ECONOMIC DEVELOPMENT

Findings Summary

ECONOMIC PERFORMANCE & EMPLOYMENT

- The region experienced economic losses during the recent recession, but the impact was not as severe as that in many other regions.
- During the past decade, employment in the region significantly outperformed that of Tennessee and the nation.
- Average employment rates in the PlanET region have remained relatively strong compared to those of Tennessee and the U.S., but the region's workers with lower levels of education are experiencing much higher levels of unemployment.
- Knox County is an important job center and provides a large source of workers for jobs in surrounding counties.

WORKER CHARACTERISTICS

- Much like the region's employment base, the PlanET region's labor force has continued to grow over the past decade.
- The region's working age population is slightly older than that of Tennessee and the nation.
- The region's working age population is better educated than that of Tennessee as a whole, due in part to high numbers of persons with advanced degrees working for major technological and institutional employers.

INDUSTRY STRUCTURE

- The majority of the region's establishments are small businesses.
- The region's major employers are concentrated in the government, education, health services, and retail sectors.
- The trade, transportation, and utilities and manufacturing sectors experienced the most job losses during the recession.
- The addition of more than 16,000 jobs in health care, education, and professional and business services offset many losses in other sectors.
- Although not an independent industry sector, tourism and hospitality services in the region generate over $1 billion in expenditures and more than $100 million in tax receipts.
- Receipts from agricultural production have increased slightly since 2009, but agricultural employment is less concentrated in the region than in the United States overall.

RESEARCH & DEVELOPMENT

- UT and ORNL are major employers but also attract federal and industry investment to the region.
- Continued growth in research and development may be affected by reductions in government spending.

INDUSTRY CLUSTERS & ECONOMIC DEVELOPMENT POTENTIAL

- Four "value chain" industry clusters have developed a critical mass of employment in the region: financial services and insurance; non-durable industrial machinery; rubber and related products and aluminum and aluminum products; and machine tools.
- Two emerging clusters, information services and plastics manufacturing, are growing more concentrated in the region and are projected to add more jobs over the next five years.
- Two potential clusters, non-residential building products and optical equipment and instruments, are developing and could become a significant component of the region's employment base.
- Although technically not an industry cluster, the Oak Ridge complex represents a critical concentration of economic activity in the region.

OCCUPATIONAL GROWTH & SKILL REQUIREMENTS

- Occupations requiring only on-the-job training or a high-school diploma account for more than half of the region's jobs.
- The region has a larger share of middle-skill jobs than the state or nation.
- The PlanET region has a larger proportion of higher-skill jobs than Tennessee as a whole, but it lags behind the national average.
- Employment growth is projected for all but two of the region's major occupational groups.
- Many of the occupations projected to have the highest rates of growth within the region are relatively low-skill jobs.
- Low-skill jobs represent the largest share of the occupations projected to lose employment over the next five years.
- Nine of the region's 20 fastest-declining occupations over the next five years are production-related occupations tied directly to job losses in manufacturing.
- Technical skill requirements are becoming more important for many middle-skill jobs.
- Science, technology, engineering, and math training and continuing education are becoming increasingly important for the region's high-skill jobs.

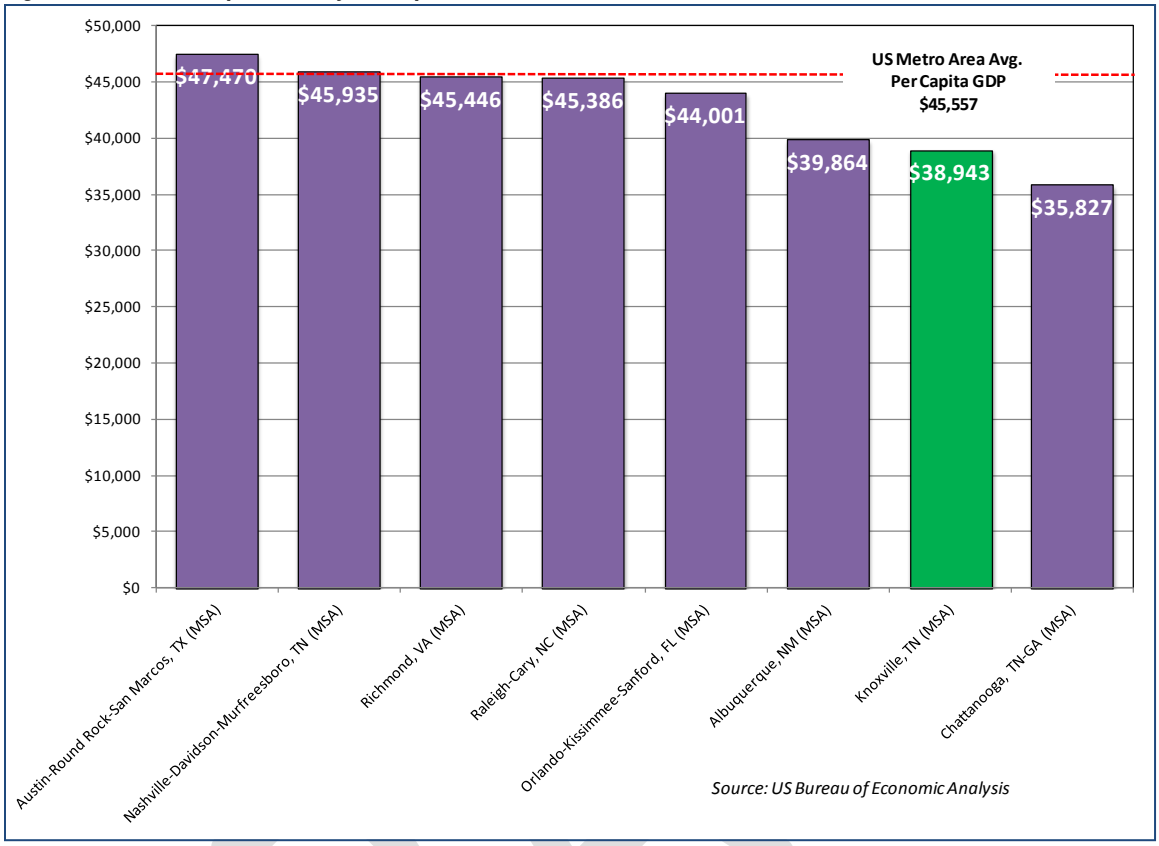
The PlanET regional economy, like others around the country, has undergone a significant transformation during the past decade. However, structural shifts within many industries left some firms and workers unprepared for the rapid changes that occurred in the economy. The region saw a major decline in its manufacturing/production jobs between 2001 and 2011 and the loss of retail/trade jobs during the Great Recession of 2008 – 2009. Despite these losses, the regional economy was able to weather challenging conditions based on the strength of two key government institutions, the University of Tennessee and the Y-12 National Security Complex/Oak Ridge National Laboratory; a large concentration of high-skill workers; and a growing need for services. Future employment projections for the region are positive, and several key industry clusters appear to be emerging. The region, however, faces major challenges due to its aging workforce, high numbers of workers with lower skill levels, and potential cuts in federal and state technology funding that could impact its ability to attract and support new businesses.

Key Findings

ECONOMIC PERFORMANCE & EMPLOYMENT

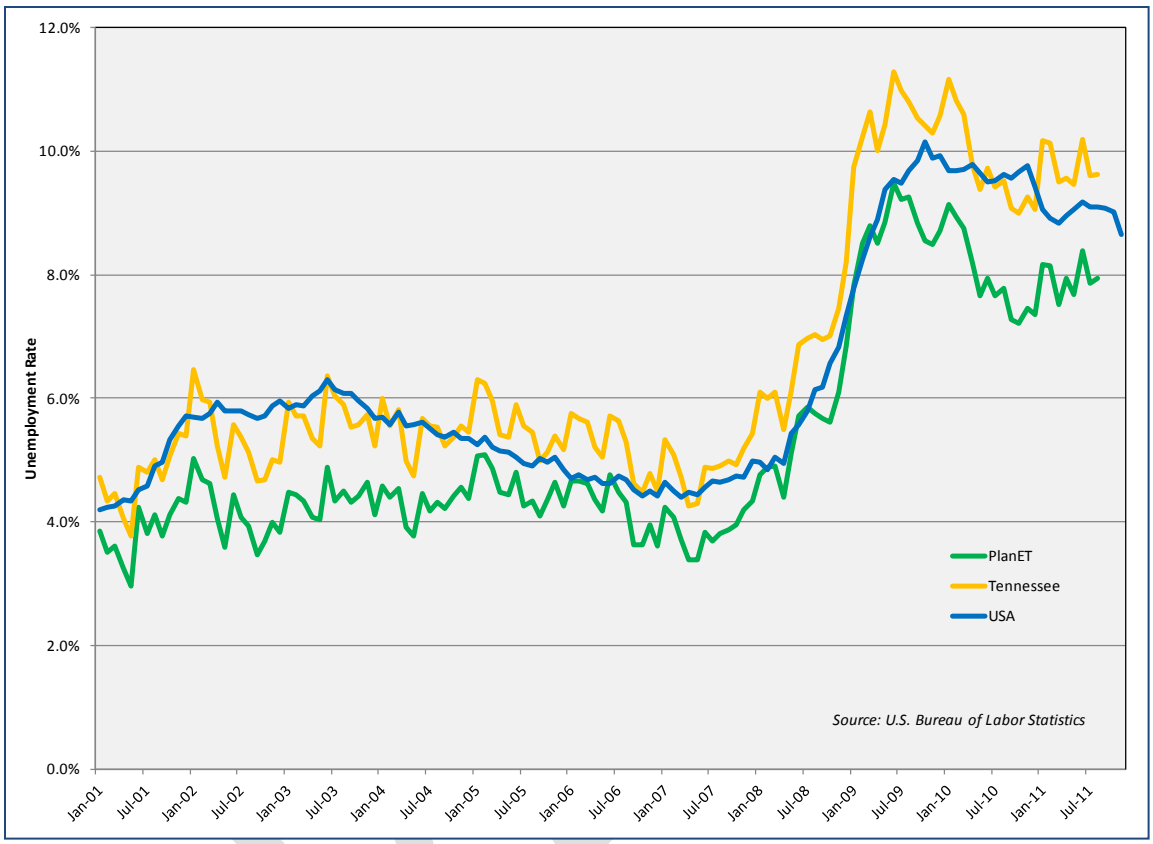
- **The region experienced economic losses during the recent recession, but the impact was not as severe as that in many other regions.** In 2010, the gross domestic product (GDP) of the Knoxville MSA totaled $29.8 billion, making it the 71st-largest U.S. metropolitan area in terms of total economic output. Like the rest of the nation, the regional economy has begun growing again, but it has not yet recovered to its 2008 level (in constant dollars). When benchmarked to several other metropolitan areas (see Figure 3), the regional economy performs modestly well. In 2010, per capita GDP was well below the national average for metropolitan areas and below six of seven rival metropolitan areas, with only Chattanooga performing more poorly.

Figure 3: 2010 Per Capita GDP by Metropolitan Area



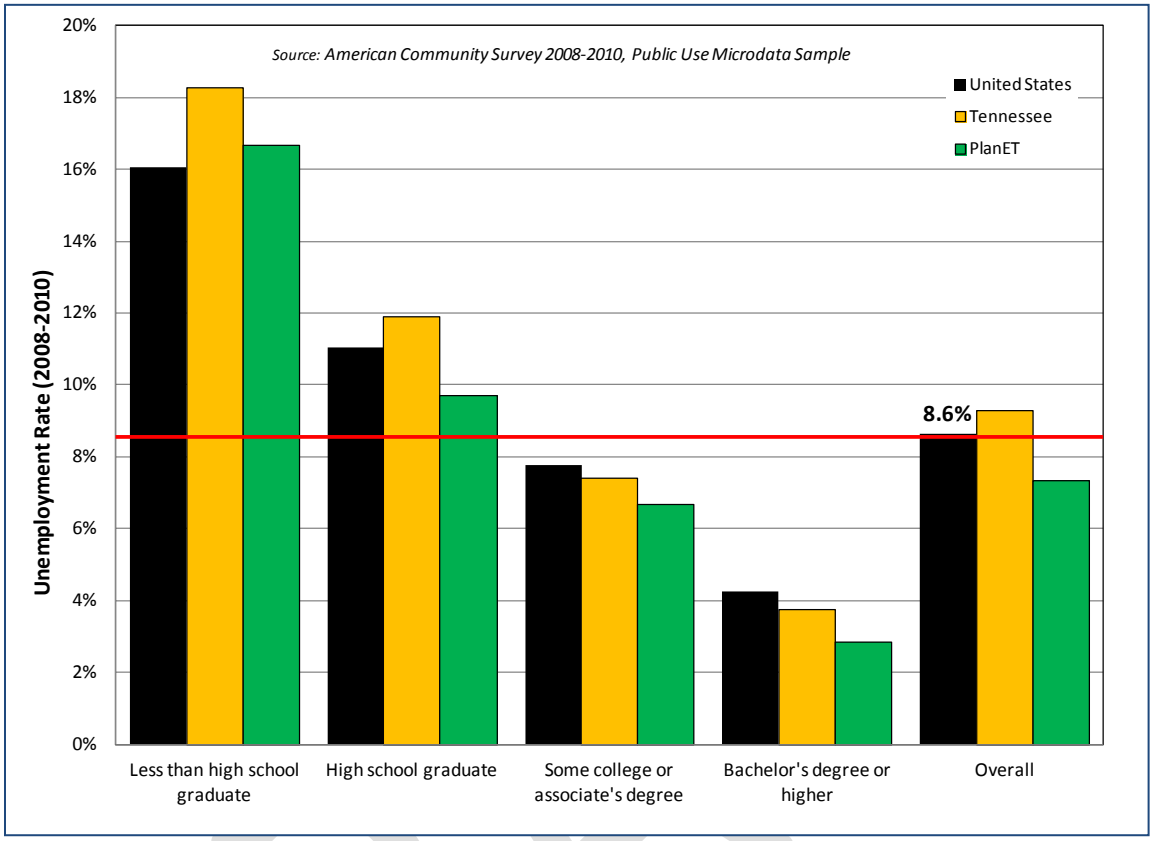
- **During the past decade, employment in the region significantly outperformed that of Tennessee and the nation.** Although the region's economy lagged coming out of the 2001 recession, it has continued to hold more jobs than it had at the start of the decade. In early 2010, employment in the PlanET region once again began to grow. Since May 2011, employment levels have exceeded 370,000 jobs and as a result have surpassed the peak employment levels seen in mid-2007. By contrast, employment gains made in Tennessee as a whole between 2005 and 2008 were largely wiped away by the recent recession. In January 2011 employment levels in Tennessee were close to the same level as those in 2001 (see Figure 4).

Figure 4: Unemployment Rates in the PlanET Region, Tennessee, & the United States, January 2001 –July 2011



- **Average employment rates in the PlanET region have remained relatively strong compared to those of Tennessee and the U.S., but the region's workers with lower levels of education are experiencing much higher levels of unemployment.** Between 2008 and 2010, the average national unemployment rate was 8.6 percent. During the same period, Tennessee's average unemployment rate was slightly higher, but the PlanET region's rate was more than a full point lower than the national average (7.3 percent). However, for people with at least a four-year college degree the unemployment rate was very low: just over half as much as the overall average rate. Conversely, the unemployment rate for people lacking a high school degree was double the regional unemployment rate (see Figure 5).

Figure 5: Unemployment Rates by Level of Educational Attainment (2008-2010 3-Year Average)



- **Knox County is an important job center and provides a large source of workers for jobs in surrounding counties.** In August 2011, Knox County accounted for 221,560 jobs, or 59.5 percent of the region's total employment. According to the U.S. Census Bureau's Local Employment Dynamics (LED), 212,444 people worked their primary job in Knox County. Over half of these people (54.5 percent) also lived in Knox County, but over 24,000 workers commuted in from Blount and Anderson counties. A large number of workers, however, commuted in the opposite direction: thirty percent of Anderson County's workforce and twenty percent of Blount County's workforce lived in Knox County. These commuter flows help bind the five-county region together as a natural economic region.

WORKER CHARACTERISTICS

- **Much like the region's employment base, the PlanET region's labor force has continued to grow over the past decade.** According to the Tennessee Department of Labor and Workforce Development, the region's labor force had 404,500 workers in August 2011. This represents a 16 percent gain, or almost 56,000 more workers, between the beginning of 2001 and August 2011. By comparison, Tennessee's labor

force grew by nine percent during the same period, and the U.S. labor force only by seven percent.

- **The region's working age population is slightly older than that of Tennessee and the nation.** Individuals aged 55 to 64—the generation expected to retire over the next decade—account for 20.4 percent of the region's working age population. This proportion was slightly smaller for the state as a whole (19.2 percent), and smaller still nationwide (18.4 percent). When this age demographic is expanded to include all people in the region aged 40 to 64, the proportion expands to more than half (54.4 percent) of the region's total working age population. Once again this slightly exceeds that of both the state (53.4 percent) and the nation (52.6 percent). The aging of the region's workforce is an issue that will require some attention because as the Baby Boomer generation retires over the next decade, there will be a need to ensure that their skills are not lost.

- **The region's working age population is better educated than that of Tennessee as a whole, due in part to high numbers of persons with advanced degrees working for major technological and institutional employers.** According to estimates from the American Community Survey (2008 – 2010), approximately 26 percent of the region's working age population had at least a four-year college degree. This was similar to the national average of 27 percent, but higher than that of Tennessee as a whole (see Table 39). That the PlanET region would only have an educational attainment level resembling the national average is somewhat surprising. The University of Tennessee and the Oak Ridge complex employ large numbers of people with advanced degrees. This illustrates that without UT and Oak Ridge the region's levels of educational attainment would more likely resemble Tennessee's below-average levels.

Table 39: Educational Attainment of the Region's Working Age Population (2008 – 2010 3-Year Average)

Highest Level of Education	% of PlanET Regional Population	% of Tennessee Population	% of United States Population
Post-Graduate	8.5	7.1	9.1
4-Year Degree or Equivalent	17.3	14.9	17.5
2-Year Degree or Equivalent	6.9	6.3	7.8
Some College; No Degree	18.1	17.7	17.8
High-School Diploma or Equivalent	39.4	41.7	36.2
Less than Grade 12	9.8	12.3	11.6

Source: U.S. Census Bureau, American Community Survey 3-Year Estimates (2008 – 2010)

INDUSTRY STRUCTURE

- **The majority of the region's establishments are small businesses.** In 2009, 69 percent of the PlanET region's businesses employed fewer than ten people. These figures are generally in line with Tennessee (70.1 percent) and somewhat lower than the nation (73.5 percent). While the PlanET region has relatively fewer businesses with less than ten employees, at 28.3 percent, it has somewhat more "second stage companies" (those with ten to 100 employees).

- **The region's major employers are concentrated in the government, education, health services, and retail sectors.** Five regional entities employ over 5,000 workers each, and the region's largest employer by far is the U.S. Department of Energy's Oak Ridge complex (see Table 40). These five employers, which provided over ten percent of the region's jobs in 2010, are units of government, public education bodies, and a health-care provider. Other large employers included regional and national chain retailers, manufacturers, and restaurant chains.

Table 40: Major Regional Employers, 2010

Company	Employment	Activity
U.S. Department of Energy—Oak Ridge Operations	13,925	Government
University of Tennessee	9.326	Education
Covenant Health	9,000	Health Services
Knox County Schools	6,945	Education
Mercy Health Partners	5,700	Health Services
Wal-Mart Stores	4,336	Retail
K-VA-T Food Stores	3,983	Retail
University Health System	3,802	Health Services
State of Tennessee	3,750	Government
McGhee-Tyson Air National Guard Base	3,493	Military
Knox County Government	3,037	Government
Denso Manufacturing	2,700	Manufacturing
Kroger Co.	2,544	Retail
Clayton Homes	2,542	Manufacturing/Corporate

		Headquarters
Blount Memorial Hospital	2,256	Health Services
McDonald's	1,870	Restaurants
East Tennessee Children's Hospital	1,834	Health Services
Yum! Brands	1,771	Restaurants
U.S. Postal Service	1,747	Government
Blount County Government	1,662	Government
Cracker Barrel	1,547	Restaurants
Blount County Schools	1,500	Education
City of Knoxville	1,492	Government
United Parcel Service (UPS)	1,474	Distribution
Tennessee Valley Authority (TVA)	1,290	Utilities & Development Authority

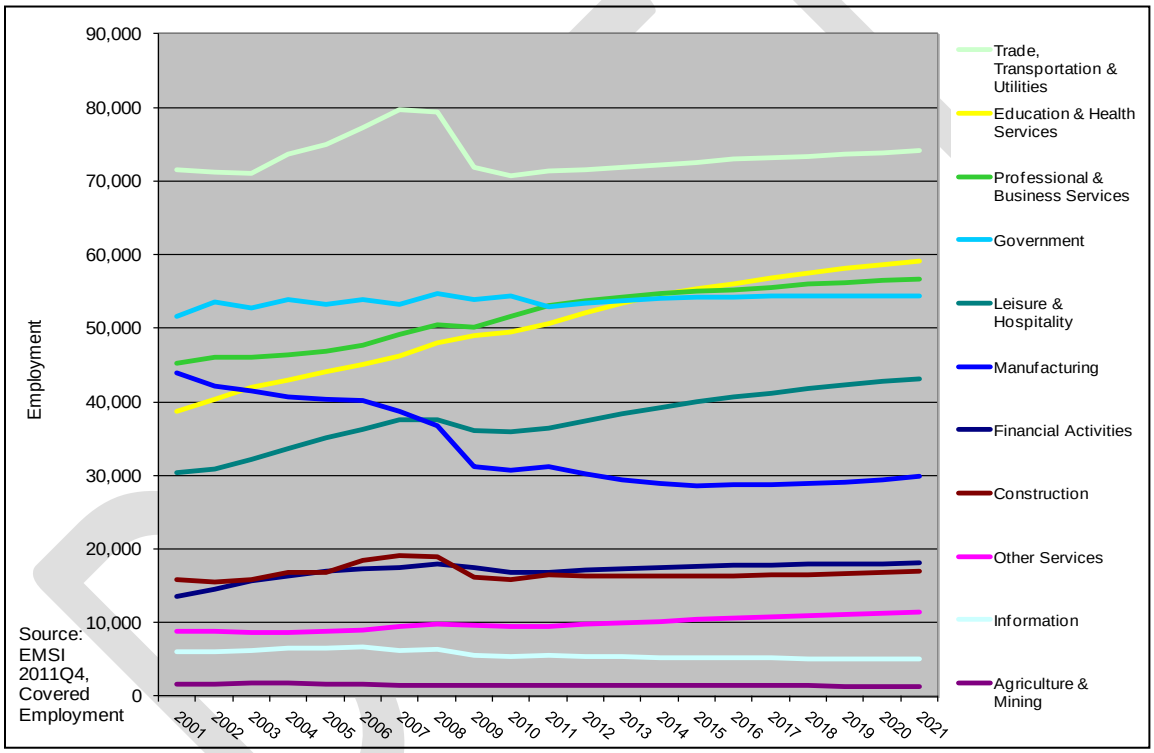
Source: Innovation Valley (2011)

- **The trade, transportation, and utilities and manufacturing sectors experienced the most job losses during the recession.** Trade, transportation and utilities (including retail) makes up the region's largest industry sector and accounts for more than one in five jobs in the region today. However, this sector suffered significant losses during the recent recession because it relies heavily on direct consumer spending and/or industries serving the consumer segments of the economy. Current regional employment levels in this sector are well below pre-recession peak levels. Manufacturing accounts for nine percent of the region's employment, down from over 13 percent in 2001. As with trade, transportation, and utilities, the reduction of consumer spending accelerated job losses in this sector, but manufacturing employment also declined due to greater outsourcing of jobs and investments in automation that have decreased the demand for labor. Boat manufacturing was the hardest-hit industry in the region during the recession: this industry lost almost 1,900 jobs between 2006 and 2011, which equaled 21 percent of the region's net manufacturing job loss during this time.

- **The addition of more than 16,000 jobs in health care, education, and professional and business services offset many losses in other sectors.** The education and health services "supersector" has added nearly 12,000 net new jobs in the region over the past decade (see Figure 6). This is not necessarily surprising given that the University of Tennessee is one of the region's main economic drivers and represents a significant portion of the region's education employment (9,800 faculty and staff). Employment growth also has been driven by the growing demand for health care. This

demand is largely due to the aging of the Baby Boomer generation and the growing number of retirees attracted to the region. As a result, health care-related industries such as hospitals, doctor's offices, care for the elderly and disabled, and home health care added over 3,600 jobs between 2006 and 2011 and were some of the region's fastest-growing industries. Professional and business services also experienced significant gains over the past decade, and are expected to drive future growth. For instance, professional and business services such as research and design (R&D) in the physical, engineering, and life sciences; other scientific and technical consulting services; and computer systems design combined to add over 2,800 net new jobs between 2006 and 2011. These knowledge-intensive industries have been able to grow in part because the region has major economic development assets such as the University of Tennessee and Oak Ridge National Laboratory.

Figure 6: Regional Employment Trends and Projections by Supersector, 2001- 2021



- **Although not an independent industry sector, tourism and hospitality services in the region generate over $1 billion in expenditures and more than $100 million in tax receipts.** The PlanET region attracts thousands of tourists each year, and these tourists spend money on accommodations, food, recreation, and other travel-related items. The Tennessee Department of Tourist Development estimated that in 2010, tourists spent more than $1.2 billion in the region, and the majority of these expenditures were in Knox County (see Table 41). These expenditures also brought more than $67 million in state tax receipts and nearly $34 million in local tax receipts.

Table 41: Tourist Expenditures, 2010

	Tourist Expenditures ($ millions)	Employment	State Tax Receipts ($ millions)	Local Tax Receipts ($ millions)
Anderson County	104.80	950	6.39	2.29
Blount County	271.11	2,810	15.05	9.46
Knox County	812.39	9,420	42.94	19.80
Loudon County	45.50	390	2.75	1.17
Union County	6.03	30	0.34	0.91
PlanET Region Total	1,239.83	13,600	67.47	33.63

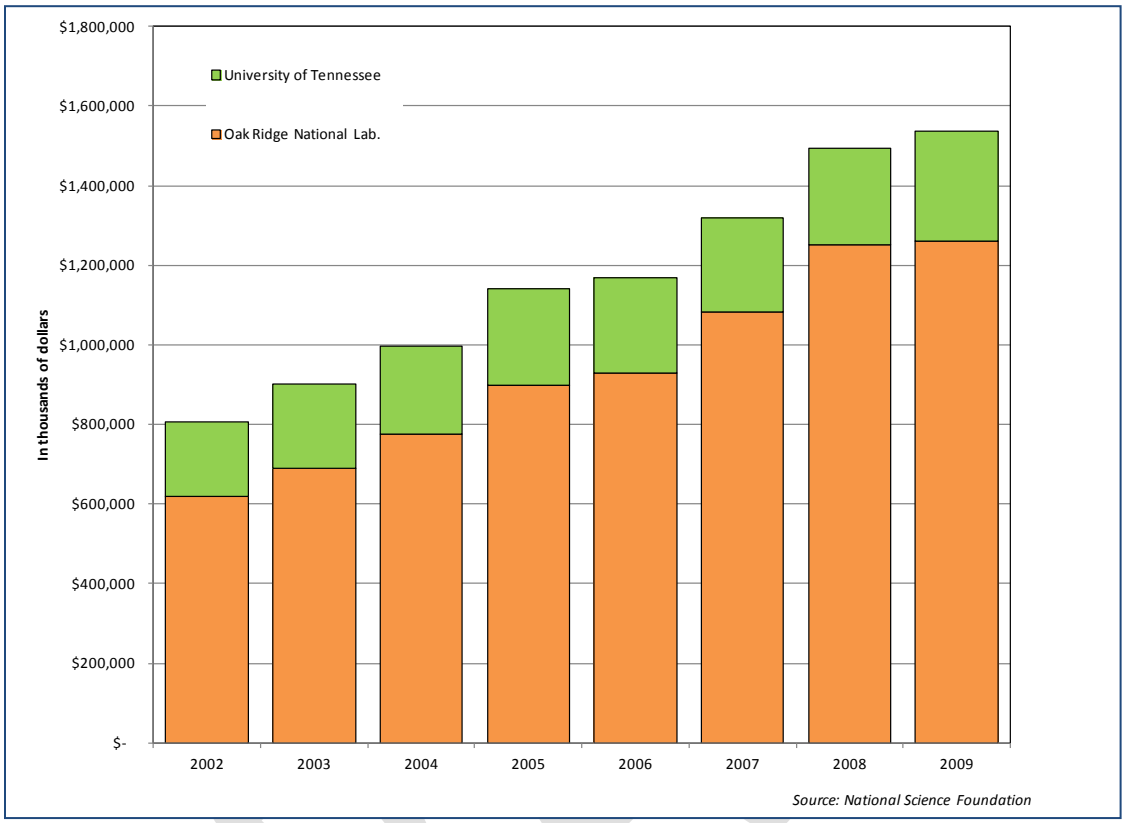
Source: Tennessee Department of Tourist Development, The Economic Impact of Travel on Tennessee Counties, 2010

- **Receipts from agricultural production have increased slightly since 2009, but agricultural employment is less concentrated in the region than in the United States overall.** The U.S. Bureau of Economic Analysis reports that agricultural receipts/income totaled about $122 million for the region in 2009. This was a modest increase since 2000, and agricultural growth in the region is not close to keeping pace with agricultural growth in Tennessee or the nation. Regional employment in crop and animal production was around 750 in 2011, which was much less concentrated than in the region than in the United States overall.

RESEARCH & DEVELOPMENT

- **UT and ORNL are major employers but also attract federal and industry investment to the region.** UT and ORNL are critical to the region's economy not only as employers, but as technological leaders that attract new investment to the region. Research and development investments at these facilities not only stimulate technology development and commercialization, but also promote technology-based businesses that generate high-quality jobs in the region. In 2009, UT and ORNL had $1.54 billion in R&D expenditures, an amount that has increased significantly over the past decade (see Figure 7). R&D expenditures at Oak Ridge National Laboratory have almost doubled since 2002, growing from $620 million in 2002 to almost $1.3 billion in 2009 (a growth rate more than twice the national rate of five percent). In addition to its role as a major contractor at ORNL, UT has also experienced dramatic growth in R&D funding. R&D expenditures at UT have increased from approximately $188 million in 2002 to $278 million in 2009. Between these two major institutions, total R&D expenditures represented more than five percent of the PlanET regional GDP in 2009.

Figure 7: Total R&D Expenditures at UT and ORNL, 2002 – 2009



- **Continued growth in research and development may be affected by reductions in government spending.** As federal budgets begin to tighten, Oak Ridge National Lab will likely feel the strain. For instance, President Obama's FY 2012 budget proposed a $63 million reduction in the lab budget and a reallocation of funding toward other activities at Oak Ridge. Reductions in R&D expenditures may impact attracting technology-oriented companies to the region and the ability of the region to weather poor economic performance in other sectors of the regional economy.

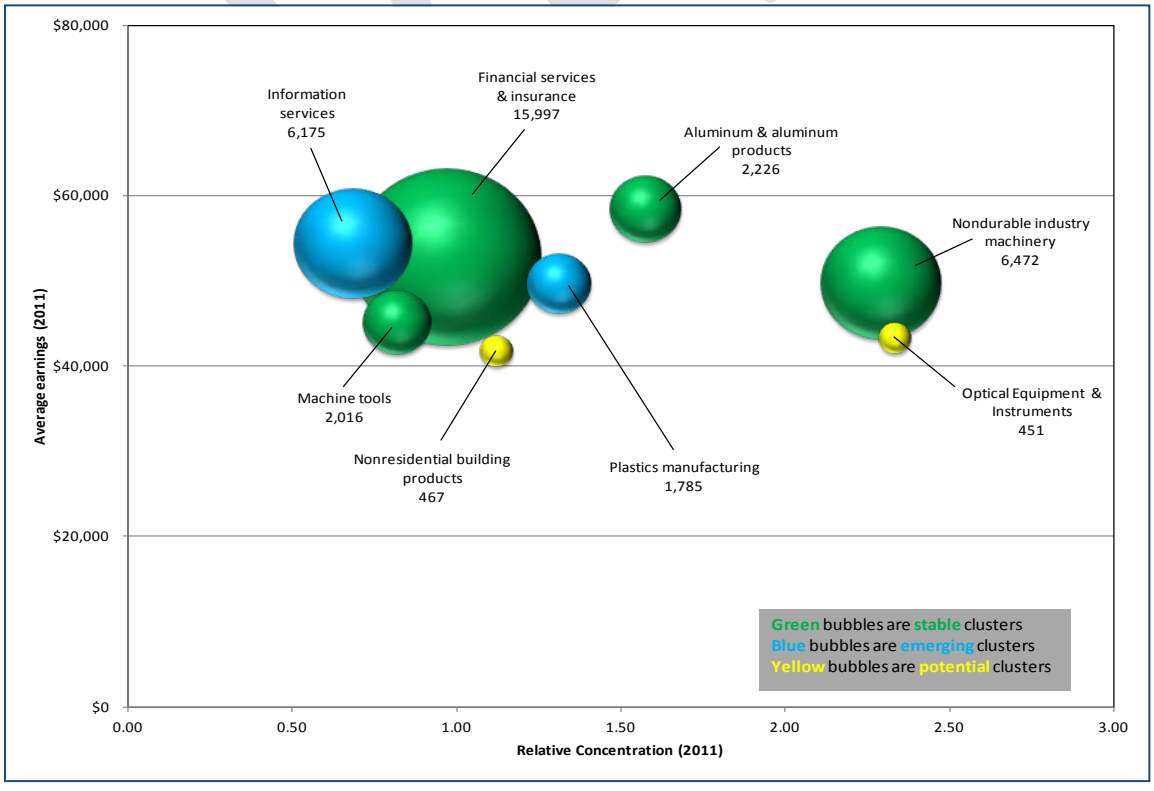
INDUSTRY CLUSTERS & ECONOMIC DEVELOPMENT POTENTIAL

- **Four "value chain" industry clusters have developed a critical mass of employment in the region: financial services and insurance; non-durable industrial machinery; rubber and related products and aluminum and aluminum products; and machine tools.** Economic potential for the region also can be analyzed by examining how industries interact with other industries. "Value chains" describe which industries purchase from which other industries. Focus on buying and selling relationships can help to narrow policy makers' attentions to a few key "driver industries" that represent the core to important industry clusters. Thus, small impacts on these driver industries potentially could have huge multiplier impacts across the entire economy.

Four "value chain" industries can be described as stable in the PlanET region, which means that they have a critical mass of workers and generally are more concentrated in the region than in other parts of the nation (see Figure 8). These "stable" regional clusters include financial services and insurance; non-durable industrial machinery; rubber and related products, aluminum and aluminum products; and machine tools. They are important as an emphasis for business retention and expansion efforts to ensure that area firms are able to continue innovating and growing.

- **Two emerging clusters, information services and plastics manufacturing, are growing more concentrated in the region and are projected to continue adding more jobs over the next five years.** Many of the information services jobs are found in industries such as wired telecommunications, computer systems design, and custom computer programming, and this cluster within the region grew at more than twice the national rate between 2006 and 2011. The region's plastics manufacturing "value chain" also showed strong growth during this time, and continued growth is projected. This is the reverse of the national trend for this cluster, which signals that it may be a growing source of competitive advantage for the region. Even though these two emerging clusters appear to be growing more rapidly within the PlanET region than in other parts of the country, they rely on only a few companies for their strength so "cluster-filling" activities may be in order. This might include recruiting new companies in related information services and plastics manufacturing industries to help expand the diversity of those clusters.

Figure 8: Significant Value-Chain Clusters in the PlanET Region, 2011



- **Two potential clusters, non-residential building products and optical equipment and instruments, are developing and could become a significant component of the region's employment base.** Potential clusters are unique sets of companies, typically relatively small, which could eventually become successful growth clusters for the region given the right economic environment and appropriate support. The region contains two potential clusters: non-residential building products and optical equipment and instruments. The non-residential building products cluster currently accounts for about 470 jobs in the region, largely in concrete manufacturing. While overall employment in this cluster is expected to decline due to continued challenges facing the residential housing market, growth in the region is projected at a rate of four percent annually over the next five years. This means that the regional cluster will become relatively more concentrated over time. The optical equipment and instruments cluster, although currently small, is expected to continue growing within the region. Regional jobs in this industry today exist not in optics *per se*, but in ancillary industries such as cutlery and flatware and pen and mechanical pencil manufacturing. Companies in these potential clusters need to be nurtured and additional efforts may be needed to promote entrepreneurial individuals or business managers in these industries.

- **Although technically not an industry cluster, the Oak Ridge complex represents a critical concentration of economic activity in the region.** The Oak Ridge National Lab, operated by UT-Battelle, represents one important element, employing some 4,600 workers with a budget estimated at $1.65 billion supporting myriad research activities in energy, biological and environment research, scientific computing, and security. In addition, ORNL is also involved in weapons and nuclear nonproliferation and cleanup research activities. The cluster also includes the Y-12 National Security complex, operated by B&W Technical Services. With a $983 million budget, another 4,600 workers are employed at that site.

OCCUPATIONAL GROWTH & SKILL REQUIREMENTS

- **Occupations requiring only on-the-job training or a high-school diploma account for more than half of the region's jobs.** Occupations that require no high-school diploma (*i.e.*, jobs requiring short-term on-the-job training) currently constitute one-third of the region's jobs. These jobs tend to be relatively low-paying, with average earnings around $23,000 per year. When combined with jobs in the region requiring a minimum of a high-school degree, this low-skill category accounted for more than half (57.5 percent) of all the region's jobs. (By comparison, this percentage was 59.5 percent in Tennessee and 55.7 percent in the nation.) Between 2011 and 2016, nearly half of the newly created jobs (49.4 percent) will be in low-skill occupations that require only a high school diploma or no minimum education at all.

- **The region has a larger share of middle-skill jobs than the state or nation.** Jobs typically considered 'middle skill' jobs—those requiring a high-school diploma and some experience, or some post-secondary education—represent a somewhat greater proportion of jobs in the PlanET region (23.3 percent), than that in the state (22.1 percent) or the nation (22.6 percent). Between 2011 and 2016, nearly one out of three

newly-created jobs will come from the middle-skill occupations that require a high-school diploma and some experience or some postsecondary education.

- **The PlanET region has a larger proportion of higher-skill jobs than Tennessee as a whole, but it lags behind the national average.** More than 18 percent of all jobs in the five-county region require at least a four-year college degree. This is higher than Tennessee's proportion of 17 percent. Despite the presence of the University of Tennessee and the the activities surrounding Oak Ridge National Laboratory, this proportion nevertheless is smaller than the national average (20.7 percent). In the next five years, nearly one out of every five newly-created jobs in the region will require at least a four-year college degree.

- **Employment growth is projected for all but two of the region's major occupational groups.** Between 2006 and 2011, the region lost jobs in 11 of its 23 major occupations, with the largest decline occurring in production and sales jobs (see Table 42). However, employment projections for the next five years indicate that only two major occupational groups are not expected to add net employment: production and construction-related jobs. Both groups continue to feel the effects of a slow recovery, rapidly rising productivity, and new business models affecting how industrial and building design are implemented on the factory floor and the construction job site. Even so, the projected losses in these occupational groups are much less severe than the losses experienced during the previous five years.

Table 42: Occupational Group Trends and Projections for the PlanET Region, 2006 - 2016

Occupational Group	2006 Jobs	2011 Jobs	2016 Jobs	Emp Change 06-11	Emp Change 11-16
Office & administrative support	59,818	59,058	60,629	(760)	1,571
Sales & related	36,501	33,656	34,209	(2,845)	553
Food preparation & serving related	31,262	31,697	35,335	435	3,638
Transportation & material moving	28,836	26,919	27,504	(1,917)	585
Healthcare practitioners & technical	22,784	24,793	27,055	2,009	2,262
Production	27,851	22,869	21,609	(4,982)	(1,260)
Management	20,561	20,406	20,731	(155)	325
Education, training, & library	16,823	17,106	17,952	283	846
Construction & extraction	17,008	15,610	15,380	(1,398)	(230)
Installation, maintenance, & repair	15,963	15,353	15,973	(610)	620
Building & grounds cleaning & maintenance	12,777	12,298	12,479	(479)	181
Business & financial operations	11,177	11,540	12,192	363	652
Healthcare support	8,618	9,568	10,809	950	1,241
Personal care & service	8,456	8,788	10,025	332	1,237
Architecture & engineering	7,868	7,899	7,938	31	39
Protective service	6,193	6,478	6,850	285	372
Computer & mathematical science	5,367	5,934	6,268	567	334
Community & social services	3,515	3,903	4,211	388	308
Arts, design, entertainment, sports, & media	4,176	3,784	3,893	(392)	109
Life, physical, & social science	2,676	2,921	3,089	245	168
Military	2,530	2,478	2,507	(52)	29
Legal	1,816	1,854	1,965	38	111
Farming, fishing, & forestry	743	662	683	(81)	21
Total All Occupations	353,319	345,574	359,286	(7,745)	13,712

Source: EMSI

- **Many of the occupations projected to have the highest rates of growth within the region are relatively low-skill jobs.** Table 43 identifies twenty occupations projected to grow the fastest within the region over the next five years. Many of these occupations require little more than short-term on-the-job training, and many are also part-time or offer limited benefits. Only three of these occupations pay above the region's average earnings of $18.87 per hour. These fast growing, low-wage/low-skill occupations tend to be in areas such as retail and food service that rely heavily on continued population growth or on an aging population demanding these "personal" or "consumer" services. They need a healthy economy and strong consumer spending to continue their expansion. However, many of these are jobs that may never lead to higher-wage, higher-skill jobs without substantial education and training well beyond what most companies would likely ever offer its employees.

Table 43: Projected Fastest-Growing Occupations in the PlanET Region, 2011 - 2016

SOC	Occupation Description	Change Emp 11-16	Avg Hourly Wages 2011	Educational Requirements
35-3031	Waiters & waitresses	1,201	$8.44	Short-term OJT
29-1111	Registered nurses	992	$27.16	Associate's degree
35-3021	Combined food preparation & serving workers, incl. fast foo	826	$8.52	Short-term OJT
31-1011	Home health aides	607	$10.22	Short-term OJT
53-3032	Truck drivers, heavy & tractor-trailer	497	$18.49	Moderate-term OJT
39-9021	Personal & home care aides	494	$9.33	Short-term OJT
35-2014	Cooks, restaurant	440	$10.35	Long-term OJT
43-9061	Office clerks, general	396	$13.57	Short-term OJT
43-4051	Customer service reps	395	$13.95	Moderate-term OJT
41-2031	Retail salespersons	288	$11.76	Short-term OJT
31-1012	Nursing aides, orderlies, & attendants	274	$10.77	Postsecondary vocational award
29-2061	Licensed practical & licensed vocational nurses	233	$16.04	Postsecondary vocational award
35-9031	Hosts & hostesses, restaurant, lounge, & coffee shop	220	$8.48	Short-term OJT
39-5012	Hairdressers, hairstylists, & cosmetologists	208	$15.02	Postsecondary vocational award
35-1012	First-line spvrs/mgrs of food preparation & serving workers	203	$11.47	Work exp. in a related field
49-9042	Maintenance & repair workers, general	196	$16.38	Moderate-term OJT
31-9092	Medical assistants	189	$12.76	Moderate-term OJT
25-2021	Elementary school teachers, except special education	182	$29.21	Bachelor's degree
35-9021	Dishwashers	182	$8.85	Short-term OJT
25-1099	Postsecondary teachers	182	$36.00	Doctoral degree

Source: EMSI

- **Low-skill jobs represent the largest share of the occupations projected to lose employment over the next five years.** Many of the region's low-skill jobs are in industry sectors that are shedding jobs as part of major structural changes in how they do business or where the industry is located across the globe (*e.g.*, manufacturing). Table 44 identifies twenty occupations projected to have the highest rates of job loss over the next five years. In some cases, those occupations represent relatively low-skill jobs that are already being replaced by technology in some form or other (*e.g.*, team assemblers replaced by robotics or clerks by product tracking software). Only two out of the 20 occupations anticipated to decline most over the next five years require some post-secondary education: general operations managers and automotive service technicians. Also, only four out of these 20 occupations offer wages that are higher than the region's average earnings ($18.87/hour).

Table 44: Projected Fastest-Declining Occupations in the PlanET Region, 2011 - 2016

SOC	Occupation Description	?Emp 06-11	Avg Hourly Wages 2011	Educational Requirements
41-2031	Retail salespersons	(1,510)	$11.76	Short-term OJT
51-2092	Team assemblers	(1,055)	$14.39	Moderate-term OJT
53-7062	Laborers & freight, stock, & material movers, hand	(782)	$11.88	Short-term OJT
39-3031	Ushers, lobby attendants, & ticket takers	(457)	$8.57	Short-term OJT
41-1011	First-line spvrs/mgrs of retail sales workers	(376)	$17.67	Work exp. in a related field
41-2011	Cashiers, except gaming	(368)	$8.87	Short-term OJT
43-5071	Shipping, receiving, & traffic clerks	(366)	$12.90	Short-term OJT
37-2011	Janitors & cleaners, except maids & housekeeping cleaner	(357)	$10.23	Short-term OJT
51-1011	First-line spvrs/mgrs of production & operating workers	(317)	$24.38	Work exp. in a related field
47-2031	Carpenters	(310)	$16.36	Long-term OJT
51-7011	Cabinetmakers & bench carpenters	(300)	$14.34	Long-term OJT
11-1021	General & operations managers	(294)	$43.77	Degree plus work exp.
53-7064	Packers & packagers, hand	(271)	$9.33	Short-term OJT
49-3023	Automotive service technicians & mechanics	(254)	$14.62	Postsecondary vocational award
53-3032	Truck drivers, heavy & tractor-trailer	(240)	$18.49	Moderate-term OJT
53-7051	Industrial truck & tractor operators	(232)	$13.83	Short-term OJT
51-2099	Assemblers & fabricators, all other	(229)	$13.83	Moderate-term OJT
51-4121	Welders, cutters, solderers, & brazers	(221)	$16.38	Long-term OJT
41-4012	Sales reps, wholesale & manufacturing, except tech. & sci	(214)	$27.68	Moderate-term OJT
53-3033	Truck drivers, light or delivery services	(209)	$14.57	Short-term OJT

Source: EMSI

- **Nine of the region's 20 fastest-declining occupations over the next five years are production-related occupations tied directly to job losses in manufacturing.** Manufacturing is on the decline in the region, but this is not to say that there is no need for production workers altogether. Given the changing nature of manufacturing, workers entering this industry will need different, and most likely more advanced, skills, often in multiple disciplines (*e.g.*, assembly, maintenance, machine operations, and so on) or in higher-order activities such as engineering, sales, or product design.

- **Technical skill requirements are becoming more important for many middle-skill jobs.** Many jobs that once required only basic workplace skills now may require industry or occupation-specific credentials generated through long-term apprenticeships or formal post-secondary training. These jobs offer some of the few opportunities for advancement for individuals not seeking to obtain a four-year college degree. Fewer of these jobs now are available overall, but they tend to offer relatively good wages and steady career opportunities, making these jobs important career paths for individuals seeking to earn a "family sustaining" wage. Table 45 identifies fast-growing middle-skill jobs in the PlanET region. Most of these jobs offer modest wages, ranging from about $12.61 to as much as $37.00 per hour.

Table 45: Projected Fast-Growing Middle-Skill Occupations in the PlanET Region, 2011 - 2016

SOC	Occupation Description	Change Emp 11-16	Avg Hourly Wages 2011	Educational Requirements
49-9041	Industrial machinery mechanics	52	$19.85	Long-term OJT
13-1041	Compliance officers, exc agric, constr, hlth, safety, & transport	52	$27.50	Long-term OJT
49-3021	Automotive body & related repairers	49	$16.99	Long-term OJT
49-9021	Heating, air conditioning, & refrigeration mechanics & installers	41	$17.85	Long-term OJT
29-2021	Dental hygienists	40	$30.15	Associate's degree
33-3051	Police & sheriff's patrol officers	36	$17.75	Long-term OJT
29-2056	Veterinary technologists & technicians	36	$12.61	Associate's degree
29-1126	Respiratory therapists	35	$20.36	Associate's degree
25-3021	Self-enrichment education teachers	35	$19.01	Work experience in a related field
39-1021	First-line supervisors/managers of personal service workers	34	$14.38	Work experience in a related field
29-2071	Medical records & health information technicians	30	$14.67	Associate's degree
49-2098	Security & fire alarm systems installers	26	$15.97	Postsecondary vocational award
41-1012	First-line supervisors/managers of non-retail sales workers	24	$37.00	Work experience in a related field
15-1041	Computer support specialists	24	$20.36	Associate's degree
31-9011	Massage therapists	23	$19.95	Postsecondary vocational award
13-1051	Cost estimators	19	$28.94	Work experience in a related field
17-3022	Civil engineering technicians	19	$20.27	Associate's degree
29-2032	Diagnostic medical sonographers	19	$24.70	Associate's degree
53-1021	First-line supervisors/managers of helpers, laborers, & material	18	$24.63	Work experience in a related field
27-4021	Photographers	18	$15.70	Long-term OJT

Source: EMSI

- **Science, technology, engineering, and math training and continuing education are becoming increasingly important for the region's high-skill jobs.** Many businesses indicate that they have a relatively easy time filling low-skill jobs, but encounter challenges in filling higher-skill occupations. As illustrated in Table 46, fast-growing high-skill occupations include many education and health care-related occupations. In addition, many business- and finance-related professions also are among the fastest-growing jobs. Information technology and engineering careers also have emerged as important high-skill occupations. Average hourly wages for these jobs exceed $27.50 (equating to about $55,000 per year) and many of the occupations offer average wages exceeding six figures. A key common theme in these jobs is the importance of science, technology, engineering, and math (STEM) in the academic disciplines supporting careers in these fields. Furthermore, these careers also reinforce the importance of access to higher education, not only to enter the careers, but to obtain continuing education and post-baccalaureate credentials for licensing and related professional development.

Table 46: Projected Fast-Growing High-Skill Occupations in the PlanET Region, 2011 - 2016

SOC	Occupation Description	Change Emp 11-16	Avg Hourly Wages 2011	Educational Requirements
25-1099	Postsecondary teachers	182	$36.00	Doctoral degree
25-2021	Elementary school teachers, except special education	182	$29.21	Bachelor's degree
29-1069	Physicians & surgeons	124	$100.70	First professional degree
13-1111	Management analysts	110	$41.26	Degree plus work experience
13-2011	Accountants & auditors	107	$27.61	Bachelor's degree
13-2072	Loan officers	92	$23.50	Bachelor's degree
29-1071	Physician assistants	80	$43.44	Bachelor's degree
41-3021	Insurance sales agents	75	$26.56	Bachelor's degree
15-1071	Network & computer systems administrators	74	$29.16	Bachelor's degree
13-1073	Training & development specialists	73	$25.23	Bachelor's degree
11-9111	Medical & health services managers	72	$34.34	Degree plus work experience
25-2022	Middle school teachers, except special & vocational education	70	$29.69	Bachelor's degree
15-1081	Network systems & data communications analysts	68	$33.83	Bachelor's degree
15-1031	Computer software engineers, applications	65	$36.27	Bachelor's degree
11-2022	Sales managers	55	$42.85	Degree plus work experience
29-1123	Physical therapists	52	$33.64	Master's degree
15-1051	Computer systems analysts	51	$33.79	Bachelor's degree
29-1051	Pharmacists	50	$54.93	First professional degree
17-2051	Civil engineers	49	$36.76	Bachelor's degree
15-1032	Computer software engineers, systems software	47	$49.26	Bachelor's degree

Source: EMSI