The Michigan Roadmap *Redux*

A Call for Leadership

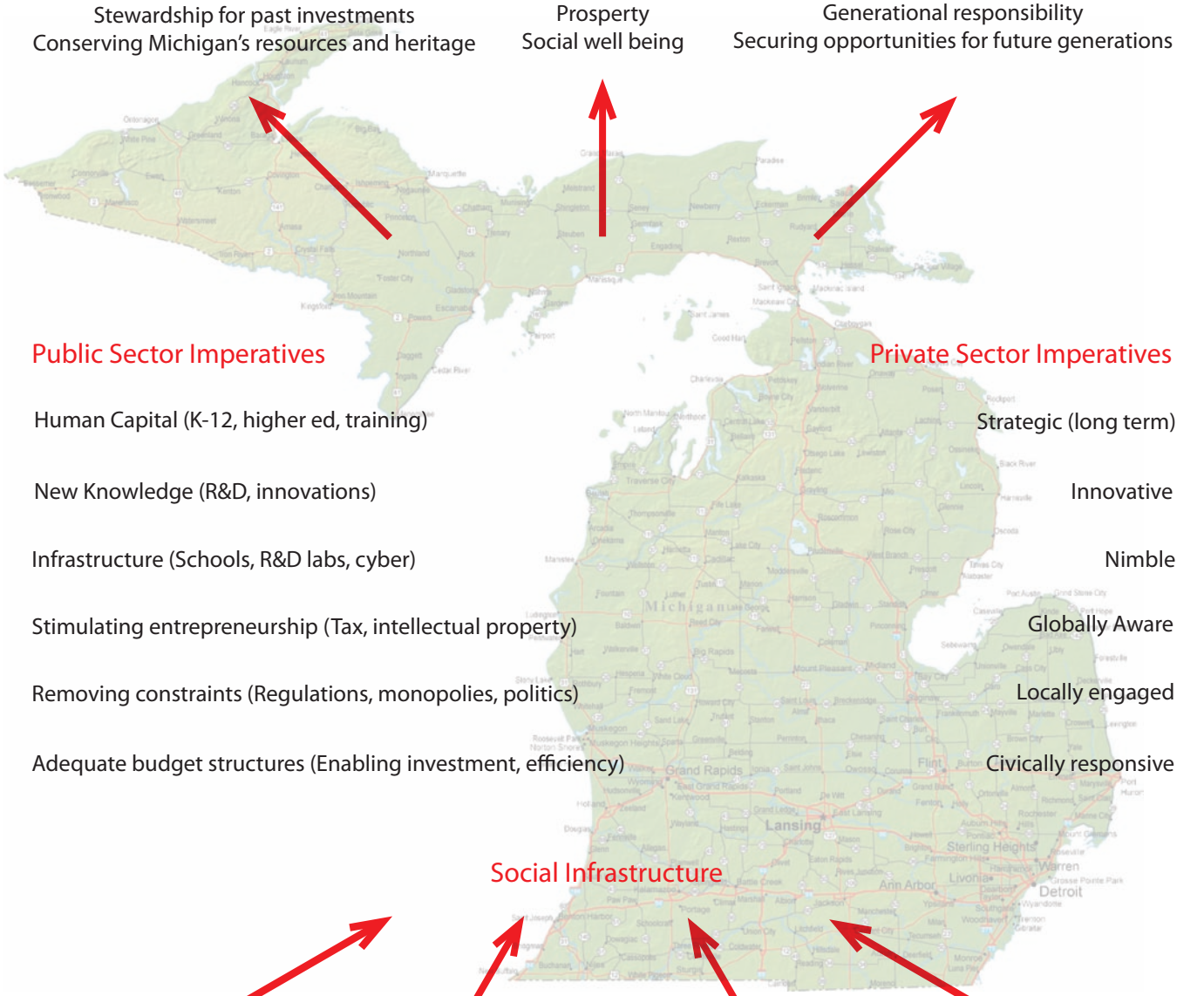
Executive Summary

The Millennium Project
The University of Michigan
Spring, 2008

Honoring Yesterday
Stewardship for past investments
Conserving Michigan's resources and heritage

Serving Today
Prosperity
Social well being

Investing for Tomorrow
Generational responsibility
Securing opportunities for future generations



Public Sector Imperatives

- Human Capital (K-12, higher ed, training)
- New Knowledge (R&D, innovations)
- Infrastructure (Schools, R&D labs, cyber)
- Stimulating entrepreneurship (Tax, intellectual property)
- Removing constraints (Regulations, monopolies, politics)
- Adequate budget structures (Enabling investment, efficiency)

Private Sector Imperatives

- Strategic (long term)
- Innovative
- Nimble
- Globally Aware
- Locally engaged
- Civically responsive

Social Infrastructure

Citizens	Families	Communities	States
Diversity	Schools	Public Health	Social Justice	Equity

The Millennium Project
The University of Michigan
2001 Duderstadt Center
2281 Bonisteel Boulevard
Ann Arbor, MI 48109-2094

For pdf downloads of this summary and the full Michigan Roadmap *Redux* report:

http://milproj.dc.umich.edu

Preface to the Michigan Roadmap, Redux

Over the past several years an increasing number of thoughtful and compelling studies and reports have appeared concerning the future of the State of Michigan, including an earlier version of this Michigan Roadmap report. While emerging from many different perspectives and sectors of our society, these studies have largely converged in recommending a series of actions that leaders of government, business, labor, and education must take if Michigan is to prosper once again in an intensively competitive, knowledge-driven, global economy. [In this regard, see Austin (2005), Bartik (2006), Clay (2007), Drake (2006), Glazer (2007), Hollins (2006), Ivacko (2007), Michigan Emergency Financial Advisory Panel (2007), Cherry (2004), Power (2006, 2007), Public Sector Consultants (2003), and Slemrod (2006).] Many of these reports not only identify the challenges facing our state today, but they have offered hope through their compelling visions for the future of our state. They have proposed actions for leaders of Michigan government, industry, and labor that could restore our economic strength and prosperity while sustaining the social and civil infrastructure so necessary to the welfare of our citizens. Their analyses draw on Michigan's remarkable history by demanding adequate investments in its people, their education, and their capacity to complete in an increasingly competitive global economy. If Michigan were to add to its considerable natural assets–the world's largest supply of fresh water, the nation's longest shoreline, and perhaps even eventually (with global warming) a mild climate–a diverse and educated population of world-class quality, it could once again achieve the global economic leadership and quality of life that characterized our state during the past century.

Yet these visions for Michigan's future, supported by such carefully considered and compelling studies and embraced by a growing number of citizens, have failed to stimulate the actions necessary to address the challenges facing our state. Little progress has been made in addressing the challenges facing Michigan. The state's public leaders remain moored to obsolete political philosophies and distracted by largely irrelevant issues, failing miserably in their responsibilities to work together to address the key issues of restructuring Michigan's government and tax system to enable the necessary investments in our future. Similarly too many leaders of Michigan business and industry continue to focus myopically on the near term, resisting the strategic changes necessary to allow their companies to thrive–or perhaps even survive–for the longer term in a hypercompetitive global, knowledge-driven economy.

By almost any measure, over the past several years Michigan has fallen even further behind other states–not to mention other nations–economically, socially, and culturally. Michigan currently ranks:

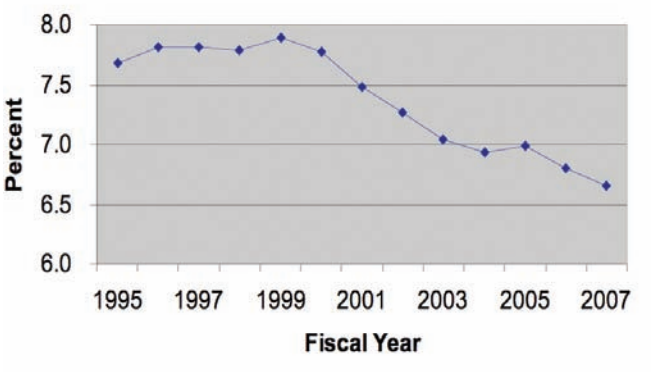
- 50th in the nation in personal income growth
- 50th in unemployment rate
- 50th in employment growth (in fact, as the only state with a decline)
- 50th in the index of economic momentum (e.g., population, personal income, and employment)
- 50th in the change of its support for higher education over the past six years
- 46th in the return of federal tax dollars

The impact of the global economy on Michigan

Moreover Detroit has now become the nation's poorest city. Several of our leading corporations face possible bankruptcy. And lest you think Ann Arbor is an oasis, immune from the challenges of the flattening world, in 2007 we learned that its largest private employer, the huge Pfizer R&D laboratory (the place that invented Lipitor, perhaps the most profitable drug of the past decade) would be eliminated, taking 2,100 high-paying jobs with it. Michigan does lead in some areas: incarceration rates and prison costs, health and retirement benefits for both public and industrial employees, mortality rates from smoking (not surprising since the Legislature continues to allow the tobacco lobby to block efforts to ban smoking in public places, putting Michigan far behind other states and nations in this public health epidemic).

The list goes on and on, providing even more testimony to the bankruptcy of our state government–both literally in its finances and figuratively in its leadership. Indeed, partisan bickering and confrontational politics brought Michigan to the brink last fall as our elected representatives in Lansing came within hours of closing down state government because of their inability to agree on the tax increases and expenditure cuts necessary to balance the state's budget. This sorry situation was condemned by the headlines across the state: "Foolish politics ruins state. Welcome to the banana republic of Michigan. There have to be cuts. There must be a tax increase. And reforms have got to begin to take hold in the next 12 months to prevent this all from happening again" (Detroit Free Press, September, 2007). "Step up, lawmaker. Step up, governor. Step up, Democrats and Republicans, and deliver a budget that works for Michigan. Plunging the state into the chaos of a shutdown while you engage in name-calling and blame-gaming is unacceptable. We've all had a bellyful of inaction" (Detroit News, September, 2007). "No anecdotes capture the astonishing combination of incompetence, isolation, irresponsibility, and rank partisanship that have characterized our political system in Lansing over the past several weeks" (Power, September, 2007).

Many of Michigan's problems arise from the fact that the state has slipped far below the national average–and the Great Lakes region–in many measures critical to prosperity and social well-being in a global, knowledge-driven society:



State taxes as a percentage of personal income:
Michigan's obsession with tax cuts over the past decade has crippled the state's capacity for investment in the future

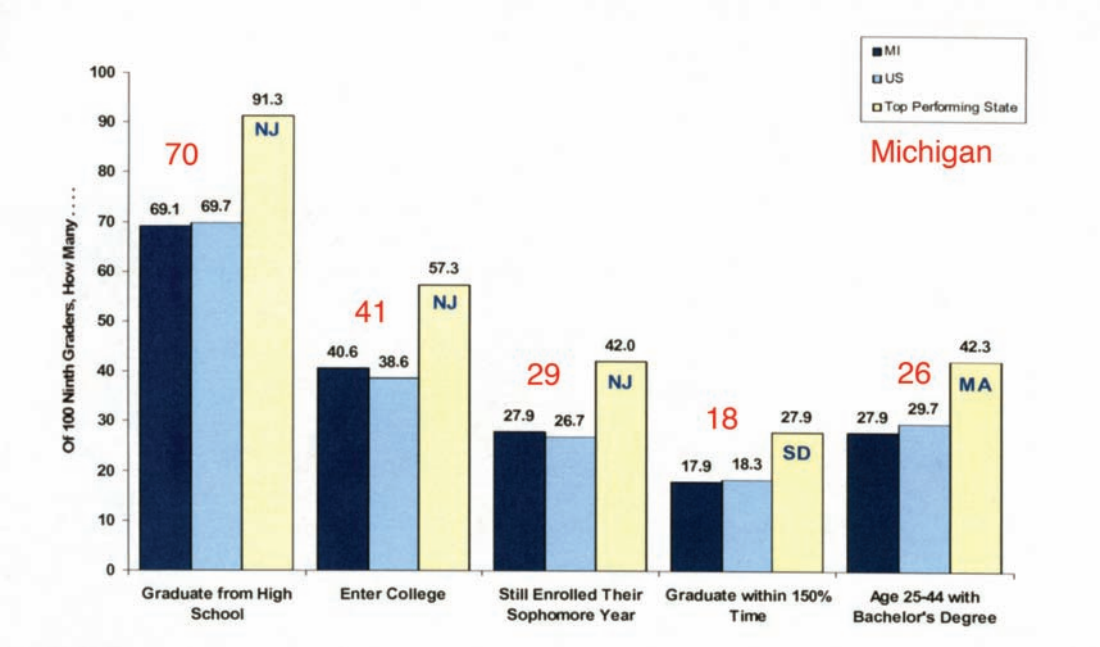
- Michigan's tax burden and revenues have fallen below the national average and considerably below those characterizing states competitive in the new economy (e.g., the West Coast and New England). Michigan's current tax system is obsolete, regressive, inequitable, and totally inadequate to generate the resources necessary to invest in the state's future.
- The costs born by public agencies and private industry are much higher than in most other states, largely because of the legacy costs associated with excessively expensive health care and retirement benefits that have led to an entitlement culture, seriously misaligned with a hypercompetitive global marketplace.
- Public and private investments in assets critical to competitiveness in the global economy–e.g., higher education, civil infrastructure, cyberinfrastructure–have dropped far below the national average and lowest among the Great Lakes states.
- State government continues to be burdened by structural constraints, including overly restrictive term limits for public officials, a state constitution that is far too easy to manipulate by special interest groups and outside forces, and obsolete policies in key areas such as incarceration, redundant regional and municipal governance, maintaining critical infrastructure, and many other areas that drive up the costs and drive down the efficiency and quality of public services.
- Ill-informed voter referenda and questionable ju-

dicial decisions have reversed Michigan's long history of tolerance, equal opportunity, and social justice, at a time when both the state and the nation are becoming increasingly diverse.

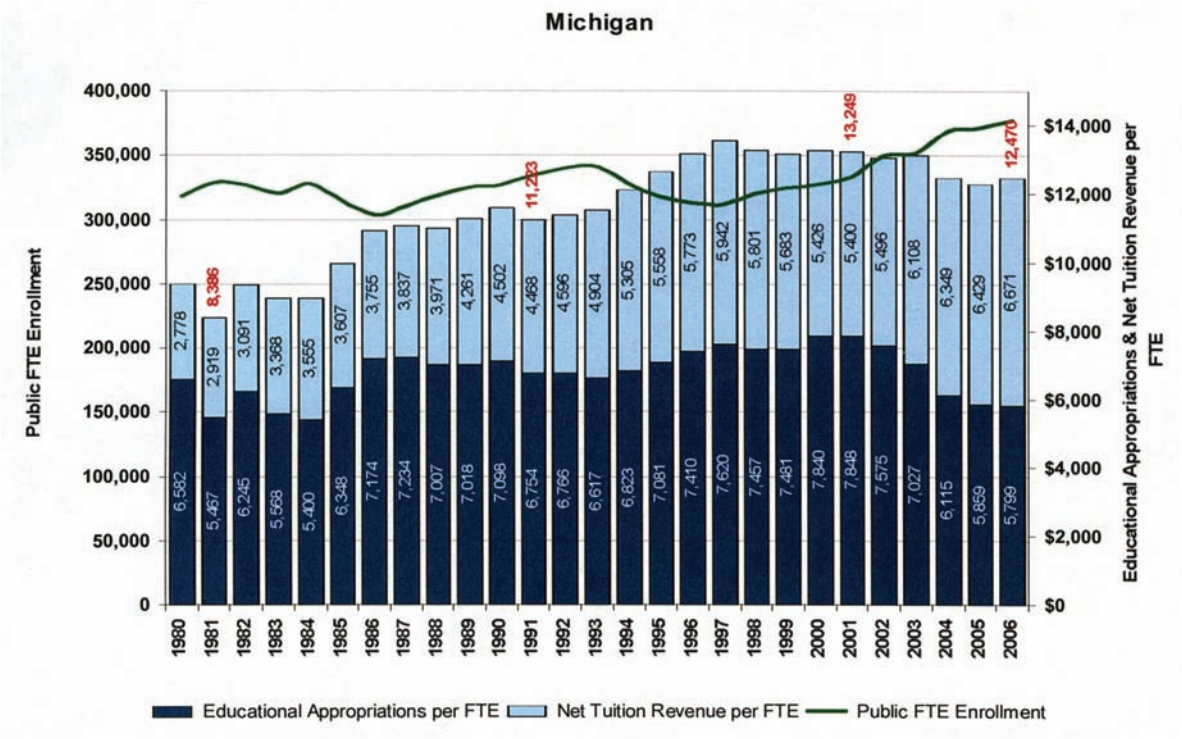
- The Michigan Congressional delegation continues to be woefully inadequate in attracting federal resources to the state, currently ranked 46th in the nation in return of federal tax dollars.
- Despite the economic trauma experienced by the state, public awareness of the actions that need to be taken (higher, broader, and more progressive taxes; lower labor benefit costs; greater investment in human capital and knowledge resources) is still inadequate, more looking backwards to past entitlements than forward to future challenges and opportunities.

Today Michigan is rapidly becoming not only the poster child but perhaps even the basket case for the global knowledge economy. And what are state leaders doing about it?

- State government remains an absolute disaster, paralyzed into rigor mortis by obsolete agendas and fueled by self-serving actions stimulated more by the personal goals of political power–and perhaps even survival in the face of term limits–as many elected public officials seem more concerned with their political careers than their public responsibilities.
- Leaders of Michigan business, industry, and labor still suffer from a not-on-my-watch syndrome, myopically fixated on short-term agendas, defending obsolete products and cost structures, and inadequately investing in the future as their executives seem more concerned with personal wealth accumulation and retirement than the long term success–indeed survival–of their companies.
- Much of the state's media is still largely tone-deaf, unable (or perhaps unwilling) to set aside narrow political agendas (e.g., tax policy) to sound the alarm as the state continues to sink further into economic collapse, with many publishers and editors more driven by obsolete political philosophies than civic responsibility.
- And as recent surveys suggest, the public remains largely uninformed, still hoping for the return of a world long since vanished and subject to manipulation by political demagogues with all too many Michigan families more committed to spending on personal desires rather than investing in opportunities for their offspring.



The Michigan education pipeline: Of 100 students entering high school, only 70 will graduate, while 41 will enter college, and only 18 will graduate within six years of admission.



Despite the tuition increases driven by declining state support, Michigan's public universities still have had to cope with an erosion in the resouces available to their education programs.

The grades are in. All of us, whether in government, business, labor, education, or as citizens, have failed miserably to turn things around. And our children will bear the brunt of our failures.

While public apathy (sometimes driven by despair), political pandering (perhaps driven by term limits), and corporate myopia (likely driven by greed) are all contributors to inaction, in the end it all boils down to an appalling absence of leadership characterizing our state at all levels and in all sectors–state and local government, business and industry, labor, education, and nonprofit foundations.

As Michigan citizens it is our right and our responsibility to state clearly what we expect, deserve, and demand from our leaders in both the public and private sectors. But beyond calling once again for enlightened, courageous, and committed leadership, it is time to go further and ask those in leadership positions either unwilling or unable to address Michigan's challenges to step aside and let others take the wheel. To continue to tolerate and perpetuate the current leadership vacuum is to dishonor the sacrifices of past generations and condemn the future for our descendants.

So, where to begin? Since the absence of leadership is at the crux of the state's challenges, perhaps the most direct approach is simply to demand a change at the helm, replacing those state leaders in both the public and private sector who have failed so miserably to turn things around. The most Draconian approach would be to launch a series of well-funded grass-roots petition drives aimed at recalling key leaders of state government who have failed to deliver (or blocked through political maneuvers) the changes necessary to allow adequate investment in Michigan's future, such as tax restructuring (e.g., broadening taxes to reflect the state's growing services economy, shifting to more progressive tax policies, and increasing tax levels sufficiently to support both needed serves and investment in the future), costs (employee benefits and incarceration rates), and key investments in the state's knowledge infrastructure (schools, universities, cyberinfrastructure). Perhaps we should go further and challenge the re-election of those members of the Michigan Congressional delegation who utilize their political influence to defend obsolete federal policies (e.g., emissions controls and fuel economy) rather that attracting badly needed federal pro-

grams and dollars back to our state. We should demand through shareholder actions the management changes in Michigan-based companies necessary to create globally competitive businesses with strong loyalty and civic responsibility to Michigan. Yet, while one could make a very strong case that most of these leaders have had their chance and have clearly failed, it is not obvious that replacing Michigan's leadership through the current political systems and corporate practices would yield anything better.

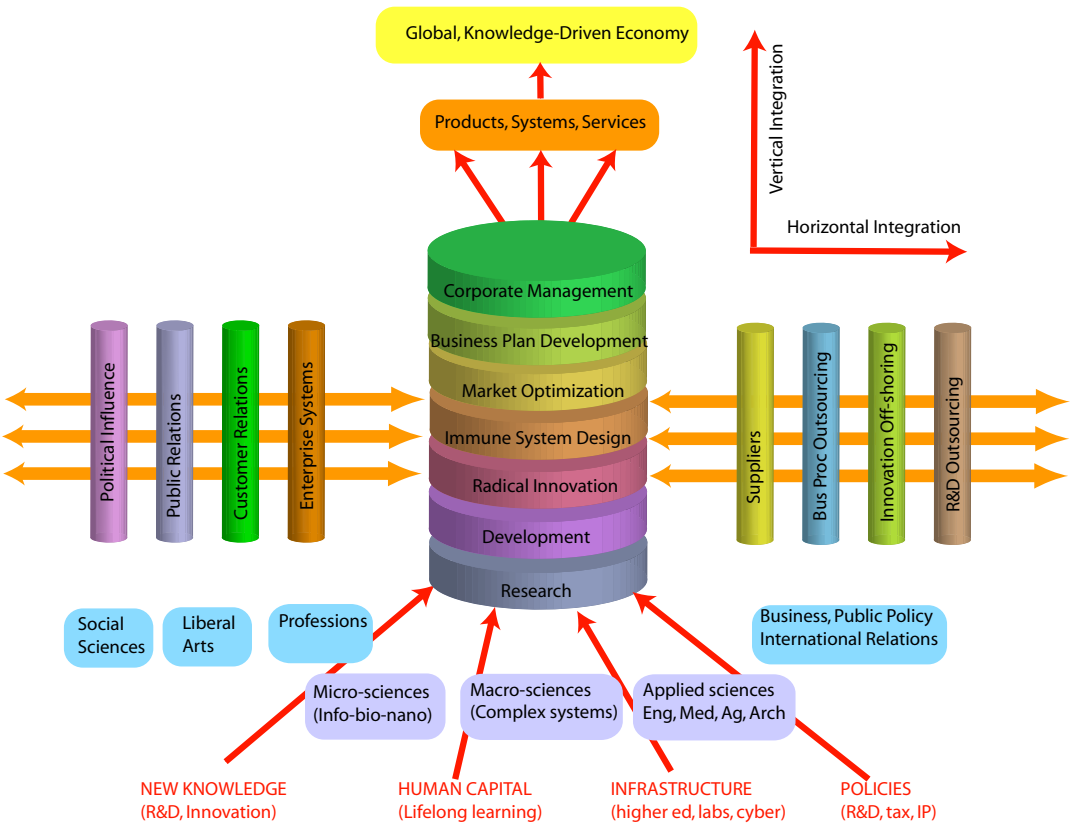
A more constructive approach might be to simply strive to return Michigan to national and regional averages in key characteristics under our direct control:

1. Tax levels (and characteristics such as breadth, balance, and progressiveness)
2. Legacy costs (such as employee benefits and incarceration rates)
3. Investment in key knowledge resources such as higher education
4. Public policies such as term limits and the ease with which special interests and outsiders can amend the state constitution
5. Return of federal tax dollars to the state through federal programs and grants

In fact one might simply accept as the target for all of these parameters a regional average of the Great Lakes states. While this may not seem like an overly ambitious first step–since, after all, nobody really should strive to be merely average–it has nevertheless been a step that our current representatives in Lansing and Washington have been unable to achieve.

Similar objectives could be set for Michigan business and industry:

1. To restructure legacy costs (e.g., health care and retirement benefits) to globally competitive levels.
2. To break the dominance of big companies, big labor, and big lobbyists that tend to manipulate public policy, regulatory policy, and financial markets to choke off entrepreneurial activities key to the new economy (e.g., break the stranglehold of the big and old over the small and new).



The way the world works today!

3. To resist the efforts of monopolies in key areas such as telecommunications and energy to stifle competition and innovation.
4. To allow both the global marketplace and the Schumpeter process of creative destruction to work.
5. While seeking global competitiveness, to also accept civic responsibility for local and regional welfare, understanding that this is key to attracting and retaining talented employees.
6. To actively support through public and political influence the long term investments necessary for prosperity in the knowledge economy (e.g., higher education, R&D, cyberinfrastructure).

Yet, once again, these strategies, so obvious to companies that tend to thrive in the global, knowledge economy, seem a particular challenge to much of Michigan's current business sector.

Hence, we prefer a bolder approach, similar to that taken in the *Michigan Roadmap* effort of 2005. It is time to sound once again the alarm, to face up to the imperatives of our times, and to recommend a clear and compelling vision for the future of our state. In this document we suggest a vision for Michigan's future that involves a series of stretch goals–a *strategic intent*–that simply can not be accomplished by clinging to the status quo. To achieve this, we provide through the *Michigan Roadmap, Redux* a suite of actions capable of guiding our state toward this future.

This brief document provides the executive summary of the Michigan Roadmap Redux. To receive a copy of the full report, contact the Millennium Project at:

The Millennium Project
The University of Michigan
2001 Duderstadt Center
2281 Bonisteel Boulevard
Ann Arbor, MI 48109-2094
734-647-7300

or download the pdf file at:

http://milproj.dc.umich.edu/roadmap/

The key question before Michigan: Are today's citizens and their leaders willing to invest in the education and knowledge resources necessary to secure a prosperous and secure future for tomorrow's generations?

Executive Summary

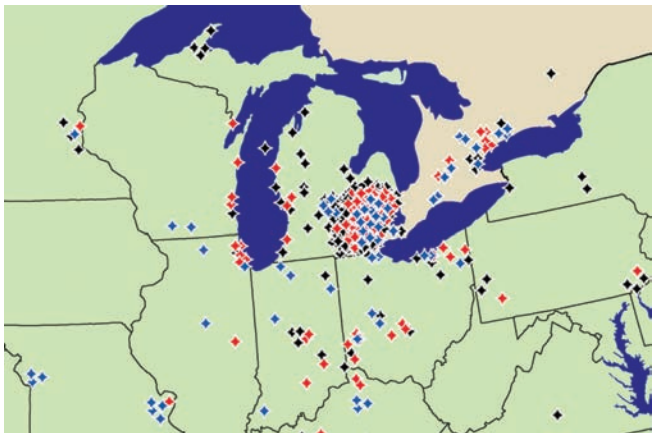
Throughout the 20th century both America and Michigan have been leaders in the world economy. The democratic values and free-market practices of the United States, coupled with institutional structures such as stable capital markets, strong intellectual property protection, flexible labor laws, and open trade policies, positioned our nation well for both economic prosperity and security. With a highly diverse population, continually renewed and re-energized by wave after wave of immigrants, America became the source of the technology and innovation that shaped the 20th-century global economy.

So, too, Michigan's history as a frontier state gave it a priceless legacy of pioneering spirit, gritty courage, and self-reliance. Vast natural resources provided the opportunities for prosperous agriculture, lumbering, and mining industries. Our ancestors made our farms and our factories the best in the world. Yet from the beginning Michigan believed in its people and invested heavily in their education and training, embracing the spirit of the Northwest Ordinance, which stated: "Religion, morality, and knowledge being necessary to good government and the happiness of mankind, schools and the means of education shall forever be encouraged."

There was broad recognition that Michigan's most valuable resources were its people. Hence investment in the knowledge, skills, and abilities of its people was seen as key to Michigan's competitive edge in achieving global leadership in innovation, productivity, and trade. Michigan built a great education system of schools, colleges, and universities aimed at serving all of its citizens. It created and supported a social and civil infrastructure that was the envy of the nation. Michigan companies invested heavily in R&D and technological innovation, working closely with the state's universities. The leaders of our state understood well the importance of investing heavily with both public tax dollars and private capital in those areas key to prosperity in an industrial economy. State leaders demonstrated a remarkable capacity to look to the future and a willingness to take the actions and make the investments that would yield prosperity and well-being for future generations. And the payoff was enormous, as Michigan led the world in productivity and prosperity. It rapidly became the engine driving the nation's economy. During the last century it was Michigan that first put the world on wheels and then became the arsenal of democracy to defend freedom during two world wars.

But that was yesterday. What about Michigan today? Ironically, as never before, the prosperity and social well-being of our state today is determined by the skills, knowledge, and talents of our people. In the global, knowledge-driven economy, educated human capital the key. Yet here, the vital signs characterizing Michigan today are disturbing indeed. The spirit of public and private investment for the future appears to have vanished in our state. In recent decades, failed public policies and inadequate investment have threatened the extraordinary educational resources built through the vision and sacrifices of past generations. Michigan business and industry have reduced very significantly their level of basic and applied research and now focus their efforts primarily on product development based on available technologies rather than exploring innovative breakthroughs. Ironically, at a time when the rest of the world has recognized that investing in education and knowledge creation is the key to not only prosperity but, indeed, to survival, too many of Michigan's citizens and leaders, in both the public and private sector, have come to view such investments as a low priority, expendable during hard times. The aging baby boomer population that now dominates public policy in our state demands instead generous retirement benefits, expensive health care, ever more prisons, and reduced tax burdens, rather than demanding that Michigan begin investing once again in education, innovation, and the future.

This neglect of adequate investment in human capital and knowledge infrastructure could not have happened at a worse time. As we enter a new century, Michigan's old industrial economy is dying, slowly but surely, putting at risk the welfare of millions of citizens



Michigan today: Still dependent on a factory economy as illustrated by automotive plant locations. (MDLEG)

in our state in the face of withering competition from an emerging global knowledge economy. For many years now we have seen our low-skill, high-pay factory jobs increasingly downsized, outsourced, and offshored, only to be replaced by low-skill, low-pay service jobs–or in too many cases, no jobs at all and instead the unemployment lines. Michigan's inability to adapt to a rapidly changing world is reflected by the fact that today our state ranks 50th in the nation in almost every economic indicator–employment, job creation, growth in personal income, economic momentum, and return of federal tax dollars.

Preoccupied with obsolete and irrelevant political battles, addicted to entitlements, manipulated by lobbyists and special interest groups, and assuming what worked before will work again, Michigan today is sailing blindly into a profoundly different future. Today's policies embraced by state leaders are increasingly incompatible with the realities of the emerging global economy. Our current tax system is not only regressive and inequitable, but it is both structurally and strategically misaligned with the character of Michigan's increasingly knowledge-driven economy, unable to generate the revenues to sustain the necessary investments in our knowledge, social, and civic infrastructure. The legacy costs of obsolete and excessively burdensome retirement and health care benefits threaten to bankrupt both government and industry. Obsolete sentencing policies have burdened us with incarceration rates and prison costs that lead the nation. Our investment in key knowledge resources such as higher education has dropped to last in the nation. We have allowed external groups to persuade voters to cripple Michigan's efforts to secure equal opportunity and social inclusion for an increasingly diverse population. And special interest groups continue to block legislative efforts to bring Michigan in line with other states and nations on critical public health measures such as smoking and environmental protection.

Thus far our state has been in denial, assuming our low-skill workforce would remain competitive and our factory-based manufacturing economy would eventually be prosperous once again. Yet that 20th-century economy will not return. Michigan is at great risk, since by the time we come to realize the permanence of this economic transformation, the out-sourcing/off-shoring train may have left town, taking with it both our low-skill manufacturing jobs and many of our higher-paying service jobs.

Michigan is certainly not alone in facing this new economic reality. Yet as we look about, we see other states, not to mention other nations, investing heavily and restructuring their economies to create high-skill, high-pay jobs in knowledge-intensive areas such as new technologies, financial services, trade, and professional and technical services. From California to North Carolina, Bangalore to Shanghai, there is a growing recognition throughout the world that economic prosperity and social well-being in a global knowledge-driven economy require public and private investment in knowledge resources. That is, regions must create and sustain a highly educated and innovative workforce, supported through policies and investments in cutting-edge technology, a knowledge infrastructure, and human capital development.

However, history has also shown that significant investment is necessary to produce the essential ingredients for innovation to flourish: new knowledge (research), human capital (education), infrastructure (facilities, laboratories, communications networks), and policies (tax, intellectual property). Other nations are beginning to reap the benefits of such investments aimed at stimulating and exploiting technological innovation, creating serious competitive challenges to American industry and business both in the conventional marketplace (e.g., Toyota) and through new paradigms such as the off-shoring of knowledge-intensive services

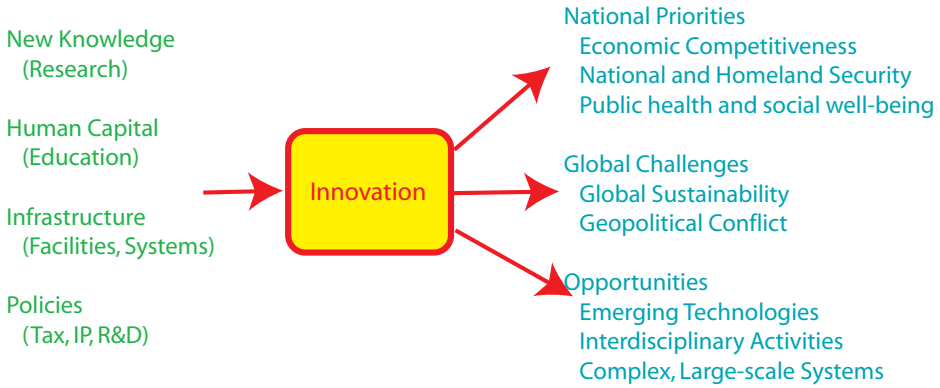
(e.g., Bangalore, Shanghai). Yet again, at a time when our competitors are investing heavily in stimulating the technological innovation to secure future economic prosperity, Michigan is missing in action, significantly under-investing its economic and political resources in planting and nurturing the seeds of innovation.

Adequately supporting education and technological innovation is not just something we would like to do; it is something we simply have to do. What is really at stake here is building Michigan's regional advantage, allowing it to compete for prosperity, for quality of life, in an increasingly competitive world. In a knowledge-intensive society, regional advantage is not achieved through gimmicks such as lotteries and casinos. It is achieved through creating a highly educated and skilled workforce. It requires an environment that stimulates creativity, innovation, and entrepreneurial behavior. Specifically, it requires investment in the ingredients of innovation–educated people and new knowledge. Put another way, it requires strategic vision, enlightened policies, and sustained investment to create a knowledge society that will be competitive in a global economy.

To this end, this study has applied the planning technique of *strategic roadmapping* to provide a framework for the issues that Michigan must face and to suggest the commitments that we must make, both as individuals, as institutions, and as a state, to achieve prosperity and social well-being in a global knowledge economy. The roadmapping process was originally developed in the electronics industry and is applied frequently to major federal agencies such as the Department of Defense and NASA. Although sometimes cloaked in jargon such as environmental scans, resource maps, and gap analysis, in reality the roadmapping process is quite simple. It begins by asking where we are today, then where we wish to be tomorrow, followed by an assessment of how far we have to go, and finally concludes by developing a roadmap to get from here to there. The roadmap itself usually consists of a series of recommendations, sometimes divided into those that can be accomplished in the near term and those that will require longer-term and sustained effort.

By any measure, the assessment of *Michigan today* is very disturbing. Our state is having great difficulty in making the transition from a manufacturing to a knowledge economy. As we have noted earlier, Michigan has dropped to dead last–50th among the states–in most measures of economic momentum. Our leading city, Detroit, now ranks as the nation's poorest. Furthermore, Michigan leads the nation in population loss, with the out-migration of young people in search of better jobs the fourth most severe among the states; our educational system is underachieving with one-quarter of Michigan adults without a high school diploma and only one-third of high school graduates college-ready. Fewer than one-quarter of Michigan citizens have college degrees. Although Michigan's system of higher education is generally regarded as one of the nation's finest, the erosion of state support over the past two decades and most seriously over the past seven years–with appropriation cuts to public universities now ranked as the most severe in the nation and ranging from 20% to 40%–has not only driven up tuition but put the quality and capacity of our public universities at great risk.

More generally, for many years Michigan has been shifting public funds and private capital away from investing in the future through education, research, and



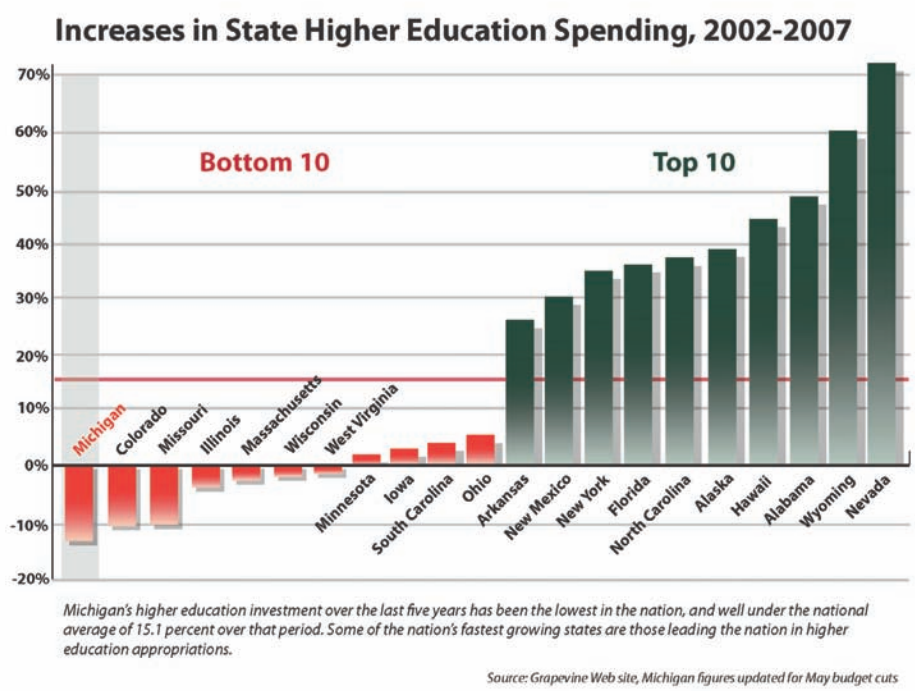
The Keys to Innovation

innovation to fund instead short term priorities such as prisons and excessive employee benefits while enacting tax cuts that have crippled state revenues. And all the while, as the state budget began to sag and eventually collapsed in the face of a weak economy, public leaders were instead preoccupied with fighting the old and increasingly irrelevant cultural and political wars (cities vs. suburbs vs. exurbs, labor vs. management, religious right vs. labor left). In recent years the state's motto has become "Eat dessert first; life is uncertain!" Yet what Michigan has really been consuming is the seed corn for its future.

A vision for *Michigan tomorrow* can best be addressed by asking and answering three key questions:

1. *What skills and knowledge are necessary for individuals to thrive in a 21st-century, global, knowledge-intensive society?* Clearly a college education has become mandatory, probably at the bachelor's level, and for many, at the graduate level. Beyond this goal, the state should commit itself to providing high-quality, cost-effective, and diverse educational opportunities to all of its citizens throughout their lives, since during an era of rapid economic change and market restructuring, the key to employment security has become continual, lifelong education.

2. *What competencies are necessary for a population (workforce) to provide regional advantage in such a competitive knowledge economy?* Here it is important to stress that we no longer are competing only with Ohio, Ontario, and California. More serious is the competition from the massive and increasingly well-educated workforces in emerging economies such as India, China, and the Eastern Bloc. Hence the challenge is no longer to simply focus on the best and brightest, the economic and social elite, as in earlier eras, but instead to recognize that it will be the education, knowledge, and skills of Michigan's entire population that determine our economic prosperity and social well-being in the global economy. We must invest in learning opportunities for all of our citizens throughout their lives. And we must recognize that equal opportunity and social inclusion are no longer simply moral obligations but moreover strategic imperatives if we are to compete in the global economy.



Drastic cuts in state appropriations over the past seven years are crippling the state's public universities.

3. *What level of new knowledge generation (e.g., R&D, innovation, entrepreneurial zeal) is necessary to sustain a 21st-century knowledge economy, and how is this achieved?* Here it is increasingly clear that the key to global competitiveness in regions aspiring to a high standard of living is innovation. And the keys to innovation are new knowledge, human capital, infrastructure, and forward-looking public policies. Not only must a region match investments made by other states and nations in education, R&D, and infrastructure, but it must recognize the inevitability of new innovative, technology-driven industries replacing old obsolete and dying industries as a natural process of "creative destruction" (*a la* Schumpeter) that characterizes a hypercompetitive global economy. Yet it must also provide a safety net for those citizens caught in such economic transformations through inclusive social programs.

So *how far does Michigan have to travel* to achieve a knowledge economy competitive at the global level? What is the gap between Michigan today and Michigan tomorrow? This part of the roadmapping process does not require a rocket scientist. One need only acknowledge the hopelessness in the faces of the unemployed, or the backward glances of young people as they leave our state for better jobs, or the angst of students and parents facing yet another increase in college costs as state government once again cuts appropriations for higher education. Yet this effort must also challenge the inability of Michigan's leaders to address the imperatives of the global economy, while building an awareness among Michigan parents that nothing will matter more to their children's future than their education. To paraphrase Thomas Friedman, "The world is flat! Globalization has collapsed time and distance and raised the notion that someone anywhere on earth can do your job, more cheaply. Can Michigan rise to the challenge on this leveled playing field?"

So, what do we need to do? What is the *roadmap to Michigan's future*? In a knowledge-intensive economy, regional advantage in a highly competitive global marketplace is achieved through creating a highly educated and skilled workforce. It requires an environment that stimulates creativity, innovation, and entrepreneurial behavior. Experience elsewhere has shown that strategic vision, enlightened public policies, and significant public and private investments in high-skilled human capital, research and innovation, and infrastructure are necessary to sustain a knowledge economy.

The Roadmap: The Near Term (...now!...)

In the near term our principal recommendations focus on Michigan's most valuable resources, its people, investing in their education, skills, and creativity, and developing the knowledge infrastructure to enable their innovation and entrepreneurial zeal. Our recommendations are also aimed at providing the state's economic sectors and institutions–including government, industry, and education–with capacity, incentives, and encouragement to become more agile and market-smart.

Human Capital

1. The State of Michigan will set as its goal that all students will graduate from its K-12 system with a high school degree that signifies they are college ready. To this end, all students will be required to pursue a high school curriculum capable of preparing them for participation in post-secondary education and facilitating a seamless transition between high school and college. State government and local communities will provide both the mandate and the resources to achieve these goals.

2. Beyond the necessary investments in K-12 education and the standards set for their quality and performance, raising the level of skills, knowledge, and achievement of the Michigan workforce will require a strong social infrastructure of families and local communities, particularly during times of economic stress. To this end, state government and local government must take action both to re-establish the adequacy of Michigan's social services while engaging in a broad effort of civic education to convince the public of the importance of providing world-class educational opportunities to all of its citizens.

3. Michigan must create clearer pathways among educational levels and institutions while removing barriers to student mobility and promoting new learning paradigms (e.g., distance education, lifelong learning, workplace programs) to accommodate a far more diverse student cohort.

4. Higher education must become significantly more engaged with K-12 education, accepting the challenge of improving the quality of our primary and secondary schools as one of its primary responsibilities and highest priorities with the corresponding commitment of faculty, staff, and financial resources. Each Michigan college and university should be challenged to develop a strategic plan for such engagement, along with measurable performance goals.

5. Michigan must increase very substantially the participation of its citizens in higher education at all levels–community college, baccalaureate, and graduate and professional degree programs. This will require a substantial increase in the funding of higher education from both public and private sources as well as significant changes in public policy. This, in turn, will require a major effort to build adequate public awareness of the importance of higher education to the future of the state and its citizens. It will also likely require a dedicated source of tax revenues to achieve and secure the necessary levels of investment during a period of gridlock in state government, perhaps through a citizen-initiated referendum.

6. To achieve and sustain the quality of and access to educational opportunities, Michigan needs to move into the top quartile of states in its higher education appropriations (on a per student basis) to its public universities. To achieve this objective, state government should set a target of increasing by 30% (beyond inflation) its appropriations to its public colleges and universities over the next five years.

7. The increasing dependence of the knowledge economy on science and technology, coupled with Michigan's relatively low ranking in percentage of graduates with science and engineering degrees, motivates a strong recommendation to state government to place a much higher priority on providing targeted funding for program and facilities support in these areas in state universities, similar to that provided in California, Texas, and many other states. In addition, more effort should be directed toward K-12 to encourage and adequately prepare students for science and engineering studies, including incentives such as forgivable college loan programs in these areas (with forgiveness contingent upon completion of degrees and working for Michigan employers). State government should strongly encourage public universities to recruit science and engineering students from other states and nations, particularly at the graduate level, perhaps even providing incentives such as forgivable loans if they accept employment following graduation with Michigan companies.

8. Colleges and universities should place far greater emphasis on building alliances that will allow them to focus on unique core competencies while joining with other institutions in both the public and private sector to address the broad and diverse needs of society in the face of today's social, economic, and technological challenges. For example, research universities should work closely with regional universities and independent colleges to provide access to cutting-edge knowledge resources and programs.

New Knowledge (R&D, innovation)

9. The quality and capacity of Michigan's learning and knowledge infrastructure will be determined by the leadership of its public research universities in discovering new knowledge, developing innovative applications of those discoveries that can be transferred to society, and educating those capable of working at the frontiers of knowledge and the professions. State government should strongly support the role of these institutions as sources of advanced studies and research by dramatically increasing public support of research infrastructure, analogous to the highly successful Research Excellence Fund of the 1980s. Also key will be enhanced support of the efforts of regional colleges and universities to integrate this new knowledge into academic programs capable of providing lifelong learning opportunities of world-class quality while supporting their surrounding communities in the transition to knowledge economies.

Investing in tomorrow's human capital

10. In response to such reinvestment in the research capacity of Michigan's universities, they, in turn, must become more strategically engaged in both regional and statewide economic development activities. Intellectual property policies should be simplified and standardized; faculty and staff should be encouraged to participate in the startup and spinoff of high-tech business; and universities should be willing to invest some of their own assets (e.g., endowment funds) in state- and region-based venture capital activities. Furthermore, universities and state government should work more closely together to go after major high tech opportunities in both the private and federal sectors (attracting new knowledge-based companies and federally funded R&D centers–FFRDCs).

11. Michigan must also invest additional public and private resources in private-sector initiatives designed to stimulate R&D, innovation, and entrepreneurial activities. Key elements would include reforming state tax policy to encourage new, high-tech business development, securing sufficient venture capital, state participation in cost-sharing for federal research projects, and a far more aggressive and effective effort by the Michigan Congressional delegation to attract major federal research funding to the state.

Boosting investments in cutting edge research such as that conducted in the University Research Corridor

Infrastructure

12. Providing the educational opportunities and new knowledge necessary to compete in a global, knowledge-driven economy requires an advanced infrastructure: educational and research institutions, physical infrastructure such as laboratories and cyberinfrastructure such as broadband networks, and supportive policies in areas such as tax and intellectual property. Michigan must invest heavily to transform the current infrastructure designed for a 20th-century manufacturing economy into that required for a 21st-century knowledge economy. Of particular importance is a commitment by state government to provide adequate annual appropriations for university capital facilities comparable to those of other leading states. It is also important for both state and local government to play a more active role in stimulating the development of pervasive high speed broadband networks, since experience suggests that reliance upon private sector telcom and cable monopolies could well trap Michigan in a cyberinfrastructure backwater relative to other regions (and nations).

Policies

13. As powerful market forces increasingly dominate public policy, Michigan's higher-education strategy should become market-smart, investing more public resources directly in the marketplace through programs such as vouchers, need-based financial aid, and competitive research grants, while enabling public colleges and universities to compete in this market through encouraging greater flexibility and differentiation in pricing, programs, and quality aspirations.

14. Michigan should target its tax dollars more strategically to leverage both federal and private-sector investment in education and R&D. For example, a shift toward higher tuition/need-based financial aid policies in public universities not only leverages greater federal financial aid but also avoids unnecessary subsidy of high-income students. Furthermore greater state investment in university research capacity would leverage greater federal and industrial support of campus-based R&D.

15. Key to achieving the agility necessary to respond to market forces will be a new social contract negotiated between the state government and Michigan's public colleges

and universities, which provides enhanced market agility in return for greater (and more visible) public accountability with respect to quantifiable deliverables such as graduation rates, student socioeconomic diversity, and intellectual property generated through research and transferred into the marketplace.

16. Michigan must recommit itself to the fundamental principles of equal opportunity and social inclusion through the actions of its leaders, the education of its citizens, and the modification of restrictive policies, if it is to enable an increasingly diverse population to compete for prosperity and security in a intensely competitive, diverse, and knowledge-driven global economy.

The Roadmap (longer term...but within a decade)

For the longer term, our vision for the future of higher education is shaped very much by the recognition that we have entered an age of knowledge in a global economy, in which educated people, the knowledge they produce, and the innovation and entrepreneurial skills they possess have become the keys to economic prosperity, social well-being, and national security. Moreover, education, knowledge, innovation, and entrepreneurial skills have also become the primary determinants of one's personal standard of living and quality of life. We believe that democratic societies–including state and federal governments–must accept the responsibility to provide all of their citizens with the educational and training opportunities they need, throughout their lives, whenever, wherever, and however they need it, at high quality and at affordable prices.

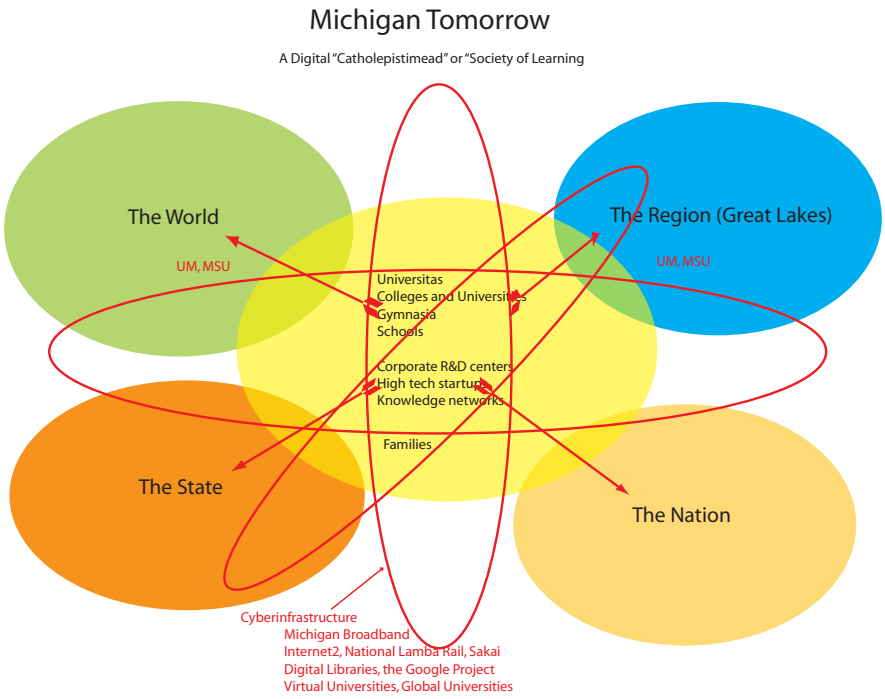
To this end, the long-term roadmap proposes a vision of the future in which Michigan strives to build a knowledge infrastructure–*a society of learning*–capable of adapting and evolving to meet the imperatives of a global, knowledge-driven world. Such a vision is essential to create the new knowledge (research and innovation), a skilled workforce, and the infrastructure necessary for Michigan to compete in the global economy while providing citizens with the lifelong learning opportunities and skills they need to live prosperous and secure lives in our state. As steps toward this vision, we recommend the following actions:

Diverse institutions for diverse students.

1. Michigan needs to develop a more systemic and strategic perspective of its educational, research, and cultural institutions–both public and private, formal and informal–that views these knowledge resources as comprising a knowledge ecology that must be adequately supported and allowed to adapt and evolve rapidly to serve the needs of the state in a change driven world, free from micromanagement by state government or intrusion by partisan politics.

2. Michigan should strive to encourage and sustain a more diverse system of education, since institutions with diverse missions, core competencies, and funding mechanisms are necessary to serve the diverse needs of its citizens, while creating an knowledge infrastructure more resilient to the challenges presented by unpredictable futures. Using a combination of technology and funding policies, efforts should be made to link elements of Michigan's learning, research, and knowledge resources into a market-responsive seamless web, centered on the needs and welfare of its citizens and the prosperity and quality of life in the state rather than the ambitions of institutional and political leaders.

3. Serious consideration should be given to reconfiguring Michigan's educational enterprise by exploring new paradigms based on the best practices of other regions and nations. For example, the current segmentation of learning by age (e.g., primary, secondary, collegiate, graduate-professional, workplace) is increasingly irrelevant in a competitive world that requires lifelong learning to keep pace with the exponential growth in new knowledge. More experimentation



Michigan tomorrow: a society of learning

both in terms of academic programs and institutional types should be encouraged.

4. The quality and capacity of Michigan's learning and knowledge infrastructure will be determined by the leadership of its research universities in discovering new knowledge, developing innovative applications of these discoveries that can be transferred to society, and educating those capable of working at the frontiers of knowledge and the professions. Because of the importance of research and graduate education to the state's future, these universities should be encouraged to give priority to these activities, while undergraduate education remains the primary mission of Michigan's other colleges and universities.

5. Michigan's research universities should explore new models for the transfer of knowledge from the campus into the marketplace, including the utilization of endowment capital (perhaps with state match) to stimulate spinoff and startup activities and exploring entirely new approaches such as "open source – open content paradigms" in which the intellectual property created through research and instruction is placed in the public domain as a "knowledge commons," available without restriction to all, in return for strong public support.

6. While it is natural to confine state policy to state boundaries, in reality such geopolitical boundaries are of no more relevance to public policy than they are to corporate strategies in an ever more integrated and interdependent global society. Hence Michigan's strategies must broaden to include regional, national, and global elements, including the possibility of encouraging the state's two internationally prominent research universities, the University of Michigan and Michigan State University, to join together to create a true world university, capable of assisting the state to access global economic and human capital markets.

7. Michigan should explore bold new models aimed at producing the human capital necessary to compete economically with other regions (states, nations) and provide its citizens with prosperity and security. Lifelong learning will not only become a compelling need of citizens (who are only one paycheck away from the unemployment line in a knowledge-driven economy), but also a major responsibility of the state and its educational resources. One such model might be to develop a 21st-century analog to the G.I. Bill of the post WWII era that would provide–indeed, guarantee–all Michigan citizens with access to abundant, high-quality, diverse learning opportunities throughout their lives, and adapts to their ever-changing needs.

8. Michigan should work closely with other Great Lakes states facing similar challenges and opportunities to develop a regional agenda, both to facilitate cooperation and to influence national priorities.

9. Michigan should develop a leadership coalition–involving leaders from state government, industry, labor, education, and concerned citizens–with vision and courage sufficient to challenge and break the stranglehold of the past on Michigan's future!

Michigan is far more at risk than many other states because its manufacturing-dominated culture is addicted to an entitlement mentality that has long since disappeared in other regions and industrial sectors. Moreover, politicians and the media are both irresponsible and myopic as they continue to fan the flames of the voter hostility to an adequate tax base capable of meeting both today's urgent social needs and longer-term investment imperatives such as education and innovation. As Bill Gates warned, cutting-edge companies no longer make decisions to locate and expand based on tax policies and incentives. Instead they base these decisions on a state's talent pool and culture for innovation–priorities apparently no longer valued by many of Michigan's leaders, at least when facing actions that challenge partisan politics.

To be sure, it is difficult to address issues such as developing a tax system for a 21st-century economy, building world-class schools and colleges, or making the necessary investments for future generations in the face of the determination of the body politic still clinging tenaciously to past beliefs and practices. Yet the realities of a flat world will no longer tolerate procrastination or benign neglect.

It is time for leaders of state government, business, labor, education, and foundations to acknowledge and explain to the public that without the sacrifices we must make today to enable investments for tomorrow, Michigan is well on its way to becoming Mississippi, a backwater filled with the rusting hulls of a obsolete manufacturing economy while other states and nations make the investments to move into the knowledge economy. A civil society does require some degree of sacrifice on the part of all citizens, relative to their capacity and means. To be sure, this might infuriate some–particularly among the affluent who benefit most from this "cut my taxes now; I'll worry about my kids later" mentality, and who will eventually pack off and retire in Florida, taking their tax-cut windfalls with them. It might also lose some votes. But what is the purpose of leadership if all one does is leave behind a legacy of poverty and hopelessness?

Unlike most states, Michigan has no alliance of business, labor, higher education, and public leaders to push for the future of the state. Instead, narrowly focused special-interest groups have captured control of the political parties and public policy process (e.g., labor-left, religious-right, neo-cons). They are running the train off the track, blocking any effective efforts of strategic action. Only the narrowest of political initiatives is able to get any traction (e.g., bans on gay marriages or affirmative action).

It is time that someone sounded the alarm: Michigan is falling apart! It is rapidly losing its ability to compete in the economy of the future. We have only a short time to make the moves that will allow us to stay competitive!

The Michigan Roadmap is intended in part for leaders in the public sector (the Governor, Legislature, and other public officials), the business community (CEOs, labor leaders), higher education leaders, and the nonprofit foundation sector. However, this report is also written for those interested, concerned citizens who have become frustrated with the deafening silence about Michigan's future that characterizes our public, private, and education sectors. The state's leaders, its government, industry, labor, and universities, have simply not been willing to acknowledge that the rest of the world is changing. They have held fast to an economic model that is not much different from the one that grew up around the heyday of the automobile era–an era that passed long ago.

It should be acknowledged that much of the rhetoric used in this report is intentionally provocative–if not occasionally incendiary. But recall here that old saying that sometimes the only way to get a mule to move is to whack it over the head with a 2x4 first to get its attention. The Michigan Roadmap is intended as just such a 2x4 wake-up call to our state. For this effort to have value, we believe it essential to explore openly and honestly where our state is today, where it must

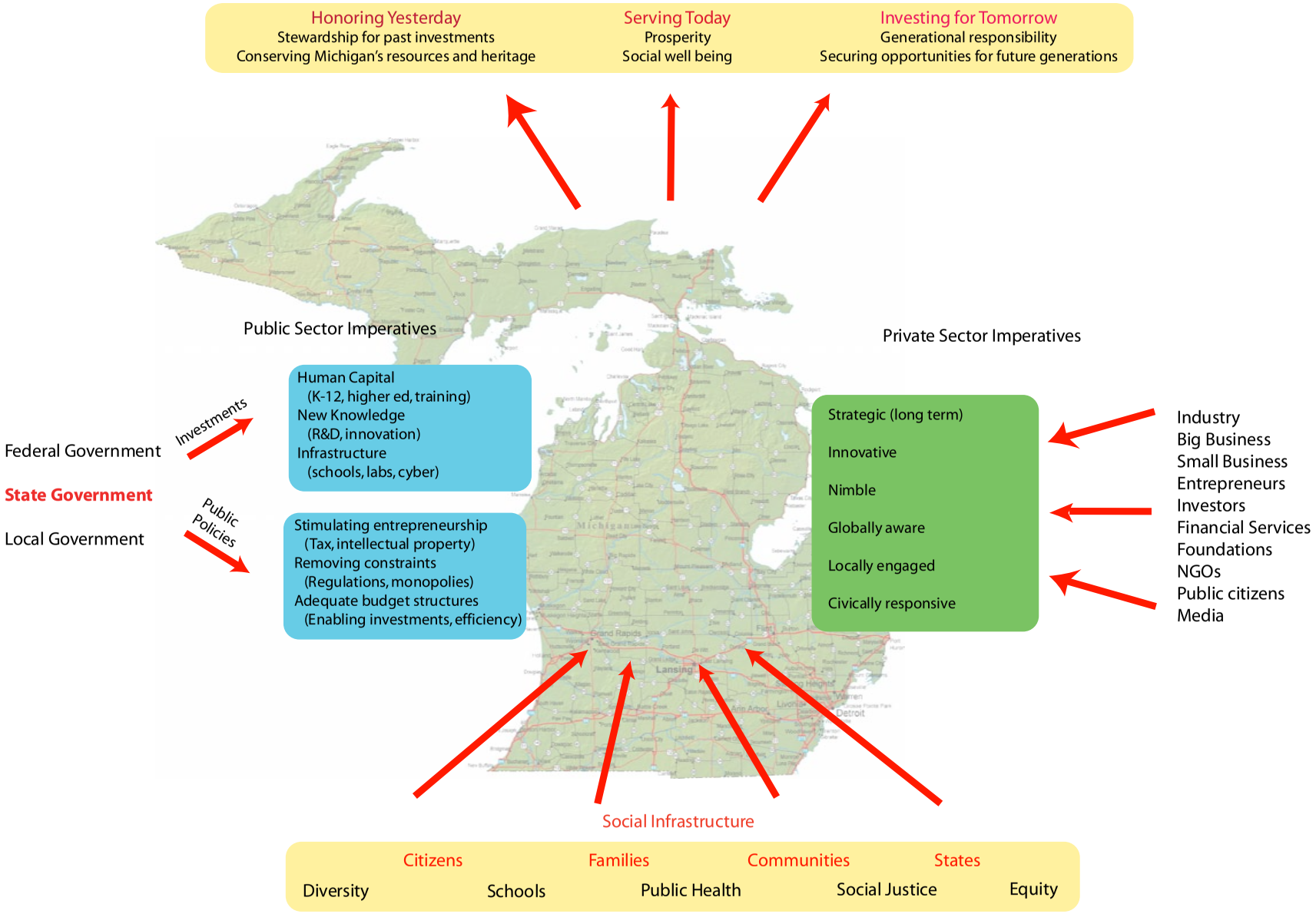
head for tomorrow, and what actions will be necessary to get there. Michigan simply must stop backing into the future and, instead, turn its attention to making the commitments and investments today necessary to allow it to compete for prosperity and social well-being tomorrow in a global, knowledge-driven economy.

Here a second caveat is important. Such roadmaps should be viewed as transient documents, since the Michigan landscape changes over time. As the world continues to change, and as thoughtful and creative people become more engaged in considering our state's challenges and opportunities, new paths to the future will become apparent. Hence it is important for readers to consider this particular effort as both organic and evolutionary. Feedback, criticism, and suggestions are strongly encouraged and these will reshape future versions of the Michigan Roadmap, just as the current Michigan Roadmap Redux was reshaped by the input of many of those who provided feedback on the earlier 2005 document.

What is really at stake today is building Michigan's regional advantage, allowing it to compete for prosperity and quality of life, in an increasingly competitive global economy. In a knowledge-intensive society, regional advantage is not achieved through traditional political devices such as tax cuts for the wealthy, regulatory relief of polluters, entitlements for those without need, or tax-subsidized gimmicks such as lotteries, casinos, or sports stadiums. A knowledge-based, competitive economy is achieved through creating a highly educated and skilled workforce. It requires public investment in the ingredients of innovation–educated people and new knowledge–and the infrastructure to support advanced learning, research, and innovation. It requires an environment that stimulates creativity, innovation, and entrepreneurial behavior. Put another way, it requires strong public purpose, wise public policy, and adequate investment to create a true society of learning. And these, in turn, require dedicated, visionary, and courageous leadership in government, business, education, and other areas of civic life.

To face the opportunities, challenges, and responsibilities of an increasingly uncertain future, Michigan needs to rekindle the spirit of adventure, creativity, innovation, and boundless hope in the future that has characterized its history. During its early years, its frontier spirit was sustained by a sense of optimism and excitement about the future and a relish for change. Today this same spirit needs to be rekindled to secure Michigan's future.

The challenge: develop a roadmap to Michigan's future



The Michigan Roadmap

Recommendations

The Near Term

Today's Challenge: Enabling Michigan's transition to a knowledge-driven economy capable of providing prosperity, security, and social well-being in a hypercompetitive global economy.

Key Vision:
To invest more adequately, strategically, and intelligently, with investments in people as the highest priority.

Investment Goals:
…human capital (lifelong learning)
…new knowledge (research, innovation, entrepreneurism)
…infrastructure (institutions, labs, cyber)
…policy (tax, investment, intellectual property)

The Elements:

1. All K-12 students will graduate college ready.
2. Priority will be given to the social infrastructure for learning.
3. Create clearer pathways among learning institutions.
4. Higher education will become more engaged with K-12 schools.
5. Increase participation of all citizens in higher education.
6. Move Michigan into top quartile in higher ed investments.
7. Targeted state investment in science and engineering.
8. Stress alliances among Michigan's colleges and universities.
9. Increase state investments in university research infrastructure.
10. Universities should become more engaged in tech transfer.
11. Incentives to stimulate private sector R&D and innovation.
12. Public investment in infrastructure such as broadband is critical.
13. Michigan should invest more in need-based financial aid.
14. State funds should be used to leverage private and federal funds.
15. Universities should be provided with agility to adapt to markets.
16. A recommitment to equity and social inclusion.

The Longer Term

Tomorrow's Challenge: To provide all of Michigan's citizens with the education and training they need, throughout their lives, whenever, wherever, and however they desire it, at high quality, and affordable cost.

Key Vision: To develop a society of learning capable of responding to the imperatives of a 21st century, global, knowledge-driven society.

Goal: A society of learning, capable of adapting and evolving rapidly to provide learning opportunities, knowledge, and innovation during a period of extraordinary change.

The Elements:

1. Michigan must develop a more systemic and strategic approach to its knowledge resources.
2. The state should encourage more diversity in institutions.
3. New paradigms for K-16 education should be explored.
4. UM and MSU should be encouraged to stress advanced education and research.
5. UM and MSU should be encouraged to develop capacity to access global markets.
6. Michigan's universities should explore bolder models of tech transfer, spinoffs, and startup activities.
7. Michigan should consider bolder models for producing human capital such as a 21st century version of the G.I. Bill that guarantees lifelong educational opportunities for all citizens.

The Millennium Project
The University of Michigan

The Millennium Project

The Millennium Project at the University of Michigan is a small research center concerned with identifying key technological, economic, and social forces driving major change in society and then launching research projects to better understand these forces, their potential impact, and shaping strategies and public policies to address them. It functions both as an "over-the-horizon" futures scanning effort as well as a "skunkworks" laboratory where actual prototyping experiments are conducted. For example, the Millennium Project played an important role in launching the Michigan Virtual Auto College (later the Michigan Virtual University), a CyberCamp for high school students, and a series of studies concerning the impact of rapidly evolving digital technology on the American research university. More recent activities include an assessment of the implications of current U.S. basic research capacity on national leadership in technological innovation, the development of new metrics for determining and assessing federal R&D priorities, launching a new research program on advanced energy sources for transportation applications in a post-hydrocarbon economy (including hydrogen-based fuels), and stimulating the evolution of global university alliances.

Biographical Profile

Dr. James J. Duderstadt is President Emeritus and University Professor of Science and Engineering at the University of Michigan. Dr. Duderstadt received his baccalaureate degree in electrical engineering with highest honors from Yale University in 1964 and his doctorate in engineering science and physics from the California Institute of Technology in 1967. He joined the faculty of the University of Michigan in 1968 in the Department of Nuclear Engineering. Dr. Duderstadt became Dean of the College of Engineering in 1981 and Provost and Vice President for Academic Affairs in 1986. He was elected President of the University of Michigan in 1988 and served in this role until July, 1996. He currently holds a university-wide faculty appointment as University Professor of Science and Engineering, co-chairing the University's program in Science, Technology, and Public Policy and directing the Millennium Project.

Dr. Duderstadt's teaching and research interests have spanned a wide range of subjects in science, mathematics, and engineering, including nuclear fission reactors, thermonuclear fusion, high-powered lasers, computer simulation, information technology, and policy development in areas such as energy, education, and science. He has published extensively in these areas, including over 20 books and 150 technical publications.

During his career, Dr. Duderstadt has received numerous national awards for his research, teaching, and service activities, including the National Medal of Technology. He has been elected to various honorific societies including the National Academy of Engineering, the American Academy of Arts and Science, Phi Beta Kappa, and Tau Beta Pi.

He has served on or chaired numerous public and private boards including the National Science Board; numerous committees of the National Academies; the National Commission on the Future of Higher Education; the Nuclear Energy Research Advisory Committee of the Department of Energy; and business organizations such as the Big Ten Athletic Conference, the University of Michigan Hospitals, Unisys, and CMS Energy.

He currently serves on several major national boards and study commissions in areas including federal science policy, higher education, information technology, energy sciences, and national security including the National Science Foundation's Advisory Committee on Cyberinfrastructure, the Glion Colloquium (Switzerland), and the Intelligence Science Board.