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It's a privilege to be here, and, on behalf of President Coleman, President Simon and our respective universities, I want to thank the Detroit Economic Club for the opportunity to speak to you this afternoon. Today we want to describe the challenge we all face in revitalizing Michigan's economy and the importance of the information and knowledge era in that revitalization. For Wayne State, Michigan State and the University of Michigan, today's topic, "The Role of Research Universities in the Emerging Knowledge Economy" translates to a recently created partnership of our three research universities, the Michigan University Research Corridor or URC. We think four issues define the economic challenge:

1. **Economic transformation** -- from a regional manufacturing economy to a global technological and knowledge driven economy
2. **Collaboration** among business, government and universities for solutions to our economic crisis
3. **Assets** available for research and development
4. **Transfer** of research innovations from the laboratory to the marketplace.

First, the economic transformation:

For more than a century, automobiles and steel were the economic foundations of Detroit and Michigan. In fact, these complementary industries determined the course of the entire nation's economy for decades. As everyone in this room is keenly aware, that has changed. Global communications, the biomedical sciences and information technology are creating an entirely new economy, one with worldwide influence.

Although manufacturing will always be important in the global economy it has and must continue to transform to the era of the information and knowledge economy that is upon us. In fact, the auto industry itself has become highly technical and thoroughly knowledge-based; the classic assembly line is now dominated by robotics and sophisticated applications of information technology. It will become inexorably more so. The very future of the auto industry rests on the development and successful market-driven production of hybrid vehicles, sophisticated batteries, feasible alternative fuels and other products currently being explored and tested in Michigan's major research universities.

We have now well into the era of the information and knowledge economy. The world has changed, and so must we. We understand the direction in which we must go; the question is how to do so—which brings us to the second point:

Collaboration among business, government and universities for solutions:

My colleagues and I believe that when Michigan returns to economic health, it will be because we act now to build, nurture and attract knowledge-based economic ventures in such fields as information technology, the biomedical sciences, health care, alternative energy, hybrid vehicles, smart sensors, and others—including most importantly, creative management of innovative companies.

I'll illustrate **collaboration** for solutions with a success story from the recent past with elements very similar to Michigan and Detroit. Pittsburgh grew to prominence decades ago on a manufacturing economy, but not long ago, the steel industry that built Pittsburgh and dominated its economy was in ruins. In the early 1980s, people were saying the same things about Pittsburgh that are starkly familiar to us

now in Michigan and Detroit. And only nine years ago Pittsburgh's unemployment rate was higher than Detroit's. Obviously Pittsburgh had to face the fact that the era of old-style steel was gone. Transforming the manufacturing economy to modern industry was a daunting task, but – just like Detroit and Michigan today -- Pittsburgh had no choice.

So in the 1980s a development plan was created that put Pennsylvania's research universities to work using state dollars to fund technology research.

Today Pittsburgh is a center of entrepreneurship in computer software, biotechnology and world class health care and medical research.

We believe what happened in Pittsburgh can be a model for the renewal of metropolitan Detroit. But we have to embrace areas that are driving the knowledge economy – and which are becoming an economic mantra—again-- biotechnology, nanotechnology, information technology, alternative energy, biofuels, health care and human services. Will it be easy? No. It certainly wasn't easy for Pittsburgh. But there is no American city with more mental toughness and a stronger work ethic than Detroit. We've

got the will and the capacity to reinvent ourselves if we leverage all the assets at our disposal.

This brings us to the third issue: Michigan's assets for research and development—both technological and economic.

We think an important asset is our new URC endeavor among our three research universities. Two years ago, Wayne State University, the University of Michigan and Michigan State University became partners in this research and development alliance. We took this action based on our belief in the extraordinary potential of this region as a world-class center of innovation, and on our commitment to work together to help realize that potential. As you know, each URC institution features complete graduate and undergraduate education, as well as professional degrees in medicine, business and the law. What you might not know is that our research laboratories produce a steady stream of patents and licenses that create new products and businesses and our health science schools develop innovative medical treatments that save lives ***and*** produce patents and licenses of their own.

Our three universities' alliance, through partnerships with the business community, public and private researchers,

policymakers and others contributes to revitalizing the state's economy. Together we can speed up technology transfer and development, increase cooperation among our institutions, businesses and government, and communicate the advantages of doing business in Michigan.

This URC partnership is very unusual nationally. There are only six other "clusters of innovation" among research universities like the URC in the United States, all in regions known as knowledge economy leaders. Let me briefly describe the six:

1. Boston's 128 Corridor -- Harvard University/MIT and Tufts University;
2. Silicon Valley/Northern California, the most imitated powerhouse of the knowledge economy -- Stanford, University of California-Berkley and UC-San Francisco;
3. The Research Triangle -- University of North Carolina, Duke University and N.C. State University; the oldest, created 50 years ago
4. Chicago and Illinois -- University of Chicago, Northwestern University and University of Illinois at Urbana-Champaign;
5. Southern California -- UCLA, USC and UC-San Diego; and

6. Pennsylvania -- Penn State University, University of Pittsburgh and Carnegie Mellon. Again this partnership was and is an important part of Pittsburgh's economic revitalization.

Although the URC was initiated just two years ago, and articles of association were signed only last November, we already rival the six other clusters. A recent study by the Anderson Economic Group measured our URC universities against those six research clusters and found that we are already ahead of half the competition in research and development expenditures, number of patents and number of technology licenses. The power of the partnership, of course, far exceeds the sum of the three parts.

Here are some of the Anderson report's findings:

- The URC beat all major national rivals for the number of degrees in physical sciences, medicine, biological sciences, agriculture and natural resources and was in the top three for engineering, math and computer science, business and law degrees conferred.
- The URC employs more than 48,000 people (one of the state's four largest employers) and spends \$6.7 billion on operations.

- We enroll more than 135,000 students -- far exceeding those of the six other competing university research consortia.
- We produce 54 percent of the state's science and engineering degrees, 100 percent of the MD, DO, veterinary and nursing PhD degrees, and nearly half of all health care-related degrees.
- The URC has more than 550,000 graduates living in the state, or 7.2 percent of Michigan's adult population.
- And very important economically, in the past five years we had 454 invention disclosures and 248 patents and/or licenses/options.
- And a key direct economic impact measure: URC institutions account for \$1.38 billion in research expenditures, which is 94 percent of federal academic research dollars brought into Michigan; and all three universities are among the top 50 U.S. public research universities.
- I've just given you a lot of numbers, but they add up to profound economic impact, not just in our operational footprint but more importantly in creativity that leads to new economic opportunity, and in the funding we attract to this state.

((brief pause))

The nonpartisan study group Michigan Future concluded in its 2006 report, *A New Agenda for a New Michigan*, that, quote, "Our higher education institutions ... are the most important assets we have in developing the concentration of talent we need to be successful in a knowledge-based economy. This is particularly true of our major research universities."

My colleagues and I feel strongly that ***all*** 15 of Michigan's public universities are important to the state's future economic stability. However, the state's research-intensive universities, collaborating as the University Research Corridor, have a unique role in promoting and sponsoring the innovation that will encourage and create new industries in Michigan.

Let me take a few minutes to describe the nationally unique, complementary strength of our URC partnership. There are basically three categories of major research universities in America, and the URC has a unique strength because it includes all three types. None of the other six research university clusters shares that characteristic.

The three types are:

1. Land-grant university
2. Very broad based, comprehensive research university—I'll label this the "mega research university"
3. Urban research university

Michigan State is the land-grant university. Land-grant universities were created by the Morrill Act, which was passed in 1862 and funded by granting federal lands to the states. The land-grant universities were the beginning of America's world preeminence in higher education and research and continue to be preeminent today. Michigan State was the nation's very first land-grant institution, and having spent most of my career in several land grant universities around the country, I can attest that MSU is one of the nation's very best.

Land grants were the economic driver of America's 19th and 20th century research and development enterprise in agriculture. And the best of the land grants, like MSU, continue as national leaders in research and development far beyond agriculture. MSU today is always among the top 25 U.S. public universities for research expenditures. And its reach far beyond agriculture is exemplified by its receiving a

\$550 million federal grant to design and build a national research facility, the Department of Energy's Facility for Rare Isotope Beams, which will become a locus of international research and advance our understanding of nuclear isotopes as well as the beginnings of the cosmos itself.

The University of Michigan merits the title of "mega research university" more than almost any university in the country. The distinguished history, reputation, achievements and worldwide influence of the U of M, which always ranks among the nation's top five research universities, are well known and need little elaboration here.

Wayne State's special niche is the urban research university, and it is one of America's premier institutions of this type; there are fewer than 20 in the entire country. Wayne State is uniquely capable of investigating and helping resolve the many issues facing America's great cities. Our location in Detroit gives us unparalleled opportunities for research, teaching and community outreach on urban challenges. Wayne State and Urban research universities like us are essential resources to address the stresses of urban life by applying our expertise to creative city planning, alternative energy, urban workforce retooling, urban economic

development, assistance to stressed public schools, and the delivery of health care and human services to underserved populations.

The URC institutions are the only three universities in Michigan classified by the Carnegie Foundation in the “**very highest research activity,**” category (a designation assigned to only 3.6 percent of America’s higher education institutions).

Finally, the fourth issue-- Transfer from the laboratory to the marketplace

Michigan’s URC and its partners are working on a long list of academic-private-governmental projects that pack an economic punch and could generate thousands of jobs. Several of our ongoing projects, for instance, came to fruition only after long advocacy by all three universities, no matter which one will preside over the results.

For example,

- As I mentioned earlier the U.S. Department of Energy \$550 million award to MSU for the nation’s rare isotope beam facility will create 400 permanent jobs. Both U of

M and Wayne State advocated vigorously on behalf of MSU in the intense national competition for this award

- The University of Michigan bought Pfizer's vacant 174-acre Ann Arbor research complex to create a new research campus that could generate 2,000 jobs.
- Massachusetts-based A123 Systems, a battery designer that partners with the URC, plans to build a manufacturing plant in southeast Michigan to supply batteries for Detroit automakers. The company says it hopes to create 14,000 jobs supplying batteries for hybrid and plug-in vehicles.
- The URC itself has invested \$900,000 of its own resources in seed grants to joint faculty teams to speed up the development of "revolutionary but feasible" alternative energy research. We have funded two joint faculty collaborations, one examining thermoelectric materials for environmentally friendly heating and cooling, the other applying nanotechnology to ethanol production from cellulose derived from switch grass and corn stalks, products of no value otherwise.

- Additionally, the URC institutions are playing a major role in the National Institutes of Health's National Children's Study, the most extensive children's health research project in history, funded by a \$57 million grant.
- TechTown, Wayne State's research and technology park, will soon be home to Michigan's first stem cell commercialization lab and we're committed to investing \$1.5 million over the next two years. The Wayne County Stem Cell Commercialization Center has the full support of Wayne County Executive Robert Ficano, who announced the initiative in his recent State of the County address. He said, "Wayne State and its University Research Corridor partners ... are the greatest medical research assets we have in Michigan, and now we have a chance to share that brainpower with the rest of the world. TechTown's Stem Cell Commercialization Center will be a place where researchers collaboratively accelerate the development of life-saving drugs and create high-tech companies that bring those treatments to the global marketplace."

The URC universities also are promoting the entrepreneurial culture required for the development of globally competitive

businesses through technology parks and startup incubators.
For example:

- Ann Arbor Spark – which was created in 2005 by the University of Michigan, Eastern Michigan University and their partners in business and government -- routinely uses the proximity of the University of Michigan's research and technology transfer capabilities to advertise its region as an ideal location for high-tech startup businesses.
- In East Lansing, MSU is a founding partner and key supporter of the Prima Civitas Foundation, which acts as a broker between MSU researchers and the financial institutions, venture capital organizations, and other resources needed to make the products of that research market-ready. The foundation seeks to diversify Mid-Michigan's economy and promote job growth through the expansion of industries such as next-generation transportation, alternative energy, biomass, health care, advanced manufacturing and homeland security.
- TechTown, Wayne State's research and technology park, is home to more than 70 companies and aims for

300. We're addressing the challenge to build an entrepreneurial culture in novel ways:

Our *SmartStart* program is aimed at helping high-technology start up businesses grow through 24 months of mentoring on business plans, sales, operations and customer relations. We're adopting a series of best practices that have been developed by the Kauffman Foundation, one of the nation's leading organizations focused on entrepreneurship.

Our "Soft Landings" program helps foreign companies explore business opportunities in Michigan through support services such as interpreters, office functions onsite from which international businesses can explore the entire market. For example, we have partnerships with the Mexican government and 25 Mexican companies on site, as well as business collaborators from China and Hungary.

TechTown also recently was selected to join Microsoft's BizSpark Program, which provides business startups with software support with no upfront costs and minimal requirements during their first three years, when these materials are most valuable and least affordable.

TechTown's biobanking initiative has the support and involvement of U of M and MSU through the URC, the Van Andel Institute and the State of Michigan Department of Community Health as well as Automation Alley and the National Institutes of Health.

And critically important to the **Translation from laboratory to business** issue is what's commonly labeled "brain drain." Data from Ann Arbor-based Michigan Future reveal that 46 percent of those who graduated from a Michigan four-year public university in 2007 left the state. Their top destinations were Illinois, California and New York. In order to boost our economy in a lasting way, we have to turn the brain drain to brain ***gain***; that means educating the brains we have in Michigan -- and attracting more quick and agile brains from elsewhere to Michigan. This is an essential role for our URC partnership.

Another key factor in **Translation from laboratory to business** is an educated, technologically informed workforce. And directly related to attracting this essential workforce is the fact that the entire state's return to prosperity will require a lasting renaissance of metropolitan Detroit as Michigan's hub of talent and transportation. When broad economic renewal becomes a fact of life in this

city, and when people move back into the neighborhoods, it will be because there are high-tech jobs, excellent public schools, accessible social services, diverse cultural experiences and stable neighborhoods. The URC is critical to this revitalization of Detroit, and of course Wayne State is a key to this transformation given its location right in the **middle** of the city and as Detroit's 6th largest employer.

In summary, Michigan and Detroit stand at a crossroads unparalleled in our history. The decisions we make, and the actions we take, will determine the economic and social well-being of our state for generations. But neither business, nor government, nor our public universities can do what needs to be done on their own. All three have to work together with a common purpose, in mutual support.

Charles Darwin said that, "It is not the strongest of species that survive, nor the most intelligent, but the ones most responsive to change."

In conclusion, the road to the new economy is steep and rugged, but the collaborative fuel of our URC-business-government partnership will adapt to the changes of the new economy and forge the roadmap for the future.

Thank you.