

# The Washington Innovation Economy

*New Economic Strategy for Prosperity*

DRAFT

**Washington Economic Development  
Commission**

**February, 2009**

**[www.WEDC.wa.gov](http://www.WEDC.wa.gov)**

The Washington Economic Development Commission is an independent, non-partisan commission charged by the Legislature with the mission of creating a comprehensive statewide strategy to guide investments in economic development, infrastructure, workforce training, small business assistance, technology transfer and export assistance. The WEDC membership is comprised of business, labor, academic, and association and government leaders. In carrying out this legislative mandate and related responsibilities the WEDC will:

- Provide leadership, guidance and direction to the Governor and Legislature on a long-term and systematic approach to economic development.
- Formulate a common set of outcomes and benchmarks for the economic development system as a whole and measure the state's economic vitality.
- Define public, private, and philanthropic sector roles and best practices ensuring Washington captures the next generation of technology investment and global market opportunities.
- Provide a forum for geographic and industry cluster "institutions for collaboration" to build stronger partnerships.

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- Talent and Workforce Development co-chaired by John Gardner and Rick Bender
- Investment and Entrepreneurship co-chaired by Jack Breese and H. Stewart Parker
- Infrastructure co-chaired by Bruce Kendall and Connie Bacon

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# EXECUTIVE SUMMARY

## The Washington Innovation Economy *A New Economic Strategy for Prosperity*

### Our Vision for Washington

***Make Washington the most attractive, creative and fertile investment environment for innovation in the world as a means of achieving long-term global competitiveness, prosperity and economic opportunity for all the state's citizens.***

Washington State is in the midst of an unprecedented economic crisis that increases the need for a framework to guide policy choices and investment priorities. While policy attention will necessarily focus on the immediate and short-term, we must also address longer term challenges. Our economy is undergoing a profound structural adjustment and facing new global realities. Our enterprises need to be focused on the technologies and markets that will grow in the future to create jobs, raise living standards and finance necessary public services. The current crisis can serve as an opportunity for Washington to emerge from this time of troubles stronger and more competitive.

The Washington Economic Development Commission has proposed a new economic development strategy that seeks to unleash the innovation capacity of businesses, institutions and communities in our state. The state needs a new strategic approach for economic development, with a whole new way of thinking, operating and interacting.

The Commission addressed three key drivers of an innovation economy—talent, investment and entrepreneurship, and infrastructure – and proposes specific ways to address those drivers. Over time we have an opportunity for our business, research, government, and education leadership to step forward to implement revolutionary—not incremental—change. This change will be facilitated by a new perspective and a capability of seeing the innovation system as a whole, and of collaborating across boundaries.

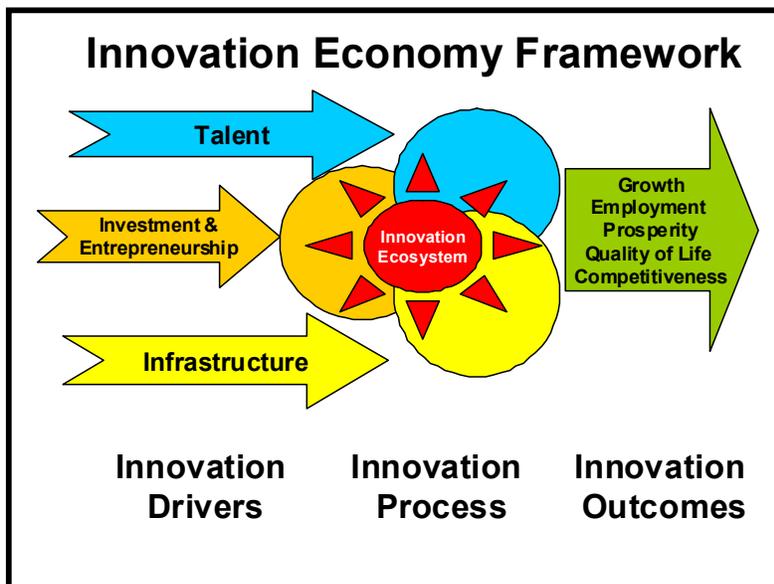


Figure 1 - Innovation Ecosystem

# New Approach for Economic Development

Economic development has long been seen as a series of real estate deals in a zero-sum game of “smokestack chasing.” It is time to put to rest this old idea that prosperity is based on low cost inputs, and place new emphasis on improving the quality of inputs and on facilitating innovation outcomes as the driver of long-term competitiveness, growth and employment. The innovation model aims to create a new dynamic of relationships – the “innovation ecosystem” – that can link all the capabilities of the state to generate new knowledge, start and grow a business, utilize infrastructure and transform existing businesses.

Traditional Model	Innovation Driven Model
Attracting companies	Investing in talent and infrastructure
Jobs	Quality of jobs, per capita incomes
Lowest cost of business inputs	Higher value inputs, increasing productivity
Focus on skills and single occupation	Focus on learning and career flexibility
Large corporations, economies of scale	Entrepreneurs, agile businesses, free agents
Top down economic development	Bottom-up partnerships and organic growth
Investing in technology inputs	Investing in innovation outcomes
Competing regions: zero sum game	Collaborating regions: value creation game
Closed innovation system	Open innovation systems, networks
Locally focused clusters	Globally focused clusters

We need to encourage a variety of innovation ecosystems to emerge around the state as local players begin working more closely together within the context of their local assets. New innovation ecosystems will emerge organically as various players share a common vision and realize the advantages of collaboration. The Commission does not envision the state commanding the formation of specific innovation ecosystems, but rather brokering regional capabilities to draw strength from each other to exploit new opportunities.

**Innovation is more than invention. It is the process by which knowledge is created and transformed to some useful purpose. Innovation has traditionally been characterized as a linear, systematic, centrally directed, process. The reality, however, is very different.**

**Innovation is:**

- Open.** Companies seek sources of knowledge outside their organizational boundaries.
- Faster.** The cycle of invention-to-product is happening at an accelerated pace.
- Distributed.** Vertical integration has given way to distributed networks.
- Global.** New economic players are capturing a larger share of private R&D investment.
- Co-creative.** New models of innovation incorporate the customer into the design process.
- Multi-disciplinary.** An intense pace of knowledge requires insight from several disciplines.

The Commission’s vision recognizes the difficulty of predicting the future of Washington’s economy with any great specificity. We will not be able to see important technological, environmental and social developments that will give rise to new opportunities over the next 20 years. But we can be prepared for the opportunities that arise, with an “attractive, creative and fertile investment environment for innovation.”

The innovation economy will be established through thousands of daily decisions made over a period of many years. If current and future decision makers are committed to the vision in this

report they will act with a full understanding of their impact on Washington’s goal of becoming the world leader in innovation. The Commission’s vision also suggests intentionality. The state needs sustained leadership and action and to overcome any complacency that puts our future at risk.

## How We Will Get There

Washington can pioneer an innovation ecosystem model that more rapidly integrates capabilities within and outside the state to create new value for its global customers. The Commission’s first round recommendations focus on augmenting three interdependent components of the ecosystems which innovation needs to thrive: talent, investment and infrastructure. Taken together these form the pillars of the comprehensive and integrated approach the commission has adopted.

Talent
While Washington will continue to welcome new residents who bring their talents to our state, we need to maximize the opportunity for Washington residents to gain the qualifications to be competitive within the state’s talent clusters. This applies both to young people coming out of high school and college, and to older workers who seek a more promising future.
<p><b>Recommendations:</b></p> <ul style="list-style-type: none"><li>• Develop home-grown talent and attract talent from around the world.</li><li>• Build a strong framework for the coordination of economic and workforce development.</li><li>• Ensure that K-12 schools are preparing students for post-secondary education and work.</li><li>• Improve the output of the state’s post-secondary system.</li><li>• Ensure that working adults can learn new skills and move up a career ladder.</li><li>• Communicate the need for change, discovery, life-long learning, and entrepreneurship.</li><li>• Facilitate job transitions and continue modernizing unemployment insurance.</li><li>• Strengthen apprenticeship programs.</li></ul>

Investment and Entrepreneurship
Washington needs to be at the forefront of science and emerging technologies that will form the foundation of whole new markets, product categories and industry clusters. But to take advantage of our many capabilities we need stronger mechanisms for commercialization. No matter how good the ideas and how dedicated the entrepreneurs, all ideas face the “Valley of Death” where good ideas fall to their doom from a lack of capital at the earliest stage of development. A critical component of the innovation ecosystem will be capital to bridge the gap between good ideas and product development.
<p><b>Recommendations:</b></p> <ul style="list-style-type: none"><li>• Compete for federal R&amp;D funds in strategic areas.</li><li>• Expand STARS Program.</li><li>• Strengthen Innovation Partnership Zones.</li><li>• Create innovation awards.</li><li>• Implement a real time Innovation Dashboard.</li><li>• Increase access to entrepreneurial capital.</li></ul>

## Infrastructure

The State can be a leader in the design and construction of smart infrastructure that takes full advantage of communications and information technologies to perform more effectively. Smart infrastructure supports a distributed model for work, more energy efficient personal transportation systems, and high speed broadband infrastructure for a vast array of new digital applications and services, and an energy grid that is smarter, more reliable and reduces carbon emissions. Smart infrastructure minimizes its environmental footprint, anticipates its lifecycle maintenance needs and remains highly flexible and adaptable so it can evolve as new energy technologies and environmental practices arise.

### **Recommendations:**

- Ensure infrastructure supports innovation.
- Provide smart utility services.
- Promote next generation broadband.
- Leverage transportation spending to enhance the state's economy.
- Reduce dependence on oil.
- Enhance the state's air and marine transportation facilities.
- Provide adequate tools for infrastructure funding.
- Streamline regulatory process.

## *Conclusion*

After a century of economic experimentation, the evidence is now in: the great successes in economic development in the past decades have combined excellent education and infrastructure with an open financial and regulatory climate in which entrepreneurship thrives. This conclusion supports the Commission's vision for Washington: a diverse array of innovation ecosystems flourishing across the state. These ecosystems are based on the excellent education and infrastructure provided by state and local governments, and seeded with a steady stream of new ideas from research institutions. The targeted deployment of investment capital allows good ideas to jump across the "Valley of Death" and become the foundations for promising businesses.

Successful economies require strong leadership. Regions and nations that have made great economic strides have done so because their strategies and goals became embedded in their cultures and successive governments sustained investments and a favorable business climate. Washington needs to commit to making innovation a long-term strategic priority through the ups and downs of the state, national and global economy. Washington has all the ingredients for a very promising future, but perhaps the most important lesson the world economy is teaching right now is that nothing can be taken for granted and success must be earned every day.

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# I. Introduction

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When the Washington Economic Development Commission began its strategy work early in 2008, the state's economic growth, employment and export metrics were outpacing the national economy. Prospects for high technology, manufacturing, agriculture and the service industries appeared to be quite robust. In the fall of 2008 the global economy entered uncharted territory: housing meltdown, credit crunch, uncertainty and fear. Since the start of the recession in December 2007, the number of unemployed persons nationally has grown by 3.6 million and the unemployment rate stands at 7.2 percent. Our state is not exempt from these trends and finds itself facing the same ambiguous future as the rest of the nation.

In late 2007 Washington State had a historically low unemployment rate. In December 2008 the unemployment rate rose to 7.1 percent, the biggest one-month rise in more than three decades. 251,700 Washingtonians were out of work that month, producing a record increase in unemployment applications. In the fourth quarter of 2008, venture capital investments in the state fell to the lowest level in more than a decade, another sign of the economic meltdown impacting the state's high-tech industry. The state's flagship aerospace and information technology industries are hitting headwinds. For the first time in Microsoft's history layoffs have been announced. The demand for Boeing airplanes is slowing down. Global manufacturing is experiencing the largest decline in production since WWII.

This economic crisis increases the need for a framework to guide policy choices and investment priorities. Policy attention will necessarily focus on the immediate and the short-term. Spending cuts will be necessary to manage an unprecedented budget deficit and government programs need to be transformed for greater productivity and efficiency. The expected federal fiscal stimulus will create jobs. However, we should thoughtfully ask what kinds of jobs and, in pursuing short term remedies, not neglect the long-term prosperity we want to achieve. The biggest need and opportunity for the state is to have a growth strategy through the current economic downturn.

Our economy is undergoing a profound structural adjustment and facing new global realities, and what will emerge in the years ahead is anything but certain. In many industries the same jobs will not be coming back, so just waiting for a national economic stimulus and hoping for "cyclical recovery" would be a mistake.

The Washington Economic Development Commission finds that we need a new strategic approach for economic development. What got us here will not get us there. In short, we need a whole new way of thinking, operating and interacting. In the pages ahead the Commission addresses three interconnected drivers of an innovation economy: talent and workforce development, investment and entrepreneurship, and infrastructure. Over time we have an opportunity for our business, government, research and education leadership to step forward to implement revolutionary—not incremental—change. No single institution will lead the way. Countless organizations, communities and innovators across the state, thinking and

interacting in a larger system of which they are a part, will evolve the *Next Washington*. This capability of seeing the economic development system as a whole, and collaborating across boundaries, will be the essential underpinning and tool for the state's future prosperity. Future employment in Washington will depend on our capacity to adapt and to nurture "new to the world" products and services. Our enterprises need to be focused on the technologies and markets that will grow in the future to create jobs, raise living standards and finance necessary public services. In fact, the current crisis can serve as an opportunity to shape an economic recovery strategy that supports and facilitates the transition to an innovation based economy. With a coherent policy framework, Washington can emerge from this time of trouble as a stronger, more adaptive, competitive and prosperous state. We have done this before and we can do it again.

"We can't solve problems by using the same kind of thinking that created them."

*Albert Einstein*

### **Foundations for an Innovation Economy**

The Commission sees an opportunity to meet the economic crisis with a bold vision. We recommend adopting an innovation-based strategy and broadening the state's long-term job creation potential with a collaborative effort that engages the resources of both the public and private sectors. We can address two critical needs with a single strategy that supports short-term job creation and also fosters an innovation economy with long-term benefits and sustainability. The near-term and the long-term can work together in three important ways.

First, the widespread attention being given to economic recovery allows for a broader discussion of what works and what does not. We are in highly unusual times and the lack of historical precedents introduces more options and forces a more imaginative debate. Washington's citizens and policymakers need to be open to new ideas not just about the short-term but also about the long-term.

Second, the federal government is expected to implement a massive fiscal effort to generate jobs and economic activity, introducing spending and tax incentives for a variety of purposes. This federal intervention can and should be programmed toward enhancing the foundations of a future innovation economy.

Third, Washington State has demonstrated innovation assets and does have major strengths upon which to build. Unlike states like New York or Michigan, which face deep restructuring of bedrock industries, most economic sectors in Washington are not fundamentally broken. With an intelligently designed strategy, we can strengthen the innovation capabilities of incumbent industries and prepare the state to capture the new opportunities the future will bring.

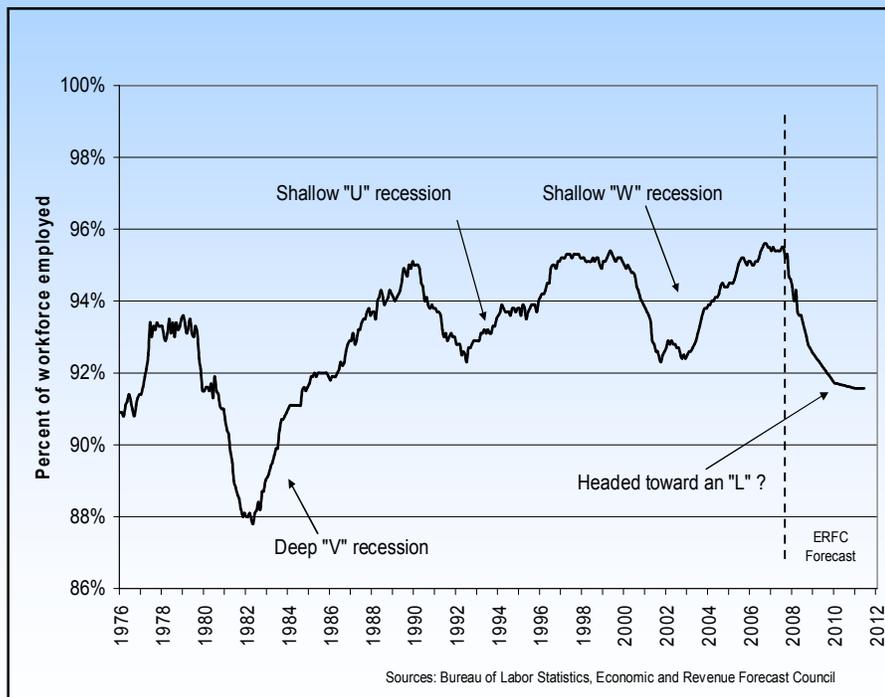
The strategy we propose presents an opportunity to overcome the fragmented, reactive approaches to economic development that have added up to something less than the sum of the parts. In this strategy the Commission introduces the concept of the "innovation

ecosystem” as a platform from which the players in economic development across the state can identify and align resources in ways that best serve statewide, local and even national objectives.

### The “L” economy

In describing economic downturns, economists frequently turn to letters to describe the shape of the graph. The most benign recession is a “V” – sharply down and sharply back up again. A “U” is slightly worse, and a “W” is the dramatic false ending. The current recession is starting to look like an “L” – sharply down, bumping along the bottom with no clear idea when it might climb back up. The following chart shows how employment has varied in Washington since 1976.

The past two economic downturns have been relatively shallow, with unemployment peaking just short of eight percent before climbing back during recovery. This downturn will likely be different. The unemployed cannot simply wait out the slump with the expectation they will return to their old jobs and industries. Radical restructuring of industry means that the economy that emerges in 2010 or 2011 will look quite different from the one that swooned in 2008.



## A New Approach for Economic Development

Economic development has long been seen as a series of real estate deals in a zero-sum game of “smokestack chasing.” States and regions offered a dizzying array of incentives to firms that became quite adept at playing possible locations off against one another. The much feared “race to the bottom” never really happened, but at the same time this process did not result in the needed transformation of economies. Companies focused on gaining free land, cheap utilities and tax relief as top priorities from economic development authorities tend not to be in the vanguard of technological and organizational change.

Washington has not played this traditional economic development game nearly as aggressively as other states. In part this is because of the state’s success in growing and attracting forward-looking businesses based on underlying competitive fundamentals and not on cut-rate location factors. Washington’s constitutional prohibitions on gifts of public funds and lending of credit played a major role.

It is time to put this old idea of lowest cost inputs for economic development to rest. The state’s regions will continue trying to attract and retain employers as opportunities arise, but current theory and practice suggests a new emphasis on the quality of inputs and on facilitating innovation outcomes as the driver of long-term competitiveness, growth and employment.

Figure 2 points out the basic differences between a traditional model of economic development and an innovation-driven model. In many ways this is the contrast between the “hunter-gatherer” model and the “gardening” approach to economic development. By emphasizing the competitiveness fundamentals of business success – talented workforce, infrastructure, and investment – the innovation-driven model creates a habitat that business will find attractive whether they are growing their company from scratch in Washington or moving their business to Washington in search of a more fertile and creative business environment.

**Figure 2 - Innovation Model Defined**

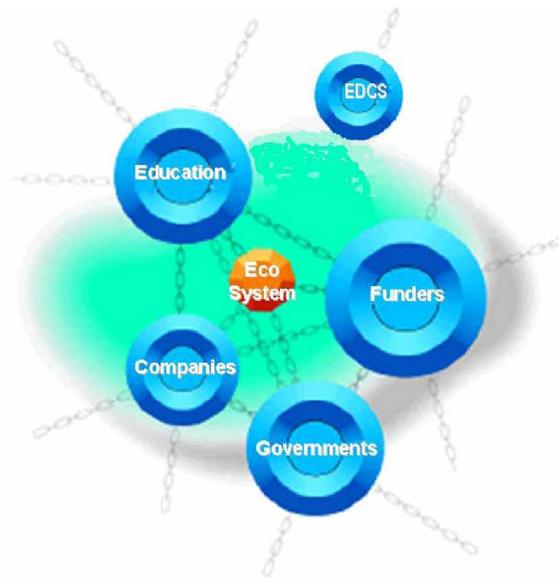
<b>Traditional Model</b>	<b>Innovation Driven Model</b>
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Competing regions: zero sum game	Collaborating regions: value creation game
Closed innovation system	Open innovation systems, networks
Locally focused clusters	Globally focused clusters

The innovation model goes farther than just tilling the ground. It aims to create a new dynamic of relationships (social capital) that can link all the capabilities of the state to generate new knowledge, start and grow a business, utilize infrastructure and transform existing business models. We call this an “innovation ecosystem.” Like a natural ecosystem in which earth and weather provide a context within which plants and animals interact, an

innovation ecosystem provides an economic context within which researchers, companies, economic development councils, education organizations, funders and governments interact in new and powerful ways to maximize innovation and economic growth.

A key priority is deepening trust and expanding linkages and the flow of ideas, people, capital and technologies, particularly at the regional level. To drive a more innovative economy we should foster collaboration among key actors and institutions within and among regions. New relationships will lessen the impact of the recession, increase adaptability, and position the state for accelerated growth once the deleveraging process concludes.

We need to encourage a variety of innovation ecosystems to emerge around the state as local players begin working more closely together within the context of their local assets. Just as natural ecosystems can look very different (rain forest, desert, ocean) innovation ecosystems will vary, based on the elements present. For example, an innovation ecosystem has taken shape in Central and Eastern Washington around the wine industry. Growers, vintners, marketers, tourism agencies, researchers, equipment suppliers and a host of other individuals, businesses and organizations all work together to create a vibrant and growing sector. This ecosystem is, however, quite different from the innovation ecosystem taking shape around global health in Seattle's South Lake Union neighborhood.



**Figure 3 - INNOVATION ECOSYSTEM  
Conceptual Framework**

An ecosystem is intensely interactive, but never directed. No one designed the industrial revolution. No single institution led the way. It was not centrally planned. It self organized, relying on thousands of actors and institutions that competed and collaborated to create economic value. Innovation ecosystems emerge organically as various players share a common vision and realize the advantages of collaboration. The Commission does not envision the state commanding the formation of specific innovation ecosystems, but rather brokering regional capabilities to draw strength from each other to exploit new opportunities. This is an acknowledgement that top-down and prescriptive approaches to innovation are notoriously unable to predict with any accuracy all the opportunities that will arise in the future. State government can play a complementary role, but in the end, innovation ecosystems will take shape through locally driven team efforts. The innovative economy follows the words of that great innovator Louis Pasteur: “fortune favors the prepared.”

### **Seeking collaborative advantage**

The modus operandi of the innovation ecosystem is collaboration among independent actors, each of whom has resources to contribute to the growth of the sector. In a mature innovation ecosystem there really is no actor in the public or civic sphere that does not play a part:

- Universities, non-profit institutions, government laboratories and private R&D operations are a major source of new ideas that will fuel innovation.
- Creating a strong workforce by maximizing human potential is the province not only of K-12, universities, community and technical colleges, but also human service agencies.
- Infrastructure is built and maintained by all levels of government, as well as private utilities and service providers.
- Governments at all levels create the tax and regulatory climate that determine the basic costs of doing business.
- Economic development organizations, chambers of commerce, trade associations and private advocacy organizations all build civic and political support for a strong business climate and targeted investments.

To attempt to stitch all these players together into a fully coordinated, comprehensive statewide economic development “plan” would be a colossal and probably impossible task and would foster the kinds of rigidity that the innovation economy must avoid. At the same time, operating in individual silos threatens to make the entire system less than the sum of the parts.

Players in an innovative ecosystem seek collaborative opportunities in pursuit of common aims that, in turn, promote economic growth and change. For example, employers, K-12 schools, apprenticeship programs and technical colleges all have an interest in addressing the skill shortage that will grow larger as Baby Boomers retire. Each has capacity to contribute to innovative solutions. Similarly, transportation agencies, traditional and alternative energy companies, new vehicle developers and employers can collaborate to promote reductions in energy use and reduced commute time and costs.

## Foundations of the WEDC policy development process

The Washington Economic Development Commission was created by the Legislature in 2003. Its mission and focus were updated by the Legislature in 2007, through SB 5995, to:

*...provide planning, coordination, evaluation, monitoring, and policy analysis and development for the state economic development system as a whole, and advice to the governor and legislature concerning the state economic development system.*

In providing a revised focus for the Commission, the Legislature clearly intended to build on and strengthen the existing network of economic development organizations in the state and foster better coordination among those organizations and the many other organizations and institutions that help drive the state's economy. The Commission's strategic plan is meant to provide a statewide framework for local economic development plans.

The Commission did not start out in a vacuum. Over the past 20 years, the state, through the Commission itself, its predecessors, CTED and the Governor's Office, have produced a series of strategy and policy documents that provide a basis for this report. (See the report summaries below.) Each of these reports reflects the economic conditions and outlook of the time and the evolution of thinking about economic development that brings us to our present focus on innovation.

The Commission has focused its efforts on discovering the state's current competitive position, creating an up-to-date inventory of economic development programs and identifying the key challenges going forward. We have connected our insights into an overall vision for guiding the state's long-term economic development. This report makes a case for the importance of innovation, defines what we mean by innovation, and presents a policy framework for expanding innovation. This policy framework was the basis for organizing the Commission's working groups and recommendations around three interrelated drivers of innovation:

1. Talent and Workforce Development
2. Investment and Entrepreneurship
3. Infrastructure

The role of the Commission is not to just issue a report and disband. The legislative charter gives the commission the continuing task of providing leadership to stakeholders and engaging communities throughout the state to integrate innovation as an economic development priority. The next phase of work will aim to mobilize stakeholders at the grass roots level to incorporate the latest thinking on innovation and competitiveness into local plans and help communities realize the benefits of collaboration. The commission will also work to align legislation and agency programs with the requirements of an innovation economy. This may include collaboration on overall policy and execution, creation of

implementation plans, coordination and integration of programs, development of organizational models and measurement of policy impact and performance. Significant components of the strategy rely directly on federal policies and program funding. A close working relationship with the state's congressional delegation and key federal agencies will be needed for implementation.

These are first steps towards a powerful change in the state's approach to economic development. Such change is required if we wish to sustain our long-term economic growth and competitive advantage. Our ongoing efforts are aimed at creating a more robust environment to innovate, collaborate and rapidly respond to the growing spectrum of technology and market opportunities. Government policies should facilitate, not impede, this market driven transition to an "innovation based economy" that is global, creative, adaptable and continuously nurtures, commercializes and supports "new-to-the-world" technologies.

We realize that our analysis and recommendations will not be the last word on the path forward. Innovation is inherently dynamic and constantly evolving. No innovation framework, strategy or program can or should be definitive and final.

DRAFT

## Economic Development Reports

### **Washington State Economic Development Board, 1987-1988**

In the late 1980s the Washington State Economic Development Board produced a multi-part economic development strategy. It began with Choices for Our Future, a four-part report with analysis and recommendations, and concluded with Washington Works Worldwide, the publicly released summary. At the time the deep recession of the early 1980s, with its 12 percent unemployment rate, was still fresh in everyone's mind, as was the traumatic restructuring of natural resource industries in the state. The reports had four principal themes: international trade, K-12 education, tax reform, distressed areas. Little mention is made of higher education. In fact, the assessment volume expresses skepticism about the role of technology as a source of economic development, suggesting that "the competition for the limited number of new high technology jobs in the future will be strong." There is some mention of innovation and technology commercialization, but the underlying point of view of the reports seems to suggest that the state's future relies on globalization of the existing industrial base rather than capturing opportunities for new sectors.

### **Department of Community, Trade and Economic Development, 1997**

In 1997 CTED commissioned an independent analysis of the state's economic development programs from a Portland-based consultant. The result, Working Together, found that the state's economic development programs were still oriented toward recovery from the recession 15 years before, and not oriented toward building on the economic success the state was then enjoying. Moreover, it found that the state had developed a reputation for failing to follow through on economic development strategies and for inconsistent support for programs. Although the consultant's research was conducted barely 10 years after the release of Washington Works Worldwide, it found that few in the state believed that an economic development strategy existed at all. The consultants recommended an aggressive array of new programs for workforce training, trade promotion, community quality, business recruitment and retention, and tourism. Although the report discusses the importance of knowledge-based industries, it makes no recommendations to strengthen the state's capacity to grow these sectors.

### **Department of Community, Trade and Economic Development, 2001**

In 2001 CTED commissioned Cluster Strategies for Washington from the Northwest Policy Center at the University of Washington. The study, based on models developed by Michael Porter, examined the agriculture, forest products, biotechnology, electronics and healthcare clusters, providing specific policy recommendations for each cluster. The study recommended that the state use the cluster framework in building public policies in education and training, higher education and research and regulation. The report recommends that clusters be a primary lens through which to observe the state's economy, although the degree to which a cluster approach crowds out other approaches is not clear.

## Economic Development Reports (con't.)

### **Washington Economic Development Commission, 2004**

The State Legislature codified the Commission during the 2003 session, with 2004 as its first full year of operation. In a 2004 Report to the Legislature, the Commission laid out a strategy focused on four areas: business investment and recruitment, business retention and expansion, technology commercialization, local capacity building. Those areas of concentration were based on a model of local collaboration and on an industry cluster approach. The plan also included a Targeted Industries Strategy with seven priority targets: aerospace, agriculture/food processing, forest products, life sciences, marine services, software/electronics/telecom, and tourism.

### **Washington Economic Development Commission, 2005**

The Commission, with the help of CTED, the Department of Revenue and Associate Development Organizations around the state, performed an *Economic Development Tax Incentive Assessment* in 2005. This study examined the range of tax exemptions, rate reductions and deferrals aimed at economic development. The report raised a long list of issues but made just a handful of “non-controversial” near-term recommendations, most of which were technical in nature, such as clarifying definitions. The final recommendation was to continue studying the incentives.

### **Washington Economic Development Commission, 2006**

The Commission’s 2004 work program had, as one of its focus areas, technology commercialization, a topic addressed in *Enhancing Washington State’s Economic Future*. The report describes a five-part commercialization model based on basic research, applied research, product development, business planning and business execution. This model, in turn, generates a series of 18 policy recommendations built around five themes: awareness, funding, regulation, collaboration, and infrastructure.

### **Global Competitiveness Council, 2006**

The Council, a high profile 35-member panel, released its final report, *Rising to the Challenge of Global Competition*, in March, 2006. As its name implies, the Council concentrated on Washington’s position in the global economy and the steps necessary to secure that position over time. This report shows a change in perspective from Washington Works Worldwide 18 years prior, acknowledging that globalization means far more than just trade in goods, but also flows of financial capital and brainpower. The Council’s recommendations covered: infrastructure, marketing, the political environment, research and innovation, skills.

### **Office of the Governor, 2007**

In January, 2007, the Governor’s office released *The Next Washington*. Written at a time when Washington’s economy was operating at its peak, the report “is a response to the remarkable times we live in and the incredible opportunities that lie before us.” The report draws heavily from the Global Competitiveness Council’s work. Key initiatives are presented in three sections. Skills initiatives include the program laid out in Washington Learns and the recent report of the Workforce Training & Education Coordinating Board. Foundation initiatives cover infrastructure, technology commercialization and local capacity-building. Open for Business initiatives include a range of new and traditional economic development programs.

## II. Where We Stand: Washington's Current Competitive Position in the World

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To better understand where Washington currently stands with respect to its competitors, a leading economic development strategy firm was retained to assist in an assessment of key indicators that drive an innovation economy. For the past several years, GSP Consulting experts have monitored economic trends and conducted rigorous analyses of best and worst economic development practices. Among the many findings, it is clear that the shift from an industrial economy to an innovation economy has fundamentally changed economic strategies and the methods of measuring and interpreting new economic growth.

Within this economic framework, GSP identified three primary and interconnected contexts:

- 1) **Innovation** considers policies, factors and indicators that influence the introduction of new products, methods and services.
- 2) **Vitality** relates to the policy framework and financial resources, both direct and leveraged, which define and contribute to the process of translating investment into new economic output.
- 3) **Socio-Ecology** includes factors and conditions that influence and define the relationship between communities, industry and workforce and their built and/or natural environment.

Each context is associated with discrete indicators that help to reveal not only the current health and direction of an economy, but also its capacity to fuel and sustain future wealth generation. According to this framework, economies produce the most optimal wealth generating output when these three contexts are aligned and the indicators relating to each demonstrate above average results. GSP benchmarked Washington's performance to the following four states:<sup>2</sup>

- **Minnesota** is comparable to Washington in many respects, especially its investment levels for innovation and economic development.
- **Massachusetts** is a similarly sized economy that invests more heavily in innovation and economic development and it has enjoyed a strong leadership position.
- **Oregon** is a geographic peer and is similar to Washington in terms of many of the inputs and contextual factors but has yet to enjoy the success of Washington. It also has a similar commitment to the environment and renewable energy.
- **Texas** has, until recently, invested little in innovation and economic development and

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<sup>2</sup> "Innovation Benchmarks" by GSP Consulting Corporation also includes an international comparison of Washington State with Korea, New Zealand and Sweden on selected indicators.

has lacked many of the inputs and assets of other innovation leaders but has benefited from NAFTA and the state’s location as a gateway to Central and South America.

In order to tell the story of Washington’s competitive position, the analysis focused on those indicators that mark a clear, consistent delineation about the condition and direction of the state. The leading indicators for Washington are its strength in renewable energy generation, exporting, growth in its technology sector, technological specialization, patent development in emerging technologies, and the development of new business starts. In most of the areas where Washington is lagging the peer states, it is above the average for the United States and these indicators are all moving in a positive direction. Several indicators hover between strength and weakness. GDP per capita, as well as the proficiency of 8th graders in Math, Science and Reading are only slightly lagging the peer states, but above the U.S. average. Unfortunately, neither of these benchmarks may be sufficient in the face of competition from around the world. Even though Washington’s GDP per capita is below the benchmarks, it has been growing at a faster rate than peer regions. There are several indications of weakness in academic R&D and graduate science and engineering students. The state has made gains in per capita R&D but its share of U.S. R&D has been stable and is falling behind the peer states. Washington also lacks the science and engineering students to compete with other innovation leaders and it will have to aggressively grow this area as well. Similarly, Washington is not producing the volume of seed and early stage venture capital deals given the prominence of its technology sectors. If Washington is to sustain its growth here, the number of VC recipients needs to increase. Figure 4 below summarizes the Washington position and trend relative to peer states on key indicators.

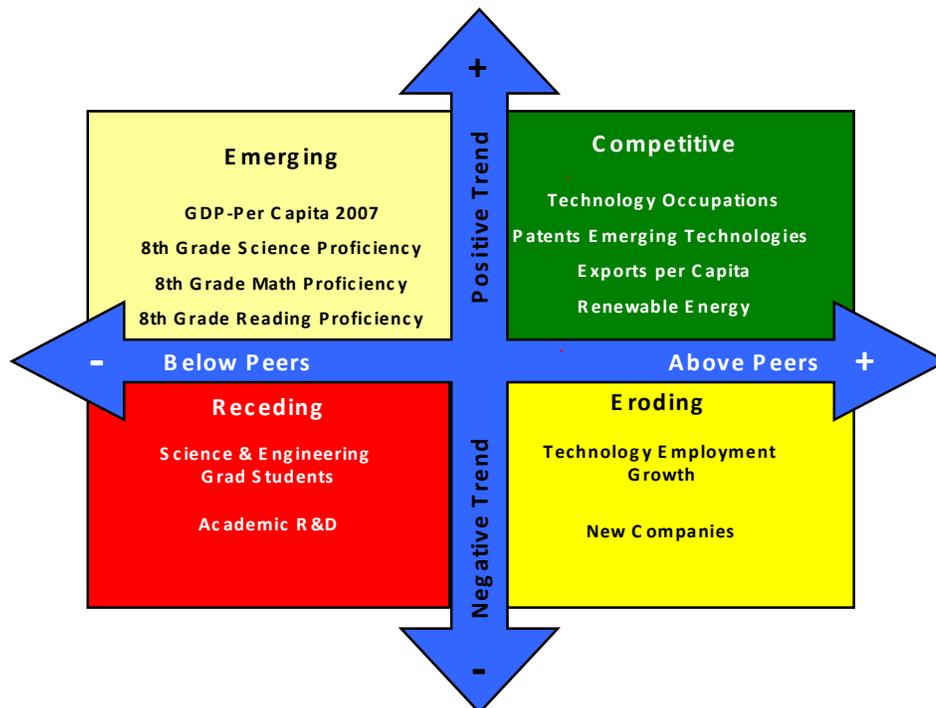


Figure 4 – Washington relative to peer states

## Innovation Context

Washington State has demonstrated above average performance against both its peer states and the national average in three of five key indicators within the Innovation Context.

Innovation	Indicator	Washington	Peer Average	United States	Relative Position
	New Companies	9.22	5.72	6.4	Advantage
	Technology Occupations	1.41	1.19	1.00	Advantage
	Patents in Emerging Technologies	1.56	1.13	1.00	Advantage
	Share of US S&E Grad Students	1.4%	4%	2%	Disadvantage
	Share of US Academic R&D	2.1%	3%	2%	Mixed

## Vitality Context

Washington has demonstrated advantages in two key Vitality Indicators but mixed to lagging results in the remaining three indicators.

Vitality	Indicator	Washington	Peer Average	United States	Relative Position
	Technology Employment Growth (2002-2007Q3)	14.1%	3.1%	0.3%	Advantage
	Venture Recipients per 100,000 Persons	2.74	2.7	3.0	Mixed
	Gross Domestic Product per Capita	\$ 48,121	\$ 48,388	\$ 45,341	Mixed
	Exports per Capita	\$ 8,207	\$ 4,305	\$ 3,468	Advantage
	Small Loans per Small Firm	\$ 61,775	\$ 76,043	\$ 115,241	Disadvantage

## Socio-Ecology Context

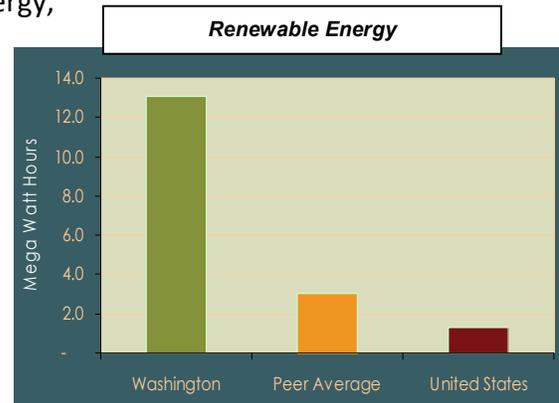
When compared to its peer states and national averages, Washington demonstrates a very strong advantage in the consumption of renewable energy and is comparable in the remaining key indicators.

Socio-Ecology	Indicator	Washington	Peer Average	United States	Relative Position
	Renewable Energy	13.1	3.0	1.3	Advantage
	8 <sup>th</sup> Grade Science Proficiency	33%	34%	27%	Mixed
	8 <sup>th</sup> Grade Math Proficiency	36%	41%	31%	Mixed
	8 <sup>th</sup> Grade Reading Proficiency	34%	36%	29%	Mixed
	High Wage Jobs	36%	33%	NA	Mixed

## Strengths of the Washington Economy

### Renewable Energy Production

Washington maintains a clear advantage over its peers and the U.S. as a whole in terms of renewable energy production per capita. It also ranks 1st nationally for renewable energy output and capacity. As such, it is not surprising that Washington played host to the 3rd global ministerial level conference on renewable energy, the Washington International Renewable Energy Conference, held in March 2008. While Washington is a hub for renewable energy development, and should use this market as a basis for further economic development and job creation, it should be noted that the American Council for an Energy-Efficient Economy ranked Washington just 6th overall in its commitment to energy efficiency.<sup>3</sup> Washington did rank high on its transportation policies and building codes.



However, several other states were perceived as doing much better on market-side drivers such as tax incentives and utility spending on energy efficiency. As other states begin to catch up to Washington's renewable energy capabilities, Washington will need to further invest in driving the market to maintain its leadership, and expand opportunities for the state to take advantage of R&D investment and public support for renewable energy production and technologies.

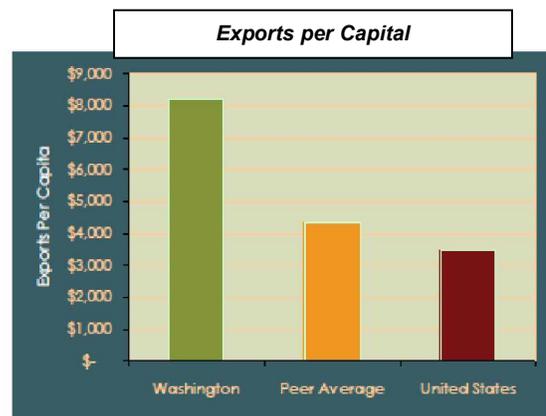
### Exports and Trade

Exporting has been a clear area of strength in Washington, driven to a large degree by the aerospace and agriculture sector. Exports as a whole have grown from 1997 to 2007, and in recent years the exports per capita have been well

India	33%
Ireland	27%
China	15%
Japan	12%
Canada	3%

Source: Wisertrade.org

above average and enjoying significant growth. More important than



the growth in export activity, are the countries that are buying goods and services from businesses in the state. Washington's top export markets are all in the top 25

export markets for the United States. Although the largest export market for the U.S. is Canada, only 3% of the U.S. exports to Canada originate in Washington. On the other hand,

<sup>3</sup> "Energy Efficiency Scorecard for 2006 - American Council for an Energy-Efficient Economy" Eldridge, Prindle, York, and Nadel. June 2007.

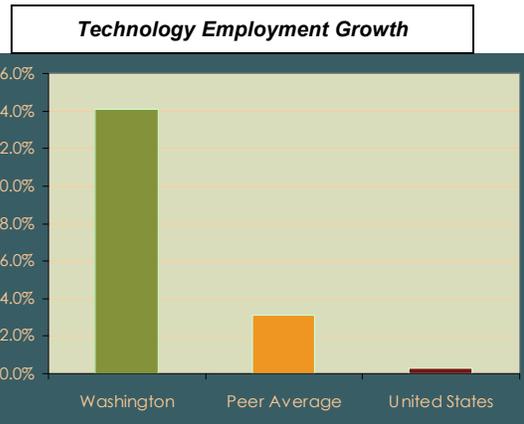
Washington accounts for one-third of U.S. exports to India, which has been growing by an average annual rate of 51% from 2005-2007. Washington also has a strong foothold in China where exports have been growing 25% per year. Overall, Washington has strong linkages to a number of growing markets, particularly China and India. These represent growth areas. However, Washington needs to be conscious of how other countries are investing to increase their export share to these growing markets. A relatively small percentage of Washington companies actually export. Expanding the export capabilities of more companies, particularly knowledge based innovation and technology companies which have limited international experience, would help drive business growth and employment

### Technology Employment

If the overall performance of the economy is strong, the performance of the state’s technology industries has also been relatively strong.

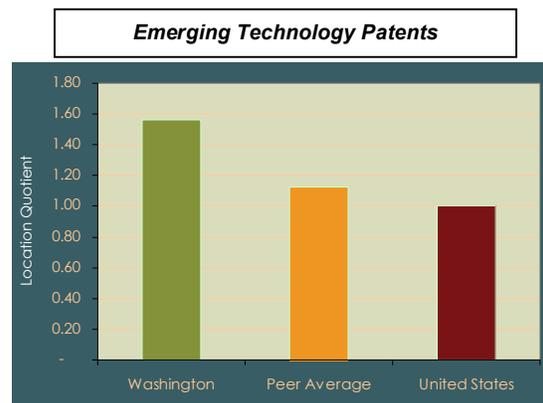
The technology sector has been more volatile than other sectors of the state’s economy and like the rest of the country the technology sector struggled through the first years of the millennium. Relative to the performance of other states and the tech sector nationally, however, Washington’s performance has been relatively better and the state rebounded with vigor by 2007.

Unfortunately, it is more difficult to assess the trend in technological growth over a longer period of time due to the transition from the Standard Industrial Classification (SIC) system, which did a very poor job of identifying many technology industries, to the North American Industry Classification System (NAICS), that provided better coverage of technology industries but made comparisons before 2000 little more than guesswork. The new system has its own kinks and difficulties, such as coding most headquarter operations under a new class – Management of Enterprises – that makes it impossible to distinguish between the headquarters of a bank or the headquarters of Microsoft. Additional changes were made to the NAICS system in 2007 that mostly affected the information sectors and which require additional caution in tracking performance after 2006.



### Patents

Another good sign for Washington is that it has strong and growing patent activity, particularly in technology related areas. Patents are at best an imperfect indicator of the innovation in a region. Patents are a less reliable indicator for industries with extremely short product cycles, but refinements in the patent system and changes in industry practice have made patenting more common in fields that

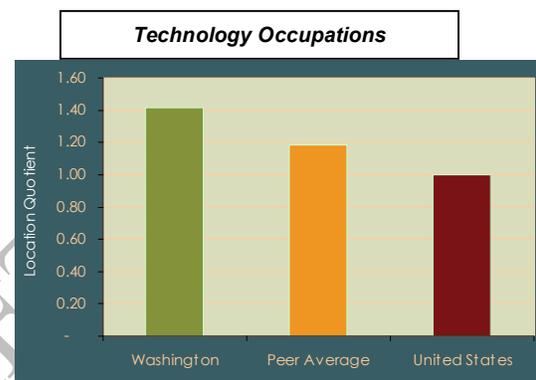


previously avoided patents, such as information technology. In many cases, patent counts will tend to be higher in regions with more mature industries and established products. In order to gain insight into future innovative capacity, the patent activity in emerging technology classes was examined. Patents in Emerging Technologies (PETs) are defined as patent classes where the majority of patents were developed in the last decade and where the average annual growth rate of activity in the class is high. PETs account for 15% of Washington’s total patent activity from 2003-2006 and 2% of the U.S. PETs. A location quotient is a measure of specialization that in this case compares the share of PETs activity in Washington to the share of PETs activity in the U.S. If Washington has the same proportion of patenting in emerging technologies as the U.S., then the index will be 1.0. Washington’s specialization (or location quotient) is a 1.56 overall for PETs patent classes. The state is particularly strong in several classes of data processing, as well as information security.

### Specialization in Technology Occupations

Washington has more than 305,000 workers in technology occupations. As much as the employment in technology industries represents a growth engine for the state, these technology workers embody the potential for technology to transform a broad range of industries. Overall, Washington has 11% of its workers in technology occupations, compared to 12% for

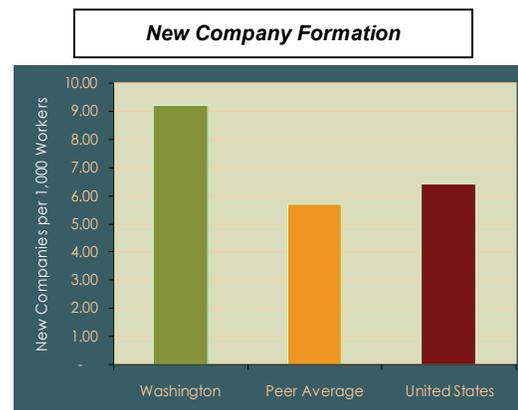
Massachusetts, and only 8% for the United States. This figure is important, especially given that Massachusetts is considered a leader in this field. At the top of the list, Washington has 6% of the following occupations in the United States: nuclear engineers, hydrologists, conservation scientists, marine engineers and naval architects. Given the importance of the environment and energy to our economic future, the presence of these workers gives Washington a critical edge. It may also help to explain how or why Washington is leading the United States in the generation of electricity from renewable sources.



### New Companies

The rate of new company formation presents a puzzle for the state of Washington. On the one hand, sources, such as the State New Economy Index and the Development Report Card for the States (DRC), have consistently ranked Washington very highly in terms of new company formation. However, the DRC also shows that from 2000-2005, the rate of new company formation declined by 33%, the second steepest decline among the states.

Overall, Washington still retains an edge in company formation relative to peer states and the U.S. but the trend could be troubling for the future if it continues. Most likely, this trend merely reflects the current conditions in national and global markets that give pause to all but the most intrepid entrepreneurs.



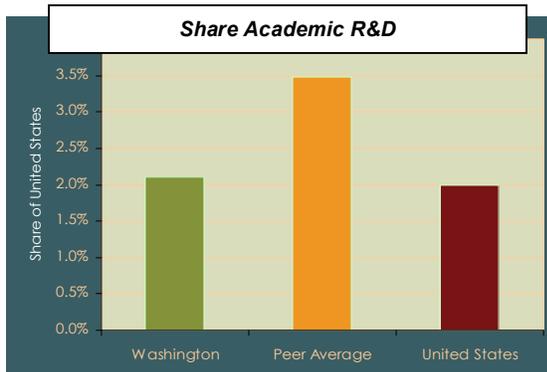
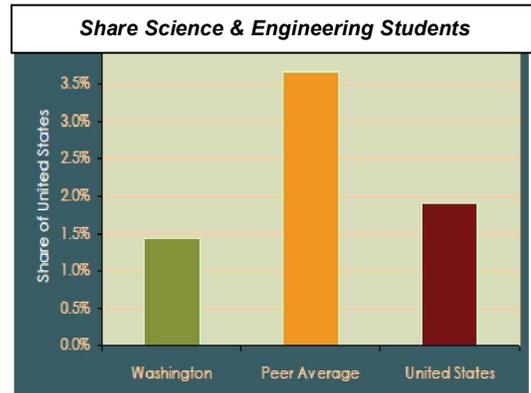
## Clear Weaknesses of the Washington Economy

### Science and Engineering and R&D Share

The difficulty for Washington is that the state appears to be losing ground in two key areas:

- Academic R&D Expenditures
- Science and Engineering Graduate Students

A further review of these indicators demonstrates that the indicators are not entirely negative, and in some cases, such as academic R&D per capita, the state has enjoyed strong growth. Unfortunately, R&D per capita does not reflect the fact that a state needs to have certain threshold levels of activity in order to be competitive.



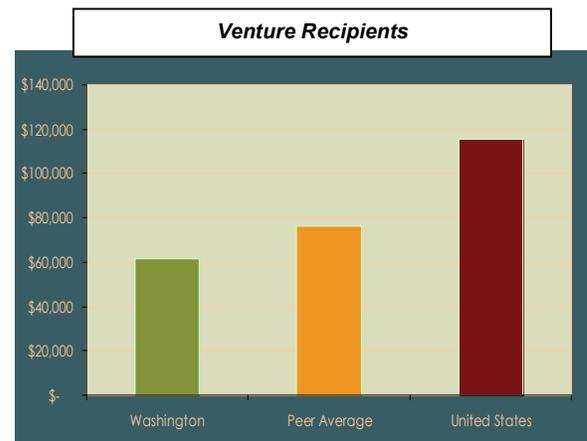
Furthermore, despite the growth in per capita measures, Washington has not increased its share of U.S. R&D or science and engineering students and peer states are enjoying much higher rates of growth. This fact may be a concern when looking at the sustainability of Washington's high level of new business starts, especially in technology industries.

Unfortunately, R&D dollars and levels of graduate students often go hand in hand. If its

R&D capacity continues to stagnate, Washington may fall further behind in attracting graduate students – leading to a smaller pipeline of new businesses and products.

### Small Business Financing

While the overall growth of the economy looks strong, Washington is severely below average in terms of small business loans. This would not be a problem if small firms and startups were receiving more venture capital funding as opposed to bank loans. However, Washington's pipeline of seed and early stage venture recipients is below the benchmarks for the U.S. and the peer group. While Washington has more venture capital investment than Oregon, Texas, and Minnesota, it is outpaced by Massachusetts and other leading states.



The number of venture recipients is actually more important than the total amount of funding because that is often distorted by a few large deals. The number of firms receiving

seed and early stage investment is a better measure of the capacity of the economy to develop good firms. Having a larger number of these firms increases opportunities for growth and employment in the state.

## Scoping Roundtable for State Innovation & Strategies

June, 2008

To help assess Washington's status as a center of innovation and to better understand the innovation landscape, the Commission held a day-long roundtable discussion in June, 2008. The panel of national experts generally found that Washington has significant advantages in innovation, but is not as aggressive as it needs to be to maintain its position. Among the findings of the day were:

**A history of innovation.** Washington has a historically strong position in R&D and innovative business. Businesses and institutions in the state have always been comfortable with a high level of risk, which provides an important competitive advantage. The state also has a history of encouraging collaboration between industry and universities. Washington risks seeing its position erode as other regions of the country and world undertake aggressive innovation programs.

**A more aggressive posture.** Washington needs to set some aggressive and measurable goals with respect to the inputs of innovation and adaptation. These goals need to transcend current politics and be durable over time and through budget cycles. Concerted economic development efforts most often begin from a position of crisis, yet with continued strong performance by innovative businesses such as Boeing, Microsoft, Starbucks and Amazon, Washington cannot reasonably claim that it is in a crisis. Washington needs to make the case for building new strengths from current strengths.

**Measurement and accountability.** Institutions in the state should continually benchmark themselves against competitors in the country and around the world. They must pay close attention to whom they are benchmarking against, and pay as much attention to trends as to absolute measurements. These measurements and trends, in turn, lead to clear standards for accountability. Leaders should not be afraid to consolidate or shut down under-performing programs.

**The talent imperative.** Washington is currently a magnet for talent from around the country, and is generally considered a hot spot. But that can change. Leaders must be cognizant of the factors that attract talent to the talent clusters of the state and nurture those strengths. A growing concern in the talent picture is how to improve the state's capacity to "recycle" people and ideas from failed enterprises. Institutions and the general culture need to ensure they are tolerant of reasonable failures and encourage those whose ideas did not work to stay around and try again. Community and technical colleges now have a need to expand services because of an unprecedented number of displaced workers.

**Money and the Valley of Death.** Money is the main ingredient for crossing the "Valley of Death" and moving ideas from research into practical innovations. Entrepreneurs in Washington will continue to need very early stage capital from angel investors or government programs. Washington is under-represented among recipients of innovation and entrepreneurship grants. The Life Sciences Discovery Fund is a good start, but to avoid being eclipsed by other states and nations, additional state research funding is needed.

**Sustained state involvement.** State governments have control over the most important determinant of innovation and economic success: education. Washington can, without any help from the outside, make itself a much stronger center of education at all levels. Governments can supply critical funding, a stable policy environment and identified priorities for innovation, but businesses must lead in putting forward specific ideas.

## **More Benchmarks**

Three other recent benchmarking studies show a mixed picture for Washington. They all show that the state is either moving up or holding its position in the majority of indicators, which is good news. They do, however, show some glaring weaknesses, many of which are addressed in the Commission's recommendations. See Appendix A for summary presentations of the data.

**New Economy Index**, published by the Information Technology and Innovation Foundation, uses 29 factors to assess the readiness of a state to accommodate innovation and entrepreneurship. The index is not a measure or predictor of economic performance, but rather an indication of the state's ability to adapt to a changing world. Overall, Washington's ranking moved, from fourth to second, since the 2007 index. Massachusetts ranked first. Of the factors that were used in both the 2007 and 2008 indexes, Washington moved up in 18, fell behind in six and stayed the same in one.

Washington ranked first in two important measures. Manufacturing value added indicates the productivity of manufacturing workers, and, therefore, the wages that can be paid. On line agriculture is a key indicator of the technology-intensity, and therefore, productivity, of the state's farms. Also of note are Washington's high rankings in export focus, on-line population, venture capital and alternative energy. Of concern is the state's showing in the sub-index of economic dynamism. While the state ranks high in innovation capacity, it may lack the entrepreneurial vigor to create new firms and move skilled talent to the most productive jobs.

**Washington Alliance for a Competitive Economy (WashACE)** compiles an annual list of competitiveness indicators in its "Red Book." These indicators apply broadly to businesses in the state, not just to those on the cutting edge of innovation. These indicators show Washington to be a relatively expensive place to do business. The state ranks on the upper end of taxes and shows poorly on the Milken Institute's cost of doing business index, with the tax and cost trends mostly static or negative. The indicators give a mixed view on the education and workforce side, and a generally positive picture on investment and technology. The state has been growing faster than the nation as a whole, but this may change as the national recession catches up with the state in 2009.

**Washington State Economic and Revenue Forecast Council** publishes an annual benchmark study that compares Washington to the other states across 41 benchmarks, a subset of which is shown in Appendix A. From 2007 to 2008, Washington surged ahead of other states in nearly all of the economic performance indicators. But the future may not look so good, as the state stayed the same or fell behind other states in six out of seven education and workforce indicators.

## Global trends impacting Washington

As useful as benchmarking is to gathering important insights, we must realize that such indicators are historical and backward looking. To shape our economic development strategy we also must look forward and anticipate global trends, events and uncertainties. Twenty years ago, Washington Works Worldwide began with the statement: “The globalization of the economy has ushered in a new epoch of intense international competition. . .the state needs to re-evaluate the basis of its economy if it is to be competitive in the future.” While that report did not anticipate many of the important developments of the past two decades it did get one thing right: Washington will only thrive by competing at a global level.

The context of global competition has changed remarkably since the 1980s. The emphasis at that time was on trade and the movement of goods through ports. In this vision, Washington would be a source of high value exports to the world and an entry port for goods moving in and out of the country. In the intervening 20 years, however, globalization has come to mean much more. Business is now spread around the world as global firms search the planet for talent, production capacity and markets. The “Flat World” presents new challenges and opportunities as Washington moves beyond trade and into an integrated world economy.

A number of global macro trends will have a major influence on future events and possibilities and need to be considered by policymakers. Trends are not immutable, but provide a useful perspective on how economies could evolve and the consequent policy implications. Five key trends are discussed below:

### Expansion of global capitalism

As the global economy boomed in the 1990s and again after the 2002 recession, it was undergoing fundamental changes. Whether we look at the “flat” world of Thomas Friedman or the “spiky” world of Richard Florida, it is abundantly clear that boundaries have less meaning for companies as they produce goods and services and supply the global market.

The international system will be unrecognizable in the next 10-15 years according to the National Intelligence Council (*Global Trends 2025: A Transformed World*). A global multipolar economic system has emerged with the rise of China, India and others. The U.S. is

### The Globally Integrated Enterprise

A new type of business organization has emerged—the globally integrated enterprise that builds its strategy, management and operations on integration and value delivery worldwide. National borders no longer define the boundaries of business practice. Internet based technology and new business models enable companies to treat their different functions and operations as component pieces. Firms can assemble, disassemble, rearrange and integrate them in new combinations, based on which operations the company wants to excel at and which are best suited to outside partners. In this model it is less about off shoring to cheap labor markets and more about collaboration and drawing on the best capabilities, talents, technologies and customers available in the world.

*(Sam Palmisano, IBM CEO, The Globally Integrated Enterprise, Foreign Affairs).*

likely to remain the leading economic power in the world in the next 10-year time frame, but it will be less dominant and have less leverage.

The shift of manufacturing, service centers, financial resources and economic power from West to East is unprecedented. Growth projections for Brazil, Russia, India, and China (the BRICs) indicate they will collectively match the original G-7's share of global GDP by 2040-2050. If current trends persist, by 2025 China will have the world's second largest economy and will be a leading military power and the world's largest importer of natural resources. The current weakness of Western economic development models may result in more countries being attracted to China's alternative development model.

The outlook for oil and gas prices is a key uncertainty. If they return to higher levels, major exporters from Russia and the Middle East will augment their level of national power. A sustained plunge in prices, supplemented by an energy transition away from oil and gas, could mean a long-term decline in the influence of current oil and gas producers.

A protracted global recession is another uncertainty. The U.S. current account deficit has been at record levels and is the major contributor to global financial imbalances. There are serious questions about how the U.S. will be able to finance an expansionary fiscal policy and a rapidly growing budget deficit.

However we may feel about this new world, it is clearly here to stay. The World Trade Organization riots in Seattle set off a flurry of similar protests around the world, but to little effect. Businesses will continue to shop the world for talent, resources and customers with less concern about national boundaries. The evolution of a new brand of capitalism driven by heavy government involvement further complicates the picture.

Washington has done well in this environment so far. Boeing, Microsoft, Costco, Starbucks and Amazon are at the forefront of globalization and these and other company brands can be seen around the world. Companies clearly need and seek global access to drive their business growth. The current economic crisis is causing many governments to reevaluate their domestic policies, so we can expect increased trade tensions and a rise in protectionist sentiment. The global economy that emerges in two or three years is likely to have a very different configuration from today, and how the state positions itself in this environment is a central policy concern.

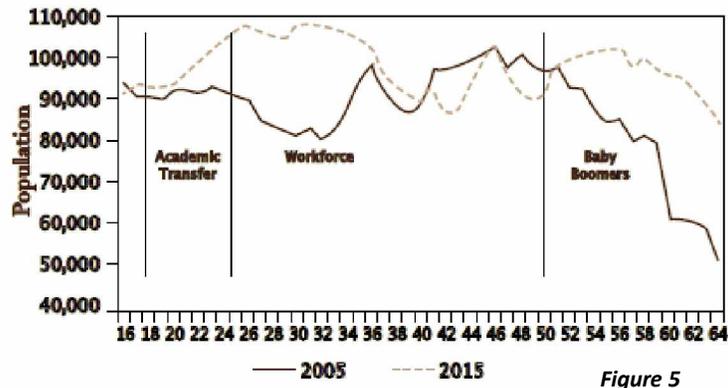
### **Global brain competition**

Since talent is at the heart of an innovation economy, top brainpower is in high demand around the globe.. Scientists, engineers, entrepreneurs and creative people move among firms and increasingly among countries. For knowledge intensive businesses the search, acquisition and development of talent is the number one priority. If talent is not available in the U.S., they seek to import it. If it cannot be imported, they open operations and R&D facilities in countries with the talent. Washington has done well in attracting excellent people

from around the globe, but does face recruitment barriers such as a higher cost of living and limits on H1B visas.

The development of talent is about to get even more challenging. For the past 40 years demographers have watched the Baby Boomers move through the workforce, and now they are beginning to retire in great numbers. The much smaller generation behind them – the Baby Bust – cannot fill all the slots that will be vacated. And to make matters worse, certain industries have

### Washington State Population Most growth in adults 25-35 and over 50



come to be dominated by an aging workforce. As downsizings have occurred in established industries over the past few decades, those with seniority – the Boomers – have stayed, while the younger generations have moved on to other things.

In-migration to the state, combined with the higher birthrate of the 1980s – the Baby Boom Echo – means that the numbers of workers will probably be there, but they will not be able to replace the skills the Boomers are taking with them into retirement. Workforce strategies, therefore, need to concentrate not just on providing skilled workers for the emerging industries of the future, but also replacements for retiring employees of established industries.

### Quality of life for billions of people

Increased globalization highlights the vast disparities in quality of life around the world. The projections of 1.2 billion more people in the world by 2025 will put pressure on energy, food and water resources. Many areas, such as Sub-Saharan Africa, remain mired in conditions of extreme poverty, poor health and political chaos. Other areas, such as China and India, have seen living standards rise dramatically, but this is often accompanied by environmental degradation and social dislocation. As China's economy slows, no one really knows how it will cope with factory closures and unemployment.

"We need a creative capitalism where business and non-governmental organizations work together to create a market system that eases the world's inequities."  
*Bill Gates, World Economic Forum speech, January 2008*

In the past decade the West has turned its attention to global health issues, shifting resources to prevention and treatment of diseases that threaten hundreds of millions of people in developing countries. Washington is a leader in global health. The state has been addressing these issues for more than three decades, with dedication from world-class organizations like PATH, Seattle Biomedical Research Institute, Washington State University and the University

of Washington. With the addition of the Bill and Melinda Gates Foundation, we are now considered to be a world center for development and delivery solutions. Engineers and scientists are working to develop new technologies to improve diagnostics, reduce vaccine costs, educate affected people, increase crop outputs and provide clean water.

In addition to the goal of improving global health, there are other critical challenges. Alternative energy researchers and social entrepreneurs recognize the need to meet the energy requirements of rapidly growing areas of the world in ways that minimize both local pollution and global climate change. Engineers and scientists need to work on new technologies to provide clean water to many areas as a precondition to improving health and agriculture. These developing countries are the next emerging markets for Washington businesses. Microsoft founder Bill Gates has challenged companies to engage in “Creative Capitalism” that utilizes the power of the profit-seeking marketplace to also serve broader social needs and the poor. Our global health sector is a model for this type of approach, and will foster the creation of deep and trusting relationships with these countries. With some additional state investment to encourage such partnerships, we have an opportunity to do well and do good.

### **Responding to climate change**

A year or two ago any observer of public affairs would have believed that climate change and energy issues would dominate public policy for the foreseeable future. The combination of an emerging scientific consensus on global warming and rapidly escalating energy prices created a sense of urgency that promoted initiatives at all levels of government. Suddenly, climate change appears to have lower priority as the financial crisis and larger economic turmoil has captured the public’s attention. Expensive energy projects seem less affordable, and with the dramatic drop in oil prices in late 2008, the sense of urgency has dissipated.

However, the problems and opportunities of climate change have not disappeared at all. High and growing dependence on hydro-carbons is likely to exacerbate climate change and increase systemic vulnerability to conflict. We still face the same environmental and economic consequences of global warming and the same opportunities to save money and generate new industries through “green” technology. An economic downturn will force us to sharpen our focus on the costs and benefits of climate change solutions and turn our efforts toward those actions that promise real impact. But at the same time, we cannot allow current exigencies to derail long-term retooling of energy production and use.

### **New energy technologies on the horizon**

Many new energy technologies that could provide viable alternatives to fossil fuels are on the horizon, yet most have not proved their commercial viability. Even with a favorable policy and funding environment for solar, wind, tidal, biofuels, clean coal, or hydrogen, the transition to new energy sources will

“No single issue is as fundamental to our future as energy. America’s dependence on oil is one of the most serious threats that our nation has faced. It bankrolls dictators, pays for nuclear proliferation, and funds both sides of our struggle against terrorism.”

be slow. Major technological shifts take time and historically the “adoption lag” in major energy transitions approach 25 years. Despite the commercial uncertainties, Washington State is well positioned to be a global leader in the transition to clean, green and energy technologies and consumer products such as plug-in hybrid automobiles. How fast we innovate and deploy will be key.

DRAFT

### III. Where We Want to Go: Strategic Vision and Goals

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#### Our vision for Washington

***Make Washington the most attractive, creative and fertile investment environment for innovation in the world as a means of achieving long-term global competitiveness, prosperity and economic opportunity for all the state's citizens.***

We need a dramatic change in Washington's approach to economic development if we wish to sustain our competitive advantage. Doing so will require a transition to an innovation-driven economy capable of routinely developing and commercializing "new-to-the-world" technologies. Rather than relying on traditional methods of industrial recruitment or increased R&D inputs, we need a long-term policy framework with new public-private relationships focused on innovation outcomes and value creation. The policy framework proposed by the Commission transitions innovation practices from the previous closed, static, linear and individualistic perspective into a dynamic and collaborative approach that is capable of staying abreast of the demands of a global economy.

#### Changing Nature of Innovation

Innovation is more than invention. It is the process by which knowledge is created and transformed to some useful purpose, the new replacing the old--a new way of doing things, a new product or service, a new distribution system, a new marketing methodology or a combination of all. There are many inventions, but not all make an impact. In fact, many inventions end up sitting on a shelf or disappearing into the oft cited "Valley of Death." R&D, discovery and invention are an important part of the innovation process, but they are not the whole process. Economic benefits derive from adding value to good ideas. Every industry, not just high tech, must be innovative to compete and grow. As innovation becomes the new imperative for prosperity, we need an understanding of what is meant by innovation.

Innovation will be the single most important factor in determining America's success through the 21<sup>st</sup> century...For the past 25 years, we have optimized our organizations for efficiency and quality. Over the next quarter century, we must optimize our entire society for innovation. *(Innovate America, Council on Competitiveness. 2005)*

Innovation is traditionally characterized as a linear process in which an idea hatched in a research laboratory moves through the various stages of development: design, prototyping, engineering, full scale manufacturing and commercialization. The process is conceptualized as being systematic, centrally directed, funded by phase, and controlled by a single organization. The reality is very different.

**Innovation is more open.** Companies increasingly seek sources of knowledge outside their organizational boundaries. A generation ago the ideal innovation model assumed a single entity could control the pace of innovation in a particular sector through a large, well funded laboratory. In today's innovation model, companies look inside-out and outside-in. Sourcing knowledge outside – from customers, suppliers, competitors, universities, federal laboratories, foreign research institutes – increases the flow of new ideas and brings them quickly to the market. The outbound side of open innovation seeks to gain revenue from in-house developed knowledge that has yet to be commercialized.

**Innovation is faster.** The cycle of invention-to-product is happening at a faster pace. Failure to innovate fast enough risks loss of value, revenue, employment and profits. To be able to move in different, faster ways requires strong leaders with clear vision and courage to take risks—the qualities associated with entrepreneurship.

**Innovation is more distributed.** Vertical integration has given way to distributed networks. In its earliest days, Ford made almost all the components that went into the Model T. Today, the structure of the auto industry is distributed across numerous component suppliers and sub-assemblers. Auto companies began as vertically integrated enterprises and are now assemblers of technologies from a network of suppliers, many of which are highly innovative.

**Innovation is global.** New economic players such as China, India, Brazil, Korea

## DEFINING INNOVATION

Earlier definitions of innovation tended to have narrow focus on the specific characteristics of an innovative product or service. Over time the definitions broadened to include how organizations innovate. Today's definitions describe innovation as a value creating system and the context in which innovation operates. Some examples below:

*Innovation is "the commercial or industrial application of something new—a new product, process or method of production; a new market or sources of supply; a new form of commercial business or financial organization." (Schumpeter, Theory of Economic Development, 1911)*

*Innovation is the intersection of invention and insight, leading to the creation of social and economic value. (Innovate America, National Innovation Initiative Report, Council on Competitiveness, 2004)*

*Innovation covers a wide range of activities to improve firm performance, including the implementation of a new or significantly improved product, service, distribution process, manufacturing process, marketing method or organizational method. (European Commission, Innobarameter, November 2004)*

*An innovation is the implementation of a new or significantly improved product (good or service), or process, a new marketing method, or a new organizational method in business practices, workplace organization or external relations. Innovation activities are all scientific, technological, organizational, financial and commercial steps which actually, or are intended to, lead to the implementation of innovations. (Oslo Manual, 3rd Edition, OECD).*

*Innovation is a process by which value is created for customers through public and private organizations that transform new knowledge and technologies into profitable products and services for national and global markets. A high rate of innovation in turn contributes to more intellectual capital, market creation, economic growth, job creation, wealth, and higher standard of living. (Innovation Vital Signs, Department of Commerce, 2007)*

*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. (Innovation Measurement, A Report to the Secretary of Commerce, 2008).*

and Russia are increasing their technology budgets and capturing a larger share of private R&D investment. U.S. companies are increasing global partnerships and alliances to tap into the local market, access talent and expand their technology sourcing alternatives. These countries are becoming significant players in the creation and commercialization of innovative products, processes and services. Turning the internationalization of innovation into a global win-win situation will require a creative and strong policy response.

**Co-creating with end-users.** Identification of customer needs is a difficult, costly and time-consuming piece of the innovation process. New models of innovation are more “empathetic” and incorporate the customer into the design and development process. GE offers web-based tools to its customers to develop improved plastic products. Suppliers of specialty food flavors have tool kits for customers to create their own flavors. Game designers have portals to allow enthusiasts to design their own video games. Co-creation strategies can accelerate the design, optimization and deployment of innovative solutions.

**Drawing on multiple disciplines.** Today’s intense pace of knowledge-based competition requires insight from several disciplines. The world of innovation has expanded to such a degree that no company can sustain a research effort that covers all the disciplines and engages all the talent necessary for product development. Innovators often orchestrate a rich web of ideas rather than originate them. The mobile phone, the 787 and alternative fuel automobile are examples of bringing together disciplines, organizations and parts for an integrated value outcome. The global health sector is another example of finding solutions through the application of multiple disciplines using academic, research, scientific, government and diverse organizations and viewpoints.

**Technology enables collaboration.** Innovation requires a higher degree of collaboration and a willingness to abandon the “not invented here” mentality. Protocols and standards allow multiple sites to interact seamlessly, facilitating collaboration across geographies. New information technology applications such as virtualization, web-based tools and cloud computing enable workloads to be spread across globally interconnected teams. The younger generation of workers who have embraced social networking web sites and multiplayer online games are attuned to this new organizational environment. This lattice like structure is adaptable to changing technologies and market conditions.

**Innovation as a government priority.** Government policies have an integral role in influencing the structure, speed and direction of innovation ecosystems. Most countries now have high level policy advocates and strategies to foster innovation. In the U.S. the Innovate America agenda, in the EU the Lisbon Agenda, in Japan—Innovation 25, the new UK Innovation Strategy. Innovation has been identified as the main engine for China’s future growth model. India has adopted a national innovation strategy. More recently, state and regional governments have launched their own versions of innovation strategies and reformed their economic development practices.

**Innovation changes public-private relationships.** The complex nature of innovation requires a systems approach, with careful analysis of the actors in the economic development system (government, business, education, foreign entities) as well as their specific contributions (R&D, commercialization, intellectual property protection). It is the links between these actors and activities and their outcomes that must be understood and accounted for, including all the feedback and feed forward loops that engender the messy, nonlinear nature of innovation. Treating the government as part of the innovation ecosystem is what we mean by a new public-private relationship.

## **State economic development system**

The Commission's mandate calls on it to work with the "state economic development system." But in an organic, bottom-up approach to economic development there is not so much a statewide "system" as a collection of local and regional networks that form innovation ecosystems around sectors, technologies or markets. These ecosystems, in turn, depend not just on the obvious programs, such as associated development organizations, ports and chambers of commerce, but also on education institutions, public works agencies, non-profits, telecommunications providers and venture capitalists.

State agencies play a very large role in innovation ecosystems. As part of its legislative mandate the Economic Development Commission conducted an inventory of economic development programs operated by state agencies. The initial survey was completed in June 2008 with twenty-five state agencies and partner organizations reporting a total of 102 economic development programs. The largest number is managed by the Department of Community, Trade and Economic Development (CTED).<sup>4</sup> The Commission's inventory also found 39 different economic incentive programs designed to stimulate activity in specific industries. These range from the reduced B&O tax rates for aerospace manufacturers to tax breaks for biofuels. This category of program also includes the tax breaks for manufacturing equipment and for R&D spending. An updated report for 2009 is being prepared which will integrate workforce development programs currently comprising some 18 programs defined by state statute and more than 20 other closely related programs.<sup>5</sup>

### **Being prepared for the future, not predicting it**

The Commission's vision recognizes the difficulty of predicting the future of Washington's economy with any great specificity. Yes, we can identify important sectors that have growth potential and that Washington is well positioned to engage in. But just as *Washington Works Worldwide* made no mention of the Internet, we will not be able to see important technological, environmental and social developments that will give rise to new opportunities over the next 20 years.

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<sup>4</sup> Inventory of Economic Development Programs in Washington State, compiled by Washington Technology Center and Washington State University. June 2008

<sup>5</sup> Workforce Development Directory 2008 compiled by Workforce Training and Education Coordinating Board.

What the vision does call for is being well prepared with an “attractive, creative and fertile investment environment for innovation.” What that innovation involves may be in front of us today – energy, alternative transportation, nano-technology – or it may yet emerge from a mind or laboratory. The question is whether the businesses, institutions and leaders of our state are nimble, creative and imaginative enough to grab opportunities as they arise? The one thing we can be sure of is that those opportunities will be just as visible and attractive to other states and nations.

Preparation for the future will be enhanced by three crucial ingredients:

**Deeply distributed innovation mindset.** The innovation economy will be determined by thousands of daily decisions made by elected and appointed officials, civic leaders, businesspeople and students. If each of these players is committed to the vision they will make their decisions with a full understanding of their impact on Washington’s goal of becoming the world leader in innovation.

**Sustained effort over time.** The Commission has set a 10-year timeframe for its goals. In 10 years the state will look different from today, with new leaders, new residents and a constantly evolving global context. The challenge is to create a program that is compelling and robust enough to be sustained through the uncertainties and surprises of the next decade.

**Political courage.** Higher rates of innovation imply winners and losers. Losers can organize to undermine the political feasibility of innovation policy. Nevertheless, leadership at the highest levels of government is essential in order secure attention, commitment and implementation of innovation as a strategic focus of public policy. Without this leadership we are likely to do what governments have done in the past: let expediency displace actions needed for future prosperity.

The Commission’s vision also suggests an intentionality that has been largely missing from Washington’s economic history. Much of the state’s success has been due to historic “accidents” (the Klondike Gold Rush), major federal projects (hydroelectric and irrigation systems, military installations) randomness of birth (the “two Bills” – Boeing and Gates) and a resilience that has allowed the state to adapt to change. Sustained, intentional strategic action has not been a hallmark of the state’s economic history, and this program aims to change that, and in doing so, overcome the pervasive complacency that puts our future at risk.

## **Industry Clusters and Opportunities to Lead**

A recent analysis of industry clusters within Washington State reveals that the state has a remarkably diverse economy and many competitive industry clusters. In a project supported by the commission, 12 Workforce Development Area (WDA) regions were defined for data collection and analysis (See Appendix B). The utility of this kind of analysis is the very popular

notion that regional competitive advantage is rooted in “industry clusters,” agglomerations of businesses in selected industries within regions.

The work of Michael Porter, a Professor at Harvard Business School and leading authority on competitive strategy and international competitiveness, is frequently cited as a foundation for the cluster approach. In a recent paper he writes: “We define clusters as a geographically proximate group of interconnected companies, suppliers, service providers and associated institutions in a particular field, linked by externalities of various types.”<sup>6</sup> A region with a strong concentration of such industries can be presumed to have some basis for comparative advantage. Washington has an enviable list of industry-leading clusters from manufacturing, software and information technology in the Seattle area, military assets in the South Sound, value add agriculture in eastern Washington, enormous hydroelectric energy and scientific talent concentrated in the Tri-Cities area. Supporting these clusters with adequately educated and trained workers, and complementary economic development programs, are seen as a strategically important public sector priority.

### **Continued leadership in established industries**

Although nothing is guaranteed, we can be reasonably certain of a few things about Washington’s economy over the next decade. First, with Boeing’s large current backlog, it will continue to be the largest employer in the state, and aerospace will continue to be the dominant sector. Washington’s farmers are among the most productive in the country, and global demand for raw and value added products will keep the state’s agricultural sector going strong. Software, digital media and related industries have been thriving, and while there is little reason to think they will not continue to do so, the retaining and nurturing of these sectors is dependent on the preferences of people rather than the sites of land or factories. As the nation’s military has restructured, Washington’s bases have survived and even taken on new missions. And, the trees continue to grow tall and straight.

Less certain are the industries in which Washington firms enjoy some advantage, but which are highly competitive. While biomedical research continues to grow in the state around the universities and non-profit institutions, commercial biotechnology enterprises have yet to be a large employment generator. The state’s ports have retained a sizable share of goods movement, but competition from California and British Columbia is fierce and increasing. Tourism should expand, especially with attention to the upcoming 2010 Winter Olympics in Vancouver, but a lot will depend on global economic recovery.

There do not appear to be any major sectors in the state likely to suffer serious decline over the next 10 years. The forest products sector will continue to fluctuate with the building industry, but appears to have reached a sustainable level. Fishing and aquaculture have similarly reached lower, but sustainable levels of activity. Aluminum refining has never recovered from the chaos in electric power distribution in 2001 and does not have many jobs

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<sup>6</sup> Michael E. Porter, “The Economic Performance of Regions,” *Regional Studies*, Vol 37 No. 6&7, p. 562

left to shed. Financial services will be hard hit by the current crisis in that industry, but it is unclear how many more jobs will be lost after the collapse of Washington Mutual.

### Two emerging growth sectors

Washington has an opportunity to be a world leader in two emerging sectors that promise strong growth in the coming decades.

**Clean, green and smart energy.** The twin realities of climate change and foreign oil dependence mean that the world will need to transform its energy infrastructure. New energy sources will power new technologies for transportation as well as industrial, commercial and residential buildings. With its history of clean energy, strong environmental ethos, and technical capabilities Washington is well positioned to be involved in new energy technologies.

The competition for these new industries will be intense. Economic development strategies around the country and across the world are emphasizing green and clean technologies, with states and nations putting significant resources into capturing them. To capture a leading role in these new technologies, Washington businesses and institutions will need to establish a framework that encourages an innovation ecosystem around the sector. It is difficult to predict which specific alternative energy technologies will emerge as winners, but we can create an environment that adapts its capabilities for a wide range of options.

**Global health.** Comprising a range of scientific, technological and organizational efforts aimed at alleviating health problems in developing countries, global health is emerging as a promising sector for the state. The talent and industry cluster has been evolving for 30 years with the dedication of organizations like the University of Washington, PATH and the Seattle Biomedical Research Institute. These organizations attract a tremendous amount of federal funding for their programs, and now, with the addition of the Bill and Melinda Gates Foundation, and a number of additional independent research institutions, global health has the potential to be a major force in the state's economy.



Figure 6

Thus far, this innovation ecosystem has developed without much strategic intention: a leading medical research university and the world's largest foundation are natural magnets for talent. The state can continue to strengthen the environment for expanding the

ecosystem of support activities and businesses for diagnostics, vaccines and low-cost delivery systems.

There is also room to take advantage of the other dimension of the global health effort: organization and delivery. International relief programs are notoriously inefficient, and a key part of the work of global health is figuring out how to deliver care and medicine most effectively in challenging environments. The state is a world leader in global health organizational innovation.

### **The outlook for Washington: advantaged but never safe**

Until the national economic crisis became unavoidable, Washington's economy was performing very well, with strong job creation, low unemployment and promising wage growth. While there are many ways we can improve the state's economic performance and ability to capture new opportunities, it is difficult to find many important aspects of the state economy that are fundamentally broken. This puts the state in an enviable position compared to many other areas of the country and allows us to craft a long-term vision from a position of relative strength.

This brings us to the one great vulnerability of Washington: complacency. Yes, the state has been successful and has the ingredients for future success. But we must never forget that other parts of the country and the world are hungry for exactly what we take for granted, and the industrial restructuring taking place right now makes them even hungrier. In a world that moves faster and faster, with fewer and fewer barriers, nothing is safe. Washington must earn its position in the world every day through excellence in education and infrastructure, and by creating an environment where innovation thrives and the world's most brilliant and creative people want to undertake their best work.

Washington does have opportunities to lead the world in important industries, both established and emerging. To capture these leadership roles, however, we cannot continue to rely on happy accidents.

## IV. How We Will Get There

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Washington can pioneer a new innovation ecosystem model that can more rapidly integrate capabilities within and outside the state to create new value for its customers throughout the world. Strengthening the links between the changing nature of innovation and economic outcomes is the primary objective of the **Innovation Economy Strategy**. Our first round recommendations are focused on augmenting three interdependent components of the ecosystem which innovation needs to thrive: Talent, Investment and Entrepreneurship and Infrastructure. An additional and crucial element is the role of measurement, essential to monitoring the impact of innovation policy. Taken together these form the pillars of the comprehensive and integrated approach the Commission has adopted.

The Commission's first task in creating a new economic development strategy has been to establish a vision and framework for creation of innovation ecosystems across the state. Its second task has been to craft a series of recommendations for specific actions needed to promote the innovation economy. To address these specific issues the Commission divided itself into three working groups: investment and entrepreneurship; talent and workforce; and infrastructure. Here are their recommendations.

### Pillar 1. Talent and Workforce Development

#### **Challenge: Raise the employment prospects for Washington residents.**

A 21<sup>st</sup> century economy must leave itself open to top talent from around the world, and Washington's leading firms have long recruited employees from across the country and overseas. Washington has among the best educated populations in the country in large part because we import people with college degrees and high skill levels. According to the U.S. Census Bureau, half the state's population growth comes from in-migration, and over 40 percent of those who move to Washington from elsewhere in the U.S. or from abroad have college degrees, versus 30 percent of the existing state population. In 2007 alone, 64,000 adults moved to Washington with at least a bachelor's degree.

While the state should always welcome talent from anywhere, the Commission believes it is the job of state and local governments and public and private institutions to ensure that Washington citizens reap the benefits of prosperity. Upgrading educational systems and improving outcomes happens at all levels: dropout prevention, improved training in skilled occupations, expanded access to higher education, and retraining of adults.

The challenge for the state's workforce development systems is to maximize the opportunity for Washington residents to gain the qualifications to be competitive within the state's talent clusters. This applies both to young people coming out of high school and college, and to older workers who seek a more promising future in emerging industries.

To stimulate innovation-based economic growth, Washington needs to ensure it has the talent to support innovative enterprises. And from the perspective of individuals, employment opportunities favor those with higher skills. Despite enormous investment and efforts at reform, we still have a K-12 system with unacceptable drop out rates, lack of math, reading, and science proficiency and basic skill levels for work. For every 100 Washington students in 9<sup>th</sup> grade, only 19 will achieve an AA degree or higher. The state imports 92 workers with Bachelors degree or higher per 100 degrees awarded in Washington. A key goal should be to improve success in growing and remediating our own talent. The largest number of jobs in the coming decade will be in middle-skilled occupations. These are jobs that underpin almost every business sector of our economy—healthcare, manufacturing and construction. Even as unemployment rises in the state, thousands of these jobs which pay well are going unfulfilled. Our education delivery systems need to be reformed to meet this demand.

**Enhance competitiveness by developing and attracting talent.**

Take action to ensure that Washington expands educational opportunities for its own citizens and grows its own talent while continuing to attract top talent from around the world. Infrastructure must be expanded to ensure that the quality of life in the state is appealing to those who have a choice of where to live. Since recruits often bring families, there need to be employment opportunities for spouses and excellent schools for their children. The state should support federal immigration policies that allow employers to recruit top talent from overseas.

**Build a strong framework for the coordination of economic and workforce development.**

Pass the “Skills for the Next Washington” bill, which coordinates planning and establishes common definitions for economic development and workforce development programs. Support Workforce Development Councils and Associate Development Organizations which coordinate planning and development at the regional level and act as channels of information to state agencies. Support programs that bring employers and workforce development together as partners, such as Skill Panels, Centers for Excellence, and Innovation Partnership Zones.

**Ensure that K-12 schools are preparing students for post-secondary education.**

Reduce the dropout rate via continued support for programs such as GEAR UP, College Bound Scholarship, dual credit programs and Navigation 101. Consider new initiatives to build the K-12 pipeline such as the Integrated College Access Network. Implement the State Board of Education’s CORE 24 plan which increases minimum credits for graduation and increases requirements for science, math, foreign language, and career readiness. Establish “Imagination Awards” to recognize schools fostering a culture of creativity and imagination.

**Improve the output of the state’s post-secondary system.**

Increase the number of associate, baccalaureate, graduate and postgraduate degrees awarded and maximize the number of degrees awarded in high demand fields. Target

scholarships for students entering science, technology, engineering and math (STEM) fields. Ensure that degrees provide next generation skills through programs that build the relationship between education and the workplace. Help students transition smoothly and efficiently from K-12 into college, and from two-year to four-year programs, by increased use of dual credit programs, college in the high school, and Tech Prep. Support college and career awareness programs such as school-to-work transition, career and technical education, as well as private programs such as Business Week and IGNITE (Inspiring Girls Now In Technology Evolution), a grassroots effort between the Seattle Public School System and professional women in the high tech field.

**Ensure that working adults can learn new skills and move up a career ladder.**

Expand the 're-entry' pipeline that allows adults to shift to new careers. Utilize Opportunity Grants and other sources of financial aid for those entering workforce training programs. Use Bachelor of Applied Sciences and programs such as I-BEST, which integrate basic skills with job skills, for better and more relevant degree completion. Improve connectivity among WorkSource Centers, community organizations, business, education, and training systems to up-skill unemployed or under-employed workers. Support activities, including technological upgrades, that move post-secondary education into the workplace, and that enhance the post-secondary achievement rates of working adults.

**Communicate the need for change.**

Implement a unified, comprehensive communications campaign to emphasize the importance of a new culture of life-long learning, discovery, creativity, and entrepreneurship. Explain the need for a redesign of our delivery systems and emphasize enhanced connections with the needs of industry and the three R's: rigor, relevance, and relationships.

**Facilitate job transitions and continue modernizing unemployment insurance.**

Change the unemployment insurance system, designed for an earlier era of short-term cyclical layoffs, to allow more time for educational experiences and to reduce the time between jobs. Workforce development programs should be demand-driven and closely linked to community and technical colleges. Structural unemployment and job turnover are increasingly challenging, with the recently unemployed needing access to training services so they can transition to higher demand occupations. The demand for education is increasing at a time when higher education institutions have tighter budgets and individuals find it harder to pay for education. Ensuring the availability of financial aid needs to be part of a recovery strategy.

**Strengthen apprenticeship programs.**

Expand apprenticeship programs to support the expected emphasis on construction in national and state economic recovery programs. Skilled workers in the manufacturing, construction and service sectors are needed to support infrastructure modernization, roads, bridges, ports, and renewable energy investments. Green building retrofits and weatherization, which tend to be labor intensive, can create opportunities for less skilled workers to learn new competencies with future market value.

## Pillar 2: Investment and Entrepreneurship

### Challenge: bridging the Valley of Death.

Washington needs to be at the forefront of science and emerging technologies that will form the foundation of whole new markets, product categories and industry clusters. The state has strong capabilities in the fields of life sciences, biotechnology, digital technologies, new media, advanced materials, global health, energy systems and others. But to take advantage of these capabilities it needs stronger mechanisms for commercialization. No matter how good the ideas and how dedicated the entrepreneurs, all ideas face the “Valley of Death” where good ideas fall to their doom from a lack of capital at the earliest stage of development. Currently, only about 4% of venture capital goes to firms at this stage.

Therefore, a critical component of the innovation ecosystem will be capital to bridge the gap between good ideas and application development. The funding gap is especially acute in the stage between original research at universities and the studies to determine what commercial products might be feasible. In an “open innovation” environment it can be difficult to get private investors to invest in knowledge that may remain in the public domain.

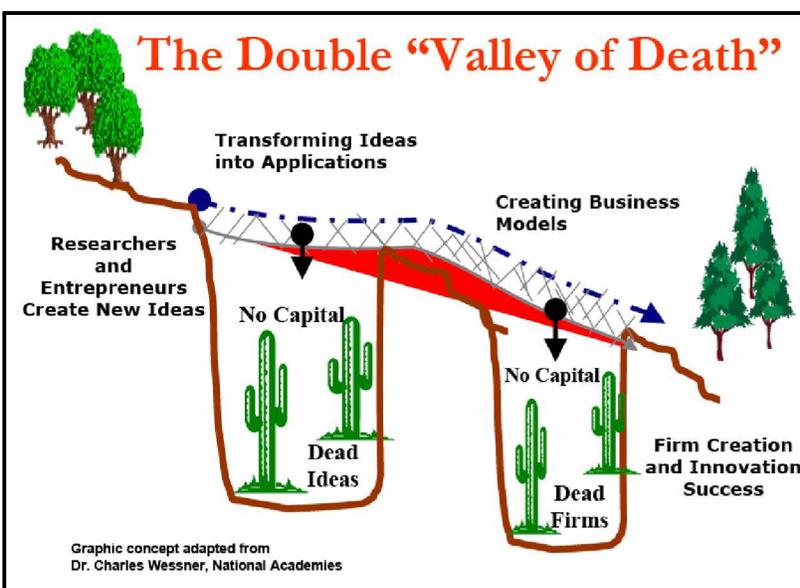


Figure 7

The next critical valley to cross is acquiring the necessary capital for business development and start-up for bringing the application, product or service to the market. A number of government programs such as the Small Business Research and Development Program (SBIR) are aimed at funding the early pre-commercial stages of product development. The challenges are to get the state’s scientists and entrepreneurs into a position to compete for that funding, and to provide necessary matching funds.

Maintaining an innovation leadership position over time requires continuous investment in R&D and research teams with an entrepreneurial bent. World class knowledge generation will be the magnet for attracting additional federal R&D, talent, and private sector investment for development of new products and services. Collaborative relationships and regional initiatives are a key to leveraging R&D assets for the growth of new business clusters. Local community leaders are eager to augment Washington’s innovation capacity and performance. By building the “innovation ecosystem” bottom up, rather than top-down, there is great

opportunity to coordinate and integrate the assets of economic development authorities, universities, colleges, non-profits, associations and business organizations across all domains. Designated Innovation Partnership Zones (IPZs) are demonstrating the potential of this approach.

#### **Compete for Federal R&D Funds in Strategic Areas.**

Launch a systematic and organized effort to increase the state's share of federal research funds across a broad spectrum of disciplines. The state should utilize its considerable assets and scientific talent to strengthen its competitiveness for federal R&D funds in such areas as clean tech, alternative energy systems, smart infrastructure, energy grid, broadband applications, global health, information sciences, advanced manufacturing and water resources. Our incumbent and high growth clusters need access to cutting edge R&D. Washington State needs a coordinated and focused effort to help shape and be responsive to these emerging opportunities over the next 12-18 months.

#### **Expand STARS Program.**

The state should expand funding of its STARS program to recruit entrepreneurial researchers to Washington. The funding of this program should be guided by a plan developed by the Innovation Partnership Advisory Committee and by rigorous metrics to measure progress and impacts. The STARS investment plan should be structured so that state funds are matched dollar for dollar with funds from a combination of business interests, foundations, local communities and the federal government. Implement the Entrepreneur in Residence program as proposed by the Higher Education Coordinating Board.

#### **Strengthen Innovation Partnership Zones.**

The state should continue capital investment competitions for designated Innovation Partnership Zones (IPZs). Additional operational funding should be provided for IPZs to broker stronger networks and relationships within and across IPZs. In order to fully test the effectiveness of this locally driven process for innovation, the current designation criteria should be maintained. The Innovation Partnership Advisory committee should develop and publish a set of IPZ performance criteria and, where possible, link the STARS program and the IPZs more explicitly. IPZs should help identify ways to integrate workforce and infrastructure resources from federal, state and local economic development agencies to reinforce IPZ projects and outcomes.

#### **Create Innovation Awards.**

Establish a Washington Innovation Award program to recognize outstanding entrepreneurial teams and the products, services and processes they have brought to commercial success. The awards would be presented by the Governor with the private sector providing innovation criteria and independent evaluators. Recipients of the award should be required to share their insights and innovation practices as models for others to emulate. Establish a Public-Private Partnership for Innovation Prize, similar to the X-Prizes, as a new demand-side mechanism to spur entrepreneurs and innovative solutions for critical state and national needs.

### **Implement a real time Innovation Dashboard.**

The Washington Innovation Performance Dashboard should provide a real time assessment of the state's innovation performance in the global economy. The purpose is to ensure that Washington policymakers and the public have the appropriate data for integrating innovation as a fundamental component of the state's economic development system. The state's innovation performance should be monitored and reviewed on a regular basis by the Governor, agency heads, Legislature and the private sector, with policies adjusted as required. Implementation of this recommendation will require accessing and integrating data from state and federal agencies, trade associations and professional societies, private research/survey organizations and international organizations, and developing methods to communicate results.

### **Increase access to entrepreneurial capital.**

Increase seed capital financing; debt or equity funding for start-ups and entrepreneurs is an urgent imperative. Entrepreneurship is vital to an innovation economy. Despite billions of federal tax dollars committed, guaranteed or spent on the financial industry (and recently the auto industry) credit availability is still limited for product development, capital investment and working capital. Recommended actions at the federal level include:

- Increase set asides for Small Business Investment and Research (SBIR).
- Expand SBA guarantees and loan authority.
- Bolster R&D funding of the NIST Technology Innovation Program, Department of Energy and National Science Foundation.
- Expand innovation assistance by the Manufacturing Extension Partnership (MEP.)
- Provide tax credits for hiring and training of unemployed for green collar jobs.
- Provide immediate write-off of renewable energy investments, energy efficient purchases and new production facilities.

Evaluate the risks and potential benefits of pension fund assets to be invested in promising innovation based high economic impact companies.

## Pillar 3: Infrastructure

### **Challenge: make smart, clean and green investments in infrastructure**

Various infrastructure stimulus options are under consideration at the state and national level as methods of generating immediate employment, and the focus of these infrastructure investments should be on innovation. The state can be a leader in the creation of enormous new markets by designing and building smart infrastructure that takes full advantage of communications and information technologies to perform more effectively.

Smart infrastructure supports a distributed model for work, more intelligent personal transportation systems that use alternative energy sources and reduce congestion, high speed broadband infrastructure for a vast array of new digital applications and services, and an energy grid that is more efficient and reduces carbon emissions. Smart infrastructure minimizes its environmental footprint and anticipates its lifecycle maintenance needs. And like all components of the innovation ecosystem, smart infrastructure remains highly flexible and adaptable so it can evolve as new energy technologies and environmental practices arise.

But it is not just the new infrastructure investment programs that need attention. Much of the state's basic infrastructure is reaching the end of its design life, requiring vast amounts of money to be spent just to repair, replace or retrofit existing capacity. Billions of dollars are being spent on massive projects that, in the end, provide the same sort of infrastructure we have now. And when all this spending is done, little money is left to build new infrastructure needed to support the innovation ecosystem. State and local governments need new and expanded tools to make targeted, smart infrastructure investments outside of existing upgrade programs.

### **Ensure that infrastructure investments support innovation.**

Prioritize state infrastructure investments so they support a strategic emphasis on innovation. This includes investments made directly by the state, such as highways and higher education institutions. It also includes investments in roads, utilities, schools and parks made by local governments using state money.

### **Provide smart utility services.**

State agencies that build, fund or regulate energy, water, wastewater and communications systems should orient their programs toward "smart" infrastructure. The state vehicle fleet should move toward 100 percent electricity and advanced alternative fuels. Smart water and wastewater systems should minimize the footprint of urbanized areas and make better use of communications technologies.

### **Promote next generation broadband.**

The state should coordinate a phased high speed broadband strategy. The digital economy will be a driver of productivity and economic growth in the years ahead. Washington should continue to build a world class competitive advantage in this vital sector. High speed internet

should also be defined by the applications that it can enable, not just upload and download speeds. Broadband technology should reach all areas of the state and, consistent with the principles of digital inclusion, all state residents should have access to training in how to make the best use of software and broadband connections.

**Leverage surface transportation spending to enhance the state's economy.**

Provide congestion relief so that the state's urbanized areas can continue to grow while maintaining a high quality of life. Improve freight mobility to maintain the state's role as a logistics center and to make the state an attractive location for manufacturers. Fill in missing links in intra-state highway connectivity. Maintain the state's roads and bridges to ensure safety and reliability. Improve farmers' access to the state's transportation network.

**Reduce dependence on oil.**

Position the state to lead in innovative solutions that advance the national priority of moving to oil-free transportation systems and infrastructure. Reducing oil imports is critical to the state economy. Governor Gregoire has noted that the state spends over \$9 billion annually on imported fuel—more than we spend on K-12 education. Working in partnership with federal agencies, primarily the Departments of Transportation and Energy and related laboratories and research programs, a model transportation system could be demonstrated using advanced communication, software and information tools from regional companies. Washington and the Northwest region could lead the nation in providing smart charging infrastructure for plug-in vehicles and creating incentives for the purchase and conversion of plug-in vehicles. Promote the regional development of a smart energy grid through public and private investment. Attract and train a workforce for electric vehicle design, engineering, component assembly and advanced manufacturing and other energy efficient grid technologies.

**Enhance the state's air and marine transportation facilities.**

Ensure that the state's container ports remain competitive by developing facilities that provide a free flow of container traffic between the water and inland markets. Plan for an additional international airport in the state, recognizing that current airports will reach their capacity limits. Improve the state's intermodal connections.

**Provide adequate tools for infrastructure funding.**

Find a new approach to tax increment financing that will be more attractive to developers and local governments while passing legal muster. Provide a permanent funding source for the Community Economic Revitalization Board. Revise program criteria in existing infrastructure funding programs to re-allocate funds to high strategic value investments. Aggressively pursue public-private partnerships for infrastructure projects.

**Streamline regulatory process.**

Review the regulatory and environmental processes that impact infrastructure projects and streamline these processes to boost private sector investment and create jobs.

**Establish criteria for funding innovation projects.**

Assemble a portfolio of recommended “innovation ready” projects. The leadership network of the Economic Development Commission across the state can ensure that projects recommended for funding meet certain general project criteria:

- Give preference to joint use facilities (private and public users/tenants/investors).
- Leverage public projects with private partners and private sector capital—require private sector participation whenever possible.
- Fund capital projects that contribute to enhancing the education/talent pipeline.
- Ensure an appropriate balance between investments in urban and rural communities.
- Require projects to show the full multi-year cost of operations.
- Demonstrate clearly how the project benefits the state’s longer term innovation, economic recovery, quality of life, and competitiveness goals.
- Provide regular innovation performance metrics to monitor progress and impact.

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# V. How We Will Measure Success

## The importance of metrics

The Commission strongly believes that a strategy for a new innovation economy must be evidence based. Measuring innovation drivers, business performance and economic outcomes demonstrates to policymakers the strengths and weaknesses of the state and areas to capitalize on and areas to improve. To the extent those measures can be meaningfully compared among states and nations, they provide benchmarks.

One of the Commission’s recommendations is to institute an “innovation performance dashboard” to track key metrics of innovation to assess how the state’s strategy is working. These metrics will cover general economic drivers, such as education and infrastructure, and outcomes such as income growth, job growth and tax revenue. It will also cover trends that relate more specifically to innovation, such as R&D spending, venture capital, patents and business start-ups.

Figure 8 provides an initial framework for measuring the outcomes of Washington’s innovation strategy.

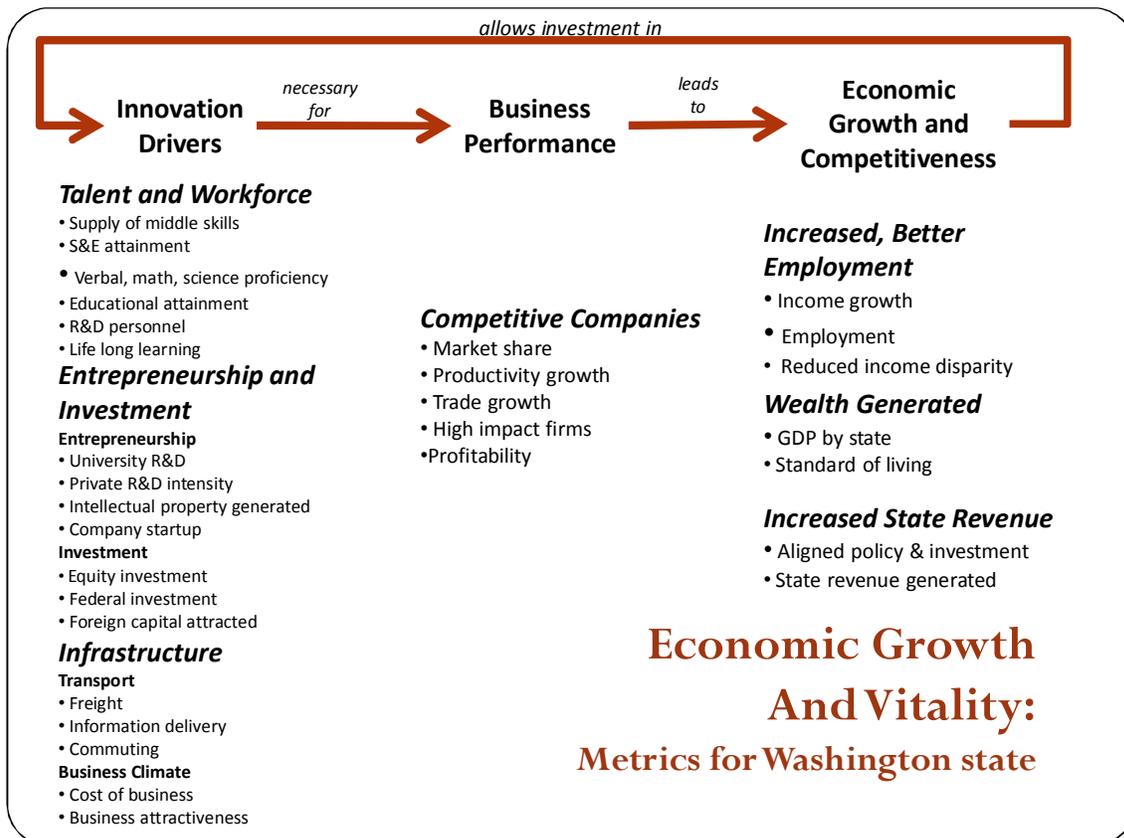


Figure 8 - Innovation Metrics for WEDC

The dashboard incorporates these metrics into a user-friendly format that provides a view of progress of the state's economy at a glance. Like its counterpart in a car, the dashboard provides a snapshot of multiple data points, behind which more details can be provided. This accessibility allows for transparency and a high level of accountability. The metrics may change over time, since the way we think about innovation may change. If the innovation ecosystem is defined by any one characteristic, it is flexibility, and the keepers of the dashboard must themselves remain flexible and open to new metrics and measurements of accountability.

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## Tools for Implementation

The Commission’s recommendations are presented below in relationship to implementation agents and policy tools. The chart confirms our innovation strategy, if it is to be implemented, requires collaboration across multiple stakeholders.

Recommendations		State	Federal	Private Initiative	Tax	Regulation	Local Leadership	Public Outreach
<b>TALENT AND WORKFORCE</b>								
T-1	Develop and attract talent	X		X			X	X
T-2	Coordinate economic and workforce development	X	X	X		X	X	X
T-3	Ensure K-12 schools prepare for post-secondary	X		X			X	X
T-4	Improve post-secondary education output	X		X			X	X
T-5	Ensure working adults learn new skills	X	X	X		X	X	X
T-6	Communicate need for change	X		X			X	X
T-7	Facilitate job transitions	X	X	X	X	X		
T-8	Strengthen apprenticeship programs	X	X	X				X
<b>INVESTMENT &amp; ENTREPRENEURSHIP</b>								
E-1	Compete for Federal R&D	X	X	X			X	X
E-2	Expand STARS program	X	X	X			X	
E-3	Strengthen Innovation Partnership Zones (IPZs)	X		X	X	X	X	X
E-4	Create innovation awards			X				X
E-5	Real time innovation dashboard	X		X				X
E-6	Access to entrepreneurial capital		X	X	X	X		
<b>INFRASTRUCTURE</b>								
I-1	Infrastructure to support innovation	X	X	X			X	
I-2	Provide “smart” utility services	X	X	X		X	X	X
I-3	Promote next generation broadband			X				
I-3	Leverage surface transportation spending	X	X	X			X	
I-4	Reduce dependence on oil	X	X	X	X	X	X	X
I-5	Enhance air and marine transportation	X	X	X			X	
I-6	Provide for infrastructure financing	X	X	X	X	X	X	X
I-7	Streamline regulatory process	X	X			X	X	
I-8	Establish criteria for innovation projects	X	X				X	X

## Leadership roles

Innovation is the new pathway to building prosperity and competitive advantage. The Economic Development Commission recommends an aggressive public policy strategy that incentivizes, invests and energizes the environment for innovation. We believe that innovation is an issue that merits the time of the Governor, the legislature and business and community leaders. The presentation of this strategy marks not the end, but the beginning of a longer, broader process of moving the state towards an innovation economy. This involves two fundamental tasks. The first task will be to implement the Commission's specific recommendations. As shown in the chart above, some will require legislation, some will require funding, and all will require a home.

The second task will be to move beyond the Commission's specific recommendations and integrate innovation as a fundamental priority and objective into the work of agencies and organizations across the state. A key theme of this report is the role that is played by just about everyone in the state in promoting innovation and doing their part to create and sustain innovation ecosystems. A generation ago, many organizations were not focused on their role in helping the state compete on the international stage, and today many agencies and institutions are not aware of their role in innovation ecosystems. Commissioners can serve as ambassadors to their regions and colleagues, promoting understanding of the fundamentals of the innovation strategy and building support for specific recommendations.

To move the Commission's specific agenda and to align the state's economy with the innovation strategy, leadership and support will need to come from:

**Governor.** We recommend that the Governor establish a focal point to frame, align and coordinate strategically the future direction of the state's innovation policies. This could be either a Cabinet level interagency group, or a new distinct mission assigned to a restructured economic development agency. This is an opportunity to break down "stovepipes" and foster closer collaboration among agencies, local communities and the private sector.

- Establish an explicit innovation agenda and measureable goals.
- Direct agencies to analyze the impact of current policies on the state's innovation capabilities and identify opportunities for immediate implementation.
- Leverage federal economic recovery funds to support innovation objectives.
- Rationalize the current fragmented set of economic development programs.
- Update economic development performance criteria used in the GMAP and Priorities of Government process by utilizing best available and timely measures of innovation.

**Legislators.** Because the innovation ecosystem touches on so many aspects of state government, most legislators will have a role in integrating the recommendations into legislative initiatives, budget plans, appropriations and constituent communications.

**Agency heads.** The innovation agenda the Commission proposes cannot be implemented through a single state agency. It necessarily will require coordination mechanisms and collaborative efforts across many agency programs. The innovation agenda will move forward much more effectively if supported by decisions made at all levels of state government.

**Workforce Training and Education Coordinating Board.** This Board, which is increasingly focused on integrating workforce development with the economic development strategy of the commission, has the unique advantage of a performance accountability board jointly led by business, labor and government. Tri-partite oversight and strategic planning ensures that all parties are working together towards the stated mission of creating a high skill, high wage economy for Washington.

**Economic development organizations.** Economic development organizations around the state will continue to perform their basic mission of attracting and retaining employers. But looking to the longer term future of their communities, these organizations should support investments and programs that build their local capacity to develop, attract and retain firms on the leading edge of business and technology.

**Universities.** The big ideas that feed the innovation pipeline can come from anywhere, but many will come from research universities. Both of Washington's major research universities are state institutions, so they should be in the forefront of creating the crucial bridge between research and business development.

**Community and Technical Colleges (CTCs).** The 34 CTCs play critical roles in the state's development of a talent pipeline. CTCs prepare students from across the state to transfer into four-year degree programs, and provide training for the thousands of technical skill jobs that keep our economy moving. They are entry points for immigrants and others who need to develop English language and other basic skills in order to compete effectively in the labor market. CTCs also work directly with employers to help upgrade the skills of their current workers to keep companies productive and able to take advantage of market opportunities as they arise.

**Ports.** Ports have unique authorities under state law to engage in economic development activities. Port authorities around the state should reexamine their programs and priorities to ensure that they support an innovation agenda.

**School districts.** The ability of Washington's young people to compete effectively within the talent clusters that drive the innovation economy depends first on a solid K-12 education. School districts need to take advantage of available assistance to strengthen their math and science programs and need to forge strong links with higher education to ensure that students move smoothly into colleges and universities.

**Local governments.** Cities and counties hold the key many of the location costs faced by businesses. While these costs may not be at the top of the list of concerns for innovative

firms, they cannot be ignored. Local governments need to make sure their policies and priorities with regard to land use, transportation and utilities provide the crucial underpinnings of the innovation ecosystem.

As these players, and the private sector service and supply businesses (financial, legal, accounting, construction, equipment) that support entrepreneurs, coalesce around a long-term innovation strategy, they will always be on the lookout for collaborative opportunities. A collaborative approach will not always come easily. But in a world that requires knowledge-intensive competencies, where the “capital” of business is increasingly in people’s heads and not on balance sheets, collaboration among talented people becomes the way to maximize innovation outcomes.

## **Collaborating outside the state**

As it strives to become a player in the global economy, Washington cannot lose sight of its position in the Pacific Northwest. Seattle is the largest city in a multi-state region, and Spokane serves as the business hub for northern Idaho and parts of Montana. Vancouver is an integral part of metropolitan Portland. Washington has long personal and business ties with Alaska, hosting a large part of the state’s fishing fleet. Seattle and Vancouver, B.C. have a longstanding friendly rivalry for port and tourism business which will take a big jump with the Vancouver Olympics.

The states and provinces of the Northwest have too much in common to ignore. They share natural resources businesses, close ties to Asia and a strong environmental ethos. Groups like the Pacific Northwest Economic Region and the Cascadia Institute continue to build ties in the Northwest. It will be natural for innovation ecosystems to extend across state and provincial boundaries and for talent clusters to spread throughout the Northwest. As the collaborative aspects of the innovation economy take hold, the first point of contact for many of Washington’s scientists and entrepreneurs will be in Portland, Boise, Vancouver or Anchorage.

## VI. Conclusion

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The history of the 20<sup>th</sup> century is, in many ways, the story of economic development. Over 100 years, dozens of nations pulled themselves out of poverty and created decent standards of living for their citizens. The evidence is now in, and we have learned what works and what does not work. The great failures were at the extremes: attempts to direct economies from the top down for the presumed benefit of all, and attempts to hoard wealth among elite. The innovation performance of Nordic countries such as Finland, Sweden, Denmark and the surging Asian economics, such as South Korea, India and China, are examples of new economic development models. Washington can garner some lessons given their focus on excellent education, infrastructure, financial and regulatory policies to help their entrepreneurs.

The Commission's vision for Washington is a diverse array of innovation ecosystems flourishing across the state. The success of innovation ecosystems will depend in large part on the quality of education and infrastructure provided by state and local governments, and a steady stream of new ideas from research institutions and entrepreneurs. The targeted deployment of investment capital allows good ideas to jump across the "valley of death" and become the foundation for promising businesses.

Another characteristic of successful economies has been strong leadership. Regions and nations that have made great economic strides have done so because their strategies and goals became embedded in their cultures and successive governments were able to sustain investments and a favorable business climate. Washington needs to commit to making innovation a long-term strategic priority through the ups and downs of the state, national and global economy,

Washington has all the ingredients for a very promising future, but perhaps the most important lesson the world economy is teaching right now is that nothing can be taken for granted.

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# Appendices

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## Appendix A

The tables contained in these appendix present indicators from three benchmarking reports:

**2008 New Economy Index–How Washington Ranks**  
Information Technology and Innovation Foundation

**2008 WashACE Competitiveness Indicators – How Washington Ranks**  
Washington Alliance for a Competitive Economy (WashACE)

**2008 Washington State Economic Climate Study Rankings**  
Washington State Economic and Revenue Forecast Council

**2008 New Economy Index—How Washington Ranks**  
**Information Technology and Innovation Foundation**

Indicator	Washington 2008 Rank	Rank Change from 2007	Trend	Top Three States
<b>OVERALL</b>	<b>2</b>	<b>+2</b>	<b>↑</b>	<b>MA, WA, MD</b>
Knowledge jobs	7	+2	↑	MA, CT, VA
IT Professionals	6	+4	↑	VA, DE, NJ
Managerial, professional, technical jobs	15	+1	↑	MA, NY, MD
Workforce education	8	+3	↑	MA, MD, CO
Immigration of knowledge workers	13	-8	↓	ND, MT, NH
Migration of U.S. knowledge workers	13	-		MA, VT, NY
Manufacturing value-added	1	+2	↑	<b>WA</b> , CT, MD
High-wage traded services	32	-1	↓	DE, CT, NY
Globalization	3	-2	↓	DE, TX, <b>WA</b>
Export focus of manufacturing and services	2	-1	↓	TX, <b>WA</b> , DE
Foreign direct investment	32	+1	↑	CT, SC, DE
Economic Dynamism	18	-12	↓	UT, MA, CO
“Gazelle jobs”	4	+5	↑	NE, NY, NJ
Job Churning	39	-37	↓	AK, GA, UT
Fastest growing firms	9	+1	↑	MA, VA, UT
IPOs	31	-9	↓	OK, MA, NV
Entrepreneurial activity	40	-24	↓	MT, GA, VT
Inventor patents	11	+7	↑	UT, CT, CA
The digital economy	7	-4	↓	MA, NV, NJ
Online population	3	+3	↑	AK, UT, <b>WA</b>
Internet domain names	5	+3	↑	NV, VA, AZ
Technology in schools	24	+3	↑	SD, ME, WY
E-Government	18	-8	↓	MI, KY, TN
Online agriculture	1	+10	↑	<b>WA</b> , OR, WY
Broadband telecommunications	13	-2	↓	NJ, RI, DE
Health IT	10	-		MA, RI, NV
Innovation capacity	2	+7	↑	MA, <b>WA</b> , CA
High-tech jobs	10	-1	↓	MA, NM, VA
Scientists and engineers	7	+4	↑	MA, MD, NM
Patents	2	+1	↑	ID, <b>WA</b> , CA
Industry investment in R&D	5	+26	↑	DE, MI, RI
Non-industry investment in R&D	10	-		NM, MD, MA
Alternative energy use	1	-		<b>WA</b> , VT, NH
Venture capital	3	0	→	CA, MA, <b>WA</b>

**2008 WashACE Competitiveness Indicators – How Washington Ranks**  
Washington Alliance for a Competitive Economy (WashACE)

Indicator	Washington 2008 Rank	Rank Change from 2007	Trend	Top Three States
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**Talent**

High school completion for population over 25	9	-3	↓	MN, UT, WY
National assessment of educational progress	12	0	→	MA, NH, VT
Public school spending per student	33	-2	↓	NY, NJ, DE
Higher education enrollment per capita	18	+2	↑	ND, WY, NM
Bachelor's degrees held by population over 25	10	-4	↓	MA, MD, CO
Import/export of college students (high importer = 1)	39	+7	↑	UT, WV, RI
Science & eng. doctorates awarded per capita	25	+2	↑	MA, RI, DE
Net migration to state	10	-1	↓	TX, NC, GA
Union membership as share of employment	4	+1		NY, AK, HI
Percent without health insurance (lowest = 1)	19	1	↑	MA, HI, MN

**Infrastructure and taxes**

Cost of doing business index (lowest cost = 1)	36	+1	↑	SD, IA, ND
Roads in poor condition (fewest poor roads = 1)	28	-14	↓	FL, KY, TN
Housing price appreciation (lowest = 1)	44	-1	↓	WY, WV, OK
Unemployment insurance taxes (lowest = 1)	49	0	→	SD, MS, NH
Workers compensation benefits paid (lowest = 1)	48	0	→	AR, IN, TX
CO2 emissions per capita	9	n/a		RI, CA, VT
State and local taxes per capita (lowest = 1)	33	-3	↓	AL, MS, TN
Business share of state/ local taxes (lowest = 1)	38	-1	↓	CN, OR, VA
Motor fuel tax (lowest = 1)	44	+2	↑	WY, AK, NJ

**Investment**

Technology and science index	5	+1	↑	MA, MD, CO
Venture capital investments	5	0	→	CA, MA, TX
R&D spending per capita -- total	6	+5	↑	MA, NM, CN
R&D spending per capita -- academic	22	+2	↑	MD, MA, ND
R&D spending per capita -- industrial	5	-1	↓	CN, MA, DE
Annual investment per manufacturing employee	14	+28	↑	LA, DE, NM

**Outcomes**

Employment growth (1 year)	4	+6	↑	TX, NY, NC
Employment growth (10 year)	9	+2	↑	TX, CA, FL
Per capita personal income	14	0	→	CT, NJ, MA
Gross state product	14	0	→	CA, TX, NY
High tech employment	13	+1	↑	CA, TX, NY
High tech average wage (highest wage = 1)	4	0	→	CA, MA, NJ
Manufacturing average wage (highest wage = 1)	5	-1	↓	MI, LA, CN
Value added per manufacturing worker	7	-2	↓	LA, WY, NM
Exports per capita	1	0	→	WA, LA, TX

**2008 Washington State Economic Climate Study Rankings**  
Washington State Economic and Revenue Forecast Council

Indicator	Washington 2008 Rank	Rank Change from 2007	Trend	Top Three States
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**Economic Performance**

Total employment growth rate	7	+2	↑	UT, WY, LA
Median household income	11	+2	↑	NJ, MD, NH
Per capita personal income	10	+4	↑	CT, NJ, MA
Per capita personal income growth rate	12	+1	↑	ND, SD, LA
Growth in high wage share of employment	25	+7	↑	NV, ND, KS
Annual earnings per job	10	+2	↑	NY, CT, MA
Annual earnings per job growth rate	13	-6	↓	ND, SD, OK
Migration rate	14	-2	↓	NV, AZ, NC
Foreign exports	1	0	→	WA, LA, TX
Foreign exports excluding transportation equip.	10	+3	↑	LA, TX, VT
Per capita university R&D spending	22	+3	↑	MD, MA, ND
Per capita industry R&D spending	3	+2	↑	MA, CT, WA
Per capita total R&D spending	5	-1	↓	NM, MD, MA
Unemployment rate	27	+10	↑	HI, ID, UT

**Quality of Life**

Homicide (lowest = 1)	13	+4	↑	NH, IA, MT
Violent crime	23	0	→	ME, VT, NH
Arrest rates for violent crime (lowest = 1)	24	+3	↑	ND, NH, ME
Air quality	1	+1	↑	N/A
Drinking water	18	-9	↓	MD, CO, AL
Toxins released	14	+3	↑	VT, SD, WY
State health index	12	+3	↑	VT, MN, HI
State Parks and Recreation Areas	5	-1	↓	OR, SD, AK
State arts	45	-7	↓	HI, NJ, MD
Public library service	5	0	→	OH, OR, UT

**Education and Skills of the Workforce**

Fourth grade reading	18	-6	↓	MA, NJ, NH
Fourth grade math	18	-6	↓	MA, NJ, NH
Student to Teacher Ratio	46	0	→	VT, ME, NJ
Population with at least High School diploma	6	0	→	MN, AK, NH
Population with Bachelor's Degree or More	13	-4	↓	MA, CO, CT
Public Two & Four Yr college Participation Rate	19	+2	↑	UT, ND, NM
Value Added per Hour of Labor in Manufacturing	7	-1	↓	NM, LA, DE

**Infrastructure**

Interstate Miles in Poor Condition	45	-6	↓	GA, ND, AZ
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**Cost of Doing Business**

State /Local Tax Per \$1,000 Personal Income	23	-9	↓	SD, NH, TN
Unemployment insurance costs	47	+2	↑	NH, SD, VA
Workers' compensation premium costs	15	+2	↑	ND, IN, VA
Electricity costs	8	+1	↑	ID, WV, WY

## Appendix B

### Industry Cluster Analysis for Major Washington State Regions (v.2.1)

By: P. Sommers, Seattle University, W. B. Beyers, University of Washington, A. Wenzl, University of Washington

An analysis of industry clusters within Washington State was done to reveal the competitive industry clusters at the sub state level. Twelve Workforce Development Area (WDA) regions were defined for data collection and analysis (Figure 1). Supporting these clusters with adequately educated and trained workers, and complementary economic development programs, are important public sector missions. The utility of this kind of analysis is the very popular notion that regional competitive advantage is rooted in “industry clusters,” agglomerations of businesses in selected industries within regions.

The work of Michael Porter is frequently cited as a foundation for the cluster approach. In a recent paper he writes: “We define clusters as a geographically proximate group of interconnected companies, suppliers, service providers and associated institutions in a particular field, linked by externalities of various types.”<sup>7</sup> A region with a strong concentration of such industries can be presumed to have some basis for comparative advantage. This comparative advantage could be evidenced by multiple measures of concentration or location quotients (LQs)—such as employment levels, sales levels, and value added. In this analysis location quotients (LQs) compare the proportion of regional employment in a particular industry to the same proportion nationally. If a region within Washington has a higher percentage of regional employment in an industry such as wood products than the nation does, the ratio of these two percentages is a number greater than 1. LQs greater than 1 suggest that the region must be exporting some of its product and therefore it must have comparative advantage. Data on levels of employment, the value of location quotients, earnings per worker, and percentage change in employment between 2001 and 2007 were developed for each WDA region. Employment data, location quotients, and earnings data were developed from the IMPLAN database, while the change values were estimated from data supplied by the Employment Security Department. The bubble charts which follow integrate graphically these multiple variables for each region.

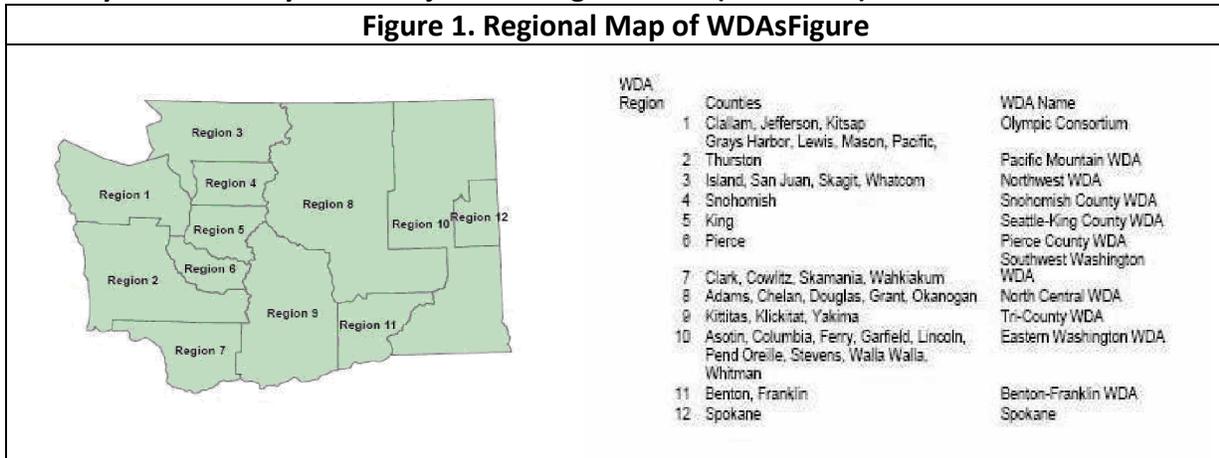
See more detailed analysis and the complete report prepared under the direction of the Workforce Development Board at: [www/WEDC.wa.gov/documents/clusteranalysisreport.pdf](http://www/WEDC.wa.gov/documents/clusteranalysisreport.pdf)

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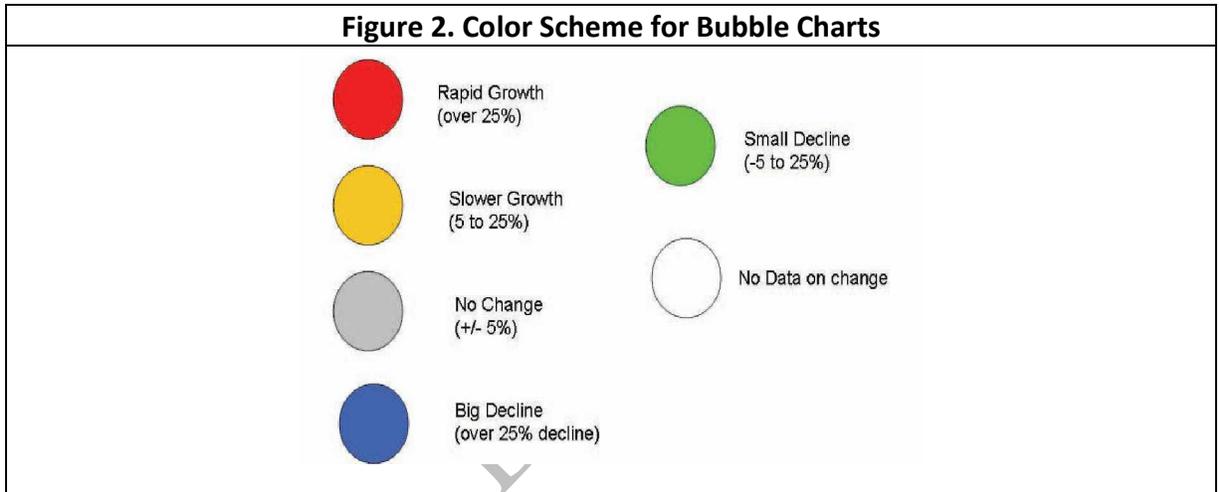
<sup>7</sup> Michael E. Porter, “The Economic Performance of Regions,” *Regional Studies*, Vol 37 No. 6&7, p. 562

**Industry Cluster Analysis for Major Washington State (continued)**

**Figure 1. Regional Map of WDAs**

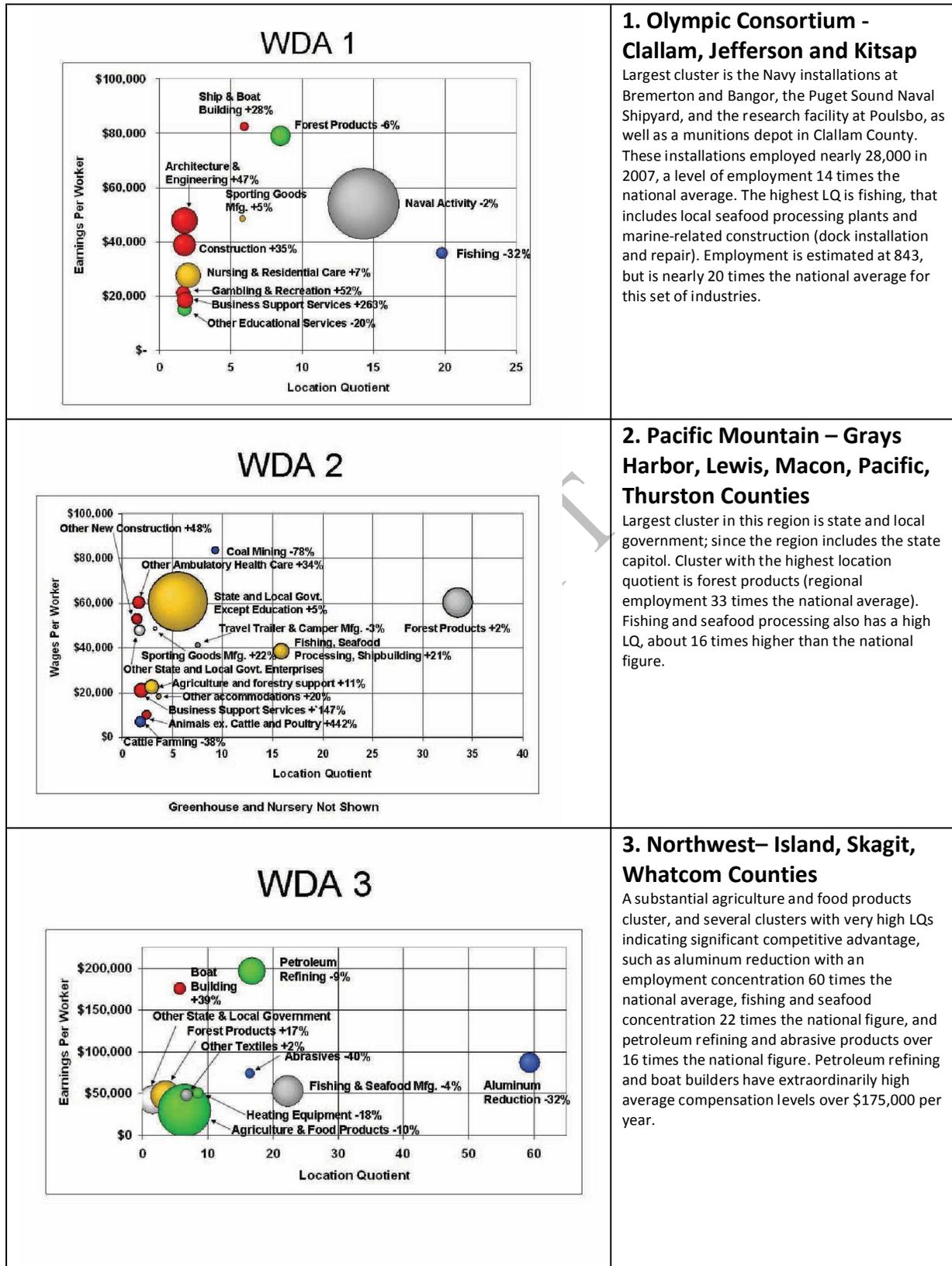


**Figure 2. Color Scheme for Bubble Charts**



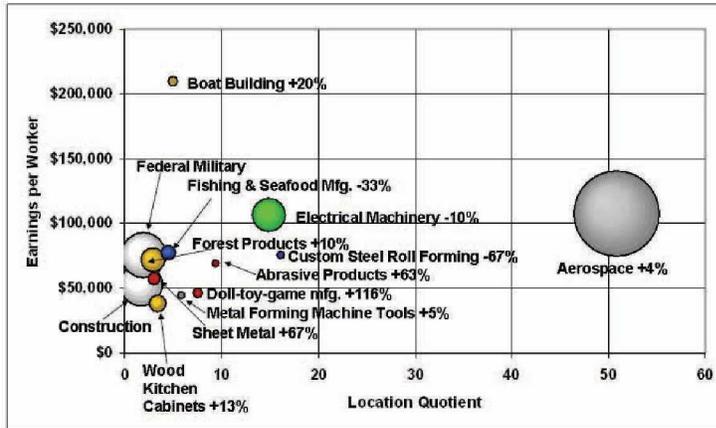
The axes in the bubble charts that follow are the location quotients and earnings per worker, while the size of the bubble is proportional to employment. Colors in the bubble chart follow a scheme shown in Figure 2 that indicates growth in employment between 2001 and 2007.

## Industry Cluster Analysis for Major Washington State (continued)



## Industry Cluster Analysis for Major Washington State (continued)

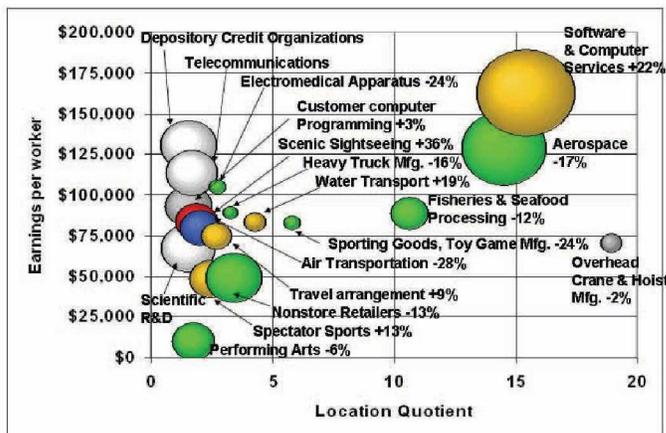
### WDA 4



### 4. Snohomish County

Home to Boeing's major aircraft assembly plant with an extremely high LQ for the aerospace cluster – 50 times the national density of employment. Aerospace is also the largest cluster in the county; in fact, aerospace is 1.5 times as large as all of the other clusters shown in the following charts and table for this region. The second largest cluster in the region is the federal military cluster, consisting mainly of the Navy base in Everett.

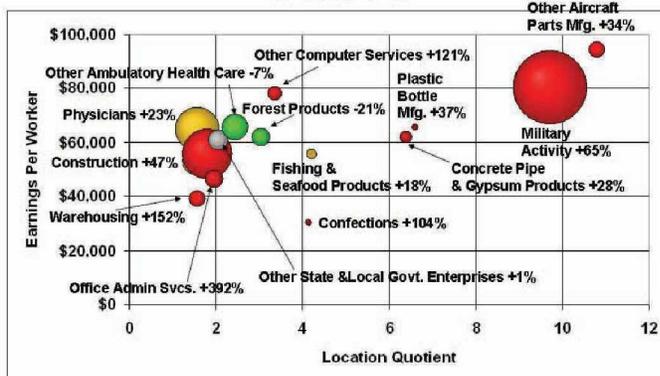
### WDA 5



### 5. Seattle - King County

King County has two very large clusters – software/computer services and aerospace – with high LQs, about 15 times the national average. Overhead Cranes and Hoist Manufacturing has an even higher LQ of nearly 19. Fishing/Seafood also has a high location quotient, about 10 times the national figure. King County is the center of the largest metro area in the state, and illustrates the diversity of the state's economy with over a dozen other clusters in the region. The software/computer services cluster has expanded steadily since the founding of Microsoft. Aerospace, on the other hand, is known for its up and down employment cycles.

### WDA 6



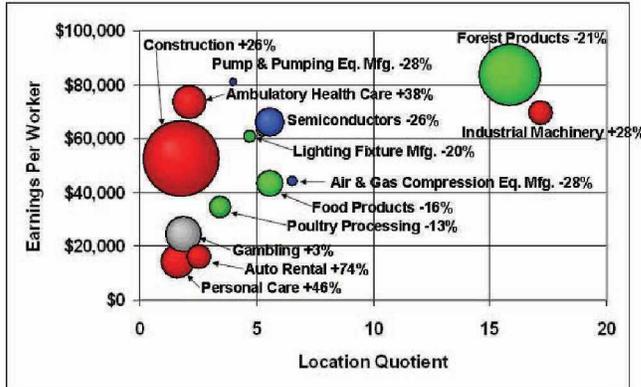
### Region 6 - Pierce County

Region is the home of Ft. Lewis and McChord AFB – two large military bases giving this county a large military cluster with a location quotient of 9.7 and employment estimated at over 34,600. The aircraft parts manufacturing cluster with a LQ of 10.8 is the highest in the county, and a concrete pipe and gypsum products cluster with LQ quotient over 6. The military cluster stands out as being both relatively large and having a quite high growth rate from 2001 to 2006. Several other clusters grew more rapidly, including office administration, warehousing and storage, other computer services, and confectionary manufacturing.

Sightseeing Not Displayed Due to Disclosure Rules

## Industry Cluster Analysis for Major Washington State (cont)

### WDA 7 Except Federal Electrical Utilities

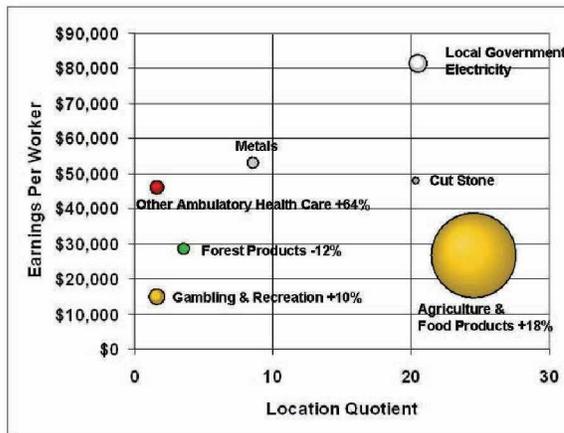


Relay and Industrial Control Mfg. Not Displayed Due to Disclosure Rules.  
Other Commercial and Service Industry Machinery is covered by semiconductors.

### 7. SW Washington – Clark, Cowlitz, Skamania, Wahkiakum

Chart excludes federal electric utilities with an extremely high location quotient of nearly 72. The Bonneville Power Administration and its Ross Complex located in Vancouver, WA. The employment level in this sector is 1,565) but below the largest clusters in this region. Construction and forest products are the two largest in the region and forest products has a high LQ. Industrial machinery, semiconductors, and food products have fairly high LQs and each cluster employs more than 1,000 workers. Ambulatory health care, personal care, gambling and other entertainment, and auto rental are large industries with lower LQs.

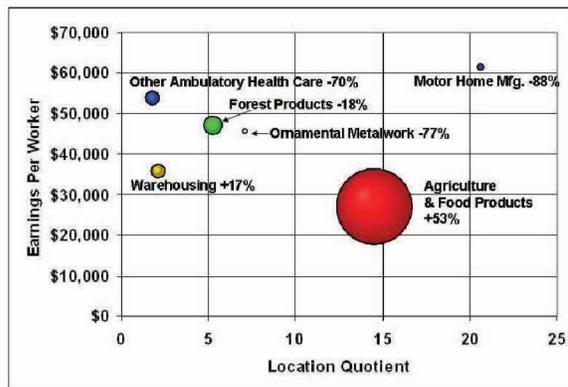
### WDA 8



### 8. North Central – Adams, Chelan, Douglas, Grant, Okanogan

This region is mostly rural, and agriculture is the dominant industry with very high LQ (24.6) and largest employment (over 32,700). Two other industries, while much smaller, have LQs over 20: local government electricity and cut stone production. Forest product cluster is small cluster with about 730 employees. Metals manufacturing and two service clusters with over 1,000 employees, gambling/other entertainment and other ambulatory health care, are also shown on the chart.

### WDA 9



Relay & Industrial Controls and Other Aircraft Parts Not Displayed Due to Disclosure Rules

### 9. Tri-County – Kittitas, Klickitat, Yakima

Large agriculture and food products cluster with a high LQ and rapid growth in recent years possibly due to the rapid expansion of wineries in the Yakima Valley, one of several regions with substantial increases in wine grape growing and winery production. A cluster with a very high LQ and high wages is motor home production. This region also has a high LQ for aircraft parts manufacturing, but the data is not displayed due to confidentiality rules.

**Industry Cluster Analysis for Major Washington State (continued)**

<p style="text-align: center;"><b>WDA 10</b></p> <p>The chart for WDA 10 plots Earnings per worker (Y-axis, \$0 to \$120,000) against Location Quotient (X-axis, 0 to 50). Industries shown include Mining (+162%), Forest Products (-12%), Agricultural Support Activities (+50%), Heating Equipment (+5%), Colleges &amp; Universities, Depository Credit Institutions (-2%), Agriculture &amp; Food Products (-12%), and Cattle Ranching (-52%).</p>	<p><b>10. E. Washington– Asotin, Columbia, Ferry, Garfield, Lincoln, Pend Oreille, Stevens, Walla Walla</b></p> <p>These 8 counties comprise a vast rural region covering most of eastern Washington except for Spokane County. The two largest clusters are agriculture/food products and forest products, followed by colleges and universities, and depository credit organizations. A growing wine industry in Walla Walla County brings some growth to the agriculture cluster, although agriculture/food products is losing employment overall. Two small clusters stand out with high LQs and growth: mining and heating equipment manufacturing.</p>
<p style="text-align: center;"><b>WDA 11</b></p> <p>The chart for WDA 11 plots Earnings per worker (Y-axis, \$0 to \$120,000) against Location Quotient (X-axis, 0 to 60). Industries shown include Architecture &amp; Engineering (+24%), Scientific R&amp;D, Inorganic Chemicals (-12%), Waste Remediation (-9%), Other Computer Services (+176%), Rail Transport, Other Ambulatory Health Care (+95%), Gambling &amp; Recreation (+22%), Agriculture &amp; Food Products (-1%), Nonstore Retailers (-1%), and Grain Farms (-45%).</p> <p>Religious Organizations Not Displayed Due To Disclosure Rule</p>	<p><b>11. Benton &amp; Franklin Counties</b></p> <p>This region brings together advanced technology and agriculture, creating a unique economic structure. Waste remediation and management is the highest ranked cluster overall, followed by other computer services, scientific research and development, agriculture/food products, and architecture/engineering. The Hanford Reservation is the site of nuclear materials production during WW II, and now hosts a mix of nuclear waste management and advanced engineering and scientific activities based at Pacific Northwest Lab. This region is a major trans-shipment point with major water, rail, and freight transportation capabilities.</p>
<p style="text-align: center;"><b>WDA 12</b></p> <p>The chart for WDA 12 plots Earnings per worker (Y-axis, \$0 to \$140,000) against Location Quotient (X-axis, 0 to 40). Industries shown include Federal Electric Power, HI Tech Mfg. (-43%), Other Ambulatory Health (+32%), Sheet Metal &amp; Metal Buildings (+25%), Metal &amp; Machinery Mfg. (-26%), Wood Kitchen Cabinets (+92%), Colleges &amp; Universities (+17%), and Business Support Services (+149%).</p> <p>Rail Transport Not Displayed Due To Disclosure Rule</p>	<p><b>12. Spokane County</b></p> <p>Spokane has traditionally served as a major distribution/services center for the “Inland Empire”. Two clusters with quite high LQs are aluminum sheet manufacturing and non-ferrous metals. Employment has been contracting in recent years. High tech manufacturing, a substantial cluster in this region, has also been contracting in recent years, but other clusters are expanding. The region is undergoing a transformation from its traditional industrial base to a more knowledge based, healthcare and services oriented economy.</p>

**Appendix C**  
**Innovation Metrics for WA State**  
 by Lee Cheatham, Washington Technology Center

**Innovation Metrics for Washington State**



**Innovation Drivers**

**Talent**

**Workforce attributes**

R&D personnel	<i>Portion of Washington's workforce qualified to work in research and new product development</i>	Number of people with Science & Engineering (S&E) post-baccalaureate degrees
Skilled jobs	<i>Portion of Washington's engaged in skilled professions</i>	TBD
Knowledge jobs	<i>Portion of Washington's workforce engaged in knowledge-related activities</i>	Scientist and Engineering jobs Information technology jobs High technology jobs Management, professional and technical jobs

**Developing Washington's talent**

Supply of middle skills	<i>Long-term availability of qualified trades workforce</i>	Number of apprentice graduates
S&Ei attainment	<i>State production of science and engineering talent</i>	Number of S&E graduates Increase in number of S&E grads
Verbal, math, science proficiency	<i>Preparation to enter Washington's workforce or higher education</i>	4th grade test scores Number of HS students taking SAT
Educational attainment	<i>Overall educational attainment of Washington's workforce and population</i>	Percent of population with HS diploma High school dropout rate Percentage with college degrees
Lifelong learning	<i>Portion of Washington's population actively engaged in lifelong learning</i>	Number participating in education programs after age 30

### Attracting talent

Immigration of knowledge workers	<i>Rate of attracting knowledge workers from outside Washington State</i>	Immigration rate of knowledge workers
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## Investment & Entrepreneurship

### Entrepreneurship

Economic dynamism	<i>Agility of Washington's companies and workforce to respond to new opportunities</i>	Fast growing companies Entrepreneurial activity Job churn
R&D intensity	<i>Amount of research and advanced product development performed in Washington's universities and private sector companies</i>	Amount of federally-funded R&D Increase in federally-funded R&D Amount of private R&D funding
IP generated	<i>Amount of protected intellectual property generated</i>	Number of patents awards Patents awarded per \$1M R&D funding
Company startup and innovation	<i>Number of new companies formed in Washington State</i>	WA ranking for new company starts Number of university startups Number of new products and services introduced

### Investment

Equity investment	<i>Amount of equity investment provided to Washington's companies</i>	Amount of local angel investment Venture investment attracted to WA companies Number of initial public offerings
Federal investment	<i>Federal research and advanced product development</i>	Number of SBIR/STTR <sup>ii</sup> awards
Foreign capital attracted	<i>Capital attracted from outside the U.S.</i>	Amount of foreign direct investment

## Infrastructure

### Transport

Freight	<i>Freight activity in Washington State</i>	Aggregated activity at WA ports Rail-based freight
Information	<i>Availability of information systems and communications infrastructure</i>	Portion of WA communities having high-speed connectivity eGovernment ranking Health information technology use
Commuting	<i>Time required to move Washington's workforce</i>	Average commute time

## Business Climate

Cost of business	<i>Cost to companies to operate within the state</i>	State rank on business costs WA tax burden compared to others
Business attractiveness	<i>Attractiveness of Washington to global business operations</i>	Number of global firms with WA state operations

## Business Performance

### Competitive Companies

Market share	<i>Measuring the dominance of Washington's industries in their markets</i>	Industry dominance <sup>iii</sup> Change in industry dominance
Productivity Growth	<i>Productivity of Washington's economy, overall and in key industries</i>	State GDP per worker earnings, statewide and in key industries
Trade Growth	<i>Expansion of WA state companies' global trade in terms of value and distribution by market</i>	State ranking – exports per capita State ranking – exports in key industry State ranking – selected global markets
High impact firmsiv	<i>Increasing the number and distribution of high-impact firms throughout all locations and industries</i>	Percentage of high impact firms compared to all firms Percentage of high impact firms outside central Puget Sound area
High value sectors	<i>Increasing the economic value of Washington's key sectors and companies</i>	High wage traded sectors Manufacturing value added

## Economic Growth and Competitiveness

### Increased, better employment

Income growth	<i>Aggregate personal income in Washington State</i>	State personal income trends, compared to other states
Employment	<i>Growth in employment, overall and in key sectors</i>	Covered employment by year Unemployment rate by year Employment in selected sectors
Income disparity	<i>Gauging the differences in income among workers relative to sectors and geographic location</i>	Median income rank among states Median income by county

### Wealth generated

Gross domestic product	<i>Result of overall state business activity</i>	WA gross domestic product by year
Standard of living	<i>Comparing cost to live in Washington State</i>	Cost of living index Healthcare uninsured rate Housing affordability index

### Increased state revenue

Policy and investment alignment	<i>Gauging the alignment in state policy priorities and state investments</i>	TBD
State revenue	<i>State revenue trend</i>	State revenue by year

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## Endnotes:

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<sup>i</sup> S&E: Scientists and Engineers, or Science and Engineering

<sup>ii</sup> SBIR: Small Business Innovation Research; STTR: Small Business Technology Transfer Research and Development

<sup>iii</sup> Industry dominance is measured by location quotient – the ratio of the size of Washington’s workforce in an industry to the national average.

<sup>iv</sup> High impact firms, as defined by U.S. Small Business Administration, are those firms having both rapid growth AND high job creation. On average these are somewhat older companies (~25 years old) of all sizes and in all industries and locations. Source: *High Impact Firms: Gazelles Revisited*, Corporate Research Board LLC, June 2008.

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