

WHITE PAPER 

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**Transforming LSU into a Premier Public Research University:
An Investment in Louisiana's Economic Future**



Research universities have played powerful roles in advancing state economies over the past 150 years. While many of today's public research universities began as small rural teaching colleges in the mid-nineteenth century, sustained federal funding commitments for teaching and research in fields important to major national industries (e.g., engineering) have deeply connected universities to the economic vitality of their states. At the same time, university knowledge has expanded with extraordinary depth and breadth of disciplinary expertise, with universities now supporting rapid discovery and innovation in modern economies.

Today's universities benefit their states in many important ways. In particular, they play a pivotal role in educating tomorrow's workforce. Additionally, they improve their communities' quality of life by offering a diverse range of creative, cultural, and entertainment activities.

The most successful research universities deliver additional benefits that can, under the right circumstances, establish a foundation for transforming state economies. These benefits include:

- Generating groundbreaking new discoveries and innovations in high-potential new research areas
- Translating innovation and talent into economic prosperity through partnerships with new and existing commercial ventures
- Encouraging partnerships, aggressive goal-setting, and higher standards for all state research institutions, creating a "ripple effect" through other campuses

Knowledge and innovation have become more and more important over the last three or four decades in determining which businesses and states succeed in the national and global economies. Businesses increasingly rely on new process and

At a Glance

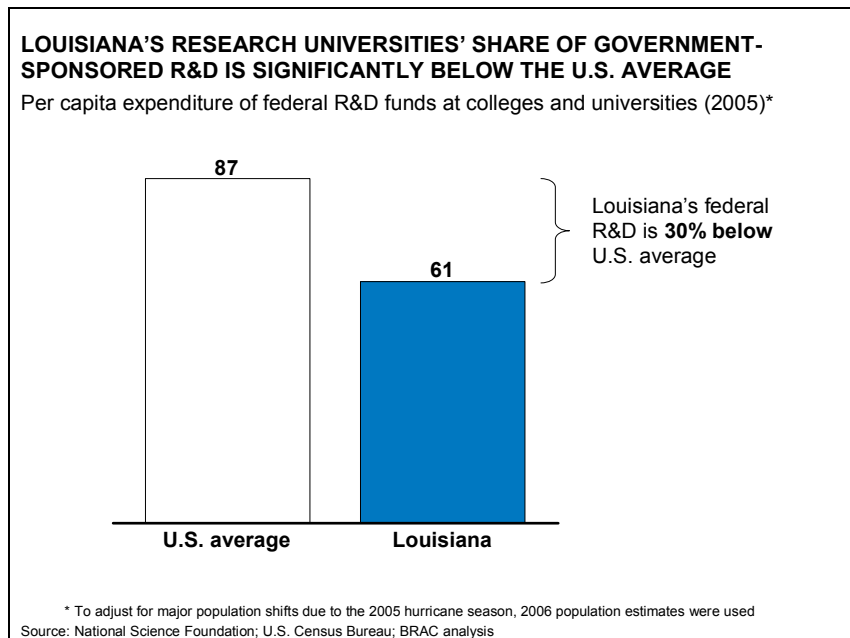
- Premier public research universities are catalyzing remarkable economic gains by enabling their states to successfully compete in today's knowledge economy; LSU is not competitive at the highest level
- To drive economic development and provide a foundation for economic transformation, Louisiana should establish LSU as a premier public research university that boasts world-class, productive research faculty; outstanding research environments; high-achieving undergraduate and graduate students; and robust university commercialization activity
- Creating a nationally-competitive LSU requires a comprehensive funding strategy to provide an additional \$113 million in recurring funding for annual operations and \$700 million in capital funding (2007 dollars) through increases in state appropriations (\$1,000 per FTE student), tuition & fees (\$2,200 per FTE student), and endowment income (\$600 per FTE student), along with new state policies to promote private giving, cost-sharing, and aggressive public support
- Strategic investments at LSU will have a net economic impact of more than \$300 million per year from increased research activity alone, along with the creation of more than 4,000 new jobs, and offer the potential to transform the state economy by significantly growing research activity, attracting the most talented undergraduate and graduate students to Louisiana, and driving substantial advances in commercialization activity

product innovations to maintain their competitiveness, while structural advantages associated with physical location or access to natural resources are steadily diminishing in importance. For this reason, state economies underpinned by world-class commercial innovation are growing significantly more quickly than their peers, evidenced by strong positive correlations between measures of states' innovative economic activity (e.g., New Economy Index) and their per capita income growth.

Premier public research universities, such as the University of North Carolina at Chapel Hill (UNC – Chapel Hill) and the University of Texas at Austin (UT - Austin), have catalyzed remarkable economic gains by enabling their states to successfully compete in today's knowledge economy. They have built research enterprises that consistently drive significant new discoveries, including many with the potential for commercialization. Conversely, universities that are not positioned to compete at the highest level generate relatively few successful transfers of research and innovation into the marketplace, in large part because they are unable to sustain a sufficient level of world-class research activity at their campuses.

Louisiana: not capturing its share of federal R&D dollars

The volume of federal research expenditures at public research universities is a strong indicator of the competitive strength of a state's research enterprise against others around the nation, as faculty in academic departments at each U.S. university compete for the same pool of federal research grants. As of 2005, Louisiana's federal R&D expenditures per state resident (\$61) ranked 37th among 50 states, and were 30 percent below the U.S. average.



The attributes of premier public research universities

Premier public research universities are characterized by extraordinary levels of scholarship, research, and commercialization activity. It is through this exceptional level of performance that they so profoundly impact state economies.

To enable success at the highest level, premier public research universities typically embody four key attributes:

- 1) A world-class, productive research faculty that generates a substantial volume of significant new discoveries
- 2) Outstanding research environments that support rapid and unfettered innovation
- 3) Sufficient numbers of high-achieving undergraduate and graduate students that enhance research and commercialization efforts
- 4) Robust university commercialization activity that aggressively leverages the full economic potential of university talents and innovations

1. World-class, productive research faculty

Research universities—public and private—compete in a relatively small pool for the world’s most accomplished research faculty. These outstanding faculty members are at the international forefront of their research fields and continually develop new, meaningful discoveries. They are extremely productive not only in basic research reflected in publications and faculty awards but also in applied research, entrepreneurship, community outreach, and teaching. They typically help establish a high-performance culture within their departments, which attracts other highly-talented faculty members and large volumes of sponsored research. Conversely, without world-class, productive research faculty—including a significant portion interested in entrepreneurial endeavors—a university will not attract sponsored research of the scale, caliber, and commercial-orientation necessary to deliver frequent innovations with high-potential economic implications.

The University of California at Berkeley has become a premier attractor and retainer of world-class faculty talent. Among its faculty are seven Nobel Laureates, 130 members of the National Academy of Sciences, 74 members of the National Academy of Engineering, and 229 Fellows of the American Academy of Arts and Sciences. Furthermore, Berkeley cultivates an entrepreneurial culture among its researchers, leading *Inc.com*, a popular business publication, to recognize Berkeley in a recent list of “Five Universities You Can Do Business With.”

In other instances, research universities participate in joint efforts to cultivate world-class research faculty. The Georgia Research Alliance (GRA) is designed to attract the world’s pre-eminent scientists to strengthen Georgia’s research universities and secure more sponsored R&D for the state. To date, the state of

Georgia has invested \$400 million in GRA initiatives to hire and support more than 50 Eminent Scholars across six state institutions. The investment has been leveraged to attract \$1 billion in new sponsored research grants and has enabled the launch of more than 125 start-up companies in Georgia.

2. Outstanding research environments

Premier public research universities demonstrate a strong commitment to building and sustaining world-class research environments. University facilities—labs, equipment, office space, and other departmental resources such as IT infrastructure, classrooms, and collaboration spaces—create an unfettered research and learning environment where faculty and students can achieve their full potential. In numerous faculty surveys, facilities are repeatedly cited among the top five most valuable assets universities have to offer faculty recruits. Recognizing this characteristic, the most successful public research universities constantly add, expand, and upgrade their facilities.

As an example, in 2007, UNC – Chapel Hill completed Phase I of the largest new construction program in the university's history, the \$205 million Carolina Physical Science Complex, to replace some of the university's outdated physical sciences facilities. This project was made possible in part by a \$3.1 billion state bond referendum for higher education in 2000, which included \$515 million for renovations and new buildings at UNC – Chapel Hill. Committed public funding enabled UNC – Chapel Hill to leverage private gifts, faculty research overhead from federal grants, and other non-state sources for a long-term, \$1.8 billion capital construction program. Other states such as Alabama, Arkansas, Ohio, and Virginia have followed suit with facility-related bond referendums ranging from \$250 million to \$1.1 billion.

3. High-achieving undergraduate and graduate students

Premier public research universities also attract first-rate students—including a relatively high proportion of graduate students—who are drawn to the intellectual vitality and institutional commitment to quality across the campus. High-achieving students, who tend to be self-starters and innovators themselves, enhance the culture of exploration and discovery established at premier public research universities. In addition, many of these high-achievers tend to seek opportunities to translate their exposure to world-class research into their own commercial enterprises.

Aspiring scholars hunt for value and excellence in higher education, which can be created through a number of offerings: financial aid packages, exceptional facilities, first-rate faculty and teachers, small classes, outstanding academic support, robust library resources, and wide-ranging extracurricular activities and programs. Premier public research universities compete for the brightest minds by tailoring their institutional assets and financial packages to offer a distinctive, compelling product to prospective students. The product can be structured to

appeal to a wide range of high-quality students, or to a more targeted group of extraordinarily-gifted young scholars.

One example of a strong commitment to enhancing academic value for top scholars is the University of Virginia's Jefferson Scholars program. Recipients of the Jefferson Scholarship—up to 35 students per year selected through a rigorous application process—receive the full cost of attending the university (i.e., tuition & fees, books, supplies, room & board, personal expenses, and travel). These students are also inducted into an elite group of approximately 130 university-wide Jefferson Scholar undergraduates, who are offered myriad educational enrichment opportunities such as a freshman-year outdoor leadership course, a two-week summer Institute for Leadership and Citizenship, a five-week foreign travel/study experience, and internship opportunities with past Jefferson Scholars. In 2006-07, the Jefferson Scholars program attracted 963 nominations throughout the nation, illustrating the effectiveness of these types of programs in attracting substantial interest from highly-qualified applicants.

4. Robust university commercialization activity

Premier public research universities take an aggressive, comprehensive approach to commercialize the ideas and discoveries associated with their on-campus research enterprise. Without this commitment to commercialization, universities severely limit their ability to catalyze real economic gains for their communities and states. A wide variety of commercialization activities are involved, including the complex process of patenting and licensing new discoveries. Over the past 30 years, patenting and licensing activities of U.S. universities have skyrocketed. From 1980 to 2002, the total number of patents issued annually by universities increased over 1,000 percent; today universities hold nearly 13,000 revenue-generating licenses.

The commercialization efforts of premier public research universities involve far more than patenting and licensing. They also include activities that nurture entrepreneurial communities among their faculty, students, and alumni. Leaders strive to form networks between existing companies and entrepreneurial faculty researchers (e.g., through industry-sponsored research); assess the commercial potential of faculty innovations; market promising university technologies to companies with potential interest; transfer eligible university-led technologies into new, high-tech companies; and support these new companies in their efforts to access capital, build their management team, further develop their technologies, and grow into successful companies.

The University of Florida's (UF) Office of Technology Licensing (OTL) has rapidly developed capacity in university commercialization over the past decade and now competes among recognized leaders like the University of California System and Massachusetts Institute of Technology. An \$8.5 million annual budget and

robust staff of 20 technology licensing officers, marketers, and administrators enable OTL to meet the needs of UF's large research faculty base. In 2006, OTL supported ten start-up firms and handled over 300 invention disclosures. Moreover, over 400 active licenses generate over \$40 million per year for UF. OTL's services are complemented by the TechConnect program, an economic development partnership between the U.S. Economic Development Administration and OTL, providing services to match faculty inventions with experienced entrepreneurs in order to spur new companies from university-developed technologies.

Establishing a premier public research university in Louisiana

Each of Louisiana's higher education institutions—community and technical colleges, four-year teaching and research institutions, and various graduate and professional schools—has a distinct and important role in improving our state's economic future through its work to train, educate, discover, innovate, and/or commercialize. Accordingly, all state institutions of higher education should be supported in their efforts to continuously improve according to their role, scope, and mission. This white paper focuses on a particular asset in the broader framework of higher education: a premier public research university which cultivates research talent, innovation, and commercialization at the highest level.

For several reasons, *LSU represents Louisiana's best opportunity to build a premier public research university, including LSU A&M, the LSU AgCenter, the LSU Law Center, and the Pennington Biomedical Research Center.* First, strong faculty in research departments at LSU (e.g., biological sciences, physics and astronomy, chemistry, oceanography and coastal studies, veterinary pathology, engineering, and computational technology) lead the state in attracting sponsored research, amassing roughly 15 times more sponsored research activity than the next-largest public, non-medical research campus. Second, LSU has in place a robust campus research infrastructure that continues to be upgraded; facility renovation and expansion work has been completed at three out of five of LSU's largest federal R&D-generating departments since the year 2000. Third, LSU continues to attract more and more of the state's brightest students, raising average freshman ACT scores continuously over the past 20 years to an all-time high of 25.4. Finally, the LSU research enterprise possesses dedicated technology transfer services that attract considerable interest among venture firms and other business enterprises. Nearby incubator space and business assistance at the Louisiana Business and Technology Center, the Louisiana Emerging Technologies Center, and Louisiana Technology Park provide additional support for successful university commercialization. These existing assets at LSU represent a solid foundation upon which a premier public research university—one that successfully competes with the best in the nation—can be developed.

LSU's Pennington Biomedical Research Center

The Pennington Biomedical Research Center (PBRC) is a world renowned academic-based nutrition and disease prevention research center with ground-breaking programs in obesity, diabetes, metabolic syndrome, adipose tissue biology, genomics and molecular biology, stem cell biology, neuroscience, clinical physiology, and population science. In 2005 PBRC articulated the ambitious "Vision 2010" plan to become the leading institution of nutrition and preventive medicine and has made strong advances towards that goal by securing over \$40 million per year in sponsored research activity.

Recognizing its powerful role in improving Louisiana's economic future, state leaders in 2007 appropriated \$21 million to construct a 92,000 square foot state-of-the-art clinical research building at PBRC. This investment is expected to create 300 new jobs, securing an additional \$20 million per year in sponsored research activity, plus another 200 jobs from indirect economic impacts. Nevertheless, PBRC faces strong competition from a number of other large, well-endowed biomedical research institutions which are making strong advances in their research capacity, resulting in a constant challenge to maintain its competitive position. As such, PBRC should be aggressively supported with continued public and private investments to develop its research and commercialization activities. ***Given PBRC's unique nature and extremely important role in transforming LSU into a premier public research university, a detailed funding strategy for PBRC will be published separately.***

Funding LSU as a premier public research university

Developing and sustaining the attributes of a premier public research university depend more than anything else on competitive financial resources. For this reason, there are no examples of poorly funded universities with world-class research and academic programs. In particular, financial resources are necessary to attract and retain world-class research faculty and to continually develop state-of-the-art facilities that enable premier public research universities to compete at the highest level.

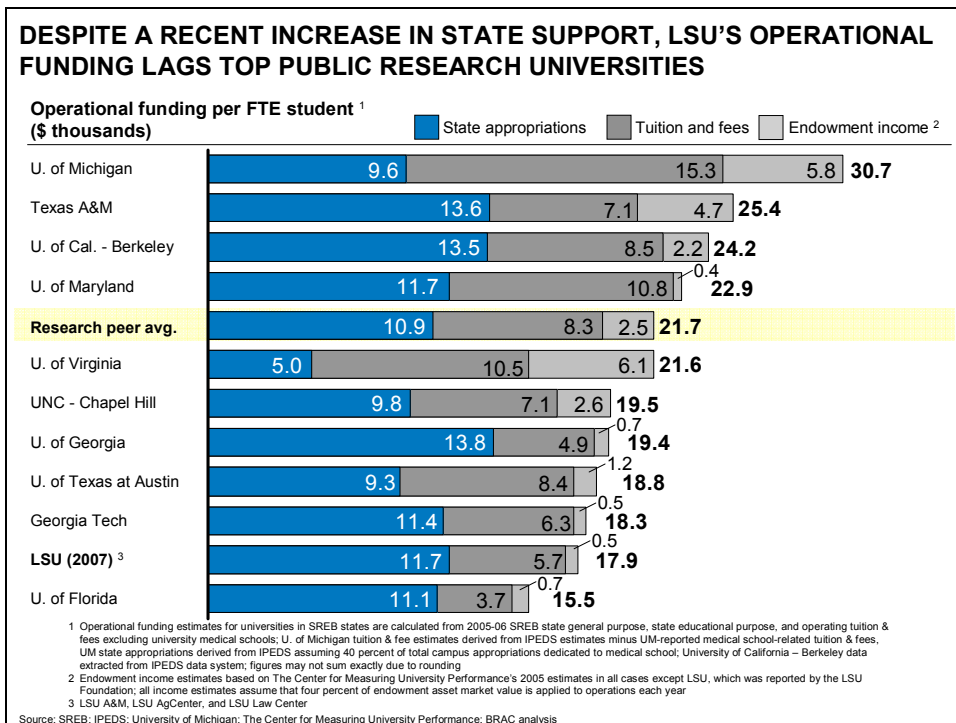
In this context, the root cause of the current performance gap between LSU and premier public research universities stems from significant funding deficiencies compounded over several decades. Accordingly, transforming LSU into a premier public research university will require a new, comprehensive funding strategy. Furthermore, funding targets for LSU should be based on appropriate benchmarks drawn from a select group of premier public research universities across the nation instead of the existing peer group which includes many campuses (e.g., University of North Texas, University of Southern Mississippi, and West Virginia University) that are clearly not regarded as top-tier institutions.

Described below is a comprehensive funding plan for LSU A&M, the LSU AgCenter, and the LSU Law Center that, if aggressively implemented, can provide LSU with the opportunity to transform itself into a premier public research university by 2025. The plan calls for (in 2007 dollars) an additional \$113 million in recurring funding for annual operations and \$700 million in capital

improvements by 2015, along with appropriate adjustments in existing revenues to keep pace with inflation in higher education costs (approximately four percent annually). The plan is based on LSU's current enrollment of approximately 29,500 full-time equivalent (FTE) students and could be scaled-up to accommodate a larger enrollment if necessary. A similar plan for PBRC will be developed and published separately to ensure that PBRC is strongly supported with continued investments commensurate with other world-class biomedical research institutions. With this funding plan implemented, LSU, for the first time in its history, would have the resources for sustained, long-term investments in the key attributes of a premier public research university.

Operational funding

Even after a large boost in state appropriations in 2007, LSU's total annual revenues from state general purpose appropriations, tuition & fees, and endowment interest are roughly \$3,800 per FTE student less (17 percent) than the *average* level for premier public research universities based on institutions selected from the Top 25 National Public Universities of the 2008 *U.S. News and World Report* ranking. Closing this funding gap will require a practical combination of increases in state appropriations, tuition & fees, and endowment income that boost annual operational funding at LSU by a total of \$113 million in 2007 dollars. These increases should be guided by comprehensive operational funding targets that consider all revenue sources and place LSU in a competitive posture relative to other premier public research universities across the U.S.



Outlined below is a set of operational funding increases that involves the state, students and their families, and private contributors. The specific distribution of funding increases across revenue sources is less important than closing the total funding gap. For instance, state leaders could choose to implement a more modest tuition & fee increase if they were more aggressive in providing state appropriations. Nevertheless, the outlined increases illustrate a practical path forward that is guided by several important considerations. For example, the targeted increase in endowment income is based on aggressive, but realistic, fund-raising goals given recent success rates with the ongoing Forever LSU campaign and the time required for cultivating new donors. Also, the recommended increase in state appropriations is relatively modest in comparison to the increase in tuition & fees since current state appropriation levels are fairly well aligned with premier public research universities, while tuition & fee levels are not.

First, annual state general purpose appropriations for LSU should be increased by approximately \$1,000 per FTE student (\$30 million total) in 2007 dollars by 2015. Currently, state appropriations for Louisiana's colleges and universities are determined on a discretionary basis by the Legislature, guided by a recommendation derived from the state Board of Regents' funding formula. The funding formula—based on funding benchmarks for universities in other southern states—is designed to consider state appropriations only (i.e., does not consider major funding sources such as tuition & fees and endowment income) and does not focus on *total* funding for LSU. Unfortunately, even though its state appropriations (as guided by the funding formula) are slightly above the benchmark average, LSU receives nearly \$4,600 per FTE student less than average from the combined sources of tuition & fees and endowment income. Accordingly, since very large near-term growth in tuition & fees and endowment income is unlikely, state appropriations should increase to enable near-term growth in LSU's research enterprise while other revenues approach parity. These increases in state appropriations are particularly important for the LSU AgCenter, which enrolls no students and therefore would derive no benefit from increased tuition & fees.

Second, annual tuition & fees at LSU should be increased by approximately \$2,200 per FTE student (\$66 million total) in 2007 dollars by 2015. Currently, Louisiana is one of only two states where the state legislature controls the tuition & fee policy of public colleges and universities, leading to infrequent adjustments and significant obstacles to achieving appropriate tuition & fee levels. The state's Tuition Opportunity Program for Students (TOPS), which covers tuition costs for qualifying Louisiana students, has further complicated tuition policy due to associated fiscal concerns. In order to establish and maintain competitive funding for LSU, the Legislature should return control of tuition & fee policy to the LSU Board of Supervisors, with appropriate checks in place to ensure that total tuition & fee funding per FTE student does not exceed levels commensurate with other

premier public research universities. Also, increases should be structured such that they are paid by students and their families in order to contain state-related obligations related to tuition & fees. Additional merit-based and need-based financial aid should be instated to ensure that all qualified students have access to an affordable education at LSU.

Finally, LSU should generate an additional \$600 per FTE student (\$18 million total) in endowment income, which would require roughly \$445 million in endowment asset growth in 2007 dollars by 2015. Accomplishing the Forever LSU campaign goal by 2010 will deliver more than half of this targeted increase.

Operational Funding Increase Targets for LSU

Value of total increase in 2007 and 2015 dollars

Source	2007 dollars		2015 dollars *	
	Per FTE (\$)	Total (\$MM)	Per FTE (\$)	Total (\$MM)
Tuition & fees	2,200	66	3,010	90
State appropriations	1,000	30	1,370	41
Endowment income	600	18	820	25
Total	3,800	113	5,200	156

* Adjusts funding targets for inflation based on the most recent 6-year higher education cost inflation factor reported by the Commonfund Institute's Higher Education Price Index; assumes constant FTE student enrollment
Source: BRAC analysis

Capital funding

In addition to increased operational funding, infrastructure needs at LSU must be addressed before significant university research expansion can begin. Louisiana has allowed many of its university facilities and equipment to deteriorate in the absence of ordinary maintenance and repair over the past several decades. As a result, LSU's immediate deferred maintenance needs total more than \$175 million for projects like repairing roofs, ventilating buildings properly, and maintaining building service units. In addition to long-standing needs, state leaders should consider committing to constructing new state-of-the-art facilities as other states (e.g., North Carolina) have done through the completion of aggressive, long-term capital construction plans and the introduction of new state incentives that encourage private gifts for capital projects.

To become a premier public research university, LSU will need funding for a capital construction plan on the order of \$525 million in 2007 dollars by 2015 (in addition to addressing deferred maintenance needs).

Near-term steps to improve Louisiana’s university research enterprise

There are several near-term objectives that state leaders can pursue to set LSU on a path to becoming a premier public research university:

- **Apply surplus funding to campus facilities** – In order to more quickly attract the nation’s best research faculty to LSU, the state should accelerate facility improvements by applying surplus funding to eliminate deferred maintenance and expand R&D lab space at LSU
- **Institute a \$2 to \$1 state-to-institution match system for renovations and expansions of university facilities** – To encourage private entities to increase and accelerate their contributions to universities for large capital projects, the state should implement a program that guarantees a significant state financial match on private contributions raised by the university
- **Improve incentives for private giving to university foundations** – To encourage more individuals and businesses to give to university foundations, the state should create a state tax credit for private giving to universities (in line with Senator Bill Cassidy’s proposal during the 2007 Regular Session)
- **Improve incentives for industry research grants and contracts at universities** – To encourage businesses to build their R&D capacity through university research contracts, the state should increase the Louisiana research and development tax credit for those companies that participate in university grant and contract research
- **Connect technology entrepreneurs with university research** – To accelerate the development of successful university-based start-ups, state leaders should create a state pilot program at LSU modeled on the University of Florida’s TechConnect to attract a network of successful entrepreneurs to university commercialization activity

Transforming LSU into a premier public research university

With competitive funding in place by 2015, LSU can position itself as a catalyst for growing the state’s knowledge economy. To achieve this goal, it must prioritize those expenditures that will develop the four attributes of premier public research universities: faculty, facilities, students, and commercialization services.

Research faculty

LSU’s current sponsored research expenditures (research funded by federal and private entities) amount to approximately half of the level typically associated with premier public research universities. To close this gap, the university should invest in developing, retaining, and recruiting innovative faculty with high research productivity and commercial interests (when applicable). This can be accomplished by increasing support for existing productive research faculty (e.g., academic collaboration funds, emergency research funds, raise provisions) and providing for hiring 100 pre-eminent faculty, along with their “start-up” costs and junior research staff. Increasing the number of research faculty at LSU will enable it to more than double current levels of sponsored research, positioning LSU’s research activities among the top 25 premier public research universities.

Strengthening accountability in faculty research

To ensure the benefits of investments in world-class researchers accrue to the public, all of Louisiana’s public research institutions including LSU should internally measure and reward productive faculty by increasing budgets for successful researchers. Better assessing faculty productivity will allow LSU to focus retention and departmental expansion investments such as application assistance for research grants and contracts, new facilities and equipment, competitive salary and benefits packages, academic collaboration funds, and other incentives in a way that rewards productive research faculty and operations at LSU.

Practical methods for tracking faculty research performance include:

- Sponsored research and federal research expended per department and per departmental faculty member
- Faculty awards received
- Faculty memberships in national academies
- Number of faculty citations in premier academic journals
- Invention disclosures (when applicable)

Research environments

LSU currently operates with about half the research lab space that is typically found at premier public research universities, and many of LSU’s prominent research department facilities are long-overdue for major renovation and modernization (e.g., Chemistry’s Choppin Hall, the original Biological Sciences building, the Howe-Russell Geosciences Complex, the School of Veterinary Medicine building, and the AgCenter’s Animal and Food Sciences buildings). Furthermore, although some of its most active research labs have undergone recent renovations, current lab space in many departments is running at or very near capacity. To bring LSU’s research facilities into line with premier public research universities, the state and university should commit to accomplishing the following specific capital initiatives before 2015:

- Eliminate all deferred maintenance at the LSU campus (\$176 million)
- Raise private gifts (university) and provide capital dollars (state) for the completion of near-term facility renovation, expansion, and operational needs as defined by LSU’s 5-year capital outlay plan (\$274 million)
- Accelerate investment in 600,000 square feet of new research lab space for large federal R&D-generating departments to accommodate pre-eminent research faculty teams (\$250 million)

Undergraduate and graduate students

LSU is characterized by significantly lower average freshman ACT / SAT scores and a proportionally smaller graduate student population than those of premier public research universities. While LSU currently appeals to some of the state’s strongest students, it has the potential to draw many more great minds from across the nation as its research enterprise grows. Successful recruitment of the nation’s top undergraduate and graduate scholars will require investing in, creating, and promoting academic experiences that offer distinctive value.

Recently, the Louisiana Board of Regents recognized the power of such investments when it reprioritized funding for capital improvements at the French House, home of the LSU Honors College. Along with many more of these types of investments, LSU should offer more competitive merit-based aid packages (particularly graduate research assistantships) and provide additional need-based aid to high-achieving, low- and moderate-income students. These investments will provide for improvement in admissions of top achieving students from throughout the U.S. as indicated by improved average freshman ACT / SAT scores and a proportionally larger graduate student body that more closely resembles the 25 percent average at premier public research universities.

Maintaining affordability for all qualified undergraduates

LSU has a strong tradition of maintaining an affordable education for all qualified students. Over 80 percent of the undergraduate student body receives some form of financial aid, including the 50 percent of undergraduates who attend LSU tuition-free under TOPS. LSU undergraduates on average assume roughly \$16,400 in debt by the time they graduate, which is approximately \$800 less than the national average for public universities (\$17,200). Additionally, financial aid packages are fairly generous. For example, an average in-state freshmen at LSU earning a 3.0 GPA and 25 ACT score receives a \$3,700 TOPS award each year, and may receive—depending on their financial need—up to \$9,000 more annually in grants, work-study, and federal subsidized and unsubsidized loans (providing a range of 20 percent to 70 percent cost of attendance coverage for these students depending on their economic circumstances).

Furthermore, LSU undergraduates whose family incomes lie below 150 percent of the federal poverty level receive a highly-competitive financial aid package that covers *100 percent* of the total cost of attendance. Over the past five years, these students have been protected in the event of tuition & fee hikes by equivalent increases in need-based aid.

Despite strong existing financial aid programs, LSU students who depend on need-based aid (roughly 25 percent of undergraduates) could experience financial barriers to attending LSU if the proposed \$2,200 per year tuition & fee increase is implemented without additional financial support. As such, roughly \$6 million in new operational funding for LSU should be dedicated towards increased financial support for students who rely most heavily on need-based aid (i.e., students currently receiving Pell grants and federal subsidized loans) to ensure that LSU remains as affordable in the future as it is today. Continuing to guarantee affordability through competitive financial aid packages to high-achieving, low- and moderate-income students is an important element in transforming LSU into a premier public research university, as diversity in the student body is increasingly important to today's top students.

University commercialization activity

LSU's commercialization activities significantly lag those of premier public research universities, with far fewer invention disclosures and active university licenses. To close this gap and ensure that a nationally-competitive LSU catalyzes statewide economic growth, LSU and its partners in university commercialization should continue to develop an infrastructure to support more frequent commercialization success. This success requires not only robust university commercialization services but also hundreds of invention disclosures each year driven by large volumes of sponsored research, along with readily-

available sources of venture capital and strong demand among the business community for innovation. Strong commercialization partnerships will attract research-seeking employers and high-tech jobs to the region, and increase the number university-related invention disclosures, start-up ventures, and revenue-generating licenses. Key steps for enhancing commercialization activity include providing clear incentives (and removing obstacles) for faculty to participate in commercialization activity, enhancing marketing and legal services, hiring additional technology officers as sponsored research grows, improving collaboration among all stakeholders, and achieving a healthy balance between the university's interests and business needs.

Strategic Spending Plan

Included below is a strategic spending plan to deliver these important improvements, enabling LSU to pursue the sustained, rapid development of key attributes associated with premier public research universities.

STRATEGIC SPENDING PLAN FOR NEW MONIES		
Goal / Initiative	Expenditures **	
	Capital (one-time)	Operating (recurring)
#1 Develop, retain, and recruit world-class research faculty		
- Create 100 pre-eminent faculty research positions		28
- Create 200 junior research faculty positions		40
- Provide new faculty research support (e.g., post-doctoral fellows, collaboration funds)		10
Subtotal:		78
#2 Create outstanding research environments		
- Eliminate deferred maintenance	176	0
- Provide for near-term renovation and expansion needs as defined by the 5-year capital outlay plan and expansion-related operational requirements	274	5
- Add 600,000 sq ft of new lab space to accommodate new faculty	250	9
Subtotal:	700	14
#3 Attract high-achieving undergraduate and graduate students		
- Create 400 new graduate research assistantships		6
- Provide competitive financial aid to students from low- and moderate- income families		6
- Increase merit-based aid and fellowships for outstanding students		4
- Provide academic enrichment, leadership, and diversity programs that appeal to outstanding students		1
Subtotal:		17
#4 Increase university commercialization activity		
- Match promising technologies with experienced entrepreneurs and capital		1
- Increase marketing and legal services for technology transfer		1
- Increase the number of technology officers proportionately as sponsored research increases		2
- Create a world-class website on commercialization services at LSU		1
Subtotal:		5
Strategic Spending Plan Total:	700	113

* Costs in 2007 dollars; costs should be appropriately adjusted over time for higher education cost inflation
 ** Figures may not sum exactly due to rounding
 Source: BRAC analysis

Monitoring LSU's path to national prominence

Transforming LSU into a premier public research university also requires a strong, unified, long-term vision for success. There are several key metrics that university officials, government leaders, community members, and economic development professionals can monitor to gauge how their combined efforts have supported progress towards four key economic outcomes driven by successful public research universities:

- 1) **Growth of sponsored research at LSU** as measured by total research, federal research, and total university research lab space
- 2) **Improved attractiveness of LSU to high-achieving undergraduate and graduate students** as measured by average freshman ACT / SAT scores and the graduate student body as a proportion of the total student body
- 3) **Increased university commercialization successes at LSU** as measured by invention disclosures, cumulative active university licenses, and the average concentration of high-tech economic activity in the Baton Rouge metropolitan area relative to the U.S. metropolitan area average
- 4) **Improved realized and perceived institutional performance** as measured by the LSU's ranking in *U.S. News and World Report* and The Center for Measuring University Research Performance

Progress Indicators	Present (1)		2015	2025
	LSU	Peers (2)	LSU	LSU
Faculty research and facilities				
Total research (\$MM, 2005 dollars)	208	413	275	400
Federal research (\$MM, 2005 dollars)	93	257	150	250
Total research lab space (000 sq ft)	736	1,315 (3)	1,000	1,336
Student quality/mix				
Average freshman SAT scores (25th to 75th percentile scores)	1039 -1260	1155 -1375	1100 -1300	1150 -1350
Graduate student % of student body	14%	25%	20%	25%
Commercialization				
3-year cumulative invention disclosures	204	331 (4)	275	350
Cumulative active university licenses	32 (5)	229 (4)	75	150
Concentration of high-tech economic activity (U.S. avg. = 1) (6)	0.5	1.2	0.5 - 0.7	0.9 -1.1
Institutional performance				
<i>U.S. News and World Report</i> rank (7)	135	Top 80	Top 120	Top 50
Appearances in The Center's Top 50 rankings (8)	4	8	6	8

(1) Present figures based on most recent published data: 2005 (total and federal research, graduate student % of student body, appearances in The Center's Top 25 and Top 50 rankings); 2006 (3-year cumulative invention disclosures, cumulative active university licenses); and 2007 (total research lab space, average freshman SAT scores, concentration of high-tech economic activity, 2008 U.S. *News and World Report* ranking); figures represent average values in all cases except cumulative active university licenses (median)

(2) Peers include U. of California – Berkeley, U. of Florida, U. of Georgia, Georgia Institute of Technology, U. of Maryland - College Park, U. of Michigan – Ann Arbor, U. of North Carolina – Chapel Hill, U. of Texas at Austin, Texas A&M University, and U. of Virginia

(3) Includes only benchmark peers without medical research hospitals

(4) Includes only U. of Georgia, Georgia Institute of Technology, U. of Maryland – College Park, and U. of Texas at Austin

(5) LSU present figure includes only cumulative active university licenses that are revenue-generating

(6) Based on Milken Institute's High-Tech GDP Location Quotient, which measures the concentration of high-tech economic activity in a given metropolitan area relative to the U.S. metropolitan area average; Milken figure refers to Baton Rouge MSA (LSU) and to the average of MSAs where peer institutions are located (peers)

(7) Includes both public and private institutions; LSU rank is estimated

(8) Of 9 individually-ranked metrics

Sources: National Science Foundation; The College Board; IPEDS Peer Analysis System; AUTM U.S. Licensing Activity Survey FY2006; Milken Institute; *U.S. News and World Report*; The Center for Measuring University Performance; BRAC analysis

Conclusion

In Louisiana, there are few assets that offer such a singular, proven investment opportunity to increase economic development and potentially transform our state economy as LSU. For example, the projected increase in new federal and private research dollars flowing into the state will provide a significant, direct economic boost. LSU is expected to receive more than three dollars in new federal and private research grants for every dollar of state investment. The new federal and privately supported research activity by itself is expected to generate a net economic impact of more than \$300 million per year, creating more than 4,000 new high-paying jobs with total earnings of approximately \$150 million per year (in 2005 dollars).

In addition, strategic investments in LSU are projected to stimulate significant increases in technology-based start-up activity and research-focused business relocations to the state. Finally, the investments will provide LSU students with a much higher quality educational experience, better preparing them for a rapidly evolving economy, career success, and improved earning potential.

In summary, establishing LSU as a premier public research university offers the potential to transform Louisiana's economy by significantly growing research activity, attracting the most talented undergraduate and graduate students to Louisiana, and driving substantial advances in commercialization activity. The leaders and citizens of Louisiana should take this opportunity to invest in our economic future through LSU. In doing so, they will prepare our state economy to aggressively compete for prosperity in the 21st century.