Enhancing Research and Scholarship
at
Rice University

__Final Report__

by

**The Senate Working Group
on
Research and Scholarship**

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"The Senate Working Group on Research and Scholarship will assess the processes and structures currently existing on campus designed to support and improve Rice's research and scholarship efforts, including strategy, support structures, assessment, and coordination and planning from the department level to the upper administration level."

Executive Summary

Chinese proverb:
"If you want one year of prosperity, grow grain.
 If you want ten years of prosperity, grow trees.
 If you want a hundred years of prosperity, grow people."

1. "Moving to the next level" in research and scholarship, formulated in a variety of ways, has been embedded within mission statements such as the Vision for The Second Century (V2C), but Rice University has had little formal discussions with faculty regarding the strategies, opportunities, directions, and tradeoffs that would be required to accomplish that in specific terms. Strategic steps toward improvement in the quality of research and scholarship at Rice as well as the external perceptions of this improvement in quality (e.g., national rankings) will require more substantial discussions between faculty and administration. In particular, Rice will need to develop a strategic plan regarding key factors in research and scholarship: e.g., the composition, size, quality, and productivity of the faculty. These factors would pertain to the faculty we currently have and would inform how we further develop and retain them; these factors would also inform how we recruit future faculty. The Rice community—that is, the faculty, the administration, and the Board of Trustees—should develop a coherent plan for the size, distribution (by intellectual area), and demographics of the faculty at 5, 10, and 20 years, as well as a strategy for developing the resources needed to implement that plan. Obviously, any significant long-term plan to improve research and scholarship will also carry significant costs; the next campaign should include a clear focus on investments in both human and organizational capital.

2. Improving Rice's return on current investments and expenditures requires ensuring that all our operations receive routine, systematic, and transparent review. Our operations are interdependent, and therefore all must be reviewed, from academic programs and departments to the Provost's office, from FE&P to the library. Access and communication improves the value and impact of the results of these reviews, and therefore, whenever possible, results should be available to the Rice community at large, from trustees to faculty, and input from this community should be welcomed as appropriate. Although Rice has recently undertaken to conduct such reviews for its academic programs, the current process is somewhat ad-hoc and lacks sufficiently systematic follow-through; it needs to be regular and methodical if we are to have the information to make strategic decisions.

3. Like most small universities that grow, Rice continues in its efforts to standardize a diverse set of processes that have developed over its history. These processes pertain to everything from hiring personnel to processing travel expenses, from providing on-campus transportation to performing

construction and renovation. All of these administrative and business processes should also be subject to routine and systematic internal and external review for their value, effectiveness and efficiency. As a community, we insist on bringing in external reviewers for academic programs; we should also make use of capable and expert external reviewers to review, analyze and assess our administrative and business processes and practices. In particular, there are many cumbersome aspects to Rice's current business process and administrative IT systems. An expert external analysis of Rice's business processes and administrative systems is essential to improving the efficiency and effectiveness of the university.

4. Rice is organized around seven schools: Architecture, Business, Engineering, Humanities, Music, Science, and Social Science. (There is also a school of Continuing Studies). Each school has its unique characteristics, and the schools share common problems and challenges as well. Any strategic research and scholarship initiatives that Rice undertakes should be targeted to strengthen its schools, their programs, their governance, and their ability to create and sustain a climate of research and scholarship at all levels.

5. To enable a culture of honest and realistic assessment, Rice must become much more transparent and open with regard to data—data on research and scholarship, programs, faculty, students (at the undergraduate, graduate, and postdoctoral levels), budgets, expenditures, and the like.

Background

By many measures, Rice University has made significant progress over the past ten years. It is well recognized as a prestigious research university, it is a member of the American Association of Universities, and it consistently ranks in the top 100 universities globally. The academic landscape, however, is intensely competitive, and we must compare Rice not only against its past but also against our peers, which have also made significant progress. For example, although Rice has doubled its research expenditures over the past decade, its portion of the national research-and-development pie remains stable, and its rank in terms of research expenditures has actually declined slightly.

The first and third point of the Vision for The Second Century (V2C) address enhancing Rice's research and scholarship as well as its graduate programs; these points reflect permanent goals that must stay our foremost priorities, be pursued with vigor, and be assessed regularly. "Moving to the next level" has been a wish expressed by the Rice community for many years, but there is a pervasive sense that we have yet to reach the "next level." It has almost become part of the university's identity. A self-deprecating quote floating around Rice for many years says that "Rice is perpetually perched on the precipice of greatness." Despite the perpetual desire to move to the "next level," the "next level" for Rice has rarely been defined precisely. Traditionally, Rice has been recognized more for its outstanding

undergraduate programs than for its research, scholarship and graduate education. The Working Group believes that a reasonable and explicit "next level" for Rice is to raise our national and international standings in research, scholarship, and graduate education to levels comparable to our standing in undergraduate education.

Enhancing our research and scholarship happens by defining our standards (rankings and otherwise), continually raising those standards, and pushing each other to excel. We must examine all aspects of the university regularly, recognizing and rewarding our strengths, facing our weaknesses honestly, and not falling into complacency with either. Increasing our standings in research, scholarship, and graduate education may require some difficult changes, which Rice must discuss as a community and undertake in the overall pursuit of excellence.

Taking Rice to the "next level" requires a joint effort by the faculty and the administration, at all levels. The faculty is the lifeblood of the university. Establishing more concrete lines of communication between faculty and administration, at all levels, is critical for exchanging input and feedback, with more engagement from larger segments of the faculty than has been the norm. Considering different incentives and structures for faculty and administrators to communicate and collaborate more frequently may be worthwhile.

Culture

Research and Scholarship is the first point in the V2C, but the community has yet to internalize the highest levels of research and scholarship as endemic to the Rice culture and an unquestioned top institutional priority. Historically, Rice has been of two minds as to whether it is "a research university with a strong undergraduate program" or "an undergraduate institution with a strong research program." Top academic institutions in the US combine a strong research program with a strong undergraduate program, but Rice has yet to achieve that balance in a manner that makes the university a stronger research competitor with its peer institutions. It is clear, for example, that our current USNWR ranking as a top-20 university reflects the strength of our undergraduate program more than it reflects the reputation of our graduate program and research and scholarship program. Perhaps it is coincidental that Rice collects and analyzes much more detailed data about our undergraduate students than about our faculty and graduate students. For instance, by all appearances, Rice understands its competitiveness much better in undergraduate recruiting than in graduate and faculty recruiting.

From its founding, Rice has had high aspirations, and indeed "no upper limit," but these high aspirations have not always been matched with concrete execution. For example, while enhancing Rice's research and scholarship profile is the top priority of the V2C, it was not accompanied by a *concrete* plan and *concrete* metrics. Without such definition, it is hard to assess progress towards that goal. This issue is

complicated by the fact that the aspirational "next level" continues to rise as other universities improve their own standing.

Rice's aspirations have created a set of *conflicting* goals: breadth, depth, *and* a small size. The reality is that Rice is simply stretched too thin to meet all these goals, yet tradeoffs and priorities between these goals are rarely discussed openly. In fact, Rice's culture puts such a premium on collegiality that there is an aversion to discussing institutional, departmental and faculty weaknesses and challenges. Without open discussion of weaknesses and challenges it is hard to formulate plans to address them. It is sometimes seen as uncollegial to point out weaknesses, but that is a precondition for remedying them.

A large number of Rice's academic programs are outstanding, but there are also programs that are in need of improvement. Nevertheless, with few exceptions, it is rather difficult to understand the nature and the variance of academic quality across Rice. We seem to lack the culture, the organization, and the data to make difficult, informed strategic choices regarding Rice's academic programs. Institutional data are often not available or not easily accessible, for example, as discussed above, regarding competitiveness in recruiting. We need to create more metrics and benchmarks and make better use of them. Our peers often compare themselves to us on various metrics (e.g., academy membership, graduate fellowships, federal awards, research expenditures), but we rarely compare ourselves (internally or externally) to our peers on the same metrics.

The culture around the budget process at Rice has traditionally been highly centralized and insufficiently transparent. There are few broad discussions of priorities and tradeoffs between the administration and the faculty. Rice does not have its budget process centered in the academic side of the administration, and perhaps this is a contributing factor to there being little discussion of the alignment between budgets and strategic academic priorities, e.g., graduate education. Ultimately, the budget process determines how Rice invests its resources. Rice cannot rise to the next level without investing in its academic programs, and that would require forming a long-term investment plan.

Recommendation 1: Rice should develop a systematic process for an external quality review of programs, departments, schools, and administrative offices.

  a) The recently launched academic-review process is to be commended, but it is yet to be fully systematized.
  b) Reviews should be preceded by prior conversation on metrics and benchmarks, semi-standardized self-study and review questions.
  c) There should be a follow-up process to ensure that reviews are consequential. For example, such a process may include unit response, review by school-wide committee, decanal response, review by standing university committee, and internal follow-up review.

d) The Senate should appoint a group to work with the administration to develop a systematic academic review process.

Responsibility: Provost, Vice Presidents, Vice Provost for Academic Affairs, Dean of Graduate Studies, School Deans, and Senate.

Recommendation 2: Rice should develop processes for establishing accountability of academic units.

a) All academic administrators, from department chair upwards, should submit annual reports, consisting of public and private sections.

b) All academic administrators should receive timely and constructive responses from higher-ups on their reports.

Responsibility: Provost, Vice Provosts, Senate, and Deans

Recommendation 3: Rice should develop processes for major academic organizational decision making.

a) Although there is a process at Rice for starting new academic programs, there is no process for terminating programs. (**Comment**: This process is currently being formulated for graduate programs.) There is also no clear process for decision making regarding academic unit reorganization such as splitting or merging units (although a recent case example has taken place in engineering). A clear process should not limit organizational flexibility, but should provide a roadmap for consultation and decision making.

b) In practice, almost all proposed major academic organizational changes encounter a significant level of opposition that makes it quite difficult to carry out such changes. Framing proposed changes within a larger plan to improve academic quality can help to generate buy-in by all constituents when change is necessary.

c) School-based faculty advisory committees with distinguished faculty/senate members could advise deans on major issues as part of a more transparent decision-making process.

Responsibility: Provost, Senate, Deans

Recommendation 4: Rice should rethink its budget process to allow for longer-term planning, a broader strategic discussion of priorities and tradeoffs, a closer alignment with strategic priorities, and enhanced flexibility and incentives for academic units at all levels. **Responsibility**: President

Faculty

The faculty is Rice's most precious resource. As has been said, "The faculty is the university." If Rice is to move up to the "next level," then it is the faculty that needs to move to the next level. But, like in many universities, stewardship of the faculty at Rice is diffuse among the provost, deans, and department chairs. Data on the faculty are not widely shared, assuming they are even available. It is difficult, for example, to know how Rice's tenure rate compares to those of its peers or how well Rice competes in faculty recruiting. (Rice is also somewhat unusual in that its Office of Institutional Research is not centered in the academic side of the administration.) The establishment of a full-time Vice-Provost for Academic Affairs in response to an early draft of this report is a positive development.

A typical academic career often spans 40 years from first appointment as an assistant professor. The first 10-15 years of that span have clear milestones, which are the awarding of tenure and promotion to the ranks of associate and full professor. The next 25-30 years constitute a "long stretch," with little mentoring and no explicit career ladder. (Many of our peers formally recognize that there are five professorial ranks: assistant, associate, full, named, and distinguished.) Although Rice has a full-professor-review process, its effectiveness is questionable, and Rice could more actively implement mentoring and development activities for its full professors to stay on an upward trajectory in all its forms. Internally, many of Rice's current academic leaders—president, provost, and school deans—are external hires, which might be seen as a signal that Rice does not consider the development of local academic leadership to be a priority. Externally, Rice lacks a coordinated effort to nominate faculty members for various national and international honors, which would promote its visibility further and might provide some positive "peer pressure."

The promotion and tenure process is the main vehicle through which Rice controls the long-term quality of its faculty. Although a significant amount of effort is spent at Rice on fine-tuning the process to ensure its fairness, the actual standards for promotion and tenure, which ultimately control quality, are rarely discussed other than on a case-by-case basis. Raising the standards for promotion and tenure is an important lever for long-term improvement of Rice's faculty. To gain tenure at Rice, a candidate dossier must be compelling. A standard of "just pass the historical bar" typically leads to mediocrity. Lack of strong support by a candidate's department, dean, and the Promotion and Tenure Committee should weigh heavily against final approval by the president. The mid-term review process for assistant professors is intended to be an important component of the promotion and tenure process, but there are reasons to believe that it may have become a routine process of questionable utility.

Finally, the composition, size, quality, and productivity of the faculty are the key factor in research and scholarship, but Rice has no visible plan for the faculty in the future. The Rice community—that is, the faculty, the administration, and the Board of Trustees, together, should develop a coherent plan for the size, distribution (by

intellectual area), and demographics of the faculty at five, ten, and twenty years, as well as a strategy to develop the resources needed to implement that plan.

Recommendation 1: The Provost should appoint a full-time Vice-Provost for Academic Affairs (VPAA), responsible for the ongoing stewardship of the faculty, including, for example, faculty development and mentoring, compilation of data on the faculty (jointly with the Office of Institutional Research), and coordination of nominations of faculty members for various honors (see also Recommendation 2). (**Comment**: This recommendation is the process of being implemented, as a consequence of an earlier draft of this report.)

Recommendation 2: The President and Senate should establish a new standing faculty committee, Committee on Academic Affairs (replacing the current Faculty Advisory Committee of the Office of Faculty Development), whose duties may include:

a) Advise on the duties of the VPAA.
b) Serve as an advisory body for the VPAA.
c) Advise the administration and the Senate on non-research faculty-related policies.
d) Provide faculty oversight of the academic external review process.
e) Develop a faculty-data dashboard.
f) Develop guidelines for a "faculty-career ladder," including service expectations, annual reports, and periodic reviews.

Recommendation 3: Developing high standards for promotion and tenure is critical to the quality of the faculty at Rice.
a) Regular discussions on hiring, promotion, and tenure standards should be held among the President, Provost, deans, and chairs.
b) The President makes final decisions on promotion and tenure. In borderline cases, the President should lean towards denial.
c) The Senate should review Rice's midterm-review process for assistant professors to examine its effectiveness.

Recommendation 4: The President and the Provost, working with the Senate, should develop a coherent plan for the size, distribution (by intellectual area), and demographics of the faculty at 5, 10, and 20 years, as well as a strategy to develop the resources needed to implement that plan.

Research Funding

Rice's research portfolio has doubled over the past decade in terms of research expenditures, but Rice has not moved up in the ranks comparatively. There is often not enough institutional conversation on aligning individual faculty priorities with institutional priorities. Rice is specifically weak in comparison to its peers with respect to the establishment of large research centers (especially interdisciplinary ones). Institutional support for proposal development is generally lacking and there is shortage of proposals for the establishment of large research centers. As the effort of preparing such proposals is quite high, and the odds of winning quite low, Rice actually provides few incentives for faculty members to undertake such projects, and therefore faculty members often shy away from such undertakings.

In today's competitive funding environment, the development of research funding cannot be fully delegated to faculty. In the past few years, research development has emerged as a distinct profession. Research-development professionals support the efforts of faculty to secure extramural research funding and initiate and nurture critical partnerships throughout the institutional research enterprise, among institutions, and with external stakeholders. Rice is well behind its peers in this arena.

Recommendation 1: Faculty productivity should become an *institution-wide topic of conversation.*

a) Data on faculty productivity should be included in the public part of departmental and school reports.
b) Deans and chairs should conduct regular conversations with faculty on their productivity.
c) It is the job of deans to create a *culture* of faculty research and grant productivity: to define *expectations*, provide *resources* and *incentives,* offer *encouragement,* and create *a climate of* positive peer pressure to encourage faculty to raise their own profile and that of their discipline.
d) Rice should issue an annual research and scholarship report, according to a template developed by the Research Committee.
e)
Responsibility: Deans, chairs, Vice Provost for Research, Senate

Recommendation 2: The Vice Provost for Research (VPR) should strengthen the *Office for Research Development,* to help identify opportunities, to help faculty form competitive research teams, and to pursue large strategic opportunities. See, for example, http://research.utk.edu/proposal-support/research-development-team/.

a) The Research Committee should work with the VPR to develop a proposal for a Rice Office of Research Development.
b) The Research Committee should work with the VPR to create incentives that will spur and reward faculty effort at creating center-scale activities at Rice.

Doctoral Programs

Strong doctoral programs are a critical component of top-tier research universities. In engineering, science, and the social sciences, a significant part of research activity takes place in the context of doctoral education. Rice has many fine doctoral programs, but few doctoral programs at Rice rank in the top 20 in their area, which would be consistent with Rice's overall *USNWR* ranking.

Thus, Rice must improve the quality of its doctoral programs at Rice if it is to move to the "next level." Furthermore, while improving faculty quality should be understood as a long and slow process, improving doctoral programs significantly *can be done in a few years with a concerted effort.* Thus, focusing on the improvement of Rice's doctoral programs is a point of high leverage for investment. Indeed, Point 3 in the V2C states explicitly that Rice must strengthen its graduate and postdoctoral programs to attract and recruit high-caliber students and young researchers. Yet, Rice's Dean of Graduate and Postdoctoral Studies (DGPS) is currently a half-time appointment, and the current institutional focus appears to be on improving operations and processes. That focus should be trained on building stronger doctoral programs and student recruiting efforts. To do this in a more informed and concerted manner, Rice should collect more metrics on the quality of their doctoral programs, to be shared both within and outside of academic units.

The Working Group's discussions on this topic made clear that there are many urgent priorities that needed to be addressed regarding doctoral education at Rice. Most urgently, Rice needs to review the size and funding of its doctoral programs and benchmark itself in comparison to its peers. There is a pervasive sentiment on campus that Rice is *underinvesting* in doctoral education, yet we lack data to substantiate this notion. Equally urgent is the need to strengthen the applicant pools for Rice's doctoral programs. Doctoral recruiting must become an institutional priority, just as undergraduate recruiting currently and clearly is. Doctoral recruiting, which is currently largely delegated to individual doctoral programs, could be meaningfully enhanced through greater institutional support. With only a half-time DGPS at present, Rice currently lacks the organizational capacity to assess and improve the quality of its doctoral programs to the level of the undergraduate program. Even with a full-time DGPS, the first level of oversight of our roughly 30 doctoral programs should be at the school level. Rice's schools also require greater organizational mechanisms and institutional support for this type of oversight, guidance, and the sharing of best practices.

Finally, although Rice's policy gives the DGPS the responsibility for oversight of doctoral programs, it gives school deans the administrative responsibility over these programs, and although the DGPS controls tuition waivers, the dean controls the funding of doctoral stipends. The oversight structure and sharing of responsibilities between school deans and the DGPS should be better defined and strengthened. Some of our peers have a formal Graduate School to meet these ends, but the

Working Group did not reach a full understanding of the pros and cons of this organizational structure.

Recommendation 1: The Provost should appoint a full-time DGPS with overall responsibility and accountability for oversight of graduate programs and with the mission of pursuing vigorously Point 3 of the V2C. (**Comment**: There is a search underway for a full-time DGPS, as a consequence of an earlier draft of this report.)

Recommendation 2: School deans should appoint associate deans for graduate education and school-wide graduate committees to provide school-level oversight of graduate programs, as well as to discuss school-wide priorities, tradeoffs, and best practices. These associate deans should report not only to their school deans, but also (via a "dotted line") to the DGPS.

Recommendation 3: The Senate should appoint a group (Graduate Council or an ad-hoc working group) to study further graduate governance at Rice. The group should study graduate governance in peer institutions (including the graduate-school issue) and recommend a governance model for Rice that would clarify the relationships, including funding authority, between the DGPS and school deans and between school-level graduate committees and Graduate Council.

Recommendation 4: The Senate should appoint a group (Graduate Council or an ad-hoc working group) to work with the new DGPS and develop an implementation plan for Point 3 of the V2C, including the desired (and feasible) level of investment by Rice, a more effective recruiting of doctoral students, and ongoing quality assessment of doctoral programs.

Undergraduate Research

Undergraduate research is critical to the health of Rice's undergraduate program, as Rice's status as a top research university is a major attraction for many of our students. Although most liberal-arts colleges of our caliber offer a strong focus on education, Rice offers students unique and valuable opportunities of early involvement in research and scholarship. Undergraduate research can also strengthen Rice's research profile and contribute to Rice's doctoral recruiting efforts. Rice has several undergraduate-research initiatives, and significant progress has been made recently in promoting these initiatives, yet these initiatives are still somewhat disparate, potentially redundant or competitive (e.g., school-based vs. university-based initiatives), and lack full institutional coordination and oversight structures. Given the strength of Rice's undergraduate program, Rice has the potential for a high-profile undergraduate research program, if provided a proper level of institutional focus and investment. Some of our peers have impressive undergraduate-research programs (see http://web.mit.edu/urop/ and http://www.surf.caltech.edu/); Rice should aspire to have similar programs.

Recommendation 1: The Senate should appoint a group (standing committee or ad-hoc group) to compile an inventory of all undergraduate research programs at Rice, study best practices at peer institutions, and develop a proposal for a comprehensive Rice program for undergraduate research (including research internships). This proposal should include also a governance structure. In analogy to our proposal for oversight of graduate programs, the Working Group believes that the first level of undergraduate-research oversight should reside at the schools, via departmental undergraduate research coordinators, school-wide undergraduate research committees, and associate deans for undergraduate education.

Recommendation 2: The Provost should assign *overall oversight responsibility* for undergraduate research to the Dean of Undergraduates and charge him/her with the task of working with school deans and the Senate to create a well-resourced, high-quality institutional undergraduate-research program.

Schools

The Schools of Engineering and Science at Rice are quite strong both nationally and internationally – even more so once size is taken into account – and there is a high concentration of faculty in national academies. The professional schools at Rice are also doing quite well; Architecture and Music are top-ranked schools, and the Business School has improved dramatically over the past 15 years. The Schools of Humanities and Social Sciences contain some strong programs and outstanding faculty members within them, but they are distributed more widely and have fewer members in distinguished academies; their academic rankings tend to be lower as a result. A general weakness shared by the four academic schools is the presence of many small departments, which are often too small to achieve academic excellence; many of Rice's academic departments are significantly below the size of top-ranked departments. Yet there is little recognition at Rice of the weaknesses of schools and therefore not enough open discussion at Rice of strategic approaches to strengthening the schools.

Recommendation: The Provost and the School Deans, working with the Senate, should develop school-by-school strategic plans to strengthen the academic schools at Rice. The planning process must include the definition of school-specific benchmarks and metrics that address the issue of how to move departments to the next level. To this end, the planning process should include a discussion on the pros and cons of further investments in departments and schools, and the pros and cons of mergers and other types of restructuring between departments or between schools.

Research Infrastructure

Research infrastructure—including scientific instrumentation, high-end computers, laboratories, and the like—is critical to the research enterprise. Rice has successfully developed very solid infrastructure of scientific instrumentation and shared computing, facilitating excellence in many areas of science and engineering. Yet certain aspects of our research infrastructure could be more competitive with those of our peers. A previous benchmarking survey of Rice's research facilities could be referred to in order to improve infrastructure. Furthermore, much of the current infrastructure has been funded from external sources and is now approaching its end of life; a plan for updating this infrastructure is urgently needed. Speaking more generally, Rice would greatly benefit from developing a sustainable funding model for Rice's research infrastructure. The current effort to develop a sustainable funding model for research computing follows the recommendation of the Information Technology Task Force. Such efforts need to be expanded to the totality of Rice's research infrastructure.

Recommendation 1: The Provost should appoint a *Research Infrastructure Task Force* to conduct a survey of Rice's current research infrastructure and benchmark it against that of our peers. The Task Force should also study alternative sustainable funding models and propose a model that should be adopted by Rice.

Recommendation 2: The Vice Provost for Research should issue an annual report, which should include a report on the status of Rice's research infrastructure.

Administrative Infrastructure

Rice has developed, over time, its own set of processes for everything from hiring personnel to processing travel expenses, from providing on campus transportation to performing construction and renovation. Many of these processes are supported by administrative Information Technology (IT) systems. While there has been some significant recent progress in the Office of Institutional Research (which is housed in the financial side of Rice's administration, rather than its academic side), institutional data are still often hard to obtain due to both processes and systems. As a result, it is often extremely difficult to have informed, data-driven discussions on tradeoffs and priorities. From the faculty perspective, there are many cumbersome aspects to Rice's current business process and administrative IT systems, and staffing in the academic units is extremely lean and hobbled by inefficient business processes and systems.

The working group is heartened by Rice's recent greater focus on gathering and integrating institutional data. The cost of data inefficiencies may not be explicit, but they are high, both in terms of financial resources and staff time. Institutional data serve to improve administrative effectiveness in terms of understanding the nature

of and relationships between institutional processes, business processes, and faculty research and scholarship. All of this is crucial for Rice's ability to raise the bar in research and scholarship.

The Rice administration, advised by the Research Administration Advisory Group, has undertaken to streamline some of Rice's business process. This admittedly is a time-consuming effort because Rice's operations and business processes are so widely distributed across administrative and academic units. The recent comprehensive review of Rice IT operations undertaken by the IT Task Force is a welcome effort and example for other administrative operations. All business processes are interrelated, however, and therefore a comprehensive administrative review would ultimately increase overall institutional effectiveness and reduce costs. Our peer institutions have undertaken such efforts to improve its competitiveness.

Recommendation 1: An expert external comprehensive analysis of Rice's business processes, administrative systems, and administrative staffing is essential to improving the efficiency and effectiveness of Rice's ongoing business. This analysis should be followed by an implementation plan and subsequent periodic reviews.
Responsibility: President

Recommendation 2: Rice should develop a comprehensive data plan, covering both administrative and academic data. The Office of Institutional Research should dually report to both the Vice President for Finance and the Provost. The Vice Provost for IT should appoint a Chief Data Officer, to support the development and ongoing support of Rice's data plan.
Responsibility: President

Resources

Rice is often perceived to be a "rich, well-endowed" institution, but, in reality, is perpetually short on resources, and income from all sources is expected to continue to be stressed in the foreseeable future. Yet, over the past two decades Rice has been very successful at raising a significant level of gifts through its capital campaigns, and one would expect that future capital campaigns would be equally successful. In tandem with these campaigns, Rice also has a long-term extensive construction plan; much of it has been executed over the past decade and will continue to be executed over the next decade. Buildings are tangible—practically permanent— legacies that donors provide to Rice and that administrators proudly associate themselves with carrying out. All of this is important for growing Rice, yet we cannot ascribe to an "if you build it they will come" mentality when it comes to attracting and developing high-quality faculty. Nevertheless, unlike the construction plans, Rice does not appear to have a long-term legacy-building plan that involves future investment in academic units and programs.

In fact, in the current budget climate, requests for faculty enhancements are typically declined. A request of $10M may seem outlandish in view of current tight budgets, yet it may be perfectly sensible—and even a low number—in the context of a 10-year $1B capital campaign. In developing a long-term faculty-building plan, Rice might benefit from the experience of Stanford, which preceded its last capital campaign by a two-year-long need-assessment process, which involved fierce discussions of tradeoffs and priorities, of what should be done and what should not be done. Inevitably, discussions like this may be hampered by a zero-sum mentality, but we must transcend such mentality and look for complementarities and synergies between fields, whereby investments can benefit most if not all parties.

Recommendation 1: The Senate should appoint a group to work with the administration to develop an *inclusive process* of need assessment, based on best practices at peer institutions. The processes must be informed by the strategic plans developed by the schools.

Recommendation 2: The President should launch a need-assessment Task Force, led by the Provost, following the process developed by the Senate.

Shared Governance

There is a natural division of labor in a university. Faculty members carry out the activities that constitute the core mission of the university—teaching, research and scholarship, while the administration is responsible for the leadership of the university and the schools, as well as for business operations of the university and its stewardship. This division of labor is harmonized in the best universities via shared governance, where faculty input improves not only curriculum, research, and scholarship, but institutional administration and policy as well. Shared governance also means shared accountability: faculty members are accountable to the administration on their educational, scholarly, and research activities, and the administration is accountable to the faculty for the operation and stewardship of the university.

Faculty members participate in shared governance via service in various university working groups, committees, and the Senate. In principle, there is an expectation for all tenured faculty members to be involved to some extent in shared governance, yet in reality this task is carried out by a relatively small subset of tenured faculty members. Thus, Rice might consider incentives for senior faculty members to participate in shared governance.   These incentives would supplement the satisfaction of service and the ability and challenge of having a say in institutional matters. Service naturally takes time away from educational, research, and scholarly activities but is generally not emphasized as strongly in annual performance appraisals, meaning that participating in shared governance might be a disincentive

to faculty who are acting in the rational interest of their careers. This is regrettable, as the Working Group claims that taking Rice to the next level requires developing a culture of research and scholarship that reflects joint communications and efforts by the administration and the faculty. To this end, Rice sorely needs *more* faculty members to participate in shared governance.

Recommendation: The Senate should form a group (ad-hoc or standing committee) to study the incentive system for faculty participation in shared governance, survey best practices at peer institutions, and develop a plan for recognizing and rewarding shared-governance service at Rice.

Summary

By many measures, Rice has achieved the stature of a top-tier research university. Yet, as one reads through the previous sections, some common challenges emerge. Rice has a highly distributed culture, both academically and administratively. A redesigned culture would incorporate greater communication between administration, at all levels, and faculty, greater oversight of programs, greater accountability, and greater transparency, where appropriate. Incentives for organizational excellence need to be established, and penalties for weak performance need to be expected. Rice has grown over its 100-year history from a tiny institution to a research university with an annual budget of over $0.5B. As a result, its institutional structures need to grow more through proactive strategy development, and numerous aspects pertaining to structure and process on the administrative and academic side need to be evaluated and optimized.

In this current era of our growth, coupled with tight budgets and increased competitiveness with our peer institutions, Rice's future effectiveness is predicated on organizational structures that align accountability with authority, resources, and processes, and that define clear process for dealing with overlapping authorities, such as between the DGPS and schools deans. Even academic institutions, which traditionally grant faculty members a tremendous level of autonomy, will require some additional level of positive cultural support and active management to align institutional and individual goals.

At the same time, we must recognize that research and scholarship flourish best in an environment of intellectual autonomy and organizational flexibility; too much administration is just as risky as too little administration. Also, accountability carries with it an overhead cost, and it is possible to have too much accountability, as it is possible to have too little accountability. There is no magical formula for the perfect balance; continual organization experimentation is needed.

For Rice to enhance its research and scholarship in a significant way would require that deep aspirations must be accompanied by a well-executed comprehensive plan. The plan must be detailed rather than vague and long term rather than short term.

We must make Rice more effective by refining our organizations and processes. We must be realistic about our needs and resources, and we must focus on developing human and organizational capital. We can, indeed, have a second century of "no upper limit."