Name: Washington Aerospace Manufacturing Community

A. Point of Contact:
   Sarah Lee, Puget Sound Regional Council, 206.971.3250, slee@psrc.org.

B. Assessment of Local Industrial Ecosystem:
   Please see the following pages, which follow the template suggested in the Federal Register notice.

C. Implementation Strategy Description:
   Please see the following pages, which follow the template suggested in the Federal Register notice. Please note we are also using the Assessment/Backbone/Tune-Up approach recommended on the Investing in Manufacturing Communities website.

D. Implementation Strategy Parties:
   The Washington Aerospace Manufacturing Community includes the I-5 Aerospace Corridor (King, Kitsap, Pierce, Snohomish and Clallam counties) and the I-90 Aerospace Corridor (Grant county and the Spokane Metropolitan Statistical Area.) Signed letters of commitment are attached.

E. Performance Metrics:
   Please see the following pages, which follow the template suggested in the Federal Register notice.

F. Federal Financial Assistance Experience:
   The Puget Sound Regional Council (PSRC) has received federal awards for many years. PSRC received $9.2 million in federal funding for FY 2013. PSRC receives grant funding from many sources, which include the Federal Transit Administration, Federal Highway Administration and Department of Housing and Urban Development. Agency staff is familiar with all aspects of handling a federal award, such as program and financial management. PSRC also provides grant management and staff support to Central Puget Sound Economic Development District. PSRC also receives an annual A-133 single audit. The recently completed FY2013 audit contained no findings or management letters. Between the program staff and finance support staff, PSRC is well equipped to manage a federal financial assistance award.

G. Geographic Scope:
   Clallam, Grant, King, Kitsap, Pierce, Snohomish counties and the Spokane Metropolitan Statistical Area (Pend Oreille, Spokane and Stevens counties.)

H. Submitting Official:
   Josh Brown, Executive Director, Puget Sound Regional Council (206.464.7515, jbrown@psrc.org). 1011 Western Ave, Suite 500, Seattle, WA 98104-1035. The bylaws of the Puget Sound Regional Council, as amended April 30, 2009, in Article VII authorize the executive director of the agency to submit this proposal and apply for assistance. See bylaws attached in the appendix.

INTRODUCTION

Thanks to William Boeing and the company he founded in Seattle, Washington state today is home to the largest aerospace cluster in the world, with over 132,000 aerospace-related employees and more than 1,350 aerospace firms. Due to the fast growing IT, life sciences and business services industry clusters, along with its historically strong maritime and agricultural industry clusters, the state's economy is no longer solely dependent on the aerospace industry. However, aerospace provides one thing that fewer and fewer industries can offer: large numbers of high-paying blue collar manufacturing jobs.

The Puget Sound Regional Council, a regional planning agency with specific responsibilities under federal and state law for transportation planning, economic development and growth management, completed a Comprehensive Economic Development Strategy for the region in 2008. The strategy, developed by over 300 business, government, labor, community, and education leaders from throughout the region and state, included a set of action items designed to grow the area's key industry clusters, which includes aerospace.

One of these action items called for development of a statewide aerospace support organization that could lead an integrated state aerospace strategy. Working closely with the newly formed Governor's Office of Aerospace and dozens of other key organizations statewide, the Washington Aerospace Partnership (WAP) was formed. Together with the director of the Governor’s Office of Aerospace, PSRC helps staff and provide support for WAP, which is a group of business, labor, government, education and community leaders. Since its formation, the Washington Aerospace Partnership has developed and implemented successful strategies to win the U.S. Air Force Tanker contract, 737 MAX and the 777X wing and final assembly. Key to success of these
strategies was broad-based private and public support backed up by a series of in-depth economic impact studies, competitive analyses and needs assessments developed by Washington Aerospace Partnership and partner organizations.

These economic analyses are pointing to a huge challenge looming ahead. Original equipment manufacturers (OEMs) like Boeing and Airbus are under mounting pressure to lower prices and speed up delivery. In turn, suppliers are being asked to lower prices by up to 15%, cut turnaround time, increase production and invest in new technology. This can be complicated enough for a large firm with in-house training resources and access to capital – but for most Washington suppliers, with a median size of 98 employees and average operating margin of 5.5 percent according to a Deloitte LLP analysis, this is going to be a stretch. If Washington aerospace suppliers are going to survive, they are going to need help.

Even though employment is expected to remain flat over the next 10 years, about half of the workforce is expected to reach retirement age by 2018. This means highly skilled workers are going to be leaving the industry at a time they are needed most. At the same time, these suppliers and OEMs are going to need employees who are highly skilled in the new technologies – like carbon fiber composite manufacturing – that are emerging in the aerospace cluster. However, Washington State continues to import the majority of engineers because it lacks the capacity to meet demand.

**Geographic Scope:** The Investing in Manufacturing Communities Partnership program couldn’t come at a better time for the Washington Aerospace Community, which is composed of the two aerospace corridors in the state – the I-5 Aerospace Corridor (King, Kitsap, Pierce, Snohomish and Clallam counties) – and the I-90 Aerospace Corridor (Grant county and the Spokane Metropolitan Statistical Area).

**Key Technologies or Supply Chains (KTS):** This application outlines a strategy of integrated public and private investments to create a virtuous cycle of development for our Aerospace Product Manufacturing (NAICS 3364) supply chain and the related products, technology and supply chains. These firms include those who develop or manufacture tools, composites, electronics, navigational devices, etc., or otherwise play key roles in support of the aerospace industry.

**KTS National Ranking:** Aerospace Product Manufacturing (NAICS 3364) in the Washington Aerospace Manufacturing Community ranks in the top third in the nation as required by this program:

- Employment Location Quotient is 11.2 in March 2011, well above the LQ of 1 listed as the cutoff in IMCP’s “Top-Third Ranked Location Quotients for Establishments and Employment” tool available on the IMCP website.
- There are 127,408 employees in the Washington Aerospace Manufacturing Community out of 132,515 statewide; 941 aerospace and related firms out 1,350 statewide. Washington is home to one out of five of the nation’s aerospace jobs, the highest aerospace employment for any single state.

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**WORKFORCE AND TRAINING**

**Assessment**

**Workforce and Training: Current Capability**

The Washington Aerospace Manufacturing Community’s workforce is both highly skilled and highly concentrated. In fact, the Location Quotient of this community’s aerospace workforce (NAICS 3364) is 11.2, which means we have a much higher than average concentration of workers in this category than the nation. After almost 100 years of aerospace manufacturing, the skills and institutional knowledge run deep.
The skills needed for different jobs and the training and education needed to achieve those skill levels vary. For example, Computer Numerically Controlled (CNC) operators in the aerospace industry need only 12 weeks of specialized training to be qualified. At the same time, an Aerospace Engineer requires a Bachelor’s degree, and a Master’s Degree and a variety of experience is required to move into management.

It’s important to note that although many of the jobs in the aerospace industry are highly specialized, they are also often transferrable to jobs in related industries. For example, PSRC’s recently completed in-depth statewide maritime industry cluster economic study uncovered that the industry plans to replace hundreds of commercial fishing boats based in the Puget Sound region. The technology and skills needed to rebuild these boats – ranging in value from $22 million to $200 million – are very similar to those needed in aerospace manufacturing. This is good news in that aerospace workers with these jobs will have the flexibility to switch industries during industry downturns. The bad news is that employers will face more competition in acquiring and keeping skilled workers.

There are four categories of education and training required for the top 50 occupations, ranked by demand in the aerospace cluster:

- **Basic** (high school education and training of less than one month) Example: Aircraft Assemblers, ranked 1st by demand, with an entry level wage of about $24,000 per year, with the median wage at $48,030/year in 2012. A CNC, ranked 23rd by demand, begins at about $33,600 per year, with the median wage at $34,320-47,258/year in 2012.

- **Mid-level** (high school education plus one month to 4 years of education) Example: Engineering Technician, ranked 9th by demand, $67,520/year and Machinists, ranked 20th by demand, starting at $25,000/year and reaching $66,000 per year with 6 years of experience.

- **Bachelor’s degree or Master Worker (Third Level Worker)**: Example: Aerospace Engineers, ranked 2nd by demand, $100,420/year, and Master (Third Level) Machinist at about $100,000/year.

- **Master’s, PhD and professional degree**. Example: Architectural and Engineering Managers, ranked 21st by demand, $133,240/year.

In addition, high demand occupations such as these in the aerospace industry require a solid foundation that must be built throughout the K-12 years. As a result this section also looks at the gaps and strategies necessary to build the next generations of the aerospace workforce.
Workforce and Training: Institutions

Basic and Mid-Level Education and Training Institutions. The aerospace industry is rapidly advancing and diversifying, which means the skills and training workers require continue to evolve. The Washington Aerospace Manufacturing Community invests heavily in a variety of aerospace training, including apprenticeships, community and technical college programs, the Inland Northwest Aerospace Technology Center (INATC), and the Washington Aerospace Training and Research (WATR) Center.

Key to the growing success of these programs is the Washington State Legislature’s formation and support of statewide organizations such as The Advanced Materials Manufacturing Pipeline Advisory Committee, which coordinates and evaluates (by completion and job placement) training programs. The committee is made up of representatives from industry and education. Each year, beginning in 2012, the Pipeline Committee publishes *The Aerospace Manufacturing Skills: Supply, Demand and Outcomes for Washington’s Aerospace Training Programs*, which is referenced in this application, as well as in the development of the statewide aerospace strategy.

- **Apprenticeships:** Through the Aerospace Joint Apprenticeship Committee (AJAC) formed by the Washington State Legislature in 2008, employers and apprentices can take advantage of a coordinated entry point for these programs where apprentices can earn a variety of specializations and certificates meeting state and FAA requirements. The AJAC board is made up of labor leaders and executives of both aerospace supply companies and Washington State’s largest aerospace Original Equipment Manufacturer (OEM), The Boeing Company. Over 150 aerospace firms in 11 locations across state currently participate. AJAC provides wrap-around support services for employers and employees in apprenticeship programs, a pipeline connecting employers with the next generation of workers and works with labor and industry to develop and run apprenticeship programs to meet industry needs. Employees earn a living wage while they learn on-the-job from a mentor and attend class one night a week at a local community or technical college, allowing employees to increase their workforce skills without disrupting production. AJAC itself is one of the state’s fastest growing programs, and in 2012 received the U.S. Department of Labor’s "21st Century Registered Apprenticeship Trailblazer and Innovator Award."

- **Community and technical colleges:** Washington State has one of the largest community and technical college systems in the nation. The Center of Excellence for Aerospace and Advanced Manufacturing (COE), created by the legislature in 2009, serves as a single point of contact for industry and serves as the communication conduit to Washington’s education system about industry trends. In addition, the COE and its board of industry, labor and education leaders, provides resources and works with industry subject matter experts to define training needs at the state’s community and technical colleges to meet industry demand.

There are two categories of programs offered at these institutions:

- **Pathways to Aerospace Careers:** 15 community and technical colleges in the Washington Aerospace Manufacturing Community, offer over 50 aerospace certificates, degree and training, for jobs ranging from Aviation Maintenance Technician to Computer Numerical Control (CNC) Operator. Five of these colleges are FAA certified and 10 of these colleges are Advanced Technology Education grantees through the National Science Foundation. The certificates and two year degrees are “stackable,” which means workers can move between education and the workforce to gain education and experience as their situation requires.

  - **Air Washington:** Together with the Center of Excellence, nine of the Washington Aerospace Manufacturing Community community and technical colleges, led by Community Colleges of Spokane (SCC) and partnering closely with area Workforce Investment Boards are part of the *Air Washington* project. The project is utilizing a $20 million Department of Labor grant to train 2,600 workers in advanced manufacturing/composites, electronics/avionics, aircraft assembly, and aircraft maintenance by fall 2014. *Air Washington* has already exceeded its 2,600 goal and has trained 3,155 workers with over a half year left in the grant.

  - **Sustaining Air Washington:** SCC is requesting funding to support the capacity expansion developed with Air Washington funds, including a cohort of Aviation Maintenance Technicians and a cohort of evening
machining classes. Spokane's local economy needs this training to support the recruitment taking place by Greater Spokane Inc. and the AIR Initiative. One new company locating in the area next year will be in need of machinists and other manufacturers are being recruited. Community college programs are critical to successful aerospace industry growth in this region and the rest of the state.

- **Composites Washington**: A consortium of 10 community and technical colleges that offer programs in composites materials including manufacturing, repair, non-destructive testing, machining and recycling. This consortium collaborates on curriculum, professional development and is focused on providing technical faculty with industry endorsed certifications. Peninsula College, in partnership with the University of Alabama-Birmingham and Skagit Valley College, is engaged in a multi-year project focused on the reclamation and recycling of composite materials. Project goals include a survey of industry leading re-use technologies and the building of a curriculum that standardizes “technician level” training required to efficiently manage and capture composite waste stream output. Supporting partners include the American Composites Manufactures Association (ACMA) and regional and national industry leading companies (e.g. Janicki Industries, Ashland Chemical). A U.S. Department of Labor TAACCCT grant would leverage this pilot project and “scale-up” its activities by developing a curriculum, augmenting delivery mechanisms, and training students to understand practices and processes related to composite materials reclamation and re-use, both of which are reshaping manufacturing practices across industry sectors.

- **Short-term Specific Programs**: These are courses that are created to meet a specific industry need. Historically, these programs have been developed with a particular company for incumbent workers. For example, Aerospace Futures Alliance, an industry interest group, with the Washington Aerospace Training and Research (WATR) Center in 2010. The WATR Center is located at Paine Field near the Boeing Everett plant and provides short term (12 week) training courses specifically designed to meet industry needs. Half of the course work is completed online, and some are held at Renton Technical College. In partnership with the National Aviation Consortium, the WATR Center received a $1.8 million U.S. Department of Labor TAACCCT grant. Additionally, the Washington State Legislature awarded Edmonds Community College, which oversees training at the center, funds for a $1.5 million expansion. The WATR Center also received the 2013 Boeing Performance Excellence Award.

### Bachelor's, Master Worker, Master's, PhD and Professional Education and Training Institutions.

About half of the top 50 ranked (by industry demand) aerospace occupations require a Bachelor's, Master's, PhD or Professional Education. These jobs include everything from Aerospace Engineers (ranked #2), Logisticians (#3) and Industrial Engineers (#5), to Purchasing Agents (#6), Computer Systems Analysts (#8), Electrical Engineers (#12), and different types of Software Developers (#13 &14.)

The Washington State Aerospace Manufacturing Community has several public and private four-year institutions providing this education, including the University of Washington William E. Boeing Department of Aeronautics and Astronautics, and Washington State University, which has the largest mechanical engineering degree program in the region, the single largest point of entry for engineers into the aerospace industry. To meet the increasing industry demand, both of these institutions have partnered with community and technical colleges in the region to provide satellite engineering programs and to ensure transition from pre-engineering programs to four year programs.

### Integration of R&D:

There are also many joint industry-university aerospace technology research programs run through these institutions, (see the Research & Innovation section for more detail) including the Joint Center for Aerospace Technology Innovation (JCATI), which works with aerospace firms and aerospace industry associations to identify research technology transfer needs and provide aerospace industry-focused research opportunities for engineering and computer science students at all of the state’s four-year institutions of higher education.

Master Worker: Even though this category of job generally involves apprenticeships and not a Bachelor’s degree, it’s included in this section because it requires more than mid-level training. Typically, the Master Worker has had a four-year apprenticeship, then has been identified for further on-the-job mentoring and training.
Within the Washington Aerospace Manufacturing Community there is a robust Career and Technical Education program led by the State’s Office of Superintendent of Public Instruction (OSPI). OSPI is responsible for all of the state’s education programs from Kindergarten through twelfth grade. Career Technical Education (CTE) offers options for high-skill, high-wage employment preparation, and advanced and continuing education. CTE is based on career clusters including aerospace. It provides students with a context for planning and studying academic and technical courses related to a career. OSPI also supervises dual credit programs which allow students to earn college credit while in high school. Thirty-one school districts within the Manufacturing Community participate in CTE programs.

**Post-secondary feeder programs:** The consortium of high schools, community and technical colleges, and the business community have developed applied integrated, academic, and technical programs that helps students transition from high school to college professional or academic programs. This allows students to save precious time and resources to complete their educational and career goals. Within the Manufacturing Community there are also seven regional Skill Centers. These Centers offer industry-defined Career and Technical education classes to junior and senior high school students from multiple school districts.

**Opportunities for Veterans**

Washington Aerospace Manufacturing Community is home to eight military installations across all five services. The Department of Defense’s continued drawdown of active duty military affords our region a unique opportunity to harness the skills of these departing soldiers, sailors, and airmen in our industries. The federal VOW act requires installations to take a much more active role in helping these folks find career opportunities that leverage the skills they have acquired during their military training. At the state level, Governor Inslee’s first executive order created the Washington Military Transition Council that is currently tackling this issue across the state and multiple industries. Other programs, such as Air Washington and the WATR Center, are creating aerospace-specific programs designed for veterans.

**Gaps**

Macro-economic data analyses show that the aerospace manufacturing employment outlook for the next five years is flat, with only up to a 1% growth in employment. However, further analysis of specific job categories and industry surveys show a more complex picture:

- **Worker loss due to retirement** – Boeing expects half of its workers to retire within 5-10 years. The Pipeline Committee’s analysis looked at the change rate based on industry employment expectations and 2018 retirement expectations, and identified a group of jobs and skills with the biggest upcoming gaps. Gaps due to retirement are mostly in Mid-Level to Master level jobs, such as Tool Makers and Mechanics. The state does not have the training capacity to meet these needs. Not only do these jobs take longer to train up, there is no institutionalized pathway to identify and train Master level workers, such as in Europe. As a result, many of these Master Workers are recruited from Europe.

- **New technology requires new skills** – At 114 feet long and 23 feet wide, Boeing’s 777X will be the largest composite wing ever built, which will create a whole set of challenges and needs. Incumbent workers are going to have to upgrade their skills and new workers are going to have to get the latest training on this new technology. Washington produces only 29.8 engineers for each 1,000 engineering employees, and 21 computer scientists for every 1,000 computer science employees, ranking 9th and 7th respectively among our 10 technology peer states. Programs in the state are going to have to gear up quickly to ensure they have the capacity, the equipment and the curriculum to meet these needs.

- **STEM gap** - There are 25,000 unfilled jobs in Washington State as a result of the job skills gap (growing to 50,000 by 2017), 80% of which are in high-skill STEM and health care roles. K-12 STEM programs are critical for building base skills important to a successful career in aerospace and supporting the natural progression to a career by building interest and connecting students with the “real world” of aerospace. However, almost half of Washington high school graduates enrolled in community and technical colleges take remedial math courses (2008-09). Societal stereotypes about STEM are absorbed in childhood and begin to sculpt interests and aspirations. As early as 2nd grade, Washington girls think that “math is for boys, not for girls.” Although the state has made real progress in this area, not enough schools statewide have the capacity they need. Key gaps are teacher training, curricula that are relevant to each community, and access to equipment.
The following are the top level action strategies to build on local assets to improve the KTS. Linkages (including training, financial and in-kind partnerships) with employers (or prospective employers) in the KTS and labor/community groups to ensure skills are useful, portable and lead to a career path:

- Add 1,000 slots to high-demand fields as determined by Workforce Board employer survey. Community and technical colleges selected by RFP process. Lead: Pipeline Committee (industry/education representatives) to select awardees, evaluate results each year and make changes based on results.

- Expand representation and role of Pipeline Committee from just Basic-Mid-Level Institutions to include Preschool – Grad School. Collect and publish data tracking the transition from education to employment, as well as the outlook for employment in private companies. This information can help direct future program prioritization and funding. Lead: Pipeline Committee, which is composed of industry and education representatives.

- Position Center of Excellence for Aerospace & Advanced Manufacturing (COE) as central point of entry for students and jobseekers to navigate aerospace careers. Lead: COE, whose board is composed of industry and education representatives.

- Boeing to evaluate all community and technical college (CTC) composite materials program curricula, identify core competencies and common courses. CTCs to adopt. Lead: Boeing and COE.

- Expand capacity (from 150 students/month to 300 students/month) for short-term aerospace training programs at WATR Center. While Washington’s aerospace workers are some of the most skilled and well-trained in the world, no workforce in North America has experience producing carbon fiber wings for a commercial airliner, especially those of the size and complexity anticipated for the Boeing 777X. Working hand-in-hand with Boeing, the state is prepared to design and fund for 10 years (or until there is no longer sufficient need) a specialized training program at the WATR Center at Paine Field to provide incumbent workers as well as new hires with the skills necessary to perform this state-of-the-art task. EHB 2088 (2013) provided $500,000 to begin designing this program and $1.5 million to fund facility upgrades and/or equipment. It is assumed that this program will receive additional capital and ongoing operational funding and be up and running to begin offering classes in 2015. Lead: Edmonds Community College/WATR Center.

- The Washington State Board for Community and Technical Colleges has approved Everett Community Colleges’ plan to create a 37,000 square foot Advance Manufacturing Training & Education Center (AMTEC). The new center will train students for high-demand jobs in manufacturing and aerospace. Construction is scheduled to start by the end of 2013. AMTEC would open in 2014. The center will bring together six programs – manufacturing pre-employment, CNC machining, composites, engineering technician, welding and fabrication, and quality assurance. AMTEC is designed to serve more than 170 manufacturing industry employers in Snohomish County. All programs will be short, stackable (individual credentials from different content areas that connect to each other) and lead to a professional certificate or college degree. Lead: Everett Community College.

- $300,000 of the General Fund--state appropriation for fiscal year 2014 and $300,000 of the general fund--state appropriation for fiscal year 2015 are provided solely for annual start-up grants for aerospace and manufacturing technical programs housed at four skill centers. The grants are provided for start-up equipment and curriculum purchases. To be eligible for funding, the skill center must agree to provide regional high schools with access to a technology laboratory, expand manufacturing certificate and course offerings at the skill center, and provide a laboratory space for high school teachers to engage in professional development in the instruction of courses leading to student employment certification in the aerospace and manufacturing industries. Once a skill center receives a start-up grant, it is ineligible for additional start-up funding in the following school year. Washington State Office of the Superintendent of Public Instruction (OSPI) shall administer the grants in consultation with the center for excellence for aerospace and advanced materials manufacturing. Lead: OSPI.

- $150,000 of the General Fund--state appropriation for fiscal year 2014 and $150,000 of the General Fund--state appropriation for fiscal year 2015 are provided solely for annual start-up grants to six high schools to implement the aerospace assembler program. Participating high schools must agree to offer the aerospace assembler training program to students by spring semester of school year 2013-14. Once a high school receives a start-up grant, it is ineligible for additional start-up funding in the following school year. The Office of the Superintendent of Public Instruction and the Education Research and Data Center at the Office of Financial Management (OFM) shall track student participation and long-term outcome data. Lead: OFM.
$3,000,000 of the economic development strategic reserve account appropriation is provided solely to support the Joint Center for Aerospace Innovation Technology (JCATI). Lead: JCATI.

**Workforce and Training: Catalytic Investment**

**Central Sound Aerospace Training Center**

**Action**

Develop state of the art facility dedicated to pursuit of aerospace and advanced manufacturing and workforce advancement in materials innovation, digital and additive manufacturing, product management as well as rudimentary technician training. "Train the trainer" model will allow faculty to be trained in innovative subjects then train K-12 and community college teachers from around the state. In addition, curriculum will be developed that can be dispersed throughout the state systems in Washington State.

**Impact**

- 1,500 workers trained per year
- K-14 teachers statewide to receive training on latest research and innovations to take back to their classrooms
- Curriculum infused with latest industry and academic research and innovations developed for K-14

**20-year Return on Investment**

<table>
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<tr>
<th>Benefits</th>
<th>Costs</th>
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<tr>
<td>Direct jobs: 31,000</td>
<td>Program and building design: $12.5 million in state funds</td>
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<td>Indirect jobs: $52,700</td>
<td>Land: $1.5 million, donated by the City of Renton</td>
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<tr>
<td>Salary before benefits: $2.9 billion</td>
<td>*Because program is still in planning stages, construction costs, operating and equipment costs not included in analysis</td>
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*Value of teacher training and curriculum not included in this analysis

**Performance Metrics**

Business plan in development. We will be happy to submit plan when complete.

**Partners**

Aerospace Joint Apprenticeship Committee (AJAC), Aerospace Futures Alliance, City of Renton, Washington State


Ensure Broad Distribution of Benefits:

- Enhance veteran recruitment for short term aerospace training programs at Washington Aerospace Training & Research Center (WATR). Leads: Edmonds Community College/WATR Center, National Aviation Consortium. Funding: $1.8 M US DOL TAACCCT grant. At the Paine Field airport in Snohomish County, WATR Center was developed at industry request.
- Add 4 new aerospace skills centers and 6 aerospace assembler programs to ensure geographic distribution of these programs. Lead: Office of Superintendent of Public Instruction Funding $1.15M
Expand student loan program at WATR Center.

Washington Aerospace Scholars Program for underserved groups established through public/private partnership. Lead: Washington Aerospace Scholars Program Board Funding: Microsoft, Boeing and State $25 million each.

Washington State University to provide engineering program and new WSU School of Aerospace and Advanced Manufacturing in Snohomish County, which had no 4-year program. Lead: WSU Funding: Washington State.

Establish 7 regional STEM networks to support teacher development, allow diverse community adaptation of STEM, raise awareness of importance of STEM throughout diverse geographic and demographic area. STEM networks are already established in Kitsap, Spokane, and south King Counties. An effort is underway to establish a STEM network in Snohomish County. Lead: Washington STEM, local partners, Funding: industry funded.

Integration of R&D activities & education:

Provide aerospace industry focused research opportunities for engineering and computer science students through the new Joint Center for Aerospace Technology Innovation (JCATI). Lead: JCATI.

Supplier Networks: Current Capability

Industry analysts are pointing to a huge challenge looming ahead. OEMs, like Boeing and Airbus, are under mounting pressure to lower prices and speed up delivery. In turn, suppliers are being asked to lower prices by up to 15%, cut turnaround time, increase production and invest in new technology. This can be complicated enough for a large firm with in-house training resources and access to capital, but for most Washington suppliers, with a median size of 98 employees, meeting this challenge is proving difficult. If Washington aerospace suppliers are going to survive, they are going to need help.

Key firms: There are over 940 aerospace industry suppliers within the Washington Aerospace Manufacturing Community representing every tier in the aerospace supply chain. Suppliers primarily support Boeing Commercial, with its five leading commercial aircraft production lines – the 737, 747, 767, 777 and 787. In addition to commercial airlines, other major state-based activities include
Boeing’s unmanned aerial vehicle subsidiary, Institu (located outside the WAMC), military technologies (such as the Air Force tanker) and Boeing’s environmental and clean energy related technologies. Suppliers in the Washington Aerospace Manufacturing Community are doing business with non-Boeing OEMs, including Airbus, Bombardier and Embraer, Mitsubishi, Sukhoi, COMAC, and Finmeccanica.

Location of firms: All supply chain tiers are located in this geographic area, making it the most diversified aerospace supply chain in the country. However, suppliers are about 80% dependent on one OEM, Boeing, which makes them highly vulnerable.

Support and connections: There are several key trade and support organizations playing separate but cooperative roles. For example, the Aerospace Futures Alliance (AFA), whose board is composed of industry and public education and government, fills the role of industry advocate in the state legislature. It also helped form the Washington Aerospace Training and Research (WATR) facility. The Washington Aerospace Partnership (WAP), whose board combines economic development, local and state government and labor leaders, created and lead implementation of the first Washington State Aerospace Strategy with the Governor’s Office of Aerospace. Most of the counties in the WAMC have an aerospace support organization affiliated with either their local economic development organization or county government; each of these is a member of WAP. The Pacific Northwest Aerospace Alliance provides networking opportunities and several organizations focus on providing training and support to these companies, including Impact Washington (the state’s Manufacturing Extension Partnership) and the Center for Advanced Manufacturing Advisory Council. Working with the Washington State Department of Commerce, a private aerospace supplier created aerospacevendors.com, an online aerospace capability search database that connects OEMs with suppliers.

Shared assets: Developed by a supplier in partnership with the Washington State Department of Commerce, aerospacevendors.com, is an online database of Washington suppliers that assists OEMs in identifying and partnering with capable supply chain partners.

New KTS products recently launched:

- Carbon fiber composite technology is changing aircraft manufacturing and automobile, unmanned aero vehicles, maritime and medical device industries. This is an important opportunity for suppliers to diversify their business.
- Aviation biofuels.
- NextGen Air Traffic Control presents an opportunity to diversify both the aerospace and IT cluster.

Supplier Networks: Institutions

In addition to the trade and support organizations listed above under “Support and connections,” the Washington Aerospace Community has the following resources to support suppliers:

Impact Washington, Washington state’s National Institute of Standards and Technology’s Hollings Manufacturing Extension Partnership (MEP), works with small and mid-sized U.S. manufacturers to help them create and retain jobs, increase profits, and save time and money. An impact statement summarizing Impact Washington’s capabilities can be found at: www.impactwashington.org.

Center for Advanced Manufacturing Puget Sound (CAMPS) is a public/private resource center that brings together manufacturers, supply chain partners, pre-qualified business development specialists, and strategic partners. CAMPS is a not-for-profit membership organization representing small and mid-sized manufacturing businesses working through strategic partnerships in the region.

Gaps
The major gaps impacting the supplier network are: the pressure to lower costs and increase efficiency by OEMs; the need to diversify to provide a buffer against cyclical industry downturns; the talent gap; and, transportation and infrastructure issues.

Pressure to lower costs: The aerospace industry is growing, but the pressures are increasing for OEMs to cut costs in the face of shrinking defense budgets and tight commercial airplane pricing. Suppliers will continue to get squeezed. Yet because so many of these suppliers are small and medium enterprises (SMEs) they lack the resources to spend time improving processes such as adopting LEAN systems.
Trouble riding out downturn: The aerospace industry is cyclical. Large companies usually have the resources to ride out the downturn, but small suppliers often cannot. That's bad for the companies and employees and bad for the industry. Suppliers who are already providing products and services for other industries, such as medical devices, maritime, recreational equipment, unmanned aerial vehicles or defense, are better to survive and even thrive. But many of these suppliers don't have the resources to determine how best to diversify. Aerospace Futures Alliance and others are currently exploring diversification strategies.

The talent gap: As mentioned in the Workforce and Training section above, the aging of the workforce and the need for new skills is putting pressure on the talent pipeline. This is a critical problem. (See Workforce Section for plans to address this gap.)

Transportation and infrastructure: The aerospace industry is highly dependent on all of the major highways within the state for both freight and labor mobility. However, the Puget Sound region has 8 of the 150 most congested corridors in the U.S., with the second-highest truck congestion cost in the nation, $546 million per year. It also has the second-highest annual truck delay rate in the nation at 71 million hours. And with increased emphasis on just-in-time and inventory minimization techniques, it's estimated that Boeing will increase its intrastate freight usage by a factor of five. Economic development plans in all parts of the WAMC require additional transportation investments to support existing companies and activate new industrial development. For example, Spokane County needs to implement additional transportation investments to facilitate new aerospace activities on the western edge of the county. The renovations have been scoped by local engineering firms and presented to WSDOT. However, the Washington State Legislature hasn't passed a transportation package since 2005. (See Infrastructure Section for plans to address this gap.)

Supplier Networks: Plans

Improving supplier capabilities:
- Map gaps in Boeing supply chain, particularly in the 737 MAX, KC-46A tanker and 777X programs. Identify opportunities to attract investment in facilities and employees in relative proximity to final assembly sites. Lead: Office of Aerospace, GSI.
- Expand use of aerospacevendors.com, online database of Washington suppliers to assist OEMs in identifying and partnering with capable supply chain partners. Lead: Washington State Department of Commerce.
- Develop informal and formal partnerships with other aerospace regions, such as Montreal, that would create a mutually beneficial relationship to cross-fertilize supply chains. Lead: King County Aerospace Alliance.
- Conduct study to research and develop strategies to align the aerospace supplier industry with the maritime, automobile, medical device manufacturing, and other industries that share transferable workforce skills. Lead: AFA.
- Organize first annual familiarization “FAM” tour for national aerospace site selectors to help make them aware of development opportunities. Lead: Washington State Department of Commerce.
- See Enterprise Value Assessment program (Catalytic Investment in Operational Improvement and Capital Access section) which is being developed to give small tier suppliers the information and guidance they need to determine whether to invest in new equipment and grow, whether to sell or whether to shut down.
- See Global Cities Initiative (Catalytic Investment in Trade & International Investment section.)
- See Advanced Composites Center (Catalytic Investment in Research & Innovation section.)
Proposal for Designation as a Manufacturing Community

Docket No. 131121981-3981

Supplier Network: Catalytic Investment

NextGen LEAN Pilot Project

Action
This pilot project is the first step in an effort to improve the efficiency of the entire aerospace supply chain. Three suppliers who agree to share results of the demonstration will be taught how to use Next Generation LEAN tools to improve manufacturing performance. Case studies will be shared with trade associations and media so suppliers can evaluate the program. The next step will be for the Impact Washington (Manufacturing Extension Partnership) to work with trade associations to scale up the training.

Impact
The Wisconsin Manufacturing Extension Partnership reported this training (of 195 suppliers) resulted in:

1. 56% improvement in customer On-Time Deliveries
2. 26% improvement in customer-reported As-Delivered Quality
3. 44% reduction in Manufacturing Critical-path Time
4. Operational Lead-Time reduction resulted in increased supplier capacity without additional capital investment

Advantage
This pilot is being developed by the team that created and implemented the performance improvement program referenced above for the defense product supply chain in partnership with the Wisconsin Manufacturing Extension Partnership. The program and software have been updated and tailored for the aerospace industry.

20-year Return on Investment

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$784,000 initial savings for 3 suppliers based on Wisconsin results</td>
<td>Software: $15,000 for three suppliers, donated by software developer</td>
</tr>
<tr>
<td></td>
<td>Consulting: $30,000 for three suppliers donated by software developer</td>
</tr>
<tr>
<td></td>
<td>(This includes training MEP consultants, so this cost would be eliminated in scaled-up project)</td>
</tr>
<tr>
<td></td>
<td>Mentoring: $150,000 for three suppliers, to be delivered by Impact Washington. Incremental costs per supplier will be lower in scaled-up project</td>
</tr>
</tbody>
</table>

Partners
Impact Washington (Manufacturing Extension Partnership), Build-to-Demand (Industry), PSRC

RESEARCH AND INNOVATION

Research and Innovation: Current Capability

University/research assets: Washington state has two internationally ranked public research universities who do collaborative research with aerospace and related industries and technologies. In 2012, the state legislature formed the Joint Center for Aerospace
Technology Innovation (JCATI), a partnership between the University of Washington and Washington State University that facilitates the development of new technologies to keep Washington at the forefront of aerospace innovation. These organizations are working closely with the private sector on industry priorities. In addition, several regional public universities, such as Western Washington University, Central Washington University and Eastern Washington University, also play an important role in educating the future aerospace workforce and conducting research relevant to the aerospace industry.

**Research and Innovation: Institutions**

Center of Excellence for Advanced Materials in Transport Aircraft Structures (AMTAS), for which the University of Washington serves academic lead, is a consortium of academic institutions, aerospace companies and government agencies and part of the FAA Joint Advanced Materials and Structures Center of Excellence. Its research focus is existing, near- and long-term applications for composites and advanced materials for large transport commercial aircraft. Industry partners include: Boeing, C&D Zodiac, Bell Helicopter, Toray Composites and others. **Funding:** federal and industry grants and research-specific industry funding.

Advanced Hardwood Biofuels Northwest (AHB), is University of Washington-led consortium focused on developing advanced biofuels from woody biomass, specifically hybrid poplar trees, as a regional alternative to other biofuels, such as ethanol. **Funding:** $40 million USDA NIFA/AFRI grant. (Funding is confirmed for the duration of the project.)

The Northwest Advanced Renewables Alliance (NARA), Led by Washington State University, the Northwest Advanced Renewables Alliance (NARA) will take a comprehensive approach to building a supply chain for aviation biofuel with the goal of increasing efficiency in everything from forestry operations to conversion processes. Using forest residuals from logging operations as feedstock, the project aims to create a sustainable industry to produce aviation biofuels and important co-products. The project includes a broad alliance of private industry and educational institutions from throughout the Northwest. **Funding:** $40 million USDA NIFA/AFRI grant. (Funding is confirmed for the duration of the project.)

FAA Designated Center of Excellence for Alternative Jet Fuels and Environment: Washington State University and the Massachusetts Institute of Technology is leading an $80 million project with over 50 public and private sector stakeholders to address barriers that have limited the commercial development and deployment of the alternative jet biofuels industry. **Funding:** $40 million in federal funding was contingent on state match, which the state legislature has appropriated. The remaining approximately $39 million is planned to be matched by private sector funding.
Extent to which training institutions currently integrate R&D activities to prepare current and future workforce:

JCATI provides aerospace industry-focused research opportunities for engineering and computer science students at the University of Washington, Washington State University, and Washington’s other public four-year institutions of higher education, through assisting the development of internship programs and undergraduate and graduate student research opportunities that give students hands-on experience with aerospace firms; and in concert with aerospace firms and aerospace industry associations, identifying research needs and opportunities for technology transfer that benefit the state’s aerospace industry. **Funding:** State funding matched by industry grants and research-specific funding.

**The Boeing Scholars** program provides students with two-year scholarships as well as internship opportunities between their junior and senior years. During their senior year, students from engineering, science and business participate in an interdisciplinary course, collaborating with Boeing scientists and engineers on a real-life aerospace industry project. **Funding:** The Boeing Company

**Center for Excellence for Advanced Materials in Transport Aircraft Structures (AMTAS),** partners with the University of Washington, Washington State University, and Edmonds Community College to apply the research to curriculum. **Funding:** See above.

**Shared facilities such as incubator space or research centers:** Both University of Washington and Washington State University have shared facilities such as incubator space and research centers including:

**Applied Sciences Laboratory (ASL) at WSU**, which is a partnership with Boeing to develop novel materials for the aerospace industry; the **Composite Materials & Engineering Center (CMEC),** which does research in composite materials development through structural testing; and the **Center for Materials Research**.

**Funding:** Boeing, state and federal.

**Center for Commercialization (C4C) at University of Washington.** **Funding:** State, federal, and private

**Record for developing small businesses and startups:** C4C has supported the commercialization of more than 100 projects since 2005, provided comprehensive mentoring and over $4 million in grants, and helped spin out new companies. These include, Fate Therapeutics, EnerG2, MicroGREEN Polymers, and Farecast.

**Robustness of revenue models:** Revenue models vary depending on entity. Please see above.

**Development of small business and startups:** The Washington Small Business Development Center, a cooperative effort among Washington State University, other educational institutions, economic development organizations and the U.S. Small Business Administration, helps small companies understand and execute export strategies to increase revenue, jobs and competiveness.

**Gaps**

**Short and long-term research challenges:**

**Composite research:** When Boeing announced it would design its new 777X with all-composite wings, it changed the trajectory of aircraft manufacturing for the next 50 years. The Washington Aerospace Manufacturing Community has an opportunity to become the global center of composite manufacturing.

**Alternative fuels and aviation biofuel research:** The future of aerospace and related industries depends on finding alternatives to petroleum based fuel. But one of the big roadblocks to producing biofuels is figuring out which crop, or raw material, can be turned into fuel without upending some other part of the economy or causing environmental problems.

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**Research and Innovation: Plans**

- Leverage research from Washington State University and University of Washington aviation biofuel research through the public/private Sustainable Aviation Biofuels Working Group to develop a commercially viable biofuels industry and position Washington as an international leader.

- Build on work of Sea-Tac Airport, Alaska Airlines and the Boeing Company’s Greener Skies over Seattle initiative to reduce environmental impact of air travel. The FAA is the federal partner in this collaborative effort. **Lead: Port of Seattle.**
Proposal for Designation as a Manufacturing Community

- Utilizing an FAA grant, PSRC completed Phase 1 Study: Preparing the Region’s Airports for NextGen Technologies in May 2013. RFQs for the Phase 2: NextGen Airspace are due April 31, 2014 with a final report anticipated by the end of the year. Both focus on the region’s general aviation airports. Both are adjacent to Boeing final production facilities. **Lead: PSRC.**

- Expand awareness of and funding for JCATI and its ability to connect industry problems with technological advances developed by university research and facilities. **Lead: JCATI.**

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**Research and Innovation: Catalytic Investment**

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**Advanced Composites Center**

**Action**

Develop the Advanced Composites Center (ACC) to accelerate the use of composite materials in clean energy applications. Partners would establish a full-scale primary center and satellite centers staffed with technical experts sharing state-of-the-art equipment.

**Impact**

- Create opportunities for aerospace supply chain to diversify book of business for long-term supply stability.
- Lower the cost of manufacturing and the use of composite materials to fully incorporate composites into everyday use, not just in exotic, high value areas. Target market areas include: lightweight vehicles, compressed gas storage in trucks, automobiles and aircraft; and, airfoils in wind blades and by extension, aircraft wings.
- Allow equipment providers opportunity to demonstrate state-of-the-art equipment to new customers in neutral environment.
- Train highly skilled workforce to meet industry need.
- Institutionalize integration of composites research with industry and workforce training.

**Advantage**

Leverage research and skills in composite technology already being developed in the Washington Aerospace Manufacturing Community due to use of composites in aerospace industry cluster.

**20-year Return on Investment**

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$40 million generated by training programs</td>
<td>Business case is being completed as part of a response to Clean Energy Manufacturing Innovation Institute for Composite Materials and Structures, Funding Opportunity Announcement (FOA) Number: DE-FOA-0000977.</td>
</tr>
<tr>
<td>$3.8 billion in salaries before benefits (2,000 new employees with an average wage of $96,000)^n</td>
<td>We will be happy to submit a copy of the completed grant application after it is submitted.</td>
</tr>
</tbody>
</table>

^nnot adjusted for inflation

**Partners**

Washington State Department of Commerce
Overview: The Washington Aerospace Manufacturing Community has two main aerospace manufacturing corridors. One is the I-5 aerospace corridor, where the largest original equipment manufacturer (OEMs) plants, such as Boeing, are located. At the north end of the corridor is Boeing’s Everett assembly plant, which is soon going to be expanded to assemble the 777X. This is where the 777X’s composite wings will be built in the to-be-constructed Advanced Materials Wing Facility. In the middle of the corridor is Boeing’s Renton facility, where 737 (soon 737MAX) planes are assembled. At the south end of the corridor is Boeing’s Fredrickson facility, where complex composites structures area created for existing airframes. Anecdotally, some say the Boeing shop floor extends from Everett to Fredrickson. The majority of the supply network is in this corridor.

The I-90 aerospace corridor, which is more rural, runs east and west and has several tier 1 (direct to OEM) companies and a growing footprint of component manufacturers and testing and certification companies. This corridor is also becoming known for its composite materials expertise, and as a center for Maintenance Repair and Overhaul (MRO), retrofits and conversions.

Describe the quality of existing physical infrastructure and logistical services that support manufacturing:

- The area’s three deep water ports, the ports of Everett, Seattle and Tacoma, can accommodate large vessels to support all the largest aerospace parts. Currently all major structures for the 777 imported by Boeing are transported by container vessel through the Port of Everett. Ports handled 450 million short tons of cargo, ranking 2nd in the nation in 2012.
- Sea-Tac International Airport (primary commercial hub), King County International Airport/Boeing Field, Spokane International Airport, and other general aviation airports adjacent to OEM facilities (Snohomish County-Paine Field, Renton Municipal Airport), and near key suppliers (Grant County International Airport, Arlington Municipal Airport).
- Electricity rates in Washington are the lowest in the nation. Strong relationships between county economic development commissions and utility providers.
- Well integrated roadway and railway network including BNSF and Union Pacific mainlines.
How transportation infrastructure serves KTS in moving people and goods:

Major OEMs and suppliers are highly dependent on all of the major highways within the state for both freight and labor mobility. Major delays associated with congestion causes increased cost pressures and inefficiencies on Boeing and other aerospace companies. With an increased emphasis on just-in-time manufacturing, it is estimated that The Boeing Company will increase its intrastate freight usage by a factor of 5. Facilitating this increase will require a number of expansion and interchange projects along the I-5 corridor in the Puget Sound region.

The primary project in the Puget Sound region is the SR 509, I-5 and SR 167 Puget Sound Gateway Project. It would relieve traffic congestion and improve freight mobility by completing the long-planned SR 167 and SR 509 corridor connections to I-5. The Gateway project is key to enhancing the state’s economic competitiveness, both nationally and globally, by connecting the state’s largest ports to key distribution centers in King and Pierce counties and to Eastern Washington. Other roadway and freight projects of note are the expansion of I-90 at Snoqualmie Pass, the completion of I-395 in Spokane, the 41st Street Freight Corridor improving connections between the Port of Everett and I-5, and a number of other roads and highways connecting to major OEM facilities.

Congestion causes risk to predictability of product delivery and causes adverse effect to just-in-time and inventory minimization techniques. The Puget Sound region has the nation’s 13th worst congested road system. 67% of all roads within the state are considered in poor or mediocre condition by the American Society of Civil Engineers. The Puget Sound region has the 10th worst travel time index in the country and this costs commuters $1,050 per year in delays (10th highest nationally) and companies $546 million per year in truck congestion costs (13th nationally).

Increased public transportation alternatives will help to minimize road congestion around the state and give cost-friendly alternatives for employees. Sound Transit, our regional mass transit authority, has work underway to expand the existing Central Link light rail (connects Downtown Seattle to Sea-Tac International Airport) to include connections to the north through the University of Washington to Lynnwood in Snohomish County, east to Bellevue, and south to Highline Community College. The connection to the University of Washington will be complete by 2016, with the full system expansion complete by 2023. Currently, Sound Transit is updating its long range plan and evaluating the feasibility of another expansion that would complete the regional system connecting Seattle, Bellevue, Tacoma, and Everett via Snohomish County-Paine Field.

Both King County Metro and Community Transit (Snohomish County) have completed bus rapid transit (BRT) lines to better connect employees with major employment centers. King County Metro will open their F line in June 2014, connecting Tukwila and the Boeing Renton Facility with connections to Sea-Tac International Airport and Central Link light rail to Downtown Seattle. Community Transit opened the state’s first BRT line in 2009 along the SR 99 corridor and is currently evaluating an E-W corridor providing connections to the existing BRT line and terminating at Snohomish County-Paine Field/Boeing Everett.

Site availability, infrastructure support and planning
The Washington State Growth Management Act requires state and local governments to manage growth by identifying and protecting critical areas and natural resource lands, designating urban growth areas, preparing comprehensive plans and implementing them through capital investments and development regulations.

In the I-5 Aerospace Corridor, long-term growth management, transportation and economic development planning is done collaboratively by representatives of all governments in the region at the Puget Sound Regional Council. The result is VISION 2040, a plan that focuses future growth into walkable, mixed-used areas called regional growth centers, as well as into dense concentrations of employment called regional manufacturing/industrial centers (MICs). These MICs are focal points for economic development and transportation infrastructure investments.

There are currently eight designated MICs. Seven of these have aerospace-related employment and collectively they are home to 47,935 aerospace cluster jobs. These MICs are served by the region’s major transportation infrastructure, including roads, rail and port facilities. Their transportation infrastructure needs and strategies long-term are outlined in the regional transportation plan called Transportation 2040, the long-term template that outlines transportation investments and financing plans at the local, regional, state and federal levels.

In 1998, PSRC developed the Industrial Land Supply and Demand in the Central Puget Sound Region report, which addressed employment, land use and infrastructure issues. PSRC is in the process of updating analysis of industrial employment, estimates of industrial land supply, estimates of demand for industrial land, and evaluation of zoning and development regulations in the region.
In the I-90 Aerospace Corridor, transportation planning is done through a community engagement process by the Spokane Regional Transportation Council and includes the regional cities, Spokane County and Greater Spokane Incorporated. This Metropolitan Transportation Plan and Regional Transportation Plan, known as HORIZON 2040, includes short-, mid- and long-range strategies for overcoming transportation challenges and capitalizing on regional opportunities. The guiding principles of this process are economic vitality, stewardship, cooperation and leadership, choice and mobility, system operations, maintenance and preservation, safety and security, and quality of life.

Key aerospace sites: The Washington Aerospace Partnership commissioned a competitiveness study in late 2013 to prepare for the RFP for 777X manufacturing site. Based on that study, Washington state proposed three 777X site options and four strategic support facilities. In addition to the sites that Washington state proposed, two other locations in the WAMC are key to our strategic aerospace footprint. Following is a brief overview of these sites:

| Site Options                  | Boeing Everett                                      | Located northeast of Snohomish County Airport (Paine Field), the Boeing Everett Plant is the largest building in the world by volume and the headquarters of all Boeing Commercial Airplanes wide-body production. Governor Inslee’s 777X Permit Streamlining Task Force created a simplified permitting process. |
|-------------------------------|------------------------------------------------------|
|                               | Paine Field Aerospace Business Park                  | 75 acres of undeveloped land on the west side of Snohomish County Airport. Paine Field is home to Boeing manufacturing plant for 747, 767, 777 and 787. This location is adjacent to the Boeing Everett facility and would have only facilitated wing assembly. |
|                               | West Spokane                                         | On the more rural I-90 Aerospace Corridor, this 800-acre footprint includes greenfield site certification, runway access, transportation and utility infrastructure investments, Boeing KSAs training and incentive development. Over the past six years, aerospace industry in this area has grown by more than 20% in number of employees and companies. |

| Supporting Facilities         | Boeing Frederickson                                  | Boeing already owns 500 acres in Frederickson and operates two major production facilities. This site includes more than 300 acres of undeveloped land and can be designated by the Pierce County Executive as an Executive Priority project, making the project a top priority for all permitting departments. |
|                               | Boeing Auburn                                        | The Auburn Fabrication Site has 2.1 million square feet. The US General Services Administration facility adjacent to Boeing’s facility could be relocated, providing 134.49 acres of future industrial zoned acres. |
|                               | King County International Airport/Boeing Field        | Boeing Field, selected as one of the 100 Most Needed Airports in the U.S., comprises 614 acres. Boeing field is also home to Boeing’s 737 flight test program and a number of other operations. |

| Additional Locations          | Grant County International Airport                   | Boeing owns a 100 acre site adjacent to the airport with 225,000 square feet of hangar and building space. The airport serves as Boeing’s primary location for flight testing and has five runways, 240 acres of ramp space, and one million square feet of adjacent industrial park with hangar space and other facilities for lease. The most recent development at the airport is Greenpoint Technologies’ announcement to bring several VIP 787 aircraft and additional work to the airport for completion. |
|                               | South Kitsap Industrial Area (SKIA)                  | Located in southwest Bremerton, contains about 3,700 acres planned for industrial development and use. The Puget Sound Regional Council’s Vision 2040 Plan has designated SKIA as one of eight Manufacturing/Industrial Centers (MICs) in the region. VISION 2040 recognized MICs as important employment locations that serve both current and long-term regional economic objectives and calls for the provision of infrastructure and services in MICs necessary to serve intensive manufacturing and industrial activity. |

The state contains multiple large-scale manufacturing sites and robust supporting facilities. In addition to the current production capacity outlined above, existing sites are accompanied by undeveloped land that can be used for expansion to support increased manufacturing. With these resources, the industry is prepared to accommodate future lucrative contracts and investments.
Is there capability for ongoing analysis to identify appropriate sites for new manufacturing activity, and efforts necessary to make them “implementation ready?”

Yes. VISION 2040 and the Regional Economic Strategy (the Puget Sound region’s CEDS) direct PSRC to update its analysis of regional industrial lands. The analysis began in October 2013 and will be completed by fall 2014. The Industrial Lands Analysis Technical Working Group is made up of professionals from around the central Puget Sound region with land use, transportation, or economic development planning expertise and knowledge of industrial lands issues. These members include employees of cities, counties, ports, and the state.

In addition, the Advanced Planning Grant Program was created by the Washington State Legislature in November 2013 during the special legislative session called to help the state win the Boeing 777X program. The Legislature appropriated $2 million in the current biennium to help local jurisdictions advance environmental review and permitting in and around large manufacturing sites. Recently, awards were made to Snohomish County Paine Field ($400,000) and the City of Spokane ($350,000) to facilitate new development of aerospace and other manufacturing facilities. In addition to this program, several jurisdiction, including the City of Everett near their Boeing manufacturing facility, have utilized a similar program called Planned Actions where permitting and environmental review are completed for an entire subarea, rather than on a project-by-project basis. This has the result of reducing time for environmental review for potential projects, while also providing a more comprehensive environmental analysis of development in the subarea.

Do the applicants control these sites? There are several sites currently undergoing the process to be designated as Manufacturing Industrial Centers. Some are privately owned and some are a combination of public/private ownership.

As a result of growth management laws, all of these sites are within the urban growth area and must be vetted through local and regional zoning procedures. Actual preparation of sites varies across the application area in terms of utilities infrastructure. Some sites are at or near ready build, while others are green fields and will require additional infrastructure investment.

Are they easily accessible by potential workers via short commutes or multiple modes of transportation?

All of these sites are within the urban growth boundary and are accessible by freeway, highway or local arterials. Many of the sites, particularly those that are designated MICs, already have significant employment activity and are served by local and regional transit systems. See the Capability section for a more detailed description.

Are they located in areas where planned uses will not disproportionately impact the health or environment of vulnerable populations?

As a result of growth management laws, all of these sites are within the urban growth area and have been vetted through local and regional zoning procedures.

Are there opportunities to improve the environmental sustainability of the KTS?

All of the power utilities, public and private, have significant energy efficiency programs focused on reducing power consumption by their large and mid-sized customers, which are often manufacturers. A Boeing manufacturing facility in the Duwamish MIC is participating in an i6 Green Challenge grant administered by PSRC. See the Operational Improvement and Capital Access: Capability section for a more detail description.

Gaps

The Competitive Assessment commissioned by the Washington Aerospace Partnership in late 2013 found that the biggest physical infrastructure gaps were:

- Competitor regions can offer low cost properties to attract aerospace companies – Washington State’s constitution prevents this.
• Freight and commuter congestion is a major problem. Although transportation use planning is excellent, Washington State has not approved a substantial highway transportation funding package since 2005.

• Additional investments in Sound Transit's regional Link light rail system are needed to complete regional network including metropolitan centers and other major employment centers like Snohomish County-Paine Field. The last voter-approved investment, ST2, was passed in 2008.

• There is concern about Paine Field maintaining certifications and federal funding. To do so, it must stay compliant with FAA requirements, including allowance of scheduled air service for cargo and passengers as defined by FAA Grant Assurance documentation.

Tune-Up Strategy

Infrastructure and Site Development: Plans

The following outlines how the Washington Aerospace Manufacturing Community intends to build on local assets to improve KTS:

• Support sustainable system of local and federal funding to ensure commercial airports are well maintained and able to support commercial and passenger freight service. **Lead: Local partners.**

• Work with key transit organizations to ensure they have funding to maintain and improve commuter access to key aerospace employment centers. **Lead: Local and regional transit agencies.**

• Continue expansion of strategic rail spurs to connect key industrial lands to the BNSF mainline to reduce truck congestion on interstates and spur economic development. The Northern Columbia Basin Railroad Project is a proposed rail construction project to promote economic development in the Moses Lake area. The purpose of the proposed Northern Columbia Basin Railroad (NCBR) Project is to provide rail service to lands designated for industrial development in the northern part of the City of Moses Lake as well as to the south and east of the Grant County International Airport (GCIA), to enhance opportunities for economic development, and to attract new rail-dependent businesses to those areas. Total cost for the project would be over $22 million. **Lead: WSDOT, local partners. Funding: $2 million for environmental documentation, construction is currently unfunded.**

• Rehabilitation of 6.9 mile rail for CW Branch Rail Relay and Rehabilitation project, which supports Spokane West Plains industrial development. **Lead: WSDOT, local partners. Funding: $7 million, TIGER grant application.**
Infrastructure and Site Development: Catalytic Investment

Statewide Transportation Package

Action
Washington Legislature to pass the state transportation package, which includes expansion and interchange projects along the I-5 Aerospace Corridor, such as the 157/509 Puget Sound Gateway Project and I-405; and along the I-90 Aerospace Corridor at Snoqualmie Pass and I-395 in Spokane; and, the first mile/last mile projects at deep water ports and roads and highways connecting to major OEM facilities.

Impact
- Better connect the state’s largest ports to Boeing and supplier networks in the Puget Sound region and to Eastern Washington
- Break open key freight chokepoints
- Also support master land use plans and economic developments developed by cities in these corridors

This is critical to aerospace cluster since Boeing will increase its interstate freight usage by a factor of 5 due to just-in-time manufacturing

Advantage
Boeing is emphasizing just-in-time manufacturing and key to this is infrastructure that supports efficient interstate freight and labor mobility. Passage of a transportation package would build on existing infrastructure to develop the most cost effective and efficient transportation system supporting the largest aerospace OEM and supply chain network in the country.

20-year Return on Investment

<table>
<thead>
<tr>
<th>Benefits</th>
<th>Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>$72 billion</td>
<td>$12 billion</td>
</tr>
<tr>
<td>Additional improvements in quality of life, safety, and freight transportation savings</td>
<td>To be funded by a combination of gas tax, freight fees, tolls, etc.</td>
</tr>
</tbody>
</table>

Milestones
5/2015: Passage by Washington State Legislature

Partners
Washington Aerospace Partnership, PSRC, Greater Spokane, Inc., all county Associate Economic Organizations

Sources: We are using the Interstate and Defense Highways in the publication The Best Investment a Nation Ever Made: A Tribute to the Dwight D. Eisenhower System of Interstate and Defense Highways by Wendell Cox and Jean Love, 1996 cost benefit analysis that estimated a return of $6 for every dollar spent.
Trade and International Investment: Capability

What is the current level and rate of change of the community's exports of products or services in the KTS? Identify existing number of international KTS firms, inward investment flow, outward investment flow, export and import figures, KTS trends in the region and internationally:

Aerospace exports were by far Washington State’s largest export category, with over $37 billion exported in 2012. This accounted for 49 percent of Washington’s commodity exports. The top countries purchasing aerospace products from Washington State are listed in the table below.

<table>
<thead>
<tr>
<th>Country</th>
<th>Export Value (millions)</th>
<th>Percent of Total</th>
<th>2008-12 Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>$4,876</td>
<td>13.10%</td>
<td>86.50%</td>
</tr>
<tr>
<td>UAE</td>
<td>$4,782</td>
<td>12.90%</td>
<td>138%</td>
</tr>
<tr>
<td>Japan</td>
<td>$4,754</td>
<td>12.80%</td>
<td>105%</td>
</tr>
<tr>
<td>Hong Kong</td>
<td>$1,464</td>
<td>3.95%</td>
<td>163%</td>
</tr>
<tr>
<td>South Korea</td>
<td>$1,429</td>
<td>3.85%</td>
<td>112%</td>
</tr>
<tr>
<td>Germany</td>
<td>$1,165</td>
<td>3.14%</td>
<td>129%</td>
</tr>
<tr>
<td>Indonesia</td>
<td>$1,139</td>
<td>3.07%</td>
<td>372%</td>
</tr>
<tr>
<td>Qatar</td>
<td>$1,128</td>
<td>3.04%</td>
<td>120%</td>
</tr>
<tr>
<td>Brazil</td>
<td>$1,095</td>
<td>2.95%</td>
<td>35.60%</td>
</tr>
<tr>
<td>Australia</td>
<td>$1,003</td>
<td>2.70%</td>
<td>195%</td>
</tr>
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Source: US Census Bureau, Foreign Trade Division

In 2012, aerospace exports accounted for $37 billion in trade, 49% of Washington’s commodity exports.

Middle East: The UAE is a rapidly expanding market for Washington aerospace exports, poised to become the top trade partner.

Asia: Japan and South Korea were recently joined by Indonesia in the top ten aerospace trade partners.

China: While China is currently the top purchaser of Washington aerospace products, it may soon start producing aircrafts domestically.
Middle East
The Middle East continues to be a hot market for Washington's aerospace industry. The United Arab Emirates (UAE) has nearly caught up to China as Washington's top aerospace export market. If growth trends continue UAE will become Washington's top aerospace export market very soon. Qatar ranks eighth, continuing its purchases of Washington aerospace products after a sharp rise in 2009. Even Saudi Arabia was a significant aerospace market, purchasing just under $1 billion of aerospace products in 2012. It now ranks 12th for Washington State aerospace exports.

Asia
Like in other industry sectors, Indonesia has been a surprisingly strong export market for aerospace. This country, with a population of 242 million, had the highest 4-year growth of any of the countries in the top ten with over $1 billion of aerospace exports. A notable absence from this list of countries is India. Aerospace exports from Washington to India peaked in 2007 then fell to around $300 million in 2011. 2012 saw aerospace exports to India rise back to just under $1 billion. It ranked 11th for aerospace exports in 2012. Japan and South Korea continue to be important destinations for aerospace exports.

China
China, with its massive population and rapid economic growth, continues to purchase airplanes and parts from Washington State. Combining Hong Kong with China, the numbers look even more impressive. Aerospace manufacturers in Washington State should continue to track China's progress in developing their own commercial aircraft, which will impact demand for both Boeing aircraft and Washington State produced aerospace parts.

The graphs below show the growth in aerospace exports since 2005. From year to year export value fluctuates a lot, but overall there is an upward trend for most of these countries.

Backbone

Trade and International Investment: Institutions

What local public sector, public-private partnership, or nonprofit programs have been developed to promote exports of products or services from the KTS?

Washington State Department of Commerce international trade function offers an experienced team that provides a range of support services, including advocacy, consulting, risk mitigation, market research, trade missions and trade show support, business matchmaking and custom programs, all designed to help open doors overseas and attract new business.

Trade Development Alliance (TDA) promotes the Greater Seattle region in international markets, connects the region—its businesses and organizations—to those markets, brings the region together to be more successful internationally and educates our region on the importance of international business broadly defined. To this end, the Trade Alliance enhances the identity of Greater Seattle in world markets by convening regional stakeholders, executing outbound missions, hosting inbound delegations, producing marketing publications, organizing educational programming, and other activities.

TDA is in the midst of developing its target markets for the next three to five year period. The target markets will be based on marriage of key industry sectors and geographic locations. For example, one target might be focusing on helping our aerospace sector export to China. TDA organizes annually at least one business mission and in partnership with the Seattle Metropolitan Chamber an International Leadership Mission. TDA and Washington State Department of Commerce collaborate and interact closely. On outbound trade missions and inbound delegations, the Commerce and the Trade Alliance often work closely together. TDA convenes and chairs a coordinating group of organizations that work internationally.
Greater Spokane Incorporated’s International Trade Development Program provides resources from counseling to introductions to workshops for businesses interested in reaching or expanding their footprint in the global market.

Washington Council on International Trade is dedicated exclusively to advocating for public policies that increase our state's international competitiveness. On behalf of its members — manufacturers, retailers, service providers, farmers & ranchers, non-profit organizations and individuals – WCIT advocates for strong, pro-trade policies and investments that benefit Washington's small, medium and large employers and create jobs for Washington residents.

Gaps

- The state no longer has overseas trade office. This work is now contracted out.
- There is a need to attract more foreign direct investment to the Seattle metropolitan region and to additional aerospace regions, including Spokane County.
- The Export-Import Bank plays a major role in financing exports of Boeing aircraft and 156 other Washington companies, 70% of them small businesses. But without reauthorization, the Ex-Im Bank will expire on September 30, 2014, jeopardizing U.S. businesses and jobs.
- U.S. Small Business Administration’s State Trade & Export Promotion (STEP) has assisted more than 400 Washington state businesses and helped generate more than $135 million in export sales. But unless Congress continues this program, many aerospace cluster businesses will lose this important resource.

Trade and International Investment: Plans

- Support reauthorization of the Import-Export Bank to ensure that existing medium and large Washington aerospace manufacturing companies have the tools and resources to access needed capital. Lead: Washington Council on International Trade.
- Include at least one aerospace market target in the Trade Development Alliance update of its five-year plan. Lead: Trade Development Alliance.
- Plan and implement one outbound trade delegation per year. Leads: Washington Department of Commerce and Trade Development Alliance.
- Expand Spokane’s aerospace footprint by facilitating two trade missions each year. Lead: Greater Spokane Incorporated’s International Trade Program.
Trade and International Investment: Catalytic Investment

Global Cities Initiative’s Metro Foreign Direct Investment Pilot • A Joint Project of Brookings & JPMorgan Chase

**Action**

Develop a customized global trade investment strategy focused on Foreign Direct Investment and exports targeted to aerospace and other advanced industries.

**Impact**

- Coordinate community’s assets – such as skills training, innovation capacity, and freight and logistics – to help local firms access new markets, align existing export services and bring new business to the region.

**Advantage**

Leverage Brookings’ strategy development process, best practices expertise and data resources; leverage recently completed Washington Council on International Trade/Trade Development Alliance International Competitiveness Strategy and Regional Economic Strategy, as well as statewide public and private resources.

**20-year Return on Investment**

**Benefits**

- Implements key Regional Economic Strategy and WCIT/IDA International Competitiveness Strategy, which direct region and state to develop, assign responsibility for and implement a foreign direct investment strategy and a more focused export strategy.

**Costs**

- Brookings Institution analysis and coordination: $1.5 million for 5 year nationwide Global Cities Initiative, funded by JPMorgan Chase

- Trade Development Alliance and Economic Development Council-Seattle King County, PSRC and partners will donate equivalent of 2 FTE’s for 6 months plus all local costs and expenses: $150,000

**Performance Metrics**

- 6/2014: 40 site visits to targeted foreign companies currently located in region completed
- 12/20/14: Global Trade and Investment Strategy completed
- 12/20/14: Brookings Institution Market Scan Completed

**Partners**

- In addition to The Brookings Institution and JPMorgan Chase, Trade Development Alliance of Seattle and Economic Development Council-Seattle King County (local leads); PSRC, associate development organizations, cities, counties throughout most of the Washington Aerospace Community, Washington State Department of Commerce and other Stakeholders.
Business operational costs and local capital access: In response to historic demand for new jets, Boeing has sped up jet output by 40% over the last three years. Airbus recently announced it will increase production of single-aisle A320 planes by nearly 10%. By 2017, industry analysts estimate Boeing and Airbus will produce 138 new jetliners per month. At the same time, airline companies are pushing original equipment manufacturers (OEMs) like Boeing, Airbus, Embraer SA, and Bombardier for lower prices.

As a result, Washington Aerospace Manufacturing Community suppliers are being pushed for lower costs and faster production too. But most of these suppliers are small, median size is 98 employees, and they lack the capital and access to talent to make the price concessions plane makers are asking. A 2011 PricewaterhouseCoopers study showed that 20% were at high risk of being unable to keep up with rising production and had relatively weak financial strength. At the same time, new technology such as composite materials mean that suppliers must invest in new equipment and train current employees and hire employees with the right skill set.

Despite having some of the lowest energy costs in the nation, public and private utilities across the Washington Aerospace Manufacturing Community are committed to helping commercial and industrial customers conserve energy through a number of conservation and efficiency programs. For example, Puget Sound Energy, a private utility in Western Washington, provided more than $69 million in energy efficiency funds and rebates to our commercial and industrial customers, helping them save over 8.3 million therms of natural gas and 334 million kilowatt hours of electricity. More than $4 million of incentive funding was provided specifically to support efficiency upgrades at industrial and manufacturing facilities. Additionally, PSE provided consulting and technical support for operational efficiency improvements through its Industrial Systems Optimization Program.

Utilizing an i6 Green Challenge grant managed by the Puget Sound Regional Council, the City of Seattle, Seattle 2030 District and Microsoft have created a smart building pilot program to increase energy efficiency in commercial and industrial buildings through systems integration and predictive analytics. One of the four test sites in the project is a Boeing manufacturing facility in south Seattle. The projected results of the program are 15-25% energy savings with a return on investment under two years. Early data show that these targets are achievable.

Another project funded by this grant is the creation of the Northwest Smart Building Center, an industry neutral demonstration facility to increase awareness, interest and adoption of energy efficiency and smart building technologies in commercial and industrial
applications. Washington State and NEEC, an energy efficiency trade association, each contributed over $5 million to create this important public asset. The NWSBC just had its grand opening in April 2014.

Impact Washington, Washington state’s National Institute of Standards and Technology’s Hollings Manufacturing Extension Partnership (MEP,) works with small and mid-sized U.S. manufacturers to help them create and retain jobs, increase profits, and save time and money. An impact statement summarizing Impact Washington’s capabilities can be found at: www.impactwashington.org.

The Washington Small Business Development Center, a cooperative effort among Washington State University, other educational institutions, economic development organizations and the US Small Business Administration, helps small companies develop and execute strategies to increase revenue, jobs and competitiveness.

Gaps
- The talent gap described in the Workforce Section will hit the supplier chain even harder than the large OEMs, who can afford to pay more for top talent.
- Since the Great Recession, access to capital has gotten tighter – smaller companies find it even tougher.
- Faster production at lower cost is going to be a huge challenge to these small and medium size companies without the internal resources to “LEAN up.”
- Continued adoption of energy efficiency and smart buildings programs across the supply chain to improve operational improvement and profitability.
- Expertise in recycling composites materials in an efficient, ecologically sound manner to reduce manufacturers waste management costs as composites become the dominant material in aerospace manufacturing.

Plans
- Workforce strategies, including Composites Washington (Please see Workforce plan section.)
- See Catalytic Investment: NextGen LEAN Pilot Project in Supplier Networks section.
- Expansion of the number of smart building test facilities in the i6 Green Challenge program, including more manufacturing facilities, and increase awareness and adoption of energy efficiency technology using the Northwest Smart Building Center.
Operational Improvement and Capital Access: Catalytic Investment

Enterprise Value Assessment Program

Action
Based on enterprise value assessment, Impact Washington (Manufacturing Extension Partnership) will develop roadmap to improve operational efficiencies and navigate the risk involved in pursuing new capital, customers, markets and products. The roadmap will be prioritized based on return on investment and ease of implementation.

Impact
Pressure to reduce costs by up to 15% means small tier suppliers must decide quickly whether to invest in new equipment and processes and grow, whether to sell their companies to larger suppliers or whether to shut down. The challenge is that suppliers (median size 96 employees) don’t have the skills or resources to do an analysis of options available and develop a strategy to move ahead. This enterprise value assessment will provide them the bandwidth to assess and plan.

Advantage
As Washington state’s Manufacturing Extension Partnership, Impact Washington will leverage existing partnerships and initiatives (such as the actions strategies supported in the state’s new US EDA Make It in America grant) to target small and mid-sized aerospace suppliers throughout the Washington Aerospace Manufacturing Community.

20-year Return on Investment

<table>
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<tr>
<th>Benefits</th>
<th>Costs</th>
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<tr>
<td>$540 million in value improvement</td>
<td>$1.25 million ($2,500 per supplier)</td>
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<tr>
<td>($1.2 million per company)</td>
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Performance Metrics
Meet average of $1.2 million value improvement per supplier

Partners
Impact Washington (lead)

CAPACITY TO CARRY OUT IMPLEMENTATION STRATEGY

Overall leadership capacity – lead organization’s capacity to carry out planned investments in public goods:

Puget Sound Regional Council’s mission is to ensure a thriving central Puget Sound now and into the future through planning for regional transportation, growth management and economic development. PSRC works with local government, business, and citizens to build a common vision for the region’s future, expressed through three connected major activities: VISION 2040, the region’s growth strategy, Transportation 2040, the region’s long-range transportation plan; and Prosperity Partnership, via the Central Puget Sound Economic Development District Board, which develops and advances the region’s economic strategy.
VISION 2040 is the region’s strategy for addressing anticipated growth of population and employment through 2040. VISION 2040 describes how and where we can grow while also supporting the well-being of people and communities, economic prosperity and a healthy environment.

Transportation 2040 is the region’s long-range transportation plan. The plan outlines the investments and strategies needed to keep the region moving as we grow.

Prosperity Partnership, via the Central Puget Sound Economic Development District Board, has convened over 300 public and private groups to develop and advance a regional economic strategy to enhance the region’s economic vitality. It develops and maintains the action-oriented Community Economic Development Strategy (CEDS) known locally as the Regional Economic Strategy. The Central Puget Sound Economic Development District Board is the federally designated economic development district for the central Puget Sound region covering King, Kitsap, Pierce and Snohomish counties.

As part of PSRC’s economic development work, it helps organize, coordinate and staff statewide programs such as the Washington Aerospace Partnership, a 501(c)4 that is responsible for assisting the Governor’s Office of Aerospace and the State Department of Commerce in developing and implementing the Washington State Aerospace Strategy and developing the Washington Aerospace Economic Impact Study and the 777X Competitiveness Study (see appendix). WAP also helped lead the successful strategy for the Airforce Tanker, the 737MAX, the 787 and the 777X.

PSRC Data: PSRC is a rich data resource for the entire region – providing the data tools required to plan for the long-term and to inform decisions made every day. PSRC develops the Regional Economic Forecast, Travel Demand Forecast and Land Use Forecast for the region. As a regional affiliate of the US Census State Data Center netowrk, PSRC also maintains and makes available a range of Census products for the central Puget Sound region.

PSRC Funding: PSRC distributes about $160 million in federal transportation funds each year and received $9.2 million in federal funding for a variety of transportation, growth and economic programs in FY 2013.

PSRC Governance and Leadership: PSRC is governed by a General Assembly and an Executive Board. Each member of PSRC is a voting member of the General Assembly, which meets at least annually to vote on major decisions, establish the budget, and elect new officers. The Executive Board is chaired by the PSRC President, meets monthly, and serves as the governing board. Both the General Assembly and Executive Board use weighted votes based on population to make decisions.

The Transportation Policy Board and Growth Management Policy Board include representatives of PSRC’s member jurisdictions, tribes, regional business, labor, civic, and environmental groups, as well as voting members representing each caucus of the state Legislature. These boards make recommendations on key transportation and growth management issues to the Executive Board.

PSRC also supports the work of the region’s Economic Development District, governed by a board composed of public and private members that meets quarterly to coordinate regional economic development planning.

Sound partnership structure: PSRC is the lead partner of the Washington Aerospace Manufacturing Community application and will be in charge of day-to-day coordination in close consultation with the Governor’s Office of Aerospace. In matters that require consensus or a vote, PSRC will defer to the board of the Washington Aerospace Partnership, which includes representation of the entire geographic region that makes up the Washington Aerospace Manufacturing Community. WAP has a sound record of not only serving as the neutral table on aerospace issues, but bringing in funding and support that resulted in the development of the Washington Aerospace Strategy, the 777X Competitive Analysis, and the Washington Aerospace Economic Impact Analysis.

The Washington Aerospace Partnership is a collaboration of business, labor and government leaders working together to ensure Washington State continues to be a thriving global leader in aerospace excellence. It is registered as a 501(c)4. The WAP board includes: Bob Drewel, President, (Interim Chancellor of Washington State University North Puget Sound at Everett); Maud Daudon,
Partner capacity to carry out planned investments in public goods: The Washington Aerospace Manufacturing Community, through PSRC and the Washington Aerospace Partnership, has a solid track record of implementing regional and statewide plans. For example, WAP and PSRC partners successfully implemented strategies to win the Airforce Tanker, the 737MAX, the 787 and, most recently, the 777X. Perhaps the best illustration of our capacity and how we track results as an entire ecosystem is the third-party evaluation of the results of our strategy to win the “Project Pegasus” 737MAX program. “Appendix: Impact of Previous Recommendations” is excerpted from the 777X Competitive Assessment developed by Revel, and included in our application’s appendix. It is an unvarnished evaluation of how the partners together did at achieving the actions we’d agreed to. We will evaluate results of this program in the same way, holding partners responsible in the same way for their promises.

State of ecosystem's institutions and readiness of industry, nonprofit, and public sector facilities to improve the way they facilitate innovation, development, production, and sale of products, as well as train/educate a corresponding workforce. As can be seen in the “Appendix: Impact of Previous Recommendations, we have made great strides in coordinating the aerospace ecosystem's institutions. All of our partners in this application (see attached matrix) have agreed continue to improve and expand our capacity and collaboration.

Depth and breadth of communities’ short, medium and long term development and employment goals, plans to utilize high-quality data and rigorous methods to evaluate progress and demonstrate that the probability of achieving these goals is realistic: When Boeing shocked the state and moved its corporate headquarters to Chicago, our state realized that business, labor, government, education, and community leaders had to work together to build a collaborative strategy and hold ourselves accountable to carrying it out. We have come a long way since then, but still use the same rigorous methods to ensure we meet our goals. We are excited about the potential of being designated a Manufacturing Community and we look forward to leveraging that designation to develop a healthy and sustainable aerospace cluster.