the implementation of the health care system.
15-1081.01	Telecommunications Specialists	Information Tech	Design or configure voice and data communications systems, supervise installation, and arrange for post-installation service and maintenance.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
15-1099.01	Software Quality Assurance Engineers and Testers	Information Tech	Develop and execute software test plans in order to identify software problems and their causes.
15-1099.02	Computer Systems Engineers/Architects	Information Tech	Design and develop solutions to complex applications problems, system administration issues, or network concerns. Perform systems management and integration functions.
15-1099.03	Network Designers	Information Tech	Determine user requirements and design specifications for computer networks. Plan and implement network upgrades.
15-1099.04	Web Developers	Information Tech	Develop and design web applications and web sites. Create and specify architectural and technical parameters. Direct web site content creation, enhancement and maintenance.
15-1099.05	Web Administrators	Information Tech	Manage web environment design, deployment, development and maintenance activities. Perform testing and quality assurance of web sites and web applications.
15-1099.06	Geospatial Information Scientists and Technologists	Geospatial	Research and develop geospatial technologies. May produce databases, perform applications programming or coordinate projects. May specialize in areas such as agriculture, mining, health care, retail trade, urban planning or military intelligence.
15-1099.07	Geographic Information Systems Technicians	Geospatial	Assist scientists, technologists, and related professionals in building, maintaining, modifying, and using geographic information systems (GIS) databases. May also perform some custom application development and provide user support.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
15-1099.08	Database Architects	Information Tech	Design strategies for enterprise database systems and set standards for operations, programming, and security. Design and construct large relational databases. Integrate new systems with existing warehouse structure and refine system performance and functionality.
15-1099.09	Data Warehousing Specialists	Information Tech	Design, model, or implement corporate data warehousing activities. Program and configure warehouses of database information and provide support to warehouse users.
15-1099.10	Business Intelligence Analysts	Information Tech	Produce financial and market intelligence by querying data repositories and generating periodic reports. Devise methods for identifying data patterns and trends in available information sources.
15-1099.11	Information Technology Project Managers	Information Tech	Plan, initiate, and manage information technology (IT) projects. Lead and guide the work of technical staff. Serve as liaison between business and technical aspects of projects. Plan project stages and assess business implications for each stage. Monitor progress to assure deadlines, standards, and cost targets are met.
15-1099.12	Electronic Commerce Specialists	Information Tech	Market products on proprietary websites. Produce online advertising. Determine website content and design. Analyze customer preferences and online sales.



ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
15-1099.13	Video Game Designers	Information Tech	Design core features of video games. Specify innovative game and role-play mechanics, story lines, and character biographies. Create and maintain design documentation. Guide and collaborate with production staff to produce games as designed.
15-1099.14	Document Management Specialists	Information Tech	Implement and administer enterprise-wide document management procedures for the capture, storage, retrieval, sharing, and destruction of electronic records and documents.
15-2041.01	Biostatisticians	Biotechnology	Develop and apply biostatistical theory and methods to the study of life sciences.
15-2041.02	Clinical Data Managers	Biotechnology	Apply knowledge of health care and database management to analyze clinical data, and to identify and report trends.
17-1022.01	Geodetic Surveyors	Geospatial	Measure large areas of the Earth's surface using satellite observations, global navigation satellite systems (GNSS), light detection and ranging (LIDAR), or related sources.
17-2051.01	Transportation Engineers	Transportation	Develop plans for surface transportation projects according to established engineering standards and state or federal construction policy. Prepare plans, estimates, or specifications to design transportation facilities. Plan alterations and modifications of existing streets, highways, or freeways to improve traffic flow.
17-2051.02	Water/Wastewater Engineers	Green	Design or oversee projects involving provision of fresh water, disposal of wastewater and sewage, or prevention of flood-related damage. Prepare environmental documentation for water resources, regulatory program compliance, data management and analysis, and field work. Perform hydraulic modeling and pipeline design.
17-2072.01	Radio Frequency Identification Device Specialists	Transportation	Design and implement radio frequency identification device (RFID) systems used to track shipments or goods.
17-2112.01	Human Factors Engineers and Ergonomists	Aerospace	Design objects, facilities, and environments to optimize human well-being and overall system performance, applying theory, principles, and data regarding the relationship between humans and respective technology. Investigate and analyze characteristics of human behavior and performance as it relates to the use of technology.
17-2141.01	Fuel Cell Engineers	Automotive	Design, evaluate, modify, and construct fuel cell components and systems for transportation, stationary, or portable applications.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
17-2141.02	Automotive Engineers	Automotive	Develop new or improved designs for vehicle structural members, engines, transmissions and other vehicle systems, using computer-assisted design technology. Direct building, modification, and testing of vehicle and components.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
17-2199.01	Biochemical Engineers	Biotechnology	Apply knowledge of biology, chemistry, and engineering to develop usable, tangible products. Solve problems related to materials, systems and processes that interact with humans, plants, animals, microorganisms, and biological materials.
17-2199.02	Validation Engineers	Biotechnology	Design and plan protocols for equipment and processes to produce products meeting internal and external purity, safety, and quality requirements.
17-2199.03	Energy Engineers	Construction	Design, develop, and evaluate energy-related projects and programs to reduce energy costs or improve energy efficiency during the designing, building, or remodeling stages of construction. May specialize in electrical systems; heating, ventilation, and air-conditioning (HVAC) systems; green buildings; lighting; air quality; or energy procurement.
17-2199.04	Manufacturing Engineers	Adv Manufacturing	Apply knowledge of materials and engineering theory and methods to design, integrate, and improve manufacturing systems or related processes. May work with commercial or industrial designers to refine product designs to increase producibility and decrease costs.
17-2199.05	Mechatronics Engineers	Adv Manufacturing	Apply knowledge of mechanical, electrical, and computer engineering theory and methods to the design of automation, intelligent systems, smart devices, or industrial systems control.
17-2199.06	Microsystems Engineers	Adv Manufacturing	Apply knowledge of electronic and mechanical engineering theory and methods, as well as specialized manufacturing technologies, to design and develop microelectromechanical systems (MEMS) devices.
17-2199.07	Photonics Engineers	Adv Manufacturing	Apply knowledge of engineering and mathematical theory and methods to design technologies specializing in light information and light energy.
17-2199.08	Robotics Engineers	Adv Manufacturing	Research, design, develop, and test robotic applications.
17-2199.09	Nanosystems Engineers	Nanotechnology	Design, develop, and supervise the production of materials, devices, and systems of unique molecular or macromolecular composition, applying principles of nanoscale physics and electrical, chemical, and biological engineering.
17-2199.10	Wind Energy Engineers	Green	Design underground or overhead wind farm collector systems and prepare and develop site specifications.
17-2199.11	Solar Energy Systems Engineers	Green	Perform site-specific engineering analysis or evaluation of energy efficiency and solar projects involving residential, commercial, or industrial customers. Design solar domestic hot water and space heating systems for new and existing structures, applying knowledge of structural energy requirements, local climates, solar technology, and thermodynamics.
17-3024.01	Robotics Technicians	Adv Manufacturing	Build, install, test, and maintain robotic equipment or related automated production systems.
17-3027.01	Automotive Engineering Technicians	Automotive	Assist engineers in determining the practicality of proposed product design changes, and plan and carry out tests on experimental test devices and equipment for performance, durability and efficiency.
17-3029.01	Non-Destructive Testing Specialists	Construction	Test the safety of structures, vehicles, or vessels using x-ray, ultrasound, fiber optic or related equipment.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
17-3029.02	Electrical Engineering Technologists	Adv Manufacturing	Apply engineering theory and technical skills to support electrical engineering activities such as process control, electrical power distribution, and instrumentation design. Prepare layouts of machinery and equipment, plan the flow of work, conduct statistical studies and analyze production costs.
17-3029.03	Electromechanical Engineering Technologists	Adv Manufacturing	Apply engineering theory and technical skills to support electromechanical engineering activities such as computer-based process control, instrumentation, and machine design. Prepare layouts of machinery and equipment, plan the flow of work, conduct statistical studies and analyze production costs.
17-3029.04	Electronics Engineering Technologists	Adv Manufacturing	Apply engineering theory and technical skills to support electronics engineering activities such as electronics systems and instrumentation design and digital signal processing.
17-3029.05	Industrial Engineering Technologists	Adv Manufacturing	Apply engineering theory and technical skills to support industrial engineering activities such as quality control, inventory control and material flow methods. May conduct statistical studies and analyze production costs.
17-3029.06	Manufacturing Engineering Technologists	Adv Manufacturing	Apply engineering theory and technical skills to support manufacturing engineering activities. Develop tools, implement designs and integrate machinery, equipment and computer technologies to ensure effective manufacturing processes.
17-3029.07	Mechanical Engineering Technologists	Adv Manufacturing	Apply engineering theory and technical skills to support mechanical engineering activities such as generation, transmission and use of mechanical and fluid energy. Prepare layouts of machinery and equipment and plan the flow of work. May conduct statistical studies and analyze production costs.
17-3029.08	Photonics Technicians	Adv Manufacturing	Build, install, test, and maintain optical and fiber optic equipment such as lasers, lenses and mirrors using spectrometers, interferometers, or related equipment.
17-3029.09	Manufacturing Production Technicians	Adv Manufacturing	Apply knowledge of manufacturing engineering systems and tools to set up, test, and adjust manufacturing machinery and equipment, using any combination of electrical, electronic, mechanical, hydraulic, pneumatic and computer technologies.
17-3029.10	Fuel Cell Technicians	Automotive	Install, operate, and maintain integrated fuel cell systems in transportation, stationary, or portable applications.
17-3029.11	Nanotechnology Engineering Technologists	Nanotechnology	Implement production processes for nanoscale designs to produce and modify materials, devices, and systems of unique molecular or macromolecular composition. Operate advanced microscopy equipment to manipulate nanoscale objects. Work under the supervision of engineering staff.
17-3029.12	Nanotechnology Engineering Technicians	Nanotechnology	Operate commercial-scale production equipment to produce, test, and modify materials, devices, and systems of molecular or macromolecular composition. Work under the supervision of engineering staff.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
19-1029.01	Bioinformatics Scientists	Biotechnology	Conduct research using bioinformatics theory and methods in areas such as pharmaceuticals, medical technology, biotechnology, computational biology, proteomics, computer information science, biology and medical informatics. May design databases and develop algorithms for processing and analyzing genomic information, or other biological information.
19-1029.02	Molecular and Cellular Biologists	Biotechnology	Research and study cellular molecules and organelles to understand cell function and organization.
19-1029.03	Geneticists	Biotechnology	Research and study the inheritance of traits at the molecular, organism or population level. May evaluate or treat patients with genetic disorders.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
19-2041.01	Climate Change Analysts	Green	Research and analyze policy developments related to climate change. Make climate-related recommendations for actions such as legislation, awareness campaigns, or fundraising approaches.
19-2041.02	Environmental Restoration Planners	Green	Collaborate with field and biology staff to oversee the implementation of restoration projects and to develop new products. Process and synthesize complex scientific data into practical strategies for restoration, monitoring or management.
19-2041.03	Industrial Ecologists	Green	Study or investigate industrial production and natural ecosystems to achieve high production, sustainable resources, and environmental safety or protection. May apply principles and activities of natural ecosystems to develop models for industrial systems.
19-2099.01	Remote Sensing Scientists and Technologists	Geospatial	Apply remote sensing principles and methods to analyze data and solve problems in areas such as natural resource management, urban planning, and homeland security. May develop new analytical techniques and sensor systems or develop new applications for existing systems.
19-3011.01	Environmental Economists	Green	Assess and quantify the benefits of environmental alternatives, such as use of renewable energy resources.
19-3039.01	Neuropsychologists and Clinical Neuropsychologists	Health Care	Apply theories and principles of neuropsychology to diagnose and treat disorders of higher cerebral functioning.
19-3099.01	Transportation Planners	Transportation	Prepare studies for proposed transportation projects. Gather, compile, and analyze data. Study the use and operation of transportation systems. Develop transportation models or simulations.
19-4099.01	Quality Control Analysts	Biotechnology	Conduct tests to determine quality of raw materials, bulk intermediate and finished products. May conduct stability sample tests.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
19-4099.02	Precision Agriculture Technicians	Geospatial	Apply geospatial technologies, including geographic information systems (GIS) and Global Positioning System (GPS), to agricultural production and management activities, such as pest scouting, site-specific pesticide application, yield mapping, and variable-rate irrigation. May use computers to develop and analyze maps and remote sensing images to compare physical topography with data on soils, fertilizer, pests or weather.
19-4099.03	Remote Sensing Technicians	Geospatial	Apply remote sensing technologies to assist scientists in areas such as natural resources, urban planning, and homeland security. May prepare flight plans and sensor configurations for flight trips.
25-3099.01	Adaptive Physical Education Specialists	Education	Provide individualized physical education instruction or services to children, youth or adults with exceptional physical needs, due to gross motor developmental delays or other impairments.
25-3099.02	Tutors	Education	Provide non-classroom, academic instruction to students on an individual or small-group basis for proactive or remedial purposes.
25-9031.01	Instructional Designers and Technologists	Education	Develop instructional materials and products and assist in the technology-based redesign of courses. Assist faculty in learning about, becoming proficient in, and applying instructional technology.
29-1069.01	Allergists and Immunologists	Health Care	Diagnose, treat, and help prevent allergic diseases and disease processes affecting the immune system.
29-1069.02	Dermatologists	Health Care	Diagnose, treat, and help prevent diseases or other conditions of the skin.
29-1069.03	Hospitalists	Health Care	Provide inpatient care predominantly in settings such as medical wards, acute care units, intensive care units, rehabilitation centers, or emergency rooms. Manage and coordinate patient care throughout treatment.
29-1069.04	Neurologists	Health Care	Diagnose, treat, and help prevent diseases and disorders of the nervous system.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
29-1069.05	Nuclear Medicine Physicians	Health Care	Diagnose and treat diseases using radioactive materials and techniques. May monitor radionuclide preparation, administration, and disposition.
29-1069.06	Ophthalmologists	Health Care	Diagnose, treat, and help prevent diseases and injuries of the eyes and related structures.
29-1069.07	Pathologists	Health Care	Diagnose presence and stage of diseases using laboratory techniques and patient specimens. Study the nature, cause, and development of diseases. May perform autopsies.
29-1069.08	Physical Medicine and Rehabilitation Physicians	Health Care	Diagnose and treat disorders requiring physiotherapy to provide physical, mental, and occupational rehabilitation.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
29-1069.09	Preventive Medicine Physicians	Health Care	Apply knowledge of general preventive medicine and public health issues to promote health care to groups or individuals, and aid in the prevention or reduction of risk of disease, injury, disability, or death. May practice population-based medicine or diagnose and treat patients in the context of clinical health promotion and disease prevention.
29-1069.10	Radiologists	Health Care	Examine and diagnose disorders and diseases using x-rays and radioactive materials. May treat patients.
29-1069.11	Sports Medicine Physicians	Health Care	Diagnose, treat, and help prevent injuries that occur during sporting events, athletic training, and physical activities.
29-1069.12	Urologists	Health Care	Diagnose, treat, and help prevent benign and malignant medical and surgical disorders of the genitourinary system and the renal glands.
29-1071.01	Anesthesiologist Assistants	Health Care	Assist anesthesiologists in the administration of anesthesia for surgical and non-surgical procedures. Monitor patient status and provide patient care during surgical treatment.
29-1111.01	Acute Care Nurses	Health Care	Provide advanced nursing care for patients with acute conditions such as heart attacks, respiratory distress syndrome, or shock. May care for pre- and post-operative patients or perform advanced, invasive diagnostic or therapeutic procedures.
29-1111.02	Advanced Practice Psychiatric Nurses	Health Care	Provide advanced nursing care for patients with psychiatric disorders. May provide psychotherapy under the direction of a psychiatrist.
29-1111.03	Critical Care Nurses	Health Care	Provide advanced nursing care for patients in critical or coronary care units.
29-1122.01	Low Vision Therapists, Orientation and Mobility Specialists, and Vision Rehabilitation Therapists	Health Care	Provide therapy to patients with visual impairments to improve their functioning in daily life activities. May train patients in activities such as computer use, communication skills, or home management skills.
29-1199.01	Acupuncturists	Health Care	Provide treatment of symptoms and disorders using needles and small electrical currents. May provide massage treatment. May also provide preventive treatments.
29-1199.02	Nurse Anesthetists	Health Care	Administer anesthetics to induce total or partial loss of sensation or consciousness in patients during surgeries, births or other medical and dental procedures.
29-1199.03	Nurse Practitioners	Health Care	Provide advanced nursing care and treatment to patients. Perform physical examinations, order diagnostic tests, develop treatment plans and prescribe drugs or other therapies.
29-1199.04	Naturopathic Physicians	Health Care	Diagnose, treat, and help prevent diseases using a system of practice that is based on the natural healing capacity of individuals. May use physiological, psychological or mechanical methods. May also use natural medicines, prescription or legend drugs, foods, herbs, or other natural remedies.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
29-1199.05	Orthoptists	Health Care	Diagnose and treat visual system disorders such as binocular vision and eye movement impairments.
29-2011.01	Cytogenetic Technologists	Health Care	Analyze chromosomes found in biological specimens such as amniotic fluids, bone marrow, and blood to aid in the study, diagnosis, or treatment of genetic diseases.
29-2011.02	Cytotechnologists	Health Care	Stain, mount, and study cells to detect evidence of cancer, hormonal abnormalities, and other pathological conditions following established standards and practices.
29-2011.03	Histotechnologists and Histologic Technicians	Health Care	Prepare histologic slides from tissue sections for microscopic examination and diagnosis by pathologists. May assist in research studies.
29-2099.01	Electroneurodiagnostic Technologists	Health Care	Conduct electroneurodiagnostic (END) tests such as electroencephalograms, evoked potentials, polysomnograms, or electronystagmograms. May perform nerve conduction studies.
29-2099.02	Hearing Aid Specialists	Health Care	Select and fit hearing aids for customers. Administer and interpret tests of hearing. Assess hearing instrument efficacy. Take ear impressions and prepare, design, and modify ear molds.
29-2099.03	Ophthalmic Medical Technologists and Technicians	Health Care	Conduct diagnostic tests such as central and peripheral visual field, ocular motility, color vision, or pharmacological pupil tests; or tonometry, tonography and tensilon tonography tests to determine intraocular pressure and pupil testing for size, equality and reaction prior to dilation.
29-2099.04	Nurse Midwives	Health Care	Provide advanced nursing care and education to obstetrical and gynecological patients.
29-9099.01	Midwives	Health Care	Provide prenatal care and childbirth assistance.
29-9099.02	Genetic Counselors	Health Care	Assess individual or family risk for a variety of inherited conditions, such as genetic disorders and birth defects. Provide information to other health care providers or to individuals and families concerned with the risk of inherited conditions. Advise individuals and families to support informed decision making and coping methods for those at risk. May help conduct research related to genetic conditions or genetic counseling.
31-9093.01	Endoscopy Technicians	Health Care	Maintain a sterile field to provide support for physicians and nurses during endoscopy procedures. Prepare and maintain instruments and equipment. May obtain specimens.
31-9099.01	Speech-Language Pathology Assistants	Health Care	Assist speech-language pathologists in the assessment and treatment of speech, language, voice, and fluency disorders. Implement speech and language programs or activities as planned and directed by speech-language pathologists. Monitor the use of alternative communication devices and systems.
33-3021.06	Intelligence Analysts	Homeland Security	Gather, analyze, and evaluate information from a variety of sources, such as law enforcement databases, surveillance, intelligence networks and geographic information systems. Use data to anticipate and prevent organized crime activities, such as terrorism.
33-9099.01	Transportation Security Officers**	Homeland Security	Inspect baggage or cargo and screen passengers to detect and prevent potentially dangerous objects from being transported into secure areas or onto aircraft.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
33-9099.02	Loss Prevention Specialists	Retail	Implement procedures and systems to prevent merchandise loss. Conduct audits and investigations of employee activity. May assist in developing policies, procedures, and systems for safeguarding assets.
35-3022.01	Baristas	Hospitality	Prepare or serve specialty coffee or other beverages. Serve food such as baked goods or sandwiches to patrons.
39-1021.01	Spa Managers	Hospitality	Plan, direct, or coordinate activities of a spa facility. Coordinate programs, schedule and direct staff, and oversee financial activities.

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Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
41-3031.03	Securities and Commodities Traders	Financial	Buy and sell securities and commodities to transfer debt, capital, or risk. Establish and negotiate unit prices and terms of sale.
41-3099.01	Energy Brokers	Energy	Purchase or sell energy for customers.
41-4011.07	Solar Sales Representatives and Assessors	Green	Contact new or existing customers to determine their solar equipment needs, suggest systems or equipment, or estimate costs.
43-4051.03	Patient Representatives	Health Care	Assist patients in obtaining services, understanding policies and making health care decisions.
43-5011.01	Freight Forwarders	Transportation	Research rates, routings, or modes of transport for shipment of products. Maintain awareness of regulations affecting the international movement of cargo. Make arrangements for additional services such as storage and inland transportation.
43-9111.01	Bioinformatics Technicians	Biotechnology	Apply principles and methods of bioinformatics to assist scientists in areas such as pharmaceuticals, medical technology, biotechnology, computational biology, proteomics, computer information science, biology and medical informatics. Apply bioinformatics tools to visualize, analyze, manipulate or interpret molecular data. May build and maintain databases for processing and analyzing genomic or other biological information.
47-1011.03	Solar Energy Installation Managers	Green	Direct work crews installing residential or commercial solar photovoltaic or thermal systems.
47-4099.01	Solar Photovoltaic Installers	Green	Assemble, install, or maintain solar photovoltaic (PV) systems on roofs or other structures in compliance with site assessment and schematics. May include measuring, cutting, assembling, and bolting structural framing and solar modules. May perform minor electrical work such as current checks.
47-4099.02	Solar Thermal Installers and Technicians	Green	Install or repair solar energy systems designed to collect, store, and circulate solar-heated water for residential, commercial or industrial use.



ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
47-4099.03	Weatherization Installers and Technicians	Green	Perform a variety of activities to weatherize homes and make them more energy efficient. Duties include repairing windows, insulating ducts, and performing heating, ventilating, and air-conditioning (HVAC) work. May perform energy audits and advise clients on energy conservation measures.
49-9099.01	Geothermal Technicians	Green	Perform technical activities at power plants or individual installations necessary for the generation of power from geothermal energy sources. Monitor and control operating activities at geothermal power generation facilities and perform maintenance and repairs as necessary. Install, test, and maintain residential and commercial geothermal heat pumps.
49-9099.02	Wind Turbine Service Technicians	Green	Inspect, diagnose, adjust, or repair wind turbines. Perform maintenance on wind turbine equipment including resolving electrical, mechanical, and hydraulic malfunctions.
51-8099.01	Biofuels Processing Technicians	Green	Calculate, measure, load, mix, and process refined feedstock with additives in fermentation or reaction process vessels and monitor production process. Perform, and keep records of, plant maintenance, repairs, and safety inspections.
51-8099.02	Methane/Landfill Gas Generation System Technicians	Green	Monitor, operate, and maintain landfill gas collection system components and environmental monitoring and control systems.
51-8099.03	Biomass Plant Technicians	Green	Control and monitor biomass plant activities and perform maintenance as needed.

Continued next page

Figure D.1: O-NET New and Emerging Occupations (CONTINUED)

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
51-8099.04	Hydroelectric Plant Technicians	Green	Monitor and control activities associated with hydropower generation. Operate plant equipment, such as turbines, pumps, valves, gates, fans, electric control boards, and battery banks. Monitor equipment operation and performance and make necessary adjustments to ensure optimal performance. Perform equipment maintenance and repair as necessary.
51-9199.01	Recycling and Reclamation Workers	Green	Prepare and sort materials or products for recycling. Identify and remove hazardous substances. Dismantle components of products such as appliances.
53-1021.01	Recycling Coordinators	Green	Supervise curbside and drop-off recycling programs for municipal governments or private firms.
n/a	Air Quality Control Specialists		Perform a wide range of air quality compliance duties including equipment and facility permitting, compliance auditing, emissions control research, recordkeeping and reporting, participation in planning processes.
n/a	Biomass Plant Engineers		Design plants that generate electricity from the combustion of biomass.

ONET CODE	OCCUPATION DESCRIPTION	RELATED INDUSTRY	DESCRIPTION
n/a	Carbon Capture and Sequestration Systems Installers		Install and maintain carbon energy capture or carbon sequestration facilities.
n/a	Carbon Credit Traders		Represent companies in the sale and purchase of carbon emissions permits.
n/a	Carbon Trading Analysts		Analyze pricing and risks of carbon trading products; develop solutions to help clients hedge carbon exposure and risk.
n/a	Environmental Certification Specialists		Guide clients such as manufacturers, organic farms, and timber companies through the process of being certified as green.
n/a	Greenhouse Gas Emissions Permitting Consultants		Conduct data gathering, data analysis, calculation, inventories and reduction planning, and be familiar with emerging regulations on greenhouse gas management.
n/a	Greenhouse Gas Emissions Report Verifiers		Conduct data audits of reported greenhouse gas emissions inventories.
n/a	Methane Capturing System Engineers/Installers/Project Managers		Design gas recovery systems and oversee installation and development process, including recovery modeling, permitting, specifications preparation and project oversight. Develop client relationships and arrange for sales of energy.
n/a	Solar Power Plant Technicians		Monitor and repair the instrumentation, controls, and electrical systems in a utility-scale solar power generating facility.
n/a	Solar Thermoelectric Plant/Concentrating Thermal Power (CSP) Plant Operators		Direct the operations of a commercial solar-generated power production plant.
n/a	Sustainable Design Specialists		Design from the outset for recycling, reuse or remanufacturing.
n/a	Testing Adjusting and Balancing TAB Technicians		Test, adjust, and balance HVAC systems so they perform as designed.

SOURCE: New and Emerging Occupations of the 21st Century: Updating the O\*NET-SOC Taxonomy, March 2009

\* denotes N&E occupations included in the O\*NET-SOC 2006 taxonomy

\*\* Transportation Security Officers was included in the O\*NET-SOC 2006 taxonomy as Transportation Security Screeners

## Appendix E: State of Texas Clusters

In October 2004, Governor Rick Perry launched the Texas Industry Cluster Initiative. The purpose of the program is to use a cluster-based approach to establish statewide strategies for addressing economic growth in the following key industry clusters:

- Advanced technology and manufacturing;
- Aerospace and defense;
- Biotechnology and life sciences;
- Information and computer technology;
- Petroleum refining and chemical products; and
- Energy.

Figure E.1 summarizes employment in these six clusters in the four-county Lower Rio Grande Valley, along with projected 5-year job growth. Not surprisingly, petroleum and chemicals is the largest of the six clusters in the region in terms of employment. With more than 23,000 jobs estimated in this sector in 2010, it is also the sector for which the largest number of jobs is expected to be added in the next five years. The largest cluster in terms of the number of establishments is the biotechnology and life sciences cluster. This figure is driven by the inclusion of support services for agriculture as a core industry of the cluster. As a result, the number of establishments would be skewed by the Valley's concentration of businesses in this industry. The fewest number of establishments are found in the Valley's aerospace and defense cluster.

Employment by core industries within each cluster is provided in Figure E.2.

Figure E.1: Summary of LRGV Employment (current and projected) in Texas Target Industry Clusters

	2010	2015	Change 2010-2015		Establishments 2009
			Number	Percent	
Advanced Technologies and Manufacturing	7,265	7,960	695	10%	322
Aerospace and Defense	11,945	12,677	732	6%	198
Biotechnology and Life Sciences	11,506	12,894	1,388	12%	657
Energy	7,739	8,387	648	8%	343
Information and Computer Technology	7,133	8,058	925	13%	495
Petroleum Refining and Chemical Products	23,148	26,527	3,379	15%	404

Source: EMSI Complete Employment – 2<sup>nd</sup> Quarter 2010

Note: Figures include cluster core industries only. Cluster definitions produced by Texas Office of the Governor and Texas Workforce Commission. Definitions

and other information can be found on Texas Industry Profiles website at <http://www.texasindustryprofiles.com>.

Figure E.2: Detail of LRGV employment (current and projected) in Texas Target Industry Clusters

	Employment		Change 2010-2015		U.S. LQ 2010	Establishments 2009
	2010	2015	Number	Percent		
Advanced Technologies and Manufacturing	7,265	7,960	695	10%		322
Architectural, Engineering, and Related Services	1,797	2,146	349	19%	0.39	154
Ship and Boat Building	1,702	1,756	54	3%	4.46	18
Aerospace Product and Parts Manufacturing	697	775	78	11%	0.51	3
Computer Systems Design and Related Services	609	743	134	22%	0.11	62
Motor Vehicle Parts Manufacturing	562	463	-99	-18%	0.46	11
Electrical Equipment Manufacturing	444	446	2	0%	1.07	4
Specialized Design Services	381	476	95	25%	0.32	10
Other General Purpose Machinery Manufacturing	210	254	44	21%	0.30	4
Ag, Construction, Mining Machinery Manufacturing	176	160	-16	-9%	0.29	6
Medical Equipment and Supplies Manufacturing	132	160	28	21%	0.15	14
Paint, Coating, and Adhesive Manufacturing	100	99	-1	-1%	0.58	1
Navigation, Measuring, Instruments Manufacturing	100	102	2	2%	0.08	3
Aerospace and Defense	11,945	12,677	732	6%		198
Federal government, civilian, except postal service	5,450	5,981	531	10%	0.90	121
Federal government, military	2,952	2,907	-45	-2%	0.51	0
Ship and Boat Building	1,702	1,756	54	3%	4.46	18
Aerospace Product and Parts Manufacturing	697	775	78	11%	0.51	3
Support Activities for Water Transportation	549	612	63	11%	2.11	20
Support Activities for Air Transportation	280	306	26	9%	0.60	15
Scientific Research and Development Services	137	147	10	7%	0.07	15
Navigation, Measuring, Instruments Manufacturing	100	102	2	2%	0.08	3
Biotechnology and Life Sciences	11,506	12,894	1,388	12%		657
Support Activities for Crop Production	4,730	4,620	-110	-2%	3.54	163

Other Professional, Scientific, and Technical Services	1,865	2,089	224	12%	0.35	81
Architectural, Engineering, and Related Services	1,797	2,146	349	19%	0.39	154
Management, Scientific, Technical Consulting Svcs	1,644	2,271	627	38%	0.30	156
Medical and Diagnostic Laboratories	731	970	239	33%	1.02	56
Support Activities for Animal Production	181	205	24	13%	0.58	3
Scientific Research and Development Services	137	147	10	7%	0.07	15
Medical Equipment and Supplies Manufacturing	132	160	28	21%	0.15	14
Navigation, Measuring, Instruments Manufacturing	100	102	2	2%	0.08	3

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Figure E.2: Detail of LRGV employment (current and projected) in Texas Target Industry Clusters [continued]

	Employment		Change 2010-2015		U.S. LQ 2010	Establishments 2009
	2010	2015	Number	Percent		
Energy	7,739	8,387	648	8%		343
Support Activities for Mining	2,032	1,998	-34	-2%	2.10	67
Architectural, Engineering, and Related Services	1,797	2,146	349	19%	0.39	154
Utility System Construction	1,280	1,452	172	13%	1.04	54
Oil and Gas Extraction	921	1,061	140	15%	0.66	24
Electric Power Generation, Trans, and Distribution	773	753	-20	-3%	0.66	21
Electrical Equipment Manufacturing	444	446	2	0%	1.07	4
Other Heavy and Civil Engineering Construction	333	368	35	11%	0.66	9
Information and Computer Technology	7,133	8,058	925	13%		495
Electronics and Appliance Stores	1,546	1,744	198	13%	1.01	120
Wireless Telecommunications Carriers	1,171	1,091	-80	-7%	1.86	54
Prof and Comm Equip and Supplies Wholesalers	1,004	1,073	69	7%	0.57	121
Technical and Trade Schools	782	1,083	301	38%	1.44	26
Computer Systems Design and Related Services	609	743	134	22%	0.11	62
Other Telecommunications	418	455	37	9%	0.99	51
Specialized Design Services	381	476	95	25%	0.32	10
Cable and Other Subscription Programming	344	349	5	1%	1.37	7
Data Processing, Hosting, and Related Services	224	321	97	43%	0.25	8
Business Schools and Computer and Mgmt Training	184	212	28	15%	0.39	6
Navigation, Measuring, Instruments Manufacturing	100	102	2	2%	0.08	3
Petroleum Refining and Chemical Products	23,148	26,527	3,379	15%		404
State government	10,515	12,504	1,989	19%	0.71	103
Federal govt, civilian, except postal service	5,450	5,981	531	10%	0.90	121
Federal government, military	2,952	2,907	-45	-2%	0.51	0
Other Financial Investment Activities	2,618	3,618	1,000	38%	0.49	68
Plastics Product Manufacturing	416	357	-59	-14%	0.27	14

Petroleum and Petroleum Products Wholesalers	268	241	-27	-10%	0.97	26
Ag, Construction, Mining Mach Manufacturing	176	160	-16	-9%	0.29	6
Chemical and Allied Products Wholesalers	146	135	-11	-8%	0.40	25
Petroleum and Coal Products Manufacturing	137	118	-19	-14%	0.42	5
Navigation, Measuring, Instrument Manufacturing	100	102	2	2%	0.08	3

Source: EMSI Complete Employment – 2<sup>nd</sup> Quarter 2010 Note: Core industries with minimum of 100 jobs shown.

## Appendix F: SOC-CIP Crosswalk for Healthcare-related Curriculum

Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
Includes Health Services/Allied Health/Health Sciences CIP codes (i.e., 51.000 to 51.9999 )

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
11-3011	Administrative Services Managers	51.071 1	Medical/Health Management and Clinical Assistant/Specialist
11-9111	Medical and Health Services Managers	51.070 1	Health/Health Care Administration/Management
11-9111	Medical and Health Services Managers	51.070 4	Health Unit Manager/Ward Supervisor
11-9111	Medical and Health Services Managers	51.070 6	Health Information/Medical Records Administration/Administrator
11-9111	Medical and Health Services Managers	51.071 7	Medical Staff Services Technology/Technician
11-9111	Medical and Health Services Managers	51.160 2	Nursing Administration (MSN, MS, PhD)
11-9111	Medical and Health Services Managers	51.220 1	Public Health, General (MPH, DPH)
11-9111	Medical and Health Services Managers	51.220 8	Community Health and Preventive Medicine
11-9111	Medical and Health Services Managers	51.221 1	Health Services Administration
11-9111	Medical and Health Services Managers	51.070 2	Hospital and Health Care Facilities Administration/Management
11-9111	Medical and Health Services Managers	51.079 9	Health and Medical Administrative Services, Other
13-1031	Claims Adjusters, Examiners, and Investigators	51.071 5	Health/Medical Claims Examiner

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
15-1011	Computer and Information Scientists, Research	51.270 6	Medical Informatics
15-1021	Computer Programmers	51.070 9	Medical Office Computer Specialist/Assistant
15-1021	Computer Programmers	51.270 6	Medical Informatics
15-1031	Computer Software Engineers, Applications	51.270 6	Medical Informatics
15-1031	Computer Software Engineers, Applications	51.279 9	Medical Illustration and Informatics, Other
15-1041	Computer Support Specialists	51.070 9	Medical Office Computer Specialist/Assistant
17-2199	Engineers, All Other	51.231 2	Assistive/Augmentative Technology and Rehabilitation Engineering
19-1041	Epidemiologists	51.140 1	Medical Scientist (MS, PhD)
19-1042	Medical Scientists, Except Epidemiologists	51.140 1	Medical Scientist (MS, PhD)
19-2012	Physicists	51.220 5	Health/Medical Physics
19-3031	Clinical, Counseling, and School Psychologists	51.150 7	Psychoanalysis and Psychotherapy
19-4051	Nuclear Technicians	51.091 6	Radiation Protection/Health Physics Technician

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
21-1011	Substance Abuse and Behavioral Disorder Counselors	51.150 1	Substance Abuse/Addiction Counseling
21-1011	Substance Abuse and Behavioral Disorder Counselors	51.150 3	Clinical/Medical Social Work
21-1011	Substance Abuse and Behavioral Disorder Counselors	51.159 9	Mental and Social Health Services and Allied Professions, Other
21-1013	Marriage and Family Therapists	51.150	Marriage and Family Therapy/Counseling



SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
		5	
21-1013	Marriage and Family Therapists	51.1506	Clinical Pastoral Counseling/Patient Counseling
21-1014	Mental Health Counselors	51.1501	Substance Abuse/Addiction Counseling
21-1014	Mental Health Counselors	51.1503	Clinical/Medical Social Work
21-1014	Mental Health Counselors	51.1508	Mental Health Counseling/Counselor
21-1014	Mental Health Counselors	51.1599	Mental and Social Health Services and Allied Professions, Other
21-1015	Rehabilitation Counselors	51.2310	Vocational Rehabilitation Counseling/Counselor
21-1015	Rehabilitation Counselors	51.2312	Assistive/Augmentative Technology and Rehabilitation Engineering
21-1019	Counselors, All Other	51.1509	Genetic Counseling/Counselor
21-1019	Counselors, All Other	51.1599	Mental and Social Health Services and Allied Professions, Other
21-1022	Medical and Public Health Social Workers	51.1503	Clinical/Medical Social Work
21-1023	Mental Health and Substance Abuse Social Workers	51.1503	Clinical/Medical Social Work
21-1091	Health Educators	51.1504	Community Health Services/Liaison/Counseling
21-1091	Health Educators	51.2207	Public Health Education and Promotion
21-1091	Health Educators	51.2209	Maternal and Child Health
21-1091	Health Educators	51.2210	International Public Health/International Health
21-1093	Social and Human Service Assistants	51.1599	Mental and Social Health Services and Allied Professions, Other
21-1099	Community and Social Service Specialists, All Other	51.1599	Mental and Social Health Services and Allied Professions, Other
21-2011	Clergy	51.1506	Clinical Pastoral Counseling/Patient Counseling

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
25-1066	Psychology Teachers, Postsecondary	51.150 5	Marriage and Family Therapy/Counseling
25-1071	Health Specialties Teachers, Postsecondary	51.010 1	Chiropractic (DC)
25-1071	Health Specialties Teachers, Postsecondary	51.020 1	Communication Disorders, General
25-1071	Health Specialties Teachers, Postsecondary	51.020 2	Audiology/Audiologist and Hearing Sciences

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
25-1071	Health Specialties Teachers, Postsecondary	51.020 3	Speech-Language Pathology/Pathologist
25-1071	Health Specialties Teachers, Postsecondary	51.020 4	Audiology/Audiologist and Speech-Language Pathology/Pathologist
25-1071	Health Specialties Teachers, Postsecondary	51.040 1	Dentistry (DDS, DMD)
25-1071	Health Specialties Teachers, Postsecondary	51.050 1	Dental Clinical Sciences, General (MS, PhD)
25-1071	Health Specialties Teachers, Postsecondary	51.060 1	Dental Assisting/Assistant
25-1071	Health Specialties Teachers, Postsecondary	51.060 2	Dental Hygiene/Hygienist
25-1071	Health Specialties Teachers, Postsecondary	51.060 3	Dental Laboratory Technology/Technician
25-1071	Health Specialties Teachers, Postsecondary	51.069 9	Dental Services and Allied Professions, Other
25-1071	Health Specialties Teachers, Postsecondary	51.080 2	Clinical/Medical Laboratory Assistant
25-1071	Health Specialties Teachers, Postsecondary	51.080 3	Occupational Therapist Assistant
25-1071	Health Specialties Teachers, Postsecondary	51.080 5	Pharmacy Technician/Assistant
25-1071	Health Specialties Teachers, Postsecondary	51.080	Physical Therapist Assistant

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
		6	
25-1071	Health Specialties Teachers, Postsecondary	51.0808	Veterinary/Animal Health Technology/Technician and Veterinary Assistant
25-1071	Health Specialties Teachers, Postsecondary	51.0899	Allied Health and Medical Assisting Services, Other
25-1071	Health Specialties Teachers, Postsecondary	51.0901	Cardiovascular Technology/Technologist
25-1071	Health Specialties Teachers, Postsecondary	51.0902	Electrocardiograph Technology/Technician
25-1071	Health Specialties Teachers, Postsecondary	51.0903	Electroneurodiagnostic/Electroencephalographic Technology/Technologist
25-1071	Health Specialties Teachers, Postsecondary	51.0904	Emergency Medical Technology/Technician (EMT Paramedic)
25-1071	Health Specialties Teachers, Postsecondary	51.0905	Nuclear Medical Technology/Technologist
25-1071	Health Specialties Teachers, Postsecondary	51.0906	Perfusion Technology/Perfusionist
25-1071	Health Specialties Teachers, Postsecondary	51.0907	Medical Radiologic Technology/Science - Radiation Therapist
25-1071	Health Specialties Teachers, Postsecondary	51.0908	Respiratory Care Therapy/Therapist
25-1071	Health Specialties Teachers, Postsecondary	51.0909	Surgical Technology/Technologist
25-1071	Health Specialties Teachers, Postsecondary	51.0910	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician
25-1071	Health Specialties Teachers, Postsecondary	51.0912	Physician Assistant
25-1071	Health Specialties Teachers, Postsecondary	51.0999	Allied Health Diagnostic, Intervention, and Treatment Professions, Other

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
25-1071	Health Specialties Teachers, Postsecondary	51.1001	Blood Bank Technology Specialist

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
25-1071	Health Specialties Teachers, Postsecondary	51.100 2	Cytotechnology/Cytotechnologist
25-1071	Health Specialties Teachers, Postsecondary	51.100 3	Hematology Technology/Technician
25-1071	Health Specialties Teachers, Postsecondary	51.100 4	Clinical/Medical Laboratory Technician
25-1071	Health Specialties Teachers, Postsecondary	51.100 5	Clinical Laboratory Science/Medical Technology/Technologist
25-1071	Health Specialties Teachers, Postsecondary	51.110 1	Pre-Dentistry Studies
25-1071	Health Specialties Teachers, Postsecondary	51.110 5	Pre-Nursing Studies
25-1071	Health Specialties Teachers, Postsecondary	51.119 9	Health/Medical Preparatory Programs, Other
25-1071	Health Specialties Teachers, Postsecondary	51.200 1	Pharmacy (PharmD [USA] PharmD, BS/BPharm [Canada])
25-1071	Health Specialties Teachers, Postsecondary	51.200 2	Pharmacy Administration and Pharmacy Policy and Regulatory Affairs (MS, PhD)
25-1071	Health Specialties Teachers, Postsecondary	51.209 9	Pharmacy, Pharmaceutical Sciences, and Administration, Other
25-1071	Health Specialties Teachers, Postsecondary	51.220 1	Public Health, General (MPH, DPH)
25-1071	Health Specialties Teachers, Postsecondary	51.220 5	Health/Medical Physics
25-1071	Health Specialties Teachers, Postsecondary	51.220 7	Public Health Education and Promotion
25-1071	Health Specialties Teachers, Postsecondary	51.230 1	Art Therapy/Therapist
25-1071	Health Specialties Teachers, Postsecondary	51.230 2	Dance Therapy/Therapist
25-1071	Health Specialties Teachers, Postsecondary	51.230 5	Music Therapy/Therapist
25-1071	Health Specialties Teachers, Postsecondary	51.230 6	Occupational Therapy/Therapist
25-1071	Health Specialties Teachers, Postsecondary	51.230 7	Orthotist/Prosthetist
25-1071	Health Specialties Teachers, Postsecondary	51.230 8	Physical Therapy/Therapist

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
25-1071	Health Specialties Teachers, Postsecondary	51.2309	Therapeutic Recreation/Recreational Therapy
25-1071	Health Specialties Teachers, Postsecondary	51.2310	Vocational Rehabilitation Counseling/Counselor
25-1071	Health Specialties Teachers, Postsecondary	51.2399	Rehabilitation and Therapeutic Professions, Other
25-1071	Health Specialties Teachers, Postsecondary	51.2401	Veterinary Medicine (DVM)
25-1071	Health Specialties Teachers, Postsecondary	51.2501	Veterinary Sciences/Veterinary Clinical Sciences, General (Cert, MS, PhD)
25-1071	Health Specialties Teachers, Postsecondary	51.3501	Massage Therapy/Therapeutic Massage

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
25-1071	Health Specialties Teachers, Postsecondary	51.3502	Asian Bodywork Therapy
25-1071	Health Specialties Teachers, Postsecondary	51.3603	Hypnotherapy/Hypnotherapist
25-1071	Health Specialties Teachers, Postsecondary	51.1102	Pre-Medicine/Pre-Medical Studies
25-1071	Health Specialties Teachers, Postsecondary	51.2202	Environmental Health
25-1071	Health Specialties Teachers, Postsecondary	51.2206	Occupational Health and Industrial Hygiene
25-1071	Health Specialties Teachers, Postsecondary	51.1103	Pre-Pharmacy Studies
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1105	Pre-Nursing Studies
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1601	Nursing - Registered Nurse Training (RN, ASN, BSN, MSN)
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1603	Adult Health Nurse/Nursing
25-1072	Nursing Instructors and Teachers, Postsecondary	51.160	Nurse Anesthetist

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
		4	
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1605	Family Practice Nurse/Nurse Practitioner
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1606	Maternal/Child Health and Neonatal Nurse/Nursing
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1607	Nurse Midwife/Nursing Midwifery
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1608	Nursing Science (MS, PhD)
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1609	Pediatric Nurse/Nursing
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1610	Psychiatric/Mental Health Nurse/Nursing
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1611	Public Health/Community Nurse/Nursing
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1612	Perioperative/Operating Room and Surgical Nurse/Nursing
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1616	Clinical Nurse Specialist
25-1072	Nursing Instructors and Teachers, Postsecondary	51.1699	Nursing, Other
25-1113	Social Work Teachers, Postsecondary	51.1503	Clinical/Medical Social Work
27-1013	Fine Artists, Including Painters, Sculptors, and Illustrators	51.2703	Medical Illustration/Medical Illustrator
29-1011	Chiropractors	51.0101	Chiropractic (DC)
29-1021	Dentists, General	51.0401	Dentistry (DDS, DMD)
29-1021	Dentists, General	51.0502	Advanced General Dentistry (Cert, MS, PhD)
29-1021	Dentists, General	51.0504	Dental Public Health and Education (Cert, MS/MPH, PhD/DPH)

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-1021	Dentists, General	51.0509	Pediatric Dentistry/Pedodontics (Cert, MS, PhD)
29-1022	Oral and Maxillofacial Surgeons	51.0507	Oral/Maxillofacial Surgery (Cert, MS, PhD)
29-1023	Orthodontists	51.0508	Orthodontics/Orthodontology (Cert, MS, PhD)
29-1024	Prosthodontists	51.0511	Prosthodontics/Prosthodontology (Cert, MS, PhD)
29-1029	Dentists, All Other Specialists	51.0501	Dental Clinical Sciences, General (MS, PhD)
29-1029	Dentists, All Other Specialists	51.0503	Oral Biology and Oral Pathology (MS, PhD)
29-1029	Dentists, All Other Specialists	51.0505	Dental Materials (MS, PhD)
29-1029	Dentists, All Other Specialists	51.0510	Periodontics/Periodontology (Cert, MS, PhD)
29-1029	Dentists, All Other Specialists	51.0599	Advanced/Graduate Dentistry and Oral Sciences, Other
29-1029	Dentists, All Other Specialists	51.0506	Endodontics/Endodontology (Cert, MS, PhD)
29-1031	Dietitians and Nutritionists	51.3101	Dietetics/Dietitian (RD)
29-1031	Dietitians and Nutritionists	51.3102	Clinical Nutrition/Nutritionist
29-1031	Dietitians and Nutritionists	51.3199	Dietetics and Clinical Nutrition Services, Other
29-1041	Optometrists	51.1701	Optometry (OD)
29-1051	Pharmacists	51.2001	Pharmacy (PharmD [USA] PharmD, BS/BPharm [Canada])
29-1051	Pharmacists	51.2002	Pharmacy Administration and Pharmacy Policy and Regulatory Affairs (MS, PhD)
29-1051	Pharmacists	51.2099	Pharmacy, Pharmaceutical Sciences, and Administration, Other
29-1051	Pharmacists	51.2003	Pharmaceutics and Drug Design (MS, PhD)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-1051	Pharmacists	51.200 4	Medicinal and Pharmaceutical Chemistry (MS, PhD)
29-1051	Pharmacists	51.200 5	Natural Products Chemistry and Pharmacognosy (MS, PhD)
29-1051	Pharmacists	51.200 6	Clinical and Industrial Drug Development (MS, PhD)
29-1051	Pharmacists	51.200 7	Pharmacoeconomics/Pharmaceutical Economics (MS, PhD)
29-1051	Pharmacists	51.200 8	Clinical, Hospital, and Managed Care Pharmacy (MS, PhD)
29-1051	Pharmacists	51.200 9	Industrial and Physical Pharmacy and Cosmetic Sciences (MS, PhD)
29-1062	Family and General Practitioners	51.120 1	Medicine (MD)
29-1062	Family and General Practitioners	51.190 1	Osteopathic Medicine/Osteopathy (DO)

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-1069	Physicians and Surgeons, All Other	51.120 1	Medicine (MD)
29-1069	Physicians and Surgeons, All Other	51.190 1	Osteopathic Medicine/Osteopathy (DO)
29-1071	Physician Assistants	51.091 2	Physician Assistant
29-1081	Podiatrists	51.210 1	Podiatric Medicine/Podiatry (DPM)
29-1111	Registered Nurses	51.160 1	Nursing - Registered Nurse Training (RN, ASN, BSN, MSN)
29-1111	Registered Nurses	51.160 3	Adult Health Nurse/Nursing
29-1111	Registered Nurses	51.160 4	Nurse Anesthetist
29-1111	Registered Nurses	51.160	Family Practice Nurse/Nurse Practitioner



SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
		5	
29-1111	Registered Nurses	51.1606	Maternal/Child Health and Neonatal Nurse/Nursing
29-1111	Registered Nurses	51.1607	Nurse Midwife/Nursing Midwifery
29-1111	Registered Nurses	51.1608	Nursing Science (MS, PhD)
29-1111	Registered Nurses	51.1609	Pediatric Nurse/Nursing
29-1111	Registered Nurses	51.1610	Psychiatric/Mental Health Nurse/Nursing
29-1111	Registered Nurses	51.1611	Public Health/Community Nurse/Nursing
29-1111	Registered Nurses	51.1612	Perioperative/Operating Room and Surgical Nurse/Nursing
29-1111	Registered Nurses	51.1616	Clinical Nurse Specialist
29-1111	Registered Nurses	51.1699	Nursing, Other
29-1111	Registered Nurses	51.1617	Critical Care Nursing
29-1111	Registered Nurses	51.1618	Occupational and Environmental Health Nursing
29-1121	Audiologists	51.0201	Communication Disorders, General
29-1121	Audiologists	51.0202	Audiology/Audiologist and Hearing Sciences
29-1121	Audiologists	51.0204	Audiology/Audiologist and Speech-Language Pathology/Pathologist
29-1121	Audiologists	51.0299	Communication Disorders Sciences and Services, Other
29-1122	Occupational Therapists	51.2306	Occupational Therapy/Therapist
29-1123	Physical Therapists	51.2308	Physical Therapy/Therapist
29-1123	Physical Therapists	51.2311	Kinesiotherapy/Kinesiotherapist

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-1124	Radiation Therapists	51.090 7	Medical Radiologic Technology/Science - Radiation Therapist
29-1125	Recreational Therapists	51.230 9	Therapeutic Recreation/Recreational Therapy
29-1126	Respiratory Therapists	51.090 8	Respiratory Care Therapy/Therapist
29-1127	Speech-Language Pathologists	51.020 1	Communication Disorders, General
29-1127	Speech-Language Pathologists	51.020 3	Speech-Language Pathology/Pathologist
29-1127	Speech-Language Pathologists	51.020 4	Audiology/Audiologist and Speech-Language Pathology/Pathologist
29-1127	Speech-Language Pathologists	51.029 9	Communication Disorders Sciences and Services, Other
29-1129	Therapists, All Other	51.230 1	Art Therapy/Therapist
29-1129	Therapists, All Other	51.230 2	Dance Therapy/Therapist
29-1129	Therapists, All Other	51.230 5	Music Therapy/Therapist
29-1129	Therapists, All Other	51.239 9	Rehabilitation and Therapeutic Professions, Other
29-1129	Therapists, All Other	51.360 1	Movement Therapy and Movement Education
29-1129	Therapists, All Other	51.360 3	Hypnotherapy/Hypnotherapist
29-1131	Veterinarians	51.240 1	Veterinary Medicine (DVM)
29-1131	Veterinarians	51.250 1	Veterinary Sciences/Veterinary Clinical Sciences, General (Cert, MS, PhD)
29-1131	Veterinarians	51.251 0	Veterinary Preventive Medicine Epidemiology and Public Health (Cert, MS, PhD)
29-1131	Veterinarians	51.251 1	Veterinary Infectious Diseases (Cert, MS, PhD)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-1131	Veterinarians	51.259 9	Veterinary Biomedical and Clinical Sciences, Other (Cert, MS, PhD)
29-1131	Veterinarians	51.250 2	Veterinary Anatomy (Cert, MS, PhD)
29-1131	Veterinarians	51.250 3	Veterinary Physiology (Cert, MS, PhD)
29-1131	Veterinarians	51.250 4	Veterinary Microbiology and Immunobiology (Cert, MS, PhD)
29-1131	Veterinarians	51.250 5	Veterinary Pathology and Pathobiology (Cert, MS, PhD)
29-1131	Veterinarians	51.250 6	Veterinary Toxicology and Pharmacology (Cert, MS, PhD)
29-1131	Veterinarians	51.250 7	Large Animal/Food Animal and Equine Surgery and Medicine (Cert, MS, PhD)
29-1131	Veterinarians	51.250 8	Small/Companion Animal Surgery and Medicine (Cert, MS, PhD)

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-1131	Veterinarians	51.250 9	Comparative and Laboratory Animal Medicine (Cert, MS, PhD)
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.100 9	Phlebotomy/Phlebotomist
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.330 1	Acupuncture
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.370 1	Aromatherapy
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.370 2	Herbalism/Herbalist
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.330 2	Traditional Chinese/Asian Medicine and Chinese Herbology
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.330 3	Naturopathic Medicine/Naturopathy (ND)
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.330	Homeopathic Medicine/Homeopathy

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
		4	
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.3305	Ayurvedic Medicine/Ayurveda
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.3399	Alternative and Complementary Medicine and Medical Systems, Other
29-1199	Health Diagnosing and Treating Practitioners, All Other	51.3401	Direct Entry Midwifery (LM, CPM)
29-2011	Medical and Clinical Laboratory Technologists	51.1002	Cytotechnology/Cytotechnologist
29-2011	Medical and Clinical Laboratory Technologists	51.1005	Clinical Laboratory Science/Medical Technology/Technologist
29-2011	Medical and Clinical Laboratory Technologists	51.1007	Histologic Technology/Histotechnologist
29-2011	Medical and Clinical Laboratory Technologists	51.1010	Cytogenetics/Genetics/Clinical Genetics Technology/Technologist
29-2011	Medical and Clinical Laboratory Technologists	51.1011	Renal/Dialysis Technologist/Technician
29-2011	Medical and Clinical Laboratory Technologists	51.1099	Clinical/Medical Laboratory Science and Allied Professions, Other
29-2012	Medical and Clinical Laboratory Technicians	51.0802	Clinical/Medical Laboratory Assistant
29-2012	Medical and Clinical Laboratory Technicians	51.1001	Blood Bank Technology Specialist
29-2012	Medical and Clinical Laboratory Technicians	51.1003	Hematology Technology/Technician
29-2012	Medical and Clinical Laboratory Technicians	51.1004	Clinical/Medical Laboratory Technician
29-2012	Medical and Clinical Laboratory Technicians	51.1008	Histologic Technician
29-2021	Dental Hygienists	51.0602	Dental Hygiene/Hygienist
29-2031	Cardiovascular Technologists and Technicians	51.0901	Cardiovascular Technology/Technologist
29-2031	Cardiovascular Technologists and Technicians	51.0902	Electrocardiograph Technology/Technician
29-2031	Cardiovascular Technologists and Technicians	51.0906	Perfusion Technology/Perfusionist

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-2031	Cardiovascular Technologists and Technicians	51.091 5	Cardiopulmonary Technology/Technologist
29-2032	Diagnostic Medical Sonographers	51.091 0	Diagnostic Medical Sonography/Sonographer and Ultrasound Technician
29-2032	Diagnostic Medical Sonographers	51.099 9	Allied Health Diagnostic, Intervention, and Treatment Professions, Other
29-2033	Nuclear Medicine Technologists	51.090 5	Nuclear Medical Technology/Technologist
29-2033	Nuclear Medicine Technologists	51.091 6	Radiation Protection/Health Physics Technician
29-2034	Radiologic Technologists and Technicians	51.090 7	Medical Radiologic Technology/Science - Radiation Therapist
29-2034	Radiologic Technologists and Technicians	51.091 1	Radiologic Technology/Science - Radiographer
29-2034	Radiologic Technologists and Technicians	51.099 9	Allied Health Diagnostic, Intervention, and Treatment Professions, Other
29-2041	Emergency Medical Technicians and Paramedics	51.081 0	Emergency Care Attendant (EMT Ambulance)
29-2041	Emergency Medical Technicians and Paramedics	51.090 4	Emergency Medical Technology/Technician (EMT Paramedic)
29-2051	Dietetic Technicians	51.310 1	Dietetics/Dietitian (RD)
29-2051	Dietetic Technicians	51.310 3	Dietetic Technician (DTR)
29-2051	Dietetic Technicians	51.310 4	Dietitian Assistant
29-2052	Pharmacy Technicians	51.080 5	Pharmacy Technician/Assistant
29-2053	Psychiatric Technicians	51.150 2	Psychiatric/Mental Health Services Technician
29-2054	Respiratory Therapy Technicians	51.081 2	Respiratory Therapy Technician/Assistant
29-2054	Respiratory Therapy Technicians	51.090 8	Respiratory Care Therapy/Therapist

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-2055	Surgical Technologists	51.081 1	Pathology/Pathologist Assistant
29-2055	Surgical Technologists	51.090 9	Surgical Technology/Technologist
29-2056	Veterinary Technologists and Technicians	51.080 8	Veterinary/Animal Health Technology/Technician and Veterinary Assistant
29-2061	Licensed Practical and Licensed Vocational Nurses	51.161 3	Licensed Practical /Vocational Nurse Training (LPN, LVN, Cert, Dipl, AAS)
29-2071	Medical Records and Health Information Technicians	51.070 7	Health Information/Medical Records Technology/Technician
29-2071	Medical Records and Health Information Technicians	51.071 3	Medical Insurance Coding Specialist/Coder
29-2081	Opticians, Dispensing	51.180 1	Opticianry/Ophthalmic Dispensing Optician
29-2091	Orthotists and Prosthetists	51.230 7	Orthotist/Prosthetist
29-2091	Orthotists and Prosthetists	51.231 2	Assistive/Augmentative Technology and Rehabilitation Engineering

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
29-2099	Health Technologists and Technicians, All Other	51.089 9	Allied Health and Medical Assisting Services, Other
29-2099	Health Technologists and Technicians, All Other	51.090 3	Electroneurodiagnostic/Electroencephalographic Technology/Technologist
29-2099	Health Technologists and Technicians, All Other	51.091 4	Gene/Genetic Therapy
29-2099	Health Technologists and Technicians, All Other	51.099 9	Allied Health Diagnostic, Intervention, and Treatment Professions, Other
29-2099	Health Technologists and Technicians, All Other	51.999 9	Health Professions and Related Clinical Sciences, Other
29-9011	Occupational Health and Safety Specialists	51.220 2	Environmental Health
29-9011	Occupational Health and Safety Specialists	51.220	Occupational Health and Industrial Hygiene

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
		6	
29-9012	Occupational Health and Safety Technicians	51.091 6	Radiation Protection/Health Physics Technician
29-9012	Occupational Health and Safety Technicians	51.220 2	Environmental Health
29-9012	Occupational Health and Safety Technicians	51.220 6	Occupational Health and Industrial Hygiene
29-9091	Athletic Trainers	51.091 3	Athletic Training/Trainer
29-9099	Healthcare Practitioners and Technical Workers, All Other	51.089 9	Allied Health and Medical Assisting Services, Other
29-9099	Healthcare Practitioners and Technical Workers, All Other	51.099 9	Allied Health Diagnostic, Intervention, and Treatment Professions, Other
29-9099	Healthcare Practitioners and Technical Workers, All Other	51.999 9	Health Professions and Related Clinical Sciences, Other
31-1011	Home Health Aides	51.260 2	Home Health Aide/Home Attendant
31-1012	Nursing Aides, Orderlies, and Attendants	51.161 4	Nurse/Nursing Assistant/Aide and Patient Care Assistant
31-1012	Nursing Aides, Orderlies, and Attendants	51.260 1	Health Aide
31-1013	Psychiatric Aides	51.150 2	Psychiatric/Mental Health Services Technician
31-1013	Psychiatric Aides	51.260 1	Health Aide
31-2011	Occupational Therapist Assistants	51.080 3	Occupational Therapist Assistant
31-2012	Occupational Therapist Aides	51.080 3	Occupational Therapist Assistant
31-2021	Physical Therapist Assistants	51.080 6	Physical Therapist Assistant
31-2022	Physical Therapist Aides	51.080 6	Physical Therapist Assistant
31-9011	Massage Therapists	51.350 1	Massage Therapy/Therapeutic Massage
31-9011	Massage Therapists	51.350 2	Asian Bodywork Therapy

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
31-9011	Massage Therapists	51.350 3	Somatic Bodywork

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
31-9011	Massage Therapists	51.359 9	Somatic Bodywork and Related Therapeutic Services, Other
31-9091	Dental Assistants	51.060 1	Dental Assisting/Assistant
31-9092	Medical Assistants	51.070 5	Medical Office Management/Administration
31-9092	Medical Assistants	51.071 0	Medical Office Assistant/Specialist
31-9092	Medical Assistants	51.071 2	Medical Reception/Receptionist
31-9092	Medical Assistants	51.071 3	Medical Insurance Coding Specialist/Coder
31-9092	Medical Assistants	51.071 6	Medical Administrative/Executive Assistant and Medical Secretary
31-9092	Medical Assistants	51.080 1	Medical/Clinical Assistant
31-9092	Medical Assistants	51.080 9	Anesthesiologist Assistant
31-9092	Medical Assistants	51.081 3	Chiropractic Assistant/Technician
31-9092	Medical Assistants	51.089 9	Allied Health and Medical Assisting Services, Other
31-9092	Medical Assistants	51.180 2	Optometric Technician/Assistant
31-9092	Medical Assistants	51.180 3	Ophthalmic Technician/Technologist
31-9092	Medical Assistants	51.180 4	Orthoptics/Orthoptist
31-9093	Medical Equipment Preparers	51.080	Medical/Clinical Assistant



SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
		1	
31-9093	Medical Equipment Preparers	51.089 9	Allied Health and Medical Assisting Services, Other
31-9094	Medical Transcriptionists	51.070 8	Medical Transcription/Transcriptionist
31-9095	Pharmacy Aides	51.080 5	Pharmacy Technician/Assistant
31-9096	Veterinary Assistants and Laboratory Animal Caretakers	51.080 8	Veterinary/Animal Health Technology/Technician and Veterinary Assistant
31-9099	Healthcare Support Workers, All Other	51.260 3	Medication Aide
31-9099	Healthcare Support Workers, All Other	51.360 2	Yoga Teacher Training/Yoga Therapy
31-9099	Healthcare Support Workers, All Other	51.370 1	Aromatherapy
31-9099	Healthcare Support Workers, All Other	51.370 2	Herbalism/Herbalist
31-9099	Healthcare Support Workers, All Other	51.269 9	Health Aides/Attendants/Orderlies, Other
31-9099	Healthcare Support Workers, All Other	51.370 3	Polarity Therapy
31-9099	Healthcare Support Workers, All Other	51.370 4	Reiki

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Figure F.1: Standard Occupational Classification (SOC) codes matched to selected Classification of Instructional Program (CIP) codes<sup>(1)</sup>  
(CONTINUED)

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
31-9099	Healthcare Support Workers, All Other	51.379 9	Energy and Biologically Based Therapies, Other
43-1011	First-Line Supervisors/Managers of Office and Administrative Support Workers	51.071 1	Medical/Health Management and Clinical Assistant/Specialist
43-4171	Receptionists and Information Clerks	51.070 3	Health Unit Coordinator/Ward Clerk
43-4171	Receptionists and Information Clerks	51.071 2	Medical Reception/Receptionist

SOC CODE	SOC TITLE	CIP CODE	CIP TITLE
43-6011	Executive Secretaries and Administrative Assistants	51.071 6	Medical Administrative/Executive Assistant and Medical Secretary
43-6013	Medical Secretaries	51.071 0	Medical Office Assistant/Specialist
43-6013	Medical Secretaries	51.071 4	Medical Insurance Specialist/Medical Biller
43-6013	Medical Secretaries	51.071 6	Medical Administrative/Executive Assistant and Medical Secretary
51-9081	Dental Laboratory Technicians	51.060 3	Dental Laboratory Technology/Technician
51-9082	Medical Appliance Technicians	51.230 7	Orthotist/Prosthetist
51-9082	Medical Appliance Technicians	51.231 2	Assistive/Augmentative Technology and Rehabilitation Engineering
51-9083	Ophthalmic Laboratory Technicians	51.100 6	Ophthalmic Laboratory Technology/Technician
53-3011	Ambulance Drivers and Attendants, Except Emergency Medical Technicians	51.090 4	Emergency Medical Technology/Technician (EMT Paramedic)
00-0000	No related SOC	51.000 0	Health Services/Allied Health/Health Sciences, General
00-0000	No related SOC	51.110 4	Pre-Veterinary Studies
00-0000	No related SOC	51.189 9	Ophthalmic and Optometric Support Services and Allied Professions, Other
00-0000	No related SOC	51.229 9	Public Health, Other
00-0000	No related SOC	51.320 1	Bioethics/Medical Ethics
00-0000	No related SOC	51.349 9	Alternative and Complementary Medical Support Services, Other
00-0000	No related SOC	51.369 9	Movement and Mind-Body Therapies and Education, Other

Source: National Crosswalk Service Center (NCSC)

(1) This excerpt is from 2000 Standard Occupational Classification Crosswalk to 2000 Classification of Instructional Programs. Although more recent versions of both the SOC and CIP classification systems exist, there is no more recent concordance between the two systems available from the NCSC.

## Appendix G: Texas Workforce Commission (TWC) Career Schools & Technical Colleges Data

The following data represent all completions reported to TWC by career schools and technical colleges on the state's Eligible Training Provider System. The data were provided for each of the two workforce development areas covered by the study (specifically, Lower Rio Grande Valley and Cameron County). However, the fact that a program of study is shown below does not indicate it was funded by the workforce board listed, only that it was completed in that workforce development area during the indicated year.

Figure G-1: Completions reported to TWC by Private Career Schools and Technical Colleges (Ranked by three-year total)

CIP	DESCRIPTION	2006/2007			2007/2008			2008/2009			3-Year Total
		Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	
51.16 14	Nursing Assistant / Aide	267	1,079	<b>1,346</b>	184	1,088	<b>1,272</b>	138	1,265	<b>1,403</b>	<b>4,021</b>
51.08 01	Medical Assistant	366	595	<b>961</b>	357	777	<b>1,134</b>	418	904	<b>1,322</b>	<b>3,417</b>
51.07 16	Medical Admin / Executive Asst. and Medical Secretary	50	310	<b>360</b>	37	426	<b>463</b>	47	547	<b>594</b>	<b>1,417</b>
51.08 06	Physical Therapy Assistant		204	<b>204</b>		263	<b>263</b>		325	<b>325</b>	<b>792</b>
51.07 10	Medical Office Assistant / Specialist	205		<b>205</b>	170	17	<b>187</b>	174	18	<b>192</b>	<b>584</b>
51.08 05	Pharmacy Tech. / Assistant		168	<b>168</b>	22	134	<b>156</b>	32	131	<b>163</b>	<b>487</b>
52.03 02	Accounting Tech.	14	58	<b>72</b>	40	105	<b>145</b>	36	127	<b>163</b>	<b>380</b>
48.05 08	Welder / Welding Technologist	81		<b>81</b>	122		<b>122</b>	128		<b>128</b>	<b>331</b>
49.02 05	Truck, Bus & Oth. Commercial Vehicle Operator	105	17	<b>122</b>	109	15	<b>124</b>		75	<b>75</b>	<b>321</b>
51.06 01	Dental Assistant		90	<b>90</b>	11	82	<b>93</b>	40	91	<b>131</b>	<b>314</b>
13.99 99	Education, Other	10	80	<b>90</b>	15	55	<b>70</b>	34	81	<b>115</b>	<b>275</b>
51.16 13	Nursing, Practical (LPN /LVN Training)		61	<b>61</b>		100	<b>100</b>		104	<b>104</b>	<b>265</b>
52.12 01	Mgmt. Inf. Systems & Business Data Processing, Gen	104		<b>104</b>	76		<b>76</b>	68		<b>68</b>	<b>248</b>
47.01 01	Elect. & Electronics Equip. Installer & Repairer,		67	<b>67</b>		73	<b>73</b>		97	<b>97</b>	<b>237</b>

CIP	DESCRIPTION	2006/2007			2007/2008			2008/2009			3-Year Total
		Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	
51.09 07	Medical Radiologic Technol. / Tech.		120	<b>120</b>		48	<b>48</b>		54	<b>54</b>	<b>222</b>
52.04 07	Information Processing / Data Entry Tech.	21	59	<b>80</b>	16	51	<b>67</b>	16	18	<b>34</b>	<b>181</b>
12.05 02	Bartender / Mixologist	64	4	<b>68</b>	40	13	<b>53</b>	27	26	<b>53</b>	<b>174</b>
15.05 01	Heating, Air Conditioning & Refrigeration Technol.	52		<b>52</b>	45		<b>45</b>	56		<b>56</b>	<b>153</b>
51.10 04	Medical Laboratory Tech.	17	19	<b>36</b>	20	26	<b>46</b>	20	35	<b>55</b>	<b>137</b>

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Figure G-1: Completions reported to TWC by Private Career Schools and Technical Colleges (CONTINUED)

CIP	DESCRIPTION	2006/2007			2007/2008			2008/2009			3-Year Total
		Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	
22.03 02	Legal Assistant / Paralegal		29	<b>29</b>		44	<b>44</b>		50	<b>50</b>	<b>123</b>
51.10 09	Phlebotomy Technician	13	32	<b>45</b>		24	<b>24</b>	19	16	<b>35</b>	<b>104</b>
32.01 08	Reading, Literacy, & Communication Skills	17	83	<b>100</b>							<b>100</b>
51.26 02	Home Health Aide / Home Attendant		45	<b>45</b>		27	<b>27</b>		25	<b>25</b>	<b>97</b>
51.07 13	Medical Insurance Coding Specialist / Coder	63		<b>63</b>		6	<b>6</b>		20	<b>20</b>	<b>89</b>
51.23 08	Physical Therapy		36	<b>36</b>		22	<b>22</b>				<b>58</b>
52.04 01	Administrative Assistant / Secretarial Science, Gen.		13	<b>13</b>		17	<b>17</b>		16	<b>16</b>	<b>46</b>
47.02 01	Heating, Air Conditioning & Refrigeration Mechanic								34	<b>34</b>	<b>34</b>
31.05 99	Personal Fitness Trainer							10	22	<b>32</b>	<b>32</b>
47.01 04	Computer Installer & Repairer		26	<b>26</b>							<b>26</b>

CIP	DESCRIPTION	2006/2007			2007/2008			2008/2009			3-Year Total
		Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	Cameron	Lower Rio	Total	
51.15 01	Alcohol / Drug Abuse Counseling		5	5		12	12		3	3	20
19.07 09	Child Care Provider / Assistant		10	10		1	1				11
22.03 01	Legal Administrative Assistant/Secretary		9	9		2	2				11
15.12 02	Computer Technology / Computer Systems Technology				6	0	6	2		2	8
46.03 02	Electrician				7		7				7
	<b>TOTAL</b>	1,449	3,219	4,668	1,277	3,428	4,705	1,265	4,084	5,349	14,722

Source: Texas Workforce Commission, TIP Strategies

## Appendix H: National Center for Education Statistics (NCES) Data for Public Institutions

Figure H.1: Public school completions (1<sup>st</sup> and 2<sup>nd</sup> majors) by CIP code as reported to the National Center for Education Statistics  
Awards/degrees conferred between July 1 of prior year and June 30 of indicated year to all recipients, across all race/ethnicities and both genders

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — CHARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
01.0106	Agricultural Business Technology	5	3	5	13			5		
03.0104	Environmental Science	2	5	8	15				8	
05.0102	American/United States Studies/Civilization	3	2	2	7					2
05.0203	Hispanic-American, Puerto Rican & Mexican-American/Chicano Studies		1	1	2					1
09.0101	Communication Studies/Speech Communication and Rhetoric	45	64	73	182				31	42
09.0401	Journalism	71	84	90	245					90
11.0101	Computer and Information Sciences, General	90	106	97	293	59	23		15	
11.0103	Information Technology	13	14	3	30			3		
11.0201	Computer Programming/Programmer, General	6	5		11					
11.0401	Information Science/Studies	16	25	31	72				26	5
11.0701	Computer Science	41	40	52	133	12				40
11.0901	Computer Systems Networking and Telecommunications			13	13			13		
12.0503	Culinary Arts/Chef Training	5	16	12	33	12				
12.0508	Institutional Food Workers	16	14	14	44			14		
13.0201	Bilingual and Multilingual Education	23	29	27	79				1	26
13.0301	Curriculum and Instruction	12	15	27	54				27	
13.0401	Educational Leadership and Administration, General	167	126	152	445				26	126
13.0501	Educational/Instructional Media Design	36	30	21	87				21	
13.1001	Special Education and Teaching, General	37	32	22	91				6	16

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Figure H.1: Public school completions (1<sup>st</sup> and 2<sup>nd</sup> majors) by CIP code as reported to the National Center for Education Statistics (CONTINUED)

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
13.1004	Education/Teaching of the Gifted and Talented	1	3	7	11					7
13.1101	Counselor Education/School Counseling and Guidance Services	117	105	110	332				16	94
13.1202	Elementary Education and Teaching	9	8	7	24					7
13.1205	Secondary Education and Teaching	13	7	7	27					7
13.121	Early Childhood Education and Teaching	18	9	8	35				7	1
13.1311	Mathematics Teacher Education	1	0	1	2					1
13.1312	Music Teacher Education		1	2	3				2	
13.1315	Reading Teacher Education	27	21	14	62				1	13
13.1401	Teaching English as Second/Foreign Language/ESL Language Instructor	5	7	5	17					5
13.1501	Teacher Assistant/Aide	25	40	38	103			38		
14.0101	Engineering, General	14	45	38	97	38				
14.0901	Computer Engineering, General			3	3					3
14.1001	Electrical, Electronics and Communications Engineering	37	49	35	121					35
14.1201	Engineering Physics	1	2	4	7				4	
14.1901	Mechanical Engineering	55	67	69	191					69
14.3501	Industrial Engineering	20	18	8	46					8
14.3601	Manufacturing Engineering	7	3	4	14					4
14.9999	Engineering, Other	1	2	1	4					1
15.0303	Electrical/Electronic/Communications Engr Technology/Technician	11	6	2	19				2	
15.0305	Telecommunications Technology/Technician	8	13	11	32			11		
15.0401	Biomedical Technology/Technician	16	19	16	51			16		

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
15.0403	Electromechanical Technology/Electromechanical Engineering Tech	5	9	15	29			15		

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Figure H.1: Public school completions (1<sup>st</sup> and 2<sup>nd</sup> majors) by CIP code as reported to the National Center for Education Statistics (CONTINUED)

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
15.0404	Instrumentation Technology/Technician	1			1					
15.0612	Industrial Technology/Technician	5	18	19	42		17		2	
15.0613	Manufacturing Technology/Technician	1	1	3	5				3	
15.0805	Mechanical Engineering/Mechanical Technology/Technician		2	1	3				1	
15.1001	Construction Engineering Technology/Technician	18	14	8	40			8		
15.1201	Computer Engineering Technology/Technician	44	32	14	90	14				
15.1202	Computer Technology/Computer Systems Technology	23	29	43	95	19		24		
15.1301	Drafting and Design Technology/Technician, General	69	87	86	242	32	30	24		
16.0101	Foreign Languages and Literatures, General	18	36	23	77	23				
16.0901	French Language and Literature	1		1	2					1
16.0905	Spanish Language and Literature	157	182	186	525		21		24	141
19.0706	Child Development	98	60	35	193	35				
19.0709	Child Care Provider/Assistant	95	81	59	235	26	33			
22.0301	Legal Administrative Assistant/Secretary	16	17	10	43	5	3	2		



CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
22.0302	Legal Assistant/Paralegal	14	14	19	47	13	6			
23.0101	English Language and Literature, General	217	236	243	696	5			37	201
23.0501	Creative Writing			2	2					2
24.0102	General Studies	575	693	554	1822	181	329			44
26.0101	Biology/Biological Sciences, General	272	317	331	920	58			72	201
27.0101	Mathematics, General	91	78	93	262	27			19	47
30.9999	Multi-/Interdisciplinary Studies, Other	987	973	1005	2965	266	97		262	380
31.0501	Health and Physical Education, General	167	154	190	511	32			58	100

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Figure H.1: Public school completions (1<sup>st</sup> and 2<sup>nd</sup> majors) by CIP code as reported to the National Center for Education Statistics (CONTINUED)

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
38.0101	Philosophy	15	9	26	50	3				23
40.0501	Chemistry, General	43	45	43	131	17			7	19
40.0801	Physics, General	7	11	11	29	1			7	3
41.0301	Chemical Technology/Technician	9	12	12	33			12		
42.0101	Psychology, General	151	160	224	535				63	161
42.0201	Clinical Psychology	9	4	7	20					7
42.0601	Counseling Psychology	8	12	2	22					2

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
42.0801	Experimental Psychology	1	1		2					
43.0102	Corrections	35	33	34	102				34	
43.0103	Criminal Justice/Law Enforcement Administration	199	196	195	590				39	156
43.0104	Criminal Justice/Safety Studies	124	162	114	400	88	22		4	
44.0401	Public Administration	9	17	13	39				5	8
44.0701	Social Work	197	194	186	577	1	69			116
45.0101	Social Sciences, General	78	154	163	395	137				26
45.0201	Anthropology	11	9	17	37					17
45.0601	Economics, General	3	3	12	18					12
45.1001	Political Science and Government, General	51	65	64	180	5			17	42
45.1101	Sociology	87	67	74	228				25	49
46.0301	Electrical and Power Transmission Installation/Installer, General			13	13	13				
46.0302	Electrician		9	4	13	4				
46.0412	Building/Construction Site Management/Manager	39	40	14	93		14			
47.0201	Heating/AC/Ventilation/Refrig Maint Technology/Technician	53	72	60	185	30	13	17		

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Figure H.1: Public school completions (1<sup>st</sup> and 2<sup>nd</sup> majors) by CIP code as reported to the National Center for Education Statistics (CONTINUED)

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
47.0603	Autobody/Collision and Repair Technology/Technician	18	26	34	78		24	10		
47.0604	Automobile/Automotive Mechanics Technology/Technician	57	92	57	206	24	24	9		
47.0605	Diesel Mechanics Technology/Technician	12	32	29	73	29				
47.0607	Airframe Mechanics and Aircraft Maintenance Technology/Technician	17	9	15	41			15		
48.0501	Machine Tool Technology/Machinist	4	12	8	24			8		
48.0503	Machine Shop Technology/Assistant	5			5					
48.0507	Tool and Die Technology/Technician	16	24	18	58	15		3		
48.0508	Welding Technology/Welder	19	34	36	89			36		
50.0301	Dance, General	5	2	6	13					6
50.0402	Commercial and Advertising Art	19	30	21	70			21		
50.0501	Drama and Dramatics/Theatre Arts, General	20	22	12	54					12
50.0701	Art/Art Studies, General	29	19	10	58				10	
50.0702	Fine/Studio Arts, General	62	80	59	201	12				47
50.0901	Music, General	26	36	48	110	6			10	32
51.000	Health Services/Allied Health/Health Sciences, General	27	17	21	65				15	6
51.0204	Audiology/Audiologist and Speech-Language Pathology/Pathologist	101	103	75	279					75
51.0601	Dental Assisting/Assistant	22	21	20	63			20		
51.0602	Dental Hygiene/Hygienist	15	27	27	69			27		
51.0603	Dental Laboratory Technology/Technician	16	8	8	32			8		
51.0707	Health Information/Medical Records Technology/Technician	19	36	40	95	10		30		
51.0708	Medical Transcription/Transcriptionist	27	20	14	61			14		
51.0713	Medical Insurance Coding Specialist/Coder	22	5	18	45	18				

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Figure H.1: Public school completions (1<sup>st</sup> and 2<sup>nd</sup> majors) by CIP code as reported to the National Center for Education Statistics (CONTINUED)

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
51.0716	Medical Administrative/Executive Assistant and Medical Secretary	33	19	10	62		10			
51.0801	Medical/Clinical Assistant	30	37	37	104	19		18		
51.0803	Occupational Therapist Assistant	12	26	13	51	13				
51.0805	Pharmacy Technician/Assistant	12	16	4	32	4				
51.0806	Physical Therapist Assistant	10	6	12	28	12				
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	80	143	86	309	76	2	8		
51.0908	Respiratory Care Therapy/Therapist	18	18	18	54		18			
51.0909	Surgical Technology/Technologist	23	15	16	54			16		
51.091	Diagnostic Medical Sonography/Sonographer & Ultrasound Technician	6	7	8	21		8			
51.0911	Radiologic Technology/Science - Radiographer	29	29	18	76	7	11			
51.0912	Physician Assistant	29	28	110	167					110
51.1004	Clinical/Medical Laboratory Technician	13	5	9	27		9			
51.1005	Clinical Laboratory Science/Medical Technology/Technologist	10	10	13	33					13
51.1601	Nursing/Registered Nurse (RN, ASN, BSN, MSN)	336	351	413	1100	172	128		30	83
51.1602	Nursing Administration (MSN, MS, PhD)			2	2				2	
51.1605	Family Practice Nurse/Nurse Practitioner	14	17	14	45					14
51.1611	Public Health/Community Nurse/Nursing	1	6	1	8				1	
51.1613	Licensed Practical/Vocational Nurse Training	163	219	205	587	138	67			
51.1614	Nurse/Nursing Assistant/Aide and Patient Care Assistant	44	47	62	153	62				
51.1699	Nursing, Other		1	2	3				2	
51.2306	Occupational Therapy/Therapist	17	16	17	50					17

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
51.2310	Vocational Rehabilitation Counseling/Counselor	19	17	23	59					23

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Figure H.1: Public school completions (1<sup>st</sup> and 2<sup>nd</sup> majors) by CIP code as reported to the National Center for Education Statistics (CONTINUED)

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
51.2399	Rehabilitation and Therapeutic Professions, Other	41	58	105	204					105
51.3101	Dietetics/Dietitian (RD)	19	12	16	47					16
52.0101	Business/Commerce, General	305	355	291	951	235	52		4	
52.0201	Business Administration and Management, General	288	332	341	961	56			97	188
52.0301	Accounting	116	134	151	401		13		39	99
52.0302	Accounting Technology/Technician and Bookkeeping	22	14	7	43		6	1		
52.0401	Administrative Assistant and Secretarial Science, General	46	36	41	123	23		18		
52.0407	Business/Office Automation/Technology/Data Entry	2	1	3	6			3		
52.0408	General Office Occupations and Clerical Services	32	30	26	88		26			
52.0801	Finance, General	132	98	118	348				6	112
52.1101	International Business/Trade/Commerce	50	62	83	195				13	70
52.1201	Management Information Systems, General	33	23	17	73					17
52.1401	Marketing/Marketing Management, General	75	87	94	256				12	82
52.1403	International Marketing	9	11	12	32		12			

CIP	DESCRIPTION	BY YEAR				BY SCHOOL				
		2007	2008	2009	3-YEAR TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST COLLEGE	TSTC — HARLINGEN	THE UNIVERSITY OF TEXAS AT BROWNSVILLE	THE UNIVERSITY OF TEXAS-PAN AMERICAN
54.0101	History, General	86	89	113	288	8			36	69
	TOTAL	7,690	8,374	8,355	24,419	2,095	1,087	467	1,149	3,557

SOURCE: National Center for Education Statistics, TIP Strategies

## Appendix I: Texas Higher Education Coordinating Board (THECB) Data

The Texas Higher Education Coordinating Board publishes data on courses offered for credit via the Profile Reports Electronically Prepared, or PREP system. Figure I.1 shows the top 25 CIP codes by number of completions for the LRGV's public schools in selected years as reported on PREP. It includes students taking courses on a credit basis only.

Figure I.2 provides enrollment figures for continuing education, or noncredit courses. Enrollment data are included (rather than completion), since schools are only required to report completions for noncredit courses that exceed 360 contact hours. This threshold would exclude all institutional certificates or marketable skills awards, which by definition cannot exceed 360 contact hours. Because these data are so sparse and because there is no guarantee that individuals who enrolled in a course actually complete it, these data did not figure into the analysis presented in Section 5.

Figure I.1: Top 25 CIP codes as measured by total completions at area colleges last 5 years (*includes students in credit courses only*)

CIP CODE	CURRICULUM AREA	MOST RECENT YEAR (2008-2009 only)					LAST FIVE YEARS (2004-2005 through 2008-2009)						
		SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST	TEXAS STATE T.C. HARLINGEN	U. OF TEXAS AT BROWNSVILLE	U. OF TEXAS-PAN AMERICAN	TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST	TEXAS STATE T.C. HARLINGEN	U. OF TEXAS AT BROWNSVILLE	U. OF TEXAS-PAN AMERICAN	TOTAL
30999901	Interdisciplinary Studies, General				205	392	597	571	85		883	1870	3,409
24010200	General Studies	187	345			45	577	911	1,832			148	2,891
51160100	Nursing - Registered Nurse Training (RN,	181	133		29	83	426	683	471		105	367	1,626
52020100	Business Administration and Management,	63			107	184	354	116			566	855	1,537
52010100	Business/Commerce, General	260	53		3		316	1,123	334		41		1,498
26010100	Biology/Biological Sciences, General	60			75	199	334	281			264	815	1,360
44070100	Social Work		72			117	189	59	480			469	1,008
23010100	English Language and Literature, General	7			37	182	226	28			148	802	978
51161300	Licensed Practical /Vocational Nurse Training	155	44				199	550	293				843
43010300	Criminal Justice/Law Enforcement Administration				46	160	206				228	605	833
16090500	Spanish Language and Literature		22		26	122	170		98		135	528	761
42010100	Psychology, General				53	146	199				247	513	760
31050110	Fitness and Sports				62	99	161				235	492	727

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Figure I.1: Top 25 CIP codes as measured by total completions at area colleges last 5 years (CONTINUED)

CIP CODE	CURRICULUM AREA	MOST RECENT YEAR (2008-2009 only)					LAST FIVE YEARS (2004-2005 through 2008-2009)						
		SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST	TEXAS STATE T.C. HARLINGEN	U. OF TEXAS AT BROWNSVILLE	U. OF TEXAS-PAN AMERICAN	TOTAL	SOUTH TEXAS COLLEGE	TEXAS SOUTHWEST	TEXAS STATE T.C. HARLINGEN	U. OF TEXAS AT BROWNSVILLE	U. OF TEXAS-PAN AMERICAN	TOTAL
13040100	Educational Leadership and Administration				45	110	155				157	536	693
43010400	Criminal Justice/Safety Studies	115	26		3		144	452	176		5		633
52030100	Accounting		13		37	102	152		58		128	402	588
13120200	Elementary Education and Teaching					7	7	519				42	561
52080100	Finance, General				5	110	115				73	455	528
13110100	Counselor Education/School Counseling and				19	94	113				81	421	502
51090400	Emergency Medical Technology/Technician	72	4	7			83	405	56	33			494
45010100	Social Sciences, General	140				25	165	352				122	474
51020400	Audiology/Audiologist and Speech-Language					75	75					474	474
11010100	Computer and Information Sciences, General	59	27		14		100	284	88		71	12	455
19070900	Child Care Provider/Assistant	24	36				60	159	283				442

Source: Texas Higher Education Coordinating Board via the Profile Reports Electronically Prepared (PREP) system



Figure I.2: Noncredit enrollments reported to the Texas Higher Education Coordinating Board by CIP code, school, and year

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
01.01 02	Agribusiness/Agricultural Business Operations							4			4		
01.03 02	Animal/Livestock Husbandry and Production							4			4		
01.09 01	Animal Sciences, General							1			1		
09.01 01	Communication Studies/Speech Communication and Rhetoric		30	35	50	51	45	3	1		53	82	80
10.03 03	Prepress/Desktop Publishing and Digital Imaging Design								1			1	
10.03 04	Animation, Interactive Technology, Video Graphics and Special Effects							2	2		2	2	
11.01 01	Computer and Information Sciences, General	2	6	6	2	5	1	3	4	6	7	15	13
11.03 01	Data Processing and Data Processing Technology/Technician	9	15	12		2	1	10	13	5	19	30	18
11.04 01	Information Science/Studies		2	2						2		2	4
11.05 01	Computer Systems Analyst/Analysis							2			2		
11.08 01	Web Page, Digital/Multimedia and Information Resources Design								4			4	
11.08 02	Data Modeling/Warehousing and Database Administration		1	1				2	4	2	2	5	3
11.10 03	Computer and Information Systems Security								3			3	
11.10 04	Web/Multimedia Management and Webmaster							6	2		6	2	
12.05 01	Baking and Pastry Arts/Baker/Pastry Chef	1	3	4							1	3	4
12.05 04	Restaurant, Culinary, and Catering Management/Manager	7						17	25	27	24	25	27
13.01 01	Education, General				2	7					2	7	

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
13.02 01	Bilingual and Multilingual Education	1	3	6							1	3	6
13.15 01	Teacher Assistant/Aide	55	60	61				1	2	1	56	62	62
15.03 03	Electrical, Electronic & Communications Engrng Technology/Technician					1		2	2	2	2	3	2
15.04 03	Electromechanical Technology/Electromechanical Engrng Technology		1	5				14	10	10	14	11	15
15.05 01	Heating, Air Conditioning and Refrigeration Technology/Technician	10	11	21							10	11	21
15.05 06	Water Quality and WW Treatment Mgmt. & Recycling Technology/Tech							2	1		2	1	
15.05 07	Environmental Engineering Technology/Environmental Technology				1	2	2	1	2	13	2	4	15

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Figure I.2: Noncredit enrollments reported to the Texas Higher Education Coordinating Board by CIP code, school, and year (CONTINUED)

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
15.06 07	Plastics Engineering Technology/Technician	19	18	11				17	2	11	36	20	22
15.06 13	Manufacturing Technology/Technician		1	1				3	2	5	3	3	6
15.07 01	Occupational Safety and Health Technology/Technician	4	20	5		1	2	7	37	53	11	58	60
15.07 02	Quality Control Technology/Technician	4	17	24		2	7		2	2	4	21	33
15.09 03	Petroleum Technology/Technician								1			1	
15.10 01	Construction Engineering Technology/Technician	1	2	2				1			2	2	2

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
15.1103	Hydraulics and Fluid Power Technology/ Technician						1	9	10	13	9	10	14
15.1301	Drafting and Design Technology/Technician, General	1	1	3				4			5	1	3
15.1302	CAD/CADD Drafting and/or Design Technology/Technician							2			2		
15.1306	Mechanical Drafting and Mechanical Drafting CAD/CADD	3	20	22					3		3	23	22
16.0101	Foreign Languages and Literatures, General							5	3	1	5	3	1
16.0905	Spanish Language and Literature		4	7			1	1	2		1	6	8
16.1603	Sign Language Interpretation and Translation							5	3	5	5	3	5
19.0709	Child Care Provider/Assistant	4						2			6		
23.1101	Professional, Technical, Business, and Scientific Writing		1	3	28	31	34	4	1		32	33	37
27.0301	Applied Mathematics	1	7	5				13	3	1	14	10	6
30.1101	Gerontology	5	4	2							5	4	2
31.0501	Health and Physical Education, General							1			1		
43.0107	Criminal Justice/Police Science				38	56	59	33	26	27	71	82	86
43.0201	Fire Protection and Safety Technology/Technician							2	5		2	5	
43.0202	Fire Services Administration							4	1		4	1	
43.0203	Fire Science/Firefighting						3	16	10	14	16	10	17
46.0201	Carpentry/Carpenter							8			8		
46.03	Electrical and Power Transmission Installation/Installer,	25	31	33	1	5		11	16	9	37	52	42

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
01	General												

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Figure I.2: Noncredit enrollments reported to the Texas Higher Education Coordinating Board by CIP code, school, and year (CONTINUED)

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
46.03 02	Electrician			3									3
46.04 03	Building/Home/Construction Inspection/Inspector		6										6
46.05 02	Pipefitting/Pipefitter and Sprinkler Fitter							1					1
46.05 03	Plumbing Technology/Plumber	12	6	11									12 6 11
47.01 03	Communications Systems Installation and Repair Technology							2		2			2 2
47.01 04	Computer Installation and Repair Technology/Technician								1				1
47.01 05	Industrial Electronics Technology/Technician							29	38	22			29 38 22
47.01 06	Appliance Installation and Repair Technology/Technician							2					2
47.02 01	Heating, A/C, Ventilation & Refrig Maintenance Technology/Technician								1				1
47.03 02	Heavy Equipment Maintenance Technology/Technician									1			1
47.06 04	Automobile/Automotive Mechanics Technology/Technician									1			1
47.06 05	Diesel Mechanics Technology/Technician	5	9	18									5 9 18
48.05	Machine Tool Technology/Machinist	1	1	2				21	13	6			22 14 8

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
01													
48.05 07	Tool and Die Technology/Technician		2	1				9	2	4	9	4	5
48.05 08	Welding Technology/Welder	30	86	73				4	8	10	34	94	83
49.02 02	Construction/Heavy Equipment/Earthmoving Equipment Operation		19	8				2			2	19	8
49.02 05	Truck and Bus Driver/Commercial Vehicle Operation	186	149	157				121	116		307	265	157
50.06 02	Cinematography and Film/Video Production								2			2	
50.09 01	Music, General				1						1		
51.00 00	Health Services/Allied Health/Health Sciences, General	1							1		1	1	
51.06 01	Dental Assisting/Assistant							5	14	25	5	14	25
51.06 02	Dental Hygiene/Hygienist							5	2	2	5	2	2
51.07 07	Health Information/Medical Records Technology/Technician							2	2		2	2	
51.07 08	Medical Transcription/Transcriptionist							4			4		

Continued next page

Figure I.2: Noncredit enrollments reported to the Texas Higher Education Coordinating Board by CIP code, school, and year (CONTINUED)

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
51.07 13	Medical Insurance Coding Specialist/Coder	3						2	6		5	6	
51.07 16	Medical Administrative/Executive Assistant and Medical Secretary		1	1								1	1

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
51.0801	Medical/Clinical Assistant	6	8	18							6	8	18
51.0805	Pharmacy Technician/Assistant							5	8			5	8
51.0904	Emergency Medical Technology/Technician (EMT Paramedic)	11	32	42	21	1		95	57	61	127	90	103
51.0909	Surgical Technology/Technologist							3	1		3	1	
51.1009	Phlebotomy/Phlebotomist	6	23	44				4	1	2	10	24	46
51.1504	Community Health Services/Liaison/Counseling	5									5		
51.1614	Licensed Practical/Vocational Nurse Training			2									2
51.2603	Medication Aide	7	10	13				18	10		25	20	13
51.3104	Dietitian Assistant		1	3								1	3
52.0101	Business/Commerce, General				1				1		1	1	
52.0201	Business Administration and Management, General	7	16	22		5	3	2	8	7	9	29	32
52.0204	Office Management and Supervision			1									1
52.0205	Operations Management and Supervision						2						2
52.0302	Accounting Technology/Technician and Bookkeeping							1	4	5	1	4	5
52.0401	Administrative Assistant and Secretarial Science, General	1	4	8			2	1	1	2	2	5	12
52.0407	Business/Office Automation/Technology/Data Entry	3	18	18	1			2	4	4	6	22	22
52.0408	General Office Occupations and Clerical Services	3	1	5						3	3	1	8
52.05	Business/Corporate Communications		5	1				2	4	4	2	9	5

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
01													
52.07 03	Small Business Administration/Management				1							1	
52.08 03	Banking and Financial Support Services								1			1	
52.10 01	Human Resources Management/Personnel Administration, General	8	1	30		2	3	8	1		16	4	33
52.14 01	Marketing/Marketing Management, General								4			4	

Continued next page

Figure I.2: Noncredit enrollments reported to the Texas Higher Education Coordinating Board by CIP code, school, and year (CONTINUED)

CIP Code	Description	SOUTH TEXAS COLLEGE			TEXAS SOUTHMOST COLLEGE			TSTC - HARLINGEN			TOTAL ALL SCHOOLS		
		2007	2008	2009	2007	2008	2009	2007	2008	2009	2007	2008	2009
52.15 01	Real Estate	73	40	8	33	4	7	12	5	2	118	49	17
52.18 01	Sales, Distribution and Marketing Operations, General						2		2			2	2
	<b>TOTAL</b>	<b>520</b>	<b>696</b>	<b>763</b>	<b>180</b>	<b>175</b>	<b>172</b>	<b>579</b>	<b>518</b>	<b>380</b>	<b>1,279</b>	<b>1,389</b>	<b>1,315</b>

Source: Obtained by special request from the Texas Higher Education Coordinating Board

## Appendix J: Selected Entrepreneurship Best Practices

### Kentucky Entrepreneurial Coaches Institute (KECI)

In 2003, the College of Agriculture at the University of Kentucky founded the Kentucky Entrepreneurial Coaches Institute to promote economic diversification in Northeastern Kentucky. Since then, the program has expanded into South Central Kentucky as well. The program trains coaches through an intensive series of seminars and a national education tour. Thirty participants are selected from the pool of applicants to receive a fellowship to attend the institute. These fellowships are funded through the Kentucky Agricultural Development Board. The Entrepreneurial Coaches are volunteers who work with entrepreneurs. Rather than providing technical assistance, they serve as a resource for entrepreneurs, help them assess their businesses, and assist them in finding the technical support that they need. The program was named one of the top programs in the nation by the Small Business Administration.

More information: <http://www.uky.edu/Ag/CLD/KECI/>

### Meet the Lender, City of Austin Small Business Development Program

The City of Austin Small Business Development Program (SBDP) offers innovative tools and services for entrepreneurs to start up or expand their businesses. The SBDP's Meet the Lender™ event matches business owners seeking capital with potential lenders. This year's seventh annual session, held in August 2010, gave more than 600 local entrepreneurs the opportunity to network with lenders and discover loan programs that meet their needs. The program has received a number of awards including Harvard University's Ash Center for Democratic Governance and Innovation (Bright Ideas Program) and the National League of Cities (2009 City Showcase Spotlight). The program was also recognized by the International Economic Development Council as part of the organization's Excellence in Economic Development Awards competition for its cost-effective marketing promotion which advertised the event to 400,000 households via an insert in Austin Energy's utility bill inserts.

More information: [http://www.ci.austin.tx.us/sbdp/downloads/mtl10\\_article.pdf](http://www.ci.austin.tx.us/sbdp/downloads/mtl10_article.pdf)

### Lemonade Day

Lemonade Day is a nation-wide event that teaches kids the skills they need to be successful in the future. Youth of all ages learn to set goals, develop a business plan, establish a budget, seek investors, provide customer service, and give back to the community. Lemonade Day 2011 will be Sunday, May 1, 2011.

More information: <http://www.lemonadeday.org/>



### Central Texas Angel Network (CTAN)

Founded in 2006 under the leadership of local entrepreneur Jamie Rhodes, with support from the Greater Austin Chamber of Commerce, CTAN provides funding from \$200,000 to \$2 million through its network of SEC accredited investors. Each of its investors pay a membership fee to encourage only serious investors to join. The executive director of CTAN carefully screens deals to ensure that high quality, investment-ready deals are presented to the network. In addition, CTAN has created a larger network of other angel investment networks in Texas that it can syndicate its deals to.

More information: [www.centraltexasangelnetwork.com](http://www.centraltexasangelnetwork.com)

### Sam Swope JA BizTown™

This Junior Achievement park in Louisville, Kentucky, is designed to teach upper elementary students the basics of financial literacy and entrepreneurship through a real-world simulation. In BizTown, students create marketing plans, raise capital, and operate businesses selling products to their classmates. The facility hosts up to 12,000 students annually, helping to promote entrepreneurship among youth in the region at a very early age.

More information: [www.jaky.org](http://www.jaky.org)

## Appendix K: California Centers of Excellence

In June 2009, the California Community Colleges system published a comprehensive study of the green economy in the state through its Centers of Excellence (COE) initiative. As part of the study, entitled *Understanding the Green Economy in California: A Community College Perspective*, the COE produced occupational-training crosswalks for several of the state's green economy sectors. Two of these matrices (renewable energy and green building/energy efficiency) are presented here. The original matrices included a concordance with California's Taxonomy of Programs, or TOP classification system. This information was omitted since the TOP is specific to California.

Figure K.1: Crosswalk between Related Green Occupations and College Programs (CIP codes)

Green Economy area/sector	Green Occupations with SOC code (from Green Jobs Framework table)	Related CIP 2000 Code	CIP Program Title
<b>Renewable Energy: Energy Generation, System Installation &amp; Storage</b>	11-1021 General and operations managers	520101	Business/Commerce, General
		520201	Business Administration and Management, General
		520201	Business Administration and Management, General
		521101	International Business/Trade/Commerce
		440401	Public Administration
	11-9041 Engineering managers	140101	Engineering, General
	13-2011.01 Accountants	520301	Accounting
		521601	Taxation
	17-2041 Chemical Engineers	150000	Engineering Technology, General
	17-2051 Civil Engineers	150000	Engineering Technology, General
	17-2071 Electrical engineers	150000	Engineering Technology, General
	17-2072 Electronics engineers	150000	Engineering Technology, General
	17-2081 Environmental engineers	999999	No related CIP
	17-2112 Industrial engineers	999999	No related CIP
	17-2131 Materials engineers	999999	No related CIP
	17-2141 Mechanical engineers	150000	Engineering Technology, General
	17-3024 Electro-mechanical technicians	159999	Engineering Technologies/Technicians, Other
		159999	Engineering Technologies/Technicians, Other
	17-3025 Environmental engineering technicians	999999	No related CIP

Green Economy area/sector	Green Occupations with SOC code (from Green Jobs Framework table)	Related CIP 2000 Code	CIP Program Title
	17-3027 Mechanical engineering technicians	150805	Mechanical Engineering/Mechanical Technology/Technician
	17-3029 Engineering technicians, except drafters, all other	150304	Laser and Optical Technology/Technician
		159999	Engineering Technologies/Technicians, Other
		150503	Energy Management and Systems Technology/Technician
		150607	Plastics Engineering Technology/Technician
		150304	Laser and Optical Technology/Technician
		159999	Engineering Technologies/Technicians, Other
	19-2042 Geoscientists	999999	No related CIP identified
	41-4011 Sales representatives, wholesale and manufacturing, technical and scientific products	521804	Selling Skills and Sales Operations
	41-9031 Sales engineers	521804	Selling Skills and Sales Operations
	41-9041 Telemarketers	999999	No related CIP
	47-2152 Plumbers, pipefitters, and steamfitters	460503	Plumbing Technology/Plumber
	47-2181 Roofers	460410	Roofer
	47-3015 Helpers-pipelayers, plumbers, pipefitters, and steamfitters	460503	Plumbing Technology/Plumber
	49-2095 Electrical and electronics repairers, powerhouse substation and relay	460301	Electrical and Power Transmission Installation/Installer, General
	49-9012 Control and valve installers and repairers, except mechanical door	999999	No related CIP
	49-9021 Heating, A/C, and refrig. mechanics & installers	150501	Heating, Air Conditioning and Refrigeration Technology/Technician (ACH/ACR/ACHR/HRAC/HVAC/AC Technology)
	49-9041 Industrial machinery mechanics (hydroelectric)	480501	Machine Tool Technology/Machinist

Green Economy area/sector	Green Occupations with SOC code (from Green Jobs Framework table)	Related CIP 2000 Code	CIP Program Title
	49-9042 Maintenance and repair workers, general	460412	Building/Construction Site Management/Manager
	49-9043 Maintenance workers, machinery	480501	Machine Tool Technology/Machinist
	49-9051 Electrical power-line installers and repairers	460301	Electrical and Power Transmission Installation/Installer, General
	49-9098 Helpers-installation, mainten. & repair workers	999999	No related CIP
	51-2022 Electrical and electronic equipment assemblers	470105	Industrial Electronics Technology/Technician
		470103	Communications Syst. Installation and Repair Technology
	51-2023 Electromechanical equipment assemblers	150403	Electromechanical Technology/Electromech. Engineering Tech
	51-2031 Engine and other machine assemblers	470302	Heavy Equipment Maintenance Technology/Technician
	51-2091 Fiberglass laminators and fabricators	999999	No related CIP
	51-2092 Team assemblers	999999	No related CIP
	51-4041 Machinists	480501	Machine Tool Technology/Machinist
	51-8012 Power distributors	999999	No related CIP
	51-8013 Power plant operators	999999	No related CIP
	51-8021 Stationary engineers and boiler operators	999999	No related CIP
	51-9061 Inspectors, testers, sorters and weighers	150702	Quality Control Technology/Technician

NOTE: Many of the listed TOP Codes for management occupations exclude their functional area of expertise (e.g. Carpentry, Engineering, etc.). CIP codes listed as 999999 may exist, but were not in the existing CCCC/LMID crosswalk referenced in the full Center of Excellence Report.

Figure K.2: Crosswalk between Related Green Occupations and College Programs (CIP codes)

Green Economy area/sector	Green Occupations with SOC code (from Green Jobs Framework table)	Related CIP 2000 Code	CIP Program Title
<b>Green Building and Energy Efficiency</b>	11-9021 Construction managers	520201	Business Administration and Management, General
		520101	Business/Commerce, General
		520201	Business Administration and Management, General
	13-1051 Cost estimators	520101	Business/Commerce, General
		520201	Business Administration and Management, General
		520201	Business Administration and Management, General
	17-1011 Architects, except landscape and naval	049999	Architecture and Related Services, Other
	17-1012 Landscape architects	040601	Landscape Architecture
	17-2051 Civil Engineers	150000	Engineering Technology, General
	17-2071 Electrical engineers	150000	Engineering Technology, General
	17-2112 Industrial engineers	999999	No related CIP
	17-2131 Materials engineers	999999	No related CIP
	17-2141 Mechanical engineers	150000	Engineering Technology, General
	17-2151 Mining & geological engineers, incl. mining safety engineer	999999	No related CIP
	17-3011.01 Architectural & civil drafters	040901	Architectural Technology/Technician
		151301	Drafting and Design Technology/Technician, General
		151303	Architectural Drafting and Architectural CAD/CADD
		151304	Civil Drafting and Civil Engineering CAD/CADD
	17-3012 Electrical drafters	151305	Electrical/Electronics Drafting and Electrical/Electronics CAD/CADD
	17-3023 Electrical & electronics engineering technicians	470101	Electrical/Electronics Equipment Installation and Repair, General
	17-3024 Electro-mechanical technicians	159999	Engineering Technologies/Technicians, Other
		159999	Engineering Technologies/Technicians, Other

Green Economy area/sector	Green Occupations with SOC code (from Green Jobs Framework table)	Related CIP 2000 Code	CIP Program Title
	17-3027 Mechanical engineering technicians	150805	Mechanical Engineering/Mechanical Technology/Technician
	17-3029 Engineering technicians, except drafters, all other	150304	Laser and Optical Technology/Technician
		159999	Engineering Technologies/Technicians, Other
		150503	Energy Management and Systems Technology/Technician
		150607	Plastics Engineering Technology/Technician
		150304	Laser and Optical Technology/Technician
		159999	Engineering Technologies/Technicians, Other
	27-1025 Interior designers	500408	Interior Design
	41-4011 Sales representatives, wholesale and manufacturing, technical and scientific products	521804	Selling Skills and Sales Operations
	41-9031 Sales engineers	521804	Selling Skills and Sales Operations
	47-1011 First-line supervisors/managers of construction trades and extraction workers	460301	Electrical and Power Transmission Installation/Installer, General
		460201	Carpentry/Carpenter
		460302	Electrician
		460503	Plumbing Technology/Plumber
		460406	Glazier
		460101	Mason/Masonry
		460408	Painting/Painter and Wall Coverer
		460404	Drywall Installation/Drywaller
		460410	Rofer
		460412	Building/Construction Site Management/Manager
		460403	Building/Home/Construction Inspection/Inspector
		469999	Construction Trades, Other
		47-2031 Construction carpenters	460201
	47-2051 Cement masons and concrete finishers	460101	Mason/Masonry

Green Economy area/sector	Green Occupations with SOC code (from Green Jobs Framework table)	Related CIP 2000 Code	CIP Program Title
	47-2111 Electricians	460302	Electrician
	47-2121 Glaziers	460406	Glazier
	47-2131 Insulation workers, floor, ceiling and wall	469999	Construction Trades, Other
	47-2152 Plumbers, pipefitters, and steamfitters	460503	Plumbing Technology/Plumber
	47-2181 Roofers	460410	Roofer
	47-3012 Helpers-carpenters	460201	Carpentry/Carpenter
	47-3013 Helpers-electricians	460302	Electrician
	47-3015 Helpers-pipelayers, plumbers, pipefitters,...	460503	Plumbing Technology/Plumber
	47-4011 Construction and building inspectors	460403	Building/Home/Construction Inspection/Inspector
	49-9021 Heating, A/C, and refrig. mechanics & installers	150501	Heating, Air Conditioning and Refrigeration Technology/Technician (ACH/ACR/ACHR/HRAC/HVAC/AC Technology)
	49-9042 Maintenance and repair workers, general	460412	Building/Construction Site Management/Manager
	51-2041 Structural metal fabricators and fitters	480506	Sheet Metal Technology/Sheetworking
	51-4121 Welders, cutters, solderers, and brazers	480508	Welding Technology/Welder

NOTE: Many of the listed TOP Codes for management occupations exclude their functional area of expertise (e.g. Carpentry, Engineering, etc.). CIP codes listed as 999999 may exist, but were not in the existing CCCC/LMID crosswalk referenced in the full Center of Excellence Report.