

If you keep *doing* what you're *doing* . . .
You'll keep *getting* what you are *getting*.

A White Paper from the Educational Institutions of Southeastern Wisconsin to the Economic Interest Organizations of Southeastern Wisconsin on an Industry cluster Business Development Plan

PREFACE

This paper is written at the request of those who are concerned with the economic future of southeastern Wisconsin and its need to create/attract high pay, high skill and high technology jobs to southeastern Wisconsin. The educational institutions, Carthage, Gateway and UW-Parkside, were asked to provide a summary of the status of the economy of southeastern Wisconsin, some predictions for the future, and a suggested game plan for the development of a positive future economy in southeastern Wisconsin through knowledge based jobs. Knowledge based jobs are those generally referred to as those which use specific knowledge in the development of products, processes or services as opposed to those who deploy repetitive skills or manual labor. Specifically, the colleges were asked to provide some game plan with suggested action initiatives to facilitate job growth and identify the industry clusters appropriate to southeastern Wisconsin.

INTRODUCTION

Governor Doyle has established his "Grow Wisconsin" economic development plan. Key to rebuilding the economy of Wisconsin is to reverse the decline of the position of Wisconsin relative to the average annual wage. Governor Doyle in his Grow Wisconsin economic development plan, identifies this as a key strategy. Governor Doyle's plan states:

- Retain and Create High Wage Jobs
"Despite Wisconsin's highly educated and skilled workforce, the state has fallen behind the national average in wages. I have set a goal that Wisconsin will exceed the national average by the end of the decade."

However, at the University of Wisconsin Economic Development conference, John P. Morgridge, chairman of the board of Cisco Systems, referring to retaining and creating high wage jobs initiative, cautioned, "We need to be careful with this one; high wage today means something different than what it meant yesterday. The jobs that generated high wages yesterday will not necessarily generate them tomorrow. Morgridge's statement is no better illustrated in any other state than Wisconsin. Wisconsin has traditionally lead the national norm in terms of annual wages, largely due to its manufacturing base. That however, no longer is the case. In the last ten years Wisconsin's per capital income has slipped to 95% of the national average and the prediction is that over a twenty year period, it will fall to 83%. Wisconsin is also slipping in relative position to surrounding states such as Illinois and Minnesota. The average annual income of an individual in Wisconsin is now almost \$4000 below that of Minnesota and \$3850 below Illinois.¹ It appears that this trend is going to continue unless strategic action plans are developed locally and statewide. If we keep doing what we have been doing we are going to get what we have been getting.

What Wisconsin needs to do is learn how to grow the new jobs of tomorrow. That's what this white paper is about – growing new high value jobs in southeastern Wisconsin. This paper also leads to the role that education will and should play in that process. Moreover, this paper also calls for the role

¹ *Vision 2020-A Model Wisconsin Economy*, Wis. Technical Council, 2002

southeastern Wisconsin can play with regard to a state strategy for economic development. Two key strategies of the state's plan are as follows:

- Prepare workers for tomorrow's economy;
- Create and unleash knowledge to build emerging industry.

Regardless of political, geographic or cultural leaning, it is obvious these goals need to be pursued in southeastern Wisconsin.

DESCRIPTION OF THE PROBLEM

When considering the need to build new high value, knowledge based companies and jobs in Wisconsin and southeastern Wisconsin, how do we stack up? In short, we do not, and therein lies the problem--Wisconsin and its various regional economies are "not" now positioned as a state that is far along a path leading to the new economy.

In 2002, the Progressive Policy Institute published for a second time a "States New Economy Index." In the Summary of Results, the following is quoted:

"The two states that remain most firmly rooted in the old economy are West Virginia and Mississippi. Other states with low scores include Arkansas, Alabama, Wyoming, Louisiana, North Dakota, South Dakota, Kentucky, South Carolina, and Wisconsin."

Clearly, the majority of states in this grouping have been traditionally rated in negative terms in economic development; however, the group has a newcomer--Wisconsin.

The problem is further illustrated in various statistics developed for the "States New Economy Index." With a total of 21 indices, Wisconsin ranked 40th of the 50 states. Wisconsin is ranked in the lowest quartile! Particularly low rankings in the index were:

- 1) Managerial, professional & technical jobs in the knowledge area – rank is 43rd;
- 2) Economic dynamism (essentially economic change) – rank is 46th;
- 3) Job churning (the number of new start-ups and business failures as a share of all established) – rank is 48th.

The only areas that Wisconsin appears in the highest quartile are:

- 1) Education level of manufacturing workforce – rank is 11th;
- 2) On line manufacturing – rank is 13th.

This further indicates Wisconsin's dependence on manufacturing, but these indices also illustrate that manufacturers that are surviving in Wisconsin are depending on a highly skilled workforce and increasingly using technology to survive which is a good sign but also indicates that Wisconsin needs to build knowledge based support companies and jobs to keep these manufacturers competitive and providing value added products to their customers.

However, it's not just the "new economy index" that southeastern Wisconsin should worry about. As John P. Morgridge, chairman of the board of Cisco, states in his address at the 2003 Economic Summit: "Wisconsin's challenges in creating a new economy also are:

- A critical mass of similar knowledge based companies so that “cross-talk” can take place to nurture and develop that industry sector;
- A lack of experienced financial and marketing professionals that understand and can work with knowledge based companies;
- The perceived lack of an entrepreneurial culture.”

Mr. Mogridge’s statement has particular impact in that he represents not only one of the most advanced high tech companies but also his experience in the development of the Silicon Valley.

Southeastern Wisconsin, while probably not as severe as other places in Wisconsin, does mirror these statistics and images. However, there is a uniqueness in terms of Walworth and Kenosha counties. According to the Wisconsin Taxpayers Alliance August 2003 publication, *The Wisconsin Taxpayer*, Kenosha and Walworth counties had the largest net gains of residents from a bordering state from the period of 1995 to 2000. These two counties alone accounted for 5,445 net in migration compared to a total of 7,313 for the entire state. Almost 75% of the in-migration from Border States comes from these two counties! The *Taxpayer* concludes, “Employment changes and retirement are the main reason for individuals migrating between states. However, overall quality of life differences might account for moves across state lines from one Border County to another.” This one factor may be a strategic factor for southeastern Wisconsin in leading the state toward knowledge based jobs. Many of the individuals who are migrating from Illinois to Kenosha and Wisconsin are young to middle age, and above average in wealth, and professional and managerial. They also represent some of the best knowledge based employers in the country. This in-migration can be capitalized on as a base to build knowledge jobs.

WHAT DO WE NEED TO DO AND ELEMENTS OF A PLAN

Focus on the Long Term

It is obvious from what has been presented so far that we can’t keep doing what we have been doing. What is needed is a bold blueprint for the future. That blueprint though should not be so rooted in the past but more directed at predicting the future. Traditionally, economic development, job forecasting and subsequent programming decisions are made on past studies of statistics, most going back ten to twenty years or more. While this may be a good strategy for the stock market, it is not a good way to predict a future economy. Predicting the future is a key component to what is needed in a plan. That folds out practically as a vision. Visions by their nature are long range. Expecting too much too soon will not serve the area well. There are no quick fixes for the fundamental, structural changes in our economy. This economy was built over at least one hundred years; it will not turn around in one.

Risk Tolerance

It is also intuitive that as with any strategic business plan, there is risk. One very key ingredient to building new knowledge based companies is the ability of that company to take risks. Without high risk there is not the chance of high reward. Whatever plan that is developed must model this concept if southeastern Wisconsin is to be a place of these companies and individuals. Political, educational, and business interests must develop both the courage and culture among themselves to tolerate and accept risk. Not all initiatives will work. Building a culture of acceptance rather than risk avoidance will be a key component for all elements of our community if we are to achieve success.

Regional & Clustered

We live in an interconnected world. Companies and businesses no longer exist as silos and even work with their competitors when it is to their strategic advantage. Those companies that have maintained their isolation have either lost market share or met their demise. Many in the public sector do not see this connectedness. Companies and businesses, particularly in the knowledge based industries, who observe this "siloism" in the public sector observes, in their opinion, negative communities. A knowledge based company or business who observes a connected public system is much more likely to think positively of that community. So another critical ingredient of the plan is that it be built upon a sense of regional partnerships between the public and private systems.

As stated in the white paper for the 2003 Economic Summit, ". . . regionally important clusters must be recognized and supported for that region to prosper economically." Clustering is a concept now adopted by the state and in southeastern Wisconsin. "Industry clusters have become, in the United States as well as in many parts of the world, the new mantra for economic development policy. It is a fact that businesses tend to cluster in order to take advantage of suppliers and specialized services that are attracted by concentrations of customers . . . Nothing is more important to clusters than the development of their human resources, and in no area are they more dependent on the state, which is the biggest single investor in education and training. . . ."²

However, the idea of clustering should not be limited to the strategies of the private and public government system. Clustering should be part of the planning of the colleges and universities.

Although many educational institutions have broad missions that include meeting the needs of a wide range of individuals and employers, it is primarily the two-year and four-year regional colleges and universities that are best able to focus on and respond to a regional, cluster based economy. ". . . But most colleges have not yet discovered the value to their economy of becoming a particular cluster's center of excellence, or figured out how to develop the specialized expertise needed by specific types of firms. . . ."³

Southeastern Wisconsin is fortunate to have an excellent PK-16 system. The higher education institutions of Carthage College, the University of Wisconsin-Parkside and Gateway Technical College have long established cooperative relationships. Strategic partnership through various 501(c)(3)s have been established already. In effect, one of the biggest strengths of southeastern Wisconsin in developing a regional cluster based economic development, knowledge based economy is just the thing that most have yet to recognize . . . the strength of education—an educational partnership to establish clusters of excellence. These partnerships need to be capitalized on further, both in terms of extending the leadership role of education and also in marketing this strategic advantage. Other regions will be playing catch-up if we continue to build upon and expand the systems of educational partnerships and leadership that has developed over the past few years.

There are no Quick Fixes

There are no quick fixes for the transition of the economy in southeastern Wisconsin or for Wisconsin. Real economic growth will not come with the traditional 300 or 400 employee relocations where one company moves from one state to another. These relocations actually will happen in a lot of instances to reduce wages and increase productivity, much of which is being done offshore. These relocations are based on an economic reality of that which has been done for a while somewhere can be done cheaper someplace else. So the future, especially for a knowledge based economy, is not in attracting large companies, but in building, nurturing, and supporting smaller companies around an existing larger enterprise that may be located regionally. In effect, the conglomeration of smaller companies builds the

² Targeting Clusters, Achieving Excellence by Stuart A. Rosenfeld, James Jacobs and Cynthia D. Liston, Regional Strategies, Inc.

³ *ibid.*

total impact of the cluster. Unlike traditional economic development, immediate results cannot be realistically expected. What can be expected is change over time. Beginning with slow development this is accelerated as image, culture, and cluster support folds out. What is needed is political, education and business enterprises have to develop the strength and capacity to recognize and be able to tolerate a long time frame for bottom line results.

A Plan

To this point, this paper has developed the problem, the need, and a basic view that the future economy of southeastern Wisconsin is dependent on knowledge based companies and jobs. The idea of a knowledge based economy where embedded knowledge creates a wealthy society with an ever increasing standard of living for everyone has widespread appeal and acceptance. In the Vision 2020 document prepared by the Wisconsin Technology Council, this point was adequately established as a noble goal for Wisconsin. They state:

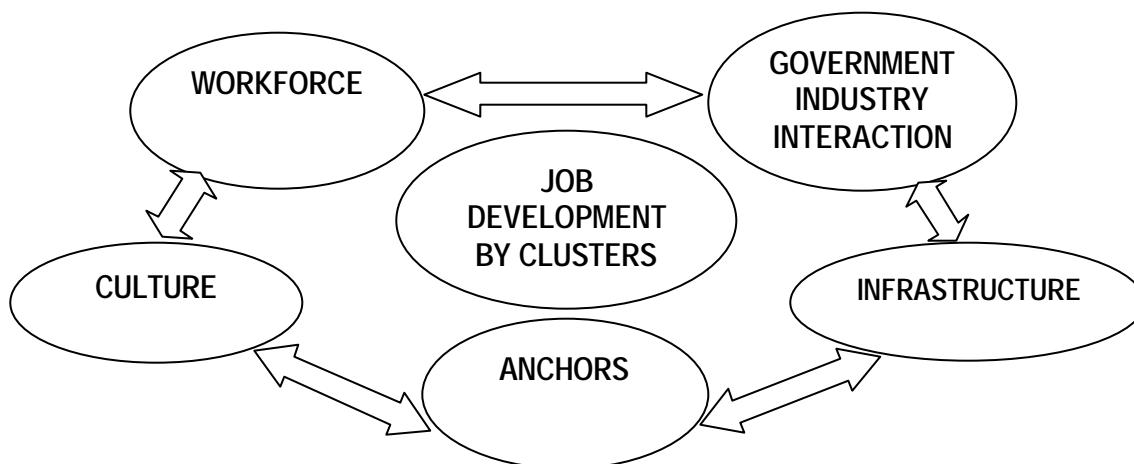
“Wisconsin needs a knowledge strategy to be competitive in the modern knowledge based, global economy. Wisconsin’s traditional industries that rely on inputs of land, labor, and capital are declining. . . . As high paying jobs are lost in that sector (manufacturing), we must replace them with new high-technology business.”

High technology, though, is not just in ‘high tech businesses.’ It is in manufacturing also, and southeastern Wisconsin needs to assist our current manufacturing base in maintaining its economic position. However, try as we might we will not be able to maintain high wage employment numbers in this sector without substantial change. Therefore, southeastern Wisconsin needs to build knowledge based, high technology employment as suggested by the Wisconsin Technology Council.

“Building a knowledge rich, high technology sector in our economy will require a clear plan for the systematic production of new knowledge based producers and services.” The following is an attempt to articulate such a plan for southeastern Wisconsin.

The Framework

John P. Morgridge, chairman of the board of Cisco, provided for us the genesis of a template for development of our plan. Mr. Morgridge outlined a template that he suggests historically characterizes the development of the so-called “high tech” centers in the United States. He used such places as Silicon Valley, the Massachusetts 128 and North Carolina research triangle as all having these essential elements. Below are his suggested elements for creating a “high tech zones” and knowledge based employment.



It seems appropriate that if indeed these are the elements essential to the development of high tech zones that they would be appropriate as the elements of a plan for high tech knowledge based cluster growth in southeastern Wisconsin. The elements then of our suggested plan are as follows:

Cluster Development: It is suggested that southeastern Wisconsin should reorient economic development programs to support regional industry clusters. These clusters should identify both existing and emerging clusters of high skill high wage jobs and organize around them. The state has identified several clusters and it seems appropriate that several of these are appropriate to southeastern Wisconsin. It is also apparent that other clusters exist right across the state line. Pulling these clusters into Wisconsin seems to be a logical strategy for the area to pursue. However, it is recommended that some structure such as indicated in this plan be adopted in order to ensure that the cluster concept of economic development be operationalized.

Status: The area has a good start in establishing the idea of clustering as a tool of economic development. The formation of the tri-county cluster initiative and the emergency of the three advanced technology centers is the beginning of this effort. The region is also being defined as the development organizations work closely together. While we want to maintain our vital linkages to the north and across the state line to the south the concept that is emerging is that the uniqueness of the area is the linkage and as such serves that unique role. The challenge lies in tying the diverse needs of the more rural areas to the west with the urban needs to the east and insuring

Workforce: Critical to the development of knowledge based jobs is a knowledge based workforce. Reviews of several studies of effective high performance companies indicate that the quality of the work force was a common characteristic. There is also a school of thought that the quality of the work force is the one area that makes it very difficult for a company to leave an area. A company dependent upon the higher and higher skill level of its people is very reluctant to abandon that base. The workforce may be the single most important component for a knowledge based company. It is recommended that each identified cluster have a strong and focused educational component.

Status: One of the area's greatest strengths lies in its educational institutions. The development of advanced technology centers within Gateway Technical College with each having a unique educational component is unique to only Gateway in Wisconsin and exists as a tool in only a couple of locations in the country. The development of skill standards in most educational delivery in the technology centers give promise for benchmarking the workforce to advanced knowledge based standards as well as identified core skills that are transferable between clusters. The signing of the contract between Gateway and IBM to offer the high end e-business certificate is a tremendous boost for the area as a high end educational delivery location. For a period of time Kenosha will be the only location in the country where this training will be offered. In addition, this education fits with the long term strategic planning of a major player in the knowledge based employment field. The Lakeview Manufacturing 9-12 Academy is unique and the effort at project based learning and high school businesses at Burlington are focused on cluster development. The K-12 system in southeastern Wisconsin is positioned to greatly assist with cluster development. The leadership provided by UW-Parkside in developing projects into learning objects at the classroom level as well as their involvement with the SBDC is positive. Carthage's involvement with *ScienceWorks* and their involvement with the establishment of the Center

for Advanced Technology and Innovation are also indicators of regional cooperation and support. The biggest positive though is that they all work together. The challenge will be to get others involved in education to participate and to weather the storm of taxpayer backlash to bad economic times when it is a time when education is needed most. An additional challenge exists in maintaining the course within the construct of the politics of boards and the politics of the public arena.

Culture: Companies and businesses have cultures that in some way influence how they operate. Much has been written about corporate culture and the fact that it, in no small way, determines the success of a company. Culture in knowledge based companies is even more of a factor. When working with a problem, it is important that an individual have a supportive climate that enables him/her to feel as though they can overcome the problem. For entrepreneurship to work in a community there must be a cultural acceptance of failure. A community that understands this and purposefully provide venues of support will be the community where knowledge based companies want to be.

Status: This area will be both the major challenge and the biggest change in image. While there are starts in other areas this one is the farthest away. There is just beginning in Racine a different approach that is intended to appeal to knowledge workers. But it is just a start. Even this effort has seen some criticism as those who want to maintain the industrial culture and image of the past do not understand the lack of appeal to bottom line economic development efforts of the past. There is a definite need to develop the image of the area as a cool place to be. That is far from the image at present.

Infrastructure: To say that everything will be "virtual" in the future is only partially true. The infrastructure must be in place to provide this "virtuality." The telecommunications/computer systems networks – both hardware and software must be in place and must be located somewhere. In addition, a focus location for the cluster will provide just that – a symbol for the cluster. A "place" identified for a cluster tends to reinforce the concept that the cluster will continue and that support structures will be in place for the years ahead. "Where" is everything. In addition, the infrastructure must also provide intellectual property support and venture capital financing.

Status: The efforts of the Racine/Kenosha technology group to assess technology infrastructure are putting the area ahead in overall infrastructure development. The location of the telecommunications hub at Gateway's Kenosha campus also helps to define a focal point for telecommunications development. The work UW-Parkside is doing to connect Internet2 to the telecommunications hub and possible connection to companies to access research holds real promise for knowledge based company growth. The start of the technology professionals group also addresses the need to form associations to keep IT professionals in the community. As the technology study indicates, though, there are some issues in the area with regard to telecommunications infrastructure, particularly west of the "I" and to the south in the Lakeview Industrial Park. As venues arise for the solving of these issues through technology or other means the institutions need to step forward in entrepreneurial ways to accelerate deployment. The region is well along in establishing the concept of advanced technology centers. These centers provide not only a physical presence for economic development initiatives; they also provide symbols for the community and the outside world that the area is moving towards knowledge based jobs. The idea as developed by Gateway is to build smaller centers niched to a few clusters

rather than a large one in the middle of the region. Each center is located in the appropriate location where that community is already heading in terms of that cluster or the community clearly desires to foster that cluster. Each though is to serve the three county area in terms of its unique service. All of the centers have a common mission in three areas. They are:

- Unique cluster development
- Education and training
- Technology deployment

While the centers would not duplicate the efforts related to the cluster, they in fact interrelate to provide deployment and education services. In addition, each may provide unique education and deployment service.

There are three advanced technology centers in operation or about to be in operation in Racine and Kenosha counties. These are overseen by either a separate not-for-profit or an executive committee. Walworth County has an extension of the Kenosha County Lakeview Center that is semi-operational.

No other Wisconsin region has developed the idea of advanced technology centers to the extent that southeastern Wisconsin has. The organization may be unique to the United States. This gives southeastern Wisconsin a distinct advantage in focus and structure to accomplish the knowledge based economy goal. However, there are challenges to be met. First, while the centers are placed strategically, they are not designed to serve only the community they are in. The challenge will be to make sure that they also serve the region. Second, the current centers do not serve all of the identified clusters. The clusters that have not been addressed to this point will need to be housed in existing centers or locations secured for their operation. Third, notably missing is service to Walworth County as related to their unique economic development needs. Walworth County has yet to develop a focus on knowledge based jobs. In addition, the existing centers all have private financial support. At the present time that support is not evident in Walworth County.

The area is fortunate that entrepreneurial structures have been set up in two of the three counties. The most prominent example is in Racine where intellectual property is used to form companies or licensed to leverage investment. The availability of seed and business development financing is a challenge. While initial efforts in Racine/Kenosha to develop an network, much more needs to be done to attract venture capital financing.

Anchor: Every successful high tech area, according to Mr. Morgridge, has had anchor businesses or enterprises. For example, Silicon Valley had HP and Fairchild, the Research Triangle had IBM, and the RT 128 corridor had Wang and DEC. While these companies were a part of the growth, they were not the majority. The most growth came from smaller companies that located around them to either vendor or locate because there was an available workforce in these companies. Anchor companies allow for growth around them. They also provide some stability around the formation of smaller companies. Some small companies will be successful and some won't. Larger companies can provide job stability as other smaller companies come and go.

Status: Southeastern Wisconsin has been fortunate to have already developed anchor relationships as follows:

- S.C. Johnson at CATI advanced technology center

- DaimlerChrysler at LakeView Advanced Technology Center
- Abbott Labs at BioCATT advanced technology center
- IBM at BioCATT advanced technology center
- TDS Metrocom at BioCATT advanced technology center
- Grand Geneva/Marcus Corporation at Lake Geneva
- Snap-on Inc.

Not only are these companies anchors for development, they are also financial contributors and business partners. The challenge to come is the development of joint business relationships that result in financial gain to all parties. Another challenge is to accommodate other partners as they emerge and still maintain the strength of the original partnership. Those involved with the development of the area initiatives are starting to see interest by other businesses so that all could be considered anchors. The other high tech areas of the country have found ways to be inclusive of other businesses as they develop. Another challenge is the perception of some that because of the partnership with anchor companies that somehow smaller companies will not be served.

Government/Industry Interaction: In order for knowledge based companies to grow as with any industry, there needs to be a positive relationship between companies and government. Communities that assist companies in securing state and federal funds for research or technology deployment are of great value to small and medium size start up ventures. Local and state political support is of absolute necessity for these companies to survive in initial stages. Public official and private business collaboration have created the high tech areas of the country. There is no reason to believe it is not a requirement in southeastern Wisconsin.

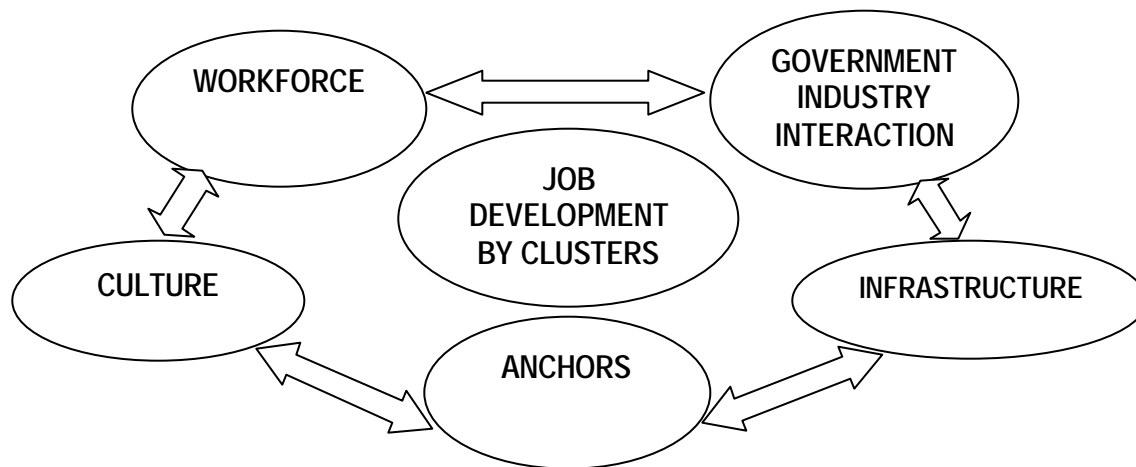
Status: Southeastern Wisconsin has in operation a large number of public/private partnerships. State funding in the name of various partnerships exist as follows:

- Racine/Kenosha advanced manufacturing consortium
- Tri-county technology zone consortium
- Center for Advanced Technology and Innovation
- Center for Bioscience and the Integration of Computer and Telecommunications Technology
- Tri-county cluster Initiative
- Lakeview Advanced Technology Center Executive Committee

In addition funding has been provided from both the legislature and the administration of three governors. The county offices of Racine and Kenosha have provided both in-kind support and funding through sources such as workforce development centers. The office of Congressman Paul Ryan has been instrumental in securing Federal funding. Additional projects are now proposed for additional funding assistance. The challenge is not to get business together with government but to get government together with government. This is starting to occur through the various consortiums. In addition, the close collaboration between the two county executives in Racine and Kenosha shows promise for collaborative growth in areas such as commuter rail and may actually save funds for use in developing the future economy. There is a challenge, though, in getting all three counties working together with all governmental units at all levels. In addition, not all local officials see the value of partnerships and not all understand the knowledge based economy.

Nesting:

Assuming we accept these elements as the key elements of cluster development, it seems appropriate to consider that since the overall plan would contain these elements that each subset cluster would also contain these elements. Nesting each cluster under these essentials will give not only clarity to direction but also weaves together a common thread to all appropriate clusters. It is suggested that for each cluster our communities that a detailed work plan be prepared that initiates activities in each of the five element areas. For example, for the workforce element, there should be in each cluster plan a workforce initiative specific to that cluster. The idea of nesting is illustrated as follows:



Identifying Clusters

In identifying clusters, it is important to not only consider jobs of the future but also what do we have as a start in terms of the basic elements identified under the framework section of this paper. Do we have a base element in the area of an existing workforce and what is the likelihood of developing expertise in education and training related to that workforce? Do we have now any government/industry interaction related to this cluster? Do we have any start on developing an infrastructure? Do we have any indication that we can advance an appropriate culture? Do we have close or can we develop an anchor enterprise? Obviously, we would not have all of these, but in order to reasonably expect that we can achieve success, we need a few elements to begin with.

Based upon these criteria, the educational institutions have identified the following clusters as appropriate:

- Automated Systems Manufacturing
- Biological Science and Medical Apparatus
- Entrepreneurship and Enterprise Development
- Computer and Telecommunications Systems Integration
- Transportation
- Travel/Tourism

Some of these track with those identified by the state; they are:

- Manufacturing
- Biotechnology
- Transportation
- Travel & Tourism

Others are more nontraditional in the sense that it is our feeling that these are enablers in order to get to a new economy. By this we mean that while these aren't specific to an occupational area they do serve the interests of all the other clusters. It may well be that without these two the others may not happen. These more futuristic clusters are:

Computer and Telecommunications Systems Integration
Entrepreneurship and Enterprise Development

BREAKING THE PLAN DOWN INTO ITS COMPONENT PARTS

Southeastern Wisconsin has actually been on a track to developing knowledge based companies and jobs for several years. However, in the last five years the effort has been accelerating. This effort began with the development of advanced technology centers. Gateway Technical College and southeastern Wisconsin is the only educational institution and region to receive Wisconsin Department of Commerce funds through legislative appropriation to develop the concept into a reality. In addition, Gateway was the second technical college to actually bond and fund advanced technology centers under newly enacted legislation. Gateway is the only institution to accomplish the establishment of these centers across county districts and to plan these centers around economic development studies and summits conducted by the same firm for all three counties. Kenosha and Racine counties have been fortunate in having the executive level leadership that supports knowledge based job development. The area then is as far along the development path as any community in Wisconsin. The next step is organizing these efforts into a cohesive and identifiable plan that gives some direction and inventory of effort against criteria. The model suggested in this paper seems appropriate for detailing progress and needed development of individual clusters. Each cluster will now be developed with a review of current efforts and status versus the plan components and then some suggestions presented as to a plan ahead.

AUTOMATED SYSTEMS MANUFACTURING (LAKEVIEW ADVANCED TECHNOLOGY CENTER)

Manufacturing employment is drastically dropping in the United States. This is no better illustrated as in Wisconsin. The hope for the future though is that manufacturing maintains its economic base. That will only happen if companies automate and reengineer their processes and workforce. Wisconsin has a good start in this direction. There are only two positive measures in the States New Economy Index related to automated manufacturing. Wisconsin ranked 11th in states in terms of an educated manufacturing workforce and 13th in the degree that manufacturing is on line. In addition, southeastern Wisconsin had the first advanced technology center dedicated to manufacturing and engineering.

Workforce Development: Since the area has long been a location for manufacturing it has developed an educated workforce in this area. The challenge though is upgrading that workforce and attracting new employees to replace those retiring. The new employees require new skills and know ledges related to automated systems and the intersection of manufacturing and information systems. Lakeview was established with this in mind. The advanced technology center contains a 9-12 high school dedicated to manufacturing and engineering. It is the site for an associate degree in automated systems manufacturing. It serves as a center for short-term, just-in-time courses for

the existing manufacturing workforce. These programs are articulated with four year engineering and management programs. Seamless engineering educational partnerships are emerging with MSOE and Marquette. Students in these programs receive not only credit from the institution they primarily attend but also simultaneously receive credit from the next level institution. The curriculum offered in the advanced technology center is referenced to the national skill standards for manufacturing.

Culture: The area has had a rich culture with regard to manufacturing; that culture has not always been conducive to change and particularly not conducive to systems automation. In the past few years that has changed considerably, particularly as it relates to manufacturing employment. There exists a culture that allows for change and allows for the development of knowledge based jobs within existing companies.

Government industry interaction: One of the real strengths of the area is the evidenced cooperation between government and manufacturing. DaimlerChrysler is in Kenosha and Case New Holland in Racine are in the area today because of the efforts of local elected officials. State assistance in funding of job retention projects have resulted in new business locations and expansions. Leadership is strong with in the business and industry associations and quasi-public economic development associations and these groups are dedicated to preserving the economic value to the area. The major challenge is being able to meet the needs of manufacturers' training and automation services quickly enough to prevent job loss.

Infrastructure: There is infrastructure in place to support manufacturing. The availability of the traditional infrastructure components of raw materials, transportation, sewer and water are in the area. There are locations, however, where the availability of high speed data service is severely limited. It will be a challenge to for the region to assist with the more rapid deployment of high speed data service. The BioCATT 501(c)(3) has the potential to accelerate this deployment.

Anchor: Unlike a lot of other communities there are a number of home based companies located in the region. There are also several very large international companies now in the region notably among these are Daimler Chrysler in Kenosha. This company can represent the others who are anchors in that they are now almost entirely automated and represent the reengineering of manufacturing in the automobile industry.

Status: Try as the region might the number of jobs in manufacturing by current employers is going to continue to decline. The region must do three things to maintain manufacturing's economic position. First, the region must continue to find ways to work with existing companies (small and large) to assist them in automation and process redesign. Second, the region must accelerate the deployment of technology/ telecommunication infrastructure. Three, the economic development interests need to replace a portion of lost manufacturing jobs with new high value manufacturing employers. Employers who are providing products on the upside of the product cycle will be the ones needing a high quality workforce.

BIOLOGICAL SCIENCE AND MEDICAL APPARATUS (BioCATT)

The numbers of people employed in the biological and pharmaceutical area residing in southeastern Wisconsin is rising every year. Younger professional, managerial and technical individuals

are moving across the state line from Illinois. Kenosha County's largest employer is Abbott Labs. The numbers in this field are also rising in Walworth County. In addition, there is much written about the possibility of very significant breakthroughs in research that will enable technology and information technology to converge to form health care products and systems that may revolutionize the health care industry. Some say that these breakthroughs may be the next wave beyond the computer impact on the economy. Southeastern Wisconsin needs to be positioned to accelerate not only the relocation of residents but to also gradually bring those jobs across the state line.

Workforce Development: Prior to the academic year of 2003-04 there was no educational program directly providing employees for this field. With the opening of the BioCATT facility two new associate degrees will be offered in this field. The bioscience laboratory program is targeted on providing the industry with technicians for the research lab or industrial lab work setting. The biological production program prepares individuals for production careers. Both of these programs are built on industry skill standards. The Bioinformatics program at UW-Parkside leads toward the next wave in the industry. The next step is to build a parallel and innovative delivery system for existing workers in this cluster.

Culture: Despite the perception that the Kenosha area is a traditional blue collar community there are more and more professionals and higher technology individuals living in Kenosha County. This is starting to have an impact not only on the culture but also the political system. There appears to be a much more professional culture merging. The challenge will be to accelerate this change through providing venues of exchange for young professionals involved in the biological fields. Such activities such as seminars, sponsored chat rooms, and the merging of work places with recreational places have the potential to move the culture more closely aligned with this cluster.

Government Industry Interaction: There exist several venues for business industry cooperation. BioCATT's board is a combination of business government and education leaders. The discussions regarding the commuter rail have brought business and government together for a common cause. There is a concern that working with the large companies in this field will somehow be at the expense of smaller companies. The region must better sell the concept of anchor companies because they can assist greatly the development of small companies and in fact there have recently been created a few companies as spin offs of larger companies. The advanced technology center should begin to facilitate this transfer.

Infrastructure: The infrastructure is in place for biological pharmaceutical cluster growth. As with other clusters the availability of high speed data service is an issue. Especially should there be a spin off company decide to locate in the southern part of the Lakeview industrial park. In addition the area does not have within it a strong university research base. Therefore, the spin off concept has more potential. Kenosha as well as Walworth county need to develop research ties to the large companies operating in this cluster. The opening of the BioCATT advanced technology center offers a physical location and symbol for the development of this cluster.

Anchor: The most obvious anchor to this cluster is Abbott Labs. Their world head quarters are just a few miles south of the state line. They are acutely involved in BioCATT and have donated funds to the project. The training offered at BioCATT has been benchmarked to their company standards.

Status: The development of this cluster is actually an extension of an already existing trend. The state line is a geopolitical boundary. Those working in this cluster do not see it as a barrier. The

local and state economic development interests should see the line in the same way. What is good for northern Illinois is good for southern Wisconsin and vice versa. However Wisconsin should concentrate more on spinning smaller support and spin off companies into the area. In the education area more should be done in short term and seminar education to build a sense of community and educate the existing workforce.

ENTREPRENEURSHIP AND ENTERPRISE DEVELOPMENT (CATI)

The real job growth in the next ten years is predicted to be in the creation of new jobs in new companies. These new companies will either be new start ups or spin offs of existing companies. The issue is particularly acute in Racine County, where it is clear that for new growth new ventures need to be started. The region needs to provide for the start up and location of these enterprises if it is to take advantage of this trend. In addition focusing on the technology these potential companies may need or use begins to build a critical mass for further development. Since the area does not have large research based University producing infant technology the strategic approach is to seek those companies and technologies that are beyond the seeding stage.

Workforce Development: In order to develop these clusters individuals need to be educated in entrepreneurship, team building, group dynamics and just how to run a business. Education needs to be modeling how knowledge based companies work. To reflect this modeling education must in some location be delivering via projects or organized like businesses. The region has a very good entrepreneurial start at CATI where project based learning is the adopted mode of delivery. A new advanced associate degree was launched in the fall of 2003 to form learning teams from students from different disciplines to address a project or assist a company needing a problem solved. Students from Burlington high school have formed there own companies and are learning the small business process. There is a need though to further develop the enterprise development phase of this cluster. There is a need to teach the technology processes associated with how small businesses can access and use information to gain strategic advantage. There is a need to deploy this knowledge to not only advanced technology centers but to workforce development centers and other centers that can provide access for the public.

Culture: There is within southeastern Wisconsin a heritage of invention. That has resulted in the progress of the past. It now needs to be reinvented. That will not occur unless there is a plan to develop an inventive culture. This inventiveness theme needs to be promoted and structures and venues need to be established where groups of entrepreneurs can exchange ideas and share successes and defeats. The Racine young professionals group I holds promise for developing this type of culture. The organization of the CATI advanced Technology building around a coffee shop atmosphere adds a symbol to the development of a young professional culture. The region needs to develop this concept further in other locations east and west of I-94.

Government industry interaction: There is considerable government business cooperation with regard to this cluster. Racine Area Manufacturers and Commerce, Racine County Economic Development Corporation, Racine County, City of Racine, Racine county workforce Development and the educational institutions are all cooperating on the CATI 501(c)(3) to assist with the development of the concept. All are also funding partners in the advanced technology center. The challenge ahead is to get the cooperation across county lines so that the concept has both support and possible funding across the other two counties and west of I-94.

Infrastructure: The infrastructure is in place for this initiative in the operation of the incubator and project based learning at the Center for Advanced Technology and Innovation. The strategic direction of concentrating on technologies and available intellectual property is beginning to show results. This is a very important future direction and positions the area uniquely to our competitive advantage.

Anchor: There are several anchors that have emerged with regard to this initiative. The first and most prominent is SC Johnson. SC Johnson is a financial contributor and a financial partner. There are two others though that are more virtual; they are International Specialty Products and Kraft. It's through these companies that the intellectual property is obtained.

Status: The Racine community has made great progress with the CATI concept having acquired over 30 million dollars in intellectual property rights. In addition, companies have started and licensing fees are being paid to the 501(c)(3). Curriculums with project based learning at there base have been started and students enrolled. The challenge again is to keep in mind that there is a service to be provided to the other two counties, and the two counties need to take advantage of the concept. In addition, while the entrepreneurial operation is now becoming successful at CATI, the region needs to also concentrate on the enterprise development portion of the cluster. The region needs a center for enterprise development.

COMPUTER AND TELLECOMMUNICATION SYSTEMS INTEGRATION (BIOCATT)

We are at that point in the fold-out of computer and telecommunications technology that both technologies are being integrated together and being integrated into the core business processes of all businesses. Technology integration is the key to the success of most companies. IBM one of the key technology companies, if not the key, has over the last ten years redesigned its entire strategic plan around this theme of connecting and integrating. The area would do well to be an early adopter of this strategic move in the area of technology and be known as an area where this integration is essential to the economic development strategy. This cluster then is a major enabling cluster without which the other clusters may not be possible.

Workforce Development: A workforce that is grounded in the use and expert in the information technology field is essential to the future of any area of the United States. As indicated in the cluster of manufacturing, there are very few businesses today that are not interconnected. Today and into the future that interconnection takes place through the intersection/integration of computers and telecommunication technology. In order for southeastern Wisconsin to participate in the economy of the future it must extend the general skill level of the workforce and provide for the specific education needs related to the front end advancement of this field. With regard to building the general skill level the educational institutions need to make allowances for information technology as core curriculum offering as a basic skill. Every individual graduating from the institutions should demonstrate skill in basic computer and information technology just as they do for other basic skills. In addition, there should be a curriculum at the high school level that concerns itself with integrating computer and information technology into business and service enterprises. Traditionally, we have tied computer technology to the disciplines of business and electronics. Prior to that, we tied the curriculum to the math and science disciplines. What we in education have done is follow the movement of these technologies from the laboratory to the business operation. However, there is a next step. We have seen much written recently about the bursting of the dot com bubble. Some have lamented that these jobs are lost. In fact, the opposite is true. The projected need for individuals in this area is actually at a critically high point. What has changed is

that as companies and businesses have integrated information and computer systems into their core business systems they have integrated these jobs into their workforce systems. Education must again follow the advance of this technology into the core of its structures. In addition as mentioned above there needs to be a curriculum that specifically teaches the workforce the skills to integrate this technologies into companies and businesses. The offering of the IBM curriculum is an example of the education needed for this next step.

Culture: In order to facilitate this cluster the area needs to be a place noted as being technology friendly. The area needs to provide places where technology people are associated with other technology people. Coffee houses and technology associations are key to developing this culture. Racine and Kenosha have a start with the business establishments that are starting to develop. The advanced technology centers in both counties have places and high tech coffee shops set up to allow for interaction. The Racine/Kenosha technology group is also a head start on the formation of associations that are technology oriented.

Government industry interaction: Since the development of the technology infrastructure is in a large way involved with approvals and funding assistance of public officials, government partnerships are critical for the development of this cluster. The cooperation in this area is evident and a strength of the southeastern area. Both Kenosha and Racine counties have become involved in not only supporting policy initiatives related to technology infrastructure, they also have provided grant funds for implementing technology system upgrades.

Infrastructure: The region conducted a study of the technology infrastructure. The result has been a blueprint for infrastructure development. The results indicate while there is infrastructure available and that it is at a high level of equipment and service, there are large pocket areas that need service. These areas include areas west of the I-94 and around the border with Illinois in Kenosha County. In addition, if the area is to assist companies and businesses with the integration of technology there exists a need to form networks for accessing research through high data services.

Anchor: The partnership between IBM and Gateway Technical College in the delivery of the e-business Developer program offers the potential of the anchor business. For at least a time, southeastern Wisconsin will be the only location in the United States offering the program. The area needs to capitalize on this to make sure this is known and to make visible that the area is on the radar screen as far as major corporations involved in technology are concerned.

Status: The region has already made progress with the development of this cluster. Workforce programs have been initiated including the E-business IBM program and the introduction of literacy courses in educational programs. Work needs to be done on making more educational programs introduce information systems literate. In addition a technology center needs to offer the basics of system integration at the secondary level. Also, government, business and education need to get together to see if both funding and expertise can be put together in innovative ways to provide high speed data service to areas where it is not available or not cost effective. The educational institutions need to also accelerate the effort to access the possibilities of Internet2 as a source of research for companies and to form the partnerships to make that happen.

TRANSPORTATION

The State of Wisconsin has identified transportation as one of the eleven clusters for economic development. Nowhere in Wisconsin is it more important than Southeastern Wisconsin as it is the Gateway to the state in terms of commerce and the movement of people. Transportation is important from two perspectives. First, the area is a major route in terms of the movement of people. More and more commuter traffic is going both north and south to the major metropolitan areas of Milwaukee and Chicago. The recent movement toward commuter rail makes this cluster even more significant. Second, the area has a wealth of companies who are in or in businesses that serve the transportation area. Snap-on Tool, for example, depends on a thriving transportation industry. The DaimlerChrysler engine plant is the most productive in the world. These two factors point toward more jobs in a number of areas not only the traditional such as automotive service technicians and collision repair technicians, but also some more entrepreneurial such as dealer training, rail locomotive operators, and mechanics and electronic repairers -transportation. This area, as are a lot of others, is being impacted by technology. There are at least eleven on-board mini-computers in a new automobile today.

Workforce Development: The need for technicians in just the auto service industry is at a very high level. With the introduction of computers to the automotive system the skill level required has increased significantly. The workforce skill shortage of the existing workforce is matched by the lack of graduates coming from traditional programs. Automotive programs are vanishing at the secondary level and the numbers are not growing at the post secondary level. There is an image problem of these careers that do not match the reality of the work situation as well as the skill level required. In addition there are no programs that transition individuals into a career ladder that moves into management or sales areas. No programs exist for the more non-traditional programs related to rail, water, transit or transportation logistics. There are programs dedicated to air transportation; however, these are principally related to flight or maintenance. There are none for aviation administration or logistics.

Government industry interaction: There is an increasing high level of cooperation between government and transportation related businesses. The recent cooperative efforts between counties and across the state line for initial funding of commuter rail are an example of this cooperation. There are discussions with regard to state support of an advanced technology center related to the transportation industry. Local governments, especially in Kenosha County, have been very active in supporting transportation related companies.

Infrastructure: Obviously the infrastructure is in place for this cluster to be one of the major regional economic development areas. The area is a major road, rail and air transportation hub. The commercial and recreational water transportation opportunities presented by Lake Michigan and the lakes of Walworth County center the area for the sales and service as well as the manufacture and distribution of water transportation products. What is not in place is a center of focus around which the cluster can develop.

Anchor: There are a lot of possibilities with regard to the possible anchor company. Major transportation companies in the area are; DaimlerChrysler, Bombardier, Volkswagen, Yamaha. All of these have been actively positioning the area as both a manufacturing center but also as service centers. Snap-on however has been very active in the promotion of education and specifically promoting transportation and transportation related education across the country. They are also one of the few home based companies still in the region. They also, because of the nature of the tool business, relationships with most all transportation related companies. If approached they may be a good choice as a lead anchor.

Status: The transportation industry comprises a large portion in the manufacturing economy in the southeastern Wisconsin region. Their interests from the perspective of the making of their product is being represented in terms of the manufacturing cluster. However, the need of transportation in terms of service, operation and sales is not being addressed. Education, training and promotion of the area as a service center are not now being addressed. These needs need to be met for a very simple reason. If these companies continue to be successful at automating manufacturing we will continue to lose jobs. These jobs need to be replaced. Most new jobs will be in the service sector. There are low pay and high pay service jobs. Service, sales and education jobs in this industry cluster are high pay jobs. Southeastern Wisconsin should position itself to replace the lost manufacturing jobs with high pay service jobs. Why not do it with the companies who are already represented in the area? In essence, the region needs to build on the companies in the area to center in on these service jobs. However, the area at present has no center. The area needs an advanced technology center in the service area of transportation. That center, similar to the other centers, would provide both secondary and postsecondary training, and serve as a focus for the development and deployment of technology into the service sector of transportation. The challenge will be to design the secondary program as appropriate to the entire transportation field and to change the image of the program away from the traditional vocational auto shop to a true academy. In addition, the center's deployment service should concentrate on providing service in all areas appropriate to the region's interest in transportation not.

TRAVEL AND TOURISM (Grand Geneva)

Travel and tourism has long been the mainstay of Walworth County. While this field does not always pay high salaries and the beginning level of employment is not considered to be high technology, technology is having an impact on this occupational area. The focus in terms of travel and tourism should be on developing a supply chain concept so that individuals who are qualified can move from low skill, low wage jobs to higher skill, higher wage jobs. In addition, the region should concentrate on assisting the industry in automating and technologically upgrading its business system. The travel and tourism industry is no different than other industries in that technology is being embedded in its core business operations. This requires a more technologically oriented workforce that knows both the travel business and the new technologies used by that industry.

Workforce Development: There are a couple of challenges to building a workforce for this cluster. First, because of the traditionally low wages at the lower positions, the occupation has a negative connotation among the general public and therefore doesn't attract the students that others might. Second, most companies would rather promote from within to fill vacancies. The business depends on the personal skills of its employees, and finding the right combination of people skills in an individual is as important as technical skills. Companies want to retain and promote individuals with these skills. The response by the workforce development system needs to be to create a knowledge and training continuum that starts with the 11-12 grade and continues through the baccalaureate level. The system of public educational offerings should parallel that of industry and various entrepreneurial approaches ought to be put together that merges the two at points. The 9 through 16 continuum exists now in Lake Geneva and is taught at the Grand Geneva.

Culture: The culture exists for the further development of this cluster area. Wisconsin is a leading tourism state and southeastern Wisconsin, particularly the Lake Geneva area, is nationally known as a resort area. The issue is to develop a culture that supports the development of jobs and

changing the image of those jobs to reflect both the higher skill levels needed for higher level jobs and to emphasize the technology needed by the industry.

Government industry interaction: There is a cooperation of travel and tourism businesses in Wisconsin. There are government funded travel and tourism offices in each county. The western areas of the counties are especially characterized as a cooperative relationship. The mayors of both Racine and Kenosha have made significant public investment in the redevelopment of the harbor areas as places attractive to tourism.

Infrastructure: The infrastructure is already in place for the further development of the tourism industry. From the Lake Michigan lakefront to the lakes of Walworth County, the natural setting exists across the region to continue the development of tourism.

Anchor: There are a number of possibilities for anchor travel and tourism. However, the Marcus Corporation has been very active in supporting the concept of promoting from within and employee development. They also provide a location for the travel and tourism academy as well as a location for Gateway Technical College hospitality and tourism program and for UW-Stout to offer courses.

Status: The issue is not market for this cluster; it is an upwardly mobile workforce. Education is the most important element in the continued growth of the industry. The establishment of the high school academy at the Grand Geneva site is a big step forward to begin to reinvent the image of the occupation with younger adults. Also, the offering of courses at the postsecondary level is a positive step. The effort in the next two to five years should be to establish fully functional programs at the secondary level and begin the process through skill standards to combine the curriculums offered by the businesses with that of the colleges. More needs to be done to illustrate the ladder concept is working within companies.

CONCLUSION, SUMMARY AND WHAT'S NEXT

What has been presented here is more of a structural blueprint than a paper on the clusters appropriate to southeastern Wisconsin. Identifying clusters are important; however, just to identify them will not operationalize the concept. What is proposed here is not only what the clusters are at present but also how we could look at the likelihood of success. It is suggested that we use a criteria for the following reasons. First, if the region uses the five elements necessary for the development of technology areas as a blueprint, it at least gives the region a game plan. Second, as we develop a cluster, if we realistically compare how the region compares to the suggested criterion, it will give the region some idea of the challenges ahead. Third, as we pursue these clusters in the future we can use the criteria to gauge our progress.

It can be concluded that in all of the clusters cited in this paper that southeastern Wisconsin has a high likelihood of success. The next steps involve testing this model. If the region were to adopt this blueprint the next steps would to develop strategies, outcomes and activities under each of the five elements for each cluster. The vision is to fold-out then a comprehensive regional plan that covers all the elements and all the clusters. The total of all then would represent a long term plan in which progress is made in increments totaling a new economic future.

So far, we have discussed a blueprint and criteria for the blueprint as related to the building of a new economy. That discussion was specific because it develops a plan. However, all planning needs to result in a sum gain. In the future, we will need to measure the overall effect of our efforts. We began this paper with a discussion of Wisconsin and southeastern Wisconsin's ability to build a knowledge based

economy. The criteria used was the "States New Economy Index." Perhaps in a few years the region should develop its own version of the index and again measure.

It should be pointed out as a final comment that as organized as we would like to think that economic development might be the fact is that most high tech areas developed more by the confluence of chance and opportunity rather than structured development. While this paper proposes structured development, it should not propose that all development has to be structured. Our planning should be flexible enough to add clusters as they emerge at anytime at any location. It is not as important that it flow logically but that it flows! What is proposed here should be viewed as just a tool to logically develop a way to operationalize and organize cluster development. The area should not develop structure at the expense of entrepreneurship. As a final comment, true high tech areas never end anything; they just keep evolving. Once cluster development starts it should not end.