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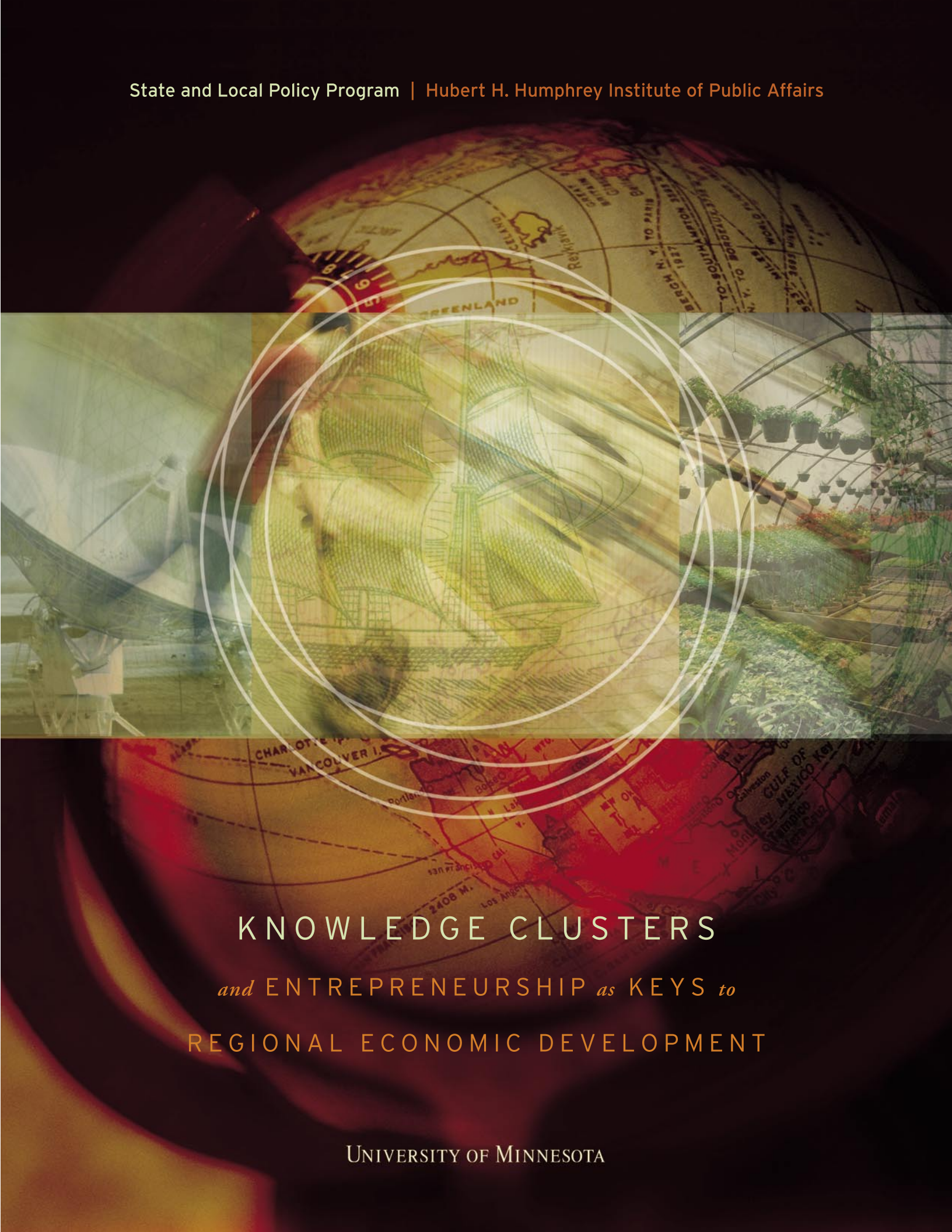

KNOWLEDGE CLUSTERS *and* ENTREPRENEURSHIP *as* KEYS *to* REGIONAL ECONOMIC DEVELOPMENT

UNIVERSITY OF MINNESOTA

KNOWLEDGE CLUSTERS *and* ENTREPRENEURSHIP *in* REGIONAL ECONOMIC DEVELOPMENT

The conference on Knowledge Clusters and Entrepreneurship in Regional Economic Development was held at the Hubert H. Humphrey Institute of Public Affairs at the University of Minnesota in Minneapolis on September 13 and 14, 2004. The conference was staged by the Humphrey Institute's State and Local Policy Program, the Carlson School of Management's Center for Entrepreneurial Studies, and the Freeman Center for International Economic Policy, with support from the US-UK Fulbright Commission, the United States Department of Agriculture, Invest Northern Ireland, the Northern Ireland Bureau, and the University of Minnesota Extension Service. For more information on the conference, visit www.knowledgeclusters.com.

The concept for the conference was developed by Senior Fellow Lee Munnich and Fulbright Fellow Paul Brush, with an eye toward seeking an intersection between Munnich's research on knowledge clusters and regional economic development and Brush's research on entrepreneurship in both the United States and in his native Northern Ireland. The conference itself brought together academics and practitioners from both sides of the Atlantic to examine the relationship between clusters, entrepreneurship, and economic development strategies.

The conference stimulated intense dialogue around innovative approaches to regional economic development, and led to the creation of this report. This report seeks to provide a synthesis of the concepts and insights discussed and developed at the conference, while also providing practitioners with tangible, actionable ideas for integrating cluster, entrepreneurship, and economic development strategies. We hope that academics and practitioners alike will find this report to be accessible, enlightening, and useful in their work and in their research.

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The Humphrey Institute of the University of Minnesota is hospitable to a diversity of opinions and aspirations. The Institute itself does not take positions on issues of public policy.

Hubert H. Humphrey Institute of Public Affairs
University of Minnesota

Dear Colleagues,

As the public policy arm of the University of Minnesota, the Humphrey Institute of Public Affairs plays an important role in connecting academic research with the broader community. The institute is particularly interested in facilitating productive dialogue between researchers and practitioners, helping to move theory to practice.

The September 2004 conference on "Knowledge Clusters and Entrepreneurship in Regional Economic Development" is a model of how the institute can bring policy analysts and practitioners together to learn from one another and the role the institute strives to play in connecting interesting but possibly heretofore independent ideas—like entrepreneurship and regional knowledge clusters—to create new understandings.

The conference built on more than 10 years of work on regional cluster strategies by the institute's State and Local Policy Program and followed on an important February 2004 institute-hosted conference on "Reining in Competition for Capital" that examined the economic costs and benefits of the tax subsidy approach to local and regional economic development. The two conferences brought together local, national, and international experts to share both research and practical advice with economic development professionals and the policy makers who are charged with the economic well-being of their local and regional communities.

The conference also represented a fruitful collaboration between the institute's State and Local Policy Program, headed by senior fellow Lee Munnich, and its International Fellowship Programs by making good use of the research and experience of Paul Brush, a visiting Fulbright Fellow from Northern Ireland who spent a year examining entrepreneurship strategies around the United States. We thank all of our conference partners, who are listed at the end of this publication.

We hope that this report will provide economic developers with an understanding of the latest research on the issues surrounding entrepreneurship and knowledge clusters as economic development strategies, along with practical new ideas and tactics. We appreciate your feedback as you apply these ideas so that we can advance knowledge about successful approaches to regional economic development together.

J. Brian Atwood, Dean**, Humphrey Institute of Public Affairs**

INTRODUCTION

The world economy has changed dramatically in the past decade. The explosive development of transport and communication technologies, increased freedom of trade, and the flow of financial and human capital across regional, national, and continental boundaries have helped create the global village we inhabit today. This increased connectivity has led many companies to spread their suppliers, facilities, operations, and customer base across a range of regions and countries. Few parts of the world have remained unaffected by these forces of economic integration.

Because of economic integration, what happens in one region affects what happens in another. The movement of information, capital, services, and products presents new competitors and customers for companies and regions.

With such fluid territorial boundaries, the challenge faced by regions attempting to develop and implement a strategy for local economic vitality seems even more formidable than before. Regional developers wonder how much influence they really have in improving the competitiveness of their area or whether they are entirely at the mercy of global market pressures. As large business enterprises threaten to shift their operations and jobs to lower cost locations, cities and regions grow anxious about losing what in many cases may be their main employer. Yet, with the emergence of India, China, and other low wage economies, it is clear that regions in Western Europe and North America cannot expect, nor should they wish, to compete on cost alone, as this will only result in a downward spiral of wages and standard of living.

"Competitiveness is the creation of products that add unique value to a sophisticated and demanding consumer who is willing to pay more for them." (Michael Fairbanks).

Michael Fairbanks

Faced with these new economic realities, regional developers have been looking for a different approach that can help them harness some of the benefits of economic integration, such as access to world markets for both products and customers. They also are aware of the need to assess and build upon the social and human capital assets that already exist in their region, rather than relying on attracting mobile investment from elsewhere (sometimes called smokestack chasing).

One promising model combines a focus on entrepreneurship with the strengthening of knowledge-based networks or clusters. With knowledge now the fundamental basis of competitive advantage, regional economic development agencies are looking for ways to grow and attract clusters of innovative, knowledge-based activity. Because the creativity and innovation of individual entrepreneurs and entrepreneurial teams often generate and sustain these clusters, strategies that focus on both entrepreneurship promotion and cluster development are worth a closer look.

On September 13 and 14, 2004, more than 100 economic development practitioners, consultants, academics, and business leaders from 15 states and four countries met at the Humphrey Institute of Public Affairs, University of Minnesota, to discuss this new model at a conference entitled "Knowledge Clusters

and Entrepreneurship in Regional Economic Development." This review presents some conference highlights, identifies the main themes discussed, and provides a set of proposals and resources for practitioners working in this area.

Knowledge Clusters Support Entrepreneurship

Research suggests that entrepreneurial activity is largely place-based, a product of the local culture, institutional arrangements, business environment, and the unique skills and knowledge base in a particular area. Although today entrepreneurial ventures need to be competitive in the global marketplace, their emergence and growth can often be traced back to this vital mix of social capital at the local or regional level. Conference participant and university professor **David Audretsch** argued that successful entrepreneurs "do what they know," but in innovative and marketable ways. Despite the mobility of business, knowledge tends to remain localized; therefore, regional economic developers must focus on improving the competitiveness of their "place." They should have a strategic approach to building the local knowledge base, which will make their area attractive to entrepreneurs positioned to exploit it.

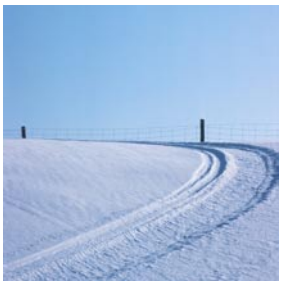
David Audtresch

A knowledge cluster is an innovative, interrelated group of firms that gain competitive advantages through building and transmitting knowledge among local actors and institutions. A cluster can revolve around a certain industry that exports beyond the region or involve technologies that cross industry boundaries.

A knowledge cluster strategy recognizes that local businesses, which share a common knowledge base, can promote regional growth, partly by providing a dynamic environment for entrepreneurship. The Competitive Advantage of Nations (Porter, 1990) drew substantial attention to clusters of geographically close, interrelated firms, industries, and institutions. Compiling case studies from around the world, Porter advanced the argument that national and regional competitive advantage and prosperity are empirically linked to dynamic industry clusters (Porter, 1998).

Some clusters emerge around a specific product, such as the design and manufacture of snowmobiles in northwest Minnesota (Munnich). Others cross product lines but draw upon a common set of skills and expertise. A good example of this is the medical-device cluster in the Twin Cities area (Knudson). In both cases, a knowledge base has developed over time, rooted in local institutional arrangements, technical and business knowledge, practices, and culture.

A number of conference speakers shared their experience of cluster facilitation and entrepreneurship promotion in different regions, such as Minnesota, Northern Ireland, and Pennsylvania (Munnich, Goldberg, Ostrem, Sheely, and Mulvenna). The integration of these two approaches has been a defining feature of the strategy being implemented in northwest Minnesota. Entrepreneurship strategies are integral to the cluster development efforts with the establishment of seed financing and a Regional Angel Investment Network (RAIN) fund, aimed at creating an investment infrastructure that will attract entrepreneurs wishing to draw upon the area's existing knowledge base.



Recreational Transportation Equipment as a Knowledge Cluster

The northwestern Minnesota communities of Thief River Falls and Roseau are home to two of the largest domestic producers of recreational transportation equipment, Arctic Cat and Polaris. Both companies were founded nearly a half-century ago by a single entrepreneur, Edgar Heteen, a producer of farm equipment who was looking for ways to help farmers get around their farms during the winter. Today these companies embody a competitive spirit that resembles the snowmobile racing culture on which they thrive. Together, they employ more than 3,200 people locally.

They derive their competitive advantage from a close connection to local snowmobile racers – a loyal and demanding customer base that sets the standard for the larger market. The fierce competition between the two companies fosters innovation and has helped transfer existing knowledge of snowmobiles to new products and industries, such as all-terrain vehicles.

Externalities or spillovers result when the full benefits (or costs) of an action extend beyond the primary actor to others. For example, a person who earns a college degree benefits, but so does the economy. This extended benefit is a common rationale for public subsidies, such as student loans. A spillover can be negative as well. A company that discharges polluted water into a municipal water supply is imposing its costs on the community as a whole.

The importance of attracting talented, creative people to your region and retaining them are key components of the cluster and entrepreneurship approach and a theme picked up by a number of presenters (Cortright, Audretsch, Fitzsimons, and Knudson). Knowledge clusters and entrepreneurship alike revolve around creative people, so in the knowledge economy, the differentiating factor for both people and places is talent. Talented people tend to cluster together, and this in turn stimulates entrepreneurship as innovative ideas are explored in a creative environment. Cortright's work on

"The Young and the Restless" suggests that regional developers should specifically focus on attracting the 25- to 34-year-old population, because they constitute the core of this talented class. They also are the most mobile and therefore, to some extent, "up for grabs." The Global Entrepreneurship Monitor (GEM) research presented by Fitzsimons showed this age group to have the highest entrepreneurship rates in almost every country covered by the survey, reinforcing their importance to any regional development strategy.

Although urban areas have been most successful in attracting these well-educated and innovative individuals, building an attractive community brand is not impossible for more rural communities. Fostering a welcoming social climate that is open to change, new ideas, and diversity may be a challenge, but it is a challenge that a number of more rural areas are now actively addressing. Whether they are rural or urban, regions should build on their own distinctive assets and use their uniqueness to attract this valuable population cohort (Cortright). An open culture is one that supports risk taking and gives people freedom to fail in an endeavor and try again. The research suggests that this type of environment is needed for entrepreneurial opportunities to be exploited. The demonstration effect that is evident in successful clusters can play an important role in encouraging both the acceptance and practice of risk taking. When one person undertakes successful entrepreneurial activity, others observe this activity and begin to feel that they too can do it (Audretsch, Fitzsimons).
The GEM study shows that the extent of social networks is one of the most important factors in encouraging entrepreneurship within any region. Faced with this evidence, policy makers are recognizing the need to create networking opportunities for the businesses, entrepreneurs, financiers, and talented people in their region. Bringing the right people together is increasingly part of their role.

The CONNECT program outlined in a presentation by **Carolyn Lee** is an early example of one such network facilitation model that has been particularly successful. Started 20 years ago by the University of California – San Diego to network entrepreneurs, government, and the university, CONNECT has been the catalyst for the development of one of the largest clusters of biotech and telecommunication companies in the United States. The model has now been emulated in many parts of the world, as economic development officials are hoping to leverage their knowledge base to create a cluster of regionally based and globally competitive entrepreneurial companies.

Carolyn Lee

Thanks to the demonstration effect of clusters, entrepreneurial success – and failure – offers valuable lessons for a region.

Entrepreneurship as a Key Component of Economic Development

After years of neglect by economists and policy makers alike, entrepreneurship is now widely accepted as an important contributor to national and regional economic growth.
As global integration shifted U.S. comparative advantage toward knowledge-based economic activity and value-added niche markets, entrepreneurship and small to medium size enterprises (SMEs) began to play an increasingly vital role. Global integration and technological change set the stage for the shift from slow-growth, bureaucratic corporations to the nimble, responsive, knowledge-based industries of the new economy. With factors such as speed, innovation, flexibility, and knowledge essential to economic growth and development, entrepreneurship has emerged as a key player in driving regional economic prosperity.

Chad Moutray, Chief Economist at the United States Small Business Administration, provided compelling evidence that entrepreneurship has been the main driver of U.S. growth in recent years. Between 60 and 80 percent of net new jobs have been created by small firms; the bulk have come from new firms under two years old. These firms also have driven innovation, with patents produced by smaller firms tending to be more important than those produced by larger ones.

Key Components to a Knowledge Cluster Strategy

Understand your local knowledge base.

What specialized knowledge propels your most innovative and successful enterprises?

Foster links between firms and the local institutions that support them.

Industry and community leaders should be in communication with educational institutions so workforce development can be enhanced.

Develop strategies for promoting innovation around knowledge clusters.

Look for ways to stimulate research and development and technology transfer among existing firms. Technical assistance and access to risk capital are important as well.

Promote a regional basis for developing local strategies.

A specialized labor pool may be geographically dispersed, especially in a rural area. Important institutions that can foster knowledge cluster development may be regional in nature as well.

Source: Lee Munnich, State and Local Policy Program, Humphrey Institute of Public Affairs

Recognizing the benefits of entrepreneurship, regional leaders are working to attract and retain any entrepreneurs who emerge, and are developing the infrastructure to support them. One important need is for locally available financing. Examples of the effort to meet that need are the Regional Angel Investment Network (RAIN) funds in Minnesota (Mercil). Investors in such funds are often cashed-out entrepreneurs who want to put something back into their region to grow and consolidate the existing business base. RAIN funds also encourage local partnerships and engagement with the entrepreneurial process, helping create the supportive, collaborative, invested community that is necessary for entrepreneurship to flourish.

Chad Moutray

As we have already suggested, innovation is a key to knowledge-cluster-led development. It can take many forms, including process and product development that responds to and leads market demands. Innovation can lead to differentiation based on cost alone or, better yet, value, which can include aesthetic value that is hard to duplicate. Whether they are in traditional or new industries, the most successful businesses implement productivity-enhancing processes and develop quality products or services that warrant a premium price and income. Contrary to popular expectations, innovation occurs not only in the latest computer and biomedical products; it also can be a competitive advantage for low-tech entrepreneurs such as artisans (Rosenfeld).

The Public Policy Role in Knowledge Cluster and Entrepreneurial Development

What is the appropriate role for government in encouraging knowledge clusters and entrepreneurship? Proponents of laissez-faire capitalism believe that government has at best a limited role in encouraging cluster relationships and entrepreneurship and, at worst, is afflicted with cronyism, waste, and inefficiency. This view is strengthened by the mixed record of sector-based government interventions (e.g., the "build the next Silicon Valley" fad of the 1990s) and incentive programs that arguably serve only to distort the affected markets and actually decrease the region's welfare. From this point of view, the government's appropriate role is limited to improving the business environment by maintaining a legal system, reducing production disincentives by keeping the effective tax rate low, and providing public goods (national defense, roads, pollution reduction) in cases of market failure. But even in this framework, a strong case still can be made for government involvement in facilitating knowledge cluster growth, as well as developing and supporting entrepreneurial ventures.

The State and Local Policy Program

The State and Local Policy Program (SLPP) was founded in 1991 to increase the commitment of the Humphrey Institute of Public Affairs at the University of Minnesota to state and local policy issues. It helps policy leaders and average citizens understand how changes in the global economy, technology, and the workplace affect communities through a variety of means.

As a highly visible regional policy resource, the SLPP partners with government, business, academic, labor, and community leaders and citizens. By convening conferences, the program increases the discussion and awareness of policy issues. By producing and integrating new information, the program enhances the development of public policy that addresses community needs.

Northern Ireland

In 2004, **Invest Northern Ireland** undertook a campaign to encourage people to take the first steps in starting their own business. This was done after finding that the population of Northern Ireland (NI) was more reluctant to engage in entrepreneurial activity than the population of the United Kingdom as a whole. The entrepreneurial push was part of a larger program to increase the competitive position of Northern Ireland in Europe and in the world.

The agency used a number of avenues to challenge citizens to "Go For It" and seek out sources of support within Invest NI and the wider business community. Radio ads, outdoor posters, and even beer coasters carried the message. Road shows further took the message to the population.

The larger campaign combines efforts to effect cultural change with mentoring, access to finance, and an integrated support structure so that would-be entrepreneurs know they are not alone.

Thanks in part to the campaign, the total entrepreneurial activity index, as measured by the Global Entrepreneurship Model, rose from 3.6 in 2002 to 5.0 in late 2004.

The agency has launched a second phase of its campaign, credited with being the impetus for thousands of people to take those first few steps toward success in business.

In the next 12 months, the new program is expected to generate more than 22,000 inquiries from people interested in starting a business. This should lead to more than 3,000 new business starts, with a combined sales turnover of £133 million, and could potentially create more than 6,000 new jobs.

Source: Invest Northern Ireland

In short, knowledge clusters resemble a public good; they provide benefits for many but may be underproduced if not encouraged by government and community involvement.

Knowledge benefits are not easily, automatically, or efficiently transmitted throughout a region. The fact that clusters are much stronger in some regions than others with similar assets suggests that local institutional arrangements, practices, and culture can do much to help or hinder knowledge spillovers.

The Possibilities—and Imperatives—of Public Action

Dileep Rao

The cluster phenomenon suggests that competitive advantage lies not solely within firms but also within specific locations. Firms in clusters benefit from linkages (among firms, workers, financiers, and so forth) and spillovers, as well as complementary assets in skills, technology, and economic information. The existence of externalities points to the need for private and public actors to work together to eliminate constraints to cluster development and to enhance the contributions of public assets, including educational institutions (Porter, 2000).

Conditions and events with spillover benefits, such as the presence of serial entrepreneurs or the acceptance of calculated risk, tend to be underproduced and so can be considered a quasi-public good. Learning effects, in other words, are good for the private sector, but private actors do not have the incentive to provide sufficient learning for others.

David Audretsch makes the case for government intervention in this way: "Local proximity is essential for accessing knowledge spillovers. Both knowledge-based firms and workers place a greater value on locations with clusters than those without. Because of knowledge spillovers, the value of an entrepreneurial firm is greater in the (local) presence of other entrepreneurial firms. Yet individual firms and workers are reluctant to invest in the creation of such a cluster . . . due to the public nature of knowledge. Policy makers, whose interest lies in generating growth for a particular location, have to step in" (Audretsch 2003).

Conference participant and president of InterFinance Corporation **Dileep Rao** highlights another potential case of market failure: the inability of the local private capital market (particularly in rural or other less developed regions) to fund start-up ventures. This funding gap is particularly acute at proof-of-concept stage and seems to exist across all developed countries. In these cases, public seed-capital investment has a clear role as a form of venture-based economic development.

Key Concepts

Business failure is an important part of economic success. Fear of failure—in an individual, among population groups, or a region—can be a barrier to development.

Economic development involves more than mere **business incubators** that provide start-up businesses with shared receptionist staff and a shipping room. It incorporates the building of a competitive region through knowledge clusters.

More and more, a region's **comparative advantage** in creating valuable goods and services lies not in its natural resources, but in its people, technologies, and knowledge that can be adapted to high-value economic activity.

Cultural sensitivity may be required for developing opportunities for women and minorities, groups historically underrepresented in the entrepreneurial class.

Entrepreneurs, people who create and nourish companies to maturity, are key factors in economic development. From 60 to 80 percent of new net jobs are created by small businesses, especially those under two years old.

There are many possible motivations for entrepreneurial activity, including personal gain, social betterment for the community, and a missionary ethic that seeks to change the culture of a region or community.

Entrepreneurial education is more than teaching the techniques of writing a business plan or securing financing; it incorporates a unique mindset.

Through **globalization**, companies and industries spread their suppliers, facilities, processes, and customers across a wide area, including across nations. What is good for General Motors is not necessarily what is good for America.

Imbedded knowledge can be a powerful economic force by concentrating in one locality workers, civic and political leaders, educators, and financiers with a stake in and knowledge of a particular market, technological field, or skill.

There are many possible types of **innovation**, including changes in products and processes. The most desired form of innovation results in products and services that can command high prices and deliver high wages.

A KNOWLEDGE CLUSTER *and* ENTREPRENEURSHIP APPROACH

SOME PRACTICAL CONSIDERATIONS

Having made the case for an approach that combines knowledge cluster development and entrepreneurship promotion, conference speakers put forward a range of ideas, recommendations, and suggestions on how this can be implemented. Although no single model can be applied universally, research findings and practical case study evidence provide examples of some practices worth considering. These are outlined below:

Use a cluster-based approach to identify regional assets and competitive advantage. This will provide strategic focus to development initiatives.

1. Start by identifying the region's existing knowledge clusters and then bring together the key stakeholders to consider how the clusters might be strengthened. This step provides a strategic approach to assessing the region's current and potential sources of competitive advantage. Setting priorities based on this assessment will help with resource allocation. It is not recommended that developers attempt to build clusters from scratch, as this is rarely successful (Munnich, Goldberg, Sheely).
2. Focus on high-value sectors that offer the potential for higher paying jobs, export possibilities, innovation, concentration of employment within the region, and competitive advantage. In examining existing clusters, which essentially is a review of a region's history, it is important to remain open to new entrants, especially in knowledge-based industries (Golberg, Sheely, Fairbanks).
3. Ensure regional success with the seven forms of required capital: natural resources, physical capital, financial capital, institutional capital, knowledge capital, human capital, and culture capital. Thriving clusters have a balance of these key components and a cluster development approach should assess regional capability against each of these and proceed to address the weak points (Fairbanks).
4. Make sure the cluster development process is driven by the private sector and has buy-in from all the key stakeholders (Goldberg, Ostrem).
5. Conduct essential fieldwork as part of the cluster-based approach. The Pennsylvania master finishing case study is a good example of this (Sheely).

Economic development planners in **Lancaster County, Pennsylvania**, noted that wood processing (furniture) was one of their main clusters. Guided by the principle that higher paying work should receive priority, officials asked wood processing companies "Who gets the highest pay?" The answer was the master finisher. After discovering that no courses existed in the area to train workers for this task, the community came together to establish such a program.

(For more information, see http://www.jobs4lancaster.com and http://www.hhh.umn.edu/centers/slp/clusters_entrepreneurship/sheely_ppt_presentation.pdf and http://www.hhh.umn.edu/centers/slp/index.htm.)

Take stock of the entrepreneurial climate in your region and obtain necessary data.

1. Look for ways to measure entrepreneurship levels in your region and benchmark its performance against others. Without adequate data, it is difficult to identify priority areas, establish targets, or evaluate the performance of ongoing efforts. The Global Entrepreneurship Monitor (carried out in 40 countries) is one useful tool for this purpose, but because of the sample size used, little analysis is available at the sub-national level. However, some regions in Europe have paid for enhanced sampling that enables them to have comprehensive data on entrepreneurship rates at their local level. Northern Ireland has participated in a regionally boosted GEM since 2002, which allows it to make comparisons with other regions and monitor changes in entrepreneurship rates over time (Fitzsimons, Markley, Pages).
2. Use existing government data to examine regional profiles and lobby for the release of more comprehensive statistical information on start-ups and growth of small firms. (For more information see http://www.gemconsortium.org and http://www.ruraleship.org.)

Encourage mentoring from experienced entrepreneurs and assist the development of support networks.

1. Organizing networking opportunities is a key role of government given the existence of public goods and market failure. Networks are important to entrepreneurs for sharing experiences, bouncing ideas off each other, gaining useful contacts, and collaborating on new initiatives. It is particularly appropriate that the public sector facilitate networking opportunities for women, minorities, and other populations with limited entrepreneurial role models and support structures (Riebe, Fitzsimons, Pages).
2. Educating local leaders on the value of entrepreneurship and providing opportunities for them to meet those involved in setting up businesses is important. Encourage experienced entrepreneurs to become mentors to those new to the entrepreneurial challenge (Scott).
3. Building networks may be especially challenging but important in rural areas. Some evidence exists that rural communities offer a less supportive culture for entrepreneurship and that their geographical remoteness and low population density makes developing knowledge clusters more difficult. The cultural issue can be addressed to some extent by efforts to energize local communities to support the entrepreneurship vision (Scott).

   One example of a successful rural initiative is the Appalachian Center for Economic Networks (ACEnet), which has helped entrepreneurs build a critical mass in southeast Ohio. It decided that focusing its entrepreneurial efforts toward the food sector and tech businesses was likely to be more effective than a generalist approach. ACEnet identifies new services, resources, and markets for entrepreneurs in these sectors. It also encourages entrepreneurs to network with each other, resulting in increased business and social capital in a region. (For more information, see http://www.acenetworks.org.)

   Conference participant **Stuart Rosenfeld** provided other case studies of rural creative enterprise clusters, from North Carolina and Montana. Perhaps more than any other cluster, a rural creative cluster incorporates many individual entrepreneurs, freelancers, and others involved on a part-time basis. Because of the large number of small business units and their geographical dispersal, considerable benefit can be gained from collaboration and networking. In Montana, this has led to virtual clusters of artisans connecting via the Internet (Rosenfeld).

Stuart Rosenfeld

4. Consider the often crucial role of community and technical colleges as the catalyst for rural clusters. It is important that they be involved in any cluster development strategy (Rosenfeld, Munnich).

Tailor programs to fit the specific requirements of women, minorities, and disadvantaged communities.

Women

1. Encourage development officials (especially those allocating financial resources) to recognize the considerable potential of women entrepreneurs. Women are less likely than men to be involved in entrepreneurial activity in all 40 countries covered by the Global Entrepreneurship Monitor. In the United States, female entrepreneurs still face a range of specific challenges, including difficulty in obtaining financing (Riebe).
2. Facilitate good networking opportunities where possible, as such opportunities are particularly important for women (as mentioned earlier).
3. Profile good female role models and offer women-only mentoring programs. These counter the restricted growth aspirations that many women face (Riebe). (For more information, see http://www.metrostate.edu/com/cwe/education.html.)

Minorities & Disadvantaged Communities

1. Consider that traditional approaches to venture assessment (e.g., business plans) can be off-putting to minority populations and those in disadvantaged communities. We need to recognize that there may be other motivations for pursuing an entrepreneurial career than traditional commercial success. Entrepreneurship with social or community objectives should be encouraged as well (Emery).
2. Develop programs that incorporate more culturally sensitive ways of accessing the knowledge base in these communities. Coaching and mentoring where there is a mutual

learning dimension may be a useful way forward. Team entrepreneurship approaches also may be particularly relevant, as well as variant methods of operation, such as cooperatives (Emery). (For more information, see http://www.ruraleship.org.)

Consider health insurance requirements of entrepreneurs.

1. One of the major obstacles stopping people moving from employment to self-employment is finding affordable health insurance (Pages). Although local economic development officials and advocates cannot do much in this regard, they can provide good information on the best options.
2. Health savings accounts (HSAs) are one new possibility, and states are experimenting with other options that may work for some people. More must be done to promote affordability and accessibility of insurance for entrepreneurs in the United States.

Use media and advertising to promote entrepreneurship as a viable career choice.

1. In regions with historically low levels of entrepreneurship, the culture may need to be challenged. One approach, used in Northern Ireland, has been to run a number of high profile multimedia advertising campaigns encouraging people to "Go for it," that is, to pursue entrepreneurial opportunities and start a business.
2. Historically, Northern Ireland has had the lowest business start-up rate in the United Kingdom and one of the lowest in Europe. This has partly been attributed to years of sectarian violence that have resulted in a risk-averse culture that values stability over change. Behind the advertising campaign sits a range of support measures offering financing, advice, and support for those willing to "go for it" (Mulvenna, Fitzsimons). (For more information, see http://www.investni.com.)

Develop an enterprise portal.

1. An enterprise portal is a cost-efficient way to support entrepreneurs who are geographically dispersed. By using this new technology, policy makers and economic developers can address many of the entrepreneurs' needs for information and advice on business plans, financing, marketing, and so on. Entrepreneurs seeking business information can drill down to material tailored to their particular stage of development, any time of day.

Jane Leonard

2. BizPathways, developed by Minnesota Rural Partners, is one good example of an enterprise portal. Not only does it act as an enterprise support service, but it also is a marketing tool for its sponsors, who offer on-site consultations. Portal use, as with other forms of telecommunication, will benefit from increased broadband availability (Leonard). (For more information, see http://www.bizpathways.org.)

Promote entrepreneurial skills at all stages of the education system.

1. Entrepreneurial skills training needs to be implemented across the curriculum and for all ages. This has been identified as a major weakness in the United States, with few states formally addressing it. Some other parts of the world (e.g., Scotland) have already made progress in building entrepreneurial training into the curriculum (Pages).
2. The Kauffman Campuses initiative is one effort to address the problem of entrepreneurial skills training within higher education. It is making entrepreneurship education freely available at eight selected universities, enabling any student, regardless of field of study, to receive entrepreneurial training. Other institutions should be encouraged to consider this approach (Pages).
3. Educational institutions should do more to nurture the innovative person and encourage creativity. This effort goes beyond the teaching of entrepreneurship and requires a more fundamental reform of conventional teaching methods and assessment (Harkins). (For more information, see http://www.entreworld.com.)

Maximize connections between the university and community.

1. Although the university can be a valuable asset in the community, the mere presence of a university does not in itself lead to knowledge cluster development. Some areas, such as Philadelphia, educate more people than they retain, while others, including Atlanta, attract more than they educate (Cortright). With some notable exceptions (e.g., the CONNECT program mentioned earlier), higher education institutions are often inwardly focused. They need to be made more aware of their potential impact on the wider community (White). But successful cooperative efforts require a two-way process. Communities must have the capacity to absorb the knowledge being generated in their midst, otherwise it will be exported. This need for capacity has implications for developing local workforce skills, managerial competence, and funding sources.
2. Reinvigorating the land-grant university ideal, with an emphasis on community service, could have widespread benefits. As Tony Strauss of the University of Minnesota noted, "The University needs to strengthen its links with business clusters around the state – engage with them on an ongoing basis about technology that is being developed

which may be relevant to them." Creating better ways for businesses and entrepreneurs to access knowledge generated inside universities is a major challenge.

3. Universities are well positioned to import knowledge into the clusters of which they are a part, and should be encouraged to play this pivotal role. Through its connections across regions and nations, a university is part of a virtual knowledge network (Harkins). Bringing outside knowledge to bear on a local cluster can make the cluster more competitive. (For more information, see http://www.connect.org.)

Develop and aggressively manage a technology transfer office within the university.

1. Although the volume of university-sponsored research leading to commercial applications has increased dramatically since 1980, progress has not been uniform. Some academics (and institutions) are better than others at recognizing opportunity and spinning off successful companies. For example, medical school faculty at The Johns Hopkins University are in general more entrepreneurial (as measured by faculty invention disclosure statements) than those at Duke University. Yet in some fields within the medical schools, Duke professors are more entrepreneurial. In general, a university that establishes a dedicated technology transfer office and uses equity-based licenses is more likely to encourage spin-offs. Having the right structure is clearly important (Bercovitz).

Janet Bercovitz

2. The prevailing culture and attitude toward commercialization within a university is crucial as well. In deciding whether or not to disclose inventions, faculty are influenced by the attitudes of their peers, their department heads, and where they received their own training. Programs to encourage spin-offs should be aware of these cultural factors (Bercovitz).

Assist cashed-out entrepreneurs in the region to reinvest in the community through coordinated efforts.

1. The Minnesota RAIN fund is an example of a regional effort to promote cluster development through local financing. By pooling investments, RAIN provides a funding option that can make the difference between keeping a new enterprise in the region and losing it to an area where funding is more easily obtained. A regional funding pool also encourages local partnerships, which can help bring about necessary cultural changes (Mercil). (For more information, see http://www.mincorp.org/index.html.)

Adopt a portfolio approach to venture financing and manage expectations.

1. Government equity funds are not in the same area of the market as commercial venture capital firms that look for low risk/high potential ventures. Government will intervene where there is market failure, mainly with high risk/high potential and low risk/low potential projects. Because of this, it is unrealistic to expect the same returns from public financing initiatives as one would require from venture capital investment.
2. A portfolio approach must be adopted because economic developers cannot expect to pick winners. In fact, even professional venture capitalists cannot do so. In any case, the winners may be those least in need of government support. "Start the many and some will succeed" (Rao).

Focus on market-driven rather than technology-driven economic development.

1. Economic development agencies that provide gap financing should do so when the entrepreneur identifies a clear market need, not just a technology with uncertain application. Mark Knudson, a serial entrepreneur, defined his business model as an incubator focused on sourcing technologies to meet specific market needs. The process of matching the technology to the need is one area where economic development agencies (EDAs) could play a greater role. There is often some early stage funding required to develop a suitable application and since this is difficult to obtain from private sources, EDAs should fill the gap (Knudson).

Reduce the regulatory burden on small businesses.

1. The regulatory environment is one important area that economic development officials can influence. Many states are now addressing this issue by seeking to reduce the regulatory burdens on small businesses. But the GEM research shows that the tax burden, the difficulty of dealing with public bureaucracies, and the regulations are still major obstacles for many would-be entrepreneurs (Moutray, Fitzsimons). (For more information, see http://www.gemconsortium.org and http://www.sba.gov.)

Improve access and delivery for government support programs.

1. Although public officials are increasingly making efforts to assist and promote entrepreneurship activity, their potential good effects are compromised by inadequate organizational cultures and structures. Programs and networks to assist entrepreneurs are often hard to find, and multiple points of contact make the search for help more difficult. Furthermore, inadequately prepared staff can impede the effects of good intentions.
2. Public and private sector officials who work in development efforts should be aware of the issues facing small

Key Concepts

A **knowledge cluster** is an innovative, interrelated group of firms that gain competitive advantages from side-to-side building and transmitting knowledge between local actors and institutions. A cluster can revolve around a certain industry, or it may involve technologies that cross industry boundaries. One example of knowledge clusters is medical hardware in the Twin Cities.

Sometimes a region's financial, entrepreneurial, and workforce resources are insufficient to absorb the **knowledge spin-offs** of higher education; in this case, social and educational networking can be used to increase regional **capacity**.

Through **knowledge transfer** of new ideas to business, universities play an important part in the development of knowledge clusters.

Thanks to the **learning effect**, entrepreneurial success—and failure—offers valuable lessons for the region.

Knowledge clusters are built on **linkages** among many types and many parties, including suppliers, workers, technical and scientific researchers, and customers. Entrepreneurs and venture capitalists need to find each other. So do business innovators and highly skilled academics. Mentors are important, especially in communities without a strong entrepreneurial tradition.

In using a **portfolio approach** to investing, public sector development officers realize that some enterprises will succeed in commercial terms, while others will fail. "Start the many and some of them will succeed."

A region's **quality of place** includes its quality of life. But it also extends to the area's creative climate.

Entrepreneurs who start a business but fail can often provide valuable lessons for others who did not have to pay the costs of failure. This **spillover effect** is one reason why public sector financing of new businesses can be useful for economic development.

When the regional **stakeholders** of higher education, finance, community groups and businesses come together to exchange resources, economic development is more likely.

The **strategic management of a place** will create a region that is not dependent on the fortunes of a few companies that may leave for greener fields.

businesses. This may require focused training or recruiting more people with previous business experience to the public sector.

Use regional geography for a place-based strategy.

1. At what scale, or at what geographic region can places be strategically managed to create a coherent package that supports and attracts entrepreneurs and fosters knowledge cluster development? This important question was considered by a number of speakers, who concluded that the region should neither be too big nor too small. Much evidence shows that entrepreneurs like to work face-to-face, and that venture capitalists choose deals within easy reach. This suggests that a more localized model is desirable. There is, however, a clear need for some critical mass to provide the range of services required by entrepreneurs, not the least of which is a skilled labor pool. Clusters should be considered on a scale that makes economic sense. In many cases they may straddle regional boundaries. In short, economic developers should be prepared to operate at whichever geographical level is most likely to maximize the benefits for the region as a whole (White).

Consider evaluation criteria at the program design stage.

Tom Lyons

1. Some qualitative research and case study evidence suggest that certain programs are more effective than others, but systematic performance measurement and evaluation of entrepreneurship and cluster approaches are still underdeveloped. It is easy to report on the number of firms assisted, or number of collaborative events held, but bottom-line results are more difficult to measure.
   Erik Pages makes the point well when he says that "creating a consensus set of performance measures and indices must become a priority in the field." Program developers should identify appropriate evaluation criteria at the outset and ensure that the necessary monitoring data is captured.
2. It is also worth remembering that entrepreneurship includes more than just start-ups. Entrepreneurs are entrepreneurs for life. Growth and development of ventures must be a component of any entrepreneurship strategy and the performance evaluation criteria should reflect this. Development efforts should measure and evaluate entrepreneurship using a pipeline approach with the aim of providing appropriate support at the various life stages of entrepreneurial activity, from start-up, through growth, to maturity (Lyons). This is a useful conceptual model for managing a portfolio of companies at different stages of development.

CONCLUSION

It is not feasible or appropriate to adopt all of the above proposals in all circumstances. In any case, resource constraints are likely to require some degree of prioritization. Developers also must recognize that entrepreneurship and cluster strategies seek to foster long-term changes and, as such, do not offer a quick fix. They require a medium- to long-term commitment, time frames that tend to exceed the political cycle and make it difficult to secure stable funding. Strong leadership at the highest level is required if these practices are to be pursued with the vigor and determination necessary to make an impact.

Gone are the days of relying on a single, large employer to provide regional economic security. Instead, global integration is providing both new competitors and new markets for communities. Entrepreneurship is an important component of growth, and it can be fostered in an environment that encourages collaboration among business, social, and public stakeholders. Economic developers who take an inventory of their communities may find that they can build on existing knowledge clusters (comprising talented employees, businesses, financiers, and educational institutions).
By taking advantage of both cluster development and entrepreneurship strategies, economic developers can help create a future for their region that best positions it for changes in the nation and world.

The Key to Unlocking Competitiveness

The need for comprehensive action fostering entrepreneurship is increasingly being recognized by political and economic actors as one of the keys to unlocking greater employment, growth, and competitiveness in Europe.

– European Commission

The Restless Generation

Between 1995 and 2000, 6.6 million 25- to 34-year-olds moved from one metropolitan area to another, with the well-educated the most likely to move long distances.

Source: Joseph Cortright, Impresa, Inc.

The 25-34 Age Group A Human Resources Department's Dream

- Well educated
- Highly mobile
- Hard working
- Adaptable
- Cheaper than older workers

Joseph Cortright, Impresa, Inc.

Speakers, Moderators, and Other Resources

Note:

- More information about the conference is available online at the State and Local Policy Program Web site. Go to http://www.hhh.umn.edu/centers/slp/clusters_entrepreneurship. Or contact the program at the HHH Institute of Public Affairs, University of Minnesota, 301 19th Avenue South, Minneapolis, Minnesota 55455 U.S.A, or phone (612) 625-8575.

Speakers

David Audretsch, director, Institute for Development Strategies, Indiana University, Bloomington, Indiana, *"Entrepreneurship Policy and the Strategic Management of Places."*

Janet Bercovitz, associate professor, Fuqua School of Business, Duke University, Durham, North Carolina, *"Academic Entrepreneurs: Social Learning and Participation in University Technology Transfer."*

Joseph Cortright, economist, Impresa, Inc., Portland, Oregon, *"The Young and the Restless in a Knowledge Economy."*

Mary Emery, North Central Regional Center for Rural Development, Ames, Iowa, "Culture and Entrepreneurship Among Women, Minorities, and Underserved Populations."

Michael Fairbanks, chair of the board, head of country competitiveness, On the Frontier (OTF) Group, Cambridge, Massachusetts, *"Economic Development in Post-Conflict Society: A Cluster-Focused Development Plan."*

Paula Fitzsimons, national coordinator, Global Entrepreneurship Monitor (GEM) Consortium, Dublin, Ireland, and Pia Arenius, professor and director GEM Global, Lausanne University, Switzerland, *"Entrepreneurship and Government Policy: An International Perspective Based on the Research of the Global Entrepreneurship Monitor."*

Trixie Golberg, president, Southern Minnesota Initiative Foundation, Owatonna, Minnesota, *"Southern Minnesota Foundation Case Study."*

Art Harkins, associate professor, educational policy and administration, University of Minnesota, *"Knowledge Bases and Innovation Clusters."*

Mark Knudson, chair and CEO, Venturi Group, LLC, St. Paul, Minnesota, *"The Entrepreneur's Perspective."*

Carolyn Lee, director of research, University of California-San Diego (UCSD), CONNECT, San Diego, California, *"UCSD Connect: Where Entrepreneurs Come for Results."*

Jane Leonard, president, Minnesota Rural Partners, St. Paul, Minnesota, *"Transforming Our Information for Entrepreneurship."*

Thomas Lyons, professor and director, Center for Research on Entrepreneurship and Enterprise Development, University of Louisville, Louisville, Kentucky, *"Building the Community's Pipeline of Entrepreneurs and Enterprises: A Fresh Approach to Evaluating Incubation Strategies."*

Deborah Markley, co-director, Center for Rural Entrepreneurship, Chapel Hill, North Carolina, *"Energizing Entrepreneurship in Rural Communities."*

Steve Mercil, president and CEO, Mincorp Equity Fund, St. Paul, Minnesota, *"RAIN® Fund."*

Chad Moutray, chief economist and director, Office of Economic Research, Small Business Administration, Washington, D.C., *"The Importance of Small Business in the Economy."*

Eamon Mulvenna, Invest Northern Ireland, Belfast, Ireland, *"Invest Northern Ireland."*

Lee Munnich, senior fellow and director, State and Local Policy Program, Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis, Minnesota, *"Knowledge Clusters as a Means of Promoting Regional Economic Development."*

John Ostrem, president, Northwest Minnesota Foundation, Bemidji, Minnesota, *"Knowledge Cluster Case Study."*

Erik Pages, president, Entreworks Consulting, Arlington, Virginia, *"What's So New About New Entrepreneurship Policies? State Government Initiatives to Foster New Venture Creation."*

Dileep Rao, president, InterFinance Corporation, and adjunct professor, Carlson School of Management, University of Minnesota, Minneapolis, Minnesota, *"Introduction to Venture-based Economic Development: Achieving Sustained Economic Growth Using Venture-focused Strategies."*

Mary Riebe, director, Center for Women Entrepreneurs and Entrepreneurship Education, Metropolitan State University, Minneapolis, Minnesota, *"Knowledge Clusters and Entrepreneurship in Regional Economic Development."*

Stuart Rosenfeld, president, Regional Technology Strategies, Carrboro, North Carolina, *"Crafting a New Rural Development Strategy."*

Leslie Scott, North Carolina Rural Center, Raleigh, North Carolina, *"What Community Leaders Can Do to Support Entrepreneurship."*

Scott Sheely, executive director, Lancaster County Workforce Investment Board, Lancaster, Pennsylvania, *"Regional Industry-driven Center of Excellence as a Vehicle for Investment in Innovation."*

Tony Strauss, acting vice president, Patents and Technology Office, University of Minnesota, Minneapolis, Minnesota, *"The University as a Collection of Capacity and Resources."*

Sam White, professor of urban planning, School of Continuing Education, University of Wisconsin, Milwaukee, Wisconsin, *"Entrepreneurship and the Strategic Management of Places."*

Tim Penny, senior fellow and co-director, Humphrey Policy Forum, Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis, Minnesota

Mary Rothchild, project manager, Minnesota State Colleges and Universities, St. Paul, Minnesota

Harry Sapienza, Professor of Strategic Management and Organization, Carlson School of Management, University of Minnesota, Minneapolis, Minnesota

G. Edward Schuh, Regents Professor and Freeman Chair, Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis, Minnesota

Moderators

J. Brian Atwood, dean, Humphrey Institute of Public Affairs, University of Minnesota, Minneapolis, Minnesota

David Beal, senior business editor and columnist, St. Paul Pioneer Press, St. Paul, Minnesota

Dan Carr, CEO of the Collaborative, Minneapolis, Minnesota

Lisa Curtin, president, Irish American Equity Group and Ireland Chamber of Commerce in the USA, Minnesota Chapter President, Minneapolis, Minnesota

Jonathan Darby, Deputy British Consul General, Chicago, Illinois

Cornelia Flora, director, North Central Regional Center for Rural Development, Iowa State University, Ames, Iowa

Louis Hohlfeld, senior program officer, the McKnight Foundation, Minneapolis, Minnesota

Matt Kramer, commissioner, Minnesota Department of Employment and Economic Development, St. Paul, Minnesota

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Romer, Paul. 1990. "Endogenous Technical Change." Journal of Political Economy 98: S71-S102.

Solow, Robert. 1956. "A Contribution to the Theory of Economic Growth." Quarterly Journal of Economics 70: 65-94.

Online Resources

Appalachian Center for Economic Networks (ACEnet)
Athens, Ohio
http://www.acenetworks.org

BizPathways (Minnesota Rural Partners)
http://www.biz pathways.org

Center for Research on Entrepreneurship and Enterprise Development
University of Louisville, Louisville, Kentucky
http://creed.louisville.edu

Center for Rural Entrepreneurship
Lincoln, Nebraska
http://www.ruraleship.org

Center for Women Entrepreneurs and Entrepreneurship Education
Metropolitan State University, Minneapolis, Minnesota
http://www.metrostate.edu/com/cwe/education.html

Entreworks Consulting
Arlington, Virginia
http://www.entreworks.net

Global Entrepreneurship Monitor (GEM), Dublin, Ireland
http://www.gemconsortium.org

Institute for Development Strategies,
Bloomington, Indiana
http://www.spea.indiana.edu/ids

Institute for Rural Entrepreneurship,
Raleigh, North Carolina
www.ncruralcenter.org/entrepreneurship

Impresa, Inc.
Portland, Oregon,
http://www.impresaconsulting.com

Invest Northern Ireland
Belfast, Northern Ireland
http://www.investni.com

Irish American Equity Group
Minneapolis, Minnesota
http://www.ieg-us.com

Lancaster County Workforce Investment Board
Lancaster, Pennsylvania
http://www.jobs4lancaster.com

The McKnight Foundation
Minneapolis, Minnesota
http://www.mcknight.org

Minnesota Department of Employment and Economic Development
St. Paul, Minnesota
http://www.deed.state.mn.us

Minnesota Investment Network / RAIN® Funds
St. Paul, Minnesota
http://www.mincorp.org/index.html

Minnesota Rural Partners
St. Paul, Minnesota
http://www.minnesotaruralpartners.org

North Central Regional Center for Rural Development
Ames, Iowa
http://www.ag.iastate.edu/centers/rdev/RuralDev.html

Northwest Minnesota Foundation
Bemidji, Minnesota
http://www.nwmf.org

The OTF Group
Cambridge, Massachusetts
http://www.onthefrontier.com

Patents and Technology Office
University of Minnesota
http://www.ptm.umn.edu

Regional Technology Strategies, Inc.
Carrboro, North Carolina
http://www.rtsinc.org

Southern Minnesota Initiative Foundation
Owatonna, Minnesota
http://www.smifoundation.org

USCD Connect
San Diego, California
http://www.connect.org/

United States Small Business Administration
Washington, D.C.
http://www.sba.gov/

Venturi Group
St. Paul, Minnesota
http://www.venturigroup.com

Sponsoring Organizations

Center for Entrepreneurial Studies
Carlson School of Management
University of Minnesota
321 19th Avenue South
Minneapolis, Minnesota 55455-9940
612-625-0027
http://www.csom.umn.edu/Page1248.aspx

Cooperative State Research, Education, and Extension Service
United States Department of Agriculture
Fund for Rural America
1400 Independence Avenue, SW, Stop 2201
Washington, DC 20250-220
http://www.csrees.usda.gov/

Freeman Center for International Economic Policy
Hubert H. Humphrey Institute of Public Affairs
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301 19th Avenue South
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http://www.hhh.umn.edu/centers/freeman/index.htm

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www.investni.com

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http://www.northernirelandbureau.com/index.htm

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