



VISION 2020

A MODEL WISCONSIN ECONOMY

Creating wealth and improving
the quality of life in Wisconsin
through the development of a
knowledge-based economy.





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Dear Citizen:

Imagine it's the year 2020, and yet another national newspaper has published a story about the miracle of Wisconsin's economy. What will that story say?

It will describe a Wisconsin where the budding "New Economy" of 2003 has blossomed. The story will credit the skills of workers who rank among the nation's best-educated, the spirit of entrepreneurs who took risks, and the investors who believed in them. It will report on a state government that is lean, open and responsive, and a business climate warmed by reliable energy supplies, efficient transportation systems, unfettered communications and a tax system that rewards innovation. The story will praise Wisconsin's high quality of life, from its great schools to its clean rivers and lakes, to its tolerant and creative culture.

The story will dwell on Wisconsin's status as a globally competitive center of research and applied technology. It will describe how the state reinvigorated its mature economic sectors - manufacturing, agriculture, services and tourism - with the help of cutting-edge technologies developed at home. And it will tell how Wisconsin forms the heart of the "I-Q Corridor," a technology thoroughfare that stretches from Chicago through our state to the Twin Cities. Finally, and

perhaps most important, the story will describe a state where per capita wages are well above the national average.

It's a great story, but it will never be written unless Wisconsin acts now to grow its way out of long-term budget problems and to retool its economy for a new century. There is no single, easy solution. But there is a larger, interconnected strategy that calls for attracting and retaining the people, the capital, the ideas and the infrastructure necessary for a growing Wisconsin economy. That comprehensive approach is embodied in my "Grow Wisconsin" economic agenda, and it's also reflected in "Vision 2020: A Model Wisconsin Economy."

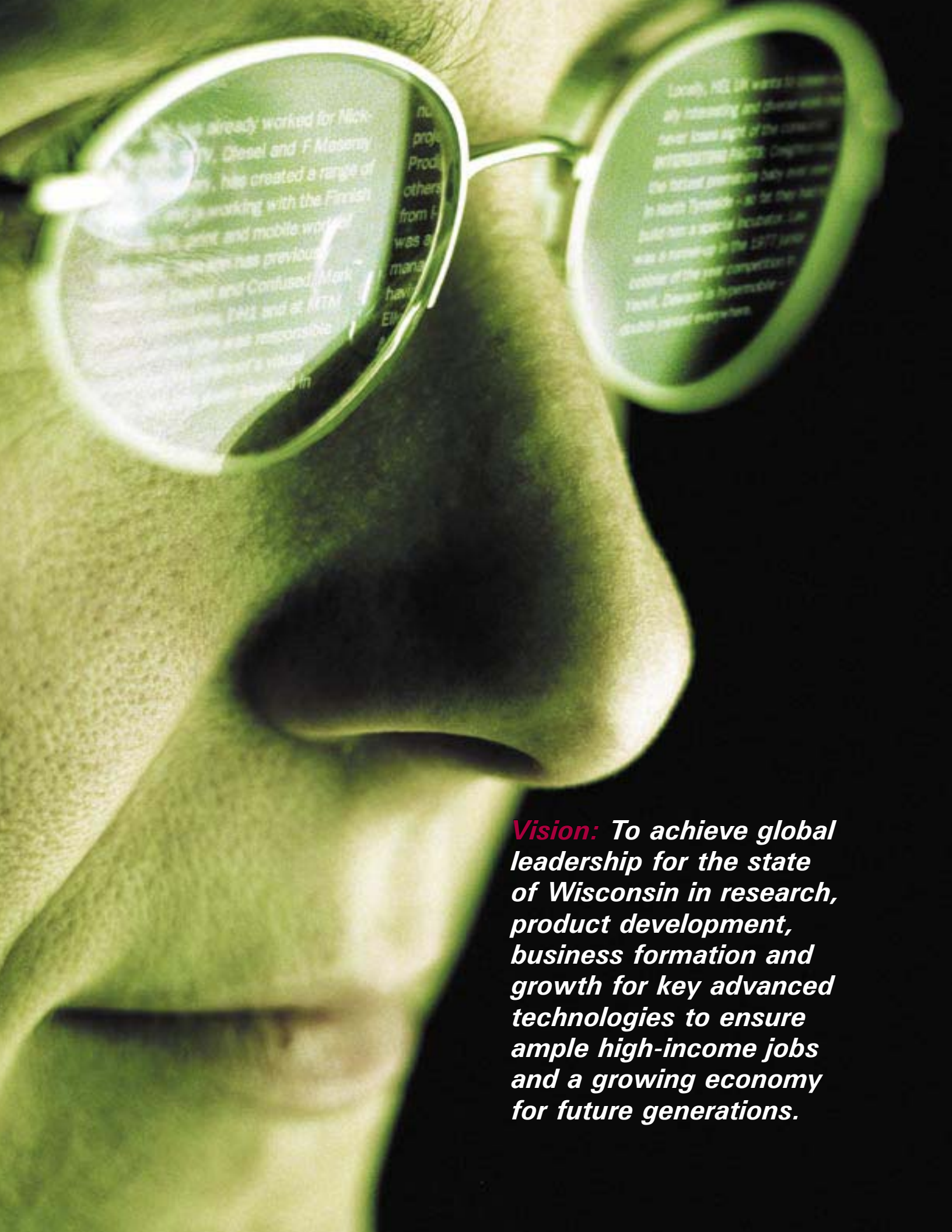
This report offers a snapshot of the Wisconsin economy as we hope it will exist in 2020. Please read on. It's a sneak preview of the headline news of tomorrow: "Wisconsin is a world leader in technology, good-paying jobs and quality of life."

Sincerely,

Jim Doyle, Governor



>> *Jim Doyle, Governor
State of Wisconsin*



Vision: To achieve global leadership for the state of Wisconsin in research, product development, business formation and growth for key advanced technologies to ensure ample high-income jobs and a growing economy for future generations.



VISION 2020: LETTER TO STAKEHOLDERS

Wisconsin's economy has been shaped and reshaped over the years by citizens who adapted quickly to changing times. We now stand at just such a crossroads in the history of the state. To build a 21st century economy, Wisconsin must make the most of its people, resources and opportunities, and meet the challenges posed by the rise of the Knowledge Economy.

The art of technology development in Wisconsin is at a relatively early stage. In order for Wisconsin to take its place among the leaders of the New Economy, some specific things must quickly take place. The state must grow, attract and retain more technology-based companies. It must build an infrastructure to support them. It must foster a tax and regulatory climate that encourages innovation. It must incubate a culture that values risk-taking and which attracts enough capital to fund our best and most marketable ideas. It must let the world know that Wisconsin has the strong research base, the quality of life and the creative workers to help tech-

based businesses grow.

The power unleashed by achieving those goals will be enormous, redefining our economy for the 21st century. Wisconsin has prospered under traditional endeavors such as manufacturing, agriculture and tourism, and those sectors will remain staples of the state economy for years to come. However, Wisconsin must also become home to technology-driven businesses built around emerging clusters of excellence. This technology-based sector will add high-paying jobs to Wisconsin—and help other sectors remain competitive through innovation.

The need for economic change is evident. In the last 10 years, Wisconsin's per capita income has slipped to 95 percent of the national average. Barring dramatic change, some forecasts suggest per capita income will fall to 83 percent of the U.S. average in 20 years. Wisconsin's quality of life would suffer if that forecast came true, but we are not doomed to a future we don't want.



Chairman:
Tod Linstroth

President:
Tom Still



“ We in Wisconsin must change our thinking and behavior as it relates to what is important for economic growth, if future generations of Wisconsin’s citizens are to enjoy the prosperity and quality of life of their predecessors.”

We need look no farther than Minnesota for an example of what can happen when a state resolves to plot a new economic course. With a culture and climate much like our own, Minnesota’s per capita income is well above the U.S. average; the income gap between Minnesota and Wisconsin is nearly \$4,000 per person and widening. That should be unacceptable to everyone—business executives, government officials, labor leaders and, most of all, Wisconsin citizens.

By working to attract high-paying jobs, Wisconsin can cure a host of ills. It can secure its quality of life. It can protect its great public institutions, including our schools and universities, which otherwise will find themselves starved for operating cash. It can break the cycle of state government deficits and offer an alternative to new taxes or additional spending cuts. By attracting high-paying, technology-based jobs, Wisconsin may eventually “grow” its way out of a multi-billion dollar crisis.

It won’t happen overnight. But it can and must happen—with the right plan.

Over the past few years, many Wisconsin citizens and public officials have visited high-growth states such as Minnesota, North Carolina, Texas and California in search of answers that might be applied to Wisconsin. These extensive studies have provided much information on approaches taken by other states. Members of the Council believe Wisconsin should now build on what we have learned from other states to develop our own, unique solutions. If we move forward together with confidence in our collective judgment, we may discover that our solutions are better—in fact, they may even be outstanding.

Wisconsin has many unique and resourceful public and private institutions that possess great potential for accelerating the growth of the state’s economy. The challenge is to bring these institutions together in an interdisciplinary effort to

AGENDA FOR CHANGE: GUIDING PRINCIPLES

1. | Start with the technology and the people who understand it
2. | Promote openness, the flow of ideas and diversity
3. | Adopt a global perspective—economic, political and cultural
4. | Foster creation of international centers of excellence
5. | Organize economic initiatives around local business communities
6. | Use existing, local resources before going elsewhere
7. | Focus on the creation of wealth, not just jobs

VISION 2020

more fully exploit the resources already in place. In this report, you will find suggestions from many of Wisconsin's thoughtful leaders about how to catalyze that effort. You will also find thought-provoking information and ideas about what lies ahead for all Americans in the early years of the 21st century.

The basic insight you should get from this report is that we in Wisconsin must change our thinking and behavior as it relates to what is important for economic growth. We want future generations of Wisconsin citizens to enjoy the prosperity and quality of life of our predecessors. A dramatic change is required to stop the steady erosion of wealth that is causing economic dislocations, which make it increasingly difficult to support our government institutions, educational systems and other common needs.

To address these challenges, the Council has developed a detailed set of recommendations that make up *Vision 2020*:

A Model Wisconsin Economy. In preparing this report, the Council was guided by its strategic mission statement and a condensed "Agenda for Change" for Wisconsin (see above). These guiding principles led to many of the recommendations in this report. They were not the exclusive source of inspiration, however, nor should they be viewed as limitations on the development of more advanced views. The pace of change in society is fast; new knowledge, scientific breakthroughs and the course of world affairs can alter our future view practically overnight.

We can say with certainty, however, that the steady advance of technology will drive future economic growth around the world. Wisconsin has a simple choice: Participate in that growth, or be left behind. Without high-tech, high-growth businesses, our economy is unlikely to measure up to the national averages, and certain never to exceed them. ■



With a culture and climate much like our own, Minnesota's per capita income is well above the U.S. average; the income gap between Minnesota and Wisconsin is nearly \$4,000 per person and widening.

Per Capita Income: 2001

Source: U.S. Bureau of Economic Analysis, 2002

	Income	Income Rank
Minnesota	\$ 33,101	8
Illinois	\$ 33,023	9
U.S. Average	\$ 30,472	n/a
Wisconsin	\$ 29,270	20
Iowa	\$ 27,331	33

n/a = not applicable

Population with 4-Year Degree: Age 25 or Older

Source: U.S. Department of Education, 2000

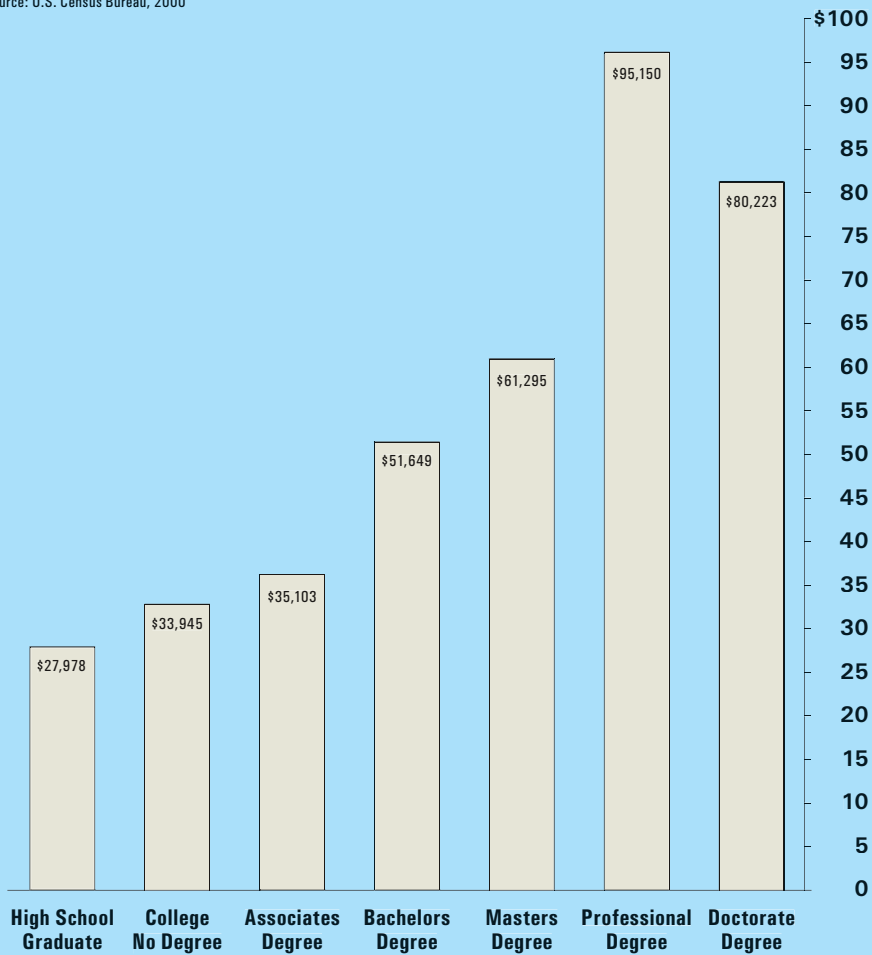
	Percent %	State Rank
Minnesota	31.2	7
Illinois	27.1	17
U.S. Average	26.0	n/a
Iowa	25.5	23
Wisconsin	23.8	31

n/a = not applicable

Wisconsin needs 150,000 more college graduates in its work force to meet the U.S. per capita income average. In addition, Wisconsin needs another 150,000 workers with post-graduate degrees in order to exceed the U.S. average for per capita income.

U.S. Mean Income by Educational Attainment: 2000

in 2000 dollars (000s)
Source: U.S. Census Bureau, 2000



*" Today, the ascendant nations and corporations are **masters** not of land and material resources but of **ideas** and **technologies**."*

>> George Gilder





VISION 2020: A KNOWLEDGE-BASED ECONOMY

It is common today for people to say that knowledge is power. The idea is central to almost every circumstance in the modern world, including education, commerce, politics, the military, and interpersonal relationships. Exactly how knowledge and its uses affect economic development, however, is a more complex subject that can be understood in terms of education and personal income. The conventional wisdom is that higher levels of knowledge lead to higher levels of personal income.

The reason for the higher average earnings of educated workers is that during the 20th century, the agricultural economy gave way to an industrial economy, then to a service economy, and finally to a knowledge economy. In this evolutionary process, the educational attainment of a worker became a key differentiator in the market for human resources. The higher the educational attainment of the worker, the more knowledge the person could apply to the job, thereby increasing the worker's overall effectiveness. Higher education, therefore, is an

essential ingredient for a knowledge-based economy because knowledge is the key input to increasing economic productivity (getting more goods and services from existing inputs) and fostering technological innovation (creating new products and services).

To be sure, the agricultural, industrial and technology economies of the 20th century used knowledge (how to farm, how to manufacture) to create income and wealth. What is different about the knowledge economy of the 21st century is that the collective knowledge of humanity is now embedded in everyday goods and services. The impact of this embedded knowledge on the value of modern products and services is enormous and increasing daily. The ability to "add value" through new technologies and discoveries, the ability to know more about customer wants and needs, and the ability to deliver products and services more precisely and quickly depend on the management of data and information to create new knowledge and a competitive advantage.

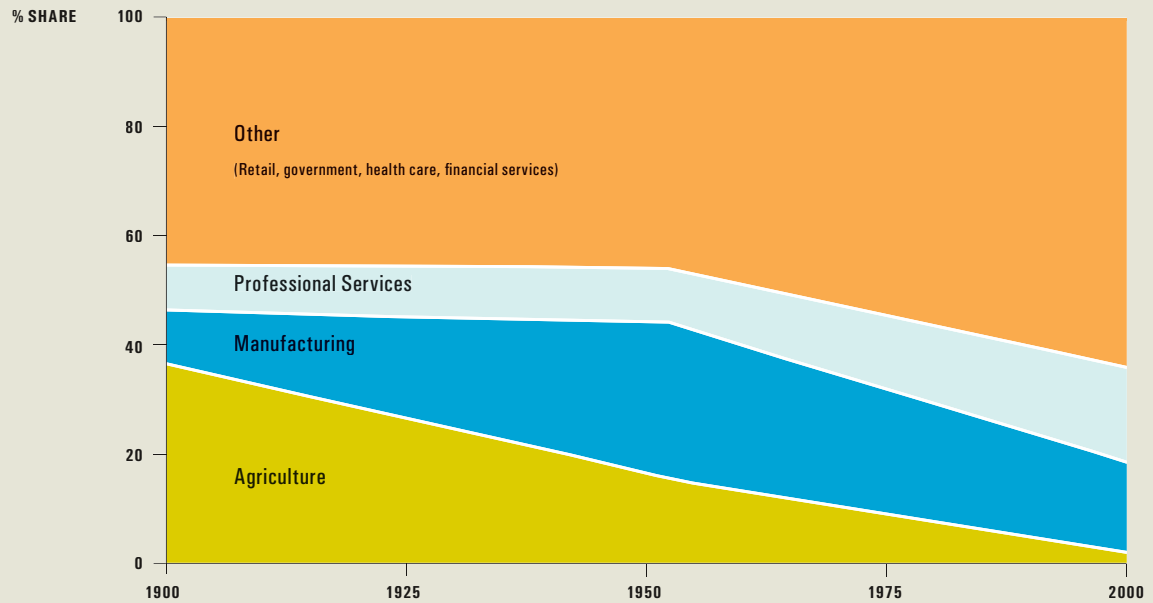


"Highly educated workers stand at the center of the 21st century economy."

>> *Katharine Lyall, President
University of Wisconsin System*

U.S. Sector Employment Trends: 1900 to 2000

Source: U.S. Census Bureau, 2000



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 global roots. European-style initiatives, such as Digital Scotland, are occurring around the world. From Nova Scotia to Australia, the knowledge economy is taking shape within the context of rapid globalization of the world's regional economies. Cities, states, and countries are developing strategies to deploy information to their competitive advantage. In the global effort to create high-growth, knowledge-based economies, the competition will be fierce.

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. While manufacturing continues to pro-

vide over 500,000 jobs in Wisconsin, it is clear that the manufacturing sector has entered a phase of gradual decline. As high-paying jobs are lost in that sector, we must replace them with high-paying jobs in new high-technology businesses.

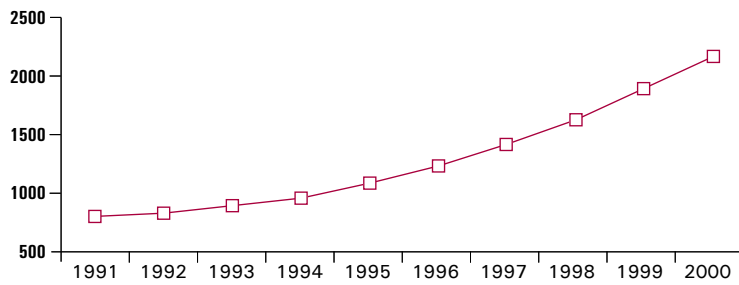
Building a knowledge-rich, high-technology sector in our economy will require that Wisconsin have a clear plan for the systematic production of new knowledge-based products and services. New scientific discoveries and technologies developed in Wisconsin can provide the competitive advantage for Wisconsin businesses, if and only if such knowledge can be identified and rapidly deployed. We need a clear plan to stimulate the creation of new knowledge in Wisconsin and improve the flow of that knowledge from our leading research institutions to Wisconsin businesses. ■

U.S. Sector Employment: Year by Year

Source: U.S. Bureau of Labor Statistics 2000

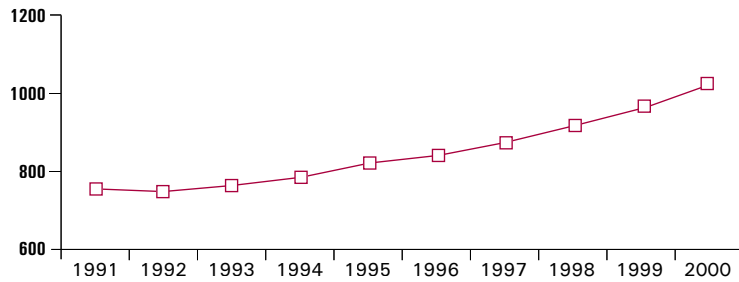
Computer & Data Processing Services

(000s of Employees)



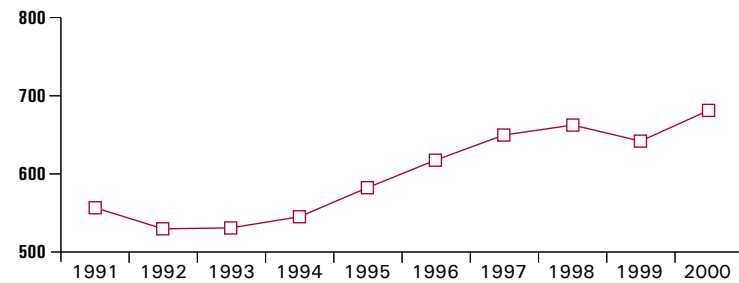
Engineering & Architectural Services

(000s of Employees)



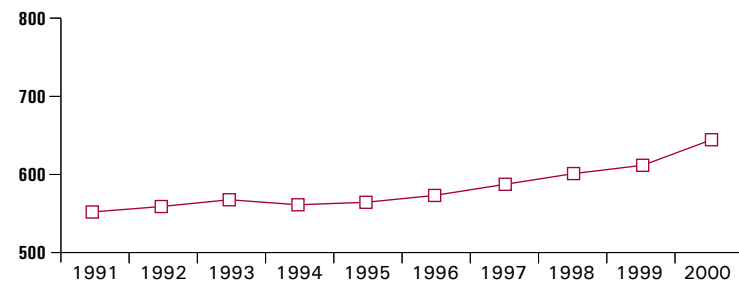
Electronic Components & Accessories

(000s of Employees)



Research, Development & Testing Services

(000s of Employees)



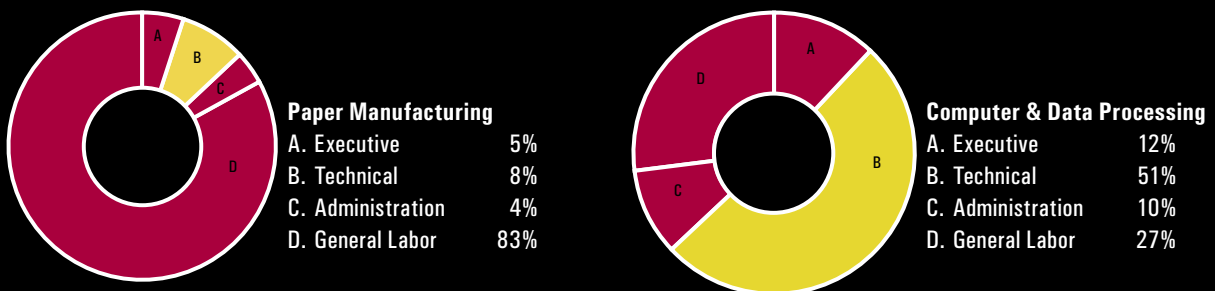
While job growth in manufacturing was in steady decline, growth of high paying jobs in the 1990s came from a wide range of knowledge intensive industries.

A KNOWLEDGE-BASED STRATEGY FOR WISCONSIN

In a knowledge-based economy Wisconsin's ability to compete will increasingly depend on its ability to produce and retain a highly skilled, highly-educated workforce that can fill positions in high-tech businesses. Rapidly growing, high-tech businesses require large numbers of technically-skilled workers and technically-proficient managers. More than 50 percent of the workers needed to operate software development, data processing, telecommunication and biotechnology firms are highly-educated, technical workers, and another 20 to 25 percent of the workers of such firms are highly compensated administrative and executive personnel. By comparison, the majority of the workers in basic manufacturing firms are general laborers.

Our state currently lacks sufficient numbers of high-technology businesses that require highly skilled, highly educated knowledge workers. As a result we have a "brain drain" of many Wisconsin college graduates and we fail to attract a "brain gain" of college graduates from other states. It is particularly troubling, although not surprising, that this situation is occurring at time when there is a serious worldwide shortage of knowledge workers, particularly in scientific fields. Talented knowledge workers are a scarce resource that we are failing to exploit in Wisconsin.

The only reliable way to reverse this alarming trend is to design and implement a strategic plan to create more job opportunities in high-tech businesses in Wisconsin-businesses that capture new knowledge and highly educated people being produced by our leading research institutions. Encouraging the creation and flow of new scientific and technical knowledge to create high-paying jobs for highly skilled knowledge workers requires an organized effort. New institutions must be created to manage the creation and transfer of new technology to private businesses in Wisconsin.



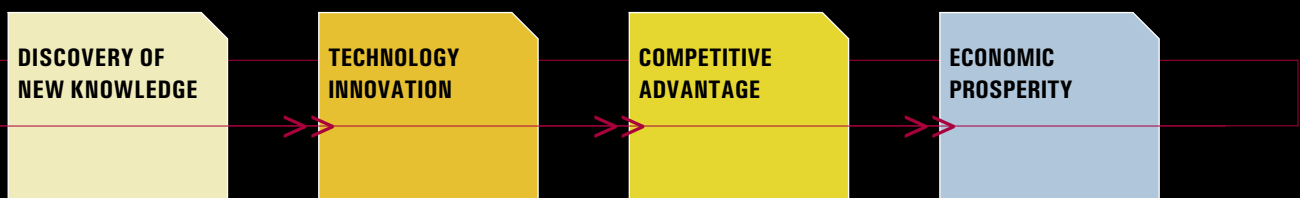
Source: U.S. Bureau of Labor Statistics, *U.S. Occupational Employment*, 2000

The Wisconsin Technology Council recommends that Wisconsin build a knowledge strategy based on the following organizational initiatives:

<p>Institute for Interdisciplinary Research</p>	<p>A “think-tank” style organization with a small staff of futurists and thought leaders that will promote better relationships between our government and the private sector by constantly renewing contacts with leaders at the highest levels. The Institute will be the research arm of the Wisconsin Technology Council.</p>
<p>Research Centers of Excellence</p>	<p>Research Centers of Excellence built around large scale opportunities to build high-technology Wisconsin businesses that compete in global markets. The Centers would focus on applied research that transfers new, public sector science and technology to the private sector to solve problems that now create business opportunities in selected vertical markets.</p>
<p>Regional and Statewide Technology Clusters</p>	<p>A technology cluster is a geographic concentration of interconnected companies, specialized suppliers, service providers and associated institutions in the same industries that collaborate through partnerships and joint development projects. Such clusters will better prepare Wisconsin business to face the competitive challenges of the global economy.</p>

These initiatives are elements of an interrelated strategy that will pull Wisconsin’s economy away from slow-growth, basic industries into emerging high-growth, high tech industries. It is a strategy that requires changing the way we think about economic development in Wisconsin, one that involves a more coordinated effort to improve the competitiveness of the Wisconsin economy. ■

A Path from Knowledge to Prosperity



A photograph of three scientists in white lab coats sitting around a small round table in a modern laboratory. They are looking at a book held by one of them. The room has large windows overlooking a harbor with boats. A large white cylindrical object is visible in the upper left corner.

*“Never doubt the **power** of a small group of intelligent and committed people to **change the world**. Indeed, it is the only thing that ever has.”*

>> Margaret Mead



VISION 2020: INSTITUTE FOR INTERDISCIPLINARY RESEARCH

The rapid growth of knowledge in the last 50 years is a direct result of the interconnectedness of the global, scientific community. The wide availability of air travel, telecommunications, television, and the Internet have made it possible for people almost anywhere to quickly distribute information and share ideas. Tens of millions of people in the world who work in scientific research, business, government, education and the arts, are now linked together in a sort of collective consciousness where new ideas move at “mind” speed.

The interconnectedness of the world has had a dramatic effect on business. In the modern, global economy business is increasingly disrupted by the flow of technology streams that change the competitive landscape of entire industries almost overnight. New knowledge that is discovered in mathematics and physics is increasingly being applied to information and communication technology, materials science and medicine, and discoveries in those fields are in turn influencing the way goods and services

are being delivered in the economy. This flow has always been there, but it is now moving much faster.

Creative collaboration, the convergence of information and ideas from many different people and sources, is accelerating the process. Knowledge and insights from a variety of intellectual disciplines help to more adequately describe a problem so it can be understood and a solution found. By breaking down traditional disciplinary boundaries, invention is accelerated as the work of one researcher is reinvigorated with new knowledge from outside fields of study. At the national level this has been recently demonstrated by the human genome project, a project that was originally expected to take much longer than it actually did.

The Institute for Interdisciplinary Research (IIR) will be Wisconsin’s center for creative collaboration and technology innovation. It will manage Wisconsin’s technology agenda by bringing together the best and the brightest minds from



“Working across scientific disciplines improves the quality of ideas—and increases the speed at which they are put to work.”

>> *Carl Gulbrandsen, Managing Director
Wisconsin Alumni Research
Foundation*



The IIR will foster in Wisconsin the flow of information and ideas among academic institutions, companies, research centers, sources of investment capital and governmental agencies.

business, government and education in an organization led by a small group of futurists and thought leaders. The IIR will increase the flow of ideas from our research laboratories, where fundamental advances in science are discovered, to local businesses. The IIR will help break down traditional boundaries by creating interdisciplinary work groups that will draw people and ideas from all parts of the economy as they are needed to help solve problems as quickly as possible.

Working within the Institute, small interdisciplinary teams will gather pertinent information about business trends and open up redundant approaches to helping Wisconsin's businesses create valuable new, knowledge-intensive products and services for the global economy. By accelerating the successful transfer of new technology to new businesses, the IIR will encourage local business

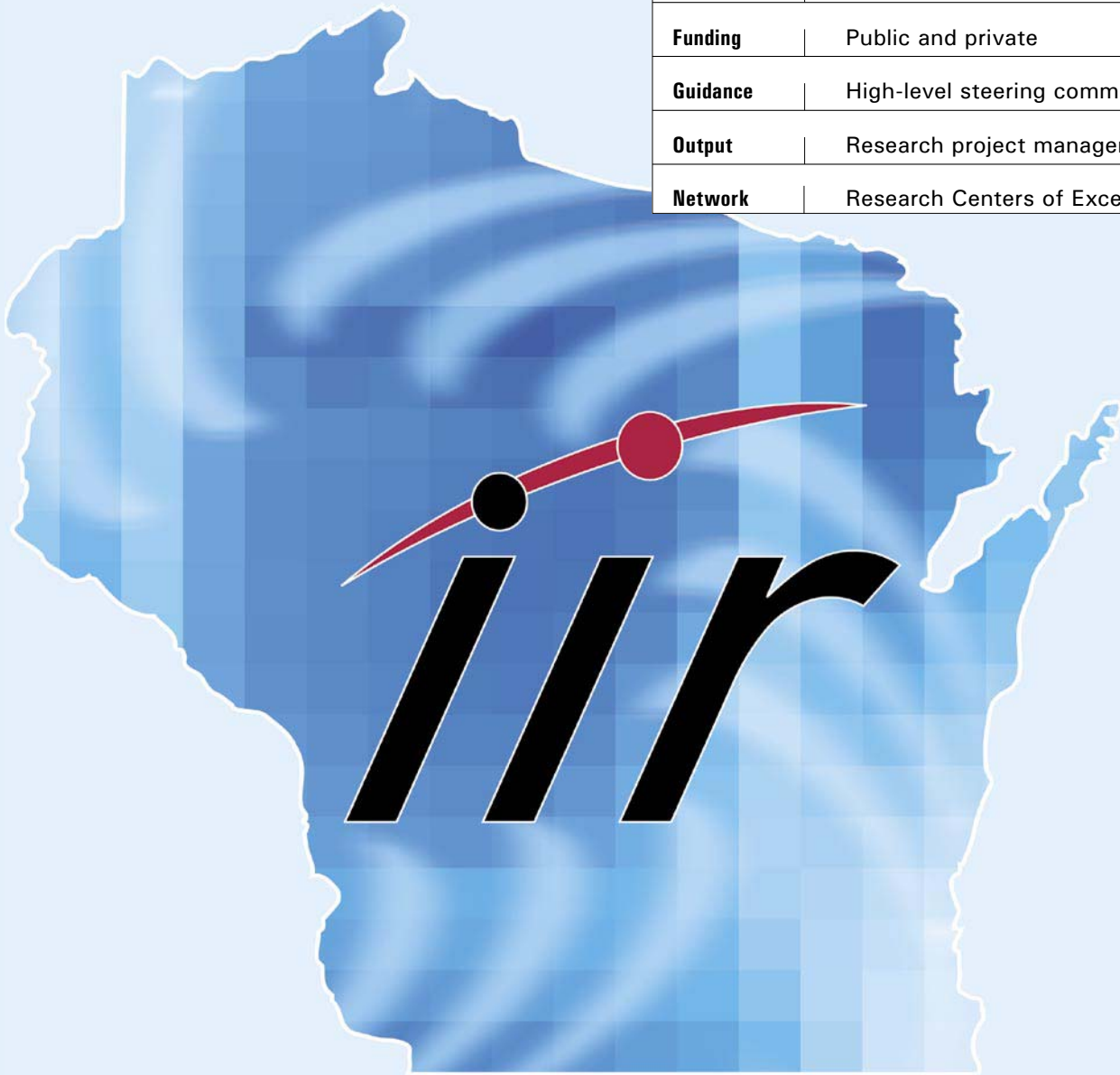
people to recognize the value of inter-disciplinary programs that rely on government-funded research and venture capital-backed start-ups. The IIR will conduct annual executive briefings to ensure that Wisconsin's leaders share a common understanding of the scientific and technical challenges facing the local, national and world economies.

The IIR has the potential to create a profound change in the basic structure and nature of the relationships between business, government and education in the Wisconsin economy. Similar organizations such as the Santa Fe Institute have helped to bring about significant change. Wisconsin's Institute for Interdisciplinary Research can help fashion unique solutions best suited to Wisconsin. In this effort, the IIR will serve as the research arm for the Wisconsin Technology Council. ■

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INSTITUTE FOR INTERDISCIPLINARY RESEARCH

Structure	A virtual organization
Participants	Business, government, and education
Leadership	Five to six endowed fellows
Vision	Futurists and thought-leaders
Funding	Public and private
Guidance	High-level steering committees
Output	Research project management
Network	Research Centers of Excellence



*"The **value** of an idea lies in the **using** of it."*

>> Thomas Edison



VISION 2020: RESEARCH CENTERS OF EXCELLENCE

Research Centers of Excellence located around the state will be the functioning arms and hands of the Institute for Interdisciplinary Research (the IIR). The Research Centers will be organized around large-scale opportunities to build high-technology Wisconsin businesses. The Research Centers will focus on applied research that transfers new, public sector science and technology to the private sector to solve unique problems of a particular industry. The Research Centers will identify disruptive technology that can be expected to force changes in the competitive landscape for Wisconsin's leading industries, thereby helping to prepare market leaders for the coming challenges and to create opportunities for new entrants.

Within each Research Center will be a competitive intelligence network that is maintained locally, but one that is globally aware. Each Research Center will manage a worldwide network that routinely collects and analyzes trends in the market, identifies customer preferences, detects the actions of market partici-

pants and watches for development of relevant new technology. This knowledge will benefit those businesses that collaborate with and support each Research Center by helping them identify "breakthrough" technology early and quickly invent new products and services based on it.

The best opportunities for truly breakthrough technologies are usually found while striving to do things that have never been done before. This means attacking "big" problems, the kind of problems that have no known solution and seem unsolvable. The solutions to big problems, if found, can change the basis of competition and create sustainable competitive advantage for those who own the solution. For example, the next big wave of innovation is expected to come in bio-medical industries, where new discoveries abound, based on recent advances in our understanding of the human genome. The demands of the aging U.S. population are creating enormous strain on the present systems of delivering healthcare that call for new



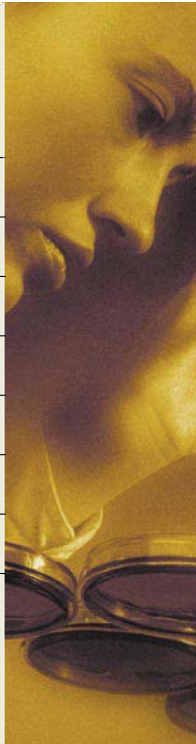
"Through Wisconsin's Research Centers of Excellence, we will think locally and compete globally."

>> *Paul Percy, Dean
College of Engineering
UW-Madison*

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RESEARCH CENTERS OF EXCELLENCE

Agenda	Focused research
Funding	Public and private programs
Mandate	Identify market problems; determine solutions
Scope	Community based, globally oriented
Trustees	Private sector representation on Board
Purpose	Encourage fluidity of ideas and people
Network	Competitive intelligence network
Alliance	Linked to the Institute for Interdisciplinary Research



“It remains for the local community and business leaders to select areas of research that are most appropriate for their situation.”

technologies to improve treatment and lower the cost of delivery.

The challenge for Wisconsin is to pick a few of the big problems about which we currently have some knowledge-areas of current research within our leading research institutions-and begin to develop Research Centers of Excellence focused on potential applications of that knowledge to real market needs. The Wisconsin Alumni Research Foundation (WARF) is ideally suited to assist with the process of identifying the world-class scientific research from the work being done in the UW System. The Medical College of Wisconsin and the Marshfield Clinic are producing remarkable technologies that offer great opportunity for new products and services. Using market-focused Research Centers around the state, we can begin to invest the

time, talent and money on product development for new, knowledge-rich businesses targeted at these opportunities.

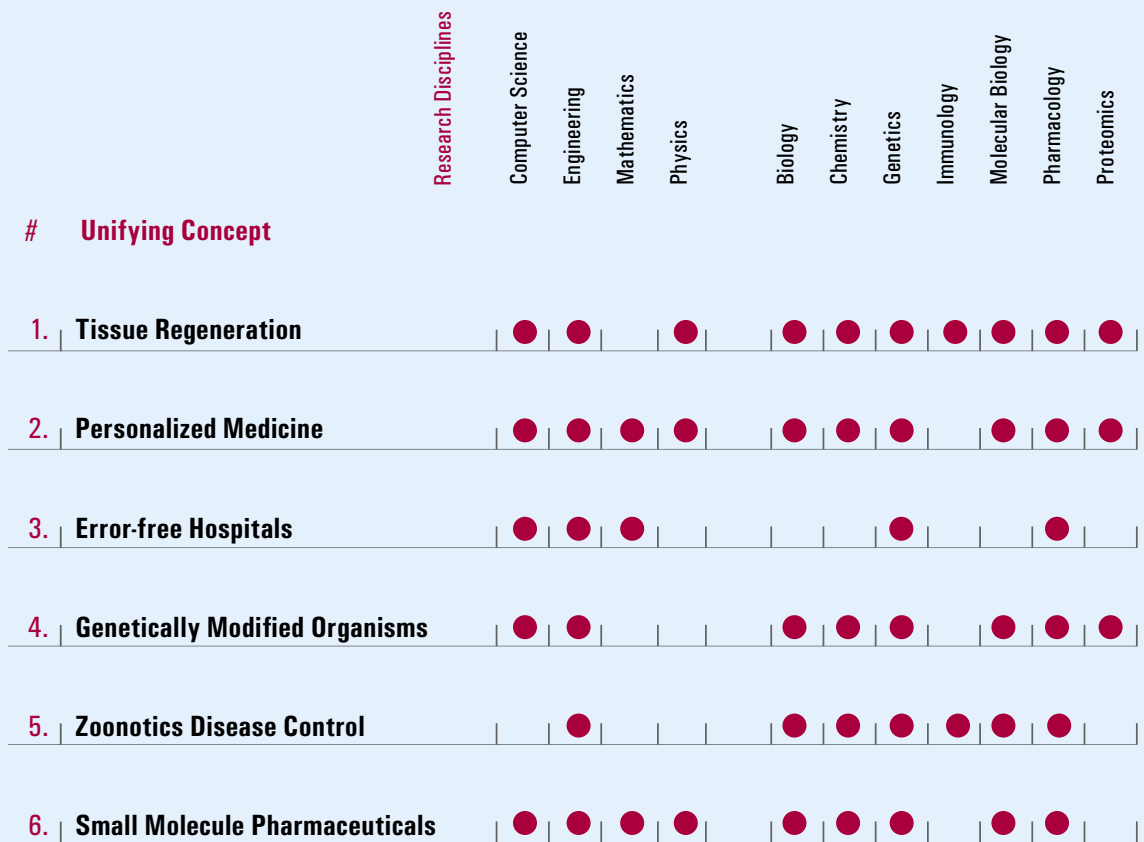
Numerous ideas are set forth on the following pages to stimulate thinking about possibilities for Wisconsin Research Centers of Excellence. The ideas are not intended to be either exclusive or exhaustive. They are merely a sampling of some of the leading ideas that have been proposed for such Research Centers. It remains for the local community and business leaders to select areas of research that are most appropriate for their situation. They must select problems that are big enough to inspire cooperation among local businesses, yet small enough to be attainable through a sustained collaborative effort of local partners. ■

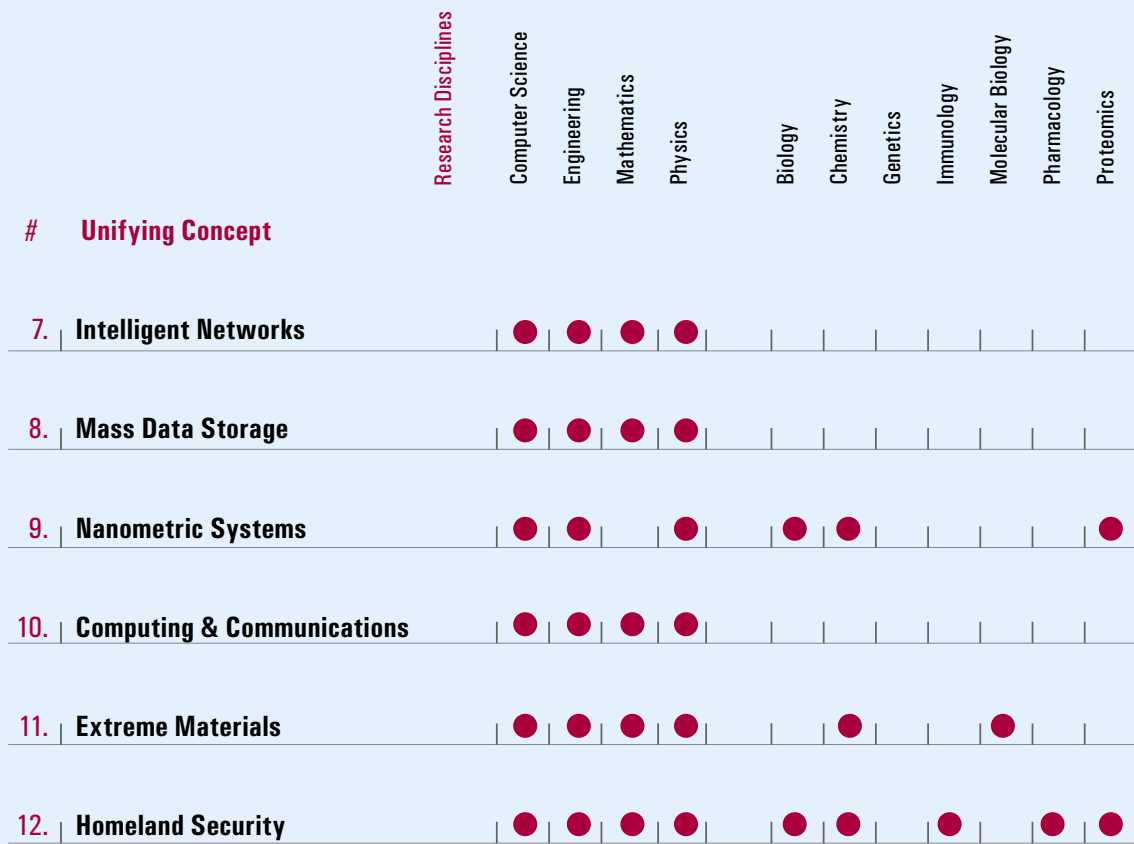
Potential Research Centers of Excellence

Discipline	Research to discover ways to:
Tissue Regeneration	Grow cells and tissues to replace diseased or damaged tissues in animals and humans.
Personalized Medicine	Use an individual's genetic code to predict likely diseases and develop unique treatments based on individual genetic predispositions.
Error-Free Hospitals	Reduce, and ultimately eliminate, medical accidents in hospitals that result from avoidable mistakes in patient information processing, diagnostic procedures, medication delivery, and treatment regimes.
Genetically Modified Organisms	Modify the genetic code of an organism to eliminate disease and improve the useful characteristics of plants and animals and to improve the quality and length of life of humans.
Zoonotic Disease Control	Prevent animal-born diseases from spreading to human populations and to control and eliminate those that do.
Small Molecule Pharmaceuticals	Discover new drugs using traditional biochemistry and molecular biology.
Intelligent Networks	Engineer high-speed communication networks that monitor traffic and automatically re-configure to accommodate demand based on user needs.
Mass Data Storage	Cost effectively capture, cleanse, condense, store, retrieve, analyze and deliver mission-critical data on demand through secure networks.
Nanotechnology Systems	Engineer materials and devices at the atomic and molecular level for making ultra-small devices that can perform work at a molecular level in microelectronic and biomedical applications.
Extreme Materials	Make new materials with properties that can meet very demanding structural specifications and/or withstand extremely harsh environments for long periods.
Homeland Security	Protect against terrorist attacks, respond to the emergencies created by such attacks, and restore normalcy to the community.
Computing and Communications	Develop the knowledge and technology to advance ultra-high performance computing and communication and accelerate the convergence of computing and communication.

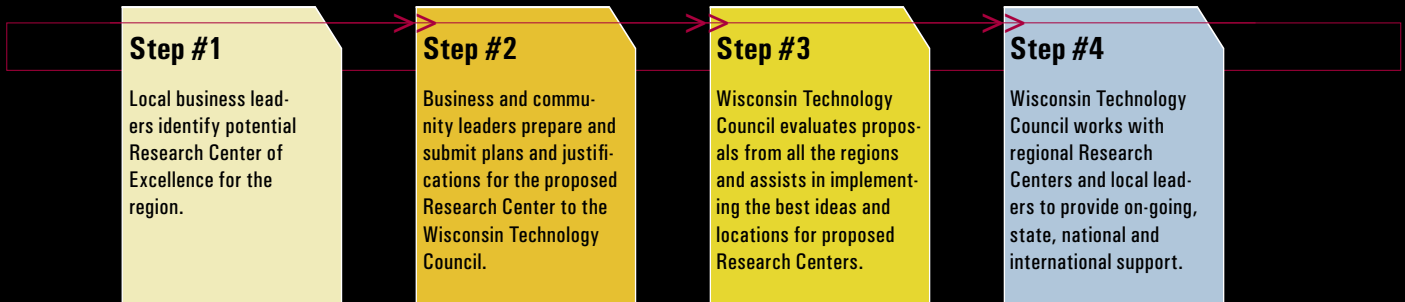


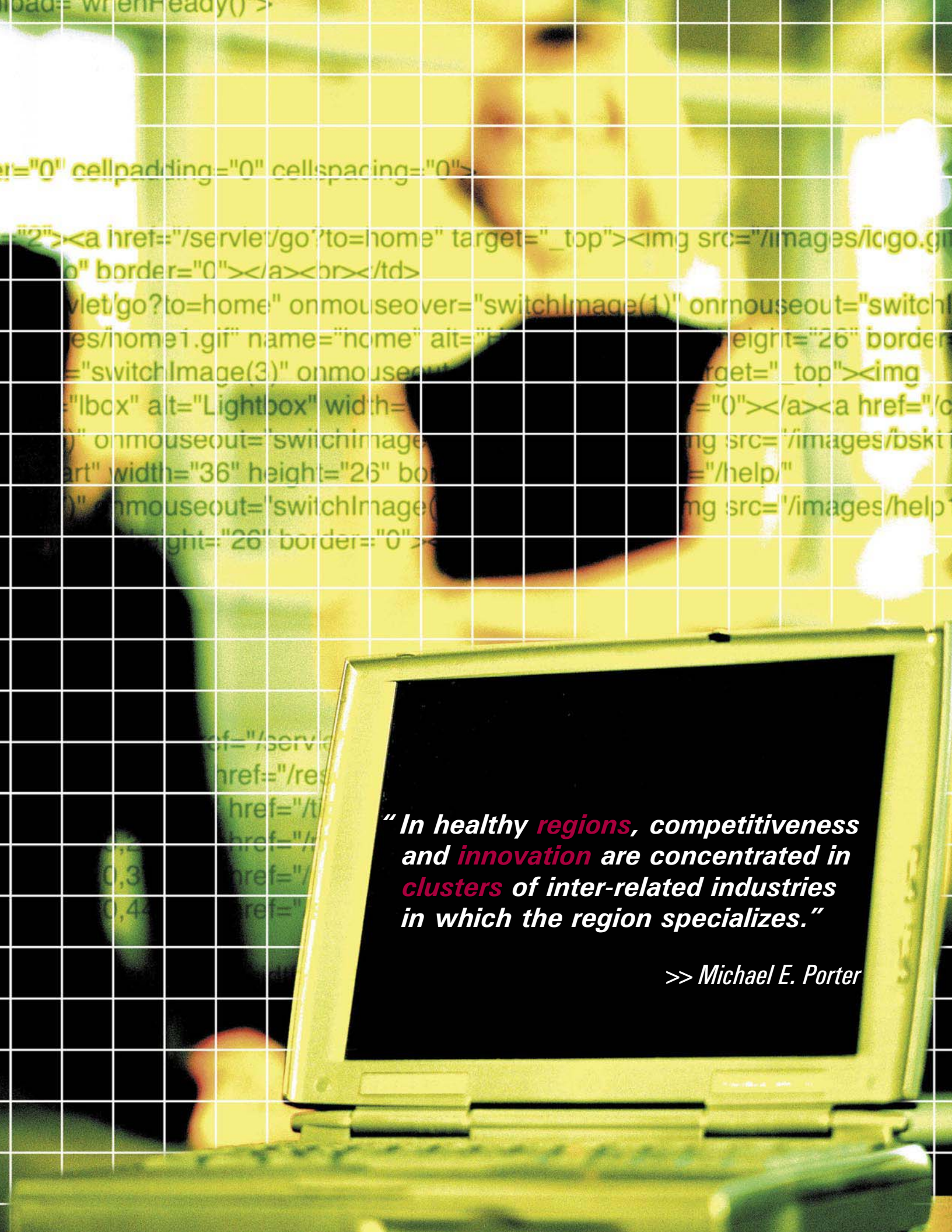
POTENTIAL HIGH-TECH RESEARCH CENTERS OF EXCELLENCE





Creating Centers of Excellence





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*“In healthy **regions**, competitiveness and **innovation** are concentrated in **clusters** of inter-related industries in which the region specializes.”*

>> Michael E. Porter



VISION 2020: TECHNOLOGY CLUSTERS

The Research Centers of Excellence established in Wisconsin must be supported by local business and community-based development organizations and networks. Local land developers and builders must help to locate and construct research parks and facilities with the needed laboratories and equipment. Funding for directed research must be provided by a combination of private philanthropy, government subsidies and tax incentives, and contract research paid for by local businesses. Angel investors and venture capitalists need to be included in the technology development networks of each Research Center.

Once in place, these networks will encourage private sector sponsorship and ultimately lead to a clustering of related technology-based businesses around each Research Center.

The role of Technology Clusters in accelerating the development of successful new businesses has been widely reported. In October 2001, the U.S.

Council on Competitiveness published a report citing the benefits of regional clusters of innovation, benefits that it believed could form the foundation for future U.S. competitiveness in global markets. The concept of Technology Clusters is based on the growing evidence that nurturing the state's key industries can improve the competitiveness of businesses within those industries, in turn boosting the state's overall economy.

A Technology Cluster is a geographic concentration of interconnected companies, specialized suppliers, service providers and associated institutions in a particular field that collaborate through partnerships that better prepare members to face the challenges created by the global marketplace. Technology Clusters combine the market knowledge and expertise of businesses within the industry with the shared resources of technological research, education and workforce development, and regulatory relationships with all levels of government.



"Technology clusters solve common problems and exploit shared opportunities—a powerful combination for Wisconsin."

**>> John Torinus,
Chief Executive Officer
Serigraph Inc.**

VISION 2020

TECHNOLOGY CLUSTERS

Structure	Community based, private sector driven
Complement	10 to 15 independent public and private businesses
Access	Access to local Research Centers of Excellence
Leadership	Led by 1 to 3 large anchor companies
Influence	Surrounded by 10 to 12 small, emerging companies
Support	Supported by local angel network and regional VCs
Advice	Supported by local legal, financial, and consulting services

Successful technology clusters enhance overall competitiveness by improving productivity, fostering innovation and accelerating the commercialization of innovations.

Successful Technology Clusters enhance business competitiveness by improving productivity, fostering innovation and accelerating the commercialization of innovations. The specific advantage of Technology Clusters include: lower operating costs, more efficient supply chains, the ready availability of specialized technical services, knowledge spillover, joint workforce training, labor market pooling and opportunities for joint actions and business partnerships through networking.

The existence of one or more Research Centers of Excellence within Wisconsin's Technology Clusters will link the clusters to the Institute for Inter-Disciplinary Research and create an environment for rapid prototyping of new ideas, rapid build up of resources and rapid roll out of the new products. Winning companies get to the market first and use early wins in the market to block out competitors and then accelerate their growth as the product gains market acceptance. The

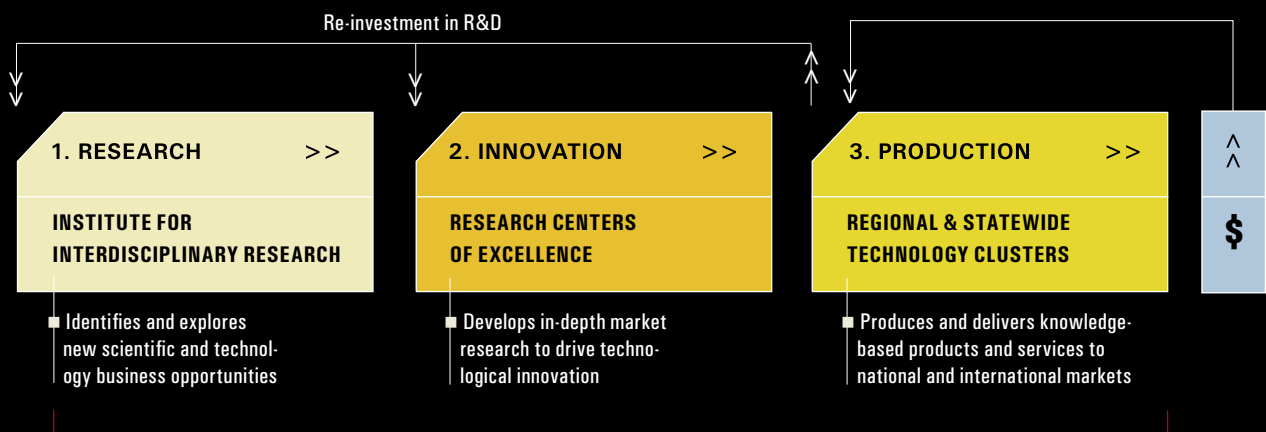
environment of a Technology Cluster, with its built-in infrastructure, creates a significant competitive advantage.

The size and structure of each Technology Cluster will vary from industry to industry. Some clusters may be statewide clusters, others will be more local in scope, and still others may have participants from other countries. Researchers will normally migrate from the Research Centers into local businesses to facilitate the efficient transfer of newly developed technology. At times the flow may go the other way. The proximity of numerous companies in one industry will enable job-sharing and create an environment for the knowledge workers of the future who seek flexible work environments that offer professional development opportunities and career advancement. The existence of clusters will help to attract and retain the human talent necessary to fuel the growth of a high-tech economy in Wisconsin. ■

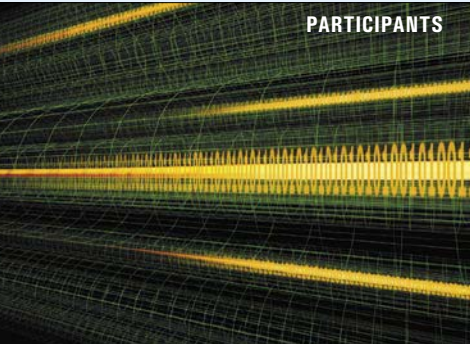

EXPANDING MARKETS BY TRANSFERRING KNOWLEDGE


Develop Knowledge Assets	The knowledge strategy for Wisconsin assumes that the Institute for Interdisciplinary Research will develop plans and strategies for exploiting Wisconsin’s burgeoning knowledge assets.
Rapid Transfer to Business Community	The strategy presumes that the intellectual property developed at Wisconsin’s Research Centers of Excellence are increasingly and rapidly transferred to local, entrepreneurial businesses in affiliated Technology Clusters where it can be embedded in knowledge intensive products and service that are sold to national and international buyers.
Cultivation of International Markets	The model also projects a steadily expanding base of high-tech services that are sold to international customers who travel to Wisconsin to be served. The existence in our state of internationally recognized, high-tech service companies will expand the market for Wisconsin knowledge-based economy by pulling foreign buyers into the local marketplace.

In-state Knowledge Transfer Strategy



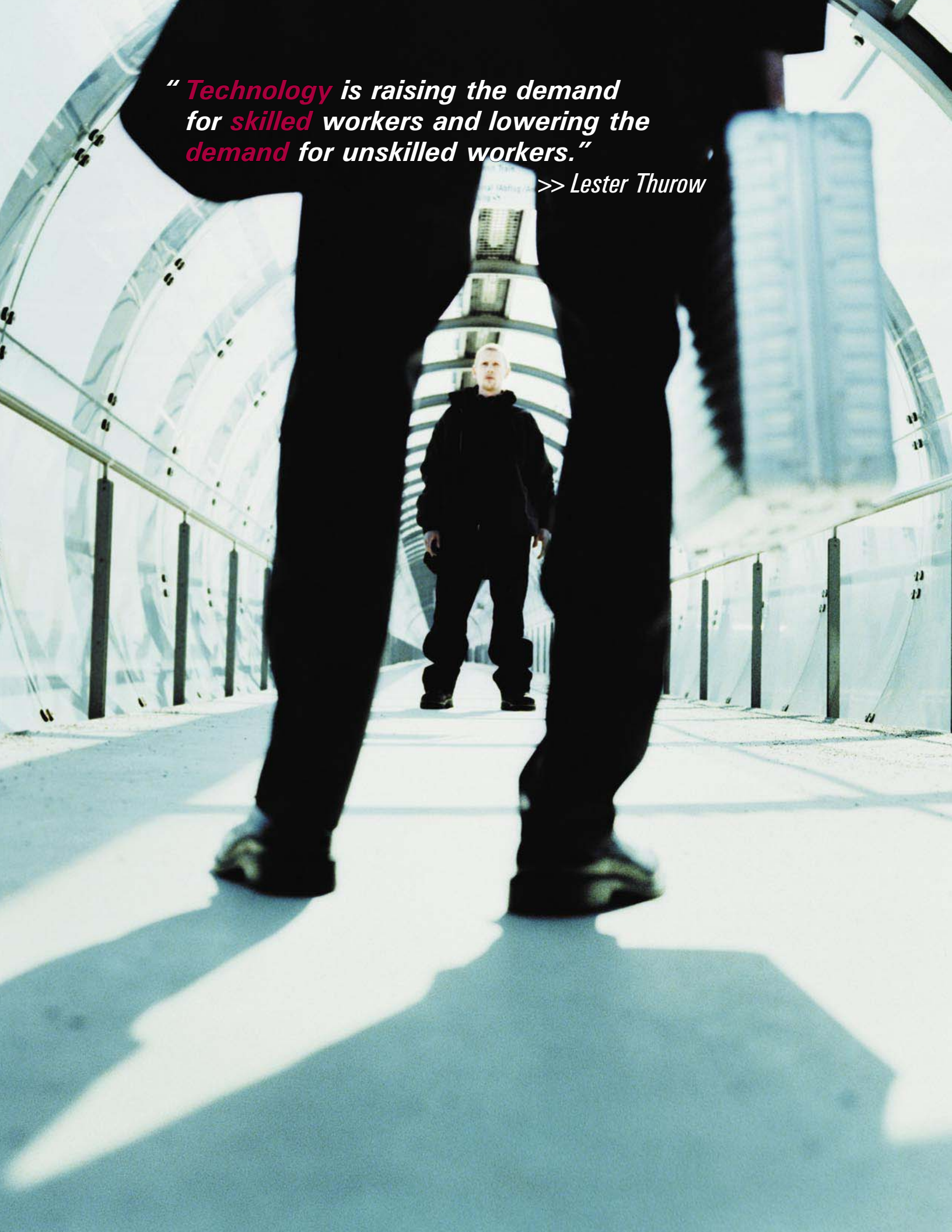
POTENTIAL STATEWIDE CLUSTERS IN KNOWLEDGE-BASED INDUSTRIES

FOCUS	HEALTHCARE	WORKFORCE EDUCATION	
<p>OPPORTUNITY</p> <p>AGENDA</p>	<p>To create an internationally recognized, high quality healthcare system that will attract patients to Wisconsin from around the world.</p> <ul style="list-style-type: none"> ■ Develop an integrated supply chain strategy to maximize sourcing and “just in time” JIT-delivery of healthcare products and services among Wisconsin-based businesses that participate in the cluster. ■ Coordinate development of Research Centers of Excellence within the cluster that focus on a shared agenda of infrastructure development and research projects to create a competitive advantage in healthcare. ■ Develop shared plans and strategies for healthcare workforce development including continuing education, employment practices and policies and support facilities and systems. ■ Develop shared plans and strategies to increase the export of high-technology healthcare products to foreign markets and the import of foreign customers for high-technology healthcare services. ■ Create interface to IIR for intergovernmental and educational coordination. 	<p>To make Wisconsin a national center for workforce education and retraining, including content development, delivery and credentialing.</p> <ul style="list-style-type: none"> ■ Develop an integrated supply chain strategy to maximize sourcing and JIT-delivery of workforce education products and services among Wisconsin-based businesses that participate in the cluster. ■ Coordinate development of Research Centers of Excellence within the cluster that focus on a shared agenda of infrastructure development and research projects to create high-tech distance learning tools and software for on-line course work and educational credentialing. ■ Aligning Wisconsin’s existing public and private educational resources to address entire spectrum of workforce needs, including K-12, higher education, skills testing and workforce readiness. ■ Develop content for workforce education targeted at selected, vertical markets in Wisconsin, national and international markets. ■ Develop shared plans and strategies to increase the export of high-technology workforce education products to foreign markets and the import of foreign customers for high-technology workforce education services. ■ Create interface to IIR for intergovernmental and educational coordination. 	
<p>PARTICIPANTS</p> 	<ul style="list-style-type: none"> ■ Hospitals and integrated delivery networks ■ Health insurance providers and organizations ■ Medical clinics and practice management companies ■ Emergency medical and disaster recovery agencies ■ Medical and nursing schools ■ Medical research laboratories ■ Pharmaceutical companies ■ Medical device and diagnostic companies ■ Medical informatics and software companies 	<ul style="list-style-type: none"> ■ Public and private colleges and universities ■ Staffing companies ■ Executive search firms ■ Distance learning companies ■ Educational publishers ■ Digital content producers 	

FOCUS	MEDIA & DESIGN	INFORMATION & DATA MANAGEMENT	
<p>OPPORTUNITY</p> <p>To create a statewide environment of openness diversity, and creativity that will attract innovative people to Wisconsin from around the world.</p> <p>AGENDA</p>	<p>■ Develop an integrated supply chain strategy to maximize sourcing and JIT-delivery of media and design products and services among Wisconsin-based businesses that participate in the cluster.</p> <p>■ Coordinate development of Research Centers of Excellence within the cluster that focuses on a shared agenda of infrastructure development and research projects to create synergistic use of Wisconsin’s resources in broadcast and print media, entertainment and the arts, industrial and commercial design to improve access to global information sources and thought leaders.</p> <p>■ Develop shared plans and strategies for media and design workforce development including continuing education, employment practices and policies and support facilities and systems.</p> <p>■ Develop shared plans and strategies to increase the export of high-technology media and design products to foreign markets and the import of foreign customers for high-technology media and design services.</p> <p>■ Create interface to IIR for intergovernmental and educational coordination.</p>	<p>To make Wisconsin a global center for data processing and mass storage of mission-critical data processed over public and private networks.</p> <p>■ Develop an integrated supply chain strategy to maximize sourcing and JIT-delivery of information and data management products and services among Wisconsin-based businesses that participate in the cluster.</p> <p>■ Coordinate development of Research Centers of Excellence within the cluster that focuses on a shared agenda of infrastructure development and research projects to create future services for transaction processing, mass data storage and data mining for financial services, healthcare, scientific research, and governmental and military applications.</p> <p>■ Develop shared plans and strategies for information and data management workforce development including continuing education, employment practices and policies and support facilities and systems.</p> <p>■ Develop shared plans and strategies to increase the export of high-technology information and data management products to foreign markets and the import of foreign customers for high-technology information and data management services.</p> <p>■ Create interface to IIR for intergovernmental and educational coordination.</p>	
<p>PARTICIPANTS</p> 	<ul style="list-style-type: none"> ■ Television, radio and newspapers ■ Web-based publications ■ Entertainment and cultural organizations ■ Colleges and universities ■ Printers and graphic artists ■ Advertising and marketing firms ■ Architects and builders 	<ul style="list-style-type: none"> ■ Outsourced data processing services ■ Internet service providers ■ Application service providers ■ Network management consultants ■ Telecommunications businesses ■ Software and hardware manufacturers 	

*“**Technology** is raising the demand for **skilled** workers and lowering the demand for **unskilled** workers.”*

>> Lester Thurow



VISION 2020: GLOBAL COMPETITION

The industrial revolution moved America from a local to a national economy, and the knowledge revolution is now moving us from a national to a global economy. For most of America's biggest corporations, global markets have become more important than national markets. And most of our mid-sized companies are finding it increasingly difficult to compete as international competitors enter our national economy.

The world's production capacity in many basic industries such as steel, chemicals, automobiles and capital equipment now exceeds worldwide demand. Globalization is forcing prices and wages down. The current production of the world's goods and services is steadily moving from high-cost to low-cost locations; as a result, prices are falling. These trends put pressures on domestic work practices, forcing productivity improvements, and producing lower wages. This is particularly true for unskilled workers. In the past 20 years, the unskilled portion of the American workforce experienced no growth in real wages.

With globalization, national governments have lost much of their ability to regulate business, to control economies, and to help their citizens. National social programs and transfer payment systems become increasingly difficult to support financially as the economic value of unskilled labor moves to the lowest international level. On Jan. 1, 1999 the Euro currency came into existence and diminished the importance of the US dollar in the global economy. The dollar must now compete with the Euro for the role of the world's reserve currency. The global economy offers no enforceable, agreed upon set of rules and regulations, no systems of law enforcement and no American-style judicial systems to appeal to correct injustices. Americans now understand that they live in a competitive world in which America's economy is not the only global force.

The only way to defend Wisconsin workers from the downward wage pressure of the global economy is to develop a vigorous, high-growth economy built on a foundation of proprietary technologies



"In our highly competitive world, knowledge workers must have the ability to learn—and to keep learning."

*>> Ulice Payne, Jr., President
Milwaukee Brewers
Former Managing Partner
International Law Group
Foley & Lardner*



Our success in the future global economy will increasingly depend on our ability to train and retrain knowledge workers for the knowledge-based industries of the future.

and the skills that go with them. Our success in the future global economy will increasingly depend on our ability to train and retrain knowledge workers for the knowledge-based industries of the future. In a knowledge based economy, skill acquisition must not be limited to early formal education for those under 25, but must continue through out the workers lifetime. Unskilled workers in a wealthy industrial economy must substantially enhance their skills several times in the course of their lives to avoid steadily declining real wages.

We cannot expect to maintain high wage levels for Wisconsin workers, unless we have the political, social and educational policies to ensure that all our citizens are better skilled and educated than any in the world. This is an economic imperative that we can ignore only at great peril. The only problem is this: in a knowledge-based economy older workers sell skills of an earlier vintage, and younger workers sell newly acquired

skills. The steady advance of the knowledge-based economy creates a knowledge-gap between old and new knowledge workers. This gap affects the earning power of the older workers. The lack of on-the-job training for older workers has created an earnings gap between age groups in the workforce that has gotten much wider in recent years.

Most Wisconsin businesses expect their workers to take the initiative to educate themselves. The best job opportunities go to those who have acquired skills off the job. Today, no system exists for providing adult continuing education. The Wisconsin educational system must be re-invented if we hope to prevent falling wages for our workforce. Enhancing the skills of our workforce cannot be done quickly, and once done, must be continued. The job of educating and re-educating the Wisconsin workforce is never ending and therefore must be a permanent part of our long-term economic strategy. ■

Top Five Wisconsin Export Markets: 2001

	Rank	Export (millions of dollars)
Canada	1	\$ 3,771
Japan	2	733
Mexico	3	670
United Kingdom	4	448
Germany	5	376

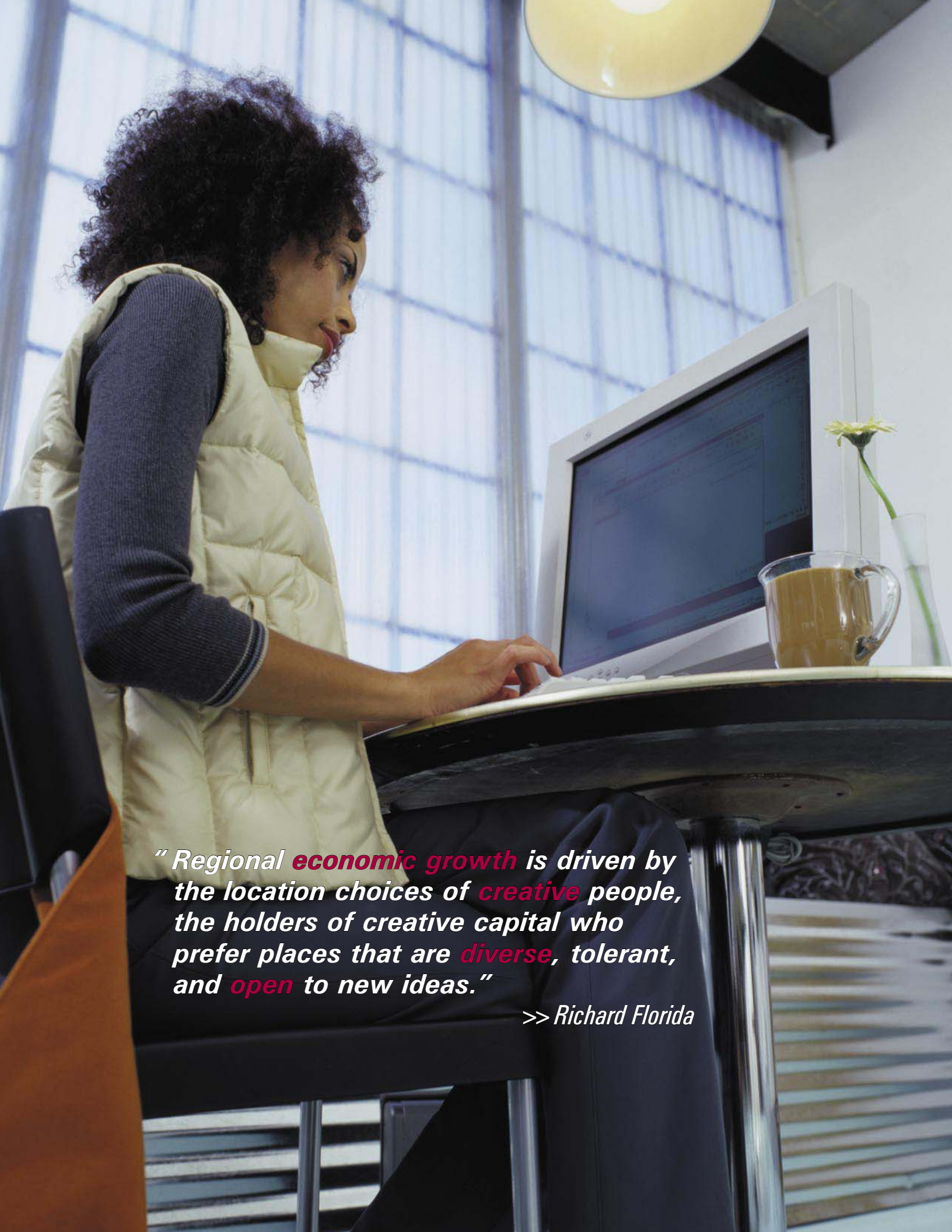
Wisconsin Industries and their International Competitors

	Competitors		
Paper	Canada	Finland	Sweden
Medical Imaging	Germany	Israel	Japan
Industrial Machinery	Italy	Germany	Japan
Electrical Machinery	Germany	Japan	U.K.
Auto Vehicles & Parts	Japan	Germany	Korea
Heavy Equipment	Japan	Germany	Brazil

A Word About China

It is widely recognized that in the last five years mainland China has made substantial investments in new manufacturing capacity that in the near future can be expected to put increasing downward pressure on prices in many of the world's basic industries.

Except for highly-engineered, precision parts, most first-tier component suppliers will find it cheaper to import many industrial components from China than to make them in the United States or in Europe.



*“ Regional **economic growth** is driven by the location choices of **creative** people, the holders of creative capital who prefer places that are **diverse**, tolerant, and **open** to new ideas.”*

>> Richard Florida

VISION 2020: WEALTH CREATION AND DIVERSITY

Wealth is created in our society when we produce more with less. It is productivity growth that ultimately drives real wealth creation, without productivity growth there is no long run wealth created in society. This is true up and down the economic ladder: wages for the many cannot be growing at the bottom without vigorous productivity growth across the entire economy.

Wealthy societies encourage the steady flow of new ideas that produce new products and services and allow its citizens to produce more with less. New, more efficient businesses create new jobs, generate increased profits, pay taxes to support our public institutions and generate investment capital to fund future development. The lack of new business formation leads to declining wealth, which in turn leads to a lack of investment capital needed to start new business ventures. Without sufficient investment capital, new ideas and discoveries are lured away by communities where investment capital is more plentiful.

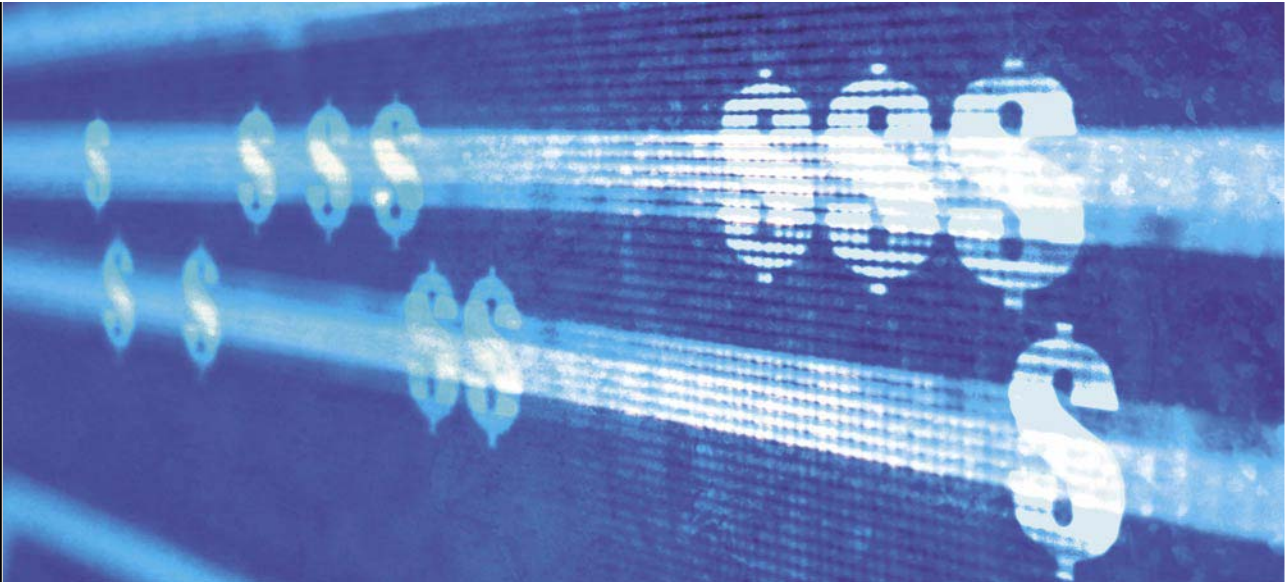
The creation of wealth is a key issue for Wisconsin. In the past 25 years, Wisconsin has not kept up with the surrounding states, or the nation, in the creation of wealth. In fact, Wisconsin stands at about 95 percent of the U.S. average in per capita income. Wisconsin's five-year income growth (25.4 percent) trails the nation and all of its neighbors except Michigan (21.5 percent). (Please see the chart on page 45 for more detail.)

To reverse this trend, Wisconsin needs to create a climate that encourages creative people who in turn can produce ideas and businesses that create wealth. Wealth can only be created in an atmosphere of diversity and tolerance. These social and cultural values are important if we are to achieve our goals of developing a high growth economy in the future. Wealthy societies not only permit but encourage individuals with explorer mentalities to flourish. The public virtues of openness and diversity are common characteristics of all wealthy societies.



"Wealth flows from creative people and productive businesses. Wisconsin must attract and nurture both."

**>> Steve Bablitch, President
Cobalt Corporation**



Although human talent is evenly distributed around the world, inventiveness is not. Inventiveness requires relentless curiosity—wondering why things work the way they do, having the courage to explore possibilities. Inventors are always learning—getting new knowledge from others and applying it in new ways, finding alternative ways of doing the same thing and building something where nothing before existed. Inventive people often are creative in more than one way. People who write good software and design new technology also frequently write music, poetry and perform in the arts.

Numerous studies have shown that economic prosperity is directly related to the presence of creative people in a community that is ethnically diverse, and which offers the ability for creative people to be themselves. Creative communities demonstrate a certain amount of disorder and even chaos. In contrast, well ordered communities of homogeneous people do not encourage innovation. In

such communities the demand for order usually over-rides intrinsic human curiosity, the desire to explore, to invent and to build.

To reverse the current economic decline, Wisconsin must become a more open and creative community, one less resistant to change. In doing so, Wisconsin must reconsider the usefulness of many of its most honored institutions and be open to a substantial make-over of some institutions for the sake of progress. Wisconsin must resist the temptation to suppress scientific and medical research.

Our system of business regulation and taxation must be re-examined and changed where necessary to accommodate and encourage individual creativity and business initiative. No one will ever know what is possible for Wisconsin's leading technologies unless we are willing to take steps now to make Wisconsin a more risk tolerant place to live and work. ■

Wisconsin Creativity Index Rankings

	Creativity Index	Overall Rank
Madison	925	20
Milwaukee	736	56
Appleton/Oshkosh/Neenah	560	118
Eau Claire	551	123
Green Bay	443	168
La Crosse	451	164

Small-Size Cities Creativity Rankings: Top Ten Cities

Rankings of 63 metro areas reporting populations 250,000 to 500,000 in the 2000 Census

#	City	Creativity Index	% Creative Workers	Creativity Rank	High-Tech Rank	Innovation Rank	Diversity Rank
1.	Madison, WI	925	32.8%	6	16	4	9
2.	Des Moines, IA	862	32.1%	8	2	16	20
3.	Santa Barbara, CA	856	28.3%	19	8	8	7
4.	Melbourne, FL	855	35.5%	1	6	9	32
5.	Boise City, ID	854	35.2%	3	11	4	6
6.	Huntsville, AL	799	35.3%	2	5	18	40
7.	Lansing, MI	739	34.3%	4	27	29	18
8.	Binghamton, NY	731	30.8%	12	7	3	60
9.	Lexington, KY	717	27.0%	28	24	10	12
10.	New London, CT	715	28.1%	23	11	13	33

Source: *The Rise of the Creative Class: and How Its Transforming Work*, Richard Florida

Although human talent is evenly distributed around the world, inventiveness is not.

*“ If we apply **knowledge** to tasks we already know how to do, we call it **‘productivity’**. If we apply knowledge to tasks that are new and different, we call it **‘innovation’**. ”*

>> Peter F. Drucker



VISION 2020: ENTREPRENEURS AND NEW BUSINESS FORMATION

Entrepreneurs are the change agents of the economy. In a capitalistic system, entrepreneurs build up new business models for the economy by introducing new economic paradigms based on new technology. Without entrepreneurs the new knowledge created in society will not be brought into the market. Economies become poor and weak because the old products and services are never improved and old business models do not decline so new ones can prosper.

The personal characteristics needed to create new knowledge are very different from those necessary to bring that knowledge into active use. Entrepreneurs are risk takers, organizers and doers, who make decisions before all relevant facts are known. Although a successful entrepreneur must have enough technical knowledge to challenge the assumptions of engineers, technical expertise is not his differentiating characteristic. The unique aptitude of the entrepreneur is his ability to create a financially successful business. Success to an entrepreneur means building a company that is grow-

ing and profitable, that has market value. Successful entrepreneurs understand that their mission is to create wealth.

Succeeding as an entrepreneur is hard work. There are many would-be entrepreneurs who fail to appreciate how hard it is, or how hard other entrepreneurs are working on their companies. Competition is fierce. First mover advantage is important. The importance of timing in the start-up of a business forces the entrepreneur to make decisions and move forward quickly. The ability to quickly figure out how to package a product so it is attractive to a large market of customers is the unique talent of an entrepreneur.

We need more entrepreneurial alternatives in Wisconsin for our ambitious young people if we hope to reverse the declining economic trends Wisconsin has experienced in recent years. A robust entrepreneurial environment will encourage talented young people to quickly step into challenging jobs where they would

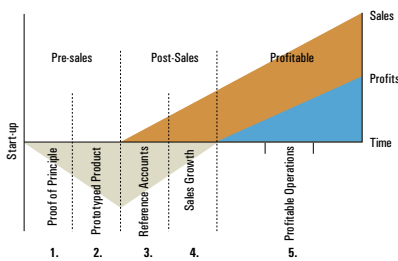


"The opportunity to invest in Wisconsin-based technology businesses has never been better. With adequate venture capital to back the best ideas, entrepreneurs can help lead Wisconsin to a more prosperous future."

>> *John Byrnes,
Executive Managing Partner
Mason Wells*



It takes time and many stages of development for a start-up company to become profitable.



1. Proof of principle
2. Prototyped product
3. Reference accounts
4. Sales growth
5. Profitable operations

be forced to learn or lose. In start-up companies there are no organizational bureaucracies, no policy manuals. In start-up companies, intelligence, intuition and common sense rule.

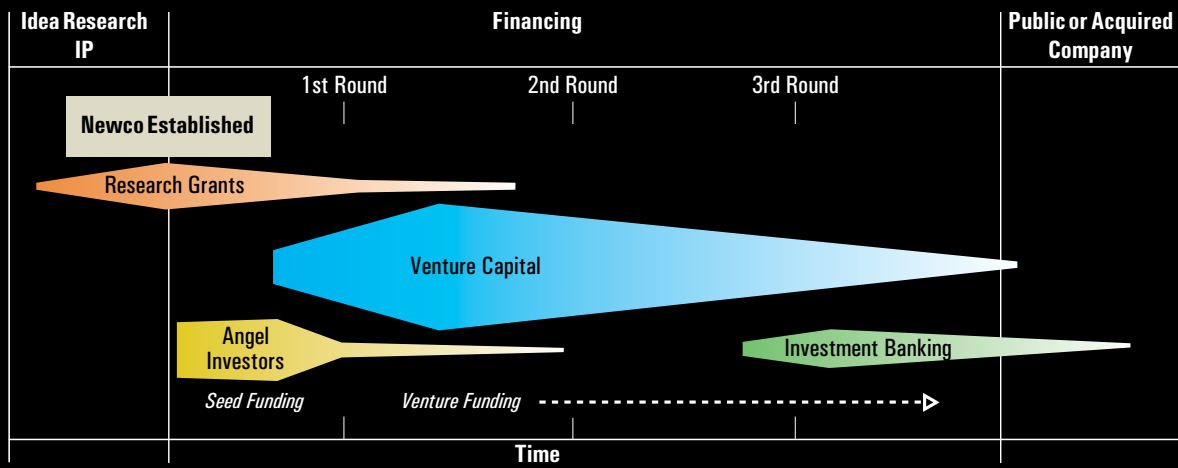
Young ambitious people learn more from success than from failure. The best way for a young entrepreneur to learn about business is, not surprisingly, from another successful entrepreneur. Experienced angel investors are themselves successful businessmen, so they are better able to provide sound business advice that is a more balanced view of the opportunities as well as the risks. They also serve as an example of how to succeed. Early interaction with successful businessmen is the best way to inspire young entrepreneurs and increase their chances for success.

More angel investors are not enough to create a vibrant entrepreneurial economy in Wisconsin. The lack of sufficient venture capital is a serious problem that must be addressed as part of the overall environment for entrepreneurship. The lack of financial resources is the

most common reason for the failure of an entrepreneurial business. Based on the level of technology development in Wisconsin (patents issued per year) and the amount of venture capital available in surrounding Midwest states, we need substantially more venture capital under management in Wisconsin by local firms. Unfortunately, less than 10 percent of the needed amount is currently available. This must change.

The large amount of venture capital needed for Wisconsin could be secured by a joint effort of the state government and our leading institutional investors and venture capitalists. The large national and international investors, such as the leading pension funds and insurance companies, are currently looking for opportunities to invest in U.S. technology businesses in regional (non-Californian) markets. There is a growing belief that mid-America offers great investment potential across all stages of the private equity market. The timing is right for a Wisconsin initiative to attract these investors into locally managed funds. ■

Financing of Start-up Companies



Venture Capital Investments in 2002:
Top 10 States plus Illinois, Minnesota, and Wisconsin

	State Rank	Investments millions of dollars	Deals
California	1	9,391	1,054
Massachusetts	2	2,403	344
Texas	3	1,252	165
New York	4	793	153
Maryland	5	604	93
Washington	6	590	109
Georgia	7	564	85
New Jersey	8	553	89
North Carolina	9	550	90
Colorado	10	546	81
Minnesota	14	327	57
Wisconsin	25	64	11

Source: PricewaterhouseCoopers/Venture Economics/National Venture Capital Association MoneyTree™ Survey

Venture capital is the primary source of financing for start-up companies in the United States. Other resources such as public and private research grants, individual “angel” investments, and bridge financing by investment bankers can contribute to a successful start-up, but sufficient venture capital must be available to carry the company through the high risk stages of development. Wisconsin needs substantially more venture capital if we hope to compete with other states.

THE MODEL WISCONSIN ECONOMY: 2020

The economic trends in the Wisconsin can be reversed by shifting the focus of the state’s business development activities to the creation of new, high-tech industries. Such a shift does not require massive dislocations in our economy, but it does mean that some things must change. Real change begins with the realization that Wisconsin does not have a large high-tech, high-growth segment in its economy—it is perhaps the only thing missing.

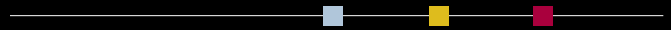
If we examine the Wisconsin economy as if it were a small nation, it becomes apparent that we have a diversified economy with some sectors declining and most other sectors growing steadily but at a modest rate. This model produces overall growth below the national averages. The missing ingredient in the Wisconsin economy is the critical high-tech sector that is growing at double digit rates. Successful, growth-oriented economies have a high-tech growth sector that raises the average earnings for an entire region.

The Model Wisconsin Economy: 2020 that is presented in this report depicts a Wisconsin economy that quickly evolves from one dominated by basic industries growing at a 4 to 5 percent annual rate to one with a new high-growth sector that is growing at a 15 to 20 percent annual rate and moving the overall Wisconsin economy forward at rates above the national averages. The new, high growth sector of our economy would be populated with knowledge-intensive, high tech businesses that employ large numbers of highly-skilled knowledge workers, particularly in the life sciences and healthcare.

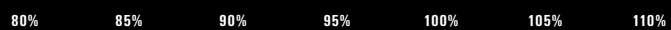
Value	Change	%Change
3,006.62	38.97 ▲	1.31%
2,649.71	33.35 ▲	1.27%
807.90	2.93 ▲	0.36%
10,744.54	96.03 ▲	0.90%
1,367.40	13.28 ▲	0.98%
626.42	4.70 ▲	0.76%
61.33	0.49 ▼	0.79%

The Roadmap: Model Wisconsin Economic Benchmarks

Per Capita Income
(% of U.S. Average)



College Graduates
(% of U.S. Average)



■ 2000 ■ 2010 ■ 2020

The Model Wisconsin Economy: 2020 provides the context for a statewide discussion of desired economic outcomes and the inputs we need to achieve those outcomes. The desired economic outcomes for the state and its people should include:

Raising Per Capita Income Above the National Average	The per capita income level of Wisconsin residents increasingly trails the U.S. average. Raising per capita income will improve the overall economic prosperity and independence of Wisconsin people.
Increasing Employment in New High-tech Businesses	Significant increases must occur in the number of new business formations each year in the high-tech, high-growth sectors of Wisconsin's economy. The best insurance against the negative impacts of economic change is a vibrant high-knowledge, high-tech sector.
Increasing Retention and Employment of Highly Educated Technologists	Economic change driven by technology and globalization is projected to continue. Wisconsin must retain a higher percentage of college and advanced degreed workers if we expect to be competitive in the emerging global economy.
Increasing Research and Development Expenditures and Patents Issued	Wisconsin needs a strong intellectual base to fuel innovation in all sectors of the economy. Per capita patent applications and issuances must rise each year to stay above the national averages. Rising levels of research and development in science and technology will produce rising economic prosperity for future generations.

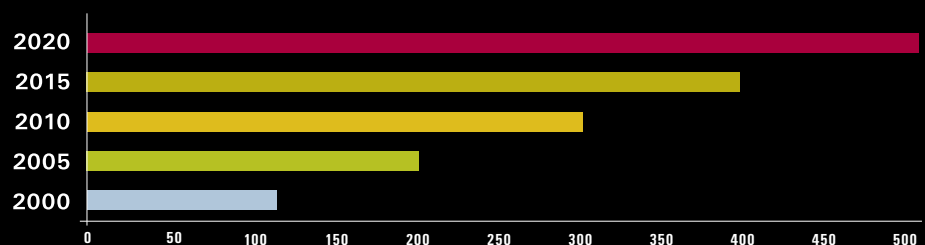
	2000	2010	2020
Net Business Formations (State Rank)	19	17	15
Tax Burden (State Rank)	3	6	11

The Wisconsin economy can return to a high level of prosperity. Wisconsin once enjoyed per capita income above the national average and high growth and high-income employment. What do we need to do to make it happen again?

<p>Develop Knowledge and Technology Resources</p>	<p>Exploit the knowledge explosion to feed innovation in products and services and give the state economy a competitive edge in a rapidly changing economic environment. Create new institutions to manage the flow of new knowledge into high-tech, high-growth businesses that are built on new discoveries and technological innovation.</p>
<p>Invest in Knowledge Workers</p>	<p>A knowledge economy produces high-paying jobs. Those jobs in turn require an educated, skilled and creative workforce. The state must improve the overall level of education in the workforce and must educate and attract creative and productive workers.</p>
<p>Grow Business and Financial Resources</p>	<p>A dynamic economy requires good financial resources, especially the availability of early stage financing for start-up businesses. To be competitive, Wisconsin must also compete in a global economy, exporting its output and attracting investment capital from around the world. In all of these areas, Wisconsin needs to improve.</p>
<p>Promote an Open, Diverse and Creative Culture in Wisconsin Communities</p>	<p>Highly skilled and educated workers can find good jobs in many areas of the country. A big factor in where they locate is the state's quality of life. Ethnic diversity, creative outlets and continuing education opportunities must be combined with the traditional life style measurements of affordable housing, a reasonable cost of living, child care facilities, and open space. With these assets Wisconsin can attract creative, highly skilled knowledge workers.</p>



Annual Venture Capital Investment (in \$ billions)



THE ROAD TO PROSPERITY

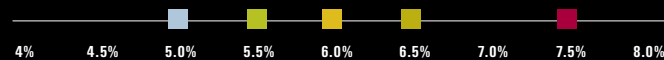
The Roadmap: Model Wisconsin Economic Benchmarks

	State Rank	2000	2005	2010	2015	2020
Economic Output						
Gross State Product (\$ millions)	20	\$173,478	\$206,037	\$244,708	\$290,636	\$345,185
Total Exports (\$ millions)	19	\$10,858	\$13,392	\$17,130	\$23,251	\$31,067
Per Capita Income	22	\$28,100	\$32,261	\$37,037	\$42,521	\$48,817
Knowledge Workers						
College Graduates (Bachelor & Graduate Degrees)	31	827,000	870,500	953,000	1,079,000	1,248,000
College Graduates as % of Population Over Age 25	31	23.8%	24%	25%	27%	30%
Doctoral Scientists & Engineers	21	9,740	10,000	11,500	13,000	15,500
Arts, Design, Entertainment & Media Workers	17	29,910	35,000	40,000	50,000	60,000
Overall Workforce Education Rank	25	25	23	21	19	15
Knowledge and Technology						
Patents Issued	16	2,078	3,000	4,000	6,000	8,000
High-Tech Occupations		203,000	210,000	240,000	270,000	310,000
Research & Development Expenditures (\$ millions)	22	\$2,640	\$3,348	\$4,282	\$5,812	\$8,630
Business and Finance						
Annual Venture Capital Investment (3 Year Average; \$ millions)	29	\$111,000	\$200,000	\$300,000	\$400,000	\$500,000
Foreign Direct Investment (\$ millions)	30	\$11,013	\$13,392	\$17,130	\$21,798	\$27,615
Annual Net Business Formations	19	579	700	800	900	1,000

Wisconsin Brain Gain Index
(Associate, Bachelor, and Graduate degrees as % of population over age 25)



Wisconsin High-Tech Business Index
(% of high technology businesses in the state)



■ 2000 ■ 2005 ■ 2010 ■ 2015 ■ 2020

A man and a woman are looking at a tablet together outdoors. The man is on the left, looking down at the tablet. The woman is on the right, smiling and looking at the tablet. They are both wearing blue shirts. The background shows green trees and a brick building.

*“ The World Bank has shifted much of its emphasis to the intangibles of **knowledge**, **institutions** and **culture** in an attempt to fashion a new development framework for our work.”*

>> Joseph Stiglitz



VISION 2020: REGIONAL ECONOMIC DEVELOPMENT

The future success of local economic development will be influenced by the way community leaders deal with socio-logical, educational and political factors that create an attractive climate for the modern “knowledge workers.” In the era of man-made, knowledge-based industries, the critical resource is people. Human resources are critical for success in a knowledge-based economy. Our community leaders must increasingly consider cultural factors when designing local business development programs if they expect to encourage the growth of knowledge-based, high-technology industries.

First, these leaders must develop a plan for making their community more attractive to creative people and highly skilled workers. A society that values and honors curiosity and creativity is a prerequisite for a knowledge-based, growth economy. The “absent-minded professor” and the so-called “mad scientist” must be viewed as community treasures, not as objects of scorn or ridicule. Communities that hope to be

centers of innovation must deliberately make room for revolutionary thinkers. Socio-political systems that accept, foster and are willing to pay for creativity will be at the center of the knowledge-based economy of the future.

Second, Wisconsin’s leaders must focus on creating through education a steady supply of newly educated and re-educated knowledge workers to fuel the growth of high-tech businesses in the community. Local businesses must encourage workforce development by implementing employment policies that are more accommodating of continuing education, including enlightened educational leave policies and job switching and sharing options for employees. The educational system must permit “second chance” educational decisions for those who missed the opportunity for formal education early in life, and provide more credentialing for course work that is completed by student-employees while on the job. A growing economy is built on a society that fosters a public and private educational system



“Regional cooperation and action are the keys to high-tech economic development in Wisconsin. Every region of the state can find a high-tech niche that can produce high paying jobs.”

*>> David J. Ward, President
NorthStar Economics, Inc.*



Fast Forward! Are You Moving at the Speed of Wisconsin?

that emphasizes creativity and intuitive thinking as part of a broad curriculum that covers the full lifetime of its skilled workers.

Third, they must build the necessary infrastructure to support the formation and rapid growth of high-technology businesses in the community. In a high-tech society, local leaders recognize that the community must provide an environment in which small businesses can easily be founded and quickly built into large companies. The process begins with the creation of research parks that contain research centers and new business incubators. Technology transfer agents working at the community level must continually work with local entrepreneurs, angel investors and venture capitalists to produce a steady supply of new businesses. Additional consulting resources must ultimately be applied to help small companies quickly develop competitive positioning strategies that will lead to rapid growth. It is a never-ending process.

Finally, Wisconsin's community leaders must adopt a global perspective. Successful strategies for exploiting our

knowledge advantage must be based on the export to foreign markets of products and services containing high levels of embedded knowledge. Our regional economic communities must develop proprietary products that cannot easily be copied by reverse engineering, and they must develop knowledge-rich services that will pull foreign buyers directly into Wisconsin, or through the Internet. In the case of healthcare, for example, it may mean inventing ways of importing patients and customers from around the world—a strategy that may require new infrastructure to better accommodate foreign travelers.

Many communities have already begun the processing of refocusing their local business development efforts through initiatives such as *Build Wisconsin*, and the Technology Zone Programs. Not surprisingly, the smaller communities are moving faster. Many regional development organizations have been formed and technology strategies are being carried out to build upon perceived competitive advantages. In the following pages, learn more about Wisconsin technology zones and the assets of our regional economies. ■



In the Zone

The *Technology Zone Program* of the Wisconsin Department of Commerce lays the foundation for the creation of regional centers of excellence and technology clusters.

In Wisconsin, eight zones covering 53 of 72 counties were designated following a process that encouraged economic development stakeholders to work within and across county lines. Each zone is effective for 10 years and is eligible for \$5 million in tax credits, to be made available to high-tech businesses locating or expanding within each zone.

The *Technology Zone Program* focuses on the development of Wisconsin's "knowledge economy" businesses—those engaged in research, development or production of high tech products or services. Businesses in the technology zone may be new companies spawned by developments in the regional centers of excellence or existing companies that use advanced technology to improve their production processes, systems, and products.

The eight technology zones including their counties are as follows:

- **South East Region:** Kenosha, Racine and Walworth.
- **Milwaukee Metro Area:** Milwaukee, Ozaukee, Washington and Waukesha
- **SuperiorLife:** Ashland, Bayfield, Burnett, Douglas, Iron and Washburn.
- **I-94 Corridor:** Chippewa, Dunn, Eau Claire, Pierce, Polk and St. Croix.
- **North Central Region:** Adams, Forest, Langlade, Lincoln, Oneida, Marathon, Portage, Wood and Vilas.
- **Western Wisconsin:** Crawford, Jackson, Juneau, La Crosse, Trempealeau and Vernon.
- **1-90 Corridor:** Dane, Jefferson and Rock.
- **NEWREP (northeast Wisconsin):** Florence, Brown, Calumet, Door, Fond du Lac, Kewaunee, Manitowoc, Marinette, Menominee, Oconto, Outagamie, Shawano, Sheboygan, Waupaca, Waushara and Winnebago.

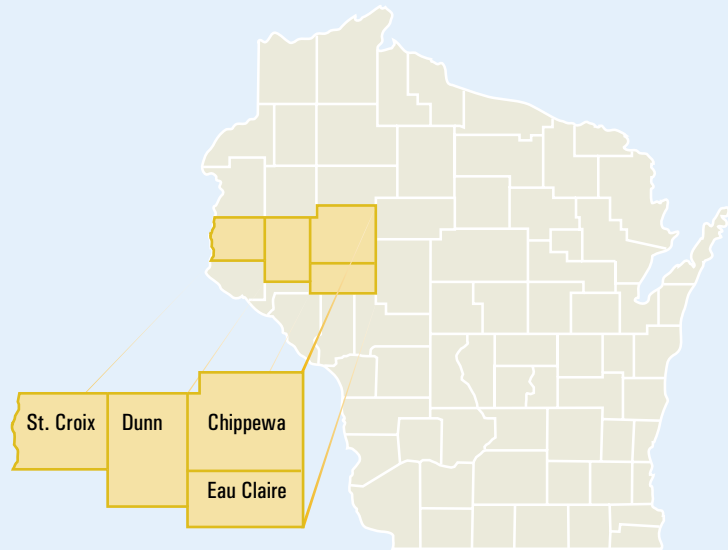
>> *Please read on to learn about the strengths of some of Wisconsin's selected regional economies.*

1. Chippewa Valley

Overview

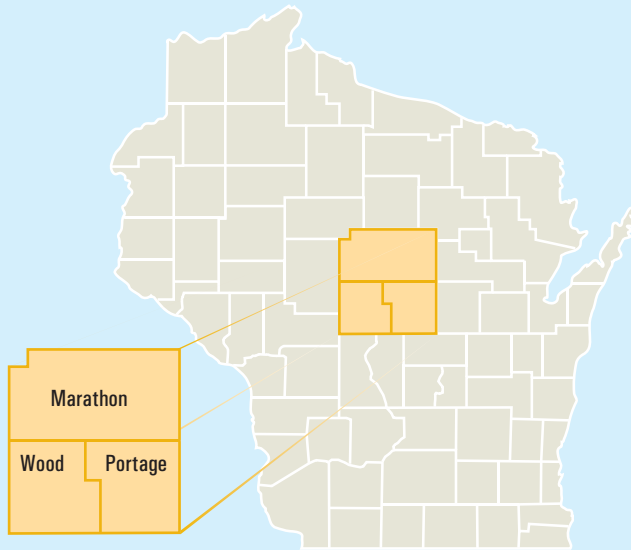
Consisting of Chippewa, Dunn, Eau Claire, and St. Croix Counties, the Chippewa Valley region thrives by virtue of its proximity to Minnesota's Twin Cities, as well as the presence of three University of Wisconsin campuses.

Major Cities: Chippewa Falls
Eau Claire
Hudson
Menomonie



Population:	2001 U.S. Census Bureau est.:	255,909
Employment Data:	Total Employment:	116,412
	Manufacturing:	22,474
	Services:	26,859
	Total Trade:	35,421
	Transportation & Utilities:	4,842
	Employment Rate:	96.6%
	Labor Force Participation:	72.8%
	Average Annual Wage:	\$ 26,409.56
Key Business Resources:	Cray Research, Inc. Excel Energy Hutchinson Technology, Inc. Johnson Matthey Semiconductor Luther Hospital McMillan Electric Company	Menard, Inc. Phillips Corporation Sacred Heart Hospital Silicon Graphics, Inc. 3M Company WalMart Associates, Inc.
Educational Resources:	Chippewa Valley Technical College UW-Eau Claire UW-Stout	Immanuel Lutheran College UW-River Falls Wisconsin Indianhead Tech. Col.

2. Central Wisconsin



Overview

Consisting of Marathon, Portage, and Wood Counties, the Central Wisconsin region is home to a flourishing health care industry, a four year University of Wisconsin campus, and several sizable manufacturers and insurance companies. There is also a heavy concentration of millworkers in the region.

Major Cities: Marshfield
Stevens Point
Wausau
Wisconsin Rapids

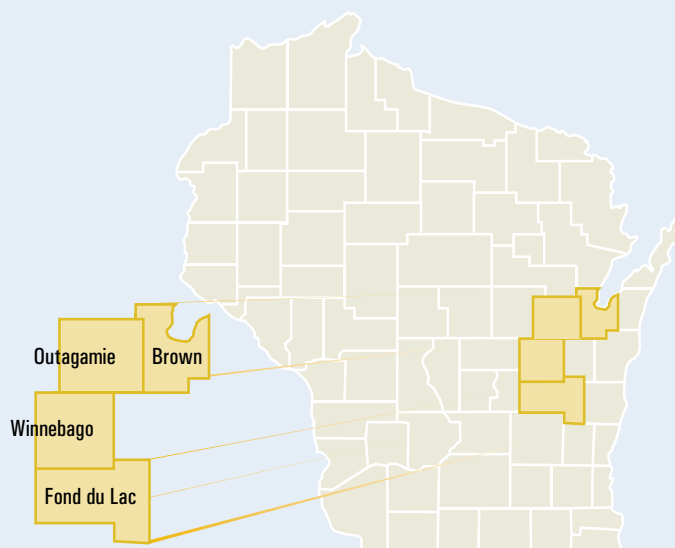
Population:	2001 U.S. Census Bureau est.:	268,258
Employment Data:	Total Employment:	141,572
	Manufacturing:	35,230
	Services:	30,352
	Total Trade:	34,224
	Transportation & Utilities:	8,220
	Employment Rate:	96.1%
	Labor Force Participation:	71.0%
	Average Annual Wage:	\$ 29,496.45
Key Business Resources:	The Copps Corporation	Roehl Transport, Inc.
	Fiskars Consumer Products	SNE Enterprises, Inc.
	Liberty Mutual Insurance Co.	St. Josephs Hospital
	Marshfield Clinic	Sentry Insurance
	Nekoosa Papers, Inc.	Stora Enso Papers
Educational Resources:	Midstate Technical College	UW-Stevens Point
	Northcentral Technical College	UW-Marathon County
	UW-Marshfield/Wood County	

3. Fox River Valley

Overview

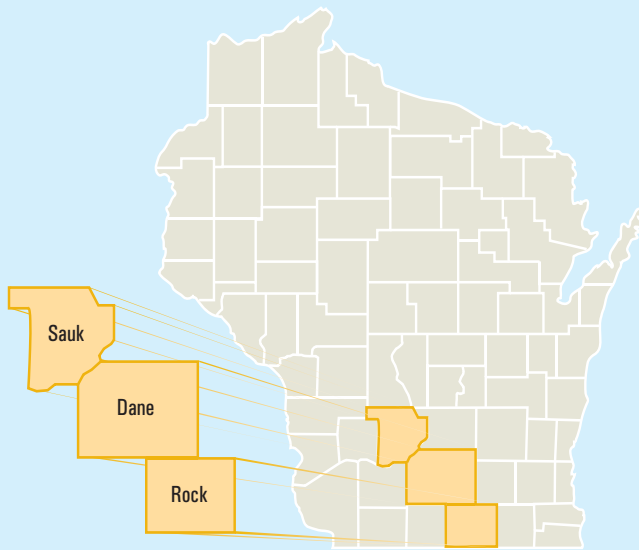
Consisting of Brown, Outagamie, Fond du Lac, and Winnebago Counties, the Fox River Valley region is home to Wisconsin's thriving paper industry, several universities and colleges, as well as one of the state's most populous Native American tribes.

Major Cities: Appleton
Fond du Lac
Green Bay
Neenah / Menasha



Population:	2001 U.S. Census Bureau est.:	648,420
Employment Data:	Total Employment:	374,336
	Manufacturing:	97,971
	Services:	85,916
	Total Trade:	83,057
	Transportation & Utilities:	22,397
	Employment Rate:	97.3%
	Labor Force Participation:	79.3%
	Average Annual Wage:	\$ 31,498.61
Key Business Resources:	Agnesian Health Care, Inc.	International Paper Company
	Appleton Papers, Inc.	Kimberly-Clark Corporation
	Brunswick Corporation	Oneida Tribe
	Employers Health Insurance Co.	Oshkosh Truck Corporation
	Fort James Operating Company	Plexus Corporation
	Giddings & Lewis, LLC	Wisconsin Public Service Corp.
Educational Resources:	Bellin College of Nursing	Ripon College
	Fox Valley Technical College	St. Norbert College
	Lawrence University	UW-Fond du Lac
	Marian College of Fond du Lac	UW-Fox Valley
	Moraine Park Technical College	UW-Green Bay
	Northeastern Wisc. Technical Col.	UW - Oshkosh

4. Capital Region



Overview

Consisting of Dane, Rock, and Sauk Counties, the Capital Region is home to the center of Wisconsin's state government and the flagship school of the University of Wisconsin system, including high-ranking medical and law schools. The health care industry is a major economic driver in the region.

Major Cities: Madison
Janesville
Beloit
Baraboo

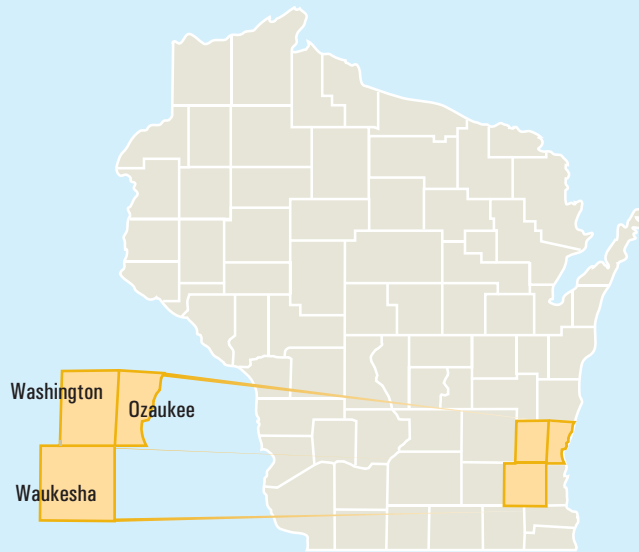
Population:	2001 U.S. Census Bureau est.:	641,882
Employment Data:	Total Employment:	375,206
	Manufacturing:	57,651
	Services:	92,543
	Total Trade:	86,633
	Transportation & Utilities:	14,262
	Employment Rate:	97.4%
	Labor Force Participation:	75.9%
	Average Annual Wage:	\$ 31,787.57
Key Business Resources:	American Family Insurance Co. CUNA Mutual Insurance Society General Motors Ho-Chunk Nation	Kraft Foods, Inc. Lands' End, Inc. Mercy Health System SSI Technologies
Educational Resources:	Beloit College Blackhawk Technical College Edgewood College Madison Area Technical College	UW-Baraboo / Sauk County UW Hospitals and Clinics UW-Madison UW-Rock County

5. Kettle County Region

Overview

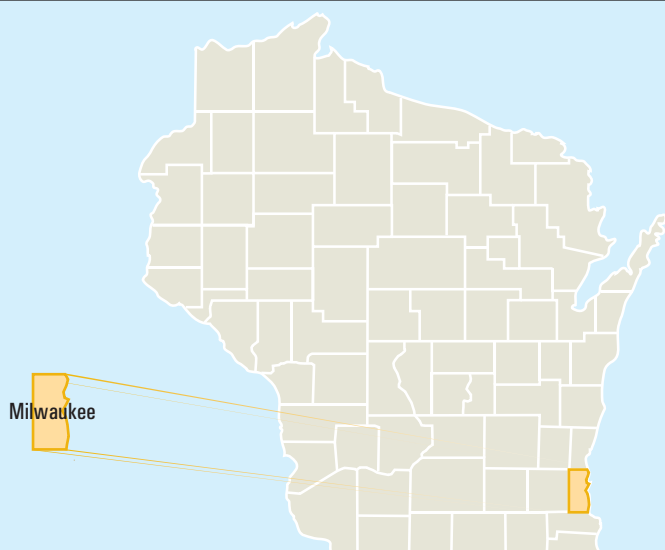
Consisting of Ozaukee, Washington, and Waukesha Counties, the Kettle County region is home to the wealthiest members of the Wisconsin workforce. The regional economy in this region is driven by health care providers, manufacturers, and printing and retail industries.

Major Cities: Brookfield
Mequon
New Berlin
West Bend



Population:	2001 U.S. Census Bureau est.:	570,449
Employment Data:	Total Employment:	311,061
	Manufacturing:	84,375
	Services:	73,139
	Total Trade:	74,883
	Transportation & Utilities:	10,867
	Employment Rate:	97.5%
	Labor Force Participation:	77.0%
	Average Annual Wage:	\$ 34,304.39
Key Business Resources:	Cooper Power Systems, Inc. Dayton-Hudson Corporation Fleming Companies, Inc. The Gap, Inc. General Electric Corporation Marks Five Corporation	Quad/Graphics, Inc. Seek, Inc. Serigraph, Inc. United Parcel Service, Inc. WalMart Associates, Inc. Waukesha Memorial Hospital
Educational Resources:	Carroll College Concordia University UW-Washington County	UW-Waukesha Waukesha County Technical College

6. Milwaukee County Region



Overview

Consisting solely of Milwaukee County, this region is the most densely populated and features the largest municipality in the state. The region employs more Wisconsin workers than any other region. The local economy is bolstered by the presence of a high-ranking medical school and law school, and a large four-year state university campus.

Major Cities: Milwaukee
West Allis
Wauwatosa

Population: 2001 U.S. Census Bureau est.: 932,012

Employment Data:

Total Employment:	632,184
Manufacturing:	90,261
Services:	244,020
Total Trade:	122,273
Transportation & Utilities:	34,026

Employment Rate: 95.3%
Labor Force Participation: 64.7%

Average Annual Wage: \$ 34,743.01

Key Business Resources:

Astronautics Corp.	Manpower Inc.
Aurora Health Care	Marshall & Ilsley Corporation
Briggs & Stratton Corp.	Midwest Express
Harley-Davidson Corporation	Northwestern Mutual Life
Johnson Controls	Rockwell International

Educational Resources:

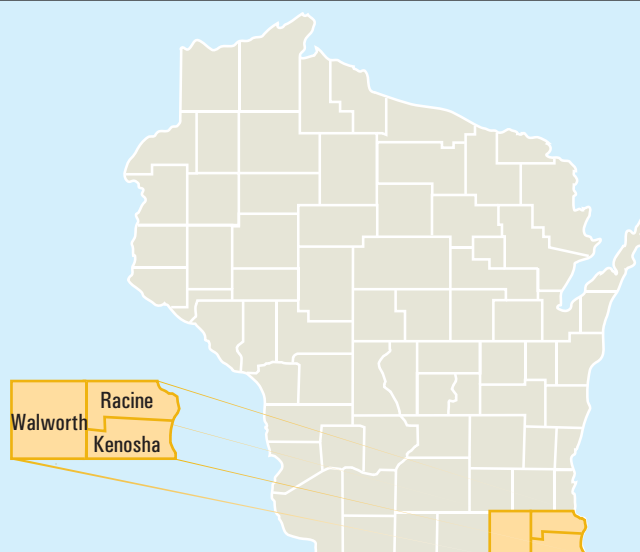
Alverno College	Milwaukee Institute of Art & Design
Cardinal Stritch University	Milwaukee School of Engineering
Marquette University	Mount Mary College
Medical College of Wisconsin	UW-Milwaukee
Milwaukee Area Technical College	Wisconsin Lutheran College

7. Southeast Wisconsin Region

Overview

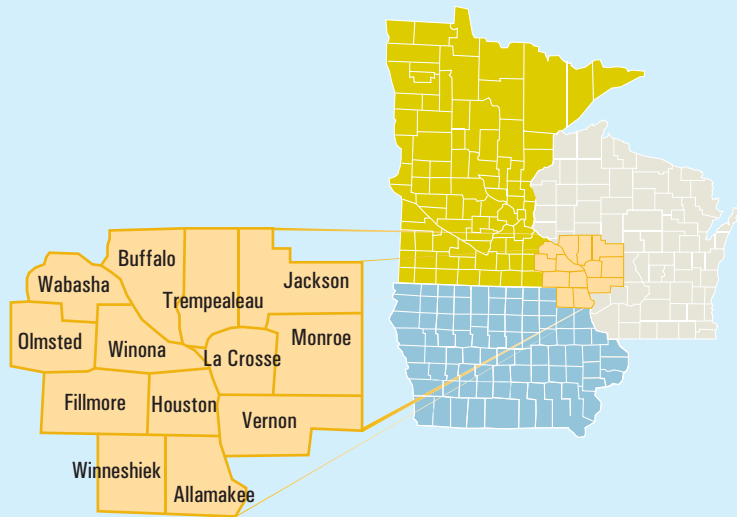
Consisting of Racine, Kenosha, and Walworth Counties, the Southeast Wisconsin Region boasts a diverse labor force, a four-year state university campus, and several major manufacturers and health care providers.

Major Cities: Kenosha
Racine
Whitewater



Population:	2001 U.S. Census Bureau est.:	437,742
Employment Data:	Total Employment:	168,835
	Manufacturing:	46,193
	Services:	40,055
	Total Trade:	39,625
	Transportation & Utilities:	5,808
	Employment Rate:	96.0%
	Labor Force Participation:	70.7%
	Average Annual Wage:	\$ 30,849.91
Key Business Resources:	Case Corporation	Modine Manufacturing Company
	Daimler Chrysler Corporation	SC Johnson & Son, Inc.
	Emerson Electric Company	Snap-On Tools, Inc.
	Kenosha Hospital & Medical Center	St. Mary's Medical Center
Educational Resources:	Carthage College	UW-Parkside
	Gateway Technical College	UW-Whitewater

8. 7 Rivers Region

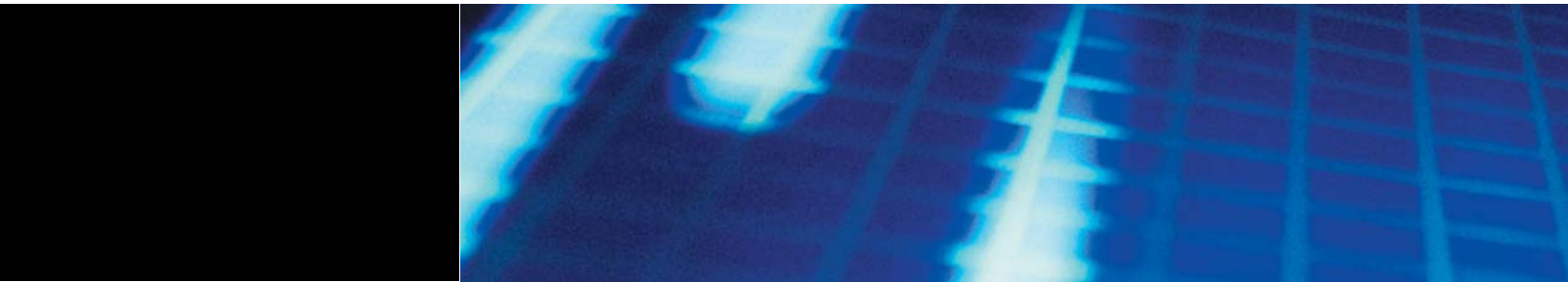


Overview

Consisting of counties in Minnesota, Iowa, and Wisconsin, the 7 Rivers region is home to several colleges and universities, as well as a thriving health care industry. In addition, there is a strong manufacturing base in the region.

Major Cities: Decorah, IA
La Crosse, WI
Rochester, MN
Winona, MN

Population:	2001 U.S. Census Bureau est.:	512,002
Employment Data:	Total Employment:	248,582
	Manufacturing:	47,225
	Services:	78,569
	Total Trade:	38,925
	Transportation & Utilities:	10,096
	Employment Rate:	96.5% (WI)
	Labor Force Participation:	70.8%
	Average Annual Wage (1999):	\$ 26,257.31
Key Business Resources:	Ashley Furniture Industries	IBM Corporation
	CenturyTel, Inc.	Firstlogic
	Crenlo, Inc.	Marten Transport
	Fastenal Corporation	Mayo Clinic
	Franciscan Skemp Healthcare Sys.	The Trane Company
	Gundersen Lutheran Medical Ctr.	TRW Automotive Electronics
	Ho Chunk Nation	U.S. Department of Defense
Educational Resources:	Luther College	UW-La Crosse
	Mayo Medical School	Upper Iowa University
	Milwaukee Area Technical College	Viterbo University
	Northeast Iowa Community Coll.	Western Wisconsin Technical College
	Rochester Community College	Winona State University
	Saint Mary's University of Minn.	Wisconsin Lutheran College
	Southeast Technical College	



Selected Bibliography

Not all of the ideas in this report are new. Most have been borrowed from thought leaders around the world who have something pertinent to say about the realities of the modern, global economy. For those who seek a better understanding of the ideas in this report we suggest the following selection of books and materials as a guide for further study.

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