



**NCHEMS**

National Center for Higher Education Management Systems

*Colleges and Universities and Their Stewardship of Place:  
A Guide for Developing Performance Measures for the Equity  
of Access and Student Success*

Patrick J. Kelly and Peter T. Ewell

Submitted to the  
National Association of System Heads

May 2009

## TABLE OF CONTENTS

	Page
Introduction.....	1
Step 1: Defining Service Regions.....	2
Step 2: Demographics of a Service Region .....	7
Step 3: College Participation and Completion.....	9
Step 4: Piecing It All Together .....	10
Supplemental Data and Information .....	11
Conclusion .....	12
Data Sources .....	13
Appendix 1 – Graphs and Charts .....	14

## LIST OF FIGURES

Number		
1	County of Origin of First-Time Students Attending Kentucky Public Four-Year Institutions (Fall 2006)	3
2	County of Origin of First-Time Students Attending Austin Peay State University (Fall 2001)	5
3	Counties from which Austin Peay State University Receives 80 Percent of its First-Time Undergraduate Enrollment, Fall 2001	6
4	Counties from which Southeast Missouri State University Receives 80 Percent of its First-Time Undergraduate Enrollment, Fall 2004	7
5	Proportions of 18- to 24-Year-Olds with Just a High School Diploma and High School Graduates by Service Region (Selected Missouri Institutions)	8
6	Participation, Completion, and Graduation Rates by Service Region (Selected Missouri Institutions)	9
7	Racial/Ethnic Representation of a Public Four-Year University’s Target Population, University Participation and Completion, and Graduation Rates	10

# Colleges and Universities and Their Stewardship of Place: A Guide for Developing Performance Measures for the Equity of Access and Student Success

## Introduction

As postsecondary education becomes a necessity for nearly all U.S. residents to compete for living-wage jobs, the ability of colleges and universities to work collectively to expand access and the opportunity to succeed is vital to our economic well-being. With the exception of a relatively small set of institutions, institutional contributions to this national imperative hinges on the degree to which they “act locally”. Based on extensive research conducted in a variety of states, the vast majority of postsecondary institutions (two- and four-year) draw their undergraduates from geographic areas that fit within a relatively small radius around the institution. Despite this reality, many four-year institutions are reluctant to embrace the regional service concept for fear that their reputations and desires to become more selective might be threatened. The aspiration to become the best at serving their regions is rare, but sorely needed across the U.S. This is especially true in regions that are becoming more diverse – with growing racial/ethnic populations that are underserved.

NCHEMS has worked with the National Association of Systems heads (NASI) – with support from the Lumina Foundation for Education – to develop (1) empirically-based access regions for postsecondary institutions based on student enrollment patterns and (2) access, transition, and completion measures to gauge how well institutions serve their regions with respect to racial/ethnic equity. This work was conducted to provide additional information to the existing comparative college graduation rates by institution and race/ethnicity presented on the website [www.collegeresults.org](http://www.collegeresults.org) – developed by the Education Trust. From a combination of detailed student enrollment data provided by several states (by county of student residency), state-to-state student migration data provided by the National Center for Education Statistics (NCES), and additional data from NCES, we developed the following categories of four-year postsecondary institutions:

- National Institutions. Highly-selective or special status independent institutions that have the potential to recruit on a national basis, an average entering ACT score of 28 or above (or SAT equivalent), or HBCU status (e.g., Harvard, Stanford, Vanderbilt, etc.).
- Statewide Institutions. Public institutions with a defined and recognized statewide mission including any of the following: a) “Flagship” or Land Grant status, b) membership in the Council of Public Liberal Arts Colleges (COPLAC), c) ACT score 26 or above, d) state HBCU status, e) state health sciences or engineering institution, or f) state military school.

- Multi-State Institutions. Independent institutions that enroll heavily from outside the state in which they are located (but are not selective enough to be classified as National institutions), 45 percent or more undergraduate enrollment drawn from outside the state in which they are located, or ACT score 26 or better. The access region defined for these institutions is the state and all contiguous states.
- Urban Institutions. Public universities that are predominantly commuter campuses, Carnegie Class=15 and 16, and percent part-time undergraduate headcount greater than or equal to 20 percent. The county in which the institution is located is the access region.
- Regional Institutions. Institutions that do not fit any of the above criteria and primarily serve students from sub-state regions within the state they are located. This is the largest category – representing nearly 80 percent of all four-year postsecondary institutions.

The examples used throughout this report focus primarily on public four-year institutions that have (or should have) regional missions – those that fall into the later two categories above. The regional service mission of two-year colleges is obvious and all of the guidelines provided below can be easily applied to them as well. The analytical framework can also be applied to institutions that draw their students from an entire state, region, or that compete in the national market. It can also be applied to private institutions that fit into any of the above categories.

The report provides a methodological framework for defining service regions and developing measures of performance with respect to the:

- Equity of service with respect to certain race/ethnic populations in their region, and
- Persistence and completion rates of these students once they enter the institution.

Drawing from NCHEMS' recent work in Missouri, Kentucky, Ohio, and Tennessee, we provide a set of straightforward analytical steps for constructing indicators for each of the above in order to expand the tool kit for policy analysts and the overall policy framework for regional stewardship.

### **Step 1: Defining Service Regions**

Over the past several years, NCHEMS has worked with state higher education policymakers in a variety of states to assist them in the development of better policy and practice around the issues of access and opportunity. In this process, we routinely examine student enrollment patterns – specifically where postsecondary institutions draw the majority of their students from. Simple tables like the one shown below (Figure 1) were provided to

NCHEMS by the state coordinating/governing bodies for higher education or the institutions themselves.

**FIGURE 1**  
**County of Origin of First-Time Students Attending Kentucky**  
**Public Four-Year Institutions (Fall 2006)**

County of Origin of First-Time Students	Eastern Kentucky University	Kentucky State University	Morehead State University	Murray State University	Northern Kentucky University	University of Kentucky	University of Louisville	Western Kentucky University
Adair County	4	1	1	-	-	14	2	11
Allen County	1	-	-	2	-	1	1	75
Anderson County	16	8	9	2	2	33	1	3
Ballard County	1	-	-	11	-	4	2	3
Barren County	1	-	2	-	-	18	7	159
Bath County	3	-	53	-	-	4	-	1
Bell County	15	-	2	-	-	9	3	3
Boone County	62	-	26	-	288	128	64	14
Bourbon County	23	1	6	-	-	20	1	3
Boyd County	23	2	50	1	2	37	7	1
Boyle County	48	1	3	1	3	23	5	17
Bracken County	2	-	4	-	15	5	-	-
Breathitt County	2	-	8	-	-	4	1	-
Breckinridge County	2	-	-	22	1	4	9	20
Bullitt County	10	-	7	6	2	14	71	34
Butler County	2	-	-	-	-	5	3	52
Caldwell County	2	-	-	19	-	8	1	17
Calloway County	-	-	-	156	-	12	4	2
Campbell County	36	-	14	1	292	92	35	19
Carlisle County	-	-	1	3	-	1	-	-
Carroll County	1	-	4	-	9	9	2	1
Carter County	3	-	83	-	-	5	-	-
Casey County	27	-	-	-	-	6	-	4
Christian County	4	9	1	49	-	28	16	36
Clark County	52	-	7	2	-	43	8	10

Source: Kentucky Council on Postsecondary Education

Figure 1 shows the counties of origin of all first-time students attending the eight public universities in Kentucky (only 25 of 120 counties are included for illustration). These data for institutions in Kentucky and the same for institutions in Missouri, Ohio, and Tennessee reveal that most public four-year institutions are remarkably regional. The majority of their students (80%) come from a relatively small number of counties – clustered tightly around each of the institutions. The exceptions in these states are the flagship and land-grant institutions (such as the University of Tennessee at Knoxville, the University of Kentucky, Ohio State University, etc.) and more selective public institutions such as Truman State

University (MO), University of Missouri Rolla (MO), and Miami University (OH) – all of which have specific state-wide missions to serve a more academically prepared student body. For these institutions, the state is their service region as opposed to a selected number of counties.

Once the data shown in Figure 1 are obtained, it is a fairly straight-forward exercise to determine which geographic areas an institution gets the majority its students from. In the case of Austin Peay State University below (Figure 2), we sorted the number of first-time students by county of origin – from high to low – and calculated a cumulative percentage in each county until we reached 80 percent of all first-time students. In this case, eight counties account for the majority of its first-time students.

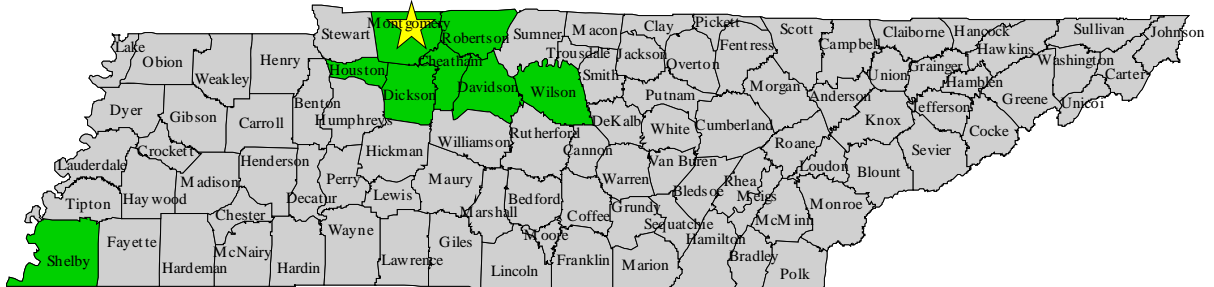
**FIGURE 2**  
**County of Origin of First-Time Students Attending**  
**Austin Peay State University (Fall 2001)**

County of Origin of First-Time Students	Number of First-Time Students (in Descending Order)	Cummulative Percent
Montgomery	470	51.0%
Davidson	72	58.8%
Robertson	48	64.1%
Dickson	47	69.2%
Cheatham	36	73.1%
Shelby	28	76.1%
Houston	19	78.2%
Wilson	18	80.1%
Sumner	16	81.9%
Williamson	16	83.6%
Stewart	15	85.2%
Humphreys	14	86.8%
Rutherford	13	88.2%
Hamilton	9	89.1%
Marshall	8	90.0%
Knox	6	90.7%

Source: Tennessee Higher Education Commission

Once the service regions are defined, the data can be presented more effectively in a map that visually displays the defined service region – as shown in Figure 3. Austin Peay State University draws the vast majority of its students from nearby counties and a small percentage from Memphis, TN (Shelby County).

**FIGURE 3**  
**Counties from which Austin Peay State University Receives 80 Percent of its**  
**First-Time Undergraduate Enrollment, Fall 2001**



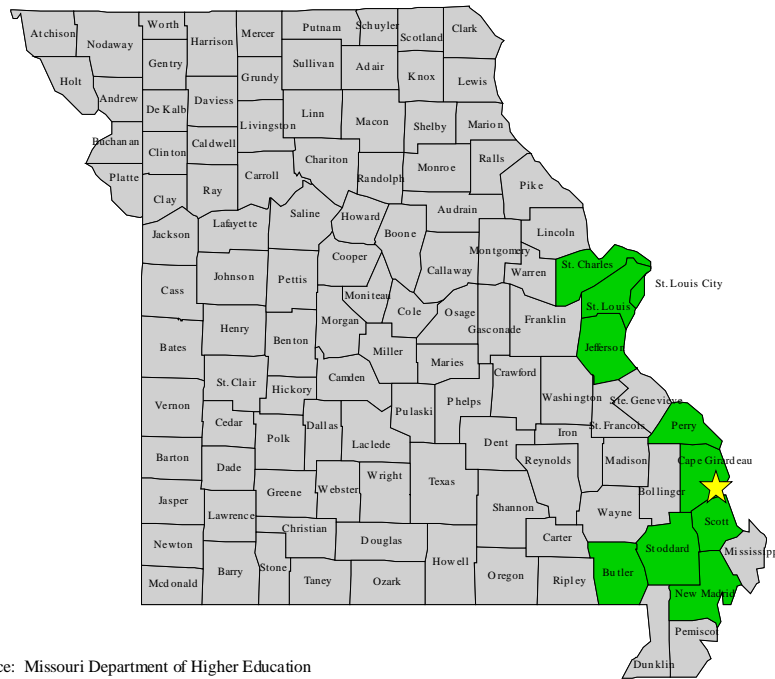
Montgomery = 51.0%  
 Davidson = 7.8%  
 Robertson = 5.2%  
 Dickson = 5.1%  
 Cheatham = 3.9%  
 Other Service Counties = 1.9% to 3.0%

Source: Tennessee Higher Education Commission.

One could just as easily apply a more strict definition of a service region by restricting the cumulative percentage to 90 percent or (vice-versa) a less strict definition at 70 percent, for example. As seen above, the counties that combine to make up a service area do not need to be geographically contiguous. Many public four year institutions located in rural areas tend to draw their students from local areas and the nearest urban area because the local population base is not large enough to support the size of the institution. Another example (shown in Figure 4) is Southeast Missouri State University – where they draw the majority of their students locally and also from nearby St. Louis.



**FIGURE 4**  
**Counties from which Southeast Missouri State University Receives 80 Percent of its First-Time Undergraduate Enrollment, Fall 2004**



Source: Missouri Department of Higher Education

Finally, different geographic boundaries of student residence can also be used to determine a service region – e.g., zip codes, census tracts, etc. This would require that these elements be included in the student record database and that access to the demographic information outlined in the following section be available.

**Step 2: Demographics of a Service Region**

In order to determine whether an institution is achieving equity in serving a region, it is also necessary to compile the race/ethnic data for the target populations in the region. In our work with the four states, we identified (using data from the 2000 Census), the number and proportions of 18- to 24-year-olds with only a high school diploma by race/ethnicity in each of the institutions’ service regions. We also identified the number and proportions of high school graduates by race/ethnicity for the same regions (provided by the National Center for Education Statistics). Examples of these data for several institutions in Missouri are shown in Figure 5.

**FIGURE 5**  
**Proportions of 18- to 24-Year-Olds with Just a High School Diploma and High School Graduates by Service Region (Selected Missouri Institutions)**

Institution	% 18-24 Year Olds with Just HS Diploma or Equivalent, 2000	% High School Grads, Fall 2002
<b>Central Missouri State University</b>		
White	73.4	77.6
African-American	19.2	18.5
Hispanic	3.9	1.7
<b>Lincoln University</b>		
White	58.2	64.8
African-American	33.3	30.8
Hispanic	4.3	1.7
<b>Missouri Western State College</b>		
White	67.8	71.8
African-American	23.9	23.7
Hispanic	4.3	2.0
<b>Northwest Missouri State University</b>		
White	65.7	73.0
African-American	26.6	23.0
Hispanic	3.8	1.7
<b>Southeast Missouri State University</b>		
White	67.2	74.3
African-American	27.3	23.2
Hispanic	2.3	0.6

Source: U.S. Census Bureau; NCES Common Core Data

By selecting these ages and the number of high school graduates, it is possible to establish a baseline for the race/ethnic proportions of high school graduates and traditional-age college students (those theoretically ready to enter postsecondary education) – in order to determine whether these baseline proportions hold steady throughout subsequent stages of the education pipeline.

For institutions that serve more non-traditional students (e.g., community colleges and four-year commuter institutions in urban areas), it might be desirable to expand the criteria to include older age-groups – e.g., 25- to 44-year-olds. The data for college participation and completion are discussed below.

### Step 3: College Participation and Completion

Participation and completion data by institution and race/ethnicity are available from the National Center for Education Statistics' Integrated Postsecondary Education Data System (IPEDS). Staffs from postsecondary institutions that wish to conduct these analyses also have these data in their student unit record systems since they report these data to NCES.

To complete the education pipeline concept, it is possible to extract cross-sectional race/ethnic data for first-time freshmen, all other undergraduates, and degrees awarded from IPEDS. IPEDS also contains six-year graduation rates for full-time degree seeking students by race/ethnicity. Together these data provide a good picture of the success of race/ethnic populations at each of these stages in the education process. Figure 6 displays the proportions by race/ethnicity for each of these data elements for a selected number of public four-year institutions in Missouri.

**FIGURE 6**  
**Participation, Completion, and Graduation Rates by Service Region**  
**(Selected Missouri Institutions)**

Institution	% First-Time Freshmen, Fall 2005	% All Other Undergraduates, Fall 2005	% Bachelor's Degrees Awarded, 2004-05	Six-Year Graduation Rates, 2005
<b>Missouri Western State College</b>				
White	81.0	87.9	90.8	30.7
African-American	15.6	8.8	6.0	17.0
Hispanic	1.5	1.6	1.8	16.7
<b>Northwest Missouri State University</b>				
White	91.7	92.2	94.0	53.4
African-American	3.6	2.5	2.0	34.5
Hispanic	1.8	1.1	0.8	28.6
<b>Southeast Missouri State University</b>				
White	88.4	89.9	91.8	50.8
African-American	8.6	5.7	4.3	34.6
Hispanic	0.6	0.8	0.5	30.0
<b>University of Missouri - Kansas City</b>				
White	63.8	71.2	69.5	45.0
African-American	14.5	11.1	12.0	30.5
Hispanic	3.3	3.5	3.2	40.0
<b>University of Missouri - St. Louis</b>				
White	76.1	81.8	77.6	39.5
African-American	14.6	12.0	9.8	17.6
Hispanic	0.6	1.4	1.4	NA

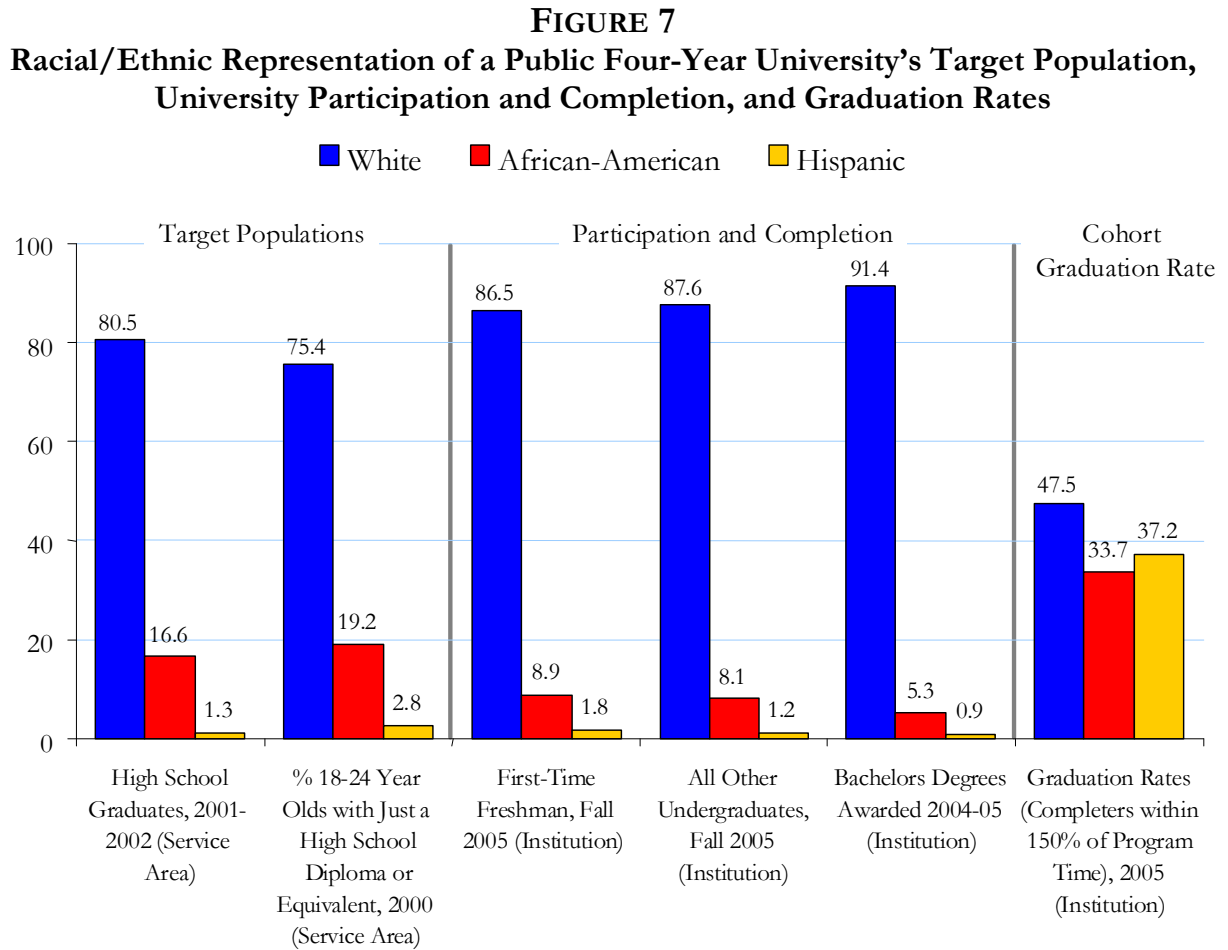
Note: Hispanic graduation rates are based on small cohort sizes.

Source: NCES: IPEDS Enrollment, Completions, and Graduation Rate Surveys

These data are available annually from NCES. While not applicable in Missouri because of small numbers, data are also available for Asians and Native Americans.

## Step 4: Piecing It All Together

Once the institution service areas are defined and the demographic, participation, and completion data are compiled, it is possible to present the data in a way that shows how well institutions are serving their region with respect to racial/ethnic equity. These data are displayed in Figure 7 for one of the public four-year institutions in Ohio.



Sources: NCES: Common Core Data; IPEDS Enrollment, Completions, and Graduation Rate Surveys, U.S. Census Bureau

This university draws the majority (80%) of its students from seven counties. Within these counties, 80.5 percent of the high school graduates were White, 16.6 percent were African-American, and 1.3 percent Hispanic. Larger proportions of 18- to 24-year-olds with just a high school diploma were African-American and Hispanic (19.2 and 2.8 percent) – indicating that among the young adults who complete high school, minorities are less likely to enroll in postsecondary education. Both of these populations represent target populations for the university.

Relative to the target populations, the proportions of African-Americans and Hispanics who enrolled at the university as first-time freshmen drop fairly dramatically – to 8.9 percent African-American and 1.8 percent Hispanic. In each subsequent stage of academic progress within the institution, the proportion of Whites increase and the proportion of minorities decrease. Whites represent over 90 percent of the bachelor’s degrees produced compared to 5.3 percent for African-Americans and less than one percent for Hispanics. The drop-off of minorities at each stage in the education process is confirmed by the graduation rates by race/ethnicity – a cohort-based measure for graduation within six-years. All combined, these metrics suggest that the university could develop more successful programs geared to the minorities in its service region – at each stage of the education process (participation, persistence, and completion).

### **Supplemental Data and Information**

For the institutions that have fairly distinct sub-state service regions, it is helpful to compile additional data that yield a much greater understanding of the demographic and economic conditions of the region relative to other parts of the state. Some of the most useful data include:

- The educational attainment of adults by age and degree-level – by race/ethnicity where appropriate
- Employment by Occupation and Industry – an indication of the types of jobs available in the region
- Numbers and percentage of adults with a high school diploma or less, living in families that earn less than a living wage – an indication of the size of the adult population that needs postsecondary education and training in order to advance their life circumstances.
- Local migration patterns by degree-level and occupation – indicating the strength of the local economy and the ability of the region to retain or attract high-skilled workers.
- Annual earnings by degree-level and the difference in earnings between a high school diploma and a college degree – another indicator of the strength of the local economy, as well as the monetary return that individuals experience as a result of college education.

An example of these data and information for a region in Oklahoma is included in the appendix. Much of these data are available from the U.S. Census Bureau’s annual American Community Survey (ACS), and even more detailed data can be extracted from the ACS Public Use Microdata Samples. These data – in combination with the data on equity, access

and success – provide a robust picture of the environment in which institutions operate and their ability to act locally.

## **Conclusion**

With the exception of the student county-of-origin data provided by the State Higher Education Executive Offices (SHEEOs), the data used throughout these calculational procedures are readily available from public sources. Provided access to student unit record data at the state or institutional levels, it may be possible to improve or expand this work by:

- Actually tracking students (by race/ethnicity) through the education system rather than relying on cross-sectional metrics.
- Developing a similar analytical process for low-income students. From public data sources, it is possible to establish how many low-income residents there are in geographic regions, but not how many enroll in, and complete, postsecondary education. If institutions or state agencies collect data on levels of student or family income, and have the ability to track them through the education system, it is possible to base these analyses on income in addition to race/ethnicity. Because student/family income data are usually only available for those who apply for financial aid, comprehensive studies of this nature are rare.

These data and information suggest the potential utility of using cross-sectional statistics to estimate equity in college access and success. They can also be used for benchmarking purposes in much the same way as the Education Trust’s Lumina project currently benchmarks graduation rates based on the National Center for Education Statistics’ Graduation Rate Survey (GRS). Finally, they also illustrate the parallel potential of using cross-sectional “pipeline-type” estimates to supplement cohort-based statistics drawn from the GRS. While GRS statistics are superior to cross-sectional estimates from a purely methodological standpoint because the data are truly longitudinal, they are limited to full-time, first-time students and do not represent most students at many colleges and universities. Cohorts can also be limited by small numbers and do not provide information about access for underserved populations. The cross-sectional approach provides a useful supplement to the GRS.

## **Data Sources**

Student County of Origin Data: Kentucky Council on Postsecondary Education, Missouri Department of Higher Education, Ohio Board of Regents, and Tennessee Higher Education Commission.

High School Graduates by Race/Ethnicity: National Center for Education Statistics, Common Core Data.

18- to 24-Year-Olds with Just a High School Diploma by County and Race/Ethnicity: U.S. Census Bureau, 2000 Decennial Census.

First-Time Students by Race/Ethnicity: National Center for Education Statistics, IPEDS Fall Enrollment Survey.

All Other Undergraduates by Race/Ethnicity: National Center for Education Statistics, IPEDS Fall Enrollment Survey.

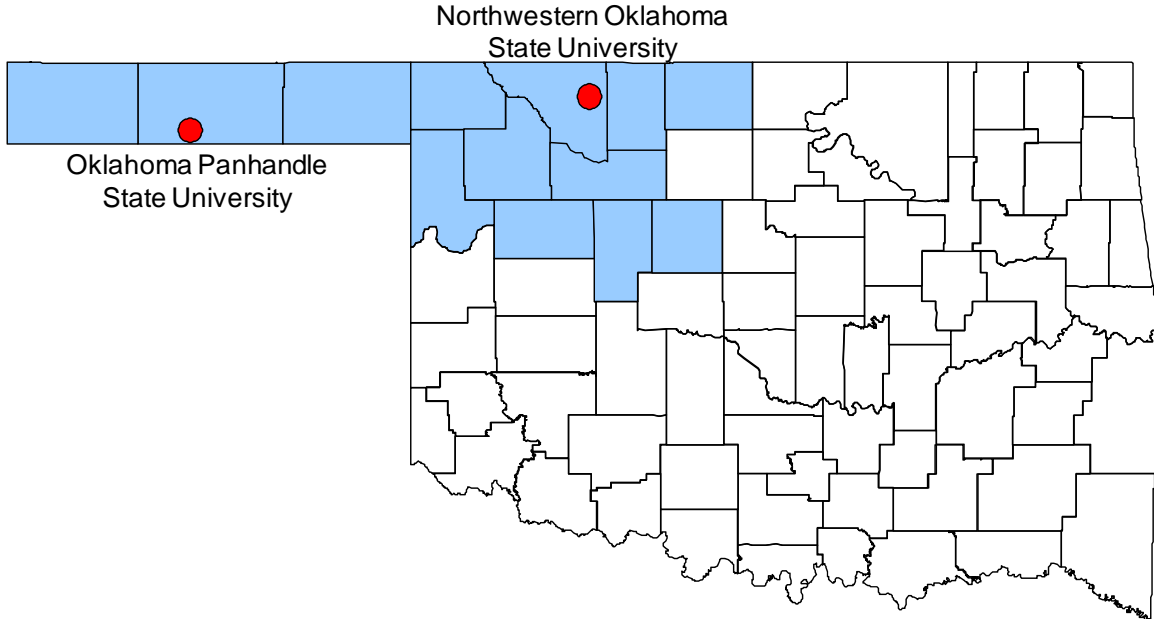
Degrees Awarded by Race/Ethnicity: National Center for Education Statistics, IPEDS Completions Survey.

Six-Year Graduation Rates of Bachelor's Students: National Center for Education Statistics, IPEDS Graduation Rate Survey.

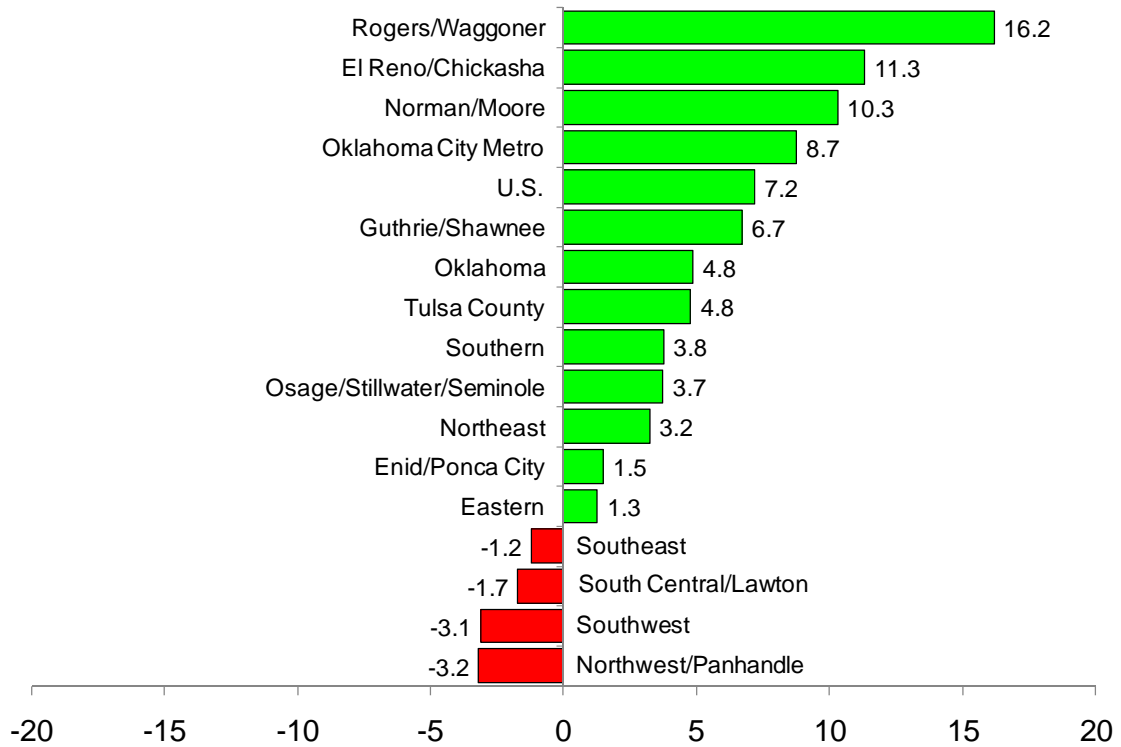
## Appendix 1 – Graphs and Charts

Sources: U.S. Census Bureau, 2005-07 American Community Survey (ACS) Three-Year Public Use Microdata Sample (PUMS) File.

### OKLAHOMA’S NORTHWEST PANHANDLE REGION

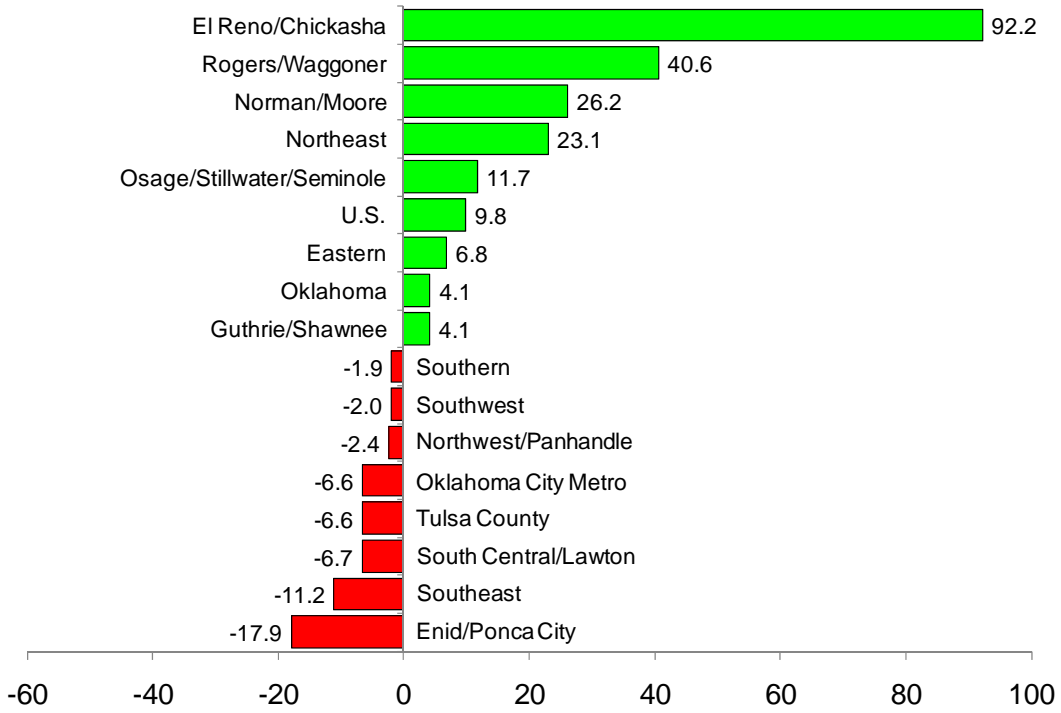


### TOTAL POPULATION CHANGE BY REGION, 2000-07

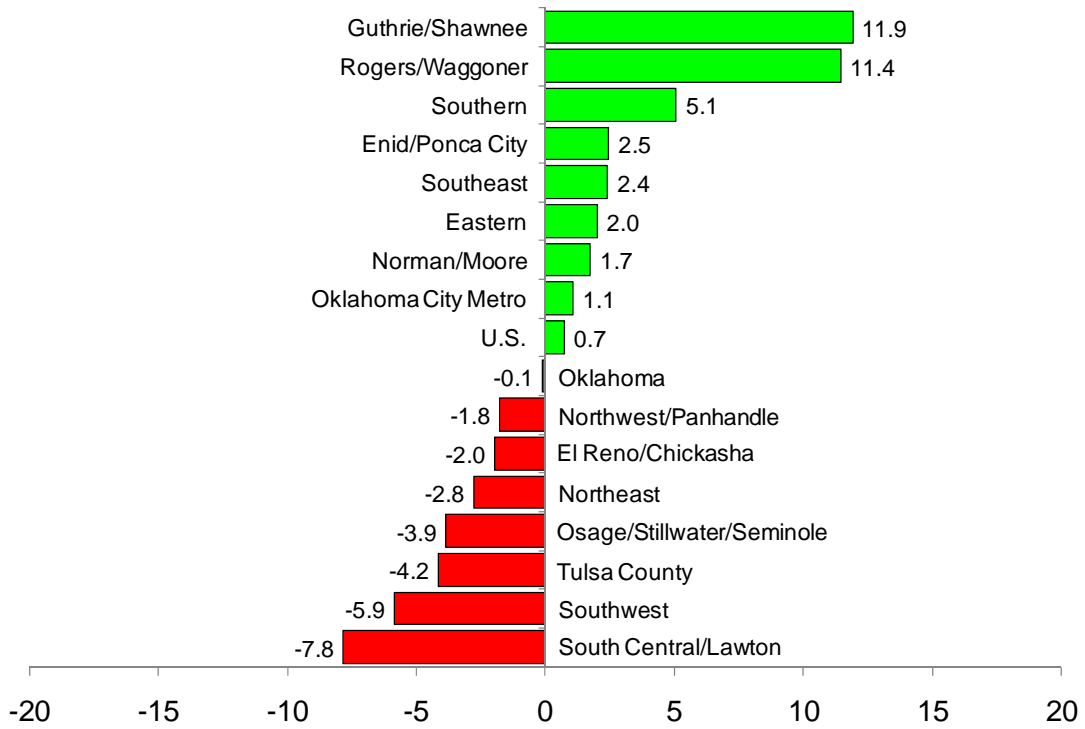




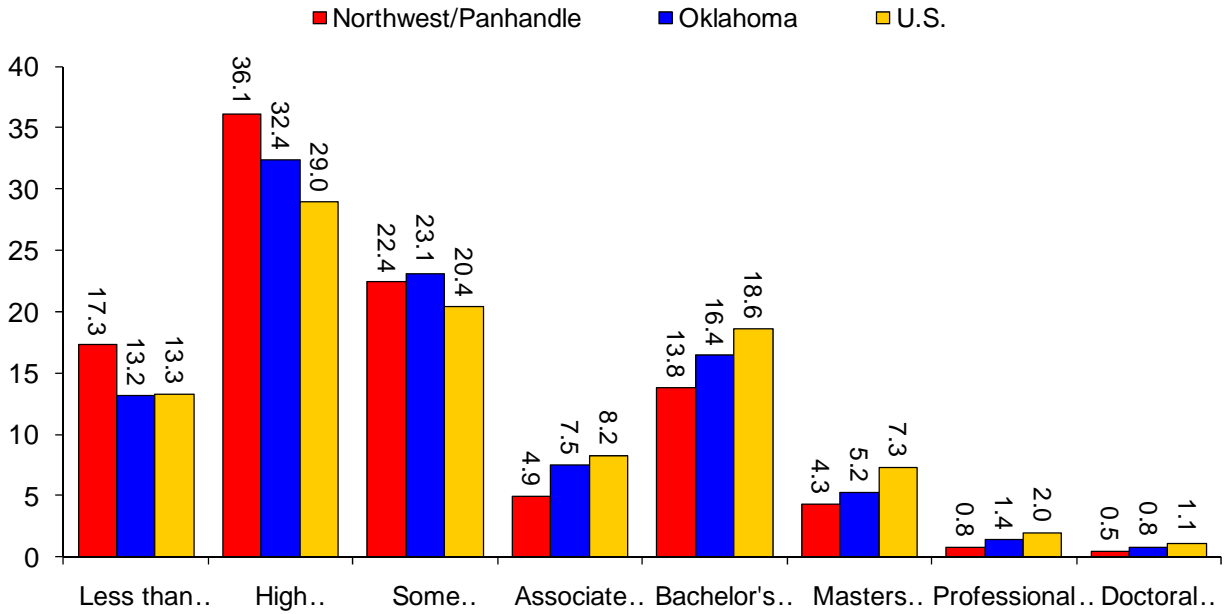
### AGE 18 TO 24 POPULATION CHANGE BY REGION, 2000-07



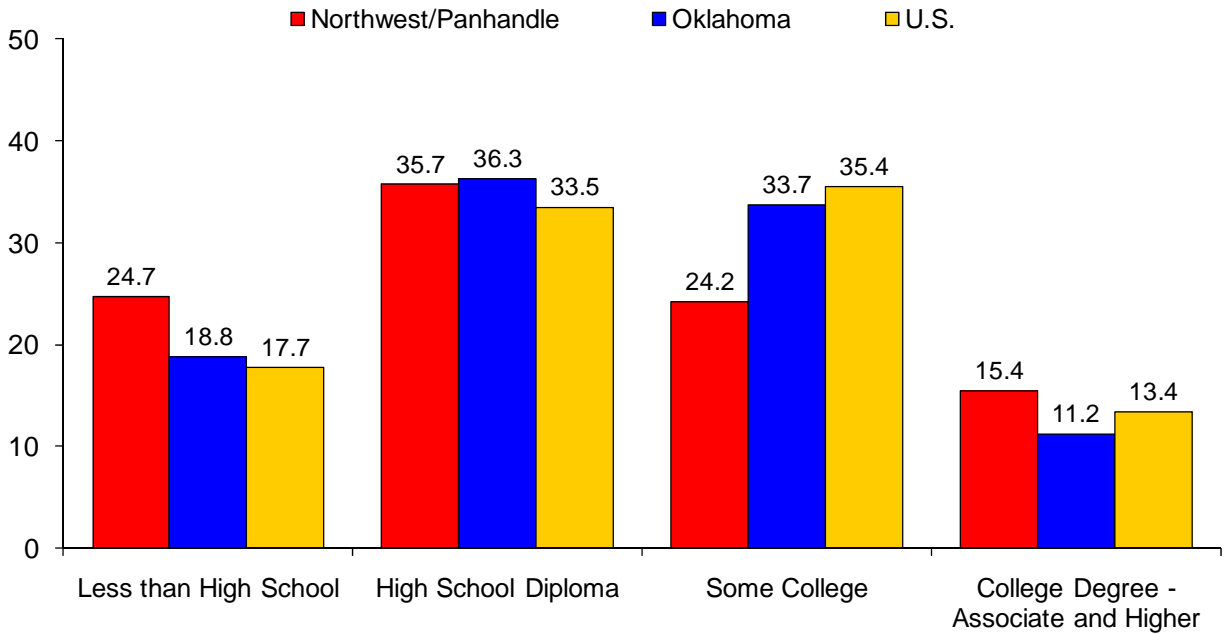
### AGE 25 TO 49 POPULATION CHANGE BY REGION, 2000-07



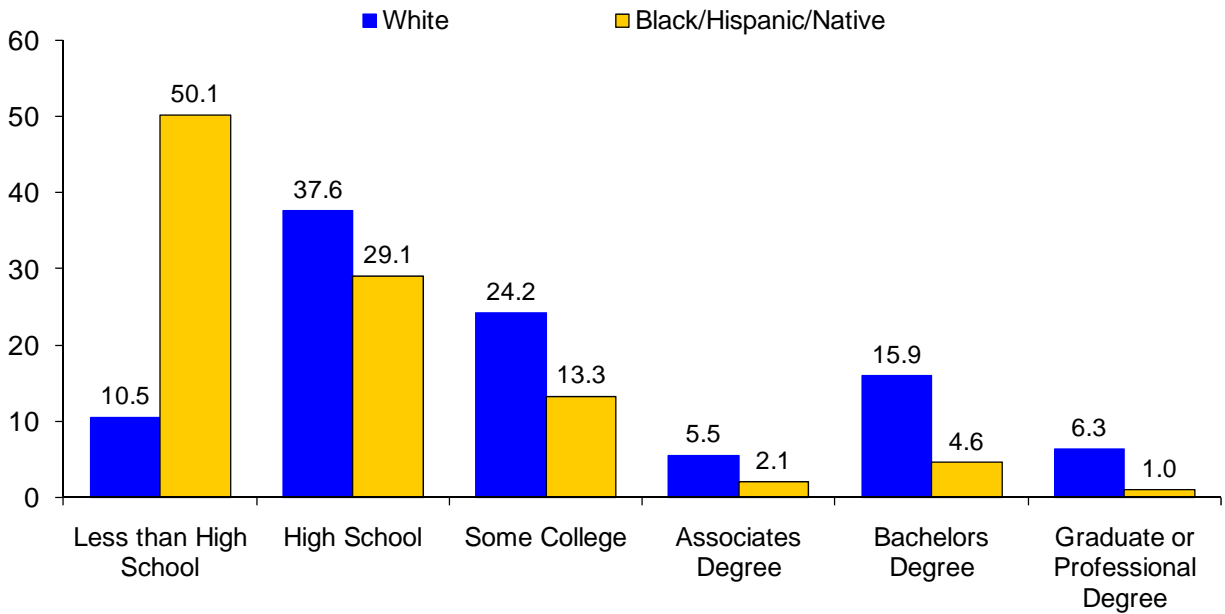
### EDUCATIONAL ATTAINMENT OF 18 TO 24 YEAR OLDS, 2005-07



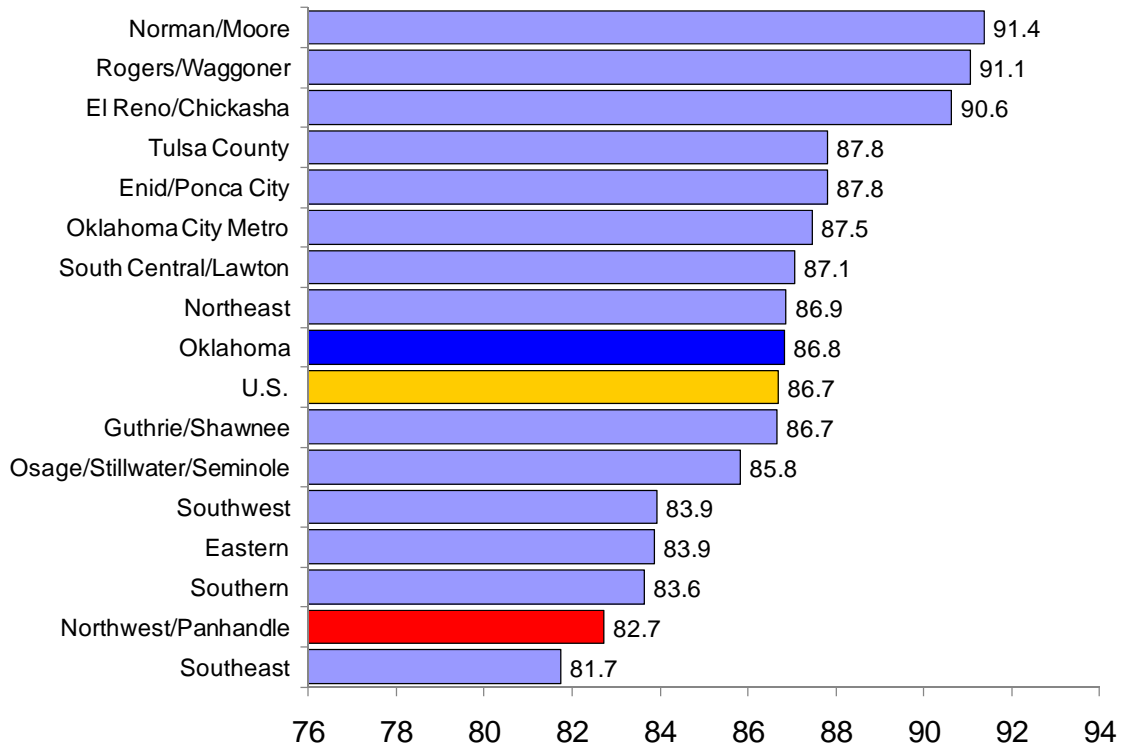
### EDUCATIONAL ATTAINMENT OF 18 TO 24 YEAR OLDS, 2005-07



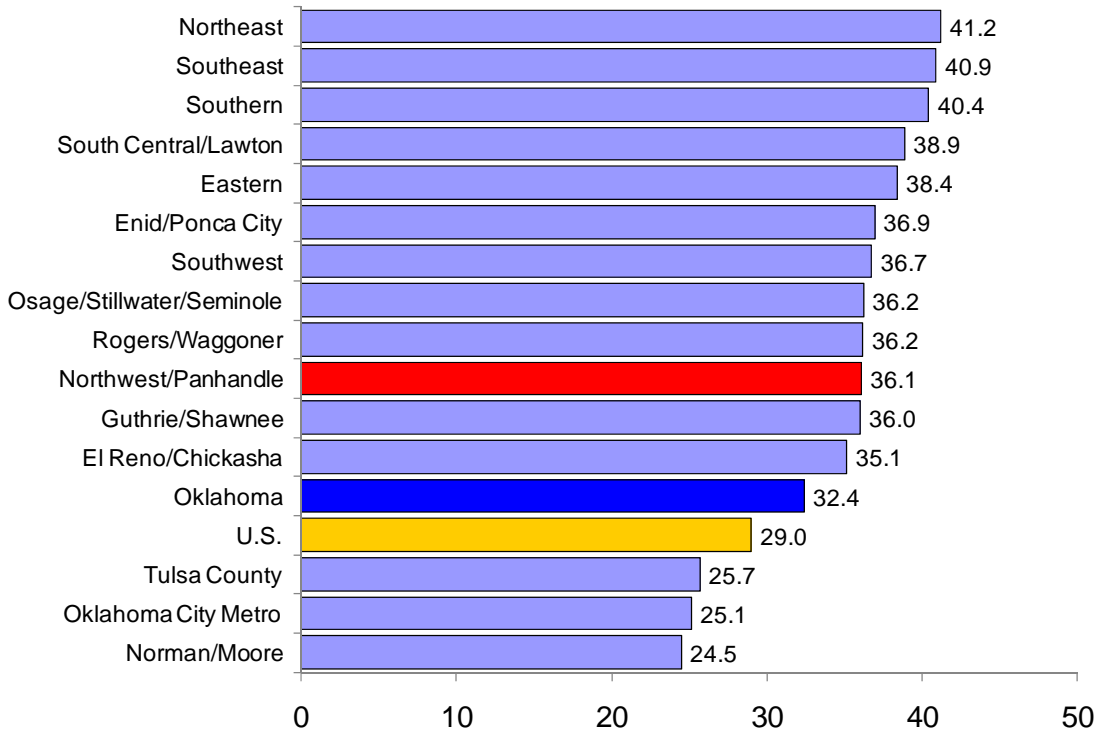
**EDUCATIONAL ATTAINMENT (%) OF 25 TO 64 YEAR OLDS BY RACE/ETHNICITY,  
2005-07 (NORTHWEST/PANHANDLE)**



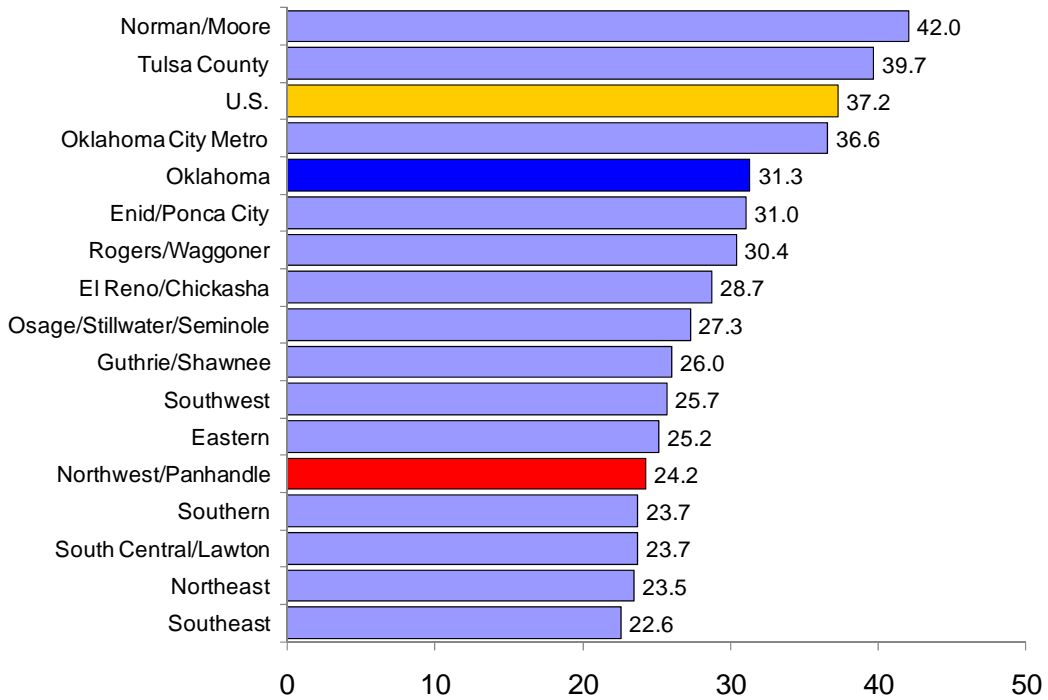
**PERCENT OF 25 TO 64 YEAR OLDS WITH AT LEAST A HIGH SCHOOL DIPLOMA,  
2005-07**



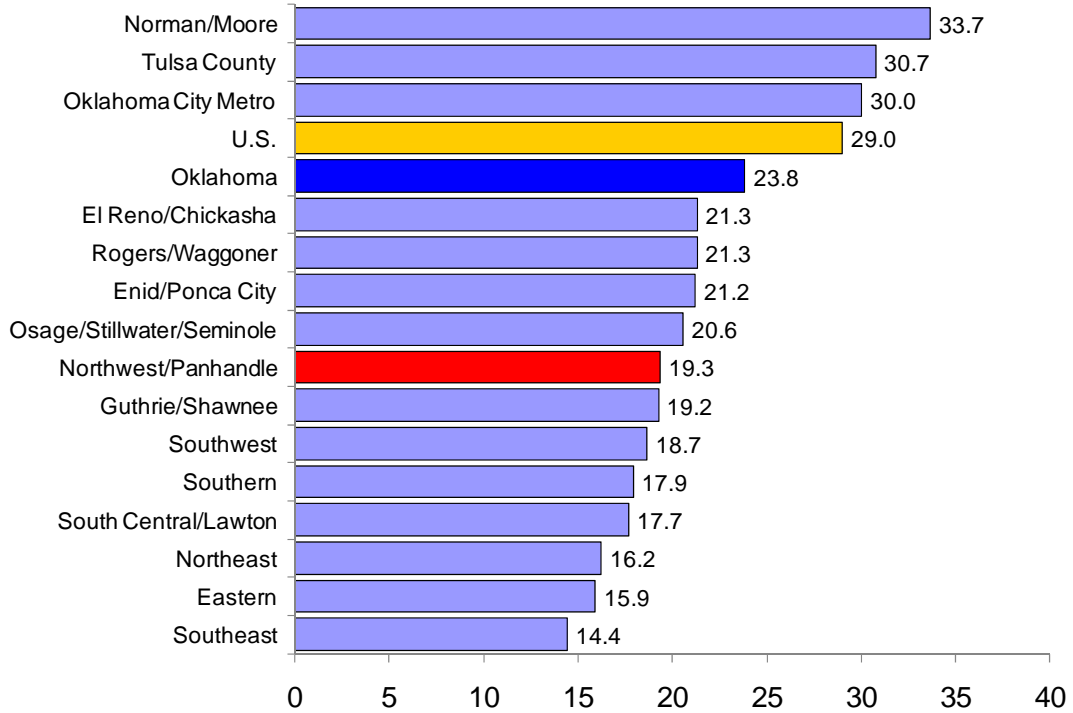
**PERCENT OF 25 TO 64 YEAR OLDS WITH A HIGH SCHOOL DIPLOMA, BUT NO COLLEGE, 2005-07**



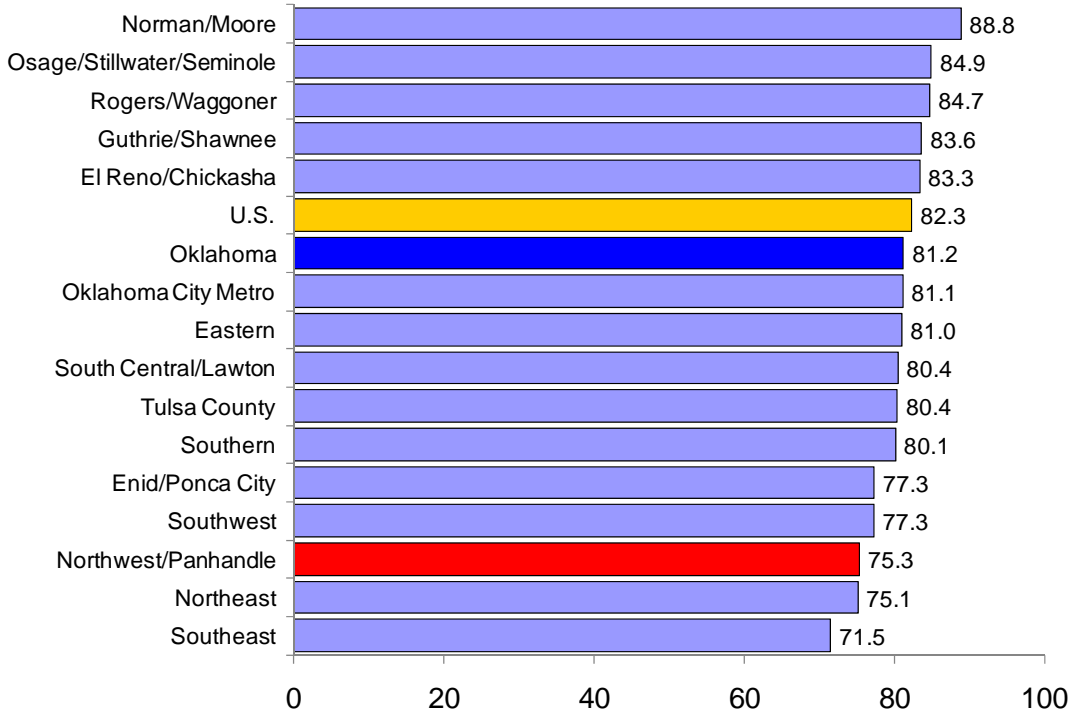
**PERCENT OF 25 TO 64 YEAR OLDS WITH AN ASSOCIATES DEGREE OR HIGHER, 2005-07**



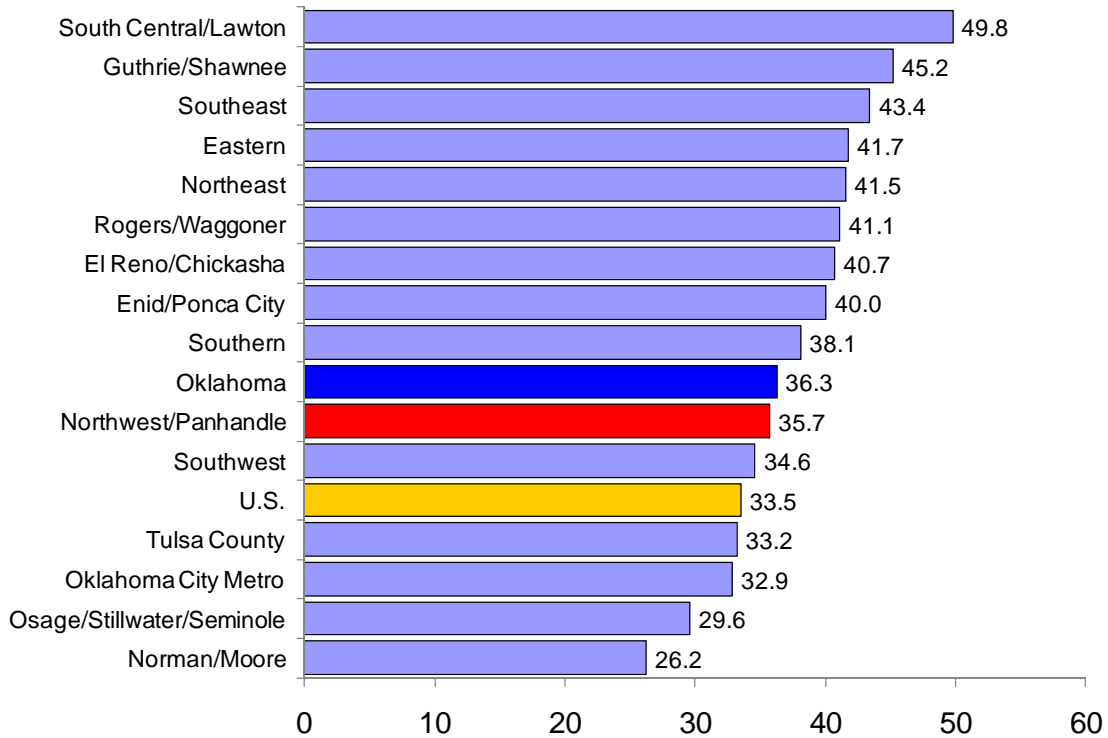
**PERCENT OF 25 TO 64 YEAR OLDS WITH A BACHELOR'S DEGREE OR HIGHER,  
2005-07**



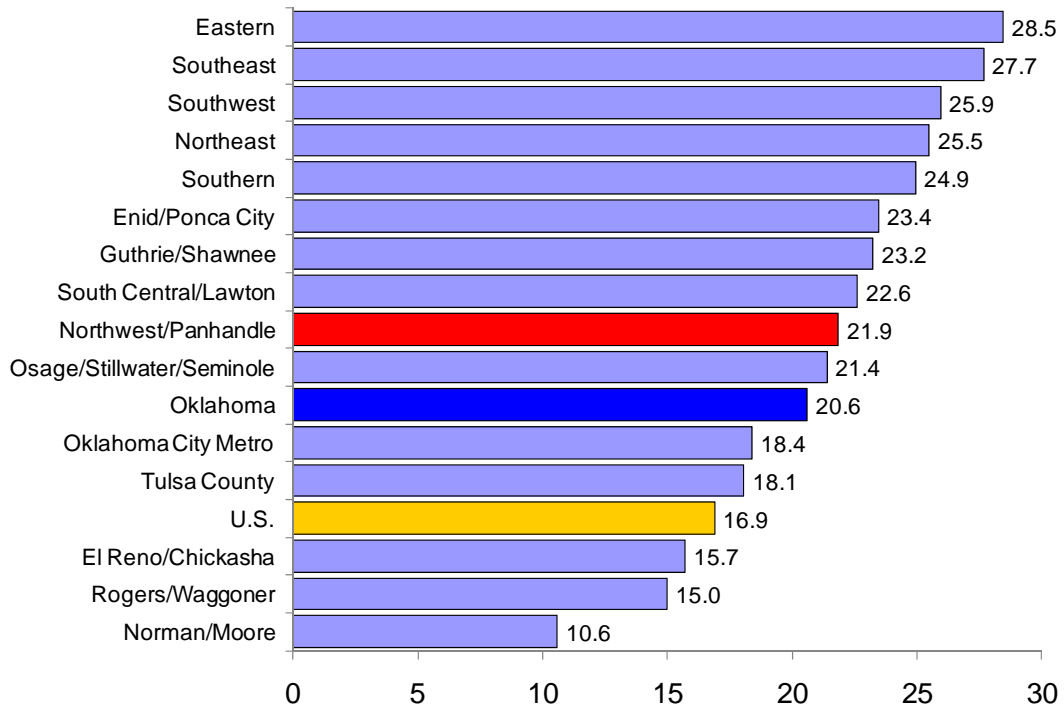
**PERCENT OF 18 TO 24 YEAR OLDS WITH AT LEAST A HIGH SCHOOL DIPLOMA,  
2005-07**



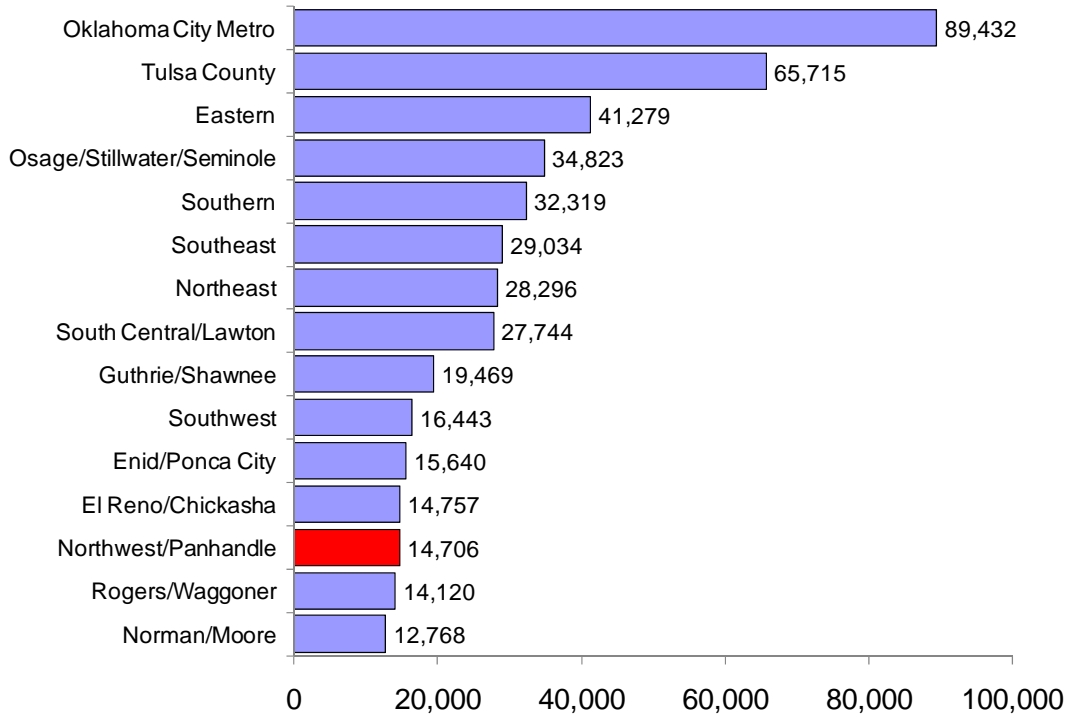
**PERCENT OF 18 TO 24 YEAR OLDS WITH A HIGH SCHOOL DIPLOMA, BUT NO COLLEGE, 2005-07**



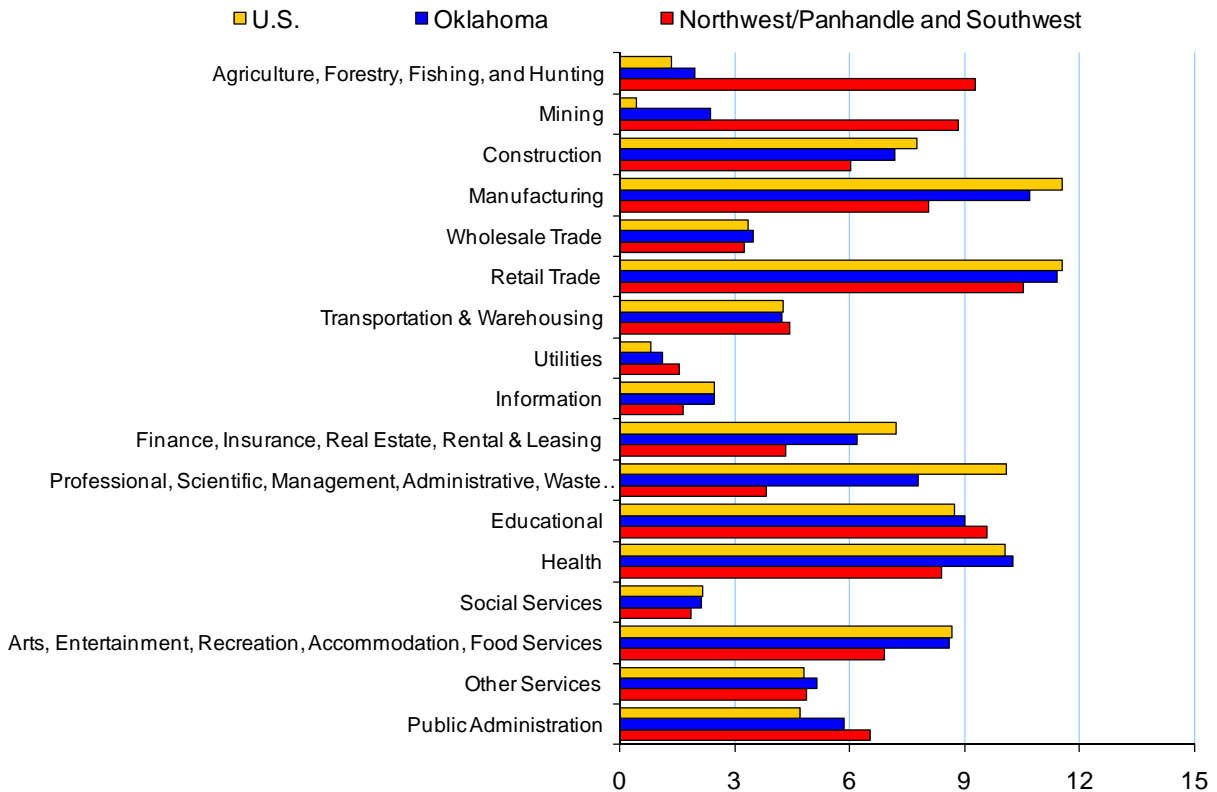
**PERCENT OF 18 TO 64 YEAR OLDS WHO HAVE JUST A HIGH SCHOOL DIPLOMA OR LESS AND ARE LIVING IN FAMILIES WITH INCOMES BELOW A LIVING WAGE**



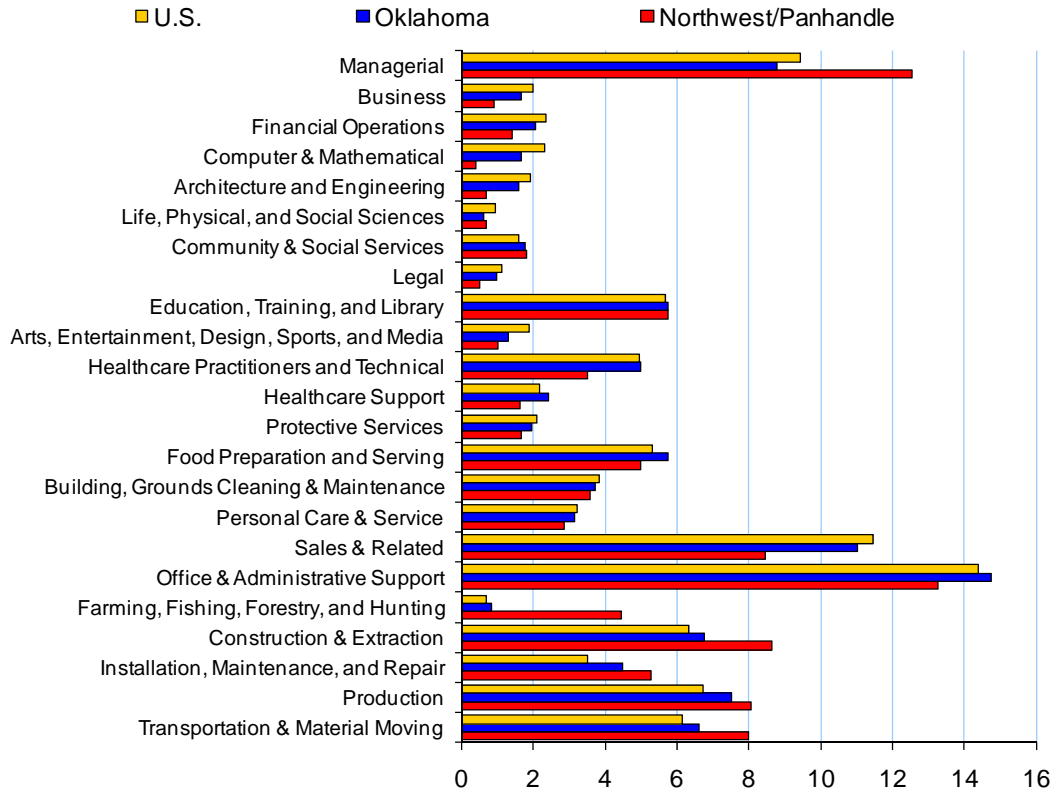
## NUMBER OF 18 TO 64 YEAR OLDS WHO HAVE JUST A HIGH SCHOOL DIPLOMA OR LESS AND ARE LIVING IN FAMILIES WITH INCOMES BELOW A LIVING WAGE



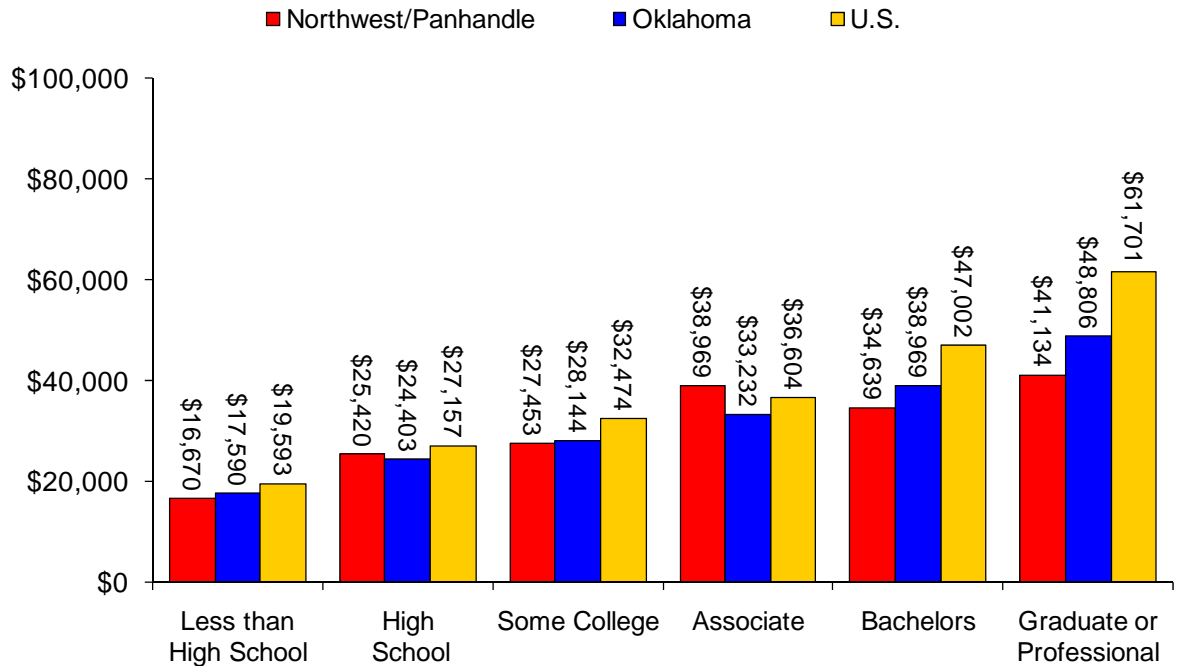
## PERCENTAGE EMPLOYMENT BY INDUSTRY, 2005-07



## PERCENTAGE EMPLOYMENT BY OCCUPATION, 2005-07

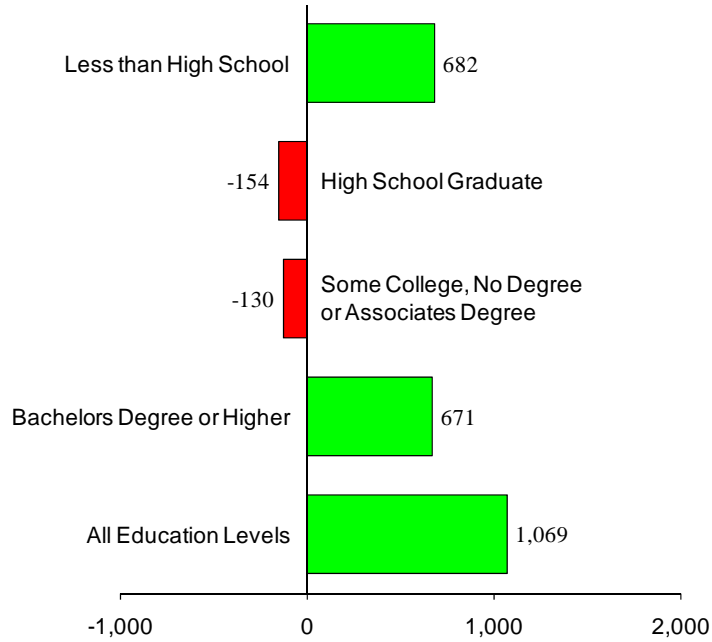


## MEDIAN EARNINGS BY DEGREE-LEVEL, 2005-07





**AVERAGE ANNUAL NET MIGRATION BY DEGREE-LEVEL (2005-2007) 22-64 YEAR OLDS (NORTHWEST/PANHANDLE REGION)**



**AGE 16+ AVERAGE ANNUAL MIGRATION BY OCCUPATION GROUP, 2005-07(NORTHWEST/PANHANDLE REGION)**

