Cooperate

A Practitioner's Guide for Effective Alignment of Regional Development and Higher Education

Prepared for the U.S. Department of Labor
Employment and Training Administration
by the Council on Competitiveness

March 2008

> Higher education must now become a full partner in formulating and implementing regional competitiveness strategies.
>
> – Report of the Strengthening America's Communities Advisory Committee (2005)

I. Introduction: Competitiveness, Innovation and Regionalism

Innovation is the key to regional competitiveness

Research by the Council on Competitiveness notes that, in the face of growing global competition, the only sustainable advantage for U.S. regions is continuous innovation.[1] Innovation is the process by which individuals, companies, regions and even entire countries remake themselves in the face of changing markets. It is the driver of productivity growth and, ultimately, of a rising standard of living.

Despite the rise of communications technologies and the proliferation of global supply chains, regions still matter—in some ways, more than ever. Many firms recognize that locating facilities in areas of concentrated expertise can significantly boost productivity and competitiveness. The extensive literature on clusters and knowledge spillovers details the mechanisms by which this works.[2]

To advance the innovation-based regional development model, the Council on Competitiveness has been studying the sources of regional innovation for almost a decade. Our regional work has served as a laboratory for the application of the national policies the Council has developed through its National Innovation Initiative.[3]

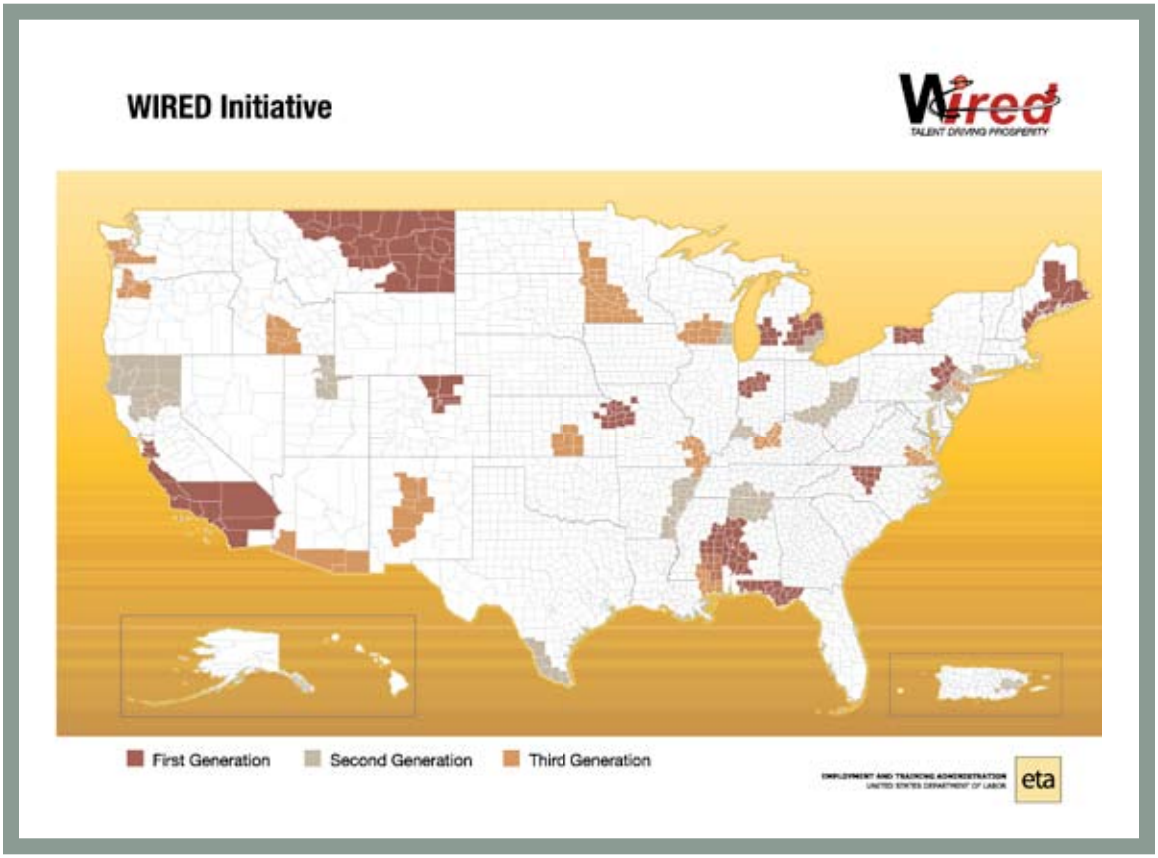
This guide is the result of a partnership between the United States Department of Labor's (DOL) Employment and Training Administration's (ETA) Workforce Innovation in Regional Economic Development (WIRED) Initiative, which has provided funding, and the Council on Competitiveness. Both ETA and the Council on Competitiveness share the belief that an economy is no longer defined by the political boundaries of a city, county or state. This regional concept promotes partnerships among key community players, including K-12 schools, community colleges, adult education centers, universities, regional employers and community economic and workforce development organizations.

---

[1] Council on Competitiveness. Innovate America. The National Innovation Initiative Summit and Report. (December 2004).

[2] Cortright, J. (2006). Making Sense of Clusters: Regional Competitiveness and Economic Development. Discussion Paper. Washington, DC: Brookings Institution Metropolitan Policy Program; Council on Competitiveness and National Governor's Association. (2007). Cluster-Based Strategies for Growing State Economies.

[3] Council on Competitiveness. Innovate America. The National Innovation Initiative Summit and Report. (December 2004).



The Council on Competitiveness has become a respected thought leader and partner to policy makers committed to promoting regional innovation. Working alongside federal, state and regional partners, the Council has worked on major national policy initiatives and participated in regional economic development efforts in nearly 20 U.S. regions.[4]

During the past decade, there has been an explosion of regional development activity. At the grassroots level, communities of all shapes and sizes have launched regional development organizations to coordinate a range of activities. And in recent years, federal and state programs have recognized that regions can be highly effective units for promoting innovation.

[4] **WIRED**, for example, was designed with significant input from the Council using the idea of "innovation hotspots" from the Council's *Innovate America* report. The Council has served as one of the designated technical assistance providers to the original thirteen **WIRED** regions. **The Regional Competitiveness Initiative** was launched in 2003 with funding from the Economic Development Administration, Over a two year period, the Council implemented regional initiatives with local partners in seven areas: Central New Mexico, Greater Rochester, New York, the Inland Northwest (Spokane – Coeur d'Alene area), Northeast Ohio, St. Louis, West Michigan, and Wilmington, Delaware. Two reports were completed as part of the project. ***Regional Innovation: National Prosperity and Measuring Regional Innovation: a Guidebook for Conducting Regional Innovation Assessments***. **The Clusters of Innovation Initiative**, launched in 1999, offered a new way of thinking about regional economies. The Initiative studied five regions around the country: Atlanta, Pittsburgh, the Research Triangle, San Diego and Wichita.

WIRED – Workforce Innovation in Regional Economic Development

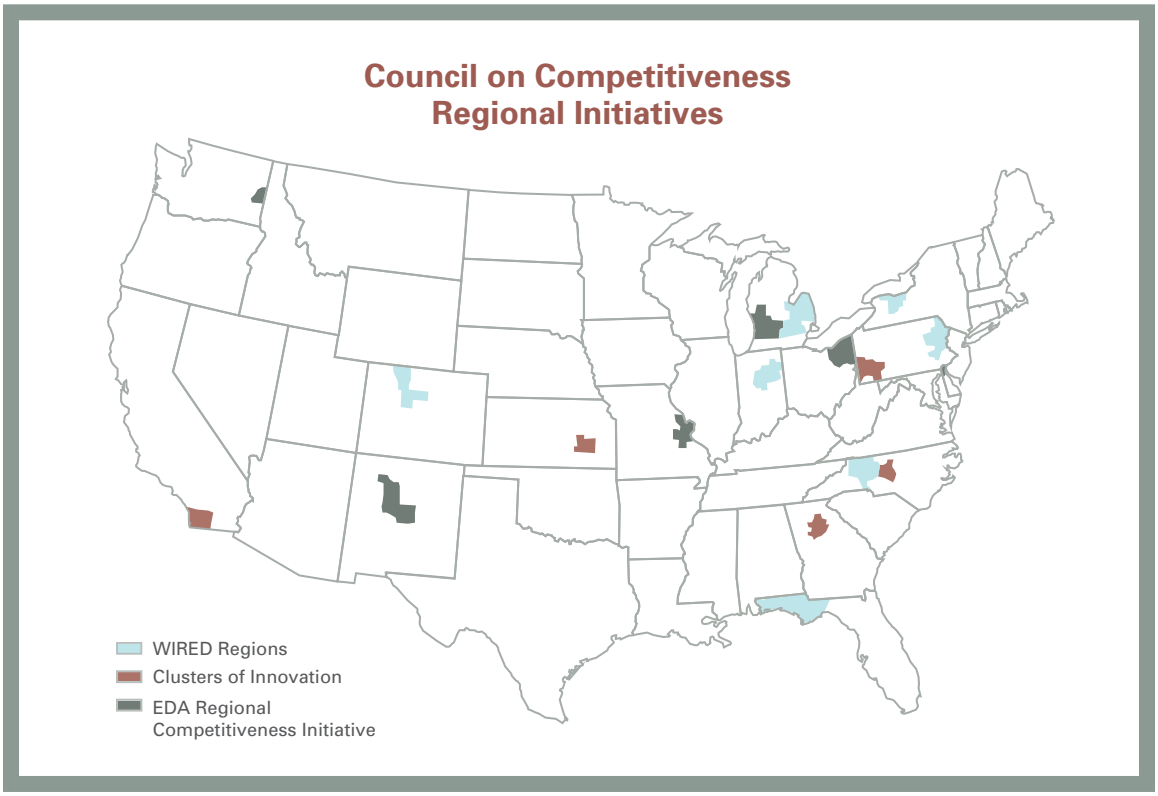
The WIRED Initiative, launched in November 2005, stresses the critical role that talent development plays in creating effective regional economic development strategies. WIRED goes beyond traditional strategies for worker preparation by bringing together state, local and federal entities; academic institutions; investment groups; foundations; and business and industry to address the challenges associated with building a globally competitive and prepared workforce.

An economy is no longer defined by the political boundaries of a city, county or state line. Instead, economies are defined regionally by a diverse group of industries, supported by factors such as infrastructure, investment and an availability of local talent. WIRED is based on the recognition that America's competitiveness ultimately depends on the ability of our regions to create the conditions that enable and encourage innovation. Those regions that are successful demonstrate the ability to network innovation assets – people, institutions, capital and infrastructure – to generate growth and prosperity in the region's economy. These regions are successful precisely because they have connected three key elements:

- workforce skills and lifelong learning strategies,
- investment and entrepreneurship strategies
- regional infrastructure and economic development strategies

Under the WIRED initiative, ETA has invested over $300 million in 39 U.S. regions that have committed to implementing strategies that embrace the regional, innovation-based model.

For more information, see http://www.doleta.gov/wired/about/



With leadership from the Department of Commerce (DOC) and DOL, regional innovation and entrepreneurship have now been adopted as the framework for economic development and workforce training efforts across the nation. Increasingly, the federal government sees its role as supporting regions as they develop their own unique strategies.

Higher education plays a central role in regional innovation

The future of national and regional competitiveness will depend on our ability to compete in the conceptual economy where the most important contest is being fought in the arenas of ideas, learning and delivering new kinds of value to the marketplace.[5]

In the conceptual economy, higher education[6] is more important for America's regions than ever. Universities and colleges are a principal source of high value-added human capital and intellectual capital. They are also a magnet for creative class amenities, technology companies and in-migration.

Universities play many roles in regions. Their presidents are frequently leaders and conveners of leaders. They are creators and providers of good jobs and invest heavily

[5] *Competitiveness Index: Where America Stands*. Council on Competitiveness, Washington, DC, 2007, p. 10.
[6] In referring to "higher education", we include all of post-secondary education, from community colleges to four-year colleges to research universities both public and private. Each higher education institution plays a unique and essential role in regional development.

in the region. They are a source of critical knowledge and experience and possess facilities of significant benefit to the regional economy. Finally, they are a provider of services such as health care, schools, consulting and research.

Higher education is both *global* – embedded in global knowledge networks and held to international standards of scholarship – and *local* – closely tied to a specific region through its impact on the local economy, its contribution to the regional labor force and the connections it has with local businesses. It therefore can serve as a bridge between regional and global knowledge flows.

Since the establishment of the Land Grant Colleges and universities in the 19th Century, U.S. higher education institutions have seen engagement in regional development as part of their mission. A number of recent trends have further increased the degree to which higher education is engaging in regional innovation activities.

- The rapid growth of higher education has made it an important industry and a source of employment, investment and consumption at a regional level. At the same time, public institutions in particular are under increasing pressure to demonstrate their contribution to the region in order to justify public support.
- As companies become more dependent on high-skilled workers and access to cutting-edge knowledge, their decisions on where to locate facilities often include consideration of access to higher education. Regional developers[7] recognize that higher education can be a critical asset in attracting new investment.
- The growing importance of high-tech startups and small business to innovation-led growth has made access to university resources a critical success factor in regional development.

Yet despite the growing connection between regional development and higher education, there is a clear consensus that regional developers have not, as a rule, captured the full benefit of their higher education institutions. There is a growing realization among academic leaders too that more can be done to optimize local and regional relationships. One recent report refers to higher education as the "sleeping giant" with the potential to transform community development.[8]

[7] By "regional developers", we mean economic development and workforce development professionals and organizations of all kinds.

[8] Steve Dubb, *Linking Colleges to Communities: Engaging the University for Community Development*, The Democracy Collaborative at The University of Maryland, June 2007.

Direct Economic Impact of the Average American Public University

While the most important role of higher education in regional development is to support the regional innovation environment, higher education is also an important industry in its own right. Many large universities are among the largest employers in their region, and the spending power represented by their direct and indirect employees, students and visitors has a major economic impact. Colleges and universities are also major owners and developers of real estate.

The average public university

- Spends $284 million annually, including equipment, maintenance and capital improvements
- Generates $5 in spending for every $1 invested by states
- Generates an additional 10,306 jobs in the community and state over 10 years
- Creates 1,205 jobs in business incubators and research parks over 10 years
- Creates an additional 1,010 jobs through startup companies formed by faculty and/or others using university-generated intellectual property over 10 years

Source: National Association of State Universities and Land Grant Colleges

II. Fostering Cooperation

While many universities and regional developers are attempting to form stronger partnerships, they have found significant challenges in collaboration. Three barriers commonly get in the way:

- Differences in culture between higher education and regional developers
- Differing incentives that inhibit collaboration
- Unrealistic expectations that have been created by highly publicized success stories

The first step in overcoming these barriers is for both regional developers and university leaders to evaluate their own operations in terms of their capacity to encourage and support collaboration. As they recognize the importance of partnership, a growing number of higher education institutions and regional developers are changing the way they engage – finding new ways to reach out and to allow others to reach in.

Recommendations for Higher Education

There is a growing trend among colleges and universities to expand their involvement in regional development. To achieve this goal, academic institutions have adopted a number of structural and strategic changes that make them more flexible and accessible, aiming to:

- **Make regional development an institutional priority**
- **Facilitate access to university resources**
- **Build long-term partnerships**
- **Support regional engagement**

Make regional development an institutional priority

Historically, many higher education institutions have seen regional development as a relatively low priority, but a growing number of colleges and universities are raising regional development to a first-tier priority. Three approaches, often found in combination, illustrate this trend:

Embed regional development in the institution's core mission. The university staff consulted for this guide[9] emphasized that the more closely regional development activities are linked to the core missions of teaching and research, the more fully all elements of the institution will embrace a regional development mission and the more likely it is that collaboration will occur.

Mary Walshok of the University of California at San Diego has observed that the solution does not lie simply in making research or teaching more applied, but rather in developing "the institutional mechanisms through which we broker, exchange, develop, organize and disseminate knowledge to the growing publics for whom it is an increasingly essential resource."[10] The more closely an activity is related directly to the college or university's core mission of teaching or research, the easier it is to get the support needed to implement that activity and effectively sustain it. When regional development is embedded in a university's mission statement, as in the example from Georgia Institute of Technology below, the university is likely to be well-known as a leader in the field, as is Georgia Tech.

> *Georgia Tech is a leading center for research and technological development that continually seeks opportunities to advance society and the global economic competitiveness of Georgia and the nation. The Georgia Institute of Technology Strategic Plan, Georgia Institute of Technology, (1995).*[11]

Make regional development part of the president's personal mission. Even though higher education is known for decentralized governance and the strength of the faculty in decision making, the president of each institution plays a crucial role in setting university priorities. The active commitment of the president of the institution to regional development is a necessary

[9] See Appendix p22.
[10] Mary Walshok, *Expanding Roles for Research Universities in Regional Economic Development*, New Directions for Higher Education, No. 97 (Spring 1997), pp. 17-26.
[11] From *Innovation U: New University Roles in a Knowledge Economy*, Southern Growth Policies Board, 2002, p. 28.

though not sufficient condition for collaboration. Michael Crow, the president of Arizona State University, is renowned for his advocacy of the "New American University."[12] As he stated in his inaugural address in November 2002:

> *"The economic and cultural vitality of the State of Arizona is inextricably linked with the vitality of its universities. The transformation of Arizona State University will transform the State of Arizona, enriching it economically and culturally. But let us not limit our vision because the development of a new American university here in Arizona will have impact beyond the borders of our state."*

Another example of the president's personal mission is Michigan State University where President Lou Anna K. Simon expects to make Michigan State a model land-grant university for the 21st century and a leader among its peers through a new initiative called "Boldness by Design." She defines the initiative's mission in three parts:

- providing outstanding graduate, undergraduate and professional education to promising, qualified students in order to prepare them to contribute fully to society as citizen leaders
- conducting research of the highest caliber that seeks to answer questions and create solutions in order to expand human understanding and the well-being of all living things
- undertaking outreach and engagement and economic development activities that are innovative, research-driven, and lead to a better quality of life for individuals and communities[13]

Michigan State is one of four colleges and universities that serve as the fiscal agents for a WIRED initiative grant.

Elevate the status of administrators responsible for regional development. Historically, regional development functions in universities have been assigned variously to the vice president for research and development or to the technology transfer office. As many of the university personnel we interviewed suggested, it is only when a function is led by a university officer (usually a vice president) that it gets the attention needed both from the administration and the faculty to make it a serious priority. There are many examples: the University of Arizona, George Mason University and Cleveland State University have all recently created positions of Vice President for Economic Development. At Cleveland State, the mission of the Vice President of Economic Development is to represent the demands of the economy to the university and help the university respond to those demands to promote the advancement of the region through the missions of teaching, research and service.

---

[12] The New American University is an institution that measures its academic quality by the education its graduates have received rather than by the academic credentials of its incoming freshman class; one whose researchers, while pursuing their scholarly interests, also consider the public good; one whose students, faculty, and staff transcend the concept of community service to accept responsibility for the economic, social, cultural, and environmental vitality of the communities they serve. http://www.asu.edu/president/newamericanuniversity/arizona/.

[13] *The State News*, September 9, 2005, http://www.statenews.com/index.

Facilitate access to higher education resources

As one developer said, "If you think the public sector is difficult to understand and access, try universities!" Not only are university resources widely dispersed among different academic departments, research institutes, degree programs and schools, they are rarely structured to provide information to the outside world. Potential collaborators struggle to understand what the university has to offer or how to make contact with the right resource. A number of strategies have evolved to address this problem.

Establish a single point of contact. Appointing a single individual who can direct outsiders to the most relevant resources eases the difficulty of accessing a university's faculty and resources. MIT's Industrial Liaison program is one of the oldest examples. Industrial Liaison Officers with deep industry expertise coordinate access to MIT experts, research facilities, and information resources. Arizona State University offers a "concierge" at its new Scottsdale Innovation Center (Skysong). It is the concierge's job to know about the fields of research and projects of individual faculty members and link them to the technology companies in the Center.

Offer access to resources through a web portal. The Greater Rochester Area Colleges & Universities have banded together to offer Biz2Edu to provide access to programs at 19 area institutions. The University of South Carolina (USC) has developed USC businessLINK to bring together five USC economic development and research resources important to the business and economic development communities, and to provide immediate access to these services.

Bring industry experts inside the university. The University of Akron has created positions for senior fellows who are experienced entrepreneurs who help link the resources of the university with startups and growth companies in the region. Similarly, the Dingman Center for Entrepreneurship at the University of Maryland has an Entrepreneur in Residence and a Venture Capitalist in Residence who advise local startups and mentor student entrepreneurs.

Share facilities. Access to university facilities like labs, clean rooms, super computers and state-of-the art manufacturing equipment can be the difference between success and failure for startups and other undercapitalized small firms. The New Jersey Institute of Technology's (NJIT) Center for Manufacturing Systems (CMS) and its Advanced Manufacturing Lab offer small and mid-sized companies product design and prototype development services using a variety of CAD/CAM systems and provide manufacturing expertise with state-of-the-art CNC equipment through its Low Volume Machining Center. The Ohio Supercomputer Center (OSC) on the Ohio State University campus provides the computational power that industry needs to compete. A special program, Blue Collar Computing™, provides high performance computing resources, training, software and expertise to small industrial clients.

Purdue Develops Virtual Facilities Sharing

The Purdue Extension Economic and Community Development center is offering a new resource to support the Economic Gardening model of economic development. Established in Littleton, Colorado, this model focuses on regions growing their own businesses in contrast to attracting them from elsewhere. A key strategy of economic gardening is providing access to proprietary business information to local enterprises to enhance their competitiveness

The e-Bin (Entrepreneurship Business Information Network) is a unique partnership of Purdue Extension Economic and Community Development, the Purdue University Krannert Management and Economics Library (MEL), and the Greater Lafayette Small Business Development Center (SBDC) to provide entrepreneurial businesses with access to proprietary databases on the Internet that are usually only available to large companies. MEL subscribes to a vast array of business data resources for its own academic purposes, which, until now, have only been available to Purdue faculty and students on campus. But through special arrangements, many of these same resources are being made available to a select number of Purdue Extension offices.

Companies can go to a local Purdue Extension office and use the e-Bin Enterprise Center—a specially designed computer station with access to MEL's business information resources. In addition to the databases, e-Bin users can also get help, via instant messaging and telephone, from MEL's specially trained business library staff, who can help point users in the right direction to find the answers they need. e-Bin is a project of Indiana WIRED, a North Central Indiana initiative funded by DOL through the Indiana Department of Workforce Development.

Build long-term partnerships

One way to institutionalize collaboration is to create long-term partnerships with other organizations in the region. Building such partnerships forces each institution to carefully evaluate the costs and benefits of collaboration, and, once formed, they can create a strong foundation for future joint activities.

Partner with other higher education institutions in the region. Different educational institutions in a region typically have different – and often complementary – strengths. Identifying those areas where joint action makes sense and formalizing the relationship opens up new opportunities that institutions could never address on their own and may not even have recognized. The University

South Texas College Spearheads Multi-University Project

South Texas College received a DOL WIRED grant of $5 million to support the North American Advanced Manufacturing Research and Education Initiative (NAAMREI) for Rapid Response Manufacturing (RRM). The project draws on the assets of many regional higher educational institutions.

South Texas College is partnering with five regional economic development agencies and the Rio Grande Valley College Alliance (STC, Texas State Technical College, Texas Southmost College, Texas State College and Laredo Community College) to develop a RRM facility and create a world-class manufacturing infrastructure in South Texas' Rio Grande Region. In addition, the University of Texas Pan American is working with several other universities to promote RRM in their engineering schools.

The Texas Workforce Commission has also committed an additional $3 million in training funds to bolster the project. The funds will be used as seed money to establish a Center for Rapid Response Manufacturing, as well as the establishment of three Advanced Manufacturing Training Institutes that will respond to the customized training needs of the workforce.

Partnership of Pittsburgh, for example, brings together the University of Pittsburgh and Carnegie Mellon University in a joint regional development initiative. The partnership actively collaborates with and serves as a university liaison to a variety of regional development agencies and provides university access and support for company attraction, faculty consulting and technology commercialization activities.

Co-invest with regional developers. Collaborations between higher education and regional developers can also benefit from a focus on long-term relationships. Committing to collaboration, particularly with shared financial responsibility, encourages all partners to overcome their own institutional barriers in order to ensure the success of the partnership. In the CORTEX example below, multiple partners, including three universities, a hospital and the botanical garden, combined to create a research park in life sciences.

CORTEX: Multi-Institution Collaboration with Economic Development

In 2000, the St. Louis Regional Chamber & Growth Association commissioned a study by the Battelle Memorial Institute outlining a biotech strategy for the region. According to Dick Fleming, the President and CEO of the Growth Association, civic leaders were concerned about the region's unfulfilled potential to capitalize on the multi-university presence in the region. The Batelle Institute recommended a plan that ultimately led to the creation of CORTEX, the Center of Research, Technology and Entrepreneurial Exchange.

CORTEX is a collaboration to pool the efforts of Washington University, Saint Louis University, the Barnes-Jewish Hospital Foundation, the University of Missouri-St. Louis and the Missouri Botanical Garden to make St. Louis a leader in life sciences research and commercialization. Supported by funding from the City of St. Louis and the State of Missouri, the three universities, the Missouri Botanical Garden and St. Louis' BJC Healthcare invested $29 million to form the legal partnership that buys and develops real estate to attract biotech startup companies. CORTEX has acquired 185 acres in midtown, close to most of the institutions that formed it.

Overall, CORTEX has raised nearly $60 million from a combination of equity, contributions, and federal and state grants. Its significance was described in a 2006 editorial in the St. Louis Business Journal

"…CORTEX marks the first time St. Louis' major institutions in both public and private sectors have come to the community with intellectual, physical and financial resources to improve the region. In the past, we looked to major companies to lead the charge. Today it is our institutions Washington and Saint Louis universities, University of Missouri-St. Louis through its sponsorship of the Center for Emerging Technologies, the Missouri Botanical Garden and BJC HealthCare who are carrying the torch. This is much more than a dream or a set of architectural sketches. There is no catchy slogan but rather a spreadsheet that predicts more than $285 million in total new taxes over twenty-five years…."

Source: St. Louis Business Journal, January 23, 2006

Support regional engagement

In addition to reaching out at the institutional level, colleges and universities are increasingly supporting student and faculty engagement with regional initiatives. Promoting entrepreneurship by both faculty and students is one key aspect, discussed in more detail in Section IV below. Others include:

Help students find positions in local organizations. Internships and other programs that place students in local businesses and nonprofit organizations do more than simply offer opportunities to students. They build relationships between the college or university and the region, relationships that facilitate the exchange of knowledge. Both Biz2edu in Rochester and College 360 in Northeast Ohio have internship searches that categorize internship Web sites in the region either by career field or by university. These links can also lead to post-graduation placement in local companies, preventing brain drain.

Provide research services to the region. Many higher education institutions offer support that ranges from data collection, analysis and provision to direct strategic assistance to regional initiatives and local businesses. The Joint Urban Studies Center in Wilkes-Barre, Pa. is an example of collaboration among a number of institutions in one region. The new Purdue Center for Regional Development (PCRD) supports regional and multi-jurisdictional approaches to problem solving throughout Indiana via applied research and education and by convening and nurturing dialogue and action. The PCRD also provides organizational capacity to regions including serving as the fiscal agent for the North Central Indiana WIRED initiative.

The Center for Economic Development (CED) at Chico State University is an example of the many University Center Economic Development Programs sponsored by the U.S. Department of Commerce.

Recommendations for Regional Developers

Traditionally, interaction between regional economic developers and higher education institutions has been limited. Generally, developers have sought collaboration with higher education institutions for physical projects like research parks and

The EDA University Center Economic Development Program

The University Center Economic Development Program is a partnership between the DOC's Economic Development Administration and academia that helps to make the varied and vast resources of universities available to economic development communities. By providing annual funding to higher education institutions throughout the United States, the Program helps improve the economies and economic development capacity of Center service areas, particularly economically distressed communities. The Program leverages staff, students, facilities, research capabilities and other resources from partnering institutions to undertake three broad categories of activity: direct technical assistance to clients, applied research and information dissemination. Technical assistance activities typically have one of two types of clients: economic development organizations or individual businesses. For more information, see www.eda.gov/AboutEDA/Programs.

Source: Economic Development Administration

dormitories; cooperation on a particular deal in which a target company needs access to specific training programs or technology; or more general work to support technology transfer efforts.

In response to the demands of the increasingly competitive global knowledge economy, a new development-higher education paradigm is emerging. Regional developers have begun to recognize the myriad ways in which a strong higher education sector can contribute to economic growth. It is not just about touting graduation rates, doing one-off deals and hoping for spin-outs based on university technology. To fully leverage the assets of higher education, regional developers are recognizing that they must actively reach into the universities to access their intellectual, cultural and human capital. In successful regions, the higher education-regional development relationship is becoming increasingly dynamic and supported by a rich network of contacts at various levels.

To build the deep partnerships necessary to support optimal economic growth, regional development leaders should pursue four strategies:

- **Understand the higher education landscape**
- **Be proactive**
- **Focus on relationships, not transactions**
- **Support higher education assets**

Understand the higher education landscape

Regional developers need to invest time in understanding the characteristics of their regional higher education landscape. At a basic level, this means identifying the number and type of institutions and the specific research, educational and operational specialties of each college or university. Development leaders should make a point of personally reaching out to the presidents of each higher education institution, both to learn more about the specific goals of each institution and to invite the academic leaders to participate in development efforts.

While it is difficult to understand the culture and inner-workings of the higher education sector, development leaders should nonetheless invest time in understanding the incentives that drive academic decision-making. One good way of learning about the local higher education sector and building goodwill is to volunteer to serve on the board of a local institution. Regional developers may also want to designate a university liaison within their organization to make it easier for academics and administrators to reach out.

Actively Engage in the Knowledge Exchange Process. Knowledge exchange is a broader category than technology transfer. It implies interactions across the spectrum of university resources and includes the use of university facilities, entrepreneurship programs, research parks, individual faculty members and departments, as well as the countless opportunities to participate in expert panels, lectures, courses and conversations where knowledge exchange takes place both formally and informally.

Nonetheless, regional developers overlook technology transfer offices at their peril. Technology transfer offices are among the most maligned arms of universities. They are often burdened by unrealistic expectations of both university and community leaders who do not understand their mission or operational constraints. Frequently, however, the technology transfer office will also house entrepreneurship programs and oversee research parks, making it all

the more important for developers to learn more about the tech transfer function. In many regions, tech transfer officials justifiably complain that the entrepreneurs who could keep the technology local are few and hard to find. Regional developers should invest in understanding the technologies available – and more importantly – in linking local businesspeople to the tech transfer or other appropriate offices. Regional developers can play an intermediary role by helping the office find regional firms and financial providers to commercialize the technology.

Be proactive

While many academic institutions are increasingly reaching out to the community, developers should not wait to connect. Developing collaborative relations with higher education typically will require that the regional developers take the initiative. Even those academic institutions that are committed to regional development or that perform regional research will need assistance understanding what is happening in the region and how they might contribute.

It is the job of the regional developer to understand the needs of the region – its strengths and weaknesses, its history and its current trends.[14] It is important for the regional developer to be able to talk about the strategic issues the region faces, to suggest potential synergies with the university and to have an idea of what the value proposition of collaboration might be for the institution.

Understand the trends in the region's industries. It is up to the regional developer to familiarize him/herself with how the region's industries operate and what challenges their technologies face in commercialization, what the special characteristics of their technologies are, what unique requirements they may have, and how they might link to existing or potential regional resources.

Fill the gaps. The basic building block of higher education's engagement in the region is ties to local firms. Regional developers are uniquely qualified to serve as go-betweens in creating those direct linkages. In regions served by more than one academic institution, regional developers can either serve as intermediaries or support existing intermediaries. A good example is the Larta Institute in southern California, which began as a public sector agency and now serves, among other things, as the tech transfer agent for a consortium of universities.

Focus on relationships, not transactions

Many of the higher education representatives who were interviewed emphasized that they are far more receptive to the new breed of regional developers who seek to optimize the intellectual advantages the university offers and who emphasize on-going relationships rather than transactions. The recent success in Danville, Va., is an excellent illustration of what can come from this approach. It is particularly compelling because Danville is in a rural area, and the closest university is 60 miles away.

[14] One useful guide to assessing regional assets is: *ILLUMINATE. Asset Mapping Roadmap: A Guide to Assessing Regional Development Resources*. Council on Competitiveness. Washington, DC, 2007.

Institute for Advanced Learning and Research (IALR)

The Future of the Piedmont Foundation, a regional group of private business leaders formed in 2000 to deal with the economic crisis facing the Danville/Pittsylvania Community (the Dan River Region) of Virginia, produced *Learning, Working, Winning: Bringing the New Economy to the Dan River Region*, a strategic plan to resurrect the region. It resulted in the creation of the Institute for Advanced Learning and Research (IALR) in Danville, Va.

IALR is fostering a new economic base for the region, attracting and developing a 21st century workforce, leveraging the region's advanced networking infrastructure, and making Southside a destination location. Its four world-class research and innovation centers in robotics, motor sports, horticulture and forestry, and polymers strengthen economic sectors by strategically linking existing industry, agribusiness and other regional assets. Each center combines research with commercial testing and engineering services and commercialization support services. Together the centers create a comprehensive initiative to generate new ideas and move them into private companies. Although IALR is still developing, these centers are attracting academic, commercial and industrial partners who bring outside resources into the region.

Virginia Tech in nearby Blacksburg is the principal higher education partner in collaboration with Danville Community College and Averett University, a private Christian institution. Virginia Tech's core role is the implementation of off-campus "distributed research." Involving regional and state investments of more than $35 million, Virginia Tech is creating research facilities and equipment infrastructure in Southside that will support 25 faculty members and engage more than 60 Virginia Tech graduate students at IALR.

Educational and outreach programs prepare people for jobs in the four economic sectors. Degree completion programs build upon curricular partnerships with regional community colleges and K-12 systems. Nearly three dozen graduate degree and certificate programs are available. More than two dozen science, technology, engineering, math and entrepreneurship outreach programs target cradle-to-grave audiences. The Institute Conference Center attracts corporate visitors to the region.

While still early in its development, three new facilities are in part attributable to IALR (700+ jobs total with base of Ph.D. scientist and engineering jobs). Since 2004, the City of Danville and Pittsylvania County leaders have announced 5,500 new jobs.

Engage the institution at multiple levels. "Mine the Gold" is Richard Lester's term for diving deeply into the institution to uncover nuggets of information that have countless opportunities contained within them.[15] To mine the gold, the local business and development community needs to link to higher education on many levels. Industry associations can benefit by working with deans and program administrators to develop internship programs, recruiting fairs and research projects. Companies may want to interact with specific professors or grad students that are focused on a relevant technology. Alumni offices can offer developers access to skilled graduates who are no longer living in the region but wish to return. Student groups often volunteer time to support regional development initiatives.

Identify potential joint ventures. Don Smith, the Director of the University Partnership of Pittsburgh, has observed that today, unlike in the past, universities are more often the initiators of deals, and regional developers are the enablers. Regional developers can be the catalysts for innovative joint ventures among universities, the public and private sectors, foundations, etc. The developer's tool kit of varied funding sources, relationships with private developers, and knowledge of federal and state bonding and other dedicated financing programs is equally as valuable to the university "customer."

The Michigan State University Board of Trustees recently authorized a new bioeconomy research center, which will use a Holland, Mich., research and development building and pilot plant to be donated by Pfizer Inc. Michigan State plans to use the site to extend campus research that supports the state's emerging bioeconomy, including biofuels, bio-based chemicals and biomaterials. Lakeshore Advantage, the Holland-area economic development organization, and MSU together have secured $3.4 million in support for the initiative from the Michigan Economic Development Corp. and MSU has also received approval for use of $500,000 from a WIRED grant.

George Mason University (GMU) and Prince William County, Va., (PWC) combined the academic and research needs and goals of the university with the innovation-led growth strategy of PWC. What Martin Briley, the Economic Development Director of PWC, calls *University-Centered Economic Development* encompasses workforce development in both the creation of new jobs and the targeting of educational offerings (bio-informatics) to the workforce needs of industry.

Measure impact. Higher education does not, as a rule, do a good job of collecting and disseminating information about its collaborations with business and regional development organizations. In areas such as faculty-business consulting relationships, the impact of corporate research and development grants and projects, and graduate hiring and retention by regional companies, data is typically not robust. Development leaders can play a valuable role by explaining the importance of this data – and serving as a partner in collecting and disseminating this information.

[15] Richard K. Lester, *Universities, Innovation, and the Competitiveness of Local Economies*, Industrial Performance Center, Massachusetts Institute of Technology Working Paper 05-010, (December 2005) p. 30.

Northern Virginia: University-Centered Economic Development

George Mason University (GMU) and Prince William County (PWC) in Virginia have built a mutually beneficial collaboration that began with the county's realization in the mid-1980's that its future growth would benefit from the presence of a major university. Their vision was that a university presence would provide a new identity to the county that had traditionally been perceived as a bedroom community for Washington, DC. Meanwhile, GMU had developed a Distributed University Model for its expansion strategy which emphasized adapting curriculum and offerings to the needs and resources of a community, attracting learners within commuting distance of any campus, and active university involvement in economic and community development. PWC put together a high-level local coalition called the Higher Education Advisory Committee which included leaders from business, education, government and GMU.

The Commission produced "A Proposal for a University Presence in Prince William County," which gained the support of the Virginia governor and legislature and eventually led to the creation of INNOVATION@Prince William, the GMU campus. The county donated 120 acres to GMU to build the campus and the technology park associated with it. Subsequently, the county purchased 525 surrounding acres for industrial development related to the tech park. GMU developed its curricular offerings based on its specialty in bioscience and IT, which appealed to the existing industrial base and corresponded to the expansion goals of PWC.

During roughly a ten year period, GMU and PWC worked hand-in-hand through a recession that almost bankrupted the project, market shifts that threatened the academic plan and competition from alternative development plans. During this period, even deeper ties were forged between GMU and PWC as the various functions of the university – academic, research, tech transfer and economic development – were drawn into the project.

The results have been outstanding. Of the $545.7 million invested in the campus between 1997 and 2006, $133.9 million is directly attributed to the GMU/PWC partnership and $102.6 million has been influenced by the partnership. The number of students enrolled at INNOVATION@Prince William jumped from 272 in 1997 to 4,483 in 2007. Of the 2,340 total jobs announced to date in the research park, 577 are a direct result of the partnership and 540 are an indirect result.

Source: Presentation by Martin Briley, Economic Development Director, PWC, and Jerry Coughter at the 4th Annual Conference of the Technopolicy Network, June 6, 2007

Support higher education upgrades

Higher education assets are critical to the long-term success of any region. Developers should seek opportunities to support well-designed efforts of colleges and universities to obtain more resources. This kind of support can range from serving on a university development board to sponsoring community forums to advocacy at the state and federal levels. University presidents and regional development organization directors can be powerful advocates for each other's key issues. Together, they can rally significant community support for mutually beneficial initiatives.

On a smaller scale, regional developers can help higher education navigate city and county zoning, permitting and land use issues. Regional development leaders are often persuasive participants in faculty and administrative recruitment. As members of the region who are not necessarily part of the university, they can provide a more objective, yet positive, perspective on community life for prospective faculty. In Galveston, TX, for example, members of the regional development organization board often host informal dinners for high-level administration recruits to the University of Texas Medical Branch.

III. Conclusion

The critical importance of institutions of higher education to our global competitive advantage and to regional economies, which a few years ago might have been an insight, has now become axiomatic. In the knowledge economy, the increased value of "brain power" means that higher education's products command a premium in the marketplace and draw new attention and resources both to the institutions and their regions.

This new prominence, which has been fueled by the technology explosion in fields like biotech, nanotech, advanced manufacturing, telecommunications and software development, is transforming both institutions of higher education and the economies where they are located. This is clear from the boom in investment in higher education infrastructure, from new dorms and classrooms to labs and research parks. Contributing to this boom has been an expansion of the number of students in higher education and rising real estate values in surrounding neighborhoods as these places become magnets for what Richard Florida[16] calls the "creative class."

The changing structural realities of the modern economy are engendering innovative activities in regions well beyond the scope of technology transfer. New concentrations of upscale consumers live and work near institutions of higher education begetting new commercial development. Companies are finding that regions with institutions of higher education are increasingly more valuable places to locate. As a result, universities are becoming even more significant engines for the creation and attraction of well paid, high-quality jobs.

As a result of the global economic transformation, many universities are changing their attitudes toward economic development. Faculty and staff are more frequently involved with the private sector in new forms of collaboration and enterprise including facilities sharing, multi-party joint ventures, new commercial ventures, and new generations of research parks and accelerators (formerly incubators).

Finally and most importantly, the growth of higher education has given rise to a "new breed" of regional developers and development-conscious institutions of higher education eager to make changes. The practitioners on both sides are building a new culture of collaboration as the press of competitive demands obliges them to cross boundaries, to develop multiple relationships across institutions and to redefine both their goals and missions. This new culture of collaboration can be seen in many of the WIRED initiatives across the country, where higher education institutions play key strategic roles well beyond the traditional advisory function that they have been asked to play in the past. Policy makers, regional developers and university leaders should promote these collaborations as they are essential to our nation's ability to compete in the conceptual economy.

[16] Richard Florida, The Rise of the Creative Class, And How It's Transforming Work, Leisure, Community and Everyday Life, Basic Books, 2002.

Appendix

Interviews

Dr. Robert Altenkirch	President, New Jersey Institute of Technology
Dr. Joel Bloom	Vice President for Academic & Student Services and Dean, Albert Dorman Honors College, NJIT
Bill Drohan	Executive Director, Association of University Research Parks
Brian Darmody	Assistant Vice President of Research and Economic Development, University of Maryland
Don Fleming	St. Louis Regional Commerce and Growth Association
Don Iannone	Donald T. Iannone & Associates
Don Smith	Carnegie Mellon University
Gale Spak	Associate Vice President of Continuing & Distance Education, New Jersey Institute of Technology
Jerry Coughter	Assistant Vice President for Regional Economic Development, George Mason University
Jim Barrood	Director of The Rothman Institute of Entrepreneurial Studies, Fairleigh Dickinson University
Jim Hettinger	President and CEO, Battle Creek Unlimited, Inc.
Joe May	President, Louisiana Community and Technical College System
Mariko Silver	Director of Strategic Projects, Office of the President, Arizona State University
Martin Briley	Economic Development Director, Prince William County
Matt Hurlbutt	Executive Director, RochesterWorks, Inc.
Ned Hill	Vice President for Economic Development, Cleveland State University
Paul Hunt	Associate Vice President for Research, Michigan State University
Scott Hutcheson	Assistant Program Leader for economic and community development, Purdue Center for Regional Development
Richard Lester	Director, Industrial Performance Center, Massachusetts Institute of Technology
Rob Melnick	Associate Vice President for Economic Affairs and Public Policy, Arizona State University
Dr. Donald Sebastian	Senior Vice President for Research and Development, NJIT
Rohit Shukla	CEO, Larta Institute
Dr. Philip Singerman	Senior Vice President of B&D Consulting
Tim Franklin	Former Executive Director, Institute for Advanced Learning and Research
Eileen Walker	Program Director, Association of University Research Parks

References

Alliance for Regional Stewardship, American Association of State Colleges and Universities & National Center for Higher Education Management Systems. (2006, January). *Tools and Insights For Universities Called to Regional Stewardship*. Denver, CO.

Arbo, Peter, & Paul Benneworth. (2007). *Understanding the regional contribution of higher education institutions: A literature review*. (Working Paper No. 9). OECD Directorate for Education.

Atkinson, Robert D. & Rick Coduri. (2002). *The 2002 State New Economy Index: Benchmarking Economic Transformation in the States*. (Policy Report, June 10, 2002). Progressive Policy Institute.

Audretsch, David & Ronnie J. Phillips. (2007). *Entrepreneurship, State Economic Development Policy, and the Entrepreneurial University*.

Braunerhjelm, Pontus. (2005, December). *Regional Specialization and Universities: The New Versus the Old*. (CESIS Working Paper No. 55). Royal Institute of Technology, Center for Excellence for Studies in Science and Innovation.

Cortright, J, & H. Mayer. (2001, January). *High Tech Specialization: A Comparison of High Technology Centres*. Institute of Portland Metropolitan Studies, Portland State University and Brookings Institution, Survey Series.

Cortright, J. (2006). *Making sense of clusters: Regional competitiveness and economic development*. (Discussion Paper). Washington, DC: Brookings Institution Metropolitan Policy Program.

Council on Competitiveness. (2006, February). *Regional Innovation, National Prosperity*. <http://www.compete.org/pdf/0361444.pdf>.

Council on Competitiveness. (2007). *Competitiveness Index: Where America Stands*.

Council on Competitiveness. (2005, October) *Measuring Regional Innovation*.

Council on Competitiveness. *Clusters of Innovation: Regional Foundations of U.S. Competitiveness*.

Darby, Michael R. & Lynne G. Zucker. (2006, April). *Movement of Star Scientists and Engineers and High-Tech Firm Entry*. (NBER Working Paper No. 12172). National Bureau of Economic Research. <http://papers.nber.org/papers/W12172>.

Florida, Richard, Gary Gates, Brian Knudsen, & Kevin Stolarick. (2006, December). *The University and the Creative Economy*. <http://creativeclass.com/rfcgdb/articles/univ_creative_economy082406.pdf>.

Goddard, John. (2000). *The Response of HEIs To Regional Needs*. University of Newcastle upon Tyne, UK.

Isaac, Larry, Richard Mattoon, & Laura Melle. (2006). *A New Social Compact: How University Engagement Can Fuel Innovation*. (WP 2006-08). Federal Reserve Bank of Chicago.

Kellogg Commission on the Future of State and Land-Grant Universities. (2000, March). *Renewing the Covenant: Learning, Discovery, and Engagement in a New Age and Different World*.

Lambert Review of Business-University Collaboration: Final Report. (2003, December). London, UK: Her Majesty's Stationery Office. <www.lambertreview.org.uk>.

Lafon, Valérie, ed. (2007, April). *Regional Engagement: The Future for Higher Education?* Paris, France: Programme on Institutional Management in Higher Education.

Lester, Richard K. (2005, December 13). *Universities, Innovation, and the Competitiveness of Local Economies: A Summary Report from the Local Innovation Systems Project—Phase I*,. Industrial Performance Center, MIT.

Litan, Robert E., Lesa Mitchell, & E.J. Reedy. (2007, April). *Commercializing University Innovations: A Better Way*. (NBER Working Paper JEL No. O18, M13, 034, 038). National Bureau of Economic Research.

National Governors Association. (2002). *A Governor's Guide to Building State Science and Technology Capacity*.

Paytas, Jerry PhD, Robert Gradeck, & Lena Andrews. (2004). *Universities and the Development of Industry Clusters*.

Reichert, Sybille. (2006, November). *The Rise of Knowledge Regions: Emerging Opportunities and Challenges for Universities*. European University Association.

Rodríguez-Pose, Andrés & Riccardo Crescenzi. (2006, October). *R&D, Spillovers, Innovation Systems and the Genesis of Regional Growth in Europe*. Bruges European Economic Research Papers, No. 5.

Schramm, Carl. (2006). *The Entrepreneurial Imperative: How America's Economic Miracle Will Reshape the World (and Change Your Life)*. New York: Harper Collins.

Seline, Richard and Yali Friedman, Ph.D. *Hubs and Nodes or: How I learned to stop worrying and love globalization*. <http://new-econ.com/pdf/email/wfs.pdf>.

Silverman, Ed. (2007, March). The Trouble with Tech Transfer. *The Scientist, Magazine of Life Sciences*.

State Science and Technology Institute. (2006, August). *A Resource Guide for Technology-based Economic Development: Positioning Universities as Drivers, Fostering Entrepreneurship, Increasing Access to Capital*. Westerville, OH.

Tornatzky, Waugaman, & Gray. *Innovation U*. Southern Growth Policy Board.

Walshok, Mary. "Expanding Roles for Research Universities in Regional Economic Development," New Directions for Higher Education, No. 97 (Spring 1997), pp. 17-26.

Resources/Case Study Examples

Anne Arundel Community College, (www.aacc.edu/)

Arizona State University Scottsdale Innovation Center (Skysong), (www.asu.edu/skysong/index.html)

Arizona State University, "The New American University" (www.asu.edu/president/newamericanuniversity/arizona/).

Arizona State University Technopolis, (www.asutechnopolis.org/)

Arizona State University Business Portal (www.asu.edu/business/index.html)

Biz2Edu, (/www.biz2edu.com/)

Carnegie Mellon Center for Economic Development (CED), (www.smartpolicy.org/index.php)

Center of Research, Technology and Entrepreneurial Exchange (CORTEX), (www.cortexstl.com/)

Chico State University, Center for Economic Development (CED), (www.csuchico.edu/cedp/)

Cleveland State University, Maxine Goodman Levin College of Urban Affairs, (www.urban.csuohio.edu)

District of Design Project, (districtofdesign.com/)

The Edson Student Entrepreneur Initiative, Arizona State University, (studentventures.asu.edu/)

Fund for Our Economic Future, (www.futurefundneo.org/)

George Mason University, Vice President for Research and Economic Development, (www.gmu.edu/research/OVPRECD/)

Illinois Institute of Technology, University Technology Park, (www.universitytechnologypark.com/incubator/index.html)

Institute for Advanced Learning and Research (IALR), (www.ialr.org/)

Joint Urban Studies Center, (www.urbanstudies.org/default.shtml)

Knowledge Industry Partnership, (www.kiponline.org/homef.htm)

Lansing Community College, Business & Community Institute, (www.lcc.edu/bci/)

MIT Industrial Liaison Program, (ilp-www.mit.edu/display_page.a4d?key=H1)

Michigan State University Bioeconomy Research Center

The North American Advanced Manufacturing Research and Education Initiative (NAAMREI) for Rapid Response Manufacturing (http://www.doleta.gov/wired/files/ip_2g_Rio_South_Texas.pdf)

New Jersey Institute of Technology, Center for Manufacturing Systems, (www.njit.edu/cms/index.php)

North Carolina State University, Professional Science Master's degree in Microbial Biotechnology (MMB), (microbiology.ncsu.edu/graduate/MMB/index.htm)

Professional Science Masters (PSM) degree (www.sciencemasters.com/ScienceMastersHome/tabid/36/Default.aspx)

Purdue Center for Regional Development, Entrepreneurship Business Information Network

Purdue Extension Economic and Community Development (http://pcrd.typepad.com/ecd/entrepreneurship/index.html)

Springfield Technical Community College, Andrew M. Scibelli Enterprise Center (sec.stcc.edu/)

The University of Maryland's Robert H. Smith School of Business, (www.rhsmith.umd.edu/)

TiE-DC, (/www.tie-dc.org/)

University of Akron Research Foundation, (www.uakron.edu/research/uarf)

University Partnership of Pittsburgh, (www.universitypartnership.com/)

University of South Carolina, USC businessLINK (uscbusinesslink.sc.edu/about.shtml)

Workforce Innovations in Regional Economic Development (WIRED), (www.doleta.gov/wired/about/)

About the Council on Competitiveness

Who We Are

The Council on Competitiveness's mission is to set an action agenda to drive U.S. competitiveness, productivity and leadership in world markets to raise the standard of living of all Americans. The Council is the only group of corporate CEOs, university presidents and labor leaders committed to the future prosperity of all Americans and enhanced U.S. competition in the global economy through the creation of high-value economic activity in the United States.

Council on Competitiveness
1500 K Street, NW
Suite 850
Washington, D.C. 20005
T: 202 682 4292
Compete.org

How We Operate

The key to U.S. prosperity in a global economy is to develop the most innovative workforce and educational system, and businesses that will maintain the United States' position as the global economic leader.

The Council achieves its mission by:

- Identifying and understanding emerging challenges to competitiveness
- Generating new policy ideas and concepts to shape the competitiveness debate
- Forging public and private partnerships to drive consensus
- Galvanizing action to translate policy into action and change

Board

Chairman
Charles O. Holliday, Jr.
DuPont

Industry Vice Chairman
John B. Menzer
Wal-Mart Stores, Inc.

University Vice Chairman
G. Wayne Clough
Georgia Institute of Technology

Labor Vice Chairman
Douglas J. McCarron
United Brotherhood of Carpenters and Joiners of America

Chairman Emeritus
F. Duane Ackerman
BellSouth Corporation

President
Deborah L. Wince-Smith

Executive Committee

William R. Brody
Johns Hopkins University

Jean-Lou A. Chameau
California Institute of Technology

Richard T. Clark
Merck & Co. Inc.

Jared L. Cohon
Carnegie Mellon University

John J. DeGioia
Georgetown University

Robert C. Dynes
University of California

John M. Engler
National Association of Manufacturers

Marye Anne Fox
University of California, San Diego

William D. Green
Accenture

James Hagedorn
The Scotts Miracle-Gro Company

Sheryl Handler
Ab Initio

John L. Hennessy
Stanford University

John A. Hillerich IV
Hillerich & Bradsby Co.

Susan Hockfield
Massachusetts Institute of Technology

Shirley Ann Jackson
Rensselaer Polytechnic Institute

D. Michael Langford
Utility Workers of America

Edward J. McElroy
American Federation of Teachers

Samuel J. Palmisano
IBM Corporation

James M. Phillips
Luminetx Corporation

Michael E. Porter
Harvard University

Luis M. Proenza
The University of Akron

James H. Quigley
Deloitte Touche Tohmatsu

Ian C. Read
Pfizer Inc.

Patricia F. Russo
Alcatel-Lucent

Kenan Sahin
TIAX LLC

David E. Shaw
D. E. Shaw & Co., Inc.

William L. Walton
Allied Capital Corporation

Lawrence Weber
W2 Group Inc.

Robert J. Zimmer
The University of Chicago

General Membership

Norman Abrams
University of California, Los Angeles

Michael F. Adams
The University of Georgia

Anthony J. Alexander
FirstEnergy Corp.

Richard E. Anthony
Synovus Financial Corporation

William F. Ballhaus, Jr.
Aerospace Corporation

Steven A. Ballmer
Microsoft Corporation

Brian M. Barefoot
Babson College

Craig R. Barrett
Intel Corporation

Robert J. Birgeneau
University of California, Berkeley

Lee C. Bollinger
Columbia University

David L. Boren
The University of Oklahoma

Erskine Bowles
The University of North Carolina

Richard H. Brodhead
Duke University

Amber M. Brookman
Brookwood Companies Incorporated

Michael J. Burns
Dana Corporation

George Campbell, Jr.
The Cooper Union for the Advancement of Science and Art

Judith Cardenas
Lansing Community College

Curtis R. Carlson
SRI International

John T. Casteen, III
University of Virginia

Clarence P. Cazalot, Jr.
Marathon Oil Corporation

Jeff Chapman
Harbinger Technologies Group, Inc.

Roy A. Church
Lorain County Community College

Mary Sue Coleman
University of Michigan

France A. Córdova
University of California, Riverside

Michael M. Crow
Arizona State University

Ruth A. David
Analytic Services, Inc. (ANSER)

Ernest J. Dianastasis
Computer Aid, Inc.

Michael V. Drake
University of California, Irvine

Roger A. Enrico
DreamWorks Animation SKG Inc.

Alice P. Gast
Lehigh University

E. Gordon Gee
Vanderbilt University

Thomas F. George
University of Missouri, St. Louis

Nancye Green
Waterworks

James W. Griffi th
The Timken Company

Amy Gutmann
University of Pennsylvania

Peter Halpin
World Resources Company

David C. Hardesty, Jr.
West Virginia University

Jack Harding
eSilicon Corporation

Robert Hemenway
The University of Kansas

Adam W. Herbert
Indiana University

Richard Herman
University of Illinois, Urbana Champaign

Karen A. Holbrook
The Ohio State University

Jerry MacArthur Hultin
Polytechnic University

Mark V. Hurd
Hewlett-Packard Company

Jeffrey R. Immelt
General Electric Company

Irwin M. Jacobs
QUALCOMM, Inc.

John I. Jenkins
University of Notre Dame

Martin C. Jischke
Purdue University

Doane Kelly
KLG Consulting

Terri Kelly
W. L. Gore & Associates

Carl F. Kohrt
Battelle Memorial Institute

Raymond R. Kwong
SCRAM Technologies, Inc.

A.G. Lafley
The Procter & Gamble Company

Robert W. Lane
Deere & Company

Lester A. Lefton
Kent State University

Robert Levinson
Brand Blueprint

Richard I. McCormick
Rutgers, The State University of New Jersey

William A. McDonough
William McDonough + Partners

Richard K. Miller
Franklin W. Olin College of Engineering

James B. Milliken
University of Nebraska

Clayton Daniel Mote, Jr.
University of Maryland

Mark A. Nordenberg
University of Pittsburgh

Edward E. Nusbaum
Grant Thornton LLP

Peter O'Donnell, Jr.
O'Donnell Foundation

Thomas F. O'Neill
Sandler O'Neill Partners

James L. Oblinger
North Carolina State University

James W. Owens
Caterpillar Inc.

Constantine Papadakis
Drexel University

Antonio M. Perez
Eastman Kodak Company

Krista Paternostro
Pittsburgh Technology Council

Peter G. Peterson
Blackstone Group

Ralph R. Peterson
CH2M Hill

Authors

David Attis

David Attis, Director of Policy Studies, serves as the Deputy Director of the National Innovation Initiative, a multi-year effort to increase America's capacity for innovation across all sectors of the economy. David is also the lead researcher on the Council's flagship publication, the *Competitiveness Index: Where America Stands*. Previously, David was a consultant with A.T. Kearney, Inc. both in their general consulting practice and in their Global Business Policy Council. He holds a PhD in the History of Science from Princeton University, an MPhil in the History and Philosophy of Science from Cambridge University, and BA in Physics from the University of Chicago.

Randall Kempner

Randall Kempner is the Council's Vice President of Regional Innovation. In his work, he has directed regional economic development initiatives in seven U.S. regions and leads the Council's partnership with the Department of Labor on their WIRED (Workforce Innovation in Regional Economic Development) Initiative. Randall graduated from the University of Texas at Austin with an M.B.A. and Masters in Public Affairs. He earned his Bachelor's degree in Government from Harvard University.

Samuel Leiken

Samuel Leiken is the Council's Senior Director of Policy Studies. Prior to the Council, he was a Senior Policy Analyst at the National Governors Association's Center for Best Practices and vice president for policy for the Council on Adult and Experiential Learning (CAEL). Earlier, he founded the Massachusetts Product Development Corporation, a state-owned, privately operated venture capital fund investing in the new products of traditional manufacturing enterprises. A graduate of Columbia University, Sam holds an M.P.A. from Harvard's Kennedy School of Government, and a journeyman machinist's license from the Commonwealth of Massachusetts.