The National Commission for IIT
Illinois Institute of Technology

Report to the Board of Trustees
November 16, 1994
November 8, 1994

TO: Board of Trustees, Illinois Institute of Technology

The final report of the National Commission for IIT contains bold recommendations for dramatic change that will assure the university's educational leadership as it moves into the next century.

We are all grateful to the members of the Commission for their thoughtful comments and diligent work. The report represents enormous expenditure of volunteer time on behalf of Illinois Institute of Technology. The Commission's legacy will be fulfilled in the action you take on these recommendations.

Best wishes,

Robert W. Galvin
Chairman
IIT National Commission

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Table of Contents

Executive Summary 3

The New IIT: A Strategy for Educational Distinction 7

The Necessity for Dramatic Change at IIT 8

A Strong Base Upon Which to Build 12

Recommendations to the Board of Trustees 19

Establish a new undergraduate college 21

Establish quality principles for the continuous improvement of the university 25

Establish new financial principles and initiate organizational changes needed to support them 26

Enhance IIT's already strong graduate professional programs 27

Support IIT's faculty in their aggressive, entrepreneurial actions to attract research funding 30

Resolve the facilities and location issues of the Main Campus 31

Ideas for Future Consideration 33

Towards the Future: Aspiring to Be the Best 35

Resources 36

Appendix A—Participants 38

Appendix B—Supplemental Data 40
Executive Summary

Illinois Institute of Technology is a university for the professions. It has academically strong professional programs with a respected scholarly and research base. Its graduates continue to have one of the highest placement rates in the nation and are successful in their careers.

The university has a history of operating effectively with very modest budgets. It has accomplished a great deal with a relatively small amount of money. Nonetheless, the university faces significant financial challenges because of three key factors: its endowment is very small; its undergraduate students require an exceptionally high level of scholarship support; and its facilities need substantial reinvestment.

This is a time of extraordinary challenge for IIT and all of higher education. A 1993 RAND Corporation report states:

*Each of the problems facing higher education, from fiscal cuts to concerns about the quality of undergraduate education is important in its own right and warrants attention. These concerns take on a much greater importance, however, when considered as a whole. They are symptoms of a fundamental transformation in higher education’s environment.*

This backdrop necessitates change. It challenges IIT to seize the opportunity to transform itself for the 21st century. By making dramatic changes, IIT will strengthen its competitive position in higher education and meet the educational and research needs of a radically changing, technologically driven, complex global economy.

This report paints a picture of a 21st century IIT that is at the cutting edge of educational innovation, integrating the strengths of its professional schools, utilizing the latest in information technology, and serving a global constituency. Like any painting, much is in the eye of the beholder. The Commission believes the IIT community will find within these recommendations the inspiration to draw the blueprints that will assure the university’s future.
The National Commission for IIT recommends these major actions to the Board of Trustees:

**Establish a new, interprofessional, technologically based undergraduate college that positions the university to better serve the needs of undergraduates who will become 21st century professionals.** The interprofessional program will give IIT a vehicle for dramatically changing the competitive position of its current undergraduate program.

Although a good program today, measured by placement rates, student and alumni surveys, as well as national rankings, IIT's undergraduate program, like the undergraduate programs of many smaller independent technological universities, lacks sufficient competitive and financial strength because:

- Undergraduate degrees are now widely viewed by prospective students as generic products. A large number of institutions offer programs similar to IIT's in engineering, architecture and business.

- Many private institutions have a lower effective price because of greater financial resources. Public universities and colleges, with the benefit of substantial government resources, have captured much of IIT's traditional student base.

- Most of the students IIT does attract need significant subsidies to attend. IIT provides most of a student's subsidy through tuition discounting because it lacks other financial resources with which to support students.

- IIT's facilities and salaries are below competitive levels. IIT's chronic lack of financial resources and small endowment are the key explanations for the major deferred maintenance on the main campus, inadequate faculty and staff salaries, insufficient investment in new program creation, and virtually no investment in sustained institutional image development.

- IIT's location has become a deterrent to many because of the lack of physical cohesion, lack of neighborhood amenities, and perceptions of security problems.
IIT has a special opportunity to integrate the strengths of its six professional units—engineering and science, law, architecture, design, business and psychology—to create the best interprofessional, technologically based undergraduate college. Interprofessional is a new term signifying the linking of professional disciplines in the educational process—a linking that will lead to more profound understanding of the complex and multi-faceted problems faced by tomorrow's professionals. These strengths should be brought together in the undergraduate college. Specific actions recommended include the following:

- Develop for the college a new, leading-edge core curriculum. This concept of interprofessional education is to be developed from the integration of math, science, engineering and architecture—the drivers of economic growth—with law, design, business and psychology—the professional disciplines of corporate change, management and human interaction, and the humanities, social sciences, and languages—the disciplines of communication, social context and multiculturalism.

- Engage the creative power of the faculty to develop this new core curriculum and innovative pedagogy utilizing new learning technologies to create a truly distinctive program.

- Employ the distinctive power of this new college to attract a broader base of well prepared, high achieving students from throughout the world, who can afford to pay the tuition; secure philanthropy and industrial support for scholarships to attract students who cannot afford to pay.

- Utilize the strength of IIT’s diverse student body and the opportunities afforded by the urban environment in which it is embedded to create a laboratory for learning to work and live together in the highly diverse, international work environment of the 21st century.

- Strengthen interaction with Chicago’s global corporations and professional organizations to monitor the effectiveness of the curriculum and aid in development of project-oriented learning experiences.

- Demonstrate to students, employers and funders the added value of the new program through a new set of outcomes-based measures defining the leadership capabilities of the new IIT graduate in the 21st century professional work environment.
Establish and implement rigorous academic and administrative quality principles for the continuous improvement of the university.

Establish new financial principles immediately to assure the orderly transition of the institution to a stronger financial base. The principles must provide clear incentives for flexibility, cooperation among units, innovation and change. They must also create clear financial expectations for each unit and provisions for orderly contraction of units if expectations are not met.

IIT should make a major effort to work with the community, government and private institutions to strengthen the surrounding community, and to attract philanthropy to the Main Campus. If such cooperative efforts fail, the Board of Trustees should consider other location options for the Main Campus, based on the kind of program developed, the market served, and on the opportunity for philanthropic support to effect a move.

The resources needed to ensure dramatic change are substantial. The first estimate of the transitional and long-term philanthropy needed to implement the recommendations of the National Commission include:

- An increase in annual net revenues by $11.5 million in current dollars to solidify the financial base.

- Establishment of an immediate five-year transitional philanthropy plan of $20 million.

- Establishment and implementation of a ten-year philanthropic campaign to raise $250-300 million for the new IIT. Components would include building renovation and new construction, endowed scholarships, endowed chairs, and expendable aid.

IIT has always aspired to be the best. As it approaches the 21st century, the university can be truly distinctive in offering the best international, interprofessional, interconnected educational programs.
The New IIT: A Strategy for Educational Distinction

Illinois Institute of Technology has the opportunity and the necessity to become a university of distinction for the 21st century. It can achieve this by transforming itself through leadership in the development of educational programs based on the integration of its strengths in technology and the professions.

To remain successful as a private university, IIT must be a leader in the educational programs it provides.

In order to be a leader, the university's programs must meet the demands of a rapidly changing, technologically driven, complex global society. This will require the university to undergo dramatic change. IIT's six professional units—engineering and science, law, architecture, design, business, and psychology—form the strong base for this dramatic change. They effectively encompass the professional disciplines most relevant to the economic health of a global society in the 21st Century.

By effectively integrating these disciplines through a new curriculum and pedagogy, IIT can play a major role in the design of 21st century professional education. The recommendation to create a new, interprofessional, international, technologically based undergraduate college recognizes this opportunity.

This report to the Board of Trustees of Illinois Institute of Technology outlines the necessity for change, based on both the technologically driven external environment and IIT's declining competitive position. The report briefly assesses IIT's competencies, values, and strengths to undertake this change. It then recommends action to initiate and sustain the new IIT.

Taken together, the elements of this report provide a painting of a successful, 21st century IIT, from which the Board of Trustees, faculty, and staff can draw inspiration to develop the blueprints.
The Necessity for Dramatic Change at IIT

The world needs improved professional education that IIT is capable of providing.

The rapidly changing nature of work and society, driven by technological change, requires professionals to have the ability to work across an ever-increasing range of activities.

The globalization of national economies necessitates a much greater understanding of different nations' government policies, business practices, languages, and cultures.

External social forces affecting companies—including environmental concerns, diversity, product safety, and multiculturalism—will require anticipation and informed decisions by professionals.

The nature of work and of employer-employee relationships will continue to change dramatically. Many professionals can expect to have multiple careers and must constantly renew their professional skills. Meanwhile, companies are moving rapidly to team-based problem-solving and horizontal organization structures that require a high degree of productivity and accountability among individual professionals.

Information technology is universal. The changes in the technology of telecommunications, computers, and imaging will affect every aspect of the professional's life. Computer-Aided Design has replaced drafting in the engineer's, designer's, and architect's work, integrating the computer and expert systems more and more into problem-solving, design functions, and decision-making.

Communications technologies allow professionals to draw instantly on a global range of colleagues, consultants, and databases to solve problems. Imaging technology provides a new family of analytic and design tools, using the dynamic, three-dimensional, and interactive systems derived from the next generation of computers and software now entering the work place.

Technological change has become the key dynamic affecting the fortunes of companies and national economies. Product and process change are so rapid now, and the tools for developing new products so sophisticated, that no professional can afford to go into the work world without an understanding of technology and its scientific underpinnings.

All of these changes are engendering a national re-examination of higher education curricula and pedagogy. Concepts of learning have changed, based on the opportunities afforded both by interactive multimedia technology and new
team-based and project-oriented problem solving.

IIT needs dramatic change in its undergraduate program to renew its competitive and financial strength.

IIT's undergraduate enrollment has declined significantly in the past few decades. While the objective quality of the student body remains strong, it is also below the levels of the 1960s.

Declining demographics nationally for college-bound students have been reflected in the declines of IIT's freshman enrollment. After a decade of steady decline, freshman enrollment dropped 30% from 1989 to 1990 (see Figure 1). A special incentive program for ROTC students has temporarily replaced the decline in numbers of students, but not the loss of tuition income.

The number of college-bound students is expected to increase by 14% nationally by 2005 (see Figure 2). This opportunity to rebuild undergraduate enrollments must be contemplated in the context of competition from lower-priced institutions, the declining ability of families to pay for private higher education, and the fact that most growth comes from groups that have traditionally been less likely to choose science-based careers.

During the period of demographic decline, IIT did not effectively address the increased market competition from other institutions of higher education.

Many other institutions in Illinois and elsewhere now offer undergraduate programs very similar to IIT's primary programs in engineering, architecture, and business. There is a growing belief that bachelor's degrees are generic products. In one sense, the accreditation process has contributed to this perception.

- Lower prices gave public institutions a competitive advantage, which has grown with IIT's tuition increases (see Figure 3).
- Improved reputation of major state universities has led to a further competitive disadvantage for IIT.

- Expansion of the community college system and new publicly supported engineering schools have added to the institution’s competitive disadvantage.

As with many other private institutions, the net price of an IIT undergraduate education has increased beyond many students’ ability to pay, forcing ever-increasing discounts. Meanwhile, the rising real need for aid has been accompanied by relative declines in federal and state scholarship support. Illinois Student Assistance Commission support to Illinois residents attending IIT has declined from 60% of tuition in 1971 to 26% in 1994 (see Figure 4).

IIT’s tradition of serving students from low- to moderate-income families requires substantial subsidy of most students. IIT’s net undergraduate tuition discount, exclusive of the even more highly subsidized ROTC program, grew from 13% of tuition in 1988 to 30% of tuition in 1993. Figure 5 compares the increase in IIT’s average tuition discount to that of similar institutions.

Figure 6 gives an example of the lack of economic diversity among undergraduates. In the freshman class, only 21% of IIT families have incomes above $60,000, compared to 60% among families in other private universities nationally and 45% among public universities.

IIT’s Main Campus suffers from a deferred maintenance problem estimated at $40 to $50 million. The general state of disrepair, coupled with the obvious lack of state-of-the-art learning facilities and laboratories, contributes also to IIT’s declining competitive position.

The Main Campus’ location, with the lack of neighborhood amenities, lack of physical cohesion of the campus—bifurcated by the elevated railway and State Street—and the perception of security problems, further reduces IIT’s ability to attract undergraduates.
IIT has a very unusual economic structure. At most private research universities the undergraduate program has historically subsidized the graduate program. At IIT that is not the case and if anything, the reverse is true. IIT's graduate and professional programs have much greater competitive market power than the undergraduate program. IIT's graduate and professional programs, while currently yielding a higher net tuition than undergraduate programs (as shown in Figure 7), cannot be totally relied upon to sustain the undergraduate program in future years.

- Public institutions are becoming more aggressive in entering this market, and once again could use their tax subsidy to underprice IIT.

- Private industry is also providing ever-more sophisticated training programs for professional employees. These programs could both be competitive and an opportunity for partnerships.

- High capital expenditures by the state to equip other institutions with distance education capabilities could allow them to underprice IIT, long a leader in distance education.

**IIT needs dramatic change to transform and strengthen the overall financial base of the institution.**

Faculty and staff have been historically underpaid because of the institution's chronic financial stress (see Figure 8). The ability to attract and retain faculty and staff is key to the university's vitality and competitiveness.

Increased philanthropic support for specific programs, facilities, and operations is needed immediately to sustain IIT's transition into the 21st century.

Increased general endowment is needed to provide the financial base for general support of students, faculty, and facilities. Figure 9 compares IIT's endowment per student with that of selected competitors.
A Strong Base Upon Which to Build

During its more than one century of service, IIT has demonstrated an ability to undergo major change to accommodate new markets and new competition.

In the late 1930s, the creation of Illinois Institute of Technology out of Armour Institute and the Lewis Institute, and the establishment of the IIT Research Institute formed the base for the modern university.

In the 1940s, '50s, and '60s, construction of the main campus, under the guidance of Mies van der Rohe, set the strengthened institution on a major period of growth in both enrollments and reputation.

In the late 1960s, the Institute became a broader-based university through acquisition of Chicago-Kent College of Law, establishment of Stuart School of Business, increase in science and liberal arts programs, and full development of a residential campus.

In the 1980s, the acquisition of the Midwest College of Engineering in DuPage County, the establishment of the suburban Rice and Moffett campuses and the development of the IITV network provided dramatic new areas of service for the university in the metropolitan Chicago region.

IIT's core competencies in its professional disciplines provide the primary base upon which to build the new undergraduate and graduate programs.

IIT's six colleges offer a special mix of disciplines that differentiate IIT both from more narrow technical institutes and broader comprehensive universities: engineering, science, mathematics, computer science, law, design, architecture, humanities, social sciences, and psychology.

IIT's small size and flexibility enable the institution to combine its strengths to serve new markets. Figure 10 lists innovative new degree programs designed to serve new markets.

IIT's outstanding placement rate signals its ability to equip undergraduate students of all backgrounds and levels of academic preparation with quality technical educations.
IIT has proven itself capable of being a responsive partner to industry and the professions, establishing strong linkages with the Chicago region's globally active, technology-driven companies.

**IIT's core values fit well with the projected work environment of the 21st century.**

Based on its one-hundred-year-old mission—to educate people of all backgrounds for meaningful roles in a changing, industrial society—the IIT community has lived by core professional values that remain at the heart of the university.

- **Professionals are dedicated to public service.** IIT's faculty, supported by the Center for the Study of Ethics in the Professions and the Justice Program in the law school, work hard to instill principles of professional responsibility and ethical standards in their students.

- **Professionals are committed to continuing personal development.** In a world where multiple job changes are a reality, the 21st century professional knows that continuous learning is at the center of a successful career.

- **Professionals find hard work fulfilling.** The IIT education has always been and will continue to be based on the hard work of students, faculty and staff. IIT is an institution that cherishes and rewards personal dedication to study and academic success.

- **Professionals know that technological change is the main engine of economic progress and growth.** IIT's graduates are key players in helping the world improve its quality of living.

- **Professionals recognize that the entrepreneurial spirit is the fuel for both individual and societal progress.** IIT's most successful graduates have become so through their entrepreneurial endeavors. The creativity, energy, and opportunity for the 21st century will also be shaped by entrepreneurship.

IIT as an institution has always been entrepreneurial and opportunistic. This value, in fact, led to development of the core competencies that now give IIT its strength for the future.
Professionals must work in and value our multicultural world. This principle, drawn from IIT's original mission, has led IIT to become a highly diverse, international institution. In the global economy of the 21st century, such a commitment to diversity will be even more important.

IIT's academic and research strengths are at the center of the proposed strategy.

IIT's faculty, drawn from all parts of the world, are committed to teaching at both the undergraduate and graduate level. The consistently high ratings from students and alumni are indicators of the institution's teaching strength. Faculty have proven themselves flexible, innovative, and industry-responsive in development of new, disciplinary and interdisciplinary programs in the 1990s.

IIT's Armour College of Engineering and Science is the leader in part-time graduate technological education in the Chicago region. As shown in Figure 11, nearly two-thirds of those enrolled in part-time engineering courses in the Chicago region are IIT students. IIT can maintain that lead, and spread its flexible approach across the country and abroad, through IITV, the university's interactive distance education network.

Chicago-Kent College of Law ranked 22nd overall in faculty scholarly productivity among 176 law schools. The 1992 survey ranked faculties based on pages of scholarly articles published in the nation's top 20 law journals.

IIT's research programs, centered in Armour College, have rapidly adapted to new opportunities in research funding support, demonstrating the faculty's entrepreneurial capabilities. Research volume doubled from $7.9 million in fiscal 1988 to $15.7 million in 1994. This growth is directly tied to IIT's faculty strengths in cutting-edge technologies sought by both government and industry.
IIT's research faculty follow in a grand tradition of innovators:

- Marvin Camras, inventor of magnetic recording
- S. I. Hayakawa, internationally renowned semanticist
- Max Jakob, one of the world's leaders in thermodynamics and heat transfer
- Fazlur Khan, structural engineer who pioneered the tubular method of high-rise construction
- Ludwig Mies van der Rohe, father of modernist architecture
- Laszlo Moholy-Nagy, founder of the Institute of Design
- Herbert Simon, Nobel laureate economist

Most important for IIT's future, the last decade has witnessed the establishment of new jointly sponsored research centers and facilities, upon which IIT can build many research collaborations. Some of the major centers include:

- The Pritzker Institute of Medical Engineering, founded in 1981, conducts research in computer-controlled detection and treatment of heart arrhythmias, electrical stimulation of paralyzed muscles, and plastic coatings for electronic implant devices.

- The Center for Fluid Dynamics Research and National Diagnostic Facility is a Department of Defense National Center of Excellence performing pathfinding research in the area of steady and unsteady aerodynamics. The center's world-class wind tunnel, completed in 1994, provides size, speed, and extremely low turbulence levels not found in any other university setting.

- The Center for Excellence in Polymer Science and Engineering, created with funding from Amoco, McDonald's, and the State of Illinois, has considerable expertise in polymer rheology and process modeling, plastic recycling, foamed plastics and lightweight composites, and biodegradable polymers for packaging based on agrowastes.

- The National Center for Food Safety and Technology, founded in 1989 as a joint project of IIT, the Food and Drug Administration, the University of Illinois-Urbana Champaign, and the nation's food industry, fosters scientific and technical exchange among the partners leading to a better understanding of the science and engineering behind food safety and packaging issues.
The Digital Communications Systems Laboratory is one of eight research laboratories in the Electrical and Computer Engineering Department that focus on advanced communications, ultrasonic signal theory, microwaves, optics, computer vision, and complex integrated circuits. Researchers in the Digital Communications Systems Laboratory consider problems in bandwidth-efficient modulation and coding, wireless and mobile communications, and novel system development.

The Center for Synchrotron Radiation Research and Instrumentation develops and uses synchrotron radiation techniques to reveal fundamental components of proteins, biological systems, catalysts, superconductors, magnetic materials, and environmentally important systems. The Center manages an industrial partnership among pharmaceutical firms and with Notre Dame and Amoco Corporation to access and utilize the Advanced Photon Source, the world’s largest synchrotron facility, now being completed at Argonne National Laboratory.

The Fuel Cell and Battery Hub was established in 1994 with Department of Defense funding to develop next-generation fuel cells and batteries for mobile operations.

IITRI has a major opportunity with IITRI, as yet untapped, to combine IITRI’s research and contract management capabilities with the university’s research strength in several key niche markets to establish critical mass. Figure 12 shows IITRI’s growth during the past 15 years.

IITRI has evolved over the years into one of the nation’s largest not-for-profit research contract management organizations with 1,300 employees in 17 sites nation-wide. IITRI’s five areas of strategic strength include:

- Environment and Health—with emphasis on soil decontamination, toxic waste clean-up, AIDS and cancer drug therapies, and toxicology testing.
■ Energy—with emphasis on better and environmentally safer recovery of existing fuel sources through IITRI’s new Westport Technology Center International in Houston.

■ Systems and Software Sciences—focus on software applications in manufacturing, transportation and power generation, as well as the new IRS-sponsored Tax Modernization Systems Institute in Lanham, Maryland.

■ Electromagnetics and Electro-Optics—support of several key defense programs related to reducing interference among military communications systems, submarine communications, and information on guidance and control systems.

■ Manufacturing, Productivity and Competitiveness—Work with industrial and government clients to evaluate materials and processes in order to improve final products, with new facilities including the Instrumented Factory for Gears and the Heat Treatment Center, both in the Chicago area.

As the issues of the management of industrial and government research become more complex, IITRI’s cost-effective management capabilities are also a major strength for the future of the two institutions.

**IIT has a global reach.**

IIT has already established a strong, multicultural, international learning environment at both the graduate and undergraduate levels. Some 72 countries are represented on the Main Campus alone.

International students comprise 14.5% of the university’s total student body. (See Figure 13). The university’s full-time graduate research programs have long educated international students. Currently, international students comprise 23% of IIT’s full- and part-time graduate enrollment and 63% of IIT’s full-time graduate enrollment. Recently, IIT has experienced an expansion in its international undergraduate enrollment. About 10% of undergraduates are from abroad.

**Figure 13**

**International Enrollment**

- Graduate - FT: 62.5%
- Graduate - PT: 10.0%
- Undergraduate: 10.0%
- Law: 3.5%
- All Students: 14.5%

Source: Registrar and Graduate School
IIT's professional colleges are engaged in or contemplating a wide variety of activities abroad:

- Armour College's worldwide network of graduates, former faculty and corporate partners, complemented by its international faculty, has led to creation of innovative graduate programs serving the needs of foreign partners. Currently, Armour is training graduate students to be professors in Turkey's expanded network of technological universities.

- The College of Architecture has a strong reputation internationally, runs academic programs in Italy, and is actively exploring joint programs in construction technology in the Far East.

- The Institute of Design's programs enjoy a strong reputation abroad as well. It conducts seminars in Taiwan, Japan, and Europe on its unique approach to industrial design processes.

- Chicago-Kent College of Law is ranked in the top 15% among international law programs in the country, and maintains the internationally famous Library of International Relations.

- Stuart School of Business contemplates the expansion of its Financial Markets and Trading program to serve international financial institutions. Its new Master of Environmental Management program will address both national and international issues.

The world-wide network of IIT alumni in technology and the professions provide an important element for recruitment, advice and support as IIT moves to establish its leadership role in professional education. IIT's dedicated and energetic alumni provide strong financial support, with a giving rate of 30%, comparable to many of the nation's premier universities. In a 1994 survey, 94% of alumni said they were satisfied with their IIT education.
Recommendations to the Board of Trustees

Illinois Institute of Technology must be a leader in the educational programs it provides to sustain itself as a private university. Its programs must also meet the demands of a rapidly changing, technologically driven, complex, global society. The following mission statement and recommendations address this opportunity and necessity for leadership.

IIT has had a variety of mission statements over its 104 year history. However, all of these statements derive in some way from founding president Frank Wakely Gunsaulus’ initial purpose statement:

To educate people from all backgrounds for meaningful roles in a changing industrial society.

The Commission believes that IIT’s core mission remains much the same as in Gunsaulus’ time, but would be better articulated this way to reflect IIT’s new global reach:

To educate people from all countries for complex professional roles in a changing technological world and to advance knowledge through research and scholarship.

The small changes from the Gunsaulus mission statement reflect the key drivers of the future IIT. IIT’s new student base is global as well as local, reflecting its growing international student body and the great potential existing in international markets. IIT should offer programs appropriate to “complex professional roles”—programs that provide a broad, integrated base of knowledge. “Changing technological world” embraces the full range of career options for IIT’s graduates, set in a global environment of technologically driven change. The mission also recognizes the importance of research and scholarship to the intellectual vitality of the institution.
The Commission applauds IIT's commitment to the Chicago metropolitan region's citizens, companies, and professional organizations that constitute the base of its programs and markets. In these recommendations, for undergraduate, graduate, and research programs, the Commission supports continued close ties with Chicago area industries and professions as the foundation for the university's local, national and international strategies. Chicago's complex industrial, professional and financial markets form a powerful magnet for students from around the world.

These recommendations deal directly with the critical issues faced by the university: the future of undergraduate education; the quality, financial, and organizational systems of the institution; and its location and facilities. The recommendations also address the generally more robust graduate professional and research programs of the university. Several promising ideas are identified by the Commission for future consideration including increased emphasis on IIT's international opportunities and image. Finally, the recommendations incorporate a proposed resource plan.
Establish a new undergraduate college

As a private university, IIT charges considerably more for tuition than public institutions. It therefore must offer a premium education in order to attract students willing and able to pay more than the tuition charged at public institutions. Undergraduate education has come to be viewed more and more as a generic product, and therefore the burden is on all private universities, including IIT, to demonstrate extra value in their educational offerings.

A new undergraduate college will enable the faculty to shape a new interprofessional, technologically based undergraduate program that will be distinguished by its:

- **Leading-edge core curriculum.** This concept of interprofessional education is to be developed by integrating math, science, engineering, and architecture—the drivers of economic growth—with law, design, business and psychology—the professional disciplines of corporate change, management, and human interaction—and the humanities, social science, and languages—the disciplines of communication, social context, and multiculturalism.

The core curriculum should increase the breadth of the student's educational experience without sacrificing technical rigor. The core curriculum should also be shaped with a view toward maximizing efficiency i.e. minimizing cost in order to keep tuition at an affordable level. It should provide for each student an opportunity to complete, in normal time, one of the professional degree programs offered at IIT.

The core curriculum must serve three distinct groups of students: those pursuing IIT's existing undergraduate professional degrees, those who are
seeking pre-professional undergraduate experience and those seeking a more custom designed undergraduate program. The latter should be made possible by providing much greater curricular flexibility.

The core curriculum should take full advantage of the strengths of the humanities and social sciences departments.

- **Innovative pedagogy** that will provide students with the best in applied learning. A component of the core curriculum should be a project that provides students with the opportunity to understand the roles played by each of the professions represented at IIT. These interprofessional projects should involve upper- and lower-division students, faculty from the various colleges, and part-time faculty from the professional and corporate worlds.

In developing these projects, the university should draw upon the considerable expertise in project-oriented learning that exists in the Institute of Design. Projects should also be derived from the urban environment in which IIT is embedded.

The undergraduate college should be interconnected, utilizing the latest in interactive multimedia computer-based educational technology. The use of technology will enable students to learn more effectively. It will also enable faculty to interact with students outside of the traditional classroom setting.

- **Interaction with Chicago area industry and the professions** to assure high relevance of the curriculum and the problem-solving projects associated with it.

- **Outcomes-based measures** defining the leadership capabilities of the new IIT graduate in terms of: professional competence; communications and interpersonal skills; career development skills of entrepreneurship, economics, quality, and creativity; and citizenship, including ethics and understanding of social responsibility.

A new undergraduate college will enable the university to improve student services, student life, and collegial interaction.

The university must serve undergraduates as primary customers of the institution. While IIT has always provided a strong academic program, undergraduates need and expect a particularly high level of services and well-inte-
grated academic programs. Therefore it is imperative to have an organization-
al structure, achieved through creation of an undergraduate college, whose
sole mission is seeing to the needs of undergraduate students.

The specific structure of the undergraduate college and its relation to the
departments and professional schools should be developed to support the
characteristics of the college described below.

Student life should be viewed as an integral part of the undergraduate college.
This includes cultural and athletic programs, student government as well as
other student activities. Undergraduate student life should also include orga-
nized residential clusters that have a direct link to the academic program.

A new undergraduate college is likely to have these characteristics:

- **A student body that is somewhat smaller than today’s enrollment level.**
The undergraduate student body currently numbers about 1,900 full-time
students. Of this number, approximately 70% entered as freshmen and
30% entered as transfer students. The past two years the freshmen enter-
ing class has consisted of 41% ROTC students. The declining financial
support for ROTC students makes it unlikely that this portion of the class
can remain over the longer term. Therefore enrollment planning must
start with the assumption that once current retention rates are applied,
our current undergraduate enrollment base is approximately 1,500.

- **A student body with significantly more students who have earned
advanced placement credit at the time of admission.** These higher ability
students will benefit the most from accelerated programs and programs of
greater breadth.

- **A more diverse environment.** The university is already well along the way
forward having a highly diverse, international environment that matches the
world that graduates will work in during the 21st century. In addition to
cultural diversity, the university should improve its economic diversity to
more nearly match the economic profile of students at major public and
private institutions with which it competes. This would mean increasing the
percentage of students from families with incomes above $60,000 from the
current level of 21% to 45% (the percentage at major state universities).

- **An increased graduation rate.** Better services to students including advis-
ing and counseling, as well as more refined admissions standards, should
enable IIT to have a graduation rate in excess of 80%.
• An increased philanthropic base for student scholarships. This will enable the university to attract high achieving and highly motivated students of diverse backgrounds who cannot afford to pay full tuition.

Several alternatives to establishing the undergraduate college were considered and deemed insufficient for long-term success by the Commission.

Criteria used to evaluate these and the recommended alternative included: potential for distinctiveness; potential to attract both faculty and students; potential to attract sufficient philanthropy; and likelihood of assuring long-term success of the institution.

A very small, science- and engineering-based honors undergraduate program was considered. It provided too small a base, would require unachievable levels of philanthropic support, and was not sufficiently distinctive.

Incremental strategies, conducted on a college-by-college basis, can achieve important, short-term operational objectives. They are unlikely, however, to significantly change the long-term recruiting position of the university. Nor are they likely to attract philanthropic support needed to underwrite the tuition discount required by a very high percentage of IIT students.

A graduate-only model was considered and appears to be a viable alternative future for the university. However, the Commission chose not to recommend this strategy at the present time for four reasons:

• IIT’s historical commitment to undergraduate education.

• A shared belief that IIT can make a distinctive contribution to the development of undergraduate education.

• The massive downsizing that would be required might result in the loss of faculty who are key to the future of graduate professional programs.

• In the short term, the university might lose significant alumni and philanthropic support.
Establish quality principles for the continuous improvement of the university

IIT must expand its commitment to continuous improvement in service to its customers—its undergraduate and graduate students, industry partners, and research sponsors.

The quality programs initiated in 1993 should be seen as the first step in improving student services, administrative support activities, and academic and research programs.

IIT should develop key performance indicators that serve as meaningful institutional goals. These should include improvement in undergraduate retention and graduation rates.

An organized benchmarking process should be established to assure constant evaluation of IIT's programs and performance in relation to its competitors.

A rigorous, regular external review process for each of its programs should be initiated. External review by professional colleagues in the academic and industrial worlds will help the university community to meet its aspiration for quality.

A new academic performance assessment system should be developed. IIT's commitment to graduation of a new "brand" of student, equipped for the complex world of the 21st century, demands an outcomes assessment system beyond grades and degrees, that is believable and acceptable to external evaluators, employers, and graduate schools.

Development of new kinds of measures, such as competency examinations, team participation evaluations, portfolios and project reports, must be undertaken by the faculty concurrent with development of new pedagogies and programs.
Establish new financial principles and initiate organizational changes needed to support them

IIT’s financial system and organizational structure must have increased capacity to respond to the rapid changes in the higher education market place. The market place for higher education is growing more competitive and constantly changing. According to a 1993 study by the RAND Corporation:

*Each of the problems facing higher education, from fiscal cuts to concerns about the quality of undergraduate education, is important in its own right and warrants attention. These concerns take on a much greater importance, however, when considered as a whole. They are symptoms of a fundamental transformation in higher education’s environment. Recent economic, demographic, political, and social changes in American society have come together to dramatically alter both the purposes the sector is asked to serve and the resources available to it.* (The Redesign of Governance in Higher Education, The RAND Corporation, 1993, p. 22.)

Clear financial principles for operation must be developed. IIT’s financial situation, while having improved in the past four years, is still fragile. The lack of a large endowment, heavy reliance on tuition, and modest borrowing power require immediate response to changes in our market places. Over the past two years, a powerful, college-based economic model has been developed with the leadership of Armour College to guide the implementation of this recommendation.

The financial principles should:
- Include a clear set of financial expectations for each unit.
- Provide clear incentives for flexibility, cooperation among units, innovation, and change. This is particularly important because academic unit responsibility can lead to isolation and lack of cooperation.
- Include new standards for the orderly contraction of units that are unable to meet financial expectations.
- Provide for greater faculty participation in financial decisions through a participatory planning and budgeting process.

Organizational responsibilities must be redefined in light of the proposed creation of the undergraduate college and the introduction of new financial principles.

A new form of college-based faculty governance should be developed to facilitate participation of the faculty in the financial decisions of the colleges.

The important role of clinical faculty should be recognized as a consequence of proposed new initiatives in law, design, and psychology to increase direct clinical services, consulting assistance and other direct interaction with industry and individual clients.
Enhance IIT’s already strong graduate professional programs

During the past three decades, the graduate professional programs of Illinois Institute of Technology have greatly increased in importance. Graduate enrollment (including law) now accounts for 64% of all IIT students and 54% of all full-time equivalent students.

While undergraduate education is important—indeed it should become more important—the graduate professional programs (including doctoral research programs) are now the reputational and financial leaders in the university.

IIT’s future depends on maintaining strong and dynamic graduate professional programs. IIT must continue to strengthen its graduate professional programs as measured by traditional standards, and reinforce its industrial linkage through responsive programs for working professionals, increased clinical and consulting services, and expanded long distance education programs. As discussed elsewhere in this report, the future success of the undergraduate program depends on a strong cooperative effort of the graduate professional programs to bring their talent, expertise, and reputation to the new undergraduate college.

The university should set clear goals for traditional measures of success of its graduate programs. The traditional academic reputation of these programs is strong. Engineering and Law rank in the top 25% as measured by U.S. News and World Report, and even better by some other measures. The Institute of Design is arguably the equal of any program in the world while the College of Architecture retains an international reputation. The reputation of other programs is less clear, but all have considerable promise.

IIT should continue its aggressive growth in the development of industry-responsive interdisciplinary graduate programs for the working professional and the lifelong learner. Armour College’s tactics of flexible format (compressed intersession courses), flexible delivery, and market responsiveness have shown promise, and the effort should be intensified. Armour has recommended the creation of interdepartmental and inter-college program development teams to develop these new programs.
As an organizing theme, IIT should identify and provide professional educational support to the key growth industries of the Chicago region. These programs, like the successful Financial Markets and Trading Program of the Stuart School of Business, can be exported nationally and internationally once proved successful in the region.

Areas for such industry-responsive strategies include: software engineering, telecommunications, environmental engineering and environmental management.

A School of Applied Psychology should be established to better develop IIT's psychology department's combined strengths in industrial/organizational, clinical, and rehabilitation psychology. This will provide an opportunity to create a board of overseers to help guide and support the school's efforts.

IITV, IIT's interactive distance education program, presents the university with a distinctive edge as the nation's universities, colleges, and secondary schools move in the direction of distance education. While many institutions are just now experimenting with distance education, IIT has run its own system since 1976 and has begun to exploit a new generation of interactive technology to achieve new levels of inter-connectedness. These technologies permit direct links among IIT's four campuses, with IIT's corporate and academic partners, and with potential new partners worldwide.

IIT should press forward with its strategic advantage through aggressive programming, packaging, and marketing of IITV courses to new regional, national and international markets. In the process, the university must determine a competitive pricing strategy to stay ahead of public institutions, and increase the quality of course presentations and technologies offered.
In line with the strategic proposals of several of its colleges, the university should support the establishment and expansion of a new generation of clinical, consulting, and executive education programs to provide direct service to industry and professional groups, organizations and individuals, enhance professional learning experiences of graduate students, and provide additional compensation to faculty and resources for the university.

The Chicago-Kent College of Law plans a major expansion of its clinical program to enhance legal education in a practical environment. It also proposes creating an Executive Program through the proposed Center for Law and Business.

The proposed School of Applied Psychology should incorporate the psychology department’s plan for a Center for Applied Psychological Research and Service, to combine the clinical practices of its faculty, provide a rich learning environment for graduate students, and provide direct income for the new school.

The Institute of Design has created an Executive Program now underway to provide leading corporations with exposure to human-centered design strategies. The faculty also propose creation of an arm of the Institute to commercialize new software and provide an opportunity for faculty to supplement compensation through design consultancies.
Support IIT's faculty in their aggressive, entrepreneurial actions to attract research funding

The university should adopt a long-term strategy to leverage its strengths and niches to build strong recognition for excellence in a few focused areas. In particular, IIT should create additional chaired professorships, seek alliances with other institutions and support individual faculty research efforts.

IIT should consider establishing several new chaired professorships to attract faculty with international reputations to support those sub-disciplines with high potential for national recognition and improved ability to attract faculty and staff. During its deliberations, the Commission reviewed six areas in which chaired professorships and focused resources could have significant impact: health care, environment and energy, manufacturing and materials, transportation, food safety and technology, and information and communications.

IIT should build and expand alliances with other institutions, universities, and industry. Potential exists, through careful work, to expand the research connections between IIT and its non-profit contract research affiliate, IIT Research Institute. The two institutions share research strength in the above-named areas, but currently different cultures, management and financial systems prevent more than occasional joint projects.

IIT should encourage individual faculty to continue their entrepreneurial and opportunistic approach to research opportunities, recognizing that current national research goals stress fulfillment of broad national needs and increasing emphasis on interdisciplinary research projects.
The campus environment, including the school’s facilities and the surrounding community, are essential factors in fulfilling the university’s mission.

The facilities on the Main Campus require major renovation and updating.

Many of IIT’s main academic buildings were built nearly fifty years ago. The buildings were constructed under a master plan and integrated architectural design created by Ludwig Mies van der Rohe, father of the modernist style. The campus is recognized internationally for its contribution to the architectural heritage of the 20th century.

Since the completion of the Main Campus in the late 1960s, a slow deterioration of the facilities set in, caused in great measure by the tight fiscal situation of the university’s budget, the unique problems presented by Mies’s experimental architecture, and the lack of philanthropy. Today, the estimated toll in deferred maintenance is between $40 and $50 million on the Main Campus. This figure does not include much higher estimates to bring the academic and residential buildings up to 21st century standards.

IIT must be able to attract the private resources it needs to refurbish the main campus. In addition, it must develop a strategy to find additional resources to bring a part of the campus up to competitive levels.

IIT should make a major effort to work with the community, city government, state government and private resources to strengthen the surrounding community, and to attract philanthropy to the Main Campus. If such cooperative efforts fail, the Board of Trustees should consider other location options for the Main Campus, based on the kind of program developed and on the market served, and on the opportunity for philanthropic support to effect a move.
The challenge of the Main Campus is clear:

Student and alumni surveys indicate that the location issue presents the single area of greatest concern to them.

Surveys and anecdotal evidence indicate that many college-bound students and their parents will not consider IIT when they learn of its location on the Mid-South Side of Chicago.

Potential undergraduates who visit often dismiss any consideration of attending after viewing the campus and the surrounding neighborhood.

Over the past several years, the Main Campus has experienced the relocation and downsizing of a number of programs and tenants. The Stuart School of Business relocated to the downtown campus in 1993. IITRI has downsized its Chicago operation from 1600 employees in 1962 to 350 presently. And this year, the Institute of Gas Technology moved to Des Plaines, with IIT acquiring its three-building complex.

IIT, its neighboring institutions, community and city agencies, and commercial developers are working hard to change both the perception and the reality of the neighborhood. Major public and private investments have been made or are contemplated which could lead to major improvements over the next 10-20 years. IIT needs to continue to work with the neighborhood to solve problems collaboratively.
Ideas for Future Consideration

The Commission discussed many different ideas regarding special opportunities for IIT. Several of these strategic ideas, while not fully developed, merit continued evaluation by the university's trustees, faculty and administration.

**Explore IIT's opportunities to dramatically expand its international role and image.**

- As indicated in the review of IIT's strengths, the university already has a major international presence. These strengths include IIT's internationally-connected faculty, high percentage of foreign graduate students, growing number of international undergraduates, increased international programming of its professional colleges, and world-wide network of alumni and former faculty colleagues.

- When evaluated against the rapidly increasing globalization of professional roles, all of these components argue for an increased focus on international recruiting, international academic partnerships and electronically transmitted course offerings. In the course of the deliberations leading to the report, several individuals have suggested the potential for a change in IIT's name to "International Institute of Technology," as a way to dramatize IIT's new focus and triggering increased international philanthropy and partnerships.

**Consider development of a special, one-year preparatory program for highly motivated students whose academic preparation does not meet IIT's new admissions standards.**

IIT has long served the needs of Chicago area students. The dramatic decline in the quality of K-12 education has been well documented. The projected time needed to fully improve the system to serve the needs of all children argues for short term solutions to benefit both the children and the university by identifying and preparing students for success at IIT.
The military has successfully employed transitional programs between high school and college to enable otherwise capable students to quickly upgrade their academic preparation. Based on this model, IIT should evaluate the potential opportunities, costs and potential alliances and sources of income for such a program. Any such effort should be undertaken in consultation with The Teachers Academy for Mathematics and Science and De LaSalle High School.

Establish a task force to investigate specific, new opportunities for increased cooperation between IIT and IITRI.

Both institutions can expect to undergo significant change in the next few years: IIT, because of the issues identified in this report; IITRI, because of the major upheavals in defense research and development. While the Commission heard many ideas for possible cooperation, including joint research collaboration and increased student work and study opportunities, it also recognized the existing cultural and administrative barriers to real collaboration. The task force should be charged with the responsibility of separating real from perceived barriers and providing guidance on new mechanisms to promote cooperation.

Consider development of lifelong learning programs for graduates.

A number of Commission members identified a special opportunity IIT might have in attracting undergraduates and building alumni loyalty and support: Given that so many alumni settle in and work in the Chicago area, that technically trained alumni face the need for upgrading of skills every three to five years, and that all professionals can use assistance with matters of personal finance, continuing professional education, and career counseling, there exists an opportunity for IIT to make a long-term commitment to serving its alumni—through courses, professional services, and counseling. Interactive multimedia technology could offer a cost-effective way to deliver such services to alumni throughout the world.
Towards the Future: Aspiring to Be the Best

IIT's drive to develop a premium education must include a commitment by all involved to be the best in its undergraduate and graduate offerings.

Three themes emerge in this report from this aspiration. They are encompassed in three words: international, interprofessional and interconnected.

**International**—to offer the best in both undergraduate and graduate professional programs to meet the needs of 21st century professionals worldwide.

**Interprofessional**—to be the first and the best in effectively integrating professional disciplines into a distinctive undergraduate experience.

**Interconnected**—to exploit the revolution in information and interactive, multimedia technology to be the best in delivering quality, cost-efficient education by linking students and faculty to academic and industrial resources both close to home and around the world.
Resources

The resources needed to insure dramatic change are substantial. While the Commission did not undertake an in depth analysis of resource needs, it is possible to provide a first estimate of the transitional and long-term philanthropy needed to implement the recommendations of the National Commission. These estimates will require careful evaluation during the implementation design process. The resource strategy is divided into three components: an overall financial goal based on present levels of operation; a five-year transitional plan for structural change and development of the undergraduate college; and a ten-year program to increase endowment and expendable aid for new facilities, scholarships, faculty chairs, and program development incentive support.

Overall Financial Goal

Present estimates indicate that IIT must increase annual net revenues by at least $11.5 million in current dollars to solidify its financial base.

The new financial principles described elsewhere in this report must be put in place immediately. Academic unit-based plans must be developed quickly to establish financial equilibrium within three years. More dramatic improvement within five years is needed to increase salaries to competitive levels, reduce dependence on endowment, unrestricted bequests, and subventions from other units that are currently in a financially stronger position.

Sources for this major change in income will include: net increases in undergraduate and graduate tuition through short term niche marketing, improved retention and increase in net tuition per student, reduction in expenses through administrative restructuring and productivity improvements and increases in expendable philanthropic aid.
Transitional Plan

Establishment of an immediate five-year transitional philanthropy plan of $20 million to include the following components: Start-up costs of the new college, administrative restructuring, structural deficit reduction and improved salaries.

Ten-Year Plan

Establishment and implementation of a ten-year philanthropic campaign for IIT to raise $250-300 million for the new IIT. Components would include:

- building renovation and new construction
- endowed scholarships
- endowed chairs at $4 million each
- expendable aid
Appendix A
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Appendix B
Supplemental Data

IIT Tuition and Comparative Prices

IIT's tuition has increased from $6,390 in 1983 to $13,750 in 1993. This is an overall increase of 115%. IIT's price is substantially higher than its local competitors, UI-Chicago and UI-Urbana Champaign, although the price of these competitors has also increased. UIC tuition and fees increased from $1,533 to $3,310. UI-Urbana Champaign increased from $1,546 to $3,376. These are increases of about 115% as well.

The average family income of IIT freshmen in 1993 was $44,267. This is up from $27,000 in 1986.
Enrollment Trends

National public high school graduation rates declined in the 1980s but are projected to increase 21% from 1993 to 2003. In general, Illinois public high school graduation rates follow this pattern, with an increase of 14% projected from 1993 to 2003.

College enrollments are also projected to increase 14% from 1991 to 2005, with the largest percentage growth in Hispanic enrollments and the largest numerical growth among whites.
IIT Enrollment

From 1983 to 1994, IIT full-time equivalent (FTE) enrollment has decreased 2% and headcount has increased 6%. Undergraduate FTE enrollment declined 27%, from 3,094 to 2,263. During this time, graduate FTE enrollment grew by 45%, from 1,052 to 1,528. Chicago-Kent FTE enrollment grew 27%, from 862 to 1,095. Course enrollments at Rice Campus, both live and IITV, have also increased.
Minority Enrollment

At the undergraduate level, the proportion of minority students has increased since 1983 from 24.7% to 33.3% in 1994. The number of African American students has declined (down 32%), but the numbers of Hispanic and Asian students have increased (up 35% and 26% respectively).

New freshmen continue to come primarily from Chicago and other areas in Illinois, with an increase of students from other countries (up from 3% to 9%). From 1983 to 1994, the proportion of minority new freshmen increased, with increases in Hispanic and Asian students.
IIT Retention and Graduation Rates

Approximately four in five freshmen return as full- or part-time students their sophomore year. This rate has been reasonably consistent since 1983 (84% for 1983 freshmen and 82% for 1992 freshmen), although the freshmen enrollment has fluctuated.

About two in three freshmen return full- or part-time for their junior year. This rate has been consistent since 1983 (69% for 1983 freshmen and 66% for 1991 freshmen).

Four-year graduation rates are about 20%. This is due in part to the five-year Architecture program. Graduation rates improve dramatically at five and six years with the six-year rates between 50% and 60%.
IT Degrees Conferred

Since 1983, the proportion of awarded bachelor's degrees has declined, compared to that of graduate degrees, down from 44% of degrees awarded in 1983 to 30% in 1993. This decline is offset by the increase in the proportion of master's degrees over ten years, up from 30% in 1983 to 41% in 1993.

The bulk of the degrees are awarded in Armour College of Engineering and Science.
IIT Faculty

From 1984 to 1994, IIT's full-time faculty size increased 4.6%, from 283 to 296.

Overall, in 1993-94 the average faculty salary was $53,484. This is similar to schools such as DePaul ($52,382), UI-Chicago ($52,206) and Loyola ($57,016) but less than other technical schools such as RPI ($63,976) and Carnegie Mellon ($67,789).
Research Funding and Endowment

IIT sponsored research funding has increased from $7.9 million in 1987-88 to $15.7 million in 1993-94. Consistent with earlier years, the majority of research funding during 1993-94 was in Armour College.

IIT's endowment has increased from $23.8 million in fiscal 1983 to $85 million in fiscal year 1994.
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