

# MEASURING REGIONAL INNOVATION

A Guidebook for Conducting Regional Innovation Assessments

*Prepared for the U.S. Department of Commerce  
Economic Development Administration*



Council on  
Competitiveness



A Publication of the Council on Competitiveness



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WELCOME



Dear Colleague:

The Council on Competitiveness is pleased to release *Measuring Regional Innovation: A Guidebook for Conducting Regional Innovation Assessments*.

In a global economy, U.S. regions can no longer primarily compete based on their natural resource endowment, low cost labor, or tax incentives. Instead, regional prosperity depends upon a region's capacity to support innovative firms, institutions, and people. The first step in building an innovation-based economic development strategy is assessing the regional innovation environment. This guidebook has been created to help regions take this first step. It outlines a process for collecting data on key measures of innovation that can then be used to drive regional economic development policies and programs.

The methods described in this guidebook are based in part on six regional projects, funded by the U.S. Economic Development Administration (EDA), which were part of the Council on Competitiveness's Regional Innovation Initiative in 2003-2005. We would like to thank the EDA and our regional partners in Central New Mexico, Northeastern Ohio, Wilmington, Delaware, the Inland Northwest, West Michigan, and St. Louis for their participation and contributions.

The Council is proud to offer this guidebook to local leaders in hopes that it supports the extraordinary work that is already taking place in regions across the U.S.

Sincerely,

A handwritten signature in black ink that reads "Deborah L. Wince-Smith". The signature is fluid and cursive, with the first name "Deborah" being the most prominent.

Deborah L. Wince-Smith  
*President*  
*Council on Competitiveness*

The background is a solid dark blue. On the left side, there is a vertical strip of lighter blue squares. In the lower half, there is a grid of squares in various shades of blue, with one square in the upper left being a distinct orange color.

# I. INTRODUCTION

## A GLOBAL CHALLENGE

In the modern global economy, U.S. regions face a new economic development challenge. Traditionally, the regional economic development endeavor has been focused on attracting smokestacks, or, more recently, large service operations using tax incentives and access to inexpensive labor as the primary promotional tools. During the past few decades, however, the U.S. industrial landscape has transformed dramatically. Many labor-intensive industries in the U.S. have either shifted production to other parts of the world or disappeared altogether. In their place, the U.S. economy has developed a large number of industries where intellectual capital drives growth.

The U.S. is not unique in building a knowledge-based economy. In addition to other advanced economies, many formerly “underdeveloped” countries are now competing in knowledge-intensive industries previously considered to be safe from international competition. America faces intensifying competition at both ends of the jobs spectrum: low wage-low-skill and high wage-high skill.

At the spectrum’s low end, U.S. regions must face the reality that there are fewer and fewer industries in which U.S. firms can compete globally using a low-cost strategy. On the high end, U.S.-based firms can and do win. In many industries, firms operating in the U.S. have been able to adjust to new global business conditions and develop international leadership. From an economic development perspective, however, many communities are still pursuing the old, incentive-based strategies. These don’t work in a world in which firm success depends ever more on the quality of ideas and talent, and ever less on traditional infrastructure. In a knowledge-based economy, new strategies are required to support the prosperity of American workers.

## THE ANSWER: INNOVATION

We already know that innovation is the key to driving growth and prosperity. Economists calculate that approximately 50% of U.S. annual GDP growth is attributed to increases in innovation. For the past two centuries, the United States has been the world-leader in developing innovative products and services. While we have utilized our natural resources, it is our national ability to innovate – to generate and apply new knowledge – that has allowed us to become the world's economic engine, and has supported consistent increases in well-being for our citizens.

### The Changing Nature of Innovation

While innovation remains the answer, the nature of innovation is changing, and so are the ways in which we need to compete. The National Innovation Initiative (NII), the Council's two-year study of America's innovation system, concluded that innovation has become:

- **Faster:** Technology advances are diffusing at ever-increasing rates. It took 55 years for the automobile to spread to a quarter of the country, 35 years for the telephone, 22 years for the radio, 16 years for the personal computer, 13 years for the cell phone, and only seven years for the Internet.
- **Multidisciplinary:** The most valuable innovations often arise from the intersections of different fields or spheres of activity. Fields like bioinformatics or nanotechnology did not even exist a few decades ago. Today, many economists believe they will become major drivers of the future U.S. economy.
- **Collaborative:** As innovations become more technologically complex, they require active cooperation and communication among scientists and engineers and between creators and users.
- **Democratized:** Innovation used to be the domain of research and development departments. Today, more workers and even customers are involved in the innovation process. Firms in industries as diverse as software and food flavoring are

providing tools to customers to design their own products.

- **Global:** Innovation can originate anywhere. Increased education and economic growth have improved the capacity of developing countries to offer new products and services. Modern communications and transportation technologies allow these countries to share advances with consumers across the globe. As a result, great ideas – regardless of where they originate – are less likely to be lost in our increasingly interconnected world.

However, great ideas are also more likely to be developed and commercialized in countries outside of the United States. Throughout the world, the competition is intensifying. Consider the following facts:

- Foreign-owned companies and foreign-born inventors account for nearly half of all U.S. patents; Japan, Korea, and Taiwan accounting for more than one-quarter of this subgroup.
- Sweden, Finland, Israel, Japan, and South Korea each spend more on R&D as a share of GDP than the United States.
- Only six of the world's 25 most competitive information technology companies are based in the United States; 14 are based in Asia.

In summary, the changing nature of innovation and accelerating global competition means that the U.S. can no longer rest on its past success. Our innovation leadership is not guaranteed and neither is our history of a rising living standard. To sustain our growth, we must innovate more, innovate better, and innovate faster. As the NII report concludes, "the capacity for innovation is going global – and we must pick up the pace...today, the forces of global economic integration and advances in technology are creating a different and more complex challenge. Sustaining competitive advantage will require moving beyond efficiency and quality toward creating new markets, increasing choice and value to customers, and innovating continuously on a global basis."



## REGIONAL INNOVATION

Paradoxically, even as innovation has globalized, the role of **regions** as the critical nexus for innovation-based economic growth has increased.

Although national and state policies create a platform for innovation, the locus of innovative activities is at the regional, or metropolitan area, level where workers, companies, universities, and government interface most directly. True innovation “hot spots” emerge regionally. Regions are the building blocks of national innovation capacity because they offer proximity and can provide specialized assets that foster firm-level differentiation.

### Proximity

Despite the virtual closeness enabled by information technology advances, innovation remains a “contact sport” that is best pursued through personal interactions at every stage in the game. In creating knowledge, research and development collaborations, particularly multidisciplinary efforts, are easier when one can interact with colleagues on a personal basis. The application of knowledge occurs faster when industry and universities maintain close working relationships. Being close to suppliers and customers promotes faster responses to changes in market demand. The relative proximity of institutions within a metro region allows for (though does not guarantee) close interaction on a consistent basis, and supports the development of strongly linked industry clusters.

### Diversification and Differentiation

Success in the global economy requires both diversification and differentiation. At a macro level, our economy must support a diverse set of businesses to provide safety from sector-specific economic shocks. At a micro level, firms need to differentiate their offerings in order to gain competitive advantage. A regional economic strategy supports both of these requirements. Regions – as opposed to individual cities or towns – offer the diversity of people, land types, and services to support a variety of businesses. As opposed to states, regions provide an environment in which firms can easily access and influence the development of specialized infrastructure, educational institutions, and workforce that supports differentiation.

Every region in the country has the capacity to become an innovation hub, at least in some industries. But only a handful of areas have developed the platform to support innovation-based growth. For those regions that have not developed a strong innovation environment, it is critical for leaders to assess the strengths and weaknesses of their regional innovation ecosystem and understand the potential drivers of future innovation-based regional growth. More importantly, leaders must *act* on this information to improve their region’s innovation platform.

This Regional Innovation Assessment (RIA) Guidebook has been designed to help regional leaders to do just that.

## PROJECT BACKGROUND

In 2001, the Council on Competitiveness released *Clusters of Innovation: Regional Foundations of U.S. Competitiveness*, a study that examined the roots of regional economic performance. That study was a collaborative effort involving Professor Michael E. Porter of the Harvard Institute for Strategy and Competitiveness, Monitor Group, and OTF Group. The study used Porter's work on cluster-based economic development theory, as well as regional surveys and interviews, to assess the strengths and weaknesses of five U.S. regions: Atlanta, Pittsburgh, San Diego, Wichita, and North Carolina's Research Triangle. The analysis illustrated the relationship between innovation and economic performance, and outlined steps that regions can take to improve their innovation capacity.

Building on this work, the Council on Competitiveness launched the Regional Innovation Initiative (RII) in partnership with the Economic Development Administration. As part of the project, the Council worked with six U.S. regions to conduct regional innovation assessments from 2003-2005. The six regions were: Central New Mexico, Northeast Ohio, Wilmington, Delaware, the Inland Northwest (Spokane area), West Michigan, and St. Louis. In addition, the Small Business Administration supported a similar project in Greater Rochester, New York.

Key objectives for the RII include:

- Improving awareness among federal, state, and local stakeholders of the conditions necessary to promote innovation-based economic development;
- Catalyzing consensus on policy priorities and practices to strengthen the regional platforms for innovation;
- Supporting a forum for business, academia, government, and supporting organizations to build partnerships by sharing new ideas and best practices;
- Providing tools and techniques that allow states and regions to inventory, evaluate and benchmark their innovation capacity; and,
- Accelerating implementation of local economic development initiatives.

Our fieldwork has led to the creation of this guidebook, a tool we hope will assist economic developers. More information on the regional projects, including presentations and news articles, is available on the Council's website ([www.compete.org/nri](http://www.compete.org/nri)). The Clusters of Innovation reports are also available on the Council's website ([http://www.compete.org/publications/clusters\\_reports.asp](http://www.compete.org/publications/clusters_reports.asp)).

## METHODOLOGY

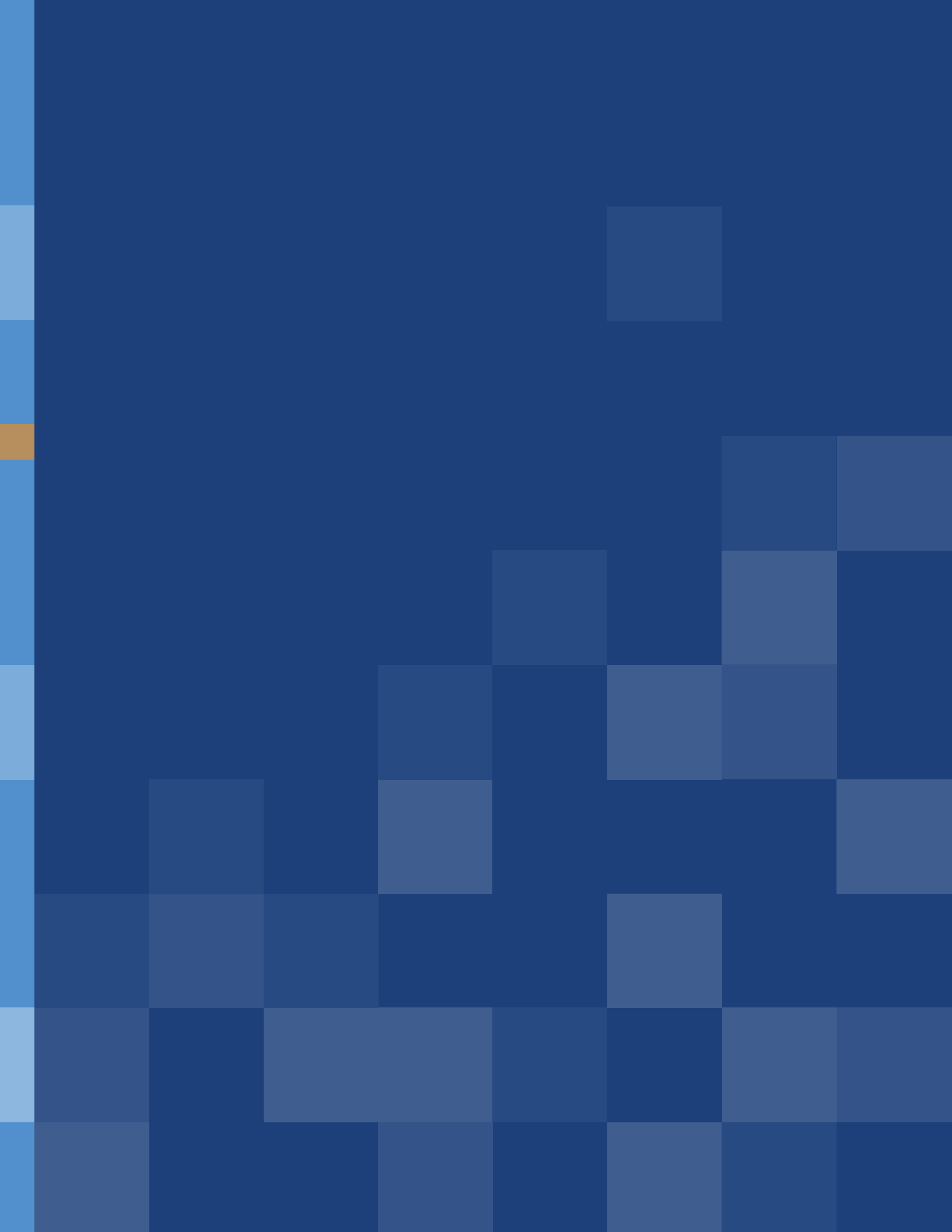
This guidebook was completed in Summer 2005 and thus reflects the most up-to-date information and sources for regional economic data available at that time. Links to online data are provided whenever possible, but may require updating if and when the websites are edited. With the exception of some data from the Harvard Institute for Strategy and Competitiveness, and information from private companies such as Economy.com, the quantitative data for an RIA is publicly available and free of charge.

The RIA was designed with regional economic analysis and planning in mind. Thus, this guidebook focuses on gathering data at the regional level. For most of the quantitative data, the unit of analysis is the Metropolitan Statistical Area (MSA) or a group of MSAs. For data that is not available at the MSA level, suggestions are offered for using alternative approaches. Conducting a regional innovation assessment on an annual or bi-annual basis will provide an opportunity to track improvements in the local innovation environment.

Defining a regional economy is a difficult task, and the user of this guidebook will have to take many factors under consideration when conducting a RIA. Classifications such as the MSA are helpful guides, but deciding which communities make up a regional economy is ultimately left to the user. The web page on MSA definitions from the U.S. Census Bureau (<http://www.census.gov/population/www/estimates/metrodef.html>) is a good starting point for understanding how the federal government classifies metro areas for statistical purposes.

**“The critical path for success is seeking regional competitive advantage, which requires the identification of regional assets of physical, scientific and intellectual infrastructure; market opportunities; and a strategy for exploiting those market opportunities.”**

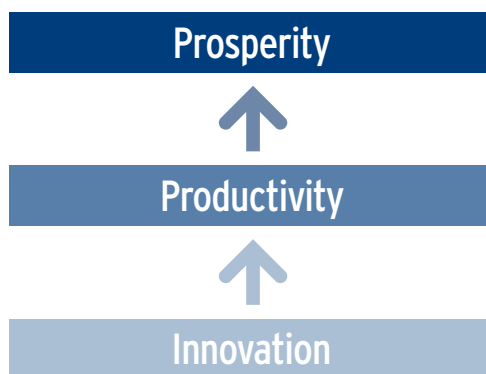
—The Honorable David A. Sampson, Deputy Secretary, U.S. Department of Commerce



## II. ANALYTICAL FRAMEWORK

Figure 1

## The Innovation-based Regional Economic Development Model



The *Clusters of Innovation* project showed that regions that embrace innovation and productivity as the foundation of economic development strategy are the most successful. For the *Clusters of Innovation* project, the Council and our partners developed the following simple model to reflect the dynamic linkage of innovation to prosperity:

### Prosperity: Goal of Economic Development

Prosperity is the fundamental goal for all economic development. The ultimate evaluation of economic development initiatives should be whether the people impacted attain a higher standard of living. While the concept of prosperity can include a number of subjective parameters, we have quantified it through financial metrics such as per capita income, median household income, and poverty levels.

### Productivity and Regional Prosperity

Regional residents' standard of living is determined by the productivity of the regional economy. Productivity is a measure of the value of goods and services produced per unit of labor and capital employed in creating the good. Put simply, it measures output per unit of input. The rate of productivity growth sets the wage level that can be sustained and the returns earned by investors, which are the two principal components of a region's per capita income. Productivity determines prosperity at all geographic levels, whether it is a nation, a region, or an inner city. In advanced economies, productivity growth depends heavily on the ability to create higher value products and services, as well as on improving the efficiency of processes. The central challenge, then, in enhancing the prosperity of a region is to create the conditions for sustained productivity growth.

### Innovation and Productivity Growth

Improving a region's standard of living requires steady growth in productivity. For advanced industrial economies, productivity growth increasingly depends on the capacity for innovation. Innovation creates competitive advantage in two ways: either by reducing bottom line costs – applying technology in ways that lower operating costs in order to compete against lower-wage countries – or by growing top line revenues through the introduction of new-to-the-world or differentiated products and services that command a price premium in the market.

So innovation capacity rests on more than just scientific discovery or idea generation. It is a process that links together regional knowledge, assets and networks to transform ideas, insights and invention into new processes, products and services that capture global market share.

### Inputs to Innovation Capacity

Successful innovation, and the increased productivity and prosperity that results, is the output of the dynamic interplay of a variety of regional factors. Every region has a different set of assets, networks, and an underlying economic culture that determines its success in supporting innovative firms and people. As shown in Figure 2, the interplay between these innovation inputs creates the regional innovation environment that impacts the ultimate prosperity of the region.

Each input in the innovation-based model affects a region's capacity for supporting innovation in different ways. The following sections describe how assets, networks, and culture can positively or negatively impact a region's innovation ecosystem.

Figure 2

## Regional Innovation Environment Inputs and Outputs



### Assets

Assets in the innovation-based economic development model include the human, intellectual, financial, physical, and institutional capital resident in a region. The asset base incorporates many common criteria for corporate location decisions, such as: availability of skilled labor, the quality of transportation infrastructure, cost of doing business, and proximity to customers. Assets also include other factors that are not as widely discussed but are important to innovation, such as: research and development investment, technology transfer, and entrepreneurship support programs. Each type of asset is described below.

### Human Capital

Talented people generate the new ideas that drive innovation. As the economic development field adapts to meet the needs of an evolving international economy, regions are increasingly touting strengths in skilled labor to attract and retain innovative companies. In fact, most studies of corporate location decisions have shown skilled labor to be such an important asset that many regions have made it the central theme of regional marketing efforts. Innovative companies choose regions with a reliable and flexible supply of local talent. Further, firms tend to expand in regions in which they can find a core workforce with specialized skills related directly to their industry.

Regions cannot develop a skilled workforce without investment in the institutions that create and nurture talent such as universities, community colleges, and the K-12 education system. Staying competitive in the modern global economy increasingly requires a greater capacity for life-long learning and skill adaptation. Research universities, such as those located in talent hubs like the Bay Area in California and Boston, MA, are key assets for building and maintaining human capital. However, for regions without major research universities, steps can still be taken to ensure that companies and employees have access to education and training programs that provide the opportunity for continuous learning and skill development. Economic

developers must account for all three factors – available workforce, specialized or skilled workforce, and quality of educational institutions – when analyzing regional capacity for innovation.

### Research and Development Institutions

Research and development (R&D) adds to the knowledge base of a region and is essential to long-term economic growth. R&D spending at universities creates opportunities for partnerships between education and industry that can significantly benefit retention of companies and talented students. R&D investment by firms and government is also critical for developing innovative new products and services that can drive regional wealth-creation and prosperity. Research parks and business incubators, when properly developed and managed, can provide the institutional infrastructure to link business and university researchers and support firm-to-firm R&D partnerships.

### Financial Capital

Access to capital is vital to supporting entrepreneurship and innovation. Transforming ideas into commercial products and services requires significant resources, and few entrepreneurs in the U.S. can finance the entire development cycle alone. Regions such as Silicon Valley have little trouble retaining entrepreneurs and start-up firms because of the significant presence of venture capital (VC) firms. Other regions, which have greater difficulty attracting the attention of non-local VC firms, must find different solutions for providing entrepreneurs with access to capital, such as organizing angel groups and other joint-investment programs to leverage sources of family-based wealth.

### Industrial Base

Understanding a region's industrial base is an essential step in crafting an effective economic development strategy. Economic development professionals need to have a sound understanding of the key employers in a region, including product and service offerings, busi-

ness models, and bases for competitive advantage. Since it is very difficult to build an industry from scratch, regions are best served by first trying to build from areas of traditional strength. Cluster analysis can identify regional strengths and weaknesses that do not necessarily come to light using the conventional methods of assessing regional industries.

## Physical Infrastructure

A region's physical infrastructure is also important to supporting regional innovation. Transportation and communications infrastructures in the U.S. are relatively developed, but without the telecommunications networks, roads, and other public utilities in place, regions have little chance of supporting and growing innovative industries. The availability of high-speed Internet access, for example, is a key asset for attracting most modern companies and entrepreneurs. For rural areas, this link has become a critical factor in attracting workers who wish to telecommute. Transportation factors, such as the average commute time, can also figure prominently in a region's capacity to attract and retain companies and talent. For some industries, natural resources (particularly access to water) can play a primary role in impacting expansion decisions.

## Legal and Regulatory Environment

The legal and regulatory environment plays a role in the success of innovation-based economic development. The relative importance of taxes and regulations among other regional factors, such as availability of skilled workforce, is frequently overstated. Nevertheless, regional tax and regulatory burdens – real or perceived – can affect the location and resource allocation decisions of companies, and should be taken into account.

## Quality of Life

Perceptions about quality of life in a region can heavily impact attraction and retention efforts of companies, skilled workers, and en-

trepreneurs. Talent is mobile, and quality of life has assumed greater importance in economic development practices as many regions have developed strategies to nurture the “creative class.”

Quality of life is a subjective metric; people have differing opinions on what constitutes “quality.” Basic, standardized measures of quality of life are well known and include: cost of living, commuting times, and crime rates. However, the quality of life factors that can define a region are not as predictable. Portland, Oregon is well known for its environmentally sensitive planning and “walkability.” New York City residents love the urban environment and proximity to arts and cultural amenities. Many citizens of Dallas, Texas point to the Dallas Cowboys and the region's other major professional sports teams as an important quality-of-life factor.

Economic developers must account for the various (and often competing) ideas about quality of life in a region and develop strategies that appeal to a citizenry's tastes and preferences.

## Networks

Assets must be linked to support regional innovation. All too often, however, innovative ideas and people remain unconnected. Many ideas generated by university researchers, while valuable from a purely intellectual standpoint, do not reach their full potential in terms of economic development because they are not translated into new products or services. Similarly, many promising entrepreneurs never get the chance to succeed because local capital providers are unaware of the investment opportunity. On the other hand, regions that do support a web of linked idea generators, managers, and capital, are more likely to become innovation “hot spots.”

Among the most effective strategies for creating networks is forming a collaborative economic development partnership involving leaders from business, education, government, and non-profits. Regional collaboration of this magnitude requires organization and resources, which are rarely available in sufficient quantity from one segment of the community alone. Many successful regions have long histories



**“In a knowledge-based economy, economic growth is inextricably linked to the capacity for innovation — the ability to transform knowledge and ideas into new products, processes or services. Healthy and innovative regional economies are the foundation of U.S. competitiveness.”**

—Deborah L. Wince-Smith, President, Council on Competitiveness

of developing effective partnerships through collaborative organizations such as the Joint Venture Silicon Valley Network, UCSD Connect in San Diego, and the Georgia Research Alliance.

Other examples of networks that can build innovation capacity include angel capital networks, research partnering between universities and businesses, incubators, and workforce development programs that encourage companies, colleges, and secondary schools to work together. Finally, while difficult to measure, it is also worthwhile to get a sense of informal networks that take shape within regions around institutions like city sports leagues or university alumni associations, as these informal ties are often as important as their formal counterparts in facilitating knowledge transfer.

## Culture

Innovation is about change. As the global economy continues to develop, the rate of change has increased and become more visible. The sources of new ideas are broadening, both geographically and culturally. The old American adage that new trends start on the West Coast has become an anachronism; new trends are launched from all over the world. The most successful businesspeople are able to look past current trends and anticipate the needs of tomorrow's markets and consumers. They must act quickly to take advantage of market opportunities. The availability of strong regional assets and knowledge networks helps in this process. So too can the underlying business culture of a region.

One key aspect of a regional business culture is the degree to which business leaders are willing to collaborate and share ideas even when they compete in some circumstances. The case of Boston and Silicon Valley in the 1980s is instructive. AnnaLee Saxenian in her book, *Regional Advantage*, argues that Silicon Valley's advantage over competing regions such as Boston was explained in large part by the willingness of Silicon Valley entrepreneurs to share ideas and information.<sup>2</sup> In contrast to the informal networks and fluid business relationships found in Northern California, Saxenian argues Boston firms and institutions in the 1980s stifled growth by holding to tradi-

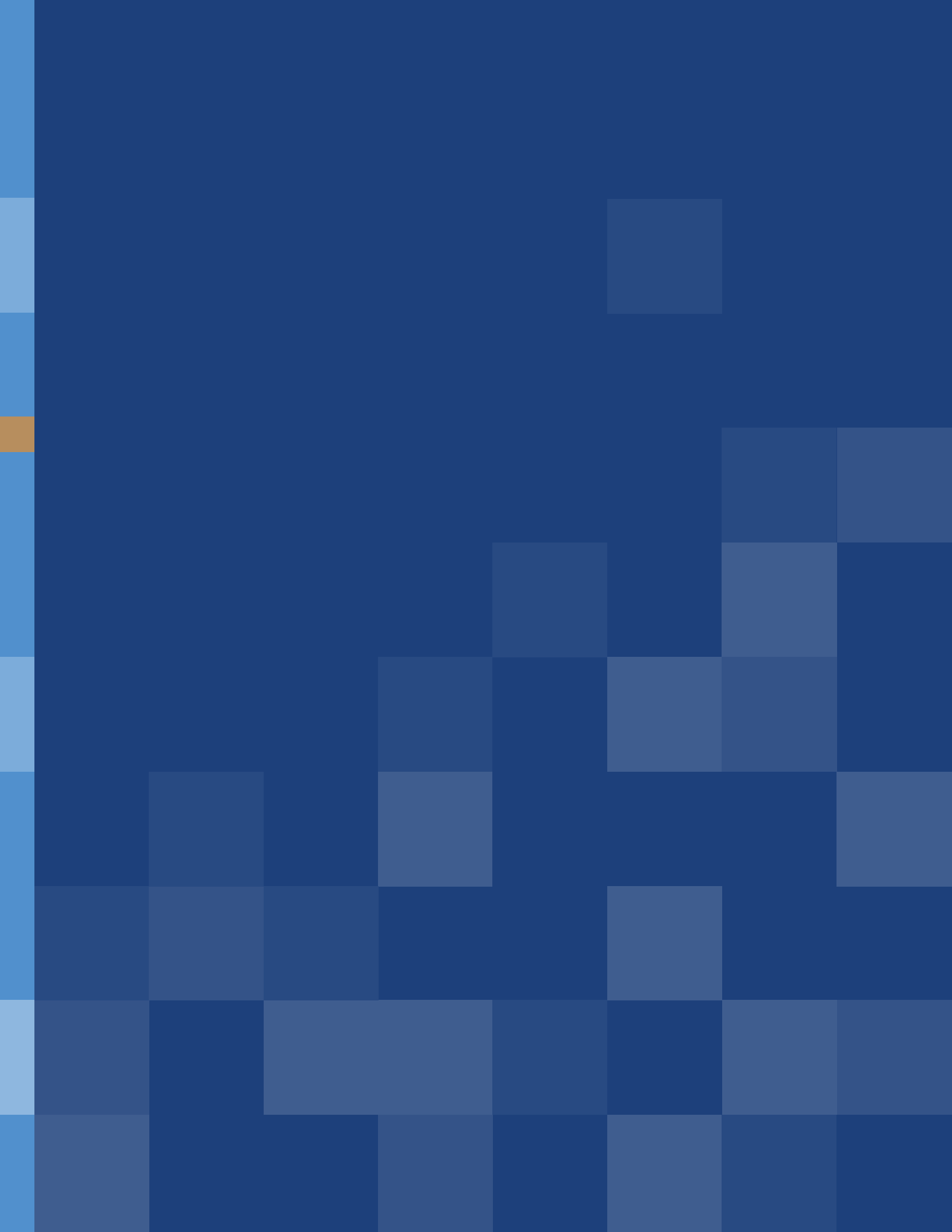
tions of firm self-sufficiency, hierarchy, and strict protection of intellectual property. For regions to get ahead of the innovation curve, leaders must be willing to share insights.

Regional attitudes toward risk comprise another key evaluation area. Many regions, like Wilmington, Delaware and Rochester, New York have had a hard time supporting entrepreneurship because large, successful firms have traditionally dominated the area economy. Success and lifetime employment opportunities have bred financial conservatism. Further, managers of successful, smaller firms have a harder time rising to leadership roles in the business community. If entrepreneurship is to take hold, risk-taking must be appreciated and celebrated, even if it often leads to failure. Failure must be understood as a component of the creative process.

A final cultural area for assessment is the regional appreciation of people from diverse experiences and backgrounds. Recent studies by the National Commission on Entrepreneurship and Richard Florida suggest that regions that value racial and cultural diversity may be better suited for supporting innovation than those that do not. Since innovators, by their very nature, often function outside the norm, regions where the populations respect and embrace diversity may have an easier time cultivating innovators.

<sup>1</sup> The following sections are adapted from the National Clusters of Innovation Report, 2001, pgs. 5-7.

<sup>2</sup> See AnnaLee Saxenian, *Regional Advantage: Culture and Competition in Silicon Valley and Route 128* (Cambridge, MA: Harvard University Press, 1994).



# III. THE REGIONAL INNOVATION ASSESSMENT

**“Innovation is a contact sport. And the global winners tend to be teams that reflect a diversity of ideas, backgrounds, and approaches. Regional institutions, then, should collaborate with each other and encourage interaction across scientific and business disciplines.”**

—Randall T. Kempner, Vice President, Regional Innovation, Council on Competitiveness

A complete regional innovation assessment involves data collection, analysis, and recommendation development. Information is gathered from four main sources: previous reports, public data, surveys, and interviews. In most regions, regional economic development organizations have developed strategic plans, industry assessments, or reports on key aspects of the local economy. Articles and reports in the local press can also provide excellent background for the assessment. There are a variety of public data sources that can offer data on regional innovation assets and performance. The federal government makes several such sources available at no cost.

The Council and our collaborators developed survey and interview templates to gain an understanding of regional dynamics that publicly available data cannot provide. While public data can help in hypothesis formation, on-the-ground interaction with residents is critical to understanding actual regional conditions. Together, the quantitative data, survey results, and interviews can provide researchers with a rich understanding of the regional business environment.

## Comparative Data Analysis

Assessing comparative public data is a critical step in evaluating a regional innovation environment. We recommend that this data-gathering be conducted at the beginning of an assessment along with the review of previous reports, as these two sources can provide sufficient information to develop a strong set of hypotheses about regional strengths and weaknesses.

In many cases, the comparative data has already been collected in previous reports. In addition, most quantitative data required for a RIA is publicly available from sources such as the U.S. Bureau of Economic Analysis (BEA), the Bureau of Labor Statistics (BLS), and the U.S. Census Bureau. As noted in the metric definitions below, there are many other resources available to economic developers for conducting a RIA, including free and fee-based publications, websites, and data obtained from private companies.

## Regional Business Survey

To supplement the publicly available data, we suggest implementing a business survey to assess regional factors that affect business success. Since choices made by private sector firms ultimately drive regional economies, the survey is targeted exclusively to private sector respondents. To get a most accurate reading on the local business environment, we ask business leaders to respond in relation to their firm’s actual experience. While government, educational, and non-profit leaders can offer an important perspective on the regional business environment, they are poorly suited to provide a first-hand view of how that environment impacts firm innovation.

The Regional Competitiveness Survey developed by the Council consists of 73 questions and it is designed to take approximately 15 to 20 minutes to complete. In line with the regional innovation model described above, the survey questions are categorized in three sections: the regional business environment (assets), innovation networks (networks), and regional economic beliefs and attitudes (culture).

In the asset section of the survey, we ask respondents to evaluate how 27 regional factors impact their success on a five-point scale ranging from “very harmful to your business” to “very beneficial to your business.”

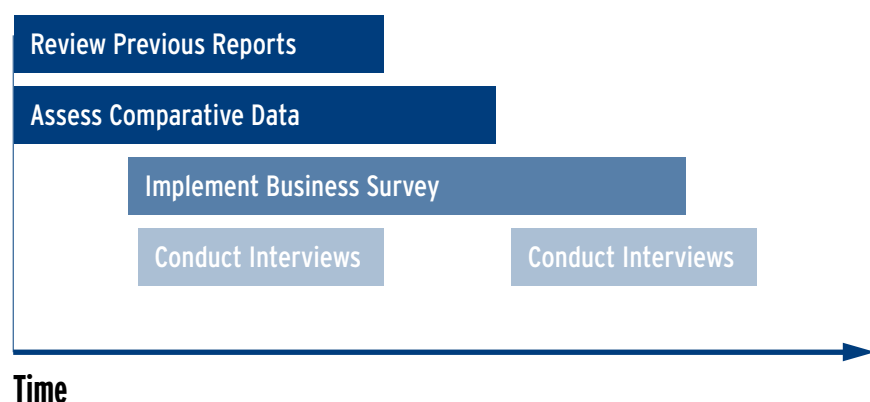
Appendix B contains a sample regional survey for reference.

## Survey Administration

The survey should be distributed to a representative group of businesses located in the region. To get the most accurate results, the survey should be administered to a random sample of managers from “traded” industry firms. Following Dr. Michael Porter’s definition, traded industries are those that produce a product or service that can be exported outside of the region. Examples include: manufacturing firms, professional service firms that serve clients outside of the region, and software firms. These are the firms – as opposed

Figure 3

## Regional Innovation Assessment: Analytical Elements



to “local” firms like grocery stores, dry cleaners, and gas stations – that drive regional economic prosperity.

In reality, it is often difficult to isolate “traded” versus “local” firms when developing the database of potential survey respondents. The most efficient and cost-effective way to implement the survey is to obtain lists from local business organizations, like the Chamber of Commerce or Technology Council, and employ a web-based system to distribute electronic surveys. If no lists are available, researchers can purchase mailing lists from companies such as Dun & Bradstreet and infoUSA. Many web-based survey services are available, including Websurveyor, SurveyMonkey, and Software4Survey. A minimum sample size of about 100 is necessary for drawing statistically valid conclusions, but higher participation is preferable – as well as beneficial for drawing attention to the RIA process.

## Community Leadership Interviews

To deepen regional understanding, we recommend conducting interviews with a wide variety of community leaders including: government officials, university leaders, venture capitalists and other financiers, business service providers and advisors, business associations, economic developers, and non-profit community groups.

The interviews with stakeholders in the region serve three key functions:

- To develop a deeper understanding about the forces/institutions that helped and hindered the region as it reached its present state of development
- To assess how alliances and networks support and promote regional innovation
- To explore and confirm survey results and the subsequent regional priorities for action

It is useful to complete at least some of the interviews after receiving the survey results, so that hypotheses based on the survey and initial data assessment can be tested. The target number of interviews is at least 30, which should include a mix of members from each target audience listed above. Interviews are ideally conducted face-to-face, but phone interviews are also effective.

Figure 3 outlines a basic timeline for a regional innovation assessment process. Appendix C provides a copy of the interview template for reference. Users should modify the interview template as appropriate for their regions.

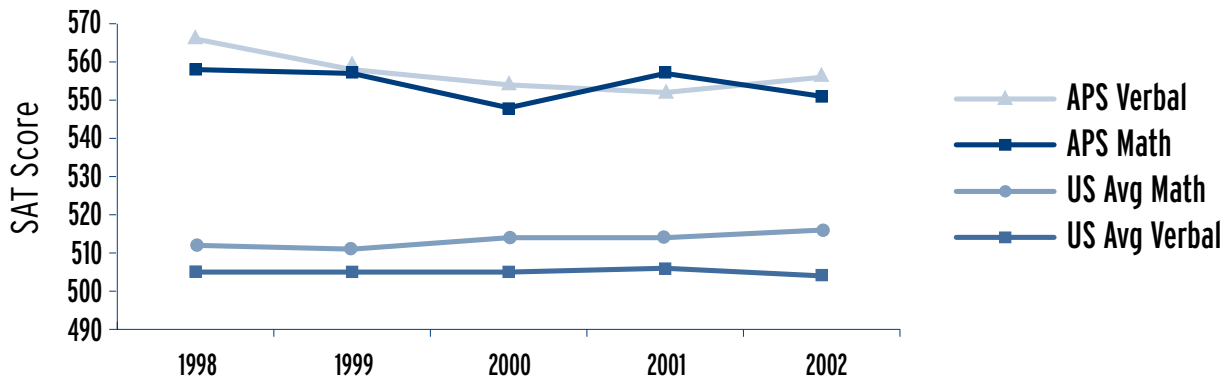
## Regional Assessment Analysis

The following sections provide guidelines and suggested metrics for measuring regional innovation inputs (assets, networks, and attitudes) and outputs (innovation, productivity, and prosperity). Data sources are noted and graphs are included as illustrative examples for how to present the information. Where applicable, we have identified specific survey questions that contribute to the analysis. Users may prefer different methods for presenting the information, based on knowledge specific to the region and the audience.<sup>3</sup>

<sup>3</sup> Examples of presentations written based on the regional assessment framework are available at [www.compete.org/nri](http://www.compete.org/nri).

Figure 4

## SAT Scores: Albuquerque Public Schools and US Average, 1998-2002



Source: Albuquerque Public Schools, Educational Testing Service

## Input Metrics

### Assets

#### Human Capital Metrics

##### Quality of K-12: Standardized Test Scores

##### NATIONAL ASSESSMENT OF EDUCATIONAL PROGRESS (NAEP)

The National Center for Education Statistics (NCES) maintains records on math, science, and reading achievement tests conducted for the NAEP. Data can be sorted by state and is provided for several different grade levels. Data on reading and math test scores for fourth and eighth graders is a useful starting point for analysis. Because all tests are not given each year, it makes sense to only use figures for years in which both tests are available for both grades. To provide a point of comparison, benchmark the local scores with the national average against a raw scale. The NCES data is available at <http://nces.ed.gov/nationsreportcard>.

##### SCHOLASTIC ACHIEVEMENT TEST (SAT) AND AMERICAN COLLEGE TEST (ACT)

The SAT and the ACT measure student performance in various subjects, including science, math, reading comprehension, and writing. SAT and ACT scores are important criteria used for college admission decisions and are therefore key indicators of a school system's ability to prepare students for college entrance. Some state level data is available from organizations such as CollegeBoard ([www.collegeboard.com](http://www.collegeboard.com)) and ETS ([www.ets.org](http://www.ets.org)). Users should search for regional data and, if available, use national and state averages for comparisons.

##### Quality of K-12: Graduation Rates

Statewide graduation rates can be found on most state Department of Education websites. Most reports show the graduation

rate by county, leaving the researcher the task of developing a weighted average, or showing the raw data for each district if seeking data on a particular MSA. Collecting data on each county, then comparing that data against national averages, will likely be the most straightforward way to present the information.

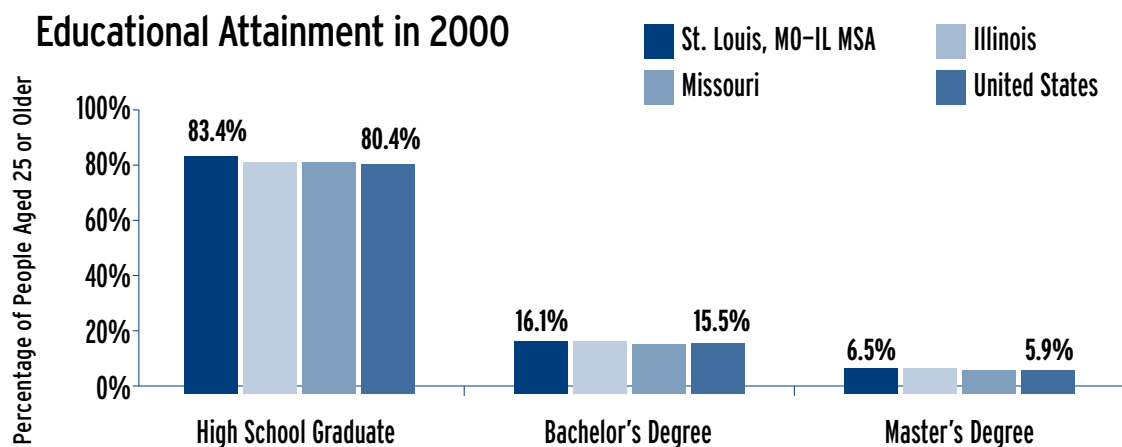
##### Quality of Higher Education: Community Colleges

Data on community colleges is not as readily available as data on four-year colleges and major research universities. Community College Week (<http://www.ccweek.com/Top100.asp>) publishes some data on the number of certificates awarded at each school, but a source for national rankings of community and technical colleges could not be found for this guidebook. As a result, users should rely on the survey and interviews to assess the role of community colleges in a regional economy. Topics of interest during the interviews include: the level and effectiveness of college collaboration with regional companies; responsiveness of course development to changing industry needs; and availability of internships.

##### Quality of Higher Education: University and Four-year Colleges

Several media sources collect data on universities and colleges and compile rankings based on various specialties and disciplines. U.S. News and World Report, Businessweek, The Wall Street Journal, and The Financial Times compile the most well-known rankings. The U.S. News rankings are perhaps the most widely followed, but most of the data must be purchased. Details are available on the U.S. News website ([www.usnews.com](http://www.usnews.com)). Also, university websites often have helpful information about rankings and other accolades. As most publications point out, rankings should never be the only source of information for rating the quality of an educational institution. Nevertheless, reputation is important because schools compete on an international playing field for the most talented students. The survey and interviews can also provide important context for data obtained from rankings.

Figure 5



Source: U.S. Census Bureau, 2000 Census

#### Quality of Higher Education: Endowment

An endowment generally refers to donations made to a university with the understanding that the principal amount of the donation will be invested with the earnings from that investment and used for the university's educational programs.<sup>4</sup> Endowments allow universities to pursue new initiatives and improve the overall quality of education and are therefore an important source of data for analyzing regional institutions. Data on endowments can be found on the Chronicle of Higher Education website (<http://chronicle.com>). Another source is the National Association of College and University Business Officers (NACUBO) (<http://www.nacubo.org>). It is useful to show the rank of the college compared to peer institutions, such as other public universities of similar size. Many of these databases require purchasing a publication subscription.

#### Educational Attainment

The U.S. Census Bureau reports educational attainment data in its *Summary File 3*. To build a regional education profile, users should show the percentage of the population having attained a high school diploma or higher and the percentage having attained a Bachelors degree or higher for the most recent years available. Regional data should be benchmarked against state and national data for comparison. The easiest way to navigate the Census website is to use the American FactFinder tool (<http://factfinder.census.gov>). Data can be searched by region in "Data Sets" and then "Detailed Tables".

Data on Ph.D. graduates is available on the National Science Foundation (NSF) website (<http://caspar.nsf.gov>). Use the WebCASPAR search engine to access the "Earned Degrees by Race & Ethnicity" file and compile data for all races. Data can only be filtered by state or geographic area (e.g., Northeast), which limits its value for regional analysis.

<sup>4</sup> A useful explanation of endowments is found on the University of Alberta's website at [www.financial.ualberta.ca](http://www.financial.ualberta.ca).

#### Labor Force: Managers, Engineers, Scientists, and Technicians

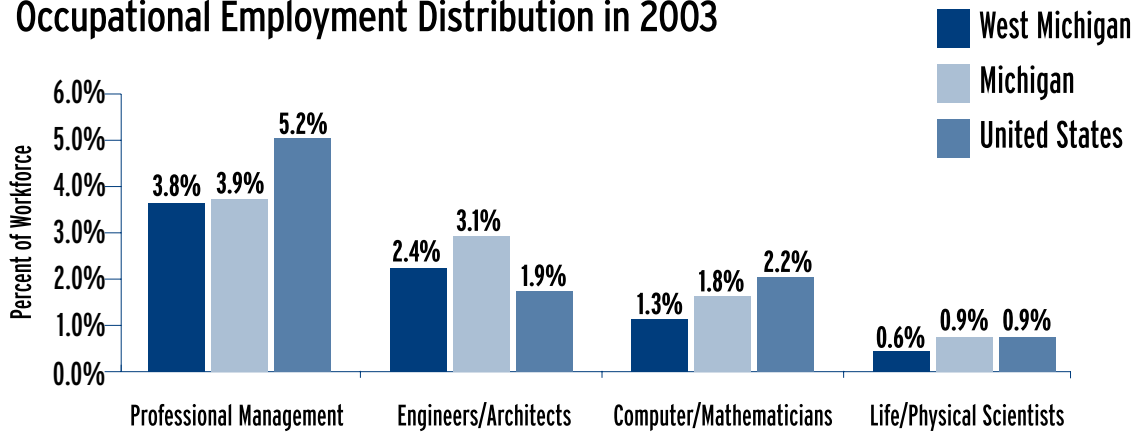
The U.S. Bureau of Labor Statistics (BLS) collects employment and occupational data in its annual Occupational Employment Statistics (OES) survey (<http://www.bls.gov/oes/home.htm>). The OES surveys approximately 400,000 establishments every year. Data collected after 1999 provides the most consistency, because the BLS occupational classification system changed that year. Users should collect data on four main occupational categories: Management (11-000), Architecture and Engineering (17-000), Computer and Mathematical (17-3022), and Life, Physical, and Social Science (19-000). The numbers in parentheses mark starting points for the occupational categories in the BLS Standard Occupational Code (SOC) system. Data can also be found for specific types of technicians, such as civil engineering technicians and chemical technicians. Users should provide comparisons to the region's state and the nation.

In addition to the external data sources, we developed a number of survey questions on human capital to supplement the assessment of the local workforce and educational institutions. In the asset section of the survey, the following factors are included:

- Overall quality of the region's community and technical colleges
- Overall quality of the region's four-year colleges and universities
- Availability in the region of workers with the skills required by regional businesses
- Availability in the region of scientists and engineers with the qualifications required by regional businesses
- Availability in the region of information technology professionals with the qualifications required by regional businesses

Figure 6

## Occupational Employment Distribution in 2003



Source: Bureau of Labor Statistics

### Research and Development Metrics

#### R&D Spending at Universities

The NSF's WebCASPAr database contains time series data for federal, state, and industry financed R&D spending at colleges and universities. Users can find the total R&D spending at universities in the region and then compare it on a per capita basis to the state and the nation. The WebCASPAr database can be found at <http://caspar.nsf.gov>.

#### R&D Spending at Companies

Because many companies are privately held, comprehensive data on R&D spending at local companies is unavailable in a national database or standard business publication. Information on individual companies in a region, collected in a survey or study, may be available through a chamber of commerce or trade group, but most users will have to obtain that information through interviews with

business leaders. Information on public companies is more readily available through required corporate filings.

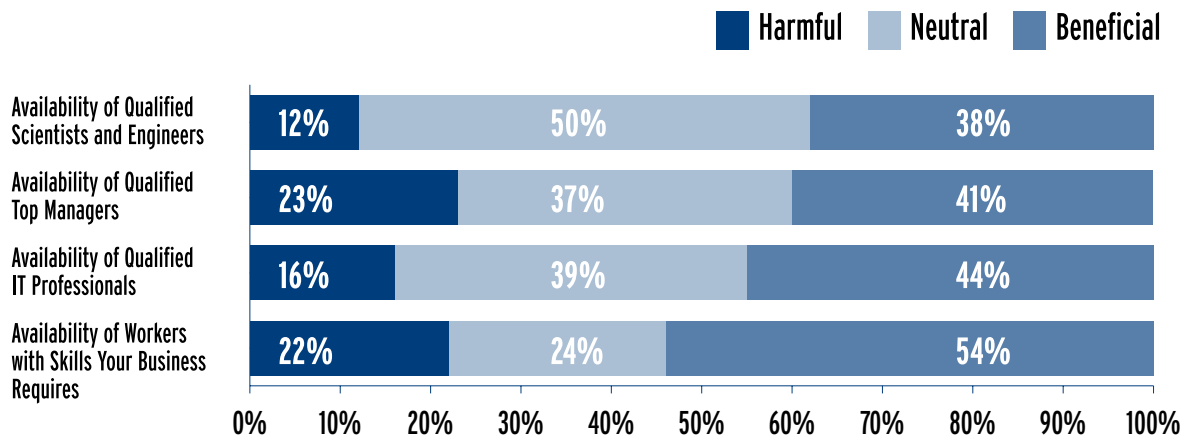
### Financial Capital Metrics

#### Venture Capital Investment

Venture capital data is collected in a collaborative project by PricewaterhouseCoopers, Thomson Financial Venture Economics, and the National Venture Capital Association. The PWC/Venture Economics/NVCA Moneytree Survey is available on the Venture Economics website ([www.ventureeconomics.com/vec/statshome.htm](http://www.ventureeconomics.com/vec/statshome.htm)). Quarterly data is available by state, region, metropolitan area, and U.S. congressional district. Users can compile the data by congressional district and aggregate for the region. A useful way to show the data is to normalize per 1,000 workers and compare the regions to peer regions, the state, or the nation.

Figure 7

## Impact of Workforce Availability on Regional Business Success

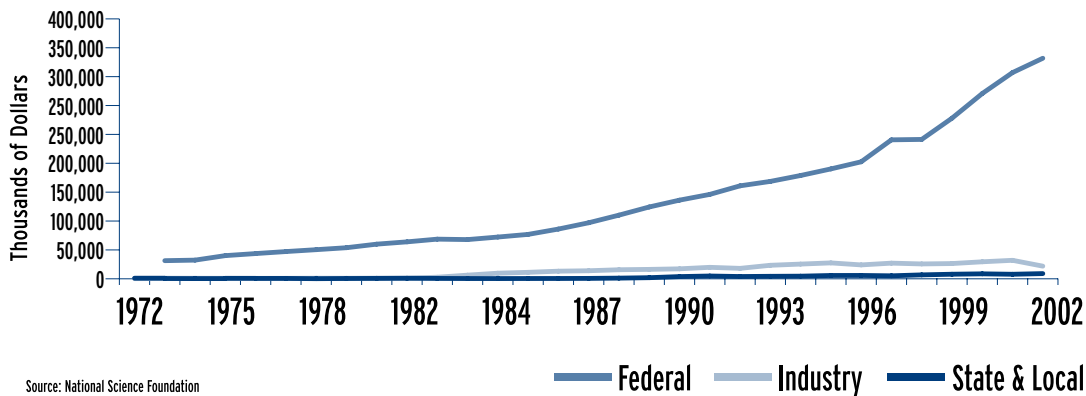


Source: Council on Competitiveness Regional Survey, N=160-208  
 Note: non-respondents and "not applicable" responses have been excluded



Figure 8

## R&D Spending by Funding Source at Universities in St. Louis Region 1972–2002



### Number of VC Firms and Angel Groups

It is equally important to collect information on venture capital firms and angel networks in the region. High net-worth individuals and VC firms tend to invest resources locally and thus are key assets for ensuring entrepreneurs have access to capital. The local Business Journal is a good starting point for finding lists of local VC firms and angel groups as well as funds under management. One company, American Business Journals, Inc. ([www.bizjournals.com](http://www.bizjournals.com)) publishes many of the regional business journals in the United States.

Financial capital survey questions include:

- Availability in the region of risk capital from venture capital firms
- Availability in the region of risk capital from “angel” investors
- Availability in the region of capital from banks

### Industrial Base Metrics

#### Specialization by Traded Cluster

The Cluster Mapping Project at the Institute for Strategy and Competitiveness uses county-level data and statistical techniques to identify clusters in regional economies. Harvard Professor Michael E. Porter, the leader of the project, defines clusters as geographically concentrated groups of interconnected companies, universities, and related institutions that arise out of linkages across industries. Data is available at the state, economic area, metropolitan area, and inner-city levels. Clusters fall into three categories: traded, local, and natural endowment dependent. Regional wealth is driven by the performance of industries that export goods and services outside of the region, and therefore the traded clusters are of greatest interest to the innovation-based model. The Cluster Mapping Project website (<http://data.isc.hbs.edu/isc/index.jsp>) is a subscription service, but some data is available free of charge.

Figure 9

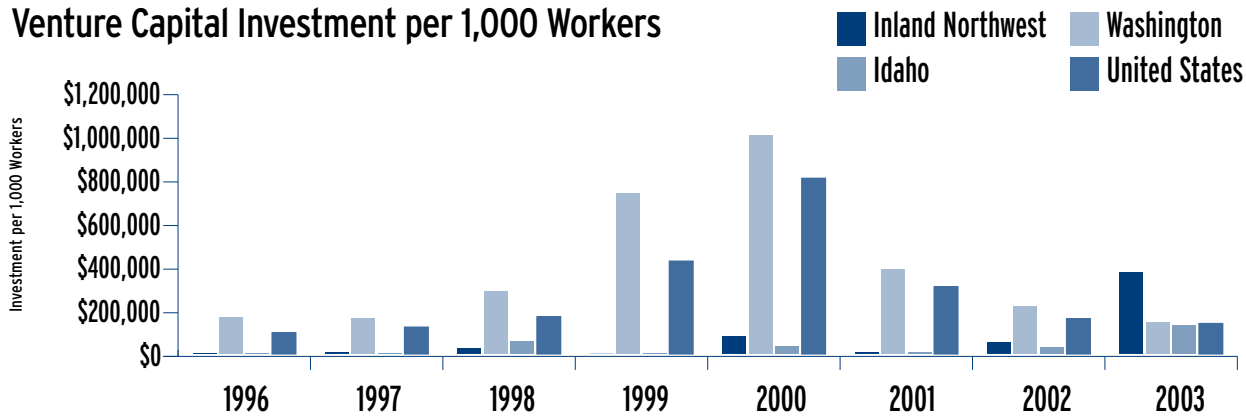
## Academic Research and Development Expenditures in St. Louis Region, 2002

<b>US Total</b>	<b>\$36,332,641,000</b>
<b>Missouri</b>	<b>\$705,593,000 (2% of U.S.)</b>
<b>St. Louis Region</b>	<b>\$463,923,000 (1.3% of U.S., 66% of state)</b>
<b>Washington University</b>	<b>\$416,960,000</b>
<b>St. Louis University - All campuses</b>	<b>\$35,444,000</b>
<b>University of Missouri - St. Louis</b>	<b>\$11,519,000</b>

Source: National Science Foundation, U.S. Census Bureau

Figure 10

## Venture Capital Investment per 1,000 Workers



Source: Price Waterhouse Coopers Money Tree Survey.

### Patents in Traded Clusters

The Cluster Mapping Project also offers time-series data on patenting within traded clusters, which is useful for tracking the rate of regional innovation over time. With innovation driving regional competitiveness, traded clusters with sustained growth in patents may be the best targets for economic development initiatives.

### Physical Infrastructure Metrics

#### Transportation Infrastructure

The most widely cited source for commuting data is the Texas Transportation Institute's (TTI) annual Urban Mobility Study ([http://mobility.tamu.edu/ums/congestion\\_data](http://mobility.tamu.edu/ums/congestion_data)). The report compares commute times for most metro areas in the nation. Arbitron Inc. ([www.arbitron.com/outdoor\\_companies/travel.asp](http://www.arbitron.com/outdoor_companies/travel.asp)) has also reviewed and compared Census 1990 and 2000 data on commuting time to work in the U.S.

### Communications Infrastructure

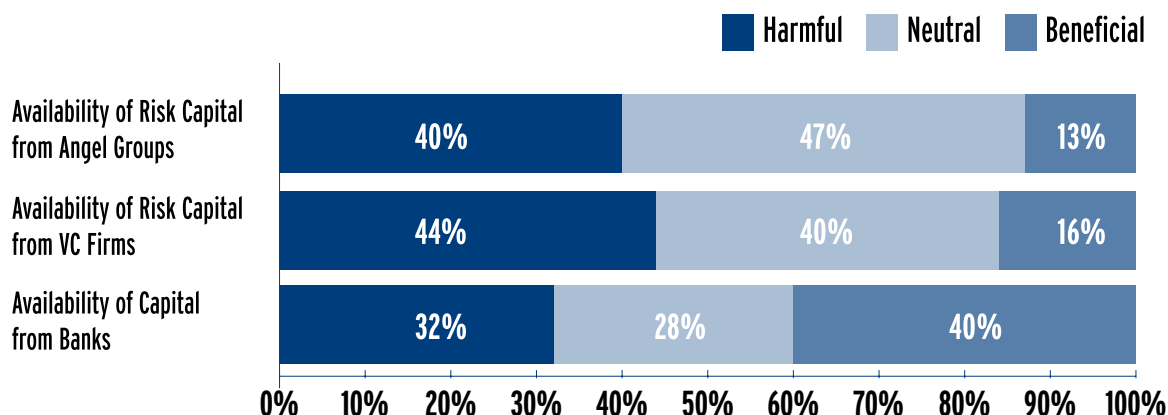
The Progressive Policy Institute maintains an index of states' achievements in a variety of "new economy" areas. Online population, for example, is a basic measure for assessing the quality of a region's communications network as well as the connectivity of its residents. Showing a single state's adoption rate alongside the highest and lowest ranking states, as well as the national average, allows users to see the data in context. The data can be found at [www.neweconomyindex.org](http://www.neweconomyindex.org). Telecommunications providers that offer services in the region may also have useful data, such as user trends, costs, and expansion plans.

Survey questions address:

- The overall quality of the region's transportation (e.g., roads, air transport, railroads and ports)
- The quality of the region's communications infrastructure (e.g., telephone, wireless, high-speed Internet access)

Figure 11

## Impact of Capital Availability on Regional Business Success

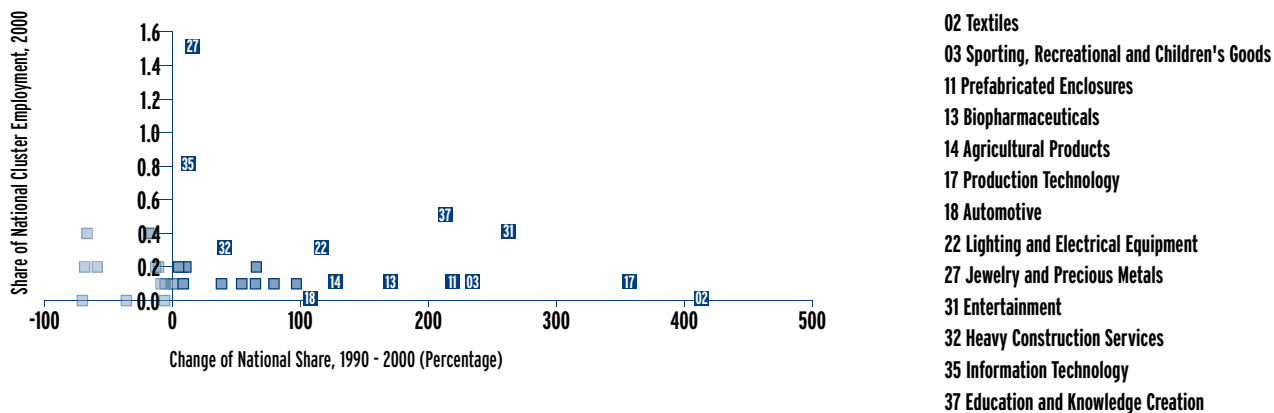


Source: Council on Competitiveness Regional Survey, N=160-208

Note: non-respondents and "not applicable" responses have been excluded

Figure 12

## Clusters with High Growth or High Share of National Employment in Albuquerque, MSA



Source: Harvard Institute for Strategy and Competitiveness, Cluster Mapping Project

### Legal and Regulatory Environment Metrics

#### Tax Burdens

Tax codes vary significantly across municipalities in a region. As a result, local sources are usually best suited for explaining a region's efforts toward making its tax code supportive to business. Several sources are available for comparing tax rate data at the national level. Economy.com offers several fee-based sources for information on business costs that include state and local tax data, such as its annual North American Business Cost Review. Reports can be found on the Economy.com website ([www.economy.com](http://www.economy.com)). The Tax Foundation ([www.taxfoundation.org](http://www.taxfoundation.org)) is another source for information on state tax and regulation systems. Its annual State Business Tax Climate Index provides data on individual income tax, fiscal balance, tax base conformity, sales and gross receipts tax, and corporate income tax. Data should be presented in a way that illustrates comparisons among peer regions, according to location, population, or some other criterion.

#### Cost of Doing Business

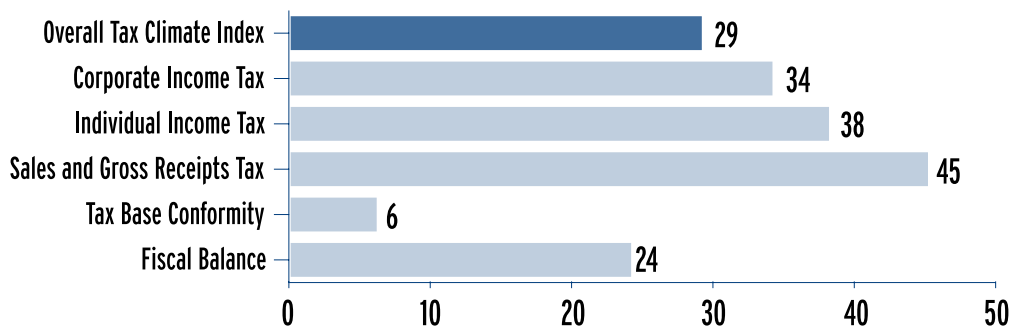
Cost-of-doing-business data can be found in publicly available and private sources. Several magazines, such as Forbes, publish annual rankings that compare metropolitan areas based on various cost-of-doing-business indicators ([www.forbes.com/lists](http://www.forbes.com/lists)). Several private economic consulting firms such as Economy.com ([www.economy.com](http://www.economy.com)) also offer cost-of-doing-business data. Economy.com's *Precis Metro Reports*, for example, include a yearly measure of the cost of doing business at the MSA and state levels. The index weights factors such as tax burdens, labor costs, and energy costs.

Survey questions address:

- Cost of doing business in the surveyed firm's region (specifically, the cost of real estate, wages and salaries, and utilities)
- Region's cost of living for the surveyed firm's employees
- State and local governmental regulations and permitting procedures affecting businesses
- Level of taxation affecting business (relative to other regions)

Figure 13

## New Mexico State Rankings Tax Foundation State Business Tax Climate Index, 2002



Source: Tax Foundation State Business Tax Climate Index, May 2003 Rankings based on 50 states and District of Columbia.  
Note: Lower is a more favorable rating.

### Quality of Life Metrics

#### Inflow/Outflow of Residents

Economy.com's *Precis Metro Reports* include an annual measure of resident inflows and outflows at the MSA, state, and national levels based on tax filing data from the Internal Revenue Service (IRS). The data shows a household's current county of residence, as well as the county to which a household may be moving, the number of household members, and household income. Economy.com aggregates this data by metro area into gross migration. IRS data only covers those families that file tax returns, so Economy.com also uses data from the U.S. Census Bureau, which covers all migrants, including international migration. The reports are available for purchase on the Economy.com website ([www.economy.com](http://www.economy.com)).

The U.S. Census Bureau also produced a report based on the 2000 Census that shows the net migration of "young, single, college-educated people" by MSA. A net loss of people in that demographic could signify that a region is experiencing "brain drain." The Census explains the data in "Migration of the Young, Single, and College Educated: 2000-2005," available at <http://www.census.gov/prod/2003pubs/censr-12.pdf>.

#### Cost of Living

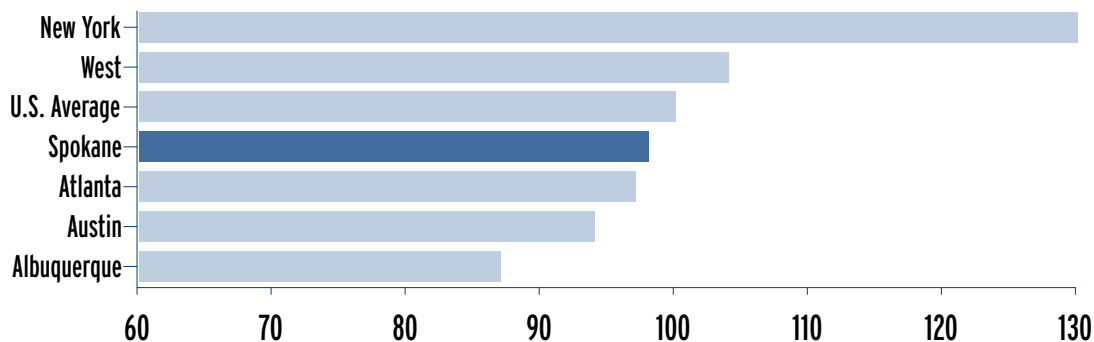
Several sources are available for obtaining cost-of-living data. Economy.com's *Precis Metro Reports* include an annual index of costs of living by MSA. Their index measures the relative cost to the average household in the nation to maintain its standard of living. The index is created by summing expenditures on various components of consumption in each metro area relative to average U.S. expenditures on the components. The components that vary across metro areas include housing, food and apparel, utilities, transportation, and auto insurance. Another source of data is the American Chamber of Commerce Researchers Association (ACCRA), which publishes its Cost of Living Index publication on a quarterly basis. The ACCRA index can be found at [www.coli.org](http://www.coli.org). Both sources are available for purchase only.

Survey questions address:

- The region's cost of living for the surveyed firm's employees
- The region's overall quality of life (e.g., climate, cultural, and recreational opportunities)

Figure 14

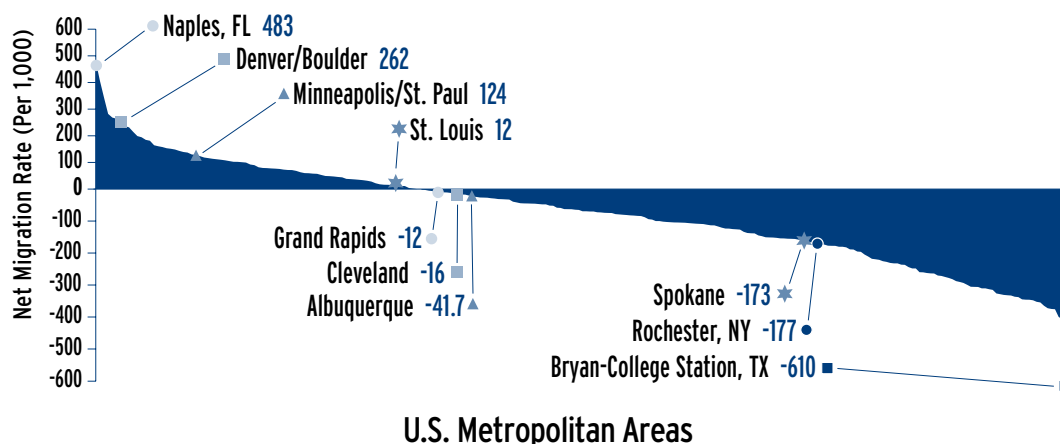
## Cost of Doing Business Index, 2003



Source: 2004 *Precis Metro Report*, Economy.com  
Note: Lower is less expensive. 100 is U.S. average.

Figure 15

## Net Migration of Young, Single, and College Educated People 1995-2000



Source: U.S. Census Bureau. Note: Rate calculated on a per thousand population basis, using 1995 as base year. Based on data from 318 MSAs.

## Networks

Section II of the regional business survey, Innovation Networks, is a series of questions that was developed to elicit information about the relationships that support innovation. Survey respondents are asked to rate relationships with other regional institutions according to value for supporting innovation. In addition, survey respondents can be presented with open-ended questions that request names and descriptions of their most valuable innovation partners. While survey efforts can be helpful, typically the interview process is necessary to provide the depth of information necessary to understand the formal and informal networks that exist in a region.

An illustrative graph that assesses the value of various linkages is included below.

## Culture

Section III of the regional business survey, Regional Norms and Attitudes, deals with the cultural aspects of a region and how they can

help or hinder innovation. The questions are divided into three main themes that are related to supporting an innovative environment:

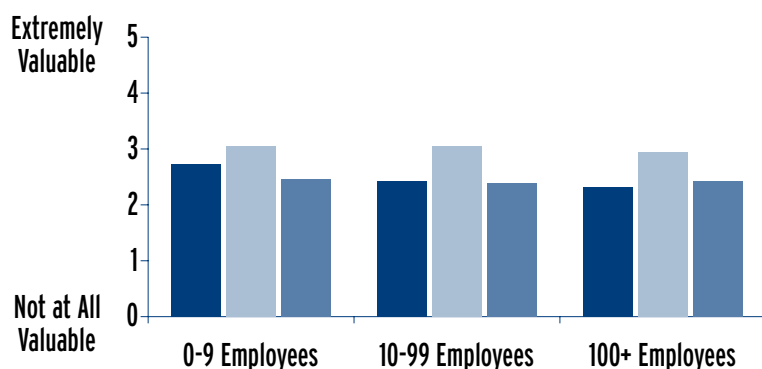
- Appreciation for diverse views and backgrounds
- Willingness to collaborate
- Understanding and appreciation for the entrepreneurial process

Rather than ask questions that directly address how a person thinks, respondents are asked to share their "level of agreement" with a number of relevant descriptive statements about the region. This method is utilized to minimize the false answers that may be offered when respondents believe there is a "right" answer to a question. (For example, few people would disclose personal racial biases, but would answer forthright that racism exists in the community)

Two graphs are included on the following page as illustrations.

Figure 16

## Value of Network Ties



### Informal Ties

Incubators, Entrepreneurial Networks, Business Assistance Centers, VC Firms, Angel Investors, Industry Associations, Non-Professional Associations

### Formal Ties

Customers, Suppliers, Banks, Professional Services Firms, Other Companies

### Research Ties

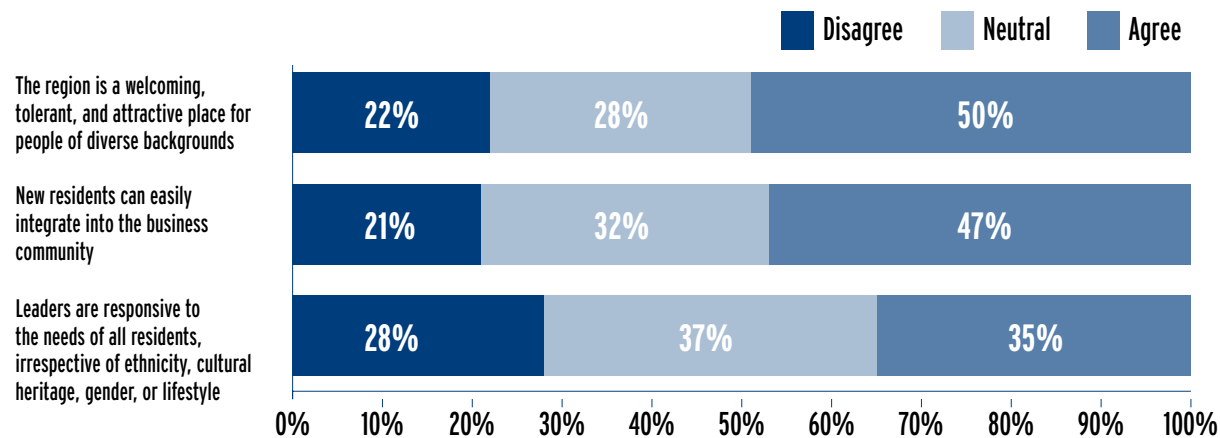
Public/Private Research Institutions, Universities, Community Colleges, Labs

Note: Responses summed across 7 Regions. 0-9 N=351; 10-99 N=503; 100+ N=354. Missing Values on Innovation Partners Items have been replaced with overall item means. Difference in Informal Tie Value is significant at p<.01 (ANOVA)

Source: Council on Competitiveness Regional Survey, 2003-4. Participants were business executives from Central New Mexico, Northeast Ohio, Wilmington, Spokane, West Michigan, Rochester, NY, and St. Louis areas.

Figure 17

## Appreciation for Diverse Views and Backgrounds

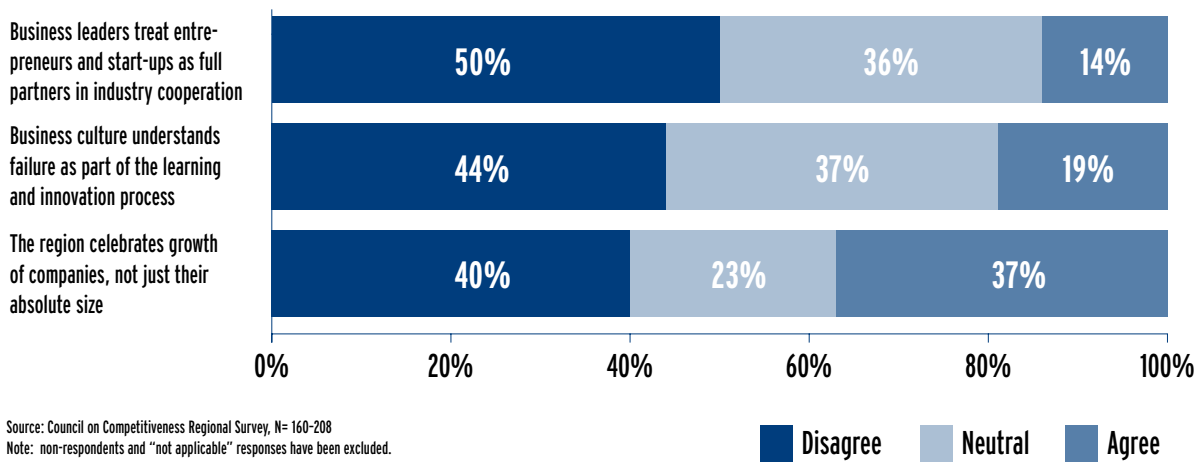


Source: Council on Competitiveness Regional Survey, N= 160-208

Note: non-respondents and "not applicable" responses have been excluded

Figure 18

## Appreciation and Understanding of Entrepreneurial Process



Source: Council on Competitiveness Regional Survey, N= 160-208

Note: non-respondents and "not applicable" responses have been excluded.

## Output Metrics

### Innovation

Innovation is the foundation of a region's capacity for achieving sustainable growth through the creation and application of new ideas. The innovation process, though not linear, can be usefully divided into three phases: Idea Generation, Idea Development, and Commercialization.

#### Idea Generation

Wealth creation starts with an idea, whether it is formed in a state-of-the-art research facility or in a neighbor's garage. A region will sink or swim based on its ability to capture and develop the innovative ideas of its residents and industries.

#### Idea Development

The second step in the innovation process is idea development. Ideas can be generated in virtually any setting, but the development and testing required to turn an idea into a new product or service require structure and resources. Software, for example, can be tested relatively cheaply and quickly with enough willing users and available equipment. In other fields, such as life sciences, the process is much longer and requires considerable investment to get products to market. Pharmaceutical companies take over a decade to develop a new drug before it reaches the market. Partnerships between industries and universities can accelerate the product life cycle and should be evaluated when analyzing this stage of the innovation process.

#### Commercialization

For tested ideas to benefit a region in terms of economic development, they must be translated into new products and services through the commercialization process. Economic developers can

nurture commercialization in a region by using strategies that create strong networks between researchers and companies, and by supporting innovation within existing firms. Examples include: business incubators; industry association sponsorships of research groups at universities; or even setting up networking events where university representatives and companies can exchange ideas and share news about local R&D projects.

Measuring the three phases of innovation is not a simple task. More metrics exist for the earlier stage of the process. Patent data is relatively easy to obtain, however data about new products or services being tested or sold is much more difficult to gather, particularly when the innovation is being undertaken by private firms that need not publicly report financials. Still, it is possible to at least indirectly measure the aspects of the entire innovation "pipeline."

#### Idea Generation Metrics

##### Patents

The United States Patent and Trademark Office (USPTO) offers a searchable database by state and city of issued patents on its website (<http://patft.uspto.gov>). Collecting information on the number of patents issued in a MSA is complicated, because the user cannot sort patents by MSA. If the MSA is of a manageable size, data can be collected by city, and the user can do multiple searches and aggregate the data to the MSA level. Collecting data at the MSA and national levels, and normalizing the data per employee with employment data from the Bureau of Labor Statistics, is a useful way for presenting the data in context.

To measure the impact (or quality) of patents, it is also possible to track the number of regional patent citations in scientific literature. However, there is no simple way to accomplish this for each patent associated with a particular region.

Not all viable ideas for new products and services reach the patent stage. For a more complete picture of a region's ability to produce

Figure 19

### Patents per 10,000 Employees in 2001



new ideas, economic developers should supplement the national patenting data with region-specific research, such as surveys and interviews.

### Idea Development Metrics

#### University Tech Transfer Scorecard

The Chronicle of Higher Education's University Tech Transfer Scorecard provides a series of metrics which rank University success in commercialization. The Scorecard is constructed with data from the five most recent surveys of the Association of University Technology Managers ([www.autm.net](http://www.autm.net)) and contains scores for only those schools that reported in four of the last five years. The Chronicle presently ranks respondents among the 117 reporting universities. Indicators offered in the report include: number of start-up companies formed per \$10 million spending on research;

licensing income per dollar of research spending; and number of inventions disclosed per \$1 million spending on research, among others. The latest report can be found at <http://chronicle.com/stats/techtransfer>.

#### New Firm Starts

The number of new firms started in a given year is a useful proxy for assessing idea development and testing. Entrepreneurs need to raise money to move an idea to market, and that usually requires starting a business. Data on new firm starts can be found at the U.S. Small Business Administration's Office of Advocacy website ([www.sba.gov/advo/research](http://www.sba.gov/advo/research)). Data is available at the national, state, and MSA levels. Users may also want to purchase data from business intelligence firms such as Dun & Bradstreet, Hoover's, and InfoUSA. Data from those firms is primarily used for marketing purposes, but is helpful if users are interested in specific information such as company names, addresses, and revenues.

Figure 20

## University Technology Transfer Scorecard

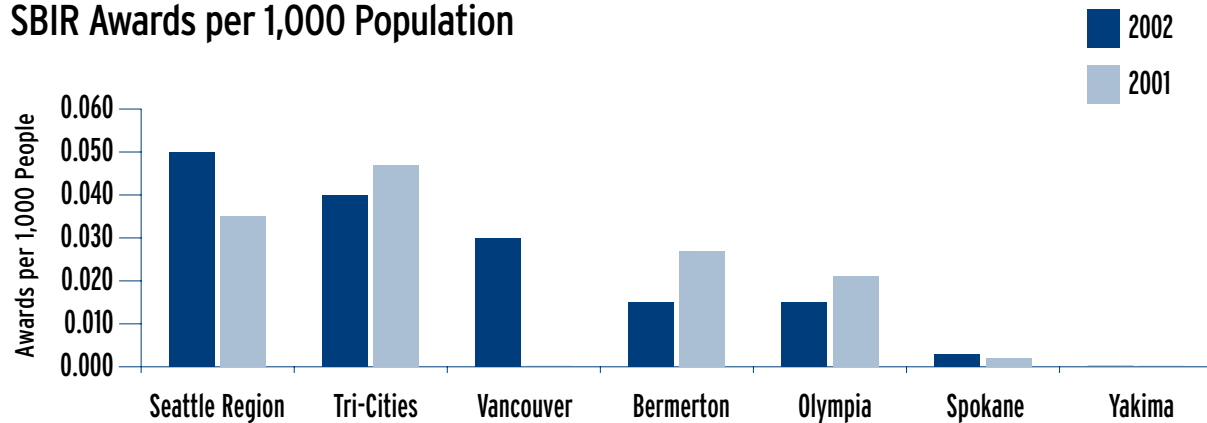
Ranking of 117 Schools	Washington University in St. Louis	Northwestern University	Stanford University	University of Pennsylvania	Vanderbilt University	Emory University	Duke University
Inventions disclosed per \$1 M spending on research	107	55	29	47	53	62	63
U.S. patent applications filed per \$1 M spending on research	65	55	13	48	59	57	49
Licenses & options executed relative to number of inventions disclosed	1	84	8	58	27	77	43
Licensing income per dollar of research spending	31	67	6	37	73	15	70
Average income per license	48	66	23	19	77	11	58
Universities that formed the most start-up companies	43	51	3	13	42	31	60
Number of start-up companies formed per \$10 M spending on research	84	81	6	55	45	42	97

Source: Chronicle of Higher Education, rankings out of 117 universities surveyed, 1997-2001



Figure 21

## SBIR Awards per 1,000 Population



Source: Washington Technology Center, 2004 Index of Innovation and Technology

### Small Business Innovation Research Grants

The U.S. Government issues Small Business Innovation Research (SBIR) grants to small companies to encourage development of new technologies. The Office of Technology of the Small Business Administration maintains information on SBIR grants. Data is available for number and value of awards at the state level. Phase I and II awards can be aggregated for easier comparisons. The SBA website also publishes locations for grant recipients, which can be aggregated for looking at MSAs. However, 1998 is the latest year for which data is available, and the SBA no longer updates the information on its website. Users should contact their local SBA offices for updated data on grant recipients. Local offices can be found using the map on the SBA website ([www.sba.gov](http://www.sba.gov)). SBIR data can be normalized per 10,000 employees for comparison to other regions. The data can be found at [www.sba.gov/sbir/indexsbir-sttr.html](http://www.sba.gov/sbir/indexsbir-sttr.html).

### Small Business Technology Transfer (STTR) grants

The U.S. Government also issues STTR grants to cooperative research projects involving a small business and a research institution, such as a university or a non-profit research group. STTR grants were developed as a vehicle for moving ideas from research institutions to market. Data availability is similar to SBIR grant data, and can be found on the same page of the SBA website ([www.sba.gov/sbir/indexsbir-sttr.html](http://www.sba.gov/sbir/indexsbir-sttr.html)).

### Commercialization Metrics

Most data on commercialization needs to be collected from regional sources, such as trade publications or business journals. Users can also conduct surveys and interviews at local companies to develop a system for benchmarking commercialization in the region. One way to indirectly measure commercialization is to collect data on business growth. Dynamic growth rates usually result from key innovations in products or services.

### Gazelles

Economic developers use the term “gazelle” to describe a company with annual sales revenue that has grown 20 percent or more as a share of total employment for at least four years. The number of gazelle companies in a region is indicative of an environment that supports rapid company growth. Sales data is available from business intelligence companies such as Dun & Bradstreet, Hoover’s, and InfoUSA. The Progressive Policy Institute publishes rankings of states according to their number of gazelles. The rankings, based on data from Cognetics, are available from the PPI’s New Economic Index ([http://www.neweconomyindex.org/states/2002/03\\_dynamism\\_02.html](http://www.neweconomyindex.org/states/2002/03_dynamism_02.html)).

### Inc. 500

*Inc* magazine’s annual *Inc.500* list ([www.inc.com/inc500](http://www.inc.com/inc500)) shows the fastest growing privately held companies in the U.S. The data is searchable by state, and users can then scroll through the list and identify companies in cities of interest. *Inc* contacts more than 500,000 firms to compile the list, and data is currently available from 1988-2004. Access to the full database requires purchasing a subscription. Users should consult the magazine’s list methodology before comparing data from multiple years.

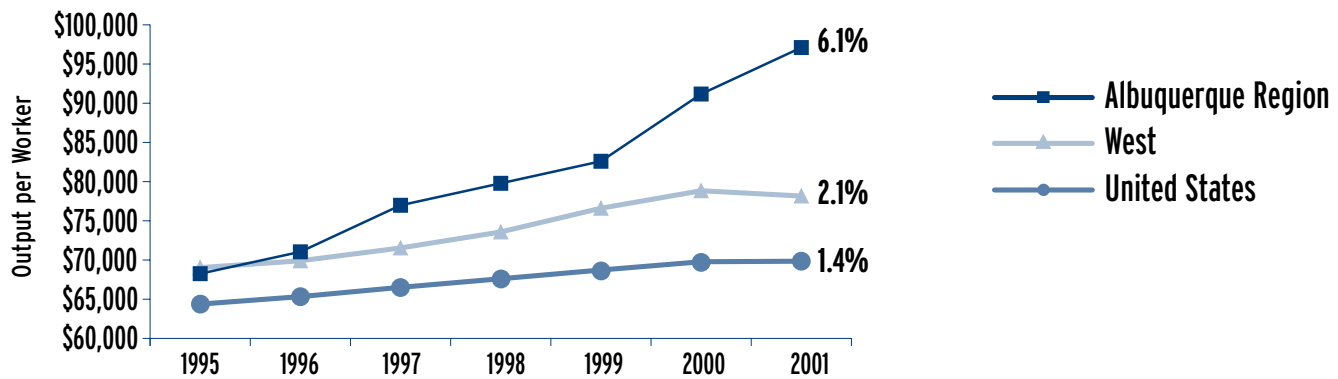
## Productivity

### Gross Regional Product (GRP) per Employee

GRP is defined as the total value of all goods and services produced in a given region. Unlike national income accounting, output at the regional level is difficult to measure and therefore not readily available in public databases. Economy.com and other economic consulting firms make estimations of regional output using various statistical techniques. Data is available for MSAs and counties, and can be purchased on Economy.com’s website.

Figure 22

## Productivity Growth, 1995 - 2001



Source: Preci Metro Reports from Economy.com, Productivity is Gross Regional Product divided by Employment. West consists of: Washington, Oregon, California, Arizona, Nevada, Idaho, Montana, Wyoming, Utah, New Mexico & Colorado

## Prosperity

Real measures of financial success exist and include indicators such as poverty, per capita income, and unemployment. However, to capture the fuller meaning of prosperity, it is also advisable to gauge residents' self-assessment of quality of life using surveys or interviews.

### Job Growth

Job growth can be calculated using the Current Employment Statistics (CES) data set from the Bureau of Labor Statistics. The BLS compiles the data monthly from payroll records at more than 390,000 businesses in the nation. Data is available on employment, hours, and earnings of workers on non-farm payrolls for all 50 states and over 270 metropolitan areas. Job growth is calculated as the percentage growth of the labor force from the previous year. The data can be presented showing year over year labor force growth for the MSA, state, and the U.S. for comparison. The data can be found on the BLS website ([www.bls.gov/sae](http://www.bls.gov/sae)).

### Unemployment Rate

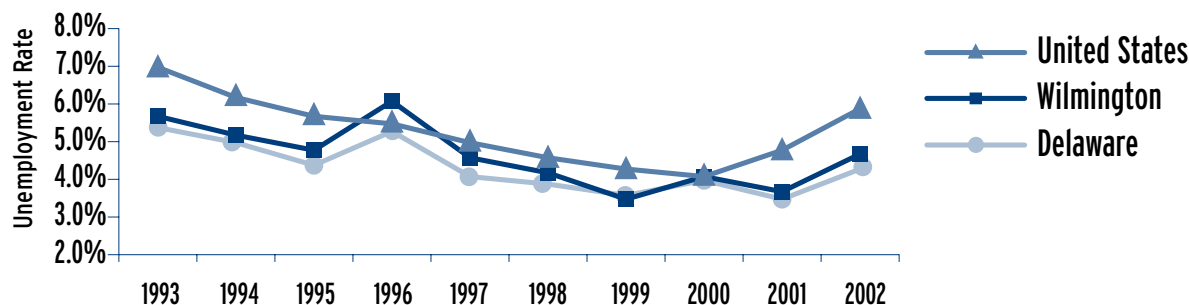
The unemployment rate is defined as the percentage of the population actively seeking employment that is not currently employed. The BLS publishes unemployment rates in the Local Area Unemployment Statistics (LAUS) section of its website ([www.bls.gov/lau](http://www.bls.gov/lau)). LAUS produces monthly and annual employment, unemployment, and labor force data for Census regions and divisions, states, counties, metropolitan areas, and many cities, by place of residence. For regional analysis, time-series data can be collected at the MSA, state, and national levels for benchmarking purposes.

### Average Wage

Regional wage data is available from two national sources: the BLS and the Bureau of Economic Analysis (BEA) Regional Economic Accounts database. The BLS publishes wage data by state, MSA, and county in its Quarterly Census of Employment and Wages. Users can download various data (e.g., average weekly wage and average annual pay) and search by NAICS industry and size of establishment.

Figure 23

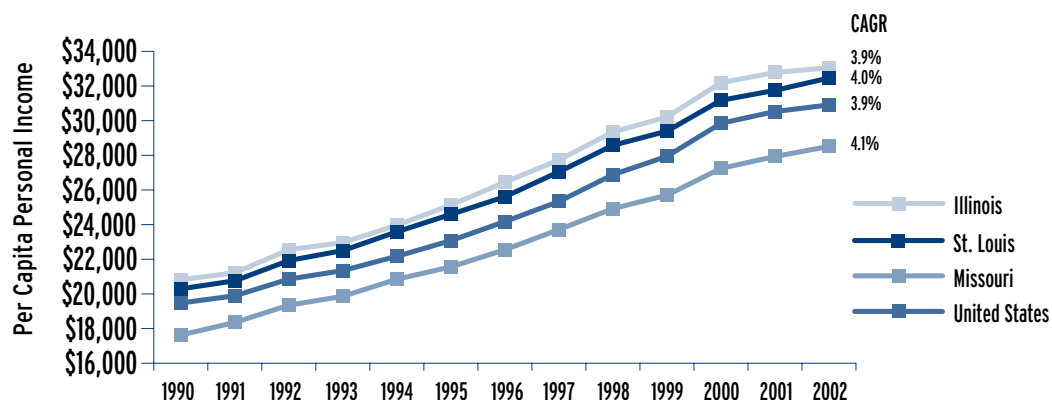
## Wilmington MSA, Delaware, and U.S. Unemployment Rates



Source: Bureau of Labor Statistics

Figure 24

## Per Capita Personal Income, 1990-2002



Source: Bureau of Economic Analysts

The BLS data is located at [www.bls.gov/cew](http://www.bls.gov/cew). The BEA publishes average wage per job data for states, MSAs, and counties from 1969 to 2003. The BEA data is found at [www.bea.doc.gov/bea/regional/reis](http://www.bea.doc.gov/bea/regional/reis).

### Per Capita Income

Per capita income is perhaps the most widely-cited statistic for assessing standard of living. The BEA provides detailed income data in the Regional Economic Accounts database. Per capita income and other income measures are available at the state, MSA, and county levels. Calculating compound annual growth rates (CAGR) for the last three decades and showing data for the region or MSA, state, and the nation provides useful context for the data. The BEA data is located at [www.bea.doc.gov/bea/regional/reis](http://www.bea.doc.gov/bea/regional/reis).

### Median Household Income

Median household income is another useful measure, because it minimizes the effect of the very high-income families in a region and therefore provides a more accurate picture of the “average”

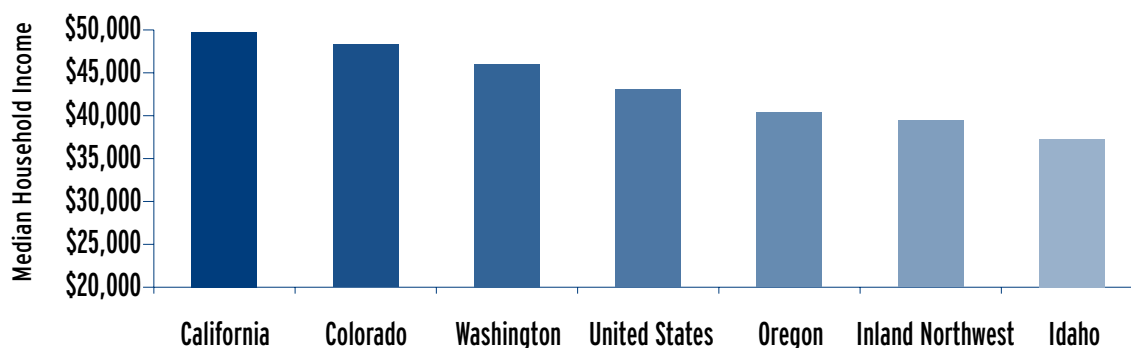
household's standard of living. Median household income data can be found in the decennial Census from *Summary File 2*. Data can be collected for either the MSA, or if unavailable, compiled from each county and weighted by population. *Summary File 2* data can be accessed through the Census American FactFinder website (<http://factfinder.census.gov>). More recent estimates of income for states and most metro areas are available in the annual American Community Survey, also available on the FactFinder page.

### Income Growth by Ethnicity

Inequality is a weakness that undermines regional economic performance. For example, disparity in income data according to race or gender can signal underlying social problems that limit the productivity potential of a region's entire workforce. Data on income growth by ethnicity is collected in the decennial Census and published in *Summary File 2*. Data can be collected for either the MSA, or if unavailable, compiled from each county and weighted by population.

Figure 25

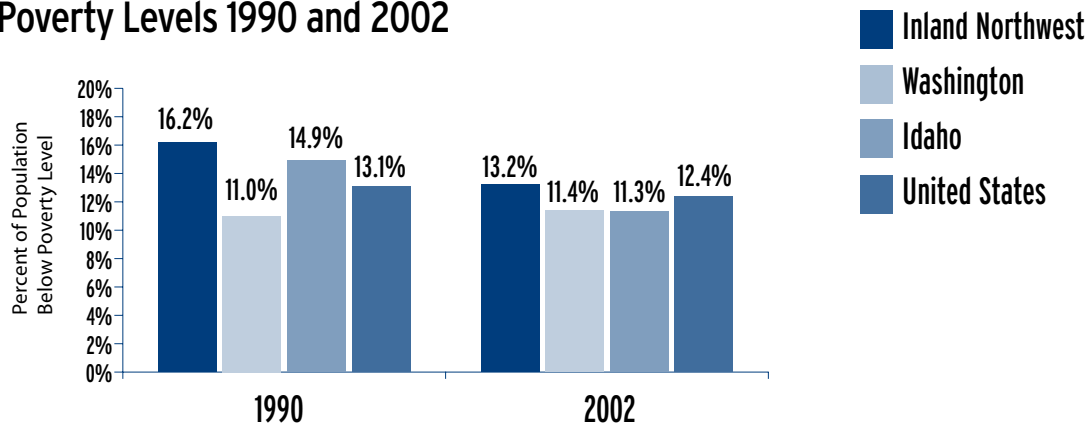
## 2002 Median Household Income



Source: U.S. Census Bureau, American Community Survey, 2002, Inland Northwest includes Spokane and Kootenai Counties

Figure 26

## Poverty Levels 1990 and 2002



Source: Census Bureau, American Community Survey. Inland Northwest includes Spokane and Kootenai Counties

Formatting the data in terms of minority percentage of white, per-capita income is a straightforward way to assess inequalities in the regional economy.

### Poverty Rate

Data on poverty rates is collected in the decennial Census and published in *Summary File 2*. More recent estimates of poverty rates are available from the American Community Survey. Data can be collected for either the MSA, or if unavailable, compiled from each county, weighted by population, and then benchmarked against national numbers for the purpose of comparison. The data can be accessed through the American FactFinder website (<http://factfinder.census.gov>). An explanation of how the Census defines and calculates the poverty rate is located at [www.census.gov/hhes/poverty/povdef.html](http://www.census.gov/hhes/poverty/povdef.html).

## Conclusion

There is no single, correct way to assess a region's innovation platform. Even the most comprehensive efforts at creating a measurement methodology are hindered by the lack of available information on key topics, including the level of research and development expenditures by private companies, and good measures of internal innovation by established companies. One of the Council on Competitiveness' target areas for ongoing work is the identification of new innovation metrics that will allow more precise assessment.

Despite these difficulties, we have endeavored to create a framework for measuring regional innovation that will help economic development leaders strengthen regional prosperity – and by extension, America's economic preeminence. We are excited by the innovation-based initiatives that have already been catalyzed by the RII and are optimistic that this guidebook will be useful to regional leaders throughout the country.

# IV . APPENDICES

# APPENDIX A. SUMMARY LIST OF METRICS AND SOURCES

## Input Metrics

Metric	Source(s)	Website
<b>Assets – Human Capital</b>		
K-12 Standardized Test Scores	National Center for Education Statistics	<a href="http://www.nces.ed.gov/nationsreportcard">www.nces.ed.gov/nationsreportcard</a>
College Entrance Exams	The College Board	<a href="http://www.collegeboard.com">www.collegeboard.com</a>
College Entrance Exams	Educational Testing Service	<a href="http://www.ets.org">www.ets.org</a>
Community College Certificates	Community College Week	<a href="http://www.ccweek.com/Top100.asp">www.ccweek.com/Top100.asp</a>
College Rankings	U.S. News and World Report	<a href="http://www.usnews.com">www.usnews.com</a>
Endowments	Chronicle of Higher Education	<a href="http://chronicle.com">http://chronicle.com</a>
Endowments	National Association of College and University Business Officers	<a href="http://www.nacubo.org">www.nacubo.org</a>
Educational Attainment	Census Bureau, American Fact-Finder	<a href="http://factfinder.census.gov">http://factfinder.census.gov</a>
Ph.D Graduates	National Science Foundation	<a href="http://caspar.nsf.gov">http://caspar.nsf.gov</a>
Regional Workforce	Bureau of Labor Statistics	<a href="http://www.bls.gov/oes/home.htm">http://www.bls.gov/oes/home.htm</a>
<b>Research and Development</b>		
R&D Spending at Universities	National Science Foundation	<a href="http://caspar.nsf.gov">http://caspar.nsf.gov</a>
<b>Financial Capital Metrics</b>		
Venture Capital Investment	PWC/Venture Economics	<a href="http://www.ventureeconomics.com/vec/statshome.htm">www.ventureeconomics.com/vec/statshome.htm</a>
Venture Capital Firms and Angel Groups	American Business Journals	<a href="http://www.bizjournals.com">www.bizjournals.com</a>
<b>Industrial Base Metrics</b>		
Clusters	Institute for Strategy and Competitiveness	<a href="http://data.isc.hbs.edu/isc/index.jsp">http://data.isc.hbs.edu/isc/index.jsp</a>
<b>Physical Infrastructure Metrics</b>		
Commuting Data	Texas Transportation Institute	<a href="http://mobility.tamu.edu/ums/congestion_data">http://mobility.tamu.edu/ums/congestion_data</a>
Commuting Data	Arbitron, Inc.	<a href="http://www.arbitron.com/outdoor_companies/travel.asp">www.arbitron.com/outdoor_companies/travel.asp</a>
Communications Infrastructure	Progressive Policy Institute	<a href="http://www.neweconomyindex.org">www.neweconomyindex.org</a>
<b>Legal and Regulatory Environment</b>		
Tax Burden	Economy.com	<a href="http://www.economy.com">www.economy.com</a>
State Tax and Regulations	The Tax Foundation	<a href="http://www.taxfoundation.org">www.taxfoundation.org</a>
Cost of Doing Business	Forbes Magazine	<a href="http://www.forbes.com/lists">www.forbes.com/lists</a>
Cost of Doing Business	Economy.com	<a href="http://www.economy.com">www.economy.com</a>
<b>Quality of Life Metrics</b>		
Migration Flows	Economy.com	<a href="http://www.economy.com">www.economy.com</a>
Brain Drain	Census Bureau	<a href="http://www.census.gov/prod/2003pubs/censr-12.pdf">www.census.gov/prod/2003pubs/censr-12.pdf</a>
Cost of Living	American Chamber of Commerce Researchers Association	<a href="http://www.coli.org">www.coli.org</a>

## Output Metrics

Metric	Source(s)	Website
<b>Idea Generation</b>		
Patents	U.S. Patent and Trademark Office	<a href="http://patft.uspto.gov">http://patft.uspto.gov</a>
<b>Idea Development</b>		
University Technology Transfer	Association of University Technology Managers	<a href="http://www.autm.net">www.autm.net</a>
Tech Transfer Scorecard	Chronicle of Higher Education	<a href="http://chronicle.com/stats/techtransfer">http://chronicle.com/stats/techtransfer</a>
New Firm Starts	Small Business Administration	<a href="http://www.sba.gov/advo/research">www.sba.gov/advo/research</a>
SBIR Grants	Small Business Administration	<a href="http://www.sba.gov/sbir/indexsbir-sttr.html">www.sba.gov/sbir/indexsbir-sttr.html</a>
<b>Commercialization Metrics</b>		
Gazelle Companies	Progressive Policy Institute	<a href="http://www.neweconomyindex.org/states/2002/03_dynamism_02.html">www.neweconomyindex.org/states/2002/03_dynamism_02.html</a>
Inc 500 Companies	Inc Magazine	<a href="http://www.inc.com/inc500">www.inc.com/inc500</a>
<b>Productivity Metrics</b>		
Gross Regional Product	Economy.com	<a href="http://www.economy.com">www.economy.com</a>
<b>Prosperity Metrics</b>		
Job Growth	Bureau of Labor Statistics	<a href="http://www.bls.gov/sae">www.bls.gov/sae</a>
Unemployment Rate	Bureau of Labor Statistics	<a href="http://www.bls.gov/lau">www.bls.gov/lau</a>
Average Wage	Bureau of Labor Statistics	<a href="http://www.bls.gov/cew">www.bls.gov/cew</a>
Per Capita Income	Bureau of Economic Analysis	<a href="http://www.bea.doc.gov/bea/regional/data/htm">www.bea.doc.gov/bea/regional/data/htm</a>
Median Household Income	Census Bureau, American Fact-Finder	<a href="http://factfinder.census.gov">http://factfinder.census.gov</a>
Poverty Rate	Census Bureau, American Fact-Finder	<a href="http://factfinder.census.gov">http://factfinder.census.gov</a>

For examples of regional innovation assessment presentations that incorporate these metrics, please visit [www.compete.org/nri](http://www.compete.org/nri).

# THE REGIONAL BUSINESS SURVEY

In this section, we are interested in learning about how each of the following factors affects your business. Please rate the region's current performance (level) on each factor.

[illegible]



(check one box in each row)

[illegible]

(check one box in each row)

[illegible]

(check one box in each row)

[illegible]

## Summary

<p>28. Considering all the factors presented so far, how would you currently rate your region overall as a place for your business to succeed?</p>	<p><input type="checkbox"/> Poor location</p> <p><input type="checkbox"/> Fair location</p> <p><input type="checkbox"/> Good location</p> <p><input type="checkbox"/> Very good location</p> <p><input type="checkbox"/> Excellent location</p>
<p>29. In five years, do you believe the quality of your region as a place for your business to succeed will decline, stay the same, or improve?</p>	<p><input type="checkbox"/> Decline</p> <p><input type="checkbox"/> Stay the same</p> <p><input type="checkbox"/> Improve</p>

30. Specifically with regard to state and local government programs and policies, please list and explain the most critical issues that should be addressed to improve your business's prospects for success.

31. Specifically with regard to *regional universities and community and technical colleges*, please list and explain the most critical issues that should be addressed to improve your business's prospects for success.

II. Innovation Networks

In this section, we are interested in understanding how your relationships with other regional institutions help your business to innovate. Innovation includes developing and commercializing new products, as well making improvements to existing products, services, or business processes.

Overall, how valuable is interaction with each of the following regional institutions to your businesses capacity to innovate?

(check one box in each row)

REGIONAL INSTITUTIONS	Not at All Valuable	Somewhat Valuable	Valuable	Quite Valuable	Extremely Valuable	Not Appli- cable (N/A)
32. Universities and 4-Year Colleges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
33. Community/Technical Colleges	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
34. Public or Private Research Organizations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
35. Professional Service Firms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
36. Federal Labs	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
37. Regional Customers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
38. Other Businesses in your Industry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
39. Regional Suppliers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
40. Banks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
41. Venture Capital Firms	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
42. Angel Investors	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
43. Business Incubators	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
44. Industry or Cluster Associations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
45. Non-professional Associations (alumni clubs, athletic clubs, etc)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
46. Entrepreneurial Networks	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
47. Business Assistance Centers	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

48. Please list, by name, the most valuable institutions to your business's innovation.

### III. Regional Norms and Attitudes

In this section, we are interested in learning about the dynamics of the business and civic environment of your region.

(check one box in each row)

	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
49. New residents can easily integrate into the regional business community	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
50. The region is a welcoming, tolerant, and attractive place for people of diverse backgrounds	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
51. Leaders in the region are responsive to the needs of all the regional residents, irrespective of ethnicity, cultural heritage, gender, or lifestyle	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
52. The business culture in the region understands failure as part of the learning and innovation process	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
53. People from different industry and economic sectors frequently interact in the region (e.g., bankers and engineers, manufacturers and tourism providers)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
54. The region celebrates the growth of companies, not just the absolute size of companies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
55. Artists and business-people frequently interact in the region	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
56. Local government institutions eagerly partner with the private sector to promote new business development	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
57. Business leaders in the region treat entrepreneurs, start-ups, and new companies as full partners in all aspects of industry cooperation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
58. Business leaders proactively share information and resources when possible	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
59. Regional residents actively participate in community development organizations and projects	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
60. Successful business people in the region actively invest in economic development projects and start-up ventures	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

61. Considering your entire regional business environment, please list and explain the most important regional issue or issues that should be addressed to improve your business's prospects for success.

## IV. Demographics

Please complete this brief background section. Please keep in mind that the information you supply about yourself and your organization will remain anonymous, and will be analyzed only in combination with other responses.

(check one box in each row)

62. What percentage of your company's sales is to customers within the region?	<input type="checkbox"/> 100% <input type="checkbox"/> 75-99% <input type="checkbox"/> 10-49% <input type="checkbox"/> less than 10% <input type="checkbox"/> don't know
63. Where is your business headquartered?	<input type="checkbox"/> in the region <input type="checkbox"/> elsewhere in the US <input type="checkbox"/> outside the US
64. Does your company sell (export) products or services outside the US?	<input type="checkbox"/> yes <input type="checkbox"/> no <input type="checkbox"/> don't know
65. Which best describes the primary industry focus of your company?  (If your company is involved with more than one focus, check the one that creates the majority of its revenues.)	<input type="checkbox"/> Aerospace <input type="checkbox"/> Manufacturing <input type="checkbox"/> Finance / Accounting <input type="checkbox"/> Insurance / Real Estate / Legal <input type="checkbox"/> Medical / Dental / Health <input type="checkbox"/> Telecommunications Services <input type="checkbox"/> Transportation / Utilities <input type="checkbox"/> Construction / Architecture / Engineering <input type="checkbox"/> Data Processing Services <input type="checkbox"/> Wholesale / Resale / Distribution <input type="checkbox"/> Education <input type="checkbox"/> Marketing / Advertising / Entertainment <input type="checkbox"/> Research / Development Lab <input type="checkbox"/> Business Service / Consultant <input type="checkbox"/> Computer / Network Consultant <input type="checkbox"/> Hospitality / Tourism <input type="checkbox"/> Food Services <input type="checkbox"/> Agriculture <input type="checkbox"/> Other
66. What year was your business founded?	
67. What year did your business first establish a presence in this region?	

68. Approximate number of people employed by your business in the region.	In 12/1999 _____ In 12/2001 _____ Current (2003) _____
69. 2002 Gross Revenues (approx.)	<input type="checkbox"/> <\$1 million <input type="checkbox"/> \$51-100 million <input type="checkbox"/> \$1-10 million <input type="checkbox"/> \$101-300 million <input type="checkbox"/> \$11-50 million <input type="checkbox"/> \$301-500 million <input type="checkbox"/> \$500 million <input type="checkbox"/> Don't know
70. Please estimate your company's average annual revenue growth over the past three years.	<input type="checkbox"/> Negative <input type="checkbox"/> 11 to 20% <input type="checkbox"/> 0% <input type="checkbox"/> 20 to 100% <input type="checkbox"/> 1 to 5% <input type="checkbox"/> Over 100% <input type="checkbox"/> 6 to 10% <input type="checkbox"/> Don't know
71. Which best describes your position in your company?	<input type="checkbox"/> Owner / President / CEO <input type="checkbox"/> Senior Executive or Senior Official <input type="checkbox"/> Director / Vice President <input type="checkbox"/> Manager <input type="checkbox"/> Other _____
72. How long have you lived in the region?	<input type="checkbox"/> less than 2 years <input type="checkbox"/> 2 to 5 years <input type="checkbox"/> 5 to 15 years <input type="checkbox"/> 15+ years
73. If willing to be contacted about your views, please provide	<input type="checkbox"/> Name: <input type="checkbox"/> Phone: <input type="checkbox"/> Email: <input type="checkbox"/> Mailing Address

This concludes the regional opinion survey. Thank you for your cooperation.



# APPENDIX C.

## COMMUNITY LEADERSHIP

### INTERVIEW TEMPLATE

## I. Interview Background and Preparation

### Interview Focus

- To develop a deeper understanding about the forces/institutions that helped and hindered the region in reaching its present state of development
- To assess how alliances and networks support and promote regional innovation
- To explore and confirm survey results regarding regional and cluster priorities for action

### Target Audience

- University/research and development community
- Selected industry cluster leaders (balance of new and established companies)
- Venture capitalists/financiers
- Business service provider/advisors
- Business associations and economic development organizations

### Target Corporate Level

Officers, senior management (special interest in Director of Research and Development, or person most involved with firm's innovation policy)

### Target Number

30 interviews (more acceptable)

### Distribution

Four to six interviews in each audience category/subcategory of individuals that have participated in and/or observed the evolution of the region's economy

### Length of Interview

Approximately one hour

### Statement of General Project Purpose

- To assess the strengths and weaknesses of the regional innovation environment
- To develop insights and recommendations for how the region can improve conditions that support innovative firms and people.
- To catalyze action to improve the regional innovation environment

## II. Interview Questions

### Regional Development

- How do you explain your region's relative economic performance compared to other regions?
- Do you think the region has been successful over time, and if so why?
- What, if any, are the catalytic events that led to its success?
- What are the major barriers to economic prosperity that have appeared (and been overcome) at critical junctures in the evolution of this region?
- Is there a regional consensus on development issues facing the region today?

### Network Focus in Development

- What sort of networks or network organizations have helped the region develop?
- How have the networks helped (e.g., finance, workforce development, etc.)?
- How have the networks evolved over time to meet the needs of the community?
- Are there any networks that have been particularly important in attracting or nurturing innovative firms?
- How have they done this? How are they doing it today?

**Priorities for Action (Confirmation/Deepening of Survey Results)**

- Why is your firm located in this region?
- What barriers do you see to expansion in this region?
- According to our leadership survey, A, B, C are priorities for your industry cluster/region to continue to successfully innovate. Do you agree? Why or Why not? Give examples?

**Innovation Specific Questions**

We have spoken broadly about the development of the region. Now let's turn to specific aspects of innovation.

**General Innovation Issues**

- What are the major sources of new ideas and information for innovation (ideas with commercial potential) been in the region?
- Where/who did they come from?
- What environmental/cultural/business factors are important to, or have an impact on, innovation in your region? Has this changed from the past? Give examples.
- Some people argue that the interaction between firms in different industries is a major source of innovation (e.g., software and entertainment = game software). Is there much of this creative interaction between different firms in your region?

**Private Sector Research and Development (R&D)**

- Broadly speaking, how does your company foster innovation?
- What is your company's R&D policy? What is R&D as a percent of sales?
- Do you partner in R&D with other companies in your industry? Your suppliers?
- What mechanisms (formal & informal, network-related) help move research from the lab to prototyping and to business development?

- Are there mechanisms (organizations) that support quick diffusion of technical or market information to companies in your cluster?
- If yes, describe?

**University R&D (to be asked of university respondents)**

- How do the universities in this region interact with businesses? Has this relationship changed (improved) over the past years? Explain.
- Are research partnerships with businesses prevalent?
- Are the partnerships focused around basic research or technology commercialization?
- Do businesses frequently and clearly state their needs from the university partnership?

**Business (to be asked of business respondents only)**

- How does the University support your cluster?
- Are they valuable partners in your innovation processes? How?
  - Basic research partnerships?
  - Commercialization partnerships?
  - Providers of employees (faculty, researchers, graduates)?
- How has this changed over time?
- Has your company licensed technology from a university, private research institution, or federal lab?
- How aggressive are the universities in commercializing applied research (licensing, equity investor, incubators)?

**Government (to be asked of government and business respondents)**

- How effective is your state and local government in fostering the development of innovative firms?
- What policies directly impact your innovation process/results?

- Which policies have helped firms innovate?
- Which policies have hindered innovation?
- Does your state or local government work with the private sector to attract suppliers, manufacturers, and service providers related to your business? Provide examples.
- Does the state or local government sponsor or support forums to bring together government, industries, and universities? Provide examples.
- Are there any other important government or non-profit organizations that support business development?

#### **New Business Formation (to be asked of all respondents)**

- How does new business formation happen in your region? Is it predominately internal or do you attract most new companies from outside the region?
- Are the founders typically from the region or people who have moved to the area to start a business?
- Do networks play a role in business formation in your region? If so how?

#### **New Venture Support (to be asked of business respondents and venture capitalists)**

- Is there a strong group of local business support and strategic advising services for start-ups? How have they been helpful to you?
- What alliances or networks provide access to capital?
- How rapidly can new ventures or expansions be financed locally?
- Does the regional culture foster start-up ventures and entrepreneurship? If so, how?
- How does government in your area support the particular needs of start-up companies? (Incubators, financing, enterprise zones?)

#### **Venture Capital (VC)/Financiers Sector**

- What is your primary source of deal flow? (Is it network related?)
- How does the VC define its role in an investment relationship (e.g., develop team, strategic/expert advisor, connect firms to talent and technology-matchmaker)?
- Apart from actual deals, what are the most prominent ways you are connected to the business community?

#### **Please have the respondent indicate yes or no to the following questions and then explain his or her answer:**

- Do you have formal and/or informal relationships with other VCs?
- Do you have linkages with University R&D community? Points of connection? Incubators? Technology licensing offices? Are the relationships formal/informal?
- Do you have involvement in industry associations?
- Is there an “angel” community providing seed capital where traditional VC does not? Does your VC follow up as the project matures?

# ABOUT THE COUNCIL ON COMPETITIVENESS



## Who We Are

The Council sets an action agenda to drive U.S. economic competitiveness and leadership in world markets in order to raise the standard of living for all Americans. We focus on strengthening U.S. innovation, upgrading the workforce, and benchmarking national economic performance. Our members are corporate chief executives, university presidents and labor leaders. Our national affiliates include nonprofit research organizations, professional societies and trade associations.

## How We Operate

The Council shapes the national debate on competitiveness by concentrating on a few critical issues. These issues include technological innovation, workforce development and the benchmarking of U.S. economic performance against other countries. Members and Council staff work together to assemble data, develop consensus-based recommendations and implement follow-up strategies in every region of the country. Our work is guided by a 31-member Executive Committee. A staff of 18 provides research and operational support. Chief executives from 17 of the country's most prominent nonprofit research organizations, professional societies and trade associations contribute their expertise as national affiliates of the Council. The Council on Competitiveness is a nonprofit, 501(c) (3) organization as recognized by the U.S. Internal Revenue Service. The Council receives funding from its members, foundations and project sponsors.

For more information about the Council, please visit [www.compete.org](http://www.compete.org).

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