



STEVENS INSTITUTE *of* TECHNOLOGY

The Future. Ours to Create.
2017-2022

STRATEGIC PLAN MIDPOINT UPDATE

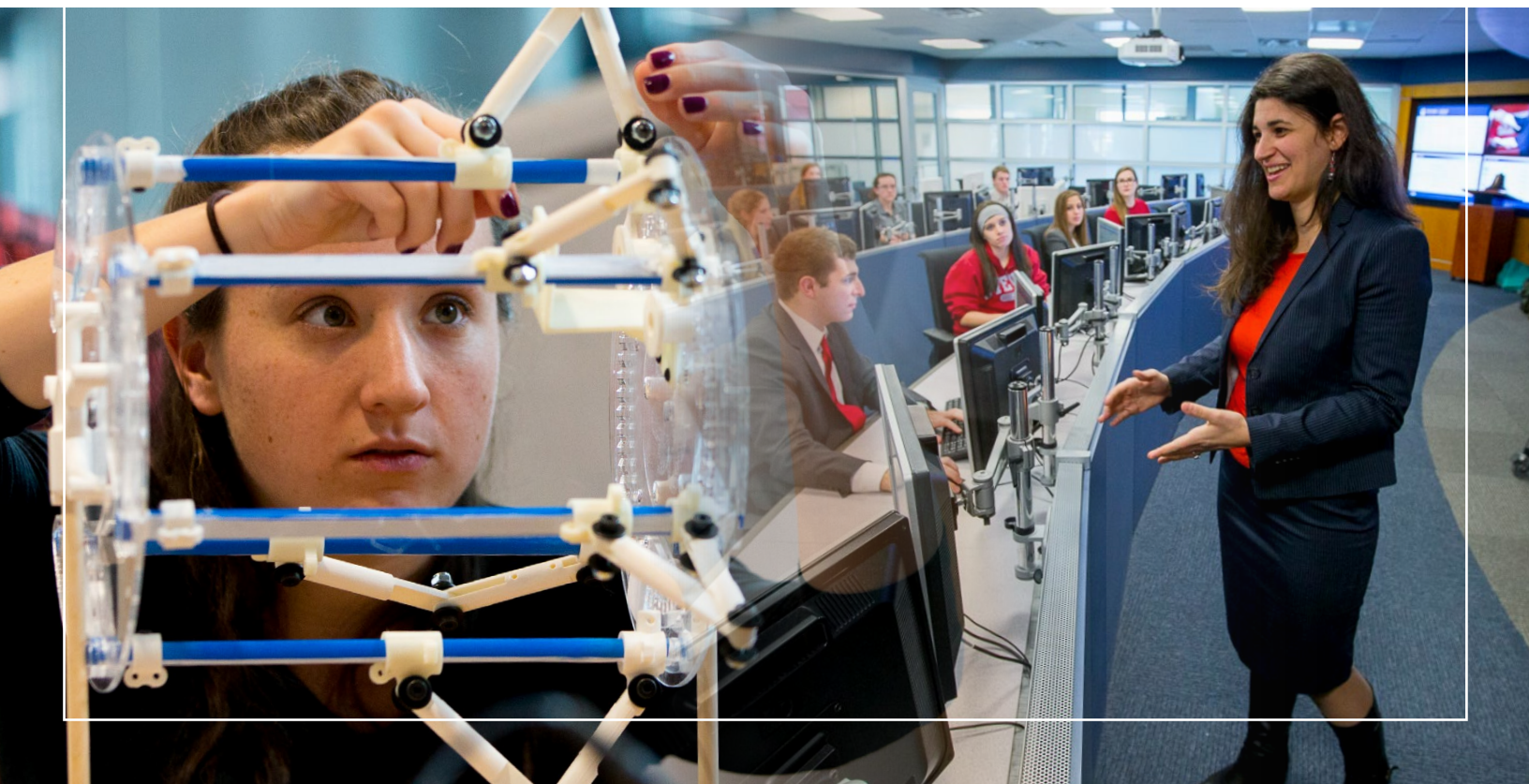




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MESSAGE FROM NARIMAN FARVARDIN



Dear Friends and Colleagues,

When I came to Stevens in July 2011, the University was confronted with a number of pressing and urgent challenges—from financial instability to an alumni body that was largely disengaged, to a campus community without a clear sense of destination. Yet, despite the challenges, I saw in Stevens what many of you have seen—a university with tremendous, unrealized potential.

In 2012, our community came together to create a plan to tap that unrealized potential. With an unprecedented level of engagement from faculty, students, alumni and staff, the University developed a plan to achieve our shared vision “*to become a premier, student-centric, technological research university.*”

With this plan, we built on the profound and significant legacy of the founders and their focus on technological innovation and entrepreneurship, which had shaped the growth and development of Stevens’ education and research programs over many decades. We brought focus and discipline to our long-standing, core emphasis on STEM fields, areas that became increasingly recognized by society as integral to a better future both for our country and for graduates. We began to better exploit our “unfair advantage” of being located near New York City, the epicenter of business, culture, and media. And, we instituted a careful and methodical approach to measuring our progress, not only against our own past, but against aspirational peer institutions.

Now, five years later, our progress has been nothing short of remarkable. Measured by external, independent rankings, Stevens is the third-fastest rising university in the nation. I am both proud and amazed at what our community has accomplished by focusing on the five strategic priorities we set for ourselves—*Excellence in All We Do; Through Collaboration, Impact; Student-Centricity; Technology at our Core; and Strengthened Reputation, Increased Prestige.* These priorities have guided our ascent as we have made substantial and significant progress across nearly all areas of the University—from recruiting the best and brightest students from around the world, to hiring truly excellent faculty from prestigious institutions, to investment in the expansion and modernization of our campus infrastructure, to alumni engagement, to financial stability, and much more. The University’s incredible ascent trajectory, guided by our ambitious Strategic Plan, has put Stevens on a solid path to achieve our aspirations.

Yet, despite all the progress we have made in the last five years, we still have far to go. I still see so much unrealized potential in this University—the potential to ascend in rankings, in prestige, in academic reputation,

in student outcomes, in the size and impact of our research portfolio, and in the pride felt by our alumni and extended community about Stevens.

This midpoint update of our Strategic Plan puts us in a very strong position to realize Stevens' full potential. It enables us to capitalize on our accomplishments, to confront new challenges, and to consider the University's future in the context of a rapidly changing world.

I am grateful to Provost Christophe Pierre, Chair of the Strategic Plan Midpoint Review Steering Committee, for his leadership in this important endeavor and to the entire Steering Committee for the wisdom, insights, and good will with which they approached this task. I also want to acknowledge the participation and engagement of the Faculty Senate and the broader Stevens community in providing substantive input throughout the revision process.

I am confident that our updated Strategic Plan will unleash Stevens' full potential as a forward-looking and far-reaching institution with global impact.

I hope you share my pride in all that Stevens has accomplished, and, as you review the Strategic Plan 2017-2022, I hope you will also share my unwavering determination to continue on our extraordinary upward trajectory.

Per aspera ad astra,

A handwritten signature in black ink that reads "N. Farvardin". The signature is written in a cursive style with a large, stylized "N" and "F".

Nariman Farvardin

President

MESSAGE FROM CHRISTOPHE PIERRE



To the Stevens Community,

Five years ago, the Stevens community united behind a comprehensive ten-year strategic plan titled, *The Future. Ours to Create*. This ambitious and visionary document set out to build on Stevens' core strengths, chart a course to a new destination, and elevate Stevens into the ranks of the nation's elite universities.

The plan laid out a bold vision, instilling direction and accountability into the university's culture by establishing clear, measurable goals and steps for achieving them. My arrival coincided with the plan's midpoint, and it was my distinct pleasure to join President Nariman Farvardin, the academic and administrative leadership, the faculty, and stakeholders from across Stevens in undertaking an update of the plan.

Our strategic plan remains a vital document. It has provided our diverse community with a shared mission, direction, and a sense of accomplishment. Its overarching goal—to make Stevens a premier, student-centric technological research university—remains unaltered. But conditions have changed, and our understanding of the challenges facing Stevens has evolved. The updated strategic plan reflects the progress we've made in many areas, accounts for new opportunities and challenges, and incorporates lessons we have learned.

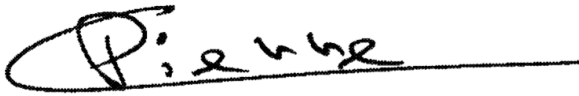
This revision could not have been accomplished without the insight and efforts of many people across the University. I am especially appreciative that our faculty took an active role. The revision process included significant give-and-take as we examined the foundations of the plan, our growth targets, our goals for undergraduate and graduate education and research, and the principles underlying our allocation of resources. We are indebted to the Faculty Senate for its leadership in facilitating this critical dialogue and for helping to synthesize a broad range of ideas into this plan. We look forward to the faculty's continued contributions, through the active participation of members of the Faculty Senate, as we transition into the implementation phase of the revised plan.

I am confident that our revised strategic plan will focus and strengthen Stevens' academic mission and reputation. It builds on our remarkable record of advancements in engineering, science, business, and the humanities and social sciences; our groundbreaking interdisciplinary research and education; and our campus-wide spirit of innovation and entrepreneurship. It provides a reasonable and sustainable growth model; a path toward building the research enterprise; a strengthened infrastructure for faculty and graduate students, especially doctoral candidates; a resource allocation philosophy that promotes empowerment and accountability; and an invigorated

commitment to diversity.

Significantly, the plan now focuses on several foundational pillars—promising and important fields in which Stevens has an outstanding record and a promising future. They are: artificial intelligence, machine learning and cybersecurity; biomedical engineering, healthcare and life sciences; complex systems and networks; data science and information systems; financial systems and technologies; and resilience and sustainability.

I am excited about the vision laid out by this plan and gratified by the university community's dedication to its evolution and success. I am certain that, together, we will continue to create a proud and distinguished future for Stevens.

A handwritten signature in black ink, appearing to read "C. Pierre", with a long horizontal line extending to the right.

Christophe Pierre

Provost and Vice President for Academic Affairs



INTRODUCTION

In preparation for the second five-year period of implementation of the ambitious ten-year Strategic Plan developed by the Stevens community in 2011-12, President Farvardin initiated a process to review and update the University's plan to achieve its stated goal to *become a premier, student-centric, technological research university*. The process provided the opportunity to revise certain aspects of the plan, in light of accomplishments achieved, challenges realized, and new circumstances and conditions, while adhering to the strategic priorities identified in the 2012 document. These strategic priorities remain unchanged:

- **Student-Centricity**
- **Excellence in All We Do**
- **Through Collaboration, Impact**
- **Technology at Our Core**
- **Strengthened Reputation, Increased Prestige**

The 2012 plan was an enormous, grassroots effort that involved more than 500 members of the extended Stevens community—faculty, staff, alumni, students, and friends—which created consensus on a very ambitious set of goals for the next decade. It should be acknowledged that the original Strategic Plan has served the University extremely well, guiding the very significant progress across many important metrics necessary to advance Stevens to the next tier of excellence. This progress has resulted in the University's 17-point ascent in *U.S. News & World Report's* Best Colleges ranking, resulting in Stevens achieving the status of third-fastest rising university in the nation.

This midpoint update process, undertaken in the spring of 2017, created an opportunity to apply lessons learned and engage newer members of the Stevens community in the process of reviewing and, in some cases, revising and redefining goals and targets.

From January through May 2017, a process to solicit input from the Stevens community on the revised Strategic Plan was implemented. President Farvardin appointed a Steering Committee, chaired by the Provost and with representation from the faculty, the Faculty Senate, staff and students. Outreach meetings, emails, and an online tool were used to solicit input from all members of the community, including alumni and students. A leadership retreat, comprised of the Cabinet, the Academic Council, the Chair of the Faculty Senate, and the Steering Committee, was held to review and synthesize input received and to develop a consensus draft. The Steering

Committee continued to meet to evaluate and integrate input from various constituencies and contributors. The Faculty Senate held two public forums to discuss the targets and offer input. And, as of June 19, 2017, the Board of Trustees, the Faculty Senate, and the Executive Committee of the Stevens Alumni Association have endorsed the updated Strategic Plan, with the expectation that an implementation and resource plan will be developed during Summer and Fall 2017 by the administration, in partnership with the faculty and the academic leadership.

While holding true to the vision, mission and ambitious goals set forth in the original Strategic Plan, this updated version of the Strategic Plan, *The Future. Ours to Create. 2017-2022*, adjusts certain goals based on progress to date and changed conditions; makes more explicit certain assumptions regarding implementation and resource allocation; and emphasizes certain key values that underpin effective and transparent University governance.

Importantly, a prospective growth model, accounting for proportionate growth in faculty, Ph.D. student growth, administrative support, and space — elements necessary to achieve the ambitious goals presented in this plan— has been shared with the Faculty Senate, the Strategic Plan Review Steering Committee, and the Cabinet. These bodies have provided input on the assumptions and the revised targets.

This Plan places renewed emphasis on several essential themes that will be the underpinnings of its successful implementation:

- **Enrollment growth at the undergraduate level and modest growth at the graduate level**
- **A concomitant increase in full-time, high-quality faculty**
- **Growth in research expenditures and Ph.D. student growth**
- **Implementation of a resource allocation philosophy that aligns budgets with priorities and level of activity at the local level; empowers units with financial authority and accountability; and provides incentives for reasoned, high-quality growth**
- **Development of a support infrastructure for the research and graduate studies enterprises, with resources, incentives, rewards, and accountability**
- **Increased goals for improved diversity among the student body and the faculty**

Implementation of the Strategic Plan will proceed in close partnership between the administrative, academic, and faculty leadership of Stevens. Annual implementation plans will be developed and openly discussed to ensure close coordination among all key stakeholders.

As a synthesis of inputs and discussions among students, faculty, administration, and alumni, this 2017-2022 Strategic Plan positions Stevens to continue to improve in all areas—student profile, faculty excellence, research impact, as well as physical and IT infrastructure, and financial stability. With this ambitious plan in place, with appropriate and judicious resource allocation, and with the continued dedication of the entire Stevens community, the University aims to ascend to the top tier of nationally-ranked technological research universities in the U.S.



CAREER
FAIR

RATIONALE FOR CONTINUED GROWTH

A key element of the 2012 Strategic Plan was enrollment growth, and continued, modest growth in undergraduate and graduate enrollment remains a priority in the final five years of the Strategic Plan¹. Such growth is essential to achieving the University's stated mission to *become a premier, student-*

centric, technological research university on par with peers such as Carnegie-Mellon University and Rensselaer Polytechnic Institute.

There are four key reasons why the institutional growth envisioned by Stevens' Strategic Plan is both necessary and beneficial:

1 Societal and economic impact: Growth will further fuel the local and global economies through the production of technology talent. Technological innovation and commercialization are among the most important drivers of economic growth. A 2012 report of the President's Council of Advisors on Science and Technology cited research showing that in the half-century following World War II, improvements in technology accounted for half of all growth in gross domestic product in the U.S. This report also cites studies demonstrating that the share of economic growth attributable to technological innovation may be as high as 85 percent. Research has shown that start-up companies that emerge from university research labs tend to cluster disproportionately around the institutions from which they emerge. Strengthening the University's capacity to generate additional technology talent for the region's and the nation's technology-based industries, to create new businesses, and to commercialize research into viable new ventures, are important aspects of Stevens' contribution to the economy and to society.

2 Increased footprint and reputation: By "right-sizing" the University's academic programs and research, we will achieve critical mass and maximum impact in areas of importance and societal relevance. Through expansion and strategic investment (enabled by growth) in critical domains, Stevens will be able to develop its reputation as a world-class technological university that contributes to the solution of the 21st century's most vexing challenges.

3 Financial stability: Enrollment growth strengthens the University's financial profile, and therefore its long-term viability, competitiveness, and impact, by achieving optimal economies of scale. As a non-profit organization with little state or federal aid, Stevens must run an effective and efficient operation. Increasing the student population while holding nearly constant some of the fixed costs allows Stevens to invest in its future and effectively compete with public universities and private universities with much larger endowments. Besides the growth in enrollment, the University will develop a more successful and comprehensive strategy to grow the endowment in order to reduce the dependence on tuition.

4 Increased opportunity and mobility for students: Increasing enrollment allows Stevens to address increased demand by students and families for proven STEM (science, technology, engineering, and mathematics) education programs. Applications to Stevens have increased more than 130 percent to both undergraduate and graduate programs in the last six years) due, in part, to the job growth in technical fields and the tremendous outcomes of Stevens' graduates. The U.S. Bureau of Labor Statistics reported that growth in STEM jobs is expected to continue to outpace growth in non-STEM jobs over the next decade. For the Class of 2016, 96 percent of Stevens graduates accepted a job offer or entered graduate school within six months of graduation. STEM graduates earn higher salaries at entry level and mid-career than all other job categories, and almost all of the highest paying majors are in engineering fields. STEM talent drives private sector growth, and STEM graduates are the highest wage earners of all categories.

Further evidence of this benefit to society is illustrated in the chart below. A recent study, entitled, "The Fading American Dream," covered in a January 2017 article in *The New York Times*, elucidated the declining probability that later generations will make more money and have a better life than their parents. The trend, overall, is downward—children born in 1940 have a 92 percent chance of earning more than their parents, but for children born in 1982 this chance dropped to 50 percent. Notably, Stevens was ranked #1 in the overall "mobility index"—the likelihood of moving students up two or more quintiles in the economic scale—among 71 "highly selective" universities. This remarkable result is a reflection of the type of student who joins Stevens and the effectiveness of a Stevens education.

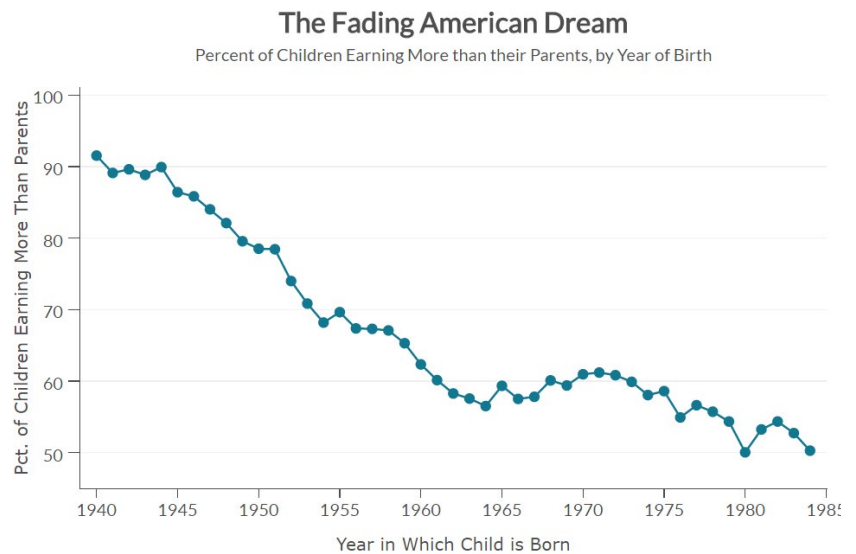


Chart courtesy of www.equality-of-opportunity.org

¹ Undergraduate enrollment is expected to grow 28 percent to 4,000 students (currently 3,115) and graduate enrollment by approximately 14 percent to 4,000 students from Fall 2016 to Fall 2022.



FOUNDATIONAL PILLARS: AREAS OF STRENGTH AND OPPORTUNITY

From its inception, Stevens has very deliberately identified and pursued research and education in areas of true societal need, from the Industrial Age to the Information Age. With this focus, Stevens has left its mark on the world over its nearly 150-year history.

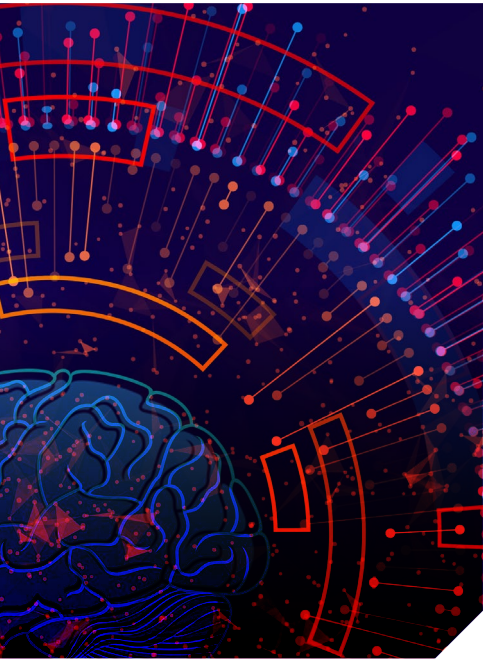
As the 21st century unfolds, Stevens will build on this record to become a global leader in targeted domains that draw upon the unique strengths and scholarly interests of our faculty and researchers. As society's needs evolve, so will our emphasis and our focus, guided by our core values and principles.

The areas upon which we will build — our “foundational pillars”— represent research and education domains in which we possess both existing expertise and a strategic focus for the future. The foundational pillars are envisioned as inter- and multi-disciplinary domains that will engage diverse collaborators, internal and external to Stevens, in dynamic partnerships and communities in the pursuit of large-scale grant funding and the creation of centers of excellence and practice. Through

interdisciplinary research collaborations and innovative educational programs, as well as external partnerships, Stevens will maximize our societal impact and build our reputation in strategically selected target areas.

In parallel, we will continue to focus on the hallmark features of a Stevens education that have distinguished the University over generations of students and prepared Stevens alumni for leadership positions in industry, as entrepreneurs, innovators, and academics, and in a wide variety of careers: a rigorous, broad-based, technology-infused curriculum spanning engineering, the sciences, and business as well as the humanities and social sciences; a methodical and quantitative approach to problem-solving; an underlying and pervasive emphasis on design, innovation and entrepreneurship; and experiential learning opportunities, including career-focused and perspective-broadening opportunities such as co-operative education, internships, international experiences, and service learning. These are some of the integral and distinctive aspects of a Stevens education.

1. ARTIFICIAL INTELLIGENCE, MACHINE LEARNING, AND CYBERSECURITY



Artificial intelligence (AI) is at the core of many of the emerging technologies that will transform daily life. Machines can now mimic sophisticated functions of the human mind, advancing the cognitive processes that allow them to “learn” without being programmed, an approach known as Machine Learning (ML). ML is what enables driverless cars to plan safe routes, translates vast amounts of health-related data into better medical care, and underpins product recommendations, digital personal assistants, new financial systems, online advertising, and more. Stevens will build capacity in AI/ML research in order to innovate and transform large-scale data sets into actionable knowledge.

In addition to the new and emerging opportunities created by the proliferation of data by individuals, corporations, and governments, new challenges are also created in the form of cyber threats to networks, information systems, and infrastructures. Stevens’ strengths in cybersecurity — reaching from mathematical foundations, formal methods, privacy, network and systems security, and cybersecurity in critical infrastructure, to application areas such

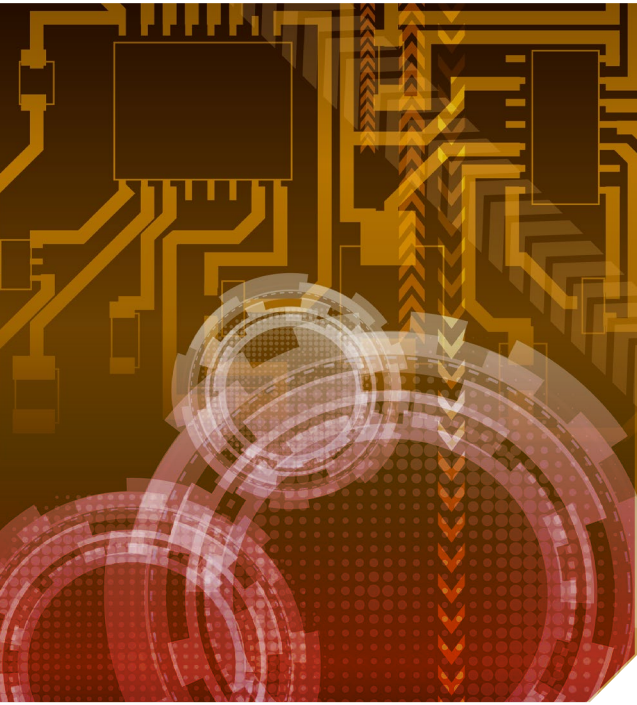
as finance and maritime transportation systems — will be leveraged to develop the tools and methods to confront increasingly sophisticated and damaging cyberattacks and address projected shortages in the cybersecurity workforce. Stevens will also advance this pillar with a vision for educational programs that equip students with strong computational foundations.

2. DATA SCIENCE AND INFORMATION SYSTEMS

The use of data in product design, marketing, and operations is reshaping the modern world. For example, projections by Gartner, Inc., indicate that in less than 12 months, 4.4 million information technology jobs will be created globally, of which 1.9 million will be in the United States. Estimates indicate that the amount of data generated over the last two years is greater than that in the previous history of the human race, with exponential growth projected for the future. More importantly, over the past decade, the value of data has increased at least as fast due to new technology, applications, and products created to understand data in order to support decision making. At Stevens, data science and information systems will be applied to measurement devices, communications networks, data management and analytics, visualization, and user access domains. Multidisciplinary teams of data engineers, computer scientists, domain experts, and statisticians will turn corporate data into knowledge that leads to smart operations and intelligent business decisions. Stevens will fuel progress through novel research in areas such as the confluence of ever-increasing network speeds and higher rates of sensor output from the Internet of Things (IoT), and will contribute to advances in visualization, machine learning, and metaheuristic optimization.



3. COMPLEX SYSTEMS AND NETWORKS



Complex systems, such as healthcare delivery, transportation, and urban infrastructure, are laced with behavioral and social phenomena; values, norms, precedents, and vested interests. Complexity in these systems compromises the ability to predict their behaviors, and to establish the causality of such behaviors. Stevens is committed to playing a leadership role in developing increased understanding of these complex systems, improving their operations, and adding to the value delivered to their constituencies. The performance, safety, security, and economics of such systems involve the interplay between humans and machines, including the ability to foster learning systems. Stevens will use models, simulations, and interactive visualizations to construct policy simulators that enable key stakeholders to explore the complexity of their domains, assess the consequences of various scenarios, and work with multi-disciplinary teams to analyze systemic policies, evaluate underlying assumptions, entertain alternative decisions, and reach well-informed conclusions.

4. FINANCIAL SYSTEMS AND TECHNOLOGIES

Finance was once an industry that operated through interpersonal exchanges, but has evolved into a fundamentally technology-based industry. The field now demands a sophisticated workforce with interdisciplinary expertise across technology, engineering, mathematics, and computer science. Stevens will approach this “new model of finance” by supporting multiple laboratories for financial systems, developing strategic partnerships with key industry constituents, such as First Derivatives and Goldman Sachs, and creating the node for a quantum computing and communications network for financial applications, analytics, and visualization. Excelling in thought leadership, researchers in the Hanlon Financial Systems Center will continue to make seminal contributions to financial cybersecurity, Fintech, and venture capital, as well as high frequency data in finance. With the merger of Stevens’ financial engineering programs into the School of Business, the University will increase and develop its finance footprint to be at the forefront of the needs of and solutions for the contemporary financial industry.



5. BIOMEDICAL ENGINEERING, HEALTHCARE, AND LIFE SCIENCES



The healthcare industry accounts for 18 percent of the nation's Gross Domestic Product and continues to grow. Stevens' Center for Healthcare Innovation (CHI) will lead in this area and will contribute significantly to the pharmaceutical and biotechnology industries, clinical research organizations, medical centers, and start-up companies, as well as to healthcare policy, delivery, and management. The University's interdisciplinary approach will capitalize on innovative content in biology, chemistry, engineering, computer science, healthcare management, pharmaceutical manufacturing, business and ethics, and leverage nano- and micro-scale technologies as innovative enablers for transformative societal impact. CHI will develop technologies and processes to address major areas of unmet medical need in domains ranging from tissue engineering, biomaterials, biosensors, drug discovery, healthcare analytics, and healthcare delivery and will form a unique academic-industry-government enterprise to become a national leader in translational biomedical

innovation. Drug discovery research will include the development of cancer drugs and emerging therapies for traumatic lung injury. Innovations in tissue engineering will advance patient-specific disease models for multiple myeloma, breast and prostate cancer, osteoporosis, and graft versus host disease and include developments in surgical instruments, physiological sensors, remote monitoring, and advanced data analytical tools.

6. RESILIENCE AND SUSTAINABILITY

The resilience and sustainability challenges of the future demand the redesign and re-engineering of urban environments, particularly in coastal locations that are increasingly vulnerable to sea-level rise. A changing climate will lead to more intense and perhaps more frequent storm events, with larger surges and damaging flooding. The ability to forecast and communicate these imminent risks with a high degree of accuracy will play a pivotal role in ensuring that coastal communities will prosper into the future. Stevens' research in resilience and sustainability will respond to the critical need for adaptive science and practice-relevant knowledge in this area. Stevens will advance its unique, combined expertise in multi-scale geophysical fluid flow and biogeochemical fate and transport modeling of legacy and emerging contaminants, science-based parameterization, and data-intensive computing that is well suited to coastal urban ocean engineering. Developing strategies and techniques for sustainability, Stevens will build new programs that meet a range of human needs such as protecting environmental quality, reducing human health risk from exposure to environmental contaminants, and balancing environmental protection with societal benefits and economic growth.





GOALS

The Strategic Plan identifies specific goals that align with the core mission areas of Stevens – undergraduate studies, graduate studies, and research and scholarship. Additionally, we have addressed the critical aspects of Stevens’ culture and governance as well as those goals that cut across these domains and are classified as internal and external bridges. Our goals were informed by a comprehensive benchmarking study that included five peer universities: Carnegie Mellon University; Rensselaer Polytechnic Institute; Lehigh University; and Worcester Polytechnic Institute. In this revision,

we replaced Case Western Reserve University with Northeastern University in our benchmarking peer set, since Northeastern University is better aligned with Stevens and its peers from a variety of perspectives. For the purpose of establishing goals and metrics, the Plan identifies the target of Stevens achieving at or above the median of these universities (for the majority of goals).

Each goal is intentionally quantitative, where possible, in order to ensure measurable progress, accountability, and focus.



GOAL U1

By Fall 2022, Stevens will have an undergraduate student enrollment on the order of 4,000 (compared to 2,427 in Fall 2011 and 3,115 in Fall 2016).

The distribution of enrollment in undergraduate majors will be more balanced between engineering programs and other new and existing technology-centric programs, such as in computer science, science, mathematics, business, humanities, social sciences, and the arts. As our overall undergraduate enrollment increases, so will numbers of undergraduate engineering students. However, in 2022 we will target that the percentage of undergraduate engineering students will be approximately 60 percent as compared to the Fall 2011 baseline of 72 percent and 67 percent in Fall 2016.

In addition, by recruitment of more diverse freshman cohorts, we will aim to have an undergraduate population that meets the following characteristics:

- At least 35 percent female (compared to 25 percent in Fall 2011 and 30 percent in Fall 2016)
- At least 48 percent from outside of New Jersey (compared to 32 percent in Fall 2011 and 38 percent in Fall 2016)
- At least 8 percent international (compared to 5 percent in Fall 2011 and 4.6 percent in Fall 2016)
- At least 15 percent underrepresented minorities (compared to 12 percent in Fall 2011 and 11.6 percent in Fall 2016)

This increase in undergraduate enrollment will be realized through careful alignment of resources with enrollment distribution, including phasing of an expanded faculty to maintain an appropriate student/faculty ratio across the three schools and college, necessary administrative staffing, necessary additions to our physical infrastructure and to student support services. We will also undertake a careful assessment of any proposed new majors to ensure our continued focus on technology, business and entrepreneurship, and to ensure a continued emphasis on student selectivity, student placement and success, and the overall student experience. We mention here the need to build on successful programs that are contributing to student diversity, selectivity, and success, including our athletic programs and our programs in music and theatre, student government, and community service.

To this end, we will also continue to support and expand programs to imbue integrity and professional ethics to our students, including our student-led Honor System. We believe that the process outlined here will result in Stevens being viewed as a national model for how a university can develop and implement a growth strategy that strengthens the University from every perspective.

OWNER: **Vice President Marybeth Murphy, Provost Christophe Pierre**

GOAL U2

As we expand undergraduate enrollment, we will continue to improve student selectivity and therefore the academic profile of the incoming classes. Specifically,

- the percentage of first-time, full-time undergraduate applicants who are admitted will be 37 percent or less for the Fall 2017 incoming class (39 percent in Fall 2016), and 35 percent or less for the Fall 2022 incoming class, compared to a baseline of 42 percent for the Fall 2011 incoming class; and
- the middle 50 percent SAT score of new freshmen will improve to 1280-1450 for the Fall 2022 incoming class² or equivalent ACT score, compared to a baseline of 1190-1390 for the Fall 2011 incoming class and 1260-1440 in Fall 2016.³

In the course of expanding our undergraduate enrollment in the next five years, we will remain cognizant of the importance of our goal to concurrently improve student selectivity, enhance the academic profile of incoming students, and achieve the demographic and diversity goals stated earlier. Therefore, we may need to adjust the rate of enrollment growth depending on our success in achieving all other goals.

OWNER: **Vice President Marybeth Murphy**

GOAL U3

As of Fall 2011, the six-year graduation rate of the freshman cohort of 2005 was 79 percent and 83 percent for the freshman cohort of 2010. The six-year graduation rate of our students will improve to at least 88 percent in Fall 2022 (for the freshman cohort of 2016).

OWNER: **Provost Christophe Pierre, Vice President Marybeth Murphy**

GOAL U4

We will maintain a stellar placement record of at least 95 percent for our students, from a baseline of 92 percent of students securing post-graduation outcomes as of November 1, 2011 and 96 percent in Fall 2016.

OWNER: **Vice President Marybeth Murphy**

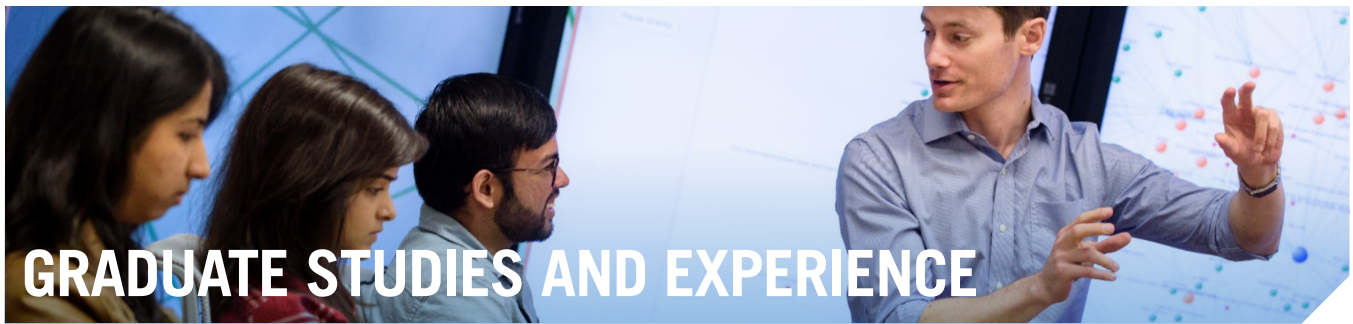
GOAL U5

As a student-centric university, faculty engagement in students' academic experience and excellence in teaching and learning are top priorities. Stevens is committed to continuous improvement in faculty-student interactions, in areas ranging from faculty adoption of research-based best practices in teaching to the use of digital, technology-based and inclusive pedagogical strategies to responsiveness and accessibility to students. By 2018 and with the involvement of faculty, Stevens will develop and/or adopt a holistic approach to evaluating teaching and learning that recognizes the significant variations in teaching environment and that incorporates multiple methods (e.g., peer evaluations, student evaluations, observations, etc.) and sources of data. The approach will be designed to provide timely and meaningful feedback, as well as professional development programming and incentives to ensure all students benefit from high quality teaching and interactions with faculty.

OWNER: **Provost Christophe Pierre**

² This goal may be revised in future years of the Strategic Plan, once the impact of the new SAT, administered for the first time in the Fall 2017 admissions cycle, is understood.

³ A target of 1230-1420 was set in the 2012 Strategic Plan for the Fall 2017 incoming class. This goal was met and exceeded one year early.



GOAL G1

We will develop a vibrant graduate studies enterprise, which critically enriches Stevens by contributing to our intellectual vitality and leading-edge research and scholarship, our financial profile, and our reputation for excellence. In so doing, we will offer a full slate of high-quality graduate programs, encompassing research, professional, and online opportunities. We will also encourage our undergraduates to pursue a Stevens graduate degree to prepare them for the rising demand in jobs requiring post-graduate degrees. We will ensure that graduate FTE enrollments grow by at least 3 percent annually with an overall FTE graduate enrollment of at least 3,025 by 2022. We will diversify the Stevens graduate student population by aggressively increasing the number of domestic students to no less than 25 percent FTE by 2022 and increasing the countries of origin of the graduate population with no more than 30 percent from a single country. We will align resources to achieve graduate enrollment goals and distribution of graduate students among graduate programs.

OWNER: **Provost Christophe Pierre**

GOAL G2

We will grow a high-quality Ph.D. program to which we recruit students from the best institutions worldwide. To this end, we will implement competitive multi-year financial aid packages for Ph.D. students (particularly for research assistantships and fellowships) as well incentive programs for faculty, in order to ensure both retention and on-time graduation of Ph.D. students. By 2022, we will increase the ratio of full-time doctoral students to full-time tenured or tenure-track faculty in STEM fields to 3:1 and 1:1 in the School of Business, and the number of doctoral degrees granted each year to 70 by 2022 on the way to a steady-state of at least 110 doctoral degrees granted per year.

OWNER: **Provost Christophe Pierre**

GOAL G3

We will systematically grow and deploy graduate studies programs with the aim of increasing Stevens' standing in well-recognized rankings such as the *U.S. News & World Report* Best Graduate Schools rankings and the attendant metrics. We will aim for an average GRE Quantitative Score of 162 and a GMAT score of 610 for entering graduate students, and for an acceptance rate of 45 percent by 2022.

OWNER: **Provost Christophe Pierre**

GOAL G4

We will establish a cohesive, integrated, strategic and distinctive approach to continuing, corporate, professional and online graduate programs with the goal of broadening recognition of the Stevens brand nationally and internationally; enrolling students that Stevens would not otherwise attract; and strengthening partnerships with strategic corporations and industries. From a baseline of 316 part-time student FTEs in Fall 2016, we will increase part-time student FTEs to 450 by Fall 2022.

OWNER: **Provost Christophe Pierre**

GOAL G5

We will provide a best-in-class graduate student experience that supports our diverse graduate student population in all its dimensions. Based on benchmark data and student input, we will develop programs, spaces, policies, services and opportunities to ensure graduate students are recognized and feel they are an important and valued constituency within the Stevens community. We will monitor and increase graduate placement rates, in particular, placement of Ph.D. students at academic institutions and research organizations of high reputation, as well as prestigious industry settings.

OWNER: **Provost Christophe Pierre**



GOAL R1

We will create and implement a foundational, holistic research ecosystem to empower faculty and ensure they actively pursue excellence in scholarship and creative activity, research productivity, Ph.D. degree production, and technology transfer. This will involve strengthening the support infrastructure, providing incentives, and, with consultation with faculty, mitigating barriers to increased productivity.

OWNER: **Provost Christophe Pierre**

GOAL R2

All tenure-stream faculty members will be engaged in substantive, original scholarly or creative activities, and will be expected to perform with excellence according to the standards in their respective fields. Non-STEM faculty are expected to be research active as well, with productivity measured by publication in the top-ranked journals and/or other venues, as well as all external support for education and research (e.g., from foundations, funding agencies, and corporations). Single- and multiple-PI peer-reviewed competitive grants are high priorities, as are interdisciplinary team research efforts (centers) within STEM disciplines and across STEM and non-STEM fields. By 2022, research expenditures for Stevens will total \$50 million per year. Each School/College will set objectives for externally-funded research awards as well as the quality and number of publications and scholarly and creative works.

OWNER: **Provost Christophe Pierre**

GOAL R3

We will achieve an ecosystem of innovation and entrepreneurship on campus, which is closely connected to our teaching, research, and technology transfer programs, and which welcomes innovators and entrepreneurs who see the value of associating themselves with Stevens. We will develop and deploy policies and incentives that advance the engagement of faculty and students in entrepreneurial activities, including through the Stevens Venture Center, and will recognize the value of such activities. We will pursue patents and licenses with a primary focus on return on investment.

OWNER: **Provost Christophe Pierre**



GOAL C1

Faculty are the keystone of the institution. Stevens will be uncompromising in recruiting and retaining a faculty of the highest-quality from best-in-class institutions worldwide, in providing them with the environment to succeed, and in recognizing their achievements through promotion and competitive compensation. This will include faculty development programs, incentives, transparent teaching load and research buyout policies, junior and senior Chairs, faculty awards, junior faculty mentoring, etc. Stevens will strategically invest in growing the tenure-stream faculty, with the aim of transforming our performance and productivity in research and scholarship, graduate studies, and thus prestige and reputation.

OWNER: **Provost Christophe Pierre**

GOAL C2

Stevens will develop and sustain a welcoming and supportive work environment that fosters a culture of excellence by applying best-in-class practices and services to advance the overall mission, goals, and strategies of the University through the acquisition, development, retention, recognition, and support of a diverse, inclusive, and engaged faculty and staff.

OWNER: **Vice President Warren Petty**

GOAL C3

Compared to our 2011 baseline, our faculty will increasingly reflect greater diversity from multiple perspectives, including gender and ethnicity. In particular, we will target that at least 30 percent of all new full-time faculty hires will be women in order to increase the percentage of full-time female faculty from the Fall 2016 baseline of 24.6 percent. In addition, we will aim to increase the number of underrepresented minority faculty in our full-time tenure and non-tenure stream faculty by at least two-thirds from the Fall 2016 baseline of nine. We will continue to diversify the administration and staff of Stevens. We will foster an inclusive institutional climate to ensure the retention of all faculty and staff, particularly female and underrepresented minority members.

OWNERS: **Provost Christophe Pierre, Executive Director Susan Metz**

GOAL C4

All salaries (faculty at all levels and disciplines, administrative and staff positions) at Stevens will be benchmarked against an appropriate peer group to ensure quality and ability to attract the very best talent, taking into account the cost of living in the metropolitan area.

OWNER: **Vice President Warren Petty**

GOAL C5

By 2022, a significant percentage of Stevens faculty will be serving in prestigious and influential professional service positions, e.g., on national advisory boards, editorial boards, and in positions of leadership within academic and industry associations. By 2022, we will achieve a steady-state level of at least 3 percent of tenure-stream faculty in sabbatical positions of influence in academic, government, industry, and non-profit sectors.

OWNER: **Provost Christophe Pierre**



GOAL 11

We will develop a new incentive-based budget model, including implementation of an appropriate form of Responsibility Center Management (RCM) for the size and configuration of the Stevens budget. The RCM model will aim to align administrative authority with financial responsibility and accountability at the local level; calibrate resources with priorities by making funding available through the annual budgeting process to achieve the goals of the strategic plan; deploy budget allocations that provide incentives for improved performance above target goals; and spur thoughtful and measured risk-taking.

OWNERS: **Provost Christophe Pierre, Vice President Louis Mayer**

GOAL 12

Periodic external reviews will be conducted for all academic units and programs. High priority will be placed on those units and programs subject to accreditation reviews by MSCHE, ABET and AACSB. Results of reviews will be used to ensure optimal effectiveness and efficient use of University resources.

OWNER: **Provost Christophe Pierre**

GOAL 13

A review methodology and quantitative metrics will be established to assess all administrative functions over a five-year period to evaluate their efficiency and effectiveness, with reference to appropriate external resources such as industry benchmark data and independent program reviews conducted by practitioners from best-in-class institutions.

OWNERS: **President Nariman Farvardin, Vice President Louis Mayer, Vice President Warren Petty**

GOAL 14

We will have a state-of-the art information technology enterprise. The IT and networking infrastructure will be an enabler to advance our academic, research, and administrative functions, providing the tools, technology, and capabilities to lead in our academic focus areas and to maximize the efficiency, effectiveness, and productivity of administrative operations.

OWNER: **Vice President David Dodd**

GOAL 15

Stevens' finances will continue to improve and strengthen, including enhancing the liquidity profile of the University from a baseline of 0.2 in 2012 to a target of a minimum of 1.0 by 2022 (the equivalent of approximately three months of operating expenses, and based on fiscal year-end audited financial statements).

OWNER: **Vice President Louis Mayer**

GOAL 16

Stevens will construct a University Center that will function as the heart of the University and a hub of student, faculty, staff and visitor interactions. In addition, a significant inventory of student housing will be added to our campus through development of new residence halls and modernization of existing dormitories.

OWNER: **Vice President Robert Maffia**

GOAL 17

We will implement plans to create a world-class physical environment for students, faculty, and staff. We will expand and modernize the physical infrastructure to accommodate planned growth and upgrade existing space for instructional, research, student life, residential, and administrative needs, including completion of the Gianforte Academic Center, the North Building, the Babbio Garage expansion, and a University Center and Student Housing project, along with ongoing renovations of classrooms, study spaces, student life spaces, and the campus itself. In addition, Stevens will be a model of sustainability, through innovative energy initiatives, policies, and programs to promote use of biodegradable materials and recycling, and smart transportation initiatives to reduce use of cars.

OWNER: **Vice President Robert Maffia**



GOAL E1

Through *The Power of Stevens* campaign, we will secure at least \$150 million in new gifts and pledges by December 31, 2018 and continue to elevate the level of philanthropic support in the post-campaign period. We will achieve an \$80 million growth in the value of the endowment over 10-years (as calculated by new gifts and pledges and bequest expectancies, but not including return on investment), from a baseline of \$144 million as of June 30, 2011 and \$166 million as of June 30, 2016.

OWNER: **Vice President Brodie Remington**

GOAL E2

We will expand and diversify opportunities for alumni to be more engaged with Stevens, in ways that lead to growth in the University's donor base. The undergraduate alumni giving rate will increase from a 2011 baseline of 17 percent to at least 19 percent by 2017 and to 21 percent by 2022. The average gift, as measured by all gifts above \$10 and under \$10,000 from alumni, will increase from the 2011 baseline of \$353 to \$433 in 2016 and \$550 by 2022. The Office of Development will work closely with academic units in order to increase donations that support and directly relate to the academic enterprise.

OWNER: **Vice President Brodie Remington**

GOAL E3

We will enhance and expand the reputation and increase the prestige of Stevens Institute of Technology among peer institutions, graduate and undergraduate admissions stakeholder groups, business and industry, the media, and other key constituencies commensurate with our substantial contributions in research, the stellar educational, career outcomes and societal impact of our graduates, and our legacy of innovation. We will monitor all generally accepted metrics, and, in particular, the Stevens peer assessment ranking in the U.S. News & World Report's Best Colleges edition will be at least 103 in 2022, compared to 140 in the 2012 edition and 123 in the 2017 edition.⁴

OWNER: **Vice President Edward Stukane**

GOAL E4

Our campus will reflect our proud legacy, our student-centricity, our technology focus, and our commitment to global impact. A compelling campus visitor experience will be created that conveys our rich history, our transformative aspirations for the future, the achievements of our alumni, our educational philosophy, our commitment to sustainability, and our strong relationship with Hoboken. The campus will be a source of pride and engagement for our entire community, inclusive of all key stakeholders in Hoboken.

OWNERS: **President Nariman Farvardin, Vice President Robert Maffia, Vice President Marybeth Murphy, Vice President Edward Stukane**

GOAL E5

We will continue to develop synergies and collaborations between Stevens and the Hoboken community that span academic and research interests, student life and volunteerism, employee and community engagement, cultural and performing arts programming, entrepreneurship and economic impact, and other areas that contribute to the mutual benefit of Stevens and Hoboken.

OWNERS: **President Nariman Farvardin, Provost Christophe Pierre, Vice President Marybeth Murphy**

GOAL E6

We will forge a small number of meaningful and mutually-beneficial agreements with prestigious domestic and international partner institutions that significantly enhance the work of the faculty and the learning opportunities for students from both universities.

OWNERS: **President Nariman Farvardin, Provost Christophe Pierre**

GOAL E7

Stevens will become a more corporate-friendly university in all its dimensions: undergraduate and graduate student engagements with corporations (including internships, co-operative education, student and faculty projects, and career transition), research collaborations, corporate and professional education programs, philanthropic support, and other joint programs.

OWNER: **President Nariman Farvardin**

⁴ 2012 edition was published in Fall 2011 and the 2017 edition was published in Fall 2016.



The Stevens Legacy

For more than two centuries, the extraordinary Stevens family helped shape the nation. They left their mark as inventors, engineers, and transportation pioneers.

Their legacy lives on through Stevens' Institute of Technology, which has preserved their original ideas and original

Inventing the Future

From arriving in the United States to corporate efficiency, the Stevens family shaped the world in



Sculptures that Move
 Sculptures that move...
 The first and greatest of sculptors, the Stevens family...
 in Stevens, NJ, making, making, making...
 in the U.S. Williams County

Reaching New Heights
 Since Stevens graduates have been...
 the first and greatest of sculptors...
 An engineer at the time of Paul &...
 in the U.S. Williams County

The final five years of the implementation of the 10-year Strategic Plan aims to continue Stevens' ascent to achieve the 2012 Plan's stated goal, *to become a premier, student-centric, technological research university.*

Like the original plan, this five-year “update” of the 10-year Plan sets high expectations for engagement and excellence for all key stakeholders—faculty, administration, staff, students, alumni, and friends. Like the 2012 Plan, this update is careful to focus on the “whats,” rather than being overly prescriptive with regard to the “hows.” However, the details of implementation continue to be essential and must be developed carefully and deliberately each year.

Implementation plans—developed by the member(s) of the executive leadership team responsible for achieving each goal—have been and will continue to be summarized in the annual Strategic Plan Report for review by the entire Stevens community. The “owner(s)” of each goal have in the past and will continue to provide the next year’s implementation plan for review by participants⁵ of an annual leadership retreat focusing on implementation. These retreats have been held each summer from 2012 to 2015⁶, and will continue from 2017 to 2022. Attendees at these Strategic Planning Implementation Retreats regularly include the President’s Cabinet, the Academic Council, and will henceforth include representatives of the Faculty Senate, and key personnel with responsibility for undergraduate and graduate recruitment, fundraising, and institutional research.⁷

As noted above and consistent with the practice of the past five years, all goals have been assigned to a Vice President, who has the accountability and authority to ensure that: appropriate progress is made toward each goal; appropriate policies exist or are developed to enable progress; and appropriate resource allocation—within the context of the University’s financial profile and constraints—is in place to achieve the annual and culminating goals and objectives. Each Vice President will then assign goals to the relevant personnel within his or her division.

Unlike the first five years of the implementation of the Strategic Plan, the Deans and the academic leadership reporting to the Provost will have increased engagement, accountability, and authority in implementing the academic-related aspects of the Strategic Plan. As a result of the Responsibility Center Management budgeting process and through School and Department-level efforts, unit-level targets will be set, and resources will be allocated that support the institutional goals established in this Plan. Each Dean will work proactively with his/her faculty to develop School and Department-level implementation plans for the academic-related goals, and the Provost and the academic leadership will continuously collaborate with the Faculty Senate to develop and deploy Stevens-wide implementation plans for these goals. The Faculty Senate, in turn, in close collaboration

with the standing committees of the faculty, such as the Academic Planning and Resources Committee (APAR), the Research and Entrepreneurship Committee, and the Institute Curriculum Committee will examine the existing implementation plan and procedures and seek input from the faculty at large.

It is noteworthy that the School of Business has created its own Strategic Plan, which has served as the blueprint for the School's stellar progress over the last five years. The College of Arts and Letters has embarked on its own strategic planning process, and, under the leadership of newly-appointed Dean Jean Zu, the Schaefer School of Engineering and Science will soon launch its own strategic planning process. Once a new Dean of the School of Systems and Enterprises is named, the strategic planning process begun under interim Dean Anthony Barrese will be formalized. These School-level strategic plans will provide the detailed and customized implementation approaches and targets relevant to each unit.

Updates on progress and implementation have been and will continue to be provided regularly to various constituencies within the University, including at Cabinet meetings and Faculty Senate meetings. Once-per-semester *Conversation with the President* presentations also provide updates on implementation and progress toward goals of the strategic plan, with opportunity for discussion and questions from the community. In addition, during the period from 2017 to 2022, the Provost and Deans will present implementation and progress updates regularly at faculty meetings and/or Faculty Senate meetings, and other Vice Presidents will provide regular updates as invited, too. The Faculty Senate and the standing committees will communicate regularly on the implementation process with the faculty at large, especially at faculty meetings.

The Office of the President will continue to convene annual leadership retreats and, with the participation of the Office of Institutional Research and Assessment and participating units, issue an annual Strategic Plan Implementation Report for the entire Stevens Community. This report will provide an objective measure of progress, ensure the continued engagement of the community, celebrate achievements, course-correct if necessary, and provide the data necessary to refine implementation or address unforeseen challenges in the future.

Results of implementation efforts—as well external trends and forces—will be closely monitored, as occurred during the first five years of implementation. As in the prior period, leadership may adjust goals and tactics depending on the changing circumstances. Therefore, the Strategic Plan will continue to be a living document.

⁵ Implementation plans for each goal are outlined in the annual strategic plan report for the following year, and annual objectives are specified in each Vice President's "objectives letter" for the following fiscal year. Annual merit and incentive awards are based on progress toward these annual objectives.

⁶ Because of transitions in key academic leadership positions, the annual retreat in Summer 2016 was postponed until February 2017 and used to discuss the Strategic Plan revision. It included the Cabinet, Academic Council, Strategic Plan Steering Committee, and Chair of the Faculty Senate.

⁷ The date of the 2017 retreat has been set for Aug. 29, 2017 at Liberty Science Center.

MEMBERS OF THE STRATEGIC PLAN MIDPOINT REVIEW STEERING COMMITTEE

Dr. Nariman Farvardin appointed 11 members of the Stevens community to steward the Strategic Plan Midpoint Review process and subsequent update to the Strategic Plan. Steering Committee members were selected from among various constituent groups including faculty, staff/administration and students. The Steering Committee was charged with guiding the development of the Strategic Plan Midpoint Update through engaging and liaising with Stevens' stakeholders, collecting and synthesizing input, and making recommendations for revisions. This Strategic Plan Midpoint Update benefited from the important service and dedicated efforts of the following members of the Steering Committee:

Dr. Christophe Pierre [Chair], Provost and Vice President for Academic Affairs

Dr. Giuseppe Ateniese, the David and GG Farber Endowed Chair in Computer Science, Professor and Department Director

Dr. Yingying (Jennifer) Chen, Professor and NIS Graduate Program Director, Department of Electrical and Computer Engineering

Dr. Frank Fisher, Associate Professor and Interim Department Director, Department of Mechanical Engineering

Dr. Thomas Herrington, Research Associate Professor, Department of Civil, Environmental and Ocean Engineering

Dr. Lou Mayer, Chief Financial Officer, Vice President for Finance and Treasurer

Ms. Beth McGrath, Chief of Staff and Director of Community and State Relations, Office of the President

Dr. Roshanak Nilchiani, Associate Professor, School of Systems and Enterprises

Dr. Gregory Prastacos, Dean, School of Business

Dr. Michael Steinmann, Professor, College of Arts and Letters

Ms. Hannah Timm, Class of 2018, Vice President of Academic Affairs of the Stevens Student Government Association

Ms. Ruani Ribe, [Staff Support to the Committee] Senior Project Manager, Office of the President



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