



A Presentation by

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The University of Michigan

A University Enterprise Zone

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Introduction

Good afternoon. I want to thank Society Bank for inviting me to speak today as part of the “Lunch & Learn” series. Today I’d like to make a few remarks about the economic future of our state and the role that both Ann Arbor and the University of Michigan might play in this future.

Over the past couple of years I have spoken frequently about the serious structural problems faced by our state, as evidenced by some very painful symptoms: the bad news from Michigan industry, plant closings, the massive losses at GM. I have also have noted the degree to which we have slipped in key indicators of the quality of life:

- 30th in per capita income
- 37th in child well-being
- 39th in housing affordability
- 48th in business climate
- 49th in return on federal tax dollars

We have risen in other alarming statistics:

- 14th in teenage unemployment rates
- 13th in incarceration rates (and rising rapidly)
- 13th in percentage of children in poverty—with one-third of our children now classified as impoverished
- 12th in property tax burden
- 10th in infant mortality
- 4th in public aid recipients
- 1st in mortality from major diseases—and 1st in smoking, I might add.

In reality, this tragic litany in statistics represents just a few of the symptoms of Michigan’s failing economic health. My colleagues have frequently referred to this as my “Lecture from Hell.” I must admit that it was crafted originally as a “fire and brimstone” sermon to use as a “2x4” to get public attention focused on the real challenges before our state.

Let me put you at ease. You are not going to get that sermon today. Indeed much of the recent economic news is good. The economy seems to be on the upswing. Unemployment in Michigan has dropped to the national average, the lowest since 1990. Retail sales are up. The mood of the country seems more upbeat than in years.

And yet it is also clear that while the recent symptoms are more encouraging, the patient is far from cured. Indeed, our most fundamental challenges still remain, and they must be faced. The subject of my remarks today will be: What to do? How do we position both the State of Michigan and Ann Arbor to regain both economic prosperity and quality of life for future generations?

What Is Going On?

Why have we seen such hard times lately? Has it been due to those aggressive Japanese? Or perhaps the numbing influence of media and TV sound bites? Perhaps it is an aging America that has forgotten its responsibilities to its children? No, these are just symptoms of underlying forces.

Few of us realize the full implications of the ever-accelerating pace of change in our world, our nation, and perhaps most of all, in our state. Change is transforming our world. Who would have predicted several years ago that: Communism would be rejected around the world, swept away by the winds of freedom? The Berlin wall would crumble, and Germany would be reunited? Eastern Europe would break away from the Soviet block to embrace democracy and unite with Western Europe? The Soviet Union would literally disintegrate from the centrifugal forces of freedom and nationalism?

Yet the changes we have seen thus far are just the tip of the iceberg. Indeed, many believe that we are going through a period of change in our civilization just as profound as that which occurred in earlier times, such as the Renaissance

and the Industrial Revolution. Except that these earlier transformations took centuries to occur, while the transformations characterizing our times will occur in a decade or less! Today we are evolving rapidly to a new post-industrial, knowledge-based society, just as a century ago our agrarian society evolved through the Industrial Revolution. A key element in the transformation is the emergence of knowledge as the new critical commodity, now as important as mineral ores, timber, and access to low skilled labor were at an earlier time. This new critical commodity knows no boundaries. It is generated and shared wherever educated, dedicated, and creative people come together and, as we have learned, it spreads very quickly—worldwide, in fact.

In a sense, we are entering a new age, an **Age of Knowledge**, in which the key strategic resource necessary for our prosperity, security, and social well-being has become knowledge: educated people and their ideas. I used to portray the 1990s as the countdown toward a new millennium, as we found ourselves swept toward a new century by these incredible forces of change. But the events of the past two years suggest that the twenty-first century is already upon us, a decade early.

But change itself is not our real problem. Our problem is that as a people we are not facing up to the challenge of change. We are not yet prepared to face a world whose economy, culture, and politics are driven by the explosion of knowledge. This is particularly true in our state.

The Challenges Before Our State

The Challenge of Change

My wife and I have lived in Michigan for almost twenty-five years—we have paid taxes here, we have brought up a family, and we have seen our state go through wrenching changes. In the past our industrial base, our economy, has relied on the fortunes of a few large companies—

in fact, one large industry. For most people, there was never any reason to be particularly entrepreneurial or to worry about anything more than occasional uptakes and downturns in the economy. Only during the last decade have many of us begun to understand that the old economy will never return, that even if our traditional industries become more successful, the huge economic base upon which all of our policies were formed will never return.

Michigan is midway through a several decade-long transition from a state dominated by a single industry and a few large companies to one dependent upon tens of thousands of small, dynamic companies competing in a broad spectrum of world markets. We are experiencing a transition from low-skill, high-pay jobs to high-skill, high-pay jobs (or, tragically, low-skill, “no” pay jobs); from a transportation industry state to an information industry state; from the Industrial Age to the Age of Knowledge in which educated people and ideas have become the key strategic commodities determining economic prosperity, national security, and quality of life.

Unfortunately, Michigan is currently not well-positioned to make this difficult transition since over the years our state tax policy, regulatory policy, social services, public investment strategy, and politics have evolved to serve big business, big labor, big government—and, in reality, a single industry. Yet this old alliance—big business, big labor, and big government—is increasingly irrelevant to our future, although we are still propping it up.

The key question then becomes: What is the new alliance that we will build, and which enterprises will comprise it? A look at the past decade provides a hint. Even as we were losing thousands of jobs with the decline of the auto industry, we were also gaining over 200,000 new jobs from thousands of new companies. Professor John Jackson makes a strong point that, despite the doom and gloom of plant closings, Michigan still

has a very dynamic economy. Yet, unlike the past, the growth and maturation of these new companies is far more rapid, and they also have shorter life spans, since they are swept along by the rapid pace of technology. He uses the analogy of a forest, where mature trees gradually fall or are harvested and young saplings grow in their place.

From this perspective it seems clear: we must **restructure** our state to create, attract, and support the tens of thousands of new companies on which our future will depend. We must enable them to function in a rapidly changing, frighteningly competitive, and knowledge-intensive world marketplace. Michigan's challenge is not dissimilar to that faced by industrial corporations, by government, and by universities themselves. We must restructure ourselves to serve the future rather than simply perpetuate the past. From a broader perspective we must restructure our state, our business and industry, our government, and our institutions to prosper in the Age of Knowledge that is already upon us. We must recognize and respond to both the challenges and the opportunities before us.

The Old Systems—Still in Place

At the present time, however, the old structures are still in place and are an impediment to future prosperity. Let me give some examples:

Our tax system, which has remained the same for decades, is designed for a 1950s-1960s economy. University of Michigan economist Paul Courant, who understands the Michigan tax system as well as anyone, suggests that virtually all of our taxes in Michigan contain special provisions, i.e., loopholes, that give an advantage to some economic activities relative to others. Over time, special interests, the industries with the most clout, have tilted the scale so that the tax system has become largely inefficient. A good example is provided by Michigan's tax abatement law. This provides big industry (primarily the automotive industry) with \$292 million in tax breaks, at the

expense of small business, school financing, and other social needs. And with little apparent positive return.

It is not that Michigan as a state is over-taxed—indeed, its total per capita tax has now dropped somewhat below the national average. Rather, it is that its present tax system is obsolete, unnecessarily burdensome, and intensely unfair. Further, Michigan's tax system is not strategically aligned to Michigan's future. The past is subsidized and perpetuated while the future is strangled by our reliance on property taxes, the Single Business Tax, tax abatements, and other tax "expenditures" or loopholes which benefit special interests. It does little, if anything, to promote economic growth. It does little to encourage saving and investment.

Simply put, the tax system is out-of-date, and it is time for tax reform. Here it is important to add that we need a total overhaul, not simply a quick patch-up job. For example, simply reducing property taxes may relieve some serious inequities; but in and of itself, it will not accomplish what really needs to be done. Indeed, simply cutting taxes could well destroy the ability to make strategic investments in areas critical to Michigan's future, such as education and infrastructure.

Our goal should be to restructure Michigan's tax system—streamlining and simplifying it—to make it less burdensome to small business, fairer to taxpayers, and capable of supporting key investments in our future.

We also need to take a harder look at state spending policy generally, to ask the important question: What is the role of state government and how should resources be allocated? For decades Michigan was fabulously wealthy. We developed a culture of expensive practices and expectations: employee benefits, health care, social services, litigation. Yet today, as Michigan's economy attempts to adjust to the brave, new world of a knowledge-driven society, it still attempts to support a Cadillac appetite on a Ford income.

We are not investing our resources strategically. We are tending to deploy them to pay for past sins (corrections, social services, entitlements) or sustain and perpetuate the past (tax abatements) rather than investing in the future by creating new knowledge, new skills, and new jobs.

We urgently need a unified, strategic approach to restructuring our state's tax and expenditure policies in a way that looks to the needs of future generations rather than simply our own present desires.

One Key: Education

One of the strongest beliefs I hold is that the key to economic growth is education, not economic development programs. Education is the only enterprise that will save us from becoming a backwater economy. It is a point of "lift off," from which we can create new markets, processes, and skills.

Over the next five years, we must make some hard choices and reform our K-12 system. We are closer to designing a system that lets students, teachers, and parents know what is expected of them—one that uses international benchmarks to compare our schools. But we are still far from getting parents to understand that there indeed IS a problem, and we are still focused on school finance versus a clear vision of what will make better schools. Michigan children may be able to compete with children from Ohio, but they are far behind children in Tokyo and Beijing. K-12 reform is imperative, and that message must be delivered more forcefully not just in Lansing, but around the state.

But there is something else. Even if we are successful in our reform of K-12 education, it is clear that we must make additional investments to create the new jobs that can employ these graduates. These jobs presently do not exist in our state.

And that leads me to a second critical area for strategic investment: research and development.

The Second Key: Job Creation in An Age of Knowledge

It is important to realize that increasing the competitiveness of existing industry, while perhaps retaining market share and sustaining profits, will NOT retain jobs (since doing things with fewer people is frequently a key to increased productivity). Efforts such as total quality management, shorter cycle times, just-in-time inventory, will not create new jobs but, at best, will only preserve some existing jobs.

Rather, in an Age of Knowledge, new knowledge itself is necessary to create new jobs.

It seems increasingly clear that new jobs in Michigan are not going to be spawned by existing industry but instead will be created by entirely new activities, e.g., genetic medicine, biotechnology, information technology and computer networking, optics, lasers, ultra-high-speed technology, and automated manufacturing.

From this perspective it is clear that the most powerful economic engines in Michigan may well turn out to be our two great research universities: the University of Michigan and Michigan State University.

Why?

The key ingredients in technology-based economic development are: (1) technological innovation, (2) technical manpower, and (3) entrepreneurs. Research universities produce all three. Through their on-campus research, they generate the creativity and ideas necessary for innovation. Through their faculty efforts, they attract the necessary "risk capital" through massive federal R&D support. Through their education programs they produce the scientists, engineers, and entrepreneurs to implement new

knowledge. And they are also the key to knowledge transfer, both through traditional mechanisms, such as graduates and publications, as well as through more direct contributions such as faculty/staff entrepreneurs, the formation of start-up companies, strategic partnerships, and so on.

There is ample evidence to support the impact of world-class research universities. We need only look at MIT's impact on the Boston area, Stanford and UC-Berkeley's impact on Northern California, Caltech's impact on Southern California, and the University of Texas's impact on Austin. But there is an important lesson from these examples. Only world-class research universities are capable of major impact. A university must be able to play in the big leagues, to compete head-to-head with institutions such as MIT, Stanford, and Berkeley if it is to attract the outstanding faculty and students and massive resources necessary for technological leadership.

Fortunately, the University of Michigan and Michigan State University are already among the best in the world. We can take advantage of the talent and resources that reside in them right now—today! But to do so, we must think and act far more strategically than we have done in the past.

The Strategy

There is already a good deal of evidence about the University of Michigan's impact on local economic development. More than 150 companies can trace their roots to the University in one way or another. In Washtenaw County there are some 148 high-tech firms employing 13,500. These firms are estimated to have created 6,000 jobs and generated over \$11 million in property taxes.

Let me give you a recent example: Three years ago the University established the National Center for Ultrafast Optical Science as one of the NSF Science and Technology Centers, headed by Professor Gerard Mourou. The Center has already

spawned three new spin-off companies while developing research collaborations with nineteen companies. It has won five Small Business Innovation Research grants from the NSF and produced six optical products that are already out in the marketplace. Here it should be stressed that the dominant activity in the Center is not applied research but rather the basic exploration of the frontiers of optical science. But this is just the type of new knowledge that generates spin-offs, new companies, and new jobs.

More of this kind of growth can occur if we can successfully transfer the technology at our research universities. In a sense, it is happening with the thousands of University faculty, staff, and student members already involved in technology transfer activities through publication, conferences, and consulting arrangements. But we would like to take this one step further and develop a strategic plan for creating real, economic growth, with hundreds of small, growing firms clustered around the University of Michigan as an R&D center. The goal we have in mind is nothing less than to make Ann Arbor an economic engine of the Midwest.

The plan we are developing is organized into six steps:

1. to attract the key people;
2. to create the knowledge;
3. to facilitate the transfer of knowledge;
4. to create a more entrepreneurial culture;
5. to form or attract new companies; and
6. to help these companies grow and flourish.

Let me discuss each step in more detail:

Step 1: Attract the People

Educators, coaches, business people, and other people who want to create successful, winning teams know that recruitment is everything. As a dean, I looked for raw talent, people who were early in their careers, who had the

potential to do great things. I sought people from around the country—indeed the world—who would build a critical mass of talent. We worked hard to keep them there and to make things exciting, to build an environment where they could flourish, making their great ideas become reality. We continue to seek to attract “crazy” people with crazy ideas and to give them the freedom to create and innovate. And we seek the very best in leadership, e.g., our new deans: Peter Banks, Dean of the College of Engineering from Stanford; Joe White, Dean of the School of Business from industry (Cummins); Gary Brewer, Dean of the School of Natural Resources and Environment from Yale; and Dan Atkins, Dean of the School of Information and Library Studies from the Electrical Engineering and Computer Science faculty here at Michigan.

It is in this same spirit that I was delighted to announce last week that Dr. Homer Neal, Chair of our Physics Department, has agreed to accept an appointment as our next Vice President for Research. Homer is not only one of the nation’s most distinguished scientists, heading up a major research team searching for the “top quark,” but he brings extensive experience, having served as Vice President for Research at Indiana, Provost at SUNY Stony Brook, member of the National Science Board, and head of the NSF Physics Advisory Committee. He is also well-versed in the ways of Washington!

Step 2: Create the Knowledge

Last month it was announced that the University of Michigan has moved ahead of MIT in the volume of our research activity. We have now achieved the ranking as America’s leading research university—and let me assure you, this particular #1 ranking won’t be lost next week—it will last at least a year!

This past year our research expenditures amounted to \$347 million—most of which was attracted from the federal government and private

industry through the competitive efforts of our faculty. Some examples illustrate both the importance and breadth of these activities.

Our medical scientists continued their revolutionary work in mapping and identifying genes responsible for devastating diseases, such as cystic fibrosis, neurofibromatosis, and breast cancer. (You've probably read about this work, which frequently makes the front pages of *The New York Times* and *The Wall Street Journal*.) Last year the University conducted the world's first clinical trials in using modified human genetic material to treat human disease (hypercholesterolemia and malignant melanoma). The first clinical trials for treating cystic fibrosis with human gene therapy have been approved and will start at Michigan in several months.

Michigan scientists and engineers have designed and built the world's most powerful laser, operating at fifty-five terawatts!

University experiments were carried on five of NASA's space shuttle missions, including the HRDI satellite developed by the UM Space Physics Research Lab and, unfortunately, the tethered satellite experiment that was "hung up" in early August.

Michigan, in partnership with IBM and MCI, continues to operate and expand the National Research and Education network, the computer network that now links together over eight million users throughout the world!

Step 3: Facilitating the Transfer of Knowledge

Several years ago, when I was Provost of the University, we took a hard look at the University's intellectual properties policies. We surveyed the policies of other peer institutions, e.g., MIT, Cornell, Wisconsin. The entire University executive officer team visited Stanford to learn more about their successful approach. Through this experience, we arrived at the following beliefs

concerning the process of knowledge transfer from the campus to society:

First, we believe that research universities—particularly public research universities—have a major obligation to make every effort to transfer intellectual properties resulting from academic activities into the private sector where they will benefit society—in a manner consistent with their academic missions, of course. Further, we recognize that such technology transfer will occur most rapidly when those who create the intellectual properties—faculty and staff—have maximum incentive, opportunity, and support to transfer them to the outside. Indeed, we believe that a research university's ability to recruit and retain outstanding faculty and staff will be increasingly influenced by the environment it provides to allow, encourage, and facilitate such knowledge-transfer activities. There is strong evidence that the best "academics" and "entrepreneurs" may be one and the same!

Further, there is considerable evidence that interaction with the broader society is a critical factor in stimulating creative research in some areas. Knowledge transfer activities can have a dramatic positive impact on the quality of basic research since they create pressures to work in exciting, high risk, interdisciplinary areas to achieve the quantum leaps in knowledge not normally available in the industrial setting. In this sense, it is wrong to equate "commercial value" with "applied research." Frequently the real barriers to application are due to a shortage of basic knowledge, only gained through fundamental research.

We concluded that it was unlikely that most universities would reap substantial income through direct control of intellectual property, such as patent licenses and equity interest in spin-off companies, at least in the near term. However, institutions could gain substantial indirect benefits from aggressive technology transfer efforts through increased public support and private

gifts. The Hewlett-Packard experience at Stanford is one example.

Finally, we realized that universities must take care to avoid a paternal attitude toward their faculty and staff. In their perhaps well-intentioned efforts to protect them from the harsh, cruel world of private enterprise, the university will constrain and frustrate those already experienced in such activities and prevent the development of a learning process among others (albeit sometimes by the school of hard knocks), while removing the incentive for wide-spread faculty involvement in technology transfer activities. We have adopted the premise that faculty and staff in universities are mature, responsible individuals who will behave properly in balancing the university's interests and their own responsibilities for teaching and research against their interests in intellectual property development and technology transfer.

In summary, then, our premise was that knowledge transfer from the campus to the market will only succeed if we recognize that it is highly people-dependent. We believed it essential to stimulate and encourage the individual researcher/inventor to participate in these activities and to remove the constraints to provide maximum incentive and opportunity for this process to occur.

It was in this spirit that the Regents of the University adopted a new set of intellectual property policies (listed in order of importance):

1. To provide services to the faculty and staff to facilitate their efforts to carry out the University's mission.
2. To facilitate the rapid and efficient transfer of knowledge and technology from the campus to the private sector in service of the public interest.

3. To attract resources for support of the academic programs of the University.

Here strong emphasis is placed first on service to the faculty and staff—in a sense, our translation of the old Stanford saying that “The University is run by the faculty for the faculty ...” These policies also reflect our belief that research universities have an obligation to transfer knowledge from the campus to the public. In framing the policies, we resisted the notion that technology transfer will be a “cash cow” for the University.

Associated with these steps, we also clarified the University’s Disclosure Policy by stating that employees have an obligation to disclose promptly and completely any intellectual property they have developed. In the months ahead we intend to similarly clarify the University’s conflict of interest policies.

The University provides several options for the commercialization of intellectual properties developed by faculty and staff. Prior to expenditure of University resources for protecting and marketing intellectual properties, the inventor is asked to select one of the following options for commercialization:

1. The University may license properties to external entities for further development and commercialization in exchange for a return on resulting revenues.
2. The University may enter into licensing agreements with employee-inventor-owned companies due to changes in State Law (“Contracts of Public Servants with Public Entities,” 1983). Terms may include royalty payments or equity interest (unlike Stanford). Emphasis here is on helping the company become viable.
3. Faculty and staff may petition the University to reassign ownership to the inventor if they elect to market, protect, and license it on their own with minimal

University involvement. (Note: Technically, the University always had the ability to reassign ownership, but in the past we would only do so if we did not see a benefit to the institution. The new philosophy allows the inventor to petition directly if he believes he can do a better job, thereby creating a "free market" culture for technology transfer.) In this case, the University would ask for recovery of any patent and licensing expenses plus 15 percent of royalties, equity, or other value received (although this can be waived).

Finally, we have adopted a royalty distribution policy that is among the most generous in the nation: 50 percent of the first \$100,000; 40 percent of the second \$100,000; 33 percent of any amount above \$200,000 (with the rest split between inventor's unit and University).

We have also taken important steps to build more effective intellectual properties organizations. First, we recognized that in an institution as complex and diverse as Michigan, it made no sense to centralize all intellectual properties activities. Indeed, this centralized approach in the past had simply bottled up much of our transfer activity. Instead, we have moved to develop a decentralized structure with relatively independent operations in both Medicine and Engineering and a small central office to ensure compliance with University-wide policies, to coordinate and support these activities in other units, and to take the lead in "deal making" with external groups.

In this regard, we have shifted our philosophy from one of licensing and contracting—from legal approaches to one of deal-making, limited partnerships, and entrepreneurship. To reflect this, we have restructured organizations to achieve a dual reporting line to the Vice President for Research and the Vice President-Chief Financial Officer. Finally, we have recruited people in leadership roles with strong entrepreneurial

experience and focus: Bob Robb, from Baylor Medical Center (now Director of UM's Intellectual Properties Office); Jay Hartford, former Vice President-Chief Financial Officer of Washington State University (now Executive Director of Technology Transfer at the College of Engineering); and Geoff Henney (now Executive Director of Technology Transfer at the Medical School).

In summary, the key themes we have stressed in this reorganization of our knowledge transfer activities are:

1. A "service to faculty" orientation.
2. A "free market" strategy: we let faculty and staff select how best to handle commercialization, including letting them own the intellectual property, if they are convinced that this is the best way to transfer it to broader society.
3. Maximum "flexibility" in negotiating research contracts, in development, in marketing and licensing.

Step 4: Creating an Entrepreneurial Culture

We have reaffirmed the importance of individual achievement, of excellence, in what we do. We are stressing a fundamental belief in the ability of talented people to do great things—if we will only get out of their way and let them! One cannot underestimate the importance of establishing an intense, entrepreneurial environment—a no-holds barred, go-for-it culture—in which individual initiative, achievement, and the quest for excellence are the dominant elements.

Further, we are committed to educating the research community about the benefits of knowledge transfer—everything from applying for a patent to determining up front licensing fees. By the way, we welcome the public to join in at our technology transfer seminar series.

Step 5: Form (or Attract) the New Companies

I'll comment more on this particular strategy in the next section.

Step 6: Help New Companies to Grow and Flourish

An important element in technology transfer is the formation of strategic alliances, comprised of R&D centers such as the University of Michigan, together with industry and government. Dean Dan Atkins likes to point out that such university-industry alliances should be viewed as symbiotic—associations between two unlike organisms for the benefit of each. Of course, both industry and university have a “service to society” component. But their fundamental goals are quite different: industry seeks to make a profit, while universities seek to create and maintain knowledge and impart it to students. In a university-industry partnership, it is important that each partner focuses on what it does best.

While such partnerships have existed for many years, they have tended to rely on traditional relationships such as the hiring of graduates, the use of faculty consultants, or the sponsorship of research. Today we face new challenges. The time required for technology transfer from university to industry must be reduced dramatically to meet the needs of existing companies and to spawn new industries. Yet academic institutions are ill-equipped to respond to the highly focused immediate needs of industry without considerable disruption of on-campus responsibilities. We need to improve mechanisms for achieving direct industrial support of academe through financial assistance, equipment donations, and visiting staff.

It is clear that both industry and academia desire stronger, more sophisticated, and sustained relationships with each other in order to respond to the needs and capabilities of each type of organization. Such mechanisms include:

1. Placement of graduates
2. Cooperative education programs
3. Continuing education
4. On-campus sponsored research
5. Consulting
6. Joint entrepreneurial activity
7. Industrial Affiliates programs
8. Industrial research partnerships
9. Bridging institutions, e.g., Sematech, the Industrial Technology Institute

University Enterprise Zones

As I noted earlier, the University of Michigan is now ranked as the leading research university in the nation—indeed, in the world—at least as measured by R&D expenditures. Hence, in Ann Arbor we clearly have the source of fundamental knowledge necessary to act as a powerful job creation engine.

Let me suggest a more strategic approach to take advantage of this extraordinary resource. Suppose we respond to this challenge, at least in a conceptual way, by attempting to build a **University Enterprise Zone** in Ann Arbor where we would do everything possible to stimulate knowledge transfer and convert it into forms that benefit society—new companies, new jobs, new prosperity. We would form a partnership involving the University; local, state, and federal government; business and industry; organized labor; and our financial institutions. All would commit themselves to adopting the best practices learned from other successful areas across the nation or around the world, from Portland to Austin to Route 128, from Hong Kong to Cambridge to Stuttgart.

We might think of the University Enterprise Zone as a type of free trade zone, free of excessive regulations, antiquated tax systems, adversarial labor-management relations. In this zone, strategic alliances would be formed through commitments from higher education, state and local government, organized labor, the business community, and the financial community.

For example, the University of Michigan would commit itself to:

- attracting key thought-leaders and entrepreneurs to Ann Arbor
- making strategic investments in key intellectual areas
- building knowledgeable advisory boards of experts from around the world
- expanding its already successful efforts to secure more R&D funding from Washington and industry
- attracting the “venture capital” necessary for knowledge generation
- overhauling its knowledge transfer activities
- forming strategic alliances with other institutions
- creating more of a risk-taking, entrepreneurial culture among its faculty, staff, and students

State government would, in turn:

- make the strategic investments in both the operating budget and capital facilities necessary to sustain a world-class university
- assist with key university-industry partnerships
- protect start-up companies within the enterprise zone from excessive regulation and burdensome taxes

Local governments would:

- take a long-term, strategic view toward planning and economic development
- work on developing more cooperative relationships with the private sector
- make the necessary commitments to build a world-class K-12 school system

Private companies would:

- shift from a short-term “what’s in it for me” attitude to a long-term strategic growth stance

- agree to participate with the University and government as partners, rather than using the public sector merely as a source of “deep pockets”

Organized labor would:

- agree to back off a bit
- allow small companies to grow, unfettered from suffocating labor contracts

Financial institutions would:

- adopt a higher-risk, entrepreneurial strategy
- give higher priority to local economic development

In a sense, the concept of a “University Enterprise Zone” is really a challenge to both the public and private sectors, to state and local government to business and labor, and to the University itself. It is a challenge to think and act more strategically. It is a challenge to position Ann Arbor as the economic engine of the midwestern United States.

Can we do it? Certainly!

Will we do it? That’s the real question!

A Caveat: The Threat of Disinvestment

Despite the fact that Governor Engler has recognized the importance of education to Michigan’s future and has protected it from the deep budget cuts experienced by other sectors of state government, higher education in Michigan has nevertheless seen hard times for the past two decades. In particular, the state has been systematically disinvesting during this period in its two major research universities, the University of Michigan and Michigan State University. State appropriations for these institutions today—in real terms—are 20 percent below the 1970s. Indeed,

state appropriations have lagged behind inflation for each of the past six years.

Moreover, because of the insatiable appetite of the massive prison construction program launched in the mid-1980s, today we find our campuses are crumbling because of the state's inability to fund critical infrastructure needs. Michigan's almost total abandonment of its support of capital facilities on campuses during the 1970s and 1980s is almost unique among the states.

The University of Michigan provides a instructive case in point, although the situation at Michigan State University is equally serious. During the 1980s and early 1990s, the University continued to move forward and reached its current position as the nation's leading research university by attracting more R&D support than any other university in 1992. Further, it became the nation's leader in key technologies of great importance to the future of the state, including genetic medicine, computer networking, optics, lasers, and ultra high-speed science.

Yet, during this same period, the University's state support deteriorated to the point where today the state appropriation amounts to less than 12 percent of UM's total operating budget. Further, in sharp contrast to essentially every other public university in the nation, the University has received only token state support for academic facilities, averaging \$3 million per year compared to the \$30 to \$40 million per year provided to peer institutions in states such as California, Wisconsin, Illinois, and Ohio. Indeed, key facilities capable of great impact on the state's future such as the Integrated Technology Instructional Center—the nerve center for the University's information technology activities—have been deferred for years because of a state impasse in capital outlay. Michigan State University faces a similar crisis, with key projects in agricultural sciences blocked for years.

Once again the same dilemma is painfully apparent: Michigan as a state has had great difficulty in achieving either an understanding or a willingness to invest in its future! Most states would give anything to build world-class research universities of the quality of MSU and UM. Yet, our state, for almost two decades, has ignored the needs of these marvelous institutions, forcing them to evolve from "state-supported" to "state-assisted" to "state-related" and perhaps eventually just to "state-located" institutions. This is a great tragedy and clearly reveals the bankruptcy of public policy over the past two decades, not to mention the tyranny of pork-barrel politics.

Fortunately, today there are strong signs that both the Governor and the Legislature have recognized the importance of investments in education and research in an increasingly knowledge-intensive world economy. There is hope that the gridlock in Lansing will soon be broken, and university capital projects of critical importance to the future of the state will begin to move forward.

The Future of Michigan

As we scramble to deal with the daily reality of continuing fiscal crisis, it is easy for all of us to lose sight of the larger forces at work here in Michigan and across America. It is easy, too, to look for scapegoats—to blame Democrats or Republicans, the Japanese or the Germans, for the problems of our economy and society. But that would not only be wrong. It would also divert us from the real challenges.

Michigan's problems are not partisan. Nor are they political. Our problems cannot be laid at foreign doors. Michigan's problems are **structural**. Our political and economic system cannot produce the revenues needed to meet the demands placed upon it. As a result of this fundamental structural inadequacy, we are being forced to meet our urgent current needs, to protect invaluable resources such as our schools, to balance our current budget, by shifting burdens to

future budgets, where they will become even more painful.

We are held hostage by our outdated tax and regulatory policies and a disturbing lack of understanding of what knowledge can do in creating economic growth. In this state, we simply are not increasing our base of knowledge quickly enough nor are we investing adequately in funding knowledge creation.

But there is something else. Like much of American industry, state government has become too large and bureaucratic, no longer responsible to its citizens. In his first years as Governor, John Engler took the very difficult and painful steps to begin to turn that around. Nobody likes to do it, but it had to be done if we are to thrive again as a state. In this effort, Governor Engler and his colleagues in Lansing have cut away much of the undergrowth that was clogging government and the economy. While it has been painful, over the last two years Michigan has indeed been unique among the states in its capacity to eliminate a massive funding deficit while holding the line on taxes, downsizing unnecessary government, and protecting education as its highest priority.

But now it is time to build once again. Michigan must augment cutbacks with a strategy for making critical investments aimed at creating new knowledge, new industry, and new jobs. This dual strategy is essential if we are to make the transition to prosperity in the next century.

As I noted at the outset, it is now painfully apparent that our state is in the midst of a profound transition. We are leaving behind our industrial economy, once prosperous due to an abundance of natural resources, unskilled labor, and—to some degree—constrained, slowly moving domestic markets. Our future will be quite different: Michigan must compete in a knowledge-based economy, characterized by intensely competitive world markets, rapid technological change, and—most important of all—its depen-

dence upon educated people and their ideas. This has not been—and this will not be—an easy transition to make. We face another five to ten years of low economic growth as we make the transition to a knowledge economy.

The truth is that the outcome is still very much in doubt. Times are going to be much worse before they improve. Will we emerge from this transition, this time of trial, as a world economic leader once again, with a strong, prosperous—albeit new—economy producing jobs and improving our quality of life? Or will we fail to heed the warnings, fail to make the necessary investments and sacrifices today necessary for strength and prosperity tomorrow, and instead become an economic backwater in the century ahead?

We have to roll up our sleeves and try new things, open our minds to new possibilities, try to understand what businesses need to grow, and take advantage of some of our greatest assets, such as the University of Michigan and Michigan State University. We must work together on a radical plan for our future. We must try to do what hasn't been done before, blaze new trails, encourage new industry to replace the old, and encourage individual initiative in the best American tradition. It is time to become a lean, mean, economic machine. That is what needs to happen. That must happen.

There is an old saying in politics: "Democracies always do the right thing . . . after they have tried everything else."

Well, I think that's where we find ourselves today.

We have tried everything else.

Now the time has come to do the right thing.

It's up to us.

