TEXAS TECH UNIVERSITY

Strategic Plan for Research

APRIL 2010

An Addendum to Texas Tech University's *Making it possible… 2010-2020 Strategic Plan*

Contents

I. Vision Statement

The institution's plan should address, at a minimum, the following elements:

A. A description of the targeted status of the institution. What kind of university will the institution be if it achieves its goals and objectives?

B. Is the plan for the future a natural expansion of the institution's existing mission, or does it reflect a substantial change in direction?

In the fall of 2008 President Guy Bailey met with the Texas Tech University (TTU) Strategic Planning Council and initiated a strategic planning process utilizing a paper entitled, *"What makes a national research university?"* The following spring, Provost Robert Smith organized an institution-wide planning process, which resulted in *Making it possible… 2010-2020 Strategic Plan.* This plan, enabled by Texas Tech's prior 2001-2004 and 2005-2009 strategic plans, was indeed, "a natural expansion" of the institution's vision, mission and planning foci. As an outcome of this process, a new vision statement has been written, along with five strategic priorities and related key performance indicators. (Note: a new Mission Statement is under review by the Texas Tech Strategic Planning Council at the time of submission of this research plan.)

VISION:

Texas Tech is a great public research university where students succeed, knowledge is advanced, and global engagement is championed.

Strategic Priorities:

1. **Increase Enrollment and Promote Student Success:** We will grow and diversify our student population in order to improve higher education participation and supply a well-equipped, educated workforce for the state of Texas.

2. **Strengthen Academic Quality and Reputation:** We will attract and retain the best faculty in the world in order to enhance our teaching excellence and grow our number of nationally recognized programs.

3. **Expand and Enhance Research and Creative Scholarship:** We will significantly increase the amount of public and private research dollars in order to advance knowledge, improve the quality of life in our state and nation, and enhance the state's economy and global competitiveness.

4. **Further Outreach and Engagement:** We will expand our community outreach, promote higher education and continue to engage in partnerships in order to improve our communities and enrich their quality of life.

5. **Increase and Maximize Resources:** We will increase funding for scholarships, professorships, and world-class facilities, and maximize those investments through more efficient operations in order to ensure affordability for students and accountability to the State of Texas.

It should be noted that the intent of *Making it possible… 2010-2020 Strategic Plan* is to lay out a vision and plan for Texas Tech University to become a great public national research university.

The plan articulates how working toward National Research University Fund (NRUF) status is one important stepping stone on the path to becoming a great public national research university.

Texas Tech, although a relatively young institution, has a collective history of consistently aspiring to excellence in undergraduate, graduate, and professional education. The record also affirms how Texas Tech has contributed through research and service to the economic and cultural development of West Texas, Texas, the nation, and the world. While these efforts—especially those in the past decade—are laudable, a criticism offered by planning-affiliated faculty and staff members, and administrators is that the university has not always been as strategic as it might have been. Thus, the concept of "being strategic" has been stressed during the development of the 2010-2020 Texas Tech's Strategic Plan. Coincident with this strategic approach to planning is a literal once-in-a-lifetime opportunity that has come about through passage in the Texas Legislature and the signing into law by Governor Rick Perry of House Bill (HB) 51 in June 2009 and the state-wide public referendum passed in November 2009 successfully repurposing a dormant fund to become the National Research University Fund.

Taken together, Texas Tech's vision, mission and strategic priorities have been used to develop strategic directions and initiatives, all of which are guided by a set of core values and ethical principles approved by the Texas Tech University System Board of Regents in March 2008. This statement is abbreviated for the Executive Summary, and included in complete and approved form in **Appendix 1**.

Texas Tech University is committed to the values of mutual respect; cooperation and communication; creativity and innovation; community service and leadership; pursuit of excellence; public accountability; and diversity.

With the overall guidance of its vision, mission, strategic priorities, and core values in the "Statement of Ethical Principles," the Texas Tech community—students, faculty, and staff—worked collaboratively to develop the new mission and vision statements and to delineate strategic priorities and key performance indicators. Extensive discussions led to a set of major initiatives that are critical to TTU's achievement of national research university status.

The initiatives recognize that Texas Tech must continue to admit and retain outstanding students, recruit and support exceptionally qualified faculty, and promote and fund notable and high-quality programs across the institution. However, paramount in all these strategies is the principle that TTU cannot be all things to all people. Thus, the University is committed to the notion of "excellence in scholarship" in all programs that are supported or initiated.

An important component of Texas Tech's strategic planning process was the identification of a set of peer institutions for comparison and benchmarking purposes. During this process it was deemed desirable to consider exclusively peers that are public research universities because of the similarities inherent in the vision and mission elements of public institutions and characteristics identified in Texas HB 51. Using these criteria, a list of 56 national public research universities was selected. *Making it possible… 2010-2020 Strategic Plan* includes comparison data on numerous key performance indicators (KPIs) for Texas Tech, these 56 institutions, and the six other Texas emerging national research universities. These peer institutions are listed in **Appendix 2**.

It is in this context of institution-wide planning and assessment that the April 2010 Texas Tech *Strategic Plan for Research* has been written. Each component of the "Guidelines for the Strategic Plan for Research" is grounded in Texas Tech's *Making it possible… 2010-2020 Strategic Plan.* In that plan, the KPIs are established with 2009 as a baseline and projected to 2020. Each KPI is defined in terms of national, state, professional, or institutional data that is annually tracked and published. Peer comparison data has been collected and published on many of the KPIs. For those KPIs where national comparison data is not yet available, Texas Tech is participating in national surveys and securing databases that provide comparison data. An annual assessment and reporting cycle has been established by Texas Tech University as well as the Texas Tech University System, with an initial report made at the February 2010 Texas Tech University System Board strategic planning retreat. Texas Tech University and the Texas Tech University System have web-sites where annual performance is reported for strategic plan priorities, strategies, and key performance indicators.

Therefore, the Texas Tech University *Strategic Plan for Research* is submitted as an addendum to the institution's planning and assessment with this singular vision:

Texas Tech is a great public research university where students succeed, knowledge is advanced, and global engagement is championed.

In order to achieve this vision, planning must occur across the institution, with high quality teaching and optimal student learning conditions at the forefront of our considerations for national research university status. As previously mentioned, *Making it possible… 2010-2020 Strategic Plan*, along with the *Strategic Plan for Research*, constitute a summary of the planning processes as of April 2010. However, the Texas Tech Strategic Planning Council; Strategic Enrollment Planning Council; Academic and Graduate Councils and the Core Curriculum Committee; Research Advisory Council; Responsibility Center Management Council; Outreach and Engagement Committee; Provost's Council; Distributed Learning Council; Faculty, Student and Staff Senates; Teacher Education Council; and the President's Executive Council are all currently engaged in developing various facets of the 2010-2020 strategic plan. Therefore, much of the detail for specific strategies designed to achieve the five priorities is still under development with a nimble and adaptive process. It is evolutionary in nature, and responsive to external and internal opportunities that align with our eight strategic research themes described later in this document. Further details will be available in future annual updates to *Making it possible… 2010-2020 Strategic Plan* and the Texas Tech S*trategic Plan for Research*.

II. Plan to Increase Research Funding and Productivity

The Making it possible… 2010-2020 Strategic Plan encompasses the entire framework for how Texas Tech will use NRUF status as a steppingstone to becoming a great public research university. The plan, as such, articulates Texas Tech's plans to ensure attainment of this goal. This *Strategic Plan for Research* submitted to the Texas Higher Education Coordinating Board is a subset of this larger institutional plan, but it also contains important and detailed information that illustrates Tech's approaches to be used as the strategic plan is implemented.

A. *External funding.* Identify the institution's targets and how progress will be monitored. Include comparisons with national peers.

Based on an environmental scan as part of the strengths, weaknesses, opportunities, and threats (SWOT) analysis during strategic planning in the last half of 2009 (see Part B, below), the following were identified as targets for increased funding, partnering, and relationship building:

1. National Science Foundation
2. U.S. Department of Agriculture
3. U.S. Department of Energy (including National Labs)
4. U.S. Department of Defense (Defense Advanced Research Project Agency, Office of Naval Research, Army Research Office, Defense Threat Reduction Agency, Air Force Office of Scientific Research)
5. Department of Commerce/National Oceanographic Atmospheric Administration/National Weather Service/U.S. Geological Survey/U.S. Fish & Wildlife Service
6. National Institutes of Health (and specific institutes within NIH)
7. National Institute of Standards and Technology
8. National Endowment for the Arts and National Endowment for the Humanities
9. Corporations, particularly those with alumni connections and full partnership opportunities
10. Corporate and family foundations, particularly with connectivity to TTU or with missions aligned with our strengths.

Texas Tech is presently developing a real-time dashboard system for metrics tied to research metabolism that will allow for us to monitor the proposal submittal and re-submittal activities of our faculty and annual and historical proposal funding by principal investigator, department, center, institute, college, and institution for each agency listed above as well as all other agencies to whom proposals are submitted. Many of these metrics are embodied in *Table 1* below, and these are tied to growing total research expenditures, restricted research expenditures, and federal funding levels per faculty full-time equivalents (FTE). Others will be developed for supplemental measures of performance and activity by agency. The dashboard will have forecast systems and the underlying database will be modified to allow other relevant and useful data to be extracted that relates to research metabolism.

The office of the vice president for research is presently establishing a large strategic initiative team to facilitate Texas Tech's pursuit of large, competitively funded initiatives with all of the entities listed above. This team will work closely with the Research Advisory Council, deans, the provost, center and institute directors and faculty members to secure very large extramural initiatives. Further, an associate vice president for research for corporate and foundation relations will be hired to develop sponsored research opportunities with corporations and foundations. This will be done in very close coordination with the Office of Institutional Advancement in the Texas Tech University System. A very proactive corporate and foundation engagement strategy is being developed in concert with this activity.

As part of our strategic planning process conducted in the latter half of 2009, Texas Tech has identified 56 peer institutions to monitor (See **Appendix 2**). Further, Texas Tech has licensed, through coordinated efforts of the vice president for research and the provost, from Academic Analytics, access to their database that allows us to track funding trends at these peer institutions.

Priority 3 **Expand and Enhance Research and Creative Scholarship**
We will significantly increase the amount of public and private research dollars in order to advance knowledge, improve the quality of life in our state and nation, and enhance the state's economy and global competitiveness.

Goal	2008	2009	% Change	2010 Target	2015 Target	2020 Target
Total Research Expenditures (NSF)	$60,165,000	$94,649,000	57.3%	$110,000,000	$150,000,000	$200,000,000
Restricted Research Expenditures (THECB) —HB 51	$27,098,487	$35,030,672	29.0%	$45,000,000	$80,000,000	$150,000,000
Federal Research Expenditures (THECB)	$21,416,823	$25,645,008	19.7%	$30,000,000	$65,000,000	$130,000,000
Federal Research Expenditures per Faculty Full-Time Equivalent (THECB)	$23,915	TBD	TBD	$25,000	$40,000	$80,000
Proposals Submitted	800	952	19%	1,000	1,400	1,800
Strategic Faculty Hires	na	na	na	15 /yr.	20/yr.	30/yr.
Research Space in Sq. Footage (THECB)	476,368	480,775	1%	500,000	700,000	1,000,000
Post-doctoral appointments	67	TBD	TBD	73	87	100
Number of funded collaborative research projects with TTUHSC that are led by TTU	3	2	-3.33%	3	5	10

Table 1: Strategic Priority Goals to Enhance Research, Scholarship and Creative Activity at Texas Tech University

Key Strategies

1. Utilize the eight strategic research themes to advance disciplinary, multidisciplinary, and interdisciplinary research.

2. Strategically hire faculty who bring extensive funding with them (*e.g.*, greater than $0.5 to over $1M, depending on their discipline). With these strategic hires, there will be clear expectations and accountability around research performance, particularly around research expenditures (ranging from $200k to $1M per year, depending on their discipline) and doctoral student support (discipline dependent).

3. Increase the number of research proposals submitted from 952 in FY 09 to 1000 in FY 2010.

4. Increase the square footage of research space from 480,775 in FY09 to 500,000 by the end of 2010.

5. Establish a corporate and foundations relations program that increases partnership opportunities supporting research, scholarship and creative activity.

B. *Research priorities.* Define and describe the institution's targeted research priorities. Describe where and how the institution will focus its efforts.

Through the institution's strategic planning efforts, eight strategic research themes were identified across all colleges, schools, centers, and institutes.

The identification of these eight themes was based on external scans and SWOT analyses, specifically informed by:

1. The Obama Administration's plans for science and technology investment in research & development (R&D), including information from White House issue papers, Office of Science and Technology Policy planning papers, Office of Management and Budget fact sheets, presentations by the White House Science Advisor, directions identified by the American Recovery and Reinvestment Act focus areas, and the America Competes Act, among others.
2. Fiscal Year 2010 and 2011 budget justifications by all federal agencies as part of the President's budget justification to Congress.
3. Public forum discussions and presentations by the American Association for the Advancement of Science, the National Academies, the National Science Board, and National Science Foundation around science, technology, engineering, and math research and development trends and directions.
4. Strategic plans of the federal agencies.
5. Conversations with state agency partners, including senior administrators.
6. Conversations with corporate and foundation partners.
7. Conversations with regional partners in Lubbock, West Texas, Texas and the Southwest.

8. Internal strategy conversations, particularly with faculty members, chairs, and deans connected to the above areas.

Eight equally important Texas Tech research themes were identified after careful deliberations based on current and future strengths as an institution. These are:

1. Sustainable Society —-Energy, Water, Agriculture and the Built Environment
2. Computational and Theoretical Sciences
3. Innovative Education and Assessment
4. Advanced Electronics and Materials
5. Integrative Biosciences
6. Community Health and Wellness
7. Culture and Communication
8. Creative Capital: Arts and Design Technologies

Within each of these themes, many sub-themes were identified by colleges and schools (and centers and institutes within those colleges and schools). The mapping and alignment of these sub-themes within each of the eight themes for each college, school, center, and institute was examined with respect to the following criteria.

1. Increasing Support to the Institution
    - Federal funding opportunities and partnerships (current and future)
    - State funding opportunities and partnerships (current and future)
    - Private sector funding and partnerships (current and future)
    - Foundation funding and partnerships (current and future)
    - Philanthropic support potential (current and future)
    - Technology transfer opportunities (particularly with current and future licensing partners)
    - Special facilities for R&D (both present and future capabilities)
2. Advancing Knowledge
    - Faculty excellence in scholarship
    - Graduate program excellence, quality, and reputation
    - Undergraduate program excellence, quality, reputation, and opportunities to promote undergraduate research
3. Improving Quality of Life
    - Cultural development
    - Economic development
    - Global partnerships

The vice president for research, the provost, the deans, and center and institute directors are collaborating on many strategic initiatives within each of these eight themes based on these criteria:

1. Relative importance of the initiative
2. Immediacy of the opportunity
3. The alignment of opportunities with strategic hiring plans
4. The short- and long-term benefit of the initiative, particularly as it relates to ensuring "excellence in scholarship."

C. *Allocation of resources.* Estimate the budget necessary to achieve the targeted goals and describe how the institution will utilize funds, staff resources, facilities, and other assets to maximize its efforts.

The vice president for research and provost are working closely with the president and the senior vice president for administration and finance to identify strategic funds for use in new Ph.D. fellowships, strategic hiring start-up packages, traditional hiring start-up packages, spousal accommodations, faculty retention packages, new lines for strategic hires, and funds to kick-start strategic initiatives. The magnitude of these investments is significant.

Critical to the consideration of resources is the aggressive initiative to implement responsibility center management (RCM) over the next three years. Inherent to RCM is the establishment of subvention funds that can be used tactically and strategically by the provost and vice president for research in a more formal and transparent fashion.

D. *Student participation.* Describe how the institution will enhance student opportunities to participate in research activities at the graduate and undergraduate levels.

One outcome of our strategic plan will be the strengthening of our undergraduate research programs and profiles. Much of the focus at the undergraduate level is tied to efforts in our Center for Undergraduate Research (CUR), our Howard Hughes Medical Institute program, our Clark Scholars program, many initiatives within colleges, schools and departments that are now being further coordinated and integrated to specifically focus on financial support for academic year and summer undergraduate research fellowships, faculty mentoring fellowships, and a signature undergraduate research week this April and annually thereafter. Our focus on undergraduate research spans the spectrum of scholarship at Texas Tech–from the performing arts, humanities, and social sciences to the science, technology, engineering, and mathematics (STEM) disciplines.

Texas Tech University is also embarking on an institution-wide plan to increase enrollment. As noted in *Making it possible… 2010-2020 Strategic Plan*, much of Texas Tech's student enrollment is expected to come from significant graduate student enrollment increases. For Texas Tech to significantly increase graduate student population, a clear road map will be developed on initiatives around making Ph.D. scholarship the core of our notion of "excellence in scholarship," increasing opportunities within our eight strategic research themes to obtain externally supported research assistants (RAs), encouraging and incentivizing faculty to build RAs into extramural proposals, pursuing significant foundation seed funding for special Ph.D. initiatives (particularly around STEM education initiatives), obtaining National Science Foundation Integrated Graduate Education and Research Traineeships (IGERTs) and similar programs from other agencies, using the interdisciplinary scholarship academy to promote collaborations and initiatives tied to increased graduate program support, and allocating central “subvention” funding to leverage initiatives.

III. Plan to Improve Undergraduate Education

The institution’s plan should address, at a minimum, the following elements:

A. Describe the institution’s plan to strengthen and improve the quality of undergraduate education, including the student profile.

B. Describe what the institution is doing to increase the number of baccalaureate degrees awarded, particularly in the critical fields identified in *Closing the Gaps by 2015*.

Priority I of *Making it possible… 2010-2020 Strategic Plan* includes strategies to “strengthen and improve the quality of undergraduate education” and to increase access to an increasingly diverse student body while promoting enrollment in “critical fields.” As part of Texas Tech’s planning process, a new Mission Statement has been proposed to affirm its commitment to the increasingly diverse student body, staff and faculty.

Texas Tech’s undergraduate culture was rigorously scrutinized during a four-year period when it applied for and ultimately was granted the Lambda Chapter of Texas of Phi Beta Kappa, the nation’s oldest and most prestigious honor society. Recognition by Phi Beta Kappa was achieved due to existing academic environments that champion student success, evidenced by Texas Tech’s increasing freshman retention rates and graduation rates. Texas Tech has long been recognized for its commitment to high-quality undergraduate curricular and co-curricular environments, and we are committed to preserving and improving student success while we increase our research productivity.

In this context, we envision a rich and engaging undergraduate learning environment. The office of the provost and the Strategic Enrollment Planning Council lead a task force that is currently conducting a comprehensive examination of the undergraduate experience at Texas Tech. *Table 2* provides a high-level view of goals, KPIs, and strategies from Strategic **Priority 1** of *Making it possible… 2010-2020 Strategic Plan*.

Priority 1- Increase Enrollment and Promote Student Success
We will grow and diversify our student population in order to improve higher education participation and supply a well-equipped, educated workforce for the State of Texas.

Goal	2008	2009	% Change or % pt. Change	2010 Target	2015 Target	2020 Target
Fall enrollment	28,422	30,097	5.9%	30,850	35,131	40,000
Transfers from Texas 2-year colleges with at least 30 credit hours	4,727	5,189	9.8%	5,500	6,500	7,500
Graduate student enrollment as a % of total enrollment (includes Law)	18.7%	19.3%	0.8	20.0%	22.5%	25.0%
First year retention rate	80.1%	80.90%	0.7	81.00%	83.00%	85.00%
Second year retention rate	72.3%	69.2%	-3.1	70.0%	75.0%	80.0%
4-year graduation rate	36.8%	35.3%	-1.5	40.0%	45.0%	50.0%
6-year graduation rate	57.4%	60.2%	2.8	61.0%	65.0%	70.0%
Total degrees awarded (annual)	6,328	5,901	-6.7%	5,800	7,907	9,000
"High achievement of freshmen class for 2 yrs." —determined by the Texas Higher Education Coordinating Board (HB 51)	TBD	TBD	TBD	TBD	TBD	TBD

Table 2: Strategic Priority Goals to Increase Enrollment and Promote Student Success

Key Strategies

1. Create a one-stop transfer student center.
2. Implement plans to offer evening and weekend classes to enhance educational opportunities for non-traditional students in high-demand undergraduate programs.
3. Continue efforts to recruit students into distance education programs, led by the University College, particularly with offerings that are attractive to non-traditional and diverse audiences of students.
4. Administer the Noel-Levitz Student Satisfaction Inventory. Data will be available by May 2010.
5. Develop a comprehensive communication flow and new student telecounseling software to increase applications and yield among new and prospective undergraduate freshman and transfer students.
6. Increase transfer student enrollment and success by joining Transfer101.org and acquiring a new online resource—u.select—software that helps students to compare current community college hours and provides information on how they transfer to different schools.
7. While increasing enrollment of Texas freshman with increasing numbers of Pell Grant and first generation college students, maintain SAT range at the 2009 benchmark of critical reading 480-580 and math 510-620.

The strategies cited above were developed for Texas Tech's initial publication of *Making it possible… 2010-2020 Strategic Plan* in the early phases of strategic planning. As mentioned in Section 1 of the Texas Tech *Strategic Plan for Research*, many university councils and committees are currently engaged in developing specific action plans to achieve or implement the goals, KPIs, and strategies mentioned above. Additional strategies are mentioned here, at the forward edge of our planning processes and in anticipation of the completion of a plan for undergraduate education that will contribute to achievement of Strategic Priority 1.

Additional Strategies for Improvement of the Quality of Undergraduate Education

- Continue to improve the core curriculum and student learning outcomes on core competencies in light of Texas Tech University student core competencies and student learning outcomes, THECB Undergraduate Education Advisory Committee (UEAC) recommendations, THECB regulations and Southern Association of Colleges and Schools Commission on Colleges (SACSCOC) standards.
- Implement undergraduate program review for all undergraduate majors.
- Increase undergraduate research opportunities through the Center for Undergraduate Research, Honors College and Howard Hughes Medical Institute funded programs.
- Implement findings from Noel-Levitz consultancy on academic advisement.
- Increase participation in IS 1100 -– Freshman Seminar and related freshman integration programs.
- Provide infrastructure to support supplemental instruction in targeted courses.
- Create recruitment and support structure for undergraduate and graduate national and international scholarship applicants.
- Complete review of the Student Conduct Code with respect to academic integrity adjudication and continue the *Strive for Honor* educational campaign.
- Initiate an undergraduate section of Introduction to Research Ethics.
- Transition from the SACSCOC Quality Enhancement Plan to the TTU Ethics Center and continue leadership of curricular and co-curricular strategies to increase ethics education.
- Increase international learning opportunities and participation rates for undergraduate students.
- Increase number of teacher education candidates in critical fields.
- Utilize the findings of the Outreach and Engagement Measurement Instrument (OEMI) to identify academic, research, and engagement opportunities for undergraduate students.

B. Describe what the institution is doing to increase the number of baccalaureate degrees awarded, particularly in the critical fields identified in *Closing the Gaps by 2015.*

Making it possible… 2010-2020 Strategic Plan proposes a 33 percent increase in total enrollment from 2010 to 2020 (from 30,097 to 40,000). In addition, freshman retention and graduation rates are proposed to increase significantly. In Fall 2009 term, Texas Tech enrollment increased by more than 5.89 percent—an increase of 1675 students. Campus master planning and enrollment management planning is underway to accommodate this growth. Accordingly, the number of total degrees awarded annually is projected to increase to 9,000 by 2020. Texas Tech's 2010 Closing the *Gaps by 2015—Performance System* report includes a projected undergraduate degree total for 2020 at 5,470. However, if at least 75 percent of the projected 9,000 graduates are undergraduates, the total number of students completing bachelor's degrees should increase significantly to 6,750.

Targets for Closing the Gaps in Success

Goal 2: Close the Gaps in Success; Target Seven (Success) Increase the number of students completing engineering, computer science, math and physical science bachelor's and associate's degrees and certificates from 12,000 in 2000 to 24,000 by 2010, and 29,000 by 2015.

	Actual 2000	Actual 2005	Target 2010	Target 2015	Target 2020
Statewide Degrees	11,979	13,677	24,000	29,000	N/A
Texas Tech	**384**	**486**	**620**	**665**	**710**
Engineering[1]	274	340	480	520	560
Computer Science[2]	41	67	40	40	40
Math[3]	33	50	50	50	50
Physical Science[4]	36	29	50	55	60

The chart above includes targets submitted to the THECB in Fall 2009. These targets will be reviewed to identify opportunities for further increase in each of the critical fields. The annual number of students completing engineering, computer science, math, and physical science bachelor's degrees will increase from 384 in 2000 to a target of 620 in 2010 and 665 in 2015. If achieved, this will represent a growth rate of 61.5 percent, which trails the statewide baccalaurate performance expectations of 142 percent growth rate. However, *Closing the Gaps by 2015: 2009 Progress Report* documents a statewide growth of only 7.5 percent in graduates for these four degree fields from FY 2000 to FY 2008 (11,979 to 12,877). Thus, Texas Tech has significantly outpaced statewide performance in graduations in these critical fields through FY 2009.

In order to continue to increase graduates in these four critical fields, Texas Tech proposes the following strategies.

Engineering and Computer Science

1. Texas Tech's Edward E. Whitacre Jr. College of Engineering is committed to making the aggressive recruitment of transfer students a strategic priority. We value the preparation that transfer students receive at community colleges and the high probability for their success at Texas Tech. To assure a smooth transition, Texas Tech University is a signatory to the recent THECB Volunteer Mechanical Engineering Transfer Compact. In addition, the Whitacre College of Engineering has developed transfer plans for degrees in chemical, civil, construction, electrical, environmental, industrial, petroleum engineering, and computer science. Articulation agreements based on these plans have been completed or are near completion with Alamo Community College District, Amarillo College, Angelo State University, Austin Community College, Dallas County Community Colleges, El Paso Community College, Lone Star College, McLennan College, Midland College, Odessa College, San Jacinto College, South Plains College, and Tarrant County Colleges.

2. The ConocoPhillips Academic Success Bridge program was developed by the Whitacre College of Engineering as a means of improving retention and academic success of at-risk

engineering students, especially those who are first generation college students, minority students, or from lower socio-economic backgrounds. Beginning with the week before classes, approximately 100 students receive an intensive math review to prepare them to qualify for and successfully pass Calculus I. The program continues through the fall and spring semesters with the students organized into cohort groups for critical freshmen courses. Students are supported and coached throughout the year by upper-division student mentors and engineering faculty.

3. Beginning with the fall 2010 term, incoming freshmen engineering students with lower demonstrated aptitude for math and science will begin in University Pre-Engineering. These students may transfer into the Whitacre College of Engineering upon successful completion of Calculus I and Physics I. The primary advantage for students within the Pre-Engineering program is that advising will be organized through the University Advising Center. Engineering presents an extremely challenging course of study and experience has shown that many freshmen will ultimately select an alternative discipline. The advisors in the University Advising Center have the specialized training and are equipped with the tools necessary to assist these students.

4. Academic computing disciplines had a significant decline in enrollment after the dot com bubble burst around the turn of the century. A shortage of information technology jobs also developed due to high tech firms closing or off-shoring of software development work. A major problem identified is that many undergraduate computing programs introduce students to the field through industrial strength languages that are difficult to use. In 2009, Texas Tech's Department of Computer Science changed to a computer language that is more amenable to problem solving than struggling with the syntax and semantics of a complex computer language. The result has been an increase of about 25 percent in undergraduate computer science students that can be attributed to the progress in recruitment and retention. This increase is significantly higher than that increases reported at the national level.

5. Texas Tech's computer science departmental chairperson received a National Science Foundation Computer & Information Science & Engineering (CISE) Pathways to Revitalized Undergraduate Computing Education (CPATH) award to inspire students in computational thinking through vertical integration of the senior capstone project. Students in undergraduate prerequisite courses are provided an opportunity to work at their skill set level on various parts of the senior capstone project. The expected result is that the recruitment and retention rates will increase because the first and second year computer science students will have the opportunity to participate in the excitement of putting together a medium scale software project.

6. In the last decade, computer science programs throughout the country have introduced computing-related degree programs and certificates as a means of increasing enrollments. The undergraduate field of software engineering had major growth with the introduction of Accreditation Board for Engineering and Technology (ABET) accreditation. Information assurance certificates have grown through federal support. Information technology under graduate degree programs have also served as add-on degree programs in computer science. Texas Tech's computer science department will explore these opportunities in a measured approach through additional faculty resources.

7. The computer science department will be moving toward ABET accreditation in computer science, thereby increasing the value and attractiveness of its degrees.

Math and Physical Sciences

1. Texas Tech's College of Arts and Sciences will target the development of STEM initiatives that will focus on math and physical sciences (physics, astronomy, atmospheric sciences, chemistry and geosciences). The following activities represent some of the programs in the college that are part of this effort:

    - The Plains Bridges to the Baccalaureate is a joint effort between TTU and South Plains College aimed at assisting underrepresented students in the sciences to overcome challenges they face to succeed in higher education.
    - The Summer Math Academy is a two- to three-week program for talented high school students and their teachers. The Joy of Thinking Program establishes girls' math clubs designed to increase interest and enthusiasm for scientific reasoning and mathematical activities among pre-adolescent and adolescent female students.
    - TexPREP-Lubbock at TTU provides a non-residential mathematics and science-based summer enrichment program for middle and high school students from cultural and economic backgrounds traditionally underrepresented in mathematics, science, and engineering.
    - The GK-12: Building Bridges Program prepares doctoral-level STEM graduate students and secondary STEM teachers to work in an interdisciplinary environment by developing novel mathematics, engineering, and science partnerships with in-service science and mathematics teachers.
    - The Texas Tech Noyce Scholars program provides support for upper level undergraduate students from mathematics and chemistry majors in two-year long K-12 experiences.

2. The College of Arts and Sciences will increase outreach and support of the Summer Math Academy.

3. The College of Arts and Sciences will increase support of "boot camps" for introductory students in chemistry to further increase student success.

4. The College of Arts and Sciences will develop outreach programs with regional community colleges that encourage students to consider degrees in math and physical sciences.

    - Programs at El Centro Community College in Dallas and McLennan community college in Waco provide a model that can be expanded to other community colleges to increase graduate rates in these designated areas.

Goal 2: Close the Gaps in Success; Target Ten (Success) Increase the number of math and science teachers certified through all teacher certification routes to 6,500 by 2015.

	Actual 2000	Actual 2005	Target 2010	Target 2015	Target 2020
Statewide Certifications	2,156	2,737	5,400	6,500	N/A
Texas Tech Certifications	**0**	**195**	**200**	**225**	**250**

Continually identified as high-need teaching fields, the math and science teaching areas have become even more strategic with the State Legislature's decision to increase high school graduation requirements to include four years of mathematics and four years of science. Texas Tech has continued to increase the production of university-based teacher education candidates, despite the downturn in university-based production statewide. In order to acknowledge the importance of university-based teacher education candidate production, **Priority 4** of the Texas Tech Strategic Plan, "Further Outreach and Engagement," will be modified to include key performance indicators for teacher education. Adding teachers in critical fields will contribute to the preparation of high school graduates to enter these fields. In addition, the following are key strategies to address the need for more teacher education candidates.

Key Strategies:

1. The Texas Tech College of Education will develop new certification specialties in elementary math/science and secondary mathematics, physical science, and engineering.
2. The Texas Tech College of Education will offer more options for the middle-level certificate in math and science.
3. The Texas Tech College of Education will continue current and develop new scholarships through the Howard Hughes Medical Institute (HHMI) science education scholar program and the Texas Tech Noyce Scholars Program.
4. The Texas Tech College of Education will advertise and promote the federally funded Project TEACH (Teacher Education Alliance Collaborative for Higher Education) grant and signing bonuses offered by school districts for teachers of math and science.

IV. Plan for Doctoral Programs

1. Existing Doctoral Programs

The institution's plan for existing doctoral programs should address, at a minimum, the following elements:

A. Summary of existing programs. Using past reviews, provide an evaluation of the institution's existing doctoral programs and how they fit into the institution's near-term and long-range plans. Include an assessment of strengths and weaknesses.

As of April 1, 2010, the THECB Program Inventory lists the following number and type of doctoral degrees offered at Texas Tech University:

DEGREE TITLE	NUMBER OF DEGREES OFFERED
Doctor of Musical Arts	4
Doctor of Education	5
Doctor of Philosophy	51
Doctor of Jurisprudence	1
Total Doctorates Offered	**61**

As shown in *Table 4*, these doctoral programs can be mapped to the eight strategic research themes. From a strengths perspective, the offerings are diverse, some of the offerings are interdisciplinary, and 26 are in the STEM disciplines. From a weakness perspective, some of the offerings need consolidation, new offerings need to evolve that are responsive to external market demands, and more interdisciplinary offerings would be beneficial. The Office of the vice president for research and the office of the provost will be developing an interdisciplinary scholarship academy for faculty. One outcome of the academy will be the development of new interdisciplinary graduate (and doctoral) degree programs.

TEXAS TECH UNIVERSITY DOCTORAL DEGREES ORGANIZED BY POTENTIAL RESEARCH THEMES			
COLLEGE	CIP CODE	PROGRAMS	DEGREE
1. Sustainable Society-Energy, Water, Agriculture and the Built Environment			
Ag Sciences and Natural Resources	13130100	Agricultural Education	EDD
Ag Sciences and Natural Resources	01010300	Agricultural and Applied Economics	PHD
Ag Sciences and Natural Resources	01110200	Agronomy	PHD
Ag Sciences and Natural Resources	01090100	Animal Science	PHD
Engineering	14080100	Civil Engineering	PHD
Arts & Sciences	26100400	Environmental Toxicology	PHD
Ag Sciences and Natural Resources	03030100	Fisheries Science	PHD
Arts & Sciences	40060100	Geosciences	PHD
Engineering	14350100	Industrial Engineering	PHD
Interdisciplinary	03020600	Land-Use Planning Management Design	PHD
Engineering	14250100	Petroleum Engineering	PHD
Ag Sciences and Natural Resources	01110600	Range Science	PHD
Engineering	14999901	Systems and Engineering Management	PHD
Ag Sciences and Natural Resources	03060100	Wildlife Science	PHD
Interdisciplinary	14130100	Wind Science and Engineering	PHD

TEXAS TECH UNIVERSITY DOCTORAL DEGREES ORGANIZED BY POTENTIAL RESEARCH THEMES			
COLLEGE	CIP CODE	PROGRAMS	DEGREE
2. Computational and Theoretical Sciences			
Arts & Sciences	45060100	Economics	PHD
Engineering	11010100	Computer Science	PHD
Arts & Sciences	27010100	Mathematics	PHD
Arts & Sciences	40080100	Physics	PHD
3. Innovative Education and Assessment			
Education	13030100	Curriculum and Instruction	PHD
Education	13040100	Educational Leadership	EDD
Education	13060100	Higher Education	EDD
Education	13060100	Higher Education	PHD
Education	13050100	Instructional Technology	EDD
Education	13100100	Special Education	EDD
Education	42180100	Educational Psychology	PHD
4. Advanced Electronics and Materials			
Engineering	14070100	Chemical Engineering	PHD
Engineering	14100100	Electrical Engineering	PHD
Engineering	14190100	Mechanical Engineering	PHD
5. Integrative Biosciences			
Arts & Sciences	26010100	Biology	PHD
Arts & Sciences	40050100	Chemistry	PHD
Arts & Sciences	26070100	Zoology	PHD
6. Community Health and Wellness			
Arts & Sciences	42020100	Clinical Psychology	PHD
Education	13110100	Counselor Education	PHD
Arts & Sciences	42060100	Counseling Psychology	PHD
Arts & Sciences	42080100	Experimental Psychology	PHD
Human Sciences	13130800	Family and Consumer Sciences Education	PHD
Human Sciences	52090100	Hospitality Administration	PHD
Human Sciences	19070100	Human Development and Famly Studies	PHD
Human Sciences	51150500	Marriage and Family Therapy	PHD
Human Sciences	19050100	Nutritional Sciences	PHD
Human Sciences	52080400	Personal Financial Planning	PHD

TEXAS TECH UNIVERSITY DOCTORAL DEGREES ORGANIZED BY POTENTIAL RESEARCH THEMES			
COLLEGE	CIP CODE	PROGRAMS	DEGREE
Culture 7. Culture and Communication			
Law	22010100	Law	JD
Business Administration	52020100	Business Administration	PHD
Arts & Sciences	23010100	English	PHD
Arts & Sciences	54010100	History	PHD
Mass Commommunications	09010200	Mass Communications	PHD
Arts & Sciences	45100100	Political Science	PHD
Arts & Sciences	16090500	Spanish	PHD
Arts & Sciences	23110100	Technical Communication and Rhetoric	PHD
8. Creative Capital: Arts and Design Technologies			
Visual & Performing Arts	50090400	Music Composition	DMA
Visual & Performing Arts	50090600	Music Conducting	DMA
Visual & Performing Arts	50090300	Music Performance	DMA
Visual & Performing Arts	50090700	Piano Pedagogy	DMA
Visual & Performing Arts	50070100	Fine Arts - Art	PHD
Visual & Performing Arts	50090100	Fine Arts - Music	PHD
Visual & Performing Arts	50050100	Fine Arts - Theatre	PHD
Human Sciences	04040100	Interior and Environmental Design	PHD

Table 4: Texas Tech Doctoral Degrees Organized by Potential Research Themes

Proposals for new doctorates and distributed delivery of existing doctorates that fall within the eight strategic research themes are subjected to a rigorous academic review process that begins with college curricular committees. After college approval, proposals for distributed doctorates are reviewed by the Distributed Learning Council and, once approved, are forwarded to the Graduate Council. Proposals for new doctorates go directly to the Graduate Council. Once the proposal arrives at the Graduate Council, an academic proposal committee determines if further information is required. Once the committee's questions have been answered, the proposal is forwarded to the Graduate Council. The Graduate Council ensures that all institutional, THECB, and SACSCOC requirements for doctorates have been met, that the proposal aligns with Texas Tech's national research university vision, and that it is not redundant or overlapping with existing doctorates.

If all of these requirements are met and student learning outcomes, assessment plan and curriculum map are satisfactorily designed, the Graduate Council sends the proposal to Academic Council. If approved, the proposal then goes to the provost for review and approval, and then is scheduled to be considered by the Texas Tech University Board of Regents at a subsequent meeting. If approved by the regents, a final, comprehensive review of the proposal is completed to ensure that all recent regulatory and comprehensive standards have been met prior to submission to the THECB and SACSCOC. This process generally requires 18-24 months of institutional review and investment prior to approval and recruitment of students. The approval process for new degree programs, including doctorates and distributed doctorates, can be found in Texas Tech's Operating Policy 36.04 at http://www.depts.ttu.edu/opmanual/OP36.04.pdf.

Once a doctoral program has been approved, it is subject to the THECB new doctorate reporting requirements. It is also entered into the six-year review rotation of all graduate degree programs led by the Graduate School. This review process is described in depth at http://www.depts.ttu.edu/gradschool/docs/programs/programreview.pdf.

> The main objective of periodic six-year program reviews is to provide a mechanism for maintaining or improving the quality of graduate programs at Texas Tech University. Periodic program reviews give administrators and academic leaders important information and the size and quality of a program, the program's future resource needs, recruitment, strengths and weaknesses, and its contributions to the mission of the university.
>
> The results of the program reviews are used to give direction, to set goals for the future, and to ensure that general academic plans and budget decisions are based on solid information and priorities that and match closely those of the university. Periodic program reviews also provide a mechanism for faculty to evaluate the effectiveness, progress, and status of their program.
>
> In addition to the six-year graduate program review rotation for 2009-2010 to 2014-2015, the following information is included here to provide a glimpse of the comprehensive and systematic nature of the graduate program review process.
>
> Gathering Preliminary Information: The Graduate School staff assists the academic unit in the preparation of a self-study document by gathering necessary data on the academic unit. Internal information is gathered from the Office of Institutional Research, the Office of Research Services and the Graduate School records. Department specific information on the areas is collected during the summer prior to the academic year and during early fall of the academic year for which the unit is to be reviewed, such as:
>
> - Number and type of degrees awarded
> - Undergraduate and graduate semester credit hours
> - Number of majors in the department for the past five fall semesters
> - Demographics of applicants and enrolled students
> - Test scores of students and applicants on GRE, GMAT, and TOEFL
> - Graduate GPAs
> - Scholarships and fellowships awarded to students by the Graduate School
> - Course enrollments by academic year, (fall, spring and summer)
> - Teaching resources
> - SCH/FTE generation
> - The departmental operating funds
> - External and internal grants and contracts awarded

Peer Institution Information: The Graduate School staff also gathers information from peer institutions that are recommended by the unit being reviewed on the areas shown below and include that information in the self-study. The chairperson of the academic unit may obtain more peer institution information if desired. Requests for additional peer institution information must reach the graduate school prior to sending out the initial requests for information.

- Number and type of degrees awarded
- Enrollment figures at all levels
- The number of tenured, tenure-track, and teaching assistants
- External and internal grants and contracts awarded

Preparation of the Program Self-Study: The chairperson of the academic unit being reviewed is ultimately responsible for the content, accuracy, and completeness of the self-study. The chairperson may designate another faculty member or a team of faculty members to carry out the self-study, but should be continually and actively involved in overseeing the preparation of the self-study. All faculty members should be involved in the preparation of the self-study. The participation of enrolled students, alumni, and professional staff is highly encouraged. The self-study should be evaluative rather than simply descriptive. It should be more than just a collection of data, but a document of academic judgment about the program, students' curriculum, resources, and future directions of the academic unit. The self-study should not be a document that describes a budget request, but one that describes administrative information of the unit's strengths, areas to strengthen, plans, and goals. Note that a self-serving document, in some measure, loses credibility. The Graduate School has a number of self-studies available for review. The format of the self-study document is shown in the next section. Components of the review that the department/college provides include:

- Scope of program(s)
- Program enrollment and degree information
- Summary of the number of publications and creative activities
- Responsibilities and leadership in professional societies
- Faculty workload
- Type of financial support available for graduate students
- Number of students who have received national and university fellowships, scholarships and other awards
- Graduate student publications and creative activities
- Program for mentoring and professional preparation of graduate students
- Department efforts to retain students
- Department operating cost
- Summary of number of proposals written and accepted
- Source of internal funds (TTU)
- Departmental resources for research and teaching (*i.e.,* classroom space, lab facilities)
- HEAF expenditures (laboratories, classroom, etc.)
- Strategic plan
- Graduate course offerings

- Recruiting materials
- Graduate student handbook
- Graduate Student Association(s) description and information
- Graduate faculty information — from application and confirmation/reappointment forms

The results of doctoral program reviews are incorporated into the respective department and college's strategic plan annual assessment reports. These findings guide the dean and college faculty in making determinations on resource allocation in support of programs that are targeted for growth and enhancement in order to contribute to Texas Tech's national research university vision. Furthermore, under Responsibility Center Management, deans will compete for funds in a "subvention pool" managed by the provost. These funds will be used to achieve strategic academic goals, including strategic doctorate program enhancement.

B. *Quality control*. Describe plans to close, consolidate, and/or improve existing doctoral programs with low graduation rates (based on Coordinating Board standards for low-productivity) or that do not meet other standards of excellence.

Texas Tech has recently concluded a review of all doctoral programs with low numbers of graduates reported to the THECB from 2006-2008. The colleges involved in this process took a broader approach to this review and many changes have been made to improve the quality of programs. A comprehensive review was conducted for each of these programs, yielding resolutions to degree production that varied depending upon the program. This process is continuing, supplemented by graduate program review, peer comparison data, and review of graduates for 2007-2009; colleges are being encouraged to critically review all doctoral program offerings. One of the major findings relates to the historic treatment by the THECB of subordinate areas in doctoral programs. More than a decade ago, the THECB policy was to identify each subordinate subject area in a doctorate with a specific Code of Instructional Program (CIP). This led to a single doctorate with several subordinate areas of emphasis, all assigned separate CIPs. The standards for low-producing degree program use the CIP to track graduates, which means that some subordinate programs within doctorates do not meet the regulatory thresholds for graduates, but when consolidated back into one doctorate, they are well-above the thresholds. This was the circumstance for four of the seven Texas Tech doctorates included on the 2009 low-producing degree report. Thus, these programs will be consolidated together under one CIP and then will yield much higher annual numbers of graduates. In the case of the three remaining programs, one was a Texas Tech error in posting of the degrees to the correct CIP; another doctorate is being consolidated with a thriving doctoral program; and an action plan has been proposed to reinvigorate enrollments and graduates in the final doctorate.

In the spring of 2010, deans of colleges were asked to review all doctoral programs in light of the recent changes to the THECB low-producing regulations using 2007-09 graduation data for each CIP. It is anticipated that each College will conduct a review of their current doctoral offerings and generate action plans to increase the standards of excellence in each program or consider consolidation, phase-out and deletion if the review indicates that these are appropriate actions.

C. *Quality enhancement*. Describe plans to raise the level of existing doctoral programs from the level of strength to the level of national prominence.

In 2007, the Graduate School conducted a survey to assess academic program capacity for graduate enrollment growth. This assessment has since been refined and supported by an external consultancy, and the Graduate School is presently engaged in conducting a 2010 update. Working in collaboration with the president's and provost's offices, the Graduate School has developed three successful programs to align institutional resources with academic quality enhancement and enrollment growth potential. The following provides a brief overview of these three programs:

1. Graduate Student Travel: each year $150,000 is dedicated to support graduate student participation in national and regional professional conferences for the purpose of sharing research finding, creative accomplishments and professional networking. These funds are often (but not necessarily) combined with college, departmental or other external funding sources to help offset travel expenses.

2. Graduate Enrollment Enhancement Program: each year $150,000 is dedicated to match university departmental initiatives to recruit the highest-quality graduate students to Texas Tech. The vast majority of these funds is directed at bringing prospective doctoral students to campus for two to three day recruiting visits. In some cases, departments (*e.g.*, chemistry, English, psychology) invite 20-30 or more of their prospective graduate students to participate in structured recruitment weekends that include the opportunity to engage with faculty and meet with current graduate students. In other instances and depending on departmental organization, the recruiting efforts are less structured and, are conducted with only 1-2 students at a time but with the same focus on faculty research interests and current graduate student interaction.

3. Growing Graduate Programs: each year approximately $700,000 is made available specifically for graduate programs across campus to participate in a competitive Request for Proposal process to secure Graduate School funding support to enhance existing or create new graduate-level opportunities. Although the use of these funds varies, resources are often directed toward such objectives as providing graduate assistantships, improving the quality of distance-delivered courses and programs, and exploring new opportunities at the nexus of external or niche funding, and existing faculty and research expertise.

Other quality enhancement initiatives are occurring at the university level. For example, under President Guy Bailey's leadership, Texas Tech has embarked upon a plan to increase graduate fellowships in existing STEM doctoral programs. For 2009-2010, 85 doctoral-level awards were made totaling $4 million. This program and related marketing initiatives achieved immediate results with an increase of 11.4 percent in the number of doctoral students enrolling in the fall 2009 term. Given these impressive results and the obvious connection between Texas Tech's research mission and our becoming more competitive at the national level in recruiting, retaining and graduating highest-quality students, the fellowship program has been expanded in 2010-2011 to include an additional 37 new doctoral students as well as 34 new master's students. Over the three-year duration between FY 10 through FY 12 it is expected that a total of $6.5 million will be devoted to these new fellowships. Despite the recent economic downturn, the Graduate School's scholarship and fellowship endowment is presently $14.6 million. In FY 09 these endowments help support more than 345 full- and part-time graduate students with a total award amount of $840,000. As a whole, Texas Tech University supported more than 3,600 graduate students with scholarships and fellowships during FY 09 with a total expenditure of approximately $3.66 million.

On a less-resource-intensive but nevertheless positive front, the Graduate School supports a number of other large- and small-scale initiatives designed to promote academic excellence. For example, on March 26, 2010 the Graduate School held its Ninth Annual Research Poster Competition. This event attracted more than 120 graduate student participants from across campus. Posters were evaluated by panels of judges comprised of business leaders, research faculty, and community representatives. Recognition of the posters selected as top among the 10 research categories is traditionally highlighted at a university-wide reception during Graduate Education Week every April. In addition to recognizing those who prepare the award-winning posters, modest stipends are also provided for ten doctoral students selected from among their peers for their instructional expertise as graduate part-time instructors.

The Graduate School is also actively engaged in providing a variety of workshops for graduate students that are designed to improve individual skills, promote collaborative and interdisciplinary research, and better prepare candidates for professional and research careers. A link to the current menu of workshop opportunities for the spring 2010 term is available at http://www.depts.ttu.edu/gradschool/grdschInfo/news.php. The list of various topics covered includes: So you want to be a professor? series (getting the academic job, balancing teaching, research and service, writing, establishing a teaching philosophy); thesis and dissertation preparation, formatting and writing; research and literature review; preparation for non-academic positions), annual New Graduate Student Orientation; and regularly-scheduled graduate student government-sponsored town hall meetings where students are provided a venue to voice their opinions and concerns related to the TTU graduate experience.

Since 2009, the Graduate School and the office of the vice president for Research have offered workshops for graduate students to develop skills at grantsmanship and identify opportunities to leverage internal funding with external fellowships that can be used to support students during their tenure.

Finally, beginning in 2009, the Graduate School developed a university-wide thesis and dissertation award recognition process. In addition to acknowledging outstanding research and creative activity, the process aligns with the Council of Graduate Schools' two-year cycle for selecting dissertations deserving of national recognition.

D. *Comparisons with national peers.* For programs the institution plans to retain, identify nationally-ranked programs against which each of the institution's existing doctoral programs will be benchmarked.

To complement the peer institution component of the graduate program review process, Texas Tech has recently purchased subscriptions to several databases to provide data on numerous variables across its 56 peers listed in **Appendix 2**. This information will be fed into the graduate program reviews. In addition, all doctoral programs will be reviewed based upon 2009 data for the national comparison databases.

2. **New Doctoral Programs**

The institution's plan for new doctoral programs should address, at a minimum, the following elements:

A. Areas of emphasis. Identify the areas the institution plans to focus on in the development of new doctoral programs. Emphasis should be placed on high-need areas, such as STEM, with sufficient documentation to support selection decisions. The plan should also demonstrate how the institution will build upon existing strengths.

New academic programs are proposed by colleges and schools through their strategic planning processes. As each college and school develops new strategic plans that align with the new Texas Tech strategic plan, the relevance of these doctoral programs with respect to the eight strategic research themes will be considered. Texas Tech requires continuous strategic planning, assessment, and improvement of planning implementation (Texas Tech University, Operating Policy 10.13: Strategic Planning and Assessment for Texas Tech University, Including All Academic Programs and Support Operations).

B. *Assessment.* Provide a plan for the rigorous, periodic review of proposed programs using external evaluators.

The present graduate program review structure includes the review of each program by external peers from comparable institutions. This program will continue, with important modifications, for all new Ph.D. programs. These reviewers are selected from the 56 peer institutions that we use to benchmark our performance (see **Appendix 2**). Further, we are asking these reviewers to address the elements described in the research priorities section.

C. *Regional Impact.* If applicable, describe the ways in which the development of doctoral programs and enhancement of research will enable the institution to better meet the needs of the region it serves and explain how the institution will monitor and assess its impact.

Much of our development of strategic initiatives under each of the eight research themes was achieved with input from partners in Lubbock, in West Texas, in Texas and in the Southwest. They reflect Texas Tech's present and future position as an outstanding institution of learning in West Texas and reflect planned collaborations as we strive to become a great public research university. *Making it possible… 2010-2020 Strategic Plan* includes recommendations for specific partnerships with the federal and state governments, federal delegation, governor and Texas legislature, corporate sector, local, state and national foundations, K-12 a community college sectors, Lubbock and regional municipal and county governmental sections, TTU community, alumni, and benefactors and friends. *The Economic Impacts of Texas Tech University on Lubbock County: Today and in the year 2020,* estimated the 2008 impact at $1.15 billion. A similar report for 2009 has been commissioned and new targets will be established for the Texas Tech strategic plan for 2015 and 2020.

Priority 4 for of the Texas Tech strategic plan states:

Further Outreach and Engagement: *We will expand our community outreach, promote higher education and continue to engage in partnerships in order to improve our communities and enrich their quality of life.*

Texas Tech has an extraordinary history of engaged research that has made an impact on the state, nation, and world. Such research has a tangible impact on our quality of life. For example, the FEMA standards for storm shelters were developed from Texas Tech research conducted on the destructive effects of wind. Now, research on the beneficial effects of wind is shaping the future of energy resources. Research on directional microwave technology is being developed to target disease-causing microorganisms and advance food safety. Partnerships with urban and rural community partners have tested technologies to reduce water consumption and ensure the future of adequate water supplies. Other Texas Tech research investigates and promulgates approaches, methods, and technologies to counter the emerging threats posed to homeland defense and security by biological and chemical weapon agents. Such research addresses fundamental human needs for shelter, energy, food, water, and safety, and directly impacts the future of the state, nation and world.

In engaged research and community partnerships that result in significant regional impact, Texas Tech has a unique history that has received national recognition. In 2006, Texas Tech was the first Texas university to be included in the Community Engagement classification of the Carnegie Foundation for the Advancement of Teaching. The Carnegie Foundation describes Community Engagement as:

> …the collaboration between institutions of higher education and their larger communities (local, regional/state, national, global) for the mutually beneficial exchange of knowledge and resources in a context of partnership and reciprocity.

In 2006, the first year of the classification, Carnegie offered institutions the opportunity to apply for classification in two areas of Community Engagement: Texas Tech was recognized in both Curricular Engagement and Outreach & Partnerships.

In 2009, Texas Tech University became the first institution in the state of Texas to be approved by a small group of national institutional leaders to join the sponsorship partners for the National Outreach Scholarship Conference. These 13 national research institutions include: Auburn, Colorado State, Michigan State, North Carolina State, Oregon State, Purdue, The Ohio State, Penn State, Alabama, Colorado, Georgia, Kentucky, Wisconsin-Extension. The list of these institutions and the 2010 conference site is at http://www.ncsu.edu/project/OPDWebSpace/2010OSC/nosc-partnership-institutions.html .

Also in 2009, Texas Tech University became the first institution in the state of Texas to be represented on the Association of Public and Land Grant University's (APLU) Council on Engagement and Outreach. This election resulted from the increasing role and visibility of Texas Tech University in the state and nation on the matter of how higher education institutions "reinvest" their significant knowledge, research and engagement assets in the forward edge of societal concerns.

With this increasing recognition of the power of Texas Tech's partnerships to address major societal issues, two significant infrastructure changes have been made in the past two years. First, the College of Outreach and Distance Education was created in 2007. Recently renamed as the University College, the college assists and supports the development and delivery of online instruction; reaches learners who reside across the state of Texas through off-campus teaching sites and evening and weekend course offerings; promotes lifelong learning communities and programming; and provides K-12 curriculum for more than 100,000 students across the globe. Second, in the spring of 2009, President Bailey named Texas Tech's first vice president of institutional diversity, equity, and community engagement and an organizational division was created.

Another first for Texas Tech University is the comprehensive assessment of its outreach and engagement efforts. Texas Tech collaborated with TTU Health Sciences Center and Angelo State University to modify the Outreach and Engagement Measurement Instrument (OEMI) for use by the TTU System. This assessment instrument was released in web-based format to all faculty, deans, directors, and vice presidents at all three instituitions in November 2009. The OEMI gathered baseline data on each institution's outreach and engagement efforts, providing comprehensive data on the total number of individuals and partners engaged with each institution, including K-12 and community college participants and partners. Furthermore, the OEMI documents the total amount of external funding generated by outreach and engagement activities, as well as the sources of funding for all participants and partners. Respondents provided narrative information about their endeavors, which will enable Texas Tech to fully describe the impact of its outreach and engagement efforts for the first time. These data will provide the baseline key performance indicators for Priority 4 of the strategic plan.

Priority 4 of the Texas Tech strategic plan emphasizes Texas Tech's substantial history and commitment to outreach and engagement. As Texas Tech considers its eight research themes, social impact and opportunities for community partnerships will be incorporated, thus advancing the regional impact of university. Furthermore, the strategies and initiatives developed for this priority are intended to expand even further the reach of Texas Tech as it partners with Texas communities, schools, community colleges, corporations, and governments to address critical societal issues.

V. Plan for Faculty and Student Development

A. *Faculty research.* Describe plans to assist faculty in becoming more productive, more innovative, and more effective in their work.

An active culture of mentoring exists at Texas Tech and efforts will be expanded as strategic and traditional hires occur each year. We have a particular focus on mentoring junior faculty to support their nominations for National Science Foundation CAREER awards (and similar awards) from other agencies. We have also begun to develop a similar program for the social sciences, humanities and creative arts disciplines.

The office of the vice president for research is being restructured to focus on faculty development. A number of initiatives are being launched, including agency-specific mentoring, faculty placement in agencies, faculty rotations at National Science Foundation, and an interdisciplinary scholarship academy.

B. *Faculty recognition.* **Describe plans to assist faculty in achieving recognition as leaders in their field.**

Texas Tech is focused on promoting its eight research themes, the strategic plan, and the successes of faculty and students. The promotion is both internal and external. Internally, we have expanded the Barney Rushing Jr. Outstanding Research Award; other awards are being developed to recognize research achievements in the colleges and schools, along with increasing the monetary awards associated with this recognition. We have also expanded the Chancellor's Council Award to recognize excellence in scholarship in the STEM disciplines and in the social sciences, humanities, and creative arts. Additional recognitions are envisioned.

Further, a program is in place to ensure that Texas Tech faculty members are nominated for prestigious awards nationally and internationally.

C. *Collaborations and Partnerships.* **Describe plans to foster cooperative efforts amongst faculty at the institution and with faculty of other institutions.**

From an internal perspective, the proposed interdisciplinary scholarship academy is designed to promote cross-disciplinary and multidisciplinary efforts to establish new Ph.D. curricula, new courses, new centers, and institute initiatives, and new initiatives to be pursued through federal funding and congressional initiatives. There are active measures in place to foster collaboration between all disciplines in initiatives that align with the eight strategic research themes.

Texas Tech is also participating in regional and national collaborative initiatives on matters pertinent to societal issues of concerns around sustainability, energy, water use, natural resources, renewable energy technologies, non-invasive diagnostics, and other areas as well.

D. *New faculty*. **Describe plans to recruit additional faculty who can contribute to the institution's goal of maintaining or achieving national recognition.**

As shown in the *Table 1*, Texas Tech has an aggressive hiring plan made possible by the application of strategic resources. Strategic hires who best exemplify the integrated-scholar concept and demonstrate excellence in scholarship will be most appropriate for consideration. At least 15 such faculty and their research teams are targeted for hiring annually. Faculty with prior significant accomplishments, recognition, and mature research programs are approached from outside of Texas and brought to campus to explore areas of opportunity and interest. Competitive salaries, start-up packages, and space are provided. A high degree of coordination occurs between the vice president for research, provost, and deans of the four colleges involved with strategic hiring (*i.e.*, Agricultural Sciences and Natural Resources, Arts and Sciences, Engineering, and Human Sciences). The strategic hires have expertise within the eight strategic research themes and particular attention is being paid to growing critical mass and capacity and bringing together talent that is complementary to that which already exists at Texas Tech. Particular attention is paid to ensuring that the prospective faculty will collaborate and mentor faculty in the departments in which they will be located.

This is complemented with a newly coordinated approach to traditional hires, with particular attention paid to spousal accommodations and cluster hiring, especially within the eight research themes where possible.

VI. Other Resources

A. ***Research facilities.*** **Describe significant projected additions to the institution's facilities related specifically to research, including timelines for completion.**

As shown in *Table 1*, the expansion of new space for research is a strategic goal of the institution. Current strategic planning around capital improvements focuses on a number of new interdisciplinary research facilities, incubator, and other research facilities tied to areas of emphasis. Benchmarks are provided for build-out over the next 10 years. Some of the financing will be supported through Higher Education Assistance Fund allocations, tuition revenue bonds, and creative financing supported by public-private partnerships.

More immediately, the current Experimental Sciences Building, one third of which had been shelled, will be completed during the next year.

B. ***Library resources.*** **Describe plans to enhance the libraries, including facilities, equipment, digital resources, and collections. Describe specifically how the plans to enhance library resources are related to improving existing doctoral programs and supporting new doctoral programs.**

The Texas Tech University Libraries are members of the Association of Research Libraries (ARL). ARL is a nonprofit organization of 124 libraries in North America. Membership is based on the research nature of the library and the parent institution's aspirations and achievements as a research institution. The libraries' membership in ARL is a sign of the quality of Texas Tech University. Member libraries are distinguished by the breadth and quality of their collections and services. They are well known for their distinctive research-oriented collections and resources of national significance. Each ARL library is ranked relative to the other member libraries using the following criteria: volumes held, volumes added, current serials (subscriptions), total library expenditures, and total professionals plus support staff. In the late 1990s when the Texas Tech Libraries were accepted for ARL membership, they were ranked 80th among the 102 members. The libraries have worked diligently to improve this ranking and are currently ranked in the mid-50s among the now 124 member libraries. The Texas Tech Libraries strive each year to improve their ranking as this is a reflection of the research capabilities of the university.

The mission of the libraries is to support the research and teaching of the university. This is achieved by providing researchers and students high-quality, high-impact resources and support services. Consequently, we support the strategic research initiatives of the institution. A strategic priority for Texas Tech is to "expand and enhance research and creative scholarship."

The libraries plan to support the eight research themes cited earlier by expanding the depth and breadth of its collections. Most of the expansion will be for new electronic resources in the above-mentioned areas, such as journals, books, and databases. This will allow researchers and students access to research collections 24/7 from their desktops from any location with an internet connection. The additions include, but are not limited to, prominent scholarly resources such as *Embase, Springer Protocols, ENGnet Base, Scopus, and Early English Books Online*. Additionally the size of the e-book collections is being increased in all disciplines as a transition toward an online book collection comtinues.

However, electronic resources are not the only area of planned growth for the libraries. To support increased enrollment there will be an increase of the expenditures in the computer hardware, printers, scanners, and software offered by the libraries. Also no single library can provide access to every journal or book published. Therefore, the libraries will selectively increase expenditures for Interlibrary Loan service to provide Texas Tech researchers and students with research materials that we do not own.

C. *Graduate student support.* Describe plans to provide competitive financial support to graduate students including teaching assistantships, research assistantships, and fellowships for the targeted doctoral programs identified in the strategic plan.

Under President Bailey's leadership, Texas Tech has embarked upon a plan to increase graduate fellowships in existing STEM doctoral programs. For 2009-2010, 85 awards were made totaling $4 million. This program and other marketing initiatives achieved immediate results with an increase of 11.4 percent in the number of doctoral students enrolling in fall 2009 term. Given these impressive results and the obvious connection between Texas Tech's research mission and our becoming more competitive at the national level in recruiting and retaining highest-quality graduate students, the fellowship program has been expanded in 2010-2011 to include an additional 37 new doctoral students as well as 34 new master's students. Over the three-year duration between FY 10 through FY 12 it is expected that a total of $6.5 million will be devoted to these new fellowships.

It is envisioned that, on top of the central subvention that is currently supporting new Ph.D. fellowships each year, additional support will be provided both tactically and strategically as RCM is implemented and additional fellowships are developed and funded within departments with research plans tied to the eight strategic research themes.

VII. National Visibility

Identify any existing or projected programs and resources, not already identified above, to increase the national visibility and research reputation of your institution.

Texas Tech will increase its national visibility and research reputation by implementing a strategic communications and marketing effort highlighting areas of research and academic excellence.

Key Strategies:

1. Paid advertising in research-specific national publications and Web sites geared to university and industry researchers. Media outlets will be chosen based on demographic information associating audience interest in research-related topics.

2. Emerging media will be used to feature research-related stories and achievements.
   a. Continuine to build university social media channels. User statistics as of April 1, 2010 are: Facebook 27,655 fans; Twitter 7,208 followers; mySpace 1,079 friends; Flickr views

4,472; iTunes University 8,324 tracks downloaded; TTU Mobile downloads 14,325 and YouTube channel views 41,545.

b. Establish social media sites specific to the vice president for research.

3. A national media relations campaign centered on promoting our research and providing research experts for specific needs will continue. The use of various types of traditional and emerging media channels will be utilized to increase the visibility of the university. Key placements since February include: *The Chronicle of Higher Education; Wall Street Journal; Christian Science Monitor; Discovery;* businessbecause (a London-based news outlet); National Public Radio; *Scientific American* and CSPAN. We will also have research featured in *Smithsonian* in May. A news release on mutual funds was picked up by the Associated Press (AP) and ran in 30 outlets, including the *New York Times, Boston Globe, Chicago Tribune,* and the *Seattle Post Intelligencer*. A news release on farmers moving from cotton to corn crops was also picked up by the Associated Press and ran in more than 200 publica tions nationally, including Forbes, the *Los Angeles Times, Austin American Statesman, Fort Worth Star-Telegram,* and the *Denver Post.*

4. Communicate strategic research faculty hires to targeted local, state, national, and industry media outlets using news releases, news conferences where appropriate, Web, and social media.

5. Communicate Texas Tech's efforts to reach national research university status.
   a. A Web page has been developed to keep track of progress. The Web site can be found at www.tier1.ttu.edu.
   b. Communicate significant gifts that further Texas Tech's goal of reaching $45 million in restricted research, using news releases, news conferences, and where appropriate, Web, and social media.

6. Enhancements to the Web sites for the vice president for research, the provost, the president and the Graduate School have been made and the continued development of these sites will increase awareness about our research endeavors and academic excellence.

7. Student excellence in earning nationally competitive scholarships, organization awards or office and state, regional, and national academic championships will be communicated using news releases, news conferences where appropriate, Web, and social media.

8. An annual report on accomplishments that details the many research and academic achievements during 2009. The report was distributed nationally and can be viewed at accomplishments.ttu.edu. The electronic report was distributed to more than 350 presidents, provosts, and vice presidents at universities around the country; 65,000 alumni and donors; all faculty members, staff and students, and a select group of state and national media. The report will be continued each year.

Appendix 1

Texas Tech University is committed to the values of mutual respect; cooperation and communication; creativity and innovation; community service and leadership; pursuit of excellence; public accountability; and diversity.

2005 Texas Tech University Strategic Plan

SUBMITTED BY THE STEERING COMMITTEE OF THE TEXAS TECH UNIVERSITY ETHICS INITIATIVE
ADOPTED BY THE BOARD OF REGENTS MARCH 6, 2008

TEXAS TECH UNIVERSITY STATEMENT OF ETHICAL PRINCIPLES "DO THE RIGHT THING"
Texas Tech University is committed to being an ethical institution. In recognition of the rights and inherent dignity of all members of the Texas Tech University community, the university is committed to supporting the following principles and to protecting those rights guaranteed by the Constitution, the laws of the United States and the State of Texas, and the policies adopted by the Board of Regents. As members of the Texas Tech community, faculty, students, staff, administration, and all stakeholders accept responsibility for abiding by and promoting the ethical principles of the university described below. Although legal behavior and ethical behavior overlap in many areas, they are quite distinct from each other. While we follow legal requirements, an ethical institution goes beyond them to achieve the following values.

MUTUAL RESPECT

Texas Tech University is committed to an open and diverse society. Each member of the Texas Tech community has the right to be treated with **respect** and dignity. This right imposes a duty not to infringe upon the rights or personal values of others. Professional relationships among all members of the Texas Tech community deserve attention so that they are not exploited for base motives or personal gain.

COOPERATION AND COMMUNICATION

Texas Tech University is committed to the promotion of professional relationships and open channels of **communication** among all individuals. The university will publish and disseminate in a timely manner its values, policies, procedures, and regulations, as well as any other information that is necessary to protect and educate all members of our community. We encourage and provide opportunities for the free and open exchange of ideas both inside and outside the classroom. While the free expression of views in orderly ways is encouraged, personal vilification of individuals has no place in the university environment.

CREATIVITY AND INNOVATION

Texas Tech University is committed to ethical institutional programs that meet the teaching, research, and service objectives of each discipline and department, to policies that are consistent with those objectives, and to a working and learning environment that encourages active participation. Such exemplary environments often challenge existing worldviews, requiring trust in the process of discovery and the acceptance of uncertainty and ambiguity within ethical parameters.

The university supports all its members in life-long learning—a process that is both challenging and rewarding—and encourages creative and innovative means to achieve this goal through both opportunities and incentives.

COMMUNITY SERVICE AND LEADERSHIP

Texas Tech University is committed to ethical **leadership** practices at all levels and to our tradition of **community service**, both within the university community and in our relationships with the greater community. We strive for exemplary professional and **community service** through research, creative works, and service programs that extend beyond the university environment. We strive to provide excellent service in a caring and friendly environment, and encourage such involvement in the community by all faculty, students, staff, and administration.

PURSUIT OF EXCELLENCE

Texas Tech University is committed to achieving **excellence** in all aspects of our community. We expect this in the expertise and performance of our faculty, staff, and administration, as well as the continuing education of our students. A high standard of professionalism, including opportunities for professional contact and continuous growth, is expected of our faculty, students, staff, and administrators. The university is committed to academic integrity and to the effective and just implementation of a system designed to preserve and protect it. The university intends to be a model of **excellence**, following best practices in its professional work, displaying the highest standards in its scholarly work, and offering venues to showcase national and international examples of achievement.

PUBLIC ACCOUNTABILITY

Texas Tech University is committed to transparency in governance, personal responsibility, and both individual and organizational integrity. Being responsible requires us to be thoughtful stewards of our resources—**accountable** and respectful to ourselves, to each other, and to the publics we serve. A sense of institutional and public responsibility requires careful reflection on one's ethical obligations and the duty to respect commitments and expectations by acknowledging the context and considering the consequences, both intended and unintended, of any course of action. We promptly and openly identify and disclose conflicts of interest on the part of faculty, staff, students, administration, and the institution as a whole, and we take appropriate steps to either eliminate such conflicts or ensure that they do not compromise our procedures and values. When we make promises, we must keep those promises. We strive to do what is honest and ethical even if no one is watching us or compelling us to "do the right thing."

DIVERSITY

Texas Tech University is committed to the inherent dignity of all individuals and the celebration of **diversity.** We foster an environment of mutual respect, appreciation, and tolerance for differing values, beliefs, and backgrounds. We encourage the application of ethical practices and policies that ensure that all are welcome on the campus and are extended all of the privileges of academic life. We value the cultural and intellectual **diversity** of our university because it enriches our lives and the community as a whole, promoting access, equity, and excellence.

Appendix 2

Peer Institutions

Arizona State University
Auburn University
Clemson University
Florida State University
Georgia Institute of Technology
Indiana University - Bloomington
Iowa State University
Kansas State University
Louisiana State University - Baton Rouge
Michigan State University
Mississippi State University
North Carolina State University
Ohio State University - Columbus
Oklahoma State University - Stillwater
Oregon State University
Pennsylvania State University - University Park
Purdue University - West Lafayette
Rutgers University - New Brunswick
Texas A&M University
University of Alabama - Tuscaloosa
University of Arizona
University of Arkansas - Fayetteville
University of California - Berkeley
University of California - Los Angeles
University of Colorado at Boulder
University of Connecticut - Storrs
University of Florida
University of Georgia
University of Illinois - Urbana-Champaign
University of Iowa
University of Kansas - Lawrence
University of Kentucky
University of Louisville

University of Maryland - College Park

University of Massachusetts - Amherst

University of Michigan

University of Minnesota

University of Mississippi - Oxford

University of Missouri - Columbia

University of Nebraska - Lincoln

University of North Carolina - Chapel Hill

University of Oklahoma - Norman

University of Oregon

University of Pittsburgh

University of Rhode Island

University of South Carolina - Columbia

University of South Florida

University of Tennessee - Knoxville

University of Texas - Austin

University of Virginia

University of Washington

University of Wisconsin - Madison

Virginia Polytechnic Institute and State University

Washington State University - Pullman

The Texas Tech University Strategic Plan for Research
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April 2010
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...is making it possible.