

STRATEGIC PLAN FOR RESEARCH

THE UNIVERSITY OF TEXAS AT SAN ANTONIO

Submitted to:

The Texas Higher Education
Coordinating Board
Austin, Texas

March 1, 2018

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Executive Summary

UTSA is committed to becoming a student focused, comprehensive research university that will fuel innovation and prosperity for San Antonio and South Texas. This focus will drive research and creative discovery aligned to a series of critical pathways to achieve R1 Carnegie Classification and trigger the Texas' National Research University Fund (NRUF) within the next five years. With the vision of a new president, UTSA has laid out a plan to: grow the university's research funding; attract new partners and create new partnership models; recruit additional research-focused faculty to support our defined areas of research excellence; cultivate our existing faculty to be recognized for their research activities; and engage more students in research, innovation and discovery.

Specific goals for the next five years are based on the current momentum of the university and expected and continued growth to include the following:

- Increase total enrollment to over 36,000
- Increase the number of tenured and tenure-track faculty to over 800
- Increase annual research expenditures to \$115M (total R&D), \$64M (restricted R&D), \$38M (federal R&D)
- Increase the doctorates awarded from 113 (Fall 2017) to 264
- Increase the endowment to over \$400M

Table 1. UTSA High-Level Summary

AREA	PARAMETER	FALL 2017	IN 5 YEARS 2022
STUDENTS	Total Enrollment	30,674	36,487
	FTE Enrollment	24,562	29,418
	4-Year Graduation Rate	22%	25%
	6-Year Graduation Rate	37%	44%
FACULTY	Tenured & Tenure-Track	632	808
	Faculty w/ Externally Funded Research	312	485
	% of Tenured, Tenure-Track Faculty w/ Externally Funded Research	50%	60%
RESEARCH	Total R&D	\$68,137,959	\$115,000,000
	Restricted R&D	\$40,091,697	\$64,000,000
	Federal R&D	\$28,046,262	\$38,000,000
DOCTORAL PROGRAMS	Number of Doctoral Programs	24	30
	Annual Graduates	113	264
OTHER	National Academy Members	1	5
	Endowment	\$154.2M	\$400M
	Academic and Research Space	710,693 sq. ft. (Acad.) 302,266 sq. ft. (Rsrch.)	802,116 sq. ft. (Acad.) 393,689 sq. ft. (Rsrch.)
	Postdoctoral Scholars	85	110

Introduction

Synopsis of UTSA Profile

The University of Texas at San Antonio (UTSA) is an emerging urban-serving research institution with nearly 31,000 students, including more than 4,200 graduate students, and more than 119,000 alumni. It is the largest university in the San Antonio metropolitan region, and the 8th largest in Texas.

Founded by the Texas Legislature in 1969, UTSA has an operating budget of \$550 million. With nine colleges, UTSA offers 67 bachelors', 69 master's and 24 doctoral programs.

A member of the University of Texas System, UTSA is a Hispanic-Serving Institution (HSI) with 67% of the student population identifying as Hispanic. Nearly 10% of the student population is designated as veterans. UTSA is an institutional member of the Hispanic Association of Colleges and Universities (HACU). Additional academic affiliations include ORAU, AASCU, AACU, APLU and CNAHEC.

UTSA has three campuses: Main Campus, Downtown Campus and Hemisfair Park Campus.

Main Campus | 1 UTSA Circle, San Antonio, TX 78249-3209

With 29 buildings on 725 acres, the UTSA Main Campus houses the Business, Education and Human Development, Engineering, Liberal and Fine Arts, Science, University, University College, and Honors academic colleges. It's also home to the Park West Athletics Complex.

Downtown Campus | 501 W. César E. Chávez Blvd. San Antonio, TX 78207

Located west of I-35 in the historic Cattleman Square District, the Downtown Campus is 18 acres and is home to the Colleges of Architecture, Construction and Planning, Education and Human Development, and Public Policy.

Hemisfair Campus | 801 E. César E. Chávez Blvd. San Antonio, TX 78205-3209

Inside UTSA's Hemisfair Campus, the Institute of Texan Cultures hosts exhibits and live performances. Through its research, collections, exhibits and programs, the ITC serves as the forum for the understanding and appreciation of Texas and Texans.

The University of Texas at San Antonio is led by President Taylor Eighmy, appointed in September 2017.

The University of Texas at San Antonio is dedicated to the advancement of knowledge through research and discovery, teaching and learning, community engagement and public service. As an institution of access and excellence, UTSA embraces multicultural traditions and serves as a center for intellectual and creative resources as well as a catalyst for socioeconomic development and the commercialization of intellectual property – for Texas, the nation and the world.

I. Vision Statement

On September 1, 2017, Dr. Taylor Eighmy began his service as the sixth president of UTSA. President Eighmy set in motion a series of key initiatives, the first phase of an immediate strategy to make UTSA San Antonio's university of the future and help it earn National Research University Fund (NRUF) eligibility and R1 (highest research activity) classification from the Carnegie Commission, critical steps along the university's path to becoming a great discovery enterprise.

By leveraging UTSA's research enterprise and strategically located Downtown Campus, Dr. Eighmy is currently developing plans to make UTSA the city's anchor for cradle to career education, economic development and community engagement – efforts that will help all San Antonians realize their dreams and attain prosperity.

A set of institutional themes and initiatives form the vision framework:

Strategic Themes

THEME 1: A Great Multicultural Discovery Enterprise

As a learning and research enterprise and next generation Hispanic-Serving Institution, UTSA will foster innovation and creative discovery by channeling our expertise into tackling critical societal issues of today and tomorrow. Cultivating a research-intensive environment where underserved students can thrive results in prosperity and opportunities for all. Transdisciplinary discovery and continuous reinvention will fuel corporate and foundational partnerships, allowing us to leverage UTSA's scholarly impact for the betterment of our world. Adopting a HSI-Carnegie R1 excellence model will propel UTSA to a new level of distinctiveness.

THEME 2: An Exemplary Urban-Serving University of the Future

Great cities need great universities and great universities need great cities. San Antonio serves as a living laboratory for learning, discovery and engagement, providing opportunities for experiential learning, cradle to career education and developing leaders for tomorrow. Active engagement with San Antonio's educational and health care systems, business communities, cultural establishments and governmental entities will solidify UTSA's role as a driver of San Antonio's cultural and economic ecosystem.

THEME 3: World Engaged

San Antonio is a multicultural, large city that serves as a portal to the Americas and the world. By building on our deep ties to Mexico and Latin America, we will bring some of the world's greatest minds to UTSA, expanding global partnerships and learning opportunities for our students. As we prepare students to be thoughtful, engaged and world-ready citizens, we will take advantage of San Antonio's unique global position. Our students will receive the intercultural knowledge they need to succeed as future leaders.

THEME 4: UTSA will Foster Exceptional Student Experiences

Creating an atmosphere where students feel welcome, supported and engaged is key to our retention and graduation efforts. UTSA will adopt a student-centric approach to our academic and out-of-classroom experiences, cultivating a sense of community even as our student population continues to grow. In alignment with U.T. System's Quantum Leap on Student Success, we will ensure our students have outstanding experiences in all facets of their academic and co-curricular activities, all while developing their sense of belonging at UTSA.

THEME 5: Cultivating the Excellence of our People

Universities can only achieve greatness through the cumulative intellectual talent of students, faculty and staff. Claiming areas of distinction as an institution hinges on the quality of our people. Our role as a driver of San Antonio's knowledge economy requires that we grow the talent of our people, and continue to recruit world-class thought-leaders, researchers, teachers and mentors. In order to reflect the community we serve, we will emphasize increasing the diversity of our leadership and faculty.

THEME 6: Operational and Infrastructure Excellence

All of our aspirations require effective and efficient solutions to resource utilization and infrastructure management. We will integrate innovative approaches and best practices to ensure our operational processes align with our goals, demonstrating nimbleness as an organization that resists ossification. This will require pursuit of new revenue streams, adoption of performance based budget models, monetization of our real estate assets and exploration of ways to reduce the financial debt burden on our students.

Strategic Initiatives

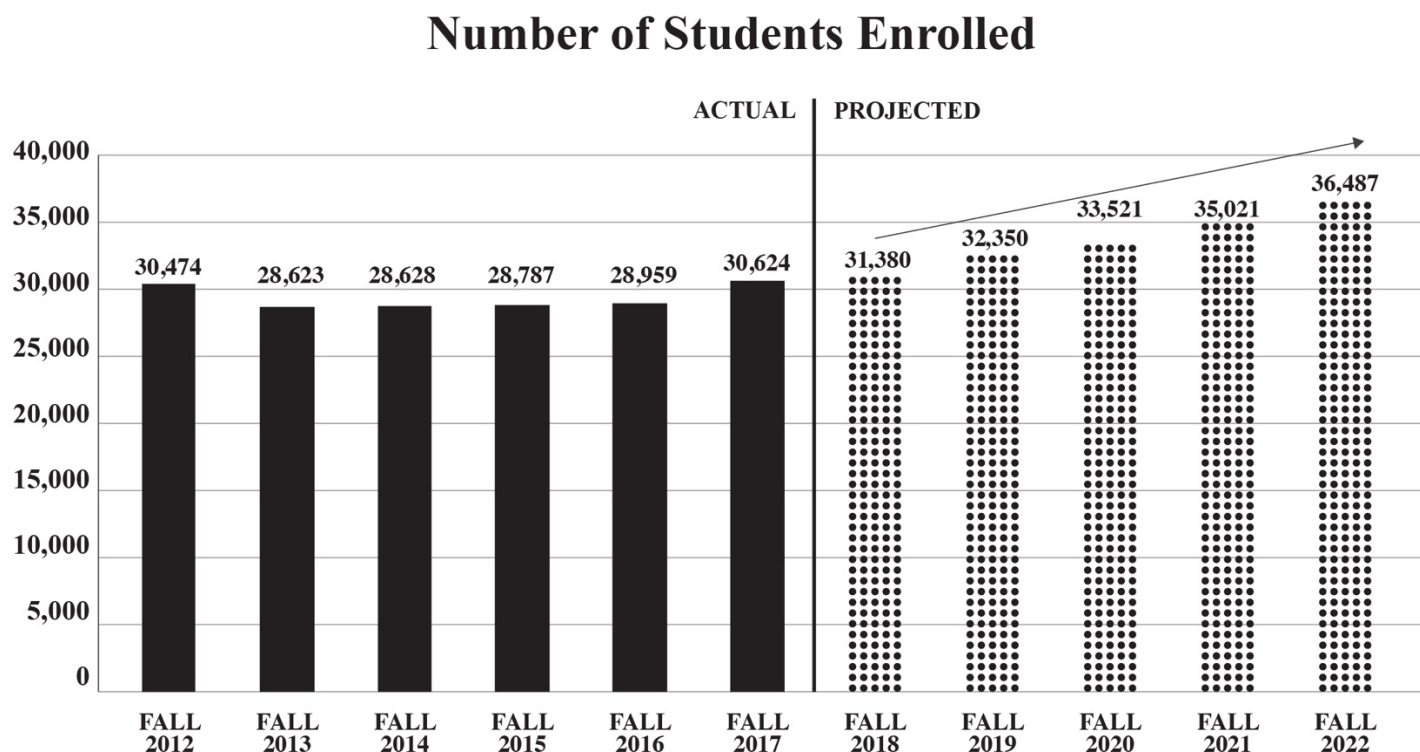
To build momentum, three Presidential Initiatives launched in fall 2017 to address the institution's highest priorities. These metrics-driven initiatives are highly integrated and have broadly representative task forces.

The first is to develop an integrated student success plan that considers the continuum from K-12 through recruitment, enrollment, academic progress, career services and placement. Over the next decade, UTSA will continue to focus its efforts on the retention and academic success of first-generation and low-income students.

Demographically, San Antonio reflects what the nation as a whole will look like over the next 20 years, making UTSA uniquely qualified to forecast the needs and challenges of the nation's changing population.

The second is to create an integrated strategic enrollment plan that adopts a creative, data analytics-driven strategy for enrollment. The work will include determining the optimal mix of undergraduate and graduate students, in-state and out-of-state students, and international students, all within the context of our role as a doctoral-granting institution. Additionally, task force members are carefully examining the 60/30TX Higher Education Plan as well as the knowledge economy needs of San Antonio given our region's emerging industries. Our current enrollment (Fall 2017) is 30,674. Our goal in 2022 is 36,487. (See **Figure 1**)

Figure. 1 Enrollment Trends from 2004 to 2017, and Projections for 2018 to 2022



The third is to create a new budget model that is transparent, data-driven, supports entrepreneurship and innovation, and aligns resources needed for our strategic mission, vision and themes. In addition to assessing our current financial practices, this task force is developing strategies to optimize our financial resources and our expenditures by adopting best financial practices.

Additional strategies will be forthcoming under the new president.

President Eighmy's vision stands on the shoulders of the university's prior strategic plan, Blueprint UTSA. The new strategic themes and initiatives build on the Blueprint's foundation, but looks ahead through an aspirational lens that extends beyond the previous focus on attaining a Tier One designation for UTSA. Though the tenets of pursuing Tier One status are embedded in the strategic themes, it is no longer the focus. This shift allows for the institution to better differentiate itself from other Texas institutions, and refocus on the larger goals of positioning UTSA to tackle the grand challenges of today's world in partnership with the city of San Antonio.

In sum, President Eighmy's vision is a natural expansion of UTSA's existing mission, but with a new emphasis on becoming world-recognized as a great multicultural discovery enterprise, with key goals for growth and research expansion (See **Table 2**), while simultaneously providing pathways that prepare students from diverse backgrounds for the jobs of the future.

Table 2. Summary of UTSA Key Goals for Growth and Research Expansion

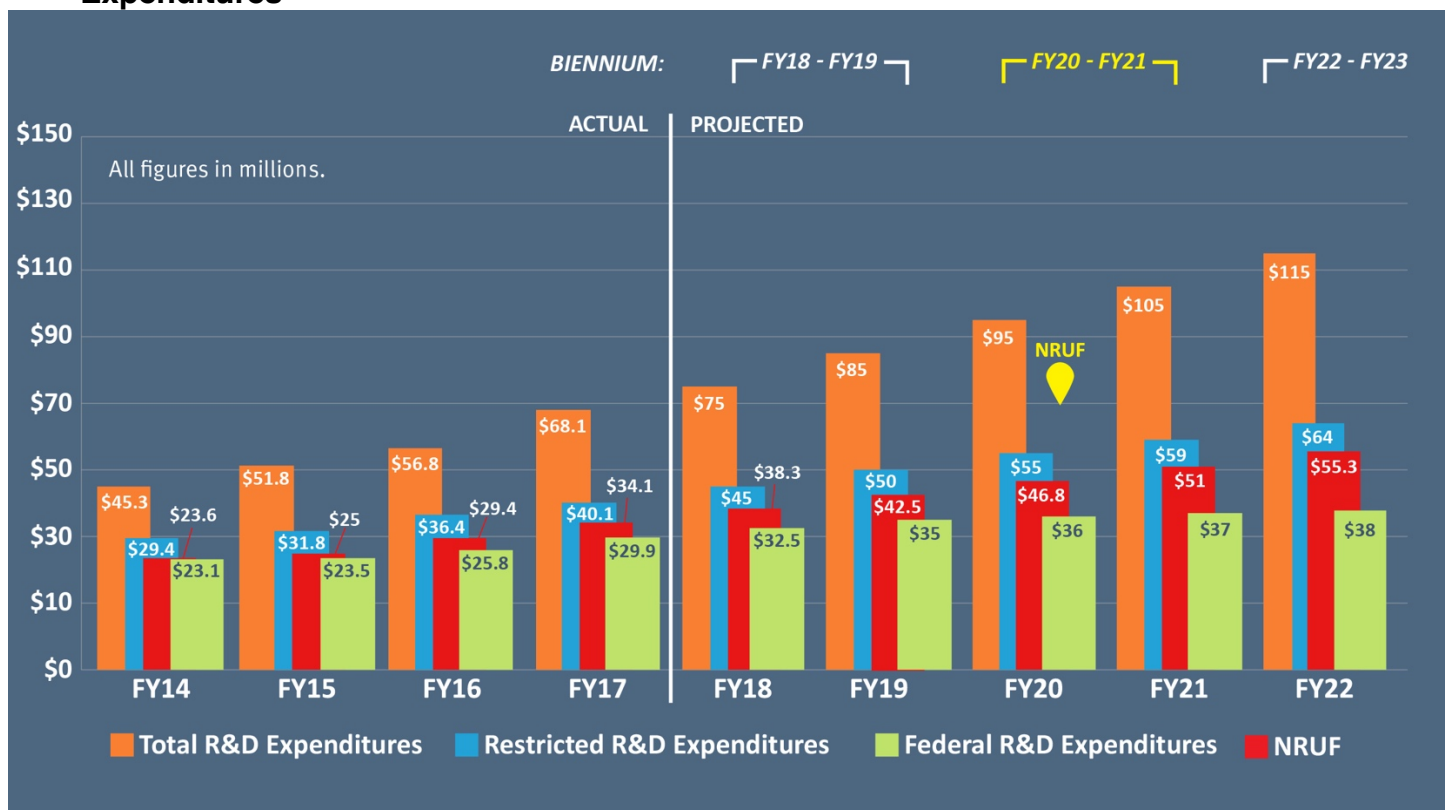
Parameter	Current Fall 2017	Target: 5 years 2022
Student Enrollment	30,674	36,487
Tenured/TT Faculty	632	808
Faculty w/Externally Funded Research	312	485
Postdoctoral Scholars	85	110
Total Research	\$68,137,959	\$115,000,000
Restricted Research	\$40,091,697	\$64,000,000
Federal Research	\$28,046,262	\$38,000,000
Endowment	\$154.2M	\$400M
Doctorates Awarded	113	264
National Academy Members	1	5

I. Plan to Increase Research Funding and Productivity

A. External Funding

Total research expenditures increased from \$56.8 million in FY16 to \$68.1 million in FY17, an increase of 19.9%. The university's restricted research expenditures grew from \$36.4 million in FY16 to US \$40.1 million in FY17. Based on this momentum and strategic framework that has been laid out, we anticipate a projected growth of total R&D expenditures to exceed \$115 million by 2022 (See **Figure 2**). This growth will help UTSA move closer toward becoming recognized as a research intensive (R1) university, as measured by the Carnegie Foundation for the Advancement of Teaching¹, and meeting eligibility for Texas' National Research University Fund (NRUF)² [See **Figure 2**]. Achievement of NRUF will trigger additional income as listed in **Table 4**.

Figure 2. Past and Projected Trends in Federal and Restricted Research Expenditures



A focus on research expenditure growth started with the implementation of “Accelerate 2025: UTSA’s Framework for Top Tier Research” plan. It was conceived in 2014 through collaboration and in-depth discussions across all levels of faculty and leadership at that time. The framework illustrated how the institution was poised to become an R1 research institution, and delineated what we had to do to achieve this

¹ <https://www.carnegiefoundation.org>

² <http://www.thecb.state.tx.us/index.cfm?objectid=0BFA90B1-E0AF-4768-F7F2C724B47B209D>

goal. UTSA has executed a series of pathways with the implementation of Accelerate 2025, which has significantly contributed to the institution's increased research expenditure trajectory.

Reference: http://research.utsa.edu/wp-content/uploads/2014/12/Accelerate_2025.pdf

UTSA identified eight pathways to success:

- Pathway 1: Invest in faculty to increase funded research**
- Pathway 2: Capitalize and promote areas of research excellence**
- Pathway 3: Reward scholarly excellence**
- Pathway 4: Enhance graduate and undergraduate research**
- Pathway 5: Strengthen and expand research partnerships**
- Pathway 6: Enhance research infrastructure**
- Pathway 7: Increase the impact of university innovations**
- Pathway 8: Build effective communications**

UTSA will continue investing to grow our research enterprise with a number of additional initiatives described in this plan, all linked to the above pathways. Pathways and outcomes are continuously monitored and measured, with adjustments implemented as required in real-time. These pathways are, and will continue to be, tied into the needs of our faculty, students, the local and regional research and innovation ecosystem and where possible, supportive of UT System initiatives, such as the Chancellor's Quantum Leads, STARs program and federal outreach efforts.

To further grow the research enterprise, UTSA has identified the following ten universities from to which to draw a comparison. They were selected based on a number of criteria including the strategies listed previously. Eight institutions are R1 Carnegie Classified, to which we aspire, and three are members of the AAU. (See **Table 3.**)

Table 3. Summary of Selected Characteristics of our Benchmark Universities^{1,3}

University	Carnegie Classification / CMUP	Medical School?	Member, Assoc. of American Univ. (AAU)	Total Enrollment ²	Number of Tenure-Line Faculty	Total Research in 2016 (\$M)	Federally Funded Research in 2016 (\$M)
Arizona State University	R1	Yes	No	97,849	1,306	\$518.2M	\$212.4M
Florida International University	R1	Yes	No	55,003	718	\$170.8M	\$76.1M
George Mason University	R1	No (pre-med)	No	34,909	876	\$108.9M	\$58.9M

Georgia State University	R1	No (pre-med)	No	32,237	745	\$161.3M	\$52.4M
Portland State University	R2	No (pre-med)	No	26,627	590	\$56.6M	\$32M
University of California-Irvine	R1	Yes	Yes	32,754	1,197	\$345.3M	\$177.8M
University of California-Riverside	R1	Yes	No	22,715	751	\$152.2M	\$70.5M
University of California-Santa Cruz	R1	No (pre-med)	No	18,783	536	\$151.2M	\$95.3M
University of Maryland-Baltimore County	R2	Yes	Yes	13,640	394	\$70.2M	\$51M
University of Oregon	R1	No	Yes	23,546	744	\$100.8M	\$66.9M
AVERAGE	-	-	-	35,806	786	\$183.6M	\$89.3M
UTSA IN FALL 2016	R2	No	No	28,959	645	\$59.8M	\$25.8M
UTSA IN FALL 2017	R2	No	No	32,674	621	\$68.1M	\$29.9M

1. UTSA Institutional Research Office
2. IPEDS Enrollment
3. CMUP

B. Research Priorities

Based on critical mass of existing faculty, five-year funding history, publication and citation success, record of research partnerships at the local, regional and national levels, as well as input from leadership in the colleges, five well established Areas of Research Excellence were identified and consolidated in “Accelerate 2025” and further refined in 2017-2018 based on the President’s Initiatives. Leading with further investment in these areas will provide the best opportunity to expeditiously increase overall research expenditures and faculty research productivity. Targeted approaches to enhance these areas of excellence and commensurate research expenditures will be referenced further in the plan.

Areas of Research Excellence

1. Advanced Materials and Manufacturing
2. Cloud, Cyber, Computing, Analytics & Data Sciences (C3A)
3. Integrative Biomedicine
 - a. Human Immunology and Infectious Diseases
 - b. Neurosciences/Brain Health
 - c. Regenerative and Molecular Medicine
4. Social and Educational Policy & Innovation
5. Sustainable Communities and Critical Infrastructure

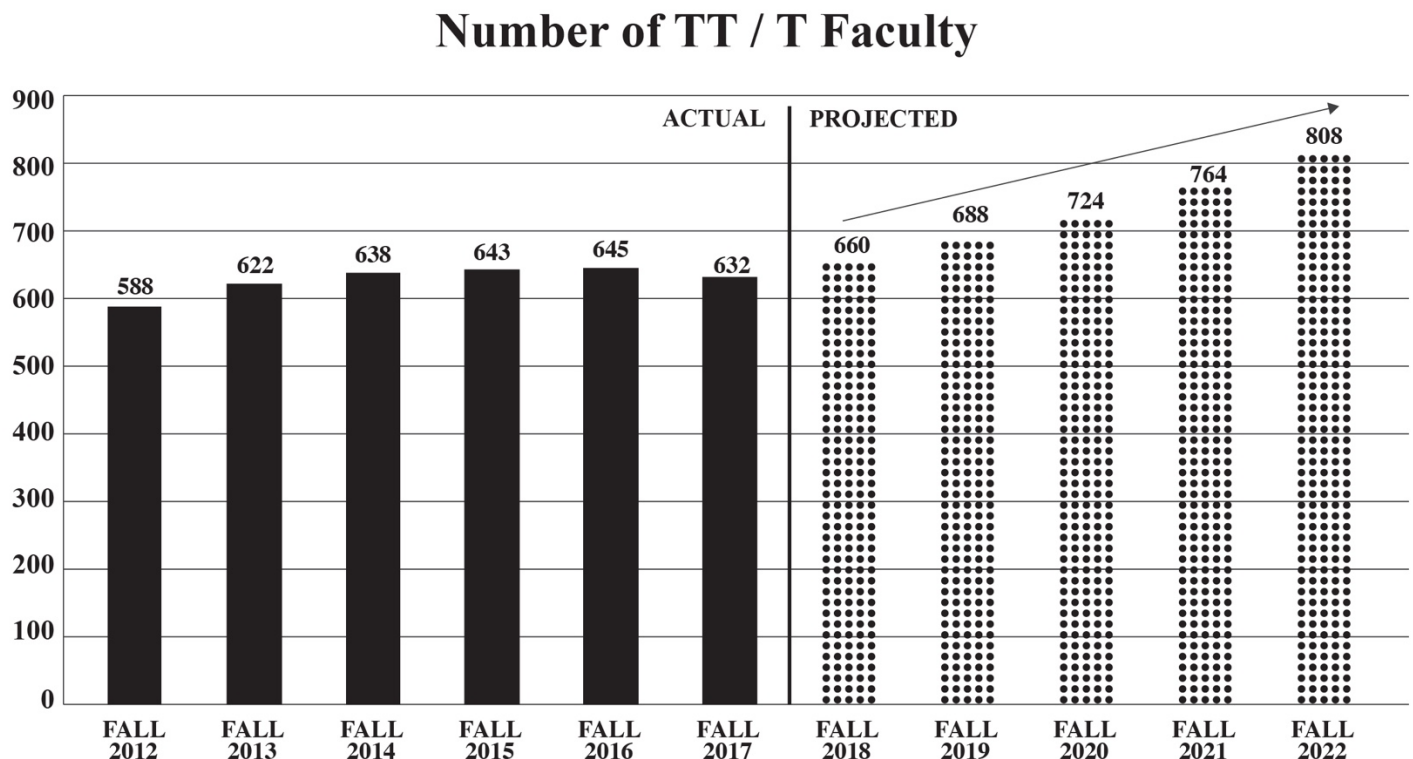
Research Centers and Institutes

The research institutes at UTSA are aligned with our areas of research excellence, and are cross-disciplinary collaborations within the university that sponsor research that informs public policy, builds cultural understanding, improves medical care, enhances scientific knowledge and often advances economic development. There are currently 23 research centers and institutes at UTSA which are governed by The Deans Research Council (DRC). (See **Appendix C**)

Goals for Research Faculty Productivity

UTSA understands that in order to increase funded research, the institution must grow its faculty body (See **Figure 3**). Faculty growth is closely linked to the areas of excellence (See **Section B**). We anticipate faculty growth to align to the expansion of overall research portfolio and commensurate with research expenditures (See **Figure 2**).

Figure 3: Past and Projected Tenured and Tenure-Track Faculty Growth



From 2012 to 2017, UTSA experienced a fluctuation in faculty losses and hires. The institution leadership plans for a steady increase in net faculty hires in future years, with a goal to successfully employ a minimum of 808 tenured/tenure-track (T/TT) faculty by 2022. Growth of faculty alone will not necessarily translate into increased research expenditure. The institution must employ strategies to increase the number of faculty who are successfully securing external funded to support their research. These strategies are described in **Section V. Plan for Faculty and Student Development.**

The productivity on a per-faculty-member basis for the approximate 312 faculty members who were involved in externally funded research at UTSA in 2017 is:

- \$218,000 per faculty member in total research expenditures (\$68M in total)
- \$128,000 per faculty member in restricted research expenditures (\$40M in total)
- \$93,000 per faculty member in federal research expenditures (\$29M in total)

By 2022, UTSA aims to increase the number of externally funded researchers to 485. The productivity on a per-faculty-member basis for an estimated 485 faculty members involved in externally funded research is:

- \$237,000 per faculty member in total research expenditures (\$115M in total)
- \$132,000 per faculty member in restricted research expenditures (\$64M in total)
- \$113,000 per faculty member in federal research expenditures (\$55M in total)

C. Allocation of Resources

Under President Eighmy's directive, a comprehensive research university require a new budget model that is transparent, data-driven, supports entrepreneurship and innovation, and aligns resources needed for our strategic mission, vision and themes.

As mentioned previously (**Section 1**), a task force is assessing our current financial practices and is developing strategies to optimize our financial resources and our expenditures by adopting best financial practices.

Current funding levels from general revenues appropriation and current tuition and required fees for students are assumed to scale with inflation over time.

The projected new annual income and expenses (five years), are summarized in **Tables 4 and 5**. The business model is based on growth in enrollment and research, producing proportional growth in faculty and providing the financial means to pay for the overall growth plan.

Table 4. Projected Additional Annual Income from New Revenue Sources in 5 Years

Source of Additional Income	Projected New Annual Income
Increased Enrollment	\$32.0M
Set Aside Scholarships (from Enrollment Income)	\$3.2M
Technology Commercialization	\$0.3M
Additional indirect cost income from increased research	\$4.5M
*National Research University Fund	\$18.0M
**Core Research Support	\$1.8M
***Income from Increased Endowment	\$12.3M
Start-up (STARS) funds from UT System	\$10.0M
TOTAL	\$82.1M

*Anticipated UTSA achieving NRUF status in 2021; receiving \$9M

**8% increase in FY20; additional 5% increase FY22

***Based on investment returns of 5% of \$245.8 million

Table 5. Projected New Annual Expenses in 5 Years

New Expense	Projected New Annual Expenses
New faculty members, support staff, and operating costs (staff, instructional resources, labs, equipment, IT, security, utilities, and building maintenance)	\$10.0M
Research support staff	\$1.8M
Student support (merit based scholarships for undergraduate students and fellowships for graduate students)	\$3.7M
Student Success (funded with 40% Endowments)	\$4.9M
Faculty Recruitment (funded with 60% Endowments)	\$7.4M
New Partnerships (25% NRUF)	\$4.5M
Research related expenses (75% NRUF)	\$13.5M
Start-up costs for new faculty	\$13.8M
*Other non-research related expenses	\$21.7M
TOTAL	\$81.3M

*Operations and maintenance, staff salaries, and utilities

New Buildings

Three new research and instruction buildings are in development/planning for the next five years. These buildings are programmed in line with the need for instructional space and expanded research activities, primarily in sciences, engineering and computation.

A. Science and Engineering Building (SEB)

The new Science and Engineering Building will be a four-story structure located off Bauerle Road and Key Circle on the UTSA Main Campus. It will provide 153,000 square feet of laboratory, classroom and meeting space to support students and researchers in brain health, chemical engineering, biology and chemistry. The total projected cost is \$95M and the estimated completion date is 5/18/2020.

Many of the laboratories in the building will be surrounded in glass so students and visitors walking by can see what's going on, a concept referred to as science on display. The goal is to encourage interaction among students from different majors, creating opportunities for students and faculty members to connect with people who have different interests. In addition to engaging more students in research, the approach has shown to improve student retention and graduation rates.

Footprint:

1 ST floor:	Engineering makerspace, collaboration spaces, Center for Innovation and Technology Entrepreneurship
2 ND floor:	Biology and instructional engineering laboratories; collaboration, classroom and office space
3 RD floor	Chemistry and chemical engineering laboratories; collaboration, classroom and office space
4 TH floor	Brain health and chemical engineering laboratories; collaboration and office space


Key Features:

- Building includes of makerspace where engineering students will design, test and fabricate their senior projects
- Building will bring together students, faculty and staff in UTSA's Brain Health Initiative
- Special two-story space will house a distillation column for chemical engineering research

B. Large-Scale Structural Testing Facility (See **Section VI.A** for details)

C. Computational Research Building (CRB)

The University of Texas at San Antonio (UTSA) seeks to establish The National Security Collaboration Center, which will focus on the advancement of research, education, and workforce development in the areas of cybersecurity, data analytics, and cloud computing as they apply to national security, for which there is an immediate national need. It will reside in the proposed Tricentennial Innovation Park to be established on the Main Campus. The total projected cost for the CRB is \$65 million (exclusive of \$10 million site development costs) and will provide 100,000 square feet of space. The targeted completion date is May 2022.

To house the NSCC, UTSA is programming a new 5-story building to enhance the cybersecurity ecosystem in the region. The **Computational Research Building (CRB)** will provide 100,000 square feet of state-of-the-art space that will house all computational capabilities, including  an Innovation Factory where academia, industry and government can rapidly develop products for application in the national security enterprise.

Federal, state, and local agencies are calling for greater collaboration related to America's national security infrastructure protection. Business and local government partners will have direct access to the technical expertise, highly trained students and specialized facilities that make UTSA a premier program in cybersecurity.

The National Security Collaboration Center, housed within the Computational Research Building (CRB), will focus on:

• Forensics	• Cyber Physical Systems/Embedded Security
• Visualization and Analytics	• Security of the Cloud
• Network Security	• Attack and Threat Modeling and Mitigation
• Cyber Training/Workforce Development	• Machine Learning and Artificial Intelligence
• Big Data Analytics and Privacy	• Platform and Software Integrity
• Post-Quantum Cryptography	• Hardware Integrity

The new CRB will be a hub for cyber activity in the region.

Footprint:

1 ST floor:	Research IT: Visualization Lab High Performance and Cloud Computing, Data Center
2 ND floor:	Cyber, Cloud Computing and Analytics Research Centers
3 RD floor:	Business Incubator/Innovation Factory
4 TH floor:	Government and Industry Partners Space/Joint Research Space for Partner Collaboration
5 TH floor:	National Security Collaboration Center I ■■■■■■■■■■■■■■■■■■■■■■■■■■

D. Student Participation in Research

Currently, students are engaged in the research enterprise through a number of pathways, at both the undergraduate and graduate level. It is a decentralized process at this time. A clear description of these activities is given in **Section V. E, F, and G**.

As noted, students engaged in research activities have a higher level of student success.

In Fall 2017, President Eighmy launched the **President's Initiative on Student Success Task Force (SSTF)**, elevating student success to an institution-wide priority. The cross-campus task force is charged with developing an integrated student success plan inclusive of goals, metrics, accountability, and self-assessment. Core to the charge is the adoption of a student-centric approach, with strategies including a plan for a pipeline continuum from K-12 through recruitment, enrollment, academic progress, career services, and post-graduation job placement. As part of their work, the task force will examine best practices from other institutions and think expansively about administrative structure, accountability and resources that will best position UTSA to be a great multicultural discovery enterprise that fosters exceptional student experiences.

The Student Success Task Force will be directed to achieve an integrated student success plan and will focus on those programs that greatest opportunity to increase graduation have the rates and student retention rates. Although engaging students in research is of the utmost priority, UTSA will focus on building programs that lead students through successful engagement across the board. UTSA is considering the impact of new revenue on student success, especially as it relates to the funding of key institutional priorities, including student research engagement (See **Table 5**).

III. Master's Degree Programs

As UTSA continues to move forward with the expansion of current and new master's degree programs, attention is being paid to ensure that they are of high caliber and meet the needs of San Antonio and Texas' workforce demands. Our vision of UTSA as an institution that serves students and society in transformational capacities can be seen in our current and future master's program offerings.

A key focus is on preparing future leaders with the capabilities and skillset to respond to current and future problems in society. This is accomplished by having programs that span across disciplinary boundaries and encourage transdisciplinary teaching, learning and research. For example, our current Cybersecurity program includes faculty experts from the College of Business, College of Sciences and the College of Engineering. This approach has afforded students opportunities that would not have been realized by a single College program. Furthermore, the research capacity of the faculty is strengthened by this approach as well with this given structure. Our Biomedical Engineering program is also built on a multi-layer partnership that includes researchers from UTSA and UT Health San Antonio. Students in this program are exposed to faculty engaged in cutting-edge research that increases the students' training capacity and workforce readiness.

The aforementioned programs are essential to our future growth as they are linked to UTSA's strategic plan of being a learning and research enterprise that fosters innovation and creative discovery. Past and future programs are aligned with mechanisms that ensure their ability to enhance the needs of the community with innovative approaches with a transformative impact.

1. Current Offerings of Masters Degrees Programs

Our current Masters programs at UTSA are highly aligned with our areas of research excellence and initiatives as defined in **Section II**. Currently, UTSA has 69 Master's Degrees Programs (See **Table 6**). The net outcome is that our master's students are exposed and engaged in cutting edge research and further develop their experiential skills along with research engagement, to be better prepared for the workforce, in addition to their academic credentials.

Table 6. Current UTSA Masters Degrees Program

COLLEGE OF ARCHITECTURE, CONSTRUCTION & PLANNING	»» Architecture (M.S. or M. Arch.)
	»» Urban and Regional Planning
COLLEGE OF BUSINESS	»» Accounting

	»» Applied Statistics
	»» Business (M.B.A. or M.S.)
	»» Business Economics
	»» Data Analytics
	»» Economics
	»» Executive M.B.A.
	»» Finance (M.B.A. or M.S.)
	»» Information Systems
	»» Management Science
	»» Management of Technology (M.B.A. or M.S.)
COLLEGE OF EDUCATION & HUMAN DEVELOPMENT	»» Bicultural/Bilingual Education
	»» Clinical Mental Health Counseling
	»» Curriculum and Instruction
	»» Dietetics Studies
	»» Early Childhood and Elementary Education
	»» Education
	»» Educational Leadership
	»» Educational Psychology
	»» Health and Kinesiology
	»» Higher Education Administration
	»» Reading and Literacy
	»» School Counseling

	»» School Psychology
	»» Special Education
	»» Teaching English as a Second Language
COLLEGE OF ENGINEERING	»» Advanced Manufacturing and Enterprise Engineering
	»» Advanced Materials Engineering
	»» Biomedical Engineering
	»» Civil Engineering (M.C.E. or M.S.C.E.)
	»» Computer Engineering
	»» Electrical Engineering
	»» Mechanical Engineering
COLLEGE OF LIBERAL & FINE ARTS	»» Anthropology
	»» Art
	»» Art History
	»» Communication
	»» English
	»» Geography
	»» History
	»» Music
	»» Philosophy
	»» Political Science
	»» Psychology
	»» Sociology

	»» Spanish
COLLEGE OF PUBLIC POLICY	»» Criminal Justice and Criminology
	»» Public Administration
	»» Social Work
COLLEGE OF SCIENCES	»» Applied Mathematics, Industrial Mathematics
	»» Biology
	»» Biotechnology
	»» Chemistry
	»» Computer Science
	»» Environmental Science
	»» Geoinformatics
	»» Geology
	»» Mathematics
	»» Mathematics Education
	»» Physics

2. New Master's Degrees Programs

Our new approach for the development of master's programs will allow for more transdisciplinary learning and research-engaging approach. We are creating programs that allow for a smoother transition from the bachelor's to master's program while decreasing time to degree.

These programs are being established with our academic and research partners within and beyond UTSA. Students will be exposed to labs and techniques beyond the UTSA campus and trained to work with scientists across various disciplines. Currently, there are plans for 4+1 and 3+2 programs in all 7 Colleges at UTSA and includes partnerships with industry, research labs and Community Colleges where students will transfer to complete their bachelor's degree and then move into the master's programs.

Proposed New Master's Program: MA in Global Affairs

One such new program that demonstrates this approach is our proposed MA in Global Affairs. This degree will offer students an opportunity to gain in-depth understanding of the impact of globalization on politics and societies and to acquire knowledge and practical skills that will prepare them for challenging careers in a global setting. San Antonio mirrors what America will look like in the future, and UTSA is at an advantage as a true learning laboratory. The program will prepare our students to be world-engaged citizens and leaders in this area.

IV. Doctoral Programs

IV.1. Existing Doctoral Programs

Currently at UTSA, we have 24 doctoral programs and one additional doctoral beginning in Fall 2018. As outlined in **Table 7**, listed are the existing doctoral programs, with the implementation date, graduation data for Fall and Spring of 2017, the average graduation numbers based on the past three years, and the projected graduation data for 2022.

UTSA's oldest standing doctoral program began in 1992. Since then, the depth and breadth of programs have expanded significantly. To date, the top doctoral granting degree programs span several colleges/programs. Currently, the 8 most productive programs with respect to degrees awarded are Anthropology, Cell and Molecular Biology, Demography, Mechanical Engineering, Electrical Engineering, Civil and Environmental Engineering, Physics, and Educational Policy and Leadership.

Overall, UTSA has received positive responses from the Coordinating Board based on progress reports submitted. These responses include, but are not limited to, persistence rates, student and faculty performance and productivity. However, the most common weaknesses noted by the Coordinating Board and external reviewers across doctoral programs have been ethnic and gender diversity, adequate financial support, program credit hours and student preparation beyond the classroom—workforce readiness. This is being addressed in **Section IV B, C, and IV.2.**

Table 7. Current Doctoral Programs at UTSA

Program Name	Date Implemented	Spring Graduates 2017	Fall Graduates 2017 (Applied For status, OIR)	Annual Average of Graduates FY 15-17	Projected Graduates in 2022
COB – Applied Statistics	September 1, 2006	1	1	2	6
COB – Accounting	January 24, 2002	0	2	2	6
COB – Finance	January 24, 2002	0	2	2	6
COB – Information Technology	January 24, 2002	1	0	2	6
COB – Marketing	January 25, 2007	3	0	2	4
COB – Organization and Management Studies	January 24, 2002	1	0	2	4
COEHD – Counselor Education and Supervision	July 15, 2004	4	3	8	16

COEHD – Culture, Literacy and Language	October 26, 2000	5	2	6	14
COEHD – Educational Leadership	July 17, 1998	10	8	12	40
COEHD – Interdisciplinary Learning and Teaching	October 23, 2008	4	2	8	15
COE – Biomedical Engineering	March 20, 2003	2	2	6	15
COE – Electrical Engineering	January 24, 2002	1	8	4	15
COE –Environmental Science and Engineering	July 17, 2003	0	2	4	10
COE – Mechanical Engineering	January 27, 2011	1	2	6	15
COE-Civil Engineering	Final Approval Received	0	0	0	4
COLFA – Anthropology	July 20, 2006	0	2	2	10
COLFA – English	April 18, 2002	1	0	1	4
COLFA – Psychology	January 26, 2012	0	0	3	8
COPP – Applied Demography	September 1, 2006	2	3	6	10
COS – Cell and Molecular	July 17, 2003	1	3	4	12
COS – Neurobiology	January 31, 1992	1	2	4	12
COS – Chemistry	October 28, 2004	0	6	6	10
COS – Computer Science	April 28, 1995	2	5	8	10
COS – Physics	September 1, 2005	3	8	7	10
Graduate School – Translational Science	October 27, 2011	0	0	0	2
Total Degrees Awarded		43	63	107	264

B. Quality Control

The Graduate Student Professional Development Center, the first of its kind in the UT System, serves as a model for graduate student success (See **Section VI C**). The Center offers programs to support graduate students with their research, teaching,

writing and grant development. The aforementioned programs are providing the necessary workforce readiness of doctoral students for roles in academia and industry.

The issues linked to student credit hours in the doctoral programs have been addressed and will be discussed in detail below. UTSA has several programs that are yet to yield an appropriate high level of doctoral graduates. These programs are currently undergoing a revitalization process to be closely aligned with our current university strategic plans. Many of these programs have undergone key personnel changes to include essential faculty and involvement of College Deans to revitalize the programs. New programs currently in the developmental stage have received cleared guidance on program expectations along with appropriate accountability mechanisms.

Another key aspect to increasing quality includes our Graduate Catalog. This past year, a meticulous review of the Catalog unveiled several issues with respect to student credit hours for doctoral programs. The first wave of the Catalog clean-up was completed this past summer. During Fall 2017, all programs were charged with assessing their student credit hours for a doctoral degree and reviewing how they size up with their peer programs (See **Table 8** for a list of peer institutions). Through this process, programs found that they were requiring more credit hours for the same degree. They then conducted a further assessment of their curricula structure and are making the necessary changes. This Spring, the Graduate School will work with all of these programs to officially reduce the credit hours so they align with peer programs.

The financial support for doctoral students is being addressed. Thus far, the Graduate School has instituted two new funding programs for doctoral students- The Presidential Distinguished Research Fellowship (PDRF) and the Graduate Tuition Assistance Program (G-TAP). The PDRF provides an additional \$10,000 beyond the awards given in the respective Colleges in an effort to bring our financial aid offers in alignment with peer institutions. The new funding moved a \$20,000 award to a \$30,000 award. PDRF students receive these additional funds for 4 years and recipients are required to participate in 10 hours of professional development programs every semester to remain eligible.

The G-TAP provides \$10,000 per year for 3 years to the next tier of outstanding graduate students. However, unlike the PDRF, the G-TAP does not require additional funds from the college/department. The G-TAP provides enough funding to assist students with tuition and fees.

Table 8. Benchmark (Peer) Doctoral Programs

Department with Doctoral Degrees	Aspirant Programs
Applied Demography	University of Colorado - Boulder, Univ. of California-Berkeley, Arizona State University, Univ. of Florida, Georgia Institute of Technology.
Biology - Neurobiology	University of Oregon, Arizona State University, Florida State University, Brandeis University, University of Maryland Baltimore County

Biology - Cell and molecular biology	Univ. of Central Florida, Arizona State University, Washington State University, Univ. of California-Riverside, Oregon State University.
Chemistry	Auburn University, Univ. of Central Florida, Univ. of Illinois at Chicago, Univ. of Delaware, Univ. of South Florida.
Computer Science	Univ. of Illinois at Chicago, Univ. of California Riverside, North Carolina State University, University of Texas at Dallas, Arizona State University.
Physics	Univ. of California-San Diego, Univ. of California-Santa Cruz, Univ. of Central Florida, State University of New York at Albany, Univ. of Houston.
Cultural, Literacy and Language (BBL)	UC Berkeley Graduate School of Education, Univ. of New Mexico, Penn State University, Ohio State University, Stanford University
Educational Leadership	Ohio State University, Michigan State University, Penn State University, Univ. of California-Los Angeles, University of Washington.
Interdisciplinary Learning and Teaching	University of New Mexico; University of California, Riverside; University of Houston; University of Central Florida; University of Illinois, Chicago;
Counselor Education and Supervision	Penn State University, University of North Carolina at Greensboro, University of Florida
Biomedical Engineering	UT Dallas, UT Arlington, U Houston, U Memphis, U Alabama at Birmingham
Electrical Engineering	Univ. of Massachusetts-Amherst, Univ. of Illinois-Chicago, Univ. of California-Riverside, Univ. of Texas-Dallas, Washington State University.
English	Arizona State University, Univ. of Connecticut, UC-Riverside, Univ. of Georgia, SUNY Buffalo.
Environmental Science and Engineering	UC-Irvine, Univ. of Delaware, Florida International University, Northeastern University, Univ. of Massachusetts-Amherst.
Mechanical Engineering	Univ. of Kentucky, Univ. of Massachusetts-Amherst, Univ. of Texas-Arlington, Univ. of Houston, Univ. of California-Riverside.
Applied Statistics	Kansas State University, Oklahoma State University, Oregon State University, University of Alabama, University of Illinois at Chicago
Business Administration - Accounting	Arizona State University, Georgia State University, Michigan State University, Temple University, University of Connecticut, University of Texas at Dallas, University of Utah
Business Administration - Finance	Arizona State University, Georgia State University, Michigan State University, Temple University, University of Connecticut, University of Texas at Dallas, University of Utah
Business Administration - Information Technology	Arizona State University, Georgia State University, Michigan State University, Temple University, University of Connecticut, University of Texas at Dallas, University of Utah
Business Administration - Management and Organization Studies	Arizona State University, Georgia State University, Michigan State University, Temple University, University of Connecticut, University of Texas at Dallas, University of Utah
Business Administration - Marketing	Arizona State University, Georgia State University, Michigan State University, Temple University, University of Connecticut, University of Texas at Dallas, University of Utah
Psychology	Univ. of Central Florida, Univ. of South Florida, San Diego State University, University of Houston, Southern Illinois University.
Anthropology	Univ. of California-Riverside, Univ. of Colorado-Boulder, Univ. of Connecticut, Univ. of Illinois-Chicago, Univ. of Minnesota.

C. Quality Enhancement

Programs with national prominence must have faculty who are extensively research-active, publishing in top scholarly journals, or making other significant creative and scholarly work aligned with the expectations of their given discipline. Over the past several years, UTSA has been committed to hiring faculty at the junior and senior level who clearly demonstrate their ability to be high performers to include conducting cutting-edge research which in turn provides funding for quality doctoral students and ultimately strengthening the doctoral programs.

In accordance with UT System rules, faculty are required to submit annual reports reviewed at the Department, Dean and Provost level. These reports provide detailed faculty performance over the academic year. Assessments are conducted to provide feedback and remedy of any problems non-aligned with the respective programs. Faculty are provided mentoring and other support services in support of improving their performance. With respect to research productivity, the Office of Research offers extensive services to assist faculty with seeking and writing grant proposals throughout the year.

While faculty productivity is essential to promoting student research engagement and appropriate advanced doctoral training, UTSA will be benchmarking all doctoral programs against their identified national peers (see **Table 8**). Furthermore, UTSA will continue to regularly evaluate the overall effectiveness of all doctoral programs by continuing to utilize established external reviewers for their input and guidance. We are also in the process of creating a more robust internal program assessment process that will include various accountability factors aligned with our strategic initiatives.

D. Comparisons with National Peers.

The institution plans to identify nationally-ranked programs against which each of the institution's existing doctoral programs will be benchmarked. (See **Table 8**.)

IV.2. New Doctoral Programs

A. Areas of Emphasis

Table 9 details planned future doctoral programs at UTSA. The addition of these new programs will move us to 31 doctoral degree programs in the next five years (See **Table 10**). The process for determining which additional programs to develop include an internal and external analysis of needs and capacity. We also took into consideration local community environment, regional and state projected growth and development, and national student and market workforce demands.

Table 9. Proposed Doctoral Programs and Overview

Program Name	Departments/ Colleges	Program Overview
Sustainable Material & Construction Science	Construction Sciences, Electrical and Computer Engineering, Civil Engineering, and Physics	The program will have significant impact on urban development, new city/community planning, and infrastructure resilience, including Smart Cities. The program will highlight the development of new technologies, the design of new products, and finding solutions to critical design problems, all to improve sustainable communities.
Molecular Microbiology and Immunology	Department of Biology, College of Sciences	Molecular Microbiology and Immunology is a specialized field with a focus on infectious diseases. There is an ongoing critical need for this specialty, given the incidence of emerging infections and the development of antimicrobial drug resistance.
Cybersecurity	College of Business, College of Engineering, College of Sciences	<p>This program leverages the national recognition of UTSA in cybersecurity, and the unmet needs and increased demands for a trained and highly-skilled cyber workforce.</p> <p>This program will complement current research areas which include information security management, applied network and information systems security, government and industry cyber preparedness, and secure software and hardware design and engineering.</p>
Data Analytic Sciences	College of Business, College of Engineering, College of Sciences, College of Liberal and Fine Arts	The program is designed to provide an in-depth understanding of how to properly employ data analytic algorithms, while providing students the skills needed to acquire, transform, analyze, visualize, and communicate vast quantities and types of data. The program will enable graduates to manage data into relevant information that leads to better decision making.
Global Security Policy	College of Liberal and Fine Arts, College of Education and Human Development, College of Public Policy	The program will offer an in-depth understanding of the impact of globalization on policy, while acquiring the necessary research skills to make appropriate analysis that can be used for multi-lateral decisions in complex societies.

<p>*Conversion of Educational and Leadership Policy EdD to PhD</p> <p><i>*This process has been completed and approved</i></p>	College of Education and Human Development	This program provides advanced academic training in educational leadership, particularly in the area of administrative and instructional leadership. Graduates will gain an advanced understanding of theories of education and learning; extensive theoretical background and experiences in emerging paradigms of organizational leadership; high-level research skills for developing, analyzing, and evaluating educational programs; and in-depth training for the increasing cultural and linguistic diversity of contemporary education.
Civil Engineering	College of Engineering	The program in Civil Engineering will be a collaborative educational and research effort between UTSA and the Southwest Research Institute (SwRI). The educational objectives are to produce graduates who have advanced technical knowledge in Civil Engineering to meet national workforce needs.

All the proposed doctoral programs are being created utilizing a transdisciplinary model with the exception of three programs (Educational Leadership Policy, Civil Engineering and Molecular Microbiology and Immunology) that are housed in their respective department and college. These programs will be built around a transdisciplinary approach that mimics the workplace environment of today, and in the future.

All of these programs will leverage their respective undergraduate, master's and graduate certificate programs.

Table 10. Proposed Launch Dates for New Doctoral Programs

Program Name	Year	Projected Graduates in 2022
Sustainable Material & Construction Science	Fall 2020	NA
Molecular Microbiology and Immunology (MMI)*converting current students in the Cell & Molecular track to the MMI program	Fall 2020	10
Cyber Security	Fall 2020	NA
Data Analytic Science	Fall 2020	NA
Global Security Policy	Fall 2020	NA
Educational and Leadership Policy EdD to PhD**conversion	Spring 2018	25
Civil Engineering	Fall 2018	4
Total		39

B. Assessment

In keeping with the requirements of The UT System and THECB, reviews of the new programs will be conducted yearly in the first five years. This level of assessment includes documentation of student productivity, graduation rates and student diversity to ensure that they are aligned with expectations noted in the original approved proposal.

Beyond this initial assessment period, UTSA requires doctoral programs to be reviewed every five years. UTSA considers the periodic review of each of its academic programs essential to promoting and maintaining excellence in undergraduate and graduate programs. Quality programs result from careful, collaborative self-study and reflection by the faculty in each of the disciplines and appropriate stewardship by university administrators.

Academic Program Review (APR) is a comprehensive process in which departments engage in a methodical evaluation of the strengths and weaknesses of degree programs; determine the degree to which departmental, college, and university goals and objectives are aligned; and summarize the assessment of educational outcomes.

The Academic Program Review process consists of three components: the Internal Program Review, External Review Report, and Response Report. The Academic Program Review process is clearly outlined on the Provost's website. The final reports from the Academic Program Review process are shared with the Graduate Council for additional review and assessment.

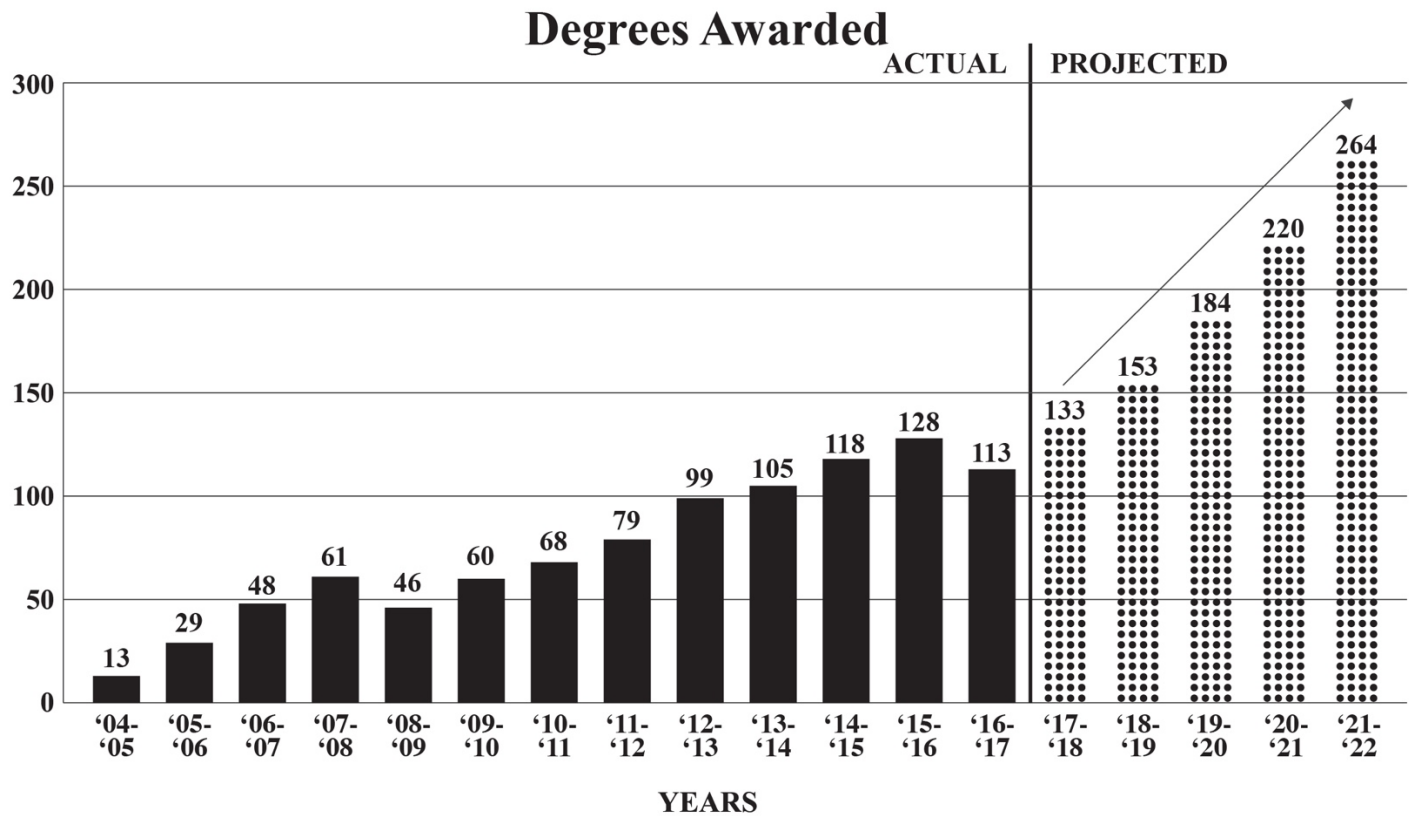
C. Regional Impact

Currently, UTSA is undergoing a significant strategic transformation based on President Eighmy's vision (See **Section I**). This bold transformation includes a more transdisciplinary approach to academics, strategic engagement and global partnerships. This transformation is noted at the forefront that UTSA is San Antonio's university of the future, producing graduates who tackle the grand challenges of today's world. Therefore, we must have doctoral programs providing innovative approaches and solutions to the challenges faced by the greater San Antonio community and beyond.

While the new programs outlined in **Table 9** include transdisciplinary internal program advancement, their success is also linked to the numerous community partnerships. Discussions are moving forward with San Antonio Intermediate School District (SAISD), North East Intermediate School District (NEISD), North Intermediate School District (NISD), HEB, Southwestern Research Institute (SwRI), The Military, City of San Antonio and other key business leaders and committees who are strong supporters of UTSA.

Collectively, the number of doctoral graduates by UTSA is shown in the figure below (**Figure 4**), and the projected outcome based on the addition of new programs.

Figure 4. Numbers of Doctorates Awarded 2004-2017 and Projected 2018-2022



V. Faculty and Student Development

A. Faculty Research

The Office of the Vice President for Research – Office for Research Support (ORS) provides a variety of services and programs for research-engaged faculty to develop and successfully manage their respective research programs. The ORS serves as a catalyst for interdisciplinary research through the promotion of innovative scholarly research and artistic activity that cross college and departmental boundaries and reach externally to industry and academic partners.

The ORS staffs a highly-engaged team of professional development specialists that work closely with research active faculty. The **Faculty Development Team** organizes workshops, trainings and research events focused on research professional development. A major focus of the faculty development team is to engage and expand partnerships between our faculty and external research organizations at the local, regional and federal level. Quarterly, the Vice President for Research with support from the ORS faculty development team travels to Washington DC with a formal delegation of UTSA faculty. These trips are funded by the research office and are meant to serve as both promotion of UTSA's research capabilities and a means to develop faculty in advancement of their research portfolios.

The **Grant Development Team** consists of four grant development professionals, servicing all seven colleges. They assist the university in pursuing large, institutionally significant grant programs. Targeting early career faculty is of utmost importance. This team works closely with junior faculty on applications to early career programs with the National Institutes for Health, National Science Foundation, Department of Defense, and the National Endowment for the Humanities. In addition, the grant development team provides all faculty with proposal critique and editing services and serve as facilitators for grant development workshops and panel discussions.

Finally, the ORS provides faculty development funding to UTSA researchers through a robust series of **Institutional Seed Grant Programs**, which have proven successful by providing a return on investment (See **Table 11**). Programs include the following:

- A. The INTRA program is part of the VPR's coordinated effort to promote research and scholarship of the highest quality within the arts, business, education, humanities and social sciences. The program awards 20 grants of \$5,000 each year. Full-time, tenured & tenure-track UTSA faculty are eligible.
- B. The GREAT program provides seed grants to support new areas of research for faculty at UTSA. The primary goal is to assemble preliminary data that can be used to seek extramural funding. Six grants for a maximum of \$20,000 are awarded annually. Full-time, tenured and tenure-track faculty at UTSA are eligible.

- C. The CONNECT Program is a joint effort between UTSA and the Southwest Research Institute (SwRI). The program encourages interaction between investigators to secure extramural, peer-reviewed research funding. Two grants for a maximum of \$125,000 are awarded annually. Full-time, tenured and tenure-track faculty at UTSA are eligible with a collaborator at SwRI.

Table 11. Institutional Seed Grant Allocations and Return on Investment (ROI)

Year	2010	2015	2022
Allocation	\$450,000	\$750,000	\$1,500,000
ROI	N/A	\$2,800,000	\$5,000,000

UTSA New Faculty Institute

Instituted in fall 2017, the **UTSA New Faculty Institute** (NFI) is a 6-session workshop series offered to all new tenured and tenure-track faculty, as well as non-tenure track faculty with multi-year contracts. It is required of all new faculty hired at the assistant professor level. The objective of the Institute is to provide an introduction to UTSA's teaching and research culture; identify people and services to support success; enhance skills related to grant seeking and writing, as well as instruction and pedagogy; share information about institutional resources and best practices; and promote collaboration and community in the first year. Outcomes from the NFI include:

Research Outcomes:

- Identify funding opportunities and potential collaborators using various tools
- understand the priorities of funding agencies and cultivate relationships with program officers
- Craft an “elevator pitch” and abstract to sell their concept to potential funders and collaborators
- Apply effective project management strategies to the proposal development process
- Write grant proposals that are responsive to the call and meet the expectations of reviewers
- Develop outreach plans and communicate the broader impacts of their research
- Create effective management and program evaluation plans for funded research projects

Teaching and Learning Outcomes:

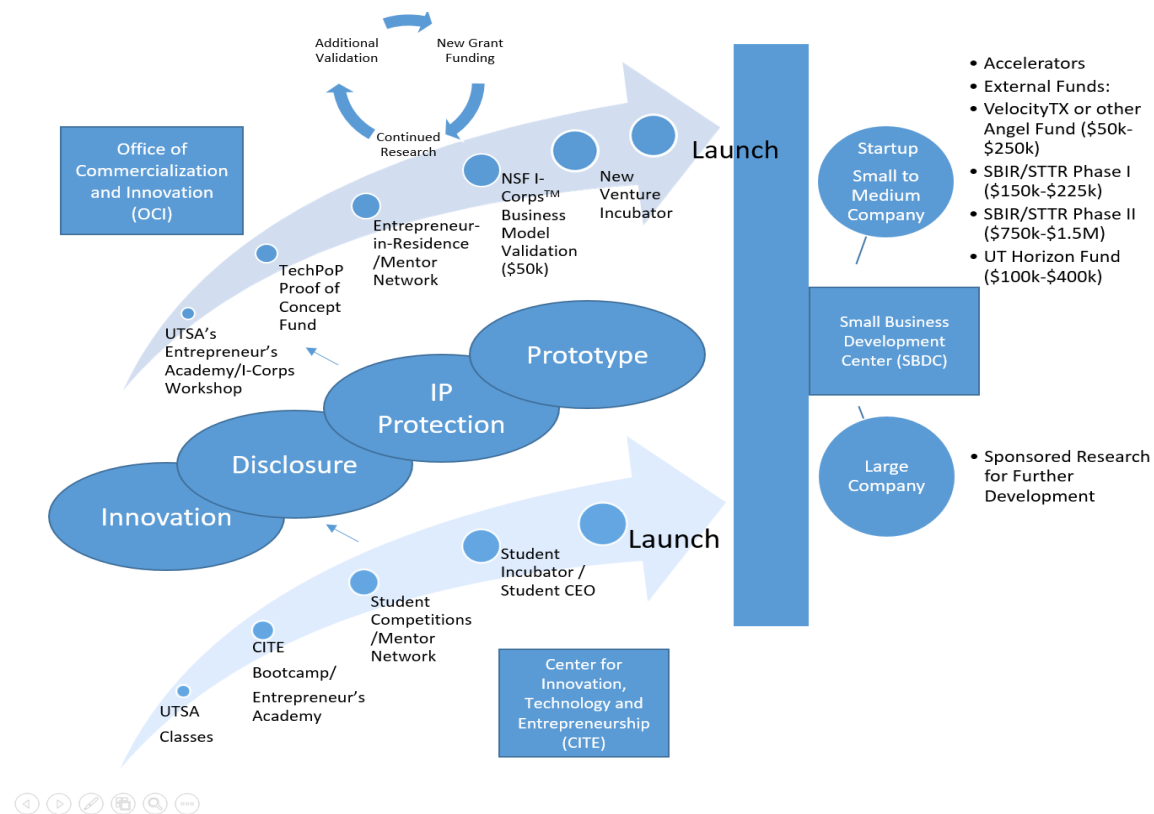
- Understand the diverse UTSA student body including military, minority, and first-generation student populations
- Apply different teaching strategies to improve student learning
- Identify support methods to help students achieve academic success
- Support inclusion and engagement in the classroom
- Explore wide-ranging assessment strategies to improve learning outcomes
- Develop cross-disciplinary dialogue around teaching and learning
- Provide preparation for effective use of relevant educational technology

Faculty will be required to attend a total of six workshops and a closing luncheon. They will attend one teaching and one research session as a cohort, and will choose two teaching and two research workshops. All these activities are held in the **UTSA Faculty Center**, a dedicated space that allows faculty to gather both formally and informally to have dialogue, collaborate across disciplines, attend professional development workshops, and access a wealth of university resources to support their teaching and research activities.

Commercialization and Innovation Programs

The Office of Commercialization and Innovation (OCI) is an important function of the research ecosystem. (See **Figure 5**.) The OCI continues to increase faculty and staff awareness, training, and support for technology development with targeted events including the annual Innovation Awards.

Figure 5. UTSA Detailed Technology Development Ecosystem³



By leading and participating in San Antonio's innovation initiatives, OCI will grow the presence and influence of UTSA in the city's innovation ecosystem, maximize opportunities for UTSA inventors, and grow the city's innovation capacity. To this end, in

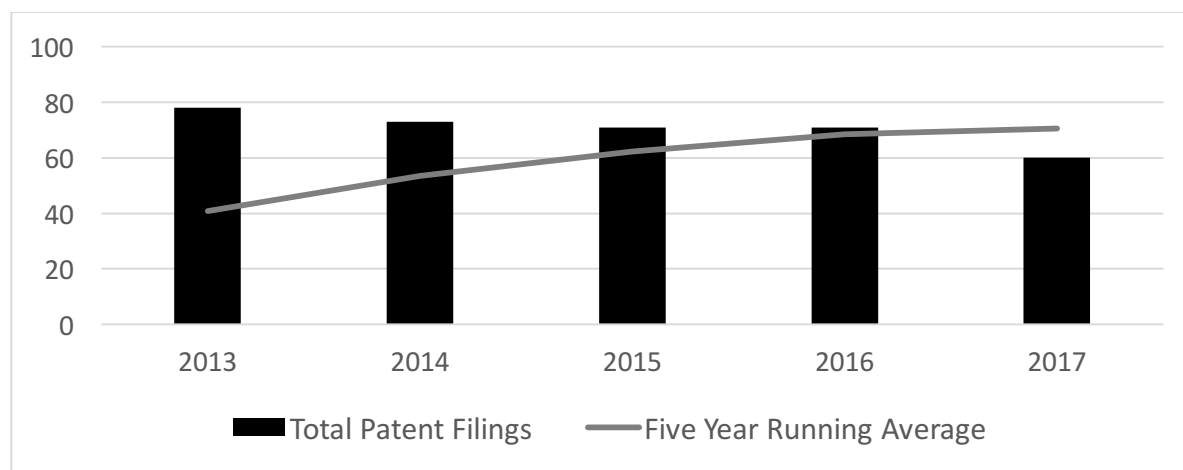
³ Detailed Technology Development Ecosystem: <http://research.utsa.edu/research-funding/commercialization/entrepreneurship-and-training/>

FY2017, OCI received 62 invention disclosures, which is a 17% increase from the previous year (See **Table 12**). Patent filings are a lagging indicator and are affected by previous FY disclosures (**Figure 6**).

Table 12. New Invention Disclosures

	2013	2014	2015	2016	2017	2022 Goal
New Disclosures	62	56	41	53	62	75

Figure 6. Average of Total Patents Filed 2013-2017



OCI will maximize the opportunities to license UTSA technologies while also optimizing their chances of success with available resources. Examples include local and national NSF I-Corps training, incubation, SBIR consulting, mentoring, introductions to external resources (funding, accelerators), proof of concept funding, industry collaboration opportunities, and flexibility with licensing terms. Through FY2017, UTSA has sent 12 teams to the national NSF I-Corps, placing UTSA in the top 6% of participating universities⁴. By offering additional training, we anticipate 6-10 teams from UTSA to participate in the I-Corps program.

Using the aforementioned listed resources, OCI will strive to increase the number of UTSA technologies to be licensed over the next five years (5-10 per year). Better developed technologies will also enhance the opportunities for license agreements with larger corporations (See Commercialization Revenue, **Table 13**).

Currently, three startups and companies are working with UTSA researchers, and reside in the existing 2,000 square foot New Venture Incubator. Six additional clients have chosen to be part of the Incubator as desk-only or virtual clients. Additional innovation space is being planned in the new Computational Research Building (See **Section II**).

⁴ <https://www.nsf.gov/awardsearch/>

Table 13. Commercialization Revenues 2013-2017

	2013	2014	2015	2016	2017
Patent Reimbursement	\$94,598	\$79,213	\$105,992	\$17,716	\$69,797
License Fees/Royalties	\$6,000	\$139,889	\$46,566	\$1,779	\$28,236
New Venture Incubator	\$8,250	\$9,075	\$15,255	\$8,280	\$30,687
Total	\$108,848	\$228,178	\$167,813	\$27,775	\$128,720

UTSA Commercialization Projections

Using current data, commercialization projections are shown below.

Table 14a. Licensing Revenue Projections

		Projected Revenue			
	2017	2018	2019	2020	2022 Goal
Current Active Licenses	\$28,236	\$40,000	\$50,000	\$90,000	\$250,000
Future Licenses		\$10,000	\$20,000	\$30,000	\$50,000
Total	\$28,236	\$50,000	\$70,000	\$120,000	\$300,000

Table 14b. Commercialization Projections

Technology Management	FY2017	FY2022 Goal
Disclosures	62	75
Total Patent Filings	60	75
Total Patents Issued	10	15

Technology Development

TechPoP Awards	8	10
Completed National I-Corps UTSA Teams	6	10

Technology Commercialization

Options Executed	5	7
Licenses Executed	3	5

B. Faculty Recognition

UTSA is using tools for effective merit evaluation such as measurement of grants and contracts, number and amount of major grants (\$500,000 and above), and emphasis on prestigious competitive federal research awards. As a current focus of the sponsored projects office at UTSA, a **shared-credit process** for recognition of each college and faculty members' efforts per project has been implemented. This process is being continuously monitored and improved where necessary to ensure accurate capturing of researcher effort.

Additional measures have been considered for scholarly excellence in research areas that are not traditionally measured by extramural funding success. Measures include publications, reviewed books and articles, books ranked by press or evaluated in published book reviews, as well as editorships. Articles ranked according to journal circulation, citation rates, and impact factors have also been considered to measure faculty excellence. In the arts, analogs to refereed publications, such as juried exhibits and compositions performed on the national stage are a recognized measurement.

Research intensive faculty receive funding to support professional travel, graduate students and outreach or other professionally enriching activities. In addition, scholarly excellence is continuously promoted through recognition in UTSA publications, at UTSA-sponsored events and through awards granted or named in the honor of faculty with significant research achievement.

Symbolic recognition of scholarly excellence includes formal acknowledgements of faculty contributions. **The Academy of Distinguished Researchers** was established in 2015 to select and honor outstanding faculty who are accomplished scholars and who share the University's continuing commitment to research excellence; to foster the highest quality of research and scholarly activity by UTSA faculty; and to promote the university's vision as a premier public research university. (See **Appendix D**). As of spring 2017, 17 professors have been inducted into the Academy, representing all colleges and a wide variety of disciplines in the Arts and Humanities, Social Sciences, Engineering and Life and Physical Sciences.

In alignment to the National Research Universities Fund (NRUF) criteria for High Quality Faculty (**Table 15**), UTSA has established a strategic team to increase the quantity and quality of applications submitted by UTSA faculty to prestigious programs that recognize academic research achievement. The task force has been working closely with faculty to increase applications to the National Sciences Foundation Early Career Faculty Development program. The university considers The Center for Measuring University Performance (CMUP) a benchmark for competitive awards received by UTSA faculty (**Table 16**).

Table 15. Number of NRUF Recognized Awards and Nominations

Year	2017	2022 (Goal)
# of National or International Awards	2	7
# of National Academy Members	1	5

Table 16. Comparison to Peer Universities (CMUP)**Total Number of Prestigious Faculty Awards (CMUP) by University 2006-2015**

Arizona State University	122
Florida International University	67
George Mason University	47
Georgia State University	45
Portland State University	37
The University of Texas at San Antonio	34
University of California-Irvine	197
University of California-Riverside	90
University of California-Santa Cruz	69
University of Maryland-Baltimore County	28
University of Oregon	97

C. Collaborations and Partnerships

In its quest to become an R1 institution, UTSA must continue to support and strengthen its current collaborative partnerships and establish new unions with leading entities in the public and private sectors including academia, healthcare, industry, small business incubators, and government agencies. For the university's potential as a research-intensive institution to be realized, these relationships must be created at the local, regional, national, and international levels. Those entities with which UTSA has an existing collaborative relationship and current activities are described below. Highlighted are activities that have been suggested as 'fertile fields' for new or expanded collaborative activities that will strengthen these relationships, and benefit all partners.

UTSA's existing research partnerships in San Antonio include (but not limited to) Southwest Research Institute (SwRI); Texas Biomedical Research Institute; UT Health San Antonio, National Security Agency (NSA) Texas, Army Research Laboratory (ARL) South and other Department of Defense (DoD) entities. The development of further collaboration with and among these institutions are highly supported by senior leadership within UTSA. This includes the development of strategies designed to develop regular outreach and communication among leaders within organizations, identification of research areas of common interest, outreach to develop multidisciplinary research teams, and institutional support to investigators including seed funding for collaborative research programs.

Military Health/UT Health SA Partnerships

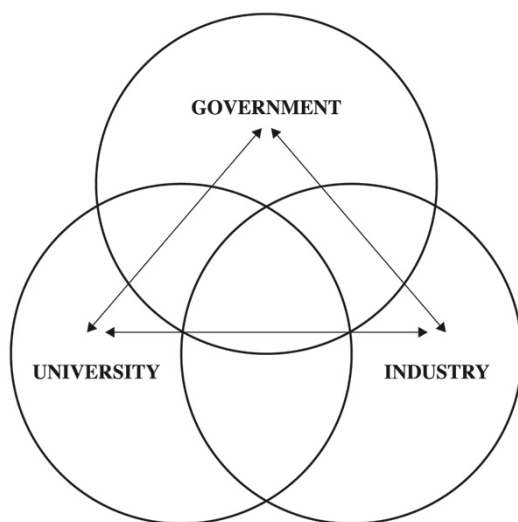
UT Health San Antonio and the San Antonio Military Health System represent primary, local partners in areas related to biomedicine and biomedical engineering. UTSA has a long history of collaboration with these entities, fueled by funding from the San Antonio Life Sciences Institute (SALSI). Established in 2003, SALSI was established to expand new scientific knowledge throughout Texas and enhance the research, teaching and service missions of The University of Texas at San Antonio (UTSA) and UT Health San Antonio. This collaboration has enabled joint doctoral programs and research projects and has driven initiatives that stimulated the growth of the biomedical and biotechnology industries in San Antonio. SALSI has also fostered the commercialization of the products of research with institutional partners such as the Southwest Research Institute and the Texas Biomedical Research Institute.

The SALSI Academy was created to serve as the focal point for a wide range of educational, scientific and policy issues in the life sciences. Under the auspices of SALSI, the Academy has a mission to bring together expertise to collaborate on joint studies that significantly contribute to solutions for challenges facing healthcare in Texas and around the nation. The SALSI Academy achieves its mission through Faculty Development Programs, Shared Resources (Core Laboratories, etc.) and Collaborative Funding Mechanisms e.g. SALSI Innovation Challenge and Clusters in Research Excellence awards.

The **SALSI Innovation Challenge** is an initiative to fund high risk, high reward studies that have the potential to create ground-breaking research and novel approaches. Proposed research should have a translational impact to the region's healthcare and bioscience industry. The current cycle focuses on substance abuse/prevention. Proposals submitted for exploratory or novel studies that break new ground or extend previous discoveries leading in a new direction or towards innovative applications. Two projects for a maximum of \$100,000 are awarded per biennium.

The **SALSI Clusters in Research Excellence** program seeks to establish and support two institutionally driven clusters in the area of Healthcare Cybersecurity over a 12-month period. Proposals will be accepted from both the life and social sciences, as applied to the broad range of issues in healthcare cybersecurity research. Two projects for a maximum of \$100,000 are awarded per biennium.

SALSI also funds the annual **San Antonio Military Health System (SAMHS) and Universities Research Forum (SURF)**, now in its fourth year, whereby participants have the opportunity to present and share research, practice, policy, and collaborations; earn continuing education credits/units; and connect with scholars and practitioners from SAMHS, academic institutions, public, government, and private organizations, and public health agencies across San Antonio for future education, research, policy, and practice collaborations. With the theme "Evidence-Based Practice & Research in Healthcare: Encouraging Collaborative Partnerships", research, practice, policy, and collaborations are presented in paper and poster sessions, roundtable discussions, and symposia along eleven focus areas/learning tracks: Biomedical Engineering and Medical Devices; Brain Health; Health Information Technology; Immunology and Infectious Diseases; Inpatient and Outpatient Care; Medical Modeling and Simulation; Patient Engagement and Continuity of Care; Personalized Medicine; Pre-hospital Trauma and Critical Care; Public Health and Wellness; and Regenerative and Molecular Medicine. In 2017, over 500 researchers, practitioners and students attended.



Government-University-Industry (GUI) Partnerships

Government-University-Industry (GUI) strategic research partnerships represent an organizational form designed to integrate disparate pools of intellectual capital. In these cases, participants in the partnership bring to the table very different skills, capabilities, and organizational contexts.

GUI partnerships play a role of growing significance in national innovation systems. These alliances evolve into a shared community of innovation, where each

participant retains the legacy of its origins, but joins a network of researchers that

evolves its own common values, norms, and vocabulary. The knowledge from each organization can then be integrated within the new context of a community of innovation, and applied by each participant toward its own learning goals.⁵

The Office of the Vice President for Research – Office for Research Support also continues a robust government and industry outreach program, through coordination of delegations to Washington D.C., through hosting of federal leadership and program officers at UTSA and through grant development training programs to bring awareness on federal funding programs and strategies for success.

Metrics for tracking engagement with government and industry partnerships include: Sponsored Research Agreements, Cooperative Research and Development Agreements (CRADAs), Memorandums of Understanding (MOU), Non-Disclosure Agreements, Joint Work Statements, and Task Orders.

In March 2017, the **Army Research Laboratory (ARL)** opened a cyber-focused research office on the main campus of UTSA as part of ARL South, with two ARL staff already placed and a third expected in summer 2017. ARL South aims to leverage regional expertise and facilities throughout the south-central region to accelerate discovery, innovation and transition of science and technology in support of the Department of Defense's Third Offset Strategy and the Army of 2050. This partnership has led to immediate collaborative research in the areas of cyber physical systems and cyber data analytics and visualization, resulting in grant awards.

The **National Security Agency (NSA) Texas** has aggressively engaged with UTSA, having opened a campus research office in January 2018, to build collaborations in research, innovation and education. The NSA has also placed a Visiting Professor in the Department of Information Systems and Cyber Security and is currently discussing an articulation agreement between UTSA and the NSA's National Cryptologic School.

The National Security Agency (NSA) also began planning efforts to launch a federally sponsored, secure research facility on the UTSA main campus, similar to the Laboratory for Analytic Sciences (LAS) at NC State, as part of the National Security Collaboration Center (NSCC).

With UTSA's federal partnership portfolio significantly strengthening with the opening of the Army Research Laboratory (ARL) South Cyber Office and the localization of the National Security Agency on UTSA's main campus, the institution is presented opportunity to expand government and industry presence on the UTSA's campuses.

UTSA will begin planning and development of the **Tricentennial Innovation Park** on the northeast side of the 1604 main campus. This will provide further capabilities for Government–University–Industry (GUI) entities to collaborate and engage our faculty and students on a myriad of real-world scenarios. In addition to partnership with the NSA and ARL, the Innovation Park will significantly strengthen the established and

⁵ <http://www.referenceforbusiness.com/management/Ex-Gov/Government-University-Industry-Partnerships.html#ixzz56qiQIkSO>

growing research ecosystem between UTSA, UT Health, Southwest Research Institute (SwRI), Texas Biomedical Research Institute (TBRI) and the military/DoD to tackle the grandest of societal challenges. The overall global expansion of UTSA's research portfolio will fuel economic expansion in San Antonio and help UTSA move closer towards becoming recognized as a research-intensive university and meeting the eligibility for Texas' National Research University Fund (NRUF).

Expanding Partnerships with Federal Labs

National labs are federally funded research and development centers (FFRDC) that are operated and staffed by private corporations or academic universities under contract to the government. While UTSA has partnered with multiple federal laboratories, efforts are underway to greatly expand these partnerships with other National Labs. UTSA's existing and emerging areas of research excellence align very closely with most of the federal laboratories. Partnering opportunities exist in support of UTSA's Research areas of excellence in Energy, Defense, and Homeland Security. In order to expand these partnerships, The Office of the Vice President for Research provides information on Federal Laboratory research funding opportunities for both faculty and student researchers. UTSA aims to expand partnerships with Oak Ridge National Laboratory, Idaho National Laboratory, Sandia National Laboratory and Los Alamos National Laboratory.

International Partnerships

As a Hispanic Service Institution (HSI), UTSA is well positioned to leverage its location in San Antonio as a gateway to nearby countries. The Institute for Economic Development has already established an extensive network of Small Business Development Centers throughout Mexico, Central America, the Caribbean and Latin America with funding assistance from USAID and the governments of the collaborating countries. The development of such networks represents significant start-up costs, but can serve as the foundation for additional partnerships. UTSA's approach for developing external partnerships is best served by building upon and leveraging existing relationships to create deep, lasting ties at strategically targeted institutions.

UTSA Mexico Center has developed a number of external partnerships with Mexican universities, both public and private, to organize conferences, publish academic books and articles, host visiting and Fulbright scholars, invite distinguished speakers, and promote cultural exchanges. Active partnerships and collaborations include: Instituto Tecnológico y de Estudios Superiores de Monterrey, Institute for Universidad Veracruzana, Universidad de Monterrey, Universidad Autónoma de Nuevo León, Universidad Autónoma del Estado de México, Universidad Autónoma de Coahuila, Universidad de las Américas Puebla, and others. The UTSA Mexico Center is also collaborating with the San Antonio Fulbright Committee and the World Affairs Council.

Working with the Office of International Programs, the UTSA Office of the Vice President for Research is expanding research opportunities for faculty and students through strategic connections with key international institutions. In November 2017, UTSA and Instituto Tecnológico y de Estudios Superiores de Monterrey signed a Memorandum of Understanding (MOU) to establish collaboration activities and facilitate

long-term academic and economic cooperation between both institutions. In October 2017, UTSA signed a MOU with Technical University-Darmstadt in Germany, a key component of a greater cultural mission between the City of San Antonio and the City of Darmstadt to build cultural and educational bridges through a sister cities agreement.

In future years, UTSA aims to build collaborative partnerships with select universities that provide significant opportunity for international recognition. Methods for selection and partnership tracking include utilization of the Times Higher Education (THE) DataPoints portal. This tool captures reputation and productivity data for 1,000+ universities reported in the World University Ranking (WUR).

D. New Faculty

Recruitment and retention of faculty and staff is critical to accomplishing the strategic initiatives of UTSA. UTSA is committed to a strategic hiring effort (See **Section B, Figure 3**) tied to its theme “Excellence of our People,” focusing on hires through GURI, CPRIT, STARS, and endowed chairs (See **Appendix B**). The university will continue to add faculty in areas of research strength through cluster hiring, a strategy which has proven very successful over the past two years.

The initial wave of cluster hiring revolved around the area of **cloud computing** in FY15. In FY16, we secured three key faculty hires in the area of brain health. In FY17, six additional faculty hires in the area of **cyber security** and one Endowed Chair of **brain health** were concluded. Both areas are aligned to the University of Texas System - Quantum Leaps and further align to the R&D portfolio of San Antonio. A collaborative funding model was leveraged by the aforementioned leadership to support salary and start-up packages, including the use of Core Research Support Funds and State Special Item Appropriations, such as the San Antonio Life Sciences Institute (SALSI). Each hire, where applicable, was leveraged for STARS Program funding.

UTSA is currently recruiting candidates to fill ten faculty positions in FY18 to foster collaborative research, education and outreach and to create interdisciplinary areas of knowledge that will advance the fields of **analytics and data sciences**. The power of computing and access to large scale information has led to the exponential growth of digital and analog datasets. The ability to provide meaningful interpretation to big datasets will lead to substantial breakthroughs in biomedicine, business, engineering, social sciences and the creative arts. To this end, innovative research solutions are required and not limited to such areas as data mining, machine learning, social network analyses, epidemiology and health, image and speech recognition and natural language processing. These vast quantities of data also raise significant societal questions in areas such as privacy, ethics, policy and global security, requiring cross disciplinary approaches to data science.

For FY19, UTSA has identified the area of **artificial intelligence (AI)** for the next possible cluster hiring initiative. Technological advances in computing capability and speed; access to large datasets and innovative algorithms have accelerated the impact of Artificial Intelligence (AI) in our daily lives. By recent analyses, AI would add

approximately \$8 trillion in gross value added to the U.S. economy by 2035. This technology will drive creative solutions for societal changes in areas such as, biomedicine, health care delivery, food security, cybersecurity and transportation^{6,7,8}. The complexity of these global problems will require a highly-prepared AI workforce and access to exponentially expanding volumes and types of data and machine learning.

UTSA will recruit for faculty positions in the area of AI to foster collaborative research, education and outreach and to create interdisciplinary areas of knowledge that will advance the field. Areas for hiring focus will be collaboratively determined with key researchers, Department Chairs, Deans and strategic partners. Proposed areas of research include: (1) Deep Learning, (2) Natural Language Processing, (3) Autonomy (4) Visualization, (5) Machine Learning, (6) Privacy, (7) Cybersecurity, (8) Marketing, (9) Biomedicine, and (10) Healthcare.

Additional faculty cluster hires will be determined accordingly by the Administration.

E. Student Awards

UTSA is committed to developing undergraduates for national awards such as Truman, Goldwater, Rhodes, and Fulbright. In 2017, the Provost created the position of Senior Director of Special Programs and Student Success within the Honors College. This position is responsible for creating a strategic plan (deadline: February 2018) to develop a consistent stream of competitive applicants for these prestigious scholarships, university timelines and processes for internal competitions and nominations, and faculty mentors to assist students with the application process. In 2018, the Honors College will be actively identifying and cultivating students for major scholarships. Utilizing the model of our Top Scholars Program, which has been successful in producing Goldwater and Gilman Scholars, the Honors College will actively identify and cultivate potential candidates earlier in their academic careers. Moreover, our new curriculum and advising structure are explicitly designed to introduce students to these awards as early as Honors Orientation, ensure that they have access to the opportunities necessary to make them competitive, and advise them toward becoming successful applicants.

Success in this area will be measured by tracking the number of students applying for institutional nominations, the actual number of applicants for the awards, and the progress of the applicants through the award process. We will utilize the methodology of Public University Honors to measure our progress alongside peer and aspirant institutions that are identified in the strategic plan. Our goal will be to meet or exceed

⁶ <https://newsroom.accenture.com/subjects/technology/artificial-intelligence-poised-to-double-annual-economic-growth-rate-in-12-developed-economies-and-boost-labor-productivity-by-up-to-40-percent-by-2035-according-to-new-research-by-accenture.htm>

⁷ https://obamawhitehouse.archives.gov/sites/default/files/whitehouse_files/microsites/ostp/NSTC/preparing_for_the_future_of_ai.pdf

⁸ <http://oversight.house.gov/hearing/game-changers-artificial-intelligence-part>

the performance of our benchmark institutions. UTSA also offers a number of programs that enhance student opportunity to participate in research at the undergraduate level. The below list is not inclusive of all current opportunities, as they change annually with sponsored project and philanthropic support secured by the institution. The following programs and scholarships reflect the comprehensive nature of UTSA's stride to support undergraduate research.

DHS Scholars Program

Funded by the Department of Homeland Security (DHS), this program advances the quantitative assessment of biological and digital threats through advanced research and strategic workforce development. First-year grant funding supported nine DHS Scholars enrolled in undergraduate courses, which introduce students to cross-disciplinary teaching and research on biological and digital pathogens, informatics techniques and procedures useful for pathogenic outbreak investigations. It also addresses biothreat agents and food defense, malware agents, cloud computing and big data analytics. Seven students were supported in the second year. The Early Career Awardees mentors collaborate with experts at two DHS Centers of Excellence, the National Center for Food Protection and Defense (NCFPD) at the University of Minnesota, and the Command, Control and Interoperability for Advanced Data Analysis (CCIADA) at Rutgers University.

RISE (Research Initiative for Scientific Enhancement)

RISE (Research Initiative for Scientific Enhancement) is a federally funded program designed to increase the number of underrepresented faculty, students, and investigators who are performing research in the biomedical sciences. The UTSA RISE program is student oriented and provides both financial and professional development support for up to 40 undergraduate and 15 doctoral students while they pursue training in biomedical research. UTSA's RISE programs, RISE Undergraduate and RISE PhD, are invaluable for the development of the next generation of biomedical researchers.

MARC-U*STAR (Maximizing Access to Research Careers)

The MARC-U*STAR (Maximizing Access to Research Careers - Undergraduate Student Training for Academic Research) Program is an Honors research training program that develops its trainees as exceptional applicants and trainees for doctoral (PhD) programs in the behavioral and biomedical sciences. Funded by the NIH Training and Workforce Development (TWD), it was developed to increase the number of underrepresented faculty and top researchers throughout the nation. Its 12 positions are available for outstanding juniors and seniors with two years remaining prior to graduation, who are majoring in Biology, Microbiology & Immunology, Chemistry (with biomedical applications), Biochemistry, Physics (with biomedical emphasis), Psychology, or Biomedical Engineering. All MARC trainees will also be integrated into the UTSA Honors College and graduate with Highest Honors.

UTSA Rising Researcher Program & Award

A \$300 award and first-semester program for first year students, the program features weekly meetings with program trainers, visiting researchers, and other undergraduates already working in research labs. Students learn about entering a research lab, other

research training programs on campus, and participate in laboratory tours. Upon completion of this one-semester program, students will be assisted in applying for additional campus research programs or in finding a research laboratory in which to volunteer.

UTSA Work Study Research Training Program

Trainees in the WS RTP work year-round, in the lab, completing a research project, interacting with a faculty research mentor who will guide their development as researchers in his/her laboratory. They receive research professional development training on how to read scientific papers and make presentations; obtain training and earn letters of recommendation required by doctoral programs, medical schools, or even entry-level research jobs following graduation; receive access to study rooms and computer laboratories; and participate in training courses and activities.

F. Student Diversity

As an emerging R1 Hispanic-Serving Institution (HSI), UTSA is committed to equity, diversity and inclusion. Currently, the Graduate School has established a comprehensive over-arching university graduate student recruitment plan with attention to the diversity of doctoral students. Furthermore, the Graduate School's recruitment and engagement team is working with seven colleges to design program-specific tailored recruitment partnership plans to address the gender and ethnic diversity issue (See **Table 17**).

Table 17. Summary of Diversity of Doctoral Recipients FY2012-2017

Ethnicity	2012-13	2013-14	2014-15	2015-16	2016-17	Sum of all Terms
American Indian or Alaskan Native	1					1
Asian	2	11	7	7	5	32
Black or African-American	2	7	4	4	4	21
Hispanic	17	17	28	31	30	123
International	38	33	30	39	37	177
Two or More Races	5	4	1	3		13
Unknown	5	3	7	5	3	23
White	29	30	41	39	33	172
TOTAL	99	105	118	128	112	562

G. Undergraduate Research

Honors College

The new Honors College curriculum redesign, to be implemented in fall 2018, strongly encourages increased student participation in undergraduate research. Currently, honors students have the option of completing a thesis to satisfy honors requirements.

The new curriculum also allows independent research, research through external programs, presentation of research, and undergraduate publication to satisfy requirements. By expanding the scope of what types of research satisfy our requirements, we expect to increase undergraduate participation in funded research. Moreover, the Honors College is currently working with several departments to create lower-division, research-based courses to introduce undergraduates to research earlier in their careers. To help facilitate matching students with appropriate research projects, Honors has added an Honors Counselor position that specializes in assisting students with finding research opportunities.

Success in this area will be measured by tracking the number of documented research experiences in which honors students participate. We will expect to see steadily increasing numbers from the baseline that we will establish based upon 2017-2018 data. This will be measured annually, with the expectation of increasing undergraduate research experiences by at least 50% above the benchmark over a 5-year period.

Office of Undergraduate Research

The Office of Undergraduate Research (O.U.R.) was created in spring 2013 to promote and facilitate the visibility and breadth of research opportunities for undergraduate (UG) students in all academic disciplines. In such, the O.U.R. has initiated collaborative networks with UG research programs to engage and support research participation and scholarly activities to develop UTSA student citizens into young professionals in keeping with the University Mission, Vision, and Core Values. O.U.R. success will positively impact UG excellence, campus research productivity, graduation & retention, student preparedness for graduate school, and perseverance in students' career trajectories.

The O.U.R. has increased visibility for undergraduate participation in research across all areas of academic inquiry. The annual UTSA Undergraduate Research and Creative Inquiry Showcase lets students disseminate their transformative experience and intellectual achievements with their peers and colleagues cultivating the connection between research and education.

The O.U.R. has increased number of partially funded UG research opportunities on campus by 20% (2013-2014 academic year). By incentivizing UG student participation in faculty-mentored research activities, the O.U.R. UG Research Scholarship helps students advance academically while doing original, publishable research.

The O.U.R. is aligning UG student research efforts with UTSA's Graduation & Retention Improvement Plan (GRIP). Program development and assessment of resources is helping to identify strengths, weaknesses, and potential areas of collaboration for existing programs as well as inform capacity-building and infrastructure needs that are required to optimize UG research training efforts at UTSA.

A range of marketing and outreach activities, promoting intramural and extramural awareness of research opportunities, has increased student inquiries about participation in research/scholarly activities. This includes outreach and marketing to high schools,

pipeline colleges, and national/international audiences.

The O.U.R. will continue providing leadership in the (1) development, implementation, and evaluation of undergraduate research opportunities at UTSA; and (2) promotion and facilitation of UTSA UG research activities across all disciplinary scopes. To this end, the O.U.R. will accomplish the following over the next 5 years by:

- Expanding current O.U.R. initiatives and programs.
- Cultivating the synergy among pre-existing UG research programs and the Honors College, as well as local and national colleges and universities through UG research exchange programs.
- Securing extramural funding for current and future programs.
- Sustaining a pipeline of effective UG researchers to faculty mentors to promote research productivity across academic disciplines.
- Maintaining UG research program assessment and capacity building strategies.
- Developing/incorporating a research-intensive academic track for underclassmen.
- Increasing UTSA attendees at national UG research and other research conferences.

VI. Other Resources

UTSA has established a robust research infrastructure to include defined research cores, and in the process of enhancing the research computing needs for faculty.

A.1. Research Facilities

Large-Scale Structural Testing Facility (Under Construction)

With 15,000 of gross square footage, the large-scale structural testing facility under development will have a 40 x 80 feet reaction floor with a clearance of 40 feet, providing researchers the ability to test real-size structural systems and components. The reaction floor will have a thickness of at least 3 feet, with a service chase and 3 feet thick walls underneath, conforming a reaction system with the capacity to apply test loads of up to 2M pounds over the entire testing area. A thicker region of the floor will be rated for test loads of up to 4M pounds, giving UTSA a capability unique in the US for testing large-scale systems and components with spans of up to 70 feet. The laboratory will have dual cranes with 30-ton capacity to load, unload, and transport heavy specimens. The projected substantial completion date is 3/31/2019 and the total projected cost is \$9,950,000.

The laboratory will have a large-capacity Hydraulic Power Supply (HPS) and high-pressure distribution lines with access manifolds in the service chase that will facilitate the use of servo-controlled actuators anywhere in the test floor. The HPS and distribution system will provide the ability to induce large loads at very high deformation rates, allowing researchers to simulate a wide range of problems including high cycle fatigue, earthquake, and blast loads.

The structural testing area will be complemented with support areas for fabrication and instrumentation of specimens, offices for students, faculty, and staff, and a conference room where visitors will be able to observe tests being performed in the lab.

A.2. Research Cores

With the creation of advanced research core facilities available to all UTSA researchers (faculty and students), UTSA's research capabilities are expanded and support can be given for complex research projects. It also helps the institution attract and retain top faculty to develop and continue their research efforts.

Immune Defense Core Facility

Provides centralized services, training, access, and support to researchers in the usage of flow cytometry equipment and related services including technical training opportunities.

Biophotonics Core Facility

Provides cutting edge technology for the study and manipulation of biological samples using light, including long-term in-depth imaging of live tissues and the technology to probe at the molecular level for protein-protein interactions within live samples.

Nanotechnology and Human Health Core Facility

Focuses on the synthesis and characterization of nanomaterials for imaging, labels for bioassays, and active targeting for in vivo or in vitro diagnostics. The Core studies the interaction of nanoparticles with living cells for application in the targeted delivery of drugs, genes, and proteins; tissue engineering scaffolds; artificial organs and implants; and bioimaging and cell labeling.

Genomics Core Facility

Prepares and sequences DNA libraries for Next Generation Sequencing, including whole genomes and whole transcriptomes. The core also prepares nucleic acids from single cells for genomic analysis.

Behavior Core Facility

Provides support and training to help increase throughput while promoting rigor and reproducibility in behavioral testing without introducing bias. The core will provide a battery of behavioral tests for any investigator interested in the effects of their physiological manipulations on behavior. Behavioral testing can also be coordinated among projects to increase throughput of data without unnecessary duplication and overuse of animals. The methods used to obtain these goals will be disseminated in the form of best practices for the greater scientific community.

A.3. Research IT

Over the past year, the UTSA administration, through the Office of the Vice President for Research, has initiated several efforts to upgrade the research computing infrastructure and support available for the campus community. These efforts include, but are not limited to:

- Establishment of a Research Computing Support Group (RCSG) in the campus' Office of Information Technology (OIT) consisting of a director and three technical staff with expertise in high performance computing, cluster management, and application support.
- Establishment of OIT management of the campus visualization center (VizLab), which includes the assignment of fulltime staff available for hands-on support and training for the VizWall and corresponding workstations. The workstations are specialized for large data analysis loaded with the corresponding software for bioinformatics, etc. The VizLab was established in 2010 as the result of an NSF MRI award (*MRI: Acquisition of an Integrated System for Advanced Visualization with Haptic Feedback Control*, Award Number: 0923468) in combination with support from the university.

- Establishment of and OIT support for an on-campus HPC research cluster, Shamu. This system is available at no cost to UTSA faculty and student researchers and is also used for educational purposes during the Introduction to High Performance Computing graduate class in Mechanical Engineering. Over the past three years, UTSA has provided total direct funding of approximately \$500K for system improvements in CPU and GPU computing and data storage. Components of Shamu include 81 physical servers; 2792 Total CPU Cores; 16.5 TB of shared memory; 150 TB of shared disk storage (expandable up to 1.05PB depending on disk configuration); 2 GPU nodes, each containing two NVidia Tesla K80 GPU cards; 8 nodes with 16 Xeon cores with 384 Gb RAM each; and 1 node with 72 Xeon cores and 1.5 Tb RAM.
- A new storage enterprise class modular disk array. This array includes a high level of fault tolerance, higher performance, and is expandable. The new array has a total of 150TB of disk capacity and can easily be expanded as needed, up to 1.05PB (depending on disk configuration).
- The Office of Information Technology Network Staff has used perfSONAR to test network throughput from the UTSA campus to the Texas Advanced Computing Center in Austin and confirmed our dedicated research network lambda 10Gb link between the two sites is capable of performing at 9.8Gb/s. UTSA has purchased two perfSONAR systems that will allow us to test point to point throughput on the proposed 10Gb/s Science DMZ. We will also be able to conduct perfSONAR tests against other collaborative partner institutions that have perfSONAR reflectors in place, e.g., Jetstream at Indiana University
- Establishment of IPV6 protocol. We have contracted with one of our service providers and they will be implementing IPV6 routing on a segment of our network. The OIT Network Staff will work alongside the service provider to get hands-on experience and receive knowledge transfer. Additionally, one OIT staff member has attended IPV6 training and another is scheduled to attend. This hands-on experience and training will allow our staff to ramp up to speed quickly and enable them to configure IPV6 routing on the proposed Science DMZ.
- Establishment of a Research Computing Advisory Board –The Associate Deans for Research from each college act as an advisory board that meets monthly to discuss research computing topics such as IT governance, campus upgrades in hardware and software, operation of the Shamu HPC Cluster, and the Research Data Center, application support, and training and workshops. This advisory board will also provide guidance for operation of the new RoadRunner DMZ.

In addition to UTSA support for computing and data intensive research, the UT System has several initiatives implemented through the Texas Advanced Computing Center (TACC). In particular,

- UTSA faculty and students can receive computer accounts at no cost on the Lonestar 5 HPC system, designed to serve as the primary HPC resource for

academic researchers across Texas as part of the University of Texas Research Cyberinfrastructure (UTRC) initiative, co-sponsored by The University of Texas System and partner institutions Texas Tech and Texas A&M University; and,

- Faculty receive 5 TB of free storage on the TACC Corral storage system, a storage and data management resource designed and optimized to support large-scale collections and a collaborative research environment.

B. Library

UTSA Libraries' mission is to advance research and education, stimulate discovery and creativity, and engage and transform our diverse communities by providing distinctive expertise, high quality information resources, inspirational spaces and innovative and responsive services. Through the use of the strategic plan implementation tool, Balanced Scorecard, and a systematic process for continuous improvement, the UTSA Libraries continuously and consistently assess all aspects of the Libraries' operations to ensure that information resources, library spaces, and services further UTSA's institutional goals. In the next 5 years, the UTSA Libraries will build a nationally recognized library system with the goal of membership to the Association of Research Libraries (ARL), an elite organization of the largest research libraries in the United States and Canada. Using aspirant peers as benchmarks, the UTSA Libraries will set challenging goals and engage in strategic projects and tactical work that meet those goals.

Facilities

The Libraries have four locations to serve students at their point of need. Located on the Main Campus, the John Peace Library (JPL) is the largest library and is open 24 hours a day, five days a week during the fall and spring semesters, as well as extended weekend hours. The Applied Engineering and Technology (AET) Library on the Main Campus—the nation's first bookless library on a college or university campus—provides study and collaborative spaces for science and engineering students. Located in the Buena Vista Building on the Downtown Campus, the Downtown Library (DTL) supports multiple undergraduate and graduate professional programs and features quiet and collaborative study areas, computing services, and stunning views of the San Antonio skyline. The Institute of Texan Cultures Special Collections Reading Room at the HemisFair Park Campus is the primary access point for University Archives, photograph collections, and manuscript collections. In total, Libraries comprise 166,603 square feet, providing 2,850 seats and 622 computers onsite. Over 1.7 million library users visited UTSA Libraries in FY 16-17.

In 2017, the UTSA Libraries authored a Facilities Master Plan that created facilities governance and allows Libraries staff to make focused, principled and evidence-based decisions on our spaces in the future. In the next 5 years, UTSA Libraries' initiatives that will help achieve annual facilities goals include:

- Redesign of 2nd floor JPL multimedia area to accommodate more computers with specialized engineering software, mixed reality and virtual reality hardware, create more study seats and improve aesthetics.
- Renovation of 3rd floor JPL to move lower-use print materials to offsite storage, create more silent study spaces and technology-enabled study rooms (desired by graduate students) and build a digital makerspace with multimedia recording and editing studios, visualization laboratory with video wall, virtual reality laboratory and 3-D printers.
- Renovation and reconfiguration of the Downtown Library to accommodate the multidisciplinary growth planned by President Eighmy's vision

- Create a research center that collocates the Libraries' Special Collections and other culturally significant collections across campus. The Libraries has engaged other campus partners (the Center for Archaeological Research, the UTSA Art Collection and the Institute of Texan Cultures) to discuss common needs, including climate controlled spaces, and room to grow these cultural assets.
- Increase the UTSA Libraries' net assigned square footage by 60% from 157,378 net assignable square feet to 252,000 net assignable square feet.
- Deepen current partnerships with the University College and the Office of Information Technology to provide essential academic services, including tutoring services, writing support and computer support in the Libraries.
- Implementation of more self-service technologies in the UTSA Libraries spaces.

Services

The Libraries employ 53 professional staff, including 36 librarians and archivists with accredited graduate degrees, as well as 60 full-time support staff and 25 graduate research assistants and student assistants. The Libraries' Faculty Liaison program promotes direct communication between the subject librarian in a particular discipline and the faculty. This process is integral to ensuring that library collections support the university's academic programs and research foci and that the collections' strengths are enhanced and any weaknesses remedied. Furthermore, librarians partner with faculty in areas of information management, research impact and expert searching.

The Libraries offer a number of services to advance research and promote student success, including Get It For Me, a document delivery service; interlibrary loan; laptop and technology checkout; and information literacy instruction. The Libraries' reference services have moved far beyond the traditional reference desk. Students and researchers are encouraged to "Ask us Anything" via the Libraries' popular online chat service, or by text, email, phone, or in person at one of our information desks.

Collections

Providing resources that advance research, teaching and student success at UTSA is a fundamental goal of the UTSA Libraries. It is vital for the research enterprise at UTSA that library collections are multidisciplinary, relevant and cost-effective. The Libraries provide access to over 3.6 million print and online monographic volumes, over 600 online databases; 90,000 electronic serials; 50,000 audiovisual items; 800,000 streaming music, videos, and maps; 3.5 million photographs, and nearly 2 million microforms, including primary research materials. The Libraries are a selective depository for Federal documents and also collect Texas documents. UTSA researchers accessed these research collections over 4.1 million times, and the UTSA Libraries website, the university's portal to information resources and services, over 7.1 million times in FY 16-17.

To ensure comprehensive coverage across all disciplines at UTSA, the UTSA Libraries collections are developed by subject specialist librarians in careful collaboration with UTSA faculty and students. UTSA Libraries spends an increasing amount of its collections budget on demand-driven acquisitions, so that graduate students and faculty can get the resources they need at the point of need. The faculty-led University Libraries Committee and Departmental Liaison Program, which includes representation

from every academic college, provide added guidance in crafting our collections profile. The UTSA Libraries perform annual subject analyses of the collection and expenditures to make sure all programs are supported satisfactorily.

In the next 5 years, UTSA Libraries' initiatives that will help achieve annual collections goals include:

- Modernizing the virtual infrastructure of the Libraries. UTSA Libraries' current system, Voyager, was implemented in 2000. Alma, a new system replacing Voyager, streamlines and makes more efficient backend processes required to order, organize, maintain and provide access to our collections. UTSA Libraries will gain efficiencies when acquiring and maintaining our collection which is more geared toward online and digital content.
- Expand participation in cooperative library agreements at the local, regional, national, and international levels that serve to broaden the base of resources available to the UTSA's faculty, students, and staff. This includes current consortial purchasing and licensing through the UT System Advisory Committee on Library Resources, TexShare, Council of Research and Academic Libraries and the Center for Research Libraries in addition to new memberships such as ORCiD, HathiTrust, and Texas Digital Library.
- Increase the purchasing of and access to unique and rare materials documenting the diverse histories of San Antonio, South Texas and Mexico. Special Collections at UTSA principally support graduate education and research in the liberal and fine arts, public policy, architecture and education.
- Implement security and authentication solutions that decrease downtime for the UTSA Libraries website and licensed resources.
- Launch a regional digital humanities cooperative with commercial, civic and academic partners and create interactive digital scholarship products
- Establish a virtual UTSA Press that captures the scholarly and creative output of UTSA students and faculty
- Promote and support the open agenda (e.g., open access, open data, open education, open science) to more quickly and efficiently promulgate knowledge
- Incrementally reallocating the Libraries budget to spend more on collections (e.g., 5-year target equaling 55% of total expenditures)
- Purchase new media formats as they come on the market (e.g., virtual reality environments, data sets)
- Purchase video collections of visualized experiments in the sciences and social sciences
- Creation of a graduate research center that collocates the Libraries' Special Collections and other culturally significant collections across campus
- Automate the fulfillment process for physical materials saving researchers time

C. Graduate Student Support

The Graduate Student Professional Development Center

Established in November 2016, The Graduate Student Professional Development Center (GSPD) is the first comprehensive graduate center in the UT System. The Center allows graduate students the opportunity to become life-long learners and prepare to be future leaders in industry and academia. The Center provides countless resources including group study areas, state of the art technology, a dedicated computer lab, a student lounge, and a venue for interdisciplinary networking, teaching and learning. Services provided include:

- Academic Research Career (A.R.C.) Development sessions
- Grant Writing Program
- Teaching and Learning workshops
- International Student Development sessions
- Dissertation Writing Camps
- Thesis/Dissertation Formatting & Submission Support
- Computer lab equipped with the latest quantitative software and citation management tools
- Professional spaces for thesis/dissertation defenses, group work and individual study

A.R.C. Programming

Academic Research Career (A.R.C.) Development is a multi-track program affording master's and doctoral students the ability to enhance skills in a variety of areas through a whole host of topics. Tracks vary by semester and include development of skillsets in research, job placement in industry and academia, and leadership. Presenters are experts in these areas and include UTSA staff and faculty members, UTSA alumni, and local industry leaders.

The majority of the sessions are streamed online for maximum graduate student participation for those who are at the Downtown Campus or off-campus. Some sessions are conducted at the Downtown Campus and other sessions are conducted on Saturdays for student convenience.

The following A.R.C. topics have been designed specifically for supporting doctoral students:

- **Doctoral Program Survival Guide**
 - From A-Z: The Doctoral Program Survival Guide
 - Developing Professional Mentor Relationships
 - Citation Management: Organizing Your Research
 - Using Endnote for Organizing Research
 - Developing Conference Proposals
 - Ethical Standards in Research
 - Presenting at Professional Academic Conferences

- **Research Skills**
 - IRB Review and Ethical Standards in Research for Graduate Students
 - Basic Research Design
 - Intro to Grant Writing
 - Database Management for Quantitative Researchers
 - Intellectual Property Rights
 - From Research to Publishing in STEM
 - Creating Your Scholarly Online Persona: Tips for Doctoral Students
 - From Research to Publishing in Humanities and Education
 - Academic Journal Publishing for Science and Social Science Majors
- **The Faculty Job Search**
 - Interactive CV Development
 - Faculty Job Search in Academia
 - Mastering the On-Campus Faculty Interview
 - Understanding Power Dynamics and Salary Negotiations
- **Beyond Academia**
 - Managing Career Change and Industry Transition
 - How to Translate Your Skills into Language Employers Can Understand
 - Writing Combination Resumes

Specialty Services for Doctoral Students

- **Dissertation Writing Camps**
 - These camps are offered during the spring and summer semesters. They provide intensive, focused writing time in a quiet and supportive environment to help doctoral students make significant progress through the dissertation writing process. This program is for doctoral students who are currently working on writing their dissertation and it is strongly recommended that the student's dissertation proposal has been approved by their committee prior to participating. During these segments, faculty coaches provide one-on-one support and guidance on the writing process.
- **Thesis/Dissertation Formatting & Submission Support**
 - Dedicated staff in the GSPD Center, including a part-time Thesis and Dissertation Officer, are available to assist with all formatting and final submission needs that doctoral students may have. Some of the services include final submission workshops, one-on-one preliminary draft reviews, and support for final submission of the dissertation.

Table 18: General Training Modules for Graduate Student Success

Modules	Courses	Outcomes
Module 1: Beyond Academic Track	Alternate STEM Careers	Getting Ready for STEM Careers
	Managing Career Change and Industry Transition	
	How to Translate your Skills into Language Employers Can Understanding	
Module 2: Outside the lab/research group	Time Management	Skills to succeed in any work place environment; Being “resource savvy”
	Basic Research Design	
	Citation Management	
	Online/offline Resources/Research Background Information	
Module 3: Writing and Speaking	The Graduate Writing Game Plan	Overcoming writer’s/speaker’s “blocks”
	The Grad's Speech: Managing and Mastering Presentations	
	Short Summary Presentations/Elevator Speeches	
Module 4: Leadership skills	Values in Inclusion and Diversity	Getting ready to face the unknowns and conflicts
	Situational Leadership/Conflict Resolution	
Module 5: Grant Writing Workshop	Preparing Preliminary Data	Skills to succeed in writing and winning grants
	Preparing Manuscripts	
	Grant Writing Workshop	
Module 6: Teaching and Learning	Building Your Craft: Teaching Philosophy/Style	Skills to succeed in teaching and engaging students at multiple academic levels
	Engaging Students Inside and Out	
	Teaching Large Classes Effectively	
	Maximizing Technology for Student Engagement	
	Developing Assets and Rubrics	
	Planning and Revising for Next Semester	
	Exploiting Instructional Tools	
	Using Technology to Engage Students in the University Classroom	

Grant Writing Program

The Grant Writing Program was created to foster graduate student innovation and research excellence at UTSA. The Grant Writing Program began in Summer 2016. The 8-week program allowed time for graduate students to move through all stages of the grant writing process. Topics in the grant writing program include finding the right sources of funding, application process and submission deadlines, abstracts, budget narratives, review and submission.

Students who completed 6 out of the 8 workshops in the program are eligible to receive a Certificate of Completion. Moreover, students who complete the program and submit a grant proposal for external funding are eligible to receive a \$1000 stipend.

In a little over a year, a total of 28 students have completed and submitted for a public or private grant. Some students worked alongside Private Investigators (PIs) or advisors on a grant while others pursued a grant individually. A diverse range of graduate students participate in The Grant Writing Program with representation from the humanities, business, public policy, education, science and engineering disciplines.

Professional Development Plan for Graduate Students

To address unmet needs of graduate students across the UTSA campuses, the following strategies are being development for

- 1) Professional development plans that provide strategies and tools to sustain success and productivity of graduate students at all stages of their career plans
- 2) Strategies that are distinct from research based learning modules provided by conventional graduate degree programs
- 3) Formal and informal methods to enhance the "value" of graduate education consistent with changing workforce needs and expectations from graduate students
- 4) Sustained Graduate Student Success consistent with research/teaching/community engagement initiatives at UTSA

Professional Development Plans at UTSA

Enhanced Infrastructure

- a) Dedicated space for networking and engagement of graduate students – Student Success and Professional Development Center (SSPD Center) at The Graduate School (GSR)
- b) Computational and information sharing and visualization systems dedicated for presentations from Graduate Students
- c) Small and large conference rooms for Graduate Student meetings and training modules
- d) Dedicated professional staff and faculty facilitating professional development plans/programs

Sustaining Research Productivity and Excellence

- a) Preparing Graduate Students in areas that complement their primary areas of research/expertise
- b) Graduate Student grant writing workshops (Summer and Fall since 2016) with an emphasis on submitting pre-doctoral fellowships (approximately since 2016 close to \$3.5 millions of students proposals have been submitted)

- c) Strategies to sustain research productivity via timely publications of research data (2 to 3 products/papers consistent with the THECB requirements for Doctoral Programs)
- d) Advancing innovations (staying ahead of the curve) via collaborative multi-disciplinary interactions/programs
- e) Research tools/university wide computation software/statistical analysis programs for Graduate Students with staff support that compliments tools available with various Colleges/Departments/Research Programs
- f) Providing an environment to establish network of experts within and outside UTSA for graduate student research portfolios/projects
- g) Alternative research-based careers and career building tools for doctoral students outside academia and industry

Excellence in Teaching at all Academic Levels

- a) Enhancing Pre- and post- secondary teaching effectiveness for all graduate students.
- b) More than 60 short courses to enhance teaching effectiveness and career development courses available
- c) Modules are offered over the entire academic year and certificates of teaching effectiveness provided upon completion of a set of modules
- d) General Strategies to offer new and discipline specific courses to prepare senior graduate students to establish their teaching careers upon graduation
- e) Measure of teaching effectiveness assessed for individual/programmatic changes

Community Outreach/Community Engagement/Communication of Research Findings/Driving Public Policy

- a) Increased community outreach by providing avenues for graduate students to interact with other educational and business enterprises
- b) Connecting graduate students to business and community leaders via lectures/graduate student presentations
- c) Certificate of Community outreach/engagement following completion of modules offered either via Graduate School or in conjunction with their respective graduate programs
- d) Tool kit to enhance communication of research findings to the public – Three-minute thesis presentations (3MTs), oral and written presentations for the public and strategies to influence public policy in all areas of research/teaching programs at UTSA

Entrepreneurial Leadership

- a) Strategies to commercialize graduate student research
- b) Modules to enhance graduate student engagement/interest in entrepreneurial leadership activities

- c) Alternative career plans advancing graduate student capabilities to establish commercial entities

A series of modules are currently offered at the Graduate School and some of the major components of the professional development plans are summarized in **Table 18**.

VII. National Visibility

The UTSA Office of University Communications and Marketing (UCM) positions and promotes the university, along with its research activities, with strategic messaging, compelling storytelling and creative integrated marketing campaigns.

UTSA's storytelling efforts form the basis of its earned and owned media strategies. Focus is placed on sharing the accomplishments of UTSA students, particularly those who have overcome great odds to achieve of the dream higher education, UTSA faculty members, whose teaching and research excellence is expanding minds and creating knowledge, and UTSA alumni, who are making impactful community contributions in San Antonio and around the nation.

Over the last five years, UTSA has been growing and refining its digital news channels. Notably, UCM redesigned the UTSA home page from a one-size-fits all venue to a web page focused on prospective and current students, its primary audience. In 2017, the UTSA home page garnered 5.3 million page views.

During that same five-year time frame, UCM has evolved UTSA Today, its official news site, through two redesigns. These initiatives have resulted in more compelling imagery and content and a focus on strategic messaging. In 2017, UCM published 757 news stories focused on teaching and learning, research and community engagement. Those efforts resulted in a 2017 impact of 1.1 million page views and more time on each page than ever before. Additionally, many of the stories that appear on UTSA Today are reported by the news media, raising further awareness of the stories told by the UCM team.

UCM manages five social media channels to extend the reach of UTSA news stories. These include the university's official Facebook, Twitter and Instagram channels (@UTSA), the university's LinkedIn page and a new Twitter channel devoted specifically to members of the news media (@UTSAnewsroom). This online audience, which continues to grow each year, includes 240,000 followers.

At the same time UCM maintains its owned channels, it continues to pitch an ongoing pipeline of stories to the media. These include UTSA Today news stories as well as news pitches, feature pitches, human interest stories and op-editorials to strategically targeted members of the media. These efforts have earned UTSA significant news coverage.

To further expand the university's visibility, UCM has engaged more than 200 faculty members to serve as experts to the media for breaking news stories and seasonal stories. These efforts resulted in the creation of UTSA's first Expert Source Guide for the Media, a robust tool that offers breaking news topics and featured experts and expanded UTSA's earned media placements outside of San Antonio. Stories have been earned in the New York Times, the Washington Post, on NPR, on the BBC and in numerous trade publications aligned with UTSA's research strengths. This tactic has been particularly effective in promoting the expertise of UTSA faculty members in STEM related disciplines, especially in information assurance and cybersecurity and in psychology.

As the UCM team further educates UTSA faculty and staff members about the benefits of working with the news media, the university's national visibility will continue to grow. Strategies have been identified to help faculty and staff better understand the benefit of working with the news media to share their work and subject matter expertise. Continued instruction on how to define op-ed opportunities and write compelling pieces for publications outside of San Antonio will further allow UTSA to generate increasing national visibility.

In fall 2017, Taylor Eighmy became UTSA's sixth president. Shortly after starting at UTSA, he outlined a vision for UTSA as San Antonio's university of the future, an institution that produces graduates who tackle the grand challenges of today's world. His vision builds upon UTSA as (1) a great multicultural discovery enterprise, (2) an exemplary urban-serving university of the future, (3) world-engaged, (4) fostering exceptional student experiences, (5) cultivating the excellence of its people and (6) operational and infrastructure excellence. Those six themes are providing a heightened lens for UTSA's communications and marketing strategy.

Notably, University Communications and Marketing has engaged Stamats, a market research firm specializing in higher education, to assess the effectiveness of its brand and key messages. Moving forward, the information collected from the surveys will be used to better improve the messaging, positioning and strategy that promotes UTSA's strengths and raises awareness and relevance of the UTSA brand.

Appendix A. Summary of UTSA 5-Year Strategic Goals

AREA	PARAMETER	FALL 2017	IN 5 YEARS 2022
STUDENTS	Total Enrollment	30,674	36,487
	FTE Enrollment	24,562	29,418
	4-Year Graduation Rate	22%	25%
	6- Year Graduation Rate	37%	44%
FACULTY	Tenured & Tenure-Track	632	808
	Faculty w/ Externally Funded Research	312	485
	% of Tenured, Tenure- Track Faculty w/ Externally Funded Research	50%	60%
RESEARCH	Total R&D	\$68,137,959	\$115,000,000
	Restricted R&D	\$40,091,697	\$64,000,000
	Federal R&D	\$28,046,262	\$38,000,000
DOCTORAL PROGRAMS	Number of Doctoral Programs	24	30
	Annual Graduates	113	264
OTHER	National Academy Members	1	5
	Endowment	\$154.2M	\$400M
	Academic and Research Space	710,693 sq. ft. (Acad.) 302,266 sq. ft. (Rsrch.)	802,116 sq. ft. (Acad.) 393,689 sq. ft. (Rsrch.)
	Postdocs	85	110

Appendix B. Faculty Recognition: Endowed Professorships and Chairs

Title of Endowment	Appointee
COLLEGE OF ARCHITECTURE, CONSTRUCTION & PLANNING	
The San Antonio Conservation Society Endowed Professorship in Memory of Mary Ann Blocker Castleberry	William Dupont
Roland K. Blumberg Endowed Professor in Architecture	John Murphy
COLLEGE OF BUSINESS	
Graham Weston Endowed Professor	Suman Basuroy
Janey S. Briscoe Endowed Chair in Business	Hamid Beladi
Melvin Lachman Distinguished Professorship in Entrepreneurship	Nicole Beebe
Anheuser-Busch Foundation Professorship in Tourism Management	David Bojanic
Elmo James Burke Jr. Chair Professor of Finance and Real Estate	Brian Ciochetti
Cloud Technology Endowed Professorship III	Kim-Kwang Raymond Choo
Frost Finance Endowed Distinguished Professorship	Palani-Rajan Kadapakkam
Richard S. Liu Distinguished Chair in Business	Don Lien
Glenn L. and Sally P. Ramsdell Memorial Chair for Accounting	K. K. Raman
AT&T Distinguished Chair in Infrastructure Assurance and Security	H. Raghav Rao

Bodenstedt Chair	Wm. Gerard (Gerry) Sanders
Quincy Lee Endowed Chair for Excellence in Real Estate Finance and Development Education	Tom Thomson
Tom C. Frost Endowed Professorship in International Business	VACANT
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT	
President's Distinguished Professorship	Margo DelliCarpini
Henrietta Frances Zezula Lowak Endowed Distinguished Professorship	Betty M Merchant
Loretta J. Lowak Clarke Distinguished Professor in Health and Kinesiology	Zenong Yin
Dr. Bertha Perez Endowed Distinguished Professorship in Biliteracy Research	VACANT
COLLEGE OF ENGINEERING	
Lutcher Brown Chair	Rena Bizios
David and Jennifer Spencer Distinguished Dean's Chair in Engineering	JoAnn Browning Matamoras
Greenstar Endowed Professorship in Energy	Krystel Castillo
Lutcher Brown Dist Chair #7 (in Mechanical Engineering)	F. Frank Chen
Microsoft President's Endowed Professorship #3	Ram Krishnan
Robert E. Clarke, Jr. Distinguished Professorship in Electrical Engineering	Ruyan Guo
Zachry Mechanical Engineering Department Endowed Chair	Hai-Chao Han

Lutcher Brown Distinguished Chair #6 (in Electrical Engineering)	Mo Jamshidi
Cloud Technology Endowed Professorship II	Wonjun Lee
Samuel G. Dawson College of Engineering Endowed Professorship	Harry Millwater
The USAA Foundation Distinguished Professorship	Anson Joo Ong
Robert F. McDermott Chair in Engineering	Athanassios Papagiannakis
Mary Lou Clarke Endowed Distinguished Professorship for Leadership in Electrical Engineering	Chunjiang Qian
The Janey and Dolph Briscoe Distinguished Professorship	Mehdi Shadaram
Robert F. McDermott Distinguished Chair in Engineering	Les E. Shephard
Burzik Professorship in Engineering Design	Heather Shipley
Jacobson Distinguished Professorship of Innovation and Entrepreneurship	VACANT
Dee Howard Memorial Endowed Faculty Fellowship in Mechanical Engineering	VACANT
The Edward E. Whitacre, Jr., Endowed Chair in Mechanics	VACANT
HONORS COLLEGE	
Ricardo Romo Ph.D. Endowed Professorship	Kinitra Brooks
COLLEGE OF LIBERAL & FINE ARTS	
Pearl Lewinn Endowed Professorship in Creative Writing	Wendy Barker

Lutcher Brown Professorship	M. Kathryn Brown
Gilbert M. Denman Endowed Professorship in American History	Catherine Clinton
Stumberg Distinguished University Chair	Daniel J. Gelo
Brackenridge Endowed Chair in Literature and the Humanities	Sonja L. Lanehart (Schutz)
Sue E. Denman Distinguished Chair in American Literature	Joycelyn K. Moody
Jack and Laura Richmond Endowed Faculty Fellowship in American Literature	Jeanne C. Reesman
UTSA President's Endowed Professorship #4	Jason Yaeger
Roland K. Blumberg Professorship in Music	VACANT
Bess Hieronymous Endowed Professorship in Music	VACANT
Celia Jacobs Endowed Professorship in British Literature	VACANT
Cloud Technology Endowed Professorship IV	VACANT
COLLEGE OF PUBLIC POLICY	
Mark G. Yudof College of Public Policy Dean's Endowed Professorshi	Rogelio Sáenz

COLLEGE OF SCIENCES	
Jane & Roland Blumberg Professorship in Biology	Bernard Arulanandam
Roland K. and Jane W. Blumberg Professorship in Bioscience	Edwin J. Barea-Rodriguez
Roland K. and Jane W. Blumberg Professorship in Bioscience	J. Aaron Cassill
Microsoft President's Endowed Professorship #2	Banglin Chen
Rita and John Feik Distinguished University Chair in Medicinal Chemistry	Michael Doyle
Jesse H. and Mary Gibbs Jones Endowed Chair in Biotechnology	Thomas G. Forsthuber
Max and Minnie Tomerlin Voelcker Fund Endowed Distinguished Professorship in Chemistry	Doug E. Frantz
Cloud Technology Endowed Professorship I	Michael Gubanov
Dan Parman Endowed Distinguished Chair in Applied Mathematics	Changfeng Gui
Semmes Foundation Endowed Chair in Cell Biology	Jenny Hsieh
Robert J. Kleberg, Jr. and Helen C. Kleberg College of Sciences Endowed Professorship	Karl E. Klose
Lutcher Brown Distinguished Chair #4 in Chemistry	Donald M. Kurtz
John H. Doran, M.D., F.A.C.P., Endowed Distinguished Professorship in Peripheral Neuropathy	Hyoung-gon Lee
Lutcher Brown Distinguished Chair #2	Aimin Liu

Margaret Batts Tobin Distinguished Chair in Biotechnology	Jose L. Lopez-Ribot
Kleberg Distinguished University Chair in Cellular & Molecular Biology	John R. McCarrey
Semmes Foundation Endowed Distinguished University Chair in Neurobiology	George Perry
Lutcher Brown Distinguished Chair #5 in Cyber Security	Ravi Sandhu
Ashbel Smith Professorship	Dhiraj Sardar
Robert A. Welch Distinguished University Chair in Chemistry 1	Kirk Schanze
Vaughan Family Endowed Professorship in Physics	Eric Schlegel
Ricardo Romo Ph.D. Endowed Professorship	Valerie Sponsel
The Ewing Halsell Distinguished Chair in Biology	Charles J. Wilson
Microsoft President's Endowed Professorship #1	Floyd L. Wormley Jr.
Lutcher Brown Distinguished Chair #3	Miguel José-Yacamán
Amy Shelton and V.H. McNutt Distinguished Professorship in Geology	VACANT
Cloud Technology Endowed Professorship IV	VACANT
Robert A. Welch Distinguished University Chair in Chemistry 2	VACANT
Dr. Weldon W. Hammond, Jr. Endowed Distinguished Professorship in Hydrogeology	VACANT

Appendix C. Research Centers & Institutes

Research Center or Institute	Director
Autism Research Center (ARC)	Lee Mason
Bank of America Child and Adolescent Policy Research Institute (BACAPRI)	Harriett Romo
Center for Advanced Manufacturing & Lean Systems (CAMLs)	Interim Director: Hung-Da Wan
Center for Archeological Research (CAR)	Paul Shawn Marceaux
Center for Community Based and Applied Health Research	Erica Sosa and Meizi He
Center for Cultural Sustainability (CCS)	William A. Dupont
Cyber Center for Security and Analytics	Nicole Beebe
Center for Infrastructure Assurance and Security (CIAS)	Greg White
Center for Innovation and Drug Discovery (CIDD)	Stanton McHardy
Center for Research and Policy in Education (CRPE)	Amaury Nora and Laura Rendon
Center for Research and Training in the Sciences (CRTS)	George Perry
Center for Urban and Regional Planning Research (CURPR)	Richard Tangum
Center for the Inquiry of Transformative Literacies (CITL)	Misty Sailors

Center for Water Research (CWR)	Yongli Gao
Institute for Cyber Security (ICS)	Ravi Sandhu
Institute for Demographic and Socioeconomic Research (IDSR)	Lloyd Potter
Institute for Health Disparities Research (IHDR)	Thankam Sunil
Open Cloud Institute (OCI)	Interim Director: Bernard Arulanandam
San Antonio Cellular Therapeutics Institute (SACTI)	John McCarrey
Simulation Visualization and Real Time Prediction (SiViRT)	Yusheng Feng
South Texas Center for Emerging Infectious Diseases (STCEID)	Karl Klose
Texas Sustainable Energy Research Institute (TSERI)	Krystel Castillo
UTSA Neurosciences Institute (NI)	Charles Wilson
Water Institute of Texas (WIT)	VACANT

Appendix D. UTSA Academy of Distinguished Researchers

College and Department	Appointee
COLLEGE OF BUSINESS	
Economics	Hamid Beladi, Chair & Charter Member
Finance	John Wald, Charter Member
COLLEGE OF EDUCATION AND HUMAN DEVELOPMENT	
Kinesiology	William Cooke, Charter Member
COLLEGE OF ENGINEERING	
Electrical and Computer Engineering	Sos Agaian, Charter Member Emeritus
Biomedical Engineering	Rena Bizios, Charter Member
Biomedical Engineering	Joo L. Ong
COLLEGE OF LIBERAL AND FINE ARTS	
Sociology	Christopher Ellison, Charter Member
English	Jeanne Reesman, Charter Member
COLLEGE OF PUBLIC POLICY	
Demography	Joachim Singelmann, Charter Member

COLLEGE OF SCIENCES	
Chemistry	Banglin Chen
Biology (Regenerative Medicine)	John McCarrey
Biology (Infectious Disease)	Jose Lopez-Ribot
Computer Science	Ravi Sandhu, Charter Member
Biology (Neurosciences)	Charles Wilson, Charter Member
Physics & Astronomy	Miguel Jose Yacaman, Charter Member