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Introduction

In an increasingly competitive global marketplace, the capacity of a community’s entrepreneurial firms will be the driving force behind economic recovery, job creation, greater resiliency in the face of disasters, and regional economic transformation. For economic developers charged with job and wealth creation in their communities, the significance of entrepreneurship requires them to adapt their practice to focus on access to tools, strategies, networks and institutions that support entrepreneurial firms.

Thus, the International Economic Development Council, under the guidance of its Economic Development Research Partners (EDRP) Program, has developed this Handbook on Entrepreneurship, to:

• Introduce the economic development professional to the increasingly urgent need to support entrepreneurship as a necessary strategy;
• Explain what entrepreneurship is and who entrepreneurs are;
• Elucidate ways to best support entrepreneurship in the community; and
• Provide tools to help economic development professionals strengthen their communities’ entrepreneurship culture and build vibrant, resilient economies.

The first part of the Handbook provides an overview of the entrepreneurship ecosystem. The first chapter examines the forces that have led to the growing importance of entrepreneurship as a mechanism for sustained economic well being and discusses why entrepreneurs are best positioned for success in a rapidly changing business environment. Chapter 2 explores entrepreneurs by type of business, as well as demographics. Chapter 3 examines and maps out the various components of the entrepreneurial ecosystem.

The remainder of the Handbook provides detailed guidance to economic developers on successful strategies for promoting entrepreneurial activity in their communities. It includes details on the components of building an entrepreneurial ecosystem; case study examples of entrepreneurial firms, as well as economic development programs and organizations that support those firms; and tools that can be utilized by economic development professionals to foster entrepreneurial growth in their communities.
CHAPTER I
The Rise of the Entrepreneurial Economy

To better understand the role of entrepreneurship in economic growth, it is essential to take a deeper look at where job creation happens. Year-to-year net job creation comes from three primary sources: start-ups, young entrepreneurial firms ages one to five years, and high-impact, established companies. According to research conducted by the Ewing Marion Kauffman Foundation, virtually all net job creation between 1980 and 2005 took place in start-ups and young firms.1 In fact, Kauffman notes that young firms (between one and five years old) account for approximately two-thirds of new employment annually and become critically important in terms of lifetime net job creation. In addition, the rate of net growth attributed to young firms has remained nearly constant over the last 25 years. Even in the current economic downturn, nearly two-thirds of all net job creation in 2007 occurred in young firms.2 Equally important, studies show that almost all job losses in the economy can be attributed to firms with over 500 employees.3 Thus, if not for these entrepreneurial companies, our economy would have experienced net job loss over the past decades.

Growth within existing companies, not just new small businesses, also generates job increases and contributes to a robust economy. Take for example high-impact firms, first described as gazelles by David Birch, and later by Acs, Parsons and Tracy in 2008.4 High-impact firms are defined as enterprises that double sales and employment growth over a four-year period. The Acs, Parsons and Tracy study found that high-impact firms are on average 25 years old and account for a significant percentage of private-sector employment and revenue growth in the U.S. economy. While we do not definitively know what triggers an existing company into a high-impact growth spurt, it is clear the firm is moving into a new, entrepreneurial stage.

Entrepreneurship, regardless of its source, ultimately creates jobs and wealth. A venture creates wealth by increasing operational efficiencies, expanding consumer choice and reducing costs. Broadly speaking,

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2 ibid
4 ibid
entrepreneurship is the establishment of any new business or the development of a product, process or service, regardless of the founder’s motivation, industry, venture type or the age of the establishment. Contrary to the stereotype of an entrepreneur as “a hero with special powers that...innovates, creates jobs, makes markets more competitive and enhances economic growth,” entrepreneurship is in reality a “very common activity, undertaken by many people at some time during their lives.” The Kauffman Center for Entrepreneurial Leadership describes entrepreneurs as “generative and self-renewing,” since they not only provide engines for innovation but also smooth exigencies in the business cycle.

Entrepreneurship has many positive impacts on a community. Most commonly, entrepreneurs:

- **Create diversity within the immediate business environment and up the value chain.** A diverse economy enables a community to withstand stagnation due to constantly changing markets and consumer demands. This is particularly important in a globalized world where demands shift rapidly, forcing businesses to innovate simply to remain competitive.
- **Drive efficiency gains as they challenge existing businesses and industries or create new ones.** Those that succeed alter the business climate with operations that are less resource-draining and ultimately more profitable.
- **Give a community a vehicle through which it can leverage existing strengths,** such as a local university, skilled labor force or unique amenities, to optimize economic gains and create wealth.

### Economic Restructuring: From the Industrial to the Knowledge Economy

The late twentieth century saw a significant change in the structure of the economy worldwide. Resources once were the primary input to production, making price the key factor of competition in markets. But the cumulative forces of globalization, rapid technological change, and shortened product and process cycles have made knowledge the essential input to, and innovation the critical driver of, competitiveness. The following characteristics of the knowledge economy highlight the accelerated importance of entrepreneurship as an economic development engine.

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6 Schramm C (2004). *Building Entrepreneurial Economies. Foreign Affairs* 83(4) (July/August)
• **Globalization**—The integration of communities and nations into a global marketplace, expanding the overall size of the market, increases competition and fuels greater mobility of people, businesses, ideas and capital. The size and scope of the global market creates significant entrepreneurial opportunities for new products, services, companies and niche markets.

• **International business climate** – Globalization has changed the business climate in significant ways. Businesses need to be flexible and nimble to respond to rapidly changing consumer demands, and gain or maintain market share. This flexibility is the mark of an entrepreneurial company. But at the same time, businesses need to be organized differently than in the past, so that they can fully exploit the opportunities offered by globalization. For example, a firm can now establish its headquarters in the United States, its advertising/marketing department in France, the accounting group in Japan, its manufacturing plant in India, and retail locations entirely on the Internet. This reorganization opens up opportunities for existing firms not only to tap into new supply chains, but to enter the global market in new ways.

• **Information & Communication Technology (ICT) advancements** – Innovation and expansion in electronic communication (World Wide Web, electronic mail, satellite-based communications, hand-held GPS and smart phones) is driving greater total production capacity, knowledge transfer rates and instantaneous communication worldwide. Equally important, IT advancements create significant opportunities for entrepreneurs along two key dimensions. First, IT lets anyone anywhere to connect to the global marketplace, giving even a solo craftsman the ability to market widely. Second, IT enables entrepreneurs to tap into long-tail markets. In a long-tail market strategy, an entrepreneur sells a small number of unique items to many customers. The most obvious example of this strategy is Amazon, which provides access to almost any book title that may not be available in a retail store (which typically caters to more popular titles). Amazon can support this strategy because it aggregates the small demand for a particular item and creates sufficient market size by spanning geographies online.

• **Higher capital mobility** – Due to IT advancements and emergence of a globally connected financial infrastructure,
local firms can attract investments from international resources. Similarly, capital sources can seek out investment opportunities worldwide regardless of location. This rapid movement of capital can lead to a less stable environment for communities, especially those that rely on large firms in few industries that may become vulnerable to global competition. This economic reality has made investing in local entrepreneurs in a wider variety of industries a more reliable and more rewarding economic strategy for many communities.

- **Changing importance of physical location** – The ability of businesses to coordinate functions and operate virtually via the Internet is changing the significance of place. While it is no longer necessary to be in a market to sell to that market, places must maintain the ability to attract and retain talent and innovation. Places that offer a high quality of life and support diversity and knowledge creation in new and interesting ways stimulate and support entrepreneurship.

- **More informed and more demanding consumers** – Consumer preferences are changing rapidly, with an immediate feedback loop to firms due in large part to online networks and communities. This can have dramatic effects, positive and negative, and increases the pressure on businesses to innovate and maintain product quality. It also opens up new spaces for entrepreneurs to meet more nuanced demands as they often can respond more rapidly to small demand changes and enter niche markets faster and more easily than larger firms with entrenched markets can.

In sum, this restructuring of business worldwide presents challenges and opportunities that are creating economic winners and losers different from those of the past. Entrepreneurship can create value at both ends of the spectrum – exploiting the disruptive environment of globalization on one hand, and providing services locally that people need on the other.

The hallmarks of small businesses – such as flexibility and agility – combined with continued innovation, allow entrepreneurs to respond quickly to changing consumer demands and address niche markets that are too small or specialized for large firms to serve cost-effectively. Further, entrepreneurial firms of all sizes provide much of the innovation that can be incorporated into larger firms’ value chains, and encourage larger firms to stay on the cutting-edge of efficient business operation and production.
Regional economic growth spurred by entrepreneurship is additive. Instead of redistributing existing economic activity by shifting enterprises to one location at the expense of another, entrepreneurial ventures bring entirely new products, services or production methods to market, generating new wealth. Thus, growing and maintaining community prosperity against the backdrop of the dynamic global economy relies upon the creation of a healthy entrepreneurial support environment.

What is more, as existing industries reach maximum output, employment growth is stunted as a result of natural growth limits. Homegrown, wealth-generating ideas add diversity to an economy that can help insulate it from the instability associated with large, globally integrated...
enterprises that operate detached from communities, in addition to providing an outlet for stranded talent that in turn produces quality jobs and increased taxable wealth for communities.

A Jobless Recovery for Established Firms

American companies have shed almost 8 million jobs since 2007 and current signs point to a tenuous recovery. On the surface, it would appear that increased corporate profits, rising stock prices, and increased capital investment bode well for future employment growth. But the dramatic increase in productivity is the most telling statistic of all. It provides the foundation for all the other increases and suggests that employment growth will be more elusive. Firms are using nominal interest rates of 0% and increased income from equity value appreciation to finance long-term capital investment. This investment will continue to improve corporate profitability and efficiency, but it will also reduce the need for additional employment, even after aggregate demand returns. Rather, job creation will be driven by entrepreneurs and entrepreneurial companies.

This means that economic development practitioners need to focus on creating new firms - not relying solely on existing firms for job growth and wealth creation. The increase in firm and talent mobility has created, and will continue to create, challenges for economic development professionals. However, opportunities will be abundant for the creation of new firms to absorb displaced workers.

The remainder of the Handbook examines the phenomenon of entrepreneurship and how economic developers can unlock this force to create sustainable, transformative change within their communities.

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CHAPTER II
Who are the Entrepreneurs?

The discussion of fostering entrepreneurship as an economic development force in a community needs to begin with an understanding of this target market – who are the entrepreneurs? This is a critical first step because different types of entrepreneurs require differentiated services and levels of support, and make different contributions to economic development. The first important distinction is by the type of businesses that they run. The second section examines entrepreneurs by demographics such as age, race, education, immigration and gender, to identify underrepresented groups and understand how to stimulate entrepreneurship across all segments of the population.

Entrepreneurs by Types of Business

Entrepreneurship can take many forms, all of which can add value to the regional economy. The value that entrepreneurs contribute varies based on the economic and cultural environment of a community and the nature of the business. Entrepreneurs can be classified in several ways, depending on their motivation, timeline, venture types, industry and investor perspective. However, whether a business drives wealth creation and employment typically depends on an entrepreneur’s motivation. The literature contains several different typologies for defining entrepreneurs\(^8\); for the purposes of this document, the most useful distinction is that between “lifestyle” and “growth” entrepreneurs.

**Lifestyle Entrepreneurs**

Lifestyle entrepreneurs typically start their own businesses for the lifestyle of self-employment, rather than aspirations to found the next Google. Generally speaking, these are individuals who prefer to “be their own boss” and enjoy the advantages of working for themselves. They may open businesses to provide products or services that they are passionate about or just as a means for employment and income. Examples of lifestyle ventures include most retail and localized service providers such as dry-cleaners or accountants. Typical mom-and-pop stores, chain franchises and independent consultants...
fall into this category as well. It can also include innovative products or services that may not currently be offered in the marketplace.

Lifestyle entrepreneurship is not restricted to a particular sector; rather, it denotes business owners who are not seeking rapid growth. Lifestyle entrepreneurs typically open businesses in areas where there will be a demand for their products and services. This can be areas that are experiencing population growth to drive demand as well as underserved areas for specific products and services. They tend to stay small and traditionally, don’t export their products or services outside the boundaries of their primary market. However, given the ICT advancements discussed earlier, that is rapidly changing now to include global markets, especially for those lifestyle entrepreneurs that conduct a majority of their business online.

Small businesses of this nature make a major contribution to the economy, and should not be discounted because of their individual employment numbers or replicative nature (providing a service or product that already exists, though it may be in a new way or an underserved location). Lifestyle entrepreneurs can contribute to a local economy in the following ways:

- Provide essential services and new amenities to fill unmet demands for the local/regional population
- Drive managerial and operational efficiencies within existing industries that result in reduced prices for consumers
- Create new jobs and provide a path for productive contribution to regional economies through self-employment
- Increase individual incomes and grow community wealth
- Attract revenue from outside the community
- Create vibrant neighborhoods

**Growth Entrepreneurs**

By contrast, growth entrepreneurs start enterprises with the explicit goal of expanding their business to reach maximum market potential. Growth entrepreneurs differ from other small business owners in their motivation by innate curiosity, creativity and/or money, and their application of innovation, whether in process, product or in the provision of services. Growth entrepreneurs take existing ideas and modify them to reach existing or new markets, or develop entirely new ideas for those markets. Innovative entrepreneurship can take place at the initial stages of start-up or within an established business.
Those driven by the need to innovate, such as scientists, may not be interested in starting a business initially. Individuals or firms motivated by growth look to maximize the commercial applications of their idea to the fullest extent. Typically annual returns of 20 percent or more are sought.

It is useful to subdivide growth entrepreneurs into the following three categories, as each type needs a particular kind of support and resources.

- **Start-ups:** Start-ups are businesses where growth and innovation drives the formation of the new venture. Typically, the founder develops and commercializes an idea as the primary purpose for starting the business. Start-ups may or may not have a business plan or management team in place, and can require help with these issues as well as accessing seed capital for prototyping, start-up costs, etc.

- **Second-stage companies:** The Edward Lowe Foundation describes second-stage companies as “those that have grown past the start-up stage but have not grown to maturity.”\(^9\) Innovation in second-stage companies occurs when an existing business, usually young (ages one to five), exploits a new idea that results in transformative change, altering how the business operates, the products and services offered or its methods of production. “They have enough employees to exceed the comfortable control span of one owner/CEO and benefit from adding professional managers, but they do not yet have a full-scale professional management team.”\(^10\)

- **Gazelles or high-impact:** Gazelles, defined earlier in this manual as firms whose profits and employment numbers double over a four-year period, are the basis for nearly all net new employment in the U.S. Such firms often emerge in business-to-business markets (usually deregulated or newly emerging industries) where they can capitalize on niche opportunities. Gazelles are often existing companies that experience a rapid stage of expansion. They are usually small-or medium-sized companies with an average age of 25 years.

Growth entrepreneurs add value to local economies in the following ways:

- Increase productivity levels within existing industries by introducing new operation or

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10 Ibid.
production methods and technologies

- Rapid and significant job and profit generation
- Generate greater firm profits that create wealth and increase a community’s standard of living
- Push regions that have reached the technological frontier, where replicative/lifestyle entrepreneurship can no longer contribute to increased GDP, toward continued economic growth
- Offer unique products or services that capitalize on unmet or unforeseen demands
- Remain nimble enough to quickly respond to changes in the global market
- Attract investment capital from outside the region because of their export-related nature

It is important to note that while not all entrepreneurs start out with expectations for rapid expansion, a business can shift from no growth to high growth if the opportunities arise. In many cases of rapid expansion, the innovation that sparks firm growth occurs decades into a firm’s existence. The example of Jelly Belly illustrates this concept. For years, the business was a small, family-owned candy maker, but the succession to leadership of a new generation – with revamped management strategies and a partnership with a novel candy chemist – sparked a major overhaul. Ultimately, the new products and processes that resulted from this transformation were the foundation of a worldwide expansion (for the complete case study, please refer to Chapter VI). This example illustrates that growth and innovation can occur from what appears to be an unlikely source.

Understanding the different needs of lifestyle and growth entrepreneurs will enable economic development professionals to work toward providing the different resources necessary for promoting entrepreneurship. All entrepreneurs need networking opportunities, access to capital, supportive tax policies, the ability to access human and physical resources, and legal frameworks that reduce barriers to entry. While these are essentially the same needs that all businesses have, there are distinct differences between the types of public policies required by lifestyle and growth entrepreneurs. Differences in management skills; accessibility and amount of start-up and working capital; real estate needs; and access to markets all represent areas that economic developers can work on to support all types of entrepreneurship.

It is equally important for economic developers to be cognizant of the fact that not all businesses in a community will fit into these
distinct categories. Assistance to these businesses will be varied by type of business, industry sectors, location and the specific needs that they have at a particular point in time.

**Entrepreneurs by Demographics**

Demographic analyses show that certain population groups have higher likelihoods of starting businesses than others. Below are some key observations about overall entrepreneurial activity in the country. Please note that these represent the overall level of business creation as opposed to business ownership in the country.

- While men are more likely than women to start a new business, according to the Global Entrepreneurship Monitor's latest research, the rate of increase in entrepreneurship is much higher among women (22 percent increase between 2007 and 2008). Entrepreneurship rates among men actually decreased slightly (9 percent) during the same time period.

- Immigrant populations are almost twice as likely to start a business as native-born in the U.S. (on an average, 510 out of 100,000 immigrant adults as compared to 300 out of 100,000 native-born adults created new businesses each month or 0.51 percent compared to 0.30 percent).

- Business creation rates are typically lowest among the youngest age group (20-34 years). It is the highest in the 34-44 age group.

- The construction industry continues to have the highest number of business start-ups as compared to all other industries, followed by services.

The discussion below provides additional information about entrepreneurship by these demographic characteristics.

**Age**

Entrepreneurs tend to be middle-aged (with an average and median age of 40 years) when they start their first company. The age group
Chapter II: Who are the entrepreneurs?

The age group of 55-64 has had the highest rate of entrepreneurial activity for the past decade, while the age group of 20-34 has had the lowest rate (the publicity young entrepreneurs received through the dot-com boom gave the perception that this age group has high rates of dynamic entrepreneurs, especially in high-tech companies). In fact, a Kauffman study found that there were twice as many entrepreneurs who started technology companies in their fifties than those who started technology companies in their early twenties. The graph above shows entrepreneurial activity by age.

**Gender**

Entrepreneurs are more likely to be male than female. However, recent survey data show the rate of entrepreneurship activity decreasing for men and increasing for women (from 2007 to 2008, rate of entrepreneurship among men decreased from 12 percent to 9.8 percent, while it increased for women from 6.1 percent to 7.5 percent), demonstrating that this gap may be narrowing. Reasons for differences in entrepreneurship rates between men and women may be due to access to finance, differences in credit scores, and other reasons. Other key differences between male and female entrepreneurs include:

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Men and women start different types of businesses. Women are nearly twice as likely to start a consumer-oriented business as men, whereas men are three times as likely to start businesses in high-technology sectors as women.\textsuperscript{19} Men and women are equally likely to establish businesses in the services sector. Women entrepreneurs are also more often represented in retail and less represented in construction.\textsuperscript{20} 

Men and women entrepreneurs are about the same average age (44 years).\textsuperscript{21} 

In terms of educational attainment, women are more likely to have attended college (41.7 percent vs. 34.2 percent), though men are more likely to have graduated (31.6 percent vs. 27.9 percent)\textsuperscript{22}. 

Men tend to be more successful than women in terms of assets and revenues, profitability, employment, and survival rates.\textsuperscript{23} 

The graphic above shows entrepreneurial activity for men and women between 1996 and 2009.

**Race/Ethnicity**

Wide variations exist in entrepreneurship by race. Latinos are almost twice as likely as African Americans to start a new business, according to the 2009 Kauffman Index for

\textsuperscript{19} ibid
\textsuperscript{21} ibid
\textsuperscript{22} ibid
\textsuperscript{23} ibid
Entrepreneurial Activity (0.46 percent vs. 0.27 percent). Whites and Asians fall somewhere in between (0.33 percent and 0.31 percent respectively). Entrepreneurial activity among African Americans had the highest rate of increase in 2009 at 22 percent.

**Immigration**

Generally speaking, in the U.S., immigrants are more likely to open a business than native-born populations, with the gap between the two groups widening in recent years (see the chart above for entrepreneurial activity by birthplace). Other noteworthy statistics about immigrant entrepreneurs are:

- Immigrants play a large role in creating new enterprises in America, particularly in the technology and engineering sector. Skilled immigrants founded 25 percent of all technology and engineering startups in the United States from 1995 to 2005.  

- These immigrants often came to the U.S. to study, receiving higher-education degrees in STEM-related disciplines and then deciding to stay in the country, founding companies an average of 13 years after their arrival in the U.S.

**Education**

Entrepreneurs are generally well educated. In one Kauffman study, 95 percent of the

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respondents had earned bachelor's degrees, with 47 percent earning more advanced degrees.\textsuperscript{26} Tech entrepreneurs with master's degrees, particularly MBAs, were the quickest to start businesses, followed closely by those with bachelor's degrees, and further by those with PhDs.

The graph above shows that while individuals with only high-school degrees have had high rates of entrepreneurship in the past, there is a rise in the level of entrepreneurship among highly educated individuals in recent years. This could be due to the recession, in which more educated workers are starting their own businesses after being laid off or unable to enter the labor market after graduating.\textsuperscript{27}

**Family Life and Marital Status**

Most entrepreneurs have a family. Nearly 70 percent of respondents from a 2009 Kauffman study were married when they started their first business, and 5.2 percent were divorced, separated, or widowed.\textsuperscript{28} In addition, nearly 60 percent had at least one child and 43.5 percent had two or more children when they began their first business.


Historically, most entrepreneurs come from middle-class backgrounds (71.5 percent). Socio-economic backgrounds, as defined by sociologist Dennis Gilbert, are primarily based on level of education and associated earnings. Middle-class is defined as those with professional education, often even graduate degrees. Those from upper-lower-class backgrounds comprise 21.8 percent of entrepreneurs; this group also was the most interested in starting businesses, with 25 percent “extremely interested” versus an average of 18.5 percent across all groups.

The graph above shows that entrepreneurs in the highest one-third income bracket in the United States had the highest percentage of entrepreneurial activity, by a large margin, from 2003 to 2005. However, in 2006, the entrepreneurial activity for the three income brackets began to converge, with this pattern continuing through 2008.

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29 ibid
31 Categories include lower-lower class, upper-lower class, lower-middle class, upper-middle class, lower-upper class and upper-upper class.
While different types of entrepreneurs need different resources, all require an entrepreneur-friendly environment and a supportive entrepreneurial culture to start up and grow. Thus, for entrepreneurs to emerge as a catalyzing economic force, economic developers must nurture the conditions that foster an entrepreneurial ecosystem. Proper legal, regulatory, financial and human capital assets, and the networks that connect them, are essential ingredients for a fertile entrepreneurial environment. By understanding these conditions that create a positive climate for entrepreneurs, why they are important to entrepreneurship and how they function and interrelate, economic developers can use this framework to evaluate their communities’ existing entrepreneurial capacity and guide actions to support increased economic activity. The purpose of this chapter is to lay out the infrastructure of an entrepreneurial environment. Additional materials in the handbook will provide guidance on how to create this entrepreneurial environment in your community.

**Structures: The Physical and Regulatory Infrastructure for Entrepreneurship**

External structures, such as political, financial or legal systems as well as physical infrastructure, anchoring institutions and cultural norms facilitate economic activity and directly influence an entrepreneur’s ease of operation and chances for success. These forces set the tone for commercial activity by determining the rules of play within a community. Structural systems encourage entrepreneurship by reducing the barriers to entry and incentivizing innovation. An economic environment that effectively lowers the cost of doing business and encourages those who fail to start over will foster more entrepreneurial activity. Notably, the federal, state and local government all play essential roles creating the entrepreneurial environment.

At the federal level, the U.S. government has developed sophisticated systems to support budding entrepreneurs by making it easy (and relatively inexpensive) to start, fund, grow and sell a company. In one afternoon, an American
citizen can incorporate a new business, obtain all necessary federal documentation from the IRS and enter into commercial transactions. Specific activities of the federal government that enable entrepreneurship include:

- **Anti-trust legislation** prevents large companies from monopolizing a market, artificially fixing prices or engaging in exclusive arrangements that stymie competition.
- **Liberal bankruptcy rules** minimize the risks associated with failure by forgiving debt and providing individuals the chance to start afresh.
- **Intellectual property protections**, such as patent laws, give an inventors proprietary rights over the use of, and profits generated by, their innovations.
- **Open trade and tariff-free policies** provide equal opportunities for businesses of all sizes to enter the market and operate at their optimal level.
- **Flexible labor laws** enable businesses to hire employees without fear that they will be unable to release employees if no longer needed.

Many state and local policies seek to further reduce entry barriers for entrepreneurs. By lowering the costs of doing business, particularly during the startup phase, more individuals are likely to pursue entrepreneurship as a viable employment activity. At the state and local level, specific actions that promote entrepreneurship include:

- **Pro-business tax structure** that provides deductions, credits or lower rates to help new and promising companies get off the ground.
- **Streamlined, simple permitting processes** that enable businesses to obtain, understand and file all necessary documentation in a single trip or using online submissions.
- **Reasonable, transparent regulations** that ease general business activities, such as applying for zoning variances, approvals from city officials and meeting licensure requirements.
- **Statewide unemployment benefits** that provide a social safety net to cushion the blow from failed ventures.
- **Physical infrastructure investments**, maintenance and upgrades that provide the capacity for modern-day business activities.

In addition to political and legal structures, financial institutions are key to supporting (or inhibiting) entrepreneurial activity. Access to the right types and amounts of capital, at the right times, directly relates to the successful

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operation of a business. It is commonly believed that entrepreneurs seek and receive a majority of their initial capital as equity from venture capitalists, angel investors or friends and family. In reality, individual resources, such as savings or personal debt from bank loans and credit cards finance the majority of new business ventures. After startup, new firms often reinvest initial profits to fund growth until reaching a point where they can leverage a successful track record for external equity investments needed to fuel expansion. This reality further supports the need for institutions to reduce barriers to entry and to incentivize innovation. Financing needs and strategies for different types of entrepreneurs will be examined in later sections.

Talent is essential to building an entrepreneurial ecosystem because it offers the following assets: 1) a pool of potential entrepreneurs; 2) human capital to provide skills to entrepreneurial companies; and 3) a source for ideas and innovations that provides the foundation of an entrepreneurial climate.

Communities strengthen their talent pool by:

- Providing a welcoming environment for all kinds of people (such as those of different racial, ethnic, religious, social and national backgrounds)
- Integrating entrepreneurship training into secondary and post-secondary education systems
- Creating strong elementary and secondary schools, especially (but not limited to) STEM disciplines (science, technology, engineering and math)
- Using post-secondary assets to attract and retain students
- Recruiting skilled workers
- Finding innovative ways to deepen the existing talent base
- Building local amenities to attract and retain talent
- Building social networks to embed talent in the social, economic and political life of the community

Talent: Human Capital Assets for Entrepreneurship

“Talent” describes skilled individuals who possess technical, managerial and innovative capabilities and knowledge. It primarily includes, but is not limited to, individuals who have attained higher levels of education. It is, a “key intermediate variable in attracting high-technology industries and generating higher regional incomes.”

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An entrepreneurial environment is one that invests in, and nurtures, its human capital assets, as they are the source of entrepreneurs and the engines of entrepreneurial firms.

**Networks: The Relationships That Bring People and Resources Together**

Networks are the formal and informal links that exist between individuals, firms and institutions. Partnerships between individuals and firms, among similar firms or across industries, provide access to peers and peer-based learning, financial resources for start-ups, growth and operational support, knowledge, services and other business resources that leads to more innovation. Networks form at a variety of levels between key players of all sizes and functions.

Entrepreneurial communities possess the following types of networks.

- **Peer networks**, the relationships that form between individuals, the base level for brainstorming, idea generation, everyday business advice, and overall support. Entrepreneurs tend to learn best from other entrepreneurs.

- **Conduits to commercialization** connect entrepreneurs with new ideas to institutions and resources that can bring those innovations to market. Places such as universities, federal labs, R&D centers provide an environment for product refinement while also drawing essential resources needed for commercialization such as finance, intellectual property services or other technical assistance.

- **Supply and service chains** are regularly used by businesses as they seek resources, services (e.g., accounting, legal) and professional assistance externally. A dense network of cooperating businesses enables each firm to focus on what it does best and draws needed resources from complementary sources.

- **Public sector support** comes from the ease and ability of entrepreneurs to utilize public resources such as SBA loans, SBIR grants or SCORE consultants, in addition to opportunities for government contracting work and public-private partnerships.

- **Financial resources** for entrepreneurs can come from a variety of sources, depending on the nature and size of the venture. Starting with personal savings, debt and
bootstrapping, entrepreneurs can access networks such as angel investors, venture capital and friends and family, for additional capital needs.

The quality of a network can be measured in its ability to connect resources across industries and people. Interconnected networks can make a local community less susceptible to volatility in the global economy. A community with dense networks that support entrepreneurship will be better equipped to respond to the constant, unpredictable churn of business creation and closings that occur from rapid innovation and globalization.

In fact, most entrepreneurship support organizations focus on building these networks in their communities because they are so essential to supporting both the success of individual entrepreneurs and providing the foundation of a dynamic entrepreneurial environment. Such networks are dynamic, flexible, and open to new people and ideas. They provide supportive resources and services to start-ups and accept failure as an unfortunate but not stigmatizing

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**Importance of Entrepreneurial Culture**

A supportive entrepreneurial culture is equally, if not more, important to a community’s vitality as a robust entrepreneurship ecosystem. As mentioned in an article by the Edward Lowe Foundation, *When building entrepreneurial economies, culture rules*, Angeline Godwin, President of the Area Development Partnership in Hattiesburg, Mississippi, says “Culture is the last mile. It’s the most important part of an entrepreneurial economy – and the hardest to achieve.” The essential ingredients of a strong entrepreneurial culture are:

- Diversity of experiences and opportunities, including education, arts, recreation, restaurants and retail;
- Recognition and celebration of the value of entrepreneurs to the community and its overall prosperity through recognition dinners, halls of fame and networking opportunities, among others; and
- Acceptance of failure not just a celebration of the achievements, leading to more risk-tolerant communities that embrace change.

event. Later, the Handbook will discuss how to create and sustain these types of networks.

**Putting It All Together**

The conditions that foster entrepreneurship - talent, structure and networks - do not operate in isolation. These community assets operate most effectively when activity is coordinated among all three. The diagram above illustrates the interconnected nature of these conditions.

The role of the economic developer is to ensure that all the pieces are in place and to serve as the convener who creates and connects the resources needed throughout all elements of the entrepreneurial environment. By increasing the capacity for people, businesses and institutions to engage in entrepreneurship, economic developers can unlock the potential within their communities for sustained economic growth.
A unique combination of structures, talent and networks is needed for creating and nurturing an entrepreneurial environment and enduring culture, yet communities must work within the constraints that their existing assets and resources present. What is right for one community is not necessarily the correct strategy for another. Consequently, fostering an entrepreneurial environment adjusts to each community’s context and will utilize elements embodied in myriad players and programs. For example, a university can be an anchoring institution (i.e., structure), supplier of skilled workforce (i.e., talent) and a connector of various resources (i.e., networks) in a community. Similarly, a chamber of commerce serves both as a network of businesses and individuals and as an advocate for improved political and legal structures. In fact, most programs and players in any community can interact to provide the connections that foster entrepreneurship, but alignment and coordination of these resources are essential.

This chapter focuses on the programs and players that are essential to formalizing the conditions of an entrepreneurial environment. Understanding their core offerings and connections enables better planning and leveraging of existing assets and resources in the community. Broadly speaking, the core players and programs of an entrepreneurial ecosystem are:

- Finance
- Education
- Innovation
- Knowledge-sharing

1. Finance

A universal need for entrepreneurs is access to capital and supportive finance programs. The issue is not just the availability of funds, but access to the right types of funding to meet their needs throughout the stages of entrepreneurship. Economic developers must first understand the financing needs of entrepreneurs in order to help them access what they need. Two main differences should be considered:

- The same firm may need different types of financing at different stages of development.
- Different types of entrepreneurial ventures need different financing options.
**Business Stages**

The financing needs of an entrepreneurial firm follow closely the lifecycle of a business:
- Pre-start-up and start up (e.g. pre-seed and seed capital)
- Early stage
- Expansion
- Maturity

The distinction between each of these stages – when does a business graduate from one stage and enter the next stage – is not always clear, especially when that evolution is taking place. A number of providers can provide access to capital under each of these categories. The mix of providers will vary by community. Before we discuss the financing needs at each stage of development, let’s discuss the types of finance and providers.

**Types of Finance**

In order to unpack these complex needs, it is important to start with the basics: debt and equity financing. Debt financing refers to capital loans that are repaid with interest within a specified time period based on a pre-established schedule. Equity financing refers to capital investment in which investors assume partial ownership of the venture and does not require the business owner to repay the debt. Investors are paid off from the appreciation in the value of their shares in the venture over time. The usefulness of each instrument depends on the needs of the business/entrepreneur, the stage of development (e.g., start-up vs. second stage), the financial situation of the business, and the business environment in the community. We will elaborate on this later.

In addition to multiple types of capital, there are myriad finance providers. Friends & family, and the entrepreneur’s personal wealth, are probably the most common sources of capital for a start-up business. These resources can be supplemented with funds from a mix of following providers:

1. **Banks** provide debt financing through loans and microloans based on the creditworthiness of the borrower. Following the enactment of the Community Reinvestment Act (CRA), banks increased the availability and accessibility of capital in distressed communities and the entrepreneurs within them. Banks are also important partners for SBA lending.

2. **Community Development Finance Institutions (CDFIs)** are financial intermediaries that promote economic
development in economically depressed areas through investments in small businesses or community groups. Microloans, unconventional loan collateral, New Market Tax Credits, financial training and education are examples of how CDFIs assist people who have not been able to access more standard funding.

3. Some Community Development Corporations (CDCs) also provide loans and grants to small businesses in distressed communities, in addition to their main focus on affordable housing. Scaled-up operations in business lending typically lead to the creation of a separate CDFI.

4. Microfinance Organizations are financial intermediaries that work with capital from banks and foundations to provide microloans to small businesses and entrepreneurs to meet gap funding needs.

5. A Bank CDC is a multi-bank consortium in which several banks in a community or region participate to provide both equity and debt financing to small businesses.

6. Venture Capital is equity financing from individuals, networks of individuals, government-backed sources, or banks and typically assume a management role in the businesses that they invest in. Venture capitalists (VCs) typically focus on high-potential businesses, which excludes a large pool of entrepreneurs. VCs tend to be located disproportionately in the Silicon Valley region and New England, where they can be close to the companies they fund. However, there are signs of change on the horizon. According to the National Venture Capital Association, several regions have experienced fast growth in VC funding over the past 10 years, including Pittsburgh, New Mexico, Seattle, Washington, D.C., and Los Angeles. VCs also tend to fund certain stages of companies (see Figure 7) and not all stages proportionately; investment in expansion and later-stage companies is far higher than startups or early-stage companies.

7. Angel Investors or Angel Networks are high-net-worth individuals or network of individuals that act as anonymous equity investors in firms. Angels typically invest locally in industries or specific types of businesses that they are familiar with. Although their investments are smaller, angels invest as much if not more than VCs in any given year. This translates into angels investing in many more businesses than VCs.
Therefore, economic developers should balance the amount of time and resources spent in cultivating angel investors and VCs as key sources of growth capital for their entrepreneurs.

8. **Non-financial institutions**, such as universities, are establishing debt and equity funding mechanisms to increase the amount of capital available locally to assist entrepreneurs.

9. **Government and government-backed providers** round out the field of capital providers. States and localities may offer debt or equity funds or other programs to support their entrepreneurship development goals. Pennsylvania’s Ben Franklin Technology Partners program is one of the oldest providers of various types of equity to support regional technology entrepreneurs. The federal government, through the SBA and other agencies, extends debt and equity capital availability. While SBA loans are often offered through banks or CDFIs, small business investment corporations (SBICs) also result from federal efforts to extend equity.

**Financial Assistance for Entrepreneurship Growth**

As mentioned above, the financial needs of businesses vary at different stages of development, as do the providers that are available to assist businesses at each stage. Economic development organizations play an important role by providing access to gap financing, especially to business owners who...
are unable to access traditional sources of funding. Gap financing is used literally to “fill the gap” between funds gathered through traditional funding streams and the needs of the entrepreneur. It generally includes alternative sources of financing such as small loans, grants or both. Expanding alternative sources of financing for entrepreneurs helps to create the connections for an entrepreneurial environment.

EDOs can also expand existing networks of service providers by providing support services such as assistance with business plan development, feasibility analyses, marketing, and mentoring and networking opportunities. It is important that EDOs prioritize filling gaps in the network, rather than competing with existing providers of finance and support services.

**Pre-Start-up and Start-up**

This is typically the concept stage for an entrepreneur leading up to the establishment of a business. There may not be a “business” per se during most of this stage. Concept development is the main business activity arising from the identification of a need or gap in the marketplace and an idea or a possible solution to address that need. Capital during this stage is primarily needed for fully developing the concept into a marketable product or service, prototype development or pilot testing, and formal registration of a business. This is especially important if a prototype must be developed to test its feasibility before the entrepreneur can access a bigger tranche of funding to build the company. A good example would be a concept for a new medical device (see the Ergonurse case in the case studies chapter for an example of a prototype scenario.) Thus, finding resources to develop a concept into a reality is a crucial process from which many ideas never see the light of the day.

Typically, entrepreneurs use personal resources to fund this stage, including personal savings, borrowing from friends and family, and credit card debt. However, personal resources may not be sufficient to cover costs for fully developing a concept and establishing a business, especially in high-tech industries. Many entrepreneurs may not be able to obtain debt financing at this stage without sufficient collateral, an established management team and a business plan. Equity financing can also be difficult to obtain without further developing concepts and prototypes. Furthermore, the needs are often too small to warrant full-fledged debt or equity financing. Therefore, gap financing ranging from $50,000 to $200,000 is needed to cover these small but critical financing needs. Organizations that provide funding at this stage include:
• Pre-seed and seed capital funds, to further develop concepts and prototypes;
• Microfinance organizations, for gap funding through revolving loan funds (RLFs\textsuperscript{35}) for small businesses and entrepreneurs;
• Angel investors or angel networks;
• Incubators; and

- Universities, which may provide resources (e.g., students, faculty, laboratories) to help with prototype development or testing.

**Early Stage**

The next stage for a business is gaining a foothold in the industry, which – with success – is followed by a steady growth phase. The financial needs of the business change dramatically during this stage. While the business is still young, it evolves from negative cash flows to profit, hiring of staff, and a step toward the full commercialization of products and services down the line.

The main financial need for entrepreneurs and small businesses is operational expenses, such as purchase of equipment and raw materials, salaries and employee benefits, and business marketing. Debt and equity financing both are options, though the choice depends on the exact needs of the business. For example, venture capital and angel investment might be the first choice for a technology entrepreneur who lacks collateral for debt financing, or wants access to high-level management skills and connections.

\textsuperscript{35} A revolving loan fund (RLF) is a gap financing measure primarily used for development and expansion of small businesses. It is a self-replenishing pool of money, utilizing interest and principal payments on old loans to issue new ones. Often the RLF is a bridge between the amount the borrower can obtain on the private market and the amount needed to start or sustain a business. For further information, please see Council of Development Finance Agencies (CDFA) website: http://www.cdfa.net/cdfa/cdfaweb.nsf/pages/rlffactsheet.html.
VCs and angels also provide much-needed business management expertise at this stage, along with other forms of technical assistance. Companies with high up-front costs that do not expect to make a profit for several years, such as a biotech company conducting medical trials, would typically need equity, which is also known as “patient capital” because it does not require the company to pay the investment back immediately. Debt requires a payback schedule, usually starting within a month of the start of the loan. Some debt is placed in companies in the form of convertible notes where the lender can convert the debt to equity. On the other hand, a lifestyle entrepreneur might prefer debt financing, in order to maintain full control of the business. Thus, management of the business is an important consideration for most finance providers at this stage.

Funding for this stage is provided by:
- Banks
- CDFIs and CDCs
- Bank CDCs
- Venture capitalists
- Angel investors
- Other institutional investors

**Expansion**

Many consider expansion or growth to be an inevitable progression from the start-up phase of a business. While expansion presents opportunities for greater financial gains for the owners and employees, it also presents logistical challenges in scaling-up operations, both financially and managerially. However, the company is now better established and has the capacity to deal with such challenges.

Once the company has grown beyond the early stage, there are two ways forward. The company could continue to grow to become a “second-stage” company, or choose to maintain a steady level of operations and stay a “lifestyle” business, as discussed above. The needs in either case vary, presenting different issues for economic development professionals who are trying to support them.

For lifestyle companies, financial needs are not about growth but about survival and stability. Lifestyle businesses, however, still need to innovate and improve business processes, evolve their product line or services, and keep track of needs and gaps in the marketplace simply to maintain operations. Financial needs might include upgrading computer systems, accelerating marketing in a tough economy, capital investments in facility maintenance or facility upgrades (new heating, or a new kitchen for a restaurant). Debt financing is typically the financing of choice, especially if the business is not entering a growth phase.
On the other hand, second-stage businesses may be concerned with fast growth and scaling-up operations including “refining core strategy, adapting to industry changes, expanding markets, building a management team, and embracing new leadership roles”. Financial considerations are related to hiring additional staff and investing in additional equipment to cater to greater demand for products and services. These may require the business owner(s) to retain a professional management team to manage expanded operations, thereby relinquishing some control over day-to-day business operations. Most financial service providers are able to provide funding for this stage of a business, be it debt or equity financing. The provider of choice will depend on the needs of the business. Providers include:

- Banks
- Venture capitalists
- Angel investors
- Government and government-backed providers

Companies in growth phase can also get financing from vendors and strategic partners.

**Maturity**

Mature businesses typically are able to handle most financial challenges through private means. Their financial needs can vary, from maintaining operations (as in lifestyle businesses, discussed above) to gearing up for a growth/expansion phase. The financial needs of gazelles would be very similar to second-stage companies – gearing up for a sustained growth phase. Yet their proven track record of multiple years in business, plus significant assets as collateral would be sufficient for most financiers to provide them with funding.

VCs and angel investors also are engaged at this stage. For entrepreneurs that accessed such funds during the early or expansion stages, VCs would be looking to divest either through initial public offerings (IPOs) or sale to other interested businesses. Merger and acquisition (M&A) activity is also common among high-growth businesses during this stage.

In summary, providers offer a mix of financial services and products to different types of businesses at different stages of growth. The tables below illustrate the services that financial service providers offer by stage and type of business.
### Table 1: Financial Providers by Type of Business

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<th>Lifestyle</th>
<th>Start-ups</th>
<th>Second Stage</th>
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### Table 2: Financial Providers by Stage of Development

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2. Education

Education is the building block of a strong entrepreneurship culture. In all communities, secondary and post-secondary education institutions are real or potential allies in both building up a culture of entrepreneurship and supporting the creation and success of entrepreneurial companies. Educating students on the benefits and processes of entrepreneurship helps them to become aware of both their potential as entrepreneurs and of the tools needed to successfully start their own businesses, which can effectively lower the unemployment rate, increase job creation, diversify the economy, and reduce the number of small business failures.

Although the economic development role in entrepreneurship education is still emerging, economic developers can play key roles as:
1. Advocates for entrepreneurship education in local schools;
2. Catalysts to engage the business community in the education process; and
3. Supporters of entrepreneurship education programs through grant development.

Secondary Education

To build a strong entrepreneurial culture, the engagement of the secondary school system is critical. From an economic development point of view, there are three important elements:
1) Ensuring that students attain sufficient skills in science, technology, engineering and math (STEM);
2) Exposing students to the opportunities and skills needed to be an entrepreneur; and
3) Providing resources that help students realize their innovation and creative potential.

Key players include:
- Middle/junior high schools;
- High schools;
- Vocational schools;
- Alternative high schools;
- Charter schools; and
- Extracurricular programs/nonprofits such as science and math clubs, Distributive Education Clubs of America, Incorporated (DECA Inc.), Boys & Girls Clubs, Junior Achievement, etc.

Science, Technology, Engineering and Math (STEM)

While a good education is necessary for building a strong talent pool, creating the next wave of technology managers, research scientists, and environmental engineers starts
with robust STEM education. Good STEM programs start in elementary school and continue through middle and high schools. These fields are the foundation of the technological innovation that has been the hallmark of our nation’s competitiveness. As an example, Navajo Elementary School in Scottsdale, Arizona, integrates STEM programs into the education curriculum from kindergarten in order to ensure that all students learn critical tools for the future. Technology is a heavy emphasis in the program, with an introduction to computer programming course taught to kindergarteners and software, three-dimensional animation, and robotics taught just a few years later.

Understanding and advocating for strong STEM curricula in local schools is an important and growing economic development function for strengthening the entrepreneurship potential of a community. For example, Juneau Economic Development Council (JEDC) in Juneau, Alaska, has actively taken a role in advocating for STEM programs in local school districts. JEDC markets robotics competitions and summer science camps for kids, as well as professional development workshops for teachers of specialized STEM programs.

**Entrepreneurial Skills**

Ensuring there are sufficient youth entrepreneurship initiatives throughout the secondary school system is another critical component of building entrepreneurial communities. Youth entrepreneurship efforts come in many forms, including class work, Junior Achievement, internships, financial planning education and much more.

Various programs led by non-profit organizations are held in secondary schools throughout the country to expose students to entrepreneurship opportunities and skills, and to build an entrepreneurial culture. Below are some of the more common programs available throughout the country.

- DECA is a program in high schools nationwide that prepares students for entrepreneurial, marketing, and management careers.37
- MicroSociety is a program that shows students how to manage real economic situations. Elementary and middle school children are given “micro” currency to invest in or borrow for entrepreneurial endeavors.38
- The U.S. Small Business Administration, along with the organization Junior Achievement, have created a program

called Mind Your Own Business that educates teen entrepreneurs on starting their own businesses, walking them through the steps of the process and connecting them to resources.\footnote{Mind Your Own Business. Retrieved from http://www.mindyourownbiz.org}


\section*{Innovation and Creativity}

Creativity and innovation are key traits of entrepreneurs. Entrepreneurs need these skills for navigating the changing marketplace, filling gaps and responding to quick changes in consumer demands and business functions, seeing and acting on new ideas and opportunities. Schools that encourage creative thinking, rather than simply memorizing facts and passing standardized tests, are helping prepare students for entrepreneurial roles.

According to the Partnership for 21st Century Skills, a national organization that advocates for improved workplace readiness skills in students, creativity and innovation skills include:

- Demonstrating originality and inventiveness in work;
- Developing, implementing and communicating new ideas to others;
- Being open and responsive to new and diverse perspectives; and

The Rothman Institute of Entrepreneurial Studies at Fairleigh Dickinson University has created an online creativity and innovation program.\footnote{Fairleigh Dickinson University. Rothman Institute of Entrepreneurial Studies. Retrieved from http://view.fdu.edu/default.aspx?id=932} The program hosts the Discover Business Teen Camp program for high school students each summer to teach innovation and creativity, linking those skills to entrepreneurship in order to better prepare teens for academic and professional careers.\footnote{Fairleigh Dickinson University. Discover Business Teen Camp. Retrieved from http://view.fdu.edu/default.aspx?id=1259}

\begin{flushright}
EntrepreneurEDU.org is a tool used by high schools to help students find an entrepreneurial higher-education program. It provides detailed information on unique and model programs for students wishing to pursue an entrepreneurship career path. For additional information, please visit, www.entrepreneuredu.org
\end{flushright}
In another program, Students for the Advancement of Global Entrepreneurship (SAGE), university students and community members assist high school students in developing, presenting, and implementing innovative business ideas that benefit their school or local community. Through the program, secondary school students learn innovation and creativity, as well as financial, economic, and entrepreneurial skills.

Economic developers should not only advocate for these types of educational programs but also take an active role in creating them. For example, the Kentucky Science and Technology Corporation (KSTC) created a program in 1999 called the entreSchools Initiative, which sought to teach creative problem-solving to secondary school students of all ages and assist them in implementing innovative entrepreneurial endeavors. The initiative even included an EdVentures Fund, “an early stage venture fund to stimulate high-speed innovation in the education enterprise that can truly transform learning and operates like a private risk-capital fund.” However, it became increasingly difficult for KSTC to attract funding for the program due to the economic downturn. The last funding year was 2007, which shows the vulnerability of entrepreneurial education programs to economic conditions.

Creating an Entrepreneurship Education Program

When creating an entrepreneurship education program, two key resources include the Council for Economic Education’s (CEE) standards and benchmarks (http://www.councilforeconed.org) and the Consortium for Entrepreneurship Education’s toolkit, National Content Standards for Entrepreneurship Education (http://www.entre-ed.org/Standards_Toolkit). These programs seek to ensure that youth and adults have the skills needed to succeed as entrepreneurs and emphasize the role of entrepreneurs as innovators.

Post-Secondary Education

Post-secondary education institutions – universities, community colleges, vocational schools and others – also play an essential role in building an entrepreneurial culture and educating entrepreneurs. Economic developers need to understand what assets are available in their communities and work with these...
players to address any gaps. Critical functions of these players are detailed below.

Courses, Certificates and Degrees
Post-secondary institutions deliver a host of education services that support entrepreneurship. They can offer individual courses in business schools, engineering departments, medical schools, and other relevant or interested departments, such as those provided by Ball State University, noted in the text box below.

In addition to courses, many universities have started to offer entrepreneurship degrees or certificates. In fact, entrepreneurship is one of the fastest-growing undergraduate degrees, up from 104 formal programs in 1975 to more than 500 in 2006. According to the Princeton Review, collegiate entrepreneurship programs have similar coursework to many existing business programs, including financial management, marketing and accounting, with particular emphasis on classes on the global economy, entrepreneurial decision-making and emerging technologies and software applications.

A program at the California State University San Bernardino, the Integrated Technology Transfer Network (ITTN), provides training and resources to help minority scientists develop innovative ideas into entrepreneurial ventures. The program is very competitive, and the limited number of individuals selected receives fellowships to cover all costs. The University of Texas at Dallas offers a Masters of Entrepreneurship degree program in its School of Management. They also have a university-wide Institute for Innovation & Entrepreneurship that addresses the training needs of faculty, students and entrepreneurs in the region.

Professional Training
In addition to student-centered courses and programs, post-secondary institutions also develop and deliver tailored, periodic or

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Entrepreneurship Courses, Ball State University

A New Venture Creation course requires students to present a business plan to an expert panel as part of earning their B.A..

An Entrepreneurial Consulting course pairs student teams with local small businesses. Student consultants help the business client with challenges ranging from accounting to marketing to IT.

For additional information, visit www.bsu.edu.

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The John Pappajohn Entrepreneurial Center (JPEC) at the University of Iowa

JPEC, founded in 1996 as a partnership among the Henry B. Tippie College of Business, the College of Engineering, the College of Liberal Arts and Sciences and University of Iowa Health Sciences, promotes entrepreneurship within the school and across the greater community. Academically, the center manages three certificate programs offered for undergraduate students, in addition to providing extracurricular learning activities and resources for obtaining business-oriented internships and scholarships. JPEC also works extensively with the Iowa business community. The center offers lectures, seminars and workshops; FastTrac training for aspiring entrepreneurs, a curriculum developed and offered by the Ewing Marion Kauffman Foundation that helps existing and aspiring entrepreneurs in non-academic environments; an extensive network of community and business partnerships; and a nationally recognized research park. JPEC sponsors numerous competitions throughout the year for students, faculty and community members and offers convertible debt financing through the Wellmark Venture Capital Fund.

For additional information, visit www.iowajpec.org.

regular entrepreneurship workshops, forums and seminars to students, entrepreneurs, the community and youth. For example, Carnegie Mellon University in Pittsburgh hosts a one-day “Invention to Venture” workshop for students interested in learning what it takes to start a technology venture. As another example, the Small Business Development Center (SBDC) hosted by Shasta Community College and College of the Siskiyous in California offers a Youth Entrepreneurship Program that delivers one-on-one resources, training and seminars for young people ages 14 to 27, including an annual “elevator competition” which involves selling a business idea to an investor in the time it takes to ride an elevator.

In addition to class work, post-secondary institutions also provide ways to connect students to real-world training. One method for doing this is through internships and research opportunities with faculty, employers and entrepreneurs in the community.

A third training area includes business plan activities. Post-secondary institutions can host business plan competitions, which can be organized within a university or other post-secondary school, as an intercollegiate event or open to the community. Competitions provide hands-on training in business planning
and are another method used to excite, incent and educate students about launching a new enterprise. Moreover, they sometimes award winners the start-up capital to launch the business, as well as the attention of other investors. Another variant of this method is the use of business plan teams that compete nationally and internationally. For example, the Rice University business plan team, composed of students from engineering and business, won the Bangkok Business Challenge hosted by the Sasin Business School at Chulalongkorn University.

Engaging with the Community

Post-secondary education institutions also are emerging as important providers of education and knowledge services to would-be entrepreneurs. Creating an “entrepreneurship center” that connects students and community entrepreneurs with resources from within the school and across the greater business community is an emerging phenomenon at both universities and community colleges. These centers provide networks, mentors, consulting services, seminars and workshops, and sometimes even access to finance.

3. Innovation

Let’s be clear – there is a difference between innovation and invention. “Invention is the first occurrence of an idea for a new product or process while innovation is the first attempt to carry it out into practice.”48 Innovation, promoted through research and development activities, provides the critical intellectual fodder for the creation of new technologies, products, services, and processes; it is the raison d’être of a new entrepreneurial endeavor. The ability of a community to facilitate the move of an idea or new discovery into the marketplace, known as technology transfer and commercialization, is critical to an entrepreneurial environment and is becoming an essential component of the economic development success of communities. Before discussing the types of institutions that support innovation in a community, it is important to explore the processes and techniques that are typically used in the process of technology transfer and commercialization.

Technology transfer can be subdivided into three inter-related activities, with differing impacts on entrepreneurship development.

- **Technology licensing** – As patent owners, research institutions can license or sell their technology rights to a third party for compensation. The specific rights associated with the license are negotiated.

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between the contracting parties. Licensing a technology provides a research institution with a low-risk, non-burdensome strategy for generating revenue by transferring commercialization responsibility to the third party. From a community perspective, a licensing strategy has some risks. The research institution may grant the license to the highest bidder, which may not necessarily be a local or even state-based firm.

- **Start-up formation** – This refers to the commercialization of a technology through the formation of a start-up business. The support can go to an aspiring researcher or by actively licensing technologies to locally based entrepreneurs and new businesses.

- **Sponsored research agreements** – Private industries frequently partner with research institutions to conduct research on specific industry projects. Such projects typically involve one or a small group of companies and the research institution, and are financed by the participating private enterprises. The research institutions benefit from immediate income that supports research with capital investment (e.g., specialized lab equipment), and the companies gain access to skilled technicians, academic knowledge and workforce recruitment channels. However, the intellectual property in these cases is usually housed in the sponsoring company; thus, this area often has the smallest impact on entrepreneurship.

### Innovation Infrastructure

Institutions such as universities and research labs foster innovation capacity in the community and are vital components of an entrepreneurial infrastructure. Several types of research institutions support innovation, including research parks, federal laboratories, research hospitals, universities and regional corporations. In addition, innovation intermediaries also are emerging nationwide with the purpose of finding new technologies in research institutions and moving them into the marketplace. While these institutions can be found in communities as stand-alone programs or structures, oftentimes partnerships exist among these institutions to leverage resources. Furthermore, multiple institutions can exist in combination, especially in the case of universities - e.g., a university can have a research park and an incubator.

### Research and Science Parks

Research parks are geographic areas that cluster companies and research together to accelerate innovation and commercialization.
They accomplish this goal by creating synergies between companies and research institutions – creating new business opportunities, keeping existing businesses competitive and fostering entrepreneurship. It is not uncommon for research parks to have incubators (discussed in more detail below) as part of their infrastructure. New companies can emerge from either the partner research institution or be generated from the research efforts of one of the park’s businesses.

While most research and science parks are associated with universities (discussed in more detail later) and other research institutions, most of them are joint ventures between research institutions and an economic development organization, state or local government, or a combination thereof. Research and science parks are expensive, high-risk undertakings which often take a minimum of 10 years before showing a return on investment. Research and science parks can also be private ventures – stand-alone efforts mirroring real estate industrial development projects, or attached in some fashion to other research institutions such as hospitals, medical facilities or federal laboratories. Stanford Research Park, Research Triangle Park and Sandia Science and Technology Parks are some of the best-known parks and exemplify these differences; however, there are over 140 such parks scattered throughout the U.S. and approximately 500 worldwide.

**Federal Laboratories**

There are over 250 federal laboratories engaged in high-level research and technology transfer activities that support business development and job creation. Technology transfer from federal labs to non-federal partners (usually the private sector) is generally governed by a Cooperative Research and Development Agreement (CRADA). Each agency can tailor the CRADA to meet its own needs and can incorporate any rules or regulations involving patents and the ownership of intellectual property.

Federal labs also license technologies in the marketplace. They do it in one of three ways: 1) exclusive licenses; 2) partially exclusive licenses, which are limited to a particular field of use or geographic area or user; and 3) non-exclusive licenses, meaning the technology is available to all takers. Also, some federal labs have technology transfer offices (discussed in more detail in the universities section) and develop a range of methods to commercialize their discoveries. The Tri-Cities Science and Technology Park, for example, is located near Pacific Northwest National Laboratory. The National Renewable Energy Laboratory
(NREL) created the Clean Energy Alliance, a network of incubators across the country that can provide business assistance for clean energy development.

Federal labs have had mixed success. As the table below demonstrates, while there has been an overall increase in the number of CRADAS and new licenses between 2003 and 2007, the growth patterns have been variable. The number of inventions and patents declined in multiple years during the same time period.

Technology transfer activities are governed by Federal Technology Transfer Act of 1986 (P.L. 99-502), which enabled government research institutions to enter into CRADAs to facilitate the exchange of personnel, services, and equipment among laboratories and nonfederal partners, and created a Federal Laboratory Consortium. The consortium serves as a common portal for the public to understand and access lab research. Specifically, it provides a technology locator for businesses and others to discover and access lab-based discoveries that are available for transfer.49 This provides a non-local resource available to all communities.

**Research Hospitals and Medical Centers**

Research and medical hospitals also contribute to innovation and entrepreneurship through technology transfer and

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<td><strong>FY 2003</strong></td>
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Source: National Science Foundation

commercialization activities. Their goal is to move discoveries made by their researchers into the marketplace. Like federal laboratories, it is not unusual for some to have a technology transfer office to manage their intellectual property licensing (patents and disclosures), sponsored research and start-up activities. Examples include:

- The Children’s Hospital in Boston launched a $1 million fund to help its researchers commercialize their products.
- Cincinnati Children’s Medical Center has a Center for Technology Commercialization which identifies and assesses the potential of internal research for commercialization, finds the appropriate way to protect the discovery (e.g., patent) and commercializes the technology through licensing or forming a start-up company.

**Incubators and Accelerators**

Incubators are one of the best-known support mechanisms, widely employed by economic developers throughout the country. However, shared services and office space at affordable rents are not the only support that budding entrepreneurs need. Incubators now also offer technical assistance, financial assistance and marketing support to participating businesses. Incubators allow entrepreneurs to take an innovation, master it and start to try to press further into greater market accessibility and commercialization. They also play a key role in knowledge sharing (discussed later) allowing entrepreneurs to learn from experienced professionals as well as one another.

Incubators can be found at:
- Universities, community colleges and institutions of higher education;
- Research parks, federal labs and other research institutions;
- Economic development organizations;
- CDCs; and
- in the private sector.

Incubators come in many forms, including incubators that specialize in certain industries,

**The Idea Village**

The Idea Village is a 501 (c) (3) non-profit organization whose mission is to identify, support and retain entrepreneurial talent in New Orleans. The Idea Village provides strategy, resources, and talent to launch entrepreneurs at critical growth junctures, and elevates entrepreneurship and New Orleans as a hub for innovation. A menu of services for entrepreneurs typically includes setting operational goals and providing business strategy, marketing support and financial guidance.

For further info, visit www.ideavillage.org
such as retail and kitchen incubators; for-profit and non-profit incubators; hybrid incubators that specialize in two or more of these categories; and accelerators, whose purpose is to support fast-growth, high-impact businesses that are often technology-focused. Physical space is not necessarily a requirement, as in the case of “incubators without walls,” or “virtual” incubators. These are special programs that provide some of the same support services as regular incubators but without providing a physical location. Incubators without walls focus on providing counseling and technical assistance to businesses, with most of their participants operating businesses based from home or from other locations. Such programs are able to ramp up quickly without the burden of debt incurred in establishing a physical incubator.

**Universities**

Universities are a key source of basic technology research, skilled personnel, equipment facilities, support services and problem-solving capabilities. According to the Association of University Technology Managers (AUTM), between 1998 and 2008, about 5,684 new products were generated within universities. Moreover, between 1980 and 2008, universities launched approximately 6,874 start-up companies.  

Universities employ multiple techniques to foster innovation, some of which were discussed above. A more comprehensive list of programs and structures to foster innovation includes:

- **Incubators and accelerators:** These can be part of a research park, stand-alone institutions or part of a specific research center. For example, the Innovations Development Facility is an incubator in the Plant Sciences Research Institute at Iowa State University.

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51 Ibid.
State University. Another variation is the student business incubator.

• **Research and Science Parks.** As mentioned above, these parks cluster technology companies and research to accelerate the timeframe for innovation and commercialization. They provide both a place to commercialize university research and for innovation-based companies to access university research and resources.

• **Restructuring institutional policies:** Universities need to ensure that their internal policies support efforts to work with industry and promote entrepreneurship, for example, by spinning off start-up companies from university research. Areas of concern include managing intellectual property rights, managing conflicts of interest, offering appropriate faculty incentives, tenure policy and others.

• **Procuring financial capital:** Universities secure funding to fuel research as well as fund start-ups.

• **Supporting entrepreneurship:** As discussed in an earlier section, universities can develop entrepreneurship centers, provide technical assistance, and recruit managers to help faculty with innovation commercialization, as well as establishing start-ups.

• **Provide specialized equipment and space:** Universities also can provide laboratory space and access to specialized technology or equipment to budding entrepreneurs for experimentation, development and prototyping.

Unfortunately, university technology transfer activities and entrepreneurship activities often evolve separately, which can create disconnections among functions that should work together to support entrepreneurs. While some universities have created umbrella institutions or coordinating committees to weave these functions together, the separations remain across many institutions.\(^{52}\) For example, at the regional level, universities may be focused on research and technology transfer while community colleges are focused on entrepreneurship and workforce development. Minnesota State Technical & Community College provides a good model of linking these activities by forming partnerships with regional universities.\(^{53}\) Another


\(^{53}\) For more information, see http://www.nacce.com/resource/resmgr/docs/msctc_und_collaborations.pdf
disconnect occurs when universities with minimal research funding (under $100 million) create technologies that have potential commercial value, but do not have the resources to develop their own technology transfer capabilities. For these institutions, state and local policy and programmatic approaches can provide added value to the region.54

**Innovation or Commercialization Intermediaries**

One of the newest players in the innovation space is the innovation intermediary. They are developed with the express purpose of identifying promising innovations (technologies, software, products, processes, etc.) in regional institutions and finding appropriate paths for commercialization (such as licensing or forming a new start-up). The easiest way to understand how they work is to review two examples.

**Innovations Works** is a commercialization intermediary in Pittsburgh that provides direct investment and hands-on assistance to university researchers, hospital systems, national energy laboratories, corporations, and students. Specifically, it works with potential entrepreneurs before the seed funding stage to identify potential markets, develop prototypes and secure intellectual property. Innovation Works also houses AlphaLab, a product development accelerator and hub for the city’s software community; invests seed funding in promising start-ups; and helped establish Pittsburgh Equity Partners, an angel fund that targets promising start-ups.

**BioEnterprise** is a Cleveland-based economic development intermediary in partnership with the Cleveland Clinic, University Hospitals, Case Western Reserve University, Summa Health System and BioInnovation Institute in Akron. Its purpose is to help commercialize the bioscience technologies discovered in its partner institutions and accelerate the overall growth of health care companies in Northeast Ohio. More precisely, BioEnterprise hosts a number of commercialization activities in its Technology Transfer Office. BioEnterprise reports the following achievements since 2002:55

- Recruited, created or accelerated over 90 life science companies;
- Procured more than $1 billion in financing to these companies;
- Concluded over 300 technology transfer deals; and
- Evaluated over 1,300 company opportunities and 2,400 invention disclosures.

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54 Ibid.
**Second-Stage Support Organizations**

Second-stage support organizations work specifically with young companies that are about to enter a growth phase, a stage that presents an entirely different set of challenges and issues from those of start-ups or lifestyle firms, as discussed earlier in the handbook. The success of such support organizations lies in their ability to package traditional and cutting-edge resources for entrepreneurship support. It is not simply a matter of designing financial resources or putting together a technical assistance program; it is about understanding the gaps and assistance that second-stage businesses need in order to support their entrepreneurial growth. Flexibility, timeliness, and an ability to think like an entrepreneur are considered necessary characteristics of a successful second-stage support organization. Oregon’s Entrepreneurial Network is one such example of a second stage support organization. Please refer to the case studies chapter for details. Further, the Edward Lowe Foundation provides a multitude of resources to assist second stage support organizations (as well as second stage business leaders) address the challenges of growth, strategic direction and innovative business models. This includes developing recognition and educational programs in addition to hosting retreats at their 2,600-acre campus in southwest Michigan.

**Corporations**

Corporations can support entrepreneurship by spinning off discoveries into new companies or making unused patents available for others to develop. Research conducted by Heike Meier on regions that lack a research university showed that corporations can serve as a surrogate university by attracting talent to the region, supporting entrepreneurial spin-offs and local entrepreneurs, and contributing to the overall innovation ecosystem. Examples include the role of Hewlett-Packard and Micron Technologies in Boise or Microsoft, Boeing and Amazon in Seattle. In fact, according to the research, more than 100 companies have spun off from Microsoft, including Expedia.com, Zillow.com and Big Fish Games. It is beyond the focus of this handbook to detail how and when corporations become surrogate universities; however, there are two other areas where economic developers can add value.

First, while spin-offs can emerge from a natural process of innovation and growth, they can also be a function of downsizing or resizing. One often-overlooked area for

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entrepreneurship development is learning to tap into the skills of a transitioning workforce. For example, Newton, Iowa, used entrepreneurship development as part of its strategy to recover from closure of a Maytag facility, its largest employer. This included providing the Kauffman Foundation FastTrac program to unemployed workers. They experienced some success: former Maytag employees founded Springboard Engineering and Central Iowa Energy, which hired 50 and 29 workers respectively, often their former Maytag colleagues.

Second, because it is common for corporations to patent their research and development but not commercialize the discovery, tapping into non-commercialized corporate R&D is another emerging strategy for promoting entrepreneurship. This has become a more prevalent trend, first documented by Henry Chesbrough as “open innovation.”

Second, because it is common for corporations to patent their research and development but not commercialize the discovery, tapping into non-commercialized corporate R&D is another emerging strategy for promoting entrepreneurship. This has become a more prevalent trend, first documented by Henry Chesbrough as “open innovation.”

Entrepreneurs and firms are seeking innovations through licensing agreements. For example, the Delaware Emerging Technology Center makes patents available to entrepreneurs based on an arrangement with DuPont, which donated 250 of its patents to the initiative. A total of 258 patents are available in 15 different fields. Darrene Hackler’s research on the interaction of entrepreneurs and open innovation shows that the regional economic environment can influence a high-technology firm’s likelihood of utilizing more open-innovation strategies. Economic developers building connections between companies with large R&D inventories and entrepreneurs foster exchanges that can leverage previously un-commercialized R&D.

4. Knowledge-Sharing

The last element in building an entrepreneurial ecosystem is knowledge and creating avenues for knowledge to flow throughout the ecosystem. Knowledge includes technical and management experience, as well as tacit wisdom, that are essential to running a successful business venture. This can be divided into three main categories:

- Support services such as legal advice, marketing and accounting;
- Networks and mentors; and
- Competitive intelligence.

Support Services

To survive and thrive, many entrepreneurs depend on networks of support services. Most


entrepreneurs outsource certain business functions from time to time, either because they don’t have the level of specialized knowledge to address the issues (e.g., legal advice) or don’t have the resources to perform them in-house (e.g., accounting or HR functions). Entrepreneurship and business management training courses provide basic instruction in some of these fields, but the need for outside expertise in these areas remains for many entrepreneurs as their businesses grow and evolve.

The economic developer’s role is to build connections with groups that provide these support services and act as a conduit of information for entrepreneurs. Most communities already will have a number of businesses that provide support services in areas such as accounting, human resources, marketing, legal issues and more. Depending upon the industrial mix in the community, specialized support services may need to be developed, such as legal advice regarding intellectual property protection.

It is not necessary that the services be available locally. However, it is important that economic developers have the relationships to access these resources when needed, whether within the region, state, country or even globally. Innovative, high-growth businesses compel economic development professionals to think in new and creative ways to meet the challenges of supporting entrepreneurship.

One often overlooked but essential service is management capacity. While many entrepreneurs may come from the world of business, many do not. A scientist with a new innovation may not have the skills or temperament to steer the commercial application of that technology to success in the marketplace. Thus, finding ways to match a potential entrepreneur with management talent is another critical component of serving entrepreneurs, particularly high-impact entrepreneurs. Mentors sometimes can provide sufficient management knowledge to budding entrepreneurs.

### Networks and Mentors

Networks and their importance in the entrepreneurial ecosystem were discussed briefly earlier in the handbook. Formal and informal networking groups and mentor programs have been crucial to the success of entrepreneurial growth in many communities. The cafes of San Diego are touted as one of the major factors in the growth of an entrepreneurial culture there. Mentoring programs connect entrepreneurs with industry experts who can
offer advice regarding various aspects of business development, such as creating a business plan, dealing with personnel issues, or technical aspects of developing a product or service. Programs such as the Service Corps of Retired Executives (SCORE) at the federal level (Small Business Administration), as well as those organized locally by chambers of commerce and technology business councils provide mentorship and support for any and all aspects of establishing and running a business, such as concept development, product refinement, management, production, marketing, and even personal problems at times.

Networking programs, on the other hand, bring entrepreneurs together to talk and learn from each other. Networking programs may bring in experts from time to time to address specific challenges faced by entrepreneurs.

Benefits of Networks

1. **Brokering** – making introductions and linkages between entrepreneurs and resources until the entrepreneur has established his or her own set of networks

2. **Creating Common Perspectives** – aggregating and projecting the voice of small entrepreneurs and emerging industries to help entrepreneurs, civic leaders, and public policy makers better understand and address barriers to growth

3. **Fostering Cultural Change** – encouraging business start-ups and providing validation to small businesses in operation, while communicating the message that entrepreneurship is important to the community

4. **Creating Civic Leaders** – nurturing and mobilizing leadership in the public sector by training entrepreneurs for leadership positions within the networks, and offering direct channels for recruiting and mobilizing a new corps of leaders

5. **Branding** – helping send the message that a community supports entrepreneurs and desires their presence in the region

6. **Regional Competitiveness** – reducing barriers to entry for business start-ups and providing avenues for continued learning and access to resources, thus creating stronger businesses that can create jobs and wealth in the community.

Source: National Commission on Entrepreneurship, Building Entrepreneurial Networks, December 2001
Economic development professionals should seek to build networks in their community that foster information exchange. Peer-to-peer learning has been shown to be one of the most effective ways for sustained learning among adults. Mentors, peers and peer networks are a source of practical information and experience that can help entrepreneurs access new resources and address challenges of owning and running a business. Networks also enable fast learning, which can be essential for fast-growth firms, which are fighting to build capacity to get products to market. Networks also contribute to regional economic growth: regions with strong networks for entrepreneurs tend to have stronger track records of new business starts and high-growth businesses, such as Austin, Texas, and San Diego.

While communities understand the importance and value of entrepreneur networks, most are unaware of the existence of these networks, much less how to support them. How do you build a network from scratch, or strengthen an existing one to foster entrepreneurship in your community? The steps involved in building an entrepreneurial network, as adapted from the National Commission on Entrepreneurship’s *Building Entrepreneurial Networks*, are:

1. **Define the purpose** – The discussion needs to start with the need and purpose of the network(s). Will it support specific industry sectors? Will it focus on a certain size or type of businesses – e.g., small business or fast-growth? Will the network support entrepreneurs located in a specific neighborhood, or is its focus regional? What structures already exist in the community, and do they provide adequate opportunities for networking? Regular communication with entrepreneurs will help answer many of these questions. Where such regular communication does not exist, economic developers can conduct surveys and start establishing these communication channels.

2. **Determine the strategy** – Economic development professionals will need to decide whether to focus resources on building a network from scratch or revitalizing one or multiple existing networks. Where networks already exist, economic developers should consider strengthening or re-energizing them, rather than starting from scratch.

3. **Establish core leadership** – Successful entrepreneur networks typically have committed volunteer business leaders

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working behind the scenes. It could be a single entrepreneur or a small group. This core leadership will provide management expertise as well as operational capacity (i.e., organizing events, contacting members, marketing and fundraising), and help expand the network. Where such core leadership does not emerge naturally, economic developers should identify strong business leaders in the community and partner with them to seed the network. Once the network has grown sufficiently large, it may become necessary to retain staff to manage operations, rather than relying on volunteers. The core leadership could then be transformed into a board of directors and continue to provide management oversight.

4. **Conduct events** – The next step is to actually start conducting events. These may be small in the beginning, but as the network grows, attendance should as well. The logistics, marketing and content of events will need to be carefully designed. Events should be short and relevant to the current needs of the members. Some trial and error will be involved with figuring out what works and what doesn’t.

5. **Market the network and the opportunities** – For the network to be successful at connecting entrepreneurs, marketing will be important – marketing not only the events, but the network itself and the value it offers to its members. Marketing entails using traditional avenues such as newsletters, websites, emails and mass media, as well as social networking outlets such as Facebook, Twitter and others.

6. **Replicate and expand** – The idea is not to build just one network, but multiple networks that are connected to each other, creating web-like relationships among entrepreneurs. No one network can serve all the needs of various types of entrepreneurs, and it should not try to do so. Well-defined networks serve specific needs of entrepreneurs and evolve to be relevant to the ever-changing needs of their members. Creating additional networks and connecting them to existing networks helps expand the resource pool for entrepreneurs throughout the region, fostering entrepreneurial growth and developing an entrepreneurial culture in the community.

7. **Let them go** — Ultimately, economic development professionals’ goal is for the private sector to drive and manage its own networks. Once the network is up and running, economic developers should let them go.
Successful entrepreneurial networks are not created overnight. Patience and perseverance – as well as openness to trying out new ideas when something fails – will help nurture an entrepreneurial culture.

**Competitive Intelligence**

Another specialized service that can help set entrepreneurs apart from the competition is actionable market intelligence, or competitive intelligence. Competitive intelligence (CI) refers to timely, reliable and actionable information about the market of a particular product or service that can improve the decision-making capacity of entrepreneurs and give businesses a competitive advantage over their competitors. It involves gathering and analyzing data regarding consumers, competitors, products and more that help businesses make informed decisions. It is a legal business practice, not espionage.

Competitive intelligence is an integral component of the innovative economic development approach called economic gardening, discussed earlier in this handbook. Littleton, Colorado, successfully adopted economic gardening as its core economic development strategy over two decades ago, not spending a single dollar on businesses attraction.

**Competitive Intelligence: Littleton, Colorado**

Providing information to entrepreneurs is a key focus of the economic gardening strategy of Littleton, Colorado. By centralizing data collection and analysis functions in the economic development department, the city is able to create economies of scale and offer critical information to small businesses and entrepreneurs that is typically available only to large corporations. Its three major components are:

1. **GIS** – Spatial analysis of publicly available information to better understand local, regional or national customer trends, target markets, real estate trends, competitors, legislative affairs and more. It is supplemented with database and Internet research to provide additional information about specific trends, competitors and markets.

2. **Business Support Services** – Information and training regarding starting a business, writing business plans or marketing strategies, customer service strategies, and programs to help businesses, such as tax credits, space available, etc.

3. **Customized Research** – Businesses with specialized needs can also approach the ED department for customized research on specific market
programs since. Other communities, such as Ponca City, Oklahoma, use economic gardening principles to provide competitive intelligence as a supplement to traditional economic development strategies. Economic development professionals can play a key role in gathering, analyzing and tracking such information for their entrepreneurs.

It is important to not confuse economic gardening and competitive intelligence. Economic gardening is the philosophy and competitive intelligence is a technique in implementing the principles of economic gardening.

When providing competitive intelligence to entrepreneurs, the first step is to understand the needs of the business. What is the entrepreneur looking for – to expand internationally, or better target-market its products to certain sections of the community? Do they need assistance with tracking legislative information or finding space for expansion? The needs of the business will govern the type of information and analysis required to develop actionable intelligence. These are known as Key Intelligence Topics (KITs) and can be determined through direct communication with businesses.

With the needs of business understood, the next step is acquiring the information and conducting analyses. A variety of information can be accessed through publicly available data sources such as the Census and other federal government agencies. This often needs to be supplemented with other databases that provide information on topics such as retail spending, real estate developments, and financial information, all services that can be purchased. The capacity of an EDO to gather such information and conduct the analyses will need to be built over time; often, contract relationships can supplement the EDO’s activities as expertise is developed.

In addition to providing intelligence on specific market opportunities, EDOs now regularly provide useful information for entrepreneurs such as legislative updates, key industry trends, and availability of space and incentives.

In summary, economic development professionals need to be a conduit of information to enable entrepreneurs to be more competitive. EDOs enable economies of scale in gathering and analyzing information that individual entrepreneurs cannot attain. Those resources better prepare businesses for challenges in regional, national and even international marketplaces.
Service Providers

Many organizations may exist in a community to connect entrepreneurs with these services, including:

- Local/regional chambers of commerce;
- Local/regional technology councils as well as the Technology Councils of North America (TECNA);
- Industry associations;
- Paid peer groups, like Vistage; and
- Incubators and other entrepreneurship support organizations.

These technical service providers can be instrumental in creating networks, offering mentoring programs and providing access to core services. Chambers of commerce often serve as the economic development arm for local government, especially in smaller communities. In that capacity, chambers can provide connections to financial resources, other innovators and entrepreneurs, business development technical assistance and other help.
CHAPTER V: Entrepreneurship Strategy in Limited-Resource Communities

While it is true that tailored entrepreneurship strategies reflect the needs and resources in a community, distressed communities face additional challenges. Distressed communities vary in their characteristics – they may be low-income areas in inner cities, areas grappling with severe economic decline from loss of a key industry, or areas devastated as a result of natural or man-made disaster. Each type of distressed community has limited resources and faces significant obstacles in attaining future economic growth. In such circumstances, distressed communities need opportunities to leverage existing resources to spur economic growth. Entrepreneurship strategies can also address the obstacles of small populations and limited economic growth opportunities that many rural communities face.

As discussed above, strategies will necessarily differ among distressed and rural communities. Entrepreneurs in these communities often face additional barriers at a greater magnitude, such as:

- Lack of
  - Basic technical skills and financial literacy
  - Skilled workforce

- Purchasing power to support local businesses
- Access to credit
- Access to capital and financing
- Economic diversity
- English language skills
- Investment in the area

- Trouble retaining talent and youth
- Local governments in financial crisis
- Inadequate infrastructure

Entrepreneurship Strategies in Low-Income Communities

Entrepreneurship can create economic growth in low-income areas where there are often numerous barriers to employment – such as language, legal issues, transportation, or racial barriers – or insufficient support services such as childcare. Yet in low-income areas, entrepreneurship may face additional challenges. For instance:

1. **Attracting capital can be more difficult.** Investors typically associate low-income areas with insufficient markets to support ventures. Low-income entrepreneurs also do not have access to the personal wealth
often used as start-up capital or as a positive sign for investors.

2. **The technical skills needed to start and run a business are often lacking in these communities.** This can lead to higher lender transaction costs when more time is needed to assist low-income entrepreneurs.

3. **There is added difficulty in reaching mainstream markets that help to increase wealth.**

4. **Entrepreneurial endeavors that do get off the ground may not hire residents from the community or provide adequate wages to support a family.** As a result, the economic impact of the enterprise on the community can be limited.\(^61\)

The assistance needed by entrepreneurs in low-income areas is often greater than what is needed in areas with more resources. For example, low-income entrepreneurs may need technical assistance regarding almost all aspects of business development, including basic business functions. Technical assistance in low-income areas should cover the basic aspects of:\(^62\)

- Market research;
- Creating a business plan;
- Finance;
- Budgeting;
- Loan application; and
- Decision-making.

Providing networking opportunities is an important role that economic development organizations must play in assisting all entrepreneurs; however, entrepreneurs in low-income areas often lack the basic social networks necessary for business development. Mentoring programs such as **Women’s Action to Gain Economic Security (WAGES)**

WAGES is a non-profit organization that has created a small business assistance program to help Latina women start house-cleaning cooperative businesses. WAGES provides a network of resources that creates efficiencies in marketing, accounting and purchasing to reduce the financial burden for the entrepreneurs. ([http://wagescooperatives.org/](http://wagescooperatives.org/))

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\(^{62}\) Ibid.
MicroMentor, a free online service that connects small business owners with business mentors, and Springboard Enterprises, a platform where entrepreneurs, investors, and industry experts meet to build women-led businesses, especially high growth companies seeking equity capital for expansion, can connect minority and low-income entrepreneurs with business mentors that help provide advice and guidance through the business development process.63

In addition, workforce development initiatives created by EDOs or in partnership with local community colleges can help provide entrepreneurs with skilled employees from the community, ensuring that job growth and economic benefits are returned to the low-income community.

Entrepreneurs in low-income areas typically form lifestyle microenterprises, or businesses with fewer than five employees and with startup funding needs of less than $35,000. Because of the lack of access to private capital in low-income areas, economic developers should:

- Work with local banks, foundations, angel and venture capital groups, and other sources of private equity and funding to ensure that access to microloan financing is available for entrepreneurs.
- Help entrepreneurs connect with public subsidies and programs for business

### Low-Income Solutions: Resources

Economic developers should help businesses capitalize on federal financing and programs for low-income areas, which may also include resources for women and minorities. Some of these include:

- HUBZone: https://eweb1sp.sba.gov/hubzone/internet/index.cfm
- 8(a) Pilot Initiative: http://smallbusiness.doe.gov/business/8a_pilot.htm
- Gateway for women-owned businesses selling to the federal government: http://www.womenbiz.gov/

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63 For further information, please visit http://www.micromentor.org/mentor/about-micromentor and http://www.springboardenterprises.org/about.
startup and expansion, since many resources are available from local, state, and federal governments for minorities and low-income individuals in distressed areas.

For example, Southeast Community Capital (SCC) is a non-profit that arose in response to the lack of capital available for small businesses in disadvantaged areas. SCC brings together funding from federal, state, local, and private programs and sources to provide capital. By the end of 2008, 10 years into operation, SCC had provided more than 400 loans totaling over $30 million to more than 300 companies, resulting in 1,000 new jobs created.

Entrepreneurship programs have been implemented in low-income areas as a successful solution to both unemployment and lack of basic community services. For example, the Enterprise Center Community Development Corporation in the distressed urban neighborhood of West Philadelphia is transforming a vacant grocery store into a state-of-the-art, 13,000-square-foot complex called the Center for Culinary Enterprises, to spur local food entrepreneurship with the assistance of a variety of resources and programming.

New Economy Initiative

The New Economy Initiative for Southeast Michigan (NEI) was created in 2008 to restore the economic prosperity of the Detroit region by restructuring economic programs and policies to better align with the new economy. One of the three main strategies of the program is to “promote a successful entrepreneurial ecosystem” that focuses on:

1. Entrepreneurial training and education,
2. Connecting entrepreneurs to resources,
3. Capitalizing on university technology transfer,
4. Improving access to capital, and
5. Endorsing an overall entrepreneurial culture in the region.

NEI recognizes that in order to move Detroit into the new economy and begin the climb back to economic prosperity, a healthy and strong entrepreneurial ecosystem must exist. (http://neweconomyinitiative.cfsem.org/)

Disaster Recovery Entrepreneurship Strategies

The need for creative economic development approaches in areas affected by disasters has grown exponentially over the past few decades. There are three major types of disaster:
• Economic disasters: Globalization has changed the economic landscape of many regions around the country, causing a devastating loss of key industries in some areas. This can be categorized as economic disaster, in which the loss of one industry type causes the job loss of thousands of people in a very short time, prompting a downward spiral of the economy.

• Natural disasters: Cities and regions that encounter natural disasters can lose, at least temporarily, much of their economic base overnight, as seen in New Orleans after Hurricane Katrina. Beyond the impact on an entire city, natural disasters like flooding, fires, earthquakes, or tornados can have lasting negative effects on neighborhoods.

• Man-made disasters: Whether acts of terrorism, such as 9/11, or malfunctions of human systems, such as the Exxon-Valdez or Deepwater Horizon oil spills, man-made disasters devastate local economies and jeopardize key industries, such as commercial fishing in Alaska and oil and natural gas throughout the Gulf Coast.

Entrepreneurs are pivotal to rebuilding disaster-impacted communities. They can offer new economic products and services to the changing economic conditions of these areas, and the entrepreneurial culture of flexibility and adaptability become critically important under these circumstances. Economic developers should mine these entrepreneurs.

The Youngstown Business Incubator (YBI)

YBI has focused on providing services to technology entrepreneurs to help their enterprises develop and flourish. YBI, located in the Rust Belt, has been dealing with a local economy hit hard by loss of major industry. Because of this, YBI knew that traditional models of incubation would not work, and that the limited resources available would prevent successful incubation of a wide range of technologies.

YBI thus decided to focus its efforts on business-to-business (B2B) software development, since it has relatively low barriers to entry, low start-up costs, could benefit the basic manufacturing in the area, and could be housed within YBI’s facilities. By focusing its efforts on this niche market, YBI has succeeded in helping entrepreneurs create 24 new commercial software applications and receive 17 intellectual property patents since 2000. In addition, more than 230 new jobs with an average salary of $57,000 have been created in the region through YBI’s initiatives. (www.ybi.org)
for local knowledge about residents’ post-disaster needs, which are much different than pre-disaster needs. This knowledge can be drawn on in business ventures that meet the new needs of the community, while also providing jobs and turning profits that help return disaster-stricken places to economic health. By ensuring essential needs are met and services are available, entrepreneurs show communities that recovery is possible and can help bring residents and investment back to the areas that need it the most. Entrepreneurship is a grass-roots approach to rebuilding the community from the ground up.

Yet the reality is that entrepreneurs in disaster-stricken areas face significant challenges. Foremost, affected local governments often experience a severe reduction in fiscal capacity and the delivery of public services, not to mention entrepreneur-oriented services. In addition, the entrepreneurial culture suffers from:

1. The flight of human capital;
2. Low levels of investment;
3. Little innovation; and

Entrepreneurs also have different needs post-disaster than pre-disaster. Economic developers should seek to address these needs to facilitate small business survival and new business formation, and foster quicker economic recovery and growth. Often the most immediate need during recovery is access to financing to enable businesses to survive in the short-term.

Although the local economy may have come to a halt, devastation requires both active physical and market rebuilding. The regulatory environment may present significant barriers to entrepreneurs; for example, pre-disaster policies involving licensing, inspection, and finances may become unduly burdensome during a period of recovery. Economic developers should work to create a flexible post-disaster regulatory environment that can come into effect immediately and address issues around licensing, the building inspection process, and access to funding. EDOs in communities severely hurt by economic, natural, or man-made disasters have successfully implemented various programs to assist entrepreneurs in times of disaster. Some of these programs include:

- **Disaster preparedness**: The Illinois Small Business Development Center and Center

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Disaster Recovery: Resources

SBA has disaster assistance loans available to businesses affected by a declared disaster. Loans can cover damages to real estate, business contents, and economic losses. More information can be found at: http://www.sba.gov/services/disasterassistance/

USDA also has natural disaster assistance programs for rural areas. These can be found at: http://www.rurdev.usda.gov/rd/disasters/

for Entrepreneurship at College of DuPage offer a disaster preparedness and assistance program free of charge to small businesses in Illinois. The program consists of one-on-one counseling, workshops, and webinars to prepare businesses to protect their resources and maintain profitability should a disaster occur.

• Financing and technical assistance: The Enterprise Corporation of the Delta and the Hope Community Credit Union, headquartered in Jackson, Mississippi, and serving Arkansas, Louisiana, Mississippi and Memphis, Tennessee, have financed and provided technical assistance to entrepreneurial endeavors in areas hit by Hurricane Katrina, as well as other rural and distressed communities in the mid-South.

• Quick disaster assistance: The “Driving Louisiana’s Economy” initiative is a project by the Louisiana Business and Technology Center, E. J. Ourso College of Business, Louisiana State University, and the U.S. Department of Agriculture to create an “Incubator on Wheels.” The project brings entrepreneurship and small business training and resources to remote areas in Louisiana, particularly those affected by multiple hurricanes. The Incubator on Wheels was able to provide Internet access to businesses in hurricane-impacted areas before Internet and telephone lines were repaired.

Rural Entrepreneurship Strategies

Economic development efforts in rural America historically have focused on resource extraction and manufacturing. While the vast open space and low cost of land was once a major attraction for industry, globalization has made it so that rural America now competes with countries around the world for manufacturing companies.
Many economic developers in rural areas now are working to tap into the new economy to keep population levels stable and increase the size, diversity and independence of local economies through entrepreneurship. Entrepreneurship laid the foundations of rural America, building farms, small towns and businesses, and is a key strategy in continued economic growth.

Yet rural areas typically have access to fewer resources than their urban counterparts, largely due to:
1. Lack of economic diversity, with the majority of job opportunities available through local school systems and governments, farms, resource extraction, and basic services;
2. Small populations, which limits available purchasing power;
3. Limited amount of businesses exporting products that bring in new dollars;
4. High poverty levels; and
5. Trouble retaining young people and talented workers.

Rural areas have new opportunities, however, with the expansion of information technology and telecommunications, which allows people to conduct business from anywhere. This involves ensuring that the necessary telecommunications infrastructure is in place for entrepreneurs to have easy access to the Internet and the resources and opportunities it provides. Economic developers can help communities develop partnerships to build essential broadband connections. In addition, they can help rural entrepreneurs who hope to serve niche markets to establish business plans that use information technology and e-commerce to reduce the costs of marketing, communication, and information; increase access to supplies and services at lower costs; and enhance efficiencies. E-commerce can help rural entrepreneurs in nearly all aspects of business development, including design, finance, production, marketing, inventory, distribution and service.65

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N.C. Rural Entrepreneurship through Action Learning (NC REAL)

This state-wide rural entrepreneurship education program in North Carolina has provided hands-on training to over 12,000 youth and adults since the program’s inception in 1985. For every business startup that REAL has helped create, an average of 2.5 new jobs has been generated, producing $3 million in sales per month across the state. (http://ncreal.org/)

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Economic developers should also help rural entrepreneurs create networks to broaden their reach into regional markets. The Juneau County Economic Development Corporation created a program called the Inventors & Entrepreneurs club, which brings together rural entrepreneurs from around the state to network, discuss strategies to overcoming problems, and find and share resources.

Financing entrepreneurial endeavors can be an issue for rural EDOs, so community resources should be leveraged and outside resources harnessed to meet the financial needs of rural entrepreneurs. Below are some examples of how communities have done so.

- **The Kentucky Highlands Investment Corporation** created a state-wide development venture capital initiative that seeks out aspiring entrepreneurs in rural areas and finances those with a promising endeavor. They must stay located in a rural target area and hire unemployed residents from those areas as well.

- **The West Central Initiative (WCI)** serves a rural region in western Minnesota as both a foundation and community development organization. WCI assists entrepreneurs and small businesses with grants, development financing, and technical assistance. A core component of its services is helping manufacturing companies restructure their businesses using productivity-enhancing technologies, in order to better compete in the global economy.

**Rural Development: Resources**

Resources available specifically for rural entrepreneurship and business development include:

• The North Carolina Rural Economic Development Center and the North Carolina Department of Commerce partnered to create and help fund an entrepreneurship program. With public investment of $600,000 in 2004, 49 new businesses and 75 new jobs (employing mostly low- and moderate-income workers) were created in rural counties in the state.

The growing agricultural and artisanal product niche also is a trend that economic developers should nurture to help rural entrepreneurs tap into the growing demand for organic and locally sourced foods.

Creating an Entrepreneurial Economic Development Strategy in Limited-Resource Communities

Methods to create an entrepreneurial economic development strategy in limited-resource communities, as adapted from the RUPRI Center for Rural Entrepreneurship’s publication 21st Century Rural America, involve five steps:

1. **Choose the right strategy.** With limited resources, there is not the time, funding, or staff available to try many different strategies to boost entrepreneurship. Therefore, economic developers should choose a strategy that best suits their communities’ development opportunities, existing assets, and preferences for development.

2. **Be realistic about investment.** In distressed communities, great investment of time, talent, and funding is needed to get economic development programs off the ground – particularly relating to entrepreneurship, in which greater assistance and resources are often needed. EDOs should have strong leadership that guides the strategy and skilled staff that see it succeeds, as well as proper funding for the strategy that may come from the organization itself, or be pulled from outside resources.

3. **Employ a systems approach.** A systems approach is necessary when limited resources are an issue. Economic developers should work to see that all major players have common goals and that their functions are linked, such as connecting workforce development programs of local educational institutions to help further an entrepreneurial economic development
strategy. It is also important for EDOs to ensure accountability for accomplishing goals, monitoring and measuring the impacts of the entrepreneurial strategy and celebrating successes.

4. *Tap into outside resources.* Economic developers in distressed communities most likely will need to tap into outside resources to fund entrepreneurship endeavors. Supplementing the community’s resources can provide increased funding, networking, and education opportunities for entrepreneurs.

5. *Move into the future while harnessing the past.* Whether low-income, rural, or impacted by disaster, distressed communities need to embrace the new economy in order to achieve economic prosperity. However, the past can and should be harnessed to bring about this change and prepare for the future. Entrepreneurial programs that stem from the traditions and economic foundations of the community and expand on these to link with the new economy are those most likely to succeed.
CHAPTER VI
Case Studies

Entrepreneurial Business Case Studies

Case 1: BioConvergence, LLC – Bloomington, Indiana

In 2004, BioConvergence, LLC, a Bloomington-based life sciences start-up company, began as a couple of words hastily jotted down on a Post-It note by Alisa Wright, the plant manager at a Baxter Pharmaceuticals production facility. Alisa had grown frustrated with the inefficiencies she faced at her facility and the pharmaceutical industry in general, which led to an idea on how to improve it. This case outlines Alisa’s story – from an employee with an idea to CEO, supported by the local economic development organization and its recently launched entrepreneurship program.

Entrepreneurial from the Beginning
Alisa’s career had a traditional start. After graduating from Purdue University with degrees in engineering and biology, she landed a job as a scientist at Eli Lilly, a large pharmaceutical company headquartered in Indianapolis. While at Lilly, Alisa’s department was involved in a major recall (a method for removing or correcting marketed consumer products, labeling, or promotional literature that violates the laws administered by the Food and Drug Administration). As she worked through the recall process, Alisa realized that there was high demand for outside expertise in the drug recall process. Shortly thereafter, Alisa left Eli Lilly to help create a start-up serving the drug recall niche. Her gamble proved successful, as Alisa help found NNC, a consulting firm that helped pharmaceutical companies outsource the recall process. NNC was eventually purchased by Stericycle, a large medical waste company aiming to move into the drug recall business.

After the sale of NNC, Alisa was recruited by the Cook Medical Group, the largest privately held medical device company in the world, to support their movement into the pharmaceutical business. The Cook Group spared no expense as it built a state-of-the-art pharmaceutical production facility and quickly began operations. Less than a year into production, Cook decided to sell its new venture to Baxter Pharma. Baxter retained Alisa as the plant manager. As Alisa became more familiar with the management side of the pharmaceutical
business and the regulatory restrictions involved with it, she began to think of ways to improve the process.

In 2004, in her office, Alisa pulled a stack of Post-It notes out of her desk and jotted down 17 ideas to improve her facility. One of those ideas was to outsource the storage of raw materials and finished product. Bio storage is a highly regulated and expensive process. As she searched for a local company that could provide those services, she quickly realized that it was a drastically underserved market—not only in central Indiana but throughout the United States. Recognizing the opportunity, Alisa began planning her venture at night while she continued working at Baxter during the day. Alisa also began consulting with her husband, Lance, an engineer at the Baxter facility with experience in supply chain logistics and on-site raw materials and finished product storage.

**Enter the Bloomington Economic Development Corporation**

In late 2004, Alisa left Baxter and became the CEO of BioConvergence, LLC, a company of two employees, herself and her husband. Alisa inadvertently found help from the local EDO. As she put together her business plan, she decided to seek out the local chamber of commerce for business assistance. She was looking for basic information, such as a list of local insurance providers to provide insurance for her company’s future employees, and a list of local construction contractors to help build her new state-of-the-art storage facility.

While visiting the chamber, Alisa met Linda Williamson, President of the Bloomington Economic Development Corporation (BEDC). BEDC had just moved forward with an innovative new program called the Bloomington Life Sciences Partnership (BLSP), founded in early 2004 as a partnership among government, higher education, and the private sector to promote and assist the region’s life sciences sector. Williamson helped Alisa find temporary workspace at INVenture, the local small business development center’s incubator facility, and also introduced her to Steve Bryant, the newly hired director of the BLSP.

In early 2005, ground was broken on a greenfield site less than a mile from Alisa’s former office at Baxter for a 50,000-square-foot, state-of-the-art facility. BioConvergence had grown to four employees, housed in a cramped suite at INVenture, where Steve Bryant became a frequent visitor. He helped Alisa procure federal and state funding assistance and tax breaks. Bryant also helped her understand the intricacies of the local
political environment and helped her work her way through the red tape involved with local zoning restrictions and building codes.

BioConvergence, LLC, held a grand-opening celebration in the spring of 2006. The building, equipment, and systems all had been validated and qualified by state and federal regulatory agencies. The brand new, state-of-the-art facility showed ambition and vision. The company started out by offering development, supply chain and consulting services. Demand was high and the company quickly grew from four to 10 employees.

**The Take-off**

By 2007, BioConvergence employed over 20 people. Services also expanded. Alisa and her team had obtained an FDA audit, and added on 20,000 square feet of temperature and humidity-controlled space, plus two ISO clean rooms with containment technology, rare and in-demand assets that would later prove crucial to the company’s growth.

The company enjoyed 100 percent revenue growth for 2007 while expanding its marketing and business development presence. Alisa’s vision of creating a best-in-class facility and Steve Bryant’s life sciences connections led to BioConvergence’s next break. Bryant left the BLSP and joined BioConvergence as the Director of Business Development. His hiring paved the way for a big announcement to kick off 2008.

BioConvergence added both production and testing services and in-sourced services for supply chain management on client sites. This, along with the facility upgrades in 2007, led to an exclusive contract with Eli Lilly, which gave the company international recognition and credibility. By the end of 2008, BioConvergence increased revenue by 100 percent over 2007 and had received multiple awards, including the MIRA Health and Life Sciences Gazelle Award, one of the top awards for life sciences entrepreneurship in Indiana.

Like most businesses, BioConvergence didn’t perform up to its aspirations in 2009. However, despite the down economy, it still had 22 percent revenue growth, added workers and continued to win statewide awards and recognition as a successful life sciences entrepreneurial venture.

BioConvergence began 2010 with 40-plus employees and in a strong position for additional growth. Alisa has taken the company full circle. She originally founded BioConvergence to serve a niche market...
that she stumbled upon while running a large pharmaceutical manufacturing facility. In late 2009, BioConvergence purchased equipment to produce small batches of contract pharmaceuticals; by the end of 2010, production was under way. She is now preparing to take BioConvergence into the pharmaceutical contract manufacturing market, competing directly with her former employer, Baxter. Business forecasts and expectations point to another record-breaking year of revenue growth and job creation.

Sources
BioConvergence, LLC - http://bioc.us/wpress
The Greater Bloomington Chamber of Commerce - www.chamberbloomington.org
Bloomington Economic Development Corporation (BEDC) – www.comparebloomington.us
Bloomington Life Sciences Partnership (BLSP) – www.bloomingtonlifesciences.com
Interview: Steve Bryant, VP of Business Development, BioConvergence

Case 2: DesignMedix, LLC – Portland, Oregon

The story of DesignMedix highlights how an entrepreneur used multiple entrepreneurial support organizations to start and grow a new venture.

A Chance Meeting
In 2006, Lynnor Stevenson participated in the “Lab to Market” program at the Portland State University (PSU) business school, which introduces the local business community to PSU research in hopes of helping faculty bring their discoveries to market. Stevenson, a consultant and an accomplished bioscience entrepreneur, was part of the mentoring team paired with PSU science faculty member David Peyton. Peyton had been researching the causes of drug resistance to malaria and had designed and synthesized some compounds to overcome it. Stevenson and Peyton proved to be a good match.

After Stevenson and Peyton met, they, along with business colleague Sandra Shotwell, formed a limited liability corporation called DesignMedix with the goal of obtaining grants to support early-stage drug development that could capture a small piece of the $30 billion anti-infectives market. They secured an exclusive license with PSU and began collaborating. DesignMedix’s first product, derived from Peyton’s discoveries, is being tested as a non-toxic cure for drug-resistant malaria that is safe for use by children and pregnant women, the most vulnerable patients with the least number of drug options available to them. The company’s lead candidate was
recently granted Orphan Drug designation by the U.S. Food and Drug Administration.\textsuperscript{67}

**Enter the Oregon Entrepreneur’s Network**

Due to the expense of pharmaceutical development, the DesignMedix team turned to the Oregon Entrepreneur’s Network (OEN), a nonprofit entrepreneur support organization, for advice regarding funding. OEN helped guide DesignMedix to the OEN-affiliated Portland Angel Network (PAN), the Women’s Investment Network (WIN) and the Oregon Angel Fund (OAF), an angel group that consisted of approximately 30 Portland-area angel investors. The angels were impressed with the DesignMedix business plan and OAF awarded Stevenson and her team $580,000 in equity funding. Individual investors from PAN and WIN also made investments. With the aid of OEN, DesignMedix was able to raise more than $1 million in Series A financing.\textsuperscript{68}

In 2009, DesignMedix also took part in the OEN-sponsored Angel Oregon competition, in which it competed with other companies for the top prize and additional funding. The angel committee meticulously reviewed and critiqued each company’s business plan and viability. DesignMedix won first place and $150,000 in funding.

The OEN provided not only an avenue for angel funding, it also offered valuable networking and educational opportunities for the start-up. The DesignMedix team attended the OEN Pub Talks series, an informal networking and educational series held at Portland-area micro breweries, and CEO roundtables led by experienced business leaders in the region. The DesignMedix team also took advantage of educational seminars to help fine-tune its business plan and investor pitch.

**DesignMedix Today**

DesignMedix, now a company of six employees, received two additional major R&D grants in 2009: $246,000 from the Oregon Nanoscience and Microtechnologies Institute and $1.4 million from the National Institute of Allergy and Infectious Disease, part of the National Institutes of Health. Stevenson credits the key contacts and business coaching received through OEN as a driver in DesignMedix’s success.

Biotech development is more of a marathon than a sprint. With all of DesignMedix’s success, it is still a long way from standing on its own as a profitable business. The anti-malarial

\textsuperscript{67} Orphan drug designation provides incentives to develop products for the treatment of rare diseases. For more information, go to http://www.fda.gov/ForIndustry/DevelopingProductsforRareDiseasesConditions/default.htm

\textsuperscript{68} Series A financing is a term used to describe a company’s first significant round of venture funding.
Product has not yet been tested on humans. Clinical trials can take up to five years before a product can go to market.

DesignMedix will continue to work closely with the OEN for the near future as it continues to raise capital and guide its products through the trial process.

Sources:
DesignMedix, LLC - www.designmedix.com
Oregon Entrepreneurs Network - http://www.oen.org
Interview: Lynnor Stevenson, Chief Executive Officer, DesignMedix

Case 3: Wicked Quick Industries, Inc – Portland, Oregon

Founded by Tarran Pitschka in 2003, Wicked Quick is a growing premium clothing and accessories brand inspired by the human fascination with speed. Wicked Quick products have landed shelf space in trendsetting boutiques as well as major retailers nationwide. Pitschka’s story highlights how an entrepreneur can start a venture and then use an entrepreneurial support organization to improve business operation and obtain funding.

Pitschka’s career began in design. He attended the College of Visual Arts in St. Paul, Minnesota, and studied advertising and communication design. This experience exposed him to wide array of faculty and staff that worked full-time in the industry. He credits a unique blend of classroom and real-world experience for fostering his entrepreneurial spirit and paving the way for Wicked Quick.

Career Path of Corporate Executive Turned Entrepreneur

Pitschka’s career trajectory is typical of many entrepreneurs, starting out in the corporate world before moving on to start an entrepreneurial venture. It illustrates the importance of both developing a significant level of expertise in an industry and the “a-ha” moment that helps people transition from employee to entrepreneur. His path also gives insight into where an entrepreneur locates a new enterprise.

While at the College of Visual Arts in St. Paul, Pitschka developed his first successful clothing line, which he eventually sold to Dayton Hudson Corporation (now Target Industries). He used the proceeds from the sale to set up his own studio, which he ran for the remainder of his time in St. Paul. Meanwhile, Dayton Hudson, pleased with the quality of his work, hired him on a contract basis. After graduating from the College of Visual Arts, Pitschka moved to Seattle to work for
Generra Sportswear, a $150 million clothing brand. He later left Generra to become a senior designer at Nike in Portland, where he led the design for Michael Jordan and Tiger Woods’ brands and MLS Soccer. Pitschka then moved from Nike to become Vice President of Design for No Fear, an $80 million apparel company for motorcross, motor-sports, surfing, and wakeboarding-themed clothing. He left No Fear to start his own graphic and product-design company — clientele included Ford Racing, Ford Motor and Company and Fila Sportswear — later joining Ford Motor Company full time as a Senior Product/Graphic Designer for its Beanstock division. While at Ford, he led graphic design projects for Land Rover, Mazda, Lincoln and Aston Martin. Pitschka also created the new Ford Racing logo used in Nascar, Rally and CART, and designed and produced the Ford executive racing collection.

The Inspiration for Wicked Quick: The A-ha moment

During his tenure at Ford, Pitschka worked closely with the auto racing industry, which included attending the National Hot Rod Association (NHRA) Funny Car races and other major racing events. While attending one of these events, his entrepreneurial spirit was rekindled. Standing near the start line at the beginning of a race, Pitschka was overcome by the sheer power; that a-ha moment became Wicked Quick, design inspired by the human fascination with speed.

After his departure from Ford, he focused his efforts on various contract work while devoting more and more time to promoting Wicked Quick at the races he attended. When Wicked Quick’s popularity took off, Pitschka dedicated himself fully to his entrepreneurial venture.

Enter the Oregon Entrepreneurs Network

Pitschka chose Portland to establish his business. He was familiar with the area from past work there and knew it had a strong industry base of over 170 apparel clothing companies, anchored by Nike and Adidas. Portland also had good business network, due in part to the work of the Oregon Entrepreneurs Network (OEN). Pitschka had occasionally taken advantage of some of OEN’s networking events.

Early on, Pitschka used his personal savings to get the company started. He recruited a Nike manager to help, and together they set out pitching the Wicked Quick concept to potential financial backers. While there was some interest, Pitschka quickly realized that their business plan and sales pitch could use some fine-tuning.
Pitschka began to explore OEN’s array of programs. He started attending OEN-sponsored Pub Talks networking events, which helped him get the word out about his company and compare best practices with other area entrepreneurs and established business owners. Pitschka also took advantage of OEN’s educational programming, attending seminars to help him fine-tune his elevator speech and business plan.

OEN President Linda Weston took note of Pitschka’s dedication to his new company. She was impressed both with him and his product and took a personal interest in seeing the venture grow and succeed. Weston helped Pitschka get in front of key local investors and encouraged him to participate in multiple venture capital and angel fund competitions.

In 2009, Wicked Quick was a finalist for the best development-stage company for OEN-sponsored entrepreneurship awards. In July of 2009, OEN helped Wicked Quick gain exposure by featuring it as Spotlight Company on the OEN website. Wicked Quick also was selected by OEN to present at Venture Northwest, an annual conference that draws institutional investors and investment bankers from across the west who are interested in emerging Northwest businesses and the region’s growth segments. (Businesses that have presented at Venture Northwest have raised over $1.3 billion in venture capital since 1996 and over $68 million in angel investment.) While Pitschka did not access capital directly from these activities, he did find investors while networking at these events, thus crediting his ability to find financing to his participation.

**Wicked Quick: Today**

Today, Wicked Quick is a dynamic venture with potential for continued market growth. On the retail front, Wicked Quick clothing has landed space in several trendy boutiques and the Hard Rock Hotel and Casino in Las Vegas. Wicked Quick has had continued retail success with Nordstrom and Metropark retailers, which Pitschka believes will propel his company to the next level. Wicked Quick T-shirts retail from $28 to $45 a piece at Nordstrom stores nationwide. Wicked Quick Industries, Inc., also outfits professional racing.

In 2008 and 2009, the company doubled its sales volume. With the help of OEN, it succeeded in garnering investment in 2009 in the midst of the recession, and experienced continued growth in 2010.

Wicked Quick currently operates out of a studio on Pitschka’s rural Oregon property.
Wicked Quick’s next move is to open a retail store in downtown Portland with an expanded design studio in the back to help meet growing demand.

**Sources:**
Wicked Quick – www.wickedquick.com
Oregon Entrepreneurs Network – www.oen.org
Interview: Tarran Pitschka, Founder, Wicked Quick

**Case 4: Suniva – Gwinnett County, Georgia**
This case highlights how a university can serve as a catalyst for entrepreneurism and economic development. It also shows how a long-time faculty member can capitalize on his body of scientific research and how a university-affiliated entrepreneurial support organization can make an impact on the local economy not only by taking a hands-on approach with the entrepreneur, but also by serving as an intermediary.

**A Trailblazer in Developing Technologies for an Emerging Industry**
Professor Ajeet Rohatgi, the director of Georgia Tech’s University Center for Excellence in Photovoltaics Research and Education (UCEP), is considered a world-renowned expert and innovator in photovoltaic (PV) technology. He founded UCEP and has dedicated over 24 years of research to making solar energy more efficient and cost-effective, with the goal of making a positive impact on the environment worldwide. In 2006, Rohatgi was approached by New Enterprise Associates (NEA), a leading international venture capital firm, to discuss possibilities of taking his PV research to the market as a profitable venture.

When NEA approached Rohatgi, he was uncertain if he was ready to move forward, as his lab technology was not quite at the 20 percent efficiency level he had set as a benchmark. There was also concern that it would be difficult to compete with China, fast becoming the industry leader due to huge government investment. As in many cases, it took someone not as close to the technology to help the inventor see its potential. NEA showed Rohatgi that his current technology could have a positive market impact and that it was a good time to enter the market. He accepted their proposal and NEA began to build an executive team around him. They brought in experienced CEO John Baumstark to help plan and structure the business. In September of 2007, Suniva incorporated as a company with seven employees and over 150 years of combined solar energy and start-up experience.
The Role of Georgia Tech’s Advanced Technology Development Center

Even before NEA entered the picture, Professor Rohatgi had built a foundation for Suniva through Georgia Tech’s Advanced Technology Development Center’s (ATDC) Venture Lab, a faculty commercialization program. After the decision to form Suniva was made, the ATDC provided a wide array of business start-up services, such as coaching on the value of start-up equity versus the option of licensing the intellectual property, and assisted the company in its IP acquisition strategy.

From the very beginning, NEA’s willingness to make significant investments put Suniva in a unique position. With the aid of Baumstark, they soon had their executive management team in place, enabling them to hit the ground running.

As Suniva’s business plan developed, it planned to invest in a large, state-of-the-art facility to house its headquarters and manufacturing operations. Due to the specific needs of the photovoltaic industry, they knew that finding a suitable building would take significant time. Hence, in need of office space and interested in staying close to its Georgia Tech roots, the company asked ATDC if it could provide office space. ATDC literally knocked down walls and reconfigured offices to provide the Suniva team with affordable and efficient office space.

ATDC Provides Other Vital Assistance

ATDC introduced Suniva’s leaders to Gwinnett County’s chamber of commerce, the county’s lead economic development group, to help them identify a suitable headquarters building. In 2008, Suniva announced that its headquarters would be located in Gwinnett County, building out an existing shell building as a PV plant and creating over 180 jobs. ATDC, along with the Gwinnett chamber, also helped Suniva obtain local tax incentives through the Gwinnett County Board of Commissioners and complete the local business permitting process. The Gwinnett chamber also collaborated with the state to provide job creation tax credits and assist in workforce training. The workforce training program served as a great help to Suniva as it ramped up production.

Suniva: Today

Today, Suniva is at full production, exporting 85 percent of its product. Goldman Sachs, H.I.G. Ventures, Congentrix, Advanced Equities, Inc, and Warburg Pincus, all well-established venture firms, have joined NEA as financial backers. Suniva has successfully raised well over $100 million in capital.
Suniva continues to receive numerous awards, including the 2009 Renewable Energy Exporter of the Year award from the Export-Import Bank, the number two ranking on the Wall Street Journal’s list of Top Venture-Backed Companies, and Renewable Energy World’s Excellence in Renewable Energy Award. Dr. Rohatgi also has received individual accolades from his Georgia Tech peers and was named the winner of the 2010 Outstanding Achievement Award in Research Innovation.

In April of 2010, Suniva announced it was a candidate for the U.S. Department of Energy’s Loan Guaranty Program. Upon potential receipt of the loan guarantee and the negotiation of acceptable terms, Suniva plans to build a new, $250 million plant to increase manufacturing capacity, which would result in 500 new jobs. Wherever the second plant is located, Suniva plans to retain its headquarters and current plant close to its roots at Georgia Tech and UCEP.

Sources:
Suniva, Inc. - www.suniva.com
Advanced Technology Development Center at Georgia Tech - http://atdc.org
Interview: Bryan Ashley, Chief Marketing Officer, Suniva

Case 5: ErgoNurse – Frisco, Texas

The concept for the ErgoNurse system was conceived by Elizabeth White, a registered nurse of 18 years. After incurring a back injury in 2003 by lifting an obese patient, she began to wonder why no bed repositioning equipment existed for nurses. White was still on medical disability from her back injury when her father suffered a massive stroke. While spending countless hours at the hospital with her father throughout his recovery, White watched the nurses tend to her father, turning and lifting him as she had done before her back injury. She could see them slowly hurting themselves with awkward lifting, just as she had done. This inspired White to find a way to help nurses lift their patients without straining their backs, thus seeding the idea for ErgoNurse.

This case explores how a nurse built on her experience and used her own personal network, plus the aid of an entrepreneurial support organization, to start a successful medical device venture that would make the nursing profession safer.

White sold her California home to finance the development of ErgoNurse. She then returned to her childhood home, Utah, to lower her
cost of living. When Elizabeth arrived in Utah, she learned of the Brigham Young University engineering department’s program to encourage senior engineering students to partner with the private sector and develop innovative products. Her idea was warmly received. White began collaborating with students and ultimately came up with the idea of creating a lift that clamps to patients’ bed sheets to lift them. White and the students collaborated with a local engineering firm to create a prototype lifting system.

**Enter Dave Stiles**

Now that White had a prototype lift device, she quickly realized that she would need help putting together a business plan and managing her new company. She consulted with her friends and family and was referred to Dave Stiles, a retired vice president of marketing for a large corporation. Stiles had just relocated to northern Texas to be closer to his children and grandchildren. After a phone conversation, Stiles was on board. While he had over 20 years of corporate product development and marketing experience, this new venture proved to be a unique challenge. Stiles had experienced product development in the corporate world, which he described as a structured and stable setting. He was now faced with new challenges, such as creating a detailed business plan, basic accounting, fundraising, and many other tasks that come along with developing a new company.

**Enter the North Texas Enterprise Center (NTEC)**

Stiles realized that they would need additional help to make this fledgling venture succeed. He began searching for incubator systems and facilities to help keep start-up costs low and provide additional business services. He learned that seven miles from his home was the North Texas Enterprise Center (NTEC), a non-profit that assisted entrepreneurs with starting and growing new medical device ventures. Founded through a public-private partnership between the Frisco Economic Development Corporation (FEDC) and Hall Financial Group, the center specialized in medical technology and provided a broad base of support to entrepreneurs, both internally and through its network. It was the perfect match to help launch their new medical device company.

Stiles and White moved their business into NTEC and began its custom acceleration program, interacting with seasoned professionals, service providers and capital providers to address strategic and tactical issues involved in starting up a medical device company. NTEC staff provided a personal touch...
by putting Stiles directly in touch with angel investors and venture capital firms. Contacts made through NTEC staff and the acceleration program enabled Ergonurse to obtain capital to advance the company.

In addition to use of the facility and its services, Stiles also attended a variety of NTEC-sponsored outreach and education programs, including CEO roundtables, brownbag panel discussions, stakeholder meetings, professional development and executive education series, and investment forums. Stiles also participated in NTEC collaborative events, such as industry-themed breakfast meetings, the annual MedTech New Ventures conference, the Medical Device Action Alliance, business plan competitions, angel funding forums, technology award events, and other seminars and training. Again, NTEC played the role of capital lead generator and facilitator for Stiles; the program provided added credibility to Ergonurse and helped him get in front of key investors.

NTEC staff not only helped Stiles identify and eventually obtain venture funding, it also helped facilitate an exclusive partnership between Ergonurse and a contract manufacturing company near Cleveland, Ohio, to produce the Ergonurse lift system.

ErgoNurse: Today

Today, ErgoNurse’s unique lift system allows an individual caregiver to safely and quickly perform on-bed patient movement functions and transfer patients weighing up to 500 pounds. It has been in use at several hospitals in Texas and has proven to be more cost-effective and efficient than existing devices at eliminating caregiver injuries.

The market for effective patient handling equipment, currently estimated at over $3 billion, is poised for significant growth as the healthcare industry struggles to solve the problems of high worker injury costs, nursing shortages, Safe Patient legislative mandates and the Center for Medicare and Medicaid Services’ (CMS) announcement that it will no longer reimburse for treatment of bedsores that occur while a patient is in the hospital. ErgoNurse has developed a proven track record and a platform of products that are rapidly establishing the company as a market leader in the space.

Hospitals throughout the United States are in various stages of procuring and using the ErgoNurse lift system. Even though ErgoNurse successfully completed the NTEC acceleration program in late 2009, it still benefits from being headquartered at the NTEC
facility and will stay there for the foreseeable future. This partnership enables Stiles to have access to NTEC’s quality facilities and staff expertise to help make business decisions, sales connections, and raise additional venture capital.

Sources:
Ergonurse - www.ergonurse.com
North Texas Enterprise for Technology - www.notec-inc.org
Interview: David Stiles, President, Ergonurse

Case 6: Jelly Belly - Fairfield, California

Anatomy of a Gazelle
The case of Jelly Belly shows what it takes for a successful first-stage company to take the leap toward becoming a high-growth business. Established as a family-run candy maker in the late 19th century, the firm experienced stable but limited income growth until the late 1960s. The company (known as The Herman Goelitz Candy Company until 1969), had built a reputation on quality, and had parlayed small innovations into stable income streams over several decades. However, the margins for most of the company’s products continued to shrink due to competition over the years so that by the late 1950s, it was barely breaking even. The family wanted to expand the company into a higher-quality product line, but was hindered by a lack of capital, incomplete business management skills, and process limitations due to limited corporate size.

Herman G. Rowland, Sr., was involved in the company at an early age, familiarizing himself with the basic production processes. In the early 1960s, armed with a high school education and one year of college, Mr. Rowland accompanied his parents to meetings with a SCORE representative. From these meetings, the family was able to accomplish several things crucial to the business’s survival and expansion. First, they developed a business plan to lay out future growth projections. This exercise exposed them to better management skills, such as merchandising and costing techniques. The company needed to improve the reliability of its profit and loss statements, which shed light on many inefficient business practices that are typical of small businesses with limited management expertise. An introduction to overhead accounting methods demonstrated resource inefficiencies in their manufacturing process.

Second, prior to developing a business plan, there was no vision for the company. Without knowing where they were headed, they could
not determine what the best current course of action would be. Finally, using the new financial reports and a more thorough knowledge of their business processes, they were able to clearly articulate needs (such as expanding their plant) that allowed them to approach a commercial bank with a rational argument for a business loan.

After securing the loan and expanding manufacturing capability, and with improved accounting practices, the firm was primed for growth. While the company continued to explore and test new products, it maintained its strong reputation. During this period, it developed the “Dutch Mint,” a peppermint-coated candy with a chocolate interior that is still one of its most popular products. The company also developed the first American-made gummy bear. The increase in operating efficiencies and strong reputation set the stage for a revolutionary new process innovation that would lead to high growth.

As an example of customer-driven innovation, the company was approached in the early 1970s with a request from a Los Angeles-area candy distributor for jelly beans with a more authentic, natural flavor. Jelly Belly’s chief confectioner, Marinus Van Dam, who joined the company in the mid-1960s, partnered with the candy distributor, David Klein, to develop a new type of jelly bean with more intense flavor. The centers of the company’s new jelly bean were colored and flavored. This flavor-enhancing process was also used on the outer candy shell. Traditional jelly beans were characterized by uncolored pectin centers that were simply sweetened with sugar; the jelly bean flavor and color were only found in the outer candy coating. With this new generation of jelly beans, the company used real fruit juices and natural flavors when possible to boost the taste experience. The finished Jelly Belly jelly beans contained about half the sugar of regular jelly beans and were more flavorful. Sales growth increased substantially in the late 1970s and 1980s, and the improved jelly bean formula caught the attention of presidential hopeful Ronald Reagan, who popularized them further.

This case underscores several important points about entrepreneurship. First, entrepreneurs are driven to innovate in order to constantly stay ahead of demand. Second, improving management skills that many boot-strap entrepreneurs may initially lack can improve the legitimacy of operations to the point at which they can attract later-stage capital. Third, this case study highlights how improved management skills can increase
business efficiency, thus freeing the entrepreneur to focus on new innovations, which is at the core of business success. Finally, the Jelly Belly case illustrates how innovation in an established firm can jump-start growth. This is a valuable lesson for economic development professionals searching for the next gazelles: they aren’t just start-ups. A prime source of growth might already be operating nearby.

**Sources:**
Jelly Belly - www.JellyBelly.com

**Case 7: The Case of Vadxx Energy – Akron, Ohio**

**Illustrating the Role of the Entrepreneurship Environment**

The story of Vadxx highlights the complexity of funding for entrepreneurial firms – particularly those involved in emerging technologies – and the benefits of using a holistic approach to solve growth issues. It is difficult for traditional financing sources to underwrite new technology firms because they are based on unproven markets. In addition, new technology requires staged testing, sometimes with large space requirements, and relatively high initial capital costs before product commercialization can begin. So what tools can economic developers use to encourage these emerging technology industries? What does an entrepreneurial ecosystem look like in practice?

Vadxx Energy developed an innovative process to create a closed-loop system of petroleum products in order to develop an alternative fuel supply. By transforming solid and liquid wastes back into their original component parts, Vadxx intends to recycle energy. Plastics, tires, and waste oils can be refined back into their base parts to create synthetic crude, natural gas and activated carbon, transforming petroleum from a finite resource that must be disposed of to a recyclable one.

Vadxx required a site for early-round testing of its process innovation. It worked with the City of Akron, which helped make improvements to a suitable facility and provided favorable lease terms. Additionally, Vadxx sought outside management expertise from Vinny Gupta, the local JumpStart Entrepreneurial Network (formerly known as the JumpStart TechLift Advisors) Entrepreneur-in-Residence. JumpStart is a nationally recognized non-profit working to assist high potential entrepreneurs and the supporting ecosystem around it. Gupta provided input on the business plan and valuable networking. Vadxx is a manufacturing firm, and therefore lies at the confluence of input suppliers and consumers; where a company lies along this continuum can affect the entrepreneur’s needs. The networking assistance

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69 For further information, please visit http://www.jumpstartinc.org/about/.
from JumpStart helped establish strategic partnerships with input suppliers for the plastic waste.

Vadxx also received guidance from several professors at Case Western Reserve University and the University of Akron, highlighting another junction in the entrepreneurial ecosystem. TechLift helped connect Vadxx to funding sources, including the North Coast Opportunities Technology Fund of Cuyahoga County and the Innovation Fund of the Lorain County Community College Foundation. Additionally, Vadxx has offices at two of the region’s business incubators, the Akron Global Business Accelerator and MAGNET in Cleveland.

The Vadxx story portrays the entrepreneurial ecosystem in action: access to management skills from JumpStart; site selection and leasing from the City of Akron; business plan and technical assistance provided by local research institutions; funding from two separate sources; and office space provided at the local business incubator. Economic developers can grow their entrepreneurial ecosystems by making sure that resources such as those that met the various needs of Vadxx are in place in their communities.

**Sources:**
Vadxx Energy - www.vadxxenergy.com
JumpStart Inc. - www.jumpstartinc.org

**Case 8: 21st Century Silicon: A Start-up Venture Case Study**

This story highlights how the governor of Texas, through the state’s Emerging Technology Fund, provided a direct cash infusion to a clean energy start-up and enabled the company to raise significant venture and angel funds and enhance its credibility.

**Company Background**
21st Century Silicon, a Richardson, Texas-based manufacturer of high-purity silicon for the solar energy industry, was founded by Dr. H. Bruce Li, a serial entrepreneur and former Texas Instruments employee. A 16-year veteran of the energy industry, Li began to notice the increasing price of polysilicon for the photovoltaic industry, and from this insight sprung 21st Century Silicon. Li partnered with Peter Mei, a highly regarded entrepreneur who had held executive and VP-level positions in the energy industry.

Through collaboration, they were able to develop a method to manufacture solar-grade silicon at half the manufacturing cost and half the cost and time for plant set-up, compared
to industry leaders. The high demand for solar-grade silicon and the anticipation of an international shortage has led industry analysts to forecast growth from a $250 million market to a $1.5 billion market in the next two years. The technology backing 21st Century Silicon indicated that it could make a significant impact in the market, leading to great investor interest.

In early 2005, 21st Century Silicon established its corporate structure and started its first round of funding. Li and Mei hired a full management team and closed on their first round of funding ($500,000) by the close of the year, which allowed the company to prove its concept and patent the technology.

From 2006 to 2008, 21st Century Silicon continued to meet and exceed funding goals and procure long-term contracts with service providers and raw material suppliers. At the same time, the company began to pursue funding from the Texas Emerging Technology Fund (ETF), created by the Texas legislature to encourage entrepreneurial growth in the state. The Texas General Assembly realized it could increase the state’s competitiveness by expediting the development and commercialization of new technologies and recruiting top research talent. This led to the creation of the ETF to provide matching and commercialization funds to Texas based start-ups. The program was designed also to leverage additional federal funds and outside investment.

The Texas governor followed up on the legislature’s action by appointing a blue-ribbon ETF Advisory Committee made up of industry leaders, top-level Texas higher education researchers, and thought leaders to help guide the program. This action led to the creation of two separate funds – the Research Superiority Acquisition Award and the Commercialization Award.

• **Research Superiority Acquisition Award**
  - Preference for this award would be given to research that had a high likelihood of being commercialized. There also must be support for the technology from a Texas public institution of higher education.

• **Commercialization Award** – The goal of this award was to grow new small businesses and to accelerate new products to the marketplace. The award is intended for early-stage ventures that are technology-based, private entrepreneurial entities willing to collaborate with a Texas public or private institution of higher education.

*The Texas Emerging Technology Fund*

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Priority of funding is given to ventures that involve emerging technology and show a high likelihood of profitability in a reasonable amount of time. Applicants are required to work with one of seven established Regional Centers of Innovation and Commercialization (RCIC), bodies created by the governor to guarantee that the applicant’s technology or business will benefit the state economically. The RCIC plays a significant role in grooming the applicant’s business plan before recommending the applicant to the governor’s office and Texas legislature for official review and determination of eligibility.

**How ETF Helped 21st Century Silicon**

21st Century Silicon’s founders decided to pursue the Commercialization Award. They began a year-long business plan review with their local RCIC. First, they focused on their quick pitch with the 15-member advisory group; the group of technology and entrepreneurship experts provided critical feedback. Eventually, the RCIC recommended 21st Century Silicon to the governor’s office, which awarded it $3.5 million, the largest one-time award in the program’s history.

Working with the RCIC not only helped the company prepare for the state-level review, but also led to additional exposure to potential investors. By the time 21st Century Silicon completed the Commercialization Award process, it had leveraged an additional $1.5 million through two undisclosed, publicly traded companies and an individual angel investor. This closed out their round-two funding at $5 million.

**A Community of Support**

The ETF has proven to be a catalyst to 21st Century Silicon, but it also was a beneficiary of an active, inclusive and collaborative region that supports its technology industry. Two regional players that provided significant assistance were the Richardson Chamber of Commerce, which identified and helped the company obtain traditional local economic development incentives, and the Metroplex Technology Business Council, a regional industry council that helped 21st Century connect with vital business service providers.

**21st Century Silicon Today**

To date, 21st Century Silicon has taken full advantage of ETF by putting significant funds towards marketing its product in Asian markets. The company recently started its third and final round of private equity with the goal of raising $15 million; 21st Century Silicon has already raised $6 million towards its goal. In the meantime, its overseas sales efforts are paying off, as 65 percent of the company’s five-year manufacturing capabilities
are actively under contract. The third round of funding will enable the purchase and completion of its manufacturing equipment and facilities to meet demands. By 2012, 21st Century Silicon projects annual revenue of $108 million, and by 2015 it plans to hire 200-plus Texas residents – a vital return on investment for the state.

As for 21st Century Silicon, over the past two years the company and its management team continue to receive awards, recognition, and headlines:

- In June of 2009, Director of Business Development, Grant Harrell was named one of the “Top 40 Under 40” from a regional publication.
- In August of 2009, the company moved into its newly expanded headquarters building.
- In September of 2009, CEO Dr. Bruce Li was named the “2009 Tech Titan” by a regional technology industry group.

To date, 21st Century’s $3.5 million award is still the single highest award given out by ETF.

Note: In October 2010, 21st Century Silicon was acquired by The X-Change Corporation, a green manufacturing company and announced the start of commercial production soon thereafter. While the acquisition may impact their business model, the lessons learned from the earlier stages of the business still provide us with valuable insights into working with and raising venture capital.

Sources:
21st Century Silicon, Inc - www.21-centurysilicon.com
X-Change Corporation - www.xchccorp.com
Interview: Grant Harrell, Director of Business Development, 21st Century Silicon

Entrepreneurship Support Organization (ESO) Case Studies

Case 1: The Fairfield Entrepreneurs Association, Fairfield, Iowa

The Goal
Foster and further the entrepreneurial spirit and success of a unique community in Iowa.

The Challenge
Fairfield, Iowa, population 9,600, is located in the southeast part of the state, most economically distressed region. The town has suffered from the loss of traditional agricultural jobs and large manufacturing employers such as Meritor Company and Rockwell Collins. Yet the town has maintained its 1920 population of about 10,000 and has tripled its income since then, a time during which most
small Iowa communities either contracted to 2,500 people or fewer, or grew to become the state’s larger urban centers with more than 25,000 people. As a leading economic development professional in the town noted, many Midwesterners are averse to risk and do not have an entrepreneurial disposition. So how do you foster entrepreneurship and maintain a population in a small town?

Part of Fairfield’s answer lies in its unique population, and part in harnessing the creative, collaborative spirit of the community for successful entrepreneurship.

Fairfield has a history of being a starter. It was home to Iowa’s first state fair and claims the oldest golf club west of the Mississippi River. In the 19th century, William Louden made his mark as one of the town’s earliest entrepreneurs when he designed and produced one of the first manure spreaders, a standard feature in modern dairy farms, and ceiling-suspended single track rail system to assist in-plant movement of materials in manufacturing facilities. Louden’s manufacturing facility still exists today in Fairfield and operates as a facility for start-ups.

Fairfield’s distinctive character was further developed in 1974 when the campus of Parsons College was bought by the Indian sage Maharishi Mahesh Yogi, who founded the Maharishi University of Management there. Maharishi is best known for introducing The Beatles to Eastern thought in India; subsequently, thousands came to Fairfield to practice Transcendental Meditation. Today, over one-third of the population is said to be followers. Many of these followers came from the east and west coasts and from abroad, and had advanced education and business development ideas; many became entrepreneurs because they needed to find a means of support to stay in Fairfield.

The Strategy
Fairfield’s entrepreneurship success has been based largely on the private efforts of individual entrepreneurs coming together to network, mentor and collaborate to help feed one another’s success. The city’s role has been to contribute resources in some cases to help companies grow and expand, but the organization most active in nurturing start-ups and small businesses has been the Fairfield Entrepreneurs Association (FEA), a volunteer organization formed 20 years ago. It has run on a shoestring budget, or what a former director called “sweat equity” – spending a total of about $100,000 over 20 years. The association, which once operated as a
wing of the chamber of commerce, is now an independent non-profit.

The FEA helps to connect entrepreneurs with mentors, capital sources and other resources. Of particular focus is the sharing of lessons learned and the dispensing of practical advice from successful entrepreneurs to budding ones. According to the organization, over $275 million has been invested in the last 20 years. Some of the ways that FEA fosters entrepreneurship include:

• **Investor’s Roundtable** - Entrepreneurs and start-ups can use the investor’s roundtable, a group of successful businesspeople from the community who make themselves available to hear a pitch and provide feedback. Many of the successful businesspeople are themselves serial entrepreneurs who may have tried and failed several times before launching a successful business.

• **Hall of Fame** – The association celebrates success in the community by recognizing successful entrepreneurs with induction into the “Entrepreneur Hall of Fame.”

• **Boot Camps** – The association holds one-day boot camps around emerging and niche industries and features speakers and panels to educate interested entrepreneurs. It has held boot camps on clean technology, digital media and the artisan food industry.70

• **Youth Entrepreneurs** – The association has reached out to local schools, including hosting an Entrepreneur Day with CEOs from a dozen companies at a local middle school. FEA deems this to be an effective age at which to begin planting the seeds of entrepreneurship.

Additionally, at eSEAL – Sigourney Entrepreneurial Academy for Leadership – about 170 students in 7th through 12th grades are participating in a new public charter school that is a pilot educational model to help young people develop entrepreneurial skills. This school, in Sigourney, Iowa, is located about 35 miles from Fairfield.

While listed above are some of the organized events hosted by FEA, the majority of sharing and networking happens informally in the community. The organization’s meeting spaces

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70 Artisan food is a niche product produced in the region and may include locally produced foods that have not been genetically modified.
include the local library, where it has invested resources, and a neighborhood café; these are designated as “economic gardening hot spots.” The environment for entrepreneurship is fostered by the downtown culture of meeting places, including cafes and restaurants; Fairfield has more restaurants per capita than San Francisco.

**Partners and Funding**

- Fairfield Entrepreneurs Association – Primary resource and networking group for entrepreneurs
- Fairfield Economic Development Association – Focuses on attracting businesses and entrepreneurs by providing information about doing business locally
- State of Iowa – The state offers various resources to businesses and industry. For example, Iowa’s Values Fund is focused on renewable and wind energy, and the Industrial New Jobs Program helps businesses that are adding new jobs with funds to train workers through one of the state’s 15 community colleges.

**Selected Metrics and Successes**

- Fairfield has attracted over $275 million in venture capital investment over the last 20 years, or about one-third of Iowa’s total.
- The investment has resulted in 4,000 new jobs in more than 70 companies.
- Per capita income in Fairfield has tripled over the last 20 years.
- The county ranks among the top five in the country in per capita charitable giving.
- New and burgeoning businesses in Fairfield are in industries as diverse as high-level financial services (Cambridge Investment Research) and biotech companies (Genetic ID) to a DVD business (Scribestorm) which relocated from Seattle.
- Over 40 software and marketing companies are headquartered in Fairfield.
- Cambridge Investment Research has grown from 10 employees when it moved to Fairfield 10 years ago to 250, with the addition of 97 more jobs expected in the next three years. The city helped put together a package of tax incentives and a low-interest loan to aid its expansion, and connected it with state workforce training dollars under Iowa’s Industrial New Jobs Training program.
- One-third of the population is self-employed in a home-based business.

**Sources:**

Fairfield Economic Development Association - www.growfairfield.com
State of Iowa – www.iowa.gov
Fairfield Entrepreneurs Association - www.toolsforbusiness.info
Case 2: The Wyoming Market Research Center – A State-Based Approach to Economic Gardening

The economy of Wyoming (population 510,000) is highly dependent on oil. A natural resource-based economy is subject to boom-and-bust cycles that can threaten the economy at any moment. Part of the state’s current economic development and job creation strategy is to diversify the economy by assisting small businesses, which dominate the state’s business community, to increase their chances of survival and expansion.

Wyoming’s businesses are spread out across the state and often far from the centers that might connect them with resources to grow and prosper. Additionally, because the businesses are small, they usually do not have in-house resources to conduct the market research to effectively evaluate the competition and locate customers, both within driving distance and across state and national borders.

While Wyoming usually runs a budget surplus, it realized the value of diversifying its economy to mitigate the impact of down cycles in natural resource extraction. Aiding small business also helps to provide a more vibrant, diversified, local economic base and a workforce with a diverse and more advanced skill set. The Wyoming Business Council consolidates many of the business activities that were formerly done under the departments of Commerce, Tourism and Agriculture. The Wyoming Business Council works with Small Business Development Centers throughout the state to provide places where business owners can physically go and get consultation. In 2003, the state decided it needed an additional tool to help its small businesses grow and succeed. The Wyoming Market Research Center (WMRC) was formed with a grant from the U.S. Economic Development Administration and state matching funds. The WMRC delivers tools that are trademarks of economic gardening, including market research, search engine optimization and other services.

The Wyoming Market Research Center

The WMRC operates out of the University of Wyoming in Laramie, in facilities that used to house a welding lab. Unlike other communities where economic gardening is based at least somewhat on face-to-face interactions, the WMRC delivers all its products to customers via the Internet or email because businesses in the state are spread across great distances. The WMRC also makes frequent use of videoconferencing and teleconferencing to interact with its clients.
WMRC’s strength lies in the power of its databases, which can mine data on markets in Wyoming, the U.S., Europe and other international markets, and GIS and other mapping data, which can determine driving distances, customer densities and other market information. The WMRC also does extensive work in search engine optimization and website consultation. Many of Wyoming’s businesses, as might be expected in a rural region, are Internet-based.

The WMRC serves a wide variety of businesses, turning no one away. While the idea was conceived principally to help entrepreneurs and small businesses, the center also helps larger businesses and even out-of-state businesses that have expressed interest or intention to locate in Wyoming. The philosophy of the center is to help any business that might create jobs in Wyoming. The WMRC also collaborates with the Manufacturing Extension Partnership and the Wyoming Women’s Business Center, which also are located at the university.

The WMRC serves about 350 clients annually in a wide array of industries, including agribusiness (e.g., rabbit ranching) and high tech (e.g., raman spectroscopy, an electronic detection technology), as well as Internet-based companies and mom-and-pop stores. The WMRC may determine an international export market for a client one day and a delivery perimeter for a pizza restaurant the next.

In 2004, after the grant that started the WMRC lapsed, the Wyoming Business Council began to fund the program and increased the budget.

Sources:
Wyoming Market Research Center - http://uwadmnweb.uwyo.edu/sbdc
State of Wyoming - www.wyoming.gov

Case 3: North Texas Enterprise Center

Creation an Incubator to Grow Emerging Niche Sectors

In 2002, the North Texas Enterprise Center (NTEC) was just an idea. In less than a year, it had become a reality and a leading regional medical technology incubator and accelerator. A public private partnership between the City of Frisco and private industry, it sprung from foresight to invest in emerging niche sectors.

The formation of NTEC was led by Larry Calton, who at the time was working in the emerging business practice of consulting firm KMPG. He was involved with various projects with Frisco city government when the idea
surfaced for the incubator facility and related programs. Calton was passionate about the need to foster entrepreneurship in the area, and given the strengths of the greater Frisco region and the state, local leaders determined that the region could capitalize on its technology and life sciences sectors. It decided to create an incubator that would seek out medical technologies, with an emphasis on medical devices that leverage the convergence of communications, software, semiconductors and information technology. The original mission of NTEC was to identify, mentor, and grow fledgling medical companies that focused on medical instruments and devices, diagnostic equipment, medical therapeutic devices, monitoring equipment, and other health-related products.

In 2010, NTEC expanded beyond medical technologies to include clean tech, focusing on game-changing technologies particularly in energy efficiency.

In its early stage, the City of Frisco partnered with the Frisco Economic Development Corporation (FEDC) and a private-sector partner, Hall Financial. FEDC agreed to provide $750,000 of funding over the first three years; Hall Financial provided free office space.

Why Medical and Clean Technology?
As the group began to put the plans together for NTEC, North Texas already was home to a scientific and technological community. State and local incentives were put in place to encourage development in life sciences and clean technology, to help create new industry clusters based on workforce skills and favorable infrastructure. North Texas also consistently receives more venture capital than any other region of Texas. All of these factors created ripe conditions for NTEC.

A Winning Facility and Innovative Programs: A Detailed Look
Frisco’s leadership chose to build an innovative facility to house NTEC, designed specifically to meet the diverse needs of high-tech companies. The facility, a 50,000-square-foot enterprise center, includes 10,000 square feet of shared administrative space to encourage collaboration and allow ventures to share common start-up expenses. Local service providers and capital providers also are on site to help address the day-to-day issues of starting up a high-tech business. The facility also includes wet lab space, furnished offices, and high-tech flex-space cubicles that allow for rapid reconfiguration. NTEC also includes high-speed Internet access with scalable bandwidth capability, data and digital IP telephony voice communications.
NTEC’s services are designed to help resident ventures identify and execute an effective strategic plan that accelerates their time to market. For example, it offers highly specialized services relevant to medical and clean technology companies through its “Rapid Plug-In Network” – services provided include regulatory, quality control, and compliance consulting. These services provide the expert management guidance and tools that help NTEC’s entrepreneurs guide their start-up through the exhaustive commercialization process.

Finding the Right Ventures
Frisco’s leadership understood that while a state-of-the-art facility plays a vital role, it is equally important to identify the right entrepreneurs and provide them with the services to accelerate their companies. NTEC staff consulted with the state, local industry and entrepreneurial leaders to establish guidelines for its tenants. It was determined that tenants must have the following:
• Innovative and identifiable intellectual property (IP);
• Probable time to market within three years;
• A business plan that shows considerable revenue within five years;
• Relevant industry focus (medical or clean tech);
• Founding entrepreneur must be fully dedicated to the venture and must have niche-specific expertise;
• Four months of capital; and
• Willingness to use all NTEC services and be open to advice and counsel.

Programs and Services
NTEC’s companies rely heavily on the center’s direct management support services in areas such as business execution, risk mitigation, best practices and business acceleration.

Once a venture has applied and been accepted into the NTEC program, staff work closely with the business owners to assess their needs and tailor services accordingly. Most businesses go through the following process:
1. First, staff completes a business gap analysis. This process helps the company understand its needs and provides short-term goals and metrics. Once this assessment is complete, NTEC’s staff closely monitors progress.
2. Next, NTEC staff guides tenants through the primary services offered, including:
• Business plan enhancement – Companies must have a viable business plan to be accepted into the NTEC program. Experts will take the original plan and help improve it.
• Mentoring – NTEC has an extensive list of accomplished entrepreneurs. Each tenant is assigned a relevant mentor to help meet the goals established in the gap analysis and enhanced business plan.

• Management team and boards – Much like the mentor process, NTEC’s staff, board of directors and advisory board have a vast number of contacts who are established in entrepreneurship and medical and clean technology. NTEC leverages these relationships to build strong management teams and boards for its tenants.

• Investment capital – Adequate funding is the lifeblood of the start-up process. NTEC identifies and introduces its clients to qualified angel investors, venture capitalists and joint venture partners, as well as traditional financing mechanisms.

NTEC also provides a wide array of complementary services, such as access to its extensive business resources library, fee-based direct consulting services, and intern support. NTEC staff will also help tenants identify reputable professional service providers.

NTEC also provides educational opportunities for its tenants to enhance their management skills, learn about best practices, new professional service providers, and various other outside assistance programs. One successful program that teaches skills directly to the start-up management team focuses on the intricacies of strong leadership and management. A second successful program is CEO Meetings, facilitated by NTEC staff and partner organizations to bring together various tenants and outside entrepreneurs in an environment of collaboration to establish short- and long-term strategic business solutions. NTEC also hosts numerous other business seminars, conferences and events with nationally recognized business leaders.

Recognition and Successes

NTEC is now the largest medical technology accelerator in the Southwest United States. It is an accredited member of the National Business Incubator Association and currently has eight companies participating in its acceleration program. It has 11 additional tenants in the medical and clean technology industries.

In June of 2009, NTEC received the “Healthcare Heroes – Innovator Award” from the Dallas Business Journal. In late 2009, NTEC graduated ErgoNurse, the first of its accelerator program tenants. ErgoNurse maintains its
headquarters at the center and continues to use the services as it executes the business plan that was created with the help of NTEC expert staff.

**Sources:**
North Texas Enterprise Center – www.ntec-inc.org
Interview: Larry Calton, Executive Director, NTEC

**Case 4: Advanced Technology Development Center – Georgia Tech University**

This case shows how a public university in Georgia created an entrepreneur support organization that fosters profitable business ventures not only by guiding its own faculty research to market, but also by working with non-university-affiliated entrepreneurs to further strengthen the regional and state economy.

**ATDC Background**

An idea born from an ambitious leadership group of Georgia Tech alumni, the Advanced Technology and Development Center (ATDC) has evolved from an effort to provide economic development benefits through employment of Georgia Tech graduates in Georgia-based companies into an economic engine for the state.

In 1979, with encouragement from Georgia Tech alumni, then-Governor George Busbee commissioned a study of the state’s science, engineering and technology programs. The Georgia General Assembly responded with funds for a facility to promote university-business partnerships. Established in 1980 with its first tenant taking up residency in 1981, the ATDC is a start-up accelerator that has helped create millions of dollars in tax revenues for the state. It has successfully graduated more than 120 companies, bringing in more than a billion dollars in outside financing to its resident companies.

ATDC is part of Georgia Tech’s Enterprise Innovation Institute (EI2), the nation’s largest and most comprehensive university-based program of assistance to business and industry. ATDC currently has facilities at Georgia Tech’s main campus in Atlanta and a satellite campus in Savannah.

ATDC recently expanded its mission by merging with Georgia Tech’s VentureLab – established in 2001 to help spin out companies from university research – and with the Georgia Small Business Innovation Research Assistance Program, a competitive grant program through the U.S. Small Business Administration. These partnerships have
allowed ATDC to expand its membership to all technology entrepreneurs in Georgia.

**ATDC’s Programs and Services**
ATDC’s staff of 17, with a wide array of expertise in technology and business, works with entrepreneurial businesses in all phases of development. ATDC has organized its services by five C’s: Consulting, Connection, Community, Credibility, and Center. ATDC provides incubation and acceleration assistance to its start-up companies through direct funding, expert consultation, group education, group networking events, and access to state-of-art facilities.

**Funding Programs (Credibility)**
ATDC manages two investment funds to assist its companies – the Seed Fund and the Georgia Tech Fund. While both funds inject capital into ventures, they also provide companies with credibility that enables them to leverage additional funds from outside investors.

- **The ATDC Seed Capital Fund** invests in Georgia-based entrepreneurial businesses pursuing innovation in bioscience and advanced technology. A competitive fund, it collaborates with local and national investors to invest $1 of its own capital for every $3 of private investment. The fund can invest up to $1 million in a company. It currently has 26 companies in its portfolio.

- **The Georgia Tech Edison Fund** - Launched with a multi-year grant from the Charles A. Edison Fund, this fund provides seed funding for early-stage technology companies that have a close association with Georgia Tech, such as those founded by Georgia Tech faculty, students and graduates; those licensing technology from Georgia Tech or sponsoring research at Georgia Tech; and even those hiring a large number of Georgia Tech alumni. Investments are generally less than $250,000. It currently has four companies in its portfolio.

**Comprehensive Member Services (Consultation, Connections, & Community)**
Along with top-notch facilities and two venture funds, ATDC member companies can take advantage of structured educational events, business tools and resources, promotional opportunities through networking and presentations, and community support.

One of the more successful programs is the Brown Bag Program, a monthly lunch with rotating topics such as sales, financing, management, and leadership skills. CapVenture, another ATDC program, is a structured,
six-week training program designed to educate and equip early-stage executives for capitalization of their business.

_Bold Traditional Business Services_  
Along with its unique programs, ATDC also provides basic perks to member tenants, such as a searchable job board; online information on peer ATDC companies and an online forum; casual networking sessions; information on area business service providers; and free start-up business consulting from ATDC’s expert staff. ATDC staff also consults with tenants on the SBIR program and provide assistance writing grant proposals.

_Bold State-of-the-art Space (Center)_  
ATDC offers physical space for start-ups that includes flexibility both in physical space and in leasing terms. Two types of space are available to new tenants: SeedSpace, which includes small offices and cubicles for short-term rent, and SuiteSpace, which entails larger offices and discount-priced wet lab space for conducting research and testing.

_Bold A Special Emphasis on Start-ups_  
ATDC has developed multiple programs to assist start-ups through early-stage development. Startup Circles are small groups organized and led by ATDC staff, focused on start-up communities defined either by geography or company focus. Startup Showcase is another program that helps unite and create collaboration among start-ups. It is an annual event that showcases ATDC member companies to the greater Atlanta technology community. Finally, ATDC provides extensive start-up resources such as best-practice presentations and document templates, and looks for other avenues to highlight and gain exposure for member companies.

_Bold Partners_  
ATDC has developed a strong partner network and relies heavily on it for continued success. A list of key partner organizations includes:

_Atlanta CEO Council_ - The Atlanta CEO Council is an exclusive networking organization for entrepreneurs, C-level executives, venture capitalists and corporate business leaders. Membership is complimentary for qualified executives.

_Georgia Research Alliance_ – The Georgia Research Alliance is a non-profit that capitalizes on innovative university research to build a vibrant, technology-rich economy.

_Georgia Tech Venture Center_ – Located at Technology Square in Midtown Atlanta, the
Georgia Tech Venture Center offers office space for companies, entrepreneurs, and service providers wanting proximity to Georgia Tech and ATDC.

**Minority Business Enterprise Center** – The Georgia Minority Business Enterprise Center (GMBEC) is part of a national network established to foster the success of minority-owned businesses. GMBEC services are designed to improve access to capital, make business more profitable and create jobs.

**National Business Incubation Association** – The National Business Incubation Association is the leading organization for advancing business incubation and entrepreneurship.

**Technology Association of Georgia** – TAG promotes the economic advancement of the state’s technology industry.

**Accomplishments, Awards, and Recognition**

Over its first 30 years, more than 100 companies started at ATDC, most notably MindSpring (now part of EarthLink) and TransNexus. Research shows that ATDC-sponsored companies have generated over $12.7 billion in revenue, generating over $100 million for the state of Georgia. This success has enabled ATDC companies to raise over $1 billion in venture capital since 1999.

ATDC has won numerous awards and accolades, including recognition by national publications Inc. Magazine and Business Week as one of the nation’s top incubators. ATDC recently was highlighted by Forbes.com as one of a short list of “technology incubators changing the world.”

*Nearly 83 percent of businesses that graduated from the incubator over its first 30 years are either still in business or have been acquired by another firm. Universities all over the world now study Georgia Tech, EI2, and ATDC as models for best practices in technology business incubation and acceleration.*

**Sources:**
Advanced Technology Development Center - [http://atdc.org](http://atdc.org)
Interview: Charles Ross, Assistant Director, ATDC
Additional content provided by Joy Wilkins, Manager, Community Innovation Services at Georgia Tech Enterprise Innovation Institute

**Case 5: The Oregon Entrepreneurs Network**

This case study highlights how the merger of two entrepreneur assistance organizations and an all-inclusive approach to supporting entrepreneurs has fostered strong start-up growth in southwest Oregon and beyond.
Portland, Oregon’s Fertile Start-up Community

The greater Portland area boasts a unique and diverse economy that includes large industry clusters in clean technology and high technology – hence the moniker “Silicon Forest” – and outdoor gear and apparel. This large number of businesses in close proximity creates significant opportunities for collaboration, resulting in spin-out entrepreneurial ventures. Another factor playing into the area’s entrepreneurship-friendly environment is that many of its large employers started out as small, local entrepreneurial ventures themselves. Enter the Oregon Entrepreneurs Network (OEN), the largest entrepreneur assistance organization in Oregon, established to encourage the growth of emerging businesses by connecting them to expertise and extensive resources.

A Brief History

Originating in 1991 as the Oregon Enterprise Forum, OEN was one of a handful of chapters of the Massachusetts Institute of Technology Enterprise Forum. In 1997, it expanded by merging with the Oregon Young Entrepreneurs Association, a fledgling entrepreneur support organization that focused on young professionals interested in start-ups and spin-out ventures. The merged group, first called the Oregon Entrepreneurs Forum, changed its name again in 2007 to the Oregon Entrepreneurs Network to better reflect its mission of being the greater Portland region’s entrepreneurial connector. Over the last three years, OEN has taken an inclusive approach to individual entrepreneurs and their ideas, leading to strong membership growth as it continues to adapt and meet the needs of today’s entrepreneurs. With its recent successes, OEN has now grown to become the leading entrepreneurial support organization in the state.

Entrepreneurial “Tribalism”

OEN has expanded throughout Oregon and southern Washington, attracting entrepreneurs from all over who seek guidance in creating start-ups and access to OEN’s vast network of over 1,200 service providers, investors, and other entrepreneurial stakeholders.

OEN’s success can be attributed to its organization-wide, holistic approach toward the entrepreneurial community. Despite its staff of only five full-time employees, OEN provides quality comprehensive educational programs, resources, networking events and mentoring opportunities by leaning on its highly skilled and motivated volunteers and partner organizations.
OEN has coined the term “entrepreneurial tribe” to explain the unique relationship it shares with its members and the community. OEN President and Executive Director Linda Weston provides more insight: “In a traditional tribe, elders serve as mentors to younger members by passing on knowledge and wisdom from their experiences. Younger members invigorate the tribe with their fiery passion and aspirations. In OEN, members help other members build successful, economy-stimulating Northwest businesses.”

A More Detailed Look at Entrepreneurial Tribalism

OEN breaks down its services and programs into three categories; knowledge, connections, and capital.

Knowledge – Along with access to OEN’s vast resource library, webinars and seminars, it also provides access to learning opportunities by quickly integrating new members into a larger group of entrepreneurs who have varying levels of experience and expertise. The goal is to create valuable dialogue and information exchange, peer review and evaluation, as well as mentorship opportunities. OEN has developed three series of programs to encourage this interaction:

• CEO Roundtables – Meetings led by an experienced CEO that cover topics essential to starting and running a successful business.
• Meet and Eats – A lunch-and-learn series hosted by a partner organization.
• Off the Record with a CEO tour – Informal, private meetings in which entrepreneurs can have off-the-record conversations with experienced CEOs.

This “tribal integration” takes place simultaneously with the entrepreneur developing her business concept and plan. During this stage, OEN offers business concept, plan and presentation reviews, critiques and seminars through its network of volunteers. Members also can gain valuable knowledge by enrolling in the OEN Executive Series, which provides entrepreneurial executives a refresher course on the elements critical to running a successful business.

Connections – Closely aligned with its philosophy on knowledge and the mantra “you’ve got something they need and they’ve got something you need,” OEN strives to create constant networking opportunities for its entrepreneurs. It does this through awards ceremonies, pub talks, swap meets, and traveling road shows, detailed below.
• Tom Holce Awards for Entrepreneurship is Oregon’s largest annual statewide gathering to celebrate entrepreneurship. Awards are given to entrepreneurs in the following categories: Development Stage, Working Capital Stage, Growth Stage, and Individual Achievement.

• OEN Pub Talk – A monthly event that mixes educational panel discussions delivered by successful entrepreneurs, investors or business experts with the opportunity for new companies to refine their pitch skills by giving brief presentations on their ventures.

• OEN SwapMeet – The newest of OEN’s networking portfolio is essentially a quarterly informal happy hour gathering for entrepreneurs to catch up and compare notes.

• OEN Around Oregon – In an effort to reach out to a broader geographic territory, OEN partners with various economic development partners to take its networking program on the road.

OEN also provides a message board, searchable jobs board and member directory on its website.

**Capital** – All entrepreneurial ventures must have access to capital to grow and prosper. OEN had this in mind when it built one of the largest, most organized and streamlined investment networks in the Pacific Northwest. It took it one step further by developing an online portal for access to each of its investment programs. The online portal serves entrepreneurs and potential investors equally. Emerging companies benefit from electronically sharing their approved executive summaries with angel investors throughout Oregon. Angels benefit from an exclusive, private opportunity to browse or search through emerging company profiles, review their executive summaries and post comments or questions for company executives.

Below is a list of OEN and its affiliate investment programs that all can be accessed through the online portal.

• Portland Angel Network (PAN) – A group of over 60 accredited angel investors who meet bi-monthly to hear presentations from early-stage entrepreneurial companies.

• Women’s Investment Network (WIN) – A forum dedicated to women who are angel investors or interesting in learning more about the angel investment process. Its mission is to promote investment opportunities, angel education and networking to increase the number women angel investors in Oregon.

• Oregon Angel Fund (OAF) – A structured and professionally managed fund that is dedicated to investing in PAN applicants.
• Oregon Angel Investment Conference – Annual event that is considered one of the nation’s premier angel investment prize conferences. It brings together Oregon and Southwest Washington’s entrepreneurial talent with accredited angel investors.

• Venture Northwest Investment Conference – Annual conference that brings together Western U.S.-based institutional investors and investment bankers who have interest in investing in Northwest business ventures. It has led to OEN-affiliated businesses raising over $1.3 billion in venture capital since 1996 and over $68 million in angel investment.

• Seed Oregon Pub Talk – A competition held during OEN Pub Talk events for Oregon and Southwest Washington seed-stage companies that are seeking capital within the range of $100,000 to $2 million. The winner earns a presenting opportunity at OEN’s Angel Oregon Investment Conference.

A Summary of OEN Recent Successes

Due to its reputation and record of success, OEN boasts nearly 100 public and private sponsor companies and organizations that provide volunteers and funds to help with programs and day-to-day operations. This support enables OEN to offer nearly 100 educational, networking and venture capital events and presentations each year. Through its coordination efforts, OEN has compiled a roster of approximately 100 investors who actively consider investment in start-up companies coming up through the ranks of OEN programs.

In an August 2009 Entrepreneur magazine article, Portland was named one of the top cities in the United States for entrepreneurs. Much of this can be credited to the hard work and keen insight of the Oregon Entrepreneurs Network.

Sources:
Oregon Entrepreneurs Network – www.oen.org
Interview: Linda Weston, President and Executive Director, OEN
Entrepreneurship is claiming center stage in economic development strategies for many communities around the country. It is seen as a key strategy to help communities emerge from the Great Recession and re-energize their economic development initiatives. Traditional economic development strategies such as business attraction will continue to play a significant role in job and wealth creation in the foreseeable future; however, innovative and entrepreneurial businesses are emerging as vital to ensuring community competitiveness in the long term.

The research and case studies in this Handbook demonstrate the common needs and challenges of entrepreneurial businesses, as well as the spectrum of resources that various communities offer to support them. However, there are distinct differences in reasons why communities deploy entrepreneurship strategies, as well as different outcomes from these strategies.

Economic development professionals play a key role in fostering entrepreneurship. While not all factors are within their control, economic developers have a large sphere of influence by virtue of their relationships with a variety of local and regional stakeholders. The success of the entrepreneur support organizations (ESOs) highlighted in this Handbook and in the second section of case studies comes from their ability to adapt to the emerging needs of their businesses, an appetite for risk-taking that mirrors the characteristics of entrepreneurial businesses, and an ability to connect resources and players throughout the region. EDOs need to convene and facilitate the connection of resources with entrepreneurs. Depending on the need in their community, economic development professionals may need to assume a leadership role, filling in gaps and advocating for entrepreneurship support and investments. Although we find trailblazers spread throughout the country, many economic development organizations are still trying to figure out what it means for them to include entrepreneurship as a key component of their economic development strategy and foster business growth from within as opposed to business attraction and retention.

We conclude our examination of entrepreneurship’s connection with economic development
with the below lessons learned. The role of economic development professionals is intricately connected with the achievement of continued economic prosperity, evolving with the emerging needs of the entrepreneurs and the resources that the community has to offer. In summary, we find that:

• Strategies to foster entrepreneurship vary by community;
• Entrepreneurship should be a key component of an economic development toolbox;
• Economic developers need training in entrepreneurship support;
• Strategy should be built on clear assessment of existing assets, plans and needs;
• Collaborative partnerships are important;
• Economic development organizations must be prepared to take a leadership role in fostering entrepreneurship;
• Entrepreneurship support requires capacity-building efforts in the community; and
• New metrics are needed to measure entrepreneurial success at the community level.

Strategies to foster entrepreneurship vary by community

Entrepreneurship strategies come in various shapes and sizes, depending upon the needs and resources of the community. It is becoming increasingly important for communities to offer some types of services to help entrepreneurs and small businesses at various stages of development in order to evolve into a more entrepreneurial community. In most communities, a mix of the three elements of an entrepreneurial environment – structures, talent and networks – helps grow and nurture entrepreneurship. Whether it is the Fairfield Entrepreneurs Association in Iowa, which supports entrepreneurs regardless of industry cluster, or the focused efforts of the North Texas Enterprise Center on the life sciences cluster, successful ESOs provide a wide range of services and programs to help local and regional entrepreneurs.

Entrepreneurship should be a key component of your economic development toolbox

More and more communities see the advantages of “growing from within.” With a few exceptions, most communities integrate certain entrepreneurship support services into an existing array of economic development tools, rather than replacing those tools entirely. In an uncertain economic environment, a diversity of strategies can help communities better...
manage their risks while addressing myriad community needs.

Communities serious about encouraging entrepreneurship must develop adequate resources and policies to ensure long-term success. Entrepreneurship elements must be integrated into the overall economic development strategy for the community, including clearly defined goals, objectives and action items; responsible agencies and partners; resources for implementation and timelines; and metrics for measuring success. The City of Frisco partnered with the Frisco Economic Development Corporation (FEDC) and invested $750,000 as seed funding for the North Texas Enterprise Center, which today is helping over a dozen businesses in north Texas after just a few years in operation.

Economic developers need training in entrepreneurship support

In order for widespread adoption of entrepreneurship programs to become an integral part of economic development strategies throughout the country, it is imperative to train economic development professionals. The strategies needed to grow companies are markedly different from those necessary to attract and retain them. Different types of skills sets and analyses are necessary to support programs such as economic gardening versus incentives for business attraction. It is clear that most communities adopt a mix of strategies rather than relying on a single economic development program.

Although this Handbook is a step towards providing insights into the reasoning and different approaches to entrepreneurship growth, further research is necessary to facilitate and operationalize entrepreneurship support programs.

Strategies should be built on a clear assessment of existing assets, plans and needs

First, a community should map out its existing network of service providers (education, finance, technical assistance, legal, accounting, mentors, international trade, consultants, institutions, nonprofits and others) that support local entrepreneurs. (The next chapter provides ready-to-use tools for mapping a community’s entrepreneurial ecosystem.) Additional data analysis will also be necessary to determine demand, supply and use of different services in the community. Economic
developers can use this manual as a guide to ensure that a wide range of services is accessible to their local entrepreneurs.

The mapping process can also highlight strong and weak parts within the ecosystem – the unique opportunities and challenges emerging from the particular set of service providers in a community. The idea for the creation of the North Texas Enterprise Center came from a detailed understanding of strengths at regional and state levels, and the potential of existing industry clusters in scientific research and technology. The ultimate, ongoing goal of the economic development professional should be a complete and detailed understanding of the ecosystem and how it might be improved.

While an assessment is a starting point for ensuring that economic development professionals are better able to assist entrepreneurs, it is not a one-time undertaking. Regular assessments of the local and regional entrepreneurial ecosystem are important to ensure that adequate policies, programs and resources are available. Such an assessment should be a standard feature of preparation for economic development plan updates.

Collaborative partnerships are important

One of the most important roles for economic development professionals is to connect users with resources and facilitate relationships among multiple stakeholders. EDOs that establish and nurture relationships with other stakeholders and service providers in the community and beyond will have a higher likelihood of success in fostering entrepreneurship. A web of entrepreneurial resource providers consists of information networks, technical assistance providers, funders, mentors and more. By building on the relative strengths of a variety of players and partners, communities are better equipped to address the constantly emerging needs of entrepreneurs and entrepreneurial businesses. Strong links between each of these “nodes” in the entrepreneurial ecosystem are important to facilitating sustained entrepreneurial growth, and expand the “sphere of influence” for EDOs as more and more players join the network.

These links and relationships should ensure that entrepreneurs receive the assistance they need regardless of their point of entry into the ecosystem. This is called the “no wrong door” approach, promoted by Erik
As an entrepreneur, it is important to approach the local chamber of commerce for help with accessing training or management assistance. If that particular need cannot be serviced by the chamber, the entrepreneur should be pointed quickly from there to the appropriate provider. Instead of turning away entrepreneurs, service providers should establish contact with appropriate providers and ensure that entrepreneurs gain access.

The example of the Oregon Entrepreneurs Network (OEN) is a case of successful collaborative partnerships—how EDOs can align their missions and offerings to provide a wide network of services and resources. It also demonstrates a successful “no wrong door” policy in action. The success of DesignMedix, LLC, is due in part to the access provided by OEN to networks of angel investors during the early stages of the business, and valuable networking and educational opportunities. Instead of limiting support to the services provided in-house, OEN made connections for DesignMedix, and the network supported its continued development.

While it is important to form partnerships with myriad players in the community and beyond, it is not necessary to forge formal partnerships every time a new potential partner is identified. Instead, it is more important to forge close working relationships to align resources and better serve the needs of the community.

**Economic development organizations must be prepared to take a leadership role in fostering entrepreneurship**

The job of economic development professionals goes beyond just networking various resources and players. As seen in the case studies, one of the most significant contributions of EDOs is to fill gaps that have been identified. For the economic development professional, that may mean starting a program, recruiting providers to the area, or connecting to non-local resources. The example of finance can illustrate this role.

- **Start your own:** An EDO may set up its own financial assistance programs to supplement resources available through the market. In such cases, it is typically gap financing that the EDO provides.

- **Recruit new players:** States and regions have provided incentives to recruit venture
capital companies to locate an office in their region to fill a gap in availability of equity capital.

- **Tap into national and global resources:**
  Economic development professionals may need to build relationships nationally or even globally to ensure access to critical resources locally. In this case, an economic developer may travel to venture events outside the region to build a wealth of finance connections. Or, communities may host their own venture forums with the purpose of bringing equity investors to their region.

As the needs of entrepreneurs evolve and change, so does the role of the entrepreneurship ecosystem in facilitating their growth. For example, entrepreneurs may need special assistance during the early stages of starting and growing a business. Once the business is set up and on track to growth and maturity, the role of the economic developer changes from facilitating hand-holding to enabling its development through networking, information exchanges, managerial and operational assistance, to name a few. The example of ErgoNurse and the North Texas Enterprise Center showcases how the needs of the business changed from strategic and tactical advice in building a medical device company to venture capital and eventually to remaining connected and networking. Throughout this transition, the ESO helped at every stage of development. While ErgoNurse has graduated from the accelerator program, it continues to be housed at NTEC in order to access critical resources and advice.

**Entrepreneurship support requires capacity-building efforts in communities**

The most supportive entrepreneurial environments are those that are nimble and adaptable to the emerging needs of local businesses. Such systems can only be built over time with devoted leadership and resources. Building capacity in an ever-changing environment, for a variety of industries or clusters, can be a challenging, sometimes daunting task.

Capacity-building for entrepreneurship support starts with dedicated leadership at various levels and a long-term vision. At the same time, it needs to be grounded in the assets and resources available, slowly building up capacity to expand the network and services offered to local entrepreneurs. The North Texas Enterprise Center is a great example
of this. The incubator program built itself on regional strengths in the technology and life sciences industries, and with demonstrated success over the next eight years, it expanded into the clean-tech industry, again focusing on the key strengths of the region. Similarly, the Advanced Technology Development Center at Georgia Tech started out as a start-up accelerator to help commercialize university research through Georgia-based businesses; its mission expanded to include establishment of spin-out companies from university research after proving successful in its core mission.

**New metrics are needed to better measure entrepreneurial success at the community level**

The field of economic development constantly faces the need to adapt to an ever-changing, more competitive, and more volatile economic and business climate. As traditional economic development strategies decline in impact, new, improved entrepreneurship-related metrics are therefore needed to accurately measure the impacts of new policies and programs.

Although most ESOs continue to measure success in terms of jobs and investments, some are including a wider spectrum of metrics. For example, the Fairfield Entrepreneurs Association lists more than a dozen different metrics, including increase in per capita income, per capita giving, diversity in local and regional industry clusters, and percentage of self-employed population. Other metrics could include number of business incorporations facilitated by the EDO, amount of equity and debt invested in entrepreneurial companies, number of patents created by the companies, dollar value of successful exits (IPO or strategic acquisition), etc. It is important that EDOs also measure their impact in a more diversified way in order to highlight their success to stakeholders, elected officials and investors.

In conclusion, the changing economic landscape essentially requires economic development professionals to include entrepreneurship as a major component of their toolbox. Properly supported, entrepreneurs and a supportive ecosystem can be the key to unlocking a community’s innovation and growth potential.
CHAPTER VIII

Toolkit

The last section of the handbook provides ready-to-use tools for economic development professionals seeking to establish or enhance entrepreneurial support services in their communities. The toolkit has the following parts:

A. Qualitative assessment of your community’s current entrepreneurship support services: The assessment should be completed by the EDO in partnership with other institutional players.

B. Quantitative assessment of the entrepreneurship and business climate in the community: Data collection from a variety of publicly available sources, such as the Census Bureau, Bureau of Labor Statistics and others, provides a baseline from which to make decisions.

C. Firm survey to assess the needs of entrepreneurs in the community: The survey is a mechanism to start dialogue between the EDO and entrepreneurs, and can determine the level of need and use of support services in the community.

D. Innovation assessment: Collection and analysis of innovation indicators reveals the dynamics of the innovation ecosystem and the level of community competitiveness.

A. Qualitative Assessment by EDOs

Community Entrepreneurship Assessment Checklist

Use this checklist to assess what services are currently provided in your community. This assessment should be supplemented with information from the tables that follow, which capture more detailed information about each of the services provided. This checklist and the tables that follow must be completed by the EDO and other institutional players in the community.
Entrepreneurship Support Services
• Business planning
• Mentoring
• Industry networks
• Technical assistance
• Competitive intelligence
• Marketing
• New market development (including exports)
• Technology transfer, commercialization and licensing programs
• E-commerce
• Management skills
• Specialized space (e.g., wet labs)

Business Services
• Legal
• Accounting
• Human resources
• Information technology
• Intellectual property
• Health and safety
• Environmental/regulatory
• Energy efficiency

Education and Training
• K-12 entrepreneurship education
• Post-secondary entrepreneurship education
• Kauffman FasTrac training or similar
• Internships

Community
• Community groups sponsoring entrepreneurship efforts
• Chamber of commerce with entrepreneurship programming
• CDC or other neighborhood groups with entrepreneurship programming
• Business plan competitions
• Entrepreneurship celebrations
• Sufficient and positive media coverage of entrepreneurship

Capital Access
• Financial literacy
• Microfinance
• Seed finance
• Revolving loan funds
• Venture capital
• SBICs
• Other equity
• SBA loans
• Angels
• Government-backed
• Other debt
• CDFIs
• Other financial institutions
## Entrepreneurship Support Services Asset Map

For the following services, identify who is able to offer each service, to whom it is offered, any costs involved, and if available, some assessment of service quality. Also note where gaps exist.

<table>
<thead>
<tr>
<th>Service</th>
<th>Who offers this service (note if it is not available in the community)</th>
<th>What type of entrepreneur does it support (e.g. lifestyle, growth)</th>
<th>Service costs</th>
<th>Quality assessment (if available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Planning</td>
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<tr>
<td>Industry Networks</td>
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<td>Technical Assistance</td>
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<td>Market Intelligence</td>
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<tr>
<td>Marketing</td>
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<tr>
<td>New Market Development (including exports)</td>
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<tr>
<td>Technology Transfer, Commercialization and licensing programs</td>
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<tr>
<td>E-commerce</td>
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<tr>
<td>Management</td>
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<tr>
<td>Specialized Space (e.g. wet labs)</td>
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</tbody>
</table>
## Capital Access Asset Map

For the following services, identify who is able to offer each service, to whom it is offered, any costs involved, and if available, some assessment of service quality. Also note where gaps exist.

<table>
<thead>
<tr>
<th>Service</th>
<th>Who offers this service (note if it is not available in the community)</th>
<th>What type of entrepreneur does it support (e.g. lifestyle, growth)</th>
<th>Service costs</th>
<th>Quality assessment (if available)</th>
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</thead>
<tbody>
<tr>
<td>Financial Literacy</td>
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<tr>
<td>Microfinance</td>
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<tr>
<td>Seed Finance</td>
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<tr>
<td>Revolving Loan Funds</td>
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<tr>
<td>Venture Capitalists</td>
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<tr>
<td>Angels</td>
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<tr>
<td>SBICs</td>
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<tr>
<td>Other Equity</td>
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<tr>
<td>SBA Loans</td>
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<tr>
<td>Other Financial Institutions</td>
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<tr>
<td>Government-backed</td>
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<tr>
<td>Other Debt</td>
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<td>CDFIs</td>
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<tr>
<td>Other Financial</td>
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</tbody>
</table>
## Business Services Asset Map

For the following services, identify who is able to offer each service, to whom it is offered, any costs involved, and if available, some assessment of service quality. Also note where gaps exist.

<table>
<thead>
<tr>
<th>Service</th>
<th>Who offers this service (note if it is not available in the community)</th>
<th>What type of entrepreneur does it support (e.g. lifestyle, growth)</th>
<th>Service costs</th>
<th>Quality assessment (if available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Accounting</td>
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<tr>
<td>Human Resources</td>
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<tr>
<td>Information Technology</td>
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<tr>
<td>Intellectual Property</td>
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<tr>
<td>Health and Safety</td>
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<tr>
<td>Environmental/Regulatory</td>
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<tr>
<td>Energy Efficiency</td>
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</tbody>
</table>
## Education and Training Asset Map

For the following services, identify who is able to offer each service, to whom it is offered, any costs involved, and if available, some assessment of service quality. Also note where gaps exist.

<table>
<thead>
<tr>
<th>Service</th>
<th>Who offers this service (note if it is not available in the community)</th>
<th>What type of entrepreneur does it support (e.g. lifestyle, growth)</th>
<th>Service costs</th>
<th>Quality assessment (if available)</th>
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</thead>
<tbody>
<tr>
<td>K-12 entrep. education</td>
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<tr>
<td>Post-secondary entrepreneurship education</td>
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<tr>
<td>Entrepreneurship training such as Kauffman Fasttrac or other similar</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Internships</td>
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</tbody>
</table>
**Community Asset Map**

For the following services, identify who is able to offer each service, to whom is offered, any costs involved, and if available, some assessment of service quality. Also note where gaps exist.

<table>
<thead>
<tr>
<th>Service</th>
<th>Who offers this service (note if it is not available in the community)</th>
<th>What type of entrepreneur does it support (e.g., lifestyle, growth)</th>
<th>Service costs</th>
<th>Quality assessment (if available)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community groups with entrepreneurship efforts</td>
<td></td>
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<tr>
<td>Chamber of Commerce with entrepreneurship programming</td>
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<tr>
<td>Neighborhood groups (CDC) with entrepreneurship programming</td>
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<tr>
<td>Business plan competitions</td>
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<tr>
<td>Entrepreneurship celebrations</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Media coverage of entrepreneurship</td>
<td></td>
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</tbody>
</table>
B. Quantitative Assessment by EDOs

Quantitative information also is essential to obtain a complete picture of the state of entrepreneurship, and helps establish a baseline from which to make decisions about services and products to be provided. Such information can be gathered from publicly available data sources such as the Census Bureau, Bureau of Labor Statistics and others. Some of this information may also be available locally.

Such data should be collected at the local, regional, state and national levels, in order to determine community performance against benchmarks. Comparisons also can be made with similar communities in or outside the state. For each of the data points below, the likely source of data is also provided.
<table>
<thead>
<tr>
<th></th>
<th>Local</th>
<th>State</th>
<th>National</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent of total employment in</td>
<td></td>
<td></td>
<td></td>
<td>Census Bureau: <a href="http://factfinder.census.gov">http://factfinder.census.gov</a></td>
</tr>
<tr>
<td>physical and social sciences,</td>
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<tr>
<td>information technology,</td>
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<tr>
<td>healthcare)</td>
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<tr>
<td>Percent change in target</td>
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<tr>
<td>industry employment (2, 5 and</td>
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<tr>
<td>10 years)</td>
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<tr>
<td>Average annual wage of target</td>
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<tr>
<td>industries, and growth</td>
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<tr>
<td></td>
<td>Local</td>
<td>State</td>
<td>National</td>
<td>Source</td>
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<td>------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Federal R&amp;D funds received</td>
<td></td>
<td></td>
<td></td>
<td>National Science Foundation: <a href="http://www.nsf.gov/statistics/nsf10302/">http://www.nsf.gov/statistics/nsf10302/</a></td>
</tr>
<tr>
<td>Total R&amp;D performed ($)</td>
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<tr>
<td>Academic R&amp;D performed ($)</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Industry R&amp;D performed ($)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBIR awards granted</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Science &amp; engineering degrees conferred, bachelor’s and graduate</td>
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<tr>
<td></td>
<td>Local</td>
<td>State</td>
<td>National</td>
<td>Source</td>
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<td>------------------------</td>
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<tr>
<td>Share of U.S. VC dollars</td>
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<tr>
<td>VC dollars per capita</td>
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<tr>
<td>Total annual VC deals</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Angel investment by state ($)</td>
<td></td>
<td></td>
<td></td>
<td>Angel Capital Education Foundation: <a href="http://www.angelcapitaleducation.org/listing-of-groups/#17">http://www.angelcapitaleducation.org/listing-of-groups/#17</a> (search by regional angel network)</td>
</tr>
<tr>
<td>Number of angel investment groups</td>
<td></td>
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</tbody>
</table>

* For explanation of business stages, see pages 24-30
<table>
<thead>
<tr>
<th></th>
<th>Local</th>
<th>State</th>
<th>National</th>
<th>Source</th>
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</thead>
<tbody>
<tr>
<td>Total new businesses</td>
<td></td>
<td></td>
<td></td>
<td>YourEconomy.org</td>
</tr>
<tr>
<td>Growth in new businesses</td>
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<tr>
<td>(2, 5 and 10 years)</td>
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<tr>
<td>Total jobs created by new</td>
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<tr>
<td>businesses, and growth</td>
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<tr>
<td>…by business stage (1-4)*</td>
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<tr>
<td>…by resident or nonresident</td>
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<td></td>
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<tr>
<td>Educational attainment of</td>
<td></td>
<td></td>
<td></td>
<td>American Community Survey:</td>
</tr>
<tr>
<td>population</td>
<td></td>
<td></td>
<td></td>
<td><a href="http://factfinder.census.gov/">http://factfinder.census.gov/</a></td>
</tr>
<tr>
<td>Median earnings according to</td>
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<td></td>
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<tr>
<td>educational attainment</td>
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<tr>
<td>In-migration by college-</td>
<td></td>
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<tr>
<td>educated adults</td>
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<tr>
<td>Local</td>
<td>State</td>
<td>National</td>
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</tr>
<tr>
<td>Domestic in/out migration</td>
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<tr>
<td>International in/out migration</td>
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</tbody>
</table>
C. Entrepreneur/Firm Survey

The firm survey should be used to start or rekindle a dialogue between the economic developer and entrepreneurs, as well as to assess the needs of local businesses and fill gaps in the community assessment. The survey should be completed by the owner or an employee intricately familiar with the operations of the business. Additional questions can be included in the survey based on resources and local needs, such as demand or use of certain services or products provided in the community.

The survey in its entirety is likely to be overwhelming for most business owners to fill out. We offer this survey as a potential list of questions to gather information from businesses. Pieces of this survey can be used or additional questions added in order to meet the needs of a particular community.

Name of the respondent: ________________________________________________

Name of the company/firm/business: ________________________________________

Is respondent an owner, employee, investor, supplier, customer: __________________

Type of company (NAICS code if know): ________________________________________

Number of years in operation: ______________________________________________

Number of years in operation at the current location: __________________________

Annual revenue for the most recently completed fiscal year: ______________________

Annual expenditures for the most recently completed fiscal year: ________________

Annual profits for the most recently completed fiscal year: ______________________
1) What was the most challenging problem your company faced during this calendar year?

<table>
<thead>
<tr>
<th>Problem</th>
<th>Yes/No</th>
<th>Don't Know</th>
<th>Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>An inability to obtain credit</td>
<td></td>
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<tr>
<td>Slow or lost sales</td>
<td></td>
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<tr>
<td>Falling real estate values</td>
<td></td>
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<tr>
<td>The cost and/or terms of credit</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>The unpredictability of business conditions</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Other problem (specify): _________________________</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2) Has your company accessed any of the following products or services through a local/ regional/state/federal government agency or non-profit?

<table>
<thead>
<tr>
<th>Service</th>
<th>Type of agency to offer the service</th>
<th>Details on the service provided</th>
<th>Costs, if any, associated with accessing the service</th>
<th>Was the service useful (Yes/No)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial Literacy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microfinance</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Seed finance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Revolving Loan funds</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venture Capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angel Capital</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBICs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Equity</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SBA Loans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Financial Institutions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government-backed Loans</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Debt</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CDFIs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other Financial</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3) Equity investment is money received in return for some portion of ownership. During this calendar year, did your company obtain equity financing from any of the following sources?

<table>
<thead>
<tr>
<th>Source</th>
<th>Yes</th>
<th>No</th>
<th>If yes, amount</th>
<th>Don’t know</th>
<th>Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spouses or life partners of owners of the business who are not already named as owners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parents, in-laws or children of owners of the business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Individuals who are not spouses or life partners, parents, in-laws or children of the owners, excluding venture capitalists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other companies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government agencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Venture capitalists</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other sources (specify):</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

4) Debt financing is borrowed money that has to be repaid, with or without interest. During this calendar year, did any of your company owners obtain personal debt financing for operation of the business from any of the following sources?

<table>
<thead>
<tr>
<th>Source</th>
<th>Yes</th>
<th>No</th>
<th>If yes, amount</th>
<th>Don’t know</th>
<th>Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal credit cards for business-related purposes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal loans from a bank or other financial institution, such as a mortgage or home equity loan used for the business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business or corporate credit cards issued in your name</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal loans from family or friends</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal loans from other individuals not associated with the management of the business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other sources (specify):</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5) Excluding the sources already reported, did your company obtain debt financing in the name of the business from any of the following sources during this calendar year?

<table>
<thead>
<tr>
<th>Source</th>
<th>Yes</th>
<th>No</th>
<th>If yes, amount</th>
<th>Don’t know</th>
<th>Re-fused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business or corporate credit cards issued in the name of the business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business loans from a commercial bank</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business line of credit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business loans from a non-bank financial institution</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business loans from family or friends of the owners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business loans from another owner of the business or a partner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loans to the business from employees that are not owners of the business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loans from government agencies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Loans from other businesses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business loans from other individuals not associated with the management of the business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other sources (specify): _____________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6) If your company’s credit application has ever been denied, consider the most recent time this occurred. What was the official reason the application was denied?

Never denied: __________

<table>
<thead>
<tr>
<th>Reason</th>
<th>Yes</th>
<th>No</th>
<th>Don’t know</th>
<th>Re-fused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Insufficient collateral</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The loan requested was too large</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inadequate documentation provided</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business credit history</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Personal credit history</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not being in business long enough</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other reason (specify): _____________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
7) Has your company ever received any loan guarantees from a federal government agency, such as the Small Business Administration, or any state or local government agencies?

<table>
<thead>
<tr>
<th></th>
<th>Yes - please provide name</th>
<th>No</th>
<th>Amount</th>
<th>Don’t know</th>
<th>Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Small Business Administration (SBA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A federal agency other than SBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A state or local government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

8) For each of the following products or services, does your company handle these functions in-house, or contract with local/regional/state/national level providers?

<table>
<thead>
<tr>
<th>Service</th>
<th>In-house</th>
<th>Outside assistance - please describe</th>
<th>Service costs, if any</th>
<th>Was the service useful (Yes/No)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accounting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Human Resources</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Information Technology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intellectual Property</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Health and Safety</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental/Regulatory</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Energy Efficiency</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
9) Has your company accessed any of the resources below?

<table>
<thead>
<tr>
<th>Service</th>
<th>Type of agency to offer the service</th>
<th>Details on the service provided</th>
<th>Costs, if any, associated with accessing the service</th>
<th>Was the service useful (Yes/No)?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Community groups with entrepreneurship efforts</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chamber of Commerce with entrepreneurship programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neighborhood groups (CDC) with entrepreneurship programming</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Business plan competitions</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Entrepreneurship celebrations</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Media coverage of entrepreneurship</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10) Has your company ever received training or assistance sponsored by a local/regional/state/federal government agency or non-profit?

<table>
<thead>
<tr>
<th>Service</th>
<th>Type of agency to offer the service</th>
<th>Details on the service provided</th>
<th>Costs, if any, associated with accessing the service</th>
<th>Was the service useful? (Yes/No)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business Planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Industry Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technical Assistance</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Market Intelligence</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marketing</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Market Development (including exports)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Technology Transfer, Commercialization and licensing programs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-commerce</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Management</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Specialized Space (e.g. wet labs)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11) Has your company ever received training or assistance sponsored by any of the following agencies?

<table>
<thead>
<tr>
<th>Agency</th>
<th>Yes</th>
<th>No</th>
<th>If yes, please describe</th>
<th>Don’t know</th>
<th>Re-fused</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Small Business Administration (SBA)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A federal agency other than SBA</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A state or local government</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A non-profit association for small businesses such as SCORE</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A community college or university</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A chamber of commerce</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A for-profit organization such as an accounting firm</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Another source (specify): __________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
12) Do you consider any of the following to have given your company an advantage over your competitors?

<table>
<thead>
<tr>
<th></th>
<th>Yes - please describe how</th>
<th>No</th>
<th>Don't know</th>
<th>Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Major reason</td>
<td>Minor reason</td>
<td>Don't Know</td>
<td></td>
</tr>
<tr>
<td>Teaming up with a college or university</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaming up with another company</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teaming up with a government lab or research center</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patents your company owns, applied for or licensed</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

13) During this calendar year, did your company invest in any of the following intangible assets?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>If yes, amount</th>
<th>Don’t know</th>
<th>Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>The design of new and improved products and services</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Software or databases</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brand development, advertising or marketing</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Organizational development, such as company formation expenses or management consulting</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worker training</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Other intangible asset investments (specify): ______ ____________________________</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

14) Does your company have any of the following?

<table>
<thead>
<tr>
<th></th>
<th>Yes</th>
<th>No</th>
<th>If yes, current Number</th>
<th>Don’t know</th>
<th>Refused</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patents</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copyrights</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trademarks</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
D. Innovation Indicators

This tool collects and analyzes innovation indicators to reveal the dynamics of the innovation ecosystem and level of the community’s competitiveness. While not all the indicators will be useful or even necessary for all communities, it provides a laundry list of indicators that can be used.

What is innovation?

Innovation drives economic growth by introducing new products, processes or services that streamline costs, expand markets or open up new ones. On one hand, innovation can cause what Joseph Schumpeter referred to as the “creative destruction” of obsolete technologies and the companies and jobs associated with them. On the other hand, it makes long-term economic growth possible by creating new companies and new jobs. Communities can increase their economic vitality by continuing to push the bounds of innovation.

The first step is to understand what innovation actually is. Innovation can be both technological and non-technological. Until recently, most measurements have focused on technological innovation, using indicators such as R&D, patents, and the diffusion of technology.72 However, innovation in the arts, for example, would not be captured in these indicators, and yet it contributes to economic growth. The Bureau of Economic Analysis is currently vested in designing methodologies that can transfer intangible innovation into measurable GDP. The initiative demonstrates that to capture all innovation relevant to economic growth, communities must cast a wide net.

Definitions of Innovation

Innovation is the “design, invention, development and/or implementation of new or altered products, services, processes, systems, organizational structures, or business models for the purpose of creating new value for customers and financial returns for the firm.”—Advisory Committee on Measuring Innovation in the 21st Century Economy, Department of Commerce, 2008

Innovation is the “intersection of invention and insight, leading to the creation of social and economic value.”—Council on Competitiveness, 2005

“Innovation activities are all scientific, technological, organizational, financial and commercial steps which actually, or are intended to, lead to implementation of inventions.”—OECD, 2005

**Why measure innovation?**

Although the high-tech sector may not be a significant player in every community, it is an increasingly important source of entrepreneurship. Globalization has outsourced many low-tech jobs, leaving the most potential for job growth in the U.S. in high-tech industries. The states currently with leading technology economies are California, Connecticut, Illinois, Maryland, Minnesota, New Jersey, New York, Pennsylvania and Virginia. More and more communities are entering the race for high-tech business development, making innovation measurement a relevant concern to economic development organizations.

**How do we measure innovation?**

As the U.S. has made the fundamental shift from an industrial to a knowledge-based economy, indicators to measure innovation should also evolve. "First generation" indicators, in the 1950s to 1960s, measured inputs such as R&D expenditures, science and technology personnel, capital and technological intensity. A decade later, second generation indicators began to look at output factors, including numbers of patents and publications. More recent indicators recognize the importance of incorporating qualitative data. Networks, clusters, quality of life and others all factor into an innovation economy and yet can be difficult to measure quantitatively. Finding a comprehensive set of measurable metrics for innovation is still elusive, yet crucial to understanding progress going forward.

This dilemma has prompted a number of approaches from community, state, federal and international economic development agencies. The U.S Department of Commerce formed a Federal Advisory Committee on innovation measurement and released a subsequent report in January 2008. The committee determined that innovation measurement is inherently an evolutionary process and recommends an ongoing dialogue and further synchronization between government agencies and the business community. The National Science Foundation has launched several initiatives specific to understanding science and technology innovation, including a Business R&D Innovation Survey and a Workshop on Advancing Measure of Innovation. The European Union has released four versions of its Community Innovation Survey, which is sent out to pri-

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75 Ibid.

\textbf{Indicators of Innovation}

One of the most comprehensive metric sets is the Index of the Massachusetts Innovation Economy, published by the Massachusetts Technology Collaborative of the John Adams Innovation Institute.\footnote{John Adams Innovation Institute. (2009). \textit{Index of the Massachusetts Innovation Economy}. Westborough, MA.} This set of data includes input and output factors of innovation, as well as less direct indicators such as housing affordability and household income. We have adapted some of these indicators, along with others, and divided them into nine categories:

1. Economic Strength
2. Corporate Competitiveness
3. Research and Development
4. Patents and Licensing
5. Funding
6. Formation and Success Rate
7. Education, Talent and Workforce
8. Community Support
9. Quality of Life

These categories can be further examined for specific industry clusters. Much of the data is available at the state and MSA level, and some can be gathered anecdotally on the community level.
### Economic Strength

The economic strength of a community or region is a good indicator of its record of innovation as well as its potential to invest in future innovation. Total employment and wages in knowledge-intensive clusters reveal trends regarding the quantity and quality of jobs in the innovation economy. Occupations and wages do the same across industries.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industry cluster employment and wages (across years)</td>
<td>a. Total employment by cluster</td>
<td>Moody’s, Bureau of Labor Statistics (BLS), Census Bureau</td>
</tr>
<tr>
<td></td>
<td>b. Average annual wage by cluster</td>
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<tr>
<td></td>
<td>c. Percent change in cluster employment</td>
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<tr>
<td>Occupations and Wages</td>
<td>a. Average annual employment growth by occupation</td>
<td>BLS</td>
</tr>
<tr>
<td></td>
<td>b. Average annual growth of real annual pay by occupation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Occupations by employment concentration and annual pay</td>
<td></td>
</tr>
</tbody>
</table>

### Corporate Competitiveness

Corporate competitiveness indicates the relative strength of the business climate compared to that of other communities. Firms that innovate will have high productivity, which is measured in the amount of GDP produced per worker (labor productivity) or per unit of capital goods (capital productivity). Corporate sales and manufacturing value added reveal the level of demand as well as growth in competitiveness. Manufacturing exports measure competitiveness on a global scale.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
<th>Data Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Productivity</td>
<td>a. GDP per worker</td>
<td>Census Bureau</td>
</tr>
<tr>
<td></td>
<td>b. Manufacturing labor productivity by cluster</td>
<td></td>
</tr>
<tr>
<td>Corporate Sales and Manufacturing Value Added</td>
<td>a. Across industries</td>
<td>Standard &amp; Poor’s (S&amp;P), Census Bureau</td>
</tr>
<tr>
<td></td>
<td>b. Across clusters</td>
<td></td>
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<tr>
<td></td>
<td>c. Change in total, compared to U.S.</td>
<td></td>
</tr>
<tr>
<td>Manufacturing Exports</td>
<td>a. Exports per $1,000 state GDP</td>
<td>WiserTrade</td>
</tr>
<tr>
<td></td>
<td>b. Average annual growth rate of manufacturing exports</td>
<td></td>
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<td></td>
<td>c. Distribution across industries</td>
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</table>

### Research & Development

Research and development is the most direct indicator of investment in innovation. This is measured in actual dollars invested in R&D by the for-profit and non-profit sectors. It is also important to examine R&D intensity to see if commitment has risen or declined as an overall percentage of output. Academic article output, especially in STEM disciplines, is a good indicator of the ability of research institutions to perform innovative research.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
<th>Data Source</th>
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</thead>
</table>
| 7 Research and Development Performed          | a. $ millions R&D performed by universities, hospitals and nonprofit research institutes  
                                             | b. Industry-performed R&D as a percent of private industry output               | Association of University Technology Managers (AUTM), National Science Foundation (NSF), Bureau of Economic Analysis (BEA) |
| 8 Corporate R&D Expenditures of Publicly Traded Companies | a. In billions of dollars  
                                             | b. R&D intensity: R&D per $1,000 sales  
                                             | c. Corporate R&D expenditure, average sales and sales growth by industry cluster: bubble chart | S&P's COMPUSTAT                                                                 |
| 9 Academic Article Output                     | a. Academic article output per million residents  
                                             | b. Academic article output per 1,000 science and engineering doctorate holders  
                                             | c. Academic article output per million academic R&D dollars                    | NSF                                                                 |

**Patents & Licensing**

Patents and licensing are crucial to the commercialization of innovation. Strong patent activity indicates a high level of innovation in R&D-intensive industries, which depend on exclusive rights to their technologies to be profitable. University technology licensing reveals the productivity of research institutions as well as future R&D investment, since licensing revenue feeds back into research. For medical devices and biotechnology drugs to advance into further stages of commercialization, they must receive regulatory approval from the U.S. Food and Drug Administration. Together, these metrics help capture the amount of research that reaches into the development stage.

| 10 Patenting                                  | a. Patents issued per 10,000 residents  
                                             | b. Computer and communications patents issued per 10,000 residents  
                                             | c. Drug and medical patents issued per 10,000 residents  
                                             | d. Patents issued per 10,000 residents, international | U.S. Patent and Trademark Office |
| 11 University Technology Licensing            | a. Technology licenses and options executed  
                                             | b. Technology licenses and options executed by major universities, hospitals and other nonprofit research institutions  
                                             | c. Technology licensing revenue received by major universities, hospitals and other nonprofit research institutions | AUTMAvailable by university |
## Indicator Specific Metrics Data Source

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
<th>Data Source</th>
</tr>
</thead>
</table>
| **12** Regulatory Approval of Medical Devices and Biotechnology Drugs | a. Medical device pre-market notifications  
b. Medical device pre-market approvals  
c. Biotechnology drugs in development | U.S. Food & Drug Administration (FDA), PhRMA |

### Funding

Without funding, a good concept cannot move forward. The federal Small Business Innovation Research (SBIR) program offers small businesses competitive funding to conduct proof-of-concept research and prototype development. Examining overall federal funding is also crucial; funds from the National Institutes of Health can be a large component of a region’s life sciences cluster. Industry funding of academic research helps reveal the industry-academia relationship and also indicates which research areas are of priority to businesses. Lastly, venture capital firms are an important source of financing for startup companies and also provide business strategy guidance.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
<th>Data Source</th>
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</thead>
</table>
| **13** Small Business Innovation Research Awards | a. State share of total SBIR awards  
b. Dollar value of SBIR awards  
c. SBIR awards by agency  
d. SBIR awards to companies by phase | U.S. Small Business Administration (SBA) |
| **14** Federal Funding for Academic, Nonprofit and Health R&D | a. Federal expenditures for academic and nonprofit R&D  
b. Per capita federal expenditures for academic and nonprofit R&D  
c. NIH funding per capital and average annual growth rate | NSF |
| **15** Industry Funding of Academic Research | a. Industry funded academic research (millions) of state and share of U.S. total  
b. Industry funding of academic R&D per capita  
c. Percent of academic R&D funded by industry | NSF |
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
<th>Data Source</th>
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<tr>
<td>16 Venture Capital</td>
<td>a. VC investment in state and as share of U.S. total</td>
<td>State Science &amp; Technology Institute, Thomson Reuters, National Venture Capital Association (NVCA), PricewaterhouseCoopers MoneyTree Report</td>
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<tr>
<td></td>
<td>b. VC investment per capita</td>
<td></td>
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<td></td>
<td>c. VC investment by stage of financing</td>
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<tr>
<td>Formation &amp; Success Rate</td>
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</tr>
<tr>
<td>Business Formation</td>
<td>a. Total establishments opened or relocated: Self-employed + Stage 1 companies</td>
<td>YourEconomy.org, AUTM, Census Bureau, County Business Patterns and MTC Analysis</td>
</tr>
<tr>
<td></td>
<td>b. Total new jobs created by companies in Stage 1 of development</td>
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<tr>
<td></td>
<td>c. New business incorporations by category</td>
<td></td>
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<tr>
<td></td>
<td>d. Spin-out companies from universities, hospitals and nonprofit research institutes</td>
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<tr>
<td></td>
<td>e. High tech business formation rate</td>
<td></td>
</tr>
<tr>
<td>Growth of company into further stages</td>
<td>a. Growth in stage 2, 3, 4 companies.</td>
<td>YourEconomy.org</td>
</tr>
<tr>
<td>of development</td>
<td></td>
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</tr>
<tr>
<td>Initial Public Offerings and Mergers</td>
<td>b. Number of IPO’s</td>
<td>Renaissance Capital, IPO Home, NVCA, FactSet MergerStat</td>
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<tr>
<td>&amp; Acquisitions</td>
<td>c. Venture-backed IPO’s</td>
<td></td>
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<tr>
<td></td>
<td>d. Mergers and acquisitions by location of acquired company</td>
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<tr>
<td></td>
<td>e. Number of companies bought per company sold</td>
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<tr>
<td>Education</td>
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<tr>
<td>Education Level of Workforce</td>
<td>a. Educational attainment of population</td>
<td>American Community Survey</td>
</tr>
<tr>
<td></td>
<td>b. College attainment of working age population</td>
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<tr>
<td></td>
<td>c. Employment rate by education</td>
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<tr>
<td></td>
<td>b. Degrees conferred per thousand inhabitants</td>
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<tr>
<td>Indicator</td>
<td>Specific Metrics</td>
<td>Data Source</td>
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</tbody>
</table>
| 22 Public Investment in K-16 Education | a. Per pupil spending of public elementary/secondary school systems  
   b. State higher education appropriations per full-time equivalent student | Census Bureau, State Higher Education Executive Officers, National Center for Education Statistics |

**Talent/Workforce**

Due to the increasingly global character of technology innovation, attracting outside talent goes hand-in-hand with building a strong educational base at home in forming a competitive workforce. Numbers of science, technology and engineering degrees provide an overview of workforce strengths in the hard sciences. Information technology professionals are instrumental players in a wide range of technology industries. Tracking international and domestic migration, especially of college-educated adults, is crucial in a day when a large proportion of entrepreneurs are foreign-born.

<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
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</thead>
</table>
| 23 Science, Technology and Engineering Career Choices and Degrees | a. Intended majors of high school seniors  
   b. Engineering, health & biological sciences and computer & information science bachelor degrees granted, as percentage of all bachelor degrees granted  
   c. Bachelors and graduate degrees granted in engineering, health & biological sciences and computer & information science, total | The College Board, Integrated Postsecondary Education Data System, NSF |
| 24 Information Technology Professionals in the Workforce | a. Percent of workforce in IT occupations  
   b. Employees in IT occupations by industry clusters, number  
   c. Employees in IT occupations by industry clusters, intensity/percentage | BLS, state dept of labor and workforce development, Moody's |
| 25 Talent Flow and Attraction | a. International and domestic migration  
   b. Relocations by college educated adults  
   c. Migration in and out, by top regions | Census Bureau, American Community Survey, IRS, based on exemption numbers |

**Quality of Life**

Quality of life is essential to talent attraction and retention. Affordable housing is especially important to young professionals, and quality school systems are a concern for more experienced professionals with families.
<table>
<thead>
<tr>
<th>Indicator</th>
<th>Specific Metrics</th>
<th>Data Source</th>
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</thead>
</table>
| **26 Housing Affordability** | a. Housing price index  
 b. Housing affordability trends for renters and homeowners with mortgage  
 c. Households spending 30 percent or more of income on housing costs | Federal Housing Finance Agency, American Community Survey |
| **27 Quality of School System** | a. Elementary & secondary rankings  
| **28 Cultural and recreational amenities** | a. Number and variety of: professional sport teams, museums, parks, restaurants, theaters, historical sites, festivals, miles of hiking/biking trail, etc.  
 b. Total and per capita, each of the above  
 c. Growth of, number and percent, each of the above  
 d. Support for the arts through foundation support, arts districts, etc. | Community Support survey |
| **29 Safety and health** | a. Crime rates  
 b. Number of hospitals and rankings | Community data/survey |
| **30 Public services** | a. Transportation (traffic congestion, availability and quality of public transit, etc.)  
 b. Airports | Community survey |
| Entrepreneurs often cite the importance of networks and community support in starting their business. It is helpful to track what community support programs are available—such as incubator programs, research parks, university partnerships—as well as how often they are utilized. Examining the public policy environment will also reveal any gaps or hindrances to entrepreneurship. Other qualitative measures include community attitudes toward entrepreneurship and alliances and networks. | **28 Support Programs** | a. Incubation Programs  
 b. Research Parks  
 c. Joint R&D partnerships between multinational corporations, small and large businesses, startups, and universities | Community survey |
| **29 Public policy environment** | a. Tax credits, revolving loan funds, other funding mechanisms for entrepreneurs  
 b. State associations | Community survey |
| **30 Culture and attitudes toward innovation** | a. Entrepreneurship-themed events and attendance: conferences, events for Global Entrepreneurship Week (sponsored by Kauffman Foundation) | Community survey |
| **31 Alliances and Networks** | a. List community networks for entrepreneurs  
 b. Participation | Census Bureau has data on revenues of business, trade and professional organizations. Can take survey on local level. |
CHAPTER IX
Resources

Below is a list of federal programs that can be useful resources for supporting entrepreneurial development in a community. Economic development organizations should not overlook local, regional, state and foundational resources (Kauffman Foundation, Edward Lowe Foundation, Angel Capital Association of America, etc.) to supplement these. Resources at the local, regional and state level are too numerous and varied to be included in this Handbook.
<table>
<thead>
<tr>
<th>Agency</th>
<th>Programs</th>
</tr>
</thead>
</table>
| Small Business Administration (SBA) | 7(a) and ARC loans  
  http://www.sba.gov/financialassistance/borrowers/guaranteed/7alp/index.html  
  504 loans through Certified Development Companies (CDCs)  
  8(a) designation for federal contracting  
  http://www.sba.gov/contractingopportunities/index.html  
  Small Business Investment Companies (SBICs) and Specialized SBICs (SSBICs)  
  Microloan Program  
  Export Working Capital Program (EWCP)  
  http://www.sba.gov/smallbusinessplanner/start/financestartup/SERV_EXPORT.html  
  Defense Loan and Technical Assistance Program (DELTA)  
  http://www.sba.gov/smallbusinessplanner/start/financestartup/SERV_DELTA.html  
  Service Corps of Retired Executives (SCORE) mentoring program  
  http://www.score.org/index.html  
  Small Business Development Centers (SBDCs)  
  Women’s Business Centers (WBCs)  
  U.S Export Assistance Centers (USEACs)  
  Veterans Business Outreach Centers (VBOCs)  
  http://www.sba.gov/aboutsba/sbaprograms/ovbd/OVBD_VBOP.html  
  Surety Bond Guarantee Program  
  Disaster Assistance Loan Program  
  Program for Investment in Micro-Entrepreneurs (PRIME)  
  Small Business Technology Transfer  
  HUBZone  
  https://eweb1sp.sba.gov/hubzone/internet/index.cfm |
<table>
<thead>
<tr>
<th>Agency</th>
<th>Programs</th>
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<tbody>
<tr>
<td>U. S. Department of Agriculture (USDA)</td>
<td>4-H <a href="http://www.4-h.org">www.4-h.org</a></td>
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<tr>
<td></td>
<td>Business &amp; Industry Guaranteed Loan (B&amp;I) <a href="http://www.rurdev.usda.gov/rbs/buspb/i_gar.htm">http://www.rurdev.usda.gov/rbs/buspb/i_gar.htm</a></td>
</tr>
<tr>
<td></td>
<td>Rural Business Enterprise Grant (RBEG) <a href="http://www.rurdev.usda.gov/rbs/buspb/rbeg.htm">http://www.rurdev.usda.gov/rbs/buspb/rbeg.htm</a></td>
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<tr>
<td></td>
<td>Intermediary ReLending Program (IERP) <a href="http://www.rurdev.usda.gov/rbs/buspb/irp.htm">www.rurdev.usda.gov/rbs/buspb/irp.htm</a></td>
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<tr>
<td></td>
<td>Rural Co-operative Develop. Grant (RCDG) <a href="http://www.rurdev.usda.gov/rbs/coops/rcdg/rcdg.htm">http://www.rurdev.usda.gov/rbs/coops/rcdg/rcdg.htm</a></td>
</tr>
<tr>
<td></td>
<td>State-based programs and resources <a href="http://www.rurdev.usda.gov/recd_map.html">http://www.rurdev.usda.gov/recd_map.html</a></td>
</tr>
<tr>
<td></td>
<td>Rural Disaster Assistance <a href="http://www.rurdev.usda.gov/rd/disasters/">http://www.rurdev.usda.gov/rd/disasters/</a></td>
</tr>
<tr>
<td>Department of Treasury</td>
<td>Community Reinvestment Act <a href="http://www.occ.treas.gov/crainfo.htm">http://www.occ.treas.gov/crainfo.htm</a></td>
</tr>
<tr>
<td></td>
<td>New Market Tax Credits <a href="http://www.cdfifund.gov/what_we_do/programs_id.asp?programID=5">http://www.cdfifund.gov/what_we_do/programs_id.asp?programID=5</a></td>
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<tr>
<td></td>
<td>Products and policies available <a href="http://www.exim.gov/products/">http://www.exim.gov/products/</a></td>
</tr>
<tr>
<td>Department of Energy</td>
<td>8(a) Pilot Initiative <a href="http://smallbusiness.doe.gov/business/8a_pilot.htm">http://smallbusiness.doe.gov/business/8a_pilot.htm</a></td>
</tr>
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<td></td>
<td>DOE’s Mentor-Protégé Program <a href="http://smallbusiness.doe.gov/business/mentor-protege.htm">http://smallbusiness.doe.gov/business/mentor-protege.htm</a></td>
</tr>
<tr>
<td>National Science Foundation</td>
<td>Small Business Innovation Research (SBIR) &amp; Small Business Technology Transfer (STTR) Program <a href="http://www.nsf.gov/eng/iip/sbir/">http://www.nsf.gov/eng/iip/sbir/</a></td>
</tr>
<tr>
<td>U.S. Department of Commerce</td>
<td>Planning and startup information to establish or expand a Minority Business Enterprise <a href="http://www.mbd.gov/?section_id=5">www.mbd.gov/?section_id=5</a></td>
</tr>
<tr>
<td>Department of Housing and Urban Development</td>
<td>Community Development Block Grants (CDBG) <a href="http://www.hud.gov/offices/cpd/communitydevelopment/programs/">http://www.hud.gov/offices/cpd/communitydevelopment/programs/</a></td>
</tr>
</tbody>
</table>