

*SmartZones and Technology Based Economic Development:
Technology-Led Economic Development in Michigan
And other Mid-Western States*

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SmartZones and Technology Based Economic Development

By Takessa Johnson & Karan Singh

I. Introduction

Technology based economic development programs are enabling regions and states to compete in the knowledge driven and services oriented economy. The ultimate goal of technology based economic development is to stimulate job growth by strengthening the science and technology capacity of an area, utilizing existing resources such as universities and large technology intensive firms, and fostering research and development in the sciences (ICMA). Additionally, technology based development is preparing the next generation for growth in an industry dominated by services and science and technology, enabling the very communities where this growth takes place to thrive. An excellent example of this is Silicon Valley in California, anchored by the existing university resource bases from Palo Alto (Stanford University) to San Francisco (University of California, Berkeley) to generate science and technology ideas which eventually lead to spin-offs in the form of technology companies. Silicon Valley is now a model for technology based economic development, and their strategies of capturing science and technology research to create firms and jobs is being modeled at the State and regional level across the globe. States across the U.S. are also playing a vital role in creating a facilitative environment for such technology based economic development to occur. States are establishing technology corridors (similar to Silicon Valley), such as Michigan's \$1

billion investment in the technology tri-corridor, focusing on life sciences, automotive technology and homeland security related technologies (Michigan Economic Development Corporation).

This policy report will briefly outline the efforts of Michigan's SmartZones and qualitatively assess these zones based on the product life cycle theory.¹ Through the paper, a review will be conducted on the technology based economic development programs in the states of Ohio, Indiana, Minnesota, Wisconsin and Illinois. It should be noted that the report will assess and capture only those programs directly sponsored by the state governments of the identified states and that it is not a comprehensive source of technology based economic development efforts, managed by the private sector and other levels of government. Some states may have a public-private partnership arrangement to sponsor such economic development, but for the purposes of this report and to maintain brevity, we will simply acknowledge their existence. Because technology based economic development programs are fairly new (either in legislation or as established programs), they are at different stages along the growth continuum (i.e., policy formulation, policy implementation, or within that range of developmental growth). As a result, our analysis does not preference programs at a particular stage; instead it

¹ Product life cycle theory is explained on pages 10-11 of this report.

portrays a picture of relevant programs from these other Mid-Western States that are poised to compete with Michigan through technology based economic development programs and strategies.

II. MICHIGAN²

Michigan SmartZones are collaborations between universities, industry, research organizations, government, and other community institutions intended to stimulate the growth of technology-based businesses and jobs by aiding in the creation of recognized clusters of new and emerging businesses, those primarily focused on commercializing ideas, patents, and other opportunities surrounding corporate, university or private research institute R&D efforts.

In order to foster public/private technology transfer ventures, Public Act 248 of 2000 was passed in June 2000. This Act expanded the Local Development Finance Authority (LDFA) Act to allow the creation of up to 10 *certified technology parks*, also known as *SmartZones*, conceptually defined as high tech development enclaves that are eligible for expanded tax increment financing and specialized state funding. SmartZones, as planned, will serve as critical masses of high technology innovation by fostering public-private partnerships in high-tech fields. SmartZones are required to be a partnership between at least one local unit of government and a

² Data and information obtained from <http://medc.michigan.org/smartzones/program/>; Data and information on the legislation of the SmartZones was obtained from <http://www.crcmich.org/EDSurvey/financg-taxauthorities/ldfa.html>

public university (not limited to one university), requiring representatives from all such concerns on the authority. Certified Technology Parks may also receive funding from an LDFA established by two or more local units of government, the first time that tax increment financing has been extended thusly in Michigan.

In April 2001, the Michigan Economic Development Corporation (MEDC) awarded Certified Technology Park status to Battle Creek, Lansing, Mount Pleasant, Kalamazoo, Grand Rapids, Muskegon, Houghton, Ann Arbor-Ypsilanti and two in Wayne County, including Pinnacle Park in Romulus, the Woodward Avenue Corridor, and another in Oakland County. These areas constituted as the eleven initial SmartZones, supported by the public act.

Programs and Program Features

SmartZones provide distinct geographical locations where technology-based firms, entrepreneurs and researchers can locate in close proximity to all of the community assets that will assist in their endeavors. The locations of the Michigan SmartZones represent areas that comprise a critical mass of technology development assets including:

- **Commitment to supporting technology development** – leadership and commitment from both the public and private sector to enable an environment that encourages and emphasizes technology development and innovation
- **Leadership and commitment of research institutions** to support technology development

- **Coordinated access to capital** – seed, venture, and conventional
- **Business development networks** - high quality business service providers and potential customers and suppliers
- **Established technology infrastructure** - laboratory space, access to university facilities, high bandwidth telecommunications, and incubator space
- **Educated and talented workforce** - access to top technology talent from universities and the private sector
- **Proximity to research and development partners** such as industry, universities, hospitals, and research laboratories
- **Education and training opportunities**
- **Quality of Place** – access to top cultural, entertainment, educational, recreational, residential and other quality of life amenities

SmartZones are more than just a location. The program attempts to coordinate all of the community assets and services necessary to support technology development in the knowledge-based economy. Services that may be provided by the SmartZones include but are not limited to the following:

- Technology “mining”
- Technology commercial assessments
- Business feasibility studies
- Business planning
- Entrepreneurial training
- Venture capital preparation and introductions
- Market analysis
- SBIR, SSTR Assistance
- Grant writing

- Product development
- Management recruitment
- Business development mentoring
- Incubator space
- Coordination of research and development with universities and industry

Unfortunately, the available data on firms supported, technology mined and investments spurred in the SmartZones is only available at the combined state level, with no specific local zone level data. The Michigan Economic Development Corporation states that since the inception of the SmartZones in April of 2001, 24 companies have located within the zones and six new business incubator facilities are either under construction or operational. To date, SmartZones have spurred more than \$120 million in private investment (MEDC).

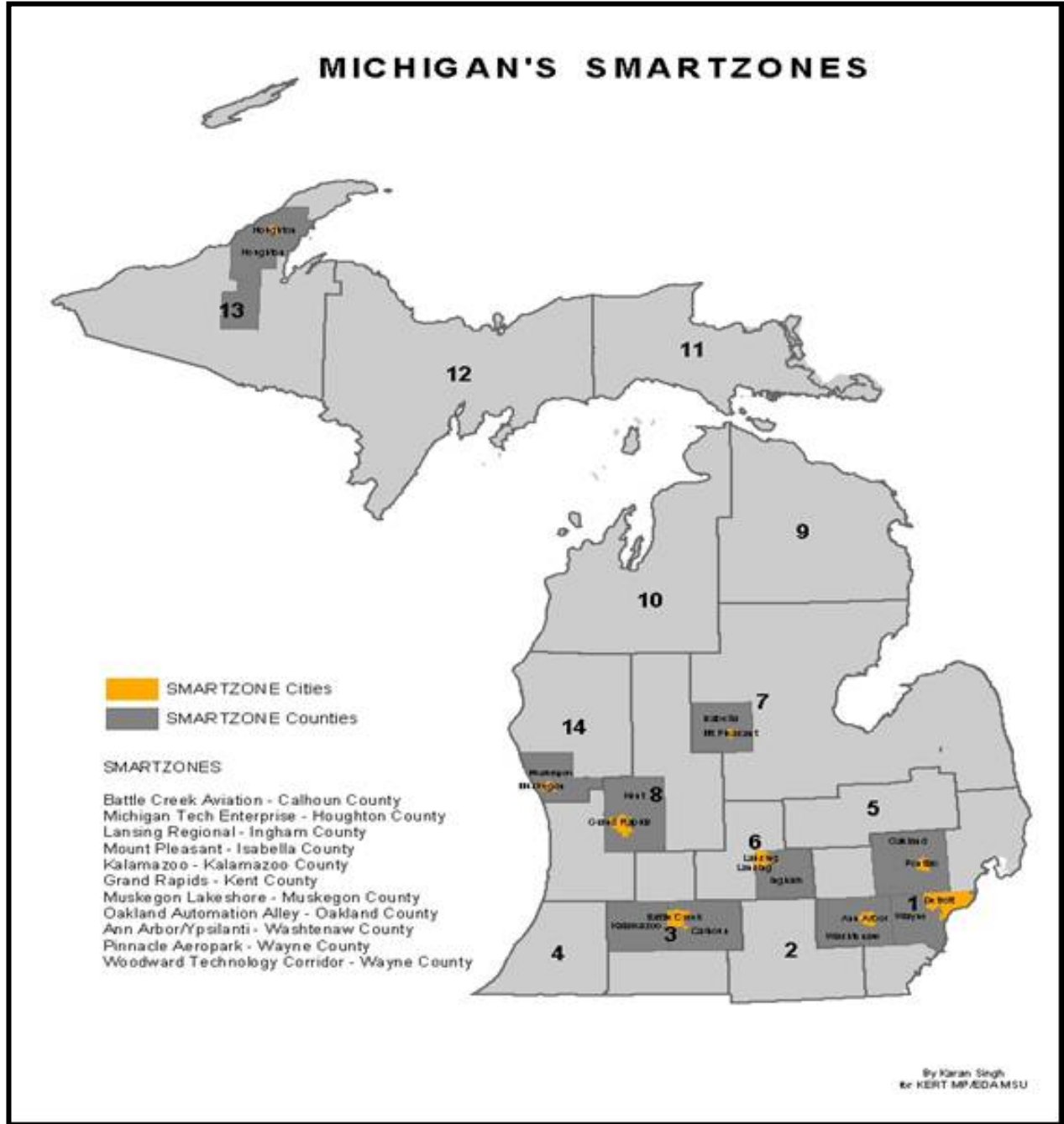
Unique Features and Industry Targets

The Michigan Economic Development Corporation in cooperation with other local sources helps to run and manage the daily activities of the SmartZone Program. The eleven SmartZones are geographically dispersed across the state, and are indicative of the science and technology based development imbued in other technology corridors such as Silicon Valley in California and Route 128 in Massachusetts. Each SmartZone has a distinct characteristic, incorporating the regional science and technology base, as well as the region’s traditional economic strengths. The following list and description of the eleven SmartZones, highlights the various competencies carried forth by each zone (see map on following page).



By Karan Singh
 for KERT MP/ED/MSU

Exhibit 1: Location of Michigan's SmartZones



Source: Michigan Economic Development Corporation

Calhoun County

Battle Creek Aviation and E-Learning

SmartZone: Aviation, aerospace and e-learning research and development will be the focus of this SmartZone to be located in Battle Creek. The emphasis on e-learning and aviation is unique in the United States. The focal points for research, development, commercialization and venture formation will be the Western Michigan University College of Aviation and Kellogg Community College Regional Manufacturing Technology Center. Driven by significant market and technology dynamics, both institutions along with Battle Creek Unlimited, will create vibrant strategic competencies to augment Michigan's economic and technology base.

Houghton County

Michigan Tech EnterPrise SmartZone:

The Cities of Houghton and Hancock, in partnership with Michigan Technological University, will support this zone, which aims to grow the high-tech job base in the Upper Peninsula. The zone will focus on nurturing biotechnology, advanced manufacturing, information technology and earth engineering industries. It utilizes existing downtown building space in the Cities of Houghton and Hancock and the facilities on the campus of Michigan Tech, to initially create up to three incubator facilities.

Ingham County

Lansing Regional SmartZone: Supported by the Cities of Lansing and East Lansing, in partnership with Ingham County, the Lansing Regional Chamber of Commerce, MBI International, Michigan State

University, the Michigan State University Foundation and the University Corporate Research Park, the zone seeks to stimulate the growth of technology-based businesses in the Lansing region. It will focus on business attraction, creation and expansion in the fields of life sciences, advanced manufacturing and information technology. Special attention will be given to helping firms capitalize on research and technical resources at Michigan State University and MBI International.

Isabella County

Mount Pleasant SmartZone: This zone was proposed by the City of Mount Pleasant in partnership with Central Michigan University, The Dow Chemical Corporation, IBM Corporation, Meijer Corporation and Middle Michigan Development Corporation. Several other corporate sponsors are anticipated. This zone's goal is to build a national center for research and development of business intelligence solutions. It includes University Park, a 600-acre site located within the City of Mount Pleasant.

Kalamazoo County

Kalamazoo SmartZone: The City of Kalamazoo, Western Michigan University and Southwest Michigan First will support this zone. The zone will be anchored by the Western Michigan University Business Technology and Research Park. The development of the zone includes an incubation center as well as space and advisory services for high-technology start-ups in the community.

Kent County

Grand Rapids SmartZone: This zone was developed by the City of Grand Rapids, Grand Rapids Community College, Grand Valley State University, the Right Place Program and the Van Andel Institute (VAI). This zone seeks to stimulate the growth of technology-based businesses and jobs in the Grand Rapids area. It will build upon the singular strength of the VAI, a sustained rebirth of downtown Grand Rapids and the commitment of regional institutions of higher education. The zone will also support the growing needs of new life sciences enterprises developed through the establishment of a life sciences product development center, to include a full-service incubation center.

Muskegon County

Muskegon Lakeshore SmartZone: The City of Muskegon, in cooperation with the County of Muskegon and Grand Valley State University, will support this zone. The zone will focus on developing high-technology firms and integrating technology created at Grand Valley State University into Muskegon area firms. The zone will be home to a business incubator, a technical skills center and research and development facilities for university and business use. The zone also seeks to develop a waterfront center of commerce, continuing the rebirth of downtown Muskegon.

Oakland County

Oakland Automation Alley SmartZone: This zone is a collaboration of Automation Alley, the City of Southfield, Lawrence Technological University (LTU), Oakland University (OU) and Oakland County. The

proposal calls for the establishment of a business incubator within the City of Southfield in conjunction with LTU and OU. Oakland County is being recognized for its unique efforts with Automation Alley. While the Oakland Automation Alley SmartZone will not be able to utilize the Tax Increment Financing recapture capabilities offered under the law, the opportunity for the City of Southfield and the universities to work together in developing a business incubator will also be recognized and encouraged to the extent possible through other programs.

Washtenaw County

Ann Arbor/Ypsilanti SmartZone: This is a joint proposal of the Cities of Ann Arbor and Ypsilanti, in partnership with the Ann Arbor IT Zone, the University of Michigan, Eastern Michigan University, ERIM and the Washtenaw Development Council. This zone will focus primarily on information technology, including Internet II and MEMS technologies. The zone envisions the entire community functioning as a virtual business incubator taking advantage of the region's rate of business formation, which is fourth in the nation. The zone will initially include 66 blocks in downtown Ann Arbor and 10 blocks in Ypsilanti, but may be expanded to take advantage of unique opportunities in the areas of MEMS, IT or life sciences.

Wayne County

Woodward Technology Corridor SmartZone: Submitted by the City of Detroit and Wayne State University, in cooperation with the General Motors Corporation, Henry Ford Health System and others, this zone seeks to establish an

attractive, well-equipped workplace community designed to nurture technological synergies among industry, government and academia in order to assist in the growth of new high-tech business ventures. The centerpiece of this zone is a multi-purpose collaboration center. Initially, the zone will include the areas bordered to the south by the I-94 expressway, to the north by Euclid, to the west by the John C. Lodge Freeway (M-10) and to the east by the Fisher Freeway (I-75).

Pinnacle Aeropark SmartZone: This zone will be supported by the City of Romulus, Huron Township and Wayne County. The SmartZone seeks to create a state-of-the-art real estate development that builds on and complements airport investment. The vision is to transform approximately 1,200 acres of underutilized, county-owned land in the airport area into a high-quality, mixed-business/technology zone.

The zones are geographically dispersed across the state, and capture the local technology niches of the regions they are located in. In all, the eleven SmartZones span technologies ranging from advanced automotive manufacturing to developmental technologies in the health and life sciences industry. Through these zones and programs, the State hopes to capture the growing technology and services sector in the national and global economy.

Additional Unique Features: SmartZones and the Business Accelerator Program

The SmartZone business accelerator program was created in July 2002 through Michigan Economic Development Corporation (MEDC) assistance. SmartZone business accelerators are designed to help entrepreneurs and researchers identify technology with commercial potential. The seven business accelerators are located in the Automation Alley, Grand Rapids, Kalamazoo, Michigan Tech Enterprise, Mount Pleasant, Ann Arbor Ypsilanti Area and Woodward Technology Corridor SmartZones.

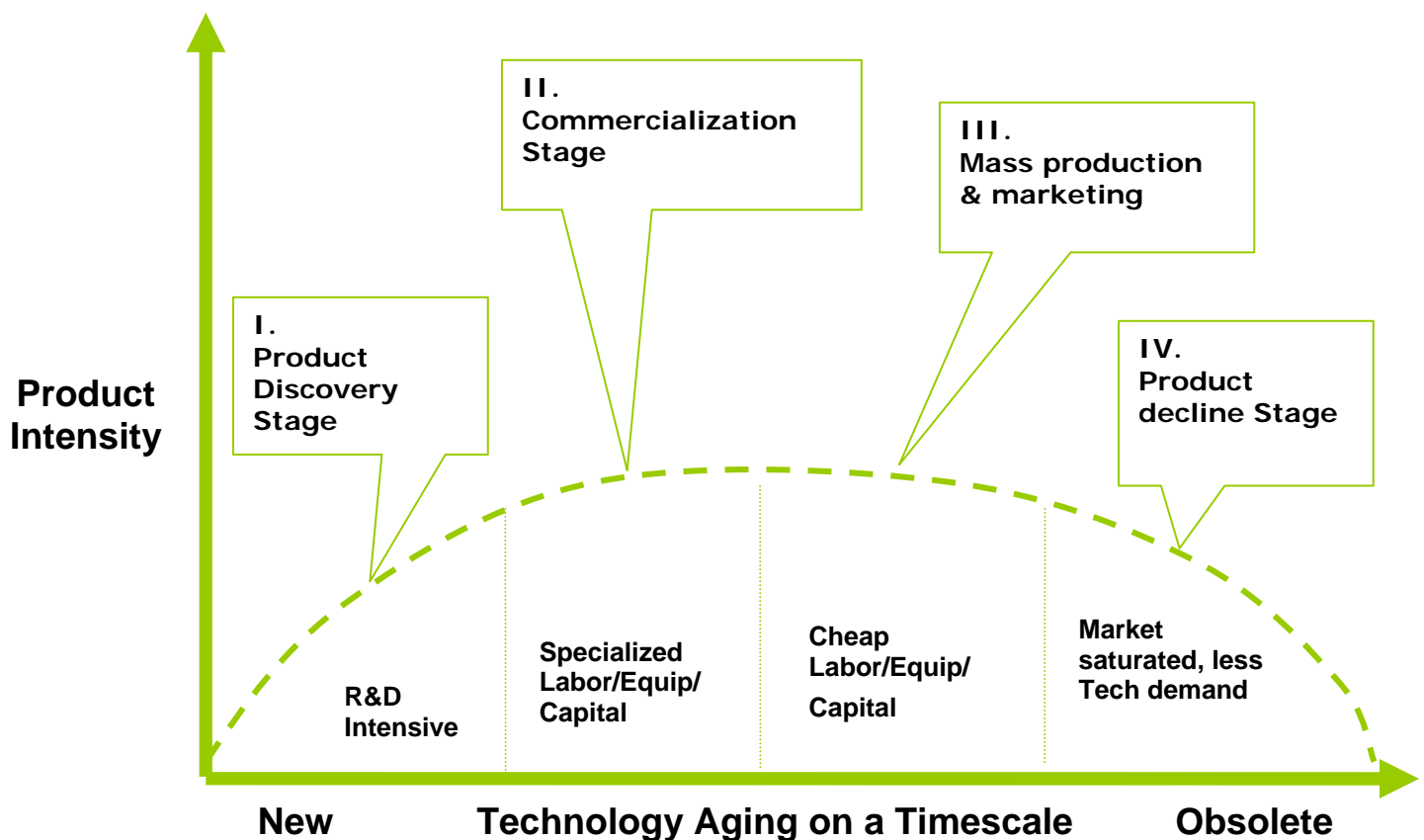
Types of services offered at the accelerators include technology mining, technology assessments, business feasibility studies, business planning, entrepreneurial training, venture capital preparation and introductions, market analysis, product development, management recruitment and business development mentoring. Although similar to the initial SmartZones, the business accelerators have had some additional success in attracting and growing technology based firms. The Michigan Economic Development Corporation states that since their inception, the accelerators have assisted more than 70 companies and helped raise more than \$165 million in capital for these firms (MEDC <http://medc.Michigan.org>).

III. Qualitative Analysis of Michigan's SmartZones

Why the Product-Cycle model?

Due to the unavailability of performance-based data on the specific SmartZone developments, and an effortless attempt by the Michigan Economic Development Corporation to provide us with the relevant information, we are inclined to adopt a different approach. Our approach is based upon a qualitative review of the eleven Smartzones in Michigan employing the Product-Cycle model, a well-articulated model used in economic geography to help understand regional economic performance (Taylor and Plummer, 2001).

Exhibit 2: Product Cycle Theory



The Product-Cycle Model and SmartZones

To help explain regional economic change, the product-cycle model was originally theorized as a framework to explain patterns of international trade (Vernon, 1966 in Taylor and Plummer, 2001). The core focus of the model was the process of technological change in multinational firms and in the disbursement of multinational capital, and the progressing nature of the development, maturation, standardization and the outmoding of products.

At the core of the model are technological change and the contention that, after the initial development of a product within an undefined business enterprise context; Market conditions and the structure of demand; Factor inputs (including human and financial capital); The nature and intensity of competition; and locational suitability, change in a systematic way as the technology ages (Taylor and Plummer, 2001).

As the technology ages, there is a need for commercialization of the technology through capital-intensive production, increasing the need for specialized equipment and labor to produce the product. Ultimately, as a critical mass is reached in the production stage and there has been a widespread sharing of the technology, the product begins to decline in demand, requiring lesser specialized equipment, cheaper unskilled labor and less managerial or executive inputs. Thus we can see the transition from initial product discovery, to development, to marketing and mass manufacturing, and finally towards a stage

of decline where the product is of lesser demand, and the market is saturated and/or the technology is outmoded. The following exhibit explains the stages of development as they pertain to the product-cycle theory.

Our analysis will emphasize using the product-cycle theory as a qualitative approach to reviewing the SmartZones in Michigan. In order to complete this, we will evaluate each SmartZone's current web site and the modest case study literature, which is readily available. Some zones may have not yet reached the further levels or stages and for these zones we acknowledge the question asked on the web-site evaluation as non-applicable (NA). Using this theory towards Michigan's SmartZones, we will evaluate as to which stage each SmartZone is in the developmental process.

The stages used are derivatives of the product-cycle theory and will qualitatively evaluate the following questions:

- Q1)** What type of research and development (R&D) are currently underway in each of the SmartZones? – This would be synonymous with the Product Discovery stage.
- Q2)** Have each of the SmartZones moved into commercializing any of the R&D technologies? – Synonymous with stage II in the product-cycle.
- Q3)** Have the SmartZones established a method to contract out the commercial technology so as to mass-produce it? – Similar to stage III in the product-cycle theory.
- Q4)** What products have reached their market potential (saturated the market), and have the SmartZones

progressed into developing new technologies? – Synonymous with stage IV in the product-cycle.

The SmartZones have an inherent structure to promote high technology businesses through the zones and advancing technology innovation, by identifying promising new technologies and creating new jobs to support the innovation growth. As the product-cycle theory posits, there will be an eventual decline in the technology being developed and produced at each SmartZone. Given an understanding of the inherent structure of the zones, the zones are likely to have in their technology “pipeline” new developments. Thus even though a certain product or technology in the SmartZone maybe undergoing decline, there is a new wave of development underway keeping the development of technologies as an ongoing process. This issue is problematic, as a zone maybe simultaneously involved in the R&D stage of product development to the commercialization stage of the product-cycle (or any other progressive stage). Nonetheless, given the lack of poor quantitative data, and our reliance on secondary case studies and press release information from the Michigan Economic Development Corporation, the approach employed is suitable for this initial level analysis.

Table One on the next page summarizes the authors’ web-site evaluation utilizing the source sites listed in column six of the table, as well as applying the four aforementioned questions (stage level analysis) to the SmartZones in Michigan.

Exhibit 3: Aerial Rendition of Pinnacle Aeropark SmartZone



Source: www.waynecounty.com

Proximity to institutions of higher education

High technology and research and development based industries are strongly dependent on university based research and the accrued spin-off’s from this research in the form of start-up companies. Summarizing the existing universities in close proximity to the zones will enable the zones to have an improved understanding of the type of firms that could be potential start-ups, as well as understand the core strength and ability of the technology based labor/University faculty strength in the area. This evaluation can help in future business recruitment efforts, as well as help position marketing strategies for the zone.

The following four tables provide a detailed table, listing the number of bachelors degrees conferred by Michigan’s four year public universities in science and technology fields. This data reflects undergraduate students graduating from these four-year institutions with degrees in Computer and Information Sciences, Engineering and Engineering related technologies and the Biological Sciences. The data was obtained from the National Center on Education Statistics and reflects the 2001 – 2002 year.

Table 1: Product Cycle Analysis on Michigan's SmartZones

SmartZone	Stage 1	Stage 2	Stage 3	Stage 4	Source
Battle Creek	Aviation, E-learning technology	Yes, tenants include British Airways, Delta Airlines etc.	Yes, through Western Michigan University	NA	http://www.bcunlimited.org
Michigan Tech Enterprise	Automotive engineering testing labs, & other high- tech business	Yes, student projects from Michigan Tech. Univ. being commercialize d	Yes, through Michigan Tech Univ., specifically to Ford Motor Company, GS Engineering	NA	www.mtf.mtu.edu , www.mtulode.com
Lansing	Life Sciences, Advanced manufacturing and IT	NA	NA	NA	http://Edc.cityoflansingmi.com
Mount Pleasant	Business intelligence, nanoscale technologies, Technology acceleration	Yes, Through Central Michigan University and private firms in the Dendrimer Nanotechnology field. Dendritic Nanotechnologies Ltd. Is the leading firm	NA.	NA	http://www.smartzone.cmich.edu/index.html
Kalamazoo	Life Sciences	Yes, NephRX and Esperion Therapeutics are the existing tenants and close collaboration with Western Michigan University	NA	NA	www.southwestmichiganfirst.com
Grand Rapids	Life Sciences, through the efforts of the Van Andel Research Institute, and through Grand Valley State University	NA	NA	NA	http://www.grpolice.grandrapids.mi.us/departments/economic/dev_programs/smartzone.asp

SmartZone	Stage 1	Stage 2	Stage 3	Stage 4	Source
Muskegon	Alternative Energy research, in fuel cells, solar power, battery storage systems	Yes, through Siemens Corp. through First Power, Harding Energy Inc. and through cooperation with Workstage LLC, a Steelcase Company	NA (Although they have a plan to mass produce the alternative energy technology by attracting manufacturing firms to Muskegon)	NA	http://www.muskegonareafirst.org/ Articles/AElectrifyCommunity.html
Oakland Automation Alley	Consortium of 500 High-Technology and manufacturing businesses	Yes, several of the consortium firms like Arvin Meritor, Autoliv Inc. are already commercializing R&D	Yes, several of the consortium firms are mass producing the technology being researched in Automation Alley	NA	http://www.automationalley.com/
Ann Arbor/Ypsilanti	Nanotechnology, Microsystems research and development	Yes, several companies have been formed in this zone working on commercializing R&D	Yes, several of the R&D work has seen useful product application in automotive, bioscience and telecomm.	NA	http://www.wdc-conecondev.com/web_mems_book.pdf
Wayne Co. – Woodward Technology Corridor	Alternative Energy	Yes, NextEnergy is already established itself in the corridor	NA	NA	http://www.nextenergy.org/020916NextEnergy.htm
Wayne Co. – Pinnacle Aeropark	Communications, office technology, Logistics technology	NA	NA	NA	http://metro.heritage.com/dtw011701/story6.htm http://www.waynecounty.com/jed/progs/Pdefault.htm

Exhibit 4: Computer Science Graduates from Michigan's Public Universities

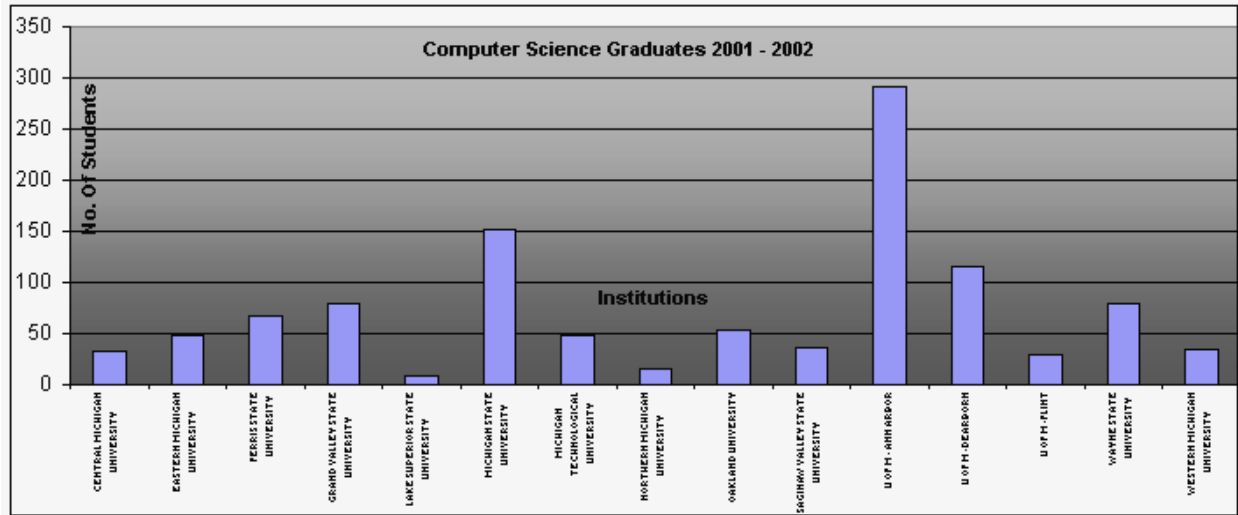
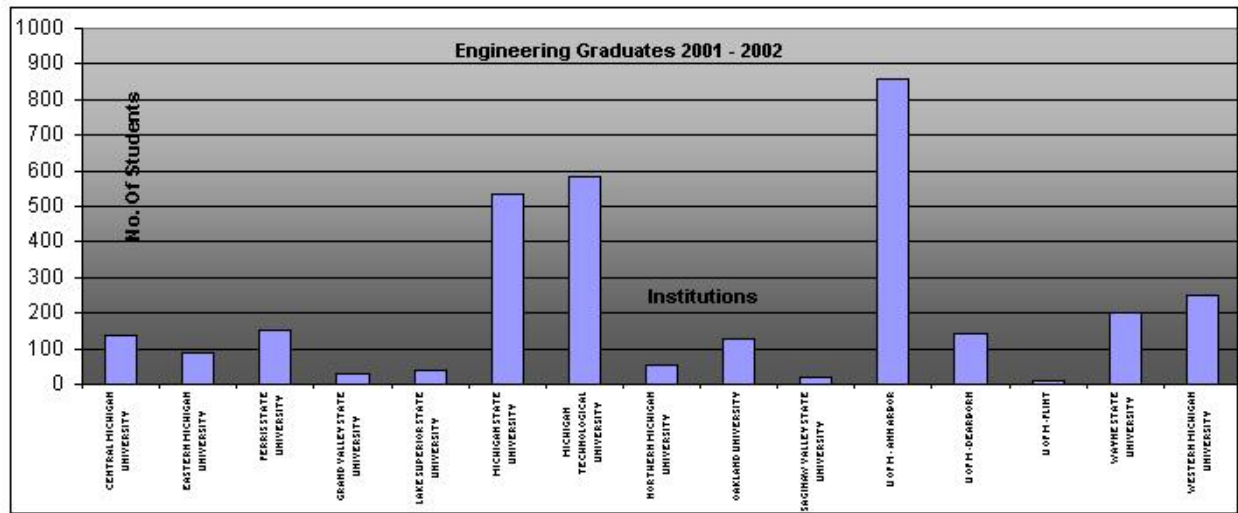


Exhibit 4 clearly shows that the concentration of undergraduate degrees awarded in the Computer Sciences is in the Detroit to Ann Arbor region. University of Michigan at both the Ann Arbor and Dearborn campuses graduated 409 students last year, and Wayne State University in Detroit graduated 80 students in the computer sciences. The other concentration of students occurs from Michigan State University, graduating about 150 students in the field.

Exhibit 5: Engineering Graduates from Michigan's Public Universities



In exhibit 5, which depicts the number of engineering undergraduates awarded degrees, we see a greater variation across the State. Large concentrations are found in Mid-Michigan with the presence of Michigan State University and Central Michigan University in Mount Pleasant, as well as in Houghton (Upper Peninsula) with the presence of Michigan Technological University. On the west side of the State, predominantly in Kalamazoo, we see a large number of engineering graduates from Western Michigan University, and also from Ferris State University in Big Rapids. In South East Michigan, Wayne State University and The University of Michigan Ann Arbor graduated a large number of engineers in the past year.

Exhibit 6: Biological Science Graduates from Michigan's Public Universities

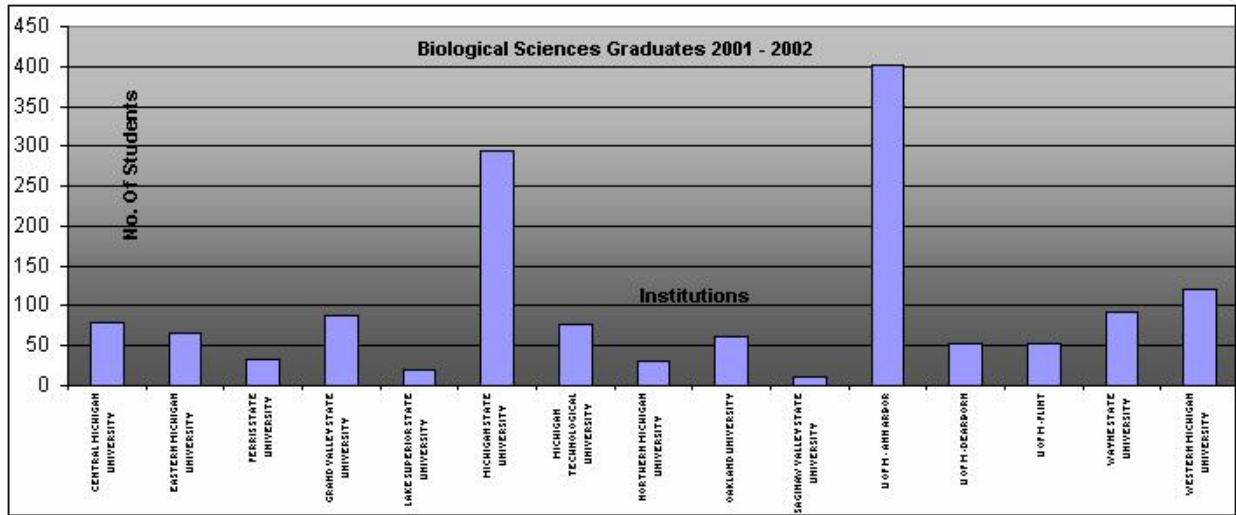


Exhibit 6: In the Biological Sciences, University of Michigan – Ann Arbor in South East Michigan and Michigan State University in Mid-Michigan clearly graduated the largest number of students in the past year. In West Michigan, there were considerable numbers of graduates in the biological science field from Western Michigan University in Kalamazoo, as well as from Grand Valley State University in Grand Rapids.

Exhibit 7: Total Number of Science & Technology Graduates from Michigan's Public Universities

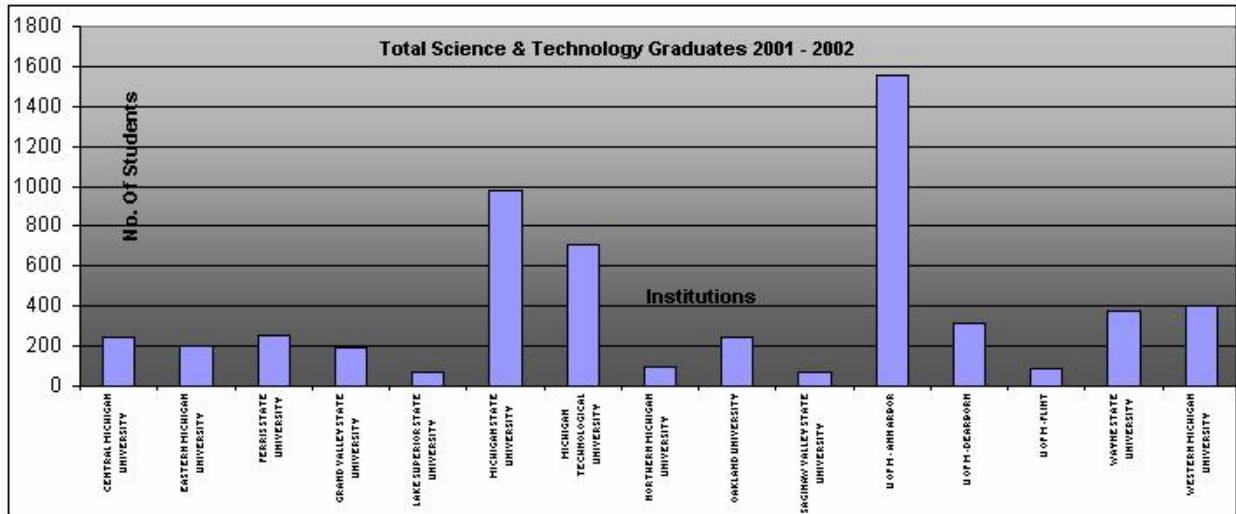


Exhibit 7, depicts the total number science and technology graduates in the State, and we see a geographic pattern that spans Mid-Michigan (Michigan State University), South East Michigan through the presence of the University of Michigan, and as well as in the Upper Peninsula through the presence of Michigan Technological University.

The number of students graduating in the science and technology fields from Michigan universities is indicative of not only the technologically adept workforce, but also the presence of science and technology faculty conducting research at the universities. SmartZones should recognize this localized talent and technology pool and foster cross-fertilization projects, such as technology transfer programs from the university to businesses and encourage research based externships for students interested in pursuing careers in the technology field.

IV. Technology based Economic Development Programs in neighboring Mid-West States

To review and summarize the state level technology based economic development programs, we relied on state government web-sites. The web-sites reviewed highlighted the programs, unique program features, industry targets, as well as strategies to attract technology industries to their State. Prior to introducing the State level programs, our evaluation provides a brief synopsis (using select indicators) of technology based economic development programs ranked by the Progressive Policy Institute (PPI)³. The Institute's report ranks the State's based upon number of New Economy variables including, high technology jobs, focus on export manufacturing, digital government (e-

government), and population in the State that is online, amongst other categories.

Our review segments the state level program(s) similarly, by first giving an introduction, which outlines the legislation and funding levels of each program. The second step reviews the programs and highlights specific program features. The third step specifies the technology industry targets the State is attempting to attract or develop infrastructure for, and the last step of the review is sensitive to unique programmatic features of technology based economic development programs. One caveat to this evaluation method is the issue of timeliness and the constant evolving of several programs. Certain state programs change and develop and accordingly improve the currency of the information provided on the site. The authors' review of the state level program web-sites are current as of December 1, 2003, as this is when the sites were last accessed.

ILLINOIS

In the PPI report (depicted in the table below as well), Illinois ranked 15 in the country in aggregated knowledge jobs. From a perspective of globalization in the New Economy, the state ranked 21 in the aggregated rank. In the economic dynamism sector the State ranked 16, and in the digital economy sector the state ranked 20. Overall, Illinois was ranked 17 nationally in the State Level New Economy Index.

³ For a detailed analysis, the Progressive Policy Institute's 2002 State New Economy Index authored by Rob Atkinson is available at <http://www.neweconomyindex.org/states/2002/index.html>

Table 2: Illinois Ranking in 2002 State New Economy Index

Economy Index	
Overall	17
Knowledge Jobs	15
Globalization	21
Economic Dynamism	16
Digital Economy	20

Source: <http://www.neweconomyindex.org/states/2002/index.html>

VentureTECH Introduction⁴

Illinois has realized that they are no longer simply in competition with just their neighboring states. Today, there is a global competition between all countries. Illinois has made a considerable advancement into this global competition by making crucial and synchronized investments of financial and human capital in technology that will improve education, training, economic development and boost the quality of life.

Governor George H. Ryan, of Illinois, developed VentureTECH in 2000 to move the state into a more inclusive competitive atmosphere. VentureTECH is the keystone of Governor Ryan's stated commitment to a broad, continuing tactical plan for technology growth in Illinois.

Programs and Program Features

Fermi Accelerator Research - Lead by the Illinois Institute of Technology, this is a \$2.5 million annual state partnership with Fermilab and a consortium of Illinois universities to examine the next generation of accelerator technology.

⁴ Data obtained from www.illinois.gov/ITO/vtechintro.cfm

Advanced Photon Source - This is a national synchrotron radiation research facility in which six Illinois universities participate collaboratively with scientists from private industry and the federal government. *VentureTECH* allocates \$3 million annually for the consortium of universities to participate in the APS.

Center for Nanofabrication and Molecular Self-Assembly

- Located in the Institute for Nanotechnology at Northwestern University, this project advances research initiatives designed to position Illinois as a leader in this field, including research, technology transfer, educational outreach programs, and expanded business collaborations. *VentureTECH* has allocated \$5 million for this project in FY02 and FY03. The state funding has leveraged \$11.2 million in NSF funding, as well as an additional \$10 million from the U.S. Department of Defense for nanotechnology research at Northwestern.

Rare Isotope Accelerator Science Center at Argonne

- The Rare Isotope Accelerator Science Center, to be located at Argonne National Laboratory, is seen as an important incentive in the competition to attract the U.S. Department of Energy's proposed \$850 million Rare Isotope Accelerator (RIA) to Illinois. Illinois is actively recruiting the Rare Isotope Accelerator, a concept seen as essential to continued scientific research into the basic questions about the origin of the elements and for important applications to medicine, industry, and other applied physics research. It is estimated that locating the RIA in Illinois could create 400 jobs and provide \$200 million per year in

benefits to the Illinois economy. The State's commitment to provide a total of \$16.6 million for the construction of the RIA Science Center would provide the offices, laboratory space, and conference rooms to serve the administrative needs of visiting scientists and students conducting research at the accelerator.

Industry Targets

Information Technology

VentureTECH is building on their existing efforts and strengths by providing investments to increase technology spin-offs, encourage new technology ventures, market their success, and maintain their leadership position in driving economic development in the high-tech New Economy.

Bridging the Digital Divide - Governor Ryan signed the "Eliminate the Digital Divide Law" in 2000 to help low-income families gain the technological skills and access to hardware needed to help them get jobs in the New Economy. This program provides resources to organizations that help plan, establish, administer and expand Community Technology Centers to serve residents in many low-income communities in Illinois. In the last two years, \$1.5 million in grants have been issued to more than 36 organizations. Because of changes in the state's Telecommunications Act, this program will be expanded to an annual \$5 million allocation.

Community Technology Fund - The Illinois Commerce Commission has created the Community Technology Fund with

money set aside as a part of the 2001 merger of Ameritech and SBC Communications. More than \$1.2 million from this fund has created a statewide virtual community-computing center to provide resources, information, and individualized assistance to community organizations in all parts of the state. More than 75 grants totaling nearly \$3 million have been issued to community organizations and schools over the past two years.

DCCA Technology Advancements -

VentureTECH increases funding to assist businesses and research institutions in the development and utilization of modern technologies to strengthen Illinois' economic competitiveness. Illinois assists in the commercialization of new technologies, to secure research and development funding, and to leverage private and federal investments. More than \$8 million has been allocated and awarded.

Illinois Technology Enterprise

Corporation - The state has established ITEC centers in Champaign and Evanston that are designed to stimulate the formation, growth and retention of technology-based businesses in Illinois. By leveraging and organizing the strength of the local universities and the growing technology leadership in many communities, ITEC promotes technology growth through the improvement of delivery of existing economic development programs and the promotion of other State resources. In fiscal year 2002, the ITEC centers have aided more than 100 entrepreneurs.

University of Illinois Tech Incubator - With *VentureTECH* funding of more than \$10 million, the incubator is becoming an integral part of the Champaign-Urbana research park, which has provided essential office and laboratory space for researchers and entrepreneurs. University and private resources are matching the State's investment. New spin-off companies are expected to result from improved commercialization of university research, creating new jobs and industries in Illinois.

Health Science and Biotechnology

The *VentureTECH* initiative is providing significant investments in the next generation of tools that will grow our food better, prevent and cure disease, and deliver up-to-date health information to patients and health professionals.

Centers for Academic Excellence - Since fiscal year 2000, more than \$46 million has been committed to teaching hospitals throughout Illinois to conduct additional clinical care research and develop new treatments and therapies. The hospitals use these grants to leverage additional federal and private research funding.

Rural Health Initiative - This initiative, through the Department of Public Health and the SIU School of Medicine, is expanding health care services in central and southern Illinois, including distance technologies, telemedicine and teleburn networks that will improve access to specialize medical care and improve communications. More than \$6 million has been allocated to provide needed technology

to bring clinical services to place-bound populations in need.

Higher Education Health Services Grants

-Nearly \$60 million has been allocated since the fiscal year 2000 to assist institutions offering programs that educate and train health professionals, allowing these colleges and universities to improve their training programs to include ever-changing technological advances in health care. This funding is for medical, dental, optometry, podiatry, pharmacy, allied health, nursing, and medical residency programs.

Alzheimer's Disease - Over the last three years, more than \$9 million has been allocated for Alzheimer's Disease Assistance Centers, which provide diagnostic, treatment, and support services to Alzheimer's patients and their families, education to the public and to professionals, and grant money for cutting-edge research into this devastating disease.

OHIO

In the PPI report (depicted in the table below as well), Ohio ranked 29 in the country in aggregated knowledge jobs. From a perspective of globalization in the New Economy, the state ranked 27 in the aggregated rank. In the economic dynamism sector the State ranked 44, and in the digital economy sector the state ranked 16. Overall, Ohio was ranked 30 nationally in the State level New Economy Index.

Table 3: Ohio Ranking in 2002 State New Economy Index

Overall	30
Knowledge Jobs	29
Globalization	27
Economic Dynamism	44
Digital Economy	16

Source: <http://www.neweconomyindex.org/states/2002/index.html>

Third Frontier Project Introduction⁵

The Third Frontier Project was created in February 2002. As Ohio attempts to transition into the knowledge economy, Ohio has decided that they must aggressively create and grow the jobs and opportunities that will lead to economic prosperity for all Ohioans. The Third Frontier Project is at the center of this goal and is the State’s largest economic development initiative ever launched. The Third Frontier Project is intended to create thousands of new jobs throughout Ohio, expanding research to save and improve lives, starting new high-tech companies and developing state-of-the-art products, keeping their kids close to home with good, high-paying jobs in Ohio.

Program and Program Features

The \$1.6 billion Third Frontier Project is designed to make Ohio a leader in new high-paying jobs for the 21st century by investing \$500 million to build world-class research facilities, known as Wright Centers of Innovation. They are also investing \$500 million to support early stage capital formation and the development of new

⁵ Data obtained from www.ohio3rdfrontier.org/documents/ThirdFrontier.pdf

products and distributing \$100 million in low interest loans to help finance high paying, high-growth job opportunities and support advanced manufacturing technologies to help existing industries become more productive. In addition to this, they sought voter approval in November for Issue 1, a \$500 million bond program to help create new high-paying jobs, recruit world-class researchers to Ohio and bring state-of-the-art products to market. Through the Third Frontier Project investments, additional federal and private sector support will help generate more than \$6 billion for Ohio’s economy, leading to the development of new products and the creation of thousands of high-paying jobs in Ohio.

Industry Targets

The Ohio Third Frontier Project focuses on manufacturing technologies in an effort to assist already established industries become more creative. They are also focused on business startup and formation for new companies.

Exhibit 8: Ohio’s Governor Taft at the 3rd Frontier Summit



Additional Unique Programs: Edison Technology Centers Introduction⁶

The Edison Technology Centers link industry with academia and government in partnerships to strengthen industrial competitiveness through technological innovation. There are currently seven Edison Centers. Each of centers offers capabilities in specific technologies including: advanced manufacturing, polymers, materials and processes, welding and materials joining, biotechnology, and environmental. Companies involved in the Edison Technology Center programs benefit from: relationships with world class universities and federal research facilities, providing state of the art basic and applied research technologies; a range of technical services including testing, technology analysis and assessment, training, hotlines, business and economic studies, information database retrieval pilot plant and microfactory assistance and computer modeling; networking and services which cover informational needs through frequent seminars, forums, and conferences.

Programs and Program Features

CAMP, Inc.-Cleveland

CAMP, Inc. provides manufacturing, engineering, technical management, and other services for manufacturers seeking to become more productive, more competitive and more profitable. (<http://www.camp.org>)

Omeris (Biosciences)-Columbus, Cincinnati, Cleveland

⁶ Data obtained from www.odod.state.oh.us/tech/edison/tiedc.htm

Omeris promotes the growth of the Ohio biomedical/biotechnology industry by providing business development services, building collaborations between industry and research institutions and funding research and development. (<http://www.ebtc.org>)

EISC, Inc.-Toledo

EISC moves Ohio companies toward world-class excellence through manufacturing modernization. Areas of expertise include: advanced imaging, applied coating technologies, food manufacturing technologies, CAD/CAM, rapid prototyping, quality improvement, plant/layout work cell design, environment and waste minimization. (<http://www.eisc.org>)

Edison Materials Technology Center (EMTEC)-Kettering

EMTEC provides problem-solving and applied research in materials and processing technologies including metals, ceramics, composites and polymers. (<http://www.emtec.org>)

Edison Welding Institute (EWI)-Columbus

EWI provides materials joining and engineering expertise to manufacturers throughout the United States. (<http://www.ewi.org>)

TechSolve, Inc.-Cincinnati

TechSolve provides assistance to manufacturers and manufacturing-related businesses, specifically in the following disciplines: waste reduction, machining, operations analysis, industrial engineering,

energy conservation and computer-aided process planning.
(<http://www.techsolve.org>)

Ohio's IT Alliance- Dayton, Athens, Cincinnati, Cleveland, Columbus, Toledo

Ohio's IT Alliance provides regional economic development programs designed to support Ohio's extensive information technology (IT) industry.

(<http://www.ohionsitalliance.org>)

Industry Targets

The Edison Technology Centers encompass an extensive range of industry targets. They are not solely limited to information technology. They also have backgrounds in biotechnology, biomedical, materials technology, bioengineering and manufacturing technology.

Additional Unique Program: Edison Technology Incubators Introduction⁷

The **Edison Technology Incubators** nurture small technology and manufacturing businesses during the start-up stage. The Incubators provide a variety of business assistance including below-market space, shared office services, and managerial and technical assistance in an environment beneficial to new small businesses. They also offer entrepreneurs the ability to concentrate in the development of a product or service without the typical problems that affect such start-up ventures and often result in their untimely termination.

⁷ Data obtained from
www.odod.state.oh.us/tech/edison/tiedincu.htm

Edison Incubators also offer a variety of administrative support to tenant companies, including: rental space, laboratories, "clean rooms", conference rooms, telephone answering, bookkeeping, access to specialized equipment, manufacturing and assembly areas, offices, reception areas, access to business equipment including copy and fax machines, word processing, and break rooms. The Edison Incubators also provides tenants access to the Edison Technology Centers and local universities, which provide an array of technical resources.

Programs and Program Features

Currently there are ten technology incubators.

The Akron Industrial Incubator-Akron: Established in 1983, the Akron Industrial Incubator enjoys an international reputation as a successful small business incubator created through a cooperative partnership. The city of Akron, the Akron Development Corporation, the University of Akron, and the state of Ohio have jointly created the program to assist small businesses.

Bio/Start-Cincinnati: BIO/START, Greater Cincinnati's biomedical, bioengineering, and biotechnology start-up business incubator since 1996, is located near the University of Cincinnati campus. As part of Ohio's Thomas Edison Program, BIO/START provides laboratory facilities, business expertise and a supportive environment for entrepreneurs and their newly formed life science companies. BIO/START is Greater Cincinnati's only bio/medical business incubator. It provides specialized wet lab

space and shared technical equipment for entrepreneurs and start-up companies at below market rates. Operational support services are also available on a fee-for-service basis. More importantly, BIO/START offers business counseling, entrepreneurial education and an infrastructure of support that enhances a tenant's probability of success. Since 1996, BIO/START has helped to create 70 jobs and assist in 31 tenant companies. In addition, it was restructured with a regional focus for company formation and statewide focus for industry advocacy and growth. It has generated over \$5 million of sales and revenue. It has also brought over \$16 million into the region through equity investments, small business innovation research programs (SBIR), and other grants and research contracts.

Mansfield/Richland Incubator (MRI)-

Mansfield: They have a business incubator program known as Braintree. Braintree is a non-profit program that assists business startups and emerging companies in Northern Ohio. Its experienced partners offer counseling, customer referral, access to capital, and training opportunities. It also offers space for heavy and light manufacturing as well as offices for business, service and high technology ventures.

Youngstown Business Incubator (YBI)-

Youngstown: The Youngstown Business Incubator was established to stimulate entrepreneurial activity and the creation and growth of early stage businesses. The Youngstown Business Incubator is designed to ease the difficulties of launching a new

technology-based enterprise. Supported by funding provided by the Ohio Department of Development, the Incubator provides a comprehensive range of services to its tenant companies to help them achieve growth, stability, and commercial success. YBI provides services such as business counseling, business plan review, business/product development assistance, general business counsel, financing sources, SBIR, public awareness and patent/invention assistance. The Youngstown Business Incubator (YBI) has entered into a cooperative agreement with the National Aeronautics Space Administration (NASA) Glenn Research Center, and the Great Lakes Industrial Technology Center (GLITec). The agreement confirms the intent of YBI, NASA, and GLITec to work together to encourage development of new companies and the implementation of new technologies that are easily applicable to commercial use.

Edison Technology Incubator

(ETI)/BioEnterprise-Cleveland: The Edison Technology Incubator program, located at Enterprise Development, Inc. (EDI), is designed to nurture new and emerging technology-oriented businesses. ETI offers services to their clients similar to those offered by YBI, i.e. financial referrals, business counseling. In addition to these services they also offer market planning, technical assistance, entrepreneurial education, public relations, and office services. This business incubator has industry targets such as: Biomedical, Biotechnical, Chemical Analysis, Software Development, Process control, Engineered Material, Microelectromechanical Systems.

Business Technology Center (BTC)-Columbus: The Business Technology Center accelerates the formation of investable, sustainable technology-based businesses by providing qualified entrepreneurs with the specialized infrastructure, guidance and networking contacts necessary to launch and realize their visions. The Business Development Office (BDO) of the Business Technology Center (BTC) assists in the successful incubation of technology businesses. The BDO is one component of a system designed to augment the start up company's management with the professional services and advisors that are critical to start up company strategic, tactical and financial development. The BDO provides assistance in a number of business development activities including: market research and analysis, competitive positioning and pricing strategies, strategic plan development, product development planning, marketing and sales program and materials development, supplier, customer and strategic partnership agreements, recruitment of management and staff. Additionally, the staff of the BDO can act as a sounding board and advisor for company management, permitting them to behave as a larger company when making critical decisions. The process of developing a new technology business is risky and arduous. The BDO can help BTC client companies reduce the risk, effort and expense of critical business development activities.

Hamilton County Business Center (HCBC)-Cincinnati: Hamilton County Business Center, Inc. (HCBC) is a private non-profit business incubation program serving the Greater Cincinnati marketplace. Since 1989, HCBC has been the home to

over 180 business start-ups. HCBC assists entrepreneurs by providing flexible space, administrative services, business counseling and assistance, and a vibrant and supportive environment. HCBC is a mixed-use incubation program that caters to those entrepreneurs who are starting up an innovative and growing business.

Lewis Incubator for Technology (LIFT)-Strongsville: LIFT is a business incubator program designed to nurture new and emerging technology-based businesses. LIFT has strong links with the NASA John H. Glenn Research Center at Lewis Field (formerly NASA Lewis) and this affiliation provides outstanding resources for technology and support. LIFT is managed by Enterprise Development, Inc--an organization with a successful history in entrepreneurial assistance in partnership with NASA Glenn Research Center, the Ohio Department of Development, and the Great Lakes Industrial Technology Center. Its primary objectives are to create businesses and jobs in the State of Ohio, and to increase the commercial value of NASA knowledge, technology and expertise. LIFT offers a wide range of services and facilities to the entrepreneur to increase the probability of business success. These services are focused on unique needs of technology based, start up companies and allow the new business to devote its limited resources to developing its product or service in the most effective manner.

The Entrepreneurs Center- Dayton: TEC researches, identifies, teaches and disseminates the critical skill and values that enable entrepreneurs to succeed. In order to

foster economic development, TEC maintains a network of other successful technology-based entrepreneurs for self-help and peer support. Utilizing NBIA "Best Practices" TEC is considered to be on the leading edge with complex infrastructures that promote the development of a spectrum of new technology businesses:

- A technology infrastructure, second to none, that will foster the development of innovative, leading edge, market oriented, and technology based products and services.
- An orchestrated set of services, beginning with a screening and evaluation process and moving on to the specifics each company needs to thrive.

Examples of assistance being offered to businesses that have a credible business concept with prospects for growth include but are not limited to:

- Guidance mentors
- Free and reduced outside services
- Access to debt and equity financing
- Business technical assistance
- Quarterly review of financials
- Centralized Office and Administrative Services

Industry Targets

The Edison Technology Incubators have a broad range of diverse industry targets. They are not limited in their contributions to the high technology New Economy. These programs target such industries as: biomedical, bioengineering, biotechnology, industrial technology, start-up businesses, and high technology ventures. These business incubators also have industry targets such as: Chemical Analysis, Software Development, Process control,

Engineered Material, Microelectromechanical Systems.

INDIANA

In the PPI report (depicted in the table below as well), Indiana ranked 41 in the country in aggregated knowledge jobs. From a perspective of globalization in the New Economy, the state ranked 22 in the aggregated rank. In the economic dynamism sector the State ranked 30, and in the digital economy sector the state ranked 31. Overall, Indiana was ranked 36 nationally in the State level New Economy Index.

Table 4: Indiana Ranking in 2002 State New Economy Index

Overall	36
Knowledge Jobs	29
Globalization	27
Economic Dynamism	44
Digital Economy	16

Source: <http://www.neweconomyindex.org/states/2002/index.html>

Indiana Certified Technology Parks Introduction⁸

Modeled after Michigan's "Smart Zones," Indiana's "Certified Technology Parks" are the state's newest economic development tool for promoting high-technology activities. "Certified Technology Park" designations were created by a bill passed during the 2002 special session of the Indiana General Assembly. As part of the law, certain incremental income taxes and sales taxes attributable to businesses within the designated park would

⁸ Data obtained from www.in.gov/doc/businesses/CertResearchPark_index.htm#5

be distributed to the commission for use in financing additional high-technology activities within that park.

Programs and Program Features

Establishing a local technology park is a key step to creating high-tech - high paying jobs. Certified Tech Parks also have the ability to capture incremental sales and income taxes for specified uses within the park. Indiana now has Certified Technology Parks in West Lafayette, Anderson and Shelbyville. The most recent, Shelbyville has yet to be built, but it already has five tenants lined up. Certified Technology Parks must have the support of a research university, access and utilization of the public, a business plan and an incubator. They must be approved by the Indiana Department of Commerce. High-technology incubators have been developed in various cities nationwide, including Dayton, Ohio, Evanston, Ill., Huntsville, Ala., and Bloomington, Ind., Robinson said. Incubators are facilities that provide space and staff for individuals and fledgling businesses, thereby better enabling small businesses to survive and grow.

Industry Targets

The Indiana Certified Technology Parks want the businesses that are within their designated areas to focus on several different targets. Some of those are: information technologies, biotechnology, electronic device technology and medical device technology.

Exhibit 9: Technology Park at Purdue University in Indiana



Additional Unique Programs: Indiana 21st Century Research and Technology Fund Introduction⁹

The Indiana 21st Century Research and Technology Fund was created in 1999 by the General Assembly to stimulate the process of diversifying the State's economy by developing and commercializing advanced technologies in Indiana. The enabling act created a Board, representing most of the academic and commercial sectors of the State, which establishes Fund award and review policies, and approves awards. The IDFA administers the 21st Century Research and Technology fund on behalf of the Budget Agency.

Programs and Program Features

The Fund has made awards in three broad categories: Science and Technology Commercialization; Centers of Excellence; and Entrepreneurial Activities. In addition, the Fund provides cost-share on behalf of Federal proposals submitted by Indiana-based entities. It emphasizes the creation of academic-sector: commercial-sector

⁹ Data obtained from www.in.gov/idfa/century

partnerships. In making awards, the Fund expects significant leverage from the partners involved in the projects. Awards are made for periods of up to two years in amounts up to \$5 million, though the Fund's Board has indicated that awards above \$2 million will be uncommon. The Fund makes awards based on peer review, involving a review panel comprised of science and technology researchers and commercialization experts from across the country.

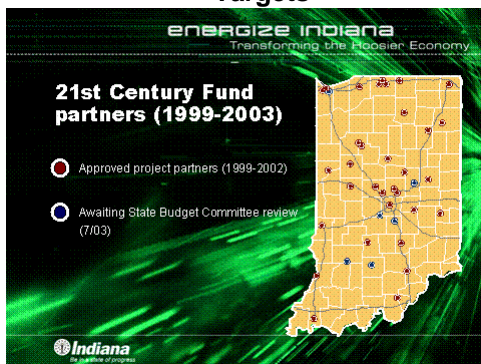
Industry Targets

Indiana 21st Century Research and Technology Fund has targeted industries such as science and research technology and commercializing experts.

Additional Unique Programs: Energize Indiana Introduction¹⁰

Energize Indiana is a 10-year, \$1.25 billion initiative for Indiana's future. Energize Indiana builds on Indiana's strengths, including its strong work ethic, its dedicated workforce, its world-class research universities and its central geographic location.

Exhibit 10: Energize Indiana's Geographic Targets



Program Features

This program is still in its planning stages. It has plans to invest capital into several different and new programs. They do not provide many details about these programs. A few of the programs and the amount of capital are listed below.

- **\$360 million** in the new Indiana Growth Fund, which will be directed to the 21st Century Research and Technology Fund and to efforts to move ideas to the marketplace
- **\$40 million** to establish technology centers or parks
- **\$42 million** in rural development
- **\$75 million** in university research construction projects
- **\$200 million** in K-12 education
- **\$135 million** for scholarships for college students studying in four targeted industrial sectors
- **\$35 million** in the State Student Assistance Commission of Indiana
- **\$50 million** in assessing skills of Hoosier workers and matching them with jobs

Industry Targets

Indiana is focusing on four sectors is to diversify the economy, making it more resilient in downturns. Those sectors include: advanced manufacturing, life sciences, information technology, and 21st century logistics.

MINNESOTA

In the PPI report (depicted in the table below as well), Minnesota ranked 9 in the country in aggregated knowledge jobs. From

¹⁰ Data obtained from www.i69tour.org/energize.html

a perspective of globalization in the New Economy, the state ranked 29 in the aggregated rank. In the economic dynamism sector the State ranked 19, and in the digital economy sector the state ranked 9. Overall, Minnesota was ranked 13 nationally in the State level New Economy Index.

Table 5: Minnesota Ranking in 2002 State New Economy Index

Overall	13
Knowledge Jobs	9
Globalization	29
Economic Dynamism	19
Digital Economy	9

Source: <http://www.neweconomyindex.org/states/2002/index.html>

Minnesota Technology, Inc.¹¹

Minnesota Technology, Inc. was established by the State in 1991 as a technology-based economic development organization focused on advanced manufacturing companies. MTI is a non-profit corporation established to contribute to the growth of Minnesota's economy by assisting industry in developing, applying and commercializing technology. The corporation has six main offices throughout the state: Minneapolis, Rochester, Virginia, Moorhead, Redwood Falls and St. Cloud.

Programs and Program Features

MTI supports a number of initiatives designed to ensure a well rounded offering of services:

eBusiness Institute: A collaboration between MTI and the UM-Crookston, these seminars are geared to senior level staff at small and medium-sized companies in

¹¹ Data obtained from www.minnesotatechnology.org/mn/index.asp

greater Minnesota, focusing on how to incorporate Internet technologies into their business strategy.

Federal Technology Transfer: Utilizing strength and knowledge at federal labs (including NASA), MTI is able to help companies find solutions to design and process issues.

University Collaborations: MTI helps companies find a resource within the University of Minnesota that may be able to assist in design solutions for products and processes.

Tekne Awards, in collaboration with the Minnesota High Tech Association, recognizes those technology companies, leaders and products that help make Minnesota a leading technology center.

Minnesota Technology Directory Online: Minnesota's most comprehensive listing of technology-intensive companies in the state.

Industry Targets

The center targets numerous industries, including manufacturers of computers and electronics, scientific and medical instruments, industrial machinery, fabricated metals, plastic and composite materials. Minnesota's technology economy thrives because it focuses on three primary technology sectors: advanced manufacturing, information technology and life sciences.

Advanced manufacturing is the largest technology umbrella in the state, comprised of over 20 separate industries organized into

six clusters. Advanced manufacturers produce electronics, chemicals, machined products, and telecommunications/computer equipment; and provide testing/measurement, photonic/laser and engineering/environmental services. Minnesota is home to approximately 1,300 firms in advanced manufacturing industries. Together they account for 4.9% of the state's gross output.

The information technology sector in Minnesota is possibly the most recognized technology sector, comprised of nine industries organized into four clusters. Information technology consists of application development/IT services, software, Internet applications, and telecommunication services. Minnesota is home to over 850 information technology firms. Many of the nation's leading information technology firms have their roots in Minnesota.

The life-science sector consists of 12 industries organized into three clusters: biotechnology, medical devices, and pharmaceutical. Minnesota is home to over 300 life science firms. Minnesota-based companies like Medtronic, St. Jude Medical, MGI Pharma, and Surmodics are internationally recognized leaders in the medical devices, pharmaceutical and biotechnology communities.

WISCONSIN

In the PPI report (depicted in the table below as well), Wisconsin ranked 35 in the country in aggregated knowledge jobs. From a perspective of globalization in the New Economy, the state ranked 39 in the aggregated rank. In the economic dynamism sector the State ranked 46, and in the digital economy sector the state ranked 27. Overall,

Wisconsin was ranked 40 nationally in the State level New Economy Index.

Table 6: Wisconsin Ranking in 2002 State New Economy Index

	Economy Index
Overall	40
Knowledge Jobs	35
Globalization	39
Economic Dynamism	46
Digital Economy	27

Source: <http://www.neweconomyindex.org/states/2002/index.html>

Introduction Technology Zones¹²

Wisconsin's Technology Zone Program is an exhilarating new economic development enterprise that offers much-needed motivation to the expansion of businesses in Wisconsin's high-technology sectors. There are currently eight zones that have been created throughout Wisconsin (see map on page 45). Each zone is effective for 10 years and receives \$5 million in income tax credits. These credits are made available to high-technology businesses located in a designated Technology Zone.

Exhibit 11: Wisconsin's Technology Zones



¹² Data obtained from www.commerce.state.wi.us/CD/CD-bed-tz-general.html

Program and Program Features

SuperiorLife Technology Zone: The region is home to the University of Wisconsin-Superior, Northland College, and the Wisconsin Indianhead Technical College. A regional training network is in place for technology-based managers who desire personalized technology-based employee training. Land is available for expansion and development of technology-based businesses with existing urban and technology infrastructure. The zone also offers the Northwest Enterprise Center Network of incubators. This technology zone provides businesses and workers access to many methods of transportation, including air, freight rail, water, and the Interstate highway system.

I-94 Corridor Technology Zone: The I-94 Corridor is home to three University of Wisconsin campuses and two technical colleges. The Chippewa Valley Initiative, a joint venture between UW-Eau Claire and UW-Stout, is designed to enhance and expand high-tech academic programs. The region guarantees a highly trained and experienced workforce. Those that work in the region are employed in professional or technology-related fields. The area is served by an excellent system of highways, including Interstate 94, the economic corridor linking the Twin Cities to Madison and Milwaukee. The zone is also accessible by freight and railways.

Western Wisconsin: Collaborative thinking and practices are inspired by technology imperatives like the Allied Health Science Center. The region boasts a labor force of

approximately 147,000, of which more than 24,000 workers are already involved in high tech-based industry employment. A diversity of technology zone tax credit sites in the seven counties with more than 2,000 acres prepared for development and more than 840,000 square feet of quality building space to accommodate expanding or new technology-oriented companies.

Capital Ideas: This region is home to one of the world's top research universities. There are numerous entrepreneur and small business support networks, including the UW-Madison research engine, WARF/Technology Transfer, BioStar Initiative, and Wisconsin Innovation Network/High Technology Consortium.

Northern Central Advantage: This technology zone has numerous business, industrial and technology parks with appropriate infrastructure and capacity for growth. It also possesses the availability of all necessary utilities, services and telecommunications. The region takes pride in its focus on commitment to education, strong work ethics, and an abundance of skilled labor forces.

Southeast Tri-County: The area is home to some of the world's leading manufacturers, which has led to the development of a skilled and dedicated workforce. This three-county Technology Zone also offers various high-amenity sites/locations. This technology zone works closely to post-secondary educational institutions such as the University of Wisconsin-Parkside. UW-Parkside works in collaboration with TechStar in an effort to turn research in

academic laboratories into commercial ventures. The area is served by interstate and state highways as well as several rail freight services and customer rail service. Access to local airports is also available in this region.

Metropolitan Milwaukee: The area is home to some of the world's foremost important manufacturers, which has led to the development of a trained and committed labor force. Milwaukee Metro Area is home to numerous institutions of higher learning including: Alverno College, Cardinal Stritch College, Carroll College, Concordia University, and Marquette University. The region has paved the way for transporting voice, fax and digital signals electronically. Fiber optic cable is woven throughout the region's infrastructure. Local markets for long distance and local telephone service are highly competitive and the telecommunications gross receipts tax is being phased out.

Newrep: An Education Action Group has been set up to help businesses meet labor needs. Collaborations between universities and technical colleges have proposed a New Business Assistance Center and incubator to be built in concert with the Northeast Wisconsin Technical College's referendum. The area also has a high concentration of corporate headquarters. This technology Zones work in collaboration with many post secondary educational institutions in its surrounding area, including the University of Wisconsin sites in Green Bay, Oshkosh, Fond du Lac, Fox Valley, Manitowoc County, Marinette County, and Sheboygan County. Four-lane highways that provide direct links to Milwaukee and Chicago

service the zone. It also has access to several rail carriers and the Great Lakes ports that make it extremely accessible.

Industry Targets

The Wisconsin Technology Zones embody a multitude of industry targets. The SuperiorLife Technology Zones has industry targets such as: factory automation, advanced materials, chemicals and pharmaceutical, telecommunications, and manufacturing equipment.

The I-94 Corridor Technology Zones' targets include: computer and electronic technologies, medical technology and devices, materials technologies and plastics, information technology and biotechnology.

The Western Wisconsin Zone includes targets such as: allied health sciences & biomedical technology, paper printing & publishing product and information services.

Capital Ideas includes targets: biotechnology, instrument manufacturing, and information technology and transportation equipment.

The Northern Central Advantage Technology Zones has industry targets such as: financial services, health care, and information services.

The Southeast Tri-County Technology Zones' targets include: biomedical technology/ informatics, information technology/ data processing, biological/chemical relations and telecommunications.

The Metropolitan Milwaukee Technology Zones includes: machinery manufacturing/ automation, biomedical technology/informatics, and information technology/data processing.

The Newrep Technology Zones' targets are comprised of: information technology, metallurgic technology, small engine technology, and engineering/ design.

V. Conclusion

Technology based economic development programs are driving the development agenda in today's states, regions and localities. With an economic shift towards services and the high technology sector, technology industries are going to dominate the economic development programs.

“Technology innovation and commercialization are the new drivers of economic growth, both in the U.S. and around the world. Our ability to create new technologies and harness their power will directly impact our national prosperity, security and global influence. Technology development is also essential to improving the quality of life, economic vitality and standard of living of communities throughout our nation.”

- Bruce Mehlman,
U.S. Department of Commerce

Recommendation 1

Understanding the outcomes and development of technology based economic development (TBED) policies are going to be essential from a public policy perspective. States are spending public tax dollars to benefit economic development policies, which necessitates evaluative measures of these policies and programs. In the report, we have highlighted several State level programs spending over \$1 billion in supporting technology business development. These programs, including the SmartZones need some form of performance based evaluation.

We suggest a simple and preliminary analysis, which will create some evaluative criteria of return on investments for communities and local governments to measure and justify support of these programs. In order to develop a monitoring scheme measuring the impact of 'success' the TBED have had in their designated areas, we suggest conducting a rank-order analysis. This analysis should rank the TBED based upon three variables, including a) the number of firms, b) number of employees and c) the sales revenue generated by companies in each zone or other programs supported by the Midwest States. The rank-order should rank each program based on the suggested variables and evaluate programmatic success through inclusive public meetings. Furthermore, the analysis should measure the relative magnitude and impact the zones have had in their areas, looking at the percentage increase of the three variables since the TBED program(s) were introduced.

Potential Outcome for Recommendation 1

The recommended analysis suggested above will enable a better understanding of the achievements of the TBED and depending on the impact, help shape future policies that would benefit these zones and State programs. Furthermore, it will enable policy-makers to understand the current landscape of technology-based development in the jurisdiction of their interest by enumerating the three variables.

Recommendation 2

Given the competitive nature of economic development and particularly of technology based business location decisions, we suggest a constant monitoring of neighboring State programs, by Michigan policy-makers.

Potential Outcome for Recommendation 2

Staying abreast with competitor State programs, will increase the competitiveness of Michigan's programs. Furthermore, the constant reviewing of these programs will also enable Michigan's policy-makers to see success and failures of technology development policies in other States and accordingly position State level policies.

The suggested recommendations are mere beginnings of policy evaluation of TBED programs, and further research needs to be conducted for creating a systematic assessment method.

VI. REFERENCES

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