Provost's Task Force on Scholarly Research and Creative Impact

Southern Methodist University

Final Report

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Introduction

America's great private universities—including SMU's aspirational peers, Ivy League institutions, and members of the prestigious Association of American Universities (AAU)––boast not only highly regarded undergraduate programs, but also comprehensive and vigorous research programs with broad regional, national, and international impact. Over the past decade, through the efforts of its faculty, administration, and board of trustees, SMU has made great strides in the quality of its undergraduate student body as well as the facilities available to them. Nonetheless, SMU recognizes that more can be done to elevate the institution. Our *Second Century Strategic Plan*, *2015-2025,* identifies that two of our principal goals are to "Enhance the academic quality and stature of the university" (Goal 1) and to "Strengthen scholarly research, creative achievement, and opportunities for innovation" (Goal 3). Meeting these goals is vital to the continued growth, vigor, and value of SMU.

It is heartening to see SMU elevate our national presence and ranking over the last decade. We have been ranked consistently among the top 75 national universities in the *U.S. News and World Report Best Colleges Rankings*, and last year, we reached our highest ranking ever at #56 in the "National Universities" category. Breaking into the top 50 and maintaining that position may be a tall order, but a reachable one. Doing so will fulfill the Strategic Plan's commitment to "Elevate SMU's national profile to raise rankings" (Goal 6, Objective 4).

Achieving this goal will require intentional, sustained commitment to the university's research mission. Indeed, *U.S. News and World Report* categorizes schools as "National Universities" on the basis of their research activity and graduate programs: "Schools in the National Universities category offer a full range of undergraduate majors, plus master's and doctoral programs, and emphasize faculty research." Last year *U.S. News* updated its method for classifying schools by drawing more directly on the Carnegie Classification of Institutions of Higher Education.[1] Now, the "National Universities" category for *U.S. News* is closely aligned with the Carnegie category of "Doctoral University," which is in turn defined by its annual conferral of at least twenty "research/scholarship doctoral degrees."[2]

The schools that rank above SMU in the *U.S. News* rankings are all defined by robust research activity and agendas. Most are members of the AAU. And nearly all receive the highest status within the Carnegie "Doctoral University" category of "R1: Highest Research Activity," a designation made on the basis of research and development

[1] https://www.usnews.com/education/best-colleges/articles/how-us-news-calculated-the-rankings

[2] http://carnegieclassifications.iu.edu/classification_descriptions/basic.php

expenditures, size of research staff, and doctoral conferrals. The two universities tied with SMU at #56 in *U.S. News* (George Washington University and the University of Georgia) are both R1 schools under the Carnegie system. SMU, in contrast, falls into the subcategory of "R2: Higher Research Activity."

Remaining in the *U.S. News* "National Universities" category at all requires SMU to continue its long-running support of research and research-oriented graduate programs. Neglecting either could downgrade SMU to the category of "Regional University," where it would join other Texas institutions like Trinity University, the University of Dallas, and St. Edwards University—excellent schools all, but decidedly unlike the peers against which SMU has measured itself for decades. Moving ahead in the rankings will require SMU to substantially enhance its support of research activity and graduate programs. Doing so would raise SMU's research profile, which influences the academic peer assessment survey that constitutes the key part of the *U.S. News* ranking indicator of "undergraduate academic reputation." Finding innovative ways to foster and include undergraduate research within SMU's larger research efforts would bolster the effect. Thus, as we strive to join the top 50 national universities, we must strategically identify and mobilize resources to strengthen our research activity.

The current state of affairs, however, suggests there is much more to be done. SMU lags well behind more highly-ranked schools—as well as our aspirational and cohort peers—in our ability to attract and retain the most dynamic and influential faculty and the best graduate students. We also lag behind these schools in securing external funding that is needed for world-changing research, scholarship, and creative activity. Moreover, as the global economy becomes increasingly dynamic and technologically sophisticated, SMU must strive to generate cutting-edge knowledge that will enhance the university's impact on society and make our graduates world-changers who are attractive to leading organizations and employers across a broad spectrum of fields.

It is also worth emphasizing that although many of the research metrics cited above are particularly relevant to the STEM disciplines and engineering, scholarly research and creative impact must be dramatically improved in every school. A broad base of excellence will benefit the entire North Texas region. For example, strengthening SMU's scholarly and scientific research, and creative activity in the arts, not only will increase our national rankings and reputation (and add broad value to the undergraduate experience), but will also provide a bridge to the city of Dallas, with its vibrant artistic and museum community, and serve as an economic engine for North Texas. Among the nation's seven largest metropolitan areas, Dallas-Fort Worth is the only one without a world-class university. As such, our region lacks the full benefits of a powerhouse research university that can generate cutting-edge scientific and engineering knowledge, business acumen, and creative artistic and intellectual outputs. Moreover, on campus,

the best students increasingly demand instruction from those who generate these innovations, inventions, and creative outputs.

If SMU is to seize a larger role in the rapidly growing North Texas economy, we must become a primary source of subject matter expertise and thought leadership across disciplines. This notion is conveyed most effectively, perhaps, by the AAU itself:

> "Research conducted at America's research universities carries a dual benefit. It creates the foundation for major advances in such areas as health and medicine, communications, food, economics, energy, and national security. And it helps educate students to be scientific leaders and innovators. The national investment in university research, in turn, has fueled U.S. economic growth and prosperity, and made the nation a beacon for the best and brightest from around the world. But this leadership is not guaranteed. Federal budget constraints have reduced funding for basic research, even as other nations ramp up their own spending, creating an innovation deficit. We must strengthen our investment in university research to maintain our scientific and technological leadership and our economic competitiveness."[3]

The idea that university research can act as a centrifuge for spreading innovation and economic growth throughout a region is best demonstrated by the economic prosperity brought by the great university systems of New York and California, or even the more recent growth of the technology industry in Austin and its ties to the University of Texas. Thus, a sustained effort to promote SMU's research capabilities, creativity, and productivity could generate similar benefits for North Texas. Fortunately, SMU is uniquely well situated to the task—we sit on a beautiful campus in the heart of an already-thriving Metroplex, with strong ties to a highly supportive external community. This Report identifies clear steps that SMU can take toward becoming the next great American research university.

But now is the time for action. SMU is not alone in aspiring to be the leading world-class university in North Texas. Both the University of Texas at Dallas and the University of Texas at Arlington are each seeking that same strategic perch, with TCU not far behind.

[3] http://www.aau.edu/research/article.aspx?id=15486

Charge to the Task Force

In October 2016, SMU Provost Steve Currall convened a Task Force on Scholarly Research and Creative Impact, which he charged with developing "faculty-led guidance" on how to strengthen our scholarly research and creative activities, with an eye toward cementing SMU's position as the leading global research university in the North Texas region.

Specifically, the Provost asked the Task Force to address the following seven questions:

1. What areas of excellence should we pursue that will help SMU distinguish and differentiate itself from our peer institutions?
2. What are key interdisciplinary themes that serve to both: (1) coalesce faculty from across the campus, and (2) contribute to society by addressing grand global challenges?
3. How can collaborations with other regional, national, or international institutions be fostered and utilized?
4. How do we capitalize on our existing strengths, such as our current programs and our location in North Texas?
5. What criteria should be used to measure the success of SMU scholarly research and creative impact, and how should those criteria be used to prioritize investments in scholarly research and creative activities?
6. What are the impediments to enhancing research and creative impact by SMU?
7. What is the role of knowledge/technology transfer activities such as incubation and innovation

This Report seeks to answer these questions and recommend specific actions in the spirit of helping SMU become a top-tier institution. A key measure of such excellence is admission into the Association of American Universities (AAU). The path to achieving that status is admittedly challenging, but it has been accomplished before—even by institutions of SMU's scale, such as Brandeis University, Carnegie Mellon University, and Rice University. The nation's best institutions have travelled that path successfully. From their journeys we know that a strong, sustained commitment to research from the university and its constituents is required. In particular, transformative gifts have dramatically elevated the profiles of many such institutions in a relatively short time (see Appendix for examples).

Moreover, even in seeking such academic eminence, SMU stands to gain immeasurably. The actions required to achieve AAU admission themselves can transform the landscape for scholarly research and creative impact at SMU, the region, the state, and perhaps the

nation. Toward that end, this Report provides a set of short- and long-term recommendations that we believe will help SMU along the path toward becoming a top-tier private, national research university with a rich liberal arts tradition.

To formulate our recommendations, the Task Force requested and received input from multiple stakeholders as well as from outside experts. We solicited feedback from the SMU faculty at large on the seven questions posed by the Provost. In turn, we received written responses from more than 80 individual faculty members. These responses were deeply thoughtful about the questions being considered and were in many cases quite detailed, indicating that such topics are of considerable interest to the SMU faculty. To supplement that, individual members of the Task Force engaged in extensive conversations with colleagues across campus, with several of the Deans of the respective colleges and schools, senior administration officials, and several members of the SMU Board of Trustees. Important data for consideration was provided by Dr. James Quick, Associate Vice President for Research and Dean of Graduate Studies, and Dr. Michael Tumeo, Director of Institutional Research.

To gain an outside perspective, the Task Force invited several experts who lead or have led world-class research institutions to share their views. These experts included: (1) Dr. Harris Lewin, the former Vice Chancellor for Research at the University of California at Davis (a member of the National Academy of Sciences); (2) Dr. David Russell, the Vice Provost & Dean of Basic Research at UT Southwestern (also a member of the National Academy of Sciences); and (3) Dr. Neal Lane, the former Provost of Rice University (as well as the former head of the National Science Foundation, and the former assistant to the U.S. President for science and technology, and Director of the White House Office of Science and Technology Policy).

To accomplish its work in the most efficient manner possible, the Task Force formed two subcommittees, one focusing on matters internal to SMU, and the other focusing on matters external. The committees met weekly over several months. The full Task Force also convened at regular intervals to further develop findings and recommendations. These were then crafted into a draft report by an Executive Committee consisting of Profs. Meltzer, Vogel, MacFarlane, Griffin, Cortez, Ketterlin Geller, Chancey, Graybill and Chang with input from all members of the Task Force to produce the final Report.

Summary of Findings

To answer the charge to the Task Force, we had to evaluate the current state of affairs of scholarly research and creative activity at SMU. This state of affairs both provides the foundation for our recommendations and helps point the way forward. Thus, to preface our recommendations, we make some key observations about the current state of research and creative activity at SMU.

SMU's strengths are immediately apparent. The university boasts an engaged and creative faculty that—despite various and substantive challenges discussed below—has achieved nationally-renowned research programs. Several of SMU's professional schools are ranked nationally, and there are core disciplinary strengths in all programs across campus.

But how can we build out **areas of excellence** that will help SMU distinguish itself from our peer institutions? The Task Force received numerous suggestions from the faculty, including global health, population health, Big Data, robotics, environmental sustainability, social entrepreneurship, creative and interactive technology, and more pragmatically, areas of research that have the highest impact. It is the sense of the Task Force that substantive areas of research excellence and distinctiveness should emerge from each school (or 'from the bottom up'), rather than be dictated centrally. That said, it is also the sense of the Task Force that SMU should: (1) focus first on improving existing Ph.D. programs; (2) choose new areas to pursue only after careful strategic consideration; (3) build new programs on the foundation of existing faculty strengths and resources (such as the already-substantial investment in research computing infrastructure); (4) focus on areas not already occupied by our local peers; and, (5) invest only in areas supported by significant faculty enthusiasm, which is a prerequisite for successful programs.

Several faculty-driven **interdisciplinary research initiatives** are already ensconced across campus, including (1) the Center for Global Health Impact (CGHI); (2) the Center for Drug Discovery, Design, and Delivery (CD4); (3) the Darwin Deason Institute for Cyber Security, (4) the Biopsychosocial research cluster; (5) the Ancient Molecules research cluster; (6) the Cognitive Science research cluster; (7) the GIS@SMU research cluster; as well as programs in digital humanities, entrepreneurship, innovation policy, computational mathematics, and, of course, the various programs spun out of the Dedman College Interdisciplinary Institute. A large number of interdisciplinary themes were identified by SMU faculty. If supported appropriately, such interdisciplinary research could generate exceptional value to organizations and businesses in the Metroplex, the state, and even the nation. One way to achieve this goal is to develop a multiyear program to fund research clusters, either within or across departments and schools. While there is a strong desire to break down disciplinary silos, we must also stress that interdisciplinary excellence will depend on established excellence in each discipline.

SMU faculty activities reach beyond campus, of course, and already include **collaborations** with a variety of external organizations, businesses, and institutions, including the University of Texas Southwestern Medical Center (UT Southwestern), the Baylor Medical System, Texas Instruments, the Federal Reserve Bank, the Botanical Research Institute of Texas (BRIT), the Press Club of Dallas, multiple museums and arts organizations in the city, non-profit organizations, Houston Methodist Hospital System, other universities in Texas and beyond, and a variety of other institutions across the country and around the world. At the moment, these collaborations are principally the result of efforts of individual faculty or departments, and do not always enjoy the support (or even the knowledge) of the university. A relatively smaller number of collaborations have been established at the institutional level (e.g., Raytheon, AT&T). Most of these collaborations are for research purposes, but in at least some instances, such as the joint program in Biostatistics between SMU and UT Southwestern, the principal goal is graduate instruction. Much more can and should be done on the research front to strengthen and leverage external collaborations.

More also needs to be done to **capitalize on our existing strengths**, both within SMU and by virtue of our location in North Texas. Suggestions include: (1) utilizing resources like the SMU-in-Taos campus (originally conceived as a research center) and the Plano campus more effectively; (2) taking leadership roles in civic engagement efforts, including the willingness to tackle challenging public needs when appropriate; (3) developing programs with the world-class museums and arts organizations in the Metroplex which will be an excellent way to capitalize on the creative work in the arts and humanities at SMU; (4) solidifying ties to the many health organizations in the region; (5) seeking more interaction with local industry; (6) sponsoring more community talks and workshops; (7) working with the region's many local entrepreneurs (including social entrepreneurs) and start-up companies; and (8) better publicizing the research and creative activities at SMU, possibly with off-campus "shop front" facilities to offset the relative isolation of SMU (e.g. facilities for artists-in-residence, performance, and exhibition). In particular, the DFW Airport hub also makes SMU a central location for conferences and expositions.

The range of disciplines and activities at SMU makes clear that the **criteria to measure success** are going to vary widely between schools and departments. Any criteria should, of course, include the traditional academic measures of success across many of the liberal arts, such as attracting external research funding and fellowships, producing publications in top-tier journals or books with prestigious publishing houses, national and international awards and prizes, election as fellows or members of academies (and not just the National Academies [Sciences and Engineering], but also other honorary organizations, including election as a fellow in discipline-specific ones), and the ability to attract top-flight graduate students. To that list should be added, specifically for engineering and computer science, the adoption of influential discoveries by industry, contributions. In professional schools such as the Business School and the Law School,

for example, research success is measured not only by publication of books and papers in leading journals, but also by the extent to which the research affects professional practice, law and public policy. For those whose research or creativity is played out on a public stage, these could include invitations to present their research to policymakers or other relevant stakeholders, performances in top venues, art exhibitions at major galleries, and the creation (and positive reviews) of new plays, dances or musical pieces. Importantly, while these many and varied accolades are earned by individual faculty, they ultimately accrue to the benefit of the institution, and become the measure of its scholarly reputation. At a more general level, given our vision of membership in the AAU, SMU should increasingly focus on the AAU admission criteria.

Success at SMU is possible, but there are many **impediments to enhancing research and creative impact**. This question drew the most extensive comments from faculty and other stakeholders across the university, and can be sorted into six broad categories related to staff, faculty, graduate students, infrastructure, research support, and culture. Because of their importance, we discuss each in turn:

(1) *Staff:* Largely as a result of OE2C, staff positions have been cut drastically (e.g. halving their number in many areas of the university). Although this may have produced modest financial savings, it has sharply increased the burden on remaining staff, and also the amount of faculty time and resources that must be devoted to administrative and clerical tasks: so-called 'shadow work.' These are tasks that trained staff could do—and before OE2C used to do—in less time and at far less per unit cost. It has been estimated that ~25% of a faculty member's time is now taken up with shadow work (with Concur singled out as a particularly egregious, poorly-supported time-sink). This effort severely reduces the amount of time faculty can devote to research and teaching; in fact, it is antithetical to the goals of raising SMU's research profile and standing. Given the present low level of staff support, not only is it unlikely SMU will make significant sustained progress upwards in the rankings, it is quite possible that over the long run it will lose ground, will fail to meet its stated Strategic Plan objective to "attract and retain a competent, diverse, and professional staff to support efficiently the academic centers of teaching, learning, and research, along with staff in administrative units," and will find it increasingly difficult to recruit and retain gifted researchers. SMU's research agenda requires a robust, empowered, resourced, and appreciated staff working alongside faculty.

(2) *Faculty*: Several areas of concern were identified here, first and foremost that the tenure-track faculty are too few in too many areas, particularly in STEM disciplines, making it difficult to meet research expectations and obligations, in the face of greater teaching loads and increasing shadow work. Our small faculty numbers likewise make it difficult to develop the critical mass campus-wide that will be necessary for boosting the amount of research funding, which is vital to enhancing

SMU's academic opportunities and reputation. Other concerns in this category include the limited returns to PIs of overhead funds; the heavy teaching loads of research-intensive faculty; the decline in special research leaves; and the lack of support for travel to conferences and workshops or the support for such here on campus.

(3) *Graduate students*: Thriving research-oriented graduate programs are a defining and necessary element of a successful, highly ranked research and teaching university, but in many areas of the campus stipends for graduate students lag noticeably behind those of peer and aspirational schools. The dollar amounts of annual stipends are uncompetitive, often too low to cover basic living expenses, and offered for too few years to cover standard lengths for degree completion. Furthermore, the health insurance coverage SMU offers to its graduate students is inconsistent, unpredictable, and sometimes prohibitively expensive. The result is that SMU frequently loses the best graduate school applicants to schools that offer better packages, and often fails to support adequately the students it does admit. Similarly, the number of graduate students admitted annually to key programs is inadequate for those programs to thrive. A greater critical mass of students will be necessary for departments to achieve the prestige and visibility that individual faculty members within them already possess, and more financial support of and administrative attention to the university's graduate programs will be essential if SMU is to establish a greater reputation as a research university.

(4) *Infrastructure*: The research space on the SMU campus is insufficient in quantity, lacking as it does sufficient space for laboratories (especially wet labs), offices for graduate students and postdoctoral or visiting fellows, but also in quality. In regard to the latter, many existing laboratories lack adequate temperature control, electrical stability, have slow Ethernet lines, etc. And many laboratories are in disrepair and inadequately maintained. Although the proposed Ford Research Building is welcome, the current plans for its size and scope will not be adequate to solve even the current infrastructure problems. A key part of infrastructure is having an adequate full-time technical staff to support instrumentation, including setup and maintenance, as well as to provide expertise with technical hardware, software programming, etc. Currently there is a shortage of staff in this area as well, the burden falling on faculty, thereby further limiting their research time. For faculty in the arts and humanities, diminished library resources and cutbacks in library staff have made it challenging to conduct their research and scholarship.

(5) *Research support*: The Office of Research Administration, which is charged with the responsibility of facilitating and supporting research on campus, is woefully understaffed, to the point that it takes far too long and requires far too much faculty time on clerical matters to submit a proposal. The process is further hamstrung by the number of steps and procedures needed to submit a grant proposal, including

redundant and irrelevant layers of IRB and 'good research' modules that must be completed prior to submission, which add weeks to proposal submission time. Other concerns included the cumbersome process for approving license agreements, patents, external collaborations (NDAs, MOUs, IP agreements, etc.); the lack of availability of (and limited flexibility in awarding) seed funding; lack of staff support post-award for interfacing between the grants office and the investigator, and the difficulty of working with budgets (and budget changes) and the current system for monitoring grants.

(6) *Culture*: SMU prides itself on its accomplishments at the undergraduate level, and much of its attention in terms of its ranking and reputation in this realm—hence the concern about SMU's place on the *U.S. News & World Report* rankings, with seemingly little or no attention to our Carnegie classification. At the moment, SMU wishes to be both an undergraduate liberal arts college and taken seriously as a research institution. Yet, most of the resources and attention are focused on the former, with little in the way of demonstrated will or means devoted to developing the latter. A change in culture will be necessary, and should include devoting human and financial resources to the research enterprise, starting with disentangling research from graduate studies and creating a Vice President for Research who would sit on the PEC and on the SMU Board of Trustees; creating more opportunities for interaction between faculty and Board members; focusing the next capital campaign on research and research infrastructure; emphasizing research excellence as much as teaching excellence is currently recognized and rewarded; helping faculty aggressively pursue research opportunities (e.g. creating incubation centers, enhancing the special research leave provisions, making investments that will allow faculty to take the lead in multi-institutional research efforts, changing the attitude of the various offices that currently are involved in research from oversight and compliance and risk-aversion toward "what can we do to help you achieve your goals"?).

Finally, there was a range of responses to the question of the role of **knowledge/technology transfer** activities such as incubation and innovation. For those faculty working in areas of the university where patentable inventions and technologies and intellectual property with commercial potential might be developed, the lack of resources and expertise in technology transfer was noted. SMU would benefit from the ability to invest financial resources to proactively protect and commercialize more of the research results. More broadly, faculty across campus noted the potential of sector-based academic incubation and innovation centers to break down disciplinary silos, and lead to broader and deeper interdisciplinary collaborations and opportunities.

Recommendations of the Task Force

Based on our findings, the Task Force generated eight categories of recommendations, a brief rationale for each category, followed by specific actions that the University can take:

Recommendation	
I. Foster an environment that produces high-impact research and creative scholarship	**Rationale:** A vibrant research community enhances the intellectual and cultural capacity of a university. The best American research universities incentivize and reward high-impact research. SMU's aspirant universities allot approximately 17% of all expenditures to research; SMU now spends only 5%. Thus we must increase the weight of scholarly productivity and impact in policy decisions and resource allocations. **Actions:** ● Encourage faculty to aggressively pursue and secure funding for research and creative scholarship from federal, state, and local agencies and foundations. Incentivize and reward submission and procurement of research proposals. Prioritize submissions to federal agencies to seek funding for basic and applied research. ● Seek large gifts that will have the potential to transform the landscape for scholarly research and creative impact at SMU and the region (see Appendix for examples). ● Encourage and improve communication between SMU-based researchers and the Board of Trustees to inform Board members about not only accomplishments but also challenges faced by faculty that impede productivity, quality, and impact of research. Consider reserving a minimum of three slots on the Board for leaders in research and higher education. ● In collaboration with deans and departments, promote and expand areas of research and creative excellence within the faculty. Target financial and other resources to build nationally-known research programs. ● Dramatically increase infrastructure funding for high-impact research and creative scholarship: o Increase seed funding for high-impact research from

	$10,000 per award to $100,000 per award. o Create a financial “war chest” for hiring new endowed chairs and directors of centers of excellence. o Create endowed research programs (as opposed to positions). o Increase the number and size of university-level and school-level grants for faculty development and research. o Increase the number of grant cycles for University Research Council funding to accommodate time-sensitive research projects. Likewise, extend the windows of time within which such awards must be spent. o Provide institutional support for grant and fellowship proposal writing, either in the form of release time or funding. ● Focus physical, financial, and personnel resources on research centers and institutes. Provide funding for faculty, postdoctoral fellows, and graduate students at a level of $10-15M per center/institute. o Identify and develop existing centers of excellence to which nationally and internationally regarded senior faculty can be recruited, which will in turn provide resources to hire faculty within those centers. o Facilitate bottom-up creation of thematic research clusters and institutes that precipitate high-impact interdisciplinary research and creative scholarship. ● Grow our own culture of research and creative excellence: o Align expectations for research and scholarly output to those at aspirant schools when making hiring and tenure and promotion decisions. Tie raises, research leaves, and other incentives to scholarly productivity and impact. o Adopt research leave policies that provide ample time for major projects, and communicate the details of those policies clearly and consistently. Numerous faculty in the Task Force's survey expressed concern about how rising teaching loads appear to throw research leaves (and thus research productivity) into jeopardy. SMU should continue to allow Special

	Research Leaves for highly productive faculty as well as regular University Research Fellowships. SMU should discontinue the recently adopted policy of withholding Stella Porter Russell bonuses from faculty who have taken research leaves; in effect this policy punishes faculty for pursuing the very opportunities and awards that lead to significant new findings and publications. o Provide incentives for senior faculty to mentor the next generation of mid-career researchers. o Facilitate existing and newly-hired early-career researchers to achieve national influence. o Endow and sustain robust speaker series to stimulate ongoing research and conversations. Attract nationally renowned scholars to increase public awareness of research, stimulate idea formation, and enhance the community connection. ● Increase the external and internal visibility and emphasis on research. Highlight accomplishments that demonstrate societal value of research to region, state, and nation. ● Institute a mechanism by which a faculty-based Task Force or group may assess SMU's research progress (per the recommendations made in this Report) on a regular basis. ● To increase the incentive for research, the overhead return rate should be restructured so that the department and principal investigator (PI) receive a greater share of the overhead (especially since it is now unclear what sort of overhead SMU actually supplies). ● Offer small matching grants awards to faculty who get funding. Similarly, offer a variety of departmental incentives if grants are received such as a new graduate line or 2-year graduate RA-ship. ● Provide publishing fees to faculty so that they can target some of the most prestigious journals (both digital and paper) that will give their work the broadest possible exposure.

Recommendation	
II. Create robust institutional capacity and necessary infrastructure for research and creative scholarship	**Rationale:** As noted in the summary of findings above, the research infrastructure at SMU is insufficient in quantity and quality, including major instrumentation, technical support, and lab space. Recent University initiatives have had mixed results. While reductions in administrative and technical support staff have lowered personnel costs, new procedures put in place (e.g. Concur, hiring, and staffing) have decreased rather than increased operational efficiency by forcing faculty to spend a large and disproportionate amount of their time performing so-called "shadow-work" as well as administrative duties related to obtaining outside technical expertise. **Actions:** ● Restructure the Office of Research and Graduate Studies into two separate entities, as is customary at major research universities. ○ Increase the size and quality of the Office of Research and Graduate Studies. Currently, there are only 11 staff members, which cannot efficiently handle present or future loads. ● Establish efficient university-wide procedures for pre- and post-grant awards: ○ Streamline the grant approval and award processes. ○ Prioritize policies and practices that support research activities among administrative support departments, including Legal Affairs, Grant Accounting, Proposal Support, Human Resources, Safety, Accounting, etc. ● Increase "localized" staff within colleges and research institutes and centers dedicated to research support in order to free up researcher time. ● Invest in physical infrastructure needed to support research and creative scholarship: ○ Build a dedicated science and engineering building with sufficient state-of-the-art laboratories. ○ Prioritize facilities maintenance and renovation to ensure the reliability and accuracy of research equipment, the stability of laboratory conditions, and the preservation of artistic materials and equipment.

	○ Adopt climate control systems for campus facilities that take into consideration research and artistic needs such as acceptable parameters for laboratory equipment or the use of weekend time to interview research subjects. ● Take steps to re-invigorate field research at SMU-in-Taos to realize the unique research potential of this campus. ● Invest in the intellectual infrastructure needed to support research and creative scholarship ○ Double the funds for library subscriptions for journals, databases, books, and private collections, in all fields. ○ Provide infrastructure support to enhance the dissemination of SMU research and creative scholarship to the state, national, and international community through various outlets, including hosting sponsored conferences, media, and others. ○ Recognize the ways in which current strategies for OE2C implementation, however well intended, are undercutting the research mission of the university, and change them.
Recommendation	
III. Increase the size of the faculty to critical mass in order to support research and scholarly impact goals	**Rationale:** Peer and aspirant institutions have much larger faculties in the core sciences, engineering, professional schools, and other programs; in particular, the minimum department size in most STEM fields is, on average, ~20. **Actions:** ● Achieve 10% compound annual growth in STEM faculty (biology, chemistry, physics, mathematics, engineering) for five years, hiring in accordance with AAU criteria (federally-funded research, National Academies members, awards, citations, etc). ● Make cluster hires to develop critical mass around specific problems and solutions. ● Increase the number and size of Ph.D. programs to achieve parity with aspirant schools. ● Ensure each Ph.D. program grows alongside faculty expansion. ● Recognize and celebrate existing areas of excellence in faculty research and creative scholarship

Recommendation	
IV. Support a larger cohort of graduate and postdoctoral researchers	**Rationale:** Across the university—but particularly in the core sciences, engineering, and the social sciences—graduate students and postdoctoral researchers are vital to research. However, university support for graduate and postdoctoral researchers lags far behind peer and aspirant institutions, which makes it difficult to attract the next generation of researchers and scholars. Postdoctoral researchers in particular are essential to a vibrant research environment, as they bring in new expertise and are usually heavily involved in graduate student training. A critical mass of postdoctoral researchers is a hallmark of highly active research universities. Annual surveys by the Office of Institutional Research shows that SMU is far behind our peer and aspirational schools on this essential metric. **Actions:** ● Create a Graduate School to manage and facilitate non-professional graduate and especially doctorate of philosophy programs to build efficiency and standardization across programs. ○ Prioritize national recruiting efforts. ● Make all graduate stipends across campus both internally consistent and commensurate with those at the most prestigious research institutions in order for our programs to become nationally competitive. Both stipend amounts and stipend durations should be increased to mirror ethical standards. ● Provide consistent and affordable health insurance options for graduate students and postdoctoral researchers, as is typical at top-tier research institutions.
Recommendation	
V. Accelerate interdisciplinary research in key areas	**Rationale:** High creative impact often comes from collaborative, multidisciplinary teams that take an integrative approach to their work. Innovative research discoveries comes about from facilitating information flows and collaboration among individuals representing different disciplines and perspectives.

	Actions: ● Ensure disciplinary programs are world class, as they must serve as the foundation for strong interdisciplinary collaboration. ○ Undergo external reviews of each Ph.D. program within 3 years. ● Foster interdisciplinary work by sharing research problems and methods from one discipline to another. Learning about new research methods and motives often triggers large-scale research projects that cross boundaries more readily. ● Education and the arts serve a large and important base of constituents and supporters. Interdisciplinary collaborations with these areas of excellence represent an opportunity for productive advances and public acclaim. ● Continue to develop programs in every school across campus that couple with area businesses, as well as organizations such as UT Southwestern, the Federal Reserve Bank of Dallas, and the Metroplex's remarkable arts organizations, to name but a few. ● The theme of Public Health, particularly if pursued with UT Southwestern, will productively unite researchers from many different schools at SMU. ● Build on SMU's emerging research programs involving digital technology as opportunities for interdisciplinary collaboration. Examples include computer gaming, educational programs in statistics, computational mathematics, cybersecurity, creative computing, Earth observation, and new initiatives in the digital humanities. ● Designate and create additional physical spaces to foster interdisciplinary collaboration. Such spaces are a prerequisite to conversation, innovation, research, and training across disciplines and units within the university. Interdisciplinary interactions will also require access to appropriate modern and technology-rich spaces usable by a wide variety of disciplines. Outward looking programs will require that these facilities have well-designed and integrated capabilities to interact with other experts around the world.

Recommendation	
VI. Facilitate collaboration with outside institutions and organizations	**Rationale:** Like other top-tier research universities, SMU can amplify its capabilities and credibility by collaborating with successful research universities, companies, government researchers, and other external organizations. Research must become part of SMU's core identity. **Actions:** ● Establish an internal organization to identify and react to new opportunities with external partners. A development-like organization at SMU could identify, help nurture, and track such relationships over the long term. ● Effective and efficient process flows must be put in place to work with research partners and industry. Coordination and cooperation must occur at all levels of the organizations. ● Encourage every school across campus to develop programs with external organizations in the North Texas region, including leading global companies based in DFW, UT Southwestern, the Federal Reserve Bank of Dallas, and the Metroplex's arts organizations, among many others.
Recommendation	
VII. Facilitate technology and knowledge transfer and entrepreneurship	**Rationale:** National research universities have robust but nimble technology and knowledge transfer systems that encourage productive research. Commercializing the research and creative advances by SMU faculty can help generate additional resources for such activities. **Actions:** ● SMU should adopt knowledge/technology transfer policies that are tailored to our resources and strategies, and accommodate the wide differences of intellectual areas, industries, products, and routes to market. ● Tech transfer policies should prioritize societal benefit rather than generating short-term revenues for individuals or the University. Industry should find it easy to transfer SMU's technology into practice.

	● If SMU pursues incubation and innovation centers, these should follow the needs and styles of different activities (i.e. arts, physical sciences and engineering, books, etc.) ● Incubation and innovation centers should be closely coupled to the particular research laboratories that have the facilities to support the commercialization of the particular technology. ● Create a separate technology transfer department, with responsibilities including timely evaluation of new technologies. Such a department would allow SMU to fulfill its Strategic Plan's pledge to "implement an updated technology transfer program ... [to] provide additional resources for scholarly research."
Recommendation	
VIII. Reduce administrative barriers that impede research and scholarly impact	**Rationale:** For scholarly research to grow, it must be easy to undertake and unencumbered by institutional apathy or resistance. Moreover, a flourishing research climate requires a full-time dedicated advocate at the highest level of administrative decision-making, and the offices to support that mission. **Actions:** ● Separate the positions of Graduate Dean and Associate Vice President of Research. Create the new position of Vice President for Research with a place on the President's Executive Council to encourage seamless communication regarding SMU's research mission among SMU's top leadership. The Vice President of Research must be empowered to make decisions and prepared to assume reasonable levels of risk. The mission of the office should be to facilitate research innovation by ensuring that requisite processes of application, implementation, and oversight run as smoothly, efficiently, and quickly as possible. The responsibilities of the office require sufficient leadership and staff support with the necessary competencies, at appropriate pay levels to ensure excellence. ● Audit all research-related offices and processes to identify ways in which they can be re-structured and

	better integrated for streamlining, efficiency, and timely and proper handling of requests and proposals. Improve transparency and efficiency of reporting on how funds, especially start-up money and external (grant) funds, are handled by financial officers and administration. Doing so reflects the Strategic Plan's commitment to "improve research infrastructure and administrative support for faculty applying for external funding to enable expanded collaborative programs with corporations, businesses, governments, educational institutions, and other partners". ● Increase the staffing of the Office of Grants and Contracts (OGC) so that research-related requests can be processed at all stages in a more timely and efficient manner. Cutting-edge research requires personnel who are readily available to assist faculty with grant application, budgeting, accounting, compliance, and other administrative tasks. As numerous respondents to the Task Force's survey reported, the current level of staffing in the OGC is insufficient to sustain our present level of research activity, much less facilitate expansion of that activity. Legal support related to grants and contracts should be embedded within the OGC in collaboration with the Office of Legal Affairs. ● Identify ways to streamline the Office of Legal Affairs' (OLA's) processes for approving intellectual property agreements, patent and license applications, non-disclosure agreements, memoranda of understanding, and similar research-related contracts. Timely processing of requests may require additional staff and specialization within the OLA. In particular, effective research collaboration with external companies and organizations will require OLA assistance. ● Reduce the number of steps and procedures needed to submit a grant proposal. There are redundant layers of IRB and 'good research' modules that must be taken prior to submission. These can add weeks to proposal submission time and should be streamlined.

Conclusions

SMU is at a crossroads today. Of the many paths we can take, only the path that emphasizes research and creative activity can lead us to national prominence. Even though numerous SMU faculty make significant contributions to their fields, the university's reputation as a whole is primarily regional rather than national. To change this, SMU must become a major research institution, which itself requires considerably more support for research, scholarship, and creative activities across campus.

As this Report has noted, in order for SMU to realize this goal, a series of changes are required. Perhaps most importantly, research and creative activities will have to become more integral to the culture of the university by incentivizing them in different ways: principally through tying such achievement to raises and leave policies, and by elevating the standards for promotion and tenure according to the national standards in particular fields. Research should be given greater visibility at SMU through the creation of a new position of Vice President for Research, someone who would report directly to the President. Programs will need to recruit nationally-known faculty who are shaping their fields, which will require larger endowments than SMU is presently offering. Along with the addition of stellar faculty, new research facilities will have to be created, including a top-notch dedicated science and engineering building, as well as an enhanced budget for library acquisitions, from the addition of books and journals to digital resources. The university will also need to enlarge substantially its services for the support and administration of outside research grants. Mentoring of junior faculty will become more critical than ever, along with startup funding for their research. SMU will also need to enlarge its in-house funding for faculty research.

Resources are always limited, so SMU should regularly assess the research productivity of all of its programs in order to provide a clear view of which departments should be strengthened and which should be downsized. Without increasing the scale of certain programs, especially in the sciences and engineering, SMU will never obtain national prominence as a research university. It may also be necessary to add new schools, for instance a School of Public Health. One of the great challenges is staying nimble enough to respond to changes in technology and the marketplace, and that could be achieved by promoting the ground-up development of innovative interdisciplinary clusters of faculty with synergies from across the campus. Moreover, the North Texas area offers countless opportunities to spark faculty and student research, and partnerships between our programs and regional businesses, universities, government institutions, and arts organizations should be expanded. The university would also benefit from sponsoring more national and international conferences at SMU. Finally, administrative barriers that exist make it unnecessarily difficult for faculty to compete for external funding.

The many changes recommended in this Report would require both a profound cultural shift and an investment of billions of dollars over the next decades. That investment will probably not be possible without a number of transformative ($100 million or larger) gifts for research, and perhaps another capital campaign focused on research alone. Even though the challenges are great, the rewards of raising our reputation nationally and internationally will be a tremendous benefit to our students and faculty (just as standing pat will almost surely lead to lost ground). SMU would in turn enhance the quality of life for people in this region by becoming an even larger economic engine, as well as a catalyst for the arts. It would also become more of a knowledge center, an institution well suited to tackle problems in education, the environment, justice, and poverty. SMU should thus make this year a defining moment in its history by committing itself to becoming a national research university with a rich liberal arts tradition, and a member of the Association of American Universities.

Appendix

Research Gifts to Colleges/Universities >=$100M (2010-2017)

(ILLUSTRATIVE)

Considerations for Inclusion: 1) Philanthropic gift/pledge >=$100M 2) U.S. Colleges and Universities ***only*** (including medical schools) 3) Grants/pledges awarded during calendar years 2010 – 2017 4) "Research Gift" determination based on keyword search within gift/pledge description and/or press release regarding specific allocation such as: 'faculty research,' 'faculty/researcher hiring,' 'build/renovate laboratory and/or clinical space for faculty and researchers,' 'postdoctoral support,' 'create/establish a new/existing center or institute on campus.'

Considerations for Exclusion: 1) Gifts to Athletics (e.g. scholarships, facilities) 2) Gifts for 'non-academic' buildings (e.g. dormitories, wellness centers) 3) Gifts for student (undergraduate) scholarships 4) Unrestricted gifts with no clear designation for research

University Name	Award Amount	Award Description	Year Received	Website
University of Oregon	$500 M	-Create an applied sciences research hub -Support endowed faculty positions -Support student learning initiatives	2016	http://www.oregonlive.com/business/index.ssf/2016/10/phil_and_penny_knight_will_giv.html
Oregon Health & Science University	$100 M	-Establish the Knight Cancer Institute to support advanced cancer research	2008	http://www.oregonlive.com/business/index.ssf/2016/10/phil_and_penny_knights_charita.html
	$125 M	-Establish the Knight Cardiovascular Institute	2012	
	$500 M	-Enhance the Knight Cancer institute	2015	

University Name	Award Amount	Award Description	Year Received	Website
Santa Clara University	$100 M	- Establish and promote cross-disciplinary exploration to enhance student learning and discovery across the fields of Science, Technology, Engineering, and Mathematics (STEM)	2017	https://www.scu.edu/news-and-events/feature-stories/sobrato-campus-for-discovery-and-innovation.html
Johns Hopkins University	$300 M	-Establish the Bloomberg American Health Initiative, a program aimed at reshaping the nation's public-health agenda. Five focus areas: drug addiction, obesity, gun violence, adolescent health, and environmental threats. Of the total, $125 million will endow faculty research across the five areas; $100 million will endow 50 public-health fellowships annually; and $75 million will fund scholarships for the university's new doctoral program in public health and support a biennial public-health summit	2016	http://hub.jhu.edu/2016/09/15/bloomberg-american-health-initiative-gift/
University of Southern California	$200 M	-Develop the Institute for Transformative Medicine, to combine inter-disciplinary research with holistic treatment to promote cancer prevention	2016	http://www.forbes.com/sites/katevinton/2016/05/12/oracle-founder-larry-ellison-donates-200-million-to-usc-for-cancer-treatment-

University Name	Award Amount	Award Description	Year Received	Website
				center/#3b2f098e3c07
University of California – San Francisco	$185 M	-Start an Institute for Neurosciences, a building campaign with 45 basic research labs and clinics -Hire 40-50 new researchers for the Institute	2016	https://www.insidehighered.com/quicktakes/2016/04/26/185-million-gift-u-california-san-francisco
University of Miami – Coral Gables	$100 M	-Provide institutional support in the areas of Applied Sciences and Engineering	2016	http://philanthropynewsdigest.org/news/university-of-miami-receives-100-million-for-science-engineering
Harvard University	$400 M	-Endow the School of Engineering and Applied Sciences to support research, financial aid, and faculty development	2015	http://news.harvard.edu/gazette/story/2015/06/harvard-receives-its-largest-gift/
	$100 M	-Provide research support for the Broad Institute for Biomedical Studies. This center researches cancer, chemical biology, genome sequencing and analysis, medical and population genetics, and infectious diseases	2013	https://www.broadinstitute.org/news/broad-institute-launches-next-decade-new-100m-gift
Cornell University - Cornell Tech	$100M	-Establish the Bloomberg Center to foster high-tech entrepreneurship in New York City		http://news.cornell.edu/stories/2015/06/100m-gift-names-bloomberg-center-cornell-tech-0

University Name	Award Amount	Award Description	Year Received	Website
Florida State University	$100 M	-Create a School of Entrepreneurship	2015	https://www.fsu.edu/indexTOFStory.html?lead.gift
University of California – Los Angeles	$100 M	-Endow financial aid for students and to support research -Build a new building to house research centers	2015	http://www.latimes.com/local/education/la-me-ucla-gift-20150514-story.html
Northwestern University	$100 M	-Create an Institute for Global Studies	2015	https://news.northwestern.edu/stories/2015/01/roberta-buffett-elliott-donates-more-than-100-million-to-northwestern
Rockefeller University	$100M	-Develop a new research center to attract faculty for Rockefeller's scientific and educational programs and enable faculty to continue to push the boundaries of biomedical knowledge	2015	http://newswire.rockefeller.edu/2015/05/20/the-marie-josee-and-henry-r-kravis-foundation-provides-landmark-gift-of-100-million-to-the-rockefeller-university/
University of Chicago	$100 M	-Establish the Pearson Global Institute and Global Forum devoted solely to the study and resolution of global conflict	2015	http://www.uchicago.edu/features/pearson_family_donates_100_million_institute_to_confront_global_conflicts/
Thomas Jefferson University	$110 M	-Support scholarships, create a capital fund, support faculty research, and create a presidential endowment to support faculty	2014	http://www.jefferson.edu/university/news/2014/06/sidney-kimmel-foundation-gives--110-million-to-

University Name	Award Amount	Award Description	Year Received	Website
				jefferson-medical.html
University of North Carolina	$100 M	-Create an Institute for Innovation in the School of Pharmacy	2014	http://www.unc.edu/spotlight/eshelman-institute-for-innovation/
Dartmouth College	$100 M	-Increase the flow of post-PhD academics through the College to support interdisciplinary research programs -Expand Thayer School of Engineering -Support experiential learning	2014	https://news.dartmouth.edu/news/2014/04/100-million-gift-boosts-hanlons-vision-scholarship
Yeshiva University – New York	$160 M	-Provide institutional support in the area of biomedical research	2013	http://www.jta.org/2014/01/02/news-opinion/the-telegraph/y-u-landed-one-of-top-10-gifts-in-2013
University of California – San Diego	$100 M	-Create the Sanford Stem Cell Clinical Center to quicken the development of drugs and cell therapies	2013	http://ucsdnews.ucsd.edu/feature/100_million_gift_launches_sanford_stem_cell_clinical_center
Cornell University – Weill Medical College	$100 M	-Establish and support the Weill Cancer Research Center and the Metabolic Syndrome Center	2013	http://news.weill.cornell.edu/news/2013/09/weill-cornell-medical-college-receives-100-million-gift-from-joan-and-sanford-i-weill-and-the-weill-1
Columbia University	$200M	-Endow the University's Mind Brain Behavior Institute	2012	http://www.columbia.edu/node/13855.html

University Name	Award Amount	Award Description	Year Received	Website
Mt Sinai School of Medicine	$150M	-Provide support and funding for medical research	2012	http://philanthropynewsdigest.org/news/icahn-pledges-additional-150-million-to-mount-sinai-school-of-medicine
Carnegie Mellon University	$265M	-Provide institutional support for technology and the arts *Note: Pledged funds were unrestricted and not explicitly directed for research. This entry included under the assumption that some unrestricted funds would be applied to research in the areas of technology and the arts		http://www.foxnews.com/us/2011/09/07/carnegie-mellon-receives-265-million-pledge.html
University of Southern California	$100M	-Unrestricted funding to provide support in faculty hiring, research, and fellowships – especially in the humanities and social sciences	2011	http://articles.latimes.com/2011/mar/09/local/la-me-0309-usc-gift-20110309
University of Pennsylvania	$225M	-Create a permanent endowment for financial aid, faculty recruitment, and research at the School of Medicine	2011	https://news.upenn.edu/news/raymond-and-ruth-perelman-donate-225-million-university-pennsylvania-s-school-medicine
Stanford University	$150M	-Establish the Institute for Innovation in Developing Economies to support researchers in the study of entrepreneurship	2011	http://giving.stanford.edu/stanford-benefactor/stories/stanford-launches-institute-alleviate-

University Name	Award Amount	Award Description	Year Received	Website
				poverty-150-million-gift
Baylor University	$200M* note this is a pledge from a donor upon her/his death	-Support research into the aging process within the School of Social Work and College of Arts and Sciences – addressing the physical, psychological, social, emotional, and spiritual needs and strengths of aging individuals	2010	http://philanthropynewsdigest.org/news/baylor-university-receives-anonymous-200-million-bequest

Source: Daniel Eady, SMU's Office of the Provost