



V2C2

Vision for the Second Century, Second Decade

Rice University's Strategic Plan



VISION FOR THE SECOND CENTURY, SECOND DECADE (V2C2)

Rice University's Strategic Plan

The Vision for the Second Century, Second Decade (V2C2) builds upon the Vision for the Second Century (V2C) that was launched 12 years ago, taking account of our achievements, our evolving aspirations and needs, and a changing world. The V2C2 is intended to raise our achievement to an even greater level as we approach the second decade of our second century. The V2C2 sets forth seven broad goals, each consisting of a number of more specific aims that will enable us to achieve those goals.

We elaborate in this supporting document the seven goals of the V2C2 and provide greater detail and background on those aspirations and the specific elements they contain. Comments and suggestions from all parts of our community — faculty, students, staff, alumni and others — helped shaped both the V2C2 and this supporting document. The final text very much reflects the range of thoughtful feedback and ideas we received in response to our circulation of framing questions in February 2017 and a draft of the V2C2 in October, as well as numerous meetings and presentations in late 2016 and throughout 2017.

Rice University opened in fall 1912, and thus the second decade of our second century stretches from 2022 until 2032. The V2C2 should guide our priorities at least to the middle of that decade, and thus for approximately the next 10 years. What are the measures that we can take that will position us to be more successful and more competitive as a university in each of our missions — teaching, research and service — over the next decade?

At the same time, however, we recognize that we are in a rapidly changing world, and if anything, that rate of change may accelerate. This requires that we anticipate and take account of those changes as best we can, and that we be prepared to constantly adapt as changes unfold.

These potential changes affect almost every aspect of our enterprise. Knowledge regarding educational effectiveness is being pursued as never before and changing the way we think about teaching and curricula. Technology is disrupting the way education is delivered and assessed. The financial streams that support higher education are under pressure: tuition discount rates might rapidly increase to make education more affordable to a wider range of students; governmental support of research may decrease; and endowment returns might turn out to be even less reliable than they are now. Competition in both the research and education spheres is increasingly global. An increasing number of universities are no longer confined to one physical place, or indeed to any physical place at all.

As we contemplate our strategies and need to adapt, we seek not only to be aware of these changes, but to be leaders in anticipating them and evolving our strategies for success. Elements of this plan seek to do exactly that, or at least explore new strategies in contemplation of these changes, while also aiming to preserve the distinctive aspects of Rice that will continue to serve us well. But if we are to be truly successful in the long run, we must foster not only the conversations about the next decade, but also creative and visionary conversations that might help us anticipate the university of the mid-21st century as we then approach our 150th anniversary. To that end, Rice will consciously support such conversations as part of implementing the V2C2. And we will regularly review our goals and assess our progress.

In addition to educating and advancing knowledge in fulfillment of our mission, we must recognize the increasing importance of communicating about what we do as a university, and what universities do collectively, to contribute to our city, our nation and our world. It is undeniable that the position of institutions of higher education has declined among the public and among many of our political leaders. A dangerous skepticism about the value of scientific research and the role of universities in objectively pursuing knowledge has arisen. We cannot rely on others to communicate and explain the value of our endeavors and contributions, but must pursue that task as part of our responsibility.

Provide Transformative Undergraduate Education.

Through exceptional teaching, faculty mentoring and experiential opportunities, we will produce graduates who have the broad intellectual and international perspectives, critical thinking capabilities and creative problem-solving skills to be leaders and contributors to our world.

Rice University has, throughout its history, been recognized for and even identified by the excellence of its undergraduate educational programs. For example, Rice was recently ranked third among national research universities for “commitment to undergraduate teaching.” National research presented in the Gallup-Purdue Index study of 60,000 recent college graduates confirmed that students were twice as likely to view their college experience as worth the cost if they had supportive relationships with professors and mentors. The study also confirmed the importance and desirability of experiential learning opportunities ranging from internships related to their field of study, active involvement in extracurricular activities or completion of a project that took a semester or more.

More than at any time in history, the best undergraduate education demands much more than excellent classroom education, although that remains a fundamental element. In discussions and surveys leading to the creation of the strategic plan, our faculty have clearly voiced their desire for strengthening our commitment to teaching and advising with increased engagement of students and faculty in the classroom, in the residential colleges, in research and scholarship, and in experiential learning. Student surveys have reported that over 80 percent of seniors graduating in 2016 were satisfied with the intellectual excitement, quality of instruction and availability of faculty at Rice. However, the Student Association’s 2017 Teaching Study reported that only about 55 percent of students interact more than once a month with faculty outside of the classroom. The 2017 Student Association 100 Ideas (SA 100 Ideas) initiative generated several suggestions that involved enhancing faculty-student engagement.

Given the widespread enthusiasm for these priorities, Rice can position itself to be the preeminent research university that provides the very best undergraduate education and preparation for leadership and impact. Our

shared values in this regard enable our recruitment of extraordinary faculty and staff to implement this vision. We must sustain the excellence of the classroom and curricular experience and strengthen faculty-student interaction across a range of educational contexts. A broad-based education that fosters the development of critical thinking lies at the foundation of our undergraduate educational mission. Rice has been recognized as providing both outstanding liberal arts education and strong professional education in areas such as engineering, architecture and music. The richness of the Rice experience draws strongly on both traditions.

Providing the very best in classroom teaching is therefore vital. We must continue to implement evidence-based innovations in teaching and learning and support teaching improvement. The Center for Teaching Excellence, which is led by extraordinary faculty fellows representing the entire campus and by a talented professional staff, has been impactful to this end. Rice students are increasingly interested in different ways of accessing information, in new ways of interacting with faculty and in new approaches to assessing their learning. Some of these approaches will make use of Rice’s strengths in digital education resources and methods. Some will focus on the development of core skills, as is the case with our successful Program for Written, Oral and Visual Communication. Some will arise from strengthening older techniques enhanced by greater understanding through faculty-led research. And some of these approaches will arise from rethinking curricular offerings to respond to emerging student interests for new and interdisciplinary courses and majors. We need to encourage and recognize faculty who are driven to excel as teachers and educational innovators.

Rice has excelled at providing the highest quality faculty-mentored research, scholarship, creative endeavors and team-based projects. With appropriate support, many more opportunities could be created. Various academic areas would like to see an expansion of the “kitchen” environment, as pioneered by the hugely successful Oshman Engineering Design Kitchen, where students learn by creating, experimenting and implementing. Among the suggestions put forth under the SA 100 Ideas initiative was a summer research grant for which students submit a research proposal. If the proposal is

accepted, the grant would provide the student with a faculty mentor and a stipend to support living expenses. In addition, within the past year, faculty members and students worked together to strengthen inquiry-based learning opportunities, focusing on those elements of the undergraduate experience that faculty and students find most valuable. The research grant and advancements in inquiry-based learning are time-intensive efforts for both faculty and students, and we must enable them to make such engagements a priority.

Rice has also become a national leader in creating and publishing online courses and digital education resources. A survey of our students indicated that they expect such technologies to be used as part of their campus experience. Utilization of such resources can enhance learning and deepen student-faculty interactions in the classroom and in other campus environments.

Rice's small size and residential college system give faculty a unique role in mentoring, academic advising and helping connect students to resources on and off campus. Approximately one-third of the faculty serve as college associates. In addition, college magisters support students within the colleges and promote the involvement of all faculty in residential student life. Students value this involvement highly, and have expressed interest in increasing informal engagements with faculty. The SA 100 Ideas includes recommendations to foster organic connections that often happen over a casual lunch, sporting event or through discussions in connection with outside scholarly events.

International study and research experiences will be increased, especially those with faculty participation. The internationalization of the student experience is achieved by incorporating more international components in our curriculum, including travel experiences such as in-country language programs, summer Rice programs and travel embedded in course studies. It is also reflected in the internationalization of our student body, where we have made great progress and must continue to do so. International experiences — whether in formal study abroad programs, research collaborations, service outreach or internships — enrich multicultural and multinational understanding and prepare our students for work and service in a global economy. Rice is situated in Houston, a highly international city and a city that is culturally

and logistically a gateway to Central and South America. Rice is thus very well positioned to be a leader in affording our students outstanding international experiences. However, to involve more students, we must provide a wider range of possibilities for such participation, lower curricular and other barriers, and assure all students access to international experiences, regardless of their financial resources.

Learning through real-world problem-solving, leadership experience, entrepreneurial opportunities, communication training, internships, mentoring and preparation for graduate education must play an increasing role in the education of our undergraduates. Experiential and professional development opportunities have expanded tremendously over the past 10 years. The Center for Civic Leadership was established to teach our students how to understand local cultural context and then equip them with the skills to have an impact on communities. We strengthened our commitment to career planning through the Center for Career Development, launched the Sallyportal to connect Rice students and alumni, and created the Owl Edge Externship program to use those connections and give our students career experiences. The Doerr Institute for New Leaders, the Rice Center for Engineering Leadership, Rice 360°, the Baker Institute for Public Policy's Jesse Jones internship program, the School of Social Sciences' Gateway program and the School of Humanities' HEDGE program all provide unique opportunities for self-development, real-world experience and professional development.

We must also play a role in fostering a culture of entrepreneurship and innovation among our students and provide related educational and experiential opportunities. We launched the Liu Idea Lab for Innovation and Entrepreneurship and the student-driven OwlSpark, which give students an early opportunity to transform ideas into practice and learn from that process. All of these efforts provide a foundation on which to build and assure that our graduates emerge with the leadership skills they will need to succeed. We will achieve the greatest success when learning from such activities is integrated with the classroom experience.

Our employer partners tell us that the most valuable attributes in new employees are communication skills and the ability to solve problems while working in teams.

Rice is committed to integrating these experiences in all phases of the undergraduate experience. With Houston's strong economy and significant alumni base, Rice is well-positioned to create many opportunities through practicum, community-based research projects, internships and externships. Such opportunities can also serve to develop a strong sense of civic responsibility in our students. Faculty and staff in programs such as Academic Advising and the Center for Career Development, along with members of our graduate student, alumni and parent communities, serve as advisers and mentors to assist students with understanding their options and building meaningful experiences.

The inculcation of leadership and team-building skills occurs in a wide range of contexts on our campus, including through such activities as intercollegiate athletics, intramural sports, community volunteering, and participation in student organizations and college governance. These remain an important part of the student experience that must be nourished and, where possible, integrated with formalized learning opportunities.

Our curriculum would benefit from greater flexibility that allows students to pursue the kinds of experiences and breadth of educational opportunities that we have been developing and that we envision. The strict and heavy requirements for certain majors, competition schedules of our athletes and performance demands on our music students often limit students' ability to engage in the many educational opportunities available to them. Another possibility could include reorganizing the academic calendar to provide for short-term courses for credit. Equally important, we must be cognizant of and address the potential impact on student workloads and mental and physical well-being as they engage in a wider range of educational opportunities. We must assure that any student who wishes to have a high-impact experience has the information about the availability of such opportunities and the financial resources to participate. As our curriculum, research opportunities, cocurricular and extracurricular programs become more robust, the need is even greater for academic advising and for faculty guidance as students navigate the complex choices they face during their time at Rice.

We must implement a new vision of our Central Quad and provide the spaces that support a more engaged and collaborative educational environment. Our campus has been a vital resource in bringing students and faculty together to collaborate and create. Recent examples of new spaces that help transform educational opportunity have been the Oshman Engineering Design Kitchen and the Moody Center for the Arts. The planned Music and Performing Arts Center (RUMPAC) will greatly enhance our music program, provide a new performance space for theater and provide a venue for Rice to host major speakers of national and global importance. We have and will continue to invest in the renovation of our colleges and in our teaching and research facilities. Although the percentage of undergraduate students housed on our campus increased as part of the expansion of the undergraduate student body, we should aim to increase that percentage to at least 80 percent as we renovate and slightly expand some of the existing residential colleges. Rice students have a special connection with our campus, and it is important to maintain its beauty and vitality as well as its functionality. Enhancements to several athletic facilities have created more dynamic spaces for our athletes and fans.

The addition of the Brochstein Pavilion and the Gibbs Recreation Center, located diagonally across from the Rice Memorial Center, as well as modest renovations of Fondren Library and the RMC, have strongly supported the vision of the Central Quad as the academic hub and focal point of the university. Yet it is clear that we need to do more to create the kinds of spaces that support student and faculty interaction and vitality. We now envision "Central Quad 4.0," encompassing a substantial renovation of Fondren Library and the RMC, including the addition of a multicultural center, and ultimately a new flexible classroom building to include vibrant spaces for education, reflection, collaboration and creativity. Such spaces, when flexibly and well designed, can play an important role in fostering the education and experiences that develop the collaboration, leadership and innovation skills vital to success.

Build Nationally and Internationally Renowned Graduate Programs.

We will be a premier choice for the most promising graduate students and empower success in their chosen careers by providing outstanding faculty, the best educational programs, extraordinary research opportunities, effective mentoring and a vibrant graduate community.

Graduate students have steadily made up a greater portion of our community and now constitute approximately 43 percent of our student body. While Rice has a number of truly extraordinary graduate programs, overall our graduate programs have not consistently achieved a quality and reputation at the level of our undergraduate programs. Over the next 10 years, we must make substantial progress in raising the success and profile of our graduate programs and scholars.

Outstanding graduate programs are essential to our broader success and reputation as a research university. Strong graduate programs play a critical role in driving the intellectual vigor of the university and bringing to fruition the ideas, insights and expertise of our faculty. World-class graduate students support scholarship, enhance research and mentoring opportunities for undergraduates and are often a vital component of securing research grants. Graduate program alumni play important roles in the global community, serve as mentors to both undergraduate and graduate students, and enhance Rice's reputation.

The very best graduate programs are built on the best research opportunities, a vibrant community of distinguished faculty, outstanding postdoctoral scholars, state-of-the-art research infrastructure and facilities, and a strong intellectual and social community among graduate students. A core strength of Rice graduate programs is the productivity generated by individual mentoring, coupled with a focus on the success and wellbeing of each scholar.

We must strategically invest in those graduate programs that can achieve international preeminence with a goal of having significantly more programs in the very top echelon. Our initial goal is to have five graduate programs ranked in the top 10 in the country, and 12 in the top 20. Our exceptionally strong graduate programs in

music, architecture, electrical and computer engineering, and bioengineering exemplify how Rice can build and sustain internationally preeminent graduate programs. The Jones School of Business has seen a rapid rise in its reputation over the last 15 years, demonstrating how programmatic improvement is driven by faculty vision and ambition, strategic leadership and achievement. We must invest in graduate programs largely by retaining and recruiting outstanding faculty and supporting their efforts to move a program into the highest echelon. While new investments must be focused and strategic, every department should develop and pursue a strategy to increase the visibility and reputation of its graduate programs.

We should make strategic choices in creating new graduate programs, especially those that leverage interdisciplinary strengths. The faculty should consider developing doctoral and master's programs in newly strengthened departments and emerging interdisciplinary areas. Rice has a track record of quickly making a strong impact with new programs. For example, our doctoral program in sociology was implemented in 2011 with the help of the Houston Endowment. All of the first three sociology doctorates took tenure-track positions at research institutions. Art history's first matriculants, supported by the Brown Foundation, are already making their mark, with three initial placements (academic and curatorial) and four top external fellowships. The new program in systems, synthetic and physical biology is already generating a steady stream of NSF fellowships. The new Master of Global Affairs and Master of Energy Economics programs are placing graduates in influential positions in both local and global communities.

Graduate education is becoming increasingly varied, and not all graduate education takes place on a physical campus or results in a degree. Further development of graduate certificate programs would substantially strengthen our ability to provide the most outstanding advanced education. For example, our professional master's programs have promoted substantial relationships with industry, and we would gain additional reach into the community by admitting students into transcribed graduate certificate programs. Such programs would establish a much stronger relationship with private enterprise and would potentially enable us to offer these programs and others at lower cost to current Rice students and alumni. Some of the new master's and certificate programs

should take advantage of online or blended education approaches. This is addressed in the Extending Rice's Reach and Impact section.

We must recruit the highest caliber graduate students. We must increase the number and quality of applicants to many of our graduate programs, improve the selectivity of admissions decisions and increase our yield. Applications to doctoral programs have grown by roughly 15 percent over the last seven years. We must be more aggressive in proactively recruiting applicants (as we are at the undergraduate level) nationally and internationally. We should significantly increase doctoral enrollment by focusing on those departments positioned to attract high caliber students and funding. While some expansion of our graduate programs is desirable, we should focus on quality and aim to double the number of new doctoral students who win major national and international awards.

Each department or program must have a recruitment outreach plan that is designed to reach as many high caliber prospective applicants and their academic advisers as possible. While many of our graduate programs already have such plans, all should become as selective as our undergraduate programs. We should review an assemblage of quantitative and qualitative admissions metrics to assess improvement and compare our success with peer institutions. Doctoral programs that cannot be put on a path to competitive excellence (measured by both recruitment and outcome criteria) should be discontinued and the resources used to build other, more focused or interdisciplinary strengths in graduate education.

Growth in quality can best be achieved by assuring we build pipelines of applicants and recruit excellent students effectively from all segments of the population to engage a student body that reflects a breadth of experiences, expertise and perspective. This is addressed further in the goal Expand Access, Diversity and Inclusiveness. We must also tap into the strength of our undergraduate population to enhance our graduate programs. Historically, some of our most outstanding graduate students have been Rice undergraduates. We should facilitate bachelor's/master's degree combinations for our undergraduates. Many Rice undergraduates would prefer a master's degree over a second major, and we should make earning these more achievable. Distinguished pro-

grams that include this component have the potential to enhance both graduate and undergraduate recruitment. We must also expand our outreach in recruiting and developing international scholars. Our location in Houston provides unique opportunities, and we must continue to build upon our strong and productive interactions with the global community. We have been extremely successful in recruiting graduate students from Asia. Both our city's cultural makeup and our position as a gateway to Latin America are compelling reasons to focus on our southern neighbors. We must undertake systematic and proactive approaches to building relationships with governments, universities and private enterprise in Mexico and Central and South America to become a magnet for students from those areas who seek opportunities for graduate study. Dual degree programs, such as the history department's with a university in Brazil and another in Mexico, may be one means. We must seek appropriate supplemental sources of funding for recruiting graduate students from these areas.

We must provide competitive stipends. Competition for the best graduate students is intense, and financial support plays an important role. Rice has sought to provide stipend levels that are competitive with those offered by our peers and must continue to do so by raising new money, developing income-earning degree programs, reallocating within departments or schools, or offering larger stipends to fewer students. We must fund more named scholarships and first-year fellowship bonuses. We must continue to ensure that graduate students have access to appropriate funds to support their research, including support for professional conference attendance and travel for research.

We must provide the professional development opportunities to enable graduate students to achieve their goals. We must support areas of professional development, including opportunities for teaching, developing communication skills, exposure to professional settings, professional networking and career development along with mentoring from faculty, staff and Rice alumni. A key measure of success is how well departments succeed at placing graduates in the career path to which they aspire. We must prepare graduates who are able to excel and compete nationally and internationally in academia, private enterprise, government and public service.

We must invest in programs and facilities that build social cohesion among our graduate students and assure them an unrivaled experience as a vital part of the Rice community. Graduate students, like all students, thrive best in environments with a strong sense of community. Increasingly, graduate student applicants seek that sense of community and engagement in addition to the quality of their research opportunities. This requires appropriate physical facilities. The outdoor space near Keck Hall and Valhalla, for example, has had enormous impact. Even the small graduate student lounge has been well-received. A critical element of “Central Quad 4.0” (renovation of the library and student center discussed above) must be the expansion of facilities devoted to fostering the graduate student community.

Many of our students who chose us over top-five ranked programs say they did so because our students undertake great scholarship while having unusually positive relationships with the faculty and enjoying the benefits of being part of a university. We should consider developing a graduate college and enhance student life in our existing graduate housing. A graduate college would be a focal point for social interactions, professional networking and development, dining with fellow graduate students and faculty, and housing for a modest number of graduate students. The scale would be similar to that of one of our undergraduate colleges. We can gain substantially by emulating approaches that have proven to be successful with our undergraduates, while attending to the different time obligations and stage of life of our graduate student population.

Invest in Faculty to Achieve Preeminence.

We will foster faculty innovation and accomplishment in education, research and artistic endeavors, and make additional investments in targeted areas to reach the highest levels of achievement and recognition.

The contributions and reputation of universities are built primarily on the quality of their faculty. Rice demands that its faculty achieve excellence in research and teaching, as both endeavors are vital to our mission and strengthen almost every aspect of the university, from raising Rice’s national and international research profile to assuring that Rice is a leader in quality graduate and undergraduate education.

Rice’s scale helps foster collegial and collaborative research and teaching environments, allowing us to attract the best faculty who seek collaborators in and outside their disciplines. At the same time, our scale requires us to be strategic in making choices for faculty investments. We must be attentive to both our teaching needs and our research strengths and strategies. Sometimes a strategy requires a focus on particular departments, sometimes on more focused endeavors within a department, and sometimes on interdisciplinary endeavors that build on synergistic strengths across departments.

For example, while many music schools include orchestral training, jazz, theater, opera, classical dance, modern dance, chamber music, voice, acting and more, the Shepherd School has maintained a focus on orchestral training, chamber music and opera. As a result, we now have a top-ranked (perhaps the best) orchestral training program in the country. We are well on our way to achieving the same in opera and chamber music.

Similarly, our highly ranked electrical and computer engineering department has strategically focused on data science, nanophotonics, systems (such as wireless networks and the internet of things), neuroengineering and, most recently, scalable health. Its excellent ranking results from its preeminence in these areas. Physics has built its reputation in significant part on AMO (atomic, molecular and optical) and condensed matter. In all these and other cases, we could not have achieved this level of accomplishment and recognition for the department had we chosen

to pursue a faculty member or two in every possible area. A number of departments, in every school, have made similar focused choices that have raised their impact and profile, and with that the reputation and success of the respective school and the university.

Materials/nanotechnology is an example of creating a long-term research and scholarly environment that has positioned Rice to attract and retain top faculty who not only undertake cutting-edge research, but also provide superior teaching in the classroom and labs. Our early successes depended on both high-performing faculty and the right equipment and facilities. Our initial and continuing investment has resulted in some \$230 million in extramural funding in the past 20 years. Our current materials/nanotechnology faculty are among the very best in the world, and their work substantially raises Rice's institutional profile. Our recent molecular nanotechnology initiative infuses additional investment to ensure our prominence, as does our decision to construct a new state-of-the-art clean room. In building our faculty, we must also pay close attention to where our teaching needs are, especially as student choices evolve over time. Most recently, as at other universities we have seen a rapid rise in the demand for engineering in particular. An outstanding faculty across the disciplines is an investment in our core mission that provides a consistent return to the university, as these scholars and researchers position Rice to handle future research and educational challenges and goals. The best faculty quickly recognize and adapt to changes going on in their fields, in interdisciplinary connections and in higher education more broadly.

We must identify areas where we can build on our strengths to develop internationally ranked disciplines and programs. In selecting areas for strategic priorities, we need to emphasize targeted investments where we have a strong enough base to become a true international leader. Such investments may be at the interdisciplinary, disciplinary or subdisciplinary specialty level. Because of our small size, we are more likely to achieve large impact in interdisciplinary areas. Thus, we must develop strategies that build interdisciplinary efforts that will also enhance departmental achievement and reputation.

The universitywide Data Science Initiative represents a recent example of making a strategic choice and then

investing. The initiative couples our historic strengths in quantitative approaches (computer science, electrical and computer engineering, statistics, and computational and applied mathematics) with our universitywide interests in applied analysis. With multiple recent new hires in key areas, and more than 150 current faculty participating at some level in data science activities, the campus is becoming a vibrant home and attractor for those wishing to immerse themselves in a stimulating data science environment. Parallel investment in information technology infrastructure has been critical to our successes. We have the potential, with some additional investment in faculty and facilities (particularly in the core departments listed above), to break through as a true national leader in data science. Exciting new programs in the School of Social Sciences and the Kinder Institute position Rice to be a leader in data driven policy analysis.

In the area of disparities research, we have made parallel investments in multiple departments and thereby created venues for collaboration. These investments include: the new sociology graduate program, as well as recent hires in the department focused on disparities research and teaching; the Kinder Institute, along with the expanded research agenda of faculty associated with the institute; support of key initiatives in racial and gender disparities in the School of Humanities; and a cohort of Rice Academy of Postdoctoral Fellows focused on disparities. We are especially well-situated to achieve preeminence in disparities research related to education, housing and health.

Similarly, our recruitment and research success in building the Rice Center for Theoretical Biological Physics has positioned that endeavor to be a world leader. Simultaneously, the return on a significant augmentation is likely high in the environment (more broadly: earth, sustainability, environment and energy), the intersection of engineering and medicine, systems and synthetic biology, materials, aspects of global health and the future of cities. We are also developing a strong presence in new learning technologies and data-driven assessments of learning. All of these interdisciplinary areas take advantage of our Houston location and enhance our ability to contribute to our home city. Within these areas we will need to find a focus that enables us to create programs of distinctive excellence. For example, neuroengineering and global health are poised at Rice to build strongly at the intersection of medicine and engineering.

Several areas that are more disciplinary appear ripe for targeted investments. These include, for example, philosophy and mathematics.

We should use regular departmental and school external review processes to gather input and information that can inform our strategies and priorities as we assess our strengths and weaknesses. Such reviews can also be an important opportunity to communicate our excellence to our academic peers. As we seek major emergent collaborative trends, we must also continue to support the research and creative work by individual faculty members that is more typical of the humanities and fine arts.

We must make targeted cluster and individual hires to support strategic programmatic leaps. We must recruit and support high-impact senior faculty, retain our most accomplished faculty, and consistently nurture the growth and development of our rising star assistant and associate professors. Such faculty, especially when fully engaged in the university, contribute disproportionately to our research success and broader recognition. They can enable the recruitment of remarkable clusters at both the junior and senior level and draw both graduate and undergraduate students. Often, they are uniquely positioned to build intellectual bridges and teams across disciplines. These faculty and the teams they build are most likely to produce the research breakthroughs that are recognized around the world. These thought leaders can significantly extend the reach and impact of Rice and push the university to innovations in research and teaching. Such appointments can usually be made only when we are adding to existing strength or hiring a faculty cluster and can assure the very best in colleagues, research facilities and equipment.

We must ensure a continued and deepened collaborative environment within the university and with external partners. Given our comparatively small size and optimally situated urban location, collaboration is an opportunity and a necessity. Fundamental research in the pursuit of knowledge is central to the distinct role of a university. Rice has the potential for local, national and global impact in pure, applied and translational research. We have a long history of working successfully within and across disciplines as well as collaborating externally with local industry and institutions, such as those in the medical center and museum district. A collegial and collaborative

environment, internally and externally, is critical for nanoscientists seeking to develop dynamic new materials, political scientists working to understand election trends, or art historians and anthropologists analyzing the impact of the destruction of the Palmyra site. Rice's already low barriers to collaboration are a strength, but we must work to further reduce those barriers to facilitate great discoveries at the interface of different disciplines. We must review current practices, such as promotion and tenure and resource allocation, to evaluate how best to align these practices with the goal of supporting collaboration and excellence. Where appropriate, we should foster faculty-sharing arrangements with other academic institutions, as such faculty members can help build deeper collaborations.

We must make Rice a destination for scholars and thought leaders from around the world. Even with an outstanding faculty and the underlying support resources they require, Rice will benefit substantially from having agile platforms to engage scholars nationally and internationally. Thus, part of the infrastructure we need to provide is administrative support and venues for conferences and collaborations that make us a destination for and convener of distinguished scholars from around the world. In all significant campus construction projects, we must consider opportunities to create the facilities that support this goal.

Attracting the best faculty cannot be done in isolation from other goals. Our ability to recruit depends on many of the goals discussed elsewhere in this document. We must assure the very best in research support, facilities and equipment. We must provide the resources and training that allow our faculty to contribute to a world-class educational experience for both undergraduate and graduate students. We must attract the very best graduate and undergraduate students. We must build and maintain a faculty that is diverse in background, experience and thought. We must provide an environment, including facilities that fosters interactions among faculty and students and creates a strong sense of community. Retaining outstanding faculty members, developing and promoting our stellar early- to midcareer faculty and hiring truly exceptional faculty will accelerate funding and achievement in research, enhance educational opportunities for our students and generally contribute to the rising reputation of the university.

Expand Access, Diversity and Inclusiveness.

We will provide the programs and financial support that attract and enable the success of outstanding graduate and undergraduate students from all backgrounds, and we will build diversity in all aspects among our faculty and staff.

Our commitment to the goal of building a diverse community in all parts of the university reflects our fundamental “ideals of human equality and potential, of political rights and participation, of free inquiry and free expression, of religious freedom and tolerance, of diversity and inclusion, of creativity and innovation, and of the possibilities of hard work and economic opportunity.” We treat all members of the Rice community — of every race, nationality, religion, ethnicity, gender identity, sexuality and ability — with respect and appreciation. This includes those with whom we have deep disagreements, recognizing that freedom of inquiry and expression are the foundation of our enterprise. Problems are better solved and innovations are more creative when we infuse the learning and research environment with scholars, students and staff who represent a wide range of life experiences and perspectives across all disciplines.

The impact of our efforts to attract a greater breadth of applicants is demonstrated in our latest entering class, in which approximately 19 percent of the domestic students self-identified as Hispanic and 10 percent self-identified as African-American. The progress has been in socioeconomic backgrounds as well as in ethnic and racial categories, which creates an environment that enriches interactions, conversations and the opportunities to learn from one another. Although the numbers fluctuate significantly, we are enrolling substantially more low-income students than we did previously. Our success is also reflected in our multiyear No. 1 ranking by the Princeton Review for interaction among students from different ethnic, racial and socioeconomic backgrounds. Demographic trends impact the applicant pool. The population of high school college applicants will remain relatively flat over the next 10 years and a larger portion of the population of high-potential college-age students will come from low-income families, including many who are underrepresented minorities. Currently available data suggest that there is a significant “undermatching” of high-achieving low income (HALI) students with the best undergraduate colleges and university programs. We

also need to do more to reach out to middle-class students. We must continue the policies we have adopted to welcome and support the enrollment of DACA, refugee and other immigrant students. In addition, we must make sure that all students feel welcome, both as individuals and as members of our communities.

Although we have met with some success in diversifying both the faculty and the graduate student body, it is much more limited, and that constrains our success for the academic experience. To come closer to our ideals, we must take a number of actions that will enhance student, faculty and staff recruitment and sustain an environment that maximizes opportunity and supports the inclusion and success of all.

We must enhance our recruitment of high achieving undergraduate and graduate students from under-resourced and middle class backgrounds and provide programs that allow all students to thrive at Rice, including access to the full range of Rice experiences. Effective recruitment of the most outstanding students from low resource and middle-income backgrounds requires strong outreach and engagement efforts. Such students also often need demanding learning opportunities to supplement what may be available in their high schools. We should therefore consider creating precollege, short-term residential summer programs that position Rice to engage with high-potential students earlier in their exploration process. We should build upon our relationships with college counselors and community leaders that can be connectors to high-potential students, with a focused effort toward HALI students, who include many underrepresented minority students. We have dramatically expanded our partnership with QuestBridge, a national program that seeks to match talented students from lower income families with selective universities, to become one of its larger users, and we should maintain that engagement. We should also establish stronger recruitment programs of the very best students from community colleges, especially in Houston. The goal of this extensive outreach is to support our tradition of making the Rice education available to a broad population of highly talented students regardless of their economic status.

We must recognize that lower income students at the undergraduate level, despite their talent, do not all come to Rice with the same level of academic experience and

awareness of practices necessary to succeed in a highly challenging academic environment as many of their peers. We must provide the transitions that enable such success. For example, our undergraduate Rice Emerging Scholars Program has been successful at helping prepare these students for study in STEM fields, and that program should be both increased and broadened. We must assure that our advising and mentoring programs are designed to support all of our lower income students.

Unlike undergraduate admissions, graduate admissions take place in individual departments and schools. Nevertheless, we must implement universitywide practices that will improve our identification and recruitment of promising graduate students and build a pipeline for such students from the time they are undergraduates. We have, for example, had success with the Mellon Mays program. Programs to bring undergraduates from a variety of backgrounds to Rice for summer research are essential. We should assure that our growing professional master's programs also include opportunities for suitable candidates who may not have the resources at the outset to pay tuition. Mentorship is especially important for our graduate students from under-resourced backgrounds. Like their undergraduate colleagues, many may have been a first-generation college student — but most are first generation graduate students. Because lessons for success at the undergraduate level are not the same or sufficient at the graduate level, we must work to ensure appropriate programs are in place for this next stage of development in the lives of our graduate students. Our goal is for students to attain a degree and a sense that they have achieved the ambitions that drove their decision to attend Rice.

We must assure affordability by implementing financial aid policies that successfully attract students from low- and middle-income families. Over the last decade, we have greatly enhanced our financial aid along many dimensions, growing such aid for undergraduates from \$23.6 million to \$71.1 million, and eliminating borrowing requirements for families earning less than \$80,000. This increase reflects the growth in enrollment, increased cost of attendance and greater student need. Rice now funds financial aid from the operating budget, endowment and government funds. The increasing costs of higher education, constraints on raising the price of tuition, reductions in governmental support and volatility in market

returns on the endowment all create an environment of financial risk, particularly with a larger population of financial aid students and perhaps ones with higher average need. We must also more robustly address the needs of students from middle-class families, who are increasingly finding themselves priced out of the best in private higher education. To accomplish these goals, we must increase the percentage of support from dedicated endowed funding from the current 38 percent to 50 percent, which is more in line with our most competitive peers. This will require raising approximately \$200 million in financial aid endowments.

Meeting a student's financial need should include funding or other mechanisms to assure that low- and middle-income students can participate fully in opportunities for research, internships, and experiential, international and cocurricular learning experiences. No curricular or cocurricular enrichment opportunities should be offered at Rice without provision for participation by students from low- and middle-income backgrounds. We should consider creating a "student opportunity" fund and program that would support one such distinctive opportunity for every student, based in part on their needs. While not delivered through the same financial aid system, this issue is relevant as well for graduate students, who may require additional support to, among other things, attend conferences, do archival research, take off campus, intensive short courses or spend time as a visitor in a laboratory to learn techniques at another university.

We must undertake actions to draw international students from a wider range of countries and backgrounds around the world. Over the last decade, the percentage of international students in the undergraduate student body has grown from approximately 3 percent to 11 percent, and from a total enrollment of about 80 students to over 400. International students have greatly enriched the experience for all students as well as for faculty and staff. However, because of the very limited amount of financial aid for international students, we have been heavily dependent on a few countries for those students, and the vast majority (other than athletes and music students) come from families who are able to provide or borrow the funds for tuition and other costs. We need to strategically identify countries where we can successfully increase recruitment and invest in those relationships.

We should also identify increased targeted funding for graduate students. For example, we systematically pursued an agreement with CONACYT, Mexico's equivalent of the National Science Foundation. This relationship has resulted in an influx of highly qualified graduate students from Mexico, all funded by the Mexican government. We are undertaking parallel initiatives with several other countries. We must make it a priority to compete effectively for Fulbright Scholars. Programs to bring star international undergrads to Rice for coursework or research have been very effective, and we should aggressively expand these to build relationships with future graduate students.

Ideally, we would want to assure financial aid on the same basis as for domestic students, but that is unlikely to be possible in the short run. Instead, we should aim to provide approximately \$4 million per year in such aid, funded largely by endowments raised for this purpose.

We must accelerate progress in building a diverse faculty and work to retain and advance the careers of faculty and academic leaders. In the past two years, our emphasis on faculty hiring has been on training search committees to review all candidates absent any implicit bias. We have also built advertising strategies, outreach efforts and pipeline tools that help schools, departments and search committees proactively reach out to diverse candidates and provided opportunities for these candidates to meet with our current faculty who can provide relevant perspective on Rice and Houston. We must continue our ongoing efforts and implement additional approaches to help departments identify high-potential faculty. We should consider, among other things, establishing a visiting scholars program; hosting conferences for NSF Graduate Research Fellows, Beinecke Scholars, Mellon-Mays Scholars and others; proactively soliciting a range of scholars to participate in university seminar series and other intellectual activities on campus; networking with faculty colleagues across the country to identify early, promising graduate and postdoctoral students; and tracking our own Rice alumni who have pursued doctorates.

We must continue to create an inclusive environment by achieving diversity in our staff and creating the programs and facilities that foster interaction and build understanding within our diverse Rice community. Students seek out role models, and our staff members make substantial contributions in this arena, directly and indirectly, and to the success of our inclusive environment. Although broadly our staff is extremely diverse, it is uneven across divisions and functions. We can also help foster an inclusive environment by building strong relationships with the affinity groups among our alumni and making sure our students and others have interactions with them.

Within the Rice community one will find a wide range of views and perspectives. We must embrace and encourage the robust and respectful exchange of ideas, and fully honor the freedom of expression and inquiry that are the foundation of the academic enterprise. Our diversity must not be merely a statistical achievement, but an opportunity for engagement, learning and collaboration.

Elevate Research Achievement and Reputation.

We will elevate our research accomplishment to the highest level to advance human knowledge and creativity, and make vital contributions to the betterment of our world.

Since its founding, Rice was envisioned as a great research institution with no upper limit to its educational endeavor. Research and scholarly achievement at the highest level underlie Rice's strong academic reputation. Raising our research achievement will provide greater educational opportunities for all of our students, both graduate and undergraduate. The university research mission thrives when curiosity and intellectual passion are fueled by strong interactions among faculty, staff, graduate and undergraduate students and partners in Houston and beyond. Excellence in research also is the essential conduit for collaborative work with the community, government, industry and other universities. It is the foundation of our international partnerships.

Research at Rice has real-world implications for our economy, our cities, our environment and our world. Through supporting and recruiting exceptional faculty and staff, generating research opportunities for graduate and undergraduate students and providing facilities and programmatic support, we must make Rice a preferred destination for conducting research and for scholarly exchange.

The competitive environment for research is intensifying, particularly as government funding has flattened or been reduced. Our research goals should be aspirational and strategic, ambitious but achievable. We have demonstrated that when we make strategic investments, our research achievements accelerate.

To be successful, our strategy must contain a number of elements.

We must identify areas where we can truly excel in research achievement and make bold investments in the best faculty, staff and students to achieve our goals. Rice will produce short- and long-term success when we identify emerging areas of study, stay on the leading edge of key areas ahead of our peers and move quickly toward producing innovative research. When we arrive at an emerging intellectual field ahead of others, we become

an international leader in those areas. In partnership with our faculty, staff and students, we must create a clear vision for how to elucidate such areas and how to determine the investments they will need, whether it be faculty hires, equipment, research facilities and/or intra and interinstitutional partnerships.

Through the Rice LIFT process and the V2C2 survey, faculty and other community members have put forth creative ideas for raising Rice's research preeminence. One area ripe for growth and a more consolidated approach is at the intersection of engineering and medicine. The currently conceived Rice Engineering Medicine Initiative (REMI) proposes that Rice, in collaboration with strategic external partners, will become an international leader in the development and translation of groundbreaking engineering technologies for personalized medical applications, especially those that enable the effective and efficient prevention, treatment and management of diseases. In addition to our traditional collaborators in the TMC, this could create opportunities for innovative partnerships with impact investment entities, which can provide the tools to bridge the gap between technology demonstration in the lab (supported typically through federal funding) and full-scale commercial development (supported typically by private sector partnerships). Medicine and health care is a social process, and Rice is well positioned to include here the humanistic and social scientific dimensions of innovative health care, especially through our sociology department and the Program in Medical Humanities.

In the sciences, materials and synthetic biology show tremendous promise as areas of cutting-edge research in which Rice is already excelling. A strategic emphasis on materials would enable research from the very fundamental to the applied, enabling a materials-by-design approach that includes the full cycle of synthesis/discovery, characterization and predictive theoretical understanding. A focus on synthetic biology derives from the realization that in the coming decades, a new industry of biological technologies will transform nearly every aspect of society, similar in impact to the computer and industrial revolutions of the last two centuries. Fifteen years of faculty efforts and more recent recruitments have put Rice in a unique position to be a leader in this scientific revolution through enhancement of our Systems, Synthetic and Physical Biology (SSPB) program.

Also identified through faculty presentation and discussions are a number of local and global problems that our faculty and students are well positioned to study. Data structure, composition and analysis play an increasingly important role in nearly all areas of research. Rice must continue to develop research, curriculum and scholarship to integrate data sciences into how we think about complex problems and invest in the excellence of fundamental competencies, such as computer science, electrical and computer engineering, computational and applied mathematics and statistics. Social sciences is developing a schoolwide strategy that focuses on data-driven social policy analysis. Social sciences and humanities also have a common interest and opportunity in the area of disparity and inequality research — identifying the health, education, employment and social challenges facing under-resourced populations, now and in the past. Past inequities illuminate and in some cases have directly created the disparities of today. As a comparatively small university, our greatest opportunities often lie in identifying those endeavors that will benefit from a deeply interdisciplinary approach. For example, a combined effort on earth, environment (including climate) and energy will leverage faculty, staff and student interest and expertise across many disciplines. The same is true of education and health. In the former, we may be well-positioned to integrate understandings of human learning and artificial intelligence.

Our faculty is remarkable at generating bold and inspirational ideas; the challenge will be to choose those that hold the greatest promise of accomplishment and impact and to secure the necessary investments to make them a reality.

We must leverage the effort of our faculty by providing the very best in support staff, infrastructure, facilities, equipment and seed grants. We must continue to increase support in all disciplines for faculty seeking, applying for and managing grants, as well as for faculty who are managing their research infrastructure. Pre-award support is key to increasing applications, and should come from both more specialized grant staff, who are well-trained, and from senior faculty who can mentor junior faculty about specific opportunities in their field. This is often an overlooked and underserved area of research success, but this support is critical to pre-award identification and post-award management.

High-quality facilities and equipment are also essential to research success. Where this entails large-scale investment, we must make strategic choices that work in conjunction with research and faculty strengths and priorities. Two recent examples of such investment include the scanning electron transmission microscope and the new clean room under construction. Such equipment not only enables our faculty to do their best work, but also helps attract new faculty and distinguished research visitors. We must assure that our facilities are competitive and fully support the research needs of our faculty and research staff. In particular, we must address the inadequate current state of some of our research laboratories, including the Abercrombie Engineering Laboratory. At the same time, we must adopt and implement policies that most effectively use our space, facilities and equipment. In addition, research faculty and research staff play a critical role in leveraging facilities and equipment and in research achievement.

Often faculty need early seed funding to support the development of new proposals and research ideas. Thus, having a robust source of such internal funding is critical to research success across the disciplines. Rice has gathered all such funds under the umbrella of the Creative Ventures website and now provides over \$1 million a year in funding through a transparent and easy-to-access platform. This amount should be increased as the number of promising projects grows.

We must significantly augment our postdoctoral program. Postdoctoral fellows leverage research and often serve as mentors to graduate and undergraduate students. Investment in postdocs and their career advancement is an investment in research productivity. A successful example includes the Rice University Academy of Fellows. Postdocs also spread Rice's reputation as these researchers leave to join other institutions' faculties. Postdocs collaborate with Rice faculty and partner with other faculties on research projects, as well as explore the most dynamic areas of emerging scholarship.

We should expand the participation and scope of the Rice University Academy of Fellows program. Several departments and centers across the campus also have high-impact postdoctoral programs, such as the Humanities Research Center (HRC) and the Center for the Study of Women, Gender and Sexuality (CSWGS). By

deepening the postdoctoral research experience, we foster growth in new areas of research, as well as continue building on our current strengths. We should seek to significantly expand the number of postdocs over the next decade.

We should aim to double our research funding over the next 10 years. This is a very ambitious goal that will require us to increase funding from existing sources and seek out new sources as well. Doubling should apply to dollars secured and measured at the stage of application as well as actual awards made. Research and creative works take many forms, and we must strive to secure the amounts and kinds of external funding that are appropriate to outstanding accomplishment in each field. Expanding our research-active faculty is an essential step toward this goal. All faculty are expected to conduct research and scholarship at the highest levels and to regularly seek out external funding and prizes. In addition, we should seek growth in license revenues and successfully licensed Rice IP.

We should continue to build deep and productive external collaborations with industry, government and nongovernmental entities, and in particular create deep institutional collaborations in focused areas with the Texas Medical Center. Our location in the city of Houston provides critical opportunities to collaborate with others in our research endeavors. Most impactful is the Texas Medical Center, which sits just across Main Street from our campus. Its world-class medical institutions are already vitally important partners for our faculty. Almost every school at Rice has ongoing collaborations there, from biosciences to the Health, Humanism and Society Scholars program. We should seek to develop deeply focused collaborations with one or more institutions of the medical center, which will position Rice as a leader in a limited number of key medically related fields, such as neuroengineering. Deeper collaborations may require the creation of new structures, such as joint institutes, and we should be open and adaptable to these ideas.

Our nearby museums, especially the Museum of Fine Arts, Houston and the Menil Collection, are similarly critical collaborators in both teaching and research. In particular, Rice can continue to develop strength in the arts as we build mutually beneficial collaborations.

Both governmental and nongovernmental entities of the city of Houston have already become crucial collaborators. A good example is the Houston Education Research Consortium (HERC), which brings together the Houston Independent School District, the Kinder Institute for Urban Research and the School of Social Sciences to pursue research designed to improve outcomes for the children of our home city. Especially in the wake of Hurricane Harvey, we have an obligation and an opportunity to contribute to the city through research across a range of disciplines.

Industry in Houston has long been a strategic partner for Rice, supporting a wide range of endeavors. We should seek to build these partnerships wherever possible and make sure that pathways for enabling such collaborations are easily identifiable and usable. New opportunities will emerge with the investments we are making in data science. As companies become increasingly reliant on data analytics, Rice should be a critical partner and use its resources to help industry determine answers to their most pressing questions. We should establish centers of operations where industry partners can present proposals to be worked on by teams of Rice students, staff and faculty. Faculty members may have access to professional research scientists or postdoctoral fellows who could help with such projects, allowing faculty to work on more high-level projects. For example, a Rice LIFT Data Science Initiative (D2K@rice) proposal offers a model that seeks to connect Houston industry with teams of student-led and faculty-supervised teams to tackle research projects.

We should identify critical global challenges where Rice can make a distinctive contribution, and we should work with the partners globally to broadly and meaningfully improve the human condition. Our world faces a number of difficult and threatening challenges that must be addressed in the coming years. Universities provide the independence and research strength that can lead to innovative solutions. Rice must contribute to these efforts. As in other areas, we must make such choices strategically, and develop the partnerships to most effectively pursue them. Likely areas for consideration include global health, education, energy, the environment, climate change, urban challenges and disparities. In several of these areas, we should identify aspects where Rice is positioned to contribute in important ways to identifying

solutions. Departments in nearly every school, as well as institutes, including the Baker Institute for Public Policy and the Kinder Institute for Urban Research, are well positioned to play a major role in these endeavors. Rice faculty, with their expertise across all disciplines and areas of the globe offer knowledge of the historical context, scientific understanding, technological possibilities and cultural responses needed to address these issues.

Extend Rice's Reach and Impact.

We will increase our impact and visibility nationally and globally through digital education, global presence and alumni engagement.

Rice faces an increasingly competitive environment for students and faculty, and greater opportunities than ever for extending its reach. A number of our peer universities have expanded their traditional on-campus student bodies or are considering doing so. Many, however, are looking to two overlapping opportunities, namely digital online education and overseas opportunities. The challenge for Rice is to maintain and even improve its competitive position by increasing its global footprint while maintaining its reputation for excellence and its distinctive campus community.

As part of the Vision for the Second Century, Rice expanded its undergraduate student population by approximately 30 percent and greatly increased applicants and matriculants from outside Texas, both nationally and internationally. International student enrollment grew from about 3 percent to 11 percent of the undergraduate student body. At the same time, the enrollment of graduate students increased by an even greater percentage, through significant growth of our doctoral programs and the addition of new programs, especially professional master's degrees. Graduate students also came increasingly from abroad. Overall, Rice's student body is today nearly 25 percent international. The result has been a significant increase in Rice's national and global recognition as our applicant pool, student body and alumni base have grown more national and international. All preeminent research universities compete in a global environment for faculty, for students and for research opportunities and resources. It is essential that we continue to enhance our visibility and reputation — locally, nationally and globally.

We face particular challenges in attaining this goal as a comparatively small university. When Rice faced the question of increasing our impact 12 years ago, growing enrollment on the physical campus was the only practical option available. Since then, new digital technologies allow Rice to grow in new ways — through online offerings that entail lower fixed costs and less impact to the on-campus experience and resources. These methods are

being increasingly used by our peers and other universities, including ambitious schools that are not now among the world's top universities, for growth and reputational positioning.

Our impact is also increased by our global engagement with other universities and our expanding alumni network. Our relationships with other universities create opportunities for our faculty and students, and extend our impact to students and researchers around the globe. Our alumni, together with other Rice advocates such as parents and donors, constitute a network of ambassadors which, if we engage effectively, can also help us increase national and international visibility.

We must use digital education technologies to enhance Rice's global presence and build new partnerships that allow Rice to take advantage of increased student mobility. Digital education is the most effective way to extend our reach to new student populations without overburdening our financial or campus resources. This strategy must be undertaken in ways consistent with what we already consider key ingredients of our success: selective admissions, programs that successfully compete with those of the best universities, meeting target enrollments on quantity and quality measures, financial contributions to support our core endeavors, successful learning outcomes, innovation and excellence. Our success in building a global presence can be significantly enhanced by the engagement of our increasingly global community of students and alumni, who can in turn benefit from online educational resources.

This digital pathway is not meant to replace or diminish the role of on-campus classroom education, but rather to enhance the already strong education experience of past, present and future Rice students. Digital education resources and technology are increasingly an essential component of both the on campus and online curricular experience of 21st-century students. To fulfill our distinctive commitment to provide the best educational experience, we must integrate these new tools into our learning environment and promote a culture of active experimentation and innovation in the online delivery of programs.

Rice has established a substantial presence in digital education. This has taken the form of free online MOOCs,

digital innovation in traditional campus-based classes, for-credit summer session courses and low-cost online courses directed toward particular competencies. In addition, we recently announced a partnership with 2U to deliver our first online degree program, MBA@Rice. This represents a hybrid model of mostly online delivery, including synchronous and asynchronous methods, with more limited on-campus presence for students. The market has evolved rapidly, and today there is increasing competition in revenue-generating online degrees, certificates and sequences. New online programs and degrees are being considered at the school and departmental levels. Many faculty have responded to the challenges and opportunities of digital education with energy and enthusiasm and expressed interest in driving the evolution of digital and online higher education.

The past five years have largely been years of experimentation, innovation and business model evolution. We have developed significant successful offerings and, more importantly, relevant knowledge and capacity. If we are to be successful in the long term and substantially enhance our rapidly evolving capabilities, we need to develop mid- and long-range strategic priorities, and make investments to achieve those priorities.

Our global future will be deeply entwined with our digital reach. Rice has long-standing and effective international partnerships in a number of countries. Digital learning can be used to amplify Rice's presence and assure that Rice research and content continue to improve education worldwide. Digital education allows Rice to engage learners across the globe with the unsurpassed teaching for which we are known and to extend opportunities to talented students and mid-career learners everywhere.

Our students on the Rice campus are also increasingly mobile and eager to seize international opportunities that range from a few weeks to several semesters. We should consider what international opportunities should be available to students during their summer, winter and spring breaks. Digital technologies can offer our own students the opportunity to continue coursework while engaged abroad, especially valuable since important courses are not necessarily offered every semester on campus. Faculty also can take advantage of increased mobility to explore international opportunities and be able to offer instruction in different locations.

At the same time, online programs can be just as important to those living in the Houston region who do not have the time to travel back and forth to the campus from communities such as The Woodlands, Katy or Friendswood. Such potential learners may, however, be able to visit the campus for elements of their educational program on some regular basis even if not for every class. Such blended courses represent a significant opportunity for the Glasscock School of Continuing Studies, which is already offering some online programs, to build on our extraordinarily strong regional reputation. While Glasscock to date has been focused more locally, moving forward it can take some programs to a national and international audience as well through digital technologies.

We must establish Rice's leading role in online education by developing five strategic online professional master's programs of exceptional quality to expand the reach and impact of Rice University nationally and globally. Rice's reputation for educational excellence and rigorous research creates the opportunity to occupy a premier position in online programming, both locally and globally. Professional master's degrees are the area of greatest opportunity to grow high quality programs via digital means. Recent figures from the U.S. Department of Education project that enrollment in online postsecondary degree programs will increase 13 percent to 23.8 million by 2021. Rice needs to position itself to take advantage of the high end of this market in terms of the students and learners we can attract. If we fail to do so, our competitors will. The potential result could be the erosion of our traditional educational market and reputation, especially in the professional and graduate education space.

Successful programs should introduce new revenue streams that fully support their cost and can be used to support other strategic investments that enhance our research and teaching missions. These programs should aim to return resources to sponsoring departments and schools and the general funds of the university.

We must build on Rice's strength in computer science, machine learning and digital educational resources to be recognized as an authority on the design and effectiveness of new learning technologies and materials. Given the highly competitive environment in all forms of

digital education, we cannot succeed unless we are seen as leaders and innovators. To do that, we must engage in research that distinguishes our faculty as important thought leaders in digital education. Research in machine learning and artificial intelligence are areas of strength for Rice faculty, and these technologies will continue to shape learning both online and on campus. Rice can leverage its established research strength to produce enhanced online courses as part of the curriculum for online or low residency degrees.

Rice is already seen as a leader in innovative publishing models and personalized learning. OpenStax is a major force in the production of digital textbooks with wrap-around personalized learning support systems. These efforts can be leveraged to amplify the effect Rice education has in certain market segments, such as AP programs, and give us an advantage in recruiting the most talented students to our undergraduate programs.

We must deepen engagement with alumni by more effectively enabling them as ambassadors of the university and providing them digital education and networking opportunities. Because of our historically small size, it is even more important for us to effectively engage our alumni. Our alumni presence outside Texas is growing as our student body has become significantly more national and international, and we have seen significant growth and engagement of alumni groups in major cities across the U.S. It is important to maintain our connection to our alumni, and that is best done by continuing to connect alumni to the life of the university including through learning opportunities and volunteer service. Our alumni are generally eager to help in multiple ways, including recruiting faculty and students, providing internships and mentoring, and connecting Rice faculty and students to their firms and professions. Rice also has the opportunity to remain a trusted institution for all of its alumni, regardless of location, to advance their careers through additional certifications or degrees. Rice should significantly increase the number of alumni who receive additional degrees or certifications from Rice midcareer, and thus see Rice as a source for lifelong learning. If Rice is an available choice for such education, we greatly increase the strong sense of Rice affiliation and benefit among our graduates. We must also assure that Rice provides the most effective means for networking and

mentoring among our alumni and between our alumni and students, as we have done with the creation of Sal-lyportal.

We must develop more global partnerships for both education and research, and determine whether establishing a small number of international centers or key relationships would significantly enhance our ability to deliver education and support the engagement of our students and faculty abroad. As we look at our peers, we see an increasing number and variety of international centers and experimental collaborations, which range from more significant and visible international partnerships to foreign campuses. A number of universities, including some of our most highly ranked peers, are establishing foreign centers or offices. Given our small size, we may have limited capacity for such investments, but we should determine whether the benefits we might receive warrant the costs. Particularly as our global online reach expands, it may be advantageous to supplement our digital presence with local opportunities for in-person engagement.

We must, in any event, continue to identify research and education relationships with outstanding universities around the world that will enhance the learning opportunities of our students and the research collaborations of our faculty. Identifying such relationships should fall primarily on our schools, departments and faculty, who are best positioned to determine the institutions that will be optimal partners for their research and education goals. Central administration and leadership, however, can provide needed support, strategy and high-level engagements. Where possible and productive, we ought to seek relationships that are broad and deep, encompassing both education and research.

Engage Houston and Empower Its Success.

We will engage Houston as a focus and partner for research and education, leveraging our broad expertise on critical urban issues to be a driving force in enabling Houston's success as a 21st-century metropolis.

From its beginnings, Rice's destiny as a great American university has been intertwined with Houston's destiny as a great American city. As Rice grew in its first century from fewer than 70 students to now nearly 7,000, Houston grew from a town of about 80,000 to a metropolis of over 6 million. Houston's success has provided Rice with a firm foundation of support. In turn, Rice's world-class reputation for scholarship and education have enhanced Houston's reputation and provided it with invaluable resources and opportunities for achieving further success. Because Houston's demographics today likely resemble those of the rest of the country three decades from now, knowledge gained in our home city has the potential to help pave the way nationally and internationally.

Rice's Vision for the Second Century called on the university to engage with the Houston community in a broader and more meaningful way — by engaging our students and faculty in the city, by making tangible contributions to improve our city, and by continuing to provide innovative educational and cultural resources to the broader Houston population. Great progress has been made toward this goal and across Houston. Rice is no longer viewed as staying "behind the hedges." In fact, it plays a role in the city well beyond its size. In a recent study by Brookings, Rice was ranked ninth in the country in impact of downtown universities.

The Center for Civic Leadership provides a wide variety of experiential learning opportunities for students across the city. The Passport to Houston provides cultural opportunities at many of the city's premier institutions. The Baker Institute, Kinder Institute, Houston Education Research Consortium, Severe Storm Prediction Education and Evacuation from Disaster (SSPEED) Center and other centers and faculty on campus have engaged Houston's political and civic leadership and provided invaluable research and policy recommendations. Humanities faculty and students engage currently with Houston social service organizations, educators, and arts organizations, and the Department of Visual and Dramatic

Arts offers important art programming for the city. The Moody Center provides a rich, new context for engagement with the city on arts and culture. The Shepherd School of Music and the new music and performing arts center, construction of which will begin soon, will make the school an even greater destination for musical performances and other events. The Glasscock School for Continuing Studies supports excellence in K–12 education and a wide range of educational opportunities for Houston’s residents.

The V2C2 provides the opportunity to significantly broaden, enrich and solidify this partnership in ways that are mutually beneficial to Rice and to Houston. We want, in fact, to be one of the driving forces that help advance the city as it faces 21st-century challenges. The recent damage inflicted by Hurricane Harvey creates an obligation and provides an opportunity to contribute to and learn from the city’s recovery and evolution. Rice also can and should play a crucial role in enabling Houston to realize its goal of becoming a city known for innovation and technology-driven startups.

The transformational aspect of this partnership lies not necessarily in the creation of completely new initiatives, although there may be some we should undertake, but in the purposeful coordination, growth and leveraging of existing efforts. Such efforts have extended across the university. For example, the Program in Jewish Studies is currently rescuing Jewish community documents in the aftermath of Harvey; the Center for the Study of Women, Gender and Sexuality is a founding member of Houston Area Rainbow Collective History; and the statistics department has worked with the Houston Health Department to identify high pollution/asthma action days. By providing the expertise, data resources and innovative ideas, we can help advance Houston’s rise as a model city where data-driven solutions drive policy improvements.

Rice should coordinate education programs around urban issues and engage with Houston, learning from and contributing to it. In contrast to past decades when students preferred to study outside large cities, a truly urban university has a competitive advantage in today’s world. Urban universities offer a rich environment for learning outside the classroom through research and policy problems identified through partnerships with business, non-

profits and governmental agencies. The most complex and pressing societal issues are now largely urban as the majority of people in the world live in urban settings, as does over 80 percent of the U.S. population. As a result, many of the best students, motivated by a desire to better society and engage directly with current issues, want a university experience that engages them in the challenges and resources of world-class cities. As a result of early visionary thinking and subsequent stewardship, Rice has perhaps the best and best-located urban campus near the center of any major American city.

In order to maximize this advantage, Rice should focus on integrating the university’s extraordinary urban curriculum and experiential learning opportunities. Rice’s Houston Area Survey has a 36 year history of tracking trends and attitudes in Houston and has been used to shape policies and programs and to document the unique optimism of our home city. The School of Architecture engages its students in a host of important projects dealing with the city’s built environment. The Center for Engaged Research and Collaborative Learning (CERCL), now housed in the Kinder Institute, offers longstanding models of engaged research, especially concerning health and racial issues.

The Center for Civic Leadership provides students with urban research opportunities through the Houston Area Research Teams and other programs. The School of Social Sciences’ new social policy analysis curriculum creates an innovative and intellectually rigorous opportunity for important student learning. The sociology department offers a host of courses that speak directly to urban issues. The School of Engineering is home to faculty and programs that engage Houston in a wide-range of infrastructure issues, as well as innovative work on smart cities. The Jones School of Business is ranked second in the country for its entrepreneurship program, and the Rice Alliance and Liu Idea Lab for Innovation and Entrepreneurship are helping foster Houston’s innovation culture and human resources. These are just a few examples of research and engagement with the city that occurs in every school of the university. We must present these rich educational resources and expertise in a more coordinated way.

Our engagement should involve all aspects of our educational mission, including the Glasscock School for Con-

tinuing Studies, which has long been an important way in which Rice has contributed to the city. Among other things, the coordination of these programs will enhance Rice's competitiveness in recruiting the best students, especially those interested in solving the challenges facing top global cities. In considering our educational role more broadly in the city, we ought also to evaluate how best to use our resources during the summer months. Better use of our campus facilities might allow an increased role in providing opportunities to K–12 students, as well as focused programs for adult learners.

Rice will participate with the city and key organizations and institutions as a strategic academic partner. Building a robust translational effort requires a wide-ranging and coordinated effort by the schools and the Baker and Kinder Institutes. This effort requires Rice to create a “policy pipeline” — a constant and coordinated identification of important challenges and an outflow of research, policy and action recommendations designed to inform the work of governmental, private sector and community-based entities. In addition, we must create a “smart cities” pipeline that uses Houston as a test bed for how to leverage technology to improve services. Success for these efforts requires three crucial elements.

First, the flow of policy recommendations must include and be shared with local philanthropies, industry, non-profit organizations and governmental entities. Within Houston's civic and political culture these entities play an especially important role in shaping and implementing policy. Making these entities part of the Rice policy pipeline will promote maximum impact in the community and also highlight the value that Rice brings to the city through these efforts, which are largely funded by philanthropy. The newly established Texas Rice Innovative Policy Lab is positioned to be an important resource in this respect.

Second, Rice must draw on the full range of relevant expertise across the university. An extraordinary range of urban research already takes place on campus, including methods for improved learning outcomes for K–16 education; the abatement of environmental issues such as flooding and reduced air quality; and social and infrastructure issues related to social and economic disparities in transportation, housing, health care and even access to wireless internet resources in underserved neighbor-

hoods. Rice has enormous research capability in engineering that can help contribute to improvements in city operations, infrastructure and technology to improve urban life. Rice social science and humanities scholars provide knowledge about Houston's past and present realities for all inhabitants. Collaboration can be fostered to greater effect. As the Kinder Institute strategically expands and broadens its base of research and data analytics, it could serve a coordination role in these cross-campus endeavors, and in particular, relationship building with the city of Houston and Harris County.

Third, using programs and platforms at the Jones School, the Glasscock School and Rice Online, Rice should create new and enhance existing programs in a wide range of areas that deliver workforce development options to Houston-based firms, local governments and not-for-profit organizations. Through degrees, certificate programs and short courses, Rice should provide targeted best-in-class educational programs that are widely accessible and which serve the needs of a city committed to job creation and a workforce ready to support technologically advanced industries.

Rice should design a method by which different actors in Houston, whether they be large, multibillion dollar corporations, or small nonprofits, can engage with us when they have a specific research question or challenge. We should create a structure that makes Rice's capabilities more inviting and more accessible to other organizations. It is important that our faculty and staff engage with other stakeholders in the city and that Rice as a whole develop strong inter-institutional relationships.

Moreover, such broad and deep engagements with Houston will enable Rice to engage more effectively with institutions addressing similar issues across the globe. Thus, these efforts should be complemented by a sustained effort to establish Rice as a global convener on a range of urban issues faced by cities around the world.

Rice should seek to use its off-campus properties strategically to benefit both the university and the city, and in particular foster Houston's emergence as a center of innovation. Rice's off-campus Houston property holdings offer an opportunity to pursue goals that help support the development of Houston and the engagement of Rice. We should carefully consider how these prop-

erties can be used to serve Rice's goals and Houston's ambitions while providing the necessary financial return to the university. Just as Rice has undertaken efforts to make Rice Village a more attractive and vibrant retail center, so too can Rice use our other properties to enhance our position as an urban university while fueling the development of our home city.

One particular area where we should focus is the development of Houston as a center for innovation, technology transfer and technology-driven startup companies. Rice faculty have produced important intellectual property that has led to numerous startup firms. We are engaged in a range of efforts with researchers in the Texas Medical Center to develop new medical technologies. The Jones School has developed a strong presence in entrepreneurship, the McNair Center focuses on related policy and the LILIE (Liu Idea Lab for Innovation and Entrepreneurship) brings this focus to students across the university. Thus, we are well-positioned to play an important role in the further development of Houston as a center of entrepreneurship and innovation.

If we successfully undertake all of these efforts, we will be able to make a leap in our engagement with the city, and the degree to which our university benefits from our urban environment and our city benefits from the presence of a great university.

What will it require to succeed, and what will our success accomplish?

Taken together, these goals and actions set forth an ambitious vision for Rice University. What will it take to succeed? Certainly, an ambitious and successful fundraising effort, but that will not be enough. We will need to find ways to increase other revenues. We will need re-allocation of effort and resources. We will need to implement strategic organizational changes that better align with some of our goals and priorities. We will need to embark on new collaborations and partnerships, within Rice and with partners in our city and around the world. And we will need determination, optimism and creativity.

If we are successful, what impact will the achievement of these goals have on Rice?

- We will provide the best undergraduate education, one that is transformative for our students and fueled by the engagement of our faculty.
- We will be a premier choice for graduate students who have sought out the excellence of our faculty, the quality of the graduate education and the vibrant graduate community we support.
- We will have earned the admiration of our peers for the faculty we have recruited and retained and the pinnacles of excellence we have built.
- We will be one of the most diverse and inclusive educational environments among the nation's top universities and provide the resources for the success of all students.
- We will achieve research excellence, recognition and impact far beyond our scale, and contribute in important ways to addressing some of the world's most pressing problems.
- Our educational impact and overall stature will be greatly expanded by new digital education programs, international engagements and the active support and success of our alumni.
- We will be recognized as a major force in increasing opportunity and improving the quality of life in Houston, and providing it with the data and policy tools of a 21st-century city.