

Strategic Plan

*Achieving Recognition as a
National Research University
2010 - 2020*

THE UNIVERSITY OF TEXAS AT ARLINGTON

INDEX

EXECUTIVE SUMMARY	3
UNIVERSITY PROFILE	5
I. VISION STATEMENT	7
II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY	8
III. PLAN TO IMPROVE UNDERGRADUATE EDUCATION	24
IV. PLAN TO ENHANCE DOCTORAL PROGRAMS	29
V. PLAN TO IMPROVE FACULTY AND STUDENT DEVELOPMENT	36
VI. PLAN TO IMPROVE STUDENT DEVELOPMENT	40
VI. PLAN TO CAPITALIZE ON OTHER RESOURCES	42
VII. PLAN TO INCREASE NATIONAL AND INTERNATIONAL VISIBILITY	51
APPENDIX	53

EXECUTIVE SUMMARY

The University of Texas at Arlington has never been more focused on its mission or more certain of its future. The vision for UT Arlington to become a major national research university has now crystallized, and the institution gains new momentum with each passing day. The creation of this strategic plan charts the course for UT Arlington to achieve its ambitious goals. This Executive Summary provides a cursory outline of the University's strategic priorities for the decade ahead.

Plan to Increase Research Funding and Productivity

UT Arlington intends to reach national prominence through its research endeavors and be recognized as a national research university in the next ten years. Identifying UT Arlington's research priorities is a critical step in the institution's plan to increase external research funding and enhance student participation in science, technology, engineering, math, and other fields. The targeted disciplines in which the institution places its efforts must generate breakthroughs in innovative technology and scientific progress. Likewise, consideration must be placed on how financial and other resources are allocated, how campus space is utilized, and how additional research space is obtained.

Plan to Improve Undergraduate Education

UT Arlington is a comprehensive university serving a diverse population of students. This diversity serves as a source of strength and contributes to a campus climate that fully embraces differences in thought and culture. The financial basis for the University's strategic plan is dependent upon continued growth in both the quality and size of the undergraduate population. A series of far-reaching initiatives have been developed to improve student success — especially first-year retention and six-year graduation rates. The University also plans to increase the number of baccalaureate degrees awarded, particularly in critical fields such as engineering, science, and nursing. Central to improving undergraduate education is an ongoing commitment to provide generous financial aid packages that recognize both need and academic merit.

Plan to Enhance Doctoral Programs

Thriving doctoral research programs help drive regional economies and keep the nation globally competitive and secure. They fuel economic growth and development through innovation and technology transfer. UT Arlington plans to enhance the quality of existing doctoral programs, adhere to strict guidelines for the creation of new doctoral programs, and improve overall doctoral education. New doctoral programs will be added in areas such as sustainability, nano-science/engineering/technology, globalism and development economics, and mind-brain education.

Plan to Improve Faculty Development

Recruiting and retaining outstanding faculty members and students is critical to the success of a major research institution. UT Arlington plans to offer more lucrative and competitive start-up packages to help attract outstanding faculty. New initiatives will be instituted to develop, support, recognize, and reward high-performing faculty members. And research productivity will be expanded and enhanced through the nurturing of faculty collaboration both within the University and with other institutions.

Plan to Improve Student Development

High-achieving students who show early promise for prestigious national awards will be mentored and coached in order to compete more favorably for those honors. The University also will increase the diversity of its doctoral student population.

Plan to Capitalize on Other Resources

The Engineering Research Complex, which opens in January 2011, will be the University's crown jewel in terms of research space. With more than 230,000 square feet of state-of-the-art laboratory and administrative space, this massive complex will become a hub of collaboration and productivity for engineering and science faculty members. Other facilities that will play a major role in the University's success are the Special Events Center (opening in late 2011), and the planned College Park mixed-use development (opening in 2012)

Plan to Increase National and International Visibility

UT Arlington will enhance its national visibility in research, undergraduate education, and graduate education as it embraces the transformation into a national research university. Multifaceted interactions with alumni, industry, professional associations, and others in the community are of vital importance. The generosity of alumni, corporate partners, parents, and friends creates opportunities for the institution to enhance the academic experience of its students and to support faculty members who conduct research that will transform the institution, the community, and the nation.

UNIVERSITY PROFILE

The University of Texas at Arlington is a Carnegie Research Institution (High Research Activity) whose mission is the advancement of knowledge and the pursuit of excellence in research, teaching, and service to the community. The mission statement affirms UT Arlington's commitment to expanding academic research; to attracting and retaining high quality faculty scholars who actively engage students; to providing a well-rounded academic experience that promotes student involvement, service learning and free discourse; to employing alternative access venues to meet students' needs; and to developing public and private partnerships.

Founded in 1895 as a private liberal arts institution, UT Arlington has evolved through a succession of names and missions. The institution achieved senior college status in 1959 and became part of The University of Texas System in 1965. The institution is currently authorized by the Texas Higher Education Coordinating Board to offer 80 baccalaureate, 74 master's, and 31 doctoral degree programs.

UT Arlington currently serves more than 28,000 students, including more than 6,700 graduate students.

The UT Arlington Fort Worth Center serves the Tarrant County region and is committed to meeting the life-long educational needs of working professionals. The center offers upper-division undergraduate and graduate programs and has the flexibility and vision to capitalize on global opportunities that address economic development.

UT Arlington is categorized by *U. S. News & World Report* as "selective" based on the test scores of freshmen applicants (mean composite SAT = 1066), percentage of first-time freshmen applicants accepted (75 percent) and percentage of incoming freshmen who graduated in the top quarter of their high school classes (61 percent).

The student population is non-traditional in many ways. Most students enter UT Arlington as transfers, many with 60 or more hours already completed. The average age of students in fall 2009 was 26, and 38 percent were enrolled on a part-time basis. According to the 2008 Student Survey, 69 percent of UT Arlington students hold jobs, with 32 percent working 21 or more hours per week. It should be noted, however, that the cohort of traditional first-time freshman is growing. The size of the incoming freshman class has almost doubled since 1999, reaching 2,629 in fall 2009. These students have an average age of 18, almost all attend full-time, and about 41 percent live in campus residence halls or apartments.

UT Arlington is one of the most diverse institutions in the nation. In fall 2009, the student population was 14.5 percent African American, 16.5 percent Hispanic, 10.2 percent Asian, 0.5 percent Native American and 10 percent International. It is

estimated that the Hispanic student population will be UT Arlington's fastest growing student segment in the coming decades.

I. VISION STATEMENT

The University of Texas at Arlington will become a major national research university that fosters academic excellence and student success, conducts life-enhancing research that benefits society, produces graduates who are prepared to get the job done, fuels economic growth and development, establishes strategic partnerships in Texas and around the world, nurtures a rich and robust residential campus experience, and is the beating heart of a vibrant college town community.

II. PLAN TO INCREASE RESEARCH FUNDING AND PRODUCTIVITY

Over the next decade, UT Arlington aims to reach national prominence through its research endeavors and be recognized as a national research university. It is generally agreed that an academic institution that ranks among the top 125 research institutions in the United States is recognized as a nationally prominent research institution. The dominant metric used to rank and compare the performance of research institutions is the annual expenditures on research. Research expenditures are measured by a number of approaches that reveal how research is funded (sources of funds), how peer institutions scrutinize the research activity of the institution (peer reviewed versus non-peer reviewed activity), and the general productivity of the faculty (average external funding per faculty member).

However, research expenditures alone do not provide a comprehensive profile of a university's overall reputation as a national research institution. *The Center for Measuring University Performance* (<http://mup.asu.edu/>) is the one entity that captures a more complete profile of national prominence by ranking institutions in the United States by several metrics. The metrics include: annual total research expenditures, annual federal research expenditures, size of endowment, number of National Academy members, annual number of faculty awards, annual number of graduating doctoral students, number of post-doctoral fellows employed every year, and annual giving. Appendix I provides key metrics with their current and projected threshold targets for UT Arlington to strive for over the next decade.

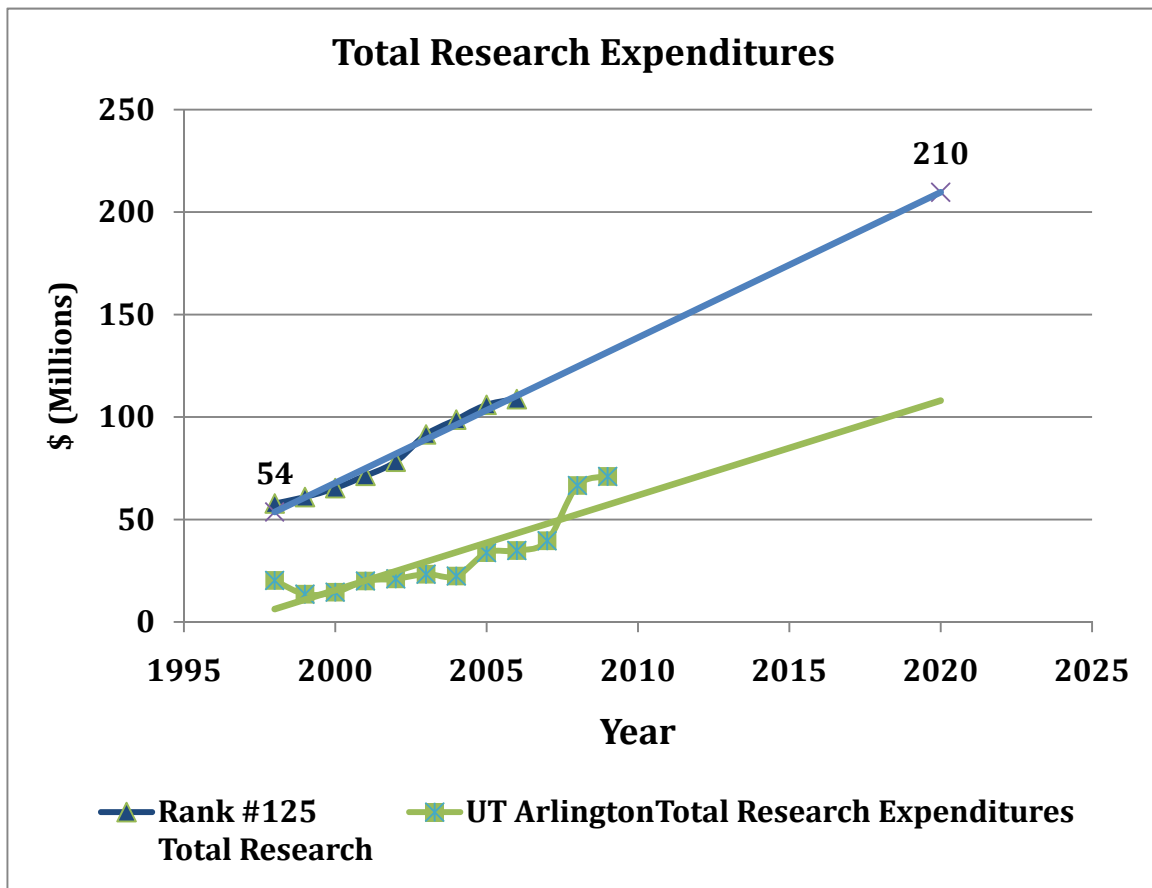
Identifying UT Arlington's research priorities is a key step toward the institution's plan to increase external research funding and enhancing student participation in science, technology, engineering, and math (STEM) and other research activity. The targeted disciplines in which the institution places its efforts have to generate breakthroughs in innovative technology and scientific progress. Likewise, consideration must be placed on how campus space is utilized, resources are allocated for greatest impact, and additional research space obtained.

A. ANNUAL RESEARCH EXPENDITURES: INCREASING EXTERNAL RESEARCH FUNDING AND MONITORING PROGRESS

Annual research expenditures are the most commonly used measure for recognizing the research prominence of an academic institution. For an institution to be considered a national research university, the often-stated rule is that its total research expenditures should exceed \$100 million per year. However, analyses show that this amount is a moving target and will be higher through the years of 2010-2020. Most research-intensive institutions have steadily increased their annual research expenditures at rates much faster than the rate of inflation. Figure

1 shows how the threshold for annual research expenditures has changed from 1998 to 2006 for an institution to be ranked as the 125th research institution in the United States. It is clear that the threshold value of \$100 million in annual research expenditures was relevant in 2001-2004, but in 2010 the value is probably too low by at least 25 percent for an institution to be ranked in the top 125, and will be by a much wider margin in the next ten years as shown, by the projected trend lines in Figure 1.

Figure 1. Annual Research Expenditures at UT Arlington and the 125th Ranked Research Institutions in the United States from 1998 to 2008, and projected values to 2020



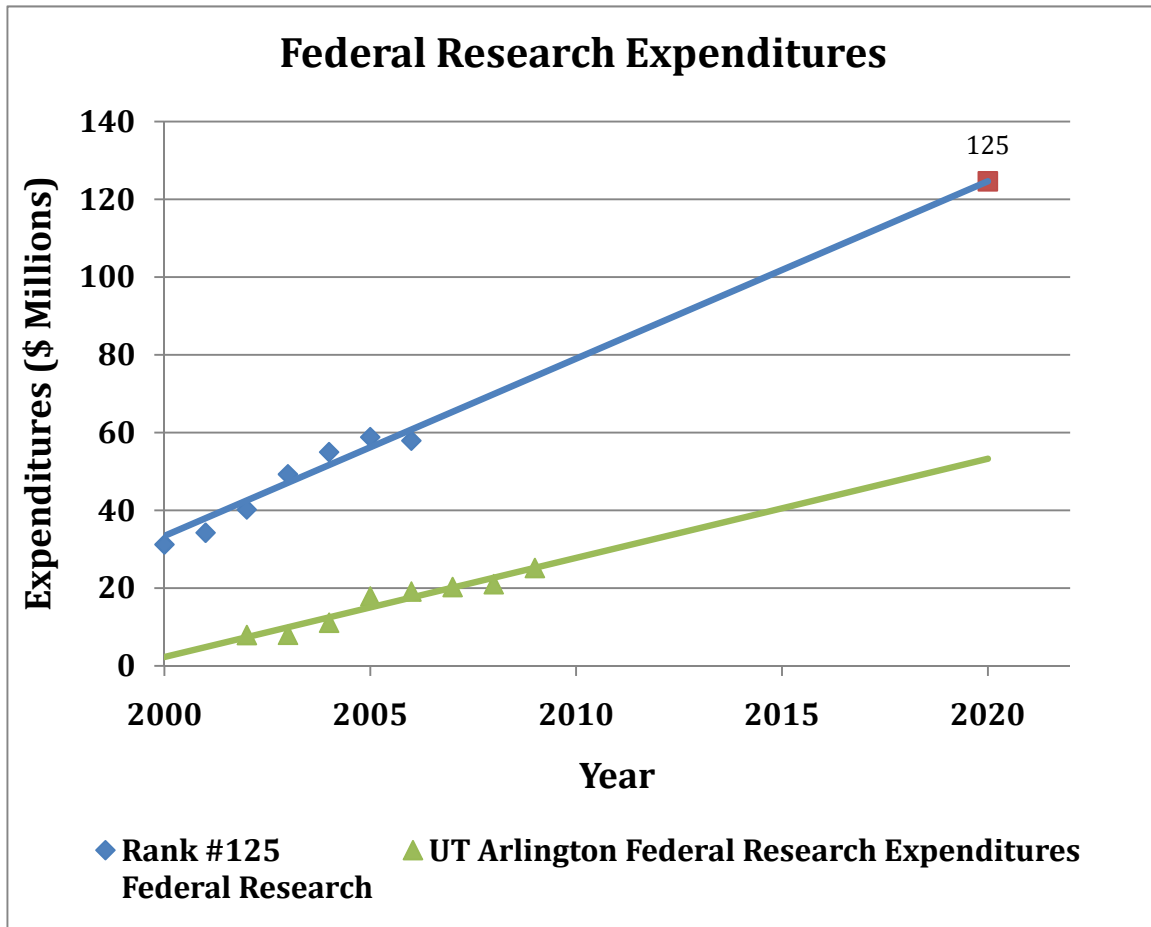
Priority 1. Enhance external research expenditures at UT Arlington to be competitive with at least the 125th ranked institution in the country

UT Arlington’s goal for the next decade is to bolster its total research expenditures to be competitive with at least the top 125th ranked institution in the nation. For this reason, it is important to extrapolate the data in Figure 1 to at least the year 2020, and compare UT Arlington’s progress against the extrapolated data points, both in terms of absolute value and slope of the curve. The primary focus of UT

Arlington's strategy will be identifying key initiatives to significantly close the gap by the end of the decade between values projected between UT Arlington and the 125th ranked institution as shown in Figure 1.

While total research expenditures provide a measure of overall research activity, research expenditures from funds acquired from external sources (restricted research expenditures) measure the competitiveness of the institution for research funds. Indirectly, this metric recognizes the quality of the faculty at the institution because it measures success in securing competitively-awarded funds. Among these external sources, the federal government dominates through its federal funding agencies, including the National Institutes of Health (NIH), the National Science Foundation (NSF), Department of Defense (DoD), Department of Energy, Department of Education, National Institute of Standards and Technology (NIST), Health and Human Services, and Homeland Security. National research institutions in the United States obtain the majority of their research funding from these sources. For this reason, annual federal research expenditures are also an important metric for ranking the research prominence of institutions (see rankings of research institutions by the National Science Foundation; <http://www.nsf.gov/statistics/rdexpenditures/>). Figure 2 shows how federal research expenditures at the 125th ranked institutions have increased from 1998 to 2006, and what the projected thresholds will be in the year 2020. This same figure shows the growth in federal research expenditures at UT Arlington from 1998 to 2009.

Figure 2. Federal Research Expenditures for UT Arlington and the 125th Ranked Institutions Projected to 2020.

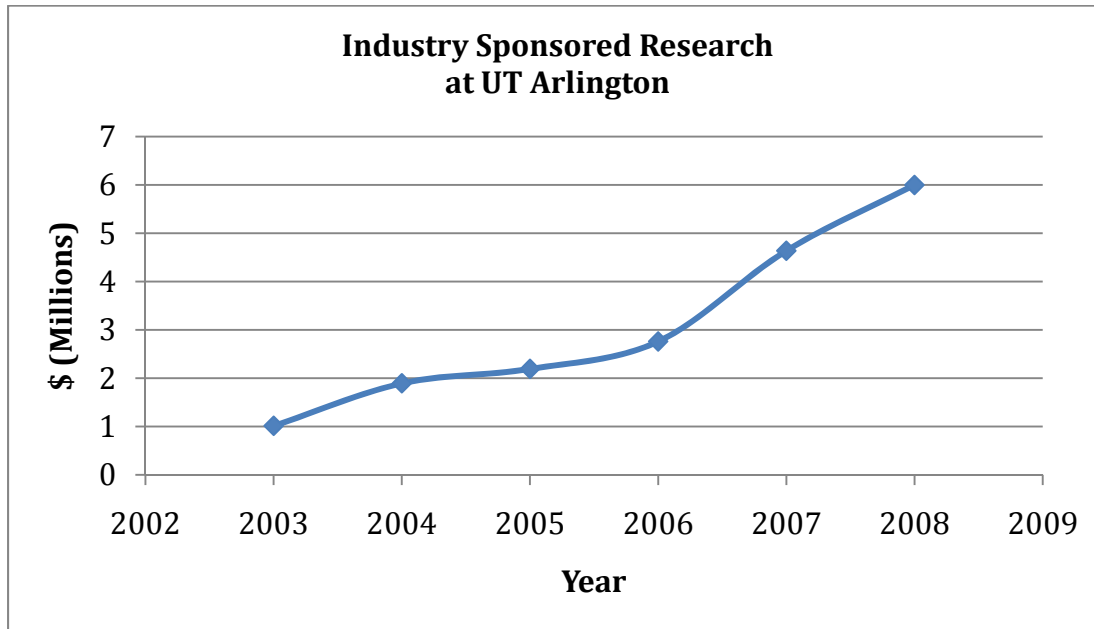


Private foundations and commercial sources are also important sources of external funding. For UT Arlington, located in the heart of the Dallas/Fort Worth region and the fourth-largest metropolitan statistical area in the United States¹, industrial support for research constitutes a major portion of its research funding. Figure 3

¹ “According to the estimate by the U.S. Census Bureau on July 1, 2008, the metropolitan area's population exceeded 6.3 million people — a larger population than 34 states in the U.S. The U.S. Census Bureau also said on April 5, 2007 that the Dallas-Fort Worth-Arlington metropolitan area was the second fastest growing area by population after Atlanta. The Dallas-Fort Worth-Arlington metropolitan statistical area is the largest metropolitan area in Texas and the fourth-largest in the United States. The Metroplex encompasses 9,286 square miles of total area of which 8,991 square miles is land and 295 square miles is water. The Metroplex is larger geographically than the combined areas of Rhode Island and Connecticut. It is also the fourth largest metropolitan area by population and sixth largest gross metropolitan product (GMP) in the United States, and approximately tenth largest by GMP in the world.”
http://en.wikipedia.org/wiki/Dallas%E2%80%93Fort_Worth_Metroplex

shows the growth in industry-supported research at UT Arlington over the last ten years. Continued growth from this sector plays a prominent role in UT Arlington's overall strategic plan for enhancing research expenditures in the next decade. This will be further addressed in Section IV.2.C *Regional Impact*.

Figure 3. Industry-Sponsored Research at UT Arlington

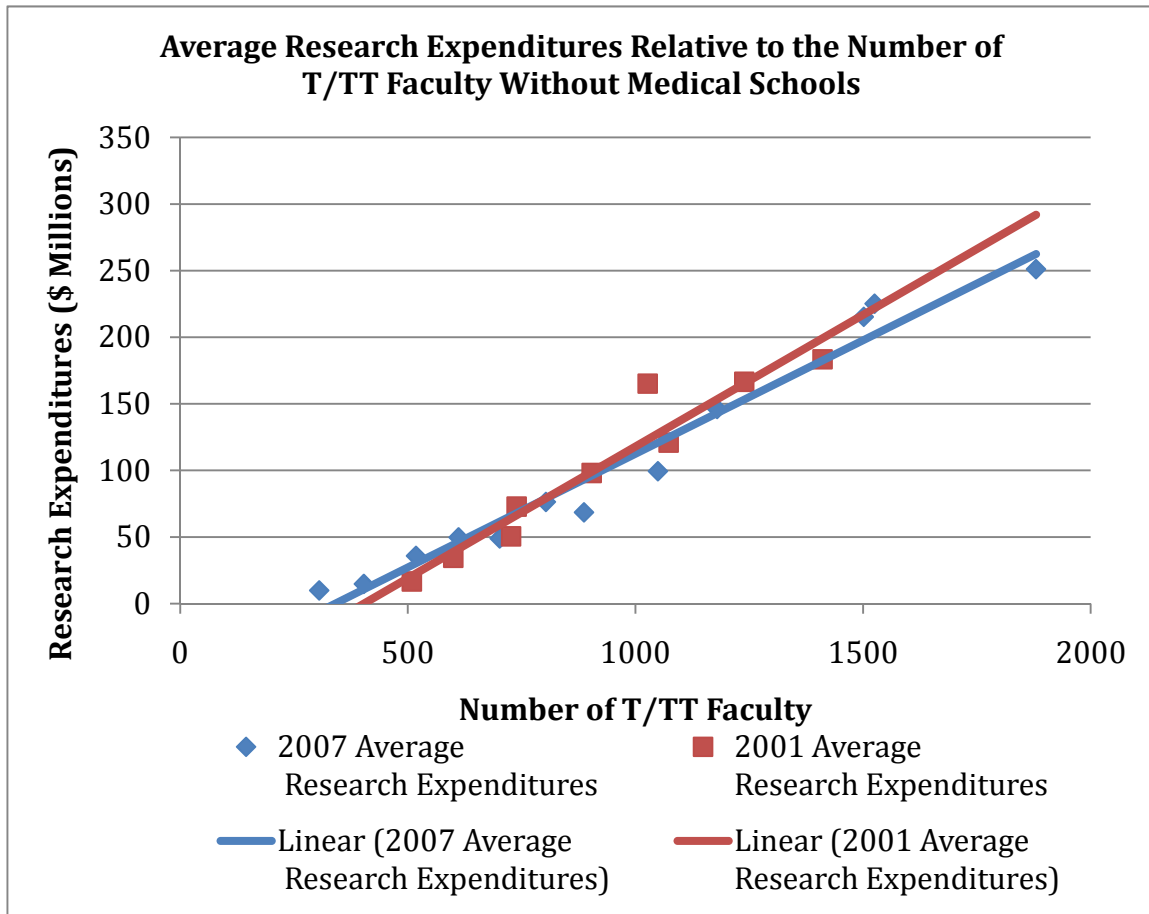


To summarize, the institution will have to focus its efforts on securing significantly more research funds from a variety of sources. Two key strategies to meet this goal are described below. They must include increasing the total number of faculty active in research and increasing the productivity of the existing faculty.

Strategy 1.1. Increase the Number of Research Faculty

National research institutions have an average of 1,000 tenure or tenure-track faculty members. Using 2007 data from The Integrated Postsecondary Education Data System from the National Center for Educational Statistics (<http://nces.ed.gov/IPEDS/>), a strong correlation can be seen between the number of tenure and tenure-track (T/TT) faculty members and total research expenditures at academic institutions without medical schools. Academic institutions without medical schools represent the most appropriate peer group for UT Arlington. Figure 4 shows that, on average, institutions with \$100 million in research expenditures (which in 2001 represented the threshold for an academic institution ranked in the top 100) had about 900 T/TT faculty. Using the thresholds noted above for an institution to be ranked among the top 125 in total research expenditures in 2007 (\$109 million), it is apparent that, on average, a comprehensive academic institution without a medical school would have more than 900 T/TT faculty.

Figure 4. Correlation Between Faculty Size (T/TT Faculty) and Total Research Expenditures Using 2001 and 2007 Expenditure Data at Academic Institutions Without Medical Schools.



From 2003 to 2009, UT Arlington added more than 100 T/TT faculty members to its ranks to reach a total of 635 T/TT faculty members in 2008. Over this same time period, total research expenditures increased 236 percent, from \$23.3 million to \$55 million. An important strategy for UT Arlington to increase its research expenditures over the next decade will be to continue to add new faculty but in specific and targeted ways.

For UT Arlington to reach a target of 900 T/TT faculty members in the next decade, approximately 25 T/TT faculty members per year, on average, would have to be hired.

Strategy 1.1.1 Preferentially hire T/TT faculty at all ranks who currently have grants they can bring to the institution.

Strategy 1.1.2 Hire National Academy members and National Academy-level researchers with significant research grants in targeted research disciplines who can establish or expand recognized centers of excellence on campus.

Strategy 1.1.3 Hire research faculty and post-doctoral associates² in limited, non-tenure track positions to act as industry liaisons.

These individuals will drive for-profit research and expand collaborative efforts with the regional business community, e.g. Texas Instruments, Alcon, Raytheon, Lockheed Martin, Bell Helicopter, Texas Health Resources, and others. The option is particularly attractive because salaries for the non-tenure track research faculty could be split with corporate partners, paid from corporate donations, or paid entirely from sponsored research grants and contracts.

Strategy 1.2. Improve Research Productivity of Existing Faculty

In addition to building research capacity by the addition of new research faculty, UT Arlington will foster an environment in which the research aspirations and productivity of current faculty are encouraged and rewarded. UT Arlington aims to improve the research grant productivity of faculty currently on campus by implementing the following strategies:

Strategy 1.2.1. Expand, encourage, and create collaborative research and instrumentation centers across campus by continuing to support existing research facilities and identifying new areas of research strength.

One of the most efficient ways to improve research productivity is to expand collaborative research both internally and externally. The immediate benefit is to move away from the predominant single-investigator grants of minimal size and short duration to more collaborative, consortia or center-type grants of significant size for longer periods of time. Recent examples of collaborations that have secured millions of dollars in research support at UT Arlington in the last five years:

- The Strategic Partnership for Research in Nanotechnology (SPRING) that led to the development of the Nanofab facility and Center for Nanostructured Materials. The facility and center today house and benefit more than 25 faculty members, 100 graduate students, and numerous collaborators from the Colleges of Science and Engineering.
- The Optical Medical Imaging Center brings together collaborators from the Departments of Bioengineering and Electrical Engineering; researchers

² The number of post-doctoral associates employed annually is an important metric for measuring university performance (see Appendix I).

from UT Dallas; and clinicians from UT Southwestern Medical Center in Dallas.

- The Center for Renewable Energy Research and Technology (CREST) that has collaborators from the Departments of Engineering and Science working jointly on important energy solutions.

New industry-led consortia are beginning to emerge in North Texas where UT Arlington faculty members play a significant role. These include the Texas Advanced Medical Technologies (TxMED) research consortia (Texas Instruments, Texas Health Resources, UT Arlington and UT Dallas), The Texas Institute for Sustainable Energy (electric smart grid), and the Nanomaterials Design and Commercialization Center (NDCC) (Lockheed Martin, Bell Helicopter, UT Arlington and UT Dallas). In addition to attracting considerable research funds from industrial sources, these have the opportunity to secure significant federal funds as well. (Additional comments on this strategy will be provided in section II.B. on Research Priorities, and in section V.C. on Collaborations and Partnerships.)

Research facilities on campus that promote faculty collaborations generally house expensive instrumentation that is useful to several research faculty members. Within the next decade, the institution envisions creating more shared facilities for multidisciplinary and multi-faculty research programs in energy and carbon footprint reduction (CREST), advanced intelligent manufacturing (the Texas Microfactory at ARRI), and a research facility for developing advanced technology to assist the disabled and aging population (SMART CARE).

In addition to creating shared research centers on campus, UT Arlington will upgrade and expand its currently successful research facilities to promote more research activity. This strategy includes upgrading and expanding the Nanofab facility, the robotics facilities at Automation and Robotics Research Institute (ARRI), the SMART Hospital, and the Translational Genomics Laboratory.

Strategy 1.2.2. Reward faculty who secure significant external funding or succeed in licensing intellectual property.

A useful strategy for increasing external funding is to reward principal investigators who secure more research grants. One aspect of the plan is to explore opportunities to reward research faculty whose salaries during the academic year are funded by grants and contracts or obtain income from licensing intellectual property. Such rewards can come in the form of research stipends for faculty and additional stipends for recruiting high-quality graduate students.

Strategy 1.2.3. Increase the number of non-tenure track researchers, e.g., postdocs, research associates, and industry-supported faculty liaisons, and Ph.D.-level students to work with tenure-earning faculty to enhance research productivity.

Many universities have multiple ways to expand their research footprint through non-tenure-earning researchers that are paid by grants or other means where researchers work with tenure-earning faculty. In a limited number of cases, the non-tenure track researchers may even work independently if they are successful in being awarded their own research grants. In most cases, their laboratory space is housed within departmental or research center spaces.

Key Metrics for Monitoring Progress

UT Arlington will monitor several important metrics to assess progress in moving towards the goal of improving research prominence and rankings. These include:

- Metric 1.1. Tracking total research expenditures, federal research expenditures, and research expenditures from industry (for-profit) sources,
- Metric 1.2. Tracking the total number of new faculty added annually (T/TT, research faculty, and industry-faculty liaisons), and
- Metric 1.3. Monitoring the percentage of faculty with sponsored programs.

These parameters will help to assess progress toward UT Arlington's overall goals in research productivity. They will also identify the most effective strategies in achieving those goals so that appropriate adjustments can be made to ensure the institution continues to make meaningful progress each year.

B. RESEARCH PRIORITIES

Priority 2. Identify areas for targeted research growth at UT Arlington

UT Arlington has identified three important strategies for targeting research growth so as to increase its research funding and improve research productivity.

Strategy 2.1. Expand basic and applied research in targeted disciplines.

UT Arlington's primary strategy is to continue to grow its basic and applied research activities in engineering, science, and related disciplines. These are undoubtedly the areas that dominate UT Arlington's current research expenditures, as well as the institution's opportunities for external funding. These disciplines will be targeted for substantial numbers of new faculty hires. UT Arlington also is planning for significant growth in the humanities and other areas of scholarship.

Strategy 2.2 Enhance and create new interdisciplinary institutes and research centers in disciplines that are strong at the institution and address technology needs of the region.

The expansion and development of interdisciplinary research institutes and centers will be created to focus on areas of existing research strengths at UT Arlington and/or areas of critical technology needs for the Dallas-Fort Worth region. Specific target areas that relate to UT Arlington research strengths include:

- Advanced Medical Technologies – integrating medical devices and imaging with sensors, wireless technologies, nanoelectronics, nanophotonics, and micromanufacturing;
- Health and Health Informatics – integrating strengths in nursing, biomechanics, genomics, proteomics, pain management, as well as computer science, applied mathematics and quantitative biology;
- Sustainability and the Environment – bringing in civil engineering with landscape architecture and environmental science and engineering,
- Energy - combining coal and natural gas liquefaction with mechanical engineering, chemistry and materials science;
- Transportation – bringing together civil engineering, systems engineering and computer science and engineering with urban and public affairs;
- Homeland Security – collaborating among the College of Science, College of Engineering, and the Departments of Sociology and Criminology and Criminal within the College of Liberal Arts;
- Gerontology: Aging in Place – collaborating among science, nursing, social work, and engineering; and
- Forensics – bringing together science, social work, sociology, and criminal justice in the state's Innocence Project.

Strategy 2.3. Promote innovation and commercialization of university-developed technology.

The third strategy for targeted research growth is to promote innovation and commercialization of university-developed technologies through collaborations. UT Arlington has developed strong partnerships with the Arlington Chamber of Commerce and more recently, with the Center for Innovation in Arlington. Together with the Office of Technology Management at UT Arlington, these agencies facilitate the creation of new companies, assist in finding venture capital, and provide additional support for the commercialization of new products and services in the region.

Just recently, the Center for Innovation in Arlington has become the latest Department of Defense Partnership Intermediary where the institution will assist with the translation of DoD technology into commercial products. The main advantage of this relationship is that commercialization of new technologies almost always requires further research and development for them to be ready for the market. Thus, the potential exists for considerably more sponsored research projects to be awarded to UT Arlington to assist with this process.

Key Metrics for Monitoring Progress

UT Arlington has to monitor several important metrics over time to assess progress toward its goal of expanding research programs and setting priorities. These metrics include:

- Metric 2.1. Annual number of new faculty hires in engineering, science, and related disciplines,
- Metric 2.2. Total number of new research centers and institutes created,
- Metric 2.3. Amount of sponsored research funds awarded to these new institutes and centers, and
- Metric 2.4. Amount of sponsored research funds from UT Arlington-licensed technologies and the DoD Partnership Intermediary to assist with commercialization of these technologies.

Monitoring this group of parameters helps to assess progress toward UT Arlington's overall goals in research productivity (total research expenditures as well as federal funding sources). It also identifies which of the strategies outlined above are having the most impact on achieving the goals. Appropriate adjustments of these strategies can be made to ensure the institution continues to make meaningful progress each year.

C. ALLOCATION OF RESOURCES

Priority 3. Provide the budget necessary to sustain staff resources, facilities and other assets needed to achieve targeted research goals.

UT Arlington President James D. Spaniolo recently stated that all future financial decisions at the institution will be scrutinized through the lens of the strategic plan to become a national research university. The highest priority of the plan is to attract nationally competitive research faculty at all ranks in highly targeted areas and provide them with sufficient research space, support personnel, and equipment necessary for cutting-edge research. Significant investments will be made in recruiting new faculty with national prominence (such as National Academy members and aspiring members), top-quality graduate students, and skilled staff to support these new hires. New research instrumentation will be purchased and research facilities to house these new hires will be expanded.

Financing this major increase in people, space, and equipment will require a significant boost in the operating budget of the institution over the next decade.

Strategy 3.1. Estimated budget for salary and fringe benefit expenses needed to support the planned expansion in personnel, and identify potential external sources of funds.

By far, the largest projected expense over the next decade is associated with salaries and fringe benefits for new faculty, graduate students, technical, and support staff. The next major expense is associated with start-up costs and new research instrumentation, followed by costs for renovation and acquisition of new research buildings.

With projected annual hiring of an average of 20 new faculty members, 60 new graduate students, and support staff, estimates are that an annual budget increase of about \$4 million per year will be necessary over the next decade. This includes budgeting for a few distinguished faculty hires, including at least two National Academy members within five years, and at least one to two more by the end of the decade to put UT Arlington on par with the top 125th ranked research institutions (see Appendix I). Establishing endowed chairs in the \$2 million to \$2.5 million range through philanthropic gifts will be essential to achieving this goal. The UT Arlington Maverick Match program (<http://www.uta.edu/giving/maverick-match.pdf>) will provide donors with a 1:1 match of their gifts for endowments over \$25,000. This significant incentive should help in establishing the endowments necessary to attract suitable faculty candidates.

Strategy 3.2. Estimated costs for new faculty set-up and purchase of new instrumentation

Laboratory set-up and new instrumentation costs for new faculty are estimated to be about \$6 million/year. Set-up and instrumentation costs are budgeted and allocated over at least a two-year period. These are one-time costs, and a significant portion of this budget already exists from indirect costs (IDC) recovered from external grants and contracts. With an expected increase in external funding, there will be a proportional increase in IDC, and much of this expense will, in effect, be self-funded. Significant sources of funds will also be provided to UT Arlington and the other “emerging research institutions in Texas” through HB 51, including the Research University Development Fund and the National Research University Fund to help offset these costs. There are also other sources of substantial funds available to assist with hiring prominent research faculty. One source is the STARS (Science and Technology Acquisition and Retention) program administered by UT System, and the other is the Acquisition of Superior Talent pool in the State’s Emerging Technology Fund. It is anticipated that the very high set-up costs associated with prominent faculty hires will be substantially covered by these sources.

Strategy 3.3. Identify and estimate costs for adding new research space.

The third essential resource to accommodate the additional faculty, student and staff hires is more research space. For the projected number of new hires, it is estimated that an additional 400,000-600,000 square feet of research space will be needed. UT Arlington will implement three strategies to provide the additional research space.

Strategy 3.3.1. Build new research facilities

UT Arlington’s new engineering and science research facility, the Engineering Research Building will be complete in January 2011 and will add more than 230,000 square feet of research space to the University’s inventory. In the near term, this facility will provide some of the space needed for new faculty hires in engineering and science.

However, given the current economic situation in Texas, it is uncertain whether there will be any Tuition Revenue Bonds (TRBs) issued to academic institutions in the next four to six years to fund the construction of additional research buildings. Assuming that TRBs will again become available for new research buildings in the second half of this decade, an overview of what additional research buildings are planned and how they relate to the campus master plan will be provided in section VI. A. Major Research Facilities.

Strategy 3.3.2. Conduct a campus-wide space survey to evaluate current space usage (both research and teaching space) to specifically identify:

- a. Existing space that may be renovated for research use.

- b. Existing research laboratories that can be reassigned to more productive faculty members.

UT Arlington must assess the current utilization of all space both on and off campus. It is anticipated that a significant amount of space can be reassigned.

Strategy 3.3.3. Explore possibility of off-campus expansion of research activity.

Another alternative in the near term for providing more research space is leasing space off campus. Again, given the current economic environment, several vacant commercial sites relatively close to campus are now available that are quite suitable for research laboratories.

Whether space is reassigned on campus, or leased off campus, there will be renovation and/or lease costs to consider. It is estimated that approximately 100,000 square feet of space will have to be leased or renovated in the next four to six years, at an annual cost of approximately \$1-2 million. One-time renovation expenses can be off-set by Library, Equipment, Repair and Renovation (LERR)³ funds provided each year to UT Arlington by UT System (typical awards have been \$1 million to \$2.3 million per year). Estimated annual costs of \$1 million are projected to provide additional research space on or off campus in the near term.

Key Metrics for Monitoring Progress

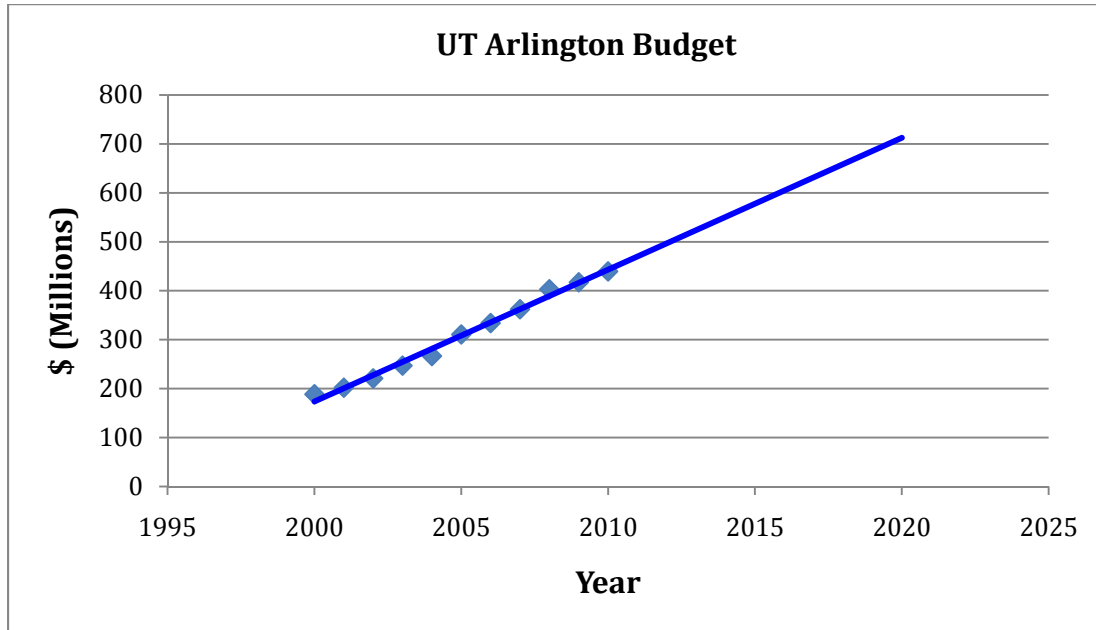
Assessment of progress and degree to which the institution remains on track with its expansion of research activity will largely be determined each year through the budgeting process. Specifically, the allocations for new faculty hires, start-up costs, graduate student support, new support staff allocation, facilities renovation, and maintenance costs are the key items to consider. Likewise, in order for the institution to gauge its rate of growth, it will be important to monitor the magnitude of these costs and the extent to which these costs are offset by external sources of funds.

Over the last ten years, UT Arlington has experienced a sustained and significant increase in its overall operating budget (Figure 5). This substantial increase in budget has helped the institution implement many of the initiatives in its strategic plan for achieving the status of a national research university. For example, in the last five years, UT Arlington added more than 100 T/TT faculty and graduate students to its ranks. Nearly 250,000 square feet of research space has been added to the campus. If the budget continues to grow as projected, most costs, if not all,

³ *Library, Equipment, Repair and Rehabilitation (LERR)*: Generally refers to library and equipment materials, Faculty STARS, or small Repair & Rehabilitation Projects that are approved annually through the UT System LERR Budget or Annual Operating Budget, and funded with PUF Debt proceeds.

associated with the proposed additions in personnel, equipment, and research space outlined above could be met.

Figure 5. Growth in UT Arlington’s Budget for the Last Ten Years and Projected Budget to 2020



Key Metrics for Monitoring Progress

- Metric 3.1. Income from increased enrollment (Educational and General funds)
- Metric 3.2. Annual amount of indirect cost (IDC) recovery returned to the institution
- Metric 3.3. Annual amount of research development funds (RDF) provided to the institution
- Metric 3.4. Annual allocations made from the National Research University Fund and/or the Research University Development Fund
- Metric 3.6. Funds received from the STARS and Emerging Technology Fund (ETF) funds
- Metric 3.7. Annual funds received from philanthropic gifts and donations

D. STUDENT PARTICIPATION

UT Arlington has a strong tradition of encouraging both graduate and undergraduate students to participate in research activities. The following programs provide examples of the institution's commitment to involving students in research. These programs will be important vehicles for expanding research opportunities for students in the coming years.

The Annual Celebration of Excellence by Students (ACES) program is a university-wide program designed to encourage and reward student research. Undergraduate and graduate students work with faculty mentors in their disciplines to write and submit abstracts for the ACES competition. The approved abstracts are then turned into oral presentations or posters to be presented at the annual symposium. Faculty judges evaluate the research presentations and select the best for awards. Past winners have presented research on gene therapy, business relations, pain control, biochemistry, and engineering. Student participation in ACES has increased significantly since the first program in 2003, and UT Arlington plans to continue to support and expand this program.

The Ronald E. McNair Achievement Program is a federally funded initiative designed to help promising undergraduates from low-income, first-generation college, or under-represented backgrounds pursue higher education careers in research and teaching. At UT Arlington, McNair scholars are given support to conduct original research under the supervision of a faculty member. Past participants in the program have gone on to develop technology that could revolutionize the pharmaceutical industry, analyze brain tissue for clues to what causes Lou Gehrig's disease, and assist the U.S. government detect paramilitary groups hidden in wooded areas. Over the years many students have built their research careers on the strong foundation provided by the McNair program.

The UT Arlington "Active Learning: Pathways to Higher Order Thinking" Quality Enhancement Plan (QEP) was developed as part of the Southern Association of Colleges and Schools (SACS) requirement for reaffirmation. Approved by SACS in 2007, the plan involves modifying teaching practices to increase student engagement and thereby improve critical thinking skills. Extensive programming including faculty workshops, invited speakers, and teaching circles is devoted to techniques by which faculty can more effectively engage students in the learning process to achieve this important learning outcome. Involving students in research activities is one highly effective means of enhancing student engagement in the learning process and improving the higher order thinking skills of application, analysis, synthesis and evaluation. SACS requires institutions to devote substantial resources to the fulfillment of their QEPs; thus, UT Arlington will use this initiative as a key means of enhancing student research opportunities on campus over the next decade.

III. PLAN TO IMPROVE UNDERGRADUATE EDUCATION

A. STRENGTHEN AND IMPROVE THE QUALITY OF UNDERGRADUATE EDUCATION, INCLUDING THE STUDENT PROFILE

UT Arlington is a comprehensive university serving a diverse population of students in the Dallas-Fort Worth Metroplex, the larger seven-county region, the state of Texas, and the nation. This diversity serves as one of the institution's strengths and it contributes to a campus climate that fully embraces differences in thought and culture. *U.S. News & World Report* recently counted UT Arlington as one of the 15 most diverse institutions in the U.S. The undergraduate student population comes predominantly from the middle to the lower economic classes as over 50 percent of the student body receives some type of need-based financial aid. UT Arlington must build upon this diversity. As President James D. Spaniolo has stated, "Although we will strive to be among the elite universities in the world, we will never be elitist." It is thus critical that the plan for UT Arlington embrace this diversity and its mission to the state.

The financial basis for UT Arlington's strategic plan is dependent upon continued growth in both the quality and size of the undergraduate student population. The institution's goal is to increase headcount from its current 28,000 students to 35,000 students by 2020. The additional revenue associated with enrollment growth and formula funding over the next decade will total approximately \$110 million annually. It will be used to hire about 200 to 250 additional tenured and tenure track faculty, hire proportional support staff, provide for campus facilities upgrades including the library, and enhance the student experience at UT Arlington.

A summary of UT Arlington's enrollment goals, based upon the 'Closing the Gaps' initiative, is provided below. In order to meet these ambitious goals, the institution will have to increase its recruitment efforts modestly, but improve its first year persistence and 6-year graduation rates significantly.

Table 1. Summary of Actual and Targeted Enrollment at UT Arlington

	Fall 2008 Actual	Fall 2009 Actual	Fall 2015 Target	Fall 2020 Target
Overall Classification	25,084	28,085	33,500	35,000
<i>Undergraduate</i>	18,985	21,370	25,500	27,400
<i>Graduate</i>	6,099	6,715	8,000	8,600
Gender				
<i>Male</i>	49%	47%	47%	47%
<i>Female</i>	51%	53%	53%	53%
Ethnicity				
<i>African American</i>	3,491	4,084	4,760	5,220
<i>Hispanic</i>	3,824	4,623	5,700	6,500
<i>White</i>	11,820	13,069	15,400	16,200
<i>Other</i>	5,949	6,309	7,640	8,080
Avg. SAT Score of FTFT Freshmen	1065	1071	1085	1100

These are aggressive but attainable goals for the institution based on the plan outlined below, which will be implemented beginning in fall 2010.

A University-wide task force spent the past year developing a series of initiatives to improve first-year retention and the institution’s six-year graduation rate. As a result of this effort, a comprehensive plan is in place to meet the needs of entering freshman and transfer students. This plan includes a \$2 million renovation of Ransom Hall, a historically significant building located in the very center of the campus, to repurpose it to serve as the physical home for University College. This new administrative unit will bring together an expanded freshman advising center (one advisor per approximately 200 students), confidential counseling services, and tutoring and supplemental instruction in one vertically oriented unit designed to enhance student success. Advisors will be up to date on core course requirements, financial aid opportunities, a wide array of available support services, co-curricular opportunities, and career counseling. Advisors also will specialize in the requirements of the majors in a particular college or school (e.g. engineering or nursing). At the conclusion of approximately 30 hours of completed coursework, each student will be transitioned seamlessly to an advisor in the department of the student’s major. The goal of this effort is to aggressively advise and support

students with the goal to move them to sophomore status in good academic standing. University College will be open and operational by fall 2010.

The task force also recommended expansion of campus co-curricular activities and the creation of a First Year Experience course. These recommendations will be phased in over the next few academic years. Overall student academic success is correlated with success in a limited number of gateway courses, including Introduction to Biology, University Chemistry, English Composition and both College Algebra and Calculus I. An academy of Freshman Scholars will be created comprising faculty who agree to teach a gateway course each semester. Faculty so honored for membership will receive additional resources in terms of salary and instructional support. In return, they will agree to utilize the full array of support services for their students, take attendance, share student progress information with his or her advisor, and offer early-semester exams to allow students to assess their progress in time to address deficiencies.

By advising all freshmen and students with undeclared majors in the University College Advising Center, significant college and school advising resources will be made available to support upper class and transfer students.

Simultaneous with UT Arlington's plan to increase the size of the undergraduate student population is the goal to increase the quality of the freshman class. For the fall 2009 cohort, the mean SAT score for entering FTFT freshman was 1071, an increase of six points over the fall 2008 cohort. Further, 25 percent of the fall 2009 cohort graduated in the top 10 percent of their high school class, while 65 percent graduated in the top quarter of their class. UT Arlington's goal is to enroll a FTFT freshman cohort by 2020 that graduates in the top 25 percent (i.e. 100 percent) of their high school class with 50 percent graduating in the top 10 percent. To accomplish these goals, the institution has expanded its recruiting base to include most of the state of Texas, and has greatly expanded merit-based scholarships to attract the best and the brightest students in the region and state. For example, the Honors College Distinction Scholarship provides more than \$20,000 per student each academic year for exceptional students. Recipients may accumulate funds and use them to cover the costs of an academic semester or a year abroad. Other merit-based scholarships provide resources at similar levels. The object of these opportunities is to provide the resources to allow creative and motivated students to fully explore the educational opportunities available at UT Arlington, both on campus and through the institution's international partners.

UT Arlington has a unique role to play in the area of higher education in the state of Texas. Although the institution's academic standards for unconditional admission will gradually increase over the next ten years to require top 25 percent status, there still must be the opportunity for all motivated students to be admitted and given the chance to succeed. Students not meeting standards in place at the time they apply can request admission through a more nuanced mechanism in which they will be asked to provide additional supporting materials including a detailed

personal statement explaining their circumstances and a face-to-face interview. Those who are properly motivated will be given the chance. Others will be encouraged to spend a year or two at a community college to complete their preparation prior to beginning studies for their baccalaureate. UT Arlington has developed articulation agreements with more than 20 community college districts in the state and plans to include additional institutions. In these detailed agreements, exact course equivalencies are established and, on some campuses, dual transcripts are created so that students can assess their progress toward their baccalaureate degree at any point in their program.

The campus also has expanded the number of courses available through a distance education (DE) format including a hybrid arrangement in which a combination of DE delivery and personal coaches is used to assure success. The crux of these initiatives is to ensure that UT Arlington has a comprehensive plan in place to provide the opportunity for all students who desire a baccalaureate degree to successfully complete one. Finally, as part of the institution's recruitment strategy, advisors will be placed on all Tarrant County Community College campuses. A preliminary effort involving a few campuses has been highly successful and will be expanded.

B. INCREASE THE NUMBER OF BACCALAUREATE DEGREES AWARDED, PARTICULARLY IN CRITICAL FIELDS

The previous section described UT Arlington's ambitious goals to increase the size and quality of the undergraduate student body and the number of degrees awarded annually. The emphasis on retention and graduation rates is designed to apply broadly across the institution and will enhance the opportunity for success for students in all colleges and schools. However, the Student Success Task Force has identified additional obstacles facing students majoring in the Colleges of Engineering, Science and Nursing. Students majoring in these colleges must take technically challenging courses as part of the core requirements for the majors in these colleges. Several of these courses, including chemistry and calculus have been identified for inclusion in the Freshman Scholars initiative and this will ensure that the top faculty teach these key courses. However, it is important that students understand the foundational basis of the material in these courses so that their knowledge base will support their continuing studies in their major. Specifically, a grade of less than B in any of these courses suggests that the student does not possess the requisite base to be successful in a technically challenging STEM major. The task force has suggested that the best way to help students understand the link between the material in these courses and their intended field is to orient the First Year Experience course specifically toward their college major. In that light, FYE courses for engineering and nursing students will be fully implemented by fall 2010 and a course for students majoring in the College of Science will be implemented by fall 2011.

The number of scholarship opportunities available for undergraduates majoring in STEM fields will be enhanced by the Maverick Match Program. Through this innovative program, royalties received from the on-campus natural gas program will be used to match philanthropic gifts for undergraduate scholarships in STEM areas. Further, plans are in progress to expand opportunities for undergraduates to participate in faculty research and scholarship. This opportunity will prove particularly important in STEM areas as it will help students better understand the relationship between the material covered in their classes and in their disciplines, thereby solidifying their career choices.

Progress in meeting the goals outlined in sections A and B will be assessed annually. Each dean now receives a report card at the beginning of each academic year that evaluates the college or school in terms of the key metrics driving the move toward becoming a national research university. Student success is a critical piece of this assessment exercise.

IV. PLAN TO ENHANCE DOCTORAL PROGRAMS

A. SUMMARY OF EXISTING PROGRAMS

UT Arlington is a comprehensive research university with 31 doctoral programs across a range of fields, with special emphasis on science and engineering. (Appendix A contains a table that lists the institution's doctoral programs.). From fall 1999 to fall 2009, the institution increased overall graduate student enrollment by 72.9 percent and new graduate student enrollment by 50.9 percent. The diversity of the graduate student population also has increased during this time, including a 153 percent increase in African-American graduate students, a 207 percent increase in Hispanic graduate students, and a 191 percent increase in Asian-American graduate students. Moreover, from 2001 to 2009, doctoral enrollment grew from 589 students to 969 students.

Doctoral degree conferrals increased significantly as well. The following table shows doctoral and doctoral-bound student enrollment for fall 2009 broken out by gender and ethnicity.

TABLE 2. DOCTORAL STUDENT ENROLLMENT BY GENDER AND ETHNICITY, FALL 2009

Gender	Ethnicity							
	Asian	African-American	Hispanic	Inter-national	Native American	Unknown	White	Total
Male	35	38	20	336	2	6	214	651
Female	21	38	29	148	1	7	207	451
Total	56	76	49	484	3	13	421	1,102

Reflecting national trends, the percentages of women and minorities with U.S. citizenship enrolled in science, technology, engineering, and math (STEM) graduate programs are lower than those for the institution as a whole. As of fall 2008, 66.9 percent of STEM students were male and 33.1 percent were female. African-Americans, Hispanics, Asians and Native Americans comprise only 6.5 percent, 10.8 percent, 13.2 percent, and 0.6 percent, respectively, of the institution's U.S. graduate student STEM population.

The quality of the institution's doctoral programs is assessed through a periodic academic program review that requires the participation of external reviewers. Overall, these program reviews have indicated that the institution's doctoral programs are strong; however, the review process has revealed some recurrent

issues, prompting aggressive action (detailed in Section C) to strengthen these programs.

- 1) Program reviews have indicated that institutional financial support for some of the doctoral students is too low. As a result, some doctoral programs have had difficulty attracting top students, especially U.S. citizens in some technical fields, and creating cohorts of full-time students. While it is appropriate to have some working professionals enrolled part-time in a doctoral program, a full-time cohort of doctoral students is important for increasing retention and accelerating completion rates.
- 2) Program reviews have indicated that the curricula for some doctoral programs needs to be reviewed with an eye toward reducing the hours required to complete a program of work, especially when a student's prior preparation justifies the reduction. Some courses and tracks need to be consolidated, and some highly specialized courses relating to faculty research need to be trimmed.
- 3) Program reviews have indicated that some doctoral programs need to increase academic quality by attracting better-qualified students.
- 4) Finally, program reviews have indicated a need to increase the number of U.S. citizens, especially from under-represented groups, in some of the STEM doctoral programs.

B. QUALITY CONTROL

UT Arlington has developed a more comprehensive doctoral program reporting methodology that is modeled after the reporting in the Council of Graduate Schools' Ph.D. Completion Project, which involves 46 Research-Very High Activity and Research-High Activity universities. This reporting has been integrated into the academic program review process. Doctoral programs and their external reviewers analyze attrition, retention, and completion rates in relation to national norms for their field or disciplinary cluster. UT Arlington's Office of Graduate Studies works with those programs that fall below their peers to improve their performance by attending to a range of issues that include but are not limited to admissions criteria and financial support.

When the THECB implements the new higher thresholds in its Low Producing Program reporting—ten Ph.D.s conferred over five years—UT Arlington will assess doctoral programs at the institution to ensure that they meet these new minimums. The doctoral program improvement initiatives described in Section C will help the institution in this regard. In addition, THECB's new "18 Characteristics of Doctoral Programs" will also be used to help doctoral programs improve their performance.

C. QUALITY ENHANCEMENT

UT Arlington has begun an aggressive initiative to strengthen its current doctoral programs. A detailed study of doctoral student stipends has been completed, and significant increases are being provided in financial support for Doctoral and Doctoral-Bound Graduate Teaching Assistants that include competitive stipends and full tuition fellowships. Within three years, all doctoral stipend levels will be at nationally competitive levels. After completing this initiative, the size of this cohort will be expanded. Additionally, the institution has also significantly increased need-based grant aid to doctoral students.

In addition to making doctoral student support more competitive, numerous other aspects of doctoral education are also being enhanced. To support this effort, UT Arlington has invested considerable resources in staff and in retention and completion activities such as academic and professional development workshops. All doctoral programs are developing recruiting plans to attract a stronger pool of applicants, and some are increasing their admissions standards. The institution is also implementing a University-wide annual visitation program for top doctoral program prospects.

To improve doctoral retention, attrition, time-to-degree, and degree conferral rates, UT Arlington is ensuring that a five-year program of work is available in each Ph.D. program so that competitively funded full-time doctoral and doctoral-bound

students can complete their degrees in a timely fashion. Additionally, all funded doctoral students and their mentors are required to participate in annual degree progress reporting that sets milestones and provides written feedback to students. In addition, doctoral program retention and completion reporting has been integrated into the academic program review process. On a case-by-case basis, the University is assessing doctoral programs to review and revise curricula, as necessary. THECB's recent collection of program length for all Texas doctoral programs will be useful in this review. Finally, the University is aggressively seeking to secure significant federal, private and corporate foundation funds for graduate student support; innovative graduate education practices; and recruiting, retaining, and graduating U.S. doctoral students from under-represented populations. The funding that has been acquired and will continue to be acquired helps drive these reforms in the institution's doctoral programs.

D. COMPARISONS WITH NATIONAL PEERS

To better align with UT Arlington's doctoral program quality enhancements, the institution will revise its inventory of aspirational peer doctoral programs. Accordingly, in 2010, the provost, deans, and department chairs will identify several nationally ranked aspirational peer doctoral programs for each of the 34 doctoral programs. The following metrics are being considered for comparison: research expenditures, faculty publications, full-time enrollment, student financial support, doctoral degree conferrals, and time-to-degree rates.

2. NEW DOCTORAL PROGRAMS

A. AREAS OF INTEREST

UT Arlington confers doctoral degrees in 31 disciplines. New Ph.D. programs proposed for UT Arlington must meet the following guidelines:

1. The degree program must be truly multidisciplinary and involve two or more colleges or schools.
2. A core of faculty expertise must already exist in the area with complementary skills and common interests involving a functioning research center.
3. The program must be in an area considered a critical need of the region, the state of Texas, and/or the nation.
4. Federal and/or industrial/private resources must be available to support research in the area, and economic opportunities must exist for graduates.

Ph.D. in the Area of Sustainability. This will be a collaborative effort involving the Schools of Architecture and Urban and Public Affairs, and the Colleges of Engineering, Liberal Arts, and Science. It is proposed that students engaged in this degree program will conduct research involving everything from policy issues to basic research in sustainable engineering. The Center for Renewable Energy Science and Technology (CREST) is an existing center of excellence in energy utilization and efficiency. Additionally, the institution has several centers that investigate policy issues related to sustainability issues. There is presently no Ph.D. program specifically oriented toward sustainability in the north Texas area or the state of Texas.

Ph.D. in Nano-Science, Nano-Engineering and Nano-Technology. Materials science at the nano-regime is now understood to be a distinct area of research in that nanomaterials exhibit novel and useful properties not observed in the bulk. Research in this area is extremely broad and can include everything from the development of catalysts to enhance energy extraction and efficiency to the development of nanostructured surfaces for medical implants. This effort is anticipated to involve faculty in the Colleges of Engineering, Science, and Nursing. There are several materials science Ph.D. programs in the state but only three that specifically target the nano-regime (UT Austin, Texas A&M, and Rice).

Ph.D. in Globalism and Development. Thomas Friedman's "Flat Earth" analogy clearly explained the interdependence of the world's economies, and economic opportunity in those countries. This program will be a collaborative effort involving the Department of Sociology and Anthropology in the College of Liberal Arts, the College of Business, and the Schools of Social Work and Urban and Public Affairs.

Ph.D. in Mind-Brain Education. Research into the relationship between neurodevelopment and the process of learning is now an area of intense national interest. Research in this area involves a diverse group of disciplines including researchers in the College of Education and Health Professions, and the Departments of Philosophy (College of Liberal Arts, cognitive science) and Psychology (College of Science). Currently there are several masters' level programs on mind-brain education in the U.S. (e.g. Harvard University, the University of Southern California) but no Ph.D. programs exist. The Southwest Center for Mind, Brain and Education is currently under development at UT Arlington.

B. ASSESSMENT

All doctoral programs are rigorously reviewed on a schedule established by the UT System. Institutional policy requires that all reviews include a thorough self-assessment to identify strengths and weaknesses, followed by an on-site review by a team of external experts in the field.

C. REGIONAL IMPACT: MEETING THE NEEDS OF THE REGION BY ENHANCING DOCTORAL RESEARCH PROGRAMS

National research universities, with their diverse graduate programs, help drive regional economies and keep the nation globally competitive and secure. Doctoral programs, particularly in STEM areas, promote the knowledge-based economy of a rapidly changing world and attract major financial investments from federal and private sources. They enhance the quality of life for everyone in the immediate region and state, producing citizens who are highly educated, creative, and more inclined to build their lives and careers near these institutions.

Doctoral programs at UT Arlington have regional influence in several ways, including:

- a. Direct economic impact
- b. Workforce development
- c. Future growth of technology-based economic development.

UT Arlington is estimated to have a direct economic impact in the North Texas region equal to about \$1 billion per year, more than twice the institution's annual budget. A significant portion of this impact derives from the doctoral programs at the institution, in particular programs in STEM fields that are driven primarily by external funding.

Expand doctoral programs that address critical technology needs of the region by increasing the number of Ph.D.s and the number of post-doctoral associates employed annually

Graduating highly trained students with advanced degrees constitutes perhaps the most valuable technology transfer activity at the institution. Doctoral programs in science, engineering, nursing, and education, along with training in health-industry professions, directly prepare a highly skilled workforce to sustain the aerospace, electronics, communications, and healthcare industries in North Texas.

Expanding doctoral programs offered by the institution, especially in interdisciplinary areas in response to industry needs, and increasing the number of doctoral students graduated, will help sustain the economic viability of the region for decades to come.

Improve Opportunities for Technology Transfer

Doctoral programs also help to fuel the economic growth in the region. They support innovation and technology-based economic development through new discoveries, start-up company formation, and commercialization of developed intellectual property. Supporting these activities through continued interaction with UT Arlington's Office of Technology Management in partnership with the Center for Innovation in Arlington and the Texas Manufacturing Assistance Center (TMAC) remains an important strategy for the institution to enhance its regional impact.

Key Metrics to Monitor Progress

Several important metrics to monitor over time to assess the impact doctoral programs have on the region include annually tracking numbers of doctoral students graduated, doctoral graduates employed locally, doctoral students enrolled in new doctoral programs, and number of graduate students working with new start-up companies in the Arlington Center for Innovation and other regional technology incubators.

V. PLAN TO IMPROVE FACULTY DEVELOPMENT

A. FACULTY RESEARCH

UT Arlington provides competitive start-up packages for all new faculty hires. Packages in STEM fields range from \$350,000 to \$2 million for experienced investigators. In non-STEM fields, start-up packages also are offered, although at a lower level. Start-up funds can be used for summer salary, graduate student and post-doctoral fellow support, purchase or rental of equipment and instrumentation, travel, supplies, and lab renovation.

New faculty members who are hired at the rank of Assistant Professor are offered an extensive array of mentoring opportunities to support their teaching and scholarship. A well-established support base is in place to help faculty quickly become productive in both the classroom and the laboratory.

To support a nationally recognized faculty, campus policies to evaluate annual performance will be enhanced including:

1. A formal third-year review will be required for all untenured faculty members in tenure-track lines. Non-successful performance will require a remediation plan, and faculty members will be given one year to correct deficiencies.
2. Annual evaluations will be standardized across the institution and will be made more rigorous. All raises will be based entirely on merit.
3. The post-tenure review policy for the institution will be revisited with the goal to make it more uniform and meaningful.

The goal of these policy initiatives is to develop, support and reward faculty who are clearly contributing to the institution's goals toward becoming a national research university.

B. FACULTY RECOGNITION

The Office of the Provost serves as the central source for all nominations for prestigious faculty awards. The associate provost for faculty development serves as the resource for such nominations. Through the academic deans, nominations are solicited and/or supported for institutional as well as state and national awards. UT Arlington's recent success in securing University of Texas System Regents' Outstanding Teaching Awards is recognition of the success of this approach.

C. COLLABORATIONS AND PARTNERSHIPS

Nurturing research collaborations is an effective way to rapidly expand research productivity, both in terms of securing more and larger research grants as well as providing better training to more graduate students. The scope of a collaborative project and the financial support needed for it usually exceed that provided by single investigators. Expanded project scope and involvement of interdisciplinary activities usually provide broader exposure and better training to the graduate students (and faculty). This is perhaps why funding agencies generally prefer to support collaborative projects.

By far, the most fruitful collaborations are those established at the investigator-to-investigator level. Institutions are generally not effective at mandating collaborations between faculty, either within or between institutions, but they can be successful in promoting them. Two key elements seem to be necessary for meaningful collaborations: motivation for the faculty and a means to easily identify and cultivate potential collaborators.

Provide motivation for faculty to collaborate

Motivation for faculty to engage in collaborations has been successfully employed in several cases. For example, UT Arlington engaged in a pilot project five years ago with the University of North Texas Health Science Center in Fort Worth. Each institution provided funds to create a collaborative research program. Each research proposal had to have at least one principal investigator from each institution. Five proposals were funded (determined by a joint institutional peer review panel) from the 14 submitted proposals. This seed program was successful enough to be repeated two years later. As a result of this program, joint institutional proposals were submitted to NIH, and a new start-up company was formed from one of the funded proposals, which is still in operation today.

This model was replicated by establishing several joint seed collaborative programs between UT Arlington and UT Dallas; UT Arlington's College of Science and College of Engineering; and UT Arlington, UT Dallas, and UT Southwestern Medical Center.

Expanding this model to include industry also has succeeded. In a recent example, the presidents of UT Arlington and UT Dallas provided funds to foster collaborations. These funds were matched by Texas Instruments and Texas Health Resources to launch a research consortium directed at establishing research collaborations between UT Arlington, UT Dallas, and Texas Health Resources that were focused on developing new electronic/diagnostic health care technologies in areas of critical need. In December 2009, seven proposals (from 18 submitted) were selected for funding, averaging \$100,000 each.

As a direct result of these seed programs, significant numbers of faculty members at each institution began a dialogue and eventually started writing joint proposals. The value of the new interactions and discussions between these faculty members far outweighs the small costs associated with funding these seed projects. Establishing these types of programs—especially those joined by our regional corporate and industrial partners who are focused on meeting their critical needs—is now an important strategy for UT Arlington to expand its research capacity and value in the community.

Provide expedient ways for faculty to find potential collaborators

Besides motivating faculty with financial incentives, another essential element in establishing collaborations is to provide a way for investigators to find others with complementary skills so they can effectively compete for specific grant funding opportunities. UT Arlington's Office of Research developed the *Faculty Profile System* and the *Collaborative Partnership*, both of which are user-friendly, web-based tools for finding faculty expertise either at UT Arlington or at several member institutions (noted above in the *Collaborative Partnership*). UT Arlington believes universities must become proactive partners for economic development by identifying and associating their resources with industrial clusters and then actively marketing these resources to industry in generating innovation. To date, there are ten academic and health institutions in Texas that have licensed UT Arlington's technology and have implemented or will be implementing it soon. For more information, please see: <http://www.uta.edu/ra/real/aboutrsp>.

Key Metrics for Monitoring Progress

Metrics to assess and monitor success at establishing new collaborations include annually tracking the number of funded collaborative projects involving UT Arlington faculty members, the number of institutions that join the Collaborative Partnership, and the number of new faculty members.

D. NEW FACULTY

All new faculty members hired into tenure-track lines at UT Arlington must be able to meet the institution's standards, which are aligned with its goal toward becoming a national research university. At the rank of assistant professor, national searches are required and employment offers extended only when the candidate clearly meets the high standards set for the institution. Faculty hires at advanced rank follow from a coherent plan designed to identify and recruit talented, nationally recognized researchers to UT Arlington who can immediately contribute to the institution's goals.

VI. PLAN TO IMPROVE STUDENT DEVELOPMENT

A. STUDENT AWARDS

The competition for national student awards is incredibly intense, and all students need mentoring and extensive preparation in order to be successful in winning Truman, Goldwater, Rhodes or National Science Foundation pre-and post-doctoral fellowships. UT Arlington will establish the Office of Student Awards and hire a director to oversee this unit's operations. This office will identify promising candidates for national awards early in their academic career. Mentoring will begin at that time and continue through to graduation. For some awards, for example, Truman Scholarships, mock interviews and other individual preparation may be critical to success. For others, for example, NSF awards, invited speakers from NSF or successful candidates will be invited under the auspices of this office to offer advice for UT Arlington students.

B. STUDENT DIVERSITY

UT Arlington is undertaking a range of activities to recruit and retain a more diverse doctoral student body. Recruiting activities include *GradFest*, a program that exposes UT Arlington undergraduate students to graduate and professional school opportunities and showcases the institution's own graduate programs. The Office of Graduate Studies continues to support and contribute to college/school level recruiting activities such as the *MavGrad* program in the College of Engineering. UT Arlington staff members also actively recruit at a number of local universities; participate in the Texas Swing, a series of graduate and professional day programs held at Texas colleges and universities, and the annual Lone Star Graduate Diversity Colloquium that was established in 2006 as a way to encourage underrepresented minorities, women, and first generation college students currently enrolled at Texas colleges and universities to stay in Texas to complete their graduate education. UT Arlington will host the Lone Star Graduate Diversity Colloquium in 2011.

In partnership with UT Brownsville, UT Pan-American, UT Permian Basin, and UT Tyler, UT Arlington is creating a Maverick Bridge program to increase the number of master's students receiving doctorates in STEM disciplines. The University will collaborate with on-campus departments and seek external funding to support this bridge program that will provide undergraduates with opportunities for hands-on research with guidance from and interaction with faculty, staff, and graduate students who are experienced researchers.

UT Arlington aggressively seeks external funding from federal agencies for doctoral students. For example, the Department of Education Graduate Assistance in Areas of National Need (GAANN) provides fellowships to assist graduate students pursuing

research in areas of national need. UT Arlington currently has GAANN programs in math, physics, computer science and engineering and has submitted proposals for additional funding. The annual GAANN Day on campus will help attract and recruit new GAANN Fellows. The campus visitation program for top doctoral program prospects will be held in conjunction with GAANN Day.

The University actively pursues students from underrepresented groups by attending and exhibiting at regional and national conferences and meetings that feature undergraduate research and provide professional development and mentoring activities for students from underrepresented groups. Each year, UT Arlington sends representatives to the conferences of the Texas National McNair Scholars Research and the National Society of Hispanic Professional Engineers (SHPE). The University also recruits at the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS) conferences.

In order to increase the visibility of UT Arlington graduates and reach more women and minorities in recruiting efforts, the University is an active partner in the McNair Scholarship program and the UT System Louis Stokes Alliance for Minority Participation (LSAMP) program. In addition, the University has adopted a holistic approach for evaluating the potential of applicant success and has removed many barriers that have historically limited access of underrepresented students to graduate study.

To retain students, the University has developed a wide variety of workshops aimed at the academic and professional development for graduate students. These workshops include online webinars and face-to-face sessions that cover topics such as effective writing skills, research skills and work-life balance.

The institution has made aggressive attempts to diversify its faculty, especially in STEM programs. Programs such as the Pre-Doctoral and Post-Doctoral Fellowship Program, Pre-Faculty Internship Partnership with Howard University, and other programs geared toward faculty diversity will also help diversify the doctoral student population.

VI. PLAN TO CAPITALIZE ON OTHER RESOURCES

A. RESEARCH FACILITIES

Engineering Research Complex

UT Arlington's Campus Master Plan was approved by the Board of Regents in May 2007 and includes an additional one million square feet of research space to support the institution's goal of becoming a national research university. The new Engineering Research Building (ERB) scheduled for completion in January 2011 will provide a significant step forward. The ERB totals over 230,000 gross square feet (gsf) with a capital budget of approximately \$128 million, providing much needed research space for the College of Engineering as well as the College of Science. The building will house the College of Engineering's Computer Science Engineering Department, research labs for the Department of Chemistry, and research labs for Bio-Medical Engineering. Much of the entire east wing of the building contains lab space for collaborative research between The Colleges of Engineering and Science. The building also will contain faculty offices, conference rooms and lab support space.

The ERB is part of a larger project known as the Engineering Research Complex (ERC). The ERC also includes a third floor addition to the existing Engineering Lab Building, as well as extensive lab renovations on floors one and two of that building. Overall, the project added more than 28,000 gsf of research space with the third floor addition for the College of Engineering. This phase of the project was completed in summer 2009 for just under \$22 million.

Prior to the Engineering Lab Building addition and renovation, a new \$10 million Civil Engineering Laboratory Building totaling over 27,000 gsf was constructed on the west campus. This multipurpose building includes lab space for asphalt, environmental, construction, transportation, geotech, and material/structures civil engineering. The building opened in August 2008.

There are also numerous renovation projects currently under way that directly support UT Arlington's research enterprise. These projects include:

- Science Hall 307/310 – a new wet chemistry lab to support the Center for Renewable Energy Science and Technology (CREST).
- Nedderman Hall 254/255 – a new Class 100,000 clean room to include support space for research faculty to be used for nanolithography and nanophotonics research.
- Engineering Lab Building 126 – a new research lab for sponsored projects concerning air bearings and high temperature fuel cells.

- Woolf Hall 223 – a new autonomous vehicles laboratory to conduct both externally sponsored research as well as undergraduate research.
- Science Hall 317 – a new research lab for the annealing of glass quartz tubing to fabricate custom glassware to support magnetic nanoparticle and nanocomposite magnet research.
- Woolf Hall 226 – a new research lab to support both NIH and NSF CAREER projects.

In addition to these new, large capital construction projects, and the on-going lab renovation projects, UT Arlington plans to construct a new shared facility between the College of Engineering and the College of Science for animal research. The current animal research facility comprises approximately 15,000 gsf, or 9,000 assignable square feet. The preliminary plan is to construct a new facility that doubles the current space, and then renovate the vacated space for the College of Science (Biology). The new facility will total approximately 25,000 gsf with a capital budget of \$15 million. The budget for the renovation for the vacated space will be approximately \$3 million, for a total project cost of just under \$20 million.

Another short-to-mid-term capital requirement is an addition to the Nanofab Building, which currently comprises approximately 40,000 gsf. The building is at capacity with many faculty members housed in other buildings across the campus and no excess clean room utilization or capacity is available. Included in the Campus Master Plan is an addition of approximately 50,000 gsf, aimed to double the current building's capacity to further support the research enterprise in this ever-expanding field of study. The capital budget for the project is estimated at \$37.5 million.

As consideration is given to budgeting and funding for the capital research projects contained in the Campus Master Plan, there is a realization that project funding will need to come from multiple sources — to include state Tuition Revenue Bonds, Permanent University Fund Bond Proceeds, UT System Revenue Financing System Bond Proceeds, external funding (gifts, grants, private donations/contributions), natural gas royalties (the institution's 2008 Natural Gas Plan approved by the Board of Regents specifies that 20 percent of such revenues will be used to fund the Campus Master Plan), and Unexpended Plant Fund Balances, as well as the possibility of additional allocations from the designated state funds to support the emerging research institutions.

Finally, while not related to research infrastructure, it is still worth noting two additional construction projects that will get under way in fiscal year 2010.

The first is a 6,500 seat Special Events Center that will dramatically change the landscape in the university and downtown district. The center will be home to UT Arlington athletics and also will provide an exceptional venue for commencement,

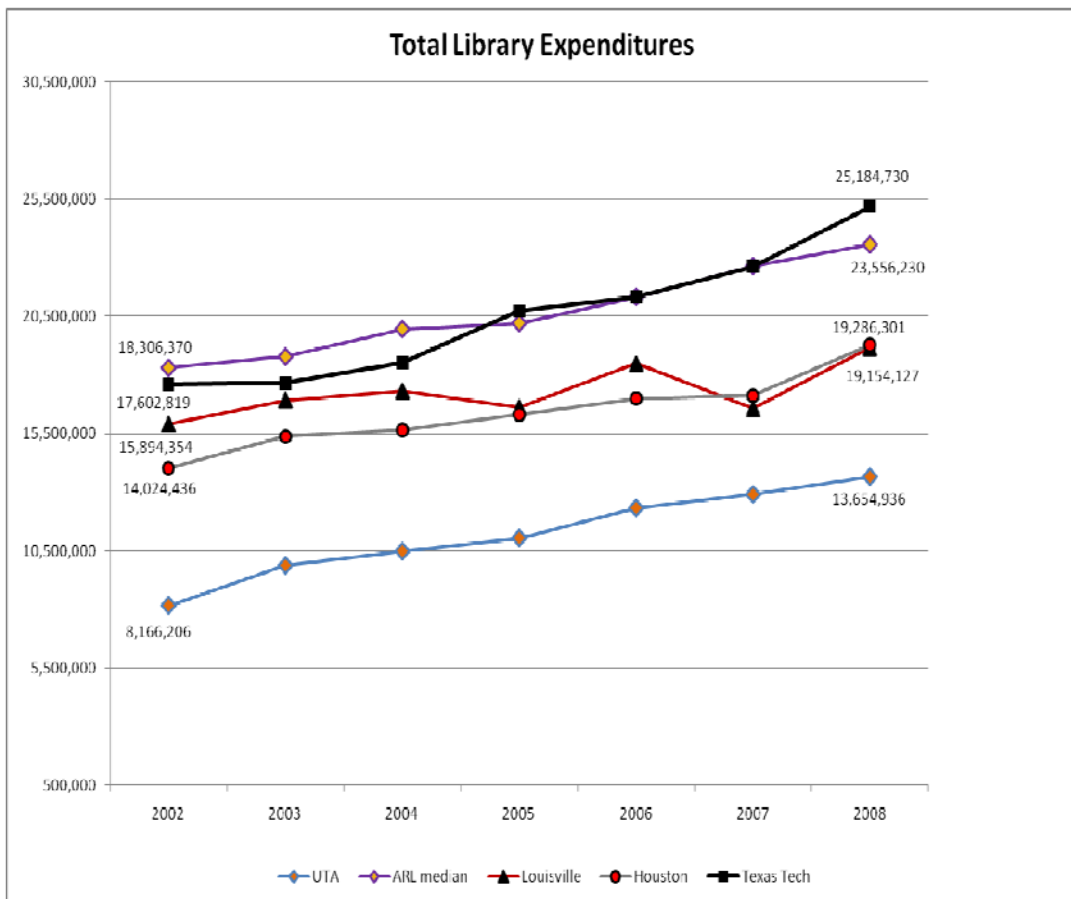
concerts, and many other community events. This venue will be ideally suited for high-profile lectures involving nationally and internationally recognized researchers. The facility will total over 218,000 gsf and is included in the UT System Capital Improvement Plan at \$78 million. It is a key component of the institution's co-curricular and enhanced student experience plans. The center will open in late 2011.

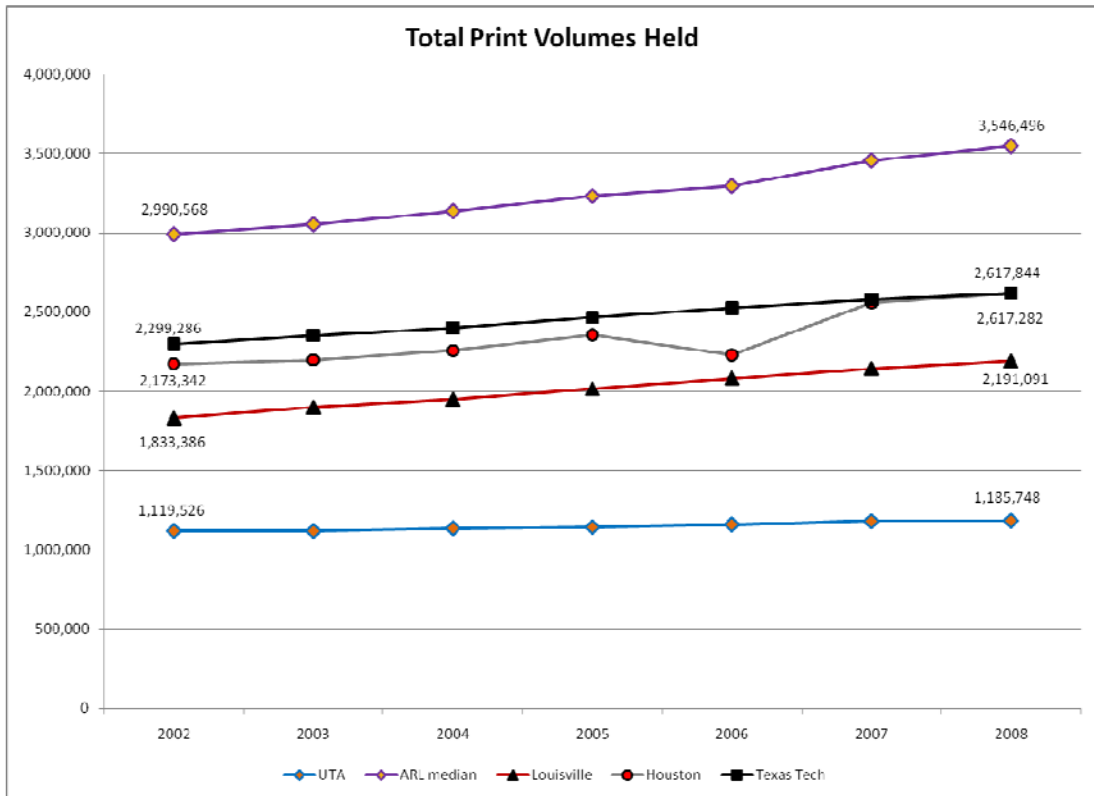
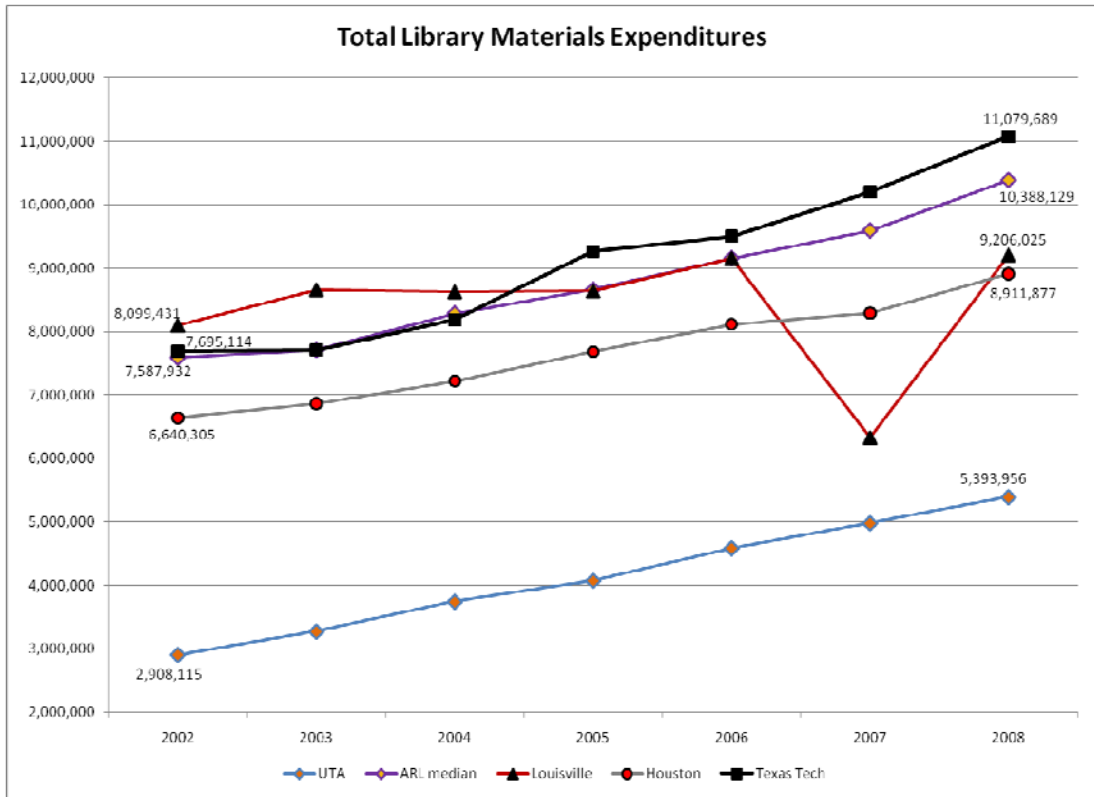
The second project is College Park, a planned mixed-use development to be constructed immediately north of the Special Events Center that will include an 1,800 car parking garage wrapped with a residence hall and student apartments, approximately 15,000 square feet of office and retail space, and the institution's new Welcome and Information Center. The preliminary project budget for College Park, which is expected to open in 2012, is \$80 million.

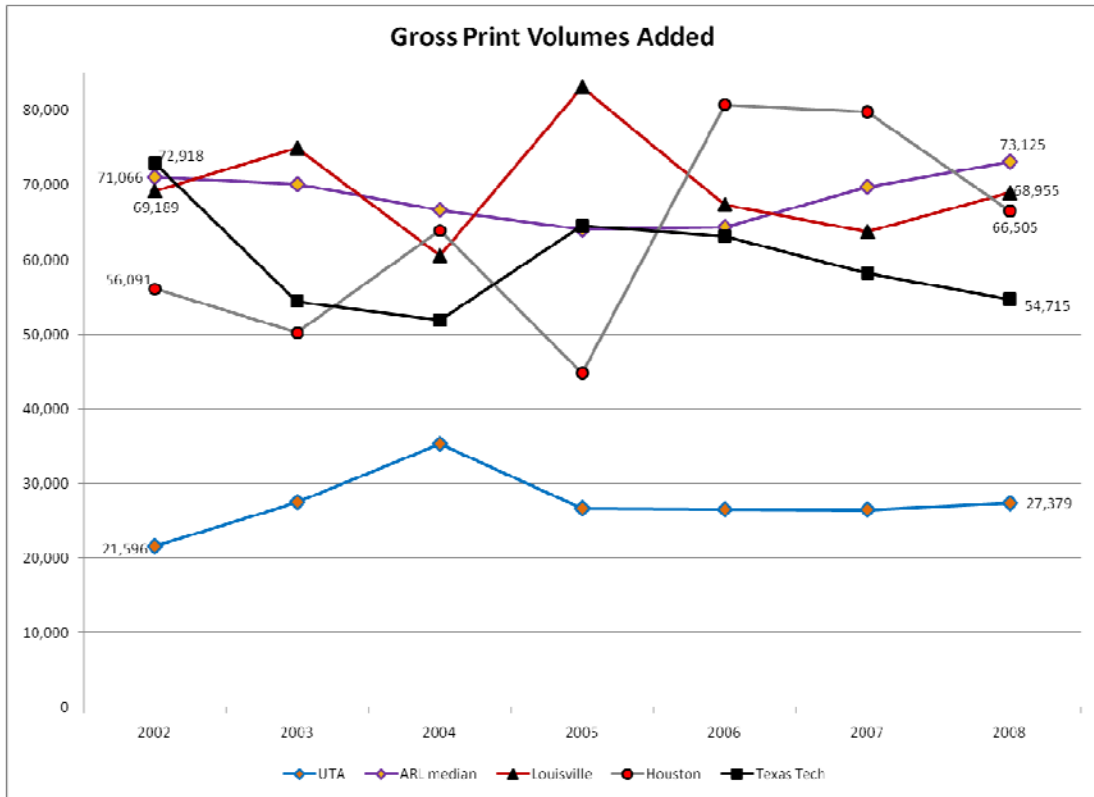
The Special Events Center and College Park will dramatically transform the university and downtown district, creating a more engaging college town community and achieving many of the university's goals related to student success initiatives.

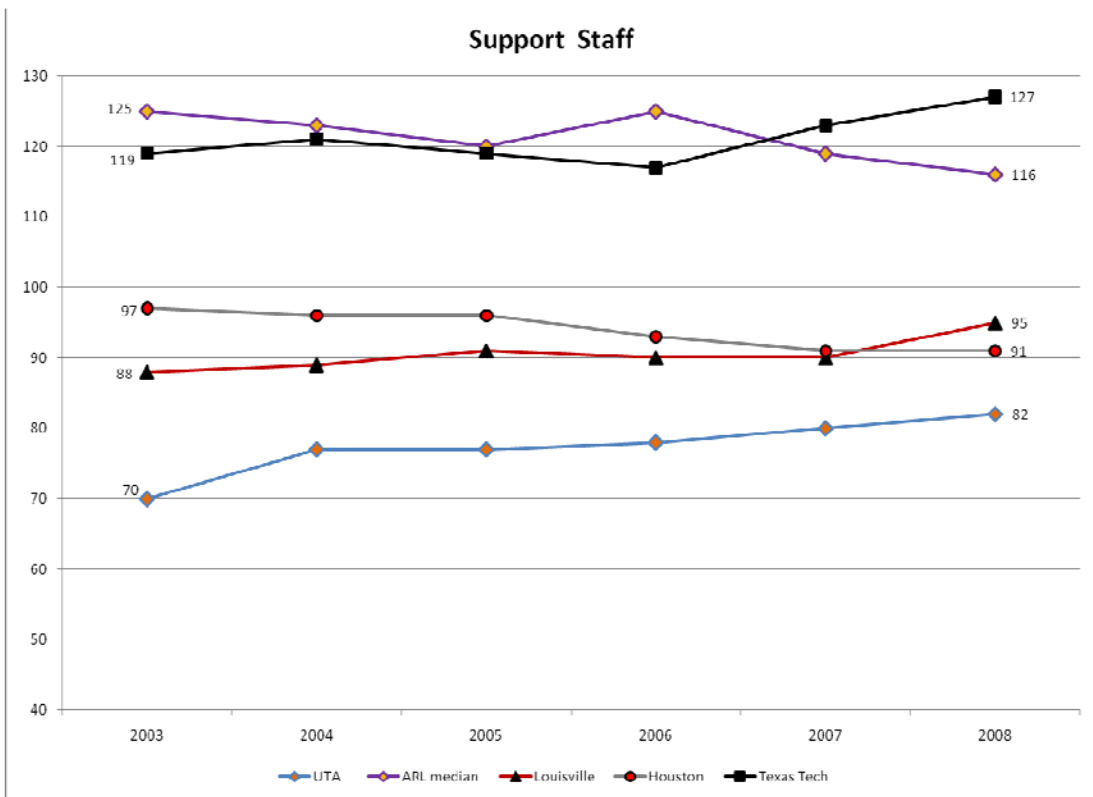
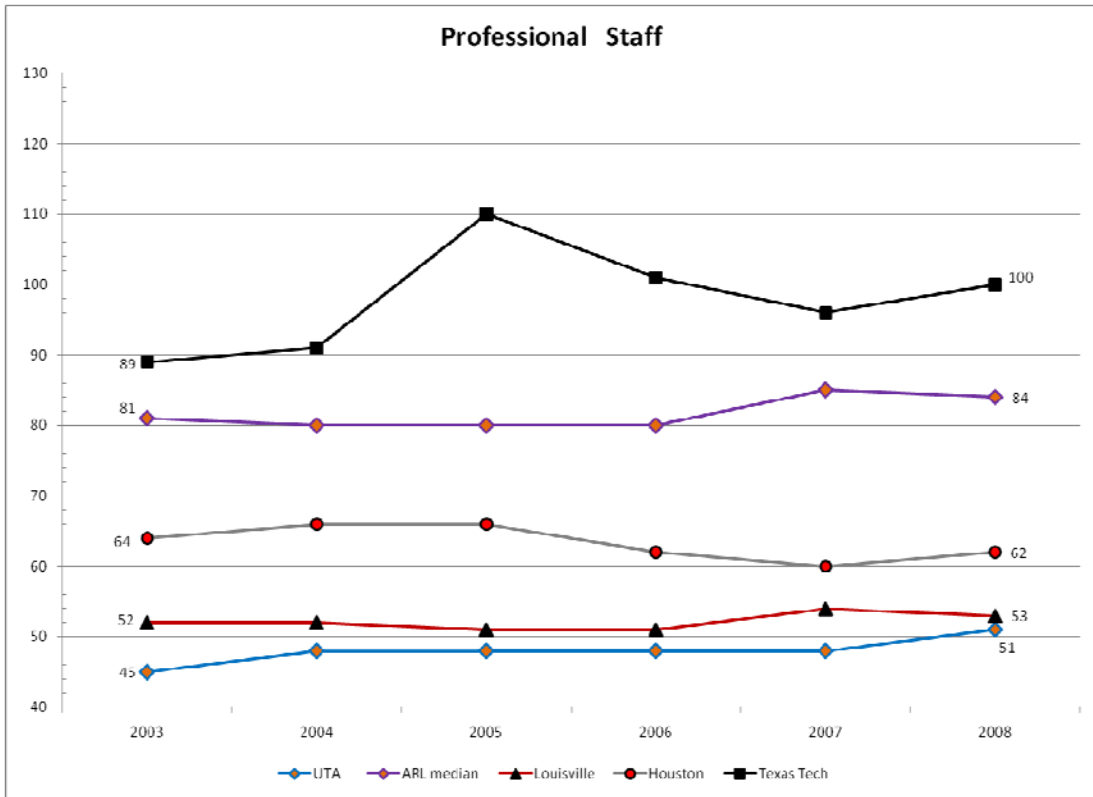
B. LIBRARY RESOURCES

It is the goal of UT Arlington to build library resources, services, and facilities to seek membership in the Association of Research Libraries (ARL) in the next fifteen years. Library staff members have been studying the current criteria for ARL membership and comparing UT Arlington data with those of various ARL libraries, including the University of Louisville, the most recent U.S. university to be invited to join ARL (2002); University of Houston and Texas Tech, both universities with ARL libraries; and the ARL median. Below are several graphs that plot where the UT Arlington Library stands in relationship with the above universities and the ARL median score.









In order for UT Arlington to apply for ARL status in 15 years, however, the following strategic goals and metrics for the library must be met in the next ten years, by 2020, and sustained at that level or greater for four succeeding years. Once these metrics are met, the institution will be ready to apply for ARL status in the fifteenth year (2025).

The library goals for the next ten years are:

1. The number of print volumes in the library collection will increase from 1.2 to 2.2 million volumes.
2. The total materials budget (acquisitions budget) will increase by 115 percent from \$6 to \$13 million.
3. The number of professional staff members will increase from 51 to 55 and support staff from 82 to 90.
4. The current Library Collections Depository (the library's remote storage facility) will be at least doubled in size to accommodate the storage of more than a million volumes and thousands of boxes of archival and manuscript collections (and will include cold storage) while the Architecture and Fine Arts Library will be expanded to accommodate additional users and services.
5. UT Arlington will dedicate funds to establish a digital laboratory to digitize the internationally important collections in the library's Special Collections, making them accessible to scholars around the world.
6. UT Arlington will fund the application of RFID tags on library volumes to better track, protect, and inventory its collection and prevent theft.
7. The library budget will increase by 70 percent to a total of \$23.8 million.

C. GRADUATE STUDENT SUPPORT

Attracting highly qualified and motivated doctoral students is pivotal to UT Arlington's strategic plan toward becoming a national research university. Qualified and motivated students will progress quickly in their studies and graduate on time, thereby increasing the number of doctoral degrees awarded annually. Having an exceptionally well-qualified graduate student body will greatly impact undergraduate student success.

UT Arlington does not currently offer competitive graduate assistantship stipends in all programs— nationally or regionally. In addition, very few of the institution's available teaching assistantships carry with them full tuition remission. A comprehensive plan has been developed to increase all graduate teaching assistantships to a nationally competitive level within three years. Competitive stipend levels have now been established in all doctoral programs across the institution.

Competition for the best graduate students is intense. Each doctoral program will be required to develop rigorous selection criteria for graduate assistantships, and they

must also develop a recruiting plan to ensure that UT Arlington's recruitment strategy extends beyond the region for all its doctoral programs. Students who hold such assistantships will be formally reviewed each year in order to ensure that acceptable progress is being made toward their degree.

Coinciding with the increase in graduate teaching assistantship stipends to nationally competitive levels is a plan to increase all graduate research assistantships to that same level. Beginning in September 2010, Principal Investigators (PI) will be required to use the Graduate Teaching Assistant stipend level plus tuition in all proposals. For those principal investigators seeking funding from organizations that do not, as a matter of policy, cover tuition, or that limit the amount that can be requested for a Graduate Research Assistant line, a separate funding source will be established to cover these situations.

VII. PLAN TO INCREASE NATIONAL AND INTERNATIONAL VISIBILITY

UT Arlington will enhance its national visibility in research, undergraduate and graduate education as it strives to transform itself into a national research university. Multifaceted interactions with industry, alumni, professional associations, and others in the community are of vital importance to the success of this endeavor.

The generosity of alumni, parents, corporate partners and friends creates opportunities for the institution to enhance the academic experience of its students and to support faculty to conduct research that will transform the institution, the community, and the nation through technology transfer.

A number of UT Arlington's programs are already nationally ranked or are on the cusp of national visibility. The College of Engineering has nationally recognized programs in Biomaterials and Tissue Engineering, Database Systems and Data Mining, and Nano-photonics. In addition, the Pulse Detonation and Supersonic Wave Engine Program and Texas Manufacturing Assistance Center have national visibility. The School of Urban and Public Affairs Program in Public Administration is recognized nationally as a regional leader. The College of Nursing Graduate MSN Program (Nurse Practitioner) has national recognition and the MSN in Nursing Administration is moving toward regional and national prominence with its Academic Partnership in Nursing Administration and the Executive MSN in Nursing Administration, which will be structured similar to Executive MBA programs.

The College of Liberal Arts programs in Art, History, and Linguistics have achieved national recognition in their fields. Two graduate programs within the School of Architecture have been recognized (Architecture) and ranked (Landscape Architecture) by Design Intelligence. Additionally, faculty members in the College of Science have generated international interest with their work in high-energy physics and genomics. Several programs within the College of Education and Health Professions are also recognized within their field.

China Immersion Executive MBA Program

Globalization is driving today's business, and success will certainly be influenced by the ability to navigate in international business environments. UT Arlington's China Immersion Executive MBA Program is an invaluable opportunity to understand and experience the power of global business. Students are connected with corresponding EMBA working professionals in China and provided the opportunity to unlock the potential of international collaboration. Students learn what they need to know about the global landscape, new emerging international markets and innovative approaches to global product development.

Throughout the EMBA program, the unique Asian global experience model, developed by UT Arlington's College of Business, serves as the cornerstone of the Graduate Certificate in Asian Studies in addition to the Executive MBA graduate degree. This dual combination of Executive MBA degree and Graduate Certificate in Asian Studies is unique UT Arlington's College of Business EMBA program.

APPENDIX

Performance Measures that Characterize National Research Institutions in the U.S. (Institutions that rank in the top 125 in the country)

The following metrics were derived from information provided by the *Center for Measuring University Performance* (<http://mup.asu.edu/>). This center is perhaps the only entity that ranks research institutions in the U.S. using a variety of metrics. Specifically, the Center ranks institutions on total research expenditures, federal research expenditures, size of endowment, annual giving, number of doctoral students graduated annually, number of post-doctoral associates employed annually, number of national academy members among faculty ranks, number of national merit scholars among student ranks, and number of prestigious faculty awards received annually.

A significant aspirational goal for UT Arlington is to meet the threshold value that defines the 125th ranked institution in the US for several of these measures. The table below provides the current institutional profile along with the values UT Arlington strives to meet within the next ten years.

DESIRED INSTITUTIONAL PROFILE FOR UT ARLINGTON BY 2020

Metric	UT Arlington 2008	Target for 2020
Total Research Expenditures	\$51 million	\$210 million
Federal Research Expenditures	\$21 million	\$125 million
Number of Ph.D. Graduated	153	200
Number of Post-Doctoral Associates Employed	79	100
Number of National Merit Scholars on Student Body		10
Number of National Academy Members on Faculty	0	4
Number of Faculty Awards	2	5

UT ARLINGTON DOCTORAL PROGRAMS

Authorized Doctoral Degree Programs				
January 2010				
College/School	Doctoral	Professional	Programs	CIP Code
College of Business	PHD		Business Admin - Management	52.0201.00
	PHD		Business Admin - Management Sciences	52.0201.00
	PHD		Business Admin - Finance	52.0803.00
	PHD		Business Admin - Business Statistics	52.1302.00
	PHD		Business Admin - Marketing	52.1401.00
	PHD		Business Admin - Accounting	52.0301.00
	PHD		Business Admin - Information Systems	52.1201.00
College of Education	PHD		Educational Leadership	13.0401.00
College of Engineering	PHD		Biomedical Engineering (joint program with UT Southwestern Medical Center, Dallas)	14.0501.00
	PHD		Civil Engineering	14.0801.00
	PHD		Computer Engineering	14.0901.00
	PHD		Computer Science	11.0101.00
	PHD		Electrical Engineering	14.1001.00
	PHD		Industrial Engineering	14.3501.00
	PHD		Materials Science & Engineering	14.1801.00
	PHD		Aerospace Engineering	14.0201.00
	PHD		Mechanical Engineering	14.1901.00
College of Liberal Arts	PHD		English	23.0101.00
	PHD		Linguistics	16.0102.00
	PHD		Transatlantic History	54.0199.01
School of Nursing		DNP	Nursing Practice	51.1699.70
	PHD		Nursing Science	51.1608.00
College of Science	PHD		Environmental and Earth Sciences	03.0104.00
	PHD		Quantitative Biology	26.1101.00
	PHD		Chemistry	40.0501.00
	PHD		Mathematics	27.0101.00
	PHD		Physics and Applied Physics	40.0801.01
	PHD		General Experimental Psychology	42.0801.00
School of Social Work	PHD		Social Work	44.0701.00
School of Urban and Public Affairs	PHD		Urban Planning & Public Policy	44.0401.00
	PHD		Public and Urban Administration	44.0401.00
Total	30	1		

Source: Texas Higher Education Coordinating Board Program Inventory



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