Renaissance at Rensselaer

THE RENSSELAER PLAN

APPROVED BY THE BOARD
OF TRUSTEES MAY 2000

Through the bold vision of *The Rensselaer Plan*, a renaissance is under way at Rensselaer Polytechnic Institute.

Indeed, an extraordinary transformation is happening across the nation's oldest technological university—in its people, its programs, and its facilities and other platforms.

Since the plan's genesis, which began with my inaugural address in September 1999, and culminated with approval by the Board of Trustees in May 2000, Rensselaer has experienced unprecedented growth and renewal. Progress has been rapid and significant. In short, the plan's "we will" statements are quickly becoming "we are" actions.

Rensselaer has always achieved great things. The plan continues to serve as our roadmap for improvement and change. To that end, our journey into this burgeoning renaissance at Rensselaer has just begun.

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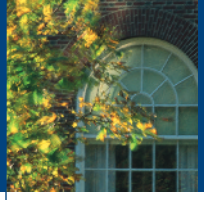
Rensselaer

TABLE OF CONTENTS



1. THE GOAL

Rensselaer pursues this goal:

To achieve greater prominence in the 21st century as a top-tier world-class technological research university with global reach and global impact.

Education and research are inextricably linked in world-class universities.

Excellence in education inspired the founders of Rensselaer, and innovative pedagogy remains a core value of the Institute. To provide leading-edge education, we must be leaders in key research fields, for the creation of the new knowledge is critical to a stimulating learning environment for our students. Cutting-edge research enables us to make our students partners in discovery and open their minds to inquiry. The Institute will, therefore, assign added emphasis to research and scholarship as a key constituent of excellence in education.

A research university is a community of learners.

Research potentiates education, bringing it to full flower. To paraphrase Dr. Paul Gray, President Emeritus and Chairman Emeritus of MIT, a research university is a community of learners – some young, some older – engaged together in creating, disseminating, and applying knowledge, using existing knowledge, skills, and judgment. Research, therefore, is about learning. At the same time, education can be defined as bringing students to the point of self-sufficiency, that is, learning how to proceed when no one knows the answer. Education, therefore, is about research.

Research and education drive reputation.

As it gains greater prominence as a world-class technological research university, Rensselaer will enhance its ability to achieve several interrelated goals – attracting highly talented students and well-respected faculty and staff, expanding geographic reach, and increasing financial support from private and public sources.

Strategic focus is essential to achieving our goal.

Rensselaer will build on its distinctive strengths in interdisciplinary inquiry, interactive learning, and technological entrepreneurship to:

- Enhance national leadership in innovative learning and teaching by providing outstanding and distinctive EDUCATION for resident undergraduates and graduate students, and for working professionals. Educational programs will incorporate interactive pedagogies, provide an engaging student experience, and create lifetime connections with Rensselaer.
- Dramatically expand the RESEARCH ENTERPRISE, including associated graduate education, by (i) creating new Institutewide initiatives in two research arenas closely aligned with societal and global priorities: information technology and biotechnology; (ii) building on and enhancing existing core research strengths; and (iii) supporting additional critical priorities in areas that offer opportunities for research leadership.
- Increase SCIENTIFIC AND TECHNOLOGICAL ENTREPRENEURSHIP across education, research, technology commercialization, new venture creation, and regional economic development.
- Achieve true intellectual, geographic, gender, and ethnic DIVERSITY in our students, faculty, and staff in order to draw upon the best talent available, and to prepare our students to work and lead in a global economy.
- Draw vitality from, and add vitality to our diverse COMMUNITIES on campus, among alumni and friends, and in the city, region, state, nation, and around the globe.
- Redesign and invigorate ENABLING ACTIVITIES to focus Rensselaer's people, administrative processes, information infrastructure, physical facilities, and financial resources on the realization of strategic goals.

Three fundamental markers will drive our actions: Excellence, Leadership, and Community.
Excellence is the mantra and the metric. Leadership suggests we participate in shaping the agenda and discourse in areas related to our mission and plans. Community compels us to be one Rensselaer as we develop and maintain essential roles and partnerships within local, state, national, and international communities.

As we build toward the goal, we insist on excellence, leadership, and community in every aspect of the Institute: in each core enterprise – resident undergraduate education, research and graduate education, education for working professionals, and scientific and technological entrepreneurship; in each academic and administrative unit; and most importantly, in the people of Rensselaer – its faculty, students, staff, alumni, and friends.

Finally, we will drive "new" resources – be they substantial new resources or savings from effective use of existing resources – to areas of the highest priority. *Under The Rensselaer Plan, discretionary, incentive, and new resources will be directed to identified priorities in research, pedagogy, and other core activities.*

2. FUNDAMENTALS

We will achieve our goal by embracing our core values, identifying the key characteristics and strengths on which we will build, and understanding the necessity of integrated planning and action.

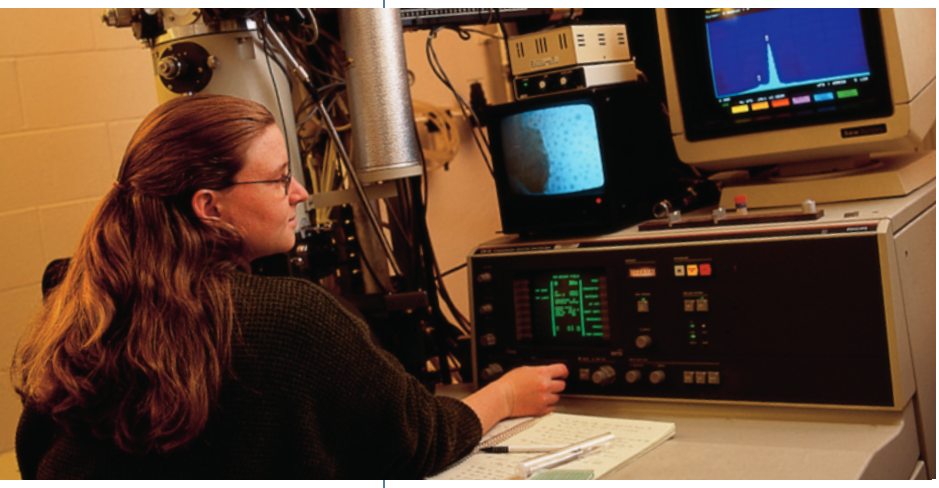
2.1 Rensselaer Today

Over nearly two centuries, Rensselaer Polytechnic Institute has maintained its reputation for providing an undergraduate education of undisputed intellectual rigor based on exceptional pedagogical innovation. As a research university, Rensselaer has attracted outstanding faculty whose research programs range from microelectronics to computational modeling and simulation, mathematical finance, advanced materials, environmental studies, lighting, and electronic arts. Rensselaer's graduate engineering program ranks 19th in the nation.

The Schools of Engineering, Science, Architecture, Humanities and Social Sciences, and Management and Technology, and the interdisciplinary Faculty of Information Technology educate 9,600 students, enrolling 5,000 undergraduates and 1,800 graduate students in residential programs. Rensselaer also enrolls 2,800 students in distance programs and at Rensselaer at Hartford. Rensselaer has earned distinction in interactive learning and the application of information technology to education. New programs have enriched the profile of the student body. The Rensselaer degree is highly regarded, and graduates are aggressively sought by industry, universities, and the public sector. Recent initiatives include new interdisciplinary degree programs in bioinformatics and information technology.

Rensselaer builds on unique strengths: A tradition of interdisciplinary inquiry, leadership in interactive learning, and a history of technological entrepreneurship.

Current annual research funding totals $40 million. A significant portion of this support comes from industry, well above the national average, and testimony to the importance of Rensselaer research to the private sector. The Institute is a pioneer in interdisciplinary research and has expanded its programs by making focused research investments supported by strong industry partnerships in such fields as microelectronics, advanced materials, scientific computation, polymer science, industrial automation, and lighting research.



In the last 20 years Rensselaer has encouraged technology partnerships and dissemination, developing an internationally recognized incubator center and a flourishing technology park. More recently the Institute has focused on technological entrepreneurship, commercializing leading-edge research and creating new business ventures.

2.2 Unique Strengths

Looking forward, Rensselaer builds on a unique combination of strengths.

Interdisciplinary inquiry. Rensselaer has excelled in employing multidisciplinary and interdisciplinary approaches in curriculum, teaching, research, and outreach. The Institute has been aggressive in building alliances with partners with complementary expertise. Interdisciplinarity is the Institute's most exploitable competitive advantage.

Interactive learning. The value of learning by doing was a central proposition in Rensselaer's first plan of education. At a time when recitation was the dominant educational model, early Rensselaer students were involved in laboratory demonstrations, taking responsibility for discovery and learning. Today, 175 years later, the Institute still is a recognized leader in interactive learning, using technology and teamwork to involve students as active participants in their own educations – both on campus and at distance.

Technological entrepreneurship. Rensselaer was founded in 1824 "for the purpose of instructing persons…in the application of science to the common purposes of life." Rensselaer people have performed the research, developed the technologies, produced the innovations, and formed the enterprises that defined and accomplished the technological agendas of the 19th and 20th centuries. They will do so in the 21st century.

Rensselaer has achieved distinction by focusing its considerable talents and energies on its unique strengths. We will infuse interdisciplinary inquiry, interactive learning, and technological entrepreneurship in all that we do. We will reach our goal by employing strategic focus, energy, agility, comity, and uncommon will.

2.3 Opportunity and Challenge

Focused technological universities in the United States enjoy an extraordinary range of opportunities. Technological innovation is driving national prosperity and is a clearly understood priority of both lawmakers and the public. U.S. high-technology industries, often spun out of universities, have gained international dominance. They have achieved unprecedented support and recognition as the leading industries of the new century. As their investors and creators have acquired wealth, they are increasing their philanthropic contributions to higher education. At the same time, federal research budgets for the physical, information, and especially, biological sciences are growing, spurred by societal priorities, and urged on by industry, which increasingly turns to technological universities as partners in research, in business, and in technological education.

As Rensselaer moves forward, so also does its peer group of technological research universities, all intent on enhancing their leadership positions. Among these schools, we are small and under-resourced. While we have achieved international prominence in innovative pedagogy and specific research areas, the pace of growth in research funding, research degrees, and endowment has lagged behind most major research universities, a reality that is reflected in our ranking as a national university. While we have realized extraordinary accomplishments with limited resources, the gap between our aspirations and our means continues to grow.

To strengthen education, enhance reputation, and increase the flow of resources, Rensselaer thus must pledge a much deeper commitment to research and graduate education, while extending our excellence in undergraduate education.

Our ability to attract and retain the best faculty, and therefore the best students, will be critical for attaining these goals. Rensselaer thus must reflect the diversity of the global community in order to have the best talent as well as the multiple perspectives and innovations necessary for a world-class technological research university.

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2.4 Planning and The Rensselaer Plan

Stephen Van Rensselaer and Amos Eaton launched their "magnificent experiment" in 1824 with The Rensselaerean Plan, a historic statement that gave form to Eaton's vision for applying science to life's common purposes. The Rensselaer Plan is a 21st century expression of this tradition.

Performance Plans: The Next Step

Following approval of The Rensselaer Plan, each school and administrative division will create a Performance Plan that defines the proposed means (action, timetable, and resources) for achieving the Institute's goal as well as the metrics that will be used to measure progress. Performance Plans will provide a three-year forward look.

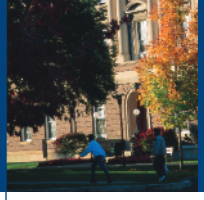
Within the framework established by The Rensselaer Plan, the President and Cabinet will prioritize actions across all Performance Plans by asking these questions:

- Where are we in a position of leadership, and what will it take to maintain that position?
- Where do we have the potential for leadership, and what will it take to achieve that position?
- Where else must we move aggressively to achieve our goal, and what will it take to stake out a position?
- What areas of current endeavor are we willing to transform, or give up, to focus our resources and energies to achieve the goal?

As the activities proposed by the Performance Plans are assigned priorities, they serve, in total, to define priorities Institutewide. These plans become the basis for investments of discretionary, incentive, and new resources, and create the case to secure substantial financial investments from private and government sources, including the next fund-raising campaign.

Each year, results are assessed against the appropriate metrics, Performance Plans are revised, and the next year's Operating Plan (budget, capital projects, etc.) is constructed.

All three levels of planning – The Rensselaer Plan, school and division performance plans, and annual operating plans – create an integrated and dynamic blueprint for achieving Rensselaer's goal of greater prominence as a top-tier world-class technological research university.



The Rensselaer Plan articulates a strategic vision and delineates the means to achieve it. An "evergreen" plan designed to be revised on a regular basis, *The Rensselaer Plan will guide our decisions and provide the framework for school and divisional performance plans that will serve as the basis for each year's operating plan and budget. Performance plans will define means and metrics, and when prioritized, will create the case for major new resources.*

Cutting-edge research enables us to make our students partners in discovery and open their minds to inquiry.

Integrated effort has created The Rensselaer Plan, and integrated effort will realize its vision. We are a diverse community comprising a broad array of talents and perspectives. Even as we celebrate this diversity, we are united in pursuit of a common goal: greater prominence as a top-tier world-class technological research university with global reach and global impact.

3. RESIDENT UNDERGRADUATE EDUCATION

Rensselaer is committed to an undergraduate experience that surpasses all others, combining theory and hands-on experience as the means to educate tomorrow's leaders for technologically based careers. The Institute will enroll outstanding undergraduate students in excellent programs distinguished by interactive pedagogies, partnerships with faculty in research and innovation, seamless customer service, and a campus culture and engaging student experience that create a lifelong relationship with the Institute.

3.1 Undergraduate Programs and Students

Excellence in undergraduate education requires constant improvement in the quality of programs, and the makeup of the student body. We will continue to provide compelling programs that suggest exciting futures; provide a firm grounding in the fundamentals; bridge knowledge to practice; emphasize discovery, reasoning, and action; inculcate a world perspective and cultural understanding; and produce leaders. We will:

- Offer a rich portfolio of traditional and nontraditional choices related to technology, the scientific underpinnings of technology, the technological professions, and the human and social dimensions of technology.
- Create course concentrations, minors, second disciplines, dual degrees, interdisciplinary projects, and other structures that enable students to work at the intersections of disciplines and forge exciting individual career trajectories.
- Update the core curriculum to reflect advances in research strengths, including information technology, biotechnology, and scientific and technological entrepreneurship.
- Offer excellent courses in the arts, sciences, humanities, and social sciences that provide strong foundations and enable students to understand and work within the cultural, social, economic, and political contexts in which they will be expected to lead.
- Integrate outcomes assessment and evaluation into all education programs, ensuring timely and continuous improvement.

Outstanding programs are geared to outstanding students who will be enriched by and add value to Rensselaer. We will:

- Set the undergraduate student body size at approximately 5,000 undergraduate students.
- Increase admissions selectivity, with particular attention to mathematics/science credentials and high school performance (especially in AP and honors courses).

- Seek diversity in its broadest and richest sense, including intellectual and cultural breadth, athletic ability, and entrepreneurial interest.
- Seek greater ethnic and gender diversity by employing new recruiting mechanisms and providing a hospitable climate for all students.
- Recruit nationally, broadening the geographic base of target schools, developing linkages with new schools, especially those enrolling students underrepresented in science and technology, and developing joint education programs with key partners.
- Graduate students known for their abilities as innovative problem-solvers, excellent communicators, interdisciplinary thinkers, team participants, and skilled leaders.

3.2 Interactive Learning

Rensselaer's internationally recognized leadership position in interactive teaching and learning provides an exceptional foundation for excellent and distinctive undergraduate education programs. Given the urgent need to excite and engage a nation of learners about science and technology, and given the importance of distinctive education programs to our success as a top-tier world-class technological university, The Rensselaer Plan nurtures and enhances interactive teaching and learning as an Institutewide enterprise. We will:

- Investigate new interactive pedagogies across all curricula, forging a deeper relationship between student and teacher.
- Engage students in collaborative learning experiences, taking advantage of technology to facilitate interactivity and teamwork skills to solve problems.

Interactive Learning: Achieving Distinction Through an Integrated Effort

Amos Eaton's Rensselaerean Plan expressed a central proposition that students learned best by doing. Students who teach truly learn the material. Students who experiment both create new knowledge and discover new applications of existing knowledge. Interactive teaching and learning are deeply rooted in the Institute's history and core.

Interactive learning, thus, is aligned with an essential societal priority: the need to interest and engage this nation in science and technology education – from youngsters starting school, to students arriving at college, to undergraduates choosing advanced study, and to older Americans who did not grow up with today's technology.

Interactive learning has touched nearly every part of the Institute. Science has introduced technology in transformational ways. Architecture has provided the studio model used in many courses. Engineering has produced dynamic and exciting studios. Management and Technology has taken leadership in team-based learning. Humanities and Social Sciences has developed innovative first-year studies courses where students encounter a range of disciplines in the pursuit of important issues or questions. The Archer Center for Student Leadership Development has been in the forefront of teaching leadership and followership both inside and outside the curriculum. The Anderson Center for Innovation in Undergraduate Education has served as an incubator for curriculum reform by supporting faculty involvement in educational computing, developing new techniques and facilities for interactive learning, and sponsoring cutting-edge research about assessment techniques to measure learning outcomes.

Interactive learning has been multiplicative, accelerating the pace of change. Experiments in one course or department have been transferred to other faculty, courses, and departments. Interactive pedagogies have been applied in distance courses. Schools and departments have reformed entire curricula to reflect new ways of learning. Student consultants have helped faculty members to innovate. Mobile computing has become a way of life. The Web has become ubiquitous as the means to access course materials, search for information, register for courses, share resumes with employers, and many other tasks.

Our leadership in interactive learning has garnered external recognition for Rensselaer. We have earned major national awards, created academic centers, such as the Academy of Electronic Media, and a major externally funded center, the Center for Academic Transformation, a project of The Pew Charitable Trusts. We are routinely queried, visited, and cited by colleagues from all over the world.

- Customize the learning experience to individual needs, deploying interactive pedagogies to engage a full range of backgrounds and learning styles.

> Rensselaer's educational strength lies in its ability to examine concepts and ideas across disciplines and relate them to the world of practice.

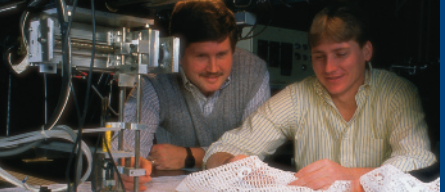
- Use interactive pedagogies to create "virtual environments" that extend the student experience in time and space, sharing courses among universities and creating virtual classrooms, discussion groups, and project settings with faculty and students at other universities, and with researchers, innovators, entrepreneurs, and policy-makers around the world.
- Develop continuous and interactive assessment techniques so that testing becomes a tool for learning.
- Pursue leadership in the use of technology in education, developing deeper understanding of how we learn, accelerating the pace of innovation in interactive learning, and providing opportunities to showcase innovative results.

3.3 Participation in Research and Innovation

Rensselaer's educational strength lies in its ability to examine concepts and ideas across disciplines and relate them to the world of practice. Our emphasis on leadership, teamwork, and communication skills transcends traditional courses or even disciplines. To enable our students to attain their full potential in the discovery and responsible application of knowledge, it is essential to involve them in the research work of the Institute. We will:

- Provide incentives for faculty who open their labs to undergraduate students to create research opportunities, facilitate faculty/student interaction, and expand the pipeline of bright, eager students into graduate study.
- Focus participation in research as a means to cultivate women and students of color to expand their representation in our faculty.
- Ensure that all students have a research experience by enlarging the Undergraduate Research Program, and by adding a thesis or comparable major scholarly work requirement for seniors.
- Expand the number of co-op, internship, and project opportunities for students in Rensselaer's innovation enterprises in the incubator program and technology park as well as in programs conducted by other universities, industry, and government. Include opportunities that may be virtual, or short-term.

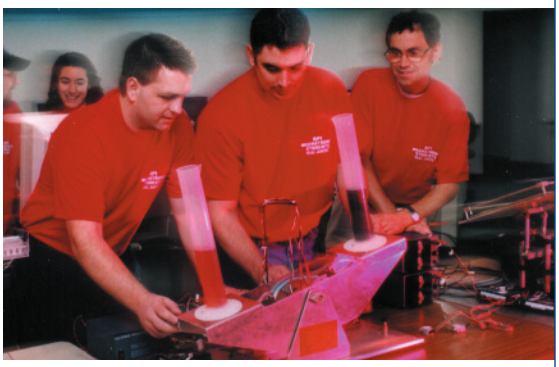
Rensselaer's unquestioned leadership in interactive teaching and learning will be at the core of the Plan's commitment to undergraduate education



3.4 An Engaging Student Experience

We will provide experiential, residential, and recreational environments that embrace our students and connect them to Rensselaer for life. This begins with a demonstrated commitment to student success that extends from their earliest contact with Rensselaer through the student and alumni years. We will:

- Restructure student orientation programs to build strong affinity groups – including wilderness, community-based, cultural, or other team-building experiences – that will commence before classes begin and continue into the first semester.
- Provide pervasive opportunities for student enterprise, entrepreneurship, community service, and leadership development within academic programs, outside the classroom, in residential settings on campus, and in sororities and fraternities. Utilize the Rensselaer Union and the Archer Center for Student Leadership Development as unique resources in these efforts.
- Empower students as learners and entrepreneurs who design and manage projects, processes, and organizations as students.
- Enliven campus life by creating social activities, competitions, and occasions to celebrate achievement, honor tradition, and create a culture in which students see themselves as belonging to the larger university community.
- Create improved presentation and performance spaces on the campus through renovation or new construction.
- Undertake rolling renovation and/or replacement of residence halls for undergraduates according to an integrated Institutewide capital plan.
- Replace or renovate athletic facilities according to an integrated Institutewide capital plan.
- Ensure full-time coaching staff for all women's and men's intercollegiate sports programs.



3.5 Seamless Student Service

The Institute is under an obligation to support students in managing the logistics of their education. These services include outstanding academic advising; career, health, and counseling services; and consolidated, timely, and accurate information on courses and educational opportunities, progress to degree, financial aid, and account status. We will, for *all* students:

- Increase the accessibility, connectivity, and reliability of information systems affecting student life; this includes upgrading the Institute's Web presence as a constant source of information and interaction with others, and completing the "wiring" of the campus for communication, information, and academic and research needs (see also 8.2).
- Provide information proactively, with the goal of enabling students to resolve issues and problems.
- Set standards for providing students and their families and sponsors with professional, competent, efficient, and friendly customer service, and redesign processes to meet these standards.
- Provide the staff and faculty who serve students with the tools, training, and performance metrics required for seamless service.

At the end of the day, Rensselaer will advance a rich research portfolio.

4. RESEARCH AND GRADUATE EDUCATION

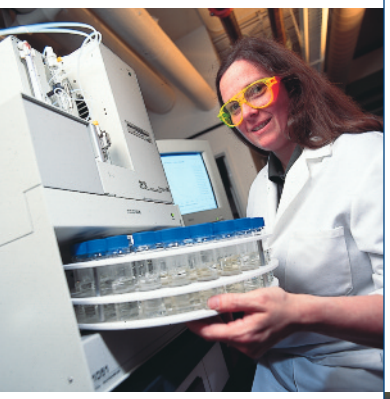
Research, fundamental to a great university, is a public trust. *The most significant transformation posited by The Rensselaer Plan is the imperative that Rensselaer create a research portfolio of substantially greater size, quality, prominence, and impact.*

Rensselaer has long taken great pride in graduates who are highly prized by employers, have immediate impact, and step up to leadership in technology-based careers. In times of very rapid technological change, our graduates cannot do this unless they are educated in an environment of leading-edge research and innovation. By building research programs, and involving students in research activity, we will preserve and enhance our historic strength in undergraduate education.

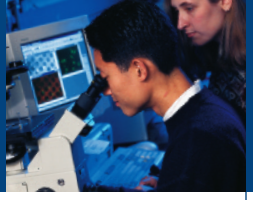
Research is a creative process that generates new principles and spawns new technologies. Such technological innovation stokes the engine of economic growth, and connects the university research enterprise to a cycle that catalyzes the development of new industries and supplies a highly educated up-to-date workforce.

Rensselaer will grow from an institution centered on undergraduate education with selected research strengths to a full research university. Rensselaer research in the future will extend over a broad portfolio that puts the Institute in a leadership position both in established fields and in evolving areas of inquiry that hold out great promise and opportunity.

The Rensselaer Plan sets its sights on tier-one ranking among U.S. technological research universities, with a goal of expanding research funding from $40 million to $100 million annually in five years and doubling from 125 to 250, the number of doctorates a year over the next eight to 10 years.



Rensselaer will grow its research enterprise dramatically in the next decade and greatly expand doctoral programs.



4.1 Enhancing and Growing Research

Greatness demands balance among the range of disciplines that comprise a fully realized technological university. To innovate and to offer the best education, each of Rensselaer's schools must be excellent in research and recognized in its own right.

Rensselaer will encourage a full range of individual and group scholarly activity. We will make dramatic investments that substantially increase our involvement in two new arenas vital for national well being and growth: *information technology* and *biotechnology*. We will add emphasis in areas of core strength with important future trajectories. We will invest in a limited number of additional research focus areas, with priorities established in the performance planning process.

Looking ahead to dramatic growth, we will build on a track record of success in interdisciplinary research and a long history of technological innovation. *We will emphasize careful selection of research problems, do research at interdisciplinary intersections, exploit our "low walls," and build strategic alliances to magnify impact. We will enhance basic research in areas that undergird selected focal areas. We will grow graduate programs associated with research and the education of researchers, and we will improve the infrastructure and resources necessary for research and graduate education.*

At the end of the day, Rensselaer will advance a rich research portfolio. To support this portfolio, we will:

- Recruit and support world-class faculty in identified priority areas.
- Review the organization of research centers and programs, and restructure and/or sunset them to ensure excellence and sustainability.
- Reorganize research facilities to increase research productivity, creating infrastructure, staff, and research equipment that support several or many research programs.
- Implement research policies (research staff, facilities management, student support, charge-out, cost sharing, and intellectual property policies) sufficient to the task.
- Provide research and researchers with internal and external visibility, including publications, Web features, alumni seminars, and living campus exhibits designed to capture the imaginations of prospective students, staff, and visitors.
- Exploit research results to drive innovation and entrepreneurship.
- Expand and improve inquiry-based graduate programs as an integral aspect of research planning and delivery.

The Research Portfolio

Rensselaer has excelled in frontier research, and has achieved international distinction in many fields. Interdisciplinary centers of excellence with strong industrial participation have been a hallmark, involving focused research programs in microelectronics, industrial automation, scientific computation, composite materials, polymer synthesis, environmental ecosystems, image processing, electronic media, lighting, civil infrastructure, multiphase systems, services, and entrepreneurship. These programs integrate basic and applied research with industrial needs, and have developed a base of support from complementary federal, state, and industry sources.

Each year, faculty receive professional recognition for their contributions in a wide range of fields. Partnerships with other laboratories and institutions are growing as models for research. Examples include cooperative programs in networking and communications, power electronics, earthquake engineering, transportation studies, and semiconductor manufacturing.

As science and technology play an increasingly important role in our society and economy, social, political, and economic studies of policies and impacts are an essential part of the Rensselaer research portfolio. These programs cut across the scientific disciplines, provide important commentary on ethics and outcomes, and enrich the intellectual environment of the Institute, engaging faculty and students in the dialogue of "why" and "what if," and not just "how."

4.2 Core Research Strengths

An essential component of our strategy to increase prominence in research will lie in identifying areas of existing distinction that represent future growth and broad impact in key research areas. These *core strengths* represent opportunities for the Institute's continuing leadership in fields that promise increased significance, new intellectual challenges, and relevance to broad societal and technological needs. In addition, these core strengths link our existing enterprise to new and exciting research arenas.

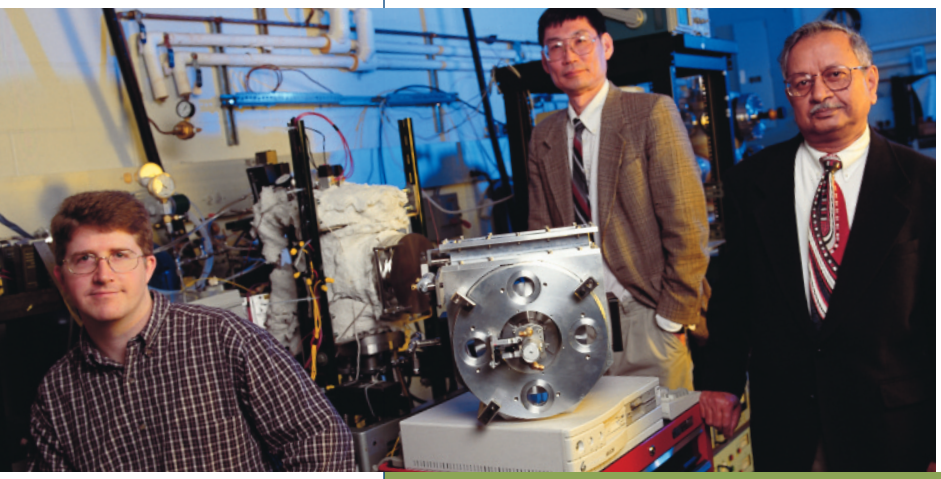
Three core research strengths on which Rensselaer will build are:

- Microelectronics, photonics, and microsystems technologies
- Advanced materials and nanotechnology
- Modeling and simulation of complex systems

Each core research strength cuts across multiple schools and departments, exemplifies interdisciplinary effort, and holds promise for stimulating the development of new fields of research. Each has achieved distinction. Each serves as a sound foundation for continued progress and deserves priority status for institutional investment.

4.3 New Research Arenas: Information Technology and Biotechnology

As an early and integral component of our strategy to enhance position and distinction, we will focus investment in two Institutewide research arenas: information technology (IT) and biotechnology.



Global societal priorities offer great opportunity for Rensselaer to develop sharply focused areas of excellence within the biotechnology and information technology arenas.

Core Research Strengths

Microelectronics, Photonics, and Microsystems Technologies

Rensselaer researchers have made important contributions to the science and technology of interconnects, devices, architectures, and packaging that will enable the next generations of micro- and nanoelectronic systems. As integrated circuit chips become smaller, faster, and more dense, they approach physical limits that challenge researchers to achieve new breakthroughs. Single electron transistors, quantum wells, molecular and spin electronics, and quantum information systems are examples of new research arenas.

In recent years, chip technologies have been used to build more than just electronics. By combining sensors, actuators, and even chemical processes on a chip, entirely new types of microsystems have been built. Biosensors, gene sequencing chips, microelectromechanical systems, microfluidic systems, chemical microsynthesis, and integrated medical sensors are examples of such devices. Micro- and nanosystems technologies are rapidly growing, and the convergence of microelectronics with information and biosystems is an especially fertile ground for scientific exploration at Rensselaer.

Advanced Materials and Nanotechnology

Rensselaer has a long history of distinction in materials science and engineering, and has invested to maintain a leadership role in the emerging field of nanotechnology. The study of materials at the atomic and molecular scale is enabling the synthesis of new materials with radically different properties and functions. The self-assembly of thin films with

All research and technology indicators suggest that biotechnology and information technology, coupled with the convergence of microsystems and nanotechnologies, are closely aligned with global and societal priorities, and primary drivers of economic growth. They will dominate the future.

Biotechnology is already transforming health care and agriculture, and opening up enormous possibilities for sustainable resource management. IT is the driving force in every industry today, transforming many of them and enabling new areas of research, such as the human genome, and enterprise, such as e-business. Both IT and biotechnology are challenging and transforming the world's underlying social, economic, and political structures.

Biotechnology and information technology are pervasive in their influence and increasingly dependent on core disciplines such as mathematics, materials, and microelectronics. Rather than Rensselaer moving toward these fields, they are moving toward us. A careful strategy to select and pursue areas of focus that match our core strengths will be critical to realizing our opportunity for research growth and influence.

A careful strategy to select and pursue areas of focus that match our core strengths will be critical to realizing our opportunity for research growth and influence.

We will exploit important niches in IT and biotechnology. *Based on existing building blocks of excellence, working at interdisciplinary intersections, and making carefully selected new investments in faculty and infrastructure, we will achieve research leadership in very selective focal areas within IT and biotechnology.* We will follow this process:

- Appoint internal and external task forces to define a small number (most likely, three) of focal areas within IT and within biotechnology. The selection will be based on the identification of important issues and on converging technical themes that build on existing Rensselaer strengths.

special optical properties has already been adopted in several industries. The assembly of complex molecular structures, such as nanotubes, has applications as varied as nanocomposite materials with extraordinary strength, nanoconducting wires for electronic interconnects, and nanomatrices for supporting active biological molecules in medical applications.

Visualization and manipulation of individual molecules has special importance in the biological realm, and the rise of nanobiotechnology as a recognized scientific pursuit has been rapid and stimulating. Rensselaer core strengths in this arena form the basis for future research opportunities.

Modeling and Simulation of Complex Systems

Rensselaer has a distinguished record of research in applied mathematics, engineering simulation, design methodology, control theory, and scientific computation. Such tools have always had an important role in the traditional practice of engineering analysis and design, but the explosion of information technology has magnified their significance. Advanced scientific computation enables the exploration of more complex and distributed systems.

Accurate modeling of anatomical structures based on computer-based biomedical imaging tools can be used to guide surgical procedures. Distributed computer models of engine combustion systems are being used to radically improve efficiency and reduce pollution. Models of human populations and urban infrastructures represent the highly interactive and dynamic changes that affect the growth of our large cities throughout the world. Modeling of world financial markets through option pricing, interest rates, stock analysis, arbitrage, and derivatives enable dynamic simulation of money markets. As visualization of matter at the nanoscale improves, extensive models of molecular interactions will be essential tools in future research in the chemical, biological, and materials sciences.

- Within each focal area, create a strategy that involves both existing and new faculty. Build or create strengths in basic undergirding areas. We will forge linkages between Rensselaer research projects and programs with other academic institutions, medical centers, state and federal laboratories, and private-sector concerns who offer complementary interests, expertise, staff, and specialized facilities.

Top-tier universities are expanding their scope to include the existing as well as the future workforce.

- Within each focal area, assemble a critical mass of people who create "constellations" of world-class faculty, staff, and students. A typical constellation will include a senior faculty member and two junior faculty in key areas needed to energize the focal area at Rensselaer. We anticipate a total of six constellations (likely three in each research arena), all or most of whom will be new hires.
- Seek endowment support for "constellation" faculty salaries plus current support for faculty start-up and early-term operating costs for approximately three years. New fund-raising efforts and internal redirection and restructuring will provide the needed support.
- Construct specialized research facilities and provide necessary equipment for the focal areas. A new biotechnology and interdisciplinary studies facility will be a necessity in order to create the appropriate synergy among biotechnology, nanotechnology, and microsystems research.
- Expand research and doctoral programs in undergirding disciplines, and create new interdisciplinary graduate programs as required.

4.4 Resident Graduate Education

Because research is the engine that drives most graduate programs and provides their intellectual grounding, dramatic growth in research requires an equally dramatic expansion in inquiry-based graduate programs leading to research-based master's and doctoral degrees. We will:

- Double the production of doctorates awarded over the next eight to 10 years.

Biotechnology and Information Technology Building Blocks

Rensselaer's current research programs in biotechnology and the biosciences may be viewed as building blocks for future growth of biotechnology research. Many of these programs also offer opportunities for important linkages to existing core strengths in areas such as nanotechnology, microsystems, modeling, and information technology.

BIOINFORMATICS, GENOMICS, and PROTEOMICS explore basic methods of molecular transcription, molecular sequence analysis, study of entire genomes, genetic engineering, protein and nucleic acid structural analysis, and molecular modeling. A collaborative alliance with Wadsworth Laboratories has enlarged the scope of this research and leverages complementary expertise in the two institutions. The new graduate program in Bioinformatics is a unique educational offering.

Basic BIOCHEMISTRY research explores topics in organic synthesis, photochemistry, molecular recognition, protein folding, drug discovery, and polymer synthesis. BIOCHEMICAL ENGINEERING research emphasizes topics in bioprocessing and biocatalysis with special emphasis on new chip-based technologies linking the understanding of expression systems and fermentation to applications of enzyme technology and metabolic engineering, especially for the pharmaceutical and agricultural industries.

In BIOMEDICAL ENGINEERING, Rensselaer has expertise in functional cell and tissue engineering, imaging, computer simulation and surgery,

- Develop a highly effective enrollment management program for graduate programs, including market research, marketing, relationship-building, admission, orientation, support, and retention activities.
- Enhance student selectivity and quality, ensuring consistency across all graduate programs. Recruit a larger number of excellent students from a national base, as well as the best international students.
- Provide both disciplinary and interdisciplinary doctoral opportunities aligned with areas of research growth.
- Offer a relatively small number of carefully selected residential professional master's programs in sync with the intellectual, research, and education goals of the sponsoring school. We will recruit the very best of our undergraduates interested in professional careers to complete their master's-level professional education at Rensselaer.
- Extend interactive learning across graduate programs. Our distinctive interactive pedagogies allow us to bring studio- and team-based learning to our graduate students.
- Pay systematic attention to the quality of the lives of graduate students, providing an engaging student experience and seamless student service as described in 3.4 and 3.5.
- Create housing options on and off campus for graduate students.
- Examine structure, pricing, and financing of all graduate programs.

5. EDUCATION FOR WORKING PROFESSIONALS

We stand at the beginning of a "learning revolution" that will transform higher education. This revolution is characterized by an astonishing pace of technological advancement, expansion of new knowledge at unprecedented rates, shifts to an information-based global economy, and a profound change in the demographics of students.

As a consequence, top-tier universities are expanding their scope to include the existing as well as the future workforce, and forging creative partnerships with business, government, and other academic institutions. Programs for working professionals allow universities to transfer research results and innovations directly into the workplace and address the lifelong learning needs of the workforce.

and medical devices and systems. The linkage of tissue engineering with nanoscale materials synthesis is being explored.

Extensive research in fresh-water ENVIRONMENTAL ECOSYSTEMS represents an important strength and links molecular scale processes to large-scale ecosystem dynamics and impacts.

Similarly, there are active research programs and significant expertise forming building blocks in the information technologies as important resources for future growth and expansion of research in this arena.

NETWORKING AND MULTIMEDIA COMMUNICATIONS spans areas of technical interest from information compression algorithms to routing control and protocols in high-speed networks. Related work in TECHNICAL COMMUNICATIONS, MULTIMEDIA APPLICATIONS DEVELOPMENT, and the SOCIAL AND ECONOMIC CONTEXT of network communications are complementary aspects. The economic and organizational implications of e-commerce have an important role in understanding information technology applications.

ADVANCED SCIENTIFIC COMPUTATION is pursued in conjunction with analytical and algorithmic tools for the modeling and simulation of complex systems. Successful studies of compliant biological materials and industrial parts at Rensselaer have resulted in important applications.

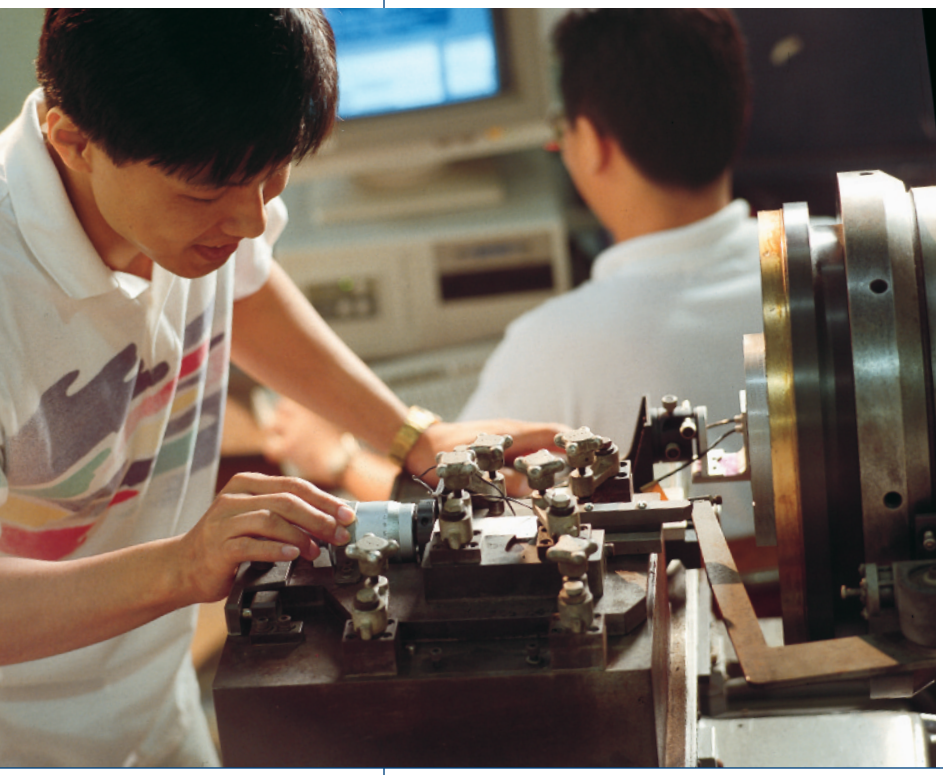
Use of data modeling and data-mining techniques in areas such as bioinformatics are emerging research areas. RELATIONAL DATABASE TECHNOLOGIES have been developed at Rensselaer, and software systems have been successfully deployed through a commercial spin-off company. SOFTWARE ENGINEERING AND PROGRAMMING are vital to complex engineering systems. The design of embedded software in real-time systems and intelligent automation is increasingly important.

In addition, creative efforts in ELECTRONIC ARTS AND MULTIMEDIA PERFORMANCE STUDIES, in the study of COMPUTER-BASED AUTHORING SYSTEMS, and in cognitive issues in HUMAN-COMPUTER INTERFACES are indicative of the wide scope of information technologies.

5.1 A Distributed Rensselaer

Rensselaer builds on a strong foundation. Together, Rensselaer at Hartford, Executive Programs, and Professional and Distance Education enroll 2,800 part-time working professionals in graduate academic programs. The RSVP program has received national recognition for leadership in distance education. With 45 years of experience in serving working professionals, Rensselaer at Hartford is a unique asset. The Rensselaer Learning Institute, located within Rensselaer at Hartford, serves over 14,000 working professionals in graduate degree programs and in non-degree training courses. These activities provide the Institute with the foundation to extend research and education beyond the "residential years" and its physical campuses to meet the career-long learning needs of working professionals.

The Rensselaer Plan calls for a *distributed* Rensselaer that operates from campuses in Troy and Hartford while also reaching a much broader audience of working professionals through regional sites, distance education, and international partnerships. A distributed Rensselaer will provide ongoing education to enable professionals in technology-based careers to maintain their leadership positions, and forge lifelong relationships with our alumni. A distributed Rensselaer will serve as the means to transfer research findings to the marketplace while bringing the people and projects of the marketplace to the Troy and Hartford campuses, creating exciting new opportunities for resident students.



To consolidate our leadership position in education for working professionals, we will:

- Develop graduate-level, interdisciplinary, and executive programs that flow directly from our leading-edge, interdisciplinary research in such areas as IT, biotechnology, microelectronics, simulation and modeling, and advanced materials. Around these cores, we will customize to meet specific corporate needs.
- Increase, significantly, the involvement of research-active faculty in design and delivery of programs.
- Incorporate interactive pedagogies, both in the classroom and at a distance, as our competitive advantage in providing education to working professionals.
- Target programs toward corporate executives, advanced professionals, and entrepreneurs whose activity exerts significant impact on technology and society.
- Create partnerships with major corporate and government groups to position Rensselaer as the educator of choice in our areas of strategic focus, and with other top-tier technological research universities to broaden our delivery capability.
- Increase, with an eye to quality, the number of students, particularly Rensselaer alumni, in professional and executive programs.
- Recruit students internationally, especially in Asia, South America, Europe, and Africa. Create new sites in strategic locations for the delivery of live and distance-based programs for working professionals.

- Present a strong institutional "common face" to business organizations, government agencies, and individuals when they turn to Rensselaer for their professional education needs via consistent marketing, enrollment management, learner services, and administrative arrangements.

5.2 Rensselaer at Hartford

Rensselaer at Hartford enrolls nearly 2,000 students from over 100 corporations in professional master's programs in management, engineering, and computer science. Courses are offered at Hartford, on site at corporate facilities, and interactively to working professionals across the U.S. and Mexico. As part of a distributed Rensselaer, we will:

- Broaden and increase the base of corporate clients served at Hartford.
- Create a one-year executive MBA program, blending an intensive on-campus experience with distance learning.
- Increase engineering enrollments in degree programs, certificate programs, and courses; and promote the master's degree in high-demand engineering disciplines (e.g., computer and systems engineering) and the dual degree program with management.
- Expand education opportunities associated with the Institute's core research strengths and the new focal areas in information technology and biotechnology.
- Increase the number of core tenure-track faculty at Hartford engaged in research, balancing teaching and service commitments as appropriate. Create appropriate Institutewide research alliances with Hartford's corporate partners.
- Expand the reach of interactive pedagogies employed at Hartford, offering a range of interactive campus-based and distance courses and course experiences. Expand experiential and practicum-based (case studies) learning.
- Expand the Rensselaer Learning Institute offerings to technologically focused organizations, adding value, quality, and opportunities for Rensselaer's research, entrepreneurship, and continuing education enterprises.
- Provide outstanding and seamless services to Hartford-based students and their sponsoring organizations (see 3.5).
- Investigate, with Hartford serving as a model, similar operations elsewhere in the U.S. and abroad.

The Rensselaer Plan calls for expanding programs for working professionals targeted at corporate executives, advanced professionals, and entrepreneurs.

6. SCIENTIFIC AND TECHNOLOGICAL ENTREPRENEURSHIP

For more than 175 years, Rensselaer has exhibited a unique strength in its ability to translate scientific discoveries into practical application, a process that we refer to as technological entrepreneurship. Historically and consistently, faculty, students, and alumni have successfully developed technologies, created innovations, and formed business ventures to bring ideas into practice to create value. Today, the Incubator program, Rensselaer Technology Park, and the Severino Center for Technological Entrepreneurship are national models. Looking ahead, rapid technological change and an emerging global marketplace present outstanding continuing opportunities for scientific and technological entrepreneurship.

6.1 Entrepreneurship Education and Research

Entrepreneurship is a way of life that springs from fundamental education and research programs. We will work to infuse understanding and encouragement of entrepreneurship through all schools and programs. Specifically we will:

- Expand the Institute's fundamental research activity in technological entrepreneurship and the management of innovation.
- Provide opportunities for students to work in settings where technology is being commercialized, such as entrepreneurial faculty projects, internships, and co-op experiences.
- Create opportunities in the Rensselaer Union and in the residence halls for students to propose, design, and implement projects, processes, and organizations.

Technological entrepreneurship will be encouraged with new curricula for students, and new programs to take Rensselaer's intellectual property to market.

- Teach the fundamentals of entrepreneurship – and intrapreneurship – to students across all majors, establishing a general curriculum requirement in this area.
- Expand opportunities for students to create innovation by increasing the number of hands-on courses such as Introduction to Engineering Design, Inventors Studio, and Multidisciplinary Design Laboratory; programs such as Product Design and Innovation; and competitions such as the Formula SAE car project.

6.2 Intellectual Property and Technology Commercialization

Research is the major driver of science and technology transfer, invention, and innovation. Technological entrepreneurship completes the technology lifecycle – from discovery to the creation of impact in the global marketplace. With an expanding research base, we will cultivate a campus culture that provides the spirit and motivation for inventors to pursue commercialization. We will:

- Increase awareness of intellectual property, preserving its value in research agreements and maximizing its value under shared equity

arrangements and licensing agreements, covering intellectual property developed in research and materials developed for distance education.

- Create intellectual property policies that encourage entrepreneurship and allow the university to take equity positions in new ventures as appropriate.
- Ensure that intellectual property policies have adequate and appropriate conflict of interest and conflict of commitment provisions.
- Develop an awareness and infrastructure of intellectual property rights policies, incentives, and marketing to support innovation and commercialization.

6.3 Creating and Supporting New Ventures

World-class technological research universities excel in transferring research outputs to the commercial sector. We will create innovative programs targeted at growing major new technological ventures and creating value. We will:

- Enhance the process of matching researchers and entrepreneurs to create new ventures that take Rensselaer intellectual property to market.
- Provide business planning and facilitate venture capital for faculty and students for start-up companies that commercialize leading-edge Rensselaer research.
- Expand the Incubator program to accommodate more start-ups and second-stage incubation.
- Expand the flow of technology, talent, and ventures into the Rensselaer Technology Park and the Capital Region. Bring new focus to the Rensselaer Technology Park as the locus for mature ventures based on the technologies taught and researched at the Institute.
- Work with private and public sources to attract new venture capital and entrepreneurial talent to the Capital Region.

7. RENSSELAER'S COMMUNITIES

A university community comprises a collection of communities: the campus community of students, faculty, staff, administration, and trustees lives in a series of larger neighborhood, city, and regional communities, and is supported by a broad national and international community of alumni, friends, business, and professional partners. Rensselaer draws its vitality from, and adds vitality to, each of these communities.

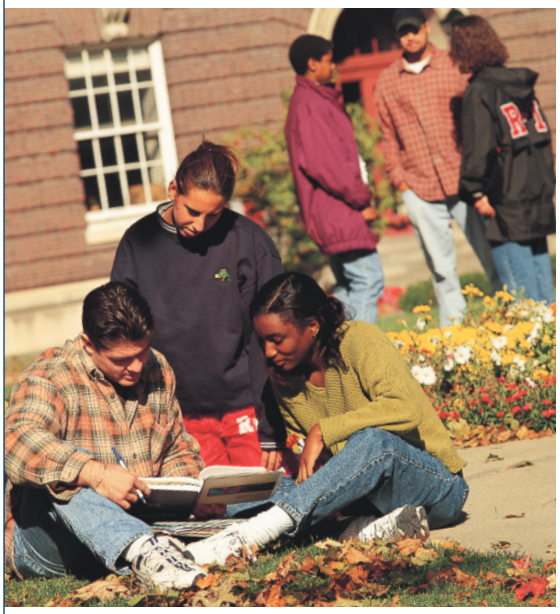
As a citizen of the world, Rensselaer must extend its reach and impact beyond present borders. Teaching and research are the starting points.

7.1 The Campus Community

World-class people create world-class universities. *Students* are drawn from the best and the brightest. *Faculty* are recognized leaders, receiving peer recognition and funding, defining the discourse in their fields, and setting scholarly and professional agendas in national and international arenas. *Staff* exemplify excellence and commitment; many are leaders in their fields. *Institute leaders* bring vision, strategic focus, managerial ability, and integrity to their work. *The Board of Trustees* provides the sustaining stewardship, fiduciary oversight, and financial support that help Rensselaer achieve its plans and aspirations. To achieve Rensselaer's goals, we will:

- Develop recruiting and admissions processes that identify the best students who will succeed at Rensselaer, and provide them an informative, exciting, and seamless process of joining our university.
- Recruit, empower, and compensate staff and faculty at levels commensurate with their skill and contribution.

A new focus on the student experience will build a greater sense of community and provide new leadership opportunities, enhanced facilities, and a seamless student service.



- Require all faculty to do research/scholarship, innovative teaching, and service, increasing the emphasis on research and scholarship in performance evaluations.
- Strengthen/elevate, significantly, the standards for hiring, promotion, and tenure of faculty with regard to research distinction and teaching quality.
- Expect and assist faculty to garner external research support through competitive grants, fellowships, research centers, research partnerships, and other mechanisms.
- Increase, significantly, the number of women and minority tenure-track faculty.
- Make Rensselaer an employer of choice among faculty and staff by developing uniform policies and approaches to critical human resource activities, and partnering between Human Resources and other academic and administrative divisions to establish optimal strategies, policies, and procedures.
- Provide staff with the tools and the training required as roles and skill-sets change.
- Create innovative administrative alignments, organizational arrangements, and reward systems designed to focus energy on goals and strategies, build teams and partnerships, and convert "low walls" to "no walls."
- Strengthen the Institute's leadership at all levels, from department heads to the most senior ranks. Strengthen administrative capabilities in every unit, including planning for leadership development and succession.
- Attract a Board of Trustees that reflects a rich mix of position and influence as well as wealth, work, and wisdom, and is philanthropically oriented.

7.2 A Very Diverse Community

Today's ideas will reach maturity and today's students will be called to lead in a world that is increasingly diverse. The Rensselaer community must be just as diverse, and the Institute must commit to leadership in bringing diversity to science and technology. We will:

- Seek a diverse body of students, via careful attention to excellence and to intellectual, geographical, gender, and ethnic diversity (especially groups underrepresented in science and technology), moving to a resident student body that has a much greater presence of women and underrepresented minority students.
- Expand pipeline programs that provide access for women and underrepresented minority students, especially to research and graduate studies.
- Build a diverse faculty and staff of women and men drawn from all ethnic groups.
- Pursue alliances with historically minority institutions to increase the flow of people and ideas to and from the campus.
- Employ interactive pedagogies to bring together students and researchers from diverse settings, including those at distance from the campus.

- Create a lively discourse on important cultural, social, gender, and ethnicity issues in courses, colloquia, fairs, and festivals as well as in residence halls, student activities, and the research environment.

7.3 Alumni

Rensselaer is fortunate to count many friends and colleagues in the industrial, academic, research, and public sectors. Our 70,000 alumni are foremost in this group. Alumni owe a significant part of their success to Rensselaer; at the same time, Rensselaer's success is coupled with the accomplishments of its alumni and depends on their continued interest, involvement, and support.

To forge lifelong partnerships between the Institute and its alumni and friends, we will:

- Direct continuing professional and executive education to alumni on leadership paths (see Education for Working Professionals, 5).
- Involve alumni as recruiters, visiting lecturers and critics, mentors, and employers of resident undergraduate and graduate students.
- Create services and networks that provide a seamless transition from student to alumni life, assist alumni in career success, and establish linkages among alumni and between alumni and their alma mater.
- Celebrate the achievements of alumni as leaders.

7.4 Neighborhood, City, and Region

Greatness in a university is inextricably linked to the vitality of the region in which it is situated. Rensselaer's campuses are located in regions with a rich tradition of technological innovation, predicated on close and mutually beneficial relationships with the surrounding community. Such mutuality extends from campus edges and gateways to the larger region. We will:

- Develop with the community an extended program for teaching and research in disciplines such as architecture, urban design, ecological economics, environmental policy and management, entrepreneurship and business development, and the human, social, economic, and political dimensions of science and technology.
- Offer to the Capital Region, the Hartford Metropolitan Region, and our other communities, faculty resources and research skills in community development and regional design. Collaboration with established community development efforts will provide an intellectual core as well as a context for action.
- Redevelop community fabric contiguous to and along gateways to the campus by joining in carefully selected neighborhood renewal, housing, hospitality, and commercial projects with private developers and public agencies.
- Expand regional technological entrepreneurship in order to assist in attracting industry, people, and capital to the Capital Region and the Hartford Metropolitan Region.

> We will realize the Plan by bringing focus, new resources, hard work, and good will – in short by acting together, as a community.

7.5 National and International Reach

As a citizen of the world, Rensselaer must extend its reach and impact beyond present borders. Teaching and research are the starting points. Students study and experience cultures that expose them to diverse outlooks, expand their ability to communicate across cultural boundaries, and deepen understanding of their own cultural circumstances. Researchers are leaders on the global scene, collaborating with colleagues and placing students in top-tier international organizations. Thus, we seek a broad representation of international students and scholars on campus. We will:

- Enable our students to increase their knowledge and understanding of international issues and cultures, including participation in international exchange programs.

- Forge strategic research partnerships with excellent national and international academic institutions and research laboratories.
- Expand corporate partnerships, adding new multinational technology-based companies and extending current partnerships to include international divisions and global operations.
- Extend education programs for working professionals into the international arena.
- Assume prominent roles in shaping federal and state research and technology agendas.
- Expand global name recognition through international media, corporations, and international alumni.

8. ENABLING CHANGE

Achieving Rensselaer's goal requires a systemic and relentless commitment to change. Meaningful change, of course, must be driven by well-based and meaningful plans. Thus, as The Rensselaer Plan enables change, change enables The Rensselaer Plan.

People are the principal enablers. Rensselaer's communities, discussed above, must have the business processes, information infrastructure, physical facilities, and financial resources to do the job.

8.1 Administrative Processes

A university's programs and initiatives are actualized through administrative processes. The Rensselaer Plan requires that we achieve high performance levels in key administrative processes. We will:

- Identify, as part of Performance Plans, essential and critical administrative processes. We will transform, outsource, or sunset processes that are not essential.
- Execute each chosen process with excellence, emphasizing access, simplicity, outcomes, and appropriate uses of technology at every step.
- Emphasize customer service.
- Create a thoughtful and friendly "electronic Rensselaer" to help knit the Institute and its communities into a seamless whole.

8.2 Information Infrastructure

A leading-edge integrated information environment is integral to teaching, learning, and research. Rensselaer employs a first-rate information culture and a robust information infrastructure. We must sustain this advantage, valuing information literacy at every level and implementing new methods for scholarly communication and electronic interactions. We will:

- Provide an integrated portfolio of education, access, and support technologies, policies, and services for teaching, learning, and research, particularly as we create a ubiquitous environment for mobile computing.
- Provide seamless multimedia access to library, research, and scholarly materials for both on-campus and off-campus use.
- Centralize administrative information systems, while improving distributed decision support throughout the Institute.
- Extend and continually upgrade the inter- and intra-networking infrastructure to support strategic purposes.

- Partner with other universities, companies, and public agencies to augment the Institute's intellectual and capital resources.
- Utilize communication technology to enhance the image of Rensselaer to external audiences, build relationships with key external constituencies, and provide state-of-the-art capabilities, such as online transactions.
- Exploit the full potential of communications technology to build community, enhance employee relations, and serve as a source of vital and interesting campus information.

8.3 Physical Facilities

Rensselaer requires land, buildings, and infrastructure that meet essential research, learning, living and dining, cultural, recreational, and other essential needs. Facilities will be accessible to our diverse population, inviting to the internal and external community, and have a cohesion that emphasizes and complements relationships with the community. Facilities will employ state-of-the-art systems and operate safely, efficiently, and reliably. Academic facilities will be research-ready with modern infrastructure and services, and will be flexible to meet changing research requirements. We will:

- Manage and utilize existing facilities for maximum contribution to the strategic purposes of the Institute.
- Establish annual maintenance levels that provide clean and safe facilities that meet Rensselaer's baseline quality of life requirements.
- Plan investment in deferred maintenance and continuing capital renewal for facilities needed to meet strategic needs.
- Construct a new biotechnology and interdisciplinary studies research facility to support and promote interdisciplinary thrusts in biotechnology, nanotechnology, and microsystems.
- Define and deliver new capital, renewal, and deferred maintenance projects consistent with the academic, research, residential, athletic, and administrative priorities derived from The Rensselaer Plan, and with careful attention to benefits achieved relative to initial and continuing costs incurred.
- Seek creative facilities delivery and financing approaches, including privatization, development partnerships, and other innovative concepts.

8.4 Our Public Face

Rensselaer is a dynamic institution, and expects to step up the pace. Even as we gain prominence, we must project the image of the top-tier technological research university we expect to be. We will:

- Project a cohesive identity, promoting the public's understanding of Rensselaer's accomplishments and increasing the Institute's name recognition and prestige in strategic environments.
- Create a cohesive, creative, timely, and user-savvy Web presence for the institution and its principal programs.
- Improve "front door" and public spaces to ensure a professional, state-of-the-art, and elegant Rensselaer.

8.5 Managing Financial Resources

The Rensselaer Plan has substantial implications for financial resources. While expanding the resource base is paramount, we must first manage existing resources to best advantage, directing expenditures to strategic purposes. We will:

- Derive Performance Plans and then annual operating plans (budgets) from The Rensselaer Plan.
- Refine or reinvent the budgetary model to focus resources for maximum strategic impact, while maintaining appropriate institutional flexibility.

- Provide managers at every level with accurate, timely, and relevant performance and management information.
- Deploy financial and administrative processes (payroll, billing, payables, collection, purchasing, etc.) that provide a baseline quality of service for students, alumni, families, employees, vendors, and partners.
- Pursue aggressive risk management and internal auditing to assure a safe working and learning environment, appropriate controls, and regulatory compliance.

8.6 Expanding the Resource Base

Garnering substantial additional resources requires a multi-front effort led by the President and Board of Trustees, financially supported by the Board of Trustees, and focused and energized by The Rensselaer Plan. We will:

- Mount a comprehensive fund-raising campaign.
- Grow the base endowment via campaign gifts and investment return so that endowment spending can support 20% or more of the budget (now 10%). Manage the pace and structure of debt financing to strategic purposes.
- Restructure corporate partnerships, adding leadership technology companies in priority areas, meeting partners' criteria for top-tier status, and achieving substantial annual total revenue (research, philanthropy, equipment, educational programs) and placement of graduates from these companies.
- Pursue major federal and state partnerships that provide facilities, specialized equipment, and maintenance and operating capital to the Institute in exchange for research and technology transfer in areas of national or state need.
- Build philanthropic and other financial support, maximizing alumni and volunteer involvement through long-term mutually beneficial relationships and doubling private investment within five years. We will challenge our major donors to provide "stretch" support as we move forward boldly and quickly.
- Pursue an advancement program that mobilizes and integrates the entire Institute to achieve the financial goals set out in The Rensselaer Plan. This includes coordination of distributed advancement efforts, outreach to students as future alumni, maximum use of technology for communications and commerce, integrated marketing, and focusing policies and programs on maximum return.

9. LEADERSHIP IN THE 21ST CENTURY

The Rensselaer Plan is aimed high. The Plan is expansive and ambitious. We will realize the Plan by bringing focus, new resources, hard work, and good will – in short by acting together, as a community.

Rensselaer has always achieved great things. Together, we can attain greater prominence with the support, intellectual and financial, of all members of the Rensselaer family: faculty, students, staff, alumni, trustees, and friends in corporations, foundations, and government.

Let us look ahead.
Let us move forward.
We can do this.

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