Proposed Strategic Plan Implementation

Submitted by the WPI Strategic Plan Implementation Committee,
September 17, 1998

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Introduction

“The Strategic Plan Steering Committee envisions WPI, in 2010, as a world leader among small, private technological universities focused on engineering, science and management. Offering integrated theory and practice through a project-based curriculum and global opportunities in all levels of study, WPI will continue to build an environment that promotes innovative thinking, values mutual respect and diversity, highly regards scholarship, promotes ethical behavior and engenders life-long learning for the campus community.” (From the Strategic Plan Steering Committee Final Report 4/27/98.)

WPI has reached a critical point in its development as one of America’s most creative technological universities. For over a century as a highly respected regional institution WPI had made a steady stream of important educational contributions producing renowned leaders in every field of science, engineering and management, from Robert Goddard, father of the space age, to Harold Black, father of modern communications. Then, during the past quarter century, WPI blossomed! It has implemented the most creative and coherent approach to technological education in the country, which combines a strong but flexible course structure with required qualifying projects in the major field (MQP), the humanities and arts ( Sufficiency) and in socio-technical interaction (IQP). WPI has moved from the status of regional college to that of national university, has become a world-class innovator in global technological education, has enhanced its facilities many fold and has developed a faculty and student body that are outstanding in intellectual capacity and achievement.

Where lies the future for WPI? As is said in the world of finance, “Past performance does not guarantee future success.” Thus WPI through its past accomplishments, by its very success, has now raised the stakes for its future in an environment of dramatic change, of powerful competition and of fiscal challenge.

To address the future of WPI, many members of the faculty, administration and student body have been working for almost two years on development of a strategic plan, beginning with the work of the Strategic Plan Steering Committee (SPSC 1996-97) and culminating in the work of the Strategic Plan Implementation Committee (PIC 1997-1998).

The report of the Strategic Plan Steering Committee put forth the following goals:

- Create a Campus in Harmony with our Programs
- Continue to Innovate in our Undergraduate Program
- Integrate Education and Research
- Develop Creative Pathways to Graduate Degrees
- Make Creative Use of Information Technology
• Improve Community Relationships and Diversity
• Provide Global Opportunities for Potentially All Students
• Recognize and Adapt to Continuing Change

Through the Plan Implementation Committee effort, many initiatives have been proposed, their educational benefits examined, their costs analyzed and their place in a coherent, achievable pattern of institutional development considered. The following introduces the five goals that have evolved from those proposed by the SPSC as PIC has continued the effort of identifying the aspirations of WPI and specific actions that would take us there.

At the core of WPI’s strategic plan is an uncompromising commitment to quality. Given WPI’s history as a student-oriented institution, its highly-selective admissions criteria and its excellent academic reputation, enhancement of quality is essential in every aspect of its educational process from the curriculum structure, the classroom interactions, project planning and execution, faculty and graduate research, and its supporting facilities. Development of a new first year curriculum, creation of new interface disciplines and expansion of the research infrastructure are all part of the initiatives proposed. A weak element in any of these aspects, however, whether graduate or undergraduate, demeans the whole. Above all, the faculty-student ratio must be adequate to allow for quality student interaction while permitting faculty to develop professionally themselves. Thus a series of initiatives have been developed to meet the core objective to enhance the quality of WPI’s Academic Programs.

WPI had earlier progressed from the status of a local institution to that of a regional college of engineering. Despite its persisting handicap of inadequate name recognition, WPI has now been granted the status by external evaluators such as the Carnegie Corporation and US News and World Report of a doctoral-level, national university. The criteria for such status encompasses items from the number of doctoral degrees awarded annually to the geographical distribution of its undergraduates and the diversity of its offerings.

It would be unthinkable for WPI, having gained a status awarded to only 287 of more than 3,500 degree-granting institutions in the US, to allow now this recognition to slip away from us. Initiatives to develop new programs and to invigorate graduate education and scholarship, are presented to meet the objective to develop WPI’s position as a National University.

Starting with its Washington Project Center and its initial exchange programs with City University of London and ETH in Zurich over 25 years ago, WPI has now developed what is probably the most unusual and extensive project-based system of global education in the world. No other institution can offer the majority of its students the opportunity to undertake the hands-on solutions of locally-sponsored problems at the interfaces of science, technology, social concern and human values. No other institution has, or will likely soon have WPI’s two essential elements for this program: (1) an
interdisciplinary degree requirement and (2) a seven-week term. The concept of education for a global society is growing in educational circles. At the moment WPI is ahead of the curve, but other institutions are organizing their own approaches to this opportunity.

To establish increased academic credibility for WPI’s global and interdisciplinary programs there is a need to strengthen the preparation of both students and advisors for the experience. In addition there is a need to provide a focus for scholarly work in a variety of global issues. Both of these needs could be addressed through an appropriately funded structure at WPI that could raise performance expectations, producing increased effectiveness and public recognition for WPI’s on-going project work.

Initiatives are thus proposed to establish WPI as an international technological leader in global education.

WPI has responsibilities to many communities, both internal and external. No community deserves more consideration and urgent attention than its own student community. With 85% of the all-male student body as members, a vibrant fraternity system provided both upper-class housing and social life for the campus for almost a century. Now, with only about 35% of students in Greek organizations, the majority of the campus has been left largely without a social focus -- “without a living room”, as one trustee stated. With a Campus Center now in view along with the programming opportunities it can inspire, WPI is on the threshold of providing its students with an all-campus facility where the social development of its students and their sense of community may grow to levels not seen before at WPI. Initiatives presented in the strategic plan address these new opportunities.

WPI’s communities also include its professional constituents involving a variety of disciplines. Great strides have been made in addressing the continuing education needs of this community with expanding centers in Westboro and Waltham, and advances in distance learning and other technological enhancements of the educational process. In addition, there is our local Worcester community where, especially in the area of K-12 education and adult-learning programs, there are opportunities for WPI to contribute in many important ways. Initiatives are presented which are designed to improve WPI’s campus culture and community presence.

The preceding objectives address the core of the academic enterprise, the creation, and dissemination of knowledge and the attendant interaction with the community and preparation of the student for this process. Not to be ignored, means to retrieve and exchange information form a fundamentally important resource of this education process. The need for facilities to keep up with the ever-changing field of communication requires resources that extend from intra- and inter-campus communications. The central educational resource of any academic institution is its library. To maintain this central role WPI’s library must not only meet the continuing need for printed references but must also accommodate the exploding world of electronic references. Furthermore, the new opportunities for teleconferencing made possible by advancements in computer and data communications technology provide timely solutions and new opportunities for the
communication between our main campus and the many outposts that we have created throughout the world. The need for expanding such resources will only grow with time. Initiatives to meet these needs are presented to expand WPI’s educational resources.

Thus we present five interwoven goals forming the basis of WPI’s Strategic Plan for 2010. The achievement of these goals, we feel, will ensure the best possible future for WPI.
Goal Case Statements and Listing of Strategic Plan Initiatives

The PIC recommends a strategic plan implementation that promotes the growth and development of WPI at the five levels identified above. The implementation plan, while so divided, should be viewed as a single plan as each level both supports the existence of the succeeding levels and benefits from their existence.

The five levels of the implementation plan target the following goals:

1. Enhance the Quality of WPI’s Academic Programs
2. Develop WPI’s Position as a National University
3. Establish WPI as an International Technological Leader in Global Education
4. Improve WPI’s Campus Culture and Community Presence
5. Expand WPI’s Educational Resources

Below we summarize the case for each of these proposed goals and list the initiatives that are recommended to achieve these outcomes within the context of the strategic plan. The following sections of the report present a description of each component initiative.

1. Enhance the Quality of WPI’s Academic Programs

WPI's success rests on the excellence and innovation of its academic programs; their maintenance, nurturing and expansion are crucial to WPI's continuance and growth. The seven action items proposed toward this first and foremost goal build upon WPI's academic reputation, even as they respond to opportunities for dramatic change in the first year experience, in undergraduate and graduate research options, in improving the student/faculty ratio, in expanding graduate project opportunities, in harnessing learning processes to new technologies of data collection, correlation, and comprehension, in assessing pedagogical successes and failures, and in devising new learning experiments for WPI students.

The initiatives, which are proposed to meet this goal, include:

1.1 Reinvigorate the Education Development Council
1.2 Create a Center for Educational Development, Technology and Assessment
1.3 Endow Undergraduate and Graduate Research Experience Fellowships
1.4 Begin a Pilot Graduate Project-Based Degree-Program
1.5 Improve the First Year Experience for All Students
1.6 Initiate a Tutorial Style Honors Program for First Year Students
1.7 Improve the Faculty/Student ratio

2. Develop WPI’s Position as a National University

A specific goal for WPI is to raise our national reputation in both undergraduate and graduate education. WPI is widely recognized for the quality of our undergraduate programs and recently has achieved status as a Doctoral Institution. We must act now to substantiate our position as a leader among national universities. This goal can be realized with investments in three areas:

New Program Development

The establishment of New Programs in areas of evolving societal challenges or emerging technologies serves to enhance our position as a nationally recognized center of innovation. These ventures will contribute to the entrepreneurial atmosphere and will provide a diverse array of offerings, which in turn will lead to greater diversity in our applicant pool. By responding quickly to the changing needs of the marketplace and embracing new technologies, WPI will assume a leadership role among universities. These efforts will result in higher demand for our students, faculty and programs.

Distance Learning

A logical extension of the New Programs initiative, which increases our diversity of offerings, is the area of Distance Learning. This venture will enhance the recognition of WPI by attracting new audiences and providing access to a diverse clientele worldwide. It will serve as a vehicle to increased revenue and will solidify our position as a technological leader in the workplace.

Research and Scholarship

Furthering strength in the area of graduate education and research is vital to the academic mission of WPI at both the Undergraduate and Graduate levels. This fact is underscored by recent reports from the NSF and National Science Board (NSB) that emphasize the critical need to integrate research and education. Strength in research in the graduate area will enhance the educational opportunities available to our undergraduate project students and provide valuable direct exposure to faculty scholarship. Investment at both levels will have a synergistic effect on the quality and recognition of our undergraduate and graduate programs.

Substantial investment in graduate studies and research beginning now and extending over the next ten years is critical to establishment of WPI as a nationally recognized university. The National Research Council’s peer review of
scholarly quality provides an important tool for assessing our progress in this area.

This decennial poll will next be conducted in 2005. Investing in our graduate programs starting now will certainly have a significant positive impact on WPI’s ranking in this poll. It should be our goal to achieve collective and individual rankings in the top fifty in this poll. For those graduate programs not reviewed by the NRC, similar metrics must be developed and periodically assessed.

PIC has assembled the following three-point strategy designed to enhance graduate education and research at WPI.

• Improve the Infrastructure at WPI to Support Graduate Studies and Research
• Promote Faculty Development to Encourage Excellence in Graduate Studies and Research
• Enhance the Environment to Create a Campus Culture Conducive to Graduate Studies and Research

The three initiatives described in the following plan that address these needs include:

2.1 Invest in Continuous New Program Development
2.2 Develop More Distance Learning Offerings
2.3 Further Increase Support and Participation in Research and Scholarship

3. Establish WPI as an International Technological Leader in Global Education

WPI has had 25 years of experience in developing and operating its unique IQP program. The combination of this interdisciplinary degree requirement with a calendar structure that permits students to complete not only IQPs but also Sufficiencies and in some cases MQPs off campus, through a truly global program is a capability that virtually no other university can duplicate. The opportunities for enhancing the educational experience of WPI students and the reputation of WPI itself can enable WPI to become a recognized world leader in an area of growing international importance. There is ample evidence that most of the activities in which our alumni are engaged are or soon will be global in their scope. WPI should seize and develop this extraordinary opportunity through enhanced infrastructure support and deepened intellectual expectations.

3.1 Expand Opportunities in the Global Program
3.2 Create a Center for Global Technology, Policy, and Culture
4. Improve WPI’s Campus Culture and Community Presence

The issues of campus culture and community presence pose great challenges for WPI and great potential rewards. If WPI can expand the diversity of its community, if it can generate a campus social life as committed, dynamic and diverse as its academic programs and if it can continue growth of its continuing education program both locally as well as at a distance, then, WPI will surely flourish in the 21st century. The first step of creating a new Campus Center has been taken, and this document takes that priority as a given and hence calls only for Alumni support for a fund to cover the new Center's operating budget. That is an act of faith surely justified by the numerous public assurances of the Center’s imminent construction.

Toward the goals of increasing diversity and improving WPI's community presence, several bold actions are proposed to help WPI further its interaction with its community of future, current, and past students.

4.1 Expand Continuing Education Division
4.2 Introduce New Diversity and Community Efforts
4.3 Seek Alumni Support for the Campus Center
4.4 Coordinate and Expand K-12 and Community Interactions
4.5 Enhance the Role of the Career Development Center
4.6 Develop a Growth Plan for Student Housing

5. Expand WPI’s Educational Resources

At the core of the processes of education and research is the need for rapid and random access to information. While the speed and accessibility of archival information and human communication provided by paper copy and paper mail once suited the pace of technological and scientific growth, this is no longer the case. So that our other efforts are not hamstrung by slow information flow, we must make further investments in information technology that build upon WPI’s already considerable information resources. We propose two actions that will enhance our archival system and which will allow us fast and convenient interaction with our students and colleagues at any of our world-spanning off-campus sites.

5.1 Create an Internet-Conferencing Based Global Virtual Classroom
5.2 Improve Library Facilities and Services
The WPI Strategic Plan Initiatives

1. Enhance the Quality of WPI’s Academic Programs

1.1. Educational Development Council

The Educational Development Council should be re-invigorated through endowed support. The EDC would make significant strategic investments in new efforts to promote the use of experimental educational tools and the application of assessment techniques.

1.2. Center for Educational Development, Technology and Assessment

A message that permeates the Task Force reports is that there is a potential synergy to be exploited at WPI by capturing and coordinating the fragmented domains of expertise in educational issues that have developed or struggle for development at WPI. There is an opportunity for leadership in educational development, application of technology for education and outcomes assessment at WPI. The work that we are currently doing could remain another well kept secret about WPI, or, we can expand upon and expose it. We believe that there is an urgency in our need to invest in ourselves and an opportunity to capture the limelight for our hard work.

We propose the expansion of WPI’s Center for Educational Development (CED) into an entity named the Center for Educational Development, Technology, and Assessment (CEDTA). CEDTA would comprise a faculty director, a group of faculty drawn from several departments, serving on a rotating basis and partly funded by this initiative and visiting faculty.

CEDTA Mission Statement: The mission of the Center for Educational Development and Assessment (CEDTA) shall be to

- Foster a university culture that values and rewards teaching and learning excellence;
- Encourage and support educational innovation;
- Support innovation in the evaluation of pedagogical practice;
- Function as a link between faculty and University services;
- Pioneer and assist in the insertion of new technology into the educational experience.

The faculty in this group would be charged with a number of tasks that include coordination and sharing of several areas of expertise that are now dispersed, uncoordinated and under-nurtured on the WPI campus. The support currently available to the CED would be increased to address the expanded mission.
The center’s director would have significant release time to spearhead the efforts of that group for the benefit of all WPI faculty. The other members of the center would include faculty, who during their term of appointment to the center would receive release time support from the center. These faculty would apply for appointment by the Provost in consultation with the CEDTA director and relevant departments, to fill chairs with specific responsibilities. For example, such chairs might include those charged with advancing our stance and contributing campus services related to: Evaluation, Cognitive Studies, Pedagogical Innovation and Educational Technology. Funds will be sought to endow these rotating release-time chairs.

That these members are to be drawn from the faculty is considered important to the cause of dissemination of this expertise to other faculty, and, to the meaningfulness of the efforts undertaken, as the members would be exposed to the reality of the WPI environment. The faculty in the center would have the opportunity to assess their own experiments in WPI educational exercises and to cast the experiences in terms that would be immediately accessible and applicable to their colleagues.

In further support of this thrust, we propose the establishment of new faculty positions, partly funded by an endowment, that would be available to those departments that can recruit faculty with demonstrated expertise which correlates with the mission of educational development, research, assessment or application of technology in teaching. This hiring challenge is meant to parallel the already successful diversity effort of the same form.

Finally, support for funded chairs for faculty who wish sabbatic leave connected to development effort in this area and for visiting faculty with such expertise will also be sought.

The members of CEDTA would be involved in production of WPI workshops in educational development areas, assistance of other faculty in the deployment of new methods and technologies, educational proposal writing, support of self-evaluation and other accreditation related activities. Members of CEDTA would also work closely with the Library, IMC and CCC in the establishment of programs and procedures for the application of new technology and new teaching methods in and outside the classroom. PIC strongly urges the creation and funding of a new position to be housed in the IMC charged with support of CEDTA efforts through instructional design and technology application.

CEDTA would also spearhead campus wide efforts to develop new pilot projects funded by external agencies such as those recently completed with the Davis Foundation. After the initial start-up phase funded by the capital campaign, CEDTA will be responsible for establishing strong external funding based upon funded educational research, technology exportation, and provision of distance learning services.

Overall, the most important charge of CEDTA would be furtherance of WPI’s position as a National University through assessment of our performance, recommendations for
improvement, pursuit of recognition and realization of new funding targeted at improving the quality of our academic program.

1.3. Endow Undergraduate and Graduate Research Experience Fellowships

Endowed research fellowship awards that target creation of teams of undergraduates and graduate students participating in new research efforts would enable undergraduate students to work in a research laboratory during a summer. Such awards would encourage our best undergraduate students to pursue graduate studies and our best graduate students to consider careers in research and academia. Those going to other institutions would help build our reputation while some of these “best and brightest” would likely continue their studies at WPI.

This form of graduate student financial aid is widely recognized as beneficial to both the graduate student and the academic program. High quality graduate students can be attracted to a department by the availability of a fellowship. As a result of their presence, the quality of classroom education, department environment and faculty research are favorably impacted. We place extra emphasis on doctoral fellowships.

A competitive stipend/tuition financial package will depend on the discipline but will generally fall in the $30,000 range requiring an increase in the endowment of $600,000 per fellowship.

1.4. Graduate Project-Based Degree Program Trial

The creation of new Graduate Project Centers for projects and professional practice would strengthen and promote practice-oriented degrees. Incorporation of project activity in degree requirements, analogous to the undergraduate program, would establish a real-world experience for those students studying to improve their professional positions. The WPI network of domestic and global project centers could be utilized as sites for the Graduate Project Centers.

To further this goal we recommend the creation of new Graduate Internships in the U.S. and Overseas in industry settings. Analogous to medical training, which includes a clinical experience, our practice-oriented degrees could significantly benefit from the inclusion of internships. Such activities not only provide an economic resource to meet costs but also provide essential professional practice experience.

1.5. Improve the First Year Experience for All Students

WPI markets itself as the place for students who are excited by the challenge of our unique projects-based education and the associated high degree of student-faculty small group contact, and these are the elements of our program that students and alumni value most. Currently, however, the first year experience at WPI is almost entirely incongruous with the letter and spirit of the rest of our educational program. We must enhance the social and academic components of the first year to better prepare students for our
outcomes-oriented project-based curriculum. While more challenge is required for many of our first year students, at the same time we must help them succeed in making the often difficult transition from high school to WPI and provide assistance to those who are not adequately prepared. The Future Search Conference on the First-Year Experience held at WPI in the summer of 1994 identified several pilot projects that could serve to bring more of the excitement and challenge of a WPI education into the first year while also providing effective assistance to students who find themselves in difficulty. One of these ideas, a Cambridge-style tutorial experience, is proposed in the next section as an "honors program" for a subset of first year students, but it is recognized that such an approach would not be appealing or appropriate for all. Other projects that, if expanded, may have the potential for enhancing the first year experience for all students include EMSEP, LEAP, the Academic Success Program and the "Summer Bridge Program," and Bridge Projects (currently funded by NSF) that provide linkages between science, math, and engineering in the first year. Many of these projects are intended to have the effect of an "extended orientation" to WPI, providing skills and information as needed during the first year. Unfortunately, we have rarely followed through in evaluating the success of these various programs by tracking participants' progress at WPI. The most popular "first year design" among Future Search participants in 1994 proposed to cluster students in base groups and provide guidance in personal development modeled after the demonstrated effectiveness of EMSEP. However, the resources that would be required to extend such a model to the entire first year class were never studied.

Thus, much work has already been done in generation and small-scale implementation of ideas to enhance the first year experience, and this work should not be repeated. Rather, PIC recommends that a study be funded to assess the effect of these past and present programs on students' retention and performance at WPI. Then commitment and leadership from the highest levels will be essential to identify the resources to fund and institutionalize the expansion of the most effective approach(es) for enhancing the first year experience.

1.6. Initiate a Tutorial-Style Honors Program for First Year Students

This initiative, which builds upon a proposal made following the First Year Future Search Conference in 1994, represents an attempt to help first year students become active participants in a learning community that values curiosity and scholarship. The goal of this program would be to create an innovative, integrative, and challenging first year experience for a subgroup of students who would be selected by application. The first year experience for this group would be significantly restructured so as to be entirely unified in approach, outcomes-based, and self-directed by the students to some extent.

Teams of five faculty "tutors" drawn from multiple disciplines would work with groups of approximately twenty students as advisors and learning facilitators. (Some simple arithmetic suggests that all first year instruction could be accommodated by assigning groups of twenty students to teams of five faculty.) Those five faculty would have complete responsibility and authority for the first-year education of their twenty students, much like the age-old tutorial model at Cambridge University. Students would not be
required to enroll in traditional courses, although they may decide to audit them. Instead the curriculum would be designed in-process by students and faculty, around a set of expected cognitive and affective objectives and outcomes for the first year (approved by CAP and the Faculty) in the areas of mathematics and science, humanities and social science, and overall personal development. It is anticipated that projects, some involving outreach to the campus and Worcester communities, would be a significant part of student activity.

The approach of this program is attractive because the intense interaction among faculty and students would rapidly nurture a sense of individual responsibility as well as social and intellectual maturity among students. As a secondary consideration, these tutorial groups would be novel enough to attract students and funding beyond the pilot stage.

To bring this program into existence PIC recommends the endowment of a fund for operational support of the program, including support for faculty who commit to the project. Such support must include at least one month summer support for each of five faculty to plan the initial pilot program, and release from a minimum of one course each during the academic year to conduct the tutorials. Among the many issues to resolve are allocation of the four units students might earn among distribution and degree requirements (in consultation with CAP and with ultimate approval by the Faculty), and preserving disciplinary integrity and perspective across the efforts of the five supervising faculty.

1.7. Improve the Faculty/Student Ratio

A key measure undertaken towards enhancing the quality of our academic programs must be an increase in the number of tenure track faculty, in recognition both of the time-intensive nature of our existing projects-based program and research activities and of the additional faculty time that will be required for new strategic initiatives.

For example, the CGSR report on "Enhancing the Role of Graduate Studies and Research at WPI" called for an increase in the number of tenure track faculty and adjusted teaching loads (see Section 2.3.2.) Significant progress in enhancing the first year experience is also not likely to occur without additional faculty and/or appropriate incentives. One of the recommendations of the First Year Future Search Conference of 1994 was to limit all fall semester, first year classes to 35 students. Furthermore, developing and implementing an EMSEP-like program for most of the entering class would require significant reallocation of faculty teaching and advising effort. There was recognition among conference participants that faculty participation in this range of activities would have to be incorporated into teaching loads, and that if they were treated on the same laissez faire, good citizen basis as academic advising, they would fail.
2. Develop WPI’s Position as a National University

2.1. New Program Development

To move WPI forward in pursuit of its vision and mission, the Strategic Planning Steering Committee (SPSC) emphasized the importance of recognizing and adapting to continuing external changes. To do so, the University will need to provide encouragement and support for innovation in undergraduate and graduate programs. Imaginative programs that tap into emerging technologies, address evolving societal challenges, and/or are unique to WPI are critical to strengthening WPI’s competitive position and academic reputation. WPI has distinguished itself by pioneering innovation in technical undergraduate education. Investment in the creative development of new programs will continue this tradition and invigorate WPI’s entrepreneurial spirit. With new technology, changing demographics, and increasing competition, academic institutions will need to respond more quickly and cost effectively to the external marketplace. An investment in new programs not only ensures the relevance of a WPI education, but also fosters a knowledge base within the University about how to generate new ideas and to implement them.

2.1.1. Purpose and Scope of Program

We recommend that a fund be established to create a perpetual source of seed money to support innovative, creative new programs and directions. Such a fund might be called the “WPI Fund for Innovative New Programs”. The purpose of the fund would be to provide significant start-up funds for proposed new programs.

The success of the Interface Discipline Program, which began in 1993, suggests that significant seed money provided to support new programs can have substantial benefits. The approximately $300,000 invested in the Interface Discipline Program has resulted in an estimated return of $3,000,000 to WPI. Benefits include new tuition revenue, new corporate linkages and the broadening of WPI’s image and educational programs. The average grant provided in the Interface Discipline Initiative was approximately $28,000; PIC believes that these awards were instrumental in the resulting success in establishing the new programs. The thrust of this initiative is to provide substantial investments for innovative new programs, which might be multi-year and would equal or exceed the size of the average investments in the Interface Discipline Program.

A new program would generally be interpreted to be broader-based than a single course. In addition, such initiatives would usually be expected to involve more than one faculty member and be geared to faculty members who have completed at least one year of service at WPI (the fund is not intended to be used for start-up funding for new faculty).
2.1.2. Funding Criteria

PIC recommends that the following criteria be used to evaluate programs considered for investment through this fund. Such programs should:

1. **Be consistent with the purpose and scope of the fund.** The purpose of the fund is to provide significant investments in innovative, creative new programs as described in the Purpose and Scope section of this initiative.

2. **Be consistent with the vision and mission of WPI.** WPI established distinctive competencies through the strategic focus provided when the Plan was endorsed and implemented. As WPI and the external environment change, WPI’s vision and mission will change, but will still serve the purpose of directing investment.

3. **Strengthen WPI’s competitive position and reputation.** Each new proposed program should be accompanied by a business plan that addresses how the program is expected to take advantage of external opportunities, to address competitive threats, and to overcome barriers to full implementation. A financial analysis of the costs and benefits of the proposed program is required. New programs should enhance WPI’s ability to attract faculty, students, and/or generate additional financial resources.

2.1.3. Program Leadership and Management

PIC recommends that New Programs Initiative funds be awarded and disbursed through the Provost’s Office, with input and evaluation provided by an Advisory Board whose membership is determined by a combination of Faculty and Administrative appointments. The Administration, through the Provost, will have the opportunity to exert leadership in identifying and encouraging strategic directions consistent with its view of what is needed to ensure curricular vitality and to strengthen WPI’s competitive position and reputation. The Advisory Board serves to encourage Faculty involvement in suggesting new program directions and to identify common ground between prospective faculty initiatives and administrative priorities. The Provost and Advisory Board are expected to work together closely to ensure overall coordination of vision, as well as of specific criteria in each year’s solicitation of proposals.

2.1.4 Advisory Board—Composition

The Advisory Board will consist of appointed members selected by Faculty Governance and the Administration. For example, the Board might consist of five members, one each selected by CGSR, CAP, and FAP, and two selected by the Administration. Board members could be selected from the Faculty, the Administration, or elsewhere as deemed appropriate.
2.1.5 Tasks

The Provost in partnership with the Advisory Board will:

1. Solicit pre-proposals—
   To encourage the widest possible participation, the Provost/Advisory Board might initially invite short summaries of proposed programs to screen for appropriateness and eligibility as well as to view as a source of new ideas in shaping their thinking.

2. Develop appropriate criteria—
   The Provost/Advisory Board will develop appropriate criteria for new programs suitable for funding as well as define the criteria that will be used to evaluate current proposals.

3. Solicit proposals—
   The Provost/Advisory Board will invite submission of full proposals, each developed to respond to announced criteria and including a business plan to quantify the expected impact of the proposed program.

4. Evaluate proposals—
   Proposals will be evaluated on a competitive basis and for their consistency with published criteria developed by the Provost/Advisory Board for that round of proposals.

5. Make funding recommendations to the Administration—
   The Board will provide rank order selections of those proposals it finds worthy of funding. The Administration would take these recommendations into account in reaching a final decision on funding.

6. Monitor the success of these funding initiatives—
   The Provost/Advisory Board will periodically evaluate and report on the success of the New Programs Initiative to the Faculty and Administration.

2.1.6 Cost of the Initiative

To ensure that the proposed purpose and scope of this initiative is met, the amount available for disbursement through New Programs funding should total between $100,000 to $200,000 annually. With this level of funding available, it is expected that 1-5 awards would be made annually. Based on the 5.5% spending rule, an endowment of between $1.82 and $3.64 million would be required to support this annual level of investment.

2.2 Distance Learning

The emergence of communications technology has resulted in the development of asynchronous communications opportunities (teleconferencing, microwave, satellite, courses delivered on the Web, desktop computing, cable TV) that have lowered the barriers to accessing many individuals and organizations around the world. With new
means and diminishing barriers to communication, opportunities for outreach are enhanced as is the threat of having competitors, near and far, reach our students. The world is operating at an increasingly rapid pace. The necessity for convenience, combined with the demand for quality, dictates that WPI participate in this arena, especially given our technological focus, to compete in the future.

When current marketing studies are completed, WPI must formulate a business plan and subsequently take action on programs that build upon our strengths.

2.3 Research and Scholarship

WPI’s Committee on Graduate Studies and Research (CGSR) wrote in its report, “Enhancing the Role of Graduate Studies and Research at WPI”:

“Increased investment in graduate education and research is absolutely vital to the continued success of WPI’s educational mission. Graduate studies and research are the keys to establishing a strong reputation for WPI. Indeed, to be recognized as a university, it is necessary to offer students a relevant and meaningful educational experience leading to undergraduate and graduate (Master’s and Ph.D.) degrees. While WPI has long been known and respected as an undergraduate institution, in recent years, the graduate and research programs have quietly gained strength sufficient to achieve Doctoral University status. It is vital to the success of WPI that this development continue. The committee believes that substantial investment in our graduate programs and research activities beginning now and extending over the next ten years will result in a significant enhancement in the quality of graduate and undergraduate education at WPI and that this will result in a concomitant enhancement in our nationwide reputation. There are, of course, many indices of reputation but the National Research Council’s peer review of scholarly quality is, perhaps, the most important. This decennial poll will next be conducted in 2005. Investing in our graduate programs starting now will certainly have a significant positive impact on WPI’s ranking in this poll. It is our goal to achieve collective and individual rankings in the top fifty in this poll. For those graduate programs not reviewed by the NRC, similar metrics must be developed and periodically assessed.

The reputation of the graduate program ultimately depends on the creativity and scholarly achievements of the faculty members and their students. We equate creative scholarship with the realization of new knowledge and its dissemination to the academic and general communities. The development of research proposals (in itself a creative activity) and the successful solicitation of funding play an important role in enhancing scholarship. It is the role of each faculty member to establish their goals with respect to these scholarly activities and strive to achieve them. It is the responsibility of each faculty member to recognize the
central role played by the student in attaining these goals and to involve them in each step of the creative process. By educating these students, who will be the future generation of scholars, the faculty member will ensure the continuity of learning.”

The full text of this report can be found at:

http://www.wpi.edu/~cgsr/Reports/enhancing.html

Many of the CGSR recommendations are substantiated in the recent NSB report “The Federal Role in Science and Engineering Graduate and Postdoctoral Education” which was approved at the 347th NSB Meeting. This report is summarized in the following excerpts from the National Science Foundation Release.

“The National Science Board (NSB) urges a reexamination of the federal/university partnership, and offers several recommendations for improvement, in a policy paper released today titled The Federal Role in Science and Engineering Graduate and Postdoctoral Education.”

“The Board paper describes changes such as an increased demand for higher education; and acknowledges many stresses on universities and faculty resulting from those changes, such as rising costs and administrative burdens. In more than a dozen recommendations, the Board emphasizes the integration of research and education, an expansion of the partnership to include a wider range of institutions, broader careers options for graduate students outside the research university, and diversity in graduate education.”

The full announcement may be found at: http://www.nsf.gov/cgi-bin/getpub?pr9814

2.3.1 Establish Chaired Faculty Positions

We envision the establishment of chaired positions to be filled by senior faculty with established, nationally-recognized research reputations. The positive effect on scholarly activity at WPI would be both immediate and long-term. Recruiting several highly active scholars would immediately enhance the level of activity. However, success breeds success and we expect the long-term level of activity of existing faculty to be enhanced as well. To further promote this symbiotic effect, we strongly believe that the chairs should be established in emerging interdisciplinary areas in which WPI now has significant strength and which academia, government and the lay community all recognize as important. These chairs would facilitate increased cross-disciplinary cooperation of WPI faculty. Below are several interdisciplinary thrust areas that we believe build upon existing strengths at WPI.

(i) Life Sciences and Bioengineering
The umbrella of life sciences and bioengineering capitalizes on several growth areas that have seen a great deal of scholarly activity at WPI crossing traditional departmental boundaries. Faculty from biology, biochemistry, chemistry, mathematics, and several engineering disciplines including electrical, chemical and biomedical are currently investigating various related research projects in this area.

(ii) Computer and Information Technology

Like the life sciences, this thrust area is also truly interdisciplinary in nature, bringing together computer scientists and a wide range of engineering, science and management disciplines.

(iii) Materials Science and Technology

The production of new materials, from sophisticated medical sensors and nano-scale electronic devices to less complex but not less important everyday materials such as protective coatings and floor finishes, requires synthesis, characterization and testing. Also interdisciplinary in nature, this thrust area could involve the scholarly efforts of nearly every science and engineering faculty member on campus. One or more chaired positions in this area could facilitate the participation of a large subset of our faculty.

(iv) Space Sciences and Engineering

This thrust area encompasses a wide range of research activities across the WPI community. Establishing a chaired, in this area, will provide opportunities for increased cross-disciplinary activity not only within WPI but also in the scientific community, here in the U.S. and abroad.

(v) Environmental Studies

The study of the environment and its protection also involves the interdisciplinary effort of engineers and scientists as well as those involved in the study of social and political policy and resource management.

(vi) Social and Humanistic Studies

Two of the three ‘capstone’ degree requirements for WPI students are the IQP and the humanities sufficiency. Thus, an integral part of the education of the WPI student is his or her exposure to the social sciences and humanities. It is vital for WPI’s reputation as a comprehensive technical university to enhance its scholarly activities in these two areas.
(vii) Computational Modelling

Theoretical modelling is used extensively in the engineering, science and social science disciplines to complement empirical measurements and to enhance understanding of basic scientific and social principles. The establishment of a chaired position in this field will serve to draw together diverse groups of researchers.

The cost of these chaired positions will vary according to the particular interdisciplinary thrust area. In order to attract nationally recognized senior we estimate a cost of $250,000 per year per chair (including salary and fringe benefits, student and technician support), translating to a need to increase the endowment by approximately $5 million per chair. This does not include one-time costs associated with renovation of research space and startup.

2.3.2 Provide More Time for Scholarly Activity

(i) Increase the Number of Tenure Track Faculty

(ii) Adjust Teaching Loads

In almost all of our discussions, a major issue for faculty was the problem of balancing scholarly activities with a heavy teaching load. This issue of balance can be resolved to a certain extent by hiring more tenure track faculty, and adjusting teaching loads among department members to take into account non-classroom teaching activities.

Thus, WPI should maintain a sufficient number of tenure-track faculty positions to insure that each faculty member is required to teach between two-and-one-half and three courses per academic year. Combined with term breaks and summer recess, this will allow sufficient time for faculty members to focus effectively on their various scholarly activities. WPI should also undertake the development of a new loading model that more realistically estimates the time involved with advising undergraduate and graduate projects.

We estimate the annual cost of increasing the faculty by one new junior tenure-track position to be approximately $80,000 exclusive of one-time setup/renovation costs. (Endowment must be increased by $1.5 million per position.) We suggest that some or all of these new positions (over and above the normal replacement of retiring faculty) be chaired positions. This should help attract even better quality faculty and appeal to capital campaign donors.
2.3.3 Improve Sabbatic Leave Program

Sufficient funds should be made available to academic departments to replace the faculty members while they are on sabbatic leave. In addition, the compensation to faculty members who take full-year sabbatic leaves should be increased from 50 percent to 80 percent of their normal salaries. Because it is difficult to secure the additional funds necessary for a full year’s leave, faculty members often settle for half-year sabbaticals, or compensate by assuming teaching responsibilities at other institutions. In either case, the opportunities for professional development are diminished, and the time for scholarly pursuits is reduced. Offering 80 percent of salary will encourage faculty to take full-year sabbaticals, and will increase the scholarly value of the sabbatic leave program.

We estimate the cost of this improvement to the sabbatic leave program to be ~$200,000 per year. (Increase in endowment needed is approximately $4 million.) For the purpose of appealing to potential capital campaign donors, these sabbaticals could also be endowed.

2.3.4 Re-Establish the Research Development Council

WPI should encourage individual faculty and small groups of faculty to initiate new research by making funds available to conduct preliminary studies in unexplored areas. A portion of these funds could be used specifically to encourage the formation of on-campus interdisciplinary research teams. This initiative has a natural synergism with the endowed interdisciplinary chairs. Proposals submitted would be judged on their scholarly merit. The funds would be used for graduate student support, equipment, supplies, and no more than one month of summer salary and benefits for each faculty member involved. Those who receive such funding would be obligated to document their results and use their findings as a basis to seek external funding for more elaborate studies in the same area.

To administer these seed grants, we recommend the re-establishment of the Research Development Council (RDC) acting as a formal sub-committee of CGSR. In addition to the evaluation of proposals and granting of funds, the new RDC would also be responsible for such tasks as:

1. Mentoring faculty supported by the internal grant program;

2. Encouraging interdisciplinary interactions within the context of its grant program and mentorship roles;

3. Engaging in on-going dialog with the Provost’s Office regarding policies relevant to the teaching expectations, loading models, growth of the graduate program, rewards and incentives;
4. Engaging in on-going dialog with University Relations to identify areas of potential growth that can be assisted with appropriate gifts for equipment and space renovation;

5. Engaging in on-going dialog with the Provost’s Office and Research Director’s Office to present faculty viewpoints on important issues arising in the establishment of flourishing funded research activities. Such issues include: intellectual property policy, RA and TA stipends, cost sharing policy, travel and professional development funds, research incentive funds, etc.

Members of the new RDC would be selected based upon their excellence in research.

The amount recommended for this purpose is $250,000 per year, with individual awards not to exceed $25,000. This would require an increase in the endowment by approximately $5 million.

2.3.5 Equipment Account

WPI should establish an account for the annual purchase of equipment that supports scholarly activity and would be made available for use by both faculty and students. Requests for funds would be submitted by faculty, and would include the costs of maintenance and service. The establishment of such a fund is required by the growing reluctance of funding agencies to support the repair and maintenance of existing equipment. These agencies generally expect such costs to be the responsibility of the academic institution. Among the criteria used to judge the merits of the requests submitted, priority would be given to pieces of equipment that would have the greatest number of users, the greatest likelihood of attracting users from a variety of disciplines and the potential for generating external funding.

The amount recommended is $300,000 per year requiring an increase in the endowment of $6 million.

2.3.6 Research Incentives

Research activity must by and large be supported by external funding. However, there are several research-related activities that traditionally are not heavily financed by most funding agencies. These include, as mentioned above, the maintenance of existing equipment, as well as research and conference travel for faculty and students, summer salary (especially NSF) and undergraduate research at the high level typically carried out by WPI students. With respect to the latter, WPI’s scholars usually underwrite the cost of undergraduate research from external funds that were not targeted specifically at undergraduates. One way to help support these under-funded activities is to increase the research incentive payments to the PI and department, which are indexed to the indirect cost raised, from 15 to 25%. A proportionally larger percentage of this payment should be
returned directly to the researcher. Such an incentive does not represent a direct cost to the endowment.

An additional incentive should involve a reduction in tuition costs, by ~50%, charged to fully funded grants, i.e., those already charged research incentive payment referenced above, and fringe benefits and those that do not already involve cost-sharing. This incentive could be employed in the same manner as the indirect cost return, i.e., as discretionary funds for the researcher, or it could be used at the front end of the funding process, making proposals more attractive to funding agencies by lowering the amount of funds requested.

3. Establish WPI as a Technological Leader in Global Education

To meet this aspiration the PIC recommends the following actions taken from the PIC subcommittee report which includes estimated costs.

3.1 Expand Opportunities in the Global Program

In order to make high-quality global opportunities available to all qualified students, we propose the following investments in our current activities:

- Create **new faculty positions**, by a combination of endowed chairs and regular positions, to be filled by candidates with expertise in areas which will complement and supplement our existing global activities. We propose creation of 6 new faculty positions. These might be drawn from among the following areas:
  a. Cultural Anthropology
  b. International Relations
  c. Technology and Policy
  d. Asian Studies
  e. Latin American Studies
  f. African Studies
  g. Middle Eastern Studies
  h. International Business
  i. Urban and Environmental Studies
- Endow a **student scholarship fund** to aid qualified students with demonstrated needs in accomplishing projects at WPI’s off-campus project sites.
- Endow a **global program development fund** to support the development of off-campus MQPs, off-campus Sufficiencies, and globally-related courses in such areas as HUA, SSPS, and IQP preparation.
- Endow a **faculty development fund** to support in-house faculty releases and small grants, by which faculty can gain experience and expertise in areas related to WPI’s global activities.
- Undertake an examination of how the various components of WPI’s undergraduate program—particularly the Sufficiency, Social Science requirement, and IQP—relate to each other in light of WPI’s global activities. Feedback we have received from
faculty and students makes clear the need to discuss how students might best make
creative use of the 11/3 units which these activities comprise.

3.2 Create a Center for Global Technology, Policy, and Culture

We recommend the creation of this center to enable a variety of scholarly and graduate-
level endeavors which will complement our existing undergraduate activities in
interdisciplinary and global studies.

We envision the **Center for Global Technology, Policy, and Culture** (CGTPC) as
being directed by an individual with a distinguished record of academic achievement in
one or more of the areas under the broad umbrella suggested by the title. This Director
would coordinate the activities of the CGTPC and coordinate efforts with other campus
constituencies.

Faculty expertise will also be drawn from visiting scholars (senior and post-doctoral
academics) and ambassadors-in-residence (distinguished individuals from the arenas of
business, diplomacy, etc.)

Further faculty expertise will be drawn from existing WPI faculty with interests in these
areas and the new positions proposed in Section 1, both by research collaborations with
CGTPC and by in-house releases to the CGTPC.

The activities of the CGTPC would include:

a. Develop new sponsored research programs based on collaborative efforts of
participants
b. Create synergies with existing WPI graduate and research activities which fit under
the CGTPC umbrella
c. Provide intellectual support for continuing education programs
d. Provide intellectual support for IQP development and preparation

4. Improve WPI’s Campus Culture and Community Presence

Campus culture is inevitably the reflection of what a university is, even as it is a lagging
product of what the institution hopes to be. Steps have already been, and are still being
taken:
- toward creating a campus culture that has greater unity and at the same time greater
diversity;
- toward a more effective, more personalized, more project-oriented first year for
students; toward more options within the very limited confines of WPI’s housing (at
present only 50% of the WPI body can be accommodated on campus);
- toward securing a more diverse and yet less geographically dependent student body;
toward a recognition that project-based learning requires a different reward system
for its practitioners.

These efforts will culminate in new directions for campus culture at WPI. The following
recommendation therefore is submitted in an effort to supplement the process already
underway; a process, as can be seen from the listing below of steps already taken, has
many components:

- The creation of the 17 million dollar Campus Center Building
- Changes in the first year orientation process so that it embodies more than academic
  competence and extends well into the first term
- The creation and growth of the Frontiers, and Strive Programs
- The rehabilitation of the residence halls (scheduled through 2002)
- The inception and growth of the LEAP Program
- The creation of the EMSEP Program
- The creation of Camp Reach
- The creation of alternative living clusters with WPI housing
- The high-speed connection of Fraternity Houses to WPI’s CCC
- The Formation of the Task Force on Community
- An increased effort at involving our alumni in campus issues and supporting them in
  throughout their careers
- Creation of campuses in Westboro and Waltham for adult learners that broaden our
  reach into the surrounding professional community and broaden the diversity of our
  offerings

The recommendations that follow are focussed on enhancing current initiatives or giving
fruit to ideas that have been under discussion for many years through new experimental
programs.

### 4.1 Continuing Education Division

While considering the various recommendations made by the Graduate Programs and
New Programs for the 21st Century Task Forces, PIC has come to the conclusion that now
is the time to expand WPI’s adult learning programs. PIC believes that the natural
evolution of WPI’s Continuing Education efforts is the establishment of a new entity
which features programs designed to meet a more extensive range of educational needs of
adult learners than presently available through WPI’s Office of Continuing Education.
The curriculum would include more hands-on advanced information technology training
and new opportunities for faculty to deliver in-demand courses on the Worcester campus
and through distance education. The new entity could also include for-credit
undergraduate certificate programs distinct from WPI’s undergraduate degree program.
This expanded entity would also bring more companies to the campus for targeted
corporate training programs. WPI has already begun evaluating this initiative by
investing in a market study that served WPI very well in launching the Waltham Campus
two years ago. This initiative, PIC believes, will enhance the reputation of an already
thriving operation, provide much needed resources, and enhance an already significant revenue stream for WPI.

PIC advocates the following steps toward determining the feasibility and implementation of this entity:

1. That a Division of Continuing Studies be established and operated with a structure and procedures developed with the advice and consent of the faculty as stated in the Faculty Handbook (Part IV, Section II), “Should the Administration propose creating, merging, realigning or eliminating an academic program …. that proposal shall be conveyed to the Committee on Governance when it has been advanced to the stage of serious consideration, but before any commitments to action have been made.”

2. That WPI invest in dedicated classrooms, computer laboratory facilities, staff and administrative space on the WPI Campus to meet the programming needs of the proposed Division of Continuing Studies. New program revenues would repay that investment - meeting the expenses associated with the build-out and maintenance of the space and additional staff. The proposed facilities, which are modeled on the Waltham Campus, might include two computer labs, one seminar room, a small student lab, and space for administrative and support staff. Since the greatest demand for Continuing Studies is expected to occur during weeknights and weekends, the labs and classroom would also be available for undergraduate and graduate classes during the weekdays.

There are clear opportunities for WPI to build upon the current and projected enrollment trends for adult learners - the fastest growing population in higher education. The number of students enrolled in WPI’s Continuing Education programs has increased over 160% in the past five years – and is now approaching 5,000 students annually. In FY98 WPI’s Continuing Education programs contributed over $1.6M net revenue to the operating budget. Our most outstanding programmatic and financial successes during this time have been our hands-on advanced information technology certificate programs at the Waltham and Westboro campuses. We have also seen a significant increase in the number of companies choosing to “partner” with WPI for the delivery of customized corporate training programs. At our branch campuses in Westboro and Waltham we are now delivering both graduate and non-credit professional development programs to adult learners. And through the Graduate Admission Office we are delivering graduate courses on site at Metcalf and Eddy. Further discussions are underway to expand off-campus graduate programs to other corporate sites. The WPI Alumni Association’s Five Year Master Plan, which was delivered at the PAC Forum (February 20 – 21, 1998), also identifies a strong interest in working with the Office of Continuing Education to help meet the life-long learning needs of alumni.

Many local and national universities including Harvard, Boston University, Northeastern, and Clark, have established credit-bearing extension colleges to meet the needs of adult learners. A possible home for these facilities on the WPI campus would be the new
classroom building, which is already funded in part by the Capital Campaign. By locating the Continuing Education Division in this facility, WPI would reap the benefits of tying these programs and these learners more closely to campus life. This is a financially self-supporting initiative that would extend WPI beyond its traditional student markets and into the most rapidly growing population in higher education.

4.2 Diversity and Community Efforts

In the final NEASC accreditation report of 1992 the evaluation team reported, "We are obliged to observe that WPI has not yet demonstrated a high priority, continuing effective commitment to achieving ethnic and gender diversity in any category of the community: students, faculty, or staff."

Increasing the ethnic and gender diversity of the student, faculty and staff populations remains an unrealized goal of the institution. It is not enough, however, to increase numbers. Rather the college must shape the environment to be welcoming and supportive of diverse populations. Only when WPI exists as a campus that embraces pluralism, multiculturalism and the value of all its members, can WPI be successful in its recruiting and retention efforts.

PIC advocates:

1) that the Capital Campaign fund a study to assess the climate on campus as it relates to ethnic, gender and sexual orientation;

2) that the position of Affirmative Action Officer be enlarged to a full-time role, and be charged with aiding in the recruitment of underrepresented faculty and staff and facilitation of multicultural awareness on the campus;

3) that an endowed fund be developed to support campus cross-cultural training, multicultural programming and ethnic, gender and sexual orientation awareness and sensitivity baseline assessment and training for the entire campus.

4.3 Campus Center Support

Plans move forward with the design and planned construction of WPI's first Campus Center. Dubbed the cornerstone of WPI's Capital Campaign, the Campus Center will serve as the arrival point for campus and admissions visitors and a showcase for WPI's diversity. The Campus Center will exist as WPI's third tower, knitting together the residential, recreational and academic corridors of our campus.

The day to day operating costs associated with the center may well place great pressure on the college's operating budget. Since the center will serve all populations - students, faculty, staff, alumni – during day, evening and weekend hours, it is imperative that the significant costs associated with operating this building be planned for carefully.
Support for staffing, programming and maintaining the building and its grounds will be needed if the Campus Center is to rise to its potential as the living room of the WPI campus.

PIC advocates the endowment of a fund to offset the operating costs of the Campus Center. Those costs include staffing by a fulltime director, night manager, and support, custodial and student staffs; a budget to support social, recreational, and multicultural programming and lectures; and funds to maintain the 70,000 SF facility and its grounds.

4.4 K-12 and Community Interactions

At this time there are many disjointed efforts involving community affairs and outreach. Discussion among PIC members revealed a wide ranging list of such activities already performed at WPI; however, many of the activities occur separately and without coordination with the rest of the WPI campus. A partial list of these efforts include:
1. Massachusetts Academy for Math and Science,
2. Division 51 Education sector IQPs,
3. First Competition (National High School event),
4. Basketball, soccer, football, etc., summer camps,
5. Science fairs,
6. Annual Odyssey of the Mind (OM) meet,
7. Frontiers program (WPI program for high school juniors),
8. Strive program (WPI program for high school minority students),
9. Camp Reach (WPI program for 7th grade women),
10. High School Mathematics Meet,
11. Various K-12 conferences and meetings held on-campus throughout the year,
12. Summer video camp (discontinued WPI program for grade school students.)

In order to best fulfill the needs of a coordinated K – 12 and community outreach program, PIC suggests the creation of a new position of Outreach Coordinator which would report to the Assistant Provost. This position would service all K – 12 outreach and community affairs at the Institute.

PIC believes that under a coordinated structure, WPI would improve its relations with the many diverse local and educational groups visiting campus. First it must be recognized that every person visiting the campus for a program is a potential student or a parent, other relative or friend of a potential student. With this in mind, this office could develop and implement a standard tour and/or presentation to expose the academic richness of the campus targeted to these visitors.

Within the purview of this coordinator would be an effort to better focus educational IQP’s for the improvement of community relations, development of students interested in higher education among K – 12 students and enhancement of the WPI IQP student experience. This may involve more extensive recruiting of client schools and stronger
preparation of WPI student teams. This effort will further allow faculty and students to focus more on the content of projects and less on administrative tasks. Additionally, Division 51 IQPs could be strengthened by providing a relatively uniform framework around which an IQP group can build a project. This framework may even be modeled in accordance with the successful Global IQP programs now on campus.

This office would also be concerned with involving WPI in more national K - 12 conferences and projects such as those connected with technology and information transfer related to education. WPI has the potential to become a leader in this effort.

A program to create teaching models for community schools (such as providing laboratory experiments to acquaint primary and secondary school students with practical uses of technology) could become an important and motivating campus-wide effort. This program could be incorporated with on- and off-campus IQPs to help strengthen the education-related IQP experience. An organized effort would benefit WPI students, K – 12 students and teachers, and the local community - and would enhance WPI’s profile in feeder schools.

A summer program could be instituted at WPI for high achieving high school students. This program (based on the College-gate program for grades 1 – 8) would focus on preparation for careers in engineering, science, mathematics and management. WPI could help high school students lift their sights toward horizons that are not sufficiently exposed in their daily experiences.

Funding for this position should derive initially from the Capital Campaign as a one-time investment. Long term, however, this should a self-sustaining operation through endowments, education development grants, and fees.

4.5 Enhancement of the Career Development Center

PIC recommends the expansion of CDC activities and support to address the needs of Alumni and graduate students. These enhancements include:

- Funds for expansion of the position of Job Development Coordinator to full time and to create a position of special Alumni and Graduate Student Counselor liaison;
- Funds to create a facility for video-conferencing and interviewing;
- Funds to support the creation and maintenance of a new Alumni Mentoring Web Site;
- Funds for special events and sessions between Alumni Association and CDC to further develop the relationship.
4.6 Develop a Growth Plan for Student Housing

Fewer than 50% of our students live in WPI housing; thus, we do not come close to meeting the standard definition of a "residential college." Discussions with undergraduate students indicate that many who would prefer to stay on campus are not able to do so because of the shortage of campus housing. Our inability to accommodate these students perpetuates a lack of community among our undergraduates, and perhaps even more so among our graduate students. If we aspire to be a nationally recognized university, investments must be made to develop a campus culture that is conducive to graduate studies and research; graduate student housing is a key element to growth of such a culture.

PIC recommends that a comprehensive study be initiated to develop a growth plan for student housing. As part of this study, the university should re-examine the question of whether Salisbury Estates might be utilized for student (undergraduate and/or graduate) and/or visiting scholar housing. The layout of Salisbury Estates, its apartment-style units, and the availability of parking make it extremely attractive in concept for both undergraduate and graduate student housing. The study should include an analysis of the costs associated with bringing Salisbury Estates up to code for student housing, and the subsidy that may be required to make it affordable for students. While implementation of the student housing growth plan is not likely to be feasible in the current Capital Campaign, initiating the planning process is a strategic imperative.

5. Expand WPI’s Educational Resources

To support the strategy outlined in the sections above requires strategic growth of the infrastructure. The following recommendations call for WPI to continue its long time strategic investments in information systems in direct support of the academic mission.

5.1 The Global Classroom

WPI now sends project teams around the world, but the resources our students have at their disposal varies greatly from place to place. We propose using distance learning and multimedia classroom technologies to unite WPI’s worldwide project operations by development of “The Global Classroom”. The Global Classroom would consist of a distributed network of resources on- and off-campus to create a “technology-enabled geographically distributed collaboration”. Such an infrastructure would allow us to share technological, informational, and human resources among WPI’s locations around the world.
The Global Classroom would provide facilities on-campus that could be used to facilitate interaction between students, faculty, and project sponsors before, during, and after project activity. The activities that might be conducted in the on-campus Global Classroom could include software training, project specific-training, global teleconferencing, language training, storage of project data, etc. In addition, similar facilities at remote sites would allow students to draw on WPI’s on-campus resources such as the library while they are off-campus. Thus, we also suggest that WPI investigate the possibility of acquiring property at project sites (e.g. London, Venice, Bangkok, etc.), which could be used for student and faculty housing, meeting rooms, etc. The inclusion of student housing could create a revenue stream to offset the cost of maintaining these facilities. Other universities have acquired such off-campus properties and their experiences could be a model for WPI to consider.

5.2 Improvement of Library Facilities and Services

Recognizing that most, if not all, PIC initiatives will impact the library, it is clear that library issues must be addressed. This initiative acknowledges the need to direct attention to the library, including an upgrade and expansion of the physical facility, and the enhancement and expansion of services and resources to a wider number of users, both on-campus and off.

This Initiative proposes a renovation of and/or addition to the library building and the creation of an endowment to support both resources and services.

5.2.1 Renovation of/addition to library building

Gordon Library was built in 1967 through the generous gift of George C. Gordon. The building was designed for a student population of 1700; the current student population is 3742 and the numbers of faculty and staff have also increased. The Association of College and Research Libraries Standards requires seating for one quarter of the total number of students, or 931 seats for Gordon Library. We currently have only 450, many of which, being the original 1967 furnishings, are now inappropriate for individual or group project work and lack access to a network linked computer. The library should provide a high quality environment with the resources and equipment needed to support a first-class education.

Although we are moving rapidly towards the era of the digital library, we still need to provide space for the physical materials we will continue to collect for many more years. The library has outgrown its walls as the original building was designed to house 200,000 volumes and we now have approximately 350,000. Two years ago compact shelving was installed in Founders Hall basement and thousands of book and periodical volumes were moved there because of insufficient shelving in the library building. In three to four years we will run out of shelving space completely and we have no areas to place additional shelving either within Gordon Library or Founders Hall.
Since its opening in 1967, the ground floor of the library has been host to a variety of tenants including the Computer Center and currently the Massachusetts Academy of Math and Science. This space is desperately needed for the expanding library collections and in order to provide better access to materials and improved services.

Library renovation/addition would enable the creation of:

- Attractive, quality student study areas by installing compact shelving on the ground floor, eliminating some existing shelving, and designing networked group study areas and quiet study areas for individuals;
- A truly functional service area on the main floor by redesigning the reference and circulation areas into a single point of service, opening up the complete floor for patron use of services and computing;
- Consolidation of the print collections so that users can find materials more easily;
- A multimedia area for student and faculty use;
- A climate controlled archives area and special Dickens Collection facility;
- An Electronic teaching classroom;
- Quality work space for staff;
- Attractive interior with new, functional furnishings.

5.2.2 Endowment to produce $300,000 annually for support of resources and services

The library has been unable to keep pace with increasing costs for resources, both print and electronic, and, as a consequence, some areas of the collection are inadequate to support the research and curricula needs of faculty and students. Many of the PIC initiatives will absolutely require additional resources to support the global program, increase in scholarship, new programs, etc. Periodical costs have risen over the last 10 years an average of over 10 percent each year resulting in the need to cancel 719 titles for a total savings of $360,200 since 1992 alone. The annual periodical budget is currently $450,000. The average cost of Physics subscriptions for example was $994 per year in 1993. In 1997 that cost had risen to an average of $1494, an increase of over 50%. The purchase of new titles in the support of new and expanding disciplines is practically impossible. Books and other library materials have also greatly increased in price. Electronic resources which enable access to remotely stored full text periodicals, databases, and indexes are expensive and yet it is vital as we move into the 21st century that we provide these electronic resources and services to the WPI community.

In 1967, library services were contained within the building. Patrons had to come into the building to use the card catalog, use indexes and abstracts, ask for Reference help, request book orders and read periodicals. There was a single campus. Telecommunications, computers and the Internet have enabled the library catalog to be on the worldwide web. This makes the catalog accessible anywhere on campus, at WPI’s satellite campuses, project centers abroad, and by members of the WPI Community all over the world. The library web pages within which the catalog is a “click-able resource” include access to remote electronic databases, provide opportunities to order books and Interlibrary loans over the campus network, and email reference service where librarians assist remote users on regular basis. The library must stay abreast of new technological developments if we are to provide the educational support expected. We must invest
greater resources and effort into teaching students lifelong learning skills in using the great variety of electronic resources available. Expectations for remote access and service continue to increase.

An endowment for resources and services would enable:

• Purchase of increasingly expensive scholarly publications such as print and electronic periodicals, licenses and access to important electronic resources. Many of these resources are currently unaffordable but required to turn the library into a quality facility which provides the WPI community with a wide range of scholarly publications and the depth of support necessary for scholarship, graduate and undergraduate curricula, global programs and new programs;

• Installation of a kiosk in a central location on campus which would enable the WPI community to register, renew and return library materials, and receive reference assistance;

• Funding for new electronic services to facilitate use of library resources;

• Ensurance of the library’s ability to meet the needs of increasing numbers of library users at remote sites.