

Report
of
The Washington Advisory Group, LLC
on
Research Capability Expansion
for
The University of Texas System

The University of Texas - Pan American

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The Washington Advisory Group, LLC

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**Report of The Washington Advisory Group on
Research Capability Expansion for
The University System of Texas
At Brownsville/Texas Southmost College (UTB/TSC), Pan American (UTPA),
of the Permian Basin (UTPB), and at Tyler (UT-Tyler)**

INTRODUCTION

The Washington Advisory Group (WAG) was engaged by the University of Texas System (UT System) to examine the research capacities and potential for expansion at eight of the UT System institutions. WAG divided the eight institutions into two groups and established teams to work with each of the two groupings. This report is the second of two reports and focuses on the four smaller, developing institutions listed in the report title.

As in its review of the larger institutions, our WAG team was asked to review information provided by the universities as well as information gathered independently before and after each visit. Appendix 1 details the scope of work for this study, including six questions to be addressed for all of the universities and four questions specific to each of the developing institutions reviewed in this report.

We held meetings with administrators, an array of faculty from many disciplines, community and business leaders, and periodically with students. Based on our review, the discussions and materials, and reports developed by each team member around the university he or she visited, we developed the individual reports that examine similar factors at each of these developing institutions.

Appendix 2 contains the biographical sketches of the team of individuals that carried out this project. We selected the members of this team based on criteria tailored to a review of developing institutions, including knowledge about university research and federally funded research; broad experience at and knowledge about community colleges, which are critical to each of the universities we visited; small college backgrounds; strong interests and expertise in minority-related issues and programs; and experience with economic development issues. We also chose at least some team members with specific backgrounds related to Texas. The goal was to provide a review team with the collective judgment, background, experience, and expertise to offer the UT System an authoritative review and assessment. Appendix 3 provides the dates and a broad overview of each of the visits to the four universities covered in this report.

Overview

The developing institutions we studied have varied strengths, but will have to make considerable strides to attain national and international research stature. According to the National Science Foundation's rankings of universities, only one of the four institutions in this report ranks among the top 589 colleges and universities in research expenditures for FY2000. With total research expenditures of \$1.6 million that year, UT-Pan American (UTPA) ranks 378th. By contrast, the four larger Texas universities WAG studied all rank among the top 250 universities. Clearly, the four developing or emerging campuses occupy a different range on the research spectrum. The research expenditures of the smallest of the larger campuses (UT-San Antonio), for example, totaled \$11.3 million in FY2000, while research expenditures at the largest of the emerging campuses (UTPA) totaled approximately \$2 million.

Using FY2002 data, the Texas Higher Education Coordinating Board more recently provided a basis for reviewing several developing universities in Texas (see Table 1 below). In FY2002, UTPA research expenditures totaled \$2.6 million; UT-Brownsville/TSC's (UTB/TSC) reached \$1.3 million, and UT-Permian Basin (UTPB) and UT-Tyler's reached \$980,000 and \$375,000, respectively.

Table 1. Research Effort and Sponsored Programs
(Total Expenditures for Research and Other Research-
Related Sponsored Programs by Source of Funds, FY02)¹

University	Total
Stephen F. Austin	\$5,583,051
UT-Brownsville/TSC	\$1,286,638
UT-Permian Basin	\$ 980,905
UT-Pan American	\$2,605,758
University of Houston Downtown	\$1,270,494
Texas A&M International	\$ 677,346
UT-Tyler	\$ 375,821
Texas A&M Commerce	\$ 629,496

It is also worth considering the status of the four institutions' research strength in terms of the Carnegie Foundation classifications.² UTPA is the farthest along with its doctorate program in business and imminent doctoral program in education. Its next doctoral programs are likely to be in science/engineering, as a new dean is actively focusing on adding to the strength of the research faculty. This focus is worthwhile for its own sake and is relevant to the Carnegie rankings.

Research activity could perhaps be most enhanced via collaboration with co-located Regional Academic Health Center (RAHC) facilities. The new UT System executive vice

¹ Source: Texas Higher Education Coordinating Board, *Research Expenditures (FY02)*, Total Expenditures for Research and Other Research-Related Sponsored Programs by Source of Funds, FY02, Institutional Research and Planning, 09/25/03.

² The Carnegie classifications can be found at: <http://www.carnegiefoundation.org/Classification/>. They are as follows:

Doctorate-granting Institutions

Doctoral/Research Universities-Extensive : These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. During the period studied, they awarded 50 or more doctoral degrees per year across at least 15 disciplines.

Doctoral/Research Universities-Intensive : These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the doctorate. During the period studied, they awarded at least ten doctoral degrees per year across three or more disciplines, or at least 20 doctoral degrees per year overall.

Master's Colleges and Universities

Master's colleges and Universities I: These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the master's degree. During the period studied, they awarded 40 or more master's degrees per year across three or more disciplines.

Master's Colleges and Universities II: These institutions typically offer a wide range of baccalaureate programs, and they are committed to graduate education through the master's degree. During the period studied, they awarded 20 or more master's degrees per year.

chancellor for health affairs should make considering such opportunities a priority. In fact, in their strategic review, the System chancellor and vice chancellors might consider whether the RAHC located at UTPA, the one located on the UTB campus, and the RAHC in nearby Harlingen could jointly collaborate with research programs at both UTPA and UTB. Such an arrangement could significantly boost the research activity of all parties on a mosaic of projects. With a successful outcome, both UTPA and UTB could achieve the Carnegie classification of Doctoral/Research Universities-Intensive within a ten-year planning horizon.

Similarly, a significant opportunity for research collaboration between UT-Tyler and UT Health Center-Tyler (UTHC-Tyler) is under discussion at the highest levels of their administrations. The UT-Tyler report covers the details of this discussion and its robust potential for both institutions. Although the level of externally funded research at UT-Tyler is quite low, the institution has already positioned itself for a quantum leap in active research projects via collaborations with UTHC-Tyler. Our optimism about this potential growth is based in part on UT-Tyler's track record in research collaborations with other more distant research partners, including Texas A&M University, Stephen F. Austin University, and the National Aeronautics and Space Administration. While the metrics for UT-Tyler do not yet show their full impact because these collaborations are credited to the partner institutions, the collaborations provide UT-Tyler with a growing and effective means to bootstrap its research future. UT-Tyler could well achieve Doctoral/Research Universities-Intensive Carnegie classification within a decade. All UT System institutions would benefit if the system began facilitating and rewarding such collaborations in its strategic planning.

In the two Carnegie classifications for Master's Colleges and Universities, all four of the campuses seem positioned to exceed the minimums.³

In general, these emerging institutions recruited their faculty to deal with the crush of entering undergraduate students in several of the most economically challenged regions of the state: East Texas, West Texas, and particularly South Texas. These are largely non-traditional students, meaning students who are employed in part- or full-time jobs, daily commuters to campus, or supporting families, in addition to often being first-generation college students. As a result, the enrollment at these institutions continues to increase rapidly, and students face extreme pressures in meeting the time commitments of college work, whether for instruction or research. Yet, in all four of the emerging institutions, some faculty have dealt with the instructional loads and successfully developed and sustained nationally competitive research projects. These exemplary faculty provide a benchmark for the research future of the four emerging campuses.

It is important for these four developing institutions to pursue research at the same time that they must succeed in educating a population so desperately requiring a college education. An institution that makes its primary contribution to a community by educating its children—children for whom education is the primary hope for a better life—may believe that research activities detract from its mission. This education brings value to the students and their futures, as well as the futures of their families and communities. UTPA and UTB/TSC, for example, provide a vital service to Texas with their work on its southern border, albeit a perhaps different service than more research-intensive institutions in the UT System. So why should the same institutions that provide this crucial educational service also focus on research? We suggest there are several answers:

³ See Carnegie definitions in footnote 2.

- First, these regions of Texas face major issues research can address including health, K-12 education, and indigenous business development. Three of the four campuses, for example, reside near parts of the UT Health Center complex. All three of these health-related centers can multiply their beneficial affects to the state via selected collaborative research projects with neighboring UT campuses, both in public health areas and through the eventual commercialization of intellectual property that the sponsored research will likely generate. To be specific, UT-Tyler is near the UT Health Center-Tyler; UTPA is co-located with RAHC facilities associated with the UTHSC-San Antonio; and the RAHC at UTB/TSC is affiliated with the UTHSC-Houston.
- Second, educational research conducted and applied with the schools of the region—particularly if it focuses on improving the quality and quantity of college-prepared high school graduates—will directly improve the region’s economic strength and vitality. Virtually all of the students entering these institutions have graduated from the region’s high schools or community colleges; most will choose to remain in the area. Students at these campuses have also had many opportunities to pursue higher learning in part because of early outreach programs, including GEARUP⁴, TRIO⁵, and similar national programs designed to improve educational effectiveness with at-risk populations, and these programs often get implemented through cooperative projects between schools or colleges of education and K-12 school systems. Further, virtually all of the teachers in the K-12 schools around these developing institutions received their education and professional training at regional UT campuses.
- Finally, the colleges of business at these emerging campuses can have a disproportionately positive effect on the success of businesses in their regions. For example, these colleges can influence practice through research that speeds the development of new businesses and improves the competitiveness of existing businesses. The College of Business at UTPA is already engaged in such research through its doctoral program. In addition, the UTPB business dean, one of the most published scholars at that University, has set a standard of research and refereed research publication that is a model for her colleagues across the campus.

We should also note that the civic and political leaders of each region expect the local university to play a critical part in their community’s growth and development. This was clear in the personal meetings the WAG team held with the community leaders in each region. It is no wonder they feel so strongly. Each university ranks as one of the largest employers and purchasers of goods and services in its region, and educates or provides professional certification for many if not most of the indigenous workers in the region.

But the mutually beneficial research projects in health, education, and business relate by no means exclusively to the state’s three less-developed regions. As the reports indicate, each campus has a number of other research bright spots. The detailed campus reports describe other

⁴ The GEARUP (Gaining Early Awareness and Readiness for Undergraduate Programs) program is a discretionary grant program funded by the U.S. Department of Education designed to increase the number of low-income students who are prepared to enter and succeed in post-secondary education.

⁵ TRIO refers to a series of programs funded under Title IV of the Higher Education Act of 1965 to help low-income Americans enter college, graduate and move on to participate more fully in America’s economic and social life.

benchmark opportunities in the sciences, engineering, and mathematics—as well as humanities and the arts.

In summary, we would prioritize the ideal objectives of each of the emerging campuses as follows:

1. Educate largely non-traditional students.
2. Continually develop selective, high-quality research programs.
3. Actively participate in the economic development of their communities.
4. Engage in programs of community service for the citizens of their region with special needs.

The campuses must succeed at the first priority to achieve the second. Success in the latter two priorities also requires success in both the first and second. All four campuses are making transitions in dealing with these priorities and would benefit from the UT System's advice and support.

The campuses will probably face their toughest decisions when choosing which areas of research they can develop to a competitive level while maintaining the high quality of their educational programs. They will have to choose carefully to avoid research tracks in which they are unlikely to be competitive. But it is doubtful the educational programs can approach or maintain competitiveness without a critical mass of relevant and respected research programs. Without such a critical mass, neither the best senior faculty nor the best young faculty can be recruited or will stay. The same goes for the best students, a pool of talent these regions should fight to keep.

Some Aggregated Perspectives

The four developing institutions covered in this report and the four larger UT institutions reviewed separately share some similarities. In the report on the larger universities, under “The Path to Tier 1 Status,” we note several issues that will determine how institutions will progress and succeed in reaching the Tier 1 goal. While the institutions covered in this report do not seek that lofty accomplishment, the issues addressed for the larger institutions apply as well to these developing institutions, if to a lesser degree. For example, the point about the need for a strategic plan in the larger institutions also applies to the emerging institutions. Likewise, since the emerging institutions are unlikely to see increases in state appropriations, they also must identify new resources to fund increased research capacity. Similarly, because of state resource constraints, the emerging institutions must also seek increased funds from the same sources as their larger peers, including the federal government, industry, alumni and foundations, and tuition and fees.

All UT institutions also face the same pressures in recruiting faculty and competing with other institutions inside and outside the state for talent. No matter the campus, it is costly to recruit faculty. And the emerging institutions, like their larger peers, must encourage and foster a faculty research culture. In this respect, the System might consider establishing a research professorship program to provide additional supplemental support and statewide recognition to all campuses attempting to hire outstanding research faculty.

As noted with the larger institutions, unproductive competition and historical strife seriously hinder relationships between the institutions, particularly UTPA and UTB/TSC. Their

individual and collective future would improve if collaboration replaced virtual non-communication. New leadership at UTPA offers that possibility. The WAG teams agree that, no matter how large the institution within the UT System, it would benefit from research and educational collaborations. The emerging institutions have fine examples of such activities, including with community colleges, other academic institutions, industry, federal agencies, and state and local governments. We strongly encourage collaborations, not least because they foster intellectual breadth and lead to stronger proposals for support and stronger final projects.

Our team and the individual reports also lead us to conclude that new graduate programs at the emerging institutions, particularly at the Ph.D. level, should develop in a highly selective fashion. Professional master's degree programs should only be instituted where they can be justified. In several instances, the emerging institutions have programs of national stature and distinction, such as gravitational wave physics at UTB/TSC; nursing at UT-Tyler; and the arts facility at UT-Permian Basin to name a few. But issues of national recognition are less paramount with the emerging institutions. These institutions would be more likely to achieve success and add optimum value within their region and Texas by focusing on programs the region needs rather than on the national stage.

Though technology transfer will play a more significant part in the immediate future of the larger and more developed institutions, the developing institutions also may well have opportunities to commercialize intellectual property and potentially stimulate the creation of new companies. If they do so, the developing institutions could have a more significant impact on both the type and scale of economic development in their regions.

The reports on the developing institutions in the UT System that follow discuss each of the four institutions in substantial detail.

THE UNIVERSITY OF TEXAS-PAN AMERICAN (UTPA)

Overview and Mission

The University of Texas-Pan American in Edinburg, Texas has evolved from a community college (Edinburg College), which was founded in 1927, into a comprehensive university that offers bachelor's and master's degrees in several fields and doctoral degrees in two areas (a Ph.D. program in business administration with an emphasis in international business and an Ed.D. degree in educational leadership). It also offers a joint pharmacy degree with the University of Texas-Austin. UTPA's stated goal is to become a doctoral/research institution by 2010.

UTPA's educational program has evolved from emphasizing teacher training (when the regional economy was based heavily on agriculture) to include business (as the region's economy diversified) and, most recently, the health sciences and science and engineering (because of the population growth and greater economic diversification). In addition, UTPA has 23 centers with a combined budget of approximately \$5 million and a total staff of about 100 individuals.

The university's vision statement is the following:

The University of Texas-Pan American will be a first-class doctoral university and the educational leader for South Texas, addressing the expanding needs of a multi-cultural, metropolitan area by offering a broad spectrum of undergraduate, graduate, and professional degree programs, by maximizing access opportunities for qualified applicants, and by pursuing research and providing professional services that emphasize the economic development, educational advancement, health improvement, environmental protection, and cultural confluence of the international borderland.¹⁷

STUDENT DEMOGRAPHICS

The UTPA student population is predominantly Hispanic and female, while the faculty is predominantly white and male. The majority of its students come from Hildago and Starr Counties, and it is largely a commuter's institution. The Texas Higher Education Coordinating Board projects that enrollment will grow from the 14,392 in the fall 2002 to 19,032 by the fall of 2010 and to more than 26,000 by 2015. Based on its enrollment, UTPA is the tenth largest public university in Texas and fifth largest in the UT System. In fall 2002, 315 of its 460 faculty members held tenure/tenure track positions.¹⁸

In fall 2002, approximately 87 percent (12,510) of the 14,392-member student body were undergraduate students and 13 percent (1,882) were graduate students.

The University's educational program is organized into the six colleges listed in the table below. The table also shows fall 2002 enrollment distribution across the colleges.

¹⁷ UTPA 2002 *Institutional Fact Book*, p. 1; and UTPA *Agency Strategic Plan for the 2001-2005 Period*, pp. 17-19.

¹⁸ *Ibid.*, pp. 31-40.

Table 4. UTPA Enrollment by College, Fall 2002¹⁹

College	Undergraduate*	Graduate*
Arts and Humanities	2,910 (23%)	354 (19%)
Business Administration	2,090 (17%)	207 (11%)
Education	2,069 (17%)	829 (44%)
Health Sciences and Human Services	1,698 (14%)	196 (10%)
Science and Engineering	2,378 (19%)	174 (9%)
Social and Behavioral Sciences	1,365 (11%)	122 (6%)
Total	12,510	1,882

* Due to rounding, percentages do not total 100.

The six-year graduation rate for first-time, full time entering students increased from 21.6 percent in academic year 1999 to 24.6 percent in academic year 2002. Approximately 87 percent of the total student body in fall 2002 received some type of financial assistance.²⁰

AN INSTITUTION IN TRANSITION

In many instances, universities with humble beginnings have become strong research universities in relatively short periods. The traditional growth of teaching colleges into research institutions is well documented. Such transformations have sometimes gone hand-in-hand with regional economic growth.

UTPA began less than a decade ago in much the same way as a number of other state universities across the country. But UTPA's profile differs significantly from many of these universities. It not only operates in a community with one of the lowest per-capita incomes in Texas and the U.S., and its predominantly Hispanic students reflect that economic environment. UTB/TSC will continue to play a significant role with this population which is also a key one to the State of Texas, as it is projected that by 2005, Hispanics will represent almost a third of the Texas population and over 90 percent of the Valley's population.²¹

UTPA is also part of a community whose economy is highly vulnerable to fluctuation, and it is in a region tied to the North American Free Trade Agreement (NAFTA) and the *maquiladora* industry. For the foreseeable future, immigration, health, educational, environmental, economic, and other U.S.-Mexico border issues have and will continue to challenge these border communities in substantial and dramatic ways.

The campus is situated in the Rio Grande Valley, one of the country's fastest-growing regions. The Valley's population is expected to continue increasing rapidly due to strong economic development, higher-than-average birth rates, and continued immigration to and within the state.

¹⁹ Ibid., pp. 80-88.

²⁰ Ibid., p. 49.

²¹ Gerald D. Brazier and David Gibson, *Assets and Challenges for Accelerated Technology-Based Growth in Hidalgo County: A Knowledge-Based Benchmarking*, Cross-Border Institute for Regional Development, UT-Austin (2001), pp. 16-19.

The expanding population of college-bound students in a community experiencing great economic change will seriously challenge the potential and resources of UTPA specifically and the UT System in general. Ahead waits not only a large, youthful population likely to become first-generation college students, but also college students whose parents may not be proficient in English or have not completed elementary school, or both. Universities that will serve these students—institutions like UTPA—occupy a unique place in our educational landscape.

UNIVERSITY LEADERSHIP TEAM

We would be remiss if we did not single out President Miguel A. Nevarez for his many years of outstanding leadership of this institution. Since he assumed the presidency in 1981, he has had a clear and unmistakable role in the growth and success of UTPA. Over a long and impressive term of leadership, he has provided the direction for the University and has been uniquely responsible for determining and building its strong foundation for the future. The new president will take the reins of UTPA at an important time in its history, making this upcoming appointment critical to the future of both the institution and the region.

Current Research and Educational Strengths and New Opportunities

We were asked whether UTPA could, within a decade, be securing \$100 million per year in extramural funding or research expenditures. Our review of UTPA convinces us that doing so is highly unlikely in the foreseeable future. With some significant changes in direction and priorities, however, by the end of the decade or shortly thereafter, UTPA might be able to generate approximately \$20 million annually in extramural research support. (The current UTPA goal is to reach this \$20 million goal within a 10-year period.) We have also concluded that focusing UTPA solely on becoming more research intensive is likely to deter its educational role within its community.

The selection of a new president in the next several months will be a particularly critical decision for the direction of this University and indeed for South Texas, which needs the best comprehensive university possible. This institution plays a central role in the education of South Texans and that strong role must continue.

Already, many of the directions President Nevarez and others have initiated have begun changing UTPA from a teaching institution into one that pursues both research and public service. Some changes in the short term would help continue—if not accelerate—this evolutionary cultural change. Short-term steps that it must consider include new faculty hiring, start-up packages to accompany the hiring, identifying and prioritizing areas for acquiring new faculty in key areas, solving space limitations, and confronting the heavy teaching loads created by surging student populations.

LINGUISTICS AND COMPOSITION

The WAG team finds research and creative strengths at the interface of communications, English, linguistics, history, modern languages, and literature. Teaching demands will continue to call for more faculty lines in these areas, and market forces will continue to produce top scholars as applicants. An interdisciplinary program in border studies (including women's studies) with appropriate areas of specialization would have substantial impact, including the development of a high-quality Ph.D. program in linguistics and composition that incorporates the existing strengths in bilingual talents. The depth of talent already at UTPA in these areas and the

faculty talent available in the national marketplace could make such a Ph.D. highly advantageous to the institution and the state.

More than that, UTPA's location, its cultural heritage, and its impressive student body, along with its partnerships with Mexican universities and businesses, give it a good chance of developing a considerable reputation in these fields. The likelihood of adding new faculty in these areas also suggests the possibility and desirability of hiring Hispanic and Mexican-Americans in these fields of study. The broad areas of cultural/border studies, including bilingual composition, communications, linguistics, and history areas, would need as many as five new faculty in several disciplines to fully realize the opportunities in these areas. The goal would be to hire the best candidates conducting research in border and U.S.-Latino issues. Such hiring could substantially boost the program, existing and new courses, and collaborative offerings.

The Dean of arts and humanities should be asked to assess these capacities and consider making a major push in this interdisciplinary area.

It is also worth mentioning that because these academic areas do not tend to generate substantial revenues, particularly from the federal sector, they also tend not to demand the salaries of some fields, such as engineering, the sciences and mathematics, and business.

ENGINEERING AND APPLIED MATHEMATICS

We see research strengths at the interface of engineering and applied mathematics. This is an important opportunity, as advanced degrees in such areas would strengthen UTPA's research activities with U.S. and Mexican companies on the border and would enhance the potential for additional external funding. Specifically, a Ph.D. in computational science, with a major in either engineering or applied mathematics, is possible. The reasons include the following:

- The engineering faculty seems extremely supportive and knowledgeable of what is required to carry out such a program.
- Active senior faculty can provide leadership that seems sufficient for continued progress, and recent hires in applied mathematics have federally-funded grants.
- The plan to hire additional young faculty is likely to help create a core of active young research faculty.
- Junior faculty in mechanical engineering and manufacturing engineering have created a critical mass of computational engineers (there is clearly an opportunity for a Ph.D. in these areas).
- The support of the senior engineering leadership provides a strong nucleus of active research faculty ready to collaborate in interdisciplinary programs that take advantage of all of UTPA's strengths in modeling and computational science.
- The recently hired dean of science and engineering seems to possess the experience and expertise to move this mathematics/engineering group in the right direction.

MATHEMATICS AND SCIENCE EDUCATION

Research strengths exist at the interface of science, mathematics, and education. Recent hires in applied mathematics, education, and physics, in combination with extraordinary senior leadership in mathematics education and applied mathematics, form a core capable of developing

Ph.D.s in mathematics and science education and/or in curriculum and instruction. The development of Ph.D. programs in these areas should be high priorities because of the faculty's strengths and the need for trained personnel in these crucial areas both within the state and the nation. The success of this effort depends on the department's ability to recruit additional mathematics and mathematics education faculty. The need for statistical expertise is also evident, but outstanding faculty could certainly be attracted to this program if planning were underway for the doctoral degree.

To develop these doctoral programs, the department would need to hire additional mathematics education faculty (possibly as many as five), science education faculty (up to three), and curriculum and instruction faculty (up to two). In addition, the department should hire faculty with strong quantitative (certifiable) statistical training (experimental design and statistical analysis experts). We recommend that the department expand the mathematics department into a mathematics and statistics department to assist in creating this type of expertise.

COMPUTER SCIENCES AND ENGINEERING

While it seems plausible to develop a Ph.D. in interdisciplinary programs at the interface of current programs in business, management, and computer science, our group did not find this possibility a high priority on campus. With serious discussions underway about a Ph.D. at the interface of computer science, mechanical engineering, and manufacturing engineering, our team suggests that electrical engineering should be added to these discussions. There seems to be sufficient leadership to explore such a program, and doing so should be a high priority. In addition, the various departments' relevant master's degree programs seem to have available a good pool of graduate students, the most viable doctoral students for such a new program. (We are pleased to hear that the Coordinating Board approved the planning for a new Ph.D. program in manufacturing engineering at their January 29, 2004 meeting.)

To create such programs, computational and engineering areas would need as many as five faculty in mathematics (computational biology, numerical analysis, computational statistics, stochastic processes, etc.), and another five in the computation-intensive fields of engineering (fluids, operations research and optimization, electrical engineering). Also, computational science programs would require professional computer support, graduate teaching assistants, reasonable teaching loads, competitive faculty salaries, and reasonable start-up funds for faculty.

PHYSICAL AND BIOLOGICAL SCIENCES WITH HEALTH SCIENCES

We found research strengths at the interface of the physical and biological sciences and the health sciences, where a joint professional degree program in pharmacy with UT-Austin exists. Relevant to this area, we met some exciting faculty from the rehabilitation and social work programs. What seemed to be lacking was a group initiative (though an initial discussion or report on the development of a Ph.D. program has been submitted to the university administration). The health and human services group requires strengthening, as it should be a candidate for involvement in any new research or Ph.D. effort. Areas such as rehabilitation services, aging, and nutrition have research strengths; nursing needs to be included and could have potential to add breadth to this area. To ensure the long-term development of a Ph.D. program, the university should implement master's programs and create interdisciplinary degrees at the master's level. Our view is that many future Ph.D. programs would benefit as joint initiatives with either other UT universities or UT health science center programs. For example, construction on the university's campus of the aforementioned RAHC is underway. With funding

construction in hand, funding is now required to plan and implement a viable research and teaching effort.

The creation of the RAHC substantially increases the potential in health and biomedical research, as well as social dynamics and health disparities research. The university could also attract federal funding in this area. According to UTPA faculty and administration sources, the RAHC is focusing its research program on such areas as diabetes, emerging infections, nutrition, and environmental health. It also has plans to include epidemiology/biometrics and research projects that will use laboratory animal resources. The RAHC could also benefit from the existing partnership between UTPA and Baylor University in pre-medical education, the joint pharmacy program, and the partnership on admission to Baylor's medical school, as well as the pre-dental partnership with the University of Houston and UTPA.

The collaboration between the RAHC and UTPA is one of the best potential win-win arrangements for both entities we can envision. As collaborations take considerable involvement and effort to become successful and productive, it is incumbent upon the leadership of both organizations to invest the required efforts to ensure success.

As noted earlier about the education area of UTB/TSC, the large number of Hispanic students graduating with bachelor's degrees in the sciences could be a unique UTPA advantage, if it channeled these students into graduate programs at either UTPA or other institutions. Success could have national implications for producing Hispanic Ph.D.s in critical science areas.

There would appear to be opportunities to strengthen coordination and planning with UTHSC-San Antonio officials; although the dean of science and engineering and the Provost mentioned several meetings that had taken place, more concrete progress could be made to achieve this goal. There is discussion among faculty about possibilities, but little involvement in setting directions for such a significant addition to the campus. We were unable to ascertain the RAHC's role in a UTPA research agenda, as we did not have the opportunity to meet with RAHC officials on our visit. Because of the multi-institutional nature of this important issue, we recommend that the institutions and the system office's new executive vice chancellor for health affairs make this collaboration a top priority.

BIOLOGY, PHYSICS, AND CHEMISTRY

We found research strengths at the interface of biology, physics, and chemistry, where a Ph.D. in environmental/ecological sciences may be possible. We found several new members of the faculty—some with strong postdoctoral experience—carrying out research at the interface of ecology, environmental science, and the plant sciences (one had two funded proposals early in his research career). We also found evidence in this group of external funding to support undergraduate research. The environmental area here could benefit from expanded efforts that could enhance use of a special South Texas resource, the Coastal Studies Laboratory. This laboratory, established in 1973 as a marine biology laboratory in Isla Blanca Park on South Padre Island, could become a valuable research and educational resource for both graduate and undergraduate students interested in marine and ecological phenomena. Since the university offers only a master's degree in biological sciences, it would need to strengthen the other science areas first for such interdisciplinary efforts to succeed.

Other Issues to Be Addressed

NEW STRATEGIC PLANNING

Opportunities will exist as long as a new strategic plan developed, reviewed, and executed over the coming years makes the growth of UTPA's research portfolio in selected areas a high priority. Such a plan would enhance the likelihood of adding new faculty interested and committed to research. Yet, the current market, while enabling institutions like UTPA to attract some top academic candidates, could remain constrained for top faculty unless the University establishes more favorable teaching loads, policies, and salaries. Faculty do recognize that targeted areas for research growth will not prosper unless they have the tools to compete: reasonable teaching loads, quality peers, adequate resources and space, and competitive graduate students. There is no point in creating and supporting Ph.D. programs—the cornerstone of a research university—unless institutions first establish an environment in which programs can develop in an appropriate fashion, with competitive tools and policies in place. Legislatively earmarked activities can assist in developing infrastructure in the short-term, but no major research activity can thrive in the longer term without the capacity and talent to compete nationally for external funding.

INFRASTRUCTURE

The university should make plans to provide appropriate levels of research infrastructure and space for incoming faculty. It is not clear that enough laboratory space and reasonable start-up funding exists for new faculty. Competitive research programs linking biology, chemistry, and physics cannot be developed using undergraduate teaching laboratories.

We could not determine if the university had adequate computational infrastructure support for areas of opportunity that include biological sciences, biomedical/health, math/science education, and engineering, to name a few. Several areas need statisticians and bio-statisticians. A computational support group that serves the science, health, education, and business areas of the university could be considered. Computational science cannot be carried out in departments lacking the support of computational resources and computer system managers to handle the demands of researchers with strong computational programs.

DEDICATED AND HARD-WORKING FACULTY

The university's overwhelming strength lies with its current active and research-oriented faculty. A tremendous advantage is that UTPA is recruiting over 45 new faculty positions this year (and within the last few years, that number has been as high as 65 new faculty per year). This pace suggests that the tenure-track and tenure faculty may be growing faster than 12 percent per year. This rapid faculty growth and the importance of using these new hires to continue to change the academic culture at UTPA make it imperative to immediately develop a hiring plan that will help minimize mistakes. Otherwise, attempts to refocus the institution in new directions may be slowed or thwarted by a large percentage of faculty hired with different expectations and capacities. We know the University is aware of this important opportunity and will endeavor to attract faculty and academic leaders who share a strong and common understanding of the research environment and its importance.

Appropriate support packages for new faculty must be a crucial part of any such plan. Many universities institute hiring policies allowing departments with less research experience to add several research faculty from other departments or even external expertise to ensure bringing

in faculty with good research records or promise. With such a strategic hiring plan, UTPA could develop faculty profiles that are more research-oriented than those many current faculty who are oriented primarily to teaching.

Market considerations drive salaries and special arrangements to attract high-quality faculty, and it is quite difficult to hire faculty in areas in demand. If doing so is a priority, appropriate levels of funding must be found. Again, UT institutions should look to faculty in Canadian universities facing mandatory retirements as a potential source of faculty. They should also explore other innovative approaches to acquiring faculty for short-term assignments.

We have also suggested previously that the University explore some sort of post-hiring assessment of faculty hires to determine if the strategy and approaches are proving successful. We reiterate the importance of deans in these hiring decisions. We also reiterate the value of considering unusual procedures in searches for these deans, including mandating national searches as well as external review of finalists' qualifications and vitas, at least until the institution strengthens.

STUDENT POPULATION GROWING, BUT NOT STUDENT RESEARCH

The overwhelming praise that the faculty we interviewed had for the student body was admirable. Most of the faculty we met noted that the opportunity to teach and mentor hard-working, first-generation-in-college, and economically disadvantaged students was critical to their decisions to join UTPA. Faculty seemed genuinely fulfilled by their students' growth and development. The faculty knows and relishes that they are making a difference in the lives of these students. Yet, as student enrollment continues growing at double-digit rates (11 percent this past year), the faculty are becoming weighed down with teaching requirements. The growth is also creating space issues for teaching and research. Space and its financing will continue to be major issues for the new administration and the System, which must be a part of any solution to meet the space demands of the most rapidly-growing institutions.

UTPA has a population of enthusiastic and well-trained students, but undergraduates have only limited opportunities to undertake funded research, and such research is not being carried out in a systematic fashion. But support for research is the key, as most undergraduates have part-time jobs that are essential to their or their family's survival. Undergraduate students also provide an extraordinary pool of potential graduate students for many of UTPA master's degree programs.

RESEARCH CENTERS OF EXCELLENCE AND RESEARCH FACILITIES

Research centers at UTPA are not created in a fashion that is typical at major research universities. That is, at UTPA, centers do not seem to emerge from groups of faculty writing joint proposals for external funding. It must become established procedure that faculty develop initiatives to search for funds and then establish centers around funded research or interdisciplinary graduate programs. If a bottom-up process were utilized, then faculty interests and strengths would drive the direction of research and the establishment of centers. This process should become part of the evolving cultural change on this campus and among its faculty.

LIBRARY

Libraries must increase access to holdings in a variety of ways. This access could include the basic journals faculty require in their disciplines. The University should involve faculty

extensively in reviewing library needs and establishing a process to determine purchasing priorities. Access to journals and many publications at the UT-Austin library is available on-line to the other UT System institutions.

POLICY ON TEACHING LOADS AND SALARIES

The University should institute a policy that makes clear that faculty teaching loads and salaries cannot be the same across all fields. One could envision a research faculty member, for example, with a 2-3 or 3-2 teaching load for professors in mathematics and in the humanities (class size being a factor in writing and language classes). But a 2-2 teaching load for biologists—with the possibility of team taught courses—may be too high.

Faculty involved in research who play leadership roles will need competitive faculty support. They must have teaching loads that are standard in the field, have access to seed money, and have teaching assistants and research assistants with competitive stipends.

In addition, UTPA requires a policy for providing start-up funds in differing but appropriate amounts for all new hires. When developing such a policy, the University should consider reducing teaching loads during the first year for faculty undertaking a research program and consider not requiring committee work from such faculty for two years. Such a policy might also stipulate seed monies and summer research opportunities.

Such issues must be addressed if UTPA expects to successfully implement Ph.D. programs in at least three additional areas and MS programs in several other areas and to build a sound portfolio of extramural funding in the next several years.

GRADUATE STUDENT SUPPORT

No graduate program can succeed without a sufficient number of excellent graduate students. While more sponsored research will eventually allow UTPA departments to fund graduate students competitively, the transition will be slow and difficult. Still, UTPA's support for graduate students is deplorably low. For example, it offers few graduate student stipends, and those it does offer are worth about \$7,000 a year, which is far from competitive; many graduate students receive stipends of approximately \$15,000 per academic year. Health insurance would be an incredible benefit for these students. The University might also consider offering some summer fellowships with appropriate stipends to the top research-oriented graduate students.

Opportunities for Collaboration

The WAG team found many examples of productive and innovative partnerships, in such varying areas as pharmacy, dentistry, and medical school admission. Ties with Mexican universities are also good and could be crucial as engineering and international business programs expand. We also found partnerships with other universities on research and education projects, including with institutions in the Texas A&M System, the University of Houston System, and among public and private institutions inside and outside of Texas. Some of these partnerships, such as with the marine laboratory on South Padre Island, could be expanded in ways that help both UTPA and its partners.

While we had no opportunity to assess local capacity or interest in assisting UTPA, we recommend that a new President put high on the administration's agenda developing local government and private sector resources. The State of Texas might find some legislative means

to support such an effort, but state budgetary issues may also preclude immediate assistance. With that fact in mind, we believe the creation of a capital-construction funding source for aspiring institutions should be undertaken at the earliest possible moment. Tuition may give a possible lift, but local economic conditions and student demographics require proceeding cautiously. As with UTB/TSC, we recommend that UTPA explore the Texas grant as a potential source of funding for needy students so that increases in tuition do not harm the neediest among them.

We noted a lack of military facilities with R&D activities located near the campus; such R&D facilities can often be a source of new educational or research initiatives. Yet if there are corporations with an R&D focus and located as near the campus as possible, they should be sought out for potential research collaborations or for student assistance for research projects or summer internships.

As we noted in the UTB/TSC report, WAG puts a very high priority on increasing the collaborations in many research and education areas at UTPA and UTB/TSC. Such collaborations will add strength to any effort and to each institution.

Finally, we were pleased to note that a number of faculty have built collaborations on some research projects in a range of disciplines and with an array of universities across Texas and beyond.

All these types of partnerships enhance UTPA's research profile and potential, and the UT System should encourage and support them wherever possible.

Priority Actions to Increase Research and Education

- First, create a review committee charged with evaluating and recommending, as needed, new university, school/college, and departmental hiring plans. This committee would work closely with the new university administration and the faculty to develop a university strategic plan that emphasizes recruiting and hiring new faculty and key academic administrative personnel. The plan should also propose a process to assess finalists for faculty positions and assist in reviewing salary ranges and teaching loads based partly on research productivity. Without this step, little institutional progress in strengthening research capacity will occur. The UT System should remain apprised of this process. Earlier, we addressed the importance of deans and provosts in institutional development, and we proposed mandatory national searches and external, pre-hiring involvement by the System for such positions. Our view is that steps like these can provide a long-term foundation for the UT institutions.
- Second, a master space plan that focuses on the growing student population and the various and often-competing needs for classroom, research, dormitory, and parking must begin soon in order to have results the new president can consider. Innovative ways to finance and deal with capital construction items should be included, as well as novel incentives for students to utilize facilities for more hours per day. The process must also ensure that the faculty understand that research space comes after they secure research support. Under-utilization of such space while making funding decisions would not be judicious. We should note as well that while the planning needed to address these issues positively and productively will make itself apparent

much more rapidly than the impact on the physical plant, the dramatic value of thorough and shrewd planning will prove itself over time.

- Finally, the new President and the Provost should review all dean positions with a focus on empowering deans with more resources and decision-making authority. Should some deans be replaced, the national search already mentioned should be used to bring new life and ideas to the campus. A dynamic new President and a few new, high-level hires that share a common vision for moving UTPA forward could quickly bring results and immediately boost campus morale.

In addition, UTPA should consider moving forward in these areas to improve its research and educational environment:

- Take advantage of the Hispanic-Serving Institution (HSI) designation and seek more federal funding. Aggressively seek partnerships with institutions in non-Hispanic regions that would likewise benefit in such a partnership.
- Establish a formula to distribute the overhead funding now being returned in full to the University. The primary goal of such a formula should be to enhance research activities at UTPA and to provide incentives to secure more external funding.
- Involve additional faculty from a range of disciplines in discussions about directions and potential research opportunities that would be available to UTPA faculty and students in partnership with the Regional Academic Health Center.
- Improve the workflow processes and overall business practices that encumber the ability of faculty to efficiently work in research activities at UTPA.
- Seek non-monetary means to regularly recognize faculty research accomplishments.
- Establish a Council on Research and Creativity drawn from faculty across all disciplines that advises the chief research officer on policies and procedures that affect research on the UTPA campus.
- Review all existing centers and institutes, determine their productivity and necessity, and establish procedures to create centers as well as mechanisms to dissolve those that have become non-productive or whose purpose is no longer viable.
- Consider establishing some departmental or college mentoring programs with travel funding for younger faculty to accompany mentors to meet with funding agency officials periodically about research opportunities.
- Continue such outstanding programs as GEARUP and other such programs that are making a positive difference among the UTPA students.

How Might UTPA Look in Five Years?

We look ahead several years and see UTPA operating under new and dynamic leadership that emerged in the presidential search of 2004. The new president and a strengthened leadership team are implementing a newly developed strategic plan. While the student population continues to grow at a rapid pace and is approaching 20,000, the quality of the incoming student cohort has

improved steadily. The students continue to come from Hildago and Starr Counties, but increasingly students come from outlying counties in the Rio Grande Valley. An aggressive capital campaign is about half completed, and funding for scholarships for undergraduate students is allowing more students to attend more classes and attain full-time status. The number and quality of graduate students continues to grow, a result of larger graduate stipends supported by private sources and expanding research grants.

The University continues to gain in stature as a strong regional university with its foundation grounded firmly in the excellence of its teaching—at the undergraduate and graduate levels. The undergraduate and master's level programs have become well recognized, and they provide the strength upon which the University is selectively building several high-quality Ph.D. programs. Most of this small and select group of new Ph.D. programs are being built jointly or with one of several UT universities. The RAHC presence on campus has improved nursing, allied health, biomedical science, and engineering areas at the undergraduate and master's levels. New programs are in place or under development or planning, including new doctoral programs in math and science education, manufacturing engineering, and a nationally recognized multi-disciplinary Ph.D. in bilingual composition.

Research funding is moving toward the goal of \$20 million per year, mostly coming from expanded federal and state support. The Pan American Foundation recently stepped forward and provided major funding for several new initiatives for the University. The policies implemented to streamline the paperwork load on faculty and to distribute the full indirect cost returns appropriately have begun to pay dividends, including rising faculty morale and increasing the number of proposals being submitted. Senior research faculty—often with a junior faculty colleague—are using these returned funds to travel to Washington and Austin to talk with program officers about funding opportunities for their programs and their students.

The campus is humming with construction due to new capital funding which is enabling aspiring universities like UTPA to handle the massive influx of undergraduates. Campus expansion has begun, including new parking areas and residence halls designed to handle the new students who raise their course load each year and have become increasingly more interested in campus residency, undergraduate research, and post-graduate educational opportunities.

Thanks to enhanced partnerships with new businesses coming into the UTPA area, students are using part-time employment to gain professional experience. They have summer internships and job opportunities in fields related to their career interests. The nearly-finished capital campaign has led to new partnerships and prospects that give both undergraduate and graduate students the chance to work with local businesses and companies. The McAllen-Edinburg area and the Rio Grande Valley are beginning to attract new industries that wish to take advantage of the growing university and hire its talented graduates.

APPENDIX 1

SCOPE OF WORK

The Consultant shall perform the following Work in connection with the development of a detailed plan (the “Plan”) to significantly expand the research capabilities of the following eight (8) academic institutions (the “Institutions”) of the University:

Group A

The University of Texas at Arlington
The University of Texas at Dallas
The University of Texas at El Paso
The University of Texas at San Antonio

Group B

The University of Texas at Brownsville
The University of Texas – Pan American
The University of Texas of the Permian Basin
The University of Texas at Tyler

In accordance with Section 4.d. of this Agreement, Consultant shall assemble two teams of individuals to perform the Work:

- One team, composed of seven or eight members, shall conduct and supervise the Work at the Group A Institutions.
- A second team, composed of six members, shall conduct and supervise the Work at the Group B Institutions.
- Team members shall include nationally recognized leaders with demonstrated competence, knowledge and experience in developing research capabilities for scientific, technological or higher education enterprises.

Consultant, through its teams, shall:

- Review background information provided by the Institutions as well as information developed independently, and shall request additional information from Institutions as the Work progresses.
- Visit Institutions during September 2003, October 2003, November 2003, December 2003 and January 2004. Analyze and evaluate the information gathered and formulate strategies to significantly expand the Institutions’ research capabilities.
- During January 2004 and February 2004, both teams shall identify their major findings and conclusions, answer questions in this Exhibit, and provide recommended strategies and tactics for using current resources to greater effect and for future development of the Institution, and for significantly expanding the Institutions’ research capabilities, in light of constraints and opportunities described in this Exhibit.

Consultant shall include the following work product in the Plan:

- 1) A set of strategies and tactics for using current resources to greater effect and for future development of each Institution.
- 2) Highly focused solutions to significantly expand the research capabilities of each Institution that are aligned with national and state research priorities.

Consultant shall address the following questions concerning each Institution in the Plan:

- 1) What are the current research strengths of the Institution?
- 2) What are the possibilities for further expansion of the research profile at the Institution, using its existing strengths?

- 3) What are the next high-opportunity research areas that the Institution could develop? Explicit recommendations concerning numbers of faculty, target departments, and specific disciplines or sub-disciplines shall be addressed.
- 4) What are the additional resources that the Institution needs to pursue its high-opportunity research possibilities? Specifics of support personnel, graduate students, space, and equipment shall be provided.
- 5) In what order should actions be taken to develop research at the Institution? What is the set of priorities, and why are these the priorities? What is a likely time frame for the research enhancement?
- 6) Are there partners (local, state, or national) who could help the Institution increase its research profile?

Consultant shall address the following questions for the group of Institutions as a whole in the Plan:

- 1) To what extent do the strengths of the Institutions overlap?
- 2) Are there obvious opportunities for collaboration among the Institutions that should be pursued?
- 3) Are there shared resources that should be developed for the Institutions?
- 4) What are the high potential possibilities for collaboration with a nearby medical or health science campus?

Consultant shall address the following constraints in the Plan:

- 1) Each Institution's enrollment is expected to grow. Largest growth is anticipated at U.T. Arlington and U.T. San Antonio. With the exception of U.T. Dallas, the Institutions do not currently pursue selective admissions policies. The pressure of enrollment, however, may lead to greater selectivity at all campuses over the next five years.
- 2) The principal basis for state appropriations is formula funding, based on semester credit hours of instruction, with a two-year lag. The formula provides additional funding for graduate and upper-division courses, and the formula also funds engineering and science courses at a higher rate. Because of the lag in formula funding, increased growth will not pay for itself in the short term.
- 3) The State faces a current revenue shortfall of approximately \$9 billion. Part of this shortfall will be met with a budget cut in appropriated funds. Even when the economy improves, it is not realistic to expect substantial increases in state appropriations.
- 4) Although six of the Institutions are entitled to share in the proceeds of the Permanent University Fund ("PUF") endowment, recent losses in the stock market make additional distributions from the PUF unlikely in the short term.
- 5) Current State law does not permit the University to waive tuition for graduate students. Research and teaching assistants who are appointed at least half time have been eligible to pay resident (in-state) tuition, and, were eligible for staff benefits, including health benefits. Recent legislative changes impact this eligibility. Funds available for graduate fellowships are quite modest.

Consultant shall address the following opportunities in the Plan:

- 1) The local communities are very supportive of the Institutions.
- 2) There may be philanthropic support from foundation or individuals for research expansion.

- 3) The Texas Legislature recently deregulated tuition. Authority for setting tuition, for the first time, will be delegated to the Board of Regents, allowing for a more differentiated tuition structure.
- 4) The state legislature recently approved legislation that will allow the Institutions to retain all of their indirect costs reimbursements. Formerly, these Institutions were permitted to retain only 50% of their indirect costs.
- 5) There is a possibility of some special item funding from the Governor's Office.

In addition to the forgoing questions, constraints and opportunities, the Consultant shall identify and respond to any additional issues relevant to the specific challenges of each Institution.

Further, the following questions were posed for each of the developing institutions:

The University of Texas at Brownsville/Texas Southmost College:

- What are the next steps UTB/TSC should take to improve its educational effectiveness with its current student body?
- What are the most promising academic areas for research expansion or for research collaboration with other institutions?
- What are the next academic degree programs that should be developed for UTB/TSC?
- How can UTB/TSC best align itself with opportunities for economic development in South Texas?

The University of Texas – Pan American:

- What academic areas are appropriate for the next doctoral-level program?
- UTPA has identified four areas of regional significance for academic focus. These areas are bilingualism; biomedical sciences and engineering; border life and international relations; and subtropical environment and ecology. Are these appropriate areas? Are other areas equally suitable or more promising?
- What academic or professional areas best align with further economic development in the South Texas area?
- What steps should UTPA take next to improve its effectiveness in educating its distinctive student body?

The University of Texas of the Permian Basin:

- What are the next steps UTPB should take to improve its educational effectiveness with its current student body?
- What are the most promising academic areas for research collaboration with other institutions, such as Odessa College or the other institutions within the UT System?
- What are the next academic degree programs that should be developed for UTPB?
- How can UTPB best align itself with opportunities for economic development in West Texas?

The University of Texas at Tyler:

- What are the next steps UT-Tyler should take to improve its educational effectiveness with its current student body?
- What are the most promising academic areas for collaboration with the University of Texas Health Center-Tyler?
- What are the next graduate and professional degree programs that should be developed for UT-Tyler?
- How can UT-Tyler best align itself with opportunities for economic development in East Texas?

APPENDIX 2

THE WASHINGTON ADVISORY GROUP TEAM

Dr. Raymond Bye has spent his career at the NSF and Florida State University (FSU) in areas related to scientific and engineering research, research administration, U.S. science policy, and legislative and public affairs. Beginning in 1972, he served over two decades at the NSF, with more than a dozen years as director of the Office of Legislative and Public Affairs. Following his service at NSF, he was named associate vice president for research at FSU in 1994. In 1999, he was named interim vice president for research and, after a national search, was named FSU's vice president for research in 2000. In that position, his responsibilities included sponsored research administration, technology transfer activities, the FSU Research Foundation, oversight of research regulatory issues, research communications programs, and several interdisciplinary research programs (such as the National High Magnetic Field Laboratory, the FSU Center for Advanced Power Systems, the Institute for Science and Public Affairs, and the FSU Marine Laboratory). In June 2003, FSU's new president asked that he assume expanded federal relations responsibilities along with leading the university's activities related to economic development. In this capacity, he serves as the lead university official in all federal and Congressional relations activities. Dr. Bye has served on a number of boards and commissions, including as president of the FSU Research Foundation; a member of the Oak Ridge National Laboratory Board of Governors and the Board of Oak Ridge Associated Universities; Chair of the National Association of State University and Land-Grant Colleges' (NASULGC) Council on Governmental Affairs; and as a member of the Board of Directors for the NASULGC. Dr. Bye has received a number of awards, including the NSF Distinguished Service Award and the President's Meritorious Executive Award.

Dr. Raúl Cárdenas served as vice chancellor for student development and community affairs for the Maricopa Community College District in Phoenix, Arizona prior to his recent retirement. He is the immediate interim chancellor of the district, the past president of Paradise Valley Community College and the founding president of South Mountain Community College, both in the Maricopa system. His active retirement assignment with the Maricopa Community College District will have him working at the Mesa and Scottsdale Community Colleges. His professional career spans three decades and all levels of education—as an elementary, junior high and high school teacher, a high school vice principal and community college dean of students in El Paso, and as an assistant vice chancellor for student affairs at the University of California at Berkeley. Dr. Cárdenas' participation in national organizations is quite extensive and includes having served as member of the Board of Directors for the American Association of Community Colleges and the American Council on Education; member of the President's Academy Executive Committee of the American Association of Community Colleges; chair of the Executive Committee of the Hispanic Association of Colleges and Universities; and member of the American Council on Education Commission on International Education. He is currently a member of the Coordinating Council for the Hispanic Border Leadership Institute, Executive Committee of the International Consortium for Education and Economic Development, Fundación Solidaridad Mexicano Americana, and other higher education organizations. Dr. Cardenas received his M.Ed. from the University of Texas-El Paso, and a Ph.D. in educational administration/student personnel from the University of Arizona.

Dr. Carlos Castillo-Chavez, a native of Mexico who immigrated to the U.S. 28 years ago, holds joint appointments in the Departments of Statistics, Biological Statistics and Computational Biology and Theoretical and Applied Mechanics at Cornell University, where he is also a member of the graduate fields of applied mathematics, biometry, epidemiology, ecology and

evolutionary biology, statistics and theoretical and applied mechanics. In 1996 he established the Mathematical and Theoretical Biology Institute (MTBI), which fosters research activities primarily among underrepresented minority undergraduate students who are enrolled at non-selective U.S. universities, but also mentors and supports underrepresented minority undergraduate and graduate students from various universities who are working in the mathematical or statistical sciences. He received a Presidential Award for Excellence in Science, Mathematics and Engineering Mentoring in 1997, in part, for the work that he carried out at MTBI. In 1997 he founded the Cornell-Sloan fellowship program in the mathematical and statistical sciences at Cornell University, a program that he has directed ever since. Dr. Castillo-Chavez has received various awards including two White House Awards (1992 and 1997), a QEM Giant in Science Mentoring Award (2000), and SACNAS distinguished senior scientist award (2001). In addition, he was named Profesor Plenario by the Universidad de Belgrano (Argentina, 1996); and held a Catedra Patrimonial by the Institute of Applied Mathematics (IIMAS) at National University in Mexico (UNAM, 1998). He was selected as the 2003 Ulam Scholar by the Center for Nonlinear Dynamics (CNLS) at Los Alamos National Laboratory. He has published over one hundred research articles, edited four volumes, and co-authored a textbook on mathematical biology with Fred Brauer (2001).

Dr. Thomas Winston Cole, Jr. served as the first president of Clark Atlanta University from 1989 until his retirement in 2002, after serving simultaneously as president of both Clark College and Atlanta University prior to their historic consolidation. Previously, he was chancellor of the West Virginia Board of Regents, the second and one of only four African Americans to head a state system of public higher education, and had served as president of West Virginia State College. Prior to these appointments, he taught at Atlanta University where he was chairman of the Department of Chemistry, Fuller E. Callaway Professor of Chemistry, and provost and vice president for academic affairs. He also served as director of the Atlanta Resource Center for Science and Engineering, the first of three centers established in the United States by the National Science Foundation. Nationally recognized for his scholarly contributions to science and his leadership in higher education administration, Dr. Cole has served as chairman of the Council of Presidents of the Member institutions of the College Fund/UNCF; chairman of the Council of Presidents for the College Fund, the Atlanta University Center; and the Black College Fund of the United Methodist Church. He currently serves as the chair of the Board of Directors of the Quality Education for Minorities (QEM) Network, and holds memberships on the Executive Committee for Project Kaleidoscope, and the General Board of Higher Education and Ministry of the United Methodist Church. He is a past member of the Executive Council, Commission on Colleges, Southern Association of Colleges and Schools. A Texas native and graduate of Wiley College, Dr. Cole has been awarded numerous honors in recognitions of his scientific, educational and community contributions.

Dr. Shirley McBay assumed the position of president of the Quality Education for Minorities (QEM) Network in July 1990, following ten years as dean for student affairs at the Massachusetts Institute of Technology (MIT) and three years as director of the QEM Project, an MIT-based initiative supported by the Carnegie Corporation of New York. Previously, she served as a program manager/director in the Science Education Directorate of the NSF, where she directed two national programs designed to increase minority participation in science and engineering. Prior to joining NSF, she spent 15 years at Spelman College, including as professor of mathematics, department head, division chair, and associate academic dean. At QEM, Dr. McBay has served as the director of several science and engineering-focused projects. These include NSF-supported projects focused on states with significant minority populations, the Historically Black Colleges & Universities (HBCU)-Undergraduate Program, the Math and Science Partnership Program, and the Faculty Early CAREER Development Program; faculty

development projects, including the Teagle Foundation-supported Scholarly Productivity Projects for Science and Engineering Faculty at HBCUs and the NASA-supported Scholarly Technical Assistance Project for Principal Investigators of NASA's Faculty Awards for Research Program; the Annenberg/CPB Math and Science Project-supported Minority Mathematics and Science Teacher Leadership Corps; the NSF- and NASA-supported Summer Science Internship Program for undergraduate and graduate students; NASA's residential Summer High School Apprenticeship Research Program (SHARP PLUS); and the GE Fund-QEM Seamless Pathway Project, a pilot initiative in three low-income areas offering a continuum of support for talented mathematics and science students, from middle school to college.

Dr. Alfredo G. de los Santos, Jr. has served as research professor at Arizona State University and as a Senior League Fellow of The League for Innovation in the Community College since his retirement as vice chancellor for student and educational development at the Maricopa Community Colleges. During the 1990s, Dr. de los Santos was principal investigator for a number of grants funded by the NSF, including the Phoenix Urban Systemic Initiative (\$15 million) and the Maricopa Advanced Technology Education Center (\$5 million). He is the founding president of El Paso Community College and served as a dean at Northampton County Community College (PA) and Florida Keys Junior College (FL), and as a librarian at Laredo Junior College (TX). Dr. de los Santos serves on the board of trustees of the Tomas Rivera Policy Institute, Jobs for the Future Inc., National Center for Public Policy and Higher Education, and the Council for Higher Education Accreditation. He is co-principal investigator for two programs funded by the NSF, including the Technical Education Initiative at the Accreditation Board for Engineering and Technology. He has served on the board of the Carnegie Foundation for the Advancement of Teaching, the American Association of Community Colleges, the American Association for Higher Education, the American Council on Education, the United States Open University, and the College Board, among others. He is the recipient of numerous honors and awards, including recognition by the American Council on Education, McGraw-Hill, the Hispanic Association of Colleges and Universities, and the National Science Foundation. Dr. de los Santos earned his associate of arts degree from Laredo Junior College and B.A. (English), M.L.S. and Ph.D. (educational administration) degrees from the University of Texas at Austin.

Joe B. Wyatt is a WAG principal who advises on strategic planning and governance in academia, management and planning of academic R&D organizations, and corporate-academic partnerships. He is chancellor emeritus of Vanderbilt University, having served as chancellor from 1982 to 2000. As chancellor, Mr. Wyatt led Vanderbilt's ascent into the top tier of U.S. teaching and research universities, overseeing the expansion of the university's academic offerings and diversity of the student body and the increase of Vanderbilt's endowment from \$170 million to more than \$2 billion. Previously, Mr. Wyatt was a member of the faculty and administration at Harvard University, serving as vice president for administration from 1976 to 1982. During this period, he led EDUCOM, a consortium of 450 universities that developed computer networks and systems for sharing information and resources. In addition Mr. Wyatt co-authored the book, *Financial Planning Models for Colleges and Universities*, and wrote extensively in the fields of technology, management and education. He has conducted research for the NSF, the Ford Foundation, the Office of Naval Research, and the Eli Lilly Foundation, among others. He is a patentee and consultant in computer system design and computer networking. Mr. Wyatt co-founded the Massachusetts Technology Development Corporation in 1978, a public venture capital group that has financed a large number of successful technology-based companies in Massachusetts. He is currently chairman of the board of the Universities Research Association of Washington, DC and chairman of the Government University Industry Research Roundtable of the National Academy of Sciences. He holds degrees in mathematics from Texas Christian University and the University of Texas at Austin.

APPENDIX 3

CHRONOLOGICAL SITE VISITS

I. University of Texas-Pan American (October 1-3, 2003)

Site visitors from the Washington Advisory Group:

Mr. Joe Wyatt, Team Leader	Dr. Carlos Castillo-Chavez
Dr. Raymond Bye, Jr., Coordinator	Dr. Thomas W. Cole
Dr. Raúl Cárdenas	Dr. Shirley McBay

Visit Overview:

Joe Wyatt, a principal of The Washington Advisory Group, led the site visit to UTPA. The group included a coordinator, Dr. Raymond Bye, and the four additional consultants listed above. The team at times divided into two subgroups (not always including the same individuals at each meeting), which conducted interviews with 14 different groups during the visit. We drew these groups primarily from faculty in a range of academic disciplines. We conducted a special interview with a large group of students involved in research (both graduates and undergraduates). In addition, we had working dinner discussions with deans as well as both initial and final meetings with the university's leadership (the president and several members of his leadership team).

II. University of Texas-Tyler (October 27-29, 2003)

Site visitors from the Washington Advisory Group:

Mr. Joe Wyatt, Team Leader	Dr. Thomas W. Cole
Dr. Raymond Bye, Jr., Coordinator	Dr. Alfredo G. de los Santos, Jr.
Dr. Carlos Castillo-Chavez	Dr. Shirley McBay

Visit Overview:

After a review of the relevant materials provided by UT-Tyler, our team, led by Joe Wyatt, visited the campus October 27-29, 2003. The group included a coordinator, Dr. Raymond Bye, and the four additional consultants listed above. The group met with 16 distinct groups and conducted our meetings and discussions either as an entire team or in two subgroups. We drew the 16 groups primarily from faculty in a broad selection of academic disciplines. We also included undergraduate and graduate students in many of the discussions. In addition, we had working dinner discussions with deans and with the president and his vice presidential team. We also had an opening meeting with the president and several members of his leadership team. Because of a commitment in Austin, President Rodney Mabry was not on-campus on the day of our departure. Mr. Wyatt and Dr. Bye conducted a final telephone de-briefing with the president several days later (November 5). Our conclusions and recommendations are based on this single visit, as well as materials received before and afterward.

III. University of Texas-Brownsville/Texas Southmost College (December 1-3, 2003)

Site visitors from the Washington Advisory Group:

Mr. Joe Wyatt, Team Leader	Dr. Carlos Castillo-Chavez
Dr. Raymond Bye, Jr., Coordinator	Dr. Thomas W. Cole
Dr. Raul Cardenas	Dr. Shirley McBay

Visit Overview:

Mr. Joe Wyatt led our team on this visit. The team was composed of its coordinator, Dr. Raymond Bye, and the four additional consultants listed above. The group met with 14 distinct groups and conducted the meetings and discussions either as an entire team or in one of our two subgroups of three consultants. These UTB/TSC groups consisted primarily of faculty drawn from a broad selection of academic disciplines. In addition, we had a meeting with a community-based group of leaders. We had working dinner discussions with the deans and another with the President Juliet García and Provost José Martín and several of her board of trustee members. In addition, we had an opening meeting with the university leadership, including the president and provost. On the last day of our visit, we held a final debriefing with President García and Provost Martín.

IV. University of Texas at the Permian Basin (December 17-19, 2003)

Site Visitors from the Washington Advisory Group:

Mr. Joe Wyatt, Team Leader	Dr. Thomas W. Cole
Dr. Raymond Bye, Jr., Coordinator	Dr. Alfredo G. de los Santos, Jr.
Dr. Carlos Castillo-Chavez	Dr. Shirley McBay

Visit Overview:

After a review of the relevant materials provided our team, a December 17-19, 2003, The Washington Advisory Group, led by Mr. Joe Wyatt, conducted a site visit to the University of Texas at the Permian Basin. The team included its coordinator, Dr. Raymond Bye, and the four additional consultants listed above. The WAG team met with 15 distinct groups. We conducted the meetings and discussions either as an entire team of six or in one of our two subgroups of three. These UTPB groups consisted primarily of faculty drawn from a broad selection of academic disciplines as well as a group of support staff. In addition, we met with a group of community leaders that included an elected official and leaders of the local Chambers of Commerce in Midland and Odessa, including the Mexican American and Black Chambers. We had working dinner discussions with the deans and another with President David Watts and Vice President for Academic Affairs William Fannin. In addition, we had an opening meeting with the university's leadership, including the president and vice presidents. On the last day of our visit, we held a final debriefing with President Watts, the vice presidents, deans, and assistant vice president for graduate Studies and sponsored research.