Washington Economic Development Commission

Building a World-Class Innovation Ecosystem

Winning Strategies for Driving Growth, Competitiveness and Job Creation in a Time of Fiscal Constraint

Version 4.52 – DRAFT

May 2012
Building a World-Class Innovation Ecosystem

Commission Members

Roger Woodworth, Chair, Spokane
Avista Corporation

Steve Van Ausdle, Ph.D., Vice Chair,
Walla Walla, Walla Walla Community College

Constance (Connie) Bacon, Tacoma
Port of Tacoma

Sen. Michael Baumgartner, Spokane
Ranking Member, Washington Senate Economic
Development, Trade and Innovation Committee

John (Jack) Breese, Mercer Island
Washington Advisory Group
Formerly Microsoft Research

Michelle Burris, Bothell
OncoGenex Corporation

Randy Gardiner, Seattle
Red Dot Corporation

Paula Hammond, Olympia
Washington Department of Transportation

Mark Harris, Tukwila
Continental Mills Inc.

Sen. Jim Kastama, Puyallup
Chair, Washington Senate Economic
Development, Trade and Innovation Committee

Bruce Kendall, Tacoma
Economic Development Board for
Tacoma-Pierce County

Rep. Phyllis Gutiérrez Kenney, Seattle
Chair, House Community and Economic
Development and Housing Committee

Rick LeFaivre, Kirkland
OVP Venture Partners

Christina Lomasney, Seattle
Modumetal Corporation

Dan Newhouse, Olympia
Washington Department of Agriculture

Eleni Papadakis, Olympia
Workforce Training and Education
Coordinating Board

Mike Schwenk, Richland
Pacific Northwest National Laboratories

Rep. Norma Smith, Oak Harbor
Ranking Member, House Community and
Economic Development and Housing
Committee

Stan Sorscher, Tukwila
SPEEA, Labor Representative

William Stafford, Seattle
Trade Development Alliance

Beth Thew, Spokane
AFL-CIO Labor Council

Paul Trause, Olympia
Washington Employment
Security Department

Rogers Weed, Olympia
Washington Department of Commerce

STAFF

Egils Milbergs, Olympia
Executive Director
Washington Economic Development
Commission

Spencer Cohen, Seattle
Senior Policy Advisor
Washington Economic Development
Commission

Noreen Hoban, Olympia
Assistant to the Director
Washington Economic Development
Commission
# Table of Contents

EXECUTIVE SUMMARY ................................................................................................................................................. 4  
  Summary of Recommendations ................................................................................................................................. 6  
I. INTRODUCTION ........................................................................................................................................................................... 11  
  New Economic Development Model .............................................................................................................................. 11  
  Accomplishments to Date ...................................................................................................................................................... 12  
II. ECONOMIC CONTEXT: WHERE ARE WE NOW? ......................................................................................................................... 15  
  Benchmarking Washington’s Performance .................................................................................................................... 15  
  Future Risk Factors .............................................................................................................................................................. 22  
III. WHERE WE NEED TO GO: FOUR PILLARS ............................................................................................................................. 25  
  Pillar One: Make talent the number one priority ........................................................................................................... 27  
  Pillar Two: Invest in innovation and entrepreneurship .............................................................................................. 32  
  Pillar Three: Modernize infrastructure and regulations ............................................................................................. 37  
  Pillar Four: Enlarge international business .................................................................................................................... 40  
IV. WORLD-CLASS INNOVATION ECOSYSTEM ............................................................................................................................ 43  
  Implementation: What Results Are We Seeking? ........................................................................................................... 44  
APPENDICES ....................................................................................................................................................................................... 46  
  1: WEDC New Legislation: SB5741 ............................................................................................................................................... 46  
  2: Innovation Partnership Zones ............................................................................................................................................... 48  
  3: Strategically Targeted Academic Researchers (STARS) .............................................................................................. 50  
  4: Entrepreneurs-in-Residence (EIRs) ......................................................................................................................................... 52  
  5: WEDC Research Projects Completed .............................................................................................................................. 55  
ACKNOWLEDGEMENTS ..................................................................................................................................................................... 57
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 comprises 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.
Executive Summary

Our state is at a critical juncture. There are signs that our economy is starting to recover from the Great Recession, creating new business and employment opportunities across all areas of the state. However, the outlook is still uncertain and the overarching imperative for accelerating the recovery is the implementation of an integrated and comprehensive strategy for sustained growth.

This report updates our first strategy report, *The Washington Innovation Economy* (February 2009). We assess our progress, benchmark Washington’s economic performance and offer our latest recommendations for economic transformation to the world’s greatest innovation ecosystem.

The first step in transforming our economy is to be realistic about the challenges. Not only do we have to restore the thousands of jobs lost to the recession, we also have to create thousands of new jobs over the coming decade. It’s clear that in many industries the same jobs will not be coming back. Equally clear is the futility of hoping for “cyclical recovery” – simply hanging on to the coattails of a national economic recovery would be a short-sighted.

By transforming our economic development model and the policies that drive it, we can take advantage of immediate opportunities and position our state for long-term economic growth. This transformation requires a thoughtful approach to setting priorities in a time of fiscal constraints – so that we don’t overlook important fundamentals of long-term prosperity. It also requires collaboration among business, government, research and education; policy creativity; and strong leadership.

We call this transformative process *building an innovation ecosystem* – an economic environment in which strategy, collaboration, creativity, and leadership coalesce to help grow businesses – and jobs.

The architecture of the innovation ecosystem must be driven by private-sector jobs, and fueled by investment in innovation, new workforce skills, modern infrastructure, and exports. This requires a fundamental reset of policy focused on the talent we need, innovating in high-potential areas, producing and manufacturing more of what we invent, and exporting more. No single institution will lead the way. The next economy will be led not from the top, but from the bottom up.

We see an opportunity for leaders in business, government, research, and education across Washington to step forward to implement revolutionary – not incremental – change. Countless organizations, communities and innovators, thinking and interacting within a larger system of which they are a part, will evolve the innovation economy. This capability of seeing the economic development system as a whole – and collaborating across boundaries – will be the essential insight and tool for the state’s future prosperity.

The pillars of our future prosperity – talent and workforce, investment and entrepreneurship, infrastructure and regulations, and international business – require clarity of vision and alignment of efforts. With such leadership, public and private sector confidence will grow, and our state’s growth and job creation will increase.
Building a World-Class Innovation Ecosystem

Our competitive strength depends on our capacity for knowledge creation, a business climate conducive to transforming knowledge into successful products and services, and an effectively trained workforce. We also need strong regulatory and infrastructure systems that support productivity, growth and expansion of global trade.

The Commission’s recommendations in this report are not all dependent on new funding; what is more important is making funding more predictable and more flexible. In particular, we call for more “local leadership” and financing tools at the regional level to raise necessary capital for each region’s unique economic development objectives and priorities. We also consider it essential for the business community to take a more active strategic leadership role for the industries and clusters in which they participate. If the recommendations are successfully implemented, we are confident that business performance will be enhanced, jobs will be generated, higher wages will be paid, and exports will increase.

Our vision for Washington is a place where citizens have access to the best learning resources in the world and are encouraged to capitalize on their abilities to create prosperity for themselves and for others. It is a place that has a global outlook, looking to emerging markets and nurturing collaboration across its diverse geography and industry clusters. It is a place that is a magnet for creative and entrepreneurial people and enterprises – where innovation is open and everyone can participate and share in its benefits. If we get it right, we have outstanding potential for economic, job and income growth. A summary of our updated recommendations to realize this vision follows.
Summary of Recommendations

Washington’s global competitiveness hinges upon how well our innovation ecosystem functions. The strength of this ecosystem depends on how well we move forward on four key pillars of the innovation economy, summarized below.

<table>
<thead>
<tr>
<th>Pillar One: Harness Talent to Win the Future Skills</th>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Future Assumptions:</strong></td>
<td></td>
</tr>
<tr>
<td>• Talent is the principle driver of the innovation economy.</td>
<td><strong>1. Recommendation:</strong> Prioritize career and technical education programs at the high school level through more interaction with business, support of skill centers, and making use of industry standards for curriculum development and career guidance.</td>
</tr>
<tr>
<td>• Productivity and earning capacity will increasingly be tied to skill levels. Wages will remain flat or decline for those with a poor education and few skills.</td>
<td><strong>2. Recommendation:</strong> Expand the capacity of community and technical colleges and four-year universities and colleges to achieve a post-secondary education attainment rate to at least 60 percent (degrees and credentials) of the working-age population by the year 2025 to ensure a productive workforce and meet high-demand industry needs.</td>
</tr>
<tr>
<td>• Washington will remain attractive to immigrants, most of whom bring high education and skill levels with them. This will require state residents to compete with national and international talent pools.</td>
<td><strong>3. Recommendation:</strong> Expand flexibility of unemployment programs to fund skill development and training of dislocated workers and the long-term unemployed.</td>
</tr>
<tr>
<td>• Washington’s education system—especially its higher education system—will dampen long-term economic recovery if it remains resource-constrained.</td>
<td><strong>4. Recommendation:</strong> Attract and retain the world’s best and brightest minds and entrepreneurs to fill critical skills gaps and grow new enterprises, including greater funding for higher education tied to high demand programs and fact-based visa related reform.</td>
</tr>
</tbody>
</table>
### Pillar Two: Invest in Entrepreneurship and Small Business

**Future Assumptions:**
- Economic growth and job creation relies increasingly on commercializing new knowledge into globally competitive products, processes and services.
- University research centers, federal labs and private R&D teams need to be connected to a responsive and robust innovation ecosystem, with a focus on local/regional manufacturing investment.
- Lack of access to business expertise, and risk-tolerant and scale-up capital act as barriers to rapid technology deployment.

<table>
<thead>
<tr>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Recommendation:</strong> Accelerate innovation by proactive support of small business and the best entrepreneurial ideas and talent.</td>
</tr>
<tr>
<td><strong>2. Recommendation:</strong> Enhance the Washington innovation ecosystem through large-scale collaboration and competing aggressively for federal, foundation and investment funding.</td>
</tr>
<tr>
<td><strong>3. Recommendation:</strong> Target improvements to regulatory and tax policy to foster business development and job creation.</td>
</tr>
</tbody>
</table>
Pillar Three: Modernize Infrastructure and Regulations

**Future Assumptions:**

- Infrastructure investments will give higher priority for economic development objectives. Regulatory processes impose costs-of-doing business, and pose significant barriers to increased business investment and hiring. Regulations, and associated compliance processes to comply, should be carefully vetted so as not to impose unnecessary costs-of-doing business.
- Overall levels of public infrastructure spending will likely fall as stimulus programs wind down and the public sector addresses fiscal restraints.
- Infrastructure priorities are likely to emphasize alternative energy and reduced carbon output, and anticipated response to climate change.
- Various economic, national security, climate and technological trends will accelerate the transition to alternative energy sources and electric transportation systems.
- Communications infrastructure will continue to be primarily a private-sector activity.

<table>
<thead>
<tr>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. <strong>Recommendation:</strong> Develop alternative, sustainable financing mechanisms for transportation infrastructure to ensure basic asset preservation and investment in economic corridors.</td>
</tr>
<tr>
<td>2. <strong>Recommendation:</strong> Prioritize infrastructure investments of national significance that can make Washington a global leader in areas such as energy efficiency, clean-water solutions, advanced manufacturing, sustainable urban design and broadband deployment.</td>
</tr>
<tr>
<td>3. <strong>Recommendation:</strong> Require the use of economic development and sustainability criteria in the capital budgeting process and selecting project investments.</td>
</tr>
<tr>
<td>4. <strong>Recommendation:</strong> Find ways to reduce regulatory burdens and the cost of regulatory compliance to help companies grow their businesses in Washington.</td>
</tr>
</tbody>
</table>
### Pillar Four: Expand International Business

**Future Assumptions:**

- Globalization – the interconnectedness of markets for goods, services, capital and labor – will continue to intensify over time, but at an uneven and unpredictable pace.
- State capitalism (e.g., China) is rising as a source of competition.
- Washington ports will confront more competition from Canada, California and East Coast ports as the Panama Canal is widened and new Arctic shipping lanes possibly open.
- Slow economic recovery in the United States and uncertainty in global markets will increase protectionist pressure and threaten to escalate trade disputes into high-risk trade wars.
- State fiscal constraints will challenge policymakers to seek creative new partnerships with the private sector to promote export growth.

<table>
<thead>
<tr>
<th>Solutions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Recommendation:</strong> Expand export assistance services and re-establish and increase investment in overseas representation to augment Washington’s international competitiveness and realize the Governor’s Export Initiative goals.</td>
</tr>
<tr>
<td><strong>2. Recommendation:</strong> Double the number of state-led, new-to-market, cluster-based trade missions (including services industries) to increase the number of new-to-market exporting firms.</td>
</tr>
<tr>
<td><strong>3. Recommendation:</strong> Optimize the state’s existing export assistance ecosystem to provide a robust and demand-driven suite of services and connections available to Washington state companies.</td>
</tr>
<tr>
<td><strong>4. Recommendation:</strong> Intensify innovation collaboration in the Pacific Northwest economic region by supporting cross-border research and development projects that can lead to commercialization, diversification and expansion of trade opportunities.</td>
</tr>
</tbody>
</table>
I. Introduction

In 2009, the Washington Economic Development Commission launched an ambitious vision for economic development to “make Washington the most attractive, creative and fertile environment for innovation in the world by 2020 as a means of achieving long-term global competitiveness, prosperity and economic opportunity for all the state’s citizens.”

In short, innovation is an idea implemented. When widely supported as a top policy priority, innovation transforms knowledge into new value and raises standards of living. All industries in all regions of the state can engage in innovation, whether they are established industries or yet to be born. An innovation-based strategy for economic growth, job creation and higher standard of living goes far beyond the traditional recruitment, expansion and retention activities of economic development organizations. The strategy rests on strengthening four interrelated pillars – talent and workforce, investment and entrepreneurship, infrastructure and regulations, and international business.

New Economic Development Model

The adjacent table points out the basic differences between a traditional model of economic development and an innovation-driven model. The state will continue to attract and retain employers as opportunities arise, but current best practice suggests a new emphasis on the quality of inputs and on facilitating innovation outcomes as the driver of long-term growth, competitiveness and employment. In many ways this is the contrast between the “hunter-gatherer” model and the “gardening” approach to economic development.
Accomplishments

Washington’s Innovation Strategy: Legislative Authorization
The WEDC vision to make Washington the leading hotspot for innovation in the world was incorporated into legislation (SSB 5741), passed the state House and Senate with overwhelming bi-partisan support, and was signed by Governor Gregoire on May 10, 2011. The economic development role of the WEDC was significantly bolstered and membership was expanded to include the departments of Agriculture and Transportation, and additional private sector, trade and labor representatives. The strengthened WEDC continues to focus its policy development in the four critical areas important to economic vitality:

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

These pillars function as the framework for state-wide collaboration and for aligning agency programs, regional initiatives and public/private investments. See Appendix 1 for the legislative mandates and future tasks assigned to the WEDC.

Innovation Partnership Zones: Innovating from the Bottom-Up
The WEDC, in collaboration with the state Department of Commerce (Commerce), has created a network of 15 Innovation Partnerships Zones (IPZ) based on:

1. Bottom-up public/private partnerships.
2. Emerging innovation opportunities.
4. Aligning federal and state infrastructure investments with regional strategies.

The IPZ program was launched in 2007 to stimulate the growth of industry clusters and build regional economies. The zones aim to create commercially viable technologies through collaborations between research entities, the private sector and work force training. In the 2012 legislative session, the IPZs were awarded $13.5 million for several projects, including a wine research and education facility in the Tri-Cities, a clear-water technology lab in Tacoma, a bio-medical incubator in Bothell, and an energy technician program in the Walla Walla valley to maintain the area’s 5,000 wind turbines. See Appendix 2 for a more details on the IPZ program and designated zones.
Strategic Targeted Academic Research (STARS): Foundations for New Growth Industries

The WEDC invested in the recruitment of entrepreneurial researchers at the University of Washington and Washington State University, and helped launch world-class innovative research initiatives in three areas:

1. Nanophotonics.
2. Bio-products, including aviation bio-fuels.
3. Smart grid technology and applications.

All three initiatives have demonstrated results by leveraging federal R&D funds, building new industry partnerships, generating intellectual property with high commercial potential, and making the state’s innovation ecosystem more globally competitive. The WEDC provides guidance, funding and performance measures for university recruitment of entrepreneurial researchers, bringing individuals with the knowledge, skills and ability to generate research products and innovations with direct commercial applications. The WEDC is chartered to recruit 10 lead entrepreneurial researchers from 2007 to 2017. As of the end of 2012, six STARS had been recruited. See Appendix 3 for more details on the STARs program.
Building a World-Class Innovation Ecosystem

**Entrepreneurs-in-Residence (EIRS): Accelerating Commercialization**

The EIR program is facilitating the transformation Washington’s rapidly growing intellectual property into viable and sustainable business strategies, plans and start-ups. With the financial support of the WEDC, more than 25 EIRS have been recruited to collaborate with university researchers – and dozens of potential spin-out companies are currently in the pipeline.

The EIRS are a substantial talent pool of business expertise to support other initiatives in the state’s innovation ecosystem. For example, in 2011 WEDC launched its first regional EIR program in Bellingham. Early results are promising and WEDC will be assessing expansion of regional EIRs to more regions in the state. The EIR program has already demonstrated improvements to the state’s technology transfer models, going far beyond intellectual property disclosure, protection and licensing. An important step going forward will be greater integration of the state’s engineering and advanced manufacturing capabilities into the program. See Appendix 4 for examples of EIRs.

**Critical Policy Research: Informing Policy with Evidence**

The WEDC bases its economic development strategies and policy recommendations on a solid foundation of objective research conducted in-house or contracted to experts in the field. These research projects have addressed Department of Defense research and contracting opportunities, trends and challenges facing the manufacturing sector, transition to electric vehicles, policy innovations from around the world, innovation metrics, and an inventory of state agency economic development programs. WEDC boosted its research capability in 2012 by hiring its first policy director with the principle task of completing state-of-the-art outcome evaluations of economic development programs. See Appendix 5 for summary research projects completed and links to complete reports.
II. Economic Context: Where are We Now?

Recent growth and employment trends are positive but we are not certain they reflect a durable path to recovery. The jobs deficit continues and we have a long ways to go to return to pre-recession levels (Figure 1). The massive federal stimulus funding temporarily helped the state’s fiscal situation and helped contain damage and lessen job losses.

However, long-term and sustainable job growth requires actions in line with new policy priorities. The biggest need and opportunity for the state is to emerge successfully out of this recession with a fully integrated strategy for sustained growth. Doing so requires a thoughtful approach to setting priorities in the context of fiscal constraints lest we neglect important priorities for the long-term prosperity we want to achieve.

![Figure 1 – Non-farm Jobs Recovery](image)

**Benchmarking Washington’s Performance**

Washington’s economic vitality hinges upon how well our innovation ecosystem functions relative to other parts of the world. Clearly, a dynamic innovation ecosystem is the winning strategy for achieving a sustainable economic prosperity, job creation and quality of life. The competitive strength of our ecosystem depends on our capacity for knowledge creation, a business climate conducive to transforming knowledge into successful products and services, and an effectively trained workforce. We also need strong regulatory and infrastructure systems that support productivity, growth and expansion of global trade.
The concept of an innovation ecosystem is by definition multi-dimensional and ever-changing. As such, linkages to broader economic goals suffer definitional and data-collection issues, and is not always easy to measure. Nonetheless, we can provide a context for assessing where Washington stands on some commonly accepted performance metrics (Table 1). These metrics are not perfect measures, but they do serve as proxies on Washington’s competitiveness and trends across a range of categories, taken from various U.S. federal data sources. We assume that investment in innovation-based factors will result in a continuous cycle of increasing returns to scale, higher-paying jobs and spillover effects that increase the prosperity of the state. Our ability to excel will depend on how well we leverage these innovation factors relative to not just other states, but to the entire world.

Table 1

<table>
<thead>
<tr>
<th>Metric</th>
<th>WA’s Rank</th>
<th>Top 3 States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real per capita GDP, 2010</td>
<td>#14</td>
<td>AK, DE, CT</td>
</tr>
<tr>
<td>Private sector non-farm employment growth, 2011</td>
<td>#11</td>
<td>ND, TX, UT</td>
</tr>
<tr>
<td>Per capita personal income, 2010 (current dollars)</td>
<td>#14</td>
<td>CT, MA, NJ</td>
</tr>
<tr>
<td>Gini coefficient, 2005-2009</td>
<td>#19</td>
<td>UT, AK, NH</td>
</tr>
<tr>
<td>Computer and mathematical occupations, as % total workforce, 2010</td>
<td>#1</td>
<td>VA, MD, WA</td>
</tr>
<tr>
<td>8th grade science proficiency (%), 2009</td>
<td>#20</td>
<td>MT, ND, MA</td>
</tr>
<tr>
<td>Individuals in S&amp;E as % of workforce, 2010</td>
<td>#5</td>
<td>VA, MA, MD</td>
</tr>
<tr>
<td>Patents [all types] per 100,000 residents, 2010</td>
<td>#2</td>
<td>VT, WA, CA</td>
</tr>
<tr>
<td>Venture capital per non-farm worker, 2011</td>
<td>#5</td>
<td>CA, MA, CO</td>
</tr>
<tr>
<td>R&amp;D as % of GDP, 2008</td>
<td>#6</td>
<td>NM, MD, MA</td>
</tr>
<tr>
<td>New Economy Index Ranking, 2011</td>
<td>#2</td>
<td>MA, WA, MD</td>
</tr>
<tr>
<td>NANA exports 2011, % change</td>
<td>#8</td>
<td>ND, LA, WV</td>
</tr>
</tbody>
</table>
**Economic Growth.** Washington lagged the resurgence in real GDP by state in 2010. National real GDP grew 2.6 percent, while Washington’s growth grew only by 1.6 percent – good for just a 38th best rebound among all states (Figure 2). The Mideast and New England regions grew the fastest, led by finance, insurance and durable-goods manufacturing.

**Employment.** The private sector added an estimated 52,400 between March 2011 and March 2012, based on a three month moving average (3mma). This was the 17th straight month with an increase in employment but 39th straight month of employment below the pre-recession peak in September 2008. Overall non-farm employment growth was slower, adding just 41,700 jobs over this period, due to cuts in public sector employment (Figure 3). Unemployment in Washington fell 1.1 percentage points between March 2011 and March 2012 (9.4 percent to 8.3 percent), though this was still the 17th highest unemployment rate in the U.S.¹

**Wages.** Figure 4 segments the labor force into high-, medium- and low-wage jobs.² The largest absolute and percentage decrease in jobs during the current recession was among medium-wage jobs, falling 12.8 percent (104,867). This group includes many sectors related to the construction industry that was severely impacted during the recession. The current, post-nadir jobs recoveries are much faster in low- and high-wage jobs, compared with anemic growth in the medium-wage group. High-wage jobs are a key driver of recovery; these jobs include software, professional, scientific and technical services, and transportation equipment. Boeing, for example, significantly ramped up its hiring in 2011.

---

¹ Rankings include Washington D.C.
² This breakdown is based on wage levels for the top, middle, and bottom thirds of the labor force using 3-digit NAICS codes for 2008. While a somewhat crude approach, this does provide some important insights into changes in the state economy and variation in responsiveness to the broader recession.
**Human Capital.** There is a growing mismatch between the requirements of an innovation-driven economy and the production of adequately educated and trained personnel (Figure 5). Although Washington ranks near the top when it comes to the intensity and payroll of its science, computer engineering and high-tech workforce, it ranks poorly on production of graduates in science, technology, engineering and mathematics disciplines. Our post-secondary system is undersupplying relative to our population base—a major bottleneck in our goal to support a workforce shift toward higher skill-demanding work. One consequence is that Washington will need to rely on imported talent from around the world while education access to state residents is being limited.

**Manufacturing Workforce.**
Nationally, U.S. manufacturing has been in a sustained and accelerated decline over the past three decades, with total employment contracting by nearly 41 percent between 1979 and 2010; between 1998 (a recent peak) and 2010, employment fell 34.4 percent. While albeit at a slower pace, the total number of manufacturing establishments has also declined, at roughly 13.8 percent between 2001 and 2010. Various factors have contributed to this decline, ranging from greater global competition, structural shifts in the workforce, and transitioning into a more services-based economy. Commentators have also pointed to corresponding labor productivity gains as an important contributor to these losses—gains in worker efficiency have displaced lower-skilled workers. However, recent studies have questioned the underlining data behind productivity measures, showing that

---

in many cases actual productivity gains have been well below those reported, raising serious questions about the long-term health and vitality of our nation’s manufacturing sector.⁴

While Washington’s manufacturing sector is unique in many respects – owing to its significant orientation around aerospace and related activities and exports – similar declines have been observed in recent years. Washington’s manufacturing labor force peaked at more than 360,600 workers in 1998. Since then, total employment went through two recent declines and partial recoveries.

The first peak-to-trough moment occurred between 1998 and 2004, with total losses of almost 100,000 jobs, a 26.9 percent contraction. The second decline was between 2007 and 2010, when employment fell more 11.9 percent, or a total loss of slightly more than 35,000 jobs.⁵ Fortunately, 2011 saw an upsurge in growth, primarily driven by the aerospace industry, adding nearly 9,600 jobs between January 2010 and January 2011.⁶ Manufacturing exports have also been strong, with both total manufacturing and non-aerospace manufacturing reached historic peaks in 2011.⁷

The state does not perform as well on the availability of workers on the fabrication, production and installation segment, despite the vast aerospace footprint in the state. The supply of these workers has become a major concern among many aerospace firms and suppliers across the state. Our post-secondary system is undersupplying relative to our population base – a concerning bottleneck in our goal to support a workforce shift toward higher skill-demanding work.

**Innovation and Entrepreneurial Capacity.** The most comprehensive analysis of how Washington is performing in innovation is the state New Economy Index. This index comprises indicators across five domains: knowledge-jobs, globalization, economic dynamism, digital economy and innovation capacity. Massachusetts (1st) and Washington (2nd) top the list of states leading the push for a global innovation based economy (Figure 6).

---


⁷ WISER Trade.
Among the innovation strengths noted for Washington were manufacturing value-added (1), export focus of business (3), online population (3), online agriculture (1), scientists and engineers (2), patents (1), industry investment in research and development (R&D) (4), alternative energy use (3), and venture capital (3). Some weaknesses included below-median ranks for high-wage traded services (34), foreign direct investment (31), job churning (43), IPOs (26), entrepreneurial activity (37), and e-government (27).

**Venture capital.** Venture capital financing plays critical roles in the commercialization process, helping new companies expand beyond their original base. While venture funds do not often provide early-stage financing, they are the source of funds to get firms to the scale necessary for long-term success. **Figure 7** shows the role venture funding plays in selected state economies. In most years, Washington ranks third in the nation in venture funding on a per capital basis, behind California and Massachusetts, the two perennial leaders.

**Patents.** The creation of intellectual property, on which innovation is based, is reflected in the issuance of patents. Since the vast majority of patents never result in any commercially successful product, they are an imperfect measure of innovation. Nonetheless, they are one of the few quantifiable measures of the innovation economy. **Figure 8** shows the rate of patenting in Washington on a per capita basis compared to selected peer states. Washington scores very well for both inventor patents and all types of patents, behind only California in both measures. This reflects both the research and development-intensive industries in the state as well as aggressive patenting activity by the state’s research universities.

**Infrastructure.** Meaningful data on infrastructure is hard to locate. However, based on available data Washington ranks well compared to...
other states in its share of bridges deemed structurally obsolete (sixth lowest share) and 11th lowest in vehicle miles traveled per resident. However, we rank 42nd for functional obsolete bridges and 16th for roads that are in “good” or “very good” condition (Table 2).

<table>
<thead>
<tr>
<th>Infrastructure Metrics</th>
<th>State Ranking (2009)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Percent functionally obsolete bridges</td>
<td>42</td>
</tr>
<tr>
<td>Percent structurally obsolete bridges</td>
<td>6</td>
</tr>
<tr>
<td>Vehicle miles traveled/person (resident)</td>
<td>11</td>
</tr>
<tr>
<td>Roads in good or very good condition</td>
<td>16</td>
</tr>
</tbody>
</table>

Table 2 – Infrastructure Metrics

**Business Environment and Regulations.** Forbes magazine produces a widely read ranking of the business environment for the 50 states. Washington ranked a very respectable seventh across six categories for businesses: costs, labor supply, regulatory environment, current economic climate, growth prospects and quality of life (Table 3). The Forbes methodology consists of multiple data sources but the choice and weighting of indicators is highly subjective. Washington ranks 20th with respect to the regulatory environment, 21st as to business costs and 26th on quality of life.

<table>
<thead>
<tr>
<th>Rank</th>
<th>State</th>
<th>Business costs rank</th>
<th>Labor supply rank</th>
<th>Regulatory environment rank</th>
<th>Economic climate rank</th>
<th>Growth prospects rank</th>
<th>Quality of life rank</th>
<th>Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Utah</td>
<td>10</td>
<td>5</td>
<td>8</td>
<td>11</td>
<td>10</td>
<td>14</td>
<td>2,800,200</td>
</tr>
<tr>
<td>2</td>
<td>Virginia</td>
<td>23</td>
<td>2</td>
<td>2</td>
<td>8</td>
<td>25</td>
<td>4</td>
<td>8,077,700</td>
</tr>
<tr>
<td>3</td>
<td>North Carolina</td>
<td>2</td>
<td>3</td>
<td>1</td>
<td>20</td>
<td>15</td>
<td>34</td>
<td>9,633,900</td>
</tr>
<tr>
<td>4</td>
<td>North Dakota</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>2</td>
<td>11</td>
<td>21</td>
<td>677,900</td>
</tr>
<tr>
<td>5</td>
<td>Colorado</td>
<td>32</td>
<td>1</td>
<td>15</td>
<td>10</td>
<td>8</td>
<td>10</td>
<td>5,092,100</td>
</tr>
<tr>
<td>6</td>
<td>Texas</td>
<td>24</td>
<td>15</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>35</td>
<td>25,472,200</td>
</tr>
<tr>
<td>7</td>
<td>Washington</td>
<td>21</td>
<td>6</td>
<td>20</td>
<td>7</td>
<td>5</td>
<td>26</td>
<td>6,777,900</td>
</tr>
<tr>
<td>8</td>
<td>Nebraska</td>
<td>3</td>
<td>29</td>
<td>24</td>
<td>6</td>
<td>34</td>
<td>12</td>
<td>1,837,000</td>
</tr>
<tr>
<td>9</td>
<td>Oregon</td>
<td>15</td>
<td>10</td>
<td>38</td>
<td>22</td>
<td>8</td>
<td>27</td>
<td>3,872,700</td>
</tr>
<tr>
<td>10</td>
<td>Iowa</td>
<td>8</td>
<td>41</td>
<td>11</td>
<td>16</td>
<td>41</td>
<td>11</td>
<td>3,051,800</td>
</tr>
</tbody>
</table>

Table 3 – State Business Environment Rankings

---

8 Data sources: Federal Highway Administration and Bureau of Transportation Statistics
9 Regulatory environment includes an index from Pollina Corporate Real Estate that measures tax incentives and the economic development efforts of each state. Other metrics include the Tort Liability Index from Pacific Research Foundation, the regulatory component of PRF’s U.S. Economic Freedom Index, Moody’s bond rating on the state’s general obligation debt and the transportation infrastructure, including air, highway and rail. Credit is also given to those states that are right-to-work states.
International Business. Washington has an extensive port and international trade system. In 2011, state goods exports – commodities and merchandises – reached $64.6 billion, fifth most in absolute terms and third best on a per capita basis. Our port system is one of the most advanced in the country, with more than $164.1 billion in goods passing through Washington ports.\(^{10}\) Washington’s intermodal, integrated freight mobility system is a key asset and factor, shaping business investment decisions, particularly those belonging to international supply chains. While services exports are not trackable at the state level, this segment of our economy is critically important, including overseas legal and architecture contracts, software licensing, tourism, and educational services to foreign students in Washington.

Future Risk Factors
The future is uncertain. Whether it’s sheer economic growth, urbanization, energy consumption, the diffusion of talent across borders, population growth, the current and next set of challenges in global health, state capitalism, or the ever-evolving global supply chain…the world is changing. Any real, meaningful strategy to grow our state economy must address these issues head on and continuously adapt strategies and tactics as possible futures unfold.

An infinite number of events could occur in the next 10 years, some with potentially profound impacts on Washington. The national economic recovery looms large over Washington’s own economic vitality, as does the opportunities and challenges associated with China’s continued rise. We must empower Washingtonians, businesses, stakeholders, and institutions to effectively respond to the growing rise of competition beyond our borders. On the innovation front, “the valley-of-death”—the period of time when additional funding is scarce, typically between the initial capital contribution to a start-up and revenue generation— in early stage business development will continue to persist and dampen our entrepreneurs’ ability to take proof-of-concept ideas and spin them into companies. Fiscal decisions in Washington D.C. will impact Washington both directly and indirectly, including potential cuts in defense spending in the coming years.

The geography of global output is also shifting. The International Monetary Fund (IMF) projects that between 2009 and 2016, the share of global GDP adjusted for purchasing power parity (PPP) from “developing Asia” will rise from 23 percent to more than 30 percent; China’s share alone will grow from 12.9 percent to more than 18 percent. Meanwhile, traditional economic superpowers will see their shares of total output decline in relative terms, with the share of GDP (PPP-adjusted) from the United States declining from 19.9 percent to 17.6 percent, and in the Euro zone from 15.1 percent to 12.4 percent.\(^{11}\) Despite a projected “slowing” of the Chinese and Indian economies, both countries will continue to drive real GDP growth globally.

Following are a select group of risk factors that could impact Washington State’s long-term opportunities for economic prosperity. Included are a possible range of uncertainty for each factor and how they might play out for the Washington economy.

\(^{10}\) WISER Trade.
\(^{11}\) International Monetary Fund, World Economic Outlook Database, September 2011.
<table>
<thead>
<tr>
<th>RISK FACTORS</th>
<th>STABLE SCENARIO</th>
<th>VOLATILE SCENARIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>National economic growth</td>
<td>High growth rate. Contributes to sustained, strong recovery for Washington and accelerating emergent innovation and industries.</td>
<td>Weak or no growth. Domestic market for Washington goods and services would diminish. Decline in federal revenues will adversely impact discretionary and defense spending.</td>
</tr>
<tr>
<td>Energy prices</td>
<td>Energy prices stable. New sources of energy are discovered. Middle East tensions ease bringing oil prices down. Households spend more on non-energy products and services. Energy intense industries have productivity gain.</td>
<td>High energy prices. Supply interruptions and excessive speculation dampen the nascent recovery. Reduction in consumer demand hurting state economy and job losses. Washington relative competitiveness improves due to cheap electricity sourced from hydropower. Interest in hybrid and electric vehicles increases dramatically.</td>
</tr>
<tr>
<td>China’s economy</td>
<td>Fair and free trade. China becomes a responsible power in global economy. Continuing reduction in trade barriers; gradual, sustained rebalancing of China’s economy towards domestic consumption; Greater exports from Washington and more Chinese foreign direct investment into Washington. Labor and resource cost advantages improve for Washington.</td>
<td>Neo-mercantilist state capitalism. A “new normal” emerges, resulting in more trade barriers and trade disputes; further intellectual property theft; greater upward pressure on energy prices and resources; and potential “hot” conflicts over access to key resources. Public turns toward protectionism. Washington firms pull back outsourced work and net trade activity declines, damaging the Washington economy.</td>
</tr>
<tr>
<td>Healthcare costs</td>
<td>Cost curve bends. U.S. controls long-term costs, helping spread coverage to all citizens. With population shifting to older age distribution, greater demand on healthcare system. Washington grows as major regional hub for healthcare services, global hub for demand for medical devices, treatments, and discoveries.</td>
<td>Out-of-control. Healthcare costs continue rising well ahead of inflation; greater share of federal and state budgets used for healthcare and related expenditures, leading to cuts in other areas; rising costs make United States less competitive. Health care entitlements for aging baby boomers likely to reduce public-sector spending on higher education, research, and other key areas of economic development, and weaken the economy.</td>
</tr>
<tr>
<td>European economic stability</td>
<td>Governance succeeds. Euro-zone able to keep together, sovereign debt issue stabilized through greater fiscal unity among Euro-zone states. Euro-zone continues to be Washington fourth largest export market for goods.</td>
<td>Euro breakdown. Either dissolution of Euro-zone and/or unresolved sovereign debt issues create systemic global risk and weaken fragile U.S. economic recovery. Derails Washington economic recovery accompanied by decline in exports to Europe and other regions indirectly affected by Euro-zone crisis.</td>
</tr>
</tbody>
</table>
## Building a World-Class Innovation Ecosystem

<table>
<thead>
<tr>
<th>RISK FACTORS</th>
<th>STABLE SCENARIO</th>
<th>VOLATILE SCENARIO</th>
</tr>
</thead>
<tbody>
<tr>
<td>Defense spending</td>
<td><strong>Defense redefined.</strong> Resources shift in response to asymmetric threats, e.g., cyber warfare, drones, energy, water, critical infrastructure, nation building. Greater defense contracting opportunities for Washington in areas of technological strength.</td>
<td><strong>Steep cuts in defense.</strong> The defense industry is the largest economic cluster in Washington. Under this scenario base closures and sharp reduction in defense industry footprint is possible. Washington could benefit through repositioning of defense assets to manage Pacific Rim threats to national security.</td>
</tr>
<tr>
<td>Investment risk</td>
<td><strong>Strong investment incentives.</strong> State and federal entities reduce tax burden and develop funding mechanisms that encourage more innovation investment and early stage start-ups. Washington augments its entrepreneurial ecosystem and is successful in expanding its pool of risk capital for start-ups and scaling up in promising areas.</td>
<td><strong>Risk avoidance.</strong> Ideological conflict and political gridlock prevent meaningful reform of capital markets, widening “valley of death.” Weaker investments in early stage technologies and IPO market suffers. Investment markets develop overseas with Washington intellectual property fueling future foreign competitors.</td>
</tr>
<tr>
<td>Technological change</td>
<td><strong>Technology acceleration.</strong> Economic development policy supports rapid deployment of new technologies in the economy with a restructured and productive education system and workforce. Washington emerges as a global innovation hotspot in manufacturing, agriculture and services.</td>
<td><strong>Technology stagnation.</strong> Growing mismatch between the requirements of a technology-intense economy and available level of skills and education lead to a new “Luddite” movement. Washington leadership and economic growth stalls in multiple technical areas and no longer attracts investment and talent. Large number of displaced workers with antiquated skills. Gradual loss of Washington competitiveness; more stress on unemployment, training and social safety net programs.</td>
</tr>
<tr>
<td>Climate change</td>
<td><strong>Less severe.</strong> Nations find ways to reduce carbon footprint, shift to renewable and energy use efficiency. Washington becomes a leader in both adoption and development of non-fossil fuel, clean technologies; strong jobs impact.</td>
<td><strong>Worst expectations.</strong> Glaciers continue to melt, sea levels rise, more volatile weather patterns, and transition to robust clean energy solutions falters. Washington starts experiencing disruption of shipping lanes, with cargo shifting to others ports, leading to jobs losses; agriculture output disrupted.</td>
</tr>
<tr>
<td>Advanced manufacturing</td>
<td><strong>U.S. leadership restored.</strong> As emerging economies attract more and more industrial activities, the U.S. moves up the global value-chain. Washington leads globally in product design, advanced materials, prototyping, simulation, engineering, managing supply networks, logistics, IT integration, skill standards, on-demand learning, customer co-creation and other high value-added manufacturing activities.</td>
<td><strong>Manufacturing abandoned.</strong> Outsourcing accelerates, not equally matched with more advanced manufacturing activities in the U.S., leading to job losses and continued decline of manufacturing sector. Results in Washington job losses; more global competition; shift in production to other regions alters trade routes, reducing cargo volume through Washington.</td>
</tr>
</tbody>
</table>
III. Where We Need to Go: Four Pillars

Washington State will need to design an economic growth strategy to restore the thousands of jobs lost to the recession and create thousands of more jobs to accommodate population growth over the coming decade. What is clear is that in many industries the same jobs will not be coming back. Hoping for “cyclical recovery” and just relying on a national economic recovery would be a mistake. Given the national policy stasis and massive federal deficit, we should not expect any substantial funding relief from Washington, D.C. Our economy is facing profound occupational adjustments, new global competitors and disruptive innovations. We have to implement a new paradigm for economic development and focus on the factors and outcomes that matter now. Simply put, the state has no choice but to be the source of policy creativity.

The longer-term state deficit outlook is forcing us to think through policy priorities and reforms to manage our own economic recovery. Attention will necessarily focus on the immediate- and the short-term. Spending cuts will be necessary to deal with an unprecedented budget deficit. Government will need to be streamlined and transformed for greater productivity and efficiency.

The biggest opportunity is to transform our economic development model and the policies that drive it. The economic development system is today too short-term oriented, disjointed and uncoordinated. The result is a lot of effort that is sub-optimal, diffused and inefficient. The strategies we advance present an opportunity to overcome this fragmented, reactive approach to economic development. Our approach is aimed at overcoming these deficiencies by applying a set of principles that:

- Shifts resources to higher-value economic development programs.
- Distributes public resources to local priorities and supports innovation where it is happening.
- Focuses on strengthening regional relationships and innovation ecosystems.
- Leverages and aligns public and private resources.
- Fosters a multi-disciplinary, collaborative and open approach to innovation.
- Accounts for outcomes.

The architecture of the economic development system must be driven by private-sector jobs, and fueled by investment in innovation, new workforce skills, a modern infrastructure and exports. This requires a fundamental reset of policy focusing on the talent we need, innovating in what matters, producing and manufacturing more of what we invent and exporting more. No single institution will lead the way. The next economy will be led not from the top, but from the bottom up.
Building a World-Class Innovation Ecosystem

Fortunately, our state economy is very diverse and has substantial leadership and innovation assets upon which to build. It will be the local economies that will be the hubs or nodes of economic revival – they will be the centers for collaboration, talent, investment, and innovation.

We see an opportunity for leaders in business, government, research, and education across Washington to step forward to implement revolutionary – not incremental – change. Countless organizations, communities and innovators thinking and interacting in a larger system, of which they are a part, will evolve the future innovation economy. This capability of seeing the economic development system as a whole – and collaborating across boundaries – will be the essential insight and tool for the state’s future prosperity.

To accelerate job creation, we must make progress on four pillars of our innovation ecosystem: talent; investment and entrepreneurship; infrastructure and regulation; and international business. This framework has proven to be useful in building consensus, formulating our policy recommendations, coordinating with other agencies, communicating to the public, and catalyzing action at the local level. The Commission’s analysis and recommendations are presented in next section.

To accelerate job creation, Washington must make progress on four pillars

- **Intellect**
  Emphasize career transition, access to learning resources and the skills that employers need.

- **Investment**
  Create innovation ecosystem to foster new products, start-ups and manufacturing.

- **Infrastructure**
  Design a 21st century infrastructure, an efficient regulatory system and align to local objectives.

- **International**
  Grow the global presence of Washington’s business.
Pillar One: Harness Talent to Win the Future Skills Race

Why This is Important
Jobs and wages are directly related to the productivity of our workforce. Contrary to popular opinion, there are thousands of job openings requiring highly skilled and knowledgeable workers that are vacant because job applicants do not have the particular skills and knowledge that employers require. Unless Washington produces more workers with the skill and knowledge competencies that employers need, Washington will experience a growing skills gap that will slow economic recovery. Use of sophisticated technologies and globalization have increased the demand for highly skilled workers and reduced the demand for workers without relevant skills. Compounding the challenge is an educational system that has failed to produce workers with education levels required in the 21st century economy. Concerns about the quality and quantity of human capital center not only on students emerging from school, but also on older workers whose skills need retooling to adapt to a rapidly changing occupational structure.

This challenge is recognized and is being discussed by educational foundations, state governments, national higher education associations, and policy councils. The Lumina Foundation for Education is providing leadership by calling for the United States to increase higher education attainment rates, the proportion of the population that holds a high-quality post-secondary degree or credential, to 60 percent of the working age population by 2025; Lumina refers to this as their “BIG GOAL.”

In February 2009, Lumina issued its first Stronger Nation report on higher education attainment in the country and for each state, which focused the nation on a new conversation about education attainment. Under Gov. Gregoire’s leadership, the National Governors Association’s top priority was to increase completion rates in postsecondary education. The association authored a report, Complete to Compete, which is influencing policy in Washington State as we address a new governance structure to help ensure student achievement at both the secondary and post-secondary levels.

Where Washington State Stands
- In 2008, 42 percent of adults in Washington had college degrees. For Washington to reach the BIG GOAL, community and technical colleges, and four-year colleges and universities will need to award more than 700,000 additional degrees and credentials by 2025. It is interesting to note that the state has attracted 92 degreed workers from out of state for every 100 we produce through our educational system.
- According to Georgetown University Center on Education and the Workforce, 67 percent of Washington’s jobs will require post-secondary education by 2018. Between now and 2018, Washington will need to fill more than one million vacancies resulting from job creation, worker retirements and other factors. Of these vacancies, 677,000 will require a post-secondary credential, while only 351,000 will need to be filled by high school graduates or dropouts. Providing sufficient talent for the workforce will require significant increases in college attainment among working adults, low-income, first-generation students, and students of color.
Building a World-Class Innovation Ecosystem

- Attainment rates vary by population group, from a high of 52.9 for Asian students to a low of 17.3 for Hispanic students. Attainment rate for Caucasians is 44.6 percent of adults ages 25-64.

- In 2010, Washington was in the bottom quartile of states in secondary school on-time graduation at just 73.7 percent; this compares with the national average of 75.5 percent. Washington ranked 16th in 2011 for average eighth grade National Assessment of Educational Progress (NAEP) mathematics scores.

- Washington fares well in terms of the workforce in life, physical and social science occupations, such as biologists, medical scientists, chemists, and environmental scientists. Roughly 1.4 percent of the workforce in 2010 was concentrated in these occupations, good for ninth highest in the nation. Washington’s share of the workforce in architectural and engineering occupations was the third highest in the country at 2.9 percent.

- The state does not perform as well on the availability of workers on the fabrication, production and installation segment, despite the vast aerospace footprint in the state. The supply of these workers is a major concern among many aerospace, and other manufacturing firms and suppliers across the state.

Future Assumptions

- Talent is the principle driver of the innovation economy.
- Productivity and earning capacity will increasingly be tied to skill levels. Wages will remain flat or decline for those with a poor education and few skills.
- Washington will remain attractive to immigrants, most of whom bring high education and skill levels with them. This will require state residents to compete with national and international talent pools.
- Washington’s education system – especially its higher education system – will dampen long-term economic recovery if it remains resource-constrained.

Recommendation #1
Prioritize career and technical education programs at the high school level through more interaction with business, support of skill centers, and making use of industry standards for curriculum development and career guidance.

The current recession should not be the time to lose ground on enhancing the pool of qualified workers. Technically trained workers are needed in almost every major industry sector. A long-term commitment for a skilled, flexible and technically competent workforce would inspire business confidence and help attract, retain and expand industry in the state. We should shift resources from our system of education-employment-lifelong learning to areas of high-demand, and facilitate entry of more Washingtonians into the high-skills jobs that are being created. It is paramount we increase Science, Technology, Engineering and Mathematics (STEM) proficiencies, provide education opportunities where skill gaps exist, and do it efficiently. We must increase and maintain budget support for post-secondary education institutions to flexibly address industry workforce needs in high-demand occupations. There are about 60,000 job vacancies currently; many of these jobs are unfilled because applicants lack the appropriate skills. More
effort is needed to integrate employer needs into education programs, use “skills panels” and provide more career pathways through industry “stackable” skills certificate programs.

- **Improve labor market demand and education supply analysis.** Tracking demand for specific labor force education or training at the state, regional and local employer levels is the first step to acquiring the appropriate educational and training resources. Tracking includes several components, including current and projected growth and job openings. Federal, state and local statistical sources should be complemented by regional surveys and intensified interactions between employers and high schools, community and technical colleges, and four-year universities and colleges. This will help in determining a reliable demand-and-supply analysis for disciplines and degrees in specified labor markets. The demand-and-supply analysis should identify significant gaps between employer demands for workers in specific disciplines and the available supply of educational resources. In addition, it is important to track actual outcomes – the transition of students from education-to-employment would determine if needs are being met and how effective current education and workforce programs are.

- **Expand work-based education programs, including apprenticeships.** Provide more “direct connect” training, which includes high school and college internship programs, on-the-job training, state-of-the-art apprenticeships, and employer-designed skill standards and training. Early exposure to the work world will assist students with effective career choices. The coming manufacturing era, as exemplified by the resurging aerospace industry in Washington, offers the prospect of landing middle-income jobs, creative work and long-term career opportunities for students not necessarily on a four-year college degree track. We should track the transition from education-to-employment for college graduates, including how many find jobs in the state and how many leave or are unable to find employment. For in-state employers, we should track how many offer internships and how many of those interns are hired for at least one year or longer.

- **Give credit for prior experience.** Education institutions and employers should recognize and give credit for prior learning experience, particularly in the case of military personnel entering the civilian workforce with applied skills and valuable occupational competencies.

- **Enhance STEM proficiencies starting in high school, including applied STEM offerings.** Support high school programs to graduate more students with real world problem-solving and STEM proficiencies, and establish more rigorous standards for science and math teachers. The Governor’s “Launch Year” program, skills centers and “Project Lead the Way” courses are examples of promising strategies to engage more high school students in STEM and problem-solving disciplines.

- **Expand use of online learning.** As a leading information technology, smart phone, interactive media, cloud applications, and software development hub, Washington has enormous potential to become a global leader in online education. Online learning, in combination with more traditional teaching methods and rigorous competency assessment, has enormous promise to expand access to learning resources and the possibility of lowering the burden-of-education costs to resource-intensive curriculum.
Building a World-Class Innovation Ecosystem

- Help students and experienced workers navigate career choices through up-to-date career counseling, personalized information, and access to learning resources and business internships. Encourage more interaction between industry executives and career counseling resources and make use of social media to crowd-source, integrate and personalize real-time knowledge about career outlooks, job opportunities and options for skills certification. Special career and technical programs are needed for older workers and veterans leaving military service.

Recommendation # 2
Expand the capacity of community and technical colleges and four-year universities and colleges to achieve a post-secondary education attainment rate of at least 60 percent (degrees and credentials) of the working-age population by the year 2025 to ensure a productive workforce and meet high-demand industry needs.

- Higher education quality must be defined in terms of student outcomes – the quality and relevance of degrees and other credentials. These degrees and credentials must be explicit and transparent to all.
- Policymakers must be able to allocate resources based on required outcomes, and employers must be able to hire graduates with confidence. If a high-quality credential is what students need, then a highly productive higher education system is how we reach the BIG GOAL. For Washington to reach the 60 percent goal, community and technical colleges, and four-year colleges and universities will need to award more than 700,000 additional degrees. Degree and credential production will need to increase by approximately 5,500 – a 5.9 annual percentage increase – each year. If our state continues to increase attainment at the rate we did between 2000 and 2008, we will have a college attainment rate of 49 percent in 2025 – well short of the BIG GOAL of 60 percent.
- Significant changes in the higher education system will be needed. New funding models will be required to build capacity addressing high-demand programs, costs will need to be contained, and resources will need to be reallocated to increase student success. We must have more students complete their certificates and degrees in high-quality programs focusing on high-return occupations. Higher education must use technology to improve lower-cost innovative options for delivering course work that is affordable to the students. High-quality information systems must be available to inform decisions about how to serve the required number of students more effectively.

One excellent place to begin looking for these additional graduates is in the ranks of Washington residents who have completed some college without earning a degree. In 2008, 950,000 Washington residents fit into this category – representing more than 26 percent of the state’s adult population. If only a small portion of this group could be enticed to return to college to complete either a two- or four-year degree, it would go a long way to helping Washington reach the goal of 60 percent higher education attainment. Also, by looking at the geographic distribution of college graduates within the state, policymakers and other stakeholders can begin to work strategically and systematically to close achievement gaps. Another important source of
Recommendation # 3
Expand flexibility of unemployment programs to fund skill development and training of dislocated workers and the long-term unemployed.

Help dislocated workers utilize transferable skills and upgrade skills to fill vacancies created by the restructuring of the economy, and provide the unemployed with learning opportunities to get the skills needed by businesses. Approximately 300,000 unemployed people in Washington are searching for work, and a growing proportion are running out of unemployment benefits. Continue the shift of the unemployment insurance system from temporary income support toward pathways for apprenticeships, training benefits and career transition would help return dislocated workers to the workforce.

Recommendation # 4
Attract and retain the world’s best and brightest minds and entrepreneurs to fill critical skills gaps and grow new enterprises, including greater funding for higher education tied to high demand programs and fact-based visa related reform.
Pillar Two: Invest in Entrepreneurship and Small Business

Why This is Important
The path from an entrepreneurial concept to the marketplace can be quite complex, involving the “push” of new ideas and the “pull” of the market; it is neither linear nor predictable. Although Washington reaps significant economic benefits from its entrepreneurial culture and research activities, our future as a global center of innovation depends on accelerating the commercialization process. Start-up companies and the formation of new regional innovation clusters is the long-term, jobs-creation engine of our economy. According to the Kauffman Foundation,12 most new jobs are created by firms less than five years old, including both technology-based ventures and traditional small business start-ups. According to the U.S. Small Business Administration13, small business (defined as those having less than 500 employees):

- Represent 99.7 percent of all employer firms.
- Employ half of all private sector employees.
- Pay 44 percent of total U.S. private payroll.
- Generated 65 percent of net new jobs over the past 17 years.
- Create more than half of the nonfarm private GDP.
- Hire 43 percent of high tech workers (scientists, engineers, computer programmers, and others).
- Are 52 percent home-based and 2 percent franchises.
- Made up 97.5 percent of all identified exporters and produced 31 percent of export value in FY 2008.
- Produce 13 times more patents per employee than large patenting firms.

Washington State should strengthen the innovation ecosystem that connects researchers, entrepreneurs, mentors, angel/venture funding, incubators and manufacturers, and put in place a robust one-stop shopping support system for small businesses beyond what is being offered by federal and private-sector programs.

Where Washington Stands
Strengths in research and development, and intellectual property need to be more strongly integrated with start-up and commercialization activity.

Human Capital
- Washington ranks second among the states in the proportion of scientists and engineers in the workforce, with much of this talent “imported” from other states.

---

Building a World-Class Innovation Ecosystem

- Washington ranks ninth in high-tech jobs in the manufacturing, software, computer-related services, telecommunications and biomedical industries.
- Washington ranks 12th among the states for the availability of knowledge-based managers, professionals and technicians.

Research and Development
- Washington ranks fourth among the states in R&D intensity – 4.9 percent of state GDP.
- Washington ranks second among the states in the amount of increase of federal R&D investment – 136 percent to $4.7 billion between 2002-2007. This far exceeds the national increase in R&D of 33 percent.
- The Department of Defense is the major federal R&D funder, providing 71.2 percent of the R&D in the state.
- Washington ranks first in the percentage of federal R&D dedicated to industry performers (69.5 percent) and is seventh in overall industry funded R&D.\(^\text{14}\)
- The University of Washington ranked first among public research universities in federal R&D it performed in 2007.
- Washington ranks first for patents produced (171.2 patents per 100,000 workers); an impressive 88.9 percent increase during 2004-2009 compared to national growth of 2.4 percent.

Commercialization Activity
- Washington typically ranks in the top five states in the nation in venture capital funding, behind perennial leaders California and Massachusetts, and competitive with New York and Texas.
- Washington ranks 14th among the states for both Small Business Innovation Research (SBIR) Phase 1 proposals submitted (451) and awards won (90), and 16th for an award-to-proposal conversion rate of 20 percent.
- Washington ranks 10th on the Fast 500 and Inc. 500 lists, with Massachusetts, Virginia, Utah, Maryland and Connecticut comprising the top five.
- Washington ranks 26th among the states in IPO offerings as a share of total worker earnings.
- Washington ranks 31st in manufacturing foreign direct investment (FDI), with Delaware, South Carolina, Connecticut, New Hampshire, and New Jersey having the greatest share of workforce employed by foreign companies.

In summary, Washington ranks very well on many knowledge-creation attributes and less so in commercialization activity. We need to foster more cultivation of home-grown talent and commercialization activity, especially among small business, to create companies with the potential to grow innovation clusters with substantial employment.

\(^\text{14}\) Source: NSF, Survey of Federal Funds for R&D. 2009 Annual Report
Future Assumptions

- Economic growth and job creation relies increasingly on commercializing new knowledge into globally competitive products, processes and services.
- University research centers, federal labs and private R&D teams need to be connected to a responsive and robust innovation ecosystem, with a focus on local/regional manufacturing investment.
- Lack of access to business expertise, and risk-tolerant and scale-up capital act as barriers to rapid technology deployment.

Recommendation #1

Accelerate innovation by proactive support of small business and the best entrepreneurial ideas and talent.

- Expand and focus resources for early-stage start-ups by encouraging and supporting the wide variety of organizations that fuel the Washington innovation ecosystem, including Innovate Washington, the Northwest Entrepreneur Network, the Washington State Microenterprise Association, the Washington Technology Industry Association, the Washington Biotechnology and Biomedical Association, Enterprise Seattle, etc. Early-stage entrepreneurial assistance services are highly fragmented and should be harmonized with unifying themes. With appropriate governance and oversight, Innovate Washington should take the lead in efficiently coordinating such services, and assisting start-ups in business planning, mentoring and identifying sources of financing – complementing existing services from federal and private-sector programs, such as the SBA.
- Expand the Entrepreneur-in-Residence (EIR) program at our research universities to team-up researchers with business professionals. Expand the EIR concept to additional research sites such as federal laboratories, industry R&D centers and innovation partnership zones.
- Expand the STARs program to continue to attract world-class research teams in emerging technology areas with broad commercial potential. The program currently generates a return of more than $5 in federal and private sector funds for every $1 invested. Complete the state’s commitment to recruit 10 world-class innovation research teams in areas of high commercial and job-creation potential. Support the creation of a Center for Aerospace Technology Innovation at UW and WSU. Expand the scope and economic relevance of STARs through private sector matching funding.

Recommendation #2

Enhance the Washington innovation ecosystem through large-scale collaboration and competing aggressively for federal, foundation and investment funding.

- Compete for federal R&D in areas of commercialization potential, including more multi-organizational research projects between universities, national labs and the private sector. The
Building a World-Class Innovation Ecosystem

state should encourage more proposal development for large cooperative innovation projects, and provide matching resources that may be required. The University of Washington continues to be the leading federal R&D recipient among public universities, but its growth rate has fallen well behind other institutions that are striving to catch up.

- Support a strong regional SBIR program through Innovate Washington and university commercialization offices to leverage federal dollars for commercialization activities.
- Provide access to “gap funding” for developing technologies to evaluate their commercial potential and get them ready for external funding. Due to the recession and downturn in the IPO market, venture capital has become more difficult to acquire in the earliest stages of technology development and firm formation.
- Support the University of Washington “W Fund” and other early-stage funds that provide initial funding for promising start-ups in the state.
- Provide assistance in pursuing SBA grants and loans for emerging small businesses in Washington that may not have access to university gap and spin-out funding.
- Consider incentive programs to bring jobs and investment for Washington by companies not headquartered in the state, including both U.S. corporations and foreign direct-investment opportunities. Washington’s growing base of research and commercialization activity, our Pacific Rim location, the quality of life and the efforts taken ensuring an education system to deliver the human talent required are all draws to companies in other regions which should be exploited.
- Launch a robust FDI initiative in partnership with the EB5 regional centers and overseas representatives to attract foreign and out-of-state investment and support immigrant investors.

Recommendation #3
Target improvements to regulatory and tax policy to foster business development and job creation.

- Provide incentives for emerging technology clusters via an enhanced Innovation Partnership Cluster program that pulls companies and researchers together to attack problems with both societal and economic benefits; for example, clean water, cyber security, biomedical, clean energy, next-generation manufacturing, agriculture technology, etc. One approach for financing faster cluster growth and job creation is by incremental sharing of tax revenues or fees above a specified growth rate for investment in industry-directed collaborative projects such as R&D, workforce training and export development. Industry associations have expressed strong interest and support for this concept.
- Provide operational support for Innovation Partnership Zones (IPZ) and capital projects that are aligned with IPZ business plans. Fourteen IPZs are presently designated by the state to accelerate the growth of regional innovation clusters. Provide a minimum of $1 million (competitively awarded) to strengthen the internal and external relationships necessary for collaborative innovation. State funding should be 50 percent matched by the local IPZ and its partners. The state should invest and support capital projects that are integral to achieving IPZ objectives, innovation infrastructure and business plans.
- Reduce start-up costs wherever possible. The state Department of Commerce (Commerce), in collaboration with the Department of Revenue, should examine ways to reduce start-ups costs, such
Building a World-Class Innovation Ecosystem

as deferral of Business and Occupation (B&O) taxes until the firm is profitable. Other strategies for early-stage financing include granting tax credits to qualified angel investors for the early stages of a start-up. A study should be conducted on the potential risks and benefits of investing a small portion of state pension fund assets in promising high growth, innovation-based companies.

• Remove regulatory barriers for new technology development and start-ups. The regulatory environment can pose formidable cost, administrative and time barriers to start-ups. There are numerous examples of small business enterprises stymied in moving forward with investments because regulatory requirements and standards were not flexible or timely enough to accommodate the introduction of a new technology. Commerce and the state Office of Regulatory Affairs should undertake an assessment of state and federal regulatory processes confronting technology-based start-ups, the testing and certification of innovative prototypes, and large-scale deployment of new-to-market products, processes and systems.

• The structure of B&O incentives should be shifted from the past practice of a patchwork of open-ended incentives to reward industries, clusters or sectors that are growing faster than population growth.

• Make permanent state tax incentives for R&D and advanced/high tech manufacturing for both existing and emerging companies and industries.

• Extend the aerospace tax incentive for pre-production expenses of the Boeing 737 MAX from 2024 to 2034 to align to expected production duration and lifecycle.
Pillar Three: Modernize Infrastructure and Regulations

Why This is Important
- Leveraging the innovation, manufacturing, service, and agriculture assets of the state requires a modern infrastructure capable of moving people, goods and ideas efficiently. Productivity is closely tied to infrastructure systems.
- The regulatory environment has an enormous influence on the timing, location and cost of investment and hiring decisions. Regulation is not only about the rules, but *compliance*. Streamlining compliance will help firms save costs without compromising the protections intended.
- Vulnerabilities in oil supply and the externalities associated with carbon-based fuel sources will drive change in the energy portfolio of the world. Infrastructure systems that support the adoption of cleaner energy sources will create more opportunities to make Washington a research, development and commercialization center for new technologies and growth of clean-technology industry clusters.
- Access to broadband infrastructure is critical to the development of rural and distressed areas, and bridging the digital divide in our state. Furthermore, broadband is an enabling platform for rapidly growing business sectors such as interactive media, e-commerce, social networking, online education, health IT systems and delivery of public services.

Where Washington Stands
Washington has ranked well compared to other states in its share of bridges deemed structurally obsolete (sixth lowest share) and 11th lowest in vehicle miles traveled per resident. However, we ran 42nd for *functionally* obsolete bridges and 16th for roads that are in “good” or “very good” condition. Washington has one of the busiest port systems in the nation, with more than $164.1 billion in goods passing through customs in our state in 2011. However, more competition and further growth of international trade is adding stress to the system. Washington’s rankings of 20th with respect to the regulatory environment, 21st as to business costs, and 26th on Quality of Life are economic development concerns.\(^\text{15}\)

Future Assumptions
- Infrastructure investments will give higher priority for economic development objectives. Regulatory processes impose costs-of-doing business, and pose significant barriers to increased business investment and hiring. Regulations, and associated compliance processes to comply, should be carefully vetted so as not to impose unnecessary costs-of-doing business.
- Overall levels of public infrastructure spending will likely fall as stimulus programs wind down and the public sector addresses fiscal restraints.

---

\(^\text{15}\) Regulatory environment as measured by Forbes state business environment rankings includes an index from Pollina Corporate Real Estate that measures tax incentives and the economic development efforts of each state. Other metrics include the Tort Liability Index from Pacific Research Foundation, as well as the regulatory component of PRF’s U.S. Economic Freedom Index. Other factors include Moody’s bond rating on the state’s general obligation debt and the transportation infrastructure including air, highway and rail. Credit is given to those states that are right-to-work states.
Building a World-Class Innovation Ecosystem

- Infrastructure priorities are likely to emphasize alternative energy and reduced carbon output, and anticipated response to climate change.
- Various economic, national security, climate, and technological trends will accelerate the transition to alternative energy sources and electric transportation systems.
- Communications infrastructure will continue to be primarily a private-sector activity.

Recommendation #1
Develop alternative, sustainable financing mechanisms for transportation infrastructure to ensure basic asset preservation and investment in economic corridors.

Current revenue sources are not sustainable going forward. The vast majority of investments to date are for preservation of the existing transportation system, with little left over to build out new, business productivity-enhancing facilities and expansions. Moreover, existing funding sources for general transportation projects are on a downward trend. The fuel tax will continue to contract as a revenue source as drivers shift to electric cars, higher fuel economy vehicles and alternative modes of transportation. For instance, between March 2007 and 2023, fuel tax revenues are projected to fall by more than $5 billion, and the elimination of the Motor Vehicle Excise Tax will cut annual revenues by another $750 million. Since 2001, real funding for maintenance and operations of the existing transportation system declined 49 percent, while construction costs have risen 77 percent. Sales tax revenues, which provide 70 percent of the funding for local transit agencies, declined sharply during the current recession.

- The state must devise long-term financing mechanisms that ensure sufficient funds available to invest in important bottlenecks in each of our state’s economic corridors. The Connecting Washington Task Force identified several possible, state-level alternative revenue sources, including an electric vehicle fee, a gross vehicle weight fee and a vehicle-miles-traveled tax.16

Recommendation #2
Prioritize infrastructure investments of national significance that can make Washington a global leader in areas such as energy efficiency, clean-water solutions, advanced manufacturing, sustainable in urban design, and broadband deployment.

- Work with the congressional delegation and other regions to ensure a fully-funded federal transportation reauthorization act that includes a national freight mobility program. Leverage the Washington State congressional delegation to improve statewide access to federal infrastructure programs, including in energy, transportation and broadband.
- Partner with other regions as joint pilot locations for nationally significant investments. Such investments can both bring in additional needed infrastructure dollars and raise Washington’s competitiveness vis-à-vis other major economies around the world.

---

16 To view the complete list of potential funding sources, see table 9 (page 22) in the Connecting Washington report (2012).  
Recommendation #3
Recommendation #3
Require the use of economic development and sustainability criteria in the state’s capital budgeting process and selecting project investments.

- Focus infrastructure projects on economic development benefits. Of the hundreds of projects currently underway, the vast majority are for safety, maintenance and preservation. These projects are important, but there needs to be a new emphasis on economic development. One approach would be to identify infrastructure bottlenecks that directly affect employment-based industry clusters around the state. Some of these needs include funding of freight-related road projects, rail corridor expansion and future airport capacity.
- Improve economic development impact analysis for infrastructure projects. To foster linkages to economic development, better data is needed on how infrastructure systems impact business productivity and performance. For example, there is no universally accepted best practice for evaluating the economic development impact of transportation projects. We recommend organizing a collaborative effort between the Commerce, Ecology and Transportation departments to establish a meaningful set of metrics that help policymakers understand critical areas in need of investment for economic development; currently available data is very limited.
- Embrace technological innovations and deploy technology assets across infrastructure investments – e.g., broadband, highway, and electric grid – to grow Washington’s economic corridors. Expanding the state’s broadband network is critical to assisting underserved areas and accommodating explosive growth in digital products and services, collaborative activity, big data, health care, and education. Commerce has already initiated efforts to track the impacts of broadband on local communities and regional economies. Continue to support data collection and tracking, and use findings to inform continued state funding for broadband after federal ARRA funding expires.

Recommendation #4
Find ways to reduce regulatory burdens and the cost of regulatory compliance to help companies grow their businesses in Washington.

- Prioritize current state agency Lean efforts to address key compliance processes required of young, growing businesses; optimize access to regulatory compliance resources.
- Eliminate state agency scope overlap and streamline decision-making processes for regulatory approval and permitting applications. Policymakers should support single-access portals for permitting and compliance information that are aligned across state departments and agencies.
- Survey the business community to identify regulatory barriers in the state and remove those that measurably reduce the ability of the business community to invest and grow, while not fulfilling their intended public policy purpose. The state should focus on the minimum regulation necessary to maintain health and safety, and limit environmental impacts, with the goal of promoting the highest level of efficient and innovative economic development and business growth.
- Direct the broadband office in Commerce to help local governments figure out how to better leverage broadband networks to deliver their services more cost effectively; doing so will help to provide a low-cost model for sustaining their networks in rural communities.
Pillar Four: Expand International Business

Why This is Important
- Exports create good paying jobs. Households continue to deleverage, dampening the role of domestic consumption in national economic growth for the foreseeable future.
- Over the coming years and decades, global growth will be driven by economies outside the United States, including China, Brazil and India.
- Washington is well positioned to be a center of global commerce in goods, services and ideas – not simply surviving in a globalized economy, but thriving in it.
- A robust exporting sector will provide new opportunities for innovation and business growth, and be a substantial driver of job creation.
- Services exports are a large and growing component of the Washington economy.

Where Washington Stands
- Washington merchandise and commodities exports (“goods exports”) in 2011 were $64.6 billion, an increase of 21.1 percent over 2010.
- Following a decline in 2010, aerospace exports reached $27.2 billion in 2011, a 16.5 percent increase over 2010.
- After removing soy, corn and rice exports (which are only consolidated in Washington and not grown in the state), Washington exported $58.1 billion in 2011, a 24.3 percent increase over 2010.
- Agriculture and food exports (stripping out soy, corn and rice) surged 37.3 percent in 2011, reaching $8.6 billion. Wheat exports reached $2.8 billion, a 122.9 percent increase over 2010.

Future Assumptions
- Globalization – the interconnectedness of markets for goods, services, capital and labor – will continue to intensify over time, but at an uneven and unpredictable pace.
- State capitalism (e.g., China) is rising as a source of competition.
- Washington ports will confront more competition from Canada, California and East Coast ports as the Panama Canal is widened and potentially new Arctic shipping lanes open.
- Slow economic recovery in the United States and uncertainty in global markets will increase protectionist pressure and threaten to escalate trade disputes into high-risk trade wars.
- State fiscal constraints will challenge policymakers to seek creative new partnerships with the private sector to promote export growth.

The following recommendations will help increase Washington’s international competitiveness and realize the goals of the Governor’s State Export Initiative to increase the number of exporting companies by 30 percent and provide export assistance to 5,000 businesses to help them achieve $600 million in new export sales by 2015.
Recommendation #1
Expand export assistance services and re-establish and increase investment in overseas representation to augment Washington’s international competitiveness and realize the Governor’s Export Initiative goals.

- Invest more aggressively in export assistance and ensure adequate overseas representation of our state economic interests. Instead of curtailing our export assistance efforts, we should be aggressively moving forward to penetrate new markets and promote our innovative culture, investment opportunities, and products and services. Having a greater overseas presence also raises Washington’s profile as a place to invest.

In fiscal year 2011, the state Department of Commerce’s (Commerce) export assistance program supported export sales of $147.5 million. Based on updated calculations equating $185,000 in export sales with one job, this export assistance supported up to 797 jobs last year. The state Department of Agriculture supported export sales of $94.3 million in fiscal year 2011, supporting an estimated 754 jobs17 and helping generate $3.78 million in tax revenue ($2.79 million more than the program’s state-funded budget).

A total of 7,963 companies exported from Washington locations in 2009 (most recently available data). Of those, 7,193 (90 percent) were small- and medium-sized enterprises with fewer than 500 employees. More job creation can be realized – only 4 percent of Washington’s small- and medium-sized goods producers export today. Export vouchers are a promising technique for efficiently allocating export assistance services for specific company needs.

Recommendation #2
Double the number of state-led, new-to-market, cluster-based trade missions (including services industries) to increase the number of new-to-market exporting firms.

- Trade missions provide crucial introductions between Washington businesses and prospective overseas buyers. The state usually leads between two and four trade missions a year (including Governor’s delegations and agency-led missions). These missions are particularly valuable and impactful in emerging economies where state capitalism plays a significant role in commerce. Working with clusters facilitates greater reach and economies of scale for state export assistance programs by partnering with cluster-based organizations. Government organization and leadership can open doors otherwise closed to Small and Medium Sized Enterprises (SMEs).

17 A different ratio is used to calculate jobs created through food and agriculture exports. According to the U.S. Department of Agriculture, every $1 billion of food and agriculture export sales represents 8,000 jobs (2010), a ratio of eight jobs for every $1 million in exports.
Recommendation #3
Optimize the state’s existing export assistance ecosystem to provide a robust and demand-driven suite of services and connections available to Washington State companies.

- With many programs facing fiscal constraints, organizations and programs around the state should strengthen collaboration to achieve better economies of scale, to the benefit of state exporters. The state, in collaboration with associations and local economic development organizations, should facilitate the creation of a private sector-led export support council. Activities should include regular meetings among stakeholders and partners to:
  - Clarify each entity’s core competencies and strengths.
  - Share information and jointly strategize ways to expand the number of exporting companies and attract additional federal money.
  - Jointly convey this system to companies across the state.

The group will function in tandem with Commerce’s Export Working Group, but be more focused on direct client engagement.

- Leverage the many existing international partnerships and linkages among the state’s multinational corporations (MNCs) to help other firms connect with exporting opportunities. Many of the state’s largest companies have strong international linkages beyond their direct business, offering potential exporting opportunities for SMEs in the state. The departments of Commerce and Agriculture should work with these MNCs to identify these opportunities and broker introductions with SMEs.

Recommendation #4
Intensify innovation collaboration in the Pacific Northwest economic region by supporting cross-border research and development projects that can lead to commercialization, diversification and expansion of trade opportunities.

- Open new pathways for job creation by intensifying cross-border policy development. Washington is the economic hub of the greater Pacific Northwest region, which if it were one country would make it the 14th largest in the world. We should improve collaboration with neighboring states and Canadian provinces in such areas as research partnerships, access to education, venture capital, transportation, energy management, water resources, climate change, regulatory harmonization, immigration and trade. In 2012, Washington will be featuring its commerce and innovation role during the 50th Anniversary Celebration of the 1962 World’s Fair.
IV. A World-Class Innovation Ecosystem

Our state is bristling with innovative clusters and a selected portfolio is highlighted in the graphic below. The potential for growing and scaling this portfolio is enormous. It directs our policymaking to the grounded interactions by which real companies in real places work on developing their business, serving customers, managing supply chains, developing employees, designing new products and expanding their markets. The regional level includes the education system; the entrepreneurs and infrastructure to move people, goods, ideas and energy efficiently; and the institutions to educate and train the workforce of the future. The federal government is also embracing regional innovation clusters as a national framework for economic development.

**Talent.** The talent pools we create in the state should be available to innovators no matter where they choose to locate. Whether acting as service providers or independent agents, individuals with specialized skills can make those skills widely accessible outside of traditional metropolitan markets.

**Innovation and Entrepreneurship.** The seeds of innovation are everywhere in the state and we can help them blossom by bringing the basic elements of innovation ecosystem to them. Entrepreneurs should not have to travel far to gain access to knowledge and services they need to move their ideas into the marketplace.
Infrastructure. The networks of entrepreneurs and service providers are all linked through infrastructure. Products and people move along transportation corridors, ideas move along information corridors, and the state connects to the world through ports and airports.

Globalization. Networks of globally-connected people and organizations allow entrepreneurs anywhere in the state to access world markets.

At the center of our effort to evolve Washington into the world’s greatest innovation ecosystem are openness, communication and cooperation. We need to break down the silos of organization that limit the scope of our activities and we need to break down the geographical barriers that keep us confined to our respective areas of the state. The synergistic opportunities are huge, but only if we stop thinking about programs, boundaries and distances, and start thinking about flexible, open statewide networks that move resources efficiently to the people and places driving innovation.

In sum, future prosperity will not come from through rigid programs directed from Olympia or Seattle, but from flexible, nimble management of policy and resources in response to exciting developments happening anywhere in the state.

Implementation: What Results Are We Seeking?

If the recommendations are successfully implemented, we are confident that business performance will be enhanced, jobs will be generated, higher wages will be paid, and exports will increase. Furthermore, these measures will:
- Prepare a skilled, flexible and adaptable workforce for high-demand occupations, and scaling up of regional innovation clusters.
- Accelerate industry/university/lab commercialization, new product development, productivity improvement, and export expansion.
- Diversify Washington’s economic base with knowledge-intensive companies.
- Strengthen collaboration between innovation clusters and avoid costly duplication of assets and effort.
- Position the state to educate, attract and retain world class research and entrepreneurial talent.
- Compete for an increased share of federal, state and private investments in science, technology and start-up companies.
- Ensure that adequate financing tools are available for next generation infrastructure, such as alternative energy, broadband and electric transportation.
- Align public policies and funding mechanisms to respond flexibly to regional economic growth and job creation priorities.

The Commission’s recommendations are not all dependent on new funding; what is more important is making funding more predictable and more flexible. In particular, we call for more “local leadership” and financing tools at the regional level to raise necessary capital for each region’s unique economic
development objectives and priorities. We also consider it essential for the business community to take a more active strategic leadership role for the industries and clusters in which they participate.

Our vision for Washington is a place where citizens have access to the best learning resources in the world and are encouraged to capitalize on their abilities to create prosperity for themselves and for others. It is a place that has a global outlook, looking to emerging markets and nurturing collaboration across its diverse geography and industry clusters. It is a place that is a magnet for creative and entrepreneurial people and enterprises – where innovation is open and everyone can participate and share in its benefits.
Appendix 1

Excerpts of Senate Bill 5741 passed by the Washington State Legislature
Signed by Governor Christine Gregoire – May 10, 2011

The legislature finds that in order to achieve long-term global competitiveness, prosperity, and economic opportunity for all the state's citizens, Washington must become the most attractive, creative, and fertile investment environment for innovation in the world.

The legislature finds that the state must take a strategic approach to fostering an innovation economy, and that success will be driven by public and private sector leaders who are committed to developing and advocating a shared vision and collaborating across organizational and geographic boundaries. The legislature therefore intends to create an economic development commission that will 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.

The Washington State Economic Development Commission is established to assist the governor and legislature by providing leadership, direction, and guidance on a long-term and systematic approach to economic development that will result in enduring global competitiveness, prosperity, and economic opportunity for all the state’s citizens.

(1) The commission must concentrate its major efforts on strategic planning, policy research and analysis, advocacy, evaluation, and promoting coordination and collaboration.

(2) During each regular legislative session, the commission must consult with appropriate legislative committees about the state’s economic development needs and opportunities.

(3) (a) By October 1 of each even-numbered year, the commission must submit to the governor and legislature a biennial comprehensive statewide economic development strategy with a report on progress from the previous comprehensive strategy.

(b) The comprehensive statewide economic development strategy must include the industry clusters in the state and the strategic clusters targeted by the commission for economic development efforts. The commission must consult with the workforce training and education coordinating board and include labor market and economic information by the employment security department in developing the list of clusters and strategic clusters that meet the criteria identified by the working group convened by the economic development commission and the workforce training and education coordinating board under chapter 43.330 RCW.

(4) (a) In developing the comprehensive statewide economic development strategy, the commission must use, but may not be limited to economic, labor market, and populations trend reports in office of financial management forecasts; the annual state economic climate report prepared by the economic
climate council; joint office of financial management and employment security department labor force, industry employment, and occupational forecasts; the results of scientifically based outcome evaluations; the needs of industry associations, industry clusters, businesses, and employees as evidenced in formal surveys and other input

(b) The comprehensive statewide economic development strategy may include:

(i) An assessment of the state’s economic vitality;

(ii) Recommended goals, objectives, and priorities for the next biennium, and the future;

(iii) A common set of outcomes and benchmarks for the economic development system as a whole;

(iv) Recommendations for removing barriers and promoting collaboration among participants in the innovation ecosystem;

(v) An inventory of existing relevant programs compiled by the commission from materials submitted by agencies;

(vi) Recommendations for expanding, discontinuing, or redirecting existing programs, or adding new programs; and

(vii) Recommendations of best practices and public and private sector roles in implementing the comprehensive statewide economic development strategy.

(5) In developing the biennial statewide economic development strategy, plans, inventories, assessments, and policy research, the commission must consult, collaborate, and coordinate with relevant state agencies, private sector businesses, nonprofit organizations involved in economic development, trade associations, and relevant local organizations in order to avoid duplication of effort.

(6) State agencies must cooperate with the commission and provide information as the commission may reasonably request.
Appendix 2
Innovation Partnership Zones

Innovation Partnership Zones (IPZs), launched in 2007 by the Washington State Legislature, consist of 15 designated “hot spots” in the state. The IPZs develop new technology; new partnerships between public, research institutions and the globally competitive firms. The current IPZs, with diverse focuses, are administered by the Washington State Department of Commerce, and are integral to the development of the “grass-roots” economic development ecosystem of Washington State.

**AUBURN**
*Urban Business Center for Innovative Partnerships*
Innovations and new business markets through public/private research partnerships and the reinvention of industrial properties into market affordable mixed use business clusters. Contact Doug Lein at (253) 804-3101

**BELLINGHAM**
*Waterfront Innovation Zone*
Industrial design, advanced materials and fuel technologies in areas such as clean transportation, marine and renewable energy. Contact Dodd Snodgrass at (360) 676-2500

**BOTHELL**
*Bothell Biomedical Manufacturing Innovation Partnership Zone*
Promoting the growth and expansion of the biomedical manufacturing cluster, including med tech and pharmaceutical companies, through programs centered on branding, funding, networking, education and secondary industry support. Contact Terrie Battuello at (425) 489-3387

**CLALLAM COUNTY**
*North Olympic Peninsula Innovation Partnership Zone*
Ocean energy research, technology engineering and development, maritime deployment, operations and maintenance that will deliver sustainable renewable energy from the region’s coastline to the region, state and west coast. Contact Linda Rotmark at (360) 457-7793

**GRAYS HARBOR**
*Grays Harbor Innovation Partnership Zone*
Advanced manufacturing clusters with research and development focus on biofuels and bio-based product manufacturing. Contact Mary Nelson at (360) 533-9504

**KING COUNTY**
*King County Financial Services Collaborative*
Growing the financial services industry through regulatory changes, workforce education, domestic and international marketing/promotion, and product differentiation. Contact Jeff Marcell at (206) 389-8654

**KITTITAS COUNTY**
*Central Washington Resource Energy Collaborative*
Renewable energy technologies development, particularly wind and solar. Contact Tony Aronica at 509-962-7244
Building a World-Class Innovation Ecosystem

PULLMAN
Pullman Innovation Partnership Zone
Clean information technology and datacenter technologies, smart grid technologies, smart farm and smart home technologies. Contact Don Tilton at (509) 552-5116

REDMOND
Interactive Media and Digital Arts Innovation Partnership Zone
Fostering an interactive media and digital arts cluster through education, research, workforce development, entrepreneurship workshops and events, and creation of a regional interactive media accelerator. Contact John Marchione at (425) 556-2101 or Jeff Marcell at (206) 389-8654

SEATTLE
South Lake Union Global Health Innovation Partnership Zone
Vaccine and immunology research, cancer research, infectious disease research, medical devices and health technologies. Contact Tina Vlasaty at (206) 684-3348

SNOHOMISH COUNTY
Aerospace Convergence Zone
Research in new materials and processes for aircraft production. Contact Mary Jane Brell Vujovic at (425) 921-3405

SPOKANE
Spokane University District Innovation Partnership Zone
Biomedical research such as computational biology, bioinformatics, systems biology, epigenetics, genomics, chromosomal biology, and drug discovery and clean energy technologies. Contact Robin Toth at (509) 321-3636

TACOMA
Urban Clean Water Technology Zone
Clean water research and technology transfer including analysis of water pollution in urban environments, stormwater management practices, clean water management applications and policy development. Contact Martha Anderson at (253) 591-5207

TRI-CITIES
Tri-Cities Research District
Research in sustainable development, with focus on integrated electrical-thermal production, solar dish generating systems, and commercial-scale fuel cells. Contact Diahann Howard at (509) 375-3060

WALLA WALLA
Walla Walla Valley Innovation Partnership Zone
Water conservation and management, wine and hospitality cluster, and alternative energy. Contact Tim McCarty at (509) 527-4540

For more information about this program, please contact:
Mary Trimaro
mary.trimarco@commerce
Appendix 3
Strategic Targeted Academic Research (STARS)

The Strategically Targeted Academic Researchers program (STARS) began in 2007. The state of Washington provides support for the recruitment of entrepreneurial researchers, bringing individuals with the knowledge, skills and ability to generate research products and innovations with direct commercial applications. The program fosters both product innovation and longer-term statewide economic development. The strategic direction of the STARS program is managed by the Washington Economic Development Commission (WEDC), which also oversees the performance criteria of the program.

The WEDC, working with the Washington Education and Training Coordinating Board, is chartered to recruit 10 lead entrepreneurial researchers over the 10-year period, 2007-2017. As of Winter 2012, six STARS had been recruited.

University of Washington - STARS

*Michael Hochberg, UW  
Nanophotonics

Daniel Kirchen, UW  
Smart Grid

Jonathan Posner, UW  
Next Generation Batteries & Fuel Cells

Jihui Yang, UW  
Next Generation Batteries & Energy Recovery

Washington State University - STARS

Birgitte Ahring, WSU  
Biofuels

Chen-Cheng Liu, WSU  
Smart Grid
STARS is designed to bolster the state’s innovation capacity in emerging technology fields with high commercial potential. The STARS program has incorporated the WEDC’s definition of innovation as the process of transforming an idea into a commercial product, process or service that has value to a customer. If the technology is commercially successful, the downstream economic benefits are significant: increases in revenues, exports, jobs, incomes, and wealth creation. By building on the strengths of the state’s research universities across a number of disciplines, Washington can shape the direction of emerging technologies and foster the critical relationships for commercialization. The STARS program today is already evolving into a larger innovation ecosystem that is characterized by:

- Early interaction between research and business as a key commercial success factor.
- Integration of technical advances (push) with emerging market demand (pull).
- Leveraging of federal and private sector R&D.
- Collaboration as a core competency for business partnerships, networks and investors.
- Entrepreneurship as a vital ingredient.
- New sources of growth and competitive advantage.

The STARS advisory committee recommended, and the WEDC has established, that during each biennial funding cycle, first-year funding goes to the recruitment package for a STAR, followed by one year of support for the newly hired researcher. It is important to note that although the STARS program benefits the researcher for only two years, the STARS team continues to accumulate return-on-investment well beyond the initial investment.

**STARS Program Performance Metrics**

**Recruiting**
- Number of STARS researchers recruited
- Number of STARS researchers hired
- Size of STARS teams

**Activity**
- Number of scholarly publications
- Number of inter-institutional collaborations
- Number of Entrepreneurs in Residence

**Impact**
- Research dollars from federal sources and foundations
- Research dollars from industry
- Tech startups based on STARS technology
- First-round investment in tech startups
- Total investment in tech startups
- Licenses of STARS technology to third parties

**Review**
- Satisfaction survey
- Number of jobs created

To date each dollar invested by Washington has leveraged approximately $4. Quarterly program reports are posted on the Washington STARS website: [www.WASTARS.org](http://www.WASTARS.org)
Appendix 4
Entrepreneurs-in-Residence (EIRs)

Entrepreneurs-in-Residence capitalize on Washington’s strong entrepreneurship history by housing leading, locally based entrepreneurial executives directly at the universities to collaborate with university researchers. The entrepreneurs contribute necessary expertise for transforming research and intellectual property into viable business strategies, plans and start-ups. After a short period of operation, the program has seen dozens of potential spin-outs in the pipeline converting university intellectual property into private businesses and jobs. The EIR also provide an expert resource for the university’s other initiatives that foster entrepreneurship and industry relations. EIRs are seasoned entrepreneurs and business executives working “shoulder-to-shoulder” with researchers whose work may have commercial relevance. They collaborate with start-up teams on identified business opportunities. These industry experts provide expertise, guiding teams on product development and market development efforts as they explore funding opportunities and staffing needs. This collaboration, and coordinating of resources, evolves ideas from initial concept all the way through to first-stage start-up financing, and is a new direction for encouraging intellectual property to “spin-out” into private sector businesses.

In 2011, the Legislature expanded the EIRs program by adding a regional Entrepreneurs-in-Residence. The pilot regional EIR, working closely with the Northwest Innovation Resource Center, is located in the Whatcom County area, working to identify and commercialize intellectual property at non-research institutions and mobilize the community to launch new startups.

Current University of Washington Entrepreneurs-in-Residence
Rob Arnold – cloud computing and Internet security solutions.
Ronald Berenson, medical oncologist – mAb-based therapeutic products used to treat cancer, biopharmaceuticals, antibody-based immunotherapies, and commercialized stem cell harvesting methodologies for hematology and oncology applications.
Lars Johansson – Cleantech angel investor, Energy/Cleantech space, and IT
Michael “Luni” Libes – mobile market research and analysis, enterprise collaboration systems, pen computing, PDAs, and early smart phones
Ken Myer – extensive knowledge of the state’s technology sector, led companies ranging from startups to those at the Fortune 100 level, worldwide marketing, sales, technical, and customer service teams. Works with faculty on information technology-related research that might have licensing or new company opportunities.
Ted Weiler – R&D and marketing of medical devices, development and clinical application of unique technologies in ultrasound, defibrillator monitors, products for the pediatric, surgery, inhalation therapy, as neonatal neurology products for the detection and treatment of brain injury.
Chris Wood – 3D medical image visualization and image guided surgery, CAD detection for Breast MRI holding several of his own patents in the areas of image post processing, registration, CAD and visualization.
Emeritus UW EIRs

Stephanie Amoss, Healthcare and Medical Device Consultant

Henry Berg, Engineering Executive and Former Director at A3 Alliance, LLC

Gino Borland, Serial Entrepreneur and Energy Angel Investor

Terri Butler, technology entrepreneur, former product developer at 3M Company

Jeff Canin, energy angel investor, former venture capitalist, investment banker, and Wall Street analyst
and co-founder of 3 energy related companies

Tom Clement, co-founder and former CEO of Pathway Medical Technologies and board chairman of the WBBA

David Croniser, former pioneer of Diagnostic Imaging at Siemens

Michael Cockrill, managing partner of Atlas Accelerator and former CTO of QPass

Perry Fell, board chairman and former CEO of NanoString Technologies and co-founder of Seattle Genetics

Alex St. John, founder of Wild Tangent and former Microsoft gaming evangelist

David Kaplan, electric vehicle entrepreneur previously at GridPoint

Deborah Kessler, former senior executive at Acucela and Rosetta Inpharmatics

Richard Mander, former executive at Apple, Human Ware, and Big Screen Live

Thomas Schulte, veteran of medical device research and development at BD

Bob Wilcox, former senior biomedical executive at EKOS and LifeSpex

Current: Washington State University Entrepreneurs-in-Residence:

Kevin Petersen – Food Chain Safety (FCS) commercial deployment of Microwave Sterilization technology.

Lewis Rumpler – M3 Biotechnology around Joseph Wright and Jay Harding’s anti-dementia, anti-cancer, anti-angiogenic, and pro-wound healing technologies.

Robert E. Schilling – Mayfield Bioscience, a company created around John Alderete’s Trichomonas test technology.

Karen Fleckner – Nu Element, Inc, based on Su Ha’s fuel cell systems technology.

Tom Murphy – Positron Analytical Services, a company created around Kelvin Lynn’s semi-conductor inspection technologies.

Therus Kolff – development of a commercial opportunity around a novel CZT composition developed in Kelvin’s Lynn lab. CZT is a semiconductor material that is used in systems that detect gamma-ray’s.

Dan Leatzow – is focused on the development of microfluidic separation devices for the detection and quantization of low-abundance biomolecules. The underlying technologies from Neil Ivory’s lab provide the means for the selective concentration and quantization of specific cardiac biomarkers for early stage detection of acute cardiovascular stress.

Justin Thornley – working toward the initial tests needed to achieve FDA approval for Sankar and Uma Jayaram’s WSU bone and joint replacement technologies under the company Intellepedics.
**Building a World-Class Innovation Ecosystem**

**Current Regional Entrepreneurs in Residence at Northwest Innovation Resource Center**

NWIRC has signed an agreement with the MBA program in the College of Business and Economics (CBE) at Western Washington University (WWU) to provide students the opportunity for applied experience working with local entrepreneurs.

**John (Skip) Dise** – Skip is currently working with Clean Power Research (a privately-held software company designing tools for solar) in Kirkland, where he is studying the effect of high penetration solar on the forecast penalty structure within a load balancing area.

**Satpal Sidhu** – is currently President / Chief Operating Officer of Sunlogics Inc. / Epod Solar Inc. Kelowna, BC. It is a solar power generation and solar modules manufacturing company engaged in development and construction of rooftop and utility scale solar power installations in USA, Canada, Germany, UK and China. In his role of managing overall company operations, he has managed development and construction of a 10 MW Solar Power project in Ontario, Canada, participated in the preparations for the public stock offering and liaison with financial institutions / investor groups, developed project plans to establish solar module manufacturing plants in Germany and USA.

**Entrepreneurs-in-Residence Program Performance Metrics**

**Activity**  
*Number of scholarly publications*  
*Number of inter-institutional collaborations*  
*Number of Entrepreneurs in Residence*

**Impact**  
*Research dollars from federal sources and foundations*  
*Research dollars from industry*  
*Tech startups based on institutions/regions technology*  
*First-round investment in tech startups*  
*Total investment in tech startups*  
*Licenses of institutions/regions technology to third parties*

**Review**  
*Satisfaction survey*  
*# of jobs created*

Quarterly program reports of the are posted on the Washington STARS website: [www.WASTARS.org](http://www.WASTARS.org)
Appendix 5
WEDC Policy Research Projects Completed

Defense Department: Connecting to Opportunities
The biggest potential customer for innovation in Washington is the U.S. Department of Defense. This research project quantified the enormous impact of the defense cluster on Washington’s economy and points to ways businesses in the state can capture more of that value. The study found that the military contributed a total of $12.2 billion (2009 data) to the state’s economy, accounting for 8 percent of labor income and 4 percent of total economic activity. But in spite of all this spending the state has not done a good overall job of highlighting the impact of the military on the state and connecting the military with businesses in the state to maximize opportunities. The report made a number of recommendations for the state to expand its partnership with the defense cluster.


Manufacturing: Building on Strengths
This project described some of the troubling trends in manufacturing and provides recommendations on how to reverse them. Sustaining innovation in manufacturing requires a strong focus on R&D and a continued influx of talent and capital. The final report discusses the major challenges facing workforce development, including demographic shifts, the growing skills gaps and promoting manufacturing as a viable career choice. Maintaining an adequate infrastructure in transportation, energy and broadband are also essential for maintaining a strong manufacturing base in Washington. The report calls on a new emphasis to increase exports by small- and medium-sized businesses.

Washington State Manufacturing Within the Global Market.

Electric Vehicles: The Case for Regulatory and Policy Modernization
A challenge for innovators is fitting new technologies and products into existing regulatory and policy frameworks. Few areas illustrate this better than the process of shifting our nation’s vehicle fleet from petroleum power to electric power. This project showed that Washington has the potential to be at the center of this revolution, taking advantage of our information technology resources, green power and progressive consumers. This report discusses a strategy for positioning Washington as the leader in this new industry.

Electrification of Transportation: An Economic Development Road Map.

Federal Funding: Breaking Down the Silos
The federal government provides billions of dollars in funding each year to promote various initiatives related to economic development, but accessing this funding can be a source of real frustration. Programs are housed in individual federal agencies, creating silos that appeal to very specific actions, but do not consider the whole impact of a project. New efforts are being made to break down these silos and direct money to fostering “innovation clusters.” This project detailed the thinking behind innovation clusters and recommends actions the state can take to increase the chances of success in competing for funding.

Regional Innovation Clusters: A Strategy to Compete for Federal Funds.
Building a World-Class Innovation Ecosystem

Policy Innovations Around the World
This research project addressed economic development practices around the nation and the world in four areas critical to the state’s future competitiveness – expanding exports, attracting talent, nurturing innovation and entrepreneurship, and promoting life sciences. A key WEDC objective is actively learning from the world what policy ideas are working and considering their merits for adoption in Washington State. This report begins to fill in this picture by benchmarking innovation policies of other states and nations and recommends several ways Washington could improve its performance. A number of the policy innovations became the basis for legislative action, including using CERB funds for export assistance, improving online tools for export assistance, creating mechanisms for self-financing cluster development, extending the state R&D tax credit, promoting the EB-5 immigrant investor program, and STEM related education initiatives. Innovation Policy: Opportunities for Washington

Measuring the Washington Innovation Economy
A successful economic development strategy, be it for a nation, state, region or business, must be supported by sound assessments of the competitive situation and an effective system for measuring progress and results. The WEDC collaborated with state agencies and economic experts to define the most useful metrics for tracking performance in five broad categories: talent, investment, infrastructure, exports, business operations and public impact. The WEDC intention is to shape a consensus on a shared dashboard of innovation metrics. High quality, relevant and timely metrics that recognize the interrelated dynamics of innovation will help inform policymakers and public on the benefits of innovation and strategies to realize these benefits. Indicators for the Washington Innovation Economy

Economic Development Programs: Impact and Value
WEDC completed in 2011 a second comprehensive survey of state economic development programs, and found that 32 state agencies manage over $2 billion annually across 126 programs related to economic development. This work has set the stage for undertaking the first-ever across the board program impact evaluation. WEDC boosted its research capability by hiring in 2012 its first policy director with the principle mission of completing state-of-the art evaluations of economic development programs. Economic Development Inventory: A Review of State Agency Programs (2008-2011)

Washington State Financial Services Cluster Study
The WEDC was the lead sponsor for a study to characterize the composition, size and competitiveness of the state’s financial industry. In 2010, the Washington State Financial Services Cluster included 131,800 jobs. This figure includes 110,800 jobs at more than 8,200 employment establishments and an additional 21,000 independent advisors and professionals. The Financial Services Cluster spans six subsectors, which align with the U.S. Census Bureau’s North American Industrial Classification System. The subsectors include: Accounting; Banking; Credit and Lending; Financial Investing; Insurance; and Public Finance. Two well attended Financial Industry Summits organized by enterpriseSeattle were completed, and a strategic plan for growing the cluster is in the implementation process. Washington State Financial Services Cluster Study
ACKNOWLEDGEMENTS

This strategy report would not have been possible without the focused leadership of WEDC chair Roger Woodworth and the generous time and expertise provided by Commission members. We wish to acknowledge contributions of our four working groups, which worked collaboratively and effectively to understand and address complex economic, technological and policy issues entwined with growing the states innovative capacity and future prosperity.

<table>
<thead>
<tr>
<th>Talent &amp; Workforce</th>
<th>Investment &amp; Entrepreneurship</th>
<th>Infrastructure &amp; Regulations</th>
<th>International Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steve Van Ausdle, Chair</td>
<td>Michelle Burris, Chair</td>
<td>Connie Bacon, Chair</td>
<td>William Stafford, Chair</td>
</tr>
<tr>
<td>Randy Gardiner</td>
<td>Rick LeFaivre</td>
<td>Christina Lomasney</td>
<td>Dan Newhouse</td>
</tr>
<tr>
<td>Michael Baumgartner</td>
<td>Jack Breese</td>
<td>Paula Hammond</td>
<td>Rogers Weed</td>
</tr>
<tr>
<td>Eleni Papadakis</td>
<td>Roger Woodworth</td>
<td>Bruce Kendall</td>
<td>Mike Schwenk</td>
</tr>
<tr>
<td>Phyllis Kenney</td>
<td>Mark Harris</td>
<td>Norma Smith</td>
<td>Stan Sorscher</td>
</tr>
<tr>
<td>Beth Thew</td>
<td>Paul Trause</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

In addition, we thank the staff of the commission that provided essential intellectual, policy and administrative support. Egils Milbergs provided the overall strategic framework and helped drive the Commission’s deliberations toward meaningful action recommendations. Noreen Hoban prepared the materials for all commission and working group meetings, managed critical stakeholder relationships and played the major role in editing, formatting and production of the report. Spencer Cohen provided much of the economic data in the report and methods for assessing the impact of state economic development programs. We also wish to thank the Washington State Department of Commerce/Research Services for its editorial support.