• NATIONAL GOVERNORS ASSOCIATION CHAIR'S INITIATIVE •

GROWING STATE ECONOMIES

TWELVE ACTIONS

National Governors Association

The **National Governors Association** (NGA), founded in 1908, is the instrument through which the nation's governors collectively influence the development and implementation of national policy and apply creative leadership to state issues. Its members are the governors of the 55 states, territories and commonwealths.

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- Learn about emerging national trends and their implications for states, so governors can prepare to meet future demands.

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Growing State Economies TWELVE ACTIONS

Of all the tough issues states face today, economic growth is not only one of the most important, but also one of the most perplexing to address. This *Growing State Economies: Twelve Actions* report aims to provide governors and other state policymakers better policy direction and strategies to foster business growth. It emphasizes understanding the pathway through which a new small business becomes a fast-growing firm and the policies that support that transformation.

Startup firms that develop organically are critical to strengthening a state's economy. Firms in their first year of existence add an average of 3 million new jobs every year in the United States.[1] More important, because many new ventures will inevitably fail, companies that survive those startup years usually create more net jobs than all the small startups do. And the most important firms that survive, the so-called gazelles, are fast-growing firms that power overall job growth and often evolve into large global corporations.

A growing number of policymakers here and abroad are recognizing the need to understand the effects of public policy on the entrepreneurial pathway—from startup venture, to high-growth company, to global corporation. The National Governors Association (NGA) set out to map that path, and the policies that governors can adopt to move their states down it, through four "best practices" regional meetings in 2011 and 2012. Those meetings provided opportunities to learn about successful examples and identify a road map for action. The meeting participants heard from:

- **Successful entrepreneurs and business owners,** about their experiences of what key policies are likely to yield the greatest returns to an entrepreneurial environment;
- **Academic researchers and other experts,** about what they have found to be the keys to promoting and supporting innovation and entrepreneurship; and
- **Governors and states,** about policies they have been pursuing that appear to be effective.

The entrepreneurs' results, the academics' research, and the states' experiences, taken together, provide policymakers with some basic guidelines and rich material on best practices for promoting entrepreneurial activity and job growth.

Twelve Actions for Growing State Economies

Policymakers with responsibility for growing economies can create a locally meaningful strategy by following twelve basic steps to help the private sector grow and thrive, creating new job opportunities for their citizens:

STRATEGIC AND FOUNDATIONAL

1. **Create a competitive tax and regulatory environment.**
2. **Put entrepreneurial activity at the top of the state's economic agenda.**
3. **Distinguish among different kinds of entrepreneurs and businesses—and target policies and resources accordingly.**

FOCUSED ON STARTUP COMPANIES

4. **Cast a wide net to find entrepreneurs.**
5. **Teach entrepreneurship skills and attitudes at all education levels.**
6. **Build a startup environment and culture.**

FOCUSED ON HIGH-GROWTH COMPANIES

7. **Find the potential high-growth companies and help them grow.**
8. **Get your entrepreneurs to give back.**

FOCUSED ON ALL COMPANIES

9. **Help companies open doors to new customers—globally and locally.**
10. **Reward strong ties among universities, companies, and entrepreneurs.**
11. **Encourage entrepreneurs and companies, small and large, to build innovation clusters.**
12. **Build ecosystems, not programs.**

1. Create a competitive tax and regulatory environment.

Evaluating the tax and regulatory structure is an important part of creating a business-friendly environment that encourages job growth. Competitive tax rates, including income, sales, property and other business taxes, do make a difference. Each state needs to assess its overall tax climate and work to improve its tax competitiveness structure.

It is also important to assess whether permits, registration, and other bureaucratic requirements interfere with new business creation and take what measures are needed to change, simplify, and speed up the most burdensome government processes. When a 2012 survey asked 6,000 small business owners nationwide to rank state friendliness to their businesses, it found that small businesses are particularly interested in easy-to-understand licensing regulations and well-publicized training programs for small businesses. The respondents also said that licensing requirements were nearly twice as important as tax rates in determining their state or city government's overall business-friendliness.[2]

The recession and slow recovery have caused many states to launch urgent efforts to redesign and downsize their governments. Several states have undertaken government-wide efficiency reviews to guide further efforts for cost savings, revenue enhancements, consolidation and elimination of agencies, and increased government efficiency in general. The following are a few examples:

Searching for the Two E's of Good Government—Effectiveness and Efficiency

Colorado began a rigorous review of state rules in 2011. To eliminate red tape, the state asked Coloradans across the state, as well as every state agency, for examples of unnecessary regulation. The state's plan is outlined in the report "Pits and Peeves."[3] The department of human services, for example, recommended the repeal of 850 unnecessary rules.

New Jersey created a bipartisan Red Tape Review Group to identify ways to streamline the state's regulatory review process. The group reported its recommendations in April 2011. Subsequently, New Jersey passed a law to require the state to consider the economic impact of new regulations, prohibit rules that exceed federal standards, and streamline permit approval for economic development projects.

Kansas established an Office of the Repealer. To help get the state's economy growing again, the Office of the Repealer, with the help of Kansans, is working to identify laws and regulations that are out of date, unreasonable, and burdensome.[4]

In 2011, **North Carolina** completed a statewide review of its rules and regulations. Those that were deemed unnecessary or excessive—a total of 900—were eliminated. Any agency proposing a new rule is now required to have a representative present at every public review hearing to explain the rule's purpose.[5]

FIGURE 1
Top Growth Concerns by Business Type

	Kauffman Poll of Inc 500 Firms *"What is the most important impediment to growth of your business."*	**National Federation of Independent Business Survey of Small Businesses** *"What is the single most important problem facing your business today."*
Finding qualified people	40%	5%
Managing fast growth	21%	—
Accessing capital	16%	3%
Sluggish economy	13%	25%
Regulatory uncertainty	3%	19%
Taxes	4%	19%
Penetrating global markets	3%	—
Other	—	29%

Sources: Kauffman Foundation (September 2011) and National Federation of Independent Business (December 2011).

2. Put entrepreneurial activity at the top of the state's economic agenda.

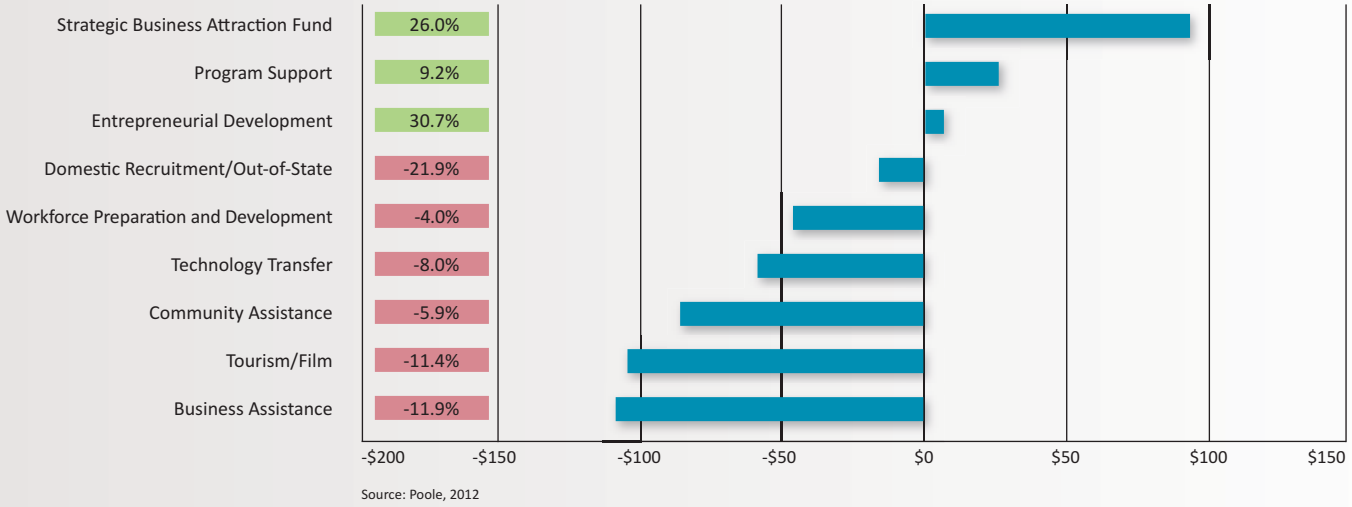
Helping entrepreneurs start, grow, and renew businesses is one of the most important things a government can do to create jobs and raise living standards. It should be a priority at all levels of government, as well as for a whole variety of institutions, including universities, economic development offices, industry associations, and chambers of commerce.

Many agencies and leaders still see attracting companies from elsewhere as the top priority, even though only 2 percent of annual job gains across states can be attributed to business relocations.[6] According to one analysis, however, in fiscal year 2013 states are planning to devote 26.9 percent more of their economic development funds to strategic business attraction than they did in fiscal year 2012 (see Figure 2).[7]

At the same time, though, focus is increasingly on launching new companies and growing and renewing existing ones. As funds for attracting business have increased, so have funds for entrepreneurial development—by 30 percent between fiscal year 2012 and 2013.[8] Over the past year, almost 20 states have introduced legislation or started programs focused on boosting their numbers of startup companies. Expanding entrepreneurial activity is not only about generating new companies, but also about making sure that the companies in a state have the support and targeted policies they need to continue to grow and add jobs. At least eight states have recently introduced policies related to helping existing businesses grow and expand their markets.

FIGURE 2

FY 2012 to FY 2013 Change in State Economic Development Investment by Function
(millions of dollars)



Source: Poole, 2012

A New Priority for Starting and Growing Companies

Michigan, for example, is replacing a complex, incentive-based way of promoting economic development with a restructured, tactical toolkit that includes resources for new business creation, business acceleration, and meeting the needs of companies that are already located in the state.[9]

One key program will leverage company-to-company connections to provide local businesses with resources and support to grow. Pure Michigan Business Connect is a more than $8 billion, multiyear initiative to help Michigan-based companies grow. The program helps companies find new ways to raise capital, obtain various business services, and connect with one another for business-to-business procurement opportunities. Initial program partners include Michigan State agencies, banks, public utilities, a technology business association, and economic development partners such as local chambers of commerce.

Michigan is also investing $12 million in entrepreneurship support services. The funds will support both business accelerators and other organizations that enhance the entrepreneurial ecosystem or promote the availability and quality of entrepreneurial talent in Michigan. To apply for funding from the business accelerator services fund, an organization must demonstrate that it is partnering with at least five SmartZones (regional networks) or local economic development organizations.

> Job creation by very small firms (those with fewer than 20 employees) and newly formed firms (established within the past five years) accounts for a majority of all overall job creation in any given year.[10]
>
> *Kane, 2010*

3. Distinguish among different kinds of entrepreneurs and businesses—and target policies and resources accordingly.

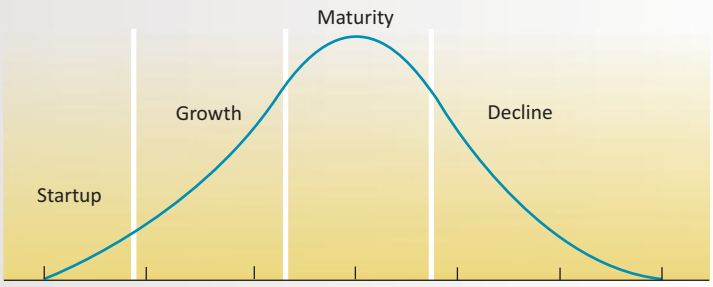
Some individuals open businesses to employ themselves. Some start small businesses that fill a niche—often providing a local service—and never grow beyond it. Others launch firms with the intent of significantly growing their own companies. It is important to distinguish among these different types of companies and also among the stages of growth—startup, growth, maturity, and decline (see Figure 3).[11] Effective strategies take into account the factors that matter most at different stages of development and match the founders' visions for their companies. Policies often need to reflect the industry in which the business is competing; for example, clean energy companies can face different challenges than biotechnology or information technology companies.

According to research by Gallup, only 25 percent of the 6 million CEOs running businesses in the United States want their companies to grow.[12] Those CEOs aspire to lead their companies on a trajectory of high growth, to build revenues of $5 million, $10 million, or even $50 million. These are the companies that have the most potential to add jobs to the economy, but states do not always know where to find them or what types of assistance they need.

The other 75 percent of U.S. companies are in business to support their owners, or because the owners are interested in being their own boss but do not have the desire to grow their companies significantly. These companies are very important, but they should not be confused with the companies that have the potential to grow rapidly.

A valuable lesson in how to distinguish entrepreneurs and how to direct resources can be drawn from two programs: the Gallup System, used in Nebraska, and the Nashville Entrepreneur Center, a model that Tennessee is replicating across nine regions of the state as part of its five-year strategic plan to boost innovation and entrepreneurship.

FIGURE 3
Business Life Cycle



Source: Savansky, Semyon D. *Engineering of Creativity,* CRC Press, 2000

Nebraska Uses Gallup System to Identify Entrepreneurs

In partnership with Gallup, **Nebraska** is using its Entrepreneur Acceleration System (EAS) to identify small-to-medium-size businesses (SMEs) with high growth potential. The program begins by identifying the entrepreneurial ability of the individual who heads a particular firm; Gallup's research indicates that certain individuals have innate qualities that make them more likely to achieve extraordinary success as entrepreneurs, leading to high business growth and ultimately job creation.

Gallup's Functional Demands of Entrepreneurship (FDE) assessment—based on more than 40 years of research into human behavior—measures the ability of an individual to meet 10 key demands of entrepreneurship. States and other EAS sponsors use the results of the assessment, along with past performance and aspirations for growth, to select a cohort of companies with high probability of growth. Concurrently, Gallup certifies guides to work closely with the individual entrepreneurs in an annual, talent-based orientation program.

EAS guides focus on strengthening entrepreneurs' talents through individual executive coaching, leadership team building, and survey-based action planning. The EAS program introduces entrepreneurs to key behavioral economic management principles, such as the importance of creating engaged workplaces and engaged customers, fundamentals of performance management, and creating strength-based teams and organizations. Leaders of SMEs track their organization's performance through 14 specific performance indicators that are tracked and reported quarterly throughout their participation in the EAS program.

As high-growth-potential entrepreneurs apply the behavioral economic principles and tools to their companies, they grow, they hire, and jobs are created.

Tennessee Concentrates on High-Value Entrepreneurs

Tennessee's Nashville Entrepreneur Center has resources to help any entrepreneur, but it focuses its incubator services, mentors, and connections to capital on the companies that have the most potential to grow quickly and add jobs to the economy. The center has several steps in place to identify those companies.

First, the center screens new business concepts and divides them into three categories: concept or early entrepreneurs; budding entrepreneurs; and high-value entrepreneurs.

- **Concept or early entrepreneurs** have ideas and a desire to build a business but need basic information, such as how to register a company or develop a business plan. The team spends 10 percent to 15 percent of its time with early entrepreneurs, often connecting them to other state or university programs that can help with the basics.
- **Budding entrepreneurs** have the potential to create high-growth companies, but they have some developmental issues or a limited model. They need coaching and assistance to finalize the business plans. The team spends 25 percent to 35 percent of its time with this group.
- **High-value entrepreneurs** have strong business plans and a good business model. They need immediate access to capital to start. The center's team spends the majority (55 percent to 65 percent) of its time with this group of entrepreneurs.

Second, the center focuses on providing support to entrepreneurs who want to start a business in one of four key sectors: health care, digital media and entertainment, technology, and social enterprise. As each of those sectors is either an established or an emerging industry cluster in Nashville, an ecosystem already exists of established companies, mentors, and funds available to help startup companies become high-growth companies.[13]

4. Cast a wide net to find entrepreneurs.

Not all current or would-be entrepreneurs are twenty-something techies. Entrepreneurs tend to be highly educated, but they are found across all sectors, ages, and backgrounds. Research by the Kauffman Foundation found that Americans between the ages of 55 and 64 had a higher rate of entrepreneurial activity than those ages 20 to 34 in each year from 1996 to 2007.[14] States are wise to recognize the potential of baby boomers, who have years of experience, to be older "re-inventeurs" and the potential for more women to join the entrepreneurial ranks. Similarly states cannot overlook the significant part that immigrants play in starting new science and technology firms: one study found that 25 percent of new computer and information technology firms formed between 1995 and 2005 had one or more immigrants among their founders.[15] Existing industrial clusters are another place to find entrepreneurs, with large companies spinning off new businesses or new firms becoming their clients.

Ideas and Talent from Around the World

> Women represent only 35 percent of startup founders, even though they make up 46 percent of the workforce. Further, women start only 3 percent of tech firms and 1 percent of high-tech firms.[16]
>
> *Mitchell, 2011*

MassChallenge is a $1 million global startup competition and accelerator designed to catalyze the success of high-growth, high-impact new businesses. Any entrepreneur can enter the MassChallenge competition, with any idea, from anywhere in the world. The first competition, held in 2010, had 440 entrants from more than 26 countries and 24 states and resulted in 111 finalists. Within a year of the 2010 competition, the 111 startups had raised over $100 million in capital and created more than 500 new jobs.[17] The 2012 competition drew 1,237 applications from 36 states and 35 countries.[18]

The competition creates a sense of urgency for a "startup renaissance" and is used to identify and aggregate high-impact teams and resources. All applicants receive feedback from expert judges on their online applications. All 300 semifinalists receive extended feedback from expert judges on their in-person pitches. About 125 finalists take part in a three-month accelerator program; they then compete for $1 million in prizes.

MassChallenge is an independent nonprofit and does not take equity from startups or place any restrictions on winners. Though it was not launched as an initiative of the state, **Massachusetts** committed to investing $1 million in

MassChallenge over four years.[19] The Massachusetts Technology Development Corporation (MTDC) also joined with MassChallenge to create the MTDC Fast Track program for MassChallenge startups to further fuel the success of the 2011 finalists and to make it easier for those companies to remain in the Commonwealth. As part of the partnership, MTDC selected five of the 26 top companies to participate in the MTDC MassChallenge Fast Track program. MTDC put the five companies through an accelerated diligence process, selecting two for additional seed funding.

Entrepreneurship Training for the Unemployed

In many states, individuals cannot claim unemployment insurance (UI) unless they are actively looking for a job. Some states are looking into how they can adjust this requirement to include actively creating a new company. Six states—**Delaware**, **Maine**, **New Jersey**, **New York**, **Oregon**, and **Washington**—are driving efforts to support unemployed individuals in becoming entrepreneurs through the U.S. Department of Labor's Self-Employment Assistance Program (SEAP). SEAP is a voluntary program for states to pay a self-employed allowance, instead of regular unemployment insurance benefits, to help unemployed workers while they are establishing businesses.[20]

One of the most important things that states have learned about training for unemployed workers is that it is critical to have a good selection process in place, just as with other startup programs. Would-be entrepreneurs need to understand how to mitigate risk and create a solid business plan.

According to Steven Blank, a serial entrepreneur who now teaches at Stanford University, there are at least six distinct organizational paths for entrepreneurs, each needing a distinct kind of supportive ecosystem.

- **Lifestyle business entrepreneurs** work to live their passion.
- **Small business owners** want to own their own business and "feed the family."
- **Entrepreneurs who start scalable companies** want to create equity in a company that eventually will become publicly traded or acquired, generating a multimillion-dollar payoff. Scalable startups tend to cluster together in innovation clusters.
- **Buyable startups** tend to be web and mobile app startups that are founded and sold to larger companies.
- **Large companies** grow by tweaking core products or by creating entirely new products sold to customers in new markets. Existing companies do this by acquiring innovative companies or by attempting to innovate from within.
- **Social entrepreneurs** start nonprofit or for-profit organizations with a goal of making the world a better place (rather than a goal of creating wealth or taking a market share).[21]

Blank, 2011

Training and Funding for Entrepreneurial Veterans

Wisconsin recently launched a program to help veterans start their own companies. The state is putting $150,000 into a fund to seed startup companies run by military veterans. The fund is managed by a Milwaukee nonprofit that will provide grants to about 15 veterans while also training them in a lean startup method that teaches would-be entrepreneurs to create prototypes and modify them based on customer feedback.[22] The grants are provided to address a unique challenge that veterans face, that is, having been deployed overseas, or having lived in multiple locations, they often do not have the traditional assets, such as equity in a home, that would help them secure the financing to start a business.

5. Teach entrepreneurship skills and attitudes at all education levels.

For any state to have a thriving entrepreneurial climate, it must have a pool of people who believe that they can be successful in starting companies and transforming ideas into vibrant businesses. Not all states or regions have a large pool of potential entrepreneurs. But as with any other workforce training initiative, a pipeline of entrepreneurs can be created.

Entrepreneurship is a set of skills that can be taught. Entrepreneurship education should go from elementary school to college and beyond. Education begun in business schools and engineering schools must continue later in life through executive education programs. According to Bill Aulet, who heads the Massachusetts Institute of Technology's Center for Entrepreneurship, educating entrepreneurs goes beyond simply providing a class or a certain type of curriculum. Teaching entrepreneurship requires providing experiences, such as internships and competitions, that bring the realities of creating a company to life for students and providing entrepreneurs and executives with "real-time" training.[23]

A University-wide Focus on Entrepreneurship

One of the best examples of a university-wide focus on entrepreneurship education is the Massachusetts Institute of Technology (MIT). MIT is known as a center for entrepreneurship and innovation, but the university is not just relying on its technology transfer office to be the source of new companies. MIT's technology transfer office creates about 30 new companies a year. MIT alumni, on the other hand, create about 900 new companies every year.

A recent analysis finds that MIT alumni have founded 25,800 currently active companies that employ about 3.3 million people and generate annual world sales of $2 trillion, producing the equivalent of the eleventh-largest economy in the world. Most of the MIT alumni companies in Massachusetts were founded by former students who came to the state to attend MIT, liked what they saw, settled down, and eventually started their own companies in Massachusetts. Less than 10 percent of MIT undergraduates grew up in the state, but approximately 31 percent of all MIT alumni companies are located in Massachusetts.[24]

> A study by Babson College found that taking just two entrepreneurship elective courses in college increased the likelihood that students would start a company after graduation or later in their careers. More than two-thirds of colleges and universities in the United States now offer at least one course in entrepreneurship.[25]
>
> *Lange et al., 2011*

To be sure, MIT is unique in the programs it offers and in its historic culture of entrepreneurship. But it also provides a benchmark by which other institutions can gauge the economic impact of their alumni entrepreneurs. Would-be entrepreneurs at MIT have a number of venues where they can test business ideas and learn what it takes to start a company. The school has four entrepreneurial competitions each year and at least 12 student clubs and organizations devoted just to entrepreneurship. Entrepreneurship courses include corporate venturing, sales, and finance; industry-focused courses for sectors as diverse as biomedical devices, software, energy, and transportation; and in-company learning courses where teams of science, engineering, and management students spend one day a week on-site with the top management of high-tech startups to gain experience in starting and running a new venture.

A New Kind of University Career Center

The University of Miami's Launch Pad opened in August 2008 as a new college career center that would show University of Miami students and alumni that starting a new business is a legitimate career path. Launch Pad is strengthening an entrepreneurial culture at the University of Miami through regular individual and group consultative sessions, workshops, networking events, and a group of local venture coaches. These Launch Pad programs connect ideas, people, and resources; provide advice and guidance; and build relationships with experts in the local business community, thus increasing the likelihood that the students will both start new companies and stay in South Florida to grow them.

Launch Pad provides free mentoring services to current students or alumni of the University of Miami. It does not offer funding directly but helps locate sources of grants or other funding. As of November 2011, the Miami Launch Pad has drawn nearly 2,000 student participants.[27] As of spring 2012, Launch Pad had created 150 jobs through 65 businesses.[28]

Through a grant from the Blackstone Foundation, Launch Pad has expanded its model to the Detroit area and to four colleges and universities in northeastern **Ohio**.[29] In the first nine months of Detroit's program, more than 100 ventures were advised by professionals, and another four were receiving coaching to get their ideas off the ground.

> Forty percent of 8-to-24-year-olds say they want to start a business one day or already have.[26]
>
> *Kauffman, 2010*

A School for Startups (that's Not Really a School)

Arizona State University's Rapid Startup School is a free, evening startup program run on campus and aimed at graduate students, doctoral students, and postdoctoral researchers. The program bills itself as "the 'pracademic' school for understanding entrepreneurship that's not really a school."[30] It aims to stimulate startup activity by providing students and researchers with a better understanding of commercialization and new venture creation.

The two-month program includes 12 modules that cover key startup fundamentals such as market feasibility, raising money, and legal issues. Modules are taught by faculty from partner organizations or delivered online. After the program concludes, potential ventures are connected with ASU Venture Catalyst team members for one-on-one meetings to further develop a startup plan and work on team creation and product development. (ASU Venture Catalyst is the ASU unit that works with startup companies, both inside and outside the university.)

The first cohort attracted 71 participants in late 2011, and at least four potential university-related startups have already been identified.

Industry-Based Internships

Nebraska recently launched InternNE, a program that connects college students with paid internships with employers based in the state. The program aims to provide interns with real-world business experience and encourage more students to stay in the state after receiving their degrees. The program provides a 40 percent match, up to $3,500 per internship, for eligible businesses hiring eligible student interns. A business may apply for funding for up to 10 interns per year, with a maximum of five per company location per year. The program was launched in 2011 and has already placed 130 interns, 44 of them in companies located in rural areas of the state.[31]

6. Build a startup environment and culture.

Although entrepreneurs are fiercely independent, they need a supportive environment and culture. Startup companies particularly need support to make it through the first five years (Figure 4).[32] According to U.S. Census data, only 48.7 percent of the new establishments started between 1977 and 2001 were alive at age 5.[33] One way to provide support is to create physical spaces, such as business incubators and shared research facilities that enable face-to-face interaction and collaboration. Smart people learn from one another, and an infrastructure for entrepreneurial activity should encourage physical proximity.

A business incubator location is only one piece of the puzzle, however. Ultimately, a supportive environment comprises people and access—not just to capital but to expertise of all kinds. What entrepreneurs need most is access to the expertise that can be provided by capable and engaged mentors, an expanded knowledge network, and a supportive culture that encourages risk taking and is tolerant of a failed business attempt.

Valuable lessons in how to build a startup environment and culture can be drawn from the Nashville Entrepreneur Center's strategy of being a front door for entrepreneurs and from state efforts to build innovation hubs.

A "Front Door" for the Startup Environment

Once the Nashville Entrepreneur Center has identified the entrepreneurs that have the potential to start a company that grows significantly, using the process described above, it acts as a "front door" to connect entrepreneurs to a startup environment. That environment includes three important pieces: successful entrepreneurs as mentors, a connection to a funding pipeline, and an expanded network of expertise. (See Figure 5 for examples across the country.[34])

Mentors. The center has a process for identifying the best, "executive quality" mentors to work with its entrepreneurs. Mentors are charged a small entry fee—most pay $150 to join the center and an additional $300 to be trained—as a way to identify the ones who are most interested in helping startups launch successfully. Mentors fall into three categories:

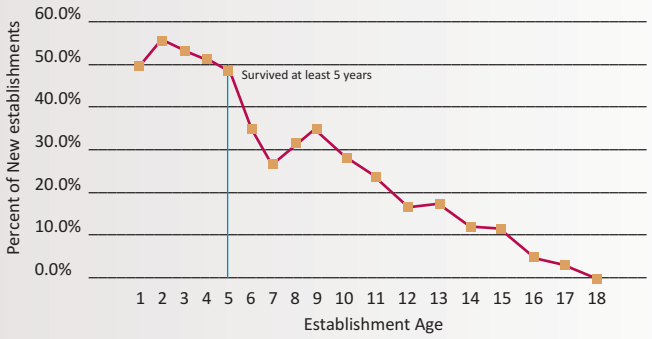
- Startup experts – Serial entrepreneurs with experience in multiple startups.
- Industry experts – Individuals with a wealth of industry-specific experience.
- Knowledge experts – Mentors with experience in specific business skills such as legal, accounting, finance, marketing, and operations.

Funding. The Entrepreneur Center pairs its other types of support with connections to sources of seed capital, including introductions to angel groups and other potential investors. In February 2011, a venture group launched to provide funding for companies connected with the Entrepreneurship Center. Bullpen Ventures makes seed stage investments focused around the same four verticals on which the center is focused: digital media and music, technology, health care, and social entrepreneurship. All of the investments are housed at the center, and the companies must work with the tools and team that the Entrepreneur Center has assembled. Investments are structured so that all companies initially receive $25,000 in equity, followed by an opportunity to receive an additional $25,000 in debt financing.

FIGURE 4

Failure Rate by Business Age

Surviving the first 5 years is a key indicator of business longevity. Failed new establishments, by age (1990–2008), indicates that survivabilty improves markedly after 5 years.



Source: Don Walls, 2011

Network. In addition to connecting entrepreneurs to mentors and business experts, an important role of the Entrepreneur Center is to connect entrepreneurs to one another.

The Nashville Entrepreneur Center has launched 50 new companies in one year.

Tennessee is adopting the Nashville Entrepreneur Center's model for creating a startup environment and culture across the state. The state has competitively selected nine business accelerators to serve as the "front doors for entrepreneurs" in each of the state's nine economic development regions. The nine regional accelerators will also play a key role in Launch Tennessee, the state's five-year strategic plan to make Tennessee a national leader in innovation and entrepreneurship.

Innovation Hubs that Encourage Collaboration

Part of San Diego's strategy to become one of the top biotech hubs in the country—a goal that was attained in less than a generation—was the creation of a densely packed, two-mile area that includes the University of California at San Diego (UCSD), Scripps Research Institute, the Salk Institute for Biomedical Studies, and dozens of private companies. Proximity reduces the overall cost of collaboration and makes it easier for both businesses and individual workers to respond to new opportunities quickly and retool or reconfigure as needed. As a vice president of the Salk Institute says, "We can throw a rock and hit UCSD. I can hit a golf ball and hit Scripps. Everything is within walking distance. That means more heads get together, and we do a lot of collaboration."[35] San Diego is now home to 75 research institutions, 600 biomedical and life sciences companies, and 1,900 companies in information technology, wireless communications, and software (another industry that benefits from proximity and collaboration).

> Incubators and accelerators that support startup companies during their early years are becoming more and more common in the United States. When Xconomy published its first guide to venture incubators (which go beyond providing space and also provide funding and mentoring) in 2009, the guide included just 20 listings. The 2011 edition lists 64 venture incubators in the United States.[36]
>
> *Xconomy.com*

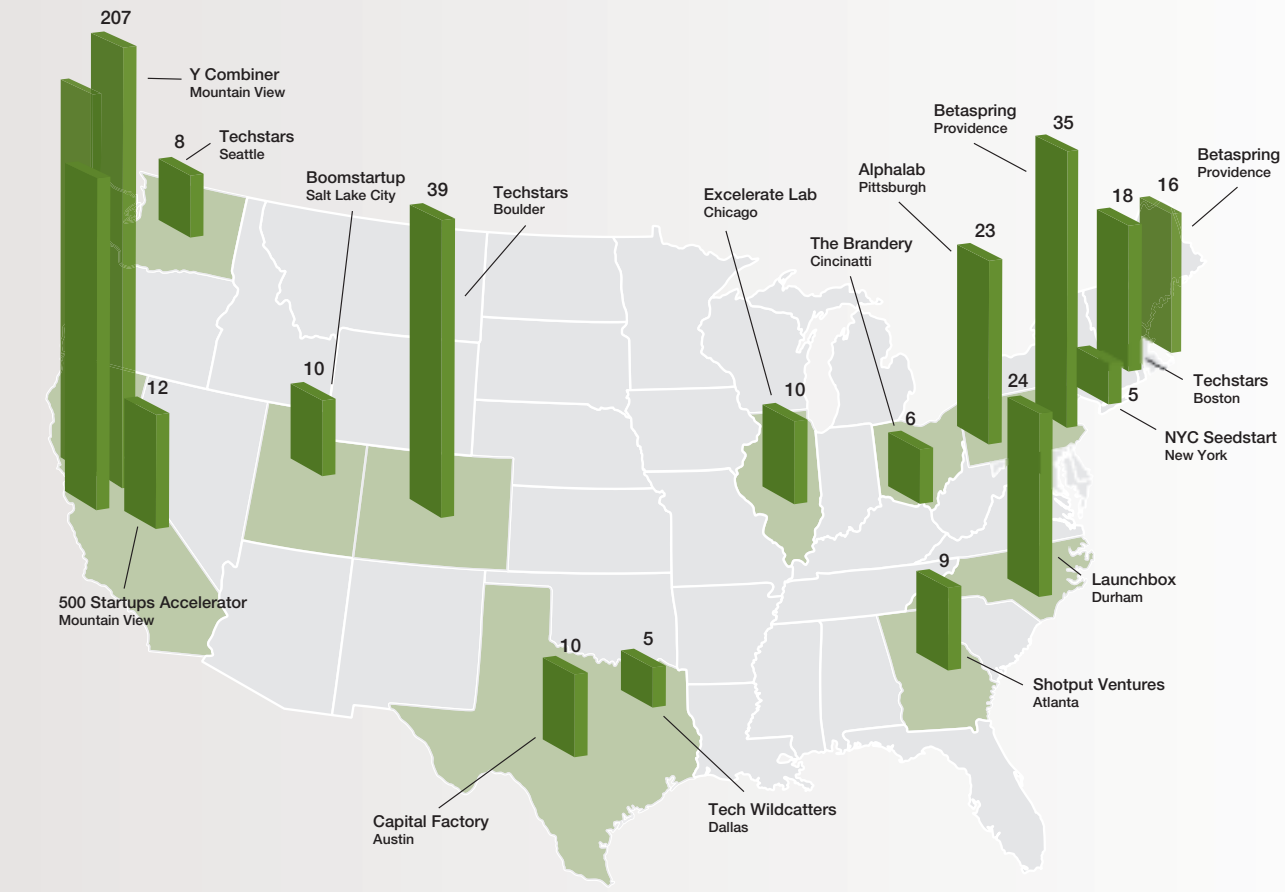
Increasingly states are assisting in creating hubs and zones that encourage this kind of proximity and inter-

action, not just within economic sectors but across a diverse range of industries in which innovation matters for growth, such as computer games, digital media, robotics, and even medical devices and high-end manufacturing. Many states are focusing on their universities and medical research institutions ("eds and meds") and the spaces around them as assets that can help build an entrepreneurial environment. The expectation is that innovation zones will be much more than land linked to a university. In addition to the physical infrastructure—roads, communication systems, subways—and mixed land use that support daily life and work, these innovation hubs are being designed physically and strategically to reinforce cross-sector interactions, social organization, and entrepreneurial spirit.

Pennsylvania is encouraging communities with universities and research institutions to develop Keystone Innovation Zones, where firms locate in close proximity to bring entrepreneurs and researchers physically together. **Ohio** is making similar investments, allocating some of its Third Frontier research money to build innovation hubs close to some of its universities. **Washington** passed legislation in 2007 to create state-designated Innovation Partnership Zones (IPZs) to encourage and support research institutions, workforce training organizations, and businesses to work cooperatively in small geographic areas. Regions that apply to be designated as an Innovation Partnership Zone must demonstrate the formation of a partnership that brings together academia, private industry, and workforce development; identify a specific geographic area with an existing or emerging industry cluster; and present a strategic plan for regional cluster development. There are currently 12 designated IPZs in the state of Washington. Thus far, the state has supported the zones with $6.5 million in state capital grant funding.[37]

FIGURE 5

Notable U.S. Venture Incubators by Location, Showing Total Number of Startups Funded in 2010



Source: Miller and Bound, 2011

7. Find the potential high-growth companies and help them grow.

If helping to create lots of new companies is one of the most important things a state can do for job growth, supporting "gazelles" is right behind it. They are the businesses that hold the potential for rapid growth (20 percent or more per year) once they have established themselves. In general, they are the former entrepreneurial startups that continue to develop new products and seek out new markets. Gazelles are usually led by entrepreneurs who pursue commercialization of an innovative idea—a new process, product, or service—that can wind up transforming entire global markets. For that reason, state policies—if they are focused on job growth—are wise to emphasize identifying and nurturing the gazelles, rather than just providing general help to all businesses.

The popular image of a gazelle is a high-tech company, such as Apple or Google. In fact, however, high-growth companies exist across all industries and in virtually every region. They are also far more nimble than other companies. A study of high-growth companies in Pennsylvania found that they are three-and-a-half times more likely than other firms to change their industry focus; three times more likely to change headquarters location; and three times more likely to change county of residence.[38]

A valuable lesson in how to support high-growth companies can be drawn from two successful programs, Innovation Works and the Pipeline Entrepreneurial Fellows Program.

Finding and Supporting High-Growth Companies

Innovation Works is a Pittsburgh-based accelerator that invests risk capital, business expertise, and other resources into high-potential companies that are most likely to have regional economic impact. Innovation Works is one of **Pennsylvania**'s four centers for the Ben Franklin Technology Partners program, a statewide, technology-based economic development program, but it is privately managed as a nonprofit organization.

When Innovation Works first engages with a young company, the entity is typically at the prototype stage and has an average of four people working on its team. At this stage, it is difficult for an entrepreneur to amass the range of expertise needed for success. Innovation Works helps fill in the expertise gaps with internal experts and outside advisors who help entrepreneurs commercialize their technology, enter the market successfully, and grow their companies.

Innovation Works selects the young, high-growth-potential companies it works with based on a number of criteria. The company must be located in, or willing to locate its headquarters or primary operations in, southwestern Pennsylvania. It must employ fewer than 50 people, be developing a proprietary technology in an area that addresses high-potential markets, and have a strategy to achieve full-scale commercialization. The companies receive two main kinds of support from Innovation Works—mentoring and access to seed capital.

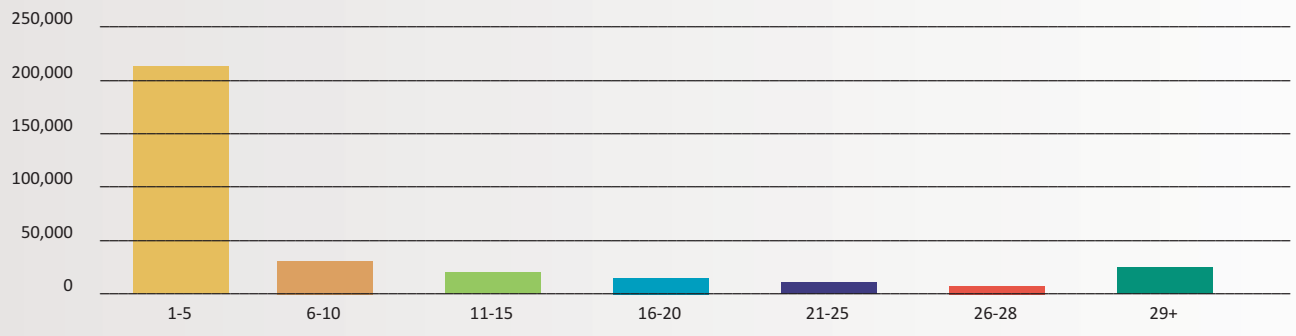
Mentoring and expertise are provided by Innovation Works staff and executives in residence. Executives in residence are former CEOs, business experts, and investors who have started technology companies, staffed them for growth, helped them launch new products into new markets, and attracted funding along the way.

In addition to providing mentorship and expertise, Innovation Works connects young companies to sources of capital, beginning with its own seed funds. The nonprofit accelerator is the single largest investor in seed-stage companies in southwestern Pennsylvania. Innovation Works makes investments directly into companies that are bringing their first products to market primarily through its seed fund, a convertible-debt investment instrument (the organization lends money to companies in the same way as a bank, but it has the right to convert outstanding principal and accrued interest into equity in a subsequent transaction in which the company's valuation is established). In a typical year, Innovation Works adds 10 to 12 new companies to its portfolio, with an average investment of $340,000.

Since the launch of Innovation Works' seed fund nearly 12 years ago, the organization has invested more than $50 million in over 150 companies that have created thousands of new jobs and attracted over $1.2 billion in follow-on capital to the region.[39]

FIGURE 6

Fast-growing Firms Account for a Disproportionate Share of Net Job Creation and These Firms are Mostly Young (Number of Top 5 Percent Growing Firms by Age)



Source: Special tabulation by U.S. Census Bureau based on Business Dynamics Statistics (hereinafter Special Tabulation). Dane Stangler (2010). High-Growth Firms and the Future of the American Economy, Kauffman Foundation.

Fellowship Program Builds Regional High-Growth Network

The PIPELINE Entrepreneurial Fellows program is a regional fellowship program that selects a small number of high-potential entrepreneurs and over the course of a year connects them to everything they need to "roll up their sleeves and grow their company"—from participating in modules on the fundamentals of business growth to connecting with national and regional mentors and investors. The fellowships are designed to equip high-growth entrepreneurs while also aggressively growing an entrepreneurial ecosystem over a diverse geography.

PIPELINE was founded in 2007 by the former **Kansas** Technology Enterprise Corporation, a state-chartered corporation dedicated to stimulating technology-based economic development. No longer supported by state funds, the program is funded by foundations and private sector contributions and has expanded to include entrepreneurs, mentors, and investors from other states in the Midwest, including **Nebraska**.

> It can be difficult for high-growth companies to find the workers they need quickly and easily when they are ready to hire. Companies that are in a period of high growth generally lack the human resources capacity that a larger company would have. Currently, small firms pay a median figure of more than $3,500 in recruiting costs per hire, compared with just under $2,000 per hire at companies employing 10,000 employees or more.[40]
>
> *O'Leonard, 2011*

Each year-long program includes four modules that are tailored to the specific needs of that year's fellowship cohort. The program focuses on providing real-time assistance and constantly adapting to the needs of entrepreneurs. Each entrepreneur is paired with at least two mentors—one who is matched to the entrepreneur's specific needs, such as a need for industry expertise, and one who is able to provide connections to local assets.

The module system creates rigor and a reason for the entrepreneurs to engage with the national network. It provides access to networks of peers and national and regional mentors, advisors, and investors, helping the entrepreneurs make connections they lack the time or stature to make themselves.

The entrepreneurs who participate in the program are diverse in age, education, and company sector but have in common the desire to build something of significant scale. During the year that they are actively engaged in the program, they build strong connections to their peers. In the process, they recognize the power of the regional network, so that they remain engaged as mentors, coaches, and investors.

Since 2007, companies led by PIPELINE entrepreneurs have grown at an average rate of 82 percent. One participating company is now the fastest-growing company in Kansas City and the 64th-fastest-growing company in the United States. In just three years, the company's revenues have grown from $224,000 to $7.8 million, and the number of people it employs grew from 5 to 35.[41]

8. Get your entrepreneurs to give back.

Encourage successful entrepreneurs to be visible role models and to give back to new startups by contributing their expertise and connecting others to their networks. One successful entrepreneur describes the top three things that entrepreneurs need as:

1. **early stage funding, including introductions to follow-on investors;**
2. **help in recruiting early team members; and**
3. **help obtaining early customers.[42]**

States can engage seasoned entrepreneurs as mentors and investors to help meet these needs. They can also engage seasoned entrepreneurs as trailblazers in emerging industry sectors.

Seasoned Entrepreneurs as Mentors

Many high potential companies are founded by domain experts who have not yet had the experience of building a successful company. Connecting them to a seasoned entrepreneur who has experience in multiple startups can provide new entrepreneurs with the expertise to help their company survive. There is often a role for an accelerator or other intermediary to play in matching a new entrepreneur with the type of mentor they most need, whether it be a seasoned entrepreneur with industry-specific experience or someone who can provide guidance in a specific business area, such as financing, marketing, or human resources. Mentors also often provide new entrepreneurs with valuable connections to networks of investors, to larger companies that could be customers or partners, and to other entrepreneurs.

> Angel investors are estimated to provide 90 percent of the seed and startup capital in the United States, filling a critical void left by venture capitalists, who focus on a much smaller number of later-stage companies.[43]
>
> *Payne, 2012*

Successful Entrepreneurs as Angel Investors

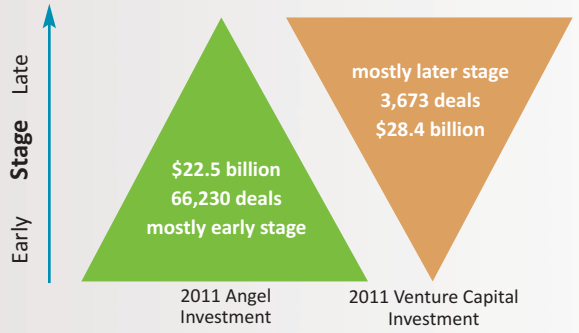
Entrepreneurs often give back by becoming angel investors. Angel investors tend to be experienced entrepreneurs and business owners who invest in early stage companies, often ones located in their region rather than in the high-tech hubs that attract the majority of venture capital in the United States. Angel investors also make investments in companies earlier than venture capitalists would. Not every company that receives angel investment will need funding from a venture capitalist. In 2011, angels invested $22.5 billion in more than 66,000 companies (see Figure 7).[44]

In addition to money, angels often provide expertise and access to networks. Angels value relationships with accelerators that provide mentorship to new entrepreneurs because they give angel groups quality deal flow. The groups know that the companies they are investing in have been vetted and are receiving the resources they need (in addition to financing) to help them grow.

To encourage an active angel investor community, at least 20 states offer income and business tax credits to angel investors in early stage businesses. Some states offer bigger credits for investments in businesses in particular sectors or in rural or economically distressed areas. **Arizona**, for example, offers angels a tax credit of up to 35 percent of the investment amount, over three years, if the investment is in a qualified bioscience company or one in a rural area. For other qualified businesses, the tax credit may total up to 30 percent over three years.[45]

FIGURE 7

Angels Invest in Early Stage Companies



Angel investors invest small amounts of funding in a lot of early stage companies, while venture capitalists tend to invest larger funds in a much smaller number of later-stage companies.

Source: Sohl, 2012

Serial Entrepreneurs as Trailblazers in Emerging Industries

Repeat or serial entrepreneurs are among a state's best entrepreneurial resources. Serial entrepreneurs can be especially valuable to industries that are just emerging in a state. The New England Clean Energy Council's Clean Energy Fellowship program leveraged the region's serial entrepreneurs to fuel growth in the clean energy sector. The program addresses a simple but acute problem: a lack of repeat entrepreneurs in the clean energy sector. Working with the John Adams Innovation Institute at the **Massachusetts** Technology Collaborative, the state funded a pilot program for clean energy fellows, selecting entrepreneurs who had succeeded in building companies in other fields, such as information technology and biotechnology, and training them to create clean energy startups. The training focuses on what the participants need to know about the energy sector, inasmuch as they already know how to start a business. The program also introduces participants to a network of organizations in the energy sector, providing connections to expertise, funding, and potential customers. Six of the original 12 fellows were unemployed when the program began. By the time their fellowships concluded, 10 were actively involved in a new startup and seven were CEOs of the new company.

9. Help companies open doors to new customers—globally and locally.

All business ventures need customers to be profitable and grow. Indeed, in recent years, the biggest concern of entrepreneurs has not been taxes or regulation or capital but the simple lack of customers.[46] Although a company's first customers tend to be local, states can help entrepreneurs find customers worldwide—a step necessary for continued rapid growth.

High-growth companies probably cannot maintain their growth trajectories without "going global," to find customers in emerging economies or become part of a global supply chain. Whereas "multinational" used to evoke an image of a large, established corporation, today we increasingly see new, small firms taking advantage of new sources of demand around the globe. Nonetheless, many small and medium-size firms are not taking advantage of such new sources of demand. Only 1 percent of U.S. businesses export, and less than half of those sell goods and services to more than one country.[47]

States can help entrepreneurs connect with global customers. They can systematically link startups and new businesses to large companies and institutions that are looking for new suppliers and partners but lack the time to vet hundreds of new, small firms. They can hold business model competitions to encourage startups to test whether they have something that is of value to someone else and a way to sell it. And they can assist small and medium-size businesses with strategy, information, and contacts to mitigate the risks of doing business in foreign markets. The following are some examples of these three types of state activity.

Opening Doors Locally

A group of entrepreneurs in Pittsburgh found a low-cost way to open doors for young firms that they call "startup speed dating."[48] For the events that they have created, the organizers choose six startups to feature. They then invite 40 to 50 large companies to attend the event as well. The companies have to send a person who can write a check. The startup companies and the established company representatives first meet for short periods face-to-face, then in a larger, more interactive group in a social setting. On average, the startup companies schedule follow-up meetings with at least two established companies. Even if these meetings do not lead to a deal, the entrepreneurs receive valuable initial feedback.

Opening Doors Globally

As they attempt to help connect more businesses to opportunities abroad, states such as **North Carolina** and **Washington** are finding that it is best to do three things:

> Less than 5 percent of U.S. small and medium-size companies export, even though 95 percent of the world's customers live beyond U.S. borders.[49]
>
> *Department of Commerce, 2010*

1. Recognize that the needs of small and medium-size businesses that are internationalizing differ according to the age and experience of each enterprise and its sector, and tailor assistance accordingly.
2. Make decisions about four components:
    - Service focus, for example, providing financial support (export insurance and loan guarantees) versus market access (market information and trade shows and trade missions).
    - Types of international activity: is the support just for exporting, or does the focus embrace other modes of international trade activity, such as importing and outsourcing?
    - Target group: for example, are programs available for all small and medium-size businesses or specific segments, for all sectors or only specific ones?
    - Mechanism through which support is provided: for example, through government agencies or through third parties, including private firms already deeply involved in international trade.
3. Use a wide range of means for businesses to tap the global market. Although the focus may be on exports, it is important to recognize that international trade is a complex, multifaceted process. Foreign direct investment, immigration, cultural exchanges, international education, and inward investment are also components of any state's efforts to assist businesses with their international position.

Holding Business Model Competitions

Many startups fail because their creators are too busy chasing financing or writing a glossy business plan, when they should be chasing customers and nailing their business model, to make sure that they have something that is of value to someone else and a way to sell it. Recognizing that, a few universities, such as MIT and Brigham Young University, and businesses such as Google are holding business model competitions that reward students and entrepreneurs for developing a tested, scalable, and repeatable business model, not a glossy business plan.[50] An example of this new approach is the X Prize. The X Prize Foundation launched the X Prize in 1996, offering $10 million to the first nongovernmental organization to launch a reusable manned spacecraft into space twice within two weeks. SpaceShipOne captured the prize in 2004, and the foundation has since developed six other competitions.[51] Google launched the Lunar X Prize in 2010, offering $30 million in prizes to the first privately funded teams to land a robot safely on the surface of the moon.[52] U.S. government agencies have started to create their own versions of the X Prize. For example, the L Prize is the first government-sponsored technology competition to spur lighting manufacturers to develop high-quality, high-efficiency, solid-state lighting products to replace the common light bulb.[53]

10. Reward strong ties among universities, companies, and entrepreneurs.

Research universities are often where entrepreneurship begins —where research breakthroughs first occur and budding entrepreneurs first think about how to take those breakthroughs to market. Because many research universities are state institutions, states can play an important role in linking research, commercialization, and entrepreneurship. Perhaps the most immediate reform that states can undertake in conjunction with their universities is to update their technology transfer policies to make the commercialization of research breakthroughs easier to accomplish. The longer-term challenge involves a larger set of actions:

- Fostering collaborative efforts across disciplines and industries to solve big problems (health care, sustainability) at scale;
- Encouraging relevant research and rewarding faculty for innovation successes;
- Making the boundaries between industry and universities more porous; and
- Designing a new, nimble, lean, and collaborative entity devoted to supporting firms and other organizations in their innovation activities.

Seeking ways to strengthen universities as agents of local economic development, some states are offering resources in new ways, for example, by tying a well-defined part of research and development (R&D) funding more closely to economic development outcomes. Some states are also developing "mega" university-industry partnerships that engage multiple universities and multiple companies in research that responds directly to companies' immediate needs.

Offering R&D Funding in New Ways

More than half of U.S. states have begun to invest their own public dollars in R&D and research institutes in the past decade. For example, **Washington** is investing $350 million in R&D over ten years through its Life Sciences Discovery Fund, **Kansas**'s University Economic Growth Initiative provides $15 million for research in areas seen as critical to growing the state's economy, and in **Colorado**, the Advancement of New Bioscience Discoveries program provides between $50,000 and $200,000 grants for research that is specifically targeted toward moving new inventions into operation.

Most states are not funding university research simply in the hopes that their investments will eventually yield worthwhile returns. Rather, funding decisions go through a criteria-based competitive process aimed at fields most critical to the economic growth of the state and support research with near-term commercial value that can be developed and realized locally. Investment decisions are increasingly made by intermediary organizations or public-private partnerships, often operating outside state government and the university system. These intermediaries take an active part in monitoring the results of university projects, eliminating funds to researchers who are not reaching their milestones.

Arizona has invested over $50 million through Science Foundation Arizona (SFAz), a public-private partnership governed by a board of directors consisting of world-renowned business leaders and experts in science, technology and engineering. The board sets investment policy and performance expectations. Projects funded by SFAz are outperforming typical output of research-performing enterprises – SFAz projects have produced:

- One patent applied for or issued for every $1.8 million in research over the past five years, well ahead of the five-year Arizona university-wide average of one patent per $4.1 million in funding;
- One new company startup for every $14.3 million in research over the past five years, well ahead of the five-year Arizona university-wide average of one start-up per $93.0 million.[54]

In **Utah**, decisions about R&D funding are made by the Utah Science Technology and Research (USTAR) initiative's governing authority board—a 10-member board that includes some of the state's top business leaders. The Utah Science Technology and Research initiative was launched in 2006 as a $25 million-a-year program to hire and support commercially minded professors in fields that align with the state's existing economic strengths, such as medical devices and computer gaming. USTAR collaborates with the University of Utah and Utah State University to create world-class research teams in what they call "strategic innovation development areas." To be considered a strategic innovation development area, a research area has to leverage Utah industry strengths, address large global markets, have commercialization opportunities, and be based on existing university strengths.

Over the past six years, the Utah Legislature has approved annual appropriations ranging from $14 million to $25 million a year. Most of the money goes to pay the costs of startup packages (including lab equipment, salaries, and graduate student support) for faculty researchers at Utah State University and the University of Utah. Although the money for additional faculty is a benefit for universities, ultimate control over the spending rests with USTAR's governing authority board, which has a large hand in selecting research priorities, awarding research

funds, and even eliminating funds for research teams that it believes are not as effective as they could be. Utah has invested a total of $977 million in research teams and infrastructure, which has generated $4,992 million in new research funds and $4,979 in new state revenues.[55] In addition, the University of Utah generated more new startups in 2011 than any other U.S. university.[56]

In addition to funding R&D at the state's top research universities, USTAR is actively promoting commercialization across the state by providing "small-light-fast money" through its Technology Outreach Innovation Program (TOIP). The program is led by directors deployed across Utah with a regional focus. They provide startups with access to business expertise and seed capital, or "small-light-fast money." Small amounts of funds are provided with immediate milestones (four months or less). Regulation and administration are light, and fast decisions sustain the technology development momentum. If companies meet their milestones, they are eligible for a subsequent round of funding.

Investing in Mega University-Industry Partnerships

Virginia's Commonwealth Center for Advanced Manufacturing (CCAM) is a research-based collaboration between the University of Virginia, Virginia Tech, Virginia State University, and manufacturing companies worldwide. The partnership bridges the gap between fundamental research typically performed at universities and product development routinely performed by companies. The manufacturers truly drive the research to be production-ready and focused on commercial use. Research is conducted in areas (such as surface engineering) that add value to manufacturers in diverse sectors. By pooling resources and keeping research focused on company needs, CCAM increases the value of the R&D dollar. Members share facilities, personnel, and precompetitive research.

The state was key in developing a "mega" partnership that provided tailored R&D and workforce training to attract a Rolls Royce production facility to the state. The state has made a number of commitments to CCAM's continued development, including matching research funds and funding laboratory renovations, faculty hires, graduate research assistantships, undergraduate student interns, and workforce development programs. The state's contributions to CCAM will total at least $40 million over five years.

CCAM's eight industry members, including Newport News Shipbuilding, Rolls Royce, and Siemens, make sizable contributions to the partnership. Tier 1 industry members contribute $400,000 annually for at least five years, have one full-time staff person on site at the CCAM facility, and engage two other companies (often smaller suppliers) as Tier 2 members. Tier 1 membership fees cover two kinds of research—generic and directed. All members have a nonexclusive, royalty-free license to intellectual property developed from generic research. Directed research is owned by the member company that funded it. There is a lower cost of entry for Tier 2 members, who have access to generic but not directed research. Industry partners have committed to contribute more than $25 million to CCAM over five years.

CCAM's collaborative, precompetitive model also focuses on preparing a skilled workforce for manufacturing jobs. Students participate in CCAM's research and development through graduate student internships, which foster the transfer of skills between seasoned industry veterans and students. CCAM is also working with Virginia's community college system to develop training that meets the specific workforce needs of the CCAM's industry members.

The three founding universities also contribute resources to CCAM. Each university member commits one staff person to be on site at CCAM facilities full-time. The universities are committing $10 million to CCAM over the course of five years, through faculty hires and startup packages, matching research funds, new manufacturing courses, and research equipment funding.[57]

11. Encourage entrepreneurs and companies, small and large, to build innovation clusters.

Innovation clusters do not normally pop up randomly. They emerge from interconnected companies and associated institutions. They can be built—and become stronger as they grow—if groups of companies, universities and educational institutions, government agencies, and others work together to build an ecosystem that uniquely supports the competitiveness of the cluster. Cluster initiatives succeed by improving information flows across sectors and by building a repository of specialized expertise, technology, and institutions to help companies in the area with competitive advantage, stimulate further innovation, and facilitate entrepreneurship so that ideas, and businesses based on them, grow in the area.

Some states have created new organizations—"institutes of collaboration"—to facilitate innovation clusters in their states. These organizations fill a gap left by state agencies and universities, which do not have the cultivation of an innovative environment as their central mission. Institutes of collaboration pull together the disparate pieces necessary to create an innovation ecosystem that improves the competitiveness of companies in a particular industry cluster or in related clusters.

States such as California and Oregon are using institutes of collaboration to connect large and small companies, research universities, and entrepreneurs to grow and strengthen industry clusters.

California's Biosciences Cluster

The **California** Institute for Quantitative Biosciences (QB3) is one of four California Institutes of Science and Innovation, which were established in 2000 to create new knowledge and talent, speed commercialization, and expand the state economy. QB3 does not directly fund research but organizes and facilitates research collaborations across the university and between university researchers and large and small companies.

QB3's services for industry include helping companies locate research expertise, master agreements that minimize the bureaucratic process, and the use of core facilities that provide such things as advanced microscopes.

When helping companies find needed research expertise, Regis Kelly, the director of QB3, compares his job to that of an "integrator" at a large company, focused on connecting people to get significant value from limited funds. QB3 has four knowledge brokers—people who interview faculty to find areas of potential collaboration, both within the university and with industry partners, and to find new ideas that could be taken to market. By fostering collaborative efforts across disciples and institutional boundaries, QB3 knowledge brokers make faculty research more attractive to outside funders and more accessible to industry partners. As the university-industry collaboration broadens, products of collaboration go from patents and disclosures to include new company formation, shared equipment classes, and sponsored research agreements.

QB3 leadership has also worked to minimize the bureaucratic processes often required for companies to engage with universities in formal partnerships. For example, the institute developed a blanket material transfer agreement with Genentech. Before the agreement, Art Levinson, Genentech's CEO, noted that Genentech was doing more sponsored research with Vanderbilt University—2,000 miles away—than with UCSF, which is 12 miles from the corporate headquarters. In the 18 months before the agreement, there were only two collaborations with Genentech because of difficulties and delays, largely related to intellectual property issues, in securing individual agreements. In the 18 months after the agreement was signed, there were 13 collaborations.[58]

The complexity of negotiating joint research projects between a company and academic researchers can be a deterrent to collaboration. In some cases, it can take eight months to a year to negotiate a research agreement. A number of institutions have started to craft master agreements with companies to shorten that time frame. Master agreements eliminate the need to negotiate agreements individually each time the company wants to partner with an investigator. They cut the time it takes to put a project into motion to about six weeks or less.

- In 2010, the University System of Ohio's 14 universities signed a master agreement with Proctor & Gamble (P&G) that established standard terms and conditions for joint research projects. The agreement saved P&G over a full year of separate negotiations with each university.
- The Pennsylvania Nanotechnology Institute, a collaboration of twelve research institutions that together comprise over 4000 research faculty and over $1 billion of annual research funding, formed a Nanotechnology Commercialization Group (NCG) to pool intellectual property related to nanotechnology and to provide a cross-institution technology transfer service. The NCG has developed a Collaboration and Inter-Institutional Agreement that applies to all twelve institutions and provides industry and investors with a single point of contact for license negotiation.[59]

In addition, QB3 connects university researchers across disciplines and provides services for academic entrepreneurs, including mentoring by industry experts and clinical advisors, precommercial funding, and access to a network of incubators. To spur the growth of new companies, QB3 has created an ever-growing network of incubators that allows very small companies access to laboratory space in close proximity to QB3 investigators. Over the past six years, QB3's network of five incubators has launched 60 new bioscience companies. Those startups have gone on to create more than 280 jobs and have attracted $226 million in follow-on funding.[60]

Oregon's Small Technologies Cluster

Another example of an institute of collaboration is **Oregon**'s Nanoscience and Microtechnologies Institute (ONAMI). Oregon created ONAMI in 2003 as the first of three signature state-supported research centers, based on a recommendation by the Oregon Council for Knowledge and Economic Development. The council recommended that the centers would be a way for the state to bring together expertise at its four research universities to focus on creating new businesses and better serve the state's knowledge-based and emerging industries.

ONAMI is fostering R&D capacity in the multi-market field of micro- and nanotechnologies among Oregon's four research universities, the Pacific Northwest National Laboratory, and the state's "Silicon Forest" high-technology industry cluster. Because it has no research staff and is not housed at one university, ONAMI can focus on boosting the research and commercialization capacities of all the state's universities. To do so, it invests in a number of programs to develop expertise, encourage interaction, and drive commercialization.

ONAMI has over 250 researcher members from five institutions. Members are eligible for competitive participation in ONAMI-sourced large projects and can apply for matching funds for research, workforce development, and equipment purchases. ONAMI provides a 5 percent match for large multi-institution collaborative projects and an 8 percent match for acquisition of shared equipment. Matching funds increase to 10 percent for industry-sponsored research. In addition to providing the matching funds, ONAMI staff build collaborative teams for both research and commercialization and assist university centers with their innovation programs, by funding and placing student internships in gap fund startup companies, for example.

To encourage interaction, ONAMI's leadership team acts as a liaison among the institutions—they are similar to QB3's knowledge brokers—by learning about the capabilities of faculty and helping them connect with faculty on other campuses. Further, ONAMI supports and promotes university-based core facilities that provide equal access to specialized equipment to researchers and companies world-wide. Outreach to Oregon companies is done in collaboration with the Oregon Business Development Department. This ONAMI "high tech extension" service connects a collection of shared/open user facilities to industry—now more than 200 companies of all sizes—on a fee-for-service basis. To encourage new clients to use the facilities, ONAMI offers first-time user grants which reimburse half of the cost for an initial project.

To drive commercialization, ONAMI offers proof-of-concept grants to university researchers and startup companies to advance technology into the marketplace. Funding is paired with business development services, as ONAMI operates with the understanding that new companies have two major gaps to overcome: a gap between research result and manufacturable product and a gap between a technology-based solution and demand for that solution from an established market.

Its effort to "bootstrap an ecosystem" is already paying off for Oregon, generating new firms, new jobs, and new economic strengths. As of May 2012, ONAMI had invested $4.7 million from its commercialization gap fund to assist 30 startup companies that have raised a total of $107.9 million in external funding. In addition, new research awards and contracts to ONAMI researchers grew from less than $10 million in 2004 to more than $50 million in 2010. [61]

> Industries located in regions with strong clusters experience higher rates of new business formation. Strong clusters also contribute to startup firm survival.[62]
>
> *Delgado, Porter, and Stern, 2010*

12. Build ecosystems, not programs.

The innovation ecosystem is an increasingly important part of economic growth. Working only on specific programs for entrepreneurs or startups is insufficient. States cannot think too narrowly, but may think too broadly, focusing only on general business conditions. A good strategy to drive economic growth is to cultivate a well-developed ecosystem, or innovation hub, of the type that Austin, Texas and San Diego, California have created over the last two decades or so.[63] It means taking steps to develop an array of statewide proficiencies—smart people, unique research institutions, strong collaborations and other linkages and resources—to not only help entrepreneurs get through the hurdles they must cross to become high-growth businesses, but to also provide strategic advantages for companies competing in the global economy.

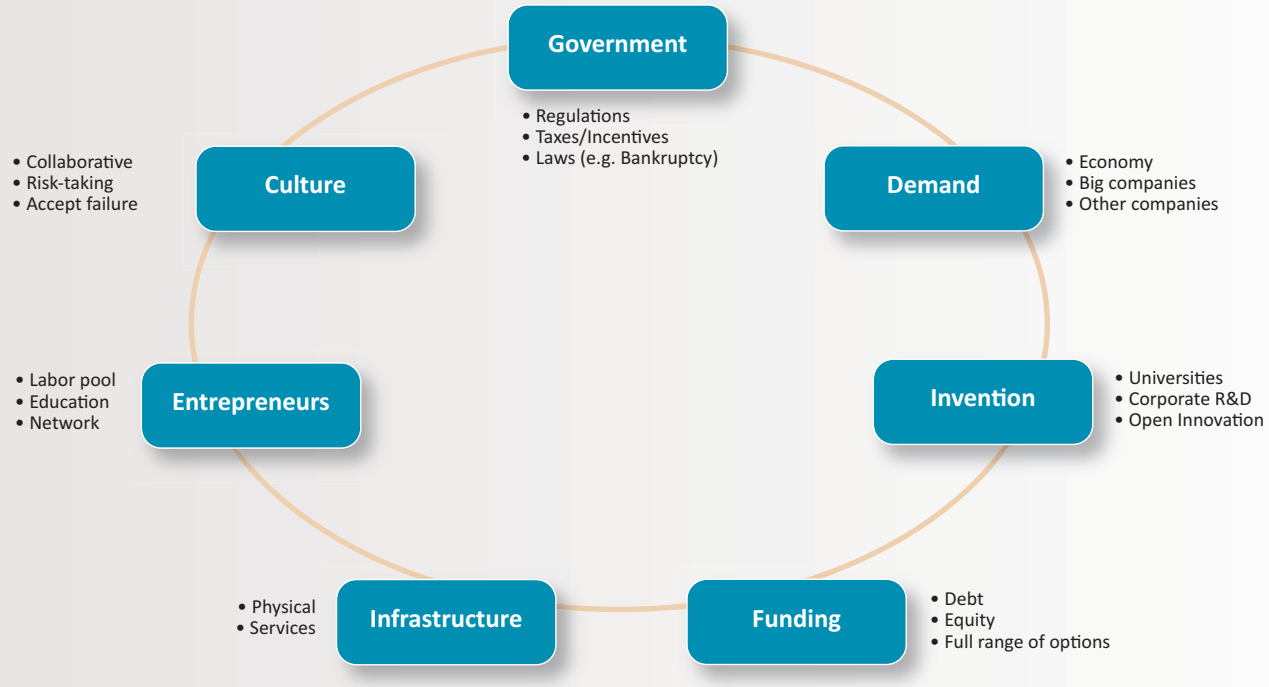
A number of diagrams of innovation ecosystems have emerged to help guide public policy and investment choices (see Figure 8).[64] It is critical to remember that it is the sum of the parts that matters most. One or two elements—research institutions and entrepreneurs, for example—are key factors in maintaining the balance of the system, but elements such as the talent pool of scientific and technological workers, services, and quality of life are also critical.

Those key elements work in concert—no one element stands on its own. The elements form a "web of relationships, which constantly nurture and interact with one another in synergistic ways that strengthen the overall economic environment and contribute to the resilience and sustainability of innovation hubs."[65]

> An innovation hub is an ecosystem in which a distinctive collection of people, firms, institutions and relationships combine in finely tuned ways to not only provide scientific advances or technological breakthroughs but to also turn ideas into products and take them rapidly to market by creating new firms.
>
> *The Silicon Valley Edge: A Habitat for Innovation and Entrepreneurship, 2000*

FIGURE 8

Elements Work in Concert to Build a Successful Innovation Ecosystem



Source: Based on Aulet Diagram, 2011

The important lesson from the Austin, San Diego and other innovation hub stories is that the creation of an ecosystem depends on creating value that is captured not by a single company but by an entire *community*—to help companies start, grow, and compete globally. Another important lesson is that the responsibility for creating an ecosystem falls on many shoulders—including the governor, state agencies, universities, the private sector and legislators. Without full participation from this array of stakeholders, success may be elusive.

Conclusion

Economic growth and job creation are two of the most important issues for every governor. This report offers Twelve Actions for governors to consider.

Taken together, the Twelve Actions emphasize:

- Understanding the pathway through which new, small businesses become fast-growing firms and the policies that support that transformation;
- Targeting policies and resources by the different stages of business growth and paying attention to the economic impacts generated by businesses in each of those stages of growth;
- Focusing resources and services on the companies that have the most potential to grow quickly, compete globally, and add jobs to the economy;
- Providing the education and training to prepare the next generation of entrepreneurs, business owners and leaders;
- Building an innovation ecosystem, not a new program, to help the private sector grow and create new job opportunities for state citizens; and
- Encouraging collaboration among key institutions such as universities and community colleges, research institutions, investment funds, industry associations, and professional networks to provide the specialized assets and essential connections that fuel innovation ecosystems.

With these guidelines in hand, states can rise to the challenge of economic growth and job creation.

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