College for all Texans

Texas Higher Education Coordinating Board

The Feasibility of Expanding Texas' Community College Baccalaureate Programs

A Report to the 81st Legislature

DRAFT

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Texas Higher Education Coordinating Board

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Mission of the Coordinating Board

The Texas Higher Education Coordinating Board's mission is to work with the Legislature, Governor, governing boards, higher education institutions and other entities to help Texas meet the goals of the state's higher education plan, Closing the Gaps by 2015, and thereby provide the people of Texas the widest access to higher education of the highest quality in the most efficient manner.

Philosophy of the Coordinating Board

The Texas Higher Education Coordinating Board will promote access to quality higher education across the state with the conviction that access without quality is mediocrity and that quality without access is unacceptable. The Board will be open, ethical, responsive, and committed to public service. The Board will approach its work with a sense of purpose and responsibility to the people of Texas and is committed to the best use of public monies. The Coordinating Board will engage in actions that add value to Texas and to higher education. The agency will avoid efforts that do not add value or that are duplicated by other entities.

The Texas Higher Education Coordinating Board does not discriminate on the basis of race, color, national origin, gender, religion, age, or disability in employment or the provision of services.

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EXECUTIVE SUMMARY

This study, mandated by House Bill 2425 of the 81st Regular Session of the Texas Legislature, examines the success of baccalaureate programs offered at Texas community colleges under the authority of Section 130.0012 of the Texas Education Code. The study also examines the feasibility of expanding the offering of baccalaureate degrees by public community colleges. Key issues examined in the document to determine the feasibility of expanding these programs include an analysis of regional and state workforce needs, current and potential university offerings, and other methods for making baccalaureate degrees available, such as distance education programs and multi-institutional teaching centers (MITCS).

During fall 2009, the Coordinating Board conducted an evaluation of the existing community college baccalaureate programs. This evaluation involved site visits to each of the three community colleges by Coordinating Board staff and a team of three external consultants with expertise in community college and undergraduate education. The consultants noted that because the programs are still so new, it is difficult to collect the longitudinal data necessary to fully determine program success and effectiveness. They concluded that at this stage of program development, all three institutions showed a commitment to continuing to offer the BAT (Bachelor of Applied Technology) and providing quality baccalaureate degree programs.

The Texas Workforce Commission projects that the state and workforce development areas will be in need of several baccalaureate-trained employees in Elementary Education, Middle School Education, Secondary Education, Accounting/Auditing, Business Operations, Computer Systems Analysis, Computer Software Engineering, Construction Management, and Agricultural Management. The state must increase baccalaureate degree program offerings in these fields through a variety of methods including online education, off-campus program expansion at higher education centers, and increased university and community college partnerships.

The expansion of baccalaureate programs at community colleges in Texas at this time should be considered carefully and only when all other options such as increased university off-campus offerings at community colleges and MITCs, increased number of distance education programs, and increased availability of on-campus university programs through more flexible scheduling have been exhausted. The expansion of community college baccalaureate programs would incur significant cost to the state at a time of budgetary constraints. Higher education funding can be better leveraged through the expansion of current university programs and the development of additional online programs.

The study makes the following recommendations.

- For community colleges:
    - The high cost of community college baccalaureate programs, the expensive and time-consuming need to secure accreditation at a higher level, the changes in faculty needs, and the persistent danger of mission creep are but four of the most significant concerns that warn against the expansion of the community college baccalaureate program.

- The three community colleges that currently offer baccalaureate programs should demonstrate the following before having additional baccalaureate degree programs approved:
    - Clearly demonstrate that the existing needs for certificate and associate degree programs in their area are being fully met.
    - Show that there is a compelling, on-going workforce need for the program.
    - Show that any existing university programs in the area are at capacity, or area universities are not interested in offering the baccalaureate program.
    - Show that alternative delivery methods such as online or university off-campus programs at higher education centers or the community college are no longer adequate.
    - Ensure that any additional baccalaureate programs will be delivered in as flexible manner as possible in order to appeal to working adults.

- For universities:
    - Universities must expand flexible course and program offerings through the use of evening and weekend classes and accelerated degree completion programs.
    - Universities should also continue to develop partnerships with area community colleges through improved articulation agreements and university course offerings hosted on the community college campus.
    - Universities should also consider increasing accessibility by offering more programs at higher education centers where there is regional demand for such programs.
    - Universities should make all efforts to provide online versions of high-need/high-demand baccalaureate programs.

- For Texas:
    - The Coordinating Board and the Texas Workforce Commission should provide public universities with information on area workforce needs and projections so institutions can provide baccalaureate degree programs that will meet area workforce needs.
    - The state should also play a greater role in facilitating the alignment of lower-division curricula with the curricular needs of baccalaureate degree programs though such agreements as the Voluntary Mechanical Engineering Transfer Compact. In November 2009, Texas was one of seven states to receive a productivity grant from Lumina Foundation for Education to integrate the "Tuning" process into such course-level alignment work.
    - The Coordinating Board should promote the development of online degree programs. It would be optimal that Texas reach a point where there is at least one quality online degree program for each of the Texas Workforce Commission's top 25 high-growth occupations.

- The state should encourage adults with a significant number of completed semester credit hours and no baccalaureate degree to return to college and complete their degree. Some ways that Texas could help returning adult students would be the creation of a web portal for returning adult students, making more state loans and grants available to part-time students, developing public–private industry partnerships that result in industry-specific marketing campaigns designed to get adult non-degree completers to complete their education, and providing incentive funding for the graduation of returning adult students.

PURPOSE

To fulfill the requirements of HB 2425, 81st Texas Legislature, staff of the Coordinating Board conducted a study relating to the success of baccalaureate degree programs offered under the authority of Texas Education Code, Section 130.0012 and to the feasibility of expanding the offering of baccalaureate degrees by public community colleges. This study includes an evaluation of the existing four community college baccalaureate degree programs, Texas regional workforce needs, current and potential university offerings, other methods for making baccalaureate degrees available, and the economic viability of expanding the offering of baccalaureate degrees by other community colleges.

INTRODUCTION

The need for baccalaureate graduates in Texas is significant. The United States Census Bureau reports that of the 15,124,846 Texas adults over the age of 25, only 3,832,100, or 25.3 percent, possess a bachelor's degree or above.[1] In its 2008 report, "Adult Learning in Focus: National and State Data," the Council for Adult and Experiential Learning and the National Center for Higher Education Management Systems indicated that only 32.7 percent of Texas adults age 25 to 64 held an associate's degree or higher, compared to 37.2 percent nationally.[2] This means that Texas ranks 40th in the nation in the number of adults who hold an associate's degree or higher. The population most impacted by community college baccalaureate programs is nontraditional students, especially working adults. The U.S. Census Bureau has reported that as of 2008, there were 3,411,055 adults in Texas with some college credit but no degree, and only 951,090 with an associate's degree.[3] There are significant economic and social payoffs for the state that are associated with increasing the number of baccalaureate graduates. For example, working-age residents with college degrees are 32 percent more likely to participate in the workforce than those with less than a high school diploma, and their lifetime earnings are twice as high. In 2007, the median annual income difference between those who completed associate's degrees and those who completed baccalaureate degrees was $13,610.[4] Additionally, the number of adults with baccalaureate degrees is often used as an indicator of global competitiveness. According to the *Report of the Select Commission on Higher Education and Global Competitiveness* (2009), "Texas must more than double the annual degree production to reach the level of the best performing country of 55 percent of the population ages 24-64 with an associate degree or higher by 2025."[5]

The challenges facing Texas are not unique, and there have been a number of different approaches to meeting this challenge in both Texas and across the nation, many of which involve increasing access to baccalaureate degree programs. In Texas, this has been accomplished through online distance education programs, degree offerings at university

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[1] U.S. Census Bureau, American Community Survey, "Texas: Selected Social Characteristics in the United States: 2006-2008," *American Fact Finder*, http://factfinder.census.gov, (accessed on February 3, 2010).
[2] Council on Adult and Experiential Learning and National Center for Higher Education Management Systems, *Adult Learning in Focus: National and State Data* (2008), 27.
[3] US Census Bureau, American Community Survey.
[4] U.S. Census Bureau. Current Population Survey, "2009 Annual Social and Economic Supplement," *U.S. Census Bureau,* http://www.census.gov/hhes/www/cpstables/032009/perinc/new03_010.htm, (accessed on April 26, 2010).
[5] Select Commission on Higher Education and Global Competitiveness, *Report of the Select Commission on Higher Education and Global Competitiveness* (2009), 13.

branch campuses and multi-institutional teaching centers, university partnerships with community colleges, expansion of the availability of for-profit, private institutions, and the offering of a limited number of applied baccalaureate programs at three Texas community colleges.

Although community college baccalaureate programs were not authorized in Texas until 2003, they have existed in other states since the 1970s when the Fashion Institute of Technology in New York, an associate degree-granting institution at the time, began offering a baccalaureate degree. Several other institutions followed in the 1980s and 1990s, most notably Westark Community College in Fort Smith, Arkansas, now the University of Arkansas at Fort Smith. Although scattered programs did exist throughout the United States, the push for community college baccalaureate programs was most significantly reinvigorated when Florida decided to allow several community colleges to offer selected baccalaureate degrees in what were deemed high-need areas. In the intervening years, a number of states, including Texas, have authorized community college baccalaureate degrees. As of 2009, there were 23 community college baccalaureate programs in five states.[6] The majority of these programs reside in Florida, but there are multiple programs in Texas and Washington.[7]

The offering of community college baccalaureate degrees in Texas was authorized by the Texas Legislature during the 78th Regular Session in 2003. At that time a number of bills were filed that would amend the Texas Education Code to authorize community college baccalaureate programs. On June 20, 2003, Governor Rick Perry signed SB 286 into law. That bill, authored by Senator Eliot Shapleigh and sponsored by Representatives Geanie Morrison amended Section 130.0012 of the Texas Education Code. The amended code established a pilot project that allowed three community colleges to offer up to five baccalaureate degrees each in the fields of applied science and applied technology. The legislation did, however, contain the following conditions:

- Participation in the project does not alter the role and mission of the community college;
- Participating community colleges must meet all appropriate accreditation requirements established by the Commission on Colleges of the Southern Association of Colleges and Schools;
- Participating community colleges may not offer more than five baccalaureate degree programs at any time;
- Degree program selection should consider regional need, how the program(s) connect to existing programs and course offerings, whether or not programs would unnecessarily duplicate existing degree programs, and the ability of the community college to support the program with adequate resources;

[6] Deborah L. Floyd and Kenneth P. Walker, "The Community College Baccalaureate: Putting the Pieces Together," *Community College Journal of Research and Practice* 33, no. 2 (2009), 106. I have excluded from this count the states whose two year baccalaureate degree granting institutions have since transitioned into four year institutions.
[7] There is some disagreement on the number of community college baccalaureate programs. Several two-year institutions that initially offered a small number of baccalaureate degrees have since been redefined as four-year degree-granting institutions. See Floyd and Walker, "The Community College Baccalaureate: Putting the Pieces Together." I have excluded from this count the states whose two year baccalaureate degree granting institutions have since transitioned effectively transitioned into four year institutions. Thus, I have counted the 14 community colleges in Florida, the one community college in Nevada, the three community colleges in Texas, the one community college in Hawaii, and the four community colleges in Washington.

- Participating programs must enter into articulation agreements with one or more general academic teaching institutions to ensure that enrolled students can complete the degree if the community college no longer offered the program;
- Participating community colleges should receive substantially the same state support for upper-level courses as that of public four-year institutions; and
- Participating community colleges should prepare biennial reports on the operation and effectiveness of the programs.

After the passage of SB 286, three community colleges were chosen by the Coordinating Board to participate in the project: Brazosport College, Midland College, and South Texas College. Working in conjunction with a Coordinating Board advisory committee comprised of community college and university academic administrators, the three institutions prepared degree program proposals for Coordinating Board consideration and approval. Concurrently, the institutions also prepared for accreditation by the Southern Association of Colleges and Schools' (SACS) Commission on Colleges as level-two baccalaureate institutions. This change in status from level-one to level-two baccalaureate institutions entailed substantive institutional proposals and rigorous site visits from SACS accreditation teams. The accreditation teams considered whether there were sufficient institutional resources, especially library and student support services, to maintain baccalaureate programs; whether there were sufficient and appropriately credentialed faculty teaching in the programs; and many other factors.[8] On April 22, 2004, the Coordinating Board approved the offering of the Bachelor of Applied Technology in Technology Management at Brazosport College, Midland College, and South Texas College on the condition that the institutions received accreditation by SACS as level-two baccalaureate institutions. In January 2005, each of the three institutions met this condition. In addition to the initial offering of the Bachelor of Applied Technology in Technology Management, one of the institutions, South Texas College, also received authority to offer a Bachelor of Applied Technology in Computer and Information Technology on October 25, 2007.

During the 80th Regular Session of the Texas Legislature, HB 2198, authored by Representatives Kino Flores and sponsored by Senator Kyle Janek, was signed into law by Governor Rick Perry on June 15, 2007. This bill further amended Texas Education Code, Section 130.0012 and removed the pilot status of the community college baccalaureate program. It did not, however, expand the program beyond the original three community colleges or remove the original conditions imposed by SB 286.

It is important to note that the Texas Education Code specifies that community college baccalaureate offerings may only be in the fields of applied science and applied technology; thus, each of the community colleges currently offers only Bachelor of Applied Technology degrees. Applied baccalaureate degrees are generally flexible degrees that usually involve large transfers of credit, often in the form of an applied associate's degree that includes career and technical education courses. Because of the flexible nature of applied baccalaureate programs, they often appeal to adult students who wish to remain in their jobs while completing their degrees. It is an inverse of the traditional model of undergraduate education, where general

[8] Southern Associaiton of Colleges and Schools Commission on Colleges, "Substantive Change for Accredited Institutions of the Commission on Colleges: Policy Statement," *Southern Association of Colleges and Schools Commission on Colleges,* http://www.sacscoc.org/pdf/081705/Substantive%20change%20policy.pdf, (accessed on April 27, 2010).

education courses are taken during the first two years and specialized courses in the major are taken during the last two years. With an applied baccalaureate degree, the first two years of college are in a specific career/technical field, and the last two years are spent with a variety of general education courses and the remaining upper-division major courses. Applied baccalaureate degree programs are also designed to be directly responsive to employer demand and need and provide an opportunity for students to remain current or advance to management positions in their careers, upgrading their existing applied associate's degree to a bachelor's degree. These programs allow students to get training in a career field first, rather than last, and continue working in that field while they take their remaining general education courses and upper-level subject content courses. With their tradition of offering workforce education and being responsive to community workforce training needs, many of the current community college baccalaureate degrees offered across the nation are applied in nature.[9] This is certainly the case in Texas where all three of the current institutions are legislatively limited to offering degrees in the fields of applied science and technology.

ANALYSIS OF CURRENT COMMUNITY COLLEGE BACCALAUREATE PROGRAMS

In fall 2009, the Coordinating Board conducted an evaluation of the existing community college baccalaureate programs. This evaluation involved site visits to each of the three community colleges by Coordinating Board staff and a team of three external consultants with expertise in community college and undergraduate education.[10] External consultants provided the Coordinating Board with a report of their findings in February 2010 (included in this report as Appendix B).

In an effort to determine the success of the current community college baccalaureate programs, the external consultants identified and analyzed 16 indicators of program success: enrollment, retention, graduation rates, student-to-faculty ratio, job placement and advancement of graduates, student satisfaction, employer satisfaction, student learning outcomes, overall institutional assessment plans, advisory boards, student support services, faculty, budget, technology and information resources, program integrity, and program marketing. In addition to these 16 quality indicators, the consultants also examined if the programs were making sufficient progress towards the overarching needs that experts have identified as the reasons for developing community college baccalaureate programs: increasing access to higher education, economic development, and opportunity for students to achieve a baccalaureate degree.

The consultants noted that because the programs are still so new, it is difficult to collect the longitudinal data necessary to fully determine program success and effectiveness. They concluded that at this stage of program development, all three institutions "were impressive in

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[9] Michael L. Skolnik and Deborah L. Floyd, "The Community College Baccalaureate: Toward an Agenda for Policy and Research," in *The Community College Baccalaureate: Emerging Trends and Policy Issues,* ed. Deborah L. Floyd, Michael L. Skolnik, and Kenneth P. Walker (Sterling, VA: Stylus, 2005), 192-93.

[10] The external site visit team was comprised of Dr. Lee Thornton, past president of Columbia Basin College in Washington; Dr. Beverly Kopper, Associate Provost for Academic Affairs at University of Northern Iowa; and Dr. Troy Paino, Provost of Truman State University. Since the visits were conducted, Dr. Kopper has moved to University of Wisconsin-Whitewater as Provost and Dr. Paino is now President of Truman State University.

their commitment to the BAT (Bachelor of Applied Technology) and the quality of the programs."

In terms of the progress towards the overarching needs that experts have identified as the reasons for the development of community college baccalaureate programs, the consultants found the following:

- Indicators supporting increased access show that enrollment in baccalaureate programs at each of the three institutions has been strong and retention rates are high. Possible contributing factors to the enrollment and retention rates are course offerings that are responsive to student work schedules (i.e., evening, weekend, and online courses) and effective marketing that aids student recruitment.
- Indicators supporting economic development show that employers are "very satisfied" with the performance of graduates and that the community and workforce advisory boards associated with each program were enthusiastic supporters of the program and being used effectively by the institutions. Advisory boards were involved in articulating the connection between community economic development and need, the availability of a well-educated and trained workforce, and the development of the applied baccalaureate degree programs.
- Indicators supporting increased opportunity for baccalaureate attainment by students showed that a significant number of students enrolled in the program were non-traditional students. This student population needs strong student support services, including advising, financial aid, and flexible class schedules. Each institution appears to have developed these services, and students reported a high level of satisfaction and support.

In addition to these findings, the consultants also reported the following regarding other quality indicators:

- All three institutions are heavily engaged in measuring student learning outcomes in efforts that are consistent with requirements for regional accreditation. Institutions demonstrated that data from these assessments are being used to make appropriate program changes.
- Faculty-to-student ratios are typical of those found for most universities.
- While most students are already employed, a number of them are receiving promotions as a result of their work in the programs.
- Faculty at each of the institutions are dedicated and enthusiastic about their involvement in the baccalaureate programs. Teaching loads, however, are high compared to that of many university faculty.
- Each institution appeared to have adequate financial resources for their programs.
- There was no indication that any of the three institutions had abandoned the traditional community college mission or were siphoning off resources from those existing programs to support the baccalaureate programs.
- Although it is too early and there is insufficient data to draw conclusions, early indications are that graduation rates are improving.

The consultants did, however, caution that high teaching loads could negatively impact faculty opportunity to fully participate in the continuing development and implementation of the programs. Additionally, the balance of administration, faculty, and advisory board responsibility for these programs is very important. Ensuring that faculty will play a key role in the decision-

making process for these programs is "of great consequence," especially in light of the American Association of University Professors' standard that "governance in higher education should result from cooperation and interdependence between and among the administration, governing board, faculty and (to a lesser degree) other constituents."[11]

Additionally, the consultants recommended that these institutions develop a set of standards that would help benchmark expectations for their future performance as well as the performance of any future community college baccalaureate programs. Such a set of standards might include:

- Developing a model that identifies the standards and criteria for determining a community's unmet need for the development of an applied baccalaureate degree.
- Defining and developing a model for effective community partnerships that outlines the roles of the community and local business in the successful development and maintenance of these baccalaureate programs.
- Developing a model that identifies the institutional resources and the amount of continuing institutional investment that is necessary for the success of these programs.
- Developing a performance model and methodology for longitudinally measuring program performance. Such a model might include outcome measures such as classroom performance, capstone performance, program performance, and student job performance; as well as student outcome measures that emphasize higher-order thinking skills such as quantitative and qualitative reasoning, moral and ethical judgment, and creativity.
- Developing formal and informal feedback loops that will allow for communicating and receiving information regarding the community college baccalaureate.

REGIONAL AND STATE WORKFORCE NEED AND EDUCATIONAL OPPORTUNITIES

One of the central arguments made for the creation of community college baccalaureate programs is that these programs can provide communities and regions with employees who have the necessary education and credentials to fill workforce needs. Thus, any assessment of the need for expansion of Texas community college baccalaureate programs should take into consideration state and regional workforce occupational projections.

State Occupational Employment Projections

The table below indicates the top 25 occupations statewide that will experience growth in the number of new positions between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

[11] American Association of University Professors, "Indicators of Sound Governance," *American Association of University Professors*, http://web.utk.edu/~senate/Form1.pdf, (accessed on February 3, 2010).

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	88,500	13,980
Retail Salesperson	78,600	18,105
Personal and Home Care Aides	74,800	9,735
Customer Service Representatives	65,600	12,535
Elementary School Teachers, except Special Education	62,250	9,405
Registered Nurses	59,600	8,565
Waiters and Waitresses	53,650	14,825
Child Care Workers	44,250	8,605
Office Clerks, General	42,050	7,775
Janitors and Cleaners, except Maids and Housekeeping Cleaners	39,450	6,950
Executive Secretaries and Administrative Assistants	32,900	5,675
Construction Laborers	32,250	4,215
Secondary School Teachers, except Special and Vocational Education	31,000	5,905
Bookkeeping, Accounting, and Auditing Clerks	30,100	5,270
Middles School Teachers, except Special and Vocational Education	29,700	4,595
Truck Drivers, Heavy and Tractor-Trailer	29,400	5,530
Nursing Aides, Orderlies, and Attendants	29,100	3,745
Teaching Assistants	28,250	4,275
Accountants and Auditors	23,400	3,960
Cooks, Restaurant	23,050	4,120
Receptionists and Information Clerks	23,000	4,420
Home Health Aides	22,200	2,685
First-line Supervisors/Managers of Food Preparation and Serving Workers	21,400	2,740
Secretaries, except Legal, Medical, and Executive	21,000	5,100
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	20,850	4,645

Importantly for this analysis, of these 25 occupations, the Texas Workforce Commission only identifies four of the positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational education, Middle School Teachers except Special and Vocational education, and Accountants and Auditors) as requiring a baccalaureate degree.[12] However, it should be noted that Texas law does not allow institutions of higher education to offer baccalaureate degrees specifically in the area of education. Students must obtain a degree in a content area, such as mathematics or history, as well as be enrolled in a teacher education certificate program leading towards state certification. Community colleges do not offer academic undergraduate content area degrees, so meeting the workforce need for teachers at community colleges is not feasible.

Texas is divided into 28 workforce development areas by the Texas Workforce Commission, which includes a detailed analysis of projected workforce need in each development area. What follows is an analysis of each workforce development area that considers the projected occupation projections for each area, preferred education, and any public higher education programs in that area that can provide the preferred educational credential.

Alamo Workforce Development Area

The Alamo Workforce Development Area is comprised of 12 counties: Atascosa, Bandera, Bexar, Comal, Frio, Gillespie, Guadalupe, Karnes, Kendall, Kerr, Medina, and Wilson. According to 2008 United States census data, this area has a population of 2,134,710. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	7,550	1,255
Personal and Home Care Aides	7,500	970
Retail Salespersons	7,500	1,625
Customer Service Representatives	6,800	1,265
Elementary School Teachers, except Special Education	5,800	860
Registered Nurses	5,200	770

[12] One occupation, Registered Nurse, is listed as requiring an associate degree. In recent years, research sponsored by the Carnegie Foundation for the Advancement of Teaching and the Atlantic Philanthropies has recommended that the Bachelor of Nursing Science become the entry-level credential for nurses. (Burner, Patricia, Molly Sutphen, Victoria Leonard, and Lisa Day. *Educating Nurses: A Call for Radical Transformation*, San Francisco: Jossey-Bass, 2009.) However, the Texas State Board of Nursing does not require a BNS for licensure, and for the purposes of this study, nursing is not included as an occupation that requires a baccalaureate degree.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Office Clerks, General	4,100	715
Janitors and Cleaners, except Maids and Housekeeping Cleaners	3,950	670
Waiters and Waitresses	3,900	1,335
Child Care Workers	3,750	720
Secondary School Teachers, except Special and Vocational Education	2,950	545
Executive Secretaries and Administrative Assistants	2,900	475
Construction Laborers	2,850	365
Middle School Teachers, except Special and Vocational Education	2,750	425
Teaching Assistants	2,700	400
Nursing Aides, Orderlies, and Attendants	2,700	350
Bookkeeping, Accounting, and Auditing Clerks	2,600	445
Cashiers	2,500	1,315
Home Health Aides	2,300	275
Receptionists and Information Clerks	2,300	420
Truck Drivers, Heavy and Tractor-Trailer	2,150	380
First-Line Supervisors/Managers of Retail Sales Workers	2,000	455
Secretaries, except Legal, Medical, and Executive	2,000	455
Maintenance and Repair Workers, General	1,950	210
Laborers and Freight, Stock, and Material Movers	1,950	600

Of these 25 occupations, the Texas Workforce Commission only identifies three positions (Elementary School Teachers except Special Education, Secondary School Teachers except Social and Vocational Education, and Middle School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Alamo Workforce Development Area contains portions of four community college service areas: Alamo College System, Coastal Bend College, Southwest Texas Community College, and Austin Community College. It also includes two public universities, The University of Texas at San Antonio and Texas A&M University-San Antonio. There is one public health-related

institution, The University of Texas Health Science Center at San Antonio, as well as one multi-institutional teaching center, Alamo University Center. It also contains six private universities: Our Lady of the Lake University, Schreiner University, St. Mary's University, Texas Lutheran University, Trinity University, and University of Incarnate Word. Undergraduate teacher preparation programs are offered at The University of Texas at San Antonio, Texas A&M University-San Antonio, Our Lady of the Lake University, Schreiner University, St. Mary's University, Texas Lutheran University, Trinity University, and University of Incarnate Word. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas at San Antonio, Texas A&M University-San Antonio, St. Mary's University, Texas Lutheran University, and four of the Alamo College System schools: Palo Alto College, St. Phillip's College, Northwest Vista College, and San Antonio College.

Brazos Valley Workforce Development Area

The Brazos Valley Workforce Development Area is comprised of seven counties: Brazos, Burleson, Grimes, Leon, Madison, Robertson, and Washington Counties. According to 2008 United States census data, this area has a population of 295,805. The table below indicates the top 25 occupations that will experience growth in the number of new positions between in this area of the state 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	1,150	180
Farmers and Ranchers	900	190
Retail Salespersons	700	185
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	650	160
Registered Nurses	600	95
Personal and Home Care Aides	550	75
Executive Secretaries and Administrative Assistants	550	100
Elementary School Teachers, except Special Education	500	90
Office Clerks, General	500	105
Child Care Workers	450	90
Health Specialties Teachers, Postsecondary	400	60
Graduate Teaching Assistants	400	65
Waiters and Waitresses	400	150

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Janitors and Cleaners, except Maids and Housekeeping Cleaners	400	75
Customer Service Representatives	400	80
Construction Laborers	400	55
Nursing Aides, Orderlies, and Attendants	300	40
Correctional Officers and Jailers	300	55
Middle School Teachers, except Special and Vocational Education	250	40
Secondary School Teachers, except Special and Vocational Education	250	55
Teacher Assistants	250	45
First-Line Supervisors/Managers of Food Preparation and Serving Workers	250	35

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Graduate Teaching Assistants, Secondary School Teachers except Social and Vocational Education, and Middle School Teachers except Special and Vocational Education) as requiring a baccalaureate degree. One occupation, Health Specialties Teachers-Postsecondary, is reported as requiring a master's degree or above.

The Brazos Valley Workforce Development Area contains portions of three community college service areas: Blinn College, McLennan Community College, and Navarro College. It also contains one public university, Texas A&M University, and one public health-related institution, Texas A&M University Health Science Center. Undergraduate Teacher Education programs are offered at Texas A&M University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas A&M University, Blinn College, and McLennan Community College.

Cameron Workforce Development Area

The Cameron Workforce Development Area is comprised of Cameron County. According to 2008 United States census data, this area has a population of 392,736. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	4,650	595
Home Health Aides	1,100	130
Retail Salespersons	1,000	245
Elementary School Teachers, except Special Education	950	160
Registered Nurses	950	140
Combined Food Preparation and Serving Workers, including Fast Food	900	160
Customer Service Representatives	700	135
Nursing Aides, Orderlies, and Attendants	550	75
Office Clerks, General	550	95
Waiters and Waitresses	500	170
Child Care Workers	500	95
Middle School Teachers, except Special and Vocational Education	450	80
Secondary School Teachers, except Special and Vocational Education	400	105
Teaching Assistants	400	70
Licensed Practical and Licensed Vocational Nurses	400	80
Janitors and Cleaners, except Maids and Housekeeping Cleaners	400	80
Receptionists and Information Clerks	350	55
Executive Secretaries and Administrative Assistants	350	60
Medical Assistants	300	35
Maids and Housekeeping Cleaners	300	50
First-Line Supervisors/Managers of retail sales workers	300	70
Cashiers	300	210
Bookkeeping, Accounting, and Auditing Clerks	300	45
Truck Drivers, heavy and tractor-trailer	300	60
Police and Sheriff's Patrol Officers	250	50
Security Guards	250	40

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
First-Line Supervisors/Managers of Office and Administrative Support Workers	250	45
Construction Laborers	250	35
Laborers and Freight, Stock, and Material Movers	250	80

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Social and Vocational Education, and Middle School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Cameron Workforce Development Area contains one community college service area, Texas Southmost College, as well as one public university, The University of Texas at Brownsville. It also contains one public technical college, Texas State Technical College-Harlingen. It also contains one private institution, Howard Payne University. Undergraduate Teacher Education programs are offered at The University of Texas at Brownsville and Howard Payne University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate Teacher Education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas at Brownsville.

Capital Area Workforce Development Area

The Capital Area Workforce Development Area is comprised of Travis County. According to 2008 United States census data, this area has a population of 998,543. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	5,600	810
Retail Salespersons	4,300	900
Customer Service Representatives	4,150	755
Waiters and Waitresses	3,850	985
Registered Nurses	3,000	420
Office Clerks, General	2,450	485

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Elementary School Teachers, except Special Education	2,350	335
Janitors and Cleaners, except Maids and Housekeeping Cleaners	2,350	400
Executive Secretaries and Administrative Assistants	2,250	415
Correctional Officers and Jailers	2,100	395
Computer Software Engineers, Applications	1,850	240
Child Care Workers	1,850	400
Bookkeeping, Accounting, and Auditing Clerks	1,850	310
Construction Laborers	1,800	235
Cooks, Restaurant	1,650	280
Computer Systems Analysts	1,550	265
First-Line Supervisors/Managers of Food Preparation and Serving Workers	1,450	180
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	1,450	275
Accountants and Auditors	1,400	245
Receptionists and Information Clerks	1,400	270
Secretaries, except Legal, Medical, and Executive	1,350	300
Landscaping and Groundskeeping Workers	1,300	195
Secondary School Teachers, except Special and Vocational Education	1,200	210
Business Operations Specialists, all other	1,150	150
Middle School Teachers, except Special and Vocational Education	1,150	165
Teaching Assistants	1,150	175

Of these 25 occupations, the Texas Workforce Commission identifies seven of these positions (Elementary School Teachers except Special Education, Computer Software Engineers-Applications, Computer Software Analysts, Accountants and Auditors, Secondary School Teachers except Social and Vocational Education, Business Operation Specialists-all others, and

Middle School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Capital Area Workforce Development Area contains portions of two community college service areas, Austin Community College and Central Texas College, as well as one public university, The University of Texas at Austin. This area also includes three private universities: Concordia University, Huston-Tillotson University, and St. Edward's University. Undergraduate Teacher Education programs are offered at The University of Texas at Austin, Concordia University, Huston-Tillotson University, and St. Edward's University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate Teacher Education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas at Austin, Huston-Tillotson University, and Austin Community College. Undergraduate programs appropriate for Computer Software Engineers, Computer Software Analysts, Accountants/Auditors, and Business Operations Specialists are available at The University of Texas at Austin, Concordia University, Huston-Tillotson University, and St. Edward's University.

Central Texas Workforce Development Area

The Central Texas Workforce Development Area is comprised of seven counties: Bell, Coryell, Hamilton, Lampasas, Milam, Mills, and San Saba. According to 2008 United States census data, this area has a population of 422,798. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	1,500	235
Elementary School Teachers, except Special Education	1,300	195
Personal and Home Care Aides	1,100	140
Retail Salespersons	1,100	250
Registered Nurses	1,050	155
Child Care Workers	700	135
Customer Service Representatives	700	140
Secondary School Teachers, except Special and Vocational Education	650	120
Middle School Teachers, except Special and Vocational Education	600	90
Teacher Assistants	600	85

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Janitors and Cleaners, except Maids and Housekeeping Cleaners	550	95
Farmers and Ranchers	500	110
Correctional Officers and Jailers	450	70
Office Clerks, General	450	90
Nursing Aides, Orderlies, and Attendants	400	55
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	400	100
Business Operations Specialists, all other	350	50
Waiters and Waitresses	350	140
Cashiers	350	210
Executive Secretaries and Administrative Assistants	350	65
Preschool Teachers, Except Special Education	300	40
Teachers and Instructors, all other	300	35
Maintenance and Repair Workers, General	300	35
Accountants and Auditors	250	45
Home Health Aides	250	30
Police and Sheriff's Patrol Officers	250	55
First-Line Supervisors/Managers of Food Preparation and Serving Workers	250	40
First-Line Supervisors/Managers of Retail Sales Workers	250	65
Bookkeeping, Accounting, and Auditing Clerks	250	55
Secretaries, Except Legal, Medical, and Executive	250	65
Bus Drivers, School	250	30
Truck Drivers, Heavy and Tractor-Trailer	250	50

Of these 25 occupations, the Texas Workforce Commission identifies six of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, Middle School Teachers except Special and Vocational Education, Business Operation Specialists-all others, Teachers and Instructors-all others, and Accountants and Auditors) as requiring a baccalaureate degree.

The Central Texas Workforce Development Area contains portions of three community college service areas: Central Texas College, Temple College, and Blinn College. There is one public university, Texas A&M University-Central Texas; and one public health related institution, Texas A&M University Health Science Center College of Medicine. This workforce development area also contains one private university, University of Mary Hardin Baylor. Undergraduate teacher education programs are offered at Texas A&M University-Central Texas and University of Mary Hardin Baylor. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas A&M University-Central Texas and Blinn College. Undergraduate programs appropriate for Business Operation Specialists and Accountants/Auditors are also available at Texas A&M University-Central Texas and University of Mary Hardin Baylor.

Coastal Bend Workforce Development Area

The Coastal Bend Workforce Development Area is comprised of 12 counties: Aransas, Bee, Brooks, Duval, Jim Wells, Kenedy, Kleburg, Live Oak, McMullen, Nueces, Refugio, and San Patricio. According to 2008 United States census data, this area has a population of 559,249. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	3,500	455
Combined Food Preparation and Serving Workers, including Fast Food	1,850	330
Registered Nurses	1,400	210
Retail Salespersons	1,250	335
Waiters and Waitresses	1,150	345
Child Care Workers	950	190
Elementary School Teachers, except Special Education	850	160
Home Health Aides	850	100
Customer Service Representatives	850	190
Nursing Aides, Orderlies, and Attendants	800	100
Office Clerks, General	750	145
Janitors and Cleaners, except Maids and Housekeeping Cleaners	600	120
Construction Laborers	600	85

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Executive Secretaries and Administrative Assistants	550	105
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	550	135
Truck Drivers, Heavy and Tractor-Trailer	550	115
Farmers and Ranchers	500	100
Teacher Assistants	450	80
Licensed Practical and Licensed Vocational Nurses	450	95
Medical Assistants	450	55
Cooks, Restaurant	450	95
Cashiers	450	360
Bookkeeping, Accounting, and Auditing Clerks	450	90
Receptionists and Information Clerks	450	90
Construction Managers	400	70
Business Operations Specialists, all other	400	55
First-Line Supervisors/Managers of Food Preparation and Serving Workers	400	55

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Construction Managers, and Business Operation Specialists- all others) as requiring a baccalaureate degree.

The Coastal Bend Workforce Development Area contains portions of three community college service areas: Coastal Bend College, Southwest Texas Community College, and Austin Community College. It also contains two public universities: Texas A&M University-Kingsville and Texas A&M University-Corpus Christi. Undergraduate teacher education programs are offered at Texas A&M University-Kingsville and Texas A&M University-Corpus Christi. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas A&M University-Kingsville, Texas A&M University-Corpus Christi, and Austin Community College. Undergraduate programs appropriate for Business Operation Specialists are also available at Texas A&M University-Kingsville and Texas A&M University-Corpus Christi. There are no undergraduate programs appropriate for construction managers in this area.

Concho Valley Workforce Development Area

The Concho Valley Workforce Development Area is comprised of 13 counties: Coke, Concho, Crockett, Irion, Kimble, Mason, McCulloch, Menard, Reagan, Schleicher, Sterling, Sutton, and Tom Green. According to 2008 United States census data, this area has a population of 150,282. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	650	85
Combined Food Preparation and Serving Workers, including Fast Food	500	80
Registered Nurses	400	60
Elementary School Teachers, except Special Education	350	50
Waiters and Waitresses	350	95
Customer Service Representatives	350	75
Farmers and Ranchers	300	80
Retail Salespersons	300	90
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	250	65
Child Care Workers	200	50
Truck Drivers, Heavy and Tractor-Trailer	200	45
Middle School Teachers, except Special and Vocational Education	150	25
Secondary School Teachers, except Special and Vocational Education	150	35
Teacher Assistants	150	25
Home Health Aides	150	20
Nursing Aides, Orderlies, and Attendants	150	20
Correctional Officers and Jailers	150	30
Police and Sheriff's Patrol Officers	150	25
Cooks, Restaurant	150	25
Janitors and Cleaners, except Maids and Housekeeping Cleaners	150	30
Bookkeeping, Accounting, and Auditing Clerks	150	20
Receptionists and Information Clerks	150	20

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Executive Secretaries and Administrative Assistants	150	30
Office Clerks, General	150	35
Slaughterers and Meat Packers	150	25

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Concho Valley Workforce Development Area contains portions of three community college service areas: Howard College, Midland College, and Central Texas College. It also has one public university, Angelo State University, and one public university teaching site, Texas Tech University Teaching Site at Junction. Undergraduate teacher education programs are offered at Angelo State University and Texas Tech University Teaching Site at Junction. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Angelo State University and Midland College through its University Center partnership with The University of Texas of the Permian Basin.

Dallas Workforce Development Area

The Dallas Workforce Development Area is comprised of Dallas County. According to 2008 United States census data, this area has a population of 2,412,827. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Customer Service Representatives	11,550	2,305
Combined Food Preparation and Serving Workers, including Fast Food	9,050	1,495
Retail Salespersons	8,000	2,170
Waiters and Waitresses	7,300	2,010
Personal and Home Care Aides	7,050	920
Registered Nurses	6,600	1,005

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Elementary School Teachers, except Special Education	6,350	915
Office Clerks, General	6,200	1,200
Truck Drivers, Heavy and Tractor-Trailer	5,400	1,030
Security Guards	5,050	845
Bookkeeping, Accounting, and Auditing Clerks	4,700	870
Executive Secretaries and Administrative Assistants	4,600	820
Accountants and Auditors	4,500	745
Janitors and Cleaners, except Maids and Housekeeping Cleaners	4,300	835
Child Care Workers	3,800	790
Construction Laborers	3,650	495
Cooks, Restaurant	3,300	580
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	3,300	845
Secondary School Teachers, except Special and Vocational Education	3,250	570
Computer Software Engineers, Applications	3,150	425
Computer Systems Analysts	3,150	545
Receptionists and Information Clerks	3,150	655
Middle School Teachers, except Special and Vocational Education	3,050	445
Teacher Assistants	3,050	440
Business Operations Specialists, all other	2,750	380
Medical Assistants	2,750	345

Of these 25 occupations, the Texas Workforce Commission identifies seven of these positions (Elementary School Teachers except Special Education, Accountants and Auditors, Secondary School Teachers except Special and Vocational Education, Computer Software Engineers-Applications, Computer System Analysts, Middle School Teachers except Special and Vocational Education, and Business Operation Specialists-all other) as requiring a baccalaureate degree.

The Dallas Workforce Development Area contains one community college service area, Dallas County Community College. It also contains two public universities: The University of Texas at

Dallas and the University of North Texas at Dallas. There are also two public health related institutions: The University of Texas Southwest Medical Center, and the Baylor College of Dentistry. There is one multi-institutional teaching center, the University Center at Dallas, and one teaching site, Texas Woman's University Dallas Center. This workforce development area also includes five private universities: Amberton University, Dallas Baptist University, Paul Quinn College, Southern Methodist University, and the University of Dallas. Undergraduate teacher education programs are offered at The University of Texas at Dallas, the University of North Texas at Dallas, Dallas Baptist University, Paul Quinn College, Southern Methodist University, and the University of Dallas. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas at Dallas, Southern Methodist University, and three of the Dallas County Community College District schools: Brookhaven College, Mountain View College, and Richland College. Undergraduate programs appropriate for Business Operations Specialists are also available at The University of Texas at Dallas, the University of North Texas at Dallas, Amberton University, Dallas Baptist University, Dallas Baptist University, Paul Quinn College, Southern Methodist University, the University of Dallas, and the University Center Dallas. Undergraduate programs appropriate for Accountants/Auditors are available at The University of Texas at Dallas, the University of North Texas at Dallas, the University Center Dallas, Amberton University, and Dallas Baptist University. Undergraduate programs appropriate for Computer Software Engineers and Computer Systems Analysts are available at The University of Texas at Dallas, Dallas Baptist University, and Southern Methodist University.

Deep East Texas Workforce Development Area

The Deep East Texas Workforce Development Area is comprised of twelve counties: Angelina, Houston, Jasper, Nacogdoches, Newton, Polk, Sebine, San Augustine, San Jacinto, Shelby, Trinity, and Tyler. According to 2008 United States census data, this area has a population of 367,440. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	1,350	175
Combined Food Preparation and Serving Workers, including Fast Food	1,100	170
Elementary School Teachers, except Special Education	700	120
Farmers and Ranchers	650	140
Retail Salespersons	650	175

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Registered Nurses	600	100
Nursing Aides, Orderlies, and Attendants	450	60
Child Care Workers	450	85
Correctional Officers and Jailers	400	70
Customer Service Representatives	400	90
Office Clerks, General	400	75
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	400	100
Secondary School Teachers, except Special and Vocational Education	350	75
Home Health Aides	350	45
Janitors and Cleaners, except Maids and Housekeeping Cleaners	350	65
Middle School Teachers, except Special and Vocational Education	300	60
Teacher Assistants	300	50
Licensed Practical and Licensed Vocational Nurses	250	55
First-Line Supervisors/Managers of Food Preparation and Serving Workers	250	25
Waiters and Waitresses	250	110
Executive Secretaries and Administrative Assistants	250	50
Accountants and Auditors	200	35
Police and Sheriff's Patrol Officers	200	45
Bookkeeping, Accounting, and Auditing Clerks	200	40
Receptionists and Information Clerks	200	40
Construction Laborers	200	30
Truck Drivers, Heavy and Tractor-Trailer	200	55

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, Middle School Teachers except Special and Vocational Education, and Accountants and Auditors) as requiring a baccalaureate degree.

The Deep East Texas Workforce Development Area contains portions of three community college service areas:Angelina College, Lone Star College, and Panola College. There is one

public university, Stephen F. Austin State University. Undergraduate teacher education programs are offered at Stephen F. Austin State University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Stephen F. Austin State University and five of Lone Star College's campuses: CyFair, Kingwood, North Harris, Tomball, and Montgomery. Undergraduate programs appropriate for Accountants/Auditors are also available at Stephen F. Austin State University.

East Texas Workforce Development Area

The East Texas Workforce Development Area is comprised of 14 counties: Anderson, Camp, Cherokee, Gregg, Harrison, Henderson, Marion, Panola, Rains, Rusk, Smith, Upshur, Van Zandt, and Wood Counties. According to 2008 United States census data, this area has a population of 805,746. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	2,950	380
Combined Food Preparation and Serving Workers, including Fast Food	2,800	440
Retail Salespersons	2,300	555
Registered Nurses	2,150	305
Farmers and Ranchers	1,450	300
Customer Service Representatives	1,400	285
Waiters and Waitresses	1,350	375
Elementary School Teachers, except Special Education	1,300	230
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,250	315
Nursing Aides, Orderlies, and Attendants	1,100	155
Janitors and Cleaners, except Maids and Housekeeping Cleaners	900	170
Child Care Workers	900	195
Office Clerks, General	900	185
Truck Drivers, Heavy and Tractor-Trailer	850	175
Construction Laborers	800	110
Home Health Aides	750	100

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Bookkeeping, Accounting, and Auditing Clerks	750	130
Executive Secretaries and Administrative Assistants	750	140
Licensed Practical and Licensed Vocational Nurses	650	135
First-Line Supervisors/Managers of Food Preparation and Serving Workers	650	80
Middle School Teachers, except Special and Vocational Education	600	110
Secondary School Teachers, except Special and Vocational Education	600	150
Receptionists and Information Clerks	600	120
Medical Assistants	550	70
Cooks, Restaurant	550	100
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	550	115
Roustabouts, Oil and Gas	550	100

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The East Texas Workforce Development Area contains portions of six community college service areas: Angelina College, Northeast Texas Community College, Kilgore College, Panola College, Trinity Valley Community College, and Tyler Community College. It also contains one public university, The University of Texas at Tyler, and one public technical college, Texas State Technical College-Marshall. There is one public health-related institution, Texas A&M University Health Science Center-Tyler. This workforce development area also includes five private upper-level institutions: East Texas Baptist University, Jarvis Christian College, LeTourneau University, Texas College, and Wiley College. There are also two private two-year institutions, Jacksonville College and Lon Morris College. Undergraduate teacher education programs are offered at The University of Texas at Tyler, East Texas Baptist University, Jarvis Christian College, LeTourneau University, Texas College, and Wiley College. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas at Tyler and Tyler Community College.

Golden Crescent Workforce Development Area

The Golden Crescent Texas Workforce Development Area is comprised of seven counties: Calhoun, De Witt, Goliad, Gonzales, Jackson, Lavaca, and Victoria. According to 2008 United States census data, this area has a population of 185,862. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Farmers and Ranchers	600	150
Registered Nurses	550	80
Elementary School Teachers, except Special Education	450	75
Nursing Aides, Orderlies, and Attendants	450	50
Retail Salespersons	450	125
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	450	110
Combined Food Preparation and Serving Workers, including Fast Food	350	80
Personal and Home Care Aides	350	55
Child Care Workers	250	60
Customer Service Representatives	250	55
Truck Drivers, Heavy and Tractor-Trailer	250	55
Middle School Teachers, except Special and Vocational Education	200	35
Secondary School Teachers, except Special and Vocational Education	200	45
Licensed Practical and Licensed Vocational Nurses	200	40
Home Health Aides	200	25
Janitors and Cleaners, except Maids and Housekeeping Cleaners	200	40
Bookkeeping, Accounting, and Auditing Clerks	200	30
Teacher Assistants	150	30
Medical Assistants	150	15
Cashiers	150	125

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	150	35
Executive Secretaries and Administrative Assistants	150	30
Office Clerks, General	150	35
Construction Laborers	150	25
Electricians	150	25
Roustabouts, Oil and Gas	150	25
Industrial Machinery Mechanics	150	15

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Golden Crescent Texas Workforce Development Area contains portions of three community college service areas: The Victoria College, Austin Community College, and Wharton County College. There is one public university, the University of Houston at Victoria. Undergraduate teacher education programs are offered at the University of Houston-Victoria. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at the University of Houston-Victoria and Austin Community College.

Gulf Coast Workforce Development Area

The Gulf Coast Workforce Development Area is comprised of 12 counties: Austin, Brazoria, Chambers, Colorado, Fort Bend, Galveston, Harris, Liberty, Matagorda, Walker, Waller, and Wharton. According to 2008 United States census data, this area has a population of 5,436,310. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	25,750	3,745
Retail Salespersons	18,900	4,265

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Elementary School Teachers, except Special Education	17,650	2,520
Registered Nurses	17,550	2,365
Waiters and Waitresses	15,950	3,895
Customer Service Representatives	15,250	2,895
Personal and Home Care Aides	13,250	1,720
Child Care Workers	13,200	2,545
Office Clerks, General	11,550	2,040
Janitors and Cleaners, except Maids and Housekeeping Cleaners	10,800	1,890
Construction Laborers	9,900	1,290
Executive Secretaries and Administrative Assistants	9,850	1,615
Secondary School Teachers, except Special and Vocational Education	9,050	1,575
Bookkeeping, Accounting, and Auditing Clerks	8,750	1,465
Middle School Teachers, except Special and Vocational Education	8,500	1,235
Teacher Assistants	8,150	1,160
Nursing Aides, Orderlies, and Attendants	8,050	970
Accountants and Auditors	7,250	1,180
Security Guards	6,800	1,075
Secretaries, Except Legal, Medical, and Executive	6,800	1,475
Cooks, Restaurant	6,750	1,120
First-Line Supervisors/Managers of Food Preparation and Serving Workers	6,450	785
Receptionists and Information Clerks	6,400	1,175
Truck Drivers, Heavy and Tractor-Trailer	6,250	1,230
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	6,000	1,310

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, and Accountants and Auditors) as requiring a baccalaureate degree. One additional occupation, Clergy, is noted as requiring a master's degree.

The Gulf Coast Workforce Development Area contains portions of ten community college service areas: Alvin Community College, Blinn College, Brazosport College, College of the Mainland, Galveston, Houston Community College, Lee College, Lone Star College, San Jacinto College, and Wharton County College. It also contains seven public universities: Texas A&M University-Galveston, Texas Southern University, the University of Houston, the University of Houston-Clear Lake, the University of Houston-Downtown, Sam Houston State University, and Prairie View A&M University. There are three public health related institutions: The University of Texas Medical Branch-Galveston, The University of Texas Health Science Center-Houston, and The University of Texas M.D. Anderson Cancer Center. There are also three multi-institutional teaching centers: the University of Houston System Center at Sugar Land/Fort Bend, the University of Houston System Center at Cinco Ranch, and Lone Star College University Center. There is one additional teaching site, Texas Woman's University Houston Center. This workforce development area also includes three private universities: Houston Baptist University, Rice University, and the University of St. Thomas. Undergraduate teacher education programs are offered at Texas A&M University-Galveston, Texas Southern University, the University of Houston, University of Houston-Clear Lake, the University of Houston-Downtown, Sam Houston State University, Prairie View A&M University, Houston Baptist University, Rice University, and the University of St. Thomas.

Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas Southern University, the University of Houston-Clear Lake, Prairie View A&M University, the University of Houston, the University of Houston-Downtown, Houston Community College, San Jacinto College, the University of Houston System Center at Sugar Land/Fort Bend, Houston Baptist University, Rice University, and the University of St. Thomas. Undergraduate programs appropriate for Accountants/Auditors are also present at Texas Southern University, the University of Houston, the University of Houston-Clear Lake, the University of Houston-Downtown, Houston Baptist University, the University of St. Thomas, the University of Houston System Center at Sugar Land/Fort Bend, the University of Houston System Center at Cinco Ranch, and Lone Star College University Center.

Heart of Texas Workforce Development Area

The Heart of Texas Workforce Development Area is comprised of six counties: Bosque, Falls, Freestone, Hill, Limestone, and McLennan. According to 2008 United States census data, this area has a population of 341,625. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including fast food	1,150	195
Elementary School Teachers, except Special Education	1,050	150
Farmers and Ranchers	950	175
Retail Salespersons	850	205
Registered Nurses	800	125
Secondary School Teachers, except Special and Vocational Education	550	95
Janitors and Cleaners, except Maids and Housekeeping Cleaners	550	105
Personal and Home Care Aides	550	80
Customer Service Representatives	550	130
Middle School Teachers, except Special and Vocational Education	500	75
Teacher Assistants	500	75
Child Care Workers	500	105
Office Clerks, General	500	100
Construction Laborers	450	60
Nursing Aides, Orderlies, and Attendants	400	60
Waiters and Waitresses	400	145
Correctional Officers and Jailers	350	65
Executive Secretaries and Administrative Assistants	350	70
Truck Drivers, Heavy and Tractor-Trailer	350	70
Clergy	300	50
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	300	75
Teachers and Instructors, all other	250	35
Home Health Aides	250	35
First-Line Supervisors/Managers of Food Preparation and Serving Workers	250	35
Landscaping and Groundskeeping Workers	250	35
First-Line Supervisors/Managers of Retail Sales Workers	250	65
Cashiers	250	220

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Bookkeeping, Accounting, and Auditing Clerks	250	60
Maintenance and Repair Workers, General	250	30

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, Middle School Teachers except Special and Vocational Education, and Teachers and Instructors-all other) as requiring a baccalaureate degree. One additional occupation, Clergy, is noted as requiring a master's degree.

The Heart of Texas Workforce Development Area contains portions of three community college service areas: Hill College, McLennan Community College, and Navarro College. There is one public technical college, Texas State Technical College at Waco, and one private university, Baylor University. There are no undergraduate teacher education programs offered by public universities in this area, but Baylor University does offer teacher education programs. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at McLennan Community College.

Lower Rio Grande Workforce Development Area

The Lower Rio Grande Workforce Development Area is comprised of three counties: Hidalgo, Starr, and Willacy Counties. According to 2008 United States census data, this area has a population of 809,453. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	8,100	1,060
Elementary School Teachers, except Special Education	3,050	450
Combined Food Preparation and Serving Workers, including Fast Food	2,850	415
Retail Salespersons	2,800	555

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Registered Nurses	2,250	300
Home Health Aides	1,650	195
Secondary School Teachers, except Special and Vocational Education	1,550	285
Middle School Teachers, except Special and Vocational Education	1,450	220
Customer Service Representatives	1,350	245
Teacher Assistants	1,300	190
Waiters and Waitresses	1,250	305
Cashiers	1,150	460
Office Clerks, General	1,150	190
Nursing Aides, Orderlies, and Attendants	1,000	120
Janitors and Cleaners, except Maids and Housekeeping Cleaners	1,000	170
Truck Drivers, Heavy and Tractor-Trailer	900	155
Child Care Workers	850	170
Licensed Practical and Licensed Vocational Nurses	700	135
Medical Assistants	700	85
First-Line Supervisors/Managers of Retail Sales Workers	700	150
Receptionists and Information Clerks	700	115
Executive Secretaries and Administrative Assistants	700	120
First-Line Supervisors/Managers of Food Preparation and Serving Workers	650	80
Secretaries, Except Legal, Medical, and Executive	650	135
Teachers and Instructors, all other	600	85
Bookkeeping, Accounting, and Auditing Clerks	600	100

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, and Accountants and Auditors) as requiring a baccalaureate degree.

The Lower Rio Grande Workforce Development Area contains portions of two community college service areas: South Texas College (which offers baccalaureate degrees in Computer and Information Technology and Technology Management) and Texas Southmost College. There is one public university, The University of Texas-Pan American. Undergraduate teacher education programs are offered at The University of Texas-Pan American. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas-Pan American and South Texas College. Undergraduate programs leading to positions as Accountants/Auditors are available at The University of Texas-Pan American.

Middle Rio Grande Workforce Development Area

The Middle Rio Grande Workforce Development Area is comprised of nine counties: Dimmit, Edwards, Kinney, LaSalle, Maverick, Real, Uvalde, Val Verde, and Zavala. According to 2008 United States census data, this area has a population of 162,150. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	1,800	235
Retail Salespersons	450	100
Elementary School Teachers, except Special Education	400	70
Home Health Aides	400	40
Registered Nurses	350	50
Detectives and Criminal Investigators	350	60
Combined Food Preparation and Serving Workers, including Fast Food	300	60
Farmers and Ranchers	200	40
Middle School Teachers, except Special and Vocational Education	200	35
Secondary School Teachers, except Special and Vocational Education	200	45
Nursing Aides, Orderlies, and Attendants	200	20
Cashiers	200	95
Customer Service Representatives	200	40

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Teacher Assistants	150	25
Licensed Practical and Licensed Vocational Nurses	150	30
Correctional Officers and Jailers	150	25
Janitors and Cleaners, except Maids and Housekeeping Cleaners	150	30
Child Care Workers	150	45
First-Line Supervisors/Managers of Retail Sales Workers	150	25
Office Clerks, General	150	30
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	150	45
Business Operations Specialists, all other	100	15
Teachers and Instructors, all other	100	10
Medical Assistants	100	5
Police and Sheriff's Patrol Officers	100	25
Waiters and Waitresses	100	40
Construction Laborers	100	10
Maintenance and Repair Workers, General	100	10
Shoe and Leather Workers and Repairers	100	15
Shoe Machine Operators and Tenders	100	10
Truck Drivers, Heavy and Tractor-Trailer	100	25

Of these 25 occupations, the Texas Workforce Commission identifies five of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, Business Operations Specialists-other, and Teachers and Instructors-all others) as requiring a baccalaureate degree.

The Middle Rio Grande Workforce Development Area contains portions of one community college service area, Southwest Texas Community College, as well as one public university, Sul Ross State University Rio Grande Campus. Undergraduate teacher education programs are offered at Sul Ross State University Rio Grande Campus. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Sul Ross State University Rio Grande Campus. Baccalaureate degree programs appropriate for Business Operations Specialists are also offered at Sul Ross State University Rio Grande Campus.

North Central Workforce Development Area

The North Central Workforce Development Area is comprised of 14 counties: Collin, Denton, Ellis, Erath, Hood, Hunt, Johnson, Kaufman, Navarro, Palo Pinto, Parker, Rockwell, Somervell, and Wise. According to 2008 United States census data, this area has a population of 2,302,987. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Retail Salespersons	7,950	1,655
Combined Food Preparation and Serving Workers, including Fast Food	7,450	1,150
Customer Service Representatives	5,900	1,055
Waiters and Waitresses	5,300	1,245
Elementary School Teachers, except Special Education	4,850	745
Janitors and Cleaners, except Maids and Housekeeping Cleaners	4,150	650
Child Care Workers	3,800	820
Office Clerks, General	3,300	565
Personal and Home Care Aides	3,100	395
Construction Laborers	3,050	370
Registered Nurses	2,650	385
Bookkeeping, Accounting, and Auditing Clerks	2,550	415
Truck Drivers, Heavy and Tractor-Trailer	2,550	425
Executive Secretaries and Administrative Assistants	2,500	400
Secondary School Teachers, except Special and Vocational Education	2,400	470
Nursing Aides, Orderlies, and Attendants	2,350	295
Middle School Teachers, except Special and Vocational Education	2,300	365
Cooks, Restaurant	2,300	370
Teacher Assistants	2,200	350

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Landscaping and Groundskeeping Workers	2,150	290
First-Line Supervisors/Managers of Retail Sales Workers	1,900	430
First-Line Supervisors/Managers of Food Preparation and Serving Workers	1,850	235
Secretaries, Except Legal, Medical, and Executive	1,850	400
Maintenance and Repair Workers, General	1,850	200
Farmers and Ranchers	1,800	380
Cashiers	1,800	1,140

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, Business Operations Specialists-other, and Middle School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The North Central Workforce Development Area contains portions of eight community college service areas: Collin College, Hill College, Navarro College, North Central Texas College, Paris Community College, Ranger College, Trinity Valley Community College, and Weatherford College. It also contains four public universities: Texas Woman's University, the University of North Texas, Tarleton State University, and Texas A&M University-Commerce. There are also two multi-institutional teaching centers, Collin Higher Education Center and Texas A&M University-Commerce Mesquite Center. This workforce development area also includes four private universities: Amberton University, Southwestern Adventist University, Southwestern Assemblies of God University, and Southwestern Christian College. Undergraduate teacher education programs are offered at Texas Woman's University, the University of North Texas, Tarleton State University, Collin Higher Education Center, Southwestern Adventist University, Southwestern Assemblies of God University, and Texas A&M University-Commerce. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at the University of North Texas, Tarleton State University, Texas Woman's University, Texas A&M University-Commerce, Collin College, and Weatherford College. Undergraduate programs appropriate for Business Operations Specialists are offered at Texas Woman's University, the University of North Texas, Tarleton State University, Texas A&M University-Commerce, and Collin Higher Education Center.

North East Texas Workforce Development Area

The North East Texas Workforce Development Area is comprised of nine counties: Bowie, Cass, Delta, Franklin, Hopkins, Lamar, Morris, Red River, and Titus Counties. According to 2008

United States census data, this area has a population of 276,779. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	1,600	205
Retail Salespersons	850	215
Farmers and Ranchers	700	155
Registered Nurses	700	110
Combined Food Preparation and Serving Workers, including Fast Food	600	125
Elementary School Teachers, except Special Education	500	95
Waiters and Waitresses	500	125
Customer Service Representatives	500	100
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	500	110
Child Care Workers	400	80
Home Health Aides	350	50
Nursing Aides, Orderlies, and Attendants	350	50
Janitors and Cleaners, except Maids and Housekeeping Cleaners	300	60
Office Clerks, General	300	60
Slaughterers and Meat Packers	300	95
Truck Drivers, Heavy and Tractor-Trailer	300	65
Middle School Teachers, except Special and Vocational Education	250	45
Secondary School Teachers, except Special and Vocational Education	250	60
Teacher Assistants	250	45
Medical Assistants	250	30
Cooks, Restaurant	250	35
Business Operations Specialists, all other	200	25
Licensed Practical and Licensed Vocational Nurses	200	50
Bookkeeping, Accounting, and Auditing Clerks	200	40

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Tellers	200	45
Receptionists and Information Clerks	200	40
Executive Secretaries and Administrative Assistants	200	40
Welders, Cutters, Solderers, and Brazers	200	45

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, Secondary School Teachers except Special and Vocational Education, and Business Operations Specialists-other) as requiring a baccalaureate degree.

The North East Texas Workforce Development Area contains portions of three community college service areas: Northeast Texas Community College, Texarkana College, and Paris Community College. There is one public university, Texas A&M University-Texarkana. Undergraduate teacher education programs are offered at Texas A&M University-Texarkana. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas A&M University-Texarkana. Undergraduate programs appropriate for Business Operations Specialists are also available at Texas A&M University-Texarkana.

North Texas Workforce Development Area

The North Texas Workforce Development Area is comprised of 11 counties: Archer, Baylor, Clay, Cottle, Foard, Hardeman, Jack, Montague, Wichita, Wilbarger, and Young. According to 2008 United States census data, this area has a population of 217,897. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	750	105
Farmers and Ranchers	550	135
Registered Nurses	550	85
Combined Food Preparation and Serving Workers, including Fast Food	500	90
Retail Salespersons	500	140

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Elementary School Teachers, except Special Education	450	75
Customer Service Representatives	400	75
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	400	100
Child Care Workers	350	75
Home Health Aides	300	30
Waiters and Waitresses	300	110
Nursing Aides, Orderlies, and Attendants	250	35
Middle School Teachers, except Special and Vocational Education	200	35
Secondary School Teachers, except Special and Vocational Education	200	45
Teacher Assistants	200	35
Janitors and Cleaners, except Maids and Housekeeping Cleaners	200	45
Executive Secretaries and Administrative Assistants	200	35
Office Clerks, General	200	55
Truck Drivers, Heavy and Tractor-Trailer	200	40
Business Operations Specialists, all other	150	15
Clergy	150	25
Teachers and Instructors, all other	150	20
Medical Assistants	150	20
Police and Sheriff's Patrol Officers	150	30
Cooks, Restaurant	150	30
First-Line Supervisors/Managers of Retail Sales Workers	150	40
Cashiers	150	140
Bookkeeping, Accounting, and Auditing Clerks	150	35
Receptionists and Information Clerks	150	30
Construction Laborers	150	20
Roustabouts, Oil and Gas	150	30
Aircraft Mechanics and Service Technicians	150	20

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Maintenance and Repair Workers, General	150	15
Welders, Cutters, Solderers, and Brazers	150	25

Of these 25 occupations, the Texas Workforce Commission identifies five of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, Secondary School Teachers except Special and Vocational Education, Business Operations Specialists-other, and Teachers and Instructors-all others) as requiring a baccalaureate degree. One additional occupation, Clergy, is noted as requiring a master's degree.

The North Texas Workforce Development Area contains portions of four community college service areas: Vernon College, North Central Texas College, Weatherford College, and Ranger College. There is one public university, Midwestern State University. Undergraduate teacher education programs are offered at Midwestern State University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Midwestern State University and Weatherford College. Undergraduate programs appropriate for Business Operations Specialists are also available at Midwestern State University.

Panhandle Workforce Development Area

The Panhandle Workforce Development Area is comprised of 26 counties: Armstrong, Briscoe, Carson, Castro, Childress, Collingsworth, Dallam, Deaf Smith, Donley, Gray, Hall, Hansford, Hartley, Hemphill, Hutchinson, Lipscomb, Moore, Ochilltree, Oldham, Parmer, Potter, Randall, Roberts, Sherman, Swisher, and Wheeler. According to 2008 United States census data, this area has a population of 292,473. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,100	285
Retail Salespersons	1,000	260
Registered Nurses	950	145

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	950	180
Elementary School Teachers, except Special Education	800	140
Waiters and Waitresses	800	235
Customer Service Representatives	750	155
Farmers and Ranchers	700	185
Child Care Workers	650	145
Personal and Home Care Aides	650	100
Slaughterers and Meat Packers	600	180
Truck Drivers, Heavy and Tractor-Trailer	600	115
Nursing Aides, Orderlies, and Attendants	500	65
Janitors and Cleaners, except Maids and Housekeeping Cleaners	450	100
Office Clerks, General	450	105
Middle School Teachers, except Special and Vocational Education	400	65
Executive Secretaries and Administrative Assistants	400	75
Accountants and Auditors	350	60
Secondary School Teachers, except Special and Vocational Education	350	90
Teacher Assistants	350	60
Medical Assistants	350	40
Bookkeeping, Accounting, and Auditing Clerks	350	75
Cooks, Restaurant	300	65
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	300	75
Receptionists and Information Clerks	300	65
Farmworkers, Farm and Ranch Animals	300	70

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special

and Vocational Education, Accountants and Auditors, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Panhandle Workforce Development Area contains portions of two community college service areas: Amarillo College and Frank Phillips College. There is one public university, West Texas A&M University, and one university teaching site, Texas Tech University Teaching Site at Amarillo. Undergraduate teacher education programs are offered at West Texas A&M University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at West Texas A&M University. Undergraduate programs appropriate for Accountants/Auditors are also available at West Texas A&M University.

Permian Basin Workforce Development Area

The Permian Basin Workforce Development Area is comprised of 17 counties: Andrews, Borden, Crane, Dawson, Ector, Gaines, Glasscock, Howard, Loving, Martin, Midland, Pecos, Reeves, Terrell, Upton, Ward, and Winkler. According to 2008 United States census data, this area has a population of 395,433. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	1,700	215
Elementary School Teachers, except Special Education	1,100	165
Combined Food Preparation and Serving Workers, including Fast Food	1,050	190
Retail Salespersons	900	245
Roustabouts, Oil and Gas	900	170
Registered Nurses	850	130
Customer Service Representatives	750	155
Child Care Workers	700	140
Middle School Teachers, except Special and Vocational Education	550	85
Secondary School Teachers, except Special and Vocational Education	550	105
Waiters and Waitresses	550	210
Janitors and Cleaners, except Maids and Housekeeping Cleaners	550	100
Office Clerks, General	550	110

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Service Unit Operators, Oil, Gas, and Mining	550	70
Truck Drivers, Heavy and Tractor-Trailer	550	115
Executive Secretaries and Administrative Assistants	500	90
Construction Laborers	500	65
Teacher Assistants	450	75
Bookkeeping, Accounting, and Auditing Clerks	450	85
First-Line Supervisors/Managers of Construction Trades and Extraction Workers	450	70
Nursing Aides, Orderlies, and Attendants	400	50
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	400	90
Accountants and Auditors	350	70
Home Health Aides	350	50
Rotary Drill Operators, Oil and Gas	350	40
Industrial Machinery Mechanics	350	50
Welders, Cutters, Solderers, and Brazers	350	65

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, Secondary School Teachers except Special and Vocational Education, and Accountants and Auditors) as requiring a baccalaureate degree.

The Permian Basin Workforce Development Area contains portions of three community college service areas: Odessa College, Howard College, and Midland College. It also contains two public universities, The University of Texas of the Permian Basin and Sul Ross State University. Undergraduate teacher education programs are offered at The University of Texas of the Permian Basin and Sul Ross State University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas of the Permian Basin, Sul Ross State University, and Midland College through its University Center partnership with The University of Texas of the Permian Basin. Undergraduate programs appropriate for Accountants/Auditors are also available at The University of Texas of the Permian Basin.

Rural Capital Workforce Development Area

The Rural Capital Workforce Development Area is comprised of nine counties: Bastrop, Blanco, Burnet, Caldwell, Fayette, Hays, Llano, and Williamson. According to 2008 United States census data, this area has a population of 765,127. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Retail Salespersons	3,350	630
Combined Food Preparation and Serving Workers, including Fast Food	2,750	415
Elementary School Teachers, except Special Education	2,150	310
Customer Service Representatives	1,600	280
Waiters and Waitresses	1,500	370
Janitors and Cleaners, except Maids and Housekeeping Cleaners	1,350	195
Cashiers	1,350	480
Child Care Workers	1,200	230
Construction Laborers	1,200	150
Farmers and Ranchers	1,150	210
Middle School Teachers, except Special and Vocational Education	1,050	155
Secondary School Teachers, except Special and Vocational Education	1,050	195
Office Clerks, General	950	155
Teacher Assistants	900	135
First-Line Supervisors/Managers of Retail Sales Workers	900	170
Registered Nurses	800	115
Bookkeeping, Accounting, and Auditing Clerks	800	125
Executive Secretaries and Administrative Assistants	750	115
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	700	130
Computer Software Engineers, Applications	650	80

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Cooks, Restaurant	650	110
Landscaping and Groundskeeping Workers	650	85
Secretaries, Except Legal, Medical, and Executive	650	130
First-Line Supervisors/Managers of Food Preparation and Serving Workers	600	80
Personal and Home Care Aides	600	80
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	600	140
Maintenance and Repair Workers, General	600	65
Truck Drivers, Heavy and Tractor-Trailer	600	95

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, Secondary School Teachers except Special and Vocational Education, and Computer Software Engineers-Applications) as requiring a baccalaureate degree.

The Rural Capital Workforce Development Area contains portions of four community college service areas: Austin Community College, Central Texas College, Temple College, and Blinn College. It also contains one public university, Texas State University-San Marcos. There are two multi-institutional teaching centers: Round Rock Higher Education Center and East Williamson County Higher Education Center. There is also one university teaching site, Texas Tech University Teaching Site-Highland Lakes. This workforce development area also includes one private university, Southwestern University. Undergraduate teacher education programs are offered at Texas State University-San Marcos and Southwestern University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas State University-San Marcos, Southwestern University, Austin Community College, and Blinn College. Undergraduate programs appropriate for Computer Software Engineers are also available at Texas State University-San Marcos and Southwestern University.

South East Texas Workforce Development Area

The South East Texas Workforce Development Area is comprised of three counties: Hardin, Jefferson, and Orange. According to 2008 United States census data, this area has a population of 378,255. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases,

annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	1,450	240
Retail Salespersons	1,200	300
Personal and Home Care Aides	1,100	155
Elementary School Teachers, except Special Education	1,000	155
Registered Nurses	800	130
Child Care Workers	650	130
Customer Service Representatives	650	130
Welders, Cutters, Solderers, and Brazers	650	100
Waiters and Waitresses	600	195
Construction Laborers	600	80
Construction Managers	550	85
Office Clerks, General	550	105
Middle School Teachers, except Special and Vocational Education	500	75
Secondary School Teachers, except Special and Vocational Education	500	95
Teacher Assistants	450	65
Janitors and Cleaners, except Maids and Housekeeping Cleaners	450	90
Executive Secretaries and Administrative Assistants	450	80
Nursing Aides, Orderlies, and Attendants	400	55
Correctional Officers and Jailers	350	65
Bookkeeping, Accounting, and Auditing Clerks	350	65
Home Health Aides	300	40
Medical Assistants	300	40
First-Line Supervisors/Managers of Food Preparation and Serving Workers	300	40
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	300	60

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Receptionists and Information Clerks	300	60
Carpenters	300	50
Maintenance and Repair Workers, General	300	35
Truck Drivers, Heavy and Tractor-Trailer	300	65

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Construction Managers, Middle School Teachers except Special and Vocational Education, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The South East Texas Workforce Development Area contains one community college service area, Galveston College, as well as one public university, Lamar University. It also contains three technical colleges: Lamar Institute of Technology, Lamar State College-Port Arthur, and Lamar State College-Orange. Undergraduate teacher education programs are offered at Lamar University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Lamar University, Lamar State College-Orange, and Galveston College. Undergraduate programs appropriate for Construction Managers are also available at Lamar University.

South Plains Workforce Development Area

The South Plains Workforce Development Area is comprised of 15 counties: Bailey, Cochran, Dickens, Floyd, Garza, Hale, Hockley, King, Lamb, Lubbock, Lynn, Motley, Terry, and Yoakum. According to 2008 United States census data, this area has a population of 391,453. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	1,400	170
Retail Salespersons	1,400	325
Registered Nurses	1,300	195
Customer Service Representatives	1,150	220

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	1,000	205
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	1,000	260
Child Care Workers	900	170
Waiters and Waitresses	850	245
Farmers and Ranchers	800	165
Nursing Aides, Orderlies, and Attendants	800	100
Office Clerks, General	550	120
Truck Drivers, Heavy and Tractor-Trailer	500	95
Home Health Aides	450	55
Executive Secretaries and Administrative Assistants	450	90
Elementary School Teachers, except Special Education	400	90
Cooks, Restaurant	400	65
Licensed Practical and Licensed Vocational Nurses	350	75
Janitors and Cleaners, except Maids and Housekeeping Cleaners	350	85
Bookkeeping, Accounting, and Auditing Clerks	350	70
Correctional Officers and Jailers	300	55
First-Line Supervisors/Managers of Retail Sales Workers	300	80
Receptionists and Information Clerks	300	65
Construction Laborers	300	40
Farm, Ranch, and Other Agricultural Managers	250	35
Business Operations Specialists, all other	250	30
Accountants and Auditors	250	50
Medical Assistants	250	35
First-Line Supervisors/Managers of Food Preparation and Serving Workers	250	35
Maids and Housekeeping Cleaners	250	55
Cashiers	250	250

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Sales Representatives, Services, all other	250	35
Tellers	250	70

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education; Farm, Ranch, and other Agricultural Managers; Business Operations Specialists-all others; and Accountants and Auditors) as requiring a baccalaureate degree.

The South Plains Workforce Development Area contains one community college service area, South Plains College, as well as one public university, Texas Tech University. This workforce development area also includes two private universities, Lubbock Christian College and Wayland Baptist University. Undergraduate teacher education programs are offered at Texas Tech University, Lubbock Christian College, and Wayland Baptist University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas Tech University. Undergraduate programs appropriate for farm, ranch, and other agricultural managers are also available at Texas Tech University and Lubbock Christian College. Undergraduate programs appropriate for business operations specialists and Accountants/Auditors are available at Texas Tech University, Lubbock Christian College, and Wayland Baptist University.

South Texas Workforce Development Area

The South Texas Workforce Development Area is comprised of three counties: Jimm Hogg, Webb, and Zapata. According to 2008 United States census data, this area has a population of 255,804. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	2,000	265
Truck Drivers, Heavy and Tractor-Trailer	1,200	190
Retail Salespersons	1,150	235

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Combined Food Preparation and Serving Workers, including Fast Food	1,000	160
Elementary School Teachers, except Special Education	750	125
Customer Service Representatives	700	120
Office Clerks, General	500	85
Registered Nurses	450	70
Home Health Aides	400	50
Detectives and Criminal Investigators	400	55
Waiters and Waitresses	400	115
Cashiers	400	180
Middle School Teachers, except Special and Vocational Education	350	60
Secondary School Teachers, except Special and Vocational Education	350	80
Cargo and Freight Agents	350	65
Teacher Assistants	300	50
Janitors and Cleaners, except Maids and Housekeeping Cleaners	300	55
Child Care Workers	300	55
First-Line Supervisors/Managers of Retail Sales Workers	300	60
Bookkeeping, Accounting, and Auditing Clerks	300	50
Executive Secretaries and Administrative Assistants	300	40
Laborers and Freight, Stock, and Material Movers, Hand	300	100
Nursing Aides, Orderlies, and Attendants	250	30
Police and Sheriff's Patrol Officers	250	40
Sales Representatives, Services, all other	250	40
First-Line Supervisors/Managers of Office and Administrative Support Workers	250	50
Tellers	250	70
Truck Drivers, Light or Delivery Services	250	35

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The South Texas Workforce Development Area contains one community college service area, Laredo Community College, as well as one public university, Texas A&M International University. Undergraduate teacher education programs are offered at Texas A&M University International University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at Texas A&M International University and Laredo Community College.

Tarrant County Workforce Development Area

The Tarrant County Workforce Development Area is comprised of Tarrant County. According to 2008 United States census data, this area has a population of 1,750,091. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Retail Salespersons	6,300	1,490
Combined Food Preparation and Serving Workers, including Fast Food	6,000	980
Customer Service Representatives	5,300	1,035
Elementary School Teachers, except Special Education	4,750	685
Registered Nurses	4,250	615
Child Care Workers	3,550	680
Waiters and Waitresses	3,400	1,110
Office Clerks, General	3,300	580
Janitors and Cleaners, except Maids and Housekeeping Cleaners	3,200	535
Personal and Home Care Aides	2,650	345
Construction Laborers	2,600	330
Secondary School Teachers, except Special and Vocational Education	2,450	430
Executive Secretaries and Administrative Assistants	2,350	395

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Middle School Teachers, except Special and Vocational Education	2,300	335
Teacher Assistants	2,200	315
Laborers and Freight, Stock, and Material Movers, Hand	2,150	690
Bookkeeping, Accounting, and Auditing Clerks	2,100	385
Nursing Aides, Orderlies, and Attendants	1,800	235
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	1,800	390
Truck Drivers, Heavy and Tractor-Trailer	1,800	345
Receptionists and Information Clerks	1,650	330
Business Operations Specialists, all other	1,600	220
Secretaries, Except Legal, Medical, and Executive	1,600	365
Maintenance and Repair Workers, General	1,600	180
Accountants and Auditors	1,500	265
Cooks, Restaurant	1,450	295

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Secondary School Teachers except Special and Vocational Education, Business Operations Specialists-all other, and Accountants and Auditors) as requiring a baccalaureate degree.

The Tarrant County Workforce Development Area contains one community college service area, Tarrant County College, as well as one public university, The University of Texas at Arlington. There is one multi-institutional teaching center, The University of Texas at Arlington Fort Worth Center. This workforce development area also includes three private universities: Texas Christian University, Texas Wesleyan University, and The College of St. Thomas More. Undergraduate teacher education programs are offered at The University of Texas at Arlington, Texas Christian University, and Texas Wesleyan University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. There is a post-baccalaureate alternative teacher certification programs offered at The University of Texas at Arlington and Texas Wesleyan University. Undergraduate programs appropriate for Accountants/Auditors are also available at The University of Texas at Arlington,

Texas Christian University, and Texas Wesleyan University. Undergraduate programs appropriate for business operations specialists are also available at The University of Texas at Arlington, Texas Christian University, and Texas Wesleyan University.

Texoma Workforce Development Area

The Texoma Workforce Development Area is comprised of three counties: Cooke, Fannin, and Grayson. According to 2008 United States census data, this area has a population of 190,440. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Retail Salespersons	600	135
Personal and Home Care Aides	550	70
Farmers and Ranchers	500	100
Combined Food Preparation and Serving Workers, including Fast Food	500	90
Registered Nurses	450	70
Waiters and Waitresses	450	110
Elementary School Teachers, except Special Education	400	65
Customer Service Representatives	350	65
Nursing Aides, Orderlies, and Attendants	250	35
Construction Laborers	250	30
Middle School Teachers, except Special and Vocational Education	200	35
Teacher Assistants	200	25
Home Health Aides	200	20
Cooks, Restaurant	200	35
Child Care Workers	200	40
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	200	45
Secondary School Teachers, except Special and Vocational Education	150	40
First-Line Supervisors/Managers of Food Preparation and Serving Workers	150	20
Janitors and Cleaners, except Maids and Housekeeping Cleaners	150	40

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
First-Line Supervisors/Managers of Retail Sales Workers	150	40
Cashiers	150	120
Sales Representatives, Wholesale and Manufacturing, except Technical and Scientific Products	150	30
Bookkeeping, Accounting, and Auditing Clerks	150	30
Receptionists and Information Clerks	150	25
Executive Secretaries and Administrative Assistants	150	30
Office Clerks, General	150	40
Roustabouts, Oil and Gas	150	15
Truck Drivers, Heavy and Tractor-Trailer	150	35

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Texoma Workforce Development Area contains portions of three community college service areas: Grayson County College, Paris Community College, and North Central Texas College. There are no public universities, multi-institutional teaching centers, or university teaching sites in this workforce development area. This workforce development area includes one private university, Austin College. Austin College offers undergraduate teacher education programs. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. There are no post-baccalaureate alternative teacher certification programs are available in this area.

Upper Rio Grande Workforce Development Area

The Upper Rio Grande Workforce Development Area is comprised of six counties: Brewster, Culberson, El Paso, Hudspeth, Jeff Davis, and Presidio. According to 2008 United States census data, this area has a population of 762,322. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Personal and Home Care Aides	2,600	350
Combined Food Preparation and Serving Workers, including Fast Food	2,250	395
Retail Salespersons	2,250	555
Customer Service Representatives	2,150	405
Waiters and Waitresses	1,600	435
Elementary School Teachers, except Special Education	1,550	280
Registered Nurses	1,500	225
Office Clerks, General	1,150	215
Truck Drivers, Heavy and Tractor-Trailer	1,100	220
Janitors and Cleaners, except Maids and Housekeeping Cleaners	950	180
Child Care Workers	900	175
Construction Laborers	900	105
Home Health Aides	750	90
Executive Secretaries and Administrative Assistants	750	130
Middle School Teachers, except Special and Vocational Education	700	135
Secondary School Teachers, except Special and Vocational Education	700	175
Cooks, Restaurant	700	120
Teacher Assistants	650	115
Nursing Aides, Orderlies, and Attendants	650	85
Bill and Account Collectors	650	80
Bookkeeping, Accounting, and Auditing Clerks	600	115
Laborers and Freight, Stock, and Material Movers, Hand	600	215
First-Line Supervisors/Managers of Food Preparation and Serving Workers	550	75
First-Line Supervisors/Managers of Retail Sales Workers	550	145
Cashiers	550	435

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Receptionists and Information Clerks	550	110

Of these 25 occupations, the Texas Workforce Commission identifies three of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree.

The Upper Rio Grande Workforce Development Area contains portions of two community college service areas, El Paso Community College and Odessa College. There is one public university, The University of Texas at El Paso. Undergraduate teacher education programs are offered at The University of Texas at El Paso. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate alternative teacher certification programs are available at The University of Texas at El Paso.

West Central Texas Workforce Development Area

The West Central Texas Workforce Development Area is comprised of 19 counties: Brown, Callahan, Coleman, Comanche, Eastland, Fisher, Haskell, Jones, Kent, Knox, Mitchell, Nolan, Runnels, Scurry, Shackelford, Stonewall, Taylor, and Throckmorton. According to 2008 United States census data, this area has a population of 324,400. The table below indicates the top 25 occupations that will experience growth in the number of new positions in this area of the state between 2006 and 2016. In some cases, annual average job openings may be higher due to a high number of replacement openings projected for each year.

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Farmers and Ranchers	1,550	310
Personal and Home Care Aides	1,000	135
Registered Nurses	900	135
Retail Salespersons	750	195
Farmworkers and Laborers, Crop, Nursery, and Greenhouse	650	170
Combined Food Preparation and Serving Workers, including Fast Food	600	130
Elementary School Teachers, except Special Education	450	90

Occupations	Total Number of Additional Job Openings, 2006-2016	Annual Average Job Openings
Nursing Aides, Orderlies, and Attendants	400	65
Child Care Workers	400	85
Customer Service Representatives	400	95
Home Health Aides	350	45
Correctional Officers and Jailers	300	55
Waiters and Waitresses	300	140
Truck Drivers, Heavy and Tractor-Trailer	300	65
Middle School Teachers, except Special and Vocational Education	250	45
Janitors and Cleaners, except Maids and Housekeeping Cleaners	250	60
Executive Secretaries and Administrative Assistants	250	55
Office Clerks, General	250	75
Construction Laborers	250	30
Accountants and Auditors	200	35
Clergy	200	35
Secondary School Teachers, except Special and Vocational Education	200	60
Licensed Practical and Licensed Vocational Nurses	200	55
Medical Assistants	200	25
First-Line Supervisors/Managers of Retail Sales Workers	200	60
Receptionists and Information Clerks	200	45

Of these 25 occupations, the Texas Workforce Commission identifies four of these positions (Elementary School Teachers except Special Education, Middle School Teachers except Special and Vocational Education, Accountants and Auditors, and Secondary School Teachers except Special and Vocational Education) as requiring a baccalaureate degree. One additional occupation, Clergy, is noted as requiring a master's degree.

The West Central Texas Workforce Development Area contains portions for four community college service areas: Ranger College, Vernon College, Cisco Community College, and Western Texas College. There is one public technical college, Texas State Technical College-West Texas. This workforce development area also includes three private universities: Abilene Christian University, Hardin-Simmons University, and McMurry University. Undergraduate teacher education programs are present at Abilene Christian University, Hardin-Simmons University, and

McMurry University. Although Elementary and Secondary Educators are most commonly trained in baccalaureate teacher education programs, post-baccalaureate alternative teacher certification programs are also used to prepare educators. Post-baccalaureate teacher certification programs exist at Hardin-Simmons University and McMurry University. Undergraduate programs appropriate for preparing Accountants/Auditors are present at Abilene Christian University, Hardin-Simmons University, and McMurry University.

ASSESSMENT OF BACCALAUREATE PROGRAM NEED AND ALTERNATIVE PROGRAM DELIVERY MODELS

The above analysis indicates that only a handful of baccalaureate programs are associated with the top 25 occupations projected by the Texas Workforce Commission to grow between 2006 and 2016: Elementary Education, Middle School Education, Secondary Education, Business Operations Specialists, Computer Software Engineers, Computer Systems Analysts, Agricultural Managers, Construction Managers, Accountants/Auditors, and Teacher/Instructors-all others. The remainder of this report will focus on the availability of these programs to students in each of the workforce development areas and across the state as well as recommend ways to meet any availability gaps. Fulfilling the projected demand for Elementary School Teachers, Middle School Teachers, Secondary School Teachers, Accountants/Auditors, Business Operations Specialists, Computer Systems Analysts, Computer Software Engineers, Construction Managers, and Agricultural Managers will require both increasing access to degree programs as well as increasing the pipeline of students interested in these fields and providing opportunities for working adults to retune their skills if necessary.

Texas currently utilizes a number of distance education and alternative delivery methods to provide access to a wide variety of undergraduate and graduate degree programs. Some of the most popular methods include the use of higher education teaching centers, multi-institutional teaching centers, university centers, branch campuses, online degree programs, electronic-to-group degree programs, and degree programs at the three legislatively authorized community colleges.

Perhaps one of the largest alternative means of delivering educational programs is through the delivery of undergraduate degree programs and courses to off-site locations. The most prevalent types of off-site delivery locations are higher education teaching sites, multi-institutional teaching centers, university centers, and branch campuses. The Coordinating Board delineates four types of off-campus delivery sites. A higher education teaching site is "an off-campus teaching location that promotes access in an area not served by other public universities. Teaching sites offer a very limited array of courses and/or programs and do not entail a permanent commitment for continued service. Teaching sites may not own facilities, nor are they eligible for state support to acquire or build facilities. Teaching sites do not require Board approval or recognition."[13] The second type of off-campus site is a recognized higher education teaching site which is defined as "a higher education teaching site that is recognized

[13] Texas Higher Education Coordinating Board, "Texas Higher Education Coordinating Board Policies Regarding Off-Campus Education Unit Designation for Universities and Health-Related Institutions," 2003, http://www.thecb.state.tx.us/index.cfm?objectid=CDFBC040-CAFE-4018-3D9B02C5206D33B1 (accessed on April 27, 2010).

by the Coordinating Board and is included in the Coordinating Board's inventory of statewide teaching sites."[14] These sites offer several degree programs, more than a teaching site, and tend to be housed in more permanent facilities where courses and programs are offered on a regular basis. The third type of off-campus site is a higher education center. Higher education centers can take the form of multi-institution teaching centers, university centers, or university system centers. Multi-institution teaching centers (MITCs) are defined as higher education centers administered under a formal agreement between two or more higher education institutions that are not a part of the same university system. MITCs may also include private university partners. A university system center is similar to a MITC, only it is administered by a university system while a university center is administered by a single institution. All higher education centers, whether a MITC, university system center, or university center, are located in permanent facilities that are either owned by one of the participating institutions or a local community college. Both undergraduate and graduate programs may be offered at all three of these higher education centers and each has some type of administrative infrastructure, whether it be a center director or coordinating committee comprised of all of the partner institutions. Higher education centers tend to concentrate on providing services to non-traditional students and, therefore, may schedule courses later in the day and on weekends. Such arrangements allow institutions to leverage existing resources to achieve greater efficiencies and also benefit students by increasing the number and types of courses, degrees, and certificate programs offered in the area.

There are currently seven higher education centers (the University Center at Dallas, Lone Star College University Center, the University of Houston System Center at Sugar Land/Fort Bend, Round Rock Higher Education Center, the University of Houston System Center at Cinco Ranch, The University of Texas at Arlington Fort Worth Center, and East Williamson County Higher Education Center) that are offering courses and degrees. Two others that have been approved by the Coordinating Board and are preparing to offer courses and programs are Colin Higher Education Center and Alamo University Center. Each of these centers is located in a high population area, and degree program offerings vary from center to center. All but one of the seven operational centers offer at least one undergraduate degree program that is appropriate for the projected high growth occupations. Six of the centers offer undergraduate degree programs in Business and/or Accounting, four offer undergraduate degree programs in Computer Science, and four offer undergraduate degree programs that could lead to teacher certification. One of the newly approved centers, the Collin Higher Education Center, plans to offer undergraduate degree programs in Accounting, Business Administration, and Child Development that could also address the projected workforce needs.

In addition to face-to-face instructional opportunities at public universities, higher education teaching centers, regional education service centers, and teaching sites, there are a number of online undergraduate degree programs that are offered by Texas public higher education institutions preparing students for employment in the high-growth occupations identified by the Texas Workforce Commission: Elementary Education, Middle School Education, Secondary Education, Business Operations Specialists, Computer Software Engineers, Computer Systems Analysts, Agricultural Managers, Construction Managers, Accountants/Auditors, and Teacher/Instructors-all others. At the baccalaureate level, there currently is one online finance degree, one accounting degree, four general business degrees, one management degree, two

[14] Ibid.

marketing degrees, one management information systems degree, one organizational development degree, one applied technology and performance improvement degree, one computer information systems technician degree, one interdisciplinary studies degree that leads to teacher certification in elementary education, and a number of post-baccalaureate/alternative teacher certification programs. Additionally, there are two Bachelor of General Studies degrees offered online. These degree programs are interdisciplinary in nature and are usually individualized to correspond to a student's interests.

Finally, there are six Bachelor of Applied Arts and Sciences (BAAS) degrees and one Bachelor of Applied Technology degree offered online. The BAAS and BAT degree is an applied baccalaureate degree that is generally flexible. These degrees usually involve large transfers of credit, often in the form of an applied associate's degree that includes career and technical education courses. Students transfer in an applied associate's degree in a specific career/technical field and spend the last two years taking a variety of general education courses and additional upper-level courses. Because much of the specialized subject courses are taken as a part of the associate's degree and additional upper-level courses are taken at the university, these degrees can usually be tailored to a student's specific interests and career goals. Thus, even though they may not be classified as a business degree or a computer science degree, they may include enough course work to prepare students to obtain jobs in those fields and are thus included in this analysis. The state does not, however, have any online baccalaureate programs available to prepare students for employment as Agricultural Managers, Construction Managers, Computer Software Engineers, Middle School Teachers, or Secondary School Teachers.

Of the 28 regional workforce development areas in Texas, only three of the areas lack access to regional undergraduate degree programs associated with high-growth occupations for that area. The Heart of Texas Workforce Development Area has no undergraduate degree programs that are appropriate for training Elementary School, Middle School, and/or Secondary School teachers and has only one post-baccalaureate/alternative teacher certification program at a public institution of higher education. The Texoma Workforce Development Area has no undergraduate degree programs or post-baccalaureate/alternative teacher certification programs that are appropriate for training Elementary School, Middle School, and/or Secondary School Teachers. The West Central Texas Workforce Development Area also has no undergraduate degree programs or post-baccalaureate/alternative teacher certification programs that are appropriate for training Elementary School, Middle School, and/or Secondary School Teachers. It also lacks an undergraduate program appropriate for the training of Accountants/Auditors.

Texas is facing a serious shortage in teachers. The Texas Workforce Commission projects that 122,950 job openings for Elementary School, Middle School, and/or Secondary School Teachers will be available between 2006 and 2016. 76,050 of these openings are new positions versus replacement positions. This represents a 39.1 percent increase in job openings between 2006 and 2016. Elementary School Teachers (not including Special Education) are projected to grow 42.8 percent; Secondary School Teachers (not including Special and Vocational Education are expected to grow 32.9 percent; and Middle School Teachers (not including Special and Vocational Education) are projected to grow 39.9 percent. This increase reflects a shift in the demographics of the state as it sees an increase in its school age population. Assuming a 0.5 migration scenario which assumes that the rates of net migration in Texas will be one-half of

that of the 1990s, the Texas State Data Center and the Office of the State Demographer project an increase of 592,834 in the under-18-year-old population in Texas between 2006 and 2016.[15] Furthermore, teaching positions are also increased because of the retirement and turnover of public school teachers.

All public universities in Texas offer extensive teacher education programs. Additionally, post-baccalaureate/alternative teacher certification programs are also offered at 19 of the 20 regional Education Service Centers, thus providing additional regional opportunities to provide training for future teachers. Furthermore, the Area Four Educational Service Center, located in Houston, offers the option of an online program where Texas students can take the coursework portion of the program online and complete the internship portion at any public school, charter school, or accredited private school throughout the state. With the exception of the Heart of Texas Workforce Development Area, the Texoma Workforce Development Area, and the West Central Texas Workforce Development Area, these programs are well dispersed throughout the state's workforce development areas. If additional programs are needed, the state should consider having institutions develop more off-campus program offerings at higher education centers and other teaching sites. Some of these off-campus programs could be located at community colleges. Because the state has recently fully aligned the Associate of Art in Teaching with baccalaureate level teacher preparation programs, it would be relatively easy for articulation agreements between community colleges and universities be put in place. Perspective teachers could take courses and receive an Associate of Arts in Teaching degree at the community college and then transfer into a university teacher preparation program that holds classes at the community college. Because the Texas Education Code does not allow for undergraduate education degrees, all prospective teachers must earn baccalaureate degrees in the subject area that they will be teaching or, if appropriate, in an interdisciplinary program that includes upper-level courses in mathematics, science, English, reading, and social studies along with upper-level education courses. Texas community colleges are not well positioned to provide a venue for baccalaureate-level teacher preparation. Although community colleges might have broad lower-level offerings, they do not have the faculty depth to add upper-level course offerings in these fields. Rather than add baccalaureate programs leading to teacher certification at community colleges, Texas should first determine if current teacher preparation programs are at capacity and then consider adding off-site, face-to-face programs or online programs in the highest need education fields such as math and the sciences.

There are currently 53 Computer Science and Computer Science-related degree programs in Texas. During the last five years, these programs have produced 5,484 graduates. In addition to these baccalaureate programs, there are also 47 graduate level programs that have produced 5,089 graduates, most of which are at the master's level. The projected need for Computer Systems Analysts and Computer Software Engineers is not standard throughout the state but is concentrated in three workforce development areas—Capital Workforce Development Area, Dallas Workforce Development Area, and Rural Capital Workforce Development Area. There are currently two online degree programs in this field, a Bachelor's of Applied Technology with a major in Computer Information Systems Technology from The University of Texas at Brownsville and a Bachelor of Applied Arts and Sciences with a concentration in Computer or Information Sciences at Texas A&M University-Commerce. There

[15] Texas State Data Center and the Office of the State Demographer, Texas Population Projection Program, "2008 Population Projections," 2008, http://txsdc.utsa.edu/tpepp/2008projections (accessed on April 9, 2010).

are also baccalaureate programs in Computer and Information Science at the Round Rock Higher Education Center, Lone Star University Center, the University of Houston System Center at Sugarland, and the University of Houston System Center at Cinco Ranch. If additional programs are needed, the state should consider both expanding baccalaureate programs to the remaining five multi-institutional teaching centers and developing online degree programs that could be accessible to students across the state. The development of such programs would be less expensive than having community colleges in these workforce development areas become accredited as Level II degree granting institutions. Since there are already online courses for the academic core curriculum available through a number of different institutions, including the Virtual College of Texas consortium, only upper-level subject courses would need to be developed. Assuming the development of 15 upper-level courses at a production cost of $10,000 each, the cost of course development for such a degree program would be approximately $150,000. Such an online program would have the potential to reach a much greater number of students than the expansion of community college baccalaureate programs. Alternatively, programs could be added to the two higher education centers that do not currently offer such a degree. Furthermore, existing programs not at capacity could be better leveraged by ensuring that they include flexibly delivered course offerings in the evening and weekends that will better work with the schedules of working adult students. The expansion of community college baccalaureate degrees in this area should only take place after the above alternatives are exhausted.

There are also 24 Business and Business-related degree programs appropriate for business specialists that have produced 60,402 graduates during the last five years.[16] Each of the three community colleges that is currently offering a baccalaureate degree offers a Bachelor of Applied Technology with a major in Technology Management which includes a number of courses that contain business content and might provide an appropriate credential for entry into the occupation of Business Specialist. The dispersal of these projected job opportunities is a bit wider than the other non-education related jobs. Nevertheless, each of the workforce development areas that projects this as a top-25 growth occupation have at least one university offering a Business or related bachelor's degree. Additionally, six of the eight multi-institutional teaching and university system centers offer at least one undergraduate Business degree, and one of the remaining MITCs is planning to offer an undergraduate Business degree. Additionally, because of the personalized nature of a number of the state's applied baccalaureate degree programs, graduates wishing to go into this occupation might also obtain an appropriate degree through any of the 21 public universities that offer applied baccalaureate degrees. This field would also make a strong candidate for increased online delivery, especially since there are already three existing online degree programs in Business: a Bachelor of Applied Arts and Sciences with a concentration in Business, Management, or Marketing from Texas A&M University-Commerce; a Bachelor of Business Administration with a major in Business Administration from Texas A&M University-Commerce; and a Bachelor in Business Administration with a major in Business Administration from West Texas A&M University. Brazosport College's Bachelor of Applied Technology with a major in Technology Management,

[16] This list of degrees includes: Business, General; Business Administration; Purchasing; Logistics and Material Management; Office Management; Operations Management and Supervision; E-Commerce; Transportation Management; Environmental Management Business; Business and Corporate Communication; Business Economics; Entrepreneurship; Finance; Human Resources; Organizational Behavior; Human Resources Development; International Business; Management Information Systems; Management Science; Marketing; Sales, Distribution; Retail Sales; Fashion Merchandising; and Special Production Marketing,

which includes a Business Management Specialty track, is also offered as an online degree program. Minimal funds would be required to leverage the existing online Business degrees, and expansion would be relatively simple. Furthermore, existing programs not at capacity could be better leveraged by ensuring that they include flexibly delivered course offerings in the evening and weekends that would better work with the schedules of working adult students.

There are currently 31 undergraduate Accounting degree programs at public Texas universities that have produced 14,394 graduates during the last five years. As with other non-education high growth occupations, the need for Accountants and Auditors is not evenly distributed across the state. Of the 10 workforce development areas that project accounting and auditing as a high growth occupation, nine of the workforce development areas have at least one public university that is offering an undergraduate Accounting degree. Additional face-to-face Accounting programs also are present at three multi-institutional teaching and university system centers, with one additional MITC planning to offer an undergraduate Accounting degree. This field would also make a strong candidate for online delivery. Although there are currently no online undergraduate degree programs in Accounting being offered by Texas public universities, it would not be difficult to leverage one of the existing online Business degrees by adding a series of online accounting courses. For example, West Texas A&M University (WTAMU) currently offers an online Bachelor of Business Administration with a major in Business Administration. This degree currently includes two Accounting courses as well as an additional 33 semester credit hours in the general business core. Since the on-campus accounting degree at WTAMU includes the same general business core as the online BBA, only an additional 6-12 courses would need to be developed. Cost of developing such a program, assuming a $10,000 per-course development fee which would include content and technological development, could be between $60,000 and $120,000. Existing programs not at capacity could be better leveraged by ensuring that they include flexibly delivered course offerings in the evening and weekends that will better work with the schedules of working adult students, and additional face-to-face programs could be added at the three higher education centers that are not currently offering programs in this field.

Not as commonly projected as high-growth occupations but still present in several workforce development areas are Construction Managers and Farm, Ranch, and Agricultural Managers. Two workforce development areas, the Coastal Bend Workforce Development Area and the South East Texas Workforce Development Area, project this occupation to be high growth. There are currently five undergraduate Construction Manager programs at Texas public universities that have produced 457 graduates over the last five years. Only one of these two workforce development areas in need of these professionals has a public university with a Construction Management program. Currently there are no Construction Management programs at the state's eight multi-institutional teaching and university system centers, and neither are there any online undergraduate degree programs. At least one public university, Lamar University, is considering the development of an online Construction Management baccalaureate. Even less commonly projected as a high-growth occupation is Farm, Ranch, and other Agricultural Managers which is projected to only impact the South Plains Workforce Development Area. There are currently 58 undergraduate degree programs in fields appropriate for Agricultural Managers that have produced 7,494 graduates over the last five years.[17] There

[17] This list of degrees includes: Agriculture, General; Agricultural Business and Management; Agribusiness; Agricultural Mechanization; Agricultural Production Operations; Animal Husbandry; Aquaculture; Turfgrass

are no Agricultural Management programs at the state's eight multi-institutional teaching and university system centers, and neither are there any online undergraduate degree programs. Unlike Business, Accounting, and Computer Science, which are areas where institutions often offer courses even if full degree programs are not being offered, faculty credentialed to teach in Construction Management and Agricultural Management are unlikely to be found at institutions without existing programs. Rather than consider the cost of developing new departments at existing institutions, or the cost of assisting a community college in one of the three workforce development areas in obtaining accreditation as a Level II baccalaureate degree granting institution, the development of online programs that leverage existing faculty and departments should be considered. Statewide access would be considerably broader and allow for a better utilization of existing human resources.

SOLUTIONS FOR INCREASING STUDENT ACCESS TO BACCALAUREATE PROGRAMS RELATED TO HIGH GROWTH OCCUPATIONS

The state's higher education master plan, *Closing the Gaps by 2015*, calls for an increase of 5.7 percent, or 630,000, students participating in higher education and 112,500 students obtaining baccalaureate degrees by 2015. There are a number of ways that Texas can improve student access to baccalaureate degree programs associated with the Texas Workforce Commission's highest growth occupations. This section considers three of those—development of more online degree programs, increased community college and university partnerships, and the expansion of baccalaureate degree authority to more Texas community colleges.

As the previous section indicated, there are already a number of online degree programs in areas associated with Texas' highest growth occupations. However, there are a number of these occupations that lack adequate online program opportunities. For example, there are a number of online master's degree programs in Computer Science, Computer Information Systems, and Computer Systems Analysis, but there is only one baccalaureate degree in a related field: The University of Texas at Brownsville's Bachelor of Applied Technology with a major in Computer Information System Technology. There are also no online undergraduate degree programs appropriate for Agricultural Managers or Construction Managers, and only one that could lead to certification in elementary education.

In general, online education is considered to be a long-term, cost-effective means of providing educational access. Although funds must be extended for startup costs including curriculum development and technological infrastructure development, maintenance costs can be fairly low consisting primarily of faculty salaries. One way of minimizing these costs is through the creation of educational consortiums where several institutions share the initial development costs for curriculum and share the costs of ongoing technical assistance and instructional costs. Although there are a few examples of such consortium in Texas (the new BAC program offered through The University of Texas TeleCampus is one of the most notable), such consortia are still rare. Some of the primary obstacles to consortia agreements such as these are the development and use of a standardized curricula, practices that university faculty have

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Management; Animal Science; Livestock Management; Poultry Science; Agronomy and Crop Science; Plant and Protection and Integrated Pest Management; Range Science and Management; and Dairy Science.

traditionally been opposed to because of concerns regarding academic freedom and the ability to best serve local student needs.

With such high-need degree areas, especially those in Computer Science, it would be possible to use state monies to fund the development of a collection of courses in the major that could be used by institutions across the state. Much of the lower-division coursework, such as that which comprises the required academic core, is already available online through consortia such as the Virtual College of Texas. This strategy could work especially well with Business degrees, Computer Science degrees, and Management degrees. Online programs might be slightly more difficult for degree programs associated with teacher certification because each of those degrees requires considerable field observations and experiences.

Besides a more efficient leveraging of resources, online degree programs may also provide much better educational access to nontraditional students. The National Center for Education Statistics defines a nontraditional student as one who has any of the following characteristics:

- Delays enrollment, i.e. does not enter postsecondary education in the same calendar year that s/he finished high school;
- Attends college part time;
- Works full time, at least 35 hours per week, while attending college;
- Is considered to be financially independent when determining financial aid eligibility;
- Has dependents other than a spouse, oftentimes children;
- Is a single parent; or
- Did not graduate from high school but does produce a GED or other similar completion certificate.[18]

In its 2002 study, "Findings from the Condition of Education 2002: Nontraditional Undergraduates," the National Center for Education Statistics reported that 73 percent of all undergraduates in 1999-2000 possessed at least one of the above characteristics.[19] Nontraditional students are particularly attracted to online degree programs because they are often delivered asynchronously and, therefore, students can work on the courses at times that are convenient to them. Also, because most online courses are offered asynchronously, it is easier for these courses to be adapted to an accelerated format where students complete course requirements in four to six weeks rather than the traditional fourteen- to sixteen-week semester.

Another way in which access to these high-need undergraduate degree programs could be fostered is through increased community college and university partnerships. For example, Deborah L. Floyd and Kenneth Walker noted in a 2009 article that student access to degree programs could be improved by the development of University Centers and concurrent use baccalaureate programs.[20] These partnerships would provide students with a more seamless transfer from community colleges to universities and would include carefully aligned curricula

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[18] Laura J. Horn and C. Dennis Carroll, *Nontraditional Undergraduates, Trends in Enrollment From 1986 to 1992 and Persistence and Attainment Among 1989–90 Beginning Postsecondary Students,* (Washington, D.C.: National Center for Education Statistics, 1996) NCES, NCES 97–578.

[19] Susan Choy, *Findings from the Condition of Education 2002: Nontraditional Undergraduates*, National Center for Education Statistics, August 2002, http://nces.ed.gov/programs/coe/2002/analyses/nontraditional/index.asp (accessed on March 24, 2010).

[20] Floyd, and Walker, "The Community College Baccalaureate: Putting the Pieces Together," 102.

and memoranda of understanding between community colleges and universities. Students in these programs take the courses necessary for the completion of the core curriculum and other required lower-division courses at the community college, and then they complete the degree by transferring to the university and taking the remainder of the university coursework that is also offered on or near the community college campus. These programs are not extraordinarily resource-intensive because the primary additional costs for the programs involve leasing space that the community college already has available. These programs would be especially useful in offering degree programs that might not lend themselves to online learning, such as degree programs leading to teacher certification. Alternatively, these programs could exist as blended online and face-to-face programs, with a percentage of the coursework taking place online and the remaining coursework taking place on the community college campus. Alternatively, the creation of additional higher education centers such as MITCs and University System Centers could be considered. This solution, however, could pose considerably more expense because it might require the building or purchasing of new facilities if lease space was unavailable.

A final possibility for improving access to high need undergraduate programs would be the expansion of the current community college baccalaureate program. There are a number of arguments that advocates for community college baccalaureate programs make:

- Community college baccalaureate programs are more affordable than university baccalaureate programs.[21]
- In many technical fields, a baccalaureate degree is replacing the associate's degree as an entry-level credential. Since community colleges are the primary providers of such programs, it is logical for them to begin to offer baccalaureate degrees in those fields.[22]
- Community college baccalaureate programs increase student access to baccalaureate programs, especially for non-traditional students such as working adults, single parents, and other place-bound students.[23]

- Community college baccalaureate programs are more closely tied to local workforce needs by leveraging existing applied associate degrees. This makes community college baccalaureate-granting institutions more flexible in responding to employer needs than four-year universities.[24]

Although the offering of baccalaureate programs at two-year institutions has existed in the United States since the 1970s when the Fashion Institute of New York began offering select baccalaureate degrees, the popularity of such programs has increased during the last decade.[25] The state with the largest number of these programs is Florida, which now has fourteen two-year schools offering 90 baccalaureate degree programs. In 2001, the Florida legislature passed laws that authorized community colleges to offer limited baccalaureate degrees in high-need areas where demand was not being met. Four institutions--Chipola College, St. Petersburg

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[21] Edwin P. Bemmel, Deborah L. Floyd, and Valerie C. Bryan, "Perceptions and Reflections of Administrators: Community Colleges Transitioning to Baccalaureate Colleges," *Community College Journal of Research and Practice* 33, no. 2 (2009), 152.
[22] Ibid.
[23] Barbara K. Townsend, "A Cautionary View," in *The Community College Baccalaureate: Emerging Trends and Policy Issue,* ed. Deborah L. Floyd, Michael L. Skolnik, and Kenneth P. Walker (Sterling, VA: Stylus, 2005), 179-90.
[24] Ibid.
[25] Barbara K.Townsend, Debra D. Bragg, and Collin M. Ruud, *The Adult Learner and the Applied Baccalaureate: National and State-by-State Inventory,* October 2008, vi.

College, Miami-Dade College, and Edison College--initially participated in the program.[26] In 2008, the number of Florida community colleges had grown to the point that the Florida Legislature created a new state college system, the Florida College System.[27]

Texas has three community colleges that offer baccalaureate degrees: Brazosport College, Midland College, and South Texas College. Each institution began offering a Bachelor of Applied Technology with a major in Technology Management in 2004, and South Texas College began offering a Bachelor of Applied Technology with a major in Computer and Information Technology in 2007. Since then, Brazosport College has graduated 64 students, Midland College has graduated 31 students, and South Texas College has graduated 171 students in Technology Management and 47 in Computer and Information Technology. Tuition costs, while higher than that of lower-division academic coursework at each institution, are lower than the state average tuition. At Brazosport, in-district tuition and fees for 15 semester credit hours of lower-division coursework (an average full-time load for a regular semester) is $771, while it is $1,296, or $35 per semester credit hour more, for upper-division coursework in the BAT.[28] At Midland College, in-district tuition and fees for 15 semester credit hours of lower-division coursework is $900, while it is $1,620 for upper-division coursework in the BAT.[29] And at South Texas College, in-district tuition and fees for 15 semester credit hours of lower-division coursework is $1,320, while it is $1,620 for upper-division coursework in the BAT.[30] Tuition, mandatory fees, and average college and course fees as of fall 2008 for 15 semester credit hours at Texas public universities ranged from $2,121 at Texas A&M University-Texarkana to $4,647 at The University of Texas at Dallas, with a state average of $3,150.[31]

In addition to student tuition and fees, each institution also receives formula funding from the state comparable to that received by public universities. Funding is determined by the following formula: Student semester credit hours*weight*formula. Currently, the 2010-2011 weight is $62.19. For the Technology Management programs at Brazosport, Midland, and South Texas, upper-level courses are funded as Business Administration courses and receive the same formula, 1.73, as comparable courses at public four-year universities. For the Computer Information Technology program at South Texas College, upper-level courses are funded as Technology courses and receive the same formula, 2.38, as comparable courses at public four-year universities. In addition to the formula funding that these three institutions regularly receive from the state, each institution also received $500,000 in Fiscal Year 2006, $500,000 in Fiscal Year 2007, and $200,000 in special item appropriation funding in Fiscal Year 2008 for a total of $1.2 million per institution and $3.6 million total. These funds were used to hire appropriately credentialed faculty, expand library and academic support services, and expand student support services and facilities to a level comparable to that of a four-year institution,

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[26] Florida Department of Education, "History of the Need for Baccalaureate Policy Paper," Florida Department of Education, July 2005, http://www.fldoe.org/cc/students/pdf/HistBacc.pdf (accessed on March 31, 2010).
[27] Deborah L. Floyd, Angela M. Garcia Falconetti, and Michael R. Hrabak, "Baccalaureate Community Colleges: The New Florida College System," *Community College Journal of Research and Practice* 33, no. 2(2009), 196.
[28] Brazosport College, *Brazosport College Catalogue, 2009-2010*, http://www.brazosport.edu/Public percent20Downloads/BC_Catalog_Web_0910.pdf, (accessed on March 31, 2010), 21.
[29] *Midland College Catalog and Handbook, 2009-2010*, http://midland.edu/admissions/images/2009_2010catalog.pdf (accessed on March 31, 2010), 46.
[30] *South Texas College Catalog, 2009-2010*, http://www.southtexascollege.edu/academics/catalogs/pdf/catalog09-10.pdf (accessed on March 31, 2010), 27-28.
[31] Texas Higher Education Coordinating Board, "Tuition and Fees Data," March 4, 2009, http://www.thecb.state.tx.us/Reports/PDF1759.PDF (accessed March 31, 2010).

according to the accreditation standards of the Committee on Colleges of the Southern Association of Colleges and Schools.

Although students may pay less tuition for baccalaureate programs at community colleges, the cost to the state could be quite expensive. State formula funding for an undergraduate business degree at a university is approximately $1,601 more than state formula funding for an undergraduate business degree at one of the three community colleges. Given these state formula funding costs, it will still take approximately 750 graduates from community college baccalaureate programs before the $1.2 million dollars investment in each college will be realized.[32]

Each of the three institutions utilized considerable input from community advisory committees comprised of community and business leaders. These committees provided faculty and administrators information on the skills that they believed were necessary for a graduate to be successfully employed; program curriculum was then constructed based upon this input and information on current curriculum practices across the nation and the state. Although faculty have the primary responsibility for the creation and maintenance of program curriculum, community advisory committees continue to advise program faculty and administrators on regional workforce needs and ideal employee knowledge and skills. Programs are limited to those that can be considered applied science and technology fields, and the institutions must demonstrate that there is an adequate workforce need that is being unmet by public four-year institutions in the area.

It is of note, however, that the current community college baccalaureate programs address very few of the anticipated high-growth occupations in Texas. Although the Bachelor of Applied Technology with a major in Technology Management could be an appropriate credential to train Business Support Specialists and the Bachelor of Applied Technology with a major in Computer and Information Technology could be an appropriate credential to train Computer Systems Analysts, there are no programs that provide training for Elementary School Teachers, Middle School Teachers, Secondary School Teachers, Construction Managers, Accountants/Auditors, Agricultural Managers, Teachers/Instructors-other, and Computer Software Engineers. It is doubtful that community college baccalaureate programs can meet the educational needs associated with several of these other high-growth occupations. For example, the Texas Workforce Commission indicates that the three projected highest growth occupations statewide between 2006 and 2016 are Elementary Educators, Middle School Educators, and Secondary Educators; regional workforce development analysis indicates that each of the 28 workforce development areas in the state includes at least one of these occupations in its top 25 high-growth occupations, and 22 include all three.

It would be difficult, though, for community colleges to meet this need due to the statutory restrictions concerning teacher certification. Texas Education Code Section 21.050 states, "A

[32] These calculations were derived by examining the state formula funding for lower-division courses at community colleges and universities. The community college baccalaureate programs receive the same formula funding as universities for the upper-level courses in their programs. State funding for 60 semester credit hours of undergraduate course work at a community college is roughly $2,244.80 (960 contact hours at a rate of $3.38 per contact hour). State funding for 60 semester credit hours of undergraduate course work at universities is roughly $4.845.91 (60 semester credit hours at a business course weight of 1.11 with a formula funding rate of $62.19 per semester credit hour, as well infrastructure costs calculated at 17 percent of Instructional and Operations Costs).

person who applies for a teaching certificate for which board rules require a bachelor's degree must possess a bachelor's degree received with an academic major or interdisciplinary academic major, including reading, other than education, that is related to the curriculum as prescribed in Subchapter A, Chapter 28." The effect of this statute is that students wishing to become certified teachers must possess an undergraduate degree in an academic content area and that no education degrees can be offered at the baccalaureate level in Texas. In the case of students preparing for certification as Elementary Educators, most enroll in interdisciplinary studies programs that combine upper-level courses in Education, Reading, English, Mathematics, Science, and Social Sciences; students preparing for certification as Middle School or Secondary Educators enroll in traditional academic degree programs such as Mathematics, Biology, Chemistry, Physics, History, or Music which are supplemented by education coursework. Although community colleges routinely offer lower-division coursework in these areas as a part of the Texas academic core curriculum, it would be difficult for them to hire the faculty with appropriate credentials necessary to offer the breadth of upper-division coursework in the subject areas outside of Education that are necessary for all teacher preparation programs.

Furthermore, when one takes into consideration the economic and workforce clusters targeted for development by the Governor's Competitiveness Council, several could come with facility costs that would make it difficult for small community colleges to offer baccalaureate programs in these fields.[33] Even advocates of community college baccalaureate programs admit that startup costs associated with such programs can be quite high. Bemmel, Floyd, and Bryan reported in a 2009 article that higher accreditation standards for baccalaureate degree-granting institutions often results in "the potential need for an increase in library holdings, a potential expansion of laboratories, and an increase in faculty with doctoral degrees. This challenge often leads to a high start-up costs, while it is expected that the initial enrollment will be low. The high start-up cost combined with a low enrollment results in a higher per credit hours cost for the community colleges as compared with the public universities."[34] Amy Cook, in her 2000 article, also raised concerns regarding high costs of community college baccalaureate programs. She suggests that it is "shortsighted" for an institution to assume than an institution can expand to a baccalaureate degree program without incurring significant costs. In addition to the costs already discussed, Cook also mentions that faculty salary and workloads are likely to add to the costs because university faculty with doctorates typically earn higher salaries and have smaller course loads than their colleagues at community colleges.[35] The issue of workloads might be of great significance when community college faculty teaching loads are compared to university faculty teaching loads. In its recent *Fall 2008 State-Wide Faculty Teaching Load,* the Coordinating Board reported the average teaching loads listed below.

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[33] The Governor's Competitiveness Council identified six clusters of jobs that would make Texas competitive: energy, petrochemical, aerospace and defense, advanced technologies and manufacturing, biotechnology and life sciences, and computer and information technology. Governor's Competitiveness Council, *Council's Report to the Governor,* July 2008, http://governor.state.tx.us/files/gcc/Councils_Report_to_the_Governor.pdfhttp://governor.state.tx.us/files/gcc/Councils_Report_to_the_Governor.pdf (accessed on April 1, 2010).

[34] Edwin P. Bemmel, Deborah L. Floyd, and Valerie C. Bryan, "Perceptions and Reflections of Administrators: Community Colleges Transitioning to Baccalaureate Colleges," *Community College Journal of Research and Practice* 33, no. 2 (2009), 151-176.

[35] Cook, Amy. "Community College Baccalaureate Degrees: A Delivery Model for the Future? Policy Paper," (Denver, CO: ECS Commission of the States, February 2000), ERIC, ED 439765.

Faculty Rank	Public Comprehensive Universities	Public Master's Universities
Full Professor	2.9 organized courses 1.8 individualized courses 2.1 other courses 1.5 supervision of theses/dissertations	1.7 organized courses 1.6 individualized courses 1.6 other courses 1.5 supervision of theses
Associate Professor	3.0 organized courses 1.8 individualized courses 1.7 other courses 1.3 supervision of theses/dissertations	3.2 organized courses 1.7 individualized courses 1.2 other courses 1.1 supervision of theses
Assistant Professor	3.1 organized courses 1.8 individualized courses 2.2 other courses 1.4 supervision of theses/dissertations	3.3 organized courses 1.7 individualized courses 1.4 other courses 1.2 supervision of theses
Instructor	2.9 organized courses 1.6 individualized courses 2.2 other courses	3.1 organized courses 1.3 individualized courses 1.0 other course
Other Faculty	2.4 organized courses 1.9 individualized courses 2.0 other courses 1.2 supervision of theses/dissertations	No faculty from this category were reported

The data show that for those universities that are most similar to the community colleges offering baccalaureate degrees, faculty teaching load per semester ranges from 1.7 organized courses to 3.3 organized courses depending upon faculty rank. According to information submitted by the three community colleges currently authorized to offer baccalaureate degrees, faculty teaching load per semester at these institutions averages 4.6 organized courses with no difference due to rank. Although initially the higher teaching loads at community colleges might mean some savings in faculty costs (less faculty are teaching more courses), eventually there is a strong probability that community college baccalaureate faculty would begin to demand teaching loads comparable to that of their colleagues at four-year universities.

In addition to considering possible facility costs, faculty costs and qualifications must also be taken into consideration. Accreditation standards established by the Committee on Colleges by the Southern Association of Colleges and Schools states that 25 percent of the discipline course hours must be taught by faculty with a terminal degree, usually a doctorate, within the discipline.[36] Additionally, SACS requires that "The number of full-time faculty members is adequate to support the mission of the institution and to ensure the quality and integrity of its academic programs."[37] And although SACS does not establish a minimum number of faculty that should be employed for a degree program, the Texas Higher Education Coordinating Board requires there to be three full-time equivalent faculty (or two full-time equivalent faculty if there are four or more faculty teaching in the program). This number of faculty supports adequate

[36] Southern Association of Colleges and Schools, Committee on Colleges, "Principles of Accreditation: Foundations for Quality Enhancement," 4th ed., 1st printing (Atlanta, GA: Southern Association of Colleges and Schools, 2010), 22. Standard 3.5.4 addresses faculty credentials.
[37] Ibid., 18. Standard 2.8 addresses full-time faculty needs.

breadth and depth to not only provide students with broad subject matter coverage, but also allows students to experience the benefits of working with a wide variety of perspectives and teaching styles. In these high-technology fields where faculty availability may already be limited, the addition of community college baccalaureates could further limit faculty availability. Additionally, salaries for faculty in these fields tend to be higher and more competitive than that of faculty in the humanities. In order to establish baccalaureate programs in these areas, community colleges would not only have to develop adequate physical facilities, but they would also have to compete for highly paid faculty.

Additionally, Texas community colleges are currently facing a number of significant challenges. Academic year 2009-2010 enrollments at community colleges across the state are up from 2008-2009. Since Fiscal Year 2000, there has been a 26.61 percent increase (334,225 students) in community college enrollment in Texas. Enrollment growth at community colleges is becoming steeper; between Fiscal Year 2008 and 2009 there was a 5.54 percent increase (69,912 students) in enrollments as opposed to the 3.37 percent increase (39,936 students) in enrollments between Fiscal Years 2007 and 2008. And with this increase in enrollment has come an increased demand for developmental education services. In fall 2007, of the 95,315 first-time-in-college students enrolled at Texas community colleges, 61,155 did not meet the Texas Success Initiative minimum scores in Math, Reading, and Writing.[38] To ask community colleges to develop baccalaureate programs and commit to the expense that entails without significant state support could very well harm what is increasingly becoming one of their most important missions: providing students with the education, skills, and knowledge necessary to successfully obtain a baccalaureate degree elsewhere.

Finally, in addition to the expense, there is also the risk of "mission creep." Although Texas Education Code, Section 130.0012 clearly states that the three community colleges with authority to offer baccalaureate degrees must not ignore or change their core mission, historically a number of two-year institutions offering baccalaureate degrees across the nation have morphed into four-year institutions. Examples of this change include Westark College of Arkansas, which is now the University of Arkansas at Fort Smith; Northern New Mexico College; Fashion Institute of Technology; Vermont Technical College; and Dixie College. In a period where four-year institutions are becoming more and more selective, the open enrollment mission of community colleges is gaining in importance.

In short, the expansion of baccalaureate programs at community colleges in Texas at this time should be considered carefully and only when all other options have been exhausted. These options include such approaches as increased university off-campus offerings at community colleges and MITCs, increased number of distance education programs, and increased availability of on-campus university programs through more flexible scheduling. Not only would the expansion of the program come at considerable expense to the state, it could also diminish educational offerings for Texas students. Texas public community colleges operate as open admission institutions; it is an integral part of their public mission. Baccalaureate degree programs, even at community colleges, are seldom open-admission programs—there are academic admission requirements that students are expected to meet. If more Texas

[38] Texas Higher Education Coordinating Board, "Developmental Education Accountability Data," *Texas Higher Education Data*, Texas Higher Education Coordinating Board, http://www.txhighereddata.org/reports/performance/deved/ (accessed on April 28, 2010).

community colleges began to offer baccalaureate degrees, a larger portion of their student population would be required to meet academic admission standards, and the amount of space and resources available to open admission students would decrease. The state might see an inadvertent and unfortunate decrease in the educational opportunities for students that might not otherwise meet the rising academic admission standards of the four-year institutions.

RECOMMENDATIONS FOR INCREASING ACCESS TO BACCALAUREATE PROGRAMS

It is imperative for Texas to increase the number of Texans with a baccalaureate degree if the state wishes to remain economically competitive, especially on a global scale. As the *Report of the Select Commission on Higher Education and Global Competitiveness* specified in 2009, "Texas must more than double the annual degree production to reach the level of the best performing country of 55 percent of the population ages 24-64 with an associate degree or higher by 2025. After accounting for increases in the population with bachelor's and associate degrees resulting from population increase and net migration from 2005 to 2025, Texas must realize an additional 2,9509,881 degrees between 2005 and 2025, an average annual increase of 125,494 or 102.6 percent beyond the 2005 level of 122,269 for every year through 2025. The requirement to meet the challenge of global competitiveness requires an annual level of degree production of nearly 100,000 higher than the target of 168,000 bachelor's and associate's degrees set by *Closing the Gaps by 2015*." Thus, Texas must make a commitment to increasing access to baccalaureate education. As this report has examined, there are a number of ways that access can be improved, whether it be through increasing the number of online programs, providing more flexible programs at existing universities, increasing the number of available programs at higher education centers such as MITCs and University Centers, or, in some limited cases, allowing community colleges to offer baccalaureate degrees. What follows is a series of recommendations for community colleges, universities, and the state.

<u>Community Colleges</u>
As stated earlier in the report, the consultants concluded that at this early stage of program development, all three institutions "were impressive in their commitment to the BAT (Bachelor of Applied Technology) and the quality of the programs." The programs have strong retention rates, employers are "very satisfied" with the performance of graduates, and the programs are attracting a large number of non-traditional students. However, there are a number of issues that caution against expansion of the community college baccalaureate program beyond the existing three institutions. The high cost of community college baccalaureate programs, the expensive and time-consuming need to secure accreditation at a higher level, the changes in faculty needs, and the persistent danger of mission creep are four of the most significant concerns.

However, if any future expansion does take place, it is imperative that certain criteria be met. To begin with, any additional community college chosen to offer a baccalaureate degree must comply with the conditions outlined in Texas Education Code, Section 130.0012. These conditions establish that:

- Participation in the project does not alter the role and mission of the community college.
- Participating community colleges must meet all appropriate accreditation requirements established by the Commission on Colleges of the Southern Association of Colleges and Schools.

- Participating community colleges may not offer more than five baccalaureate degree programs at any time.
- Degree program selection should consider regional need, how the program(s) connect to existing program and course offerings, whether or not programs would unnecessarily duplicate existing degree programs, and the ability of the community college to support the program with adequate resources.
- Participating programs must enter into articulation agreements with one or more general academic teaching institutions to ensure that enrolled students can complete the degree if the community college no longer offered the program.
- Participating community colleges should receive substantially the same state support for upper-level courses as that of public four-year institutions.
- Participating community colleges should prepare biennial reports on the operation and effectiveness of the programs.

Additionally, any future community college baccalaureate programs should clearly demonstrate that the existing needs for certificate and associate degree programs in their area are being fully met before expansion to the baccalaureate level is considered. Community colleges should also be able to show that there is a compelling workforce need for the program that will be on-going. Also before consideration, any existing university programs in the area should be at capacity, area universities are not interested in offering the baccalaureate program, or alternative delivery methods such as online or university off-campus programs at higher education centers or the community college are no longer adequate. Finally, if baccalaureate authority is granted, the resulting programs should endeavor to ensure that they are delivered in as flexible manner as possible in order to appeal to working adults. This could be in the form of online programs, accelerated weekend courses, or offering courses in the evening.

The existing three community colleges authorized to offer baccalaureate degrees, Brazosport College, Midland College, and South Texas College, have statutory authority to offer up to five baccalaureate degrees. Several conditions should be met before authorization is given to add new baccalaureate programs at these schools. These conditions should include:

- Evidence that the institution is adequately responding to the area's certificate and associate degree demands.
- Evidence of a significant, long-term workforce need that can only be filled with baccalaureate graduates.
- Evidence that area universities cannot or will not meet the demand for the proposed program.
- Assurance that the program is within the scope of the authorizing legislation.
- Evidence that the addition of the baccalaureate program will not divert the institution from its mission and that it will not negatively impact the college's existing workforce education, academic, and developmental education programs.
- Assurance that there are adequate resources and funding to support the program.
- Assurance that the program is comparable to similar programs offered at universities.

<u>Universities</u>

Many scholars have concluded that one of the factors that has contributed to the growth of community college baccalaureate programs across the nation is a lack of willingness on the part of universities to offer more workforce-oriented baccalaureate degrees as well as a lack of willingness to make existing degree programs accessible to nontraditional students, especially

returning adult students. One of the most cost effective ways that the state can increase access to high-need baccalaureate programs is through institutions offering courses in a more flexible manner. By providing courses in the evening, weekends, or online, such programs can have strong appeal to students who are working adults. There is no reason why existing public university programs should not increase their appeal to nontraditional students by offering classes in a more flexible manner, especially by offering evening and weekend classes and accelerated course sequences, and constructing degree programs that would allow a student to complete the program with a minimal amount of traditional daytime class work. The costs of providing more flexible course offerings are minimal if existing resources are utilized.

In addition to offering programs in a variety of accessible formats, universities should also continue to develop partnerships with area community colleges. These cooperative arrangements must include articulation agreements that will allow students to easily transfer all academic credit earned at the community college and apply that credit toward a baccalaureate degree. Transfer articulation agreements are not enough, however. Community college students must receive accurate academic advising to ensure that students understand what courses they need to take at the community college in order to be prepared for admission into a university baccalaureate program. It is still common for some community college students to take academic courses at the community college level that do not fit into the university baccalaureate program into which they wish to transfer.

Universities should also consider increasing accessibility by offering more programs at higher education centers where there is regional demand for such programs. In addition to offering more programs at higher education centers such as MITCs or University Centers, universities should also explore partnerships with community colleges where students would complete the core curriculum and lower-level course offerings at the community college and then transfer into a university program that is being offered using space on the community college campus. Placing university degree completion programs on community college campuses would provide students with a much more seamless transition into a baccalaureate program. Not only would the presence of university faculty and advisors increase the accuracy and amount of student advising, but students would also have the benefit of the familiarity and proximity of the community college campus. Such concurrent baccalaureate programs could be even more effective and accessible if both lower-division and upper-division courses are offered in several different modalities that give students the opportunity to choose the format, time, and place for their education that is most appropriate for them.

Finally, universities should make all efforts to provide online versions of high-need/high-demand baccalaureate programs. At institutions where there may not be adequate resources and personnel to offer a complete degree program online, consortia arrangements should be considered. Through such a consortia, institutions would be able to better leverage limited resources in the development of curriculum and online student and academic support services. Although many institutions have embraced online education for the delivery of graduate-level programs, especially master's degrees, there are still relatively few fully online programs that provide graduates with baccalaureate degrees appropriate for entry into the state's projected highest growth occupations, such as Elementary Education, Middle School Education, Secondary Education, Business Operations, Computer Software Engineering, Computer Systems Analysis, Construction Management, Agricultural Management, and Accounting/Auditing. Development of

online programs in these areas would remove at least one of the primary barriers against obtaining a baccalaureate education for place-bound students.

State

There are also a number of measures that the state can take that would result in improving access to high need/high demand baccalaureate degree programs. To begin with, the Coordinating Board and the Texas Workforce Commission should provide public universities with information on area workforce needs and projections. Although university officials take into account workforce demand when considering new baccalaureate degree programs, they often focus on statewide or national demand. By including an analysis of regional demand, officials would be in a better position to assure that their degree offerings are providing their communities with an adequately trained workforce.

The state should also play a greater role in facilitating the alignment of associate degree programs with baccalaureate programs. The Texas Higher Education Coordinating Board recently did just this in the area of Mechanical Engineering. By convening a working group comprised of university and community college engineering faculty, the Coordinating Board was able to provide institutions with a recommended lower-division curriculum that is aligned with the curriculum needs of baccalaureate Mechanical Engineering degrees. This alignment assures students that they are taking the necessary courses at the community college level that will lead to timely graduation with a bachelor's degree in Mechanical Engineering. The Coordinating Board is expanding these alignment efforts with grant support from Lumina Foundation for Education. This grant will allow the Board to convene community college and faculty groups in a number of disciplines to discuss and create an appropriate lower-division curriculum that can be completed at the community college and that will align with the upper-division degree requirements present at universities. The Coordinating Board has also recently aligned the Associate of Art in Teaching with baccalaureate-level teacher preparation programs.

The Coordinating Board should promote the development of online degree programs. It is necessary that Texas reach a point where there is at least one quality online degree program for each of the Texas Workforce Commission's top 25 high-growth occupations. Although the Coordinating Board does not have the authority to develop and offer these degrees itself, it can provide institutions with an incentive to develop quality, scalable online degree programs statewide.

Finally, the state should engage in ways in which it can encourage adults with a significant number of completed semester credit hours and no baccalaureate degree. This may include the creation of a web portal aimed exclusively at providing adult degree completion students with information on flexible programs, financial aid opportunities, and relevant statewide academic policies. The state could also consider removing financial aid barriers for adult degree completion students. Many state, federal, and private financial aid programs require that a student be enrolled full-time in order to receive financial aid. Many adult students returning to complete a bachelor's degree, however, are trying to juggle the challenges of work, family, and school and may prefer to take only one or two courses at a time and, thus, become ineligible for financial aid. The state could also partner with different industries that are in need of more baccalaureate-trained workers and create industry-specific marketing campaigns designed to get adult non-degree completers at least considering the option of returning to school to finish their degrees. Finally, incentive funding for the graduation of non-traditional students in high-

need/high-demand fields could be provided. Under this plan, institutions that graduate adult degree completion students in high-need/high-demand fields would receive a small financial award in the form of extra state funding.

In short, although the existence of community college baccalaureate programs has certainly provided access to baccalaureate education that some place-bound students might not have otherwise had, the costs of expanding the number of community colleges offering these programs is greater than the cost of developing online degree programs or incentivizing institutions to offer off-campus, face-to-face programs in these fields. The expansion of community college baccalaureate programs in Texas should continue to be carefully considered and balanced against alternative means. Not only would the cost of expanding the program be significant for the state and local taxing districts, but the diversion of resources away from developmental education, workforce education, and academic transfer programs could harm these programs and students. Only if there are no statewide online degree programs or nearby public universities interested in offering the degree in a format accessible to nontraditional students should the creation of a community college baccalaureate program be considered. And even then, the costs and demands associated with becoming reaccredited as a Level II baccalaureate degree-granting institution would preclude most small, rural community colleges from offering baccalaureate degrees.

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APPENDIX A

House Bill 2425, 80th Texas Legislature

H.B. No. 2425

AN ACT

relating to engineering recruitment programs at public or private institutions of higher education and to certain degree programs at public community colleges.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF TEXAS:

SECTION 1. Section 61.791(a), Education Code, is amended to read as follows:

(a) The board shall establish and administer, using funds appropriated for that purpose, a one-week summer program to take place on the campus of each general academic teaching institution <u>or private or independent institution of higher education</u> that offers an engineering degree program. The summer program must be designed for middle and high school students and to expose those students to math, science, and engineering concepts that a student in an engineering degree program may encounter.

SECTION 2. Sections 61.792(a) and (b), Education Code, are amended to read as follows:

(a) The board shall establish and administer, using funds appropriated for that purpose, scholarships for students pursuing a degree in engineering at a general academic teaching institution <u>or a private or independent institution of higher education</u>.

(b) To qualify for a scholarship under this section, a student must:

(1) have graduated with a grade point average in the top 20 percent of the student's high school graduating class;

(2) have graduated from high school with a grade point average of at least 3.5 on a four-point scale or the equivalent in mathematics and science courses offered under the recommended or advanced high school program under Section 28.025(a); and

(3) maintain an overall grade point average of at least 3.0 on a four-point scale at the general academic teaching institution <u>or the private or independent institution of higher education</u> in which the student is enrolled.

SECTION 3. Section 130.0012, Education Code, is amended by adding Subsection (k) to read as follows:

<u>(k) The board shall conduct a study relating to the success of baccalaureate degree programs offered under this section and to the feasibility of expanding the offering of baccalaureate degrees by public community colleges. The study must consider the economic viability of expanding the degree programs, the workforce needs served by the degree programs for various areas of the state, current and potential university course offerings, and other methods for making baccalaureate degrees available, such as distance education programs and multi-institutional teaching centers. Not later than November 15, 2010, the board shall report the results of the study to each standing committee of the legislature with primary jurisdiction over higher education. This subsection expires January 1, 2011.</u>

SECTION 4. (a) Sections 61.791 and 61.792, Education Code, as amended by this Act, apply beginning with the 2009-2010 academic year.

(b) The Texas Higher Education Coordinating Board shall adopt rules for the administration of Sections 61.791 and 61.792, Education Code, as amended by this Act, as soon as practicable after this Act takes effect. For that purpose, the coordinating board may adopt the rules in the manner provided by law for emergency rules.

SECTION 5. This Act takes effect immediately if it receives a vote of two-thirds of all the members elected to each house, as provided by Section 39, Article III, Texas Constitution. If this Act does not receive the vote necessary for immediate effect, this Act takes effect September 1, 2009.

APPENDIX B

Consultants' Report

An Evaluation of the Success of the Baccalaureate Applied Technology Degrees (BAT) Offered by Midland College, South Texas College and Brazosport College

I. Introduction:

The purpose of this project was to evaluate the success of the Bachelor of Applied Technology (BAT) degree programs offered by Midland College, South Texas College and Brazosport College. The actual legislative language specifically stated: a study shall be conducted "relating to the success of baccalaureate degree programs…"

The BAT degrees are a recent innovation. They are an applied technical degree that provides a pathway for students with Applied Associate of Science (AAS) degrees to continue their education and complete a baccalaureate degree. Until the development of the BAT, the AAS degree was considered a terminal or non-transferable degree. The BAT is a degree that management expert, Peter Drucker, might conclude as an appropriate educational experience for the development of what he referred to as a "knowledge worker"---an individual with both the theory and the ability to apply the theory to practical situations (Drucker, 1999).

Although there are some exceptions, applied technical degrees are generally not offered at four-year universities. Currently, 17 states have allowed community colleges to award bachelor degrees (Community College Baccalaureate Association website). Florida has been the most active state in authorizing the BAT degree.

The implementation of BAT programs has ignited a debate regarding the wisdom of shifting enrollments and resources to community colleges. Recent research shows that those beginning their post-secondary education at a two-year institution and have the intent of ultimately earning a four-year degree have a significantly lower rate of baccalaureate degree attainment than those who begin at traditional four-year institutions. Those troubled by the BAT programs believe the enrollment shift to community colleges might have the unintended consequence of actually lowering graduation rates (Bowen, 2009; Doyle, 2008).

Advocates for expansion of BAT programs, on the other hand, argue that these programs actually remove the obstacles that have traditionally prevented two-year college transfers from earning their baccalaureate degrees. In short, community college systems have a wide network of campuses and facilities geographically distributed across states designed to improve access to higher education. With the introduction of the BAT into the community college curriculum, these schools can identify specific local educational/training gaps and design and deliver programs that support economic development in the service area while meeting the educational aspirations of those who are place bound (Walker, 2005).

The American Association of State Colleges and Universities (AASCU) noted that these degrees are, "embarked upon with great caution after workforce need has been documented, alternatives involving four-year colleges have been explored and exhausted, and community college capacity has been determined (AASCU, 2004). They concluded that, ""With growing

pressures to address the challenges of access, cost, and capacity, the phenomenon of the independent community college baccalaureate is undoubtedly here to stay. To best serve the public interest, both policymakers and campus leaders need to carefully assess the motivation for changes, their form and scope, cost factors, and effects" (AASCU, 2004).

II. Evaluating Success Based on the BAT's Stated Objectives:

As reported by states offering the BAT and documented by a number of researchers (See, for example, Walker, K.P., "History, Rationale, and Community College Baccalaureate Association," in Floyd, et. al.. The Community College Baccalaureate: Emerging Trends and Policy Issues, 2005) there are at least three overarching needs that the BAT is designed to address: 1) increased access to higher education, 2) increased economic development, and 3) increased opportunity for students---especially non-traditional students---to achieve a baccalaureate degree.

> 1) The increased demand for more highly skilled workers is requiring states to find new ways to improve access to higher education and, in particular, increase the percentage of students with baccalaureate degrees. Community college systems in many states have a wide network of campuses and facilities geographically distributed throughout the state. Utilizing the existing community college network, the BAT has the potential to provide baccalaureate degree access to geographically underserved populations.
>
> 2) A highly educated, well-trained citizenry is integral to state and local economic development. Specifically, businesses throughout the country have identified the lack of a technically trained workforce as an impediment to future growth. The BAT provides the opportunity for community colleges that are able to document specific local educational/training gaps to design and deliver programs that support economic development in the service area. The types of technical degrees will vary by regional workforce demand.
>
> 3) Community colleges enroll nearly half of all higher education students. Less than one-half of those students will matriculate to a four-year university (*Almanac of Higher Education*, 2009). Many of the students who do not transfer would like to but are unable because they are place bound or because their program of study has limited baccalaureate opportunities. Many of these students are referred to as "non-traditional" students. Non-traditional students tend to be older, often employed, married with families, and/or living in rural regions of the state with no easy access to a four-year university. The BAT, in particular, is designed to meet the needs of local, place bound students enabling them to achieve their educational goals, often while continuing to be employed.

III. Process of Evaluation of Texas's BAT Degrees:

The initial challenge presented to the evaluators was to define the notion of "success" both in the context of the BAT purpose and in terms of effectiveness and efficiency. Is the BAT meeting the intended need, and is the program being conducted with quality in a cost efficient manner?

It is important to understand there are no national assessment standards of performance or achievement currently available for the BAT. However, a generally accepted methodology for evaluating institutional performance is for each institution to set their own goals, collect performance data, and then make appropriate changes based upon the analysis of the data. Utilizing that concept, the evaluators, after personally visiting each college and interviewing faculty, staff, administrators, students, and employers, created their own assessment tool by identifying 16 indicators from which to collect data at each of the three institutions. The questionnaire was sent to the three institutions approximately one week after the visits. The indicators were: 1) enrollment, 2) retention, 3) graduation rates, 4) student to faculty ratio, 5) job placement and advancement, 6) student satisfaction, 7) employer satisfaction, 8) student learning outcomes, 9) overall institutional assessment plan, 10) advisory boards, 11) student support, 12) faculty, 13) budget, 14) technology and information resources, 15) integrity, and 16) marketing. (See questionnaire and institutional responses in Appendix.) Each of the 16 indicators provided information about how effectively and efficiently the institution is fulfilling the three overarching needs for a BAT.

IV. Summary of indicators:

Enrollment: Enrollment at the BAT programs at all three community colleges is strong. As of fall 2009, Brazosport College enrolls 115 (headcount) students in its BAT program, Midland College enrolls 65 (headcount) students, and South Texas College enrolls 131 (headcount) students in its BAT Technology Management program and 79 (headcount) students in its BAT Computer & Information Technologies program. The colleges have made the necessary changes in course offerings to accommodate the work schedules of students. Local civic and industry leaders express a need for these programs and encourage their employees to enroll (in some cases paying for tuition).

Retention: In light of the challenges facing many of the students enrolled in these programs, particularly the demands of family and work, the student retention rate is high at each college. The BAT program retention rate (fall-to-fall) for Brazosport College's ranges from 72 percent to 84 percent, for Midland College 60 percent to 89 percent, and for South Texas College between 85 percent and 93 percent. Brazosport and South Texas colleges have addressed the challenges facing many students by trying to accommodate and support the students in a variety of ways, most notably more convenient scheduling and methods of course delivery, advising, tutoring, mentoring, and programs to increase student engagement and decrease student stress.

Graduation rates: It is still too early to draw many conclusions about successful completion rates. However, early indicators hint at great success, particularly with Brazosport and South Texas College's programs. Brazosport College's BAT program graduated 11 students of the first 38-student cohort in 2007, an additional 9 students in 2008, 17 students in 2009, and 27 in 2010. On a positive note, 80% of the original 2005-2006 cohort has graduated within four years. Midland College's BAT program produced 8 graduates in 2007, 2 graduates in 2008, 10 graduates in 2009, and 27 graduates in 2010. South Texas College's BAT Technology Management Program has graduated 171 students from 2007 to 2010. Of the 116 graduates between 2007 and 2009, 101 completed the program within three years. Given the size of the program and the work and family demands on the students, this is an incredible accomplishment. The BAT Computer and Information Technology Program has graduated a

total of 47 students from 2008 to 2010. Of the 23 graduates between 2008 and 2009, 20 of them completed the Program within two years.

Student to faculty ratio: Brazosport College's BAT program's full-time student to full-time faculty ratio is approximately 15 to 1, Midland College's ratio is approximately 21 to 1 and South Texas College's BAT programs' ratio is approximately 16 to 1. These numbers are in the range of most liberal arts and comprehensive university student to faculty ratios and suggest that students should have sufficient faculty contact.

Job placement and advancement: The vast majority of students in these programs are already employed, so placement rates are a bit skewed. The relatively high advancement rate is the more relevant indicator of success for these programs. The high percentage of graduates experiencing career advancement is expected because many employers in the area are encouraging their students to pursue these degrees to create pathways for promotion.

Student satisfaction: Student evaluation instruments reveal high student satisfaction in all four BAT programs at the three colleges. The one exception to this overall satisfaction is the one course at Midland College, TMGT 3302. It will be important for the programs to monitor the attitudes of their graduates as they continue on in their careers. If they still express the same level of satisfaction five and ten years out, this will demonstrate that the programs are promoting success from one job to the next.

Employer satisfaction: While each institution is collecting data from employers, and employers are reporting a high level of satisfaction with the performance of BAT graduates, it is recommended that each institution develop a more systematic approach to this process. As the programs mature, institutions should design multiple data collection strategies over a longer period of time. For example, employers of 2009 graduates should be surveyed at the end of years one, three, and five. This would provide the opportunity to assess the validity of the programs impact/value over time.

Student learning outcomes: Each college is engaged in a variety of activities that measure student performance at the course and program levels. These include basic skills improvement via the Collegiate Assessment of Academic Proficiency (CAAP) testing, casework projects, portfolio analysis, research projects, and capstone projects. It is clear that each institution is focused on student learning outcomes and utilizes a variety of methods to collect information. In some cases, colleges also report program changes they have made as a result of data collected. Generally speaking, efforts to assess student outcomes are a strength of their BAT process. In fact, in some cases, it appears there may be too many assessment processes utilized by the institutions. As the BAT programs mature, it is likely institutions will focus on the most productive measures ultimately creating a best practices portfolio of student learning outcomes measures. These measures should be logically linked to faculty expectations for student learning and employer satisfaction surveys that are designed to assess classroom learning applied practically in the workplace. The best practices portfolios should be shared statewide.

Overall institutional assessment plan: The BAT assessment process should function clearly within the context of an overall institutional assessment plan. The indicators assessing institutional effectiveness include but are not limited to student learning outcomes. All

components of the institutional effectiveness process should be clear and transparent to the college's internal and external constituencies. Sufficient outcomes should be evaluated in terms of progress achieved on stated goals.

Advisory Committees: Each institution reports the widespread and effective use of advisory committees for program development, curriculum development and evaluation, as well as the support and promotion of the BAT programs. Advisory Committees connect the institutions to community economic development and specifically to employers providing expertise, networking, and resources. Advisory Committees meet either annually or semi-annually; however, working groups meet more frequently to focus on specific program projects as well as to update the college on changing industry needs. All three colleges are to be commended for their involvement of Advisory Committees in the development and support of the BAT programs.

Student support: A variety of services have been developed to serve the needs of the BAT student. It is recommended that each institution regularly survey students to determine the degree of functionality and satisfaction these services provide. As the programs mature, it would be valuable to create a "best practices" document to share among the colleges.

Faculty: The faculty members the site visitors met were very dedicated and enthusiastic regarding their work in the BAT programs. The teaching loads of these faculty members are very high when compared to other liberal arts and public comprehensive universities, which make accomplishing the other critical activities carried out by faculty in baccalaureate programs extremely difficult.

Budget: All of the colleges reported a sound and stable financial base that has not been negatively impacted by the implementation of the BAT programs. The start-up costs associated with these programs were offset by the legislatively approved special appropriations.

Technology and information resources: Additional resources have been added by each of the colleges to support the BAT programs. A variety of updates to existing facilities and software programs, in addition to the development and expansion of information and technology resources have been completed to meet the needs of the students in these programs.

Integrity: Each college has a well-defined mission and the goals of the BAT programs are well integrated into their mission. The colleges have well-defined, comprehensive student learning outcomes plans to ensure they are providing quality programs. The faculty, staff, administrators, students, and community members that the site visitors met enthusiastically endorsed the programs. It is clear that the BAT is meeting the needs of students and employers in the areas served by the colleges.

Marketing: The colleges have utilized a variety of strategies and targeted marketing efforts to advertise and market the BAT programs. These strategies have included both electronic and print materials and a variety of presentations. These efforts appear to be effective in recruiting students, as the enrollment in the BAT programs in all three of the colleges is strong.

V. Findings:

The purpose of this study was to determine the "success" of the BAT programs currently being offered by three Texas community colleges: Midland, South Texas, and Brazosport. Success was defined by the consultants as "sufficient progress" on fulfilling the three overarching needs that experts have identified as the reasons for the development of the BAT: 1) increased access to higher education, 2) increased economic development, and 3) increased opportunity for students---especially non-traditional students---to achieve a baccalaureate degree. The consultants also considered whether the BAT was being conducted in an effective and cost efficient manner.

It is important to note that the Texas Legislature authorized the BAT in 2003. In terms of collecting longitudinal data and evaluating the long-term impact of the BAT, it is still early in its development. However, it is safe to conclude that even in this early stage of program development, all three colleges were impressive in their commitment to the BAT and the quality of the programs.

1) Indicators supporting increased access

The BAT has increased the higher education opportunity for many students who report that without the BAT they would not be attending college. Enrollment at all three colleges has been strong. Colleges have been particularly responsive to student work schedules and have adjusted course offerings accordingly. Additionally, retention rates are high with few students dropping only because of work schedules or family issues. Effective marketing and advertising by all three colleges aids the recruitment of students.

2) Indicators supporting economic development

Because higher education institutions are important community economic engines, it is not surprising that the addition of a new BAT would have a positive effect on local economic development. However, what was surprising was the uncommon level of involvement, enthusiasm, and support that Advisory Committees were providing the programs. The on-campus interviews with these local business and civic leaders were inspiring. It was evident that all three colleges have made effective use of Advisory Committees for program development, evaluation, and support. Advisory Committees clearly articulated the connection between community economic development and the availability of a well educated and trained workforce. Advisory Committee members see themselves as partners with the colleges in a synergistic effort to create educational opportunities for their employees specifically and the community more generally. Additionally, employers reported a high satisfaction rate with students from each of three colleges. While this indicator is generally considered a program quality indicator, the availability of quality employees is a stimulus for business expansion and job growth.

3) Increased opportunity for students

A significant number of the students in the BAT program are non-traditional students. They often are older students, attending part time, working, and supporting families. Non-traditional

students need strong student support services including advising, financial aid, and flexible class schedules. Each of the colleges has developed a variety of services and approaches to meeting student needs. In meetings with students, they reported a high level of satisfaction and support. Faculty also expressed strong support of their students and a willingness to help them be successful. Testimonials from students clearly indicated that they would not be attending college and completing a baccalaureate degree without the BAT.

4) Quality indicators

All three colleges are heavily engaged in measuring student-learning outcomes. These efforts are also consistent with their requirements for regional accreditation. It is clear they take these efforts seriously and are using the data to make appropriate program changes. It is too early to draw conclusions from graduation rates; however, early indications look promising.

Faculty-to-student ratios are typical of most universities.
While most of the students are already employed, a number of them are receiving promotions as a result of their work in the program. An important dimension of the BAT program is the strong support and involvement of employers. It is a paradigm that establishes a quid pro quo between the college and the employer both programmatically and financially.

Students are very satisfied with the BAT.

Employers are very satisfied with the performance of the BAT students.
Faculties at all three colleges are dedicated and enthusiastic about their involvement in the program. Even though teaching loads are high compared to university faculty, they were pleased with the opportunity to participate in teaching BAT courses.

Monetary support is adequate.
Budgets appeared adequate to support the new programs with additional technology and information resources made available to students.

The traditional mission of community colleges has not been endangered.
There was no indication that any of the colleges was abandoning their traditional community college mission or were siphoning resources from existing programs.

In summary, each college had a well-defined mission and clear goals for the BAT, support from their Boards of Trustees, faculty, staff, administrators, students and the community. They have a well-defined plan for measuring programs and a serious commitment to high quality.

VI. Recommendations:

In terms of day-to-day operations, the consultants conclude that all three colleges demonstrate a strong commitment to the BAT. While there have been challenges, the colleges have listened to their students, advisory committees, faculty, and staff in making necessary adjustments to improve the program. As stated in the previous section, enrollments, retention, and feedback from employers and students and graduation rates have been strong.

The colleges have also collected significant data on student performance, developed strategies for student support, and learned important lessons about how to work with advisory committees and other community partners. One senses a strong cooperative relationship when talking with the colleges and community supporters.

The balance of administration, faculty, and advisory board responsibility for and control of the BAT programs is very important. The BAT faculty have very high teaching loads and it is crucial that they have the opportunity to fully participate in the continuing development and implementation of the programs. Shared governance in higher education is a very long-standing and essential practice. According to the American Association of University Professors, "governance in higher education should result from cooperation and interdependence between and among the administration, governing board, faculty and (to a lesser degree) other constituents" (AAUP, 2001). Ensuring faculty play a key role in the decision-making process for the BAT programs is of great consequence to the continued growth and success of these programs.

Utilizing Midland's, South Texas's, and Brazosport's experience, and in the interest of future BAT development in the state of Texas, now may be an opportune time for the colleges, working cooperatively, to develop a set of standards that would help benchmark expectations both for future performances of the programs as well as for future Texas community colleges that might be considered to offer the BAT. The result would be a shared set of standards that the three institutions agree fairly represents their best effort at providing an efficient and effective BAT. A few areas for standards development might include: 1) demonstrating the need for the BAT, 2) community partnership, 3) institutional support, 4) measuring learning outcomes, and 5) feedback loops.

> **1) Need:** Develop a model that identifies the standards and criteria for determining a community's unmet need for the development of the BAT. For example, variables might include higher education needs of local/regional students and, in particular, AAS students, industry needs, employer needs, community economic development needs, and long-term employment outlook.
>
> **2) Community partnership:** The BAT is an applied baccalaureate degree. Community partnerships with business and industry are critical to the program's success. What are standards that appropriately define the necessary relationship between the college and the local/regional business partners? What level of investment, e.g., resources, expertise, internships, are necessary to ensure a successful program?
>
> **3) Institutional support:** Develop a model that articulates the standard for supporting the BAT. Variables would include counseling/advising, financial aid, educational resources, faculty, technical support, job placement, etc.
>
> **4) Measuring outcomes:** What constitutes sufficient knowledge in a discipline? Standards reflecting that knowledge and criteria measuring its attainment is an on-going issue in education. Develop a performance model and valid methodology for longitudinally measuring program performance. The model should include a variety of scaled variables measured over time. For example, it should include classroom performance, capstone performance, program performance, and student performance

on the job over a number of years. The evaluators heard from a few students that they were pursuing or planning to pursue post-graduate degrees. Although this is excellent evidence of success of the BAT programs, it also creates an imperative that these programs demonstrate that students not only learn the skills and content that will make them successful in their current place of employment, but that they are developing the higher order thinking skills that will make them successful in their future studies and career pursuits. The demonstration of these higher order thinking skills such as quantitative and qualitative reasoning, moral and ethical judgment, and creativity must also be built into the measurement of learning outcomes if the BAT is to demonstrate its educational integrity and legitimacy over time.

5) Feedback loops: Institutions utilize both formal and informal feedback loops to effectively communicate. Model the most effective/valuable formal feedback loops that need to be in place in order to both communicate and receive information about the operation of the BAT.

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APPENDIX C
Pros and Cons of Expanding Community College Baccalaureate Programs

Pros:

- In many technical fields, a baccalaureate degree is replacing the associate's degree as an entry-level credential. Since community colleges are the primary providers of such programs, it is logical for them to begin to offer baccalaureate degrees in those fields.[39]
- Community college baccalaureate programs are more affordable than university baccalaureate programs for students because tuition and fees are less expensive.[40]
- Community college baccalaureate programs increase student access to baccalaureate programs, especially for non-traditional students such as working adults, single parents, and other place-bound students.[41]
- Community college baccalaureate programs are more closely tied to local workforce needs by leveraging existing applied associate degrees. This makes community college baccalaureate-granting institutions more flexible in responding to employer needs than four-year universities.[42]
- Community college baccalaureate programs allow community college students to experience a more seamless transfer from an associate degree program to a baccalaureate program because they are able to remain on the community college campus that they are already comfortable on and maintain established academic and social relationships.
- Applied baccalaureate degrees, which include the community college baccalaureate programs in Texas, provide greater avenues for transfer of an applied associate's degree. These applied baccalaureate degrees provide students who hold an applied associate's degree with good pathways for transfer into an institution where they can apply their existing college credit towards receiving a baccalaureate degree.

Cons:

- Although community college baccalaureate program tuition and fee costs for students may be less expensive than those found at universities, the cost to the State is considerably expensive since it involves the need to create baccalaureate-level academic and student support facilities and services. In the case of the current three Texas community colleges offering baccalaureate degrees, the state provided each institution with $1.2 million dollars in startup funding.
- There is a danger that community colleges offering baccalaureate degree programs will experience mission creep and begin to focus on baccalaureate degree programs to the detriment of their historical mission.
- Permission to offer a baccalaureate degree program requires community colleges to be reaccredited at a higher level; this is a process that is both lengthy and expensive.

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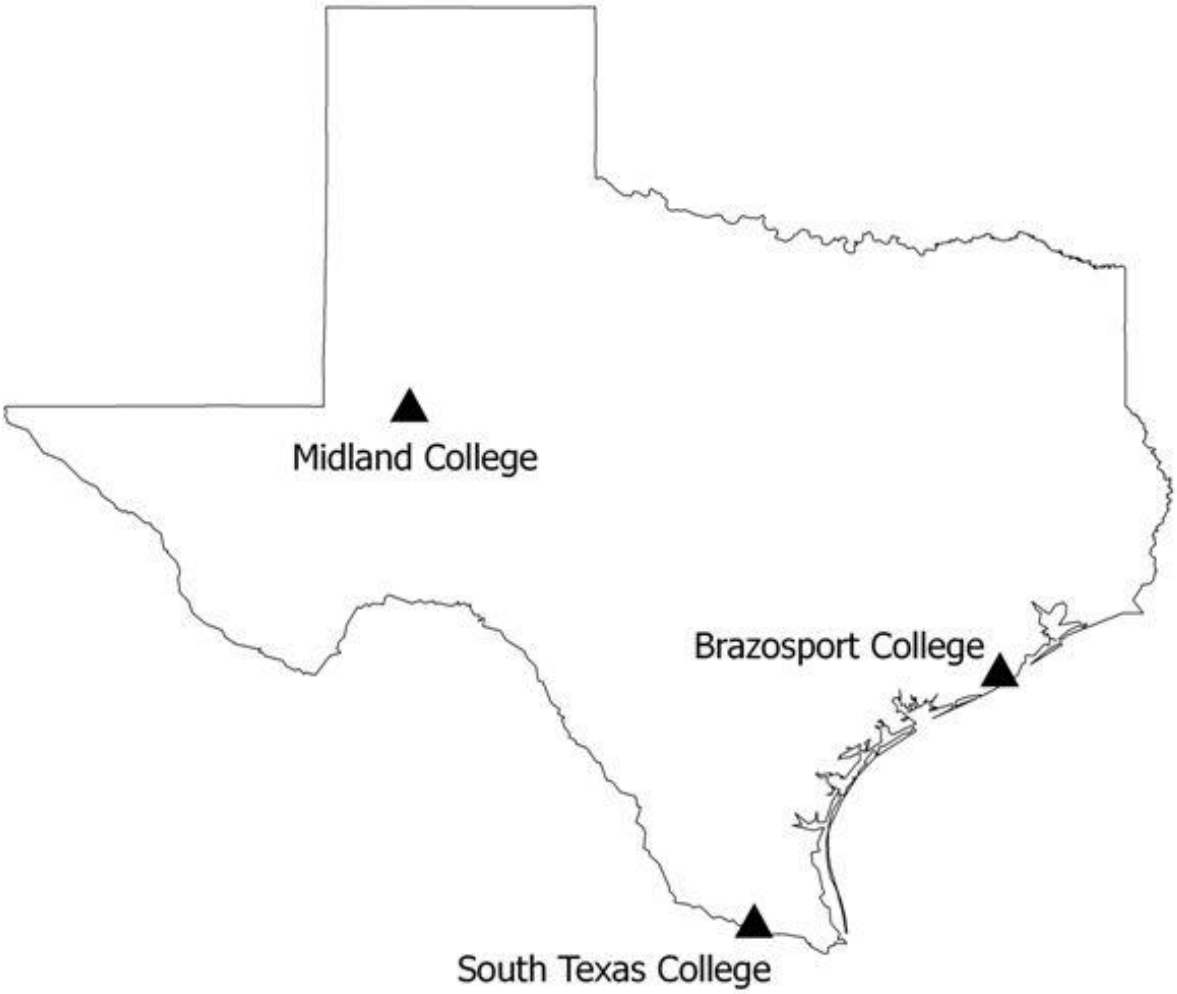
[39] Ibid.
[40] Bemmel, Edwin P., Deborah L. Floyd, and Valerie C. Bryan, "Perceptions and Reflections of Administrators: Community Colleges Transitioning to Baccalaureate Colleges," *Community College Journal of Research and Practice* (2009), vol. 33, no. 2, pp. 151-176, p. 152.
[41] Townsend, Barbara K., "A Cautionary View," in Floyd, Deborah L., Michael L. Skolnik, and Kenneth P. Walker, eds. *The Community College Baccalaureate: Emerging Trends and Policy Issues*. Sterling, VA:Stylus, 2005, pp. 179-190, p.181.
[42] Ibid.

- There is a danger that a two-tiered faculty system will be created within the community college between baccalaureate faculty and non-baccalaureate faculty who may receive different pay and teaching loads.
- There is the danger that increased competition with universities could harm university–community college relationships if universities feel that they are forced to compete with community colleges for baccalaureate students and funding.
- Community college baccalaureate programs may be seen by employers and graduate schools as an inferior degree.

APPENDIX D
Map of Current Community College Baccalaureate Programs



Brazosport College
Bachelor of Applied Technology in Technology Management

Midland College
Bachelor of Applied Technology in Technology Management

South Texas College
Bachelor of Applied Technology in Technology Management
Bachelor of Applied Technology in Computer and Information Technology

This document is available on the Texas Higher Education Coordinating Board Website: http://www.thecb.state.tx.us

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