
THE MICHIGAN TECH PLAN

An Action Agenda for 2010

Approved by the Board of Control – May 19, 2000

Updated – May 11, 2002

Updated – February 28, 2003

This strategic planning document for Michigan Tech is based on portfolios prepared by academic and administrative units that are by their very nature and role quite different but must support a common vision. A general agreement on key features and key strategies has emerged. In its first form, the Michigan Tech Plan captures these key features and strategies and outlines a vision for the University ten years from now. It provides commentary on why these key features and strategies are considered to be essential. It is input for a first step in an iterative process that involves all our constituents. Students, faculty, staff, Board of Control members, alumni, and advisory board members are encouraged to forward comments and recommendations to the Strategic Planning Group at comments-1@mtu.edu.

On March 8 -10, 2000, a Board of Control retreat provided an opportunity for the Board, in collaboration with a group of MTU stakeholders, to focus on key elements of the strategic plan. Revisions resulted from this retreat, from industrial advisory board meetings, town-hall meetings, bulletin board input, and from a National Advisory Board meeting on April 30 - May 2, 2000. The Board of Control endorsed the present version of the strategic plan at its May 19, 2000 meeting. The Board of Control, in conjunction with the persons in responsible charge of each of the 15 academic or administrative unit strategic plans, and the members of the university-wide strategic planning working group, reviewed the public comments received on the proposed plan for implementing the “Action Agenda,” and recommended a revised implementation plan and some improvements to the “Action Agenda” at a retreat held on March 9, 2001. Following an additional period of public comments, the Board of Control endorsed the current version of the strategic plan at its May 11, 2001 meeting.

Methods for evaluating and measuring progress toward achieving our vision and goals are in the process of being developed. The plan will be updated each year in an iterative process. Resource allocations will be linked to the strategic plan within a general framework for financial modeling that allows us to explore the financial consequences of curriculum, staffing, workload, average class size, scholarship, research, and both undergraduate and graduate enrollment decisions in terms of their short- and long-term impact.

MISSION

We prepare students to create the future.

VISION

Michigan Tech will be a national university of choice.

Michigan Tech will be a nationally prominent and internationally recognized technological university which bridges technology and business and will meet the needs of a global and technologically rich society through excellence in undergraduate and graduate education, scholarship, and research.

OUR GUIDING PRINCIPLES

- The success of our students will always be the most important measure of the success of the institution.
- Everyone's contribution to our success is needed, and will be valued and rewarded.
- Through collaborative efforts we will serve the people of Michigan, the nation, and the world.
- Hallmarks of this university will be the creativity and leadership of our graduates, the relevance and benefits of our research, and the value we place on ethics, sustainability, diversity, and quality of life.
- MTUs faculty will emphasize scholarship, research and inspirational teaching. Our faculty should be read and respected by leaders of science, industry, government, policy groups and business.
- Engineering, science and technology, and the business of technology, will remain the focus of our university. We recognize that success in this focus requires vital programs that contribute to the cultural development, social skills and well-rounded education of our students.

I. OUR VISION

Michigan Technological University is in many ways a unique institution of higher learning. From its beginning as a small focused college in 1885, Michigan Tech has evolved into a university offering a range of programs in science, engineering, technology, business, forestry, and special aspects of the humanities and social sciences. In continuing this evolution, we want Michigan Tech to become a national university of choice. In defining our vision and outlining a strategic plan to achieve it, we must answer four questions:

1. What does it mean to be a national university of choice?
2. Why is this the right thing to do?
3. Will it improve the education we provide?

4. What steps do we have to take?

1. What does it mean to be a national university of choice?

For students: Students from around the country and the world choose to come here because of the excellence of our faculty, educational programs and laboratories, research, our student/faculty ratios that allow for pervasive, discovery-based learning activities, and the quality of life on our campus.

For faculty: Faculty from the very best universities choose to come here because of the excellence of our students and educational programs, our facilities and infrastructure that will allow them to create and disseminate knowledge, and the quality of life within the University, the community, and beyond.

For staff: Staff will choose to come here because of the excellence of our facilities, the reputation and integrity of the faculty and administration, the professional development opportunities available, and the quality of life on campus and in the community.

For external partners: Corporations and enterprises from around the country choose our students because they have received a rich and relevant technological education that emphasizes liberal arts, business processes, people skills, innovation, creativity, and leadership within a diverse campus community. Industry and government agencies from around the country will identify our students and our research as outstanding, all leading to our inclusion on more company "select lists" as opposed to only "interview lists."

Reaching this position of being a university of choice will differentiate Michigan Tech from other regional colleges. It will make us more competitive in the region from which we draw the majority of our students. We will attract a significantly greater number of some of the best high school students from outside of this region, and we will significantly increase our ability to attract the best graduate students both nationally and internationally. In realizing our vision, we must be recognized as one of Michigan's research universities (tier 1) and as one of the nation's research universities.

2. Why is this the right thing to do?

For many years, Michigan Tech has enjoyed its role as one of the few choices for prospective students from Michigan, Wisconsin, and Minnesota interested in science, technology, and engineering. We attracted relatively few students nationally. More recently, many other colleges and state universities in Michigan that are closer to home for many students have begun offering engineering and technology education. This has resulted in greater competition for the students in the upper Midwest. At a national level, competition for the best students is also greater. These pressures have prompted the University to intensify its marketing activities, even as it assesses its vision and identity.

However, most of the new competing programs in Michigan are different than Michigan Tech in

that they are not based in doctoral-granting, research-oriented departments where much new knowledge is created. New opportunities for research and education within and among disciplines have never been greater. Technology is expanding at an explosive rate. The advantage of a Michigan Tech education is that many new discoveries have almost instant practical application and the rate at which new discoveries become translated into education has increased dramatically. As a result, Michigan Tech has pursued a vision, seeking to transform itself from a primarily undergraduate teaching institution into a university with solid graduate programs and sponsored research endeavors that are synergistic with undergraduate education.

Michigan Tech will be successful if it can transform its traditionally narrow technological core competencies into science, technology, and business competencies, and if it can continue to blend research and scholarship together with education into a new learning environment. This new learning environment must educate, as never before, engineers and scientists who understand business and business leaders who understand technology. New high demand areas are in communications, computing and information technology, biotechnology, smart materials, and environment and resource sustainability. These are reflected by the fast-growth industries in e-commerce, internet, web applications, micro- and nano-technology, biotechnology, industrial ecology and sustainability. Faculty members who are actively engaged in the creation of knowledge will stay current in their course offerings.

3. Will it improve the education we provide?

In most fields and disciplines, discovery-based learning with faculty as coaches and mentors needs to replace the traditional lecture as the basic means of instruction. To stay current and adopt new methods while creating excitement and magic that we want in our teaching, courses, and programs, Michigan Tech must have faculty who are not only teaching but creating new knowledge. To educate students who will become innovative and creative leaders, the faculty members teaching them must be innovative, creative, and leaders in their fields - there can be no compromise on this point. Excellent students demand excellent faculty, and we must have excellent staff to support the breadth of the learning environment.

This does not mean we will abandon the past strengths of Michigan Tech. In developing the scholarship and graduate programs that advance this effort, we must continue to seek balance and integration. Balance means we will never allow our research to compromise our educational programs. Integration means that we will strive to involve all of our students in the research enterprise and thereby improve their educational experience. Scholarship and education are inextricably linked. The question is no longer whether we will be a university dedicated to teaching or a research university: *we must be an institution of learning.*

4. What steps do we have to take?

To take the next step in developing Michigan Tech beyond this regional reputation, we will have to make changes. We can no longer be known simply as an undergraduate engineering school.

We must build recognition and reputation for the wide array of engineering, scientific,

business, and technological activities that make this campus an outstanding technological university. This includes broader recognition of excellent educational and research programs in the College of Sciences and Arts, School of Forestry and Wood Products, School of Business and Economics, and School of Technology. This recognition will attract larger numbers of undergraduates to fields outside the traditional engineering areas.

We must optimize ratios of undergraduate and graduate students to faculty in all areas of the campus. This is not only a requirement of research-oriented programs, but also a necessity for the active, discovery-based learning we seek for all educational programs.

We also must insure that students appreciate the diversity of humanity. Globalization is no longer simple rhetoric, but a fact of business. We must encourage students to learn languages and be involved in international exchange programs and internships as well as increasing the numbers of international students on campus.

Together, these steps will increase the cost of undergraduate education. A technological university, which requires first-class technological equipment and laboratories, has very few low-cost programs. At Michigan Tech, high-cost science, engineering, and technology programs enroll the majority of the student body. Because state funding is decreasing as a percentage of the University budget, it will not be possible to maintain the necessary facilities and equipment, lower the student/faculty ratio, and still charge the tuition rate of a regional undergraduate university. This situation creates a dilemma for Michigan Tech, which has always prided itself on its accessibility to students from families of modest means. In order not to lose this heritage, the University must aggressively pursue external funds, especially from alumni and other sponsors, in support of need-based scholarships and other forms of financial assistance. We can increase tuition but still be perceived as offering great value for the money if we place true value into the educational process. There are very few instances where quality and cost are not connected and even fewer cases where quality is not worth the price. In essence, Michigan Tech must do what some other universities have done. To thrive in the face of decreased state funding they developed a clear strategy of privatization by shifting to an increased emphasis on other sources of revenue, i.e., tuition and fees and gifts and contracts.

We also will see changes in our graduate education efforts. Currently, graduate students make up about 10 percent of the student body. A common trait of nationally recognized technological universities is a graduate student population of at least 20 percent of the total student body in which about one-half are doctoral students. While the optimal enrollment mix has to be determined, it is clear that we must increase the number of graduate students on campus and double the number of doctoral students to meet our goal of being a recognized research university. Success also requires a combination of increased faculty research based upon external sponsorship, and expanded advancement activities. Enrollment in currently under-subscribed programs needs to increase. Finally, since most of the emerging areas of critical need are at the interface of the traditional disciplines, more and more of the scholarship of these students and their faculty mentors will be interdisciplinary efforts.

We can achieve our vision if we carefully focus new and existing efforts to improve Michigan

Tech so that it becomes a national university of choice. Defining our strategies to accomplish this is the heart of this plan.

II. OUR CURRENT CONTEXT

Michigan Tech is at the threshold of moving from a regional university to one of the nation's research universities. We are typically in the top 50 among state universities and in the top 100 among all national universities in *U.S. News & World Report's America's Best Colleges*. We enjoy several strategic advantages:

- our mission continues to be focused on technology, innovation in the education of students, and serving industry;
- our undergraduate education is recognized for its high-quality;
- we have excellent, dedicated faculty and staff;
- we are located in an area of natural beauty which is unmatched for the possibilities in ecological education and research and offers unlimited outdoor activities;
- many programs enjoy high-quality facilities;
- there is a rich environment for interdisciplinary work and translating science into technology;
- we have a campaign projected to provide \$140 million to supplement state support, tuition income, and external research funding.

At the same time, Michigan Tech faces several challenges:

- there is increased competition for students, particularly female and minority students;
- the “engineering-only” reputation is viewed as an impediment to recruitment for other programs;
- there is a recognized need to “right-size” our programs in conjunction with an effective marketing strategy;
- the portion of Michigan Tech’s operating budget, which is provided by the State of Michigan, is decreasing;
- there is a low endowment per student;
- there is a need to develop an improved framework to better link strategic planning and resource allocation;
- there is inadequate physical infrastructure and facilities for some units;
- the University is not well-positioned in many areas of national research priorities and in some emerging fields of study required for this century’s workforce.

Each unit prepared an extensive analysis of its strengths and weaknesses, opportunities and threats. In addition, current statistics and the institutional database provide the quantitative basis for our modeling efforts and a gap analysis between our current situation and where we would like to be.

III. OUR GOALS

Universities that are recognized nationally are recognized because they have excellent educational programs, ground-breaking research and scholarship, outstanding faculty, staff, and students, and they are supported by a strong financial base, efficient business practices, and excellent facilities. In one way or another, these key attributes of a nationally recognized research university define the goals of all university strategic plans. We must proceed from a realistic assessment of Michigan Tech's current advantages and challenges to make the goals of our strategic plans more specific.

The University's vision is driven by education and scholarship and must have input from all of stakeholders. Our businesses, organizations, and infrastructure are crucial to enabling these educational and scholarly goals. At any given time, one goal might require more immediate attention and focus. However, it is imperative that we make progress across all of the following seven goals:

GOAL 1: LEARNING - Provide an outstanding and relevant learning environment, consistent with a national university of choice.

GOAL 2: SCHOLARSHIP - Expand our scholarship and research activities, sustaining successful existing programs while pursuing new endeavors in carefully targeted areas.

GOAL 3: SIZE AND COMPOSITION - Achieve the best size and blend for our educational programs, which includes a diverse student body, faculty, and staff.

GOAL 4: ENRICHMENT - Be the residential campus that provides a sense of diverse community and student experiences that develop the whole person.

GOAL 5: ADMINISTRATION - Provide an optimized administrative framework with sound physical, technological, and financial resources that are consistent with a national university of choice.

GOAL 6: OUTREACH - Support economic development, public sector outreach, and distance education appropriate for a technological university.

GOAL 7: IMAGE - Build our reputation beyond the borders of Michigan and the Midwest such that Michigan Tech becomes a national university of choice.

The portfolios of the different units that make up Michigan Tech articulate to various degrees detailed strategies, timelines, sets of quantitative productivity factors, indicators of quality, and numerical targets against which progress can be measured. Here we present under each goal only major objectives and some key strategies.

GOAL 1: LEARNING - Provide an outstanding and relevant learning environment, consistent with a national university of choice

Our first goal links directly to our mission: to benefit the State of Michigan and society as a whole. The following objectives address the needs of the 21st century work force. First, the greatest job growth is in areas that demand a solid grounding in mathematics, science, and technology. Second, many of the new industries are related to emerging areas of science and technology that are interdisciplinary. Quite often, the most exciting areas are the overlaps of areas that already are multi-disciplinary, like bio-, nano-, and information-technology. Third, the explosion in global electronic communication has not only made all modern research truly global, it demands that we educate people who can function in a global and diverse environment. Finally, even in the midst of such changes, every student at Michigan Tech will gain the enriching and broadening academic and co-curricular experiences that have been the hallmark of a university education.

Objectives:

1.1 Provide an excellent foundation in the fundamental principles and areas of creativity and enrichment which are at the core of all university learning.

Strategies:

- continuously assess and improve the general education program;
- assess curricular outcomes and revise accordingly;
- assess the integrated engineering first-year experience and revise accordingly;
- increase the use of instructional technology; particularly on-line instruction for remedial courses.

1.2 Provide active, discovery-based learning experiences that include the integration of research and co-op/internship experience.

Strategies:

- seek more funding for opportunities such as REU (Research Experience for Undergraduates);
- increase participation in the enterprise programs including more disciplines and corporate sponsors;
- develop fast-track (honors) program so undergraduates can start early on a professional master's degree;
- provide every interested student with an opportunity to work with faculty on research;
- reward and recognize individuals who successfully generate monies in support of these activities.

1.3 Offer programs in new and emerging areas, particularly interdisciplinary areas (e.g. bioinformatics, information technology).

Strategies:

- network with all of our stakeholders, e.g., advisory boards, alumni, industry, to identify emerging areas;
- seek new state support for emerging areas beyond general fund revenues and pursue

- all existing state funding opportunities;
- create interdisciplinary teams in both undergraduate education and research;
- offer flexible undergraduate degree programs and fast-track professional master's degrees;
- structure a system in which cooperation between units is rewarded.

1.4 Repackage programs to keep current with the trends in science and technologies;

Strategies:

- look at base line statistics to identify programs and establish criteria for rightsizing;
- benchmark with external competitors;
- look at overall quality, visibility, critical need and future demand;

1.5 Strengthen our international programs;

Strategies:

- integrate the international experience in all educational programs;
- strengthen the modern language instructional facility;
- ensure a strong international cultural enrichment program;
- establish meaningful partnerships with universities and companies abroad with both virtual and real exchanges;
- enhance the English as a Foreign Language and culture awareness programs.

1.6 Develop unparalleled classrooms, learning laboratories, and centers that make the best use of information technology, with anywhere, anytime computing and communication.

Strategies:

- optimize mix of centralized and decentralized computing infrastructure;
- make high-tech instructional technologies available in all classrooms and laboratories and provide instructional support for its implementation;
- implement wireless network connectivity in University commons areas such as the Library, the Memorial Union, and selected lecture halls; explore comprehensive laptop environment.

GOAL 2: SCHOLARSHIP - Expand our scholarship and research activities, sustaining successful existing programs while pursuing new endeavors in carefully targeted areas.

Our national recognition and reputation must be based on scholarship and research. The goal of reaching national prominence can best be achieved by selecting and promoting a few strategic *platforms* that can be supported university-wide. Platforms will provide a network structure that links faculty, staff, departments, colleges, educational programs, and strong disciplinary cores which fuel the development of new interdisciplinary science and technologies. Platforms which have been proposed are: Biotechnology, Environmental Science and Engineering, Manufacturing, Nanotechnology, Engineered Materials, Information Technology, Natural Resource Development. Some of these platforms link with new areas the National Science Foundation has identified as critical for promoting economic growth, creating rewarding jobs, and ensuring competitiveness: core disciplinary research, nanoscale science and engineering, information technology research

initiative, biocomplexity focusing on environmental research, and the needs of the 21st century workforce. We have to consider these and other national priorities in further narrowing our focus.

Objectives:

2.1 Increase the number of interdisciplinary efforts in a few, well-focused platforms that will lead to world-class recognition;

Strategies:

- form cross-departmental, cross-college/schools faculty teams in our areas of focus;
- obtain endowed chairs in key areas;
- ensure that interdisciplinary work is properly recognized and rewarded

2.2 Increase the number of faculty actively engaged in research and graduate education;

Strategies:

- Reward scholarship and graduate education;
- Choose new faculty with strong research and graduate education interests;
- Devise equitable policies for the distribution of royalties from patents and copyrights among investigators, the central administration, schools/colleges, and departments.

2.3 Increase the percentage and number of graduate students who are supported externally;

Strategies:

- reward faculty who support graduate students;
- give the recruitment of graduate students highest priority;
- provide competitive compensation and benefit packages to attract and retain quality graduate students.

GOAL 3: SIZE AND COMPOSITION - Achieve the best size and blend for our educational programs, which includes a diverse student body, faculty, and staff.

Graduate students need to grow from 10% to approximately 15% of the total student population, including a growth in the number of PhD students from currently 260 to about 500. Industry and businesses of Michigan need, and will continue to need, more engineers than are being graduated from Michigan schools. The State of Michigan needs to invest in increased capacity at Michigan Tech to educate more engineers and graduates in areas of high demand. As state funding permits, Michigan Tech will market and grow programs targeted to industry needs. In addition, we must take every step to encourage that Michigan Tech will be a diverse campus.

Objectives:

3.1 Determine the right mix of graduate/undergraduate students for the benefit of all of our stakeholders.

Strategies:

- Develop a university resource model that can explore the financial consequences of curriculum, staffing, workload, average class size, scholarship, research, and both

undergraduate and graduate enrollment decisions in terms of their short- and long-term impact.

3.2 Aggressively support and implement strategies to increase the diversity of our student body.

Strategies:

- coordinate all efforts to recruit under-represented students, with a target of increasing the number of women students to those of our benchmarks;
- and, similarly, increase the number of minority students to those of our benchmarks.

3.3 Manage and optimize enrollments within disciplines, schools and colleges for the benefit of all of our stakeholders.

Strategies:

- coordinate and align academic and enrollment management efforts;
- align financial aid with enrollment policy;
- increase the effectiveness of financial aid by developing new programs, such as targeting national merit scholars;
- examine a differential tuition structure by degree program;
- implement incentives for increasing 4-year graduation rates.

3.4 As demand increases, obtain substantial additional resources to support programs important to the economic development of Michigan.

Strategies:

- have industry and business leaders be advocates for increased State appropriations for programs relevant to the economic vitality of Michigan;
- convince State government leaders to provide significant increases in general fund appropriations to increase Michigan Tech's capacity to educate graduates.

GOAL 4: ENRICHMENT - Be the residential campus that provides the sense of diverse community and student experiences that strive to develop the whole person.

Michigan Tech needs to identify its competitive niche in an environment where the e-commerce markets try to segregate “knowledge delivery”, “knowledge creation”, and the “social aspects” of a traditional college education. Fewer institutions will offer robust residential programs devoted to the student-centered development of educated citizens and leaders. Michigan Tech must take advantage of its beautiful location on the shores of Lake Superior and become a university where undergraduate students have the developmental experience of living and studying in a small, residential setting among a true community of scholars.

In addition to outstanding recreational opportunities (cross-country skiing, down-hill skiing, golfing), the completion of the Rozsa Performing Arts Center will provide the university and the community with an acoustically superb and visually beautiful facility in which to experience, perform, and learn about the arts. It will elevate the quality of the University's music, theatre, and visual arts programs through its performance and exhibit spaces and its specialized rehearsal, recording and computer labs. It will provide each of our students the possibility to actively

participate in artistic, acting, or music experiences. In sum, we should strive to become a student-centered university, known for attention to student needs and committed to student success.

Objectives:

4.1 Become recognized for high quality student life activities

Strategies:

- initiate and fund student centered outdoor activities such as an “Outdoors Club” focused on outdoor recreation and taking advantage of our location, particularly the waterfront and cross-country ski trails;
- create an integrated center for student life programs that includes advising;
- integrate the administration of student life programs including academic, residential, co-curricular, counseling, and career center activities;
- develop proactive programs to foster student success;
- reinforce the traditions of the past and begin new traditions that will instill a sense of community and pride;
- foster student leadership and self-managed teams in co-curricular and classroom activities;
- offer exciting intramural and varsity athletics programs.

4.2 Provide and promote cultural and artistic experiences.

Strategies:

- coordinate cultural and artistic activities to maximize their impact on students;
- increase the support of cultural and artistic experiences through outside funding sources.

4.3 Provide an attractive campus environment.

Strategies:

- promote campus beautification efforts;
- establish an inviting campus entrance;
- expand the Memorial Union and make it the center of student services.

4.4 Provide outstanding residence hall options such as suites, etc.

GOAL 5: ADMINISTRATION - Provide an optimized administrative framework, with sound physical, technological, and financial bases, consistent with a national university of choice.

One of the greatest assets at Michigan Tech is our people. We would do them, and the institution as a whole, a disservice if we did not maximize their potential and provide a sound framework in which to work. If we are to become a national university of choice, it will be because our people made it happen. Appropriate compensation, possibilities for professional advancement, and professional respect are all necessary ingredients for a quality workplace.

Too often the administrative framework of an institution remains stagnant. As the world around us changes, so must we. We need to continue to pursue innovative processes that will enable the University to move forward into the 21st century. Michigan Tech must promote an outlook that encourages organizational agility and flexibility. We especially want to ensure that we implement practices that benefit the entire Michigan Tech community and to tear down the barriers which prevent us from working as a team.

Objectives:

5.1 Continue to improve operational methods, simplify processes, remove bureaucratic barriers and empower our people.

Strategies:

- set up a problem-solving team who will make a self-improvement do-list for administration and continuously work across units to make procedural improvements;
- evaluate and redesign systems to be more efficient and customer-service oriented, both for internal and external customers;
- encourage cross-training to ensure the coverage of critical services;
- recognize and reward the support of and the participation in faculty and staff development activities;
- implement processes to optimize communication between students, faculty, staff, and administration.

5.2 Optimize the financial structure to provide for adequate checks and balances, and most, importantly, to best support the education and development of students.

Strategies:

- implement efficient, cost-saving practices;
- develop a university resource model that can explore the financial consequences of curriculum, staffing, workload, average class size, scholarship, research, and both undergraduate and graduate enrollment decisions in terms of their short- and long-term impact;
- develop a budget model that combines positive feedback, internal quantitative productivity measures, quality measures, and benchmarking, in order to allocate resources based on unit contributions to the strategic plan.

5.3 Increase the financial resource base.

Strategies:

- successfully conclude the "Leaders for Innovation" campaign and raise \$140 million by 2003;
- link the capital campaign to the strategic plan;
- build endowment for student scholarships, faculty chairs, and university operations to \$400 million by 2010;
- improve Michigan Tech's response to state and federal opportunities for funding;
- move Michigan Tech into the first tier of Michigan's university funding structure;
- increase number of endowed chairs;

- increase the extramural funding for education and research.

5.4 Provide well-maintained physical facilities with up-to-date technological features.

Strategies:

- evaluate and redesign physical facilities to be more efficient, technologically up-to-date, and customer-oriented;
- link the campus master plan to the strategic plan;
- improve the space allocation process for more effective utilization;
- implement the ubiquitous sharing of resources, laboratories, and equipment.

5.5 Provide an outstanding work environment and support opportunities for all members of the Michigan Tech community.

Strategies:

- provide competitive compensation and family-friendly benefit packages to attract and retain quality faculty, staff, and students;
- insure the availability of resources to retain the best faculty and staff without penalizing others;
- provide day-care opportunities on campus;
- expand professional development of faculty and staff to ensure they have the necessary tools to carry out their mission effectively;
- actively recruit diverse faculty and staff.

GOAL 6: OUTREACH - Support economic development, public sector outreach, and distance education appropriate for a technological university.

Objectives:

6.1 Increased activities in research & development and technology transfer will become a hall mark of Michigan Tech.

Strategies:

- establish a program to revitalize the manufacturing and natural resource base of the state of Michigan through cutting edge technology;
- establish a technology park;
- pursue cost-effective building options for the seamless integration of enterprise, incubator and technology transfer programs;
- develop new partnerships with non-traditional, emerging companies and businesses;
- initiate a “client service” approach to corporate and entrepreneur relations;
- establish a comprehensive technology transfer program that provides incentives to all stakeholders;
- extend the boundaries of the campus through the development of distance learning programs, K-12 outreach programs, and other initiatives.

6.2. Develop distance learning programs that contribute to the financial well being of the University, especially by partnering with industry and state agencies.

Strategies:

- look at distance education and residential markets under separate administrative structures;
- explore downstate presence and satellite campus.

GOAL 7: IMAGE - Build our reputation beyond the borders of Michigan and the Midwest such that Michigan Tech becomes a national university of choice.

Objectives:

7.1. Develop a pervasive marketing plan that emphasizes quality.

7.2. Develop a compelling statement to other institutions that emphasizes a high quality environment of learning and scholarship.

7.3 Pursue aggressive targeted marketing for programs with potential and need.

Strategies:

- develop a marketing plan that is in line with the strategic plan;
- increase the visibility and enhance the image of Michigan Tech, move from “easy to get into and hard to get out of” to an image of quality and selectivity (“hard to get into but once in, the quality of our programs, faculty and staff will ensure your success”);
- develop first-class web presence;
- form a marketing advisory board.

IV. ELEMENTS FOR SUCCESS.

Achieving our goals and implementing the objectives outlined in the Strategic Plan will require that Michigan Tech make adjustments in a variety of areas. Some of these changes could be substantial and might entail policy and procedural changes, or marshalling financial resources beyond the scope or reach of any single unit.

We must always remember that we are a student-centered institution. A core element of our goals and objectives is that we have to optimize our enrollment at the undergraduate and graduate level. Everyone should recognize that this plan requires a commitment of significant financial resources if we are going to carry out its innovative goals, objectives, and strategies. We can do this by enhancing our financial resources and by making better use of our existing resources through increasing our capabilities in financial analysis, budgeting, resource allocation and reallocation, and planning. All are in order. We must also consider what advantages we might gain by making organizational adjustments that would bring together those people working on common concerns. We acknowledge that achievement of certain goals will require expansions or renovations of facilities, such as the proposed center for integrated learning and information technology. However, we also recognize the need to more fully utilize existing space by an

improved allocation process that considers the attributes of that space (information technology access, for example).

These kinds of processes will help us achieve our goals, however, they are not the ends. Our success will be based on our ability to focus on results, not activities. Results-driven programs are more effective than activities-oriented programs and aim for quick, measurable gains within a few months. Thus, it is important that we begin to identify key measures of our progress toward reaching our goals. Some possibilities are:

- Achieve recognition as one of the nation's research universities and move into the first tier of Michigan's universities;
- Increase the number of doctoral students to 500 by 2010
- Move from Leaders for Innovation capital campaign to building an endowment of \$400 million by 2010;
- Develop greater resources from external sources, partners, and the state of Michigan so that by 2010 sponsored research plus philanthropy will equal state appropriations plus tuition and fees;
- Improve the standing of Michigan Tech's undergraduate and graduate programs in National Rankings of colleges and universities;
- Reach targets for optimal enrollment recognizing that many programs already have too many undergraduate majors. Many of the new students will be in new programs in interdisciplinary areas like Bioinformatics;
- Benchmark the key characteristics of "aspirational" universities as a means of measuring our progress;
- Become a benchmark for innovative and inspirational undergraduate programs.

V. CONTINUOUS STRATEGIC PLANNING

This Action Plan is designed to be a "living document" in two ways. First, it encourages the Michigan Tech community to build an institution in which our actions and our vision are connected. The plan will be used as the basis for our direction, decisions, and activities. Second, it is designed to ensure that the vision is connected to changing environmental conditions. The process that developed this plan will continue, with annual reviews and examinations of our progress, adjusting our efforts as circumstances change. The expectations outlined here look ambitious and they will come to fruition only with the continued commitment and energy of the University community and its external partners.

To connect our actions to our vision, we will have to change the way we do things. We will need to tie decisions made about resource allocation to the goals in the plan, we will need to coordinate efforts across campus towards the achievement of goals, and we will need to reward individuals and groups for their contribution towards these goals. This may involve finding new structures and systems that are more effective, identifying useful assessment methods, and developing budget models that reward performance.

The plan will be updated each year in an iterative process. Resource allocation will be linked to the strategic plan within a general framework for financial modeling that allows us to explore the financial consequences of curriculum, staffing, workload, average class size, scholarship, research, and both undergraduate and graduate enrollment decisions in terms of their short- and long-term impact. The implementation of this plan and its linkage to the budgeting process are described in the addendum. Specifically,

- we will develop strategic initiatives and campaigns in support of the strategic plan, complete with identification of timelines, resources necessary, and budgetary impact;
- we will identify specific sources of funding for our strategic initiatives and develop specific plans to obtain this funding;
- we will allocate and reallocate resources in favor of successful or high-demand programs;
- we will keep Michigan Tech accessible for all qualified students through a competitive package of tuition, scholarships, financial aid, loans, and aggressive procurement of appropriate state, private, and corporate funding.

To connect our vision with the changing environment, this document must be an evolving plan, not a rigidly fixed road map. Today's environment for institutions of higher education is no longer characterized by steady-state – change – steady-state, but akin to a white-water rapid that is turbulent from many interacting factors. Our strategic plan sets a general direction within that white-water, but we will need to constantly assess and respond to this environment. Periodic reexaminations will track the measurable outcomes we have identified, allowing course corrections due to changes in the external environment. It is a new beginning, not an end in itself, that can focus our efforts into a consistent purpose, one that serves well our students and alumni, our partners, and the community itself.

There are many scientific and technological universities. We seek not to be one of many, but a recognized leader among them. We seek to be one of the few scientific and technological universities with national recognition in research and excellence in education—that is, a university of choice. Admittedly, these are ambitious goals. The Michigan Tech community—staff, faculty, and students alike—are recognized for their dedication and hard work. The continued commitment, energy, and hard work of the entire University community are critical to reaching our vision.

VI. IMPLEMENTING OUR PLAN

The purpose of this Implementation Plan is to provide a process by which we can apply our strategic plan – The Action Agenda for 2010. The Implementation Plan's objective is to ensure our Mission is achieved, our Vision is realized, and our Strategic Goals are attained. We will use three approaches to achieving this vision:

- Alignment of Unit Plans and linking to the budget process - Unit plans will be updated annually and supported through the budget processes. Progress will be measured against performance metrics - consistent with national recognition.

- Creation of a University Vision Initiative - A Request for Proposals to the entire Campus community will be issued in order to achieve our vision in a spirit of cooperation.
- Reinstatement of the Research Excellence Fund (REF) - Develop a coordinated effort to reinstate all or part of this fund to assist new researchers, focusing on multi-disciplinary efforts.

The Alignment of Unit Plans and Linking to the Budget Process

The implementation process was begun by having each of the fifteen major academic and administrative units (henceforth, “unit”) on campus develop individual strategic plans based on input from across the unit. Unit action plans were formulated to align unit goals with the Michigan Tech Strategic Plan. Action plans specified the unit objectives to be achieved, how those objectives aligned with Michigan Tech’s Strategic Goals, the methods for achieving the objectives, the timelines for achieving them, and the measures for assessing progress towards them.

Planning will continue annually at the unit level, including discussions of the alignment of unit plans with the Michigan Tech plan, how units can redirect resources and efforts to pursue Strategic Goals, how units across campus can coordinate some of their efforts, and how units have progressed on their plan according to performance metrics.

It is time to again look at our strategic portfolios, review goals, objectives, and strategies, and develop methods of measuring progress toward achieving the unit's strategic goals as outlined below in more detail. Units should also detail what new tasks and programs have been initiated and which task, thrusts, or programs have been scheduled for downsizing or elimination.

A second aspect of the Strategic Plan implementation is linking it to the creation of the annual University budget. Strategic activities can and will be supported through the budget allocation processes. Unit leaders are encouraged to evaluate how time, effort and money can be redirected in the pursuit of their initiatives and strategic goals, and how resources from friends, foundations and funding agencies can leverage University resources. We will use the budget process in synchronization with the yearly update of unit plans and measure progress against performance metrics consistent with national recognition.

In summary:

- Fifteen major units and their constituent units/departments will continue to work through administrative channels to attain their respective strategic objectives (action plans).
- Unit objectives or new strategic directions that need new resources will be submitted through the budget request process which will occur concurrently with the unit plan updates.
- Overlap between the unit and University initiatives is possible and encouraged. All

- initiatives should point toward national recognition.
- Units are encouraged to pursue their goals by seeking external funding.

Creation of a University Vision Initiative

We have established the University Vision Initiative process which will be used as seed funds for proposals from individuals or teams that support the University's Mission and Vision while achieving one or more of the Strategic Goals. It is anticipated that awards from the Vision Initiative process for strategic planning activities will be made annually. Requests for funds from the Vision Initiative process should anticipate the award cycle and plan accordingly. The process is described in detail in **Appendix 1**.

Strategic Planning and resource reallocation are a normal part of every operating unit's activities. Therefore, special requests submitted to the Vision Initiative process off-cycle will generally be directed back to the proposer with the suggestion that funds be sought through other means such as the budgeting process or various unit sources. In the rare instances when an out-of-cycle request is considered, the Strategic Planning Working Group will apply review criteria similar to those used during the normal cycle.

This aspect of implementing Michigan Tech's Strategic Plan is to coordinate efforts across campus. Unit leaders are best suited to be advocates for unit ideas and plans and to work with others across campus to make them a reality. However, extra effort is often necessary to bring key people and resources together to advance some of the more innovative, and sometimes higher risk, initiatives. Therefore, this Vision Initiative process proposed here will enable units working alone or in groups to pursue their most innovative and creative ideas to accomplish the goals of the University's Strategic Plan. For the purpose of soliciting and identifying proposals of **common interest** it might be useful to restate some of the goals of the strategic plan as general interest areas:

1. Innovation in education (Goal 1)
2. Emerging technologies and research (Goal 2)
3. Residential and community campus (Goal 4)
4. Resources, size, and composition. (Goal 3, 5)

Examples of these interest areas are given in **Appendix 2**.

In summary, the vision initiative is meant to

- Select strategic initiatives in support of the Action Agenda, complete with timelines, resource needs, and budget impacts;
- Identify specific sources of funding for our strategic initiatives and develop specific plans to obtain funding;
- Allocate resources in support of our most promising initiatives;
- Invite participation by every member of the Michigan Tech community.

- Promote a bottom up process. .
- Encourage initiatives that cross unit boundaries.
- Targets audiences different from the Research Excellence Fund, e.g., educational programs, university life, research support, etc.

Reinstatement of the Research Excellence Fund (REF)

This is self-explanatory. The emphasis is to build REF back over time to help new investigators and/or teams of investigators to build areas of national prominence. The focus is on faculty responsible for building the research enterprise.

These three approaches will be used in parallel. The fifteen major units and their constituent units, which developed individual strategic plans, will continue through the administrative channels to work towards their respective strategic objectives (action plans). Some of the constituent unit strategic objectives will not need new resources, but some may require new funds. These unit plans are linked to the annual University budget through the submittal of budget requests. These submittals occur concurrently with the proposals in the solicitation cycle described above and the call for proposals suitable for the Research Excellence Fund. Overlap between unit and institutional initiatives is possible, even encouraged. Units are also encouraged to pursue their goals by seeking grants, building their endowment, and forming coalitions with other universities around the world as well as with government and non-governmental organizations.

In a given year, the Provost, meeting with all relevant groups (the Executive Council, the Deans Council, the Strategic Allocation Committee, the Budget Advisory Group, the Strategic Planning Group, and the Board of Control's Finance Committee) throughout the decision-making process, will make the final determination of funding and, therefore, implementation of the strategic plan and this multi-faceted approach to achieving our vision.

Measuring Our Success

We measure progress at three levels (see also www.mtu.edu/stratplan/measurables.html) :

The **Goal Measures** are university level measurables and are purposely few in number. They are holistic, university-wide, appropriate for Board or university executive use, small in number, and developed once per strategic plan. They are rarely, if ever, revised. The six proposed goal measures are described below.

The **Thematic/National Measures** are measurements made by others that allow us to measure ourselves against peers and those to which we aspire to emulate. They are tied to national benchmarks and similar or identical to those used for national rankings. They are “top level” and cross-cutting and may measure more than one MTU strategic goal. The SPWG reviews data annually. Possible Choices include:

“The Nine Indicators of Competitiveness” (the Center’s “Top American Research Universities)
USN&WR Rankings
NSF Research Expenditures Annual Report
Selected Components of USN&WR Rankings
Research Council Doctoral Program Rankings
Carnegie Research Institution Classifications
National Survey of Student Assessment

Unit Measures are measurables developed and used by individual units to assess unit progress toward unit strategic goals stated and described in the Unit Strategic Portfolios. They are annually reviewed/revised by the SPWG, Deans, Chairs, Faculty, Directors.

The six proposed **GOAL MEASURES** and the associated 2010 goals are:

1. Increased student learning and academic success.

1. 70% undergraduate student graduation rate (6-year rate)
2. 60% graduate student graduation rate

2. Increase mix and diversity of graduate and undergraduate enrollments to achieve a total residential enrollment of 7,000 full-time students.

1. Total residential enrollment of 7,000
2. 15% of total enrollment to be graduate
3. 50% of our graduate enrollment to be doctoral students

3. Increase the national visibility of MTU.

1. Increase the number of non-Michigan undergraduate students by 10%
2. Increase the number of inquiries by 60%

4. Increase sponsored research.

1. To achieve \$50 million of research expenditures by 2010.

5. Increase scholarly productivity.

1. 80% of tenured/tenure track faculty to be actively pursuing research, scholarship, and/or creative activity
2. Increase peer-reviewed scholarship by 5% per year

6. Increase the University endowment.

1. Increase the endowment to \$400 million

2. 85% of the endowment is to consist of “people” assets (endowed scholarships, fellowships, faculty chairs; professorships)

Some of the unit measurables will need to be modified or expanded in order to acquire the information that the SPWG will need in order to assess our progress towards achieving our University strategic goals. A member of the SPWG will be contacting each Portfolio manager during October to assist in developing measurables that can be appropriately incorporated into the university level measurables.

The Board of Control expects to receive a report on all three levels of progress measurements at its March, 2003, strategic planning workshop. Thus, the SPWG will need to receive progress reports from all unit portfolio managers by February 1, 2003, in order to develop a comprehensive report for the Board. The SPWG member who is working with each portfolio manager will help develop a timeline that will allow the unit to meet this February 1 report date.

APPENDIX 1

Vision Initiative Proposal Solicitation 2002 Proposal Guideline

PLANNING DATELINE

- Proposals are due in Provost's Office October 15, 2002
- Proposals are reviewed by SPWG October 15 - November 15, 2002
- Recommended proposals are reviewed by appropriate Deans and Vice-presidents : November 15 - December 12, 2002
- Public presentation of recommended proposals December 5-6, 2002
- Proposals are recommended to the Michigan Tech Fund December 16, 2002
- Portfolio of proposals is completed for use by the Michigan Tech Fund February 28, 2003

GENERAL INFORMATION

After reviewing the first round of the Vision Fund, the Strategic Planning Working Group decided to simplify and shorten the process. Thus, the proposal process has been reduced to one round. Successful proposal writers will be required to work with the Michigan Tech Fund to turn their proposal into a document suitable for use by the Michigan Tech Fund for solicitation of support for the project.

The revised process involves two steps:

1. Proposal
2. Portfolio preparation

Guidelines and templates for the proposal and budget are described below and can be accessed on the Web at <http://www.mtu.edu/stratplan/vision-initiatives.html>

Two types of proposals are being solicited:

- **Focused Initiatives**
 - o Initiatives narrow in scope
 - o 1-2 page(s) proposal
 - o Proposals submitted by individuals or small groups
 - o Proposals must address some aspect of the Strategic Plan

- University Initiatives
 - o Broad-based initiatives
 - o 3-5 pages proposal
 - o Proposals will involve many segments of the University
 - o Proposal must have major impact on the Strategic Plan

The proposals are expected to be in one of the following areas:

- Innovation in Education
- Emerging Technologies and Research
- Residential and Community Campus
- Resources, Size, and Composition

ELIGIBILITY

- Any faculty, staff, administrator, student, or unit within Michigan Tech may submit a proposal.
- Friends of the University, including, but not limited to, advisory board members, alumni, and research collaborators may apply through partnerships with faculty and staff.
- An individual can be involved in more than one proposal.

PROPOSAL REVIEW

The Strategic Planning Working Group will review all proposals and make recommendations to the Provost who will make the final selections. The proposal will be reviewed based on the following criteria:

- Impact of the proposed strategic initiative on Michigan Tech progressing toward becoming a National University of Choice
- Direct and compelling support of one or more goals of the Action Agenda
- Estimated impact of the effort on recruiting and retention of students at all levels
- Skills and experience of the project leader and the team
- Methods for measuring progress and assessing accomplishment
- Cost effectiveness - how effectively does the proposal use existing resources, reallocations, and external matching funds? (Distinction will be made concerning external matches that are “in hand”; versus those that are being pursued. Shared use of facilities, laboratories, equipment, and other resources are important considerations.)
- Overall merit and quality of the proposal

APPENDIX 2

Examples of Areas of Common Interests

1. Innovation in Education

It is important that our innovations in education encompass both undergraduate and graduate education with a comprehensive effort to develop the whole person. Many portfolios proposed teaching and learning innovations in undergraduate and graduate programs. Portfolios stressed the need for developing nationally recognized programs and improving the preparation of our graduates as strong teachers as well as strong researchers and scholars. Recommended innovations include improving the connection of teaching and research at Michigan Tech, developing collaborations between departments and information technology for research in teaching and learning, and creating the future of technological education.

Strategic initiatives that would accomplish this and fall within the “Innovations in Education” area include, but are not limited to:

- Approaching teaching and learning in a multidimensional fashion, to develop standards in technological literacy, and develop nontraditional educational delivery systems that include studio-style and Web-based instruction;
- Expanding innovative technical education which develop learning contexts that extend beyond the confines of the traditional academic environment, such as internships, on-site practice, distance and distributed learning, partnerships between universities and industries, community-based client projects, and service learning;
- Integrating teacher education programs and research in learning into the institutional agenda;
- Expanding the role of the Center for Teaching, Learning and Faculty Development; and
- Addressing widely known and recognized critical issues and national needs in the science, mathematics, engineering, and technology (SMET) teaching workforce; aligning the University with the national action agenda; and providing us with excellent funding opportunities.

2. Emerging Technologies and Research

The development of research initiatives will support the traditional graduate and undergraduate education role of Michigan Tech. The common element in each of these research areas is inquiry-driven faculty productivity. Faculty must teach the courses, write the research proposals, and

supervise the graduate students if any significant progress is to be made toward the goal of achieving national prominence in these areas.

Strategic initiatives that would accomplish this and fall within the “Emerging Technologies and Research” area include, but are not limited to,

- Nanotechnology. Research in nanotechnology that will lead to understanding and control over the fundamental building blocks of all physical things and will likely change the way things are designed and made. (i.e., vaccines, computers, common consumer goods);
- Biotechnology. Research in developing new materials, combating diseases, increasing food production, reducing pollution, and enhancing the quality of life (i.e., genomic profiling, biomedical engineering, therapy and drug developments, genetic modification, and DNA identification and applications);
- Natural Resources/Environment/Remote Sensing. Research on aquatic and terrestrial ecosystems as well as natural resource management and pollution prevention and mitigation, research on remote sensing spanning a number of disciplines, including imaging science, signal processing, visualization, and data mining; and.
- Information Technology. Research on developing new IT-enabled devices, applications, and services (i.e., wireless connectivity via hand-held devices, decrease in equipment costs, increase in performance).

These areas, which are very broadly defined, encompass much of what Michigan Tech is already doing well, and there are additional plans for new directions in research and education. We can continue to support faculty members by maintaining broad definitions of these fields. For example, "biotechnology" can be defined to include most of the efforts of several divisions: bioengineering, biology, chemistry, civil and environmental engineering, forestry, and others.

3. Residential and Community Campus

Several unit plans included strategies for achieving the vision of a residential student-centered learning environment. Michigan Tech needs to identify its competitive niche in an environment where the e-commerce markets try to segregate knowledge delivery, knowledge creation, and the social aspects of a traditional college education. Fewer institutions will offer robust residential programs devoted to the student-centered development of educated citizens and leaders. Michigan Tech must take advantage of its beautiful location on the shores of Lake Superior and become a university where students have the developmental experience of living and studying in a small, residential setting among a true community of scholars.

Strategic initiatives that would accomplish this and fall within the “Residential and Community Campus” area include, but are not limited to,

- Creating an attractive physical environment, including gathering places for socializing and

schoolwork;

- Developing opportunities for student/faculty interaction outside the classroom;
- Providing excellent housing options;
- Sponsoring diverse options for social activities; and
- Enhancing mentoring and advising services.

Examples of how these might be combined in strategic initiatives include

- Developing an Advising and Learning Center that would serve first-year students by providing information about course requirements and educational programs, as well as offer career exploration services and coordinate intervention for students with disabilities and students having difficulties;
- Sponsoring diverse social and professional opportunities that would provide students with the ability to pursue interests outside the classroom that would serve to increase both emotional development and campus connectivity; and
- Developing a “town square” that would improve the quality of student life by providing a broader range of housing options, social gathering places, areas for studying, organizational meeting spaces, and areas for faculty-student interaction outside of the classroom.

4. Resources, Size, and Composition

"Quality is embodied in our people ... It will be the ubiquitous contact between our faculty and staff and our students in active, discovery-based learning settings that will be the hallmark of this University."

Quality is not driven by the absolute size of the University but by having enough faculty and staff to enable this learning environment. The faculty must be eminent in their fields if we are to "prepare students to create the future." Then we must have faculty who are creating the future through innovative teaching, research, and scholarship. Thus, key enabling ingredients in Michigan Tech's quest to become a national university of choice will be to determine the right size for the University, implement the right student-to-faculty ratios along with the right composition, and then find the resources necessary to accomplish this.

Strategic initiatives that would accomplish this and fall within the “Resources, Size, and Composition” area include, but are not limited to,

- Developing and implementing programs designed to increase enrollment to 7,000;

- Developing and implementing programs designed to increase graduate enrollment to at least 15 percent of the total enrollment with half of these at the Ph.D. level (some programs may increase Ph.D. student levels more since not all programs, departments or schools have graduate programs);
- Designing and implementing ways to maintain or develop student-to-faculty ratios in each of the colleges and schools that are consistent with those of nationally recognized programs (e.g., 16 to 1);
- Benchmarking various areas of campus to determine the optimum size, then developing and implementing methods to reach target numbers for non-degree students and degree students;
- Developing ways to increase the percentage of minorities and women in all programs;
- Adding distance education programs that contribute to our on-campus programs and reach out to alumni and industry;
- Developing and implementing ways to increase our resource base to support the infrastructure for quality research and teaching;
- Developing ways to restructure tuition rebate dollars to attract certain types of students (e.g., students with need, diverse students, merit scholars, students in under-subscribed programs) as well as reducing our amount of rebate dollars while still attracting students; and
- Evaluating the quality of high-cost programs, such as our entire fee structure (lab, computer, etc.) to make sure that all stakeholders are receiving quality service and facilities for the price.