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Asset Mapping Roadmap: A Guide to Assessing Regional Development Resources

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Asset Mapping Roadmap: A Guide to Assessing Regional Development Resources

Asset mapping is an important first step in understanding the resources that a community can leverage to support integrated workforce and economic development initiatives. This guidebook is designed to help regional leaders understand the theory and practice of asset mapping, make a decision about what level of asset mapping is appropriate for their region, and provide an easy-to-use guide for implementation.

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Asset Mapping Roadmap:
A Guide to Assessing Regional Development Resources

Prepared for the U.S. Department of Labor's Employment and Training Administration

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Letter from the President

Dear Colleagues:

America's regions face new challenges from their competitors around the world. Competing in the global economy requires creating regional innovation ecosystems that drive growth and prosperity. The challenge is to optimize their assets—human, capital, institutional and intangible—around the innovation imperative.

Many regions have yet to fully understand the competitive value of the asset base. Only a few have implemented a systematic process to identify their innovation assets or developed strategies to ensure that these assets are sufficiently linked and leveraged.

The Council on Competitiveness has been committed to helping U.S. regions drive increased productivity for the past decade. Through our thought leadership in federal and state innovation policy and our on-the-ground efforts to assist revitalizing regions, the Council has become a key partner in building prosperity across our country.

Asset Mapping Roadmap: A Guide to Assessing Regional Development Resources is our newest tool designed to help regional leaders support innovation-based growth. Developed with the support of the Employment and Training Administration (ETA) of the U.S. Department of Labor, this guide is focused on helping regions build strategies that align education, workforce development and economic development programs. It lays out a step-by-step process to implement an asset mapping effort in any community.

Under the ETA's Workforce Innovation in Regional Economic Development (WIRED) initiative, 39 regions across the U.S. have launched efforts to build integrated, innovation-based development strategies. We believe this guidebook will be helpful to all of the WIRED regions and to any region that is pursuing innovation-based growth

As we have come to understand at the Council, our national prosperity depends upon regional innovation. We hope that this guide contributes to the efforts of leaders who are addressing this innovation imperative in communities across this country.

Sincerely,

Deborah L. Wince-Smith

President

Introduction:
What is Asset Mapping?

The U.S. Department of Labor's Employment and Training Administration (ETA) has commissioned this asset mapping "roadmap" to provide guidance to regions seeking to strengthen their competitive position in the global economy. Asset mapping is an important first step in understanding the resources that a community can leverage to support integrated workforce and economic development initiatives.

According to *Webster's Second International Unabridged Dictionary*, an asset is "any item of value." In pursuit of economic and workforce development goals, every region has its own unique set of assets—both tangible and intangible—to call upon. These resources provide the foundation for actions that a region can take in realistic hopes of improving its overall competitive position.

Asset mapping can be undertaken at different levels, depending on the availability of time and resources and on the ambition of the regional leadership team. At its most basic level, the asset mapping process will provide leaders with an inventory of key resources that can be utilized in a development effort. A more comprehensive asset mapping initiative will provide a deep understanding of the key networks and cultural attitudes that shape the regional economy, indicate gap areas that require further investment, and provide a baseline by which to judge future progress toward regional prosperity. Such an effort requires significant research to assess the impact of regional assets—human, financial, institutional, and natural, among others—on the innovation and productivity that ultimately drive the prosperity of local citizens.

This guidebook is designed to help regional leaders understand the theory and practice of asset mapping, make a decision about what level of asset mapping is appropriate for their region and provide an easy-to-use guide for implementation.

The Value of Asset Mapping

As global competition for innovative firms and people increases, regional asset mapping serves a number of purposes.

Resource Identification

Mapping allows the region's leadership to identify the resources that can be utilized to support development initiatives. Too often, visionary economic or workforce development efforts begin without a full understanding of the regional asset base. A mismatch between strategy and assets can severely diminish the potential impact of a development initiative.

Foundation for Strategic Planning and Implementation

Asset mapping can either lay the foundation for development of a new strategic plan or enable the realignment of existing efforts. Asset mapping illuminates the gaps, redundancies and inefficiencies and thus can help regions reallocate resources to key challenge areas and avoid needless expenditures if high quality assets already exist. The initial asset map provides a region with a baseline against which to measure progress over time.

Deepened Understanding of Key Regional Systems and Linkages

A comprehensive asset mapping process leads to a deeper understanding of the ways in which regional institutions interact with each other and with entities outside of the region. With a new perspective on well-established institutions, community leaders can more accurately assess the institutions' current value to the economy. Leaders can also identify ways to strengthen institutions, build linkages between them, and, ultimately, improve the regional innovation system.

Catalyst for Partnership

Asset mapping aggregates the knowledge possessed by a few individuals and makes it available to others who may conceive of new ways to leverage the assets. A visual resource map can help demonstrate to stakeholders that they work within a regional community. As leaders see common interests and organizational links, they may be inspired to strengthen or form new partnerships.

Organizing and Motivational Tool for Implementation

The process of creating the asset map can have a positive effect in engaging community members in a regional development effort. The mapping team members can form a critical mass that becomes the cornerstone of future development activities. Engaging leaders through business surveys and in-person interviews in the analytical phase of an effort can motivate their participation in the implementation phase.

Levels of Asset Mapping

Asset mapping can be implemented at three levels of analytical depth. While the greatest impact is usually gained from the most comprehensive approach, less intensive efforts are also valuable. The appropriate level of depth will depend upon the goals of the implementing organization, the available financial and human resources, and time constraints. Consideration of these factors should be undertaken in the scoping phase of the project.

The three levels of mapping are:

Level 1 Asset Identification

Level 2 Basic Evaluation

Level 3 Comprehensive Assessment

Regardless of what level a region chooses to complete, the asset mapping process should lead to two action-oriented steps:

Documenting and Disseminating the Asset Map

Launching Regional Development Initiatives

The following section more fully describes each of the levels and provides guidance on how to translate asset mapping into regional action initiatives.

Level 1 Asset Identification

As the name suggests, this phase includes the identification and cataloging of all major assets relevant to regional development. Developing this list is similar to completing a product inventory in the business world. The region needs to know what it has to work with, supplement, and "sell." At the end of this level of work, a region will have a list of the assets within its geographical borders, along with identifying information about each asset.

Process Overview

The compilation of the asset inventory should be accomplished by:

- Reviewing previous regional economic reports and profiles
- Scanning the Internet and other information sources for current information
- Obtaining input from local leaders of relevant public, private, academic and non-profit entities

The asset mapping team should review economic studies and reports of the region from the previous five to seven years. This level of review will allow the mapping team to capture a historical perspective on asset inventories and avoid duplicative efforts. Relevant data from the previous reports and current data sources should be entered into a mapping matrix or database. Once the initial inventory is drafted, it should be circulated among a limited group of stakeholders for review, refinement and additional input.

It is possible to take the inventory to a more sophisticated level by employing GIS software to map the physical locations of assets. As discussed earlier, a spatial perspective on the region can be valuable in driving thinking about ways to link different entities. Even at this basic level, the mapping data will support comparisons over time to track improvement or decline.

Level 2 Basic Evaluation

The next level of mapping allows analysts to assess the strengths and weaknesses of assets and identify gaps in the regional innovation platform. Through secondary and some primary research, the asset mapping team will be able to evaluate the significance and impact of each major type of regional asset.

Process Overview

The mapping project team should use publicly available data to obtain metrics that indicate the relative value of an asset to the region. In addition, in this stage, regional leaders should select a set of competitor regions for benchmarking. By benchmarking assets against national norms and key competitor regions, regional leaders will develop a stronger sense of key areas for improvement. Typically, the benchmarking regions should include some combination of:

- Regions that are in close proximity to the home region
- Regions that are known to compete for the kinds of business investment that is currently and/or planned to be the focus of the home region
- Regions that are perceived to have similar characteristics/challenges to the home region

Consideration should be given to including relevant competitors from outside as well as within the United States.

Table I (see page 13) provides a list of widely available sources and tools for obtaining the kinds of data necessary to produce a comprehensive asset map. Existing comprehensive economic database services can significantly contribute to the research task.

Level 3 Comprehensive Assessment

The most comprehensive level of mapping moves beyond identification and gap analysis to provide a deeper understanding of the factors that drive the regional economy. This phase focuses on capturing three additional types of data:

- Local leaders' perspectives on the value of regional assets to their operations
- The linkages between regional assets
- The underlying business culture of the local community

By evaluating the specific value of regional assets to local leaders, revealing the networks that exist to leverage those assets, and assessing regional attitudes toward business and entrepreneurship, regional leaders will develop a strong knowledge base upon which to design or modify a development effort.

Process Overview

Capturing this level of region-specific knowledge requires a significant investment. Input should be solicited from civic, business, entrepreneurial, and academic leaders, as well as investors (public, private, and philanthropic) representing regional organizations, institutions and companies. The process is best accomplished through a formal information gathering effort that includes: a) the distribution of a survey; and b) interviews with key regional stakeholders to better understand and validate the survey findings. The survey and additional interviews seek to capture current and future utilization levels of assets, challenges and barriers to utilization, and the demand for increased asset creation and investment. They also provide an opportunity to obtain a qualitative evaluation of key assets.

Once the project team has completed the information gathering associated with this level of work, the next step is to review the data for completeness and relevance to the goals of the development initiative. While difficult to forecast, it is important to consider the impact of global trends on the value of regional resources. For example, a particular industry cluster may be operating with impressive profit margins at

the present time. However, research may show that global trends suggest a relocation of this industry to other countries. If this is the case, the assessment should note a likely diminished value of the enterprise to the region over time.

Moving Toward Action

As previously indicated, all asset mapping exercises should include dissemination and regional development phases.

Documentation and Dissemination

Regardless of the level of the effort, a region should develop a communications plan for sharing asset map findings. Regional leaders should consider how the data will ultimately be captured, documented, and disseminated in the planning phases of the asset mapping exercise.

The most effective means of capturing all of the necessary information is in a dynamic database format. Databases will allow continual updating of information and maintain historical data for comparison. Most database software programs also provide sorting options and statistical tools that can be helpful for more detailed levels of asset mapping analysis.

The mapping data should be useful to those who will be working on a daily basis to achieve the regional objectives and adaptable for other uses that may arise. In terms of visual display, the emphasis should be on creating an information source that can be easily understood by multiple audiences. Displaying the assets on a geographic map of the region is often the best way of emphasizing the concentration of resources within an area. Appendix C offers links to asset mapping reports completed by a variety of regional organizations.

Launching Regional Development Initiatives

The true value of an asset-mapping project will be judged by how the output is utilized to advance regional efforts to build an innovation-based economy. In some cases, the next step will be to launch a strategic planning process. In other cases, where a development plan is already underway, the next step will be to revise the existing strategy to reflect any strengths or gaps revealed by the map. The key point is that asset mapping is not an academic exercise—it is a foundational effort that can significantly enhance a region's development efforts.

At its most powerful, asset mapping is about understanding the relationship between assets. A fully-executed asset mapping project will enable decision-makers to know, for example, whether a large medical facility located in the region has a well-developed set of relationships with researchers at area universities, or whether such connections will need to be made in order to support an emerging biomedical cluster. Mapping is intended to promote connections or relationships between individuals, between individuals and organizations, and between organizations.

In sum, the asset mapping process is a means of assessing available regional assets that will reveal ways to better link and strengthen these assets in order to support an effective innovation-based development strategy.

Organizing the Mapping Process

Because regions will find themselves at different stages of building their innovation-based regional economy, it is not possible to prescribe a single method for asset mapping. However, the following is a suggested process for the implementation of comprehensive asset mapping.

As the first step, a region must determine how it will define success in transforming the regional economy. Particularly with regard to Level 2 and 3 mapping, the value of assets can only be meaningful in the context of a defined set of objectives. The process for defining development success will vary from region to region. Regions may choose to conduct a poll of a selected audience and aggregate the results or, alternatively, assign the effort to a taskforce of professionals and volunteers from a cross-section of the community.

Assembling the Project Team

The asset mapping project will require a core team of dedicated individuals. Involvement should be sought from organizations/individuals that will likely be involved in the action initiatives that emerge as a result of the asset mapping project. In addition, a region may want to engage an outside contractor with asset mapping experience to supplement the efforts of regional participants.

The team should include individuals with knowledge of the general asset classes that will be mapped. Ideally, the team will include representatives of the private, academic, public and non-profit sectors, as well as individuals with knowledge of the workforce, educational and economic development institutions in the region. In addition, it will be important to have one or more individuals with research and analytical skills and familiarity with creating and managing databases. Interviewing, writing and public speaking skills will also be valuable to the team for the research and communication tasks.

For larger scale projects, it is valuable to create a steering committee of respected community leaders who can give guidance on the subject matter and use their convening power to build local support for the effort. A template and checklist to help guide project team creation, and to address challenges that can arise in the process, is included in Appendix A.

Project Scoping and Goal Setting

Developing a clear project scope and goal statement is critical to the success of the mapping project. The significance of this stage of work cannot be overstated—it will impact everything from the data collection plan to the ultimate implementation strategies.

To start, the region must be defined. In some cases, there may be a clear delineation of a region based on geography or history. In other cases, it will be a function of cooperation between different jurisdictions that may not have previously worked together for economic or workforce development purposes.

Additional key questions the project team must address are:

- What are the learning objectives for the asset mapping process?
- What level of asset mapping should be undertaken?

- What should the region be benchmarked against—national norms, the data of other competitor regions, or some other standards?
- Should the region be benchmarked as of a point in time or over a period of time, and how should that data be gathered?
- What resources are available for accomplishing the asset mapping?
- Which stakeholders need to be consulted at the various stages of work?
- To whom and how should the asset map be disseminated?

The scoping phase should lead to development of an implementation plan that identifies key roles and responsibilities and contemplates a process of ongoing dissemination and updating of mapping information.

Mapping Implementation

The time and resource commitment required to produce usable asset mapping output is dependent on the quality and quantity of resources assigned to the project. In most cases, it is reasonable to expect approximately 24 weeks of fully dedicated effort by the project team to complete a comprehensive mapping exercise.

The upfront work—creation of the project team, scoping and goal-setting and Level 1 work—can be completed in six to eight weeks. This includes time for obtaining review of, and feedback on, the inventory list from stakeholders outside the project team.

Level 2 analysis can be completed by the project team itself or in conjunction with outside contractors. In general, this work can be finished in three to four weeks.

Level 3 evaluation can greatly vary in scope of effort. For example, if the project team decides that additional input-gathering will help build support for the overall regional initiative, it may decide to conduct a greater number of interviews or meetings. Scheduling and holding these meetings can extend the completion date. Generally, four weeks should be sufficient for the compilation of the necessary data if sufficient planning is undertaken.

Evaluation of the data can take another two to four weeks. The net result of the evaluation may be a determination that additional data is needed, in which case individuals should be delegated to fill in the information gaps. A template and checklist to help guide project planning, preparation, and implementation is included in Appendix A.

Dissemination

After evaluating the data, the final step is the creation and dissemination of the asset mapping report. Once the report has been created, the draft should be circulated among the entire project team, and perhaps a larger advisory board, for review and comment. The process of creating the draft report and then finalizing it can require an additional three weeks of work because of the desirability of having a number of stakeholders review it for accuracy and impact.

Dissemination can occur through a number of means. These include:

- Development and distribution of print collateral
- Presentations at public forums
- Posting on Web site(s)
- Publication through mass media, such as newspapers
- Direct mailings to key stakeholders and/or a wider audience

The asset mapping team should consider which means of dissemination will be most useful in their particular region.

In each region, there will be at least three groups which need to be provided with the results of the asset mapping: a top echelon of regional leaders; a broader set of leaders; and the general public. The asset mapping team must consider the information needs and learning styles of constituents in each of these groups.

The asset mapping team may want to provide each member of the top echelon with an executive summary of the entire process and key findings, and then offer personal briefings. These briefings will provide the leaders with an intimate understanding of the outputs and allow them to ask the questions that are most meaningful to them.

The second, broader set of leaders does not necessarily require personal briefings, but it may be prudent to develop a special version of the asset map report that is tailored to their needs.

The general public can be informed through a variety of means. It is often useful to employ more graphics and summary charts in a publicly-released report than might be the case with the two leadership groups.

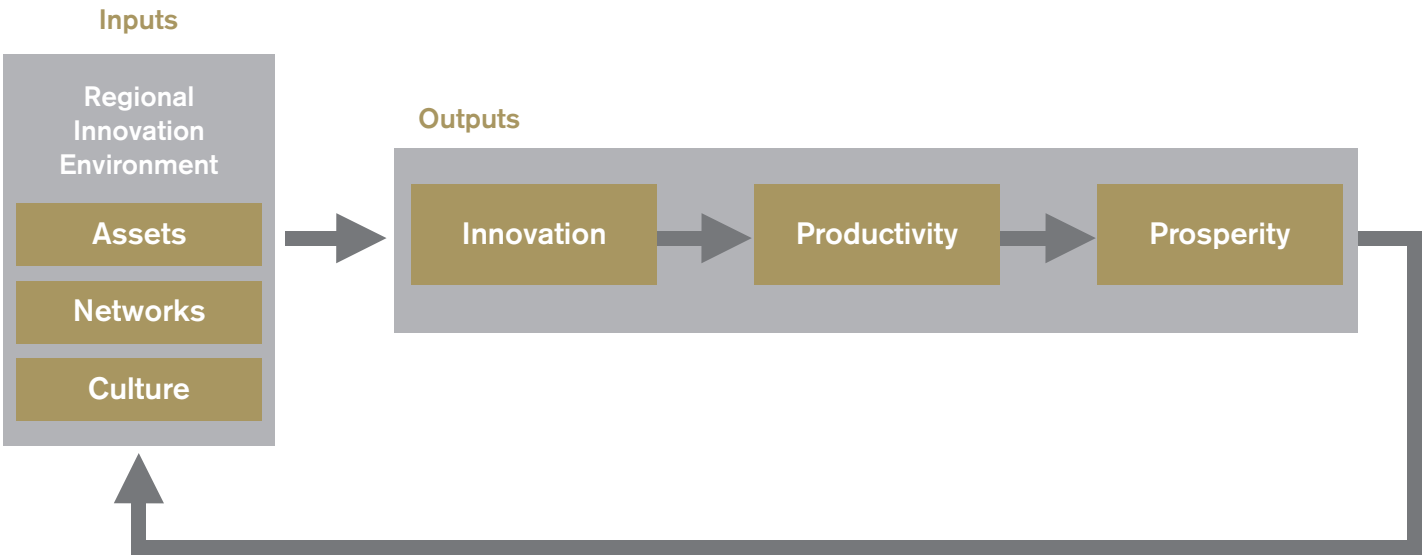
Recognizing that funds for communication are finite, the asset mapping team must carefully analyze how it can best ensure comprehensive exposure to its work by the regional community.

Table I: Representative Timeline for Asset Mapping

Weeks 1–8	Weeks 9–12	Weeks 13–20	Weeks 21–24	Ongoing
• Create the Project Team • Project Scoping and Goal Setting • Level 1: Asset Identification	• Level 2: Basic Evaluation - Data collection - Interviews	• Level 3: Comprehensive Assessment - Additional Interviews - Business Survey - Evaluation and synthesis of Level 2 and 3 research	• Document the Asset Mapping Results • Circulate the Draft Report for Review by Stakeholders	• Disseminate Asset Mapping Reports • Update Asset Mapping Results Periodically • Launch Action Initiatives

What Gets Mapped?

Figure I: Regional Innovation Environment Inputs and Outputs



Asset mapping examines both the inputs and outputs of the regional innovation-based economy.

Inputs to Innovation Capacity

Successful innovation and the increased productivity and prosperity that result are the output of the dynamic interplay of a variety of regional factors. Every region has a different set of assets, networks and an underlying business culture that determines its success in supporting innovative firms and people. As shown in Figure I on this page, these innovation inputs form 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 platform. Specific elements recommended for inclusion in the mapping exercise are provided.

Input Metrics

Assets

Assets in the innovation-based economic development model include the human, intellectual, financial, physical and institutional capital 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, the cost of doing business and proximity to customers. Assets also include many other factors that are not as widely measured but are important to innovation. These include research and development (R&D) investment, technology transfer and entrepreneurship support programs.

The major types of assets that should be included in the mapping exercise are:

- Human capital, including K-12 and higher educational institutions
- Research and development institutions
- Financial capital
- Industrial base
- Connective organizations
- Legal and regulatory environment
- Physical infrastructure
- Quality of life

Table II outlines the detailed asset types and specific metrics that can be employed in the assessment, and Appendix B provides a fuller explanation of the importance of each asset class.

Networks

Having numerous and even high-quality regional assets is not sufficient to drive growth. Assets must be linked to support regional innovation-based growth. For example, ideas generated by university researchers, while valuable from a purely intellectual standpoint, must be translated into new products or services to reach their full potential for economic development.

Collaborative economic development partnerships involving leaders from busines, education, government, and non-profits are among the most effective strategies for creating networks. Other networks that can build innovation capacity include angel capital networks, research partnerships between universities and businesses, and workforce development programs that encourage companies, higher education, and secondary schools to work together to train the next generation of skilled workers. Informal ties often are as important as formal ones for facilitating knowledge transfer, though they can be difficult to measure. Getting a sense of the informal networks that form within regions around institutions, such as university alumni associations, is worthwhile.

Understanding the formal and informal linkages between regional assets—and the organizations that promote such linkages—is a key aspect of developing a comprehensive understanding of the regional economic environment.

Culture

The final aspect of a comprehensive regional assessment is understanding the underlying attitudes about business in a region. The availability of strong regional assets and knowledge networks helps innovators identify new ideas and new partners. A supportive business culture can lead to successful leveraging of these assets and to stronger networks and willingness to invest in regional innovation assets.

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 are competitors. For regions to get ahead of the innovation curve, local leaders must be willing to share insights. Regional attitudes toward risk are also important to evaluate. If entrepreneurship is to take hold, risk taking and failure must be appreciated.

A final cultural area to assess is regional appreciation of people from diverse experiences and backgrounds. Since innovators, by their very nature, are often different from the norm, regions where the populations respect and embrace diversity often have an easier time cultivating innovators.

Output Measures

The input measures in an asset mapping are useful descriptors of the regional business environment. However, it is critical to remember that the ultimate goal of economic development is not high research rankings, new business creation, or even jobs—it is to increase the prosperity of the region's citizens. Therefore, key outcome measures should be tracked. Following the previously described framework, there are three output areas to be assessed.

Prosperity

At the end of the day, the ultimate evaluation of economic development initiatives should be whether the region's citizens have a higher standard of living. While the concept of prosperity includes a number of subjective parameters (e.g., personal happiness, quality of life), it can be quantified through financial metrics such as per capita income, median household income, and poverty levels.

Productivity

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 level of productivity determines the level of wages that can be sustained and the returns earned by investors, which are the two principal components of a region's per capita income.

Innovation

Productivity today determines current competitiveness, but increasing a region's standard of living requires the steady growth of productivity. A high level of productivity itself is not enough when developing countries and regions are improving their workforces' skills and can rapidly access modern technology. Advanced regions need to continually innovate to be able to produce products and services that lower-wage regions cannot yet offer and to maintain the productivity advantage that supports their higher wages.

Table II offers a comprehensive list of the assets that may be present in a region and suggests criteria for evaluating the assets through Level 3 of the mapping process. For each type of asset, regional leaders should consider three types of evaluation: comparisons to previous years within the same region; benchmarking publicly available data against competitor regions; and capturing the satisfaction of the local business community via a survey. As some of the assets listed will be hard to identify or evaluate, the mapping team will need to assess what level of data and evaluation is appropriate for their regional effort.

Table II: Detailed Asset Inventory and Evaluation Criteria

Note The data listed are not necessarily directly related to the adjacent evaluation criteria.

Human Capital

K–12 education systems

Data

- Number, names and location of school districts
- Names and contact info of school district leaders
- Number, names and location of schools
- Names and contact information of principals
- Number of students (including English as second language students)
- Special programs, such as internships and advanced placement for high school students
- Articulation agreements with community colleges

Evaluation Criteria

- National Test Scores (NAEP scores)
- Graduation rates
- SAT/ACT scores
- State standardized test scores
- Enrollment projections
- Breadth of articulation agreements in allowing for transfers of credit
- Programs for high school students to take classes at or with higher education institutions
- Number of students in internship programs which place them in workplaces
- Business community satisfaction with quality of K-12 education/graduates

Community colleges

Data

- Number, names and locations
- Names and contact information of officers
- Number of students, with breakdown by relevant categories (such as full/part time)
- List of academic areas/programs relevant to regional initiatives (with enrollments)
- List of specialized programs and faculty
- Collaborations with business community and with regional K-12 schools
- Number of annual graduates

Evaluation Criteria

- Job placement information for graduates
- Grants received for workforce development
- Articulation agreements with regional 4-year colleges
- Business community satisfaction with general quality of education and with customized training offerings

Human Capital (continued)

Four-year colleges and universities

Data

- Names and locations of each institution
- Names and contact information of relevant officials, such as president, deans, etc.
- Total enrollments and enrollments in undergraduate and graduate degree programs relevant to regional economic initiatives
- List of specialized programs and faculty
- List of Professional Science Master degree programs at regional institutions
- List of special purpose facilities
- List of relevant research programs
- Collaborations with regional business community and other institutions that support regional growth
- Number of international students and programs
- Number of online courses offered

Evaluation Criteria

- Rankings by relevant arbiters of quality and popularity (e.g., U.S. News and World Report Rankings)
- Retention rate of graduates in region
- History of funding for areas of study/research relevant to regional industries
- Annual number of math/science graduates
- Annual number of Professional Science Master graduates
- Endowment size
- Transactions involving technology transfer (licensing, spin-outs, sales)
- Amount of technical assistance offered to region's businesses
- Placements in businesses through apprenticeship/internship programs
- Business community satisfaction with quality of education, employability of graduates, and private-academic collaboration

Private/non-profit technical schools and institutes

Data

- Names, location and contact info for relevant officials
- Areas of specialization
- List of programs
- Affiliations with other area institutions
- Eligibility requirements
- Total enrollment and enrollment in relevant programs

Evaluation Criteria

- Annual number of graduates and graduation rates
- Retention rates of graduates in region
- Rankings by relevant ranking service
- Business community satisfaction with quality of education, employability of graduates, and ease of interaction
- Eligibility for Pell Grants

Continuing and professional education providers

Data

- Names, location and contact information for relevant officials
- Nature of institution (e.g. four-year college)
- List of certificates and programs offered
- Affiliations with other regional institutions

Evaluation Criteria

- Number of certificates awarded in programs relevant to regional industry workforce needs
- Business community satisfaction with quality of education, employability of graduates, and ease of interaction

Human Capital (continued)

Available workforce

Data

- Breakdown of regional population by age groups, including number of adults over 18 years of age
- Location of population within region
- Breakdown of regional population by income levels
- Breakdown of regional population by occupation
- Breakdown of regional population by degree and/or educational attainment

Evaluation Criteria

- Educational attainment levels (versus other regions)
- Number of adults with multilingual capabilities
- Business satisfaction with general quality and availability of workers
- Comparisons of availability to other regions
- Number of registered job seekers with applicable state and local agencies

Specialized workforce

Data

- Number of skilled workers in areas of employment relevant to innovation-based economy
- Future skill needs for industries that are growing or targeted for growth

Evaluation Criteria

- Business satisfaction with quality and availability of skilled labor in their industry
- Comparisons of availability to other regions
- Comparisons of skilled labor types to other regions (managers, scientists, engineers, and technicians)
- Alignment of workforce with industry needs (projected occupational growth categories for workforce compared with current workforce occupational mix)

Workforce system

Data

- Names and locations of workforce one-stop service centers
- Names of programs/services offered by government agencies
- Non-profit organizations offering programs in, or making investments in, workforce development
- Private sector programs for workforce development
- Remediation programs for displaced workers
- Career advancement programs for incumbent workers

Evaluation Criteria

- Number of regional residents served by relevant agencies
- Time it takes to fill key jobs in target industries
- Dollar value of workforce development investments in region
- Budgets for workforce agencies
- Outcomes of workforce development programs, e.g. job advancement or job placements
- Alignment of programs with industry needs
- Integration of programs across educational institutions
- Alignment of workforce system with economic development and educational systems
- Planned increases or decreases in funding

Research and Development

Research centers

Data

- Names, address and contact information
- Type of institution (public, private, academic, mixed)
- Names and contact information for officers
- Areas of research focus
- Names, addresses and contact information for high-performance computing centers in the region
- Identification of institutions with high performance computing capabilities

Evaluation Criteria

- Overall budget (and portion dedicated to work likely to be of use to regional industry)
- Number of patents held
- Patenting rates (patents/research dollars)
- Transactions involving technology transfer (licensing, spin-outs, sales)
- Government grants received, over time
- Number of entities in region with high performance computing capability
- Notable inventions/research studies (awards)
- Business sector satisfaction with level of interaction

Business incubators

Data

- Names, address and contact information
- Mission and any specialized focus of incubator
- Names of companies located in incubator, with contact information and area of focus tor each

Evaluation Criteria

- Success rate of incubation (percent of companies that survive beyond five years)
- Number of jobs created by graduates from the incubator and average wages of those jobs
- Successful collaborations with other regional entities

Research parks

Data

- Names, address and contact information
- Available space for lease or building
- Specialized focus of research, if any

Evaluation Criteria

- Occupancy rates
- Sponsored networking activities
- Successful collaborations with other regional entities

Corporate research and development

Data

- Names, addresses and contact information for companies with significant R&D activities
- Areas of R&D activities
- Relationships with other regional institutions
- Overall budget

Evaluation Criteria

- Number of patents and patenting rates (patents/research dollars)
- Notable inventions/research studies
- Successful collaborations with other regional entities
- Spin-outs and major licensing deals

Financial Capital

Venture capital (VC) firms

Data

- Names and locations of firms and contact information for principals
- Size (amount of capital under management) of existing firms
- Targeted sectors of firms

Evaluation Criteria

- Amount of assets invested in region (number of deals and total dollar amounts)
- Return on investments
- Co-investments with other regional investors
- Strength of relationships with VC firms outside of region (bringing in non-regional investment to regional deals)

Angel investors/networks

Data

- Names and contact information for individual/network principal
- Size (amount of capital under management) of existing angel groups
- Targeted sectors of investors/networks
- Names and contact numbers for attorneys, accountants and other support professionals with relevant expertise

Evaluation Criteria

- Amount of assets invested in region (number of deals and total dollar amounts)
- Return on investments
- Co-investments with other regional investors
- Strength of relationships with firms outside of region (bringing in non-regional investment to regional deals)
- Availability of attorneys, accountants and other support professionals with relevant expertise

Commercial banks

Data

- Names and locations of bank regional headquarters and contact information
- Names of bank presidents
- Special investment programs

Evaluation Criteria

- Amount of loans outstanding to regional businesses
- Relationships with region's businesses
- Relationships with other financial institutions inside and outside the region

Philanthropic foundations (national and regional)

Data

- Name, addresses and primary points of contact for staff and boards
- Background/history
- Geographic focus and limitations on giving
- Fields of interest
- Lists of grantees in recent years

Evaluation Criteria

- Assets and other financial data
- Number and types of grants made, especially within region

Financial Capital (continued)

Government programs

Data

- SBA loans
- SBIR support programs

Evaluation Criteria

- Number and amount of SBA loans in region
- Number and amount of SBIR contracts

Industrial Base

Major employers

Data

- List of largest employers in region
- Names, location, and contact information for officers
- Applicable industrial codes
- Number of employees
- Product and service offerings

Evaluation Criteria

- Position versus international competitors in their industry
- Growth plans of individual firms
- Successful collaboration with other regional entities
- Number of registered ISO companies
- Business satisfaction survey cut by cluster to determine key gaps or needs for firm development

Clusters

Data

- List of regional clusters
- Number of firms in clusters
- Number of employees in clusters
- Cluster support structure

Evaluation Criteria

- Growth rate of employees, firms, concentration
- Benchmark clusters against others outside the region in terms of size, concentration, innovation output (patenting)
- Business satisfaction survey cut by cluster to determine key gaps or needs for cluster development
- Business satisfaction with related and supporting services (law, banking, consulting, etc.)
- Location quotients of clusters
- Shift-share analysis of key clusters

Small business/entrepreneurship

Data

- List of successful entrepreneurial firms
- Names and locations of entrepreneurship and small business support centers/programs
- List of supporting professional firms, including lawyers, accountants, marketing firms, etc.

Evaluation Criteria

- Rate of firm birth and firm death (versus competitor regions) and net business creation rates
- Amount of VC and angel funding received by regionally-based firms
- Business satisfaction with entrepreneurial support organizations/training

Connective Organizations

Business and economic development organizations (e.g., Chamber of Commerce)

Data

- Names of organizations and contact information for professional and volunteer officials
- Names of member organizations
- Major program areas

Evaluation Criteria

- Size of membership
- Budget
- Alignment of programs with key regional business/economic development needs

Business/education partnerships

Data

- Names of partnerships and contact information for leaders
- Mission of partnership
- Major program areas

Evaluation Criteria

- Size of membership
- Budget
- Alignment of programs to key regional business/economic development needs

Industry/cluster associations

Data

- Names and contact information for officials
- Names and contact information for member organizations
- Major program areas

Evaluation Criteria

- Budget
- Size of membership
- Alignment of programs with key regional business/economic development needs

Legal and Regulatory Environments

Taxes

Data

- Federal, state, local, and regional tax rates potentially impacting regional businesses
- Available tax credits/tax incentive programs

Evaluation Criteria

- Effective tax rates for region (vs. competitor regions)
- Amount provided in tax incentive programs
- Overall business satisfaction with business environment (via survey)
- Scores on "Ease of Doing Business" indices

Wage structure

Data

- Breakdown of region's skilled worker categories

Evaluation Criteria

- Wage rates for relevant skilled labor categories in region (vs. competitor regions)

Legal and Regulatory Environments (continued)

Utilities

Data

- Names, contact information and service areas for major suppliers of water, gas and electricity

Evaluation Criteria

- Average gas, electric and water rates in region (vs. competitor regions)

Local government

Data

- Names and contact information for local officeholders
- Nature of relationship to/jurisdiction over regional assets
- Key development-related programs

Evaluation Criteria

- Amount of funding for relevant activities, satisfaction with government services and programs

State government

Data

- Names and contact information for state officeholders
- Nature of relationship to/jurisdiction over regional assets
- Key development-related programs

Evaluation Criteria

- Amount of funding for relevant activities, satisfaction with government services and programs

Federal government

Data

- Names and contact information for elected officials representing region
- Names and contact information for relevant federal officials in regional offices
- Nature of relationship to/jurisdiction over regional assets
- Key development-related programs

Evaluation Criteria

- Amount of funding for relevant activities, satisfaction with government services and programs

Legislation/Laws

Data

- Pending legislation impacting on assets of/plans for the region
- Existing statutes/regulations, on state/local/regional levels, that provide or prevent competitive advantage over other regions and/or support other regional assets

Evaluation Criteria

- Financial impacts
- Similar legislation/laws in other competitor regions

Physical Infrastructure

Airports

Data

- Names and locations of regional airports
- Number of carriers
- Number of flights
- Destination cities
- Cargo handling capacity

Evaluation Criteria

- Current passenger and cargo traffic and projections
- Growth plans

Highways

Data

- Names of major highways
- Miles of interstate roads
- Number of interstate interchanges

Evaluation Criteria

- Average commute times
- Driving distances to other major metro areas

Rail and trucking

Data

- List of regional and interstate passenger services
- List of regional and interstate cargo services
- Location of intermodal facilities
- Names and contact information for interstate trucking firms with operations in region

Evaluation Criteria

- Frequency of service and destination cities
- Performance records. (e.g., on-time history)

Maritime

Data

- Names of port facilities and contact information for officers
- Names of shipping lines using facility
- Nature of cargo handled

Evaluation Criteria

- Tonnage handled at port on annual basis

Communications

Data

- Names and contact information for telecommunication providers in region

Evaluation Criteria

- Availability of high-speed Internet access
- Capacity of networks
- Plans for expansion

Physical Infrastructure (continued)

Natural resources

Data

- Available water supply and infrastructure for delivery
- Available resources to support business clusters and infrastructure for delivery

Evaluation Criteria

- Quantification of relevant resources

Real estate

Data

- Available land for building
- Available buildings for occupancy
- Projects online
- Available single family and multi-family dwellings for purchase or rental

Evaluation Criteria

- Average purchase price/square foot
- Average rental cost/square foot
- Vacancy rates
- Vacancy rates/number of dwellings on market and average number of days on market
- Range of, and average, housing costs

Industrial/business parks

Data

- Names, locations and contact information for management
- Special features

Evaluation Criteria

- Average purchase price/square foot
- Average rental cost/square foot
- Vacancy rates

Mass media channels, such as television, radio, and newspaper

Data

- List of mass media channels and contact information

Evaluation Criteria

- Circulation figures/Nielsen ratings/Arbitron ratings
- Programming/reporting that supports development efforts
- Involvement in regional initiatives

Quality of Life

Amenities and Population flow

Data

- Parks and recreational facilities
- Cultural attractions and institutions (museums, theater, music, etc.)
- Inflow/outflow of residents, by age and education

Evaluation Criteria

- Cost of living indices
- Quality of life indices
- Net migration rate by age and education level

Information Sources for Mapping

Information for asset mapping is gathered from five primary sources: the existing knowledge of project participants; previous regional reports; public data; surveys; and interviews. These last three sources are particularly relevant to comprehensive asset mapping projects.

Table III: Suggested Data Collection Approaches by Mapping Level

Level 1	**Identification**	• Review of basic public data • Review of previous regional reports • Input from regional team members and regional partners
Level 2	**Basic Evaluation**	• Data sources in Level I • Public data sources/databases • Interviews
Level 3	**Comprehensive Assessment**	• Data sources in Level I and II • Regional business survey • Additional interviews

Public Data and Historical Reports

There are a variety of public data sources that can offer data on regional innovation assets, most of which are available at little or no cost. Among the public data sources, some capture multiple data elements and can play an important role in Level 2 work. These include www.census.gov, www.workforce3one.org, and Moody's www.economy.com. In addition, comprehensive databases like EMSI Strategic Advantage aggregate much of the information.

It is important to note that local data sources may be available for information specifically pertinent to the performance of local institutions—and such information may already have been captured in other reports. Local media (newspapers, television, etc.) can be useful both for their knowledge and evaluation of assets, and they often write comparisons of the region with another.

At other times, the project team may have to extract whatever meaningful data it can from state, county, or other data that encompasses geographic areas not identical to the region. Although precise data is a worthwhile goal, there will be occasions when the project team may decide to use imperfect data in order to have some means of evaluating an entity identified as a regional asset.

Regional Business Survey

To supplement the publicly available data collected during Levels 1 and 2, a survey of business leaders is a critical element of the qualitative research of Level 3. Since the choices made by private sector firms ultimately drive regional economies, the survey should be targeted exclusively to private sector respondents who report their actual knowledge. The survey should elicit information from executives about their perceptions of the regional business platform (regional assets), their participation in

regional business organizations, their links to other regional institutions (networks), and their attitudes toward business and the region (culture).

A sample business survey created by the Council on Competitiveness that has been effectively utilized in numerous regions is available in Appendix D.

Community Leadership Interviews

To deepen understanding of the regional assets, interviews should be conducted with a wide variety of community leaders including: government officials; university leaders; venture capitalists and other financiers; business service providers and advisors; business associations leaders, economic developers, and non-profit and community group leaders. Twenty-five to 30 interviews will usually be sufficient, however, more may be needed for larger regions or more comprehensive efforts.

Interviews with stakeholders in the region serve at least three key functions:

- To ensure identification of the major organizations that serve as regional assets
- To identify key alliances and networks that support and promote regional innovation, and to learn how they work
- To properly value the regional assets identified

Even though community leadership interviews are likely to be most useful in Level 3, a region may decide to undertake a small number as part of Level 2 analysis for obtaining certain data that may not be available from other sources. A sample interview guide is included in Appendix E.

In addition, a region may want to consider engaging in a specific network mapping exercise that allows for graphic representations of existing connections between assets. This can suggest areas in which stronger connections need to be made. Complex human system analysis, using software developed for purposes other than economic or workforce development, can be applied effectively. Resources can be found for a fee at Web sites like www.network-weaving.com and www.orgnet.com.

Table IV: Data Sources for Asset Evaluation Input and Output Metrics

Table IV provides suggested public sources for key data elements identified in the previous section.

Evaluation Areas	Source	Web site
Input Metrics		
HUMAN CAPITAL		
K-12 Education Systems	National Assessment of Educational Progress (NAEP) Scores	www.nces.ed.gov
	College Board SAT/ACT Scores	www.collegeboard.com
	ETS Graduation Rates	www.ets.org
	State Department of Education Web site	
Community Colleges and Technical Schools	Higher Education Directory	www.ccweek.com/news/templates/template.aspx?articleid=13&zoneid=1
Four-Year Colleges and Universities	U.S. News and World Report rankings	www.usnews.com/sections/rankings
	Business Week rankings of specific disciplines	www.businessweek.com/bschools
	The Wall Street Journal rankings of specific disciplines	www.wsj.com
	National Science Founation Data on Ph.D. graduates of regional institutions	caspar.nsf.gov
	Chronicle of Higher Education Data on Endowments	www.chronicle.com
	National Association of College and University Business Officers	www.nacubo.org
Workforce Availability/Occupational Analysis	U.S. Census American Factfinder Summary File 3 data on Educational Attainment	factfinder.census.gov
	Burea of Labor Statistics data on regional workforce of managers, scientists, and technicians	www.bls.gov/oes
Worker Productivity	Moody's Economy.com Précis Metro Reports	www.economy.com
Job Growth	Bureau of Labor Statistics	www.bls.gov/cew
Workforce and Training Programs	Various sources	

Evaluation Areas	Source	Web site
Wage Data	Bureau of Labor Statistics Bureau of Economic Analysis	www.bls.gov/cew www.bea.doc.gov/bea/regional/reis
Payroll by Cluster	Moody's Economy.com	www.economy.com
RESEARCH AND DEVELOPMENT		
University Spending	NSF WebCASPAR database	caspar.nsf.gov
Federal R&D Expenditures	RAND Radius database	https://radius.rand.org/radius/index.html
Private R&D	Schonfeld & Associates	www.saibooks.com
FINANCIAL CAPITAL		
Venture Capital	PWC/Venture Economics/NVCA Money-tree Survey	www.pwcmoneytree.com/moneytree/
Angel Networks/VC Firms	Local print media, such as business news-papers published by American Business Journals and Crain Communications, and the Angel Capital Association	www.bizjournals.com www.crain.com www.angelcapitalassociation.org
Foundation Giving	The Foundation Center	fconline.fdncenter.org
Commercial Bank Assets and Lending	Public filings with government agencies	www.sec.gov
Government Programs	Small Business Administration	www.sba.gov

Evaluation Areas	Source	Web site
LEGAL AND REGULATORY ENVIRONMENTS		
Tax Burdens	Moody's Economy.com	www.economy.com
	The Tax Foundation	www.taxfoundation.org
Business Costs	Moody's Economy.com Précis Metro Reports	www.economy.com
	Forbes rankings	www.forbes.com/lists
Government Programs	Web sites of relevant government entities	
INDUSTRIAL BASE		
Clusters	Harvard Institute of Strategy and Competitiveness Cluster Mapping Project	www.data.isc.hbs.edu/isc/index.jsp
Patents in Traded Clusters	Harvard Institute of Strategy and Competitiveness Cluster Mapping Project	www.data.isc.hbs.edu/isc/index.jsp
Cluster Employment, Location Quotient	Harvard Institute of Strategy and Competitiveness Cluster Mapping Project	www.data.isc.hbs.edu/isc/index.jsp
	Moody's Economy.com	www.economy.com
	EMSI Strategic Advantage	www.economicmodeling.com
PHYSICAL INFRASTRUCTURE		
Highways	TTI's Annual Urban Mobility Study	mobility.tamu.edu/ums
	Arbitron's Average Travel Time to Work Comparison	www.arbitron.com/outdoor_companies/travel.asp
Telecommunications	Information Technology & Innovation Foundation	www.itif.org
	Specific regional telecom providers	
Airports	Federal Aviation Administration	www.faa.gov/airports_airtraffic/

Evaluation Areas	Source	Web site
Maritime	Regional and state government	
	Port authorities	
Rail and Trucking	Regional and state government	
	Rail and rrucking companies	
Residential Housing	Local realtors	
	Online services	
QUALITY OF LIFE		
Quality of Life	Money Magazine Best Places to Live Report	money.cnn.com/magazines/moneymag
Cost of Living	ACCRA Cost of Living Index	www.coli.org
	Moody's Economy.com Précis Metro Reports	www.economy.com
Migration Data	Moody's Economy.com Précis Metro Reports	www.economy.com
	U.S. Census American Fact Finder	www.census.gov/population/www/index.html
Output Metrics		
IDEA GENERATION		
Patents	U.S. Patent and Trademark Office	patft.uspto.gov
Patent Analysis and Scorecards	1790 Analytics	www.1790analytics.com
	U.S. Patent and Trademark Office	patft.uspto.gov
IDEA DEVELOPMENT		
University Tech Transfer	Association of University Technical Managers	www.autm.net
	Chronicle of Higher Education	www.chronicle.com/stats/techtransfer

Evaluation Areas	Source	Web site
New Firm Starts	Small Business Administration	www.sba.gov/advo/research
Small Business Innovation Research Grants	Small Business Administration	www.sba.gov/sbir/indexsbir-sttr.html
COMMERCIALIZATION METRICS		
Gazelle Companies	Information Technology & Innovation Foundation	www.itif.org
Inc 500 Companies	Inc Magazine	www.inc.com/inc500
PRODUCTIVITY METRICS		
Gross Regional Product	Moody's Economy.com Précis Metro Report	www.economy.com
PROSPERITY METRICS		
Job Growth	Bureau of Labor Statistics	www.bls.gov/cew
Unemployment Rate	Bureau of Labor Statistics	www.bls.gov/lau
Average Wage	Bureau of Labor Statistics	www.bls.gov/cew
	Bureau of Economic Analysis	www.bea.gov/bea/regional/reis
Per Capita Income	Bureau of Economic Analysis	www.bea.gov/bea/regional/reis
Median Household Income	Census Bureau, American FactFinder	factfinder.census.gov
Poverty Rate	Census Bureau, American FactFinder	factfinder.census.gov

Appendix B provides a more detailed explanation of the data metrics and sources.

Appendices

Appendix A: Checklists for Regional Asset Mapping Teams

Although there is not one prescribed method for successfully creating a regional asset map, certain tasks are central to achieving worthwhile results. Within each of these tasks falls a number of sub-tasks that will be dictated by the region's specific circumstances.

Checklist 1: Major Tasks

Because asset mapping always involves numerous team members and stakeholders, leaders of the project team should work to ensure coordination and proper deployment of human resources. It is important to maintain focus on specific project objectives since it is easy to get distracted by accumulating available, but unimportant, data.

The following checklist includes the major tasks of a successful asset mapping project.

Planning and Preparation

- ❑ Set goals/objectives for asset mapping
- ❑ Assign staff to asset mapping project team
- ❑ Develop communication plan for asset mapping process and final product
- ❑ Decide on data compilation strategy and acquire/set up database to hold data

Implementation

Level 1

- ❑ Identify and secure written reports about region from previous five to seven years
- ❑ Collect and analize data from historical written reports.
- ❑ Collect data from public data sources

Level 2

- ❑ Determine benchmark regions
- ❑ Obtain quantitative data about each asset for region and benchmark regions
- ❑ Conduct interviews with regional leaders to understand satisfaction with assets

Level 3

- ❑ Survey regional business leaders to learn about regional networks and culture
- ❑ Conduct additional interviews with regional leaders to better understand and validate survey findings

Evaluation and Documentation

- ❑ Review aggregated data to develop key findings and initial recommendations
- ❑ Document asset mapping findings and recommendations in presentation format
- ❑ Share mapping with project team/key leaders for review
- ❑ Obtain review of final draft by stakeholders and revise as needed

Communications

- ❑ Review communications plan based on findings
- ❑ Distribute final product in accordance with revised communications plan

Ongoing Action

- ❑ Develop action plans based on asset map
- ❑ Review asset map at least annually and update as needed

Checklist 2: Forming a Leadership Team

Identifying a core team of dedicated individuals to serve on the project team is critical to the success of any regional asset mapping project. Selecting individuals involves a number of considerations:

- While there is no rule of thumb for the size of a team, effort should be made to ensure that it has sufficient membership to enable work to be accomplished in a timely and efficient manner while not growing so large that it could get bogged down in operational challenges
- Involvement should be sought from organizations/individuals that could be involved in the action initiatives that will emerge from the asset mapping
- For larger scale projects, it will be valuable to create a steering committee of respected community leaders who can give guidance on the subject matter and use their convening power to build local support for the effort

The following checklist ensures that the composition of the project team meets the demands of a typical asset mapping project. Individuals on the team will likely have multiple skills/knowledge bases from which to draw. Ideally, each of the knowledge bases, skills sets and affiliations would be covered by at least one team member.

Knowledge Base

- ❑ Knowledge of regional human capital
- ❑ Knowledge of regional R&D
- ❑ Knowledge of regional physical infrastructure
- ❑ Knowledge of financial capital
- ❑ Knowledge of relevant regional networks
- ❑ Knowledge of regulatory and business operating environment
- ❑ Knowledge of industrial base/clusters
- ❑ Knowledge of quality of life factors
- ❑ Knowledge of economic development organizations

Affiliation

- ❑ Private sector
- ❑ Public sector
- ❑ Non-Profit sector
- ❑ Academic sector

Skill Sets

- ❑ Research skills
- ❑ Analytical skills
- ❑ Database management skills
- ❑ Interviewing skills
- ❑ Writing skills
- ❑ Marketing/public relations skills
- ❑ Public speaking skills

While individuals recruited for the asset mapping project team may readily join the effort, there will be times when the organizers of the team will need to make specific appeals to different categories of recruits. A few examples of the rationales that can be offered to specific categories of candidates are:

Business Owners/Executives

- Make a civic contribution to the community in which they do business and from which they recruit employees
- Provide input into transformation that will affect their business in any number of ways, ranging from ease of recruitment of employees to potential for lucrative business partnerships with new or growing companies

K-12 Educators

- Attract support, financial and in-kind, and to generally improve education system

Higher Education Representatives

- Inform others in region of the assets the institution has to offer and discover possible beneficial linkages to other entities in the public and private sectors

Foundation Representatives

- Better understand the needs of the region that the foundation could, in fulfillment of mission, help address

Economic Development Officials

- Contribute to a valuable tool for business recruitment efforts

Workforce Development Officials

- Identify needs that workforce system must address, and discover educational and other partners that could work with WIBS and others

Checklist 3: Data Resources

As one of its first steps, an asset mapping project team must identify and gather reports and other documents related to the region's economic structure. Typically, documents extending back as far as five to seven years will be valuable. These documents may be helpful for:

- Identifying assets and/or individuals with knowledge of the assets
- Highlighting potential challenges to regional growth
- Shedding light on existing networks within the region, as well as on the business culture
- Explaining the successes and failures of previous strategies for economic and workforce development

The project mapping team should seek out written resources from all sources they can identify, including from within and outside of the region. Organizations that could be contacted for information are:

- ❑ Chambers of Commerce
- ❑ Industrial development authorities
- ❑ Economic development organizations
- ❑ Workforce Investment Boards
- ❑ Professional organizations, such as bar associations
- ❑ Other business associations or networks
- ❑ Local, regional, and state government agencies involved in workforce or economic development
- ❑ Metropolitan planning organizations/councils of government
- ❑ U.S. Department of Labor
- ❑ U.S. Department of Commerce
- ❑ Universities located in the region, especially business, planning, and public policy schools
- ❑ K-12 education systems in the region
- ❑ Civic groups, including those focused on education, the environment and regulatory issues
- ❑ Non-profits/foundations with a regional focus
- ❑ Commercial and residential real estate firms (for site selection studies)

Appendices

Appendix B: Detailed Explanation of Metrics and Sources

Explanation of Asset Classes

Human Capital

Talented people generate the new ideas and product enhancements that drive innovation. As the economic development field adapts to meet the needs of an evolving international economy, regions are increasingly touting their strengths in skilled labor to attract and retain innovative companies. In fact, most studies of corporate location decisions have shown that skilled workforce is such an important asset that many regions have made it the central theme of their 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 of workers with specialized skills related directly to their industry.

Regions cannot develop skilled workforces without investment in the institutions that create and nurture talent, such as universities, 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 opportunities for life-long 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 their regional capacity for innovation.

Merely the presence of certain institutions is not sufficient to ensure regional capacity. It is also necessary to ensure adequate levels of investment in human capital development by public, private, and non-profit entities in the workforce system. Proper integration of the education, workforce development, and economic development systems is also critical.

Research and Development Institutions

Research and development 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 encourage 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 a vital asset for supporting entrepreneurship and innovation. Transforming ideas into commercial products and services requires significant resources, and few entrepreneurs in the United States can finance the entire development

cycle alone. Regions such as Silicon Valley have little trouble retaining entrepreneurs and startup firms because of the significant presence of venture capital (VC) firms. Other regions, which have more difficulty attracting the attention of VC firms located outside the area, must find different solutions for providing access to capital for entrepreneurs, 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 for crafting an effective economic development strategy. Economic development professionals need to have a sound understanding of the key businesses in the region, including product and service offerings, business 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 wisdom of how regional industries are structured.

Physical Infrastructure

A region's physical infrastructure is an important asset for supporting regional innovation. Transportation and communications infrastructures in the United States are relatively developed, but without 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, having this link has become a critical factor in their ability to attract 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 an important 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 accounted for in regional economic analysis.

Quality of Life

Perceptions about quality of life in a region can heavily impact attraction and retention efforts of companies, skilled workers, and entrepreneurs. Talent is mobile, and quality of life has assumed greater importance in economic development practices as many regions have developed strategies to nurture creative workers.

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, OR, is well known for its environmentally sensitive planning and walkability. In New York City, residents love the urban environment and proximity to arts and cultural amenities. Many citizens of Dallas, TX, point to the Dallas Cowboys and the region's other major professional sports teams as an important quality of life factor.

Not all characteristics of a region that are mentioned under the umbrella term "quality of life" are equally beneficial in terms of supporting innovation. Professional sports teams, for example, are great assets for promoting tourism and entertainment. However, their contributions to enhancing a region's capacity for innovation are minimal. Economic developers must account for the various (and often competing) ideas about quality of life in a region, and develop strategies that promote innovation and appeal to residents' tastes and preferences.

Detailed Metric Descriptions

Human Capital Metrics

- Quality of K-12: Standardized Test Scores

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 are 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 nces.ed.gov/nationsreportcard.

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 College Board (www.collegeboard.com) and ETS (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 Web sites. 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* (www.ccweek.com/Top100.asp) publishes some data on the number of certificates awarded at each school, but there is no suggested source for national rankings of community and technical colleges. 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 could 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 or characteristics. *U.S. News and World Report, Business Week, 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* Web site (www.usnews.com). Also, university Web sites 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 business survey and interviews can also provide important context for data obtained from rankings.

- Quality of Higher Education: Endowment

An endowment generally refers to donations made to a university with the understanding that the prin-

cipal amount of the donation will be invested with the earnings from that investment and used for the university's educational programs.[1] 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 Web site (www.chronicle.com). Another source is the National Association of College and University Business Officers (NACUBO) (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 Web site is to use the American FactFinder tool (factfinder.census.gov). Data can be searched by region in "Data Sets" and then "Detailed Tables".

Data on Ph.D. graduates are available on the National Science Foundation (NSF) Web site (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 region (e.g., Northeast), which limits its value for regional analysis.

- 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 (www.bls.gov). 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 sciences (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 recommend a number of survey questions on human capital to supplement the assessment of the local workforce and educational institutions (see survey in Appendix D). 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

1 A useful explanation of endowments is found on the University of Alberta's Web site at www.financial.ualberta.ca.

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 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 Web site (www.pwcmoneytree.com/moneytree/index.jsp). 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.

- Number of VC Firms and Angel Groups

It is equally important to collect information on VC 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 that entrepreneurs have access to capital. The local business periodical is a good starting point for finding lists of local VC firms and angel groups, as well as funds under management. American Business Journals, Inc. (www.bizjournals.com) and Crain Communications (www.crain.com) publish many of the regional business journals in the United States.

Financial capital survey questions include:

- Availability in the region of risk capital from VC 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. 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 Web site (data.isc.hbs.edu/isc/index.jsp) is a subscription service, but some data is available free of charge.

- 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 (mobility.tamu.edu/ums). The report compares commute times for most metro areas in the nation. Arbitron Inc. (www.arbitron.com/outdoor_companies/travel.asp) has also reviewed and compared Census 1990 and 2000 data on commuting time to work in the United States.

- Communications Infrastructure

The Information Technology & Innovation Foundation 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 the state level at www.itif.org in *The 2007 State New Economy Index*. It is possible that regional information will be forthcoming from the same source. Telecommunications providers that offer services in the region may also have useful data, such as user trends, costs, and expansion plans.

Survey questions include:

- 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 and high-speed Internet access)

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. Moody's 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 Web site (www.economy.com). The Tax Foundation (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). Several private economic consulting firms such as Moody's Economy.com (www.economy.com) also offer cost-of-doing-business data. Economy.com's *Précis Metro Reports*, for example, include a yearly

measure of the cost of doing business at the MSA and state levels. The index weighs factors such as tax burdens, labor costs, and energy costs.

Survey questions include:

- 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)

Quality of Life Metrics

- Inflow/Outflow of Residents

Moody's Economy.com's *Précis 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 show 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 cover those families that file tax returns, so Economy.com also uses data from the U.S. Census Bureau, which cover all migrants, including international migration. The reports are available for purchase on the Economy.com Web site (www.economy.com).

- Cost of Living

Several sources are available for obtaining cost-of-living data. Moody's Economy.com's *Précis 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. Both sources are available for purchase only.

Survey questions include:

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

Culture Metrics

Section III of the regional business survey (see Appendix D sample 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.)

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 more than 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 stages 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 Web site (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 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 Technical Managers (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 startup 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 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 Web site (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.

- 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 the number and value of awards at the state level. Phase I and II awards can be aggregated for easier comparisons. The SBA Web site also publishes locations for grant recipients, which can be aggregated for looking at MSAs. However, 1998 is the latest year available, and the SBA no longer updates the information on its Web site. Users should contact their local SBA offices for updated data on grant recipients. Local offices can be found using the map on the SBA Web site (www.sba.gov). SBIR data can be normalized per 10,000 employees for comparison to other regions. Data can be found at 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 Web site (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 Information Technology & Innovation Foundation publishes a state ranking of gazelle companies. The rankings are available in *The 2007 State New Economy Index* at www.itif.org.

- Inc. 500

Inc. magazine's annual "Inc. 500" list (www.inc.com/inc500) shows the fastest growing privately held companies in the United States. 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 1988–2006. Access to the full database requires purchasing a subscription. Users should consult the magazine's list methodology before comparing data from multiple years.

Productivity Metrics

- 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. Moody's 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 Web site.

Prosperity Metrics

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 critical 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 (BLS). 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 more than 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 nation for comparison. The data can be found on the BLS Web site (www.bls.gov/cew).

- 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 Web site (www.bls.gov/cew). 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. The BLS data is located at 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.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.

- 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 3.* Data can be collected for either the MSA, or if unavailable, compiled from each county and weighted by population. *Summary File 3* data can be accessed through the Census American FactFinder Web site (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 3*. Data can be collected for either the MSA, or if unavailable, compiled from each county and weighted by population. Formatting the data in terms of minority percentage of white per-capita income is a straightforward way to assess inequalities in the regional economy.

Appendices

Appendix C: Additional Asset Mapping Examples

Numerous examples of asset maps developed by other organizations, using distinct methodologies, are available on the Internet. Some good examples include:

Washington State Innovation Index

(www.watechcenter.org/downloads/index_final.pdf)

Example of a comprehensive asset mapping effort.

Halifax-Moncton Growth Corridor Asset Mapping

(www.greaterhalifax.com/site-ghp/media/Parent/HMGC_Executive_Summary.pdf#search=%22Halifax%20Moncton%2)

Example of a narrative summary of an economic asset mapping project.

Piedmont Triad Higher Education Assets, April 2006

(www.piedmonttriadvision.com/Higher_Ed_Assets_lg.pdf)

The Piedmont Triad Partnership identified nine clusters for inclusion in the inventory: healthcare; biotechnology; logistics; wholesale trade; finance and insurance; food processing; arts; recreation/tourism; chemicals and plastics; and automotive. Interviews were conducted with representatives of the Triad's higher education institutions to gather information about the assets that relate specifically to each industry cluster.

The Metro Denver WIRED Initiative Asset Map

(www.metrodenver.org/wired/)

Example of a comprehensive mapping effort that focuses particularly on workforce assets.

Appendix D: Sample Regional Business Survey

I. Business Environment

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.

Section 1	Very harmful to your business	Harmful to your business	Neither harmful nor beneficial to your business	Beneficial to your business	Very beneficial to your business	Not applicable (N/A)
1. The overall quality of the region's transportation (e.g., roads, air transport, railroads and ports)	☐	☐	☐	☐	☐	☐
2. The quality of the region's communications infrastructure (e.g., wireless and high-speed internet)	☐	☐	☐	☐	☐	☐
3. The cost of doing business in your region (specifically, the cost of real estate, wages and salaries, and utilities)	☐	☐	☐	☐	☐	☐
4. The region's cost of living for your employees	☐	☐	☐	☐	☐	☐
5. The region's overall quality of life (e.g., climate, and cultural and recreational opportunities)	☐	☐	☐	☐	☐	☐
6. The overall quality of the region's community and technical colleges	☐	☐	☐	☐	☐	☐

Section 1 (continued)	Very harmful to your business	Harmful to your business	Neither harmful nor beneficial to your business	Beneficial to your business	Very beneficial to your business	Not applicable (N/A)
7. The overall quality of the region's four-year colleges and universities)	☐	☐	☐	☐	☐	☐
8. The availability of regional college and university apprenticeship/internship programs	☐	☐	☐	☐	☐	☐
9. The quality of technical assistance offered by regional colleges and universities to businesses	☐	☐	☐	☐	☐	☐
10. The quality of R&D collaboration between businesses and regional college/university researchers	☐	☐	☐	☐	☐	☐
11. The availability in the region of workers with the skills your business requires	☐	☐	☐	☐	☐	☐
12. The availability in the region of top managers with the qualifications your business requires	☐	☐	☐	☐	☐	☐
13. The availability in the region of scientists and engineers with the qualifications your business requires	☐	☐	☐	☐	☐	☐

Section 1 (continued)	Very harmful to your business	Harmful to your business	Neither harmful nor beneficial to your business	Beneficial to your business	Very beneficial to your business	Not applicable (N/A)
14. The availability in the region of information technology professionals with the qualifications your business requires	☐	☐	☐	☐	☐	☐
15. The availability in the region of risk capital from venture capital firms	☐	☐	☐	☐	☐	☐
16. The availability in the region of risk capital from angel investors	☐	☐	☐	☐	☐	☐
17. The availability in the region of capital from banks	☐	☐	☐	☐	☐	☐
18. The availability in the region of specialized facilities and laboratories for product testing and development	☐	☐	☐	☐	☐	☐
19. The quality of the region's specialized suppliers for your business	☐	☐	☐	☐	☐	☐
20. The regional availability of demanding customers for your business	☐	☐	☐	☐	☐	☐

Section 1 (continued)	Very harmful to your business	Harmful to your business	Neither harmful nor beneficial to your business	Beneficial to your business	Very beneficial to your business	Not applicable (N/A)
21. The effectiveness of the region's university technology transfer offices	☐	☐	☐	☐	☐	☐
22. State and local governmental regulations and permitting procedures affecting businesses	☐	☐	☐	☐	☐	☐
23. The level of taxation affecting business (relative to other regions)	☐	☐	☐	☐	☐	☐
24. The effectiveness of government-sponsored growth incentives (tax breaks, seed funding, etc.)	☐	☐	☐	☐	☐	☐
25. The quality of promotional and marketing campaigns featuring the region	☐	☐	☐	☐	☐	☐
26. The effectiveness of regional programs to help startup businesses	☐	☐	☐	☐	☐	☐
27. The effectiveness of regional programs to train entrepreneurs	☐	☐	☐	☐	☐	☐

Summary

Section 1 (continued)	Poor location	Fair location	Good location	Very good location	Excellent location
28. Considering all the factors presented so far, how would you currently rate your region overall as a place for your business to succeed?	☐	☐	☐	☐	☐
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?	☐	☐	☐	☐	☐

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.

Please rate how valuable interaction with each of the following regional institutions is to your business's capacity to innovate.

Regional Institutions	Not at all valuable	Somewhat valuable	Valuable	Quite valuable	Extremely valuable	Not applicable (N/A)
32. Universities and four-year colleges	☐	☐	☐	☐	☐	☐
33. Community/technical colleges	☐	☐	☐	☐	☐	☐
34. Public or private research organizations	☐	☐	☐	☐	☐	☐
35. Professional service firms	☐	☐	☐	☐	☐	☐
36. Federal labs	☐	☐	☐	☐	☐	☐
37. Regional customers	☐	☐	☐	☐	☐	☐

Regional Institutions (continued)	Not at all valuable	Somewhat valuable	Valuable	Quite valuable	Extremely valuable	Not applicable (N/A)
38. Other businesses in your industry	☐	☐	☐	☐	☐	☐
39. Regional suppliers	☐	☐	☐	☐	☐	☐
40. Banks	☐	☐	☐	☐	☐	☐
41. Venture capital firms	☐	☐	☐	☐	☐	☐
42. Angel investors	☐	☐	☐	☐	☐	☐
43. Business incubators	☐	☐	☐	☐	☐	☐
44. Industry or cluster associations	☐	☐	☐	☐	☐	☐

Regional Institutions (continued)	Not at all valuable	Somewhat valuable	Valuable	Quite valuable	Extremely valuable	Not applicable (N/A)
45. Non-professional associations (alumni clubs, athletic clubs, etc)	☐	☐	☐	☐	☐	☐
46. Entrepreneurial networks	☐	☐	☐	☐	☐	☐
47. Business assistance centers	☐	☐	☐	☐	☐	☐

48. Please list, by name, the institutions most valuable 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.

Regional Norms and Attitudes	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
49. New residents can easily integrate into the regional business community	☐	☐	☐	☐	☐
50. The region is a welcoming, tolerant, and attractive place for people of diverse backgrounds	☐	☐	☐	☐	☐
51. Leaders in the region are responsive to the needs of all the regional residents, irrespective of ethnicity, cultural heritage, gender, or lifestyle	☐	☐	☐	☐	☐
52. The business culture in the region understands failure as part of the learning and innovation process	☐	☐	☐	☐	☐
53. People from different industry and economic sectors frequently interact in the region (e.g., bankers and engineers, manufacturers and tourism)	☐	☐	☐	☐	☐
54. The region celebrates the growth of companies, not just the absolute size of companies	☐	☐	☐	☐	☐

Regional Norms and Attitudes (continued)	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
55. Artists and businesspeople frequently interact in the region	☐	☐	☐	☐	☐
56. Local government institutions eagerly partner with the private sector to promote new business development	☐	☐	☐	☐	☐
57. Business leaders in the region treat entrepreneurs, start-ups, and new companies as full partners in all aspects of industry cooperation	☐	☐	☐	☐	☐
58. Business leaders proactively share information and resources when possible	☐	☐	☐	☐	☐
59. Regional residents actively participate in community development organizations and projects	☐	☐	☐	☐	☐
60. Successful businesspeople in the region actively invest in economic development projects and startup ventures	☐	☐	☐	☐	☐

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.

62. What percentage of your company's sales is to customers within the region?

- ❑ 100 percent
- ❑ 75 percent to 99 percent
- ❑ 50 percent to 74 percent
- ❑ 10 percent to 49 percent
- ❑ less than 10 percent
- ❑ Don't know

63. Where is your business headquartered?

- ❑ In the region
- ❑ Elsewhere in the United States
- ❑ Outside the United States

64. Does your company sell (export) products or services outside the United States?

- ❑ Yes
- ❑ No
- ❑ 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.)

- ❑ Aerospace
- ❑ Manufacturing
- ❑ Finance / accounting
- ❑ Insurance / real estate / legal
- ❑ Medical / dental / health
- ❑ Telecommunications services
- ❑ Transportation / utilities
- ❑ Construction / architecture / engineering
- ❑ Data processing services
- ❑ Wholesale / resale / distribution
- ❑ Education
- ❑ Marketing / advertising / entertainment
- ❑ Research / development lab
- ❑ Business service / consultant
- ❑ Computer / network consultant
- ❑ Hospitality / tourism
- ❑ Food services
- ❑ Agriculture
- ❑ 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 12/2002 _____

In 12/2005 _____

Current (2007) _____

69. Previous Year's Gross Revenues (approx.)

- ☐ Less than $1 million
- ☐ $1 million to $10 million
- ☐ $101 million to $300 million
- ☐ $11 million to $50 million
- ☐ $51 million to $100 million
- ☐ $301 million to $500 million
- ☐ More than $500 million
- ☐ Don't know

70. Please estimate your company's average annual revenue growth during the past three years.

- ☐ Negative
- ☐ 0 percent
- ☐ 1 percent to 5 percent
- ☐ 6 percent to 10 percent
- ☐ 11 percent to 20 percent
- ☐ 20 percent to 100 percent
- ☐ More than 100 percent
- ☐ Don't know

71. Which best describes your position in your company?

- ☐ Owner / president / CEO
- ☐ Senior executive or senior official
- ☐ Director / vice president
- ☐ Manager
- ☐ Other _____

72. How long have you lived in the region?

- ☐ Less than 2 years
- ☐ 2 to 5 years
- ☐ 5 to 15 years
- ☐ More than 15 years

73. If willing to be contacted about your views, please provide:

Name:

Email:

Phone:

Mailing Address:

Appendices

Appendix E: Sample Community Leadership Interview Template

I. Interview Background And Preparation

Interview Focus

- To develop a deeper understanding about the forces/institutions that have impacted the region's development
- To assess how alliances and networks support and promote regional innovation
- To explore and confirm results of the Business Survey about regional priorities for action

Target Audience

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

Target Corporate Level

Officers, senior management (in the case of business firms, special interest in Director of R&D or person most involved with firm's innovation policy)

Target Number

Thirty interviews (more acceptable)

Distribution

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

Length of Interview

Approximately one hour

II. Interview Introduction

The following section provides the interviewer a basic interview script that can be modified as necessary. Bold sections represent interview cues and are not intended to be read aloud.

Thank you for agreeing to participate today. To begin, I would like to provide a concise description of this project's purpose, as well as the focus of today's interview.

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 the conditions that support innovative firms and people.
- To catalyze action to improve the regional innovation environment

III. Interview Questions

This section asks respondents to provide regional performance data (potential indicators: new job growth; employment growth; income per capita growth; and cluster growth).

In answering the following question set, consider the economic indicators of your region's performance that we just discussed.

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 sorts 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, [fill in the blank] 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 have 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 (to be asked of private sector respondents)

- 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 and 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?

University-Business Relationships (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 the 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 startups? 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 startup ventures and entrepreneurship? If so, how?
- How does government in your area support the particular needs of startup companies? (Incubators, financing, enterprise zones?)

Venture Capital / Financiers Sector (to be asked of venture capitalists)

- 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 (to be asked of venture capitalists)

- Do you have formal and/or informal relationships with other VCs?
- Do you have linkages with university R&D communities? 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? Do you follow up as the project matures?

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- Forging public and private partnerships to drive consensus
- Galvanizing action to translate policy into action and change

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Notes

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