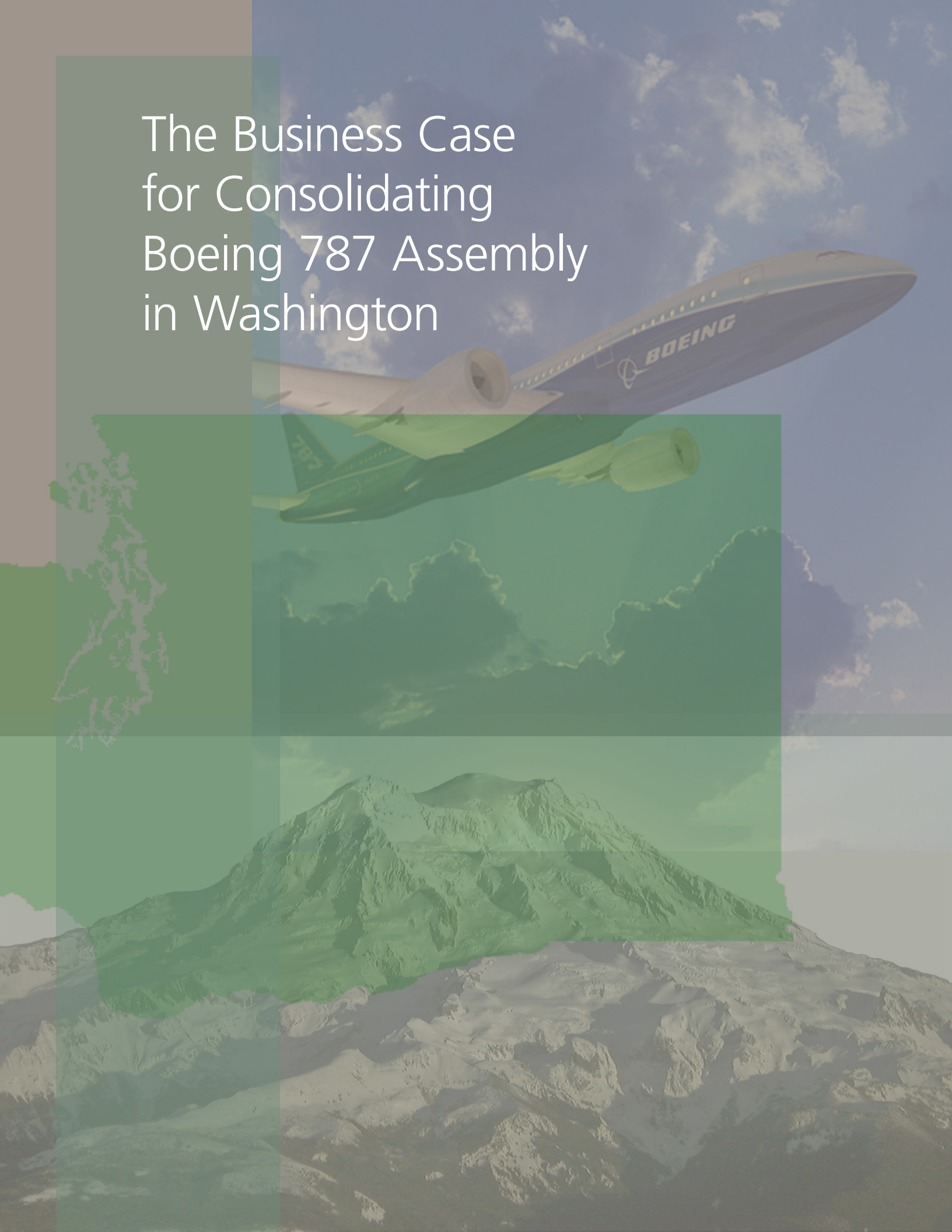
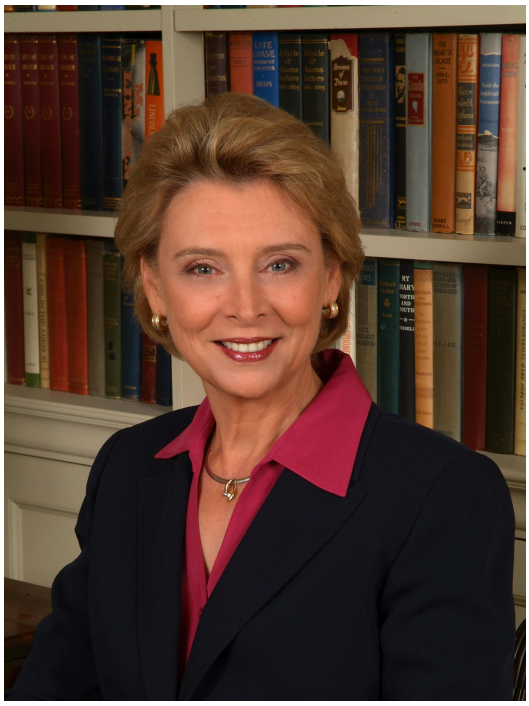
The Business Case for Consolidating Boeing 787 Assembly in Washington



cover image: Boeing 787, courtesy of The Boeing Company

A Message From The Governor



Washington is proud of its long history as the commercial airplane capital of the world. We are proud of the thousands of airplanes in service that originated in Renton or Everett. And we are proud of the many thousands of men and women who have dedicated their lives to designing, building, selling and servicing these airplanes. Commercial aerospace is in our blood.

Boeing's revolutionary 787 is the quickest selling airplane in history, with over 800 planes already on order. That success has generated competition among states for a second production line for this highly popular model.

Washington provides Boeing with the best location for the second line. Washington is the highest quality location Boeing could possibly identify for siting additional 787 production. Washington has a large, highly skilled and adaptable workforce, an attractive business climate, stable and sustainable government, a robust and funded infrastructure improvement plan, a strong education system, and the highest quality of life of any competitor state. Washington also has a highly competitive cost environment.

Boeing can site a second 787 assembly line in Washington with confidence that the world's best airplanes can be built at a competitive cost.

For almost a century, Boeing, Washington and countless other companies and organizations have worked in partnership to improve Washington's economic and business competitiveness. True there is more to do, but we have made significant progress, and we look forward to continuing to improve.

On behalf of the people of this great state, I am proud to deliver the business case for consolidating Boeing 787 assembly in Washington.

Chris Gregoire

GOVERNOR

State of Washington

Washington Aerospace Scholars, Museum of Flight

Washington Is The Best Location For 787 Assembly

Boeing can set up a second 787 assembly line in Washington with confidence that the world's best airplanes can be built at a competitive cost. The state offers the lowest risk and the highest assurance.

attractive business climate

- Independent rankings show Washington among top tier states for business
- Aerospace business taxes in Washington compare favorably with other states'
- Recent tax reform measures benefit aerospace
- Washington's unemployment insurance fund is healthy

low production risk

Washington has the following already in place:

- Factory, machines and tools
- Proven manufacturing protocols
- Experienced and productive workforce
- Concentration of aerospace partners
- Transportation system that works
- World-class medical care and research centers
- Programs to train existing and new workers
- Alternative location (Moses Lake)
- Partnerships with university and private research groups
- Broad-based business and labor support
- Stable local and state governments

quality workforce and improving labor relations

- 80,000 workers in the aerospace industry
- Community/elected leaders contributing to improving labor relations

stable government, providing infrastructure improvements

- Elected officials at all levels are strong advocates for aerospace
- More than $10 billion voter approved taxes for new transportation investments

commitment to education

- Washington students regularly outscore other states in college placement exams
- Washington is investing in workforce training, college education, and research
- Washington is focused on improving STEM performance
- Washington's early learning efforts lead the nation

strong, broad-based support

- Improving education across the board, starting with K-12
- Coordinating community colleges and universities with aerospace
- Supporting improved relations between labor and management
- Moving expeditiously on transportation improvements
- Advocating for Boeing-built refueling tankers

best quality of life

- CNBC placed Washington 9th in the U.S. for quality of life
- Gallup-Heathways Well-Being Index rated Washington 13th
- Washington was 18th in the annual State Rankings' "Most Livable State Awards"


City of Bellevue

Attractive Business Climate

Washington has an attractive business environment and elected officials are working hard to make it even better.

- Independent rankings show Washington among top tier states for business
- Aerospace business taxes in Washington compare favorably with other states'
- Recent tax reform measures benefit aerospace companies
- Washington's unemployment insurance fund is healthy

independent analysts rank washington high

Washington's business climate falls within the top tier among states, and the state consistently ranks higher than its competitor states. Like every state, Washington can continue to improve, but our foundation is strong.

kauffman new economy index (nei)

The NEI measures 29 indicators, including innovation capacity, economic dynamism, global connectedness and knowledge jobs. Washington ranks second overall; South Carolina trails at 34.

forbes magazine

Forbes measures the business climate of all 50 states, examining such variables as business costs, labor, regulatory environment, economic climate and quality of life. Washington ranks second in the nation, well ahead of California and South Carolina.

business tax index

The Small Business and Entrepreneurship Council measures 16 variables, including unemployment insurance taxes, corporate taxes, sales taxes and property taxes. Washington ranks fourth in the nation, ahead of all its competitor states.

corporation for enterprise development state report card

CFED's annual state report card ranks all 50 states on 46 performance measures. Washington received the best grade of any competitor state in this ranking.

american legislative exchange council economic performance

ALEC ranks Washington's economic performance highly. Among the competitor states, Washington is surpassed only by Texas.

moody's economy.com — first out of recession

Moody's predicts Washington will be one of the first five states to exit the recession, due to our strong credit, workforce and dynamic industry mix. All competitor states except Texas are predicted to recover much later than Washington.

washington's credit rating

Washington's credit rating by S&P is AA+, which reflects our dedication to rigorous financial management and our actions to weather the recession.

Measurements of State Economic Competitiveness

	WASHINGTON	CALIFORNIA	KANSAS	N. CAROLINA	S. CAROLINA	TEXAS
Kauffmen NEI	2	8	31	24	34	18
Forbes Magazine	2	38	15	5	25	8
Business Tax Index	4	47	33	38	11	5
CFED State Report Card	B	C	C	D	D	F
CFED 8th Grade Math	6	41	13	19	25	22
CFED 2 Years College	4	19	29	16	18	43
CFED 4 Years College	14	10	22	29	38	28
ALEC Economic Performance	5	27	42	23	18	1
Moody's Recession Emergence	Q4 2009	Q3 2010	Q3 2010	Q1 2010	Q2 2010	Q4 2009

washington's business taxes compare favorably

Washington's overall business taxes are lower than its competitor states.

Major State and Local Tax Comparison — *taxes per year of an ongoing airframe final assembly plant ($ million per year, 60 planes per year)*

	Moses Lake WA	Everett WA	Charleston SC	Wichita KS	Kinston NC	San Antonio TX	Long Beach CA
Low Property Value Scenario							
Corporate Income, Franchise, B&O Taxes	$3.1	$3.1	$3.5	$4.9	$5.2	$3.0	$6.1
Retail Sales/Use Taxes	$5.4	$5.0	$4.7	$4.4	$4.5	$6.0	$6.4
Property Tax	$1.8	$2.3	$2.6	$2.8	$3.2	$5.5	$2.6
Total Yearly Taxes	**$10.3**	**$10.4**	**$10.8**	**$12.1**	**$12.9**	**$14.5**	**$15.1**
High Property Value Scenario							
Corporate Income, Franchise, B&O Taxes	$3.1	$3.1	$3.5	$4.9	$5.2	$3.0	$6.1
Retail Sales/Use Taxes	$5.4	$5.0	$4.7	$4.4	$4.5	$6.0	$6.4
Property Tax	$2.5	$3.2	$3.6	$4.0	$4.4	$7.6	$3.7
Total Yearly Taxes	**$11.0**	**$11.3**	**$11.8**	**$13.3**	**$14.1**	**$16.6**	**$16.2**

Source: Washington Department of Revenue Analysis

Washington offers the most attractive tax environment of any competitor state.

Washington's taxes on the aerospace industry in relation to revenues and property are the lowest of any competitor state. Our sales taxes are within a couple percentage points of nearly all competitors with sales taxes.

corporate / b&o / income tax

While it is difficult to directly compare operating income taxes to gross revenue taxes, Washington jurisdictions have rates approximately one-half that of our nearest competitors.

Corporate Tax Rates

SITE LOCATION	CORPORATE TAX RATE
Everett, Washington	0.29% on gross revenues
Moses Lake, Washington	0.29% on gross revenues
Kinston, North Carolina	6.90% on operating income
Charleston, South Carolina	5.00% on operating income
San Antonio, Texas	1.00% on the lesser of gross income or 70.00% of gross income
Wichita, Kansas	7.10% on operating income

Source: Deloitte Consulting, April 2009 report to State of Washington, State of Washington Department of Revenue

property tax

Washington's property taxes are the lowest among five peer states. Everett's property taxes are approximately one third of the property tax imposed in Charleston, South Carolina.

Real and Personal Property Tax Rates

SITE LOCATION	REAL PROPERTY	PERSONAL
Everett, Washington	0.87%	0.87%
Moses Lake, Washington	1.27 – 1.28%	1.27 – 1.28%
Kinston, North Carolina	1.50%	1.50%
Charleston, South Carolina	2.69%	2.69%
San Antonio, Texas	2.50 – 3.00%	2.50 – 3.00%
Wichita, Kansas	2.95%	0.00%

Source: Deloitte Consulting., April 2009 report to State of Washington

sales tax

Washington's sales tax falls within two percent of all competitor states that have sales taxes (Kansas does not have a sales tax.)

Sales Tax Rates

SITE LOCATION	CONSTRUCT.	MACHINES & EQUIPMENT	SUPPLIES	COMPONENTS
Everett, Washington	8.60%	0.00%	8.60%	0.00%
Moses Lake, Washington	7.90%	0.00%	7.90%	0.00%
Kinston, North Carolina	6.80%	1.00%	6.80%	0.00%
Charleston, South Carolina	7.50%	0.00%	7.50%	0.00%
San Antonio, Texas	8.10%	1.90%	8.10%	1.90%
Wichita, Kansas	0.00%	0.00%	7.10%	0.00%

Source: Deloitte Consulting., April 2009 report to State of Washington

washington's tax reform measures benefit aerospace companies

Washington's governor and legislature consistently adopt new and innovative measures to maintain a competitive environment in the state for aerospace companies.

Beginning with the enactment of landmark competitive aerospace legislation in 2003, the governor and legislature enacted multiple measures to support the aerospace industry including:

- Reducing the Business & Occupation (B&O) tax rate from 0.4840% of gross revenues to 0.2904% of gross revenues, numerous credits against B&O tax liabilities, exemptions to other taxes.

- Exempting from taxation, the installation, repair, cleaning, altering, imprinting or improving of transportation equipment, and other machinery and equipment, retroactive to June 2002.
- Expanding the 2003 tax package to cover suppliers and subcontractors of manufacturers. This includes credits against the B&O tax for property taxes paid on new buildings, new machinery and equipment, and land used for manufacturing.
- Creating the Employment Resource Center, specifically designed to assess and train employees on production methods for the 787.
- Creating a statewide aerospace apprenticeship training program, which is working with employers, community and technical colleges, labor and workforce development partners across Washington to identify, develop and implement apprenticeship programs. The program is growing rapidly and will begin delivering service to over 20 employers this year. Two more programs are scheduled for kickoff in January of 2010.
- Extending aerospace tax incentives to design/engineering services, other services; extending through June 2024 the B&O tax rate, as well as B&O tax credits for property and other taxes paid, to commercial airplane sales, component sales, manufacturing or sales of tooling, and FAR 145 certified repair stations.

washington's unemployment insurance fund is healthy

While other states might have lower rates, Washington's unemployment insurance (UI) fund is in solid financial condition, and the rates charged to employers are declining. Washington's average UI tax rate declined 42 percent in the past four years, almost double the national average

Washington's UI trust fund is among the healthiest in the nation. This stands in stark contrast to many of our competitor states, which will need to raise taxes because they have insolvent or nearly-insolvent trust funds.

This year, Washington's legislature and governor made key changes to UI:

- Lowered the mandatory floor on "social taxes," which seek to recoup costs that cannot be recovered from a single employer and are therefore shared by all employers.
- Decreased experience-tax rates — some taxes were moved from the experience rated portion of the system to the social portion.
- Lowered the cap on total unemployment taxes for an individual employer — from 6.5% to 6.0%.

UI Trust Fund Solvency Status and Provisions

	WASHINGTON	KANSAS	N. CAROLINA	S. CAROLINA	TEXAS
Solvency Status	Solvent	Solvent	Insolvent	Insolvent	Will become insolvent within 2–3 months
Trust Fund Balance*	18.7 months	9.7 months	1.3 months	0 months	3.7 months
Borrowing Status	None	None	$649 million; projected to rise to $1 billion in next few months	$300 million; state projects total borrowing of $800-900 million by 12/31	Borrowing of $1 billion to begin in next month
Solvency Provision	0.2% solvency tax. Not currently in effect.	No provision	State Reserve Tax when trust fund balance below $163 million	No provision	Deficit assessment of up to 2.0%. Currently in effect.
Borrowing Compared to 2008 Tax Revenues	Not applicable	Not applicable	2008 revenues = $909 million. Borrowing will exceed 1 year of tax revenue.	2008 revenues = $277 million. Borrowing will exceed 2.5 to 3 years of tax revenues.	2008 revenues = $923 million. Borrowing will exceed 1 year of tax revenue.

** Measured in months of benefits as of the end of 1st quarter 2009.*
Source: Washington Employment Security Department

other states face insolvent funds

At least three consequences loom for states with insolvent or near-insolvent trust funds:

1. Most of the selected states will need to raise unemployment taxes due to a lack of reserve funding. Washington's unemployment insurance trust fund is in better financial shape than that of any competitor state.
2. Insolvent states with solvency provisions will need to enact them. Some states have separate taxes to deal with potential insolvency. Some states have higher tax rate schedules, which go into effect when the state trust fund level is low.
3. Most of the competitor states will also need to raise taxes to repay loans. Some of the selected states have separate tax provisions that go into effect when their unemployment trust fund reserves are low. The selected states with these provisions have begun collecting these taxes. Washington, which has a solvency tax, has a healthy trust fund and does not need to impose this tax.

The repayment of the federal and private loans taken by competitor states to continue to pay benefits will equal at least one year of tax revenues for North Carolina and Texas and close to three years of tax revenues for South Carolina. These states are likely to need to continue to borrow additional funds in 2010 to pay needed benefits.

The Boeing Company

Low Production Risk

boeing can choose washington with confidence

Boeing can choose to set up a second 787 assembly line here with confidence that the world's best airplanes will be built at a competitive cost.

Everything that Boeing needs to expand 787 production in Washington is in place and ready to go:

- Factory, machines and tools
- Proven manufacturing protocols
- Experienced and productive workforce
- Concentration of aerospace partners
- Transportation system that works
- Education programs to train existing and new workers
- Partnerships with university and private research groups
- Broad-based business and labor support
- Stable local and state governments

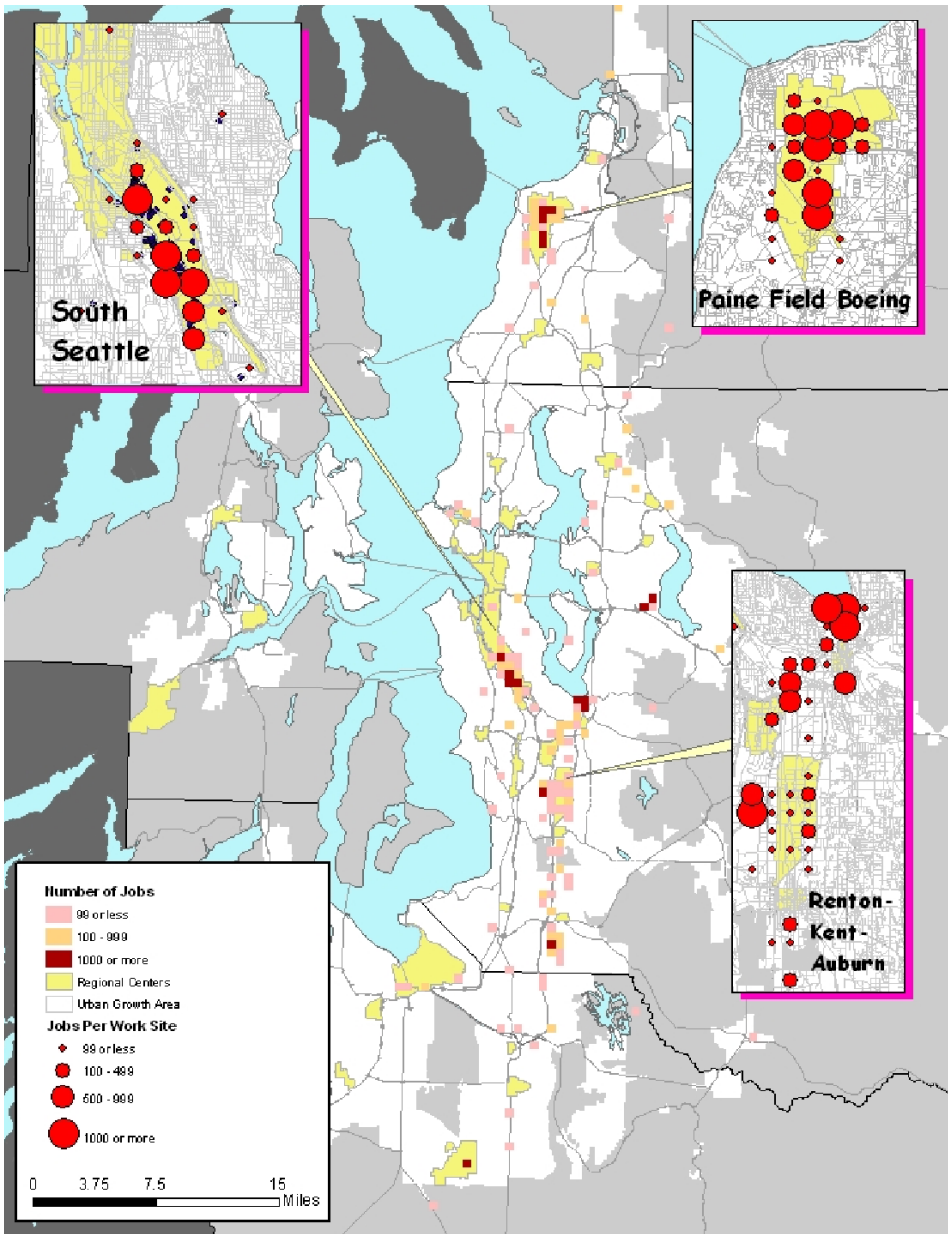
Washington and Boeing have benefited from a long partnership. The people of Washington are fully committed to our partnership, and to doing whatever it takes to ensure that this region remains the best place in the world to manufacture airplanes.

global aerospace center advantages

More aerospace companies are concentrated in Washington than any other location in the world. That concentration provides important advantages for Boeing in capacity, flexibility, hiring, and professional services.

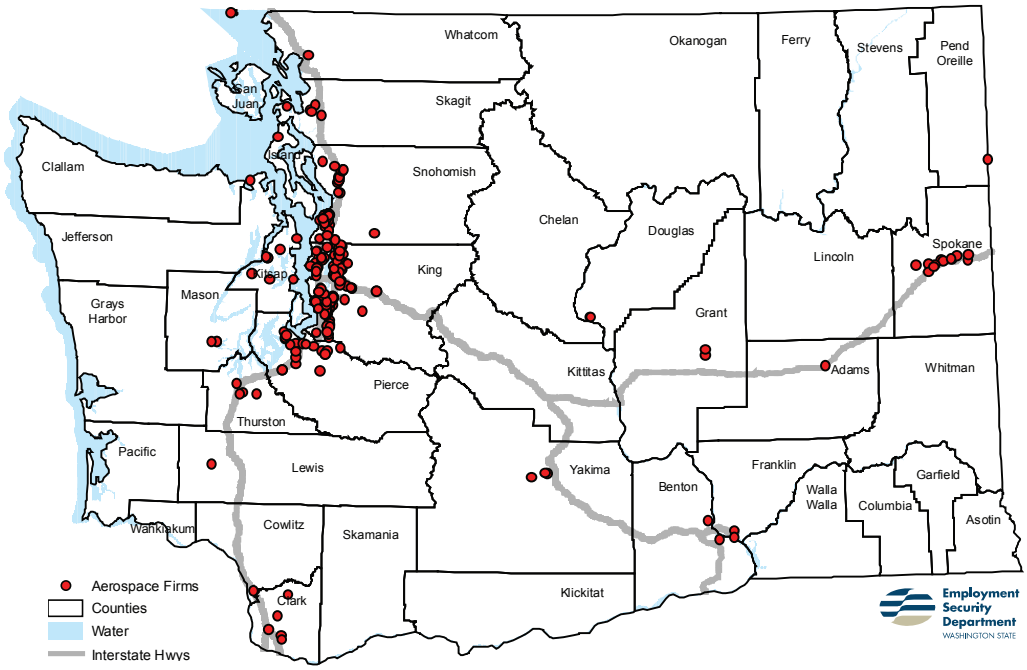
- A higher number of highly qualified suppliers and potential suppliers creates a critical mass of capabilities that the company can draw on here in Washington, but would be impossible to find elsewhere.
- Washington's vast supplier network and deep aerospace cluster provide Boeing with considerable flexibility and constitute a critical mass of competencies and capabilities that are invaluable to the production process.
- Similarly, as employment levels rise and fall, having an existing aerospace skill base to draw upon allows the company to grow more quickly, since the hires would need less training than a new hire in a competing state. Professional services that are specific to individual facilities are of substantially higher quality in Washington than they are in competing states as well.

Aerospace Centers in Puget Sound Region



Source: Puget Sound Regional Council

Aerospace Firms in Washington



Source: Washington State Employment Security Department

global innovation center advantages

Washington is known throughout the world as a leading center for innovation and discovery across the business spectrum – aerospace, medical research, life sciences, education, computer science, manufacturing, transportation, software and retailing.

The Boeing Company was the first company in Washington to reach all corners of the globe. The early technological and intellectual environment created by Boeing has helped to make it possible for an amazing succession of other global companies and institutions to plant roots and prosper here:

- Alaska Airlines
- Microsoft
- Nintendo
- Amazon
- Fred Hutchinson Cancer Research Center
- PATH
- Bill and Melinda Gates Foundation
- Paccar
- Costco
- Nordstrom
- Starbucks

Today, those companies and organizations — and hundreds of others — are benefiting from the concentration of exceptionally talented and motivated people who call Washington home. Companies are collaborating with each other, with universities and with research centers to discover new technologies and solutions to some of the world's greatest challenges.

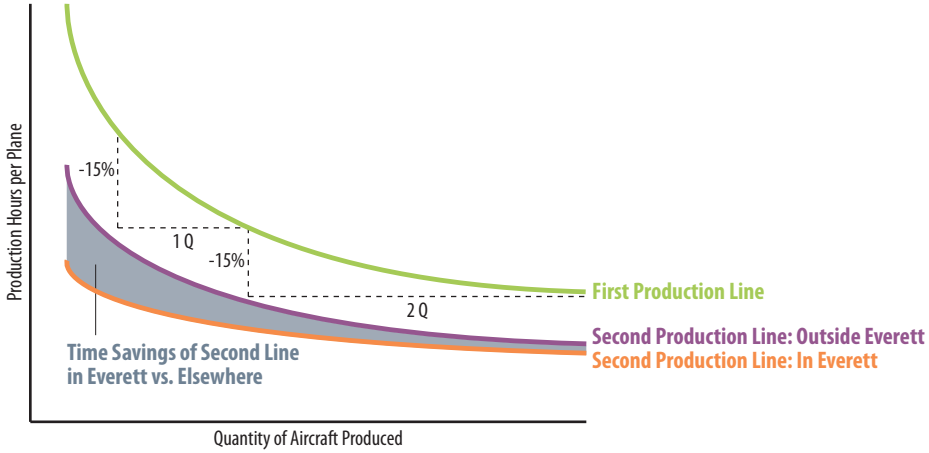
everett offers process efficiencies unmatched elsewhere

Aerospace manufacturing benefits to a greater degree than most other operations from co-location of numerous functions. Boeing's Renton plant saw tremendous efficiency gains by instituting lean manufacturing and co-locating engineering with production. Tremendous efficiencies are also gained by co-locating manufacturing lines with each other, both through management of worker assignments and through adopting better practices as workers improve their knowledge of production practices.

City of Everett

The greatest benefit from locating the second 787 production line with the existing line is the transfer of **learning curve** efficiencies to the new line. Simply stated, the learning curve concept recognizes that each subsequent airplane requires fewer hours to build than the last, due to employees learning to assemble airplanes more efficiently. Over time, this leads to dramatic reductions in cost per airplane. Initially of course, the learning curve is quite steep but over time it flattens out as most of the "learning" has been achieved.

Theoretical Aerospace Learning Curve (example)



This learning takes many forms, including labor efficiency, standardization and specialization of tasks, automated production technologies, shared experience effects and others. Taken together, these combined efficiencies can help build each additional 787 with fewer labor hours. The resulting savings can be thousands of person-hours to build a single airplane.

Disruptions can diminish or eliminate these efficiencies, however. Changes in design, suppliers and production rates have all been known to impact the drive to efficiency. **Most important, a new factory or a dramatic change to the workforce significantly diminishes efficiencies.**

By locating the second 787 production line in Everett, Boeing is assured that the learning benefits achieved on the first line will be transferred as completely as possible, maximizing the efficiencies achieved and minimizing the time it takes to achieve them.

risk management: moses lake offers an alternate site


Grant County International Airport

Recognizing that Boeing may be concerned with the threat of natural and other disasters, Washington can confidently offer an alternative site. In 2003, during the original *7E7 Dreamliner* competition, land owned by the Port of Moses Lake in Grant County was considered by Boeing as a potential site for final assembly. This option provides access to five separate runways, with a main runway of 13,500 feet in length and 200 feet in width.

Moses Lake sits approximately 190 miles from both Boeing's Everett and Renton facilities — approximately three hours' drive. This proximity to design, engineering, headquarters functions and most importantly the primary assembly line of the 787 means that, should it choose to do so, Boeing can mitigate any risk associated with co-location, while at the same time mitigating much of the risk associated with disparate location.

During the 2003 competition, Moses Lake was a very strong contender. Boeing, however, ultimately had a number of concerns about the land proposed in Moses Lake. These concerns have been addressed and Moses Lake is a viable option for the second line of the 787.

Clover Park Technical College

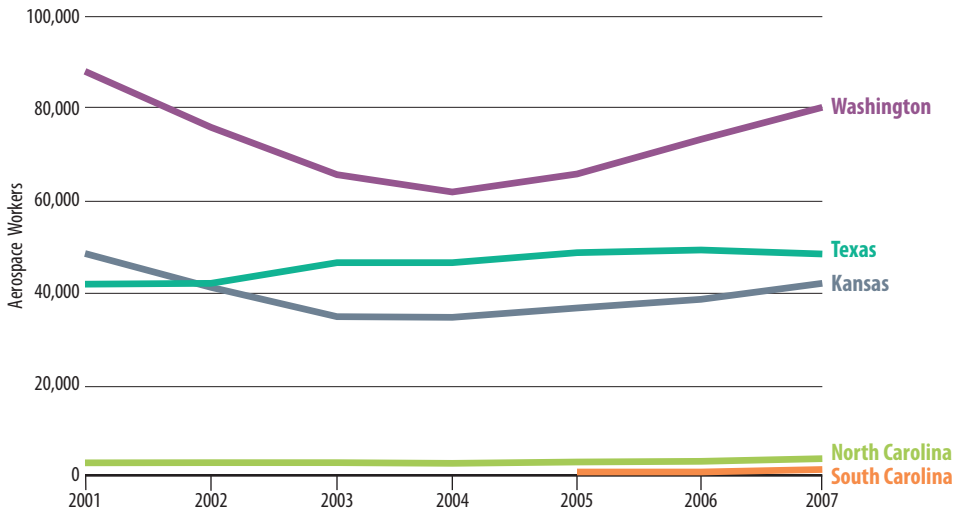
Quality Workforce And Improving Labor Relations

washington offers more and higher quality workers

Washington has over 80,000 workers currently in the aerospace industry, and thousands more with aerospace experience. The number of workers here is almost double our nearest competitor, Texas, double Kansas, and exponentially more than North or South Carolina.

The aerospace expertise of Washington's workforce is unmatched in the world and is the key to developing and producing advanced technology aircraft.

Number of Aerospace Workers by State



Source: Deloitte Consulting, Bureau of Labor Statistics

labor relations

Only Boeing and its unions can negotiate labor-management agreements. But leaders in our community and our elected officials can contribute to an atmosphere of improving those relations by ensuring the environment exists to engage in meaningful, productive negotiations. Key elected officials and a host of community leaders are working to ensure this atmosphere exists in Washington.

Tacoma Narrows Bridge

Stable Government, Providing Infrastructure Improvements

Washington citizens, and their elected representatives, place a very high value on the aerospace industry. Elected officials at all levels are strong advocates for the aerospace industry in state, national and international forums. Voters of the state have agreed to tax themselves to make transportation improvements.

aerospace advocacy

Washington's congressional delegation includes senior members of armed services and appropriations committees that are vital to the future of aerospace – these leaders have consistently acted as strong advocates for the aerospace industry and our nation's aerospace capabilities. Congressman Norm Dicks is a senior member of the House Appropriations Committee. Three other members of our delegation serve on the House Armed Services Committee. Senator Patty Murray serves in Senate leadership, and on the Senate Appropriations Defense Subcommittee. All members of the delegation are strong and effective advocates for Washington's aerospace industry.

Washington's governor is an outspoken advocate for the state's aerospace industry. Her first international trade mission as governor was to the 2005 Paris Airshow to promote Boeing and the state's aerospace industry. She created the Washington Council on Aerospace to oversee state government's efforts to keep Washington a competitive location for the aerospace industry. And she is an effective advocate before the Washington legislature for measures that benefit the aerospace industry and its workers.

transportation investments

Washington — with the strong support of voters — is making the most dramatic improvements to its transportation system since the interstate highway system was constructed more than 50 years ago. Through the *Moving Washington* program we are making investments that will improve mobility, increase safety and reduce congestion throughout the state, with a focus on the Puget Sound region, in which Boeing has its facilities.

The 2003 Nickel Tax, the 2005 Transportation Partnership Act and the 2008 Sound Transit measures are providing almost $33 billion in new funding for major improvements across the state, and over $28 billion in the Puget Sound region alone, including:

- **I-5 in Everett:** Washington extended lanes, modified interchanges, added a lane and built a new direct-access ramp, restoring rush hour speeds to free-flow conditions and dropping commute times ($263 million).
- **SR-167 through Kent Valley:** Added an HOV lane, instituted high occupancy toll (HOT) lanes to give solo drivers the option to pay a toll to use HOV lane, increasing volumes and speeds on this critical highway ($61 million).
- **I-405 comprehensive improvements:** Washington is midway through a comprehensive improvement to I-405 that will add general purpose and HOV lanes, rebuilding interchanges and adding overpasses to this critical highway, resulting in less congestion, improved access to Renton and the Kent Valley and faster, more predictable travel times (approx $900 million).
- **SR 99 — Alaskan Way Viaduct:** Washington will replace the aging Alaskan Way Viaduct's central section with a tunnel beneath downtown Seattle, as was advocated by regional business leaders, resulting in a safe and sustainable replacement that continues the free flow of people and goods through this vital corridor ($2.39 billion).
- **SR-520 bridge replacement:** Washington will soon replace the aging SR-520 floating bridge, adding capacity in both directions and improving travel times for people and goods on this and other corridors ($2 billion est.).
- **Light rail extensions north and east of Seattle:** In 2008, voters in the Puget Sound region approved the second Phase of Sound Transit, the region's light rail, commuter rail and express bus agency. This investment will extend light rail north to Everett and east to Redmond, resulting in 36 additional miles of light rail, 65% more commuter rail capacity and a 17% increase in express bus service ($17.9 billion).

King County and City of Seattle voters have approved additional measures to fund expanded transit and street and bridge improvements in their jurisdictions.

South Puget Sound Community College, Olympia Washington

Commitment To Education

Washington's business, community, education and government leaders place the highest priority on education — early learning, K–12, vocational, community colleges and universities — and on creating a nexus between education and the needs of employers in our state. This commitment is bearing fruit, as Washington consistently outranks competitor states in standard assessments of student achievement. Washington students consistently score higher on the ACT than any other state, and higher on SAT than all but Kansas. Only 7% of Kansas students take the SAT however.

	ACT	SAT			
	AVGERAGE COMPOSITE SCORE	PARTICIPATION %	READING	MATH	WRITING
Washington	22.8	53%	524	531	507
California	22.2	49%	500	513	498
Kansas	21.9	7%	581	589	564
North Carolina	21.6	63%	495	511	480
Texas	20.8	51%	486	506	475
South Carolina	19.8	67%	486	496	470

ACT, College Board 2009 data

Washington is building on that success. This year, Governor Gregoire, in response to recommendations from Deloitte Consulting, established the Washington Council on Aerospace, with a specific mandate to improve coordination among Washington's worker training programs, community colleges and universities.

vocational and technical training

Washington leaders recognize that the aerospace workforce throughout the country is aging. Therefore, Washington is committed to providing world-class training to workers entering the industry, in order to replace the knowledge retiring workers will take with them.

Washington offers a broad range of aerospace training opportunities at locations throughout the state.

Thirty-four colleges, with geographic distribution throughout Washington, provide critical workforce training in aerospace-related fields.

Since 2004, Washington's community and technical colleges have enrolled 13,000 full-time equivalent students and invested more than $22 million in programs directly supporting aerospace manufacturing alone. Examples include:

- Advanced composites manufacturing
- Robotics
- Precision machining
- Nanotechnology
- Computer integrated manufacturing
- Electrical design
- Electromechanical technology
- Engineering
- Computer-aided drafting and design
- Aerospace composite maintenance programs

Washington has created an Aerospace and Advanced Materials Manufacturing Center of Excellence to serve as a liaison between the aerospace industry and the state's educational system.

Examples of Washington's training network include:

- Edmonds Community College developed a partnership with Dassault Systemes to deliver Computer-Aided Three-dimensional Interactive Application (CATIA) software training to primarily Boeing employees.
- Everett Community College developed an airframe apprenticeship program that will begin training its first students this fall. A new machinist apprenticeship program is in the planning stages.
- Clover Park Technical College, in partnership with Boeing, launched an aerospace composite program that will begin training its first students this fall. The college has also developed a state-of-the-art training facility located at Thun Field.
- South Seattle Community College developed four aerospace apprenticeship programs in partnership with the Aerospace Joint Apprenticeship Committee, Boeing and the International Association of Machinists.

- Spokane Community College developed strategic partnerships resulting in the relocation of its aviation mechanics program to Geiger Field.
- A new partnership has formed between the aerospace industry and Edmonds Community College to provide industry-wide training opportunities at Everett's Paine Field, just south of Boeing's production facility.

universities and research

Washington's world class research institutions and universities provide Boeing and other aerospace companies with the skilled employees, managers and business executives needed to maintain world leadership in this critical industry. The Boeing Company has hired thousands of University of Washington and Washington State University engineers over the years, from a wide range of disciplines within engineering, and they have made major contributions to every Boeing commercial plane.

Washington state ranked 16th among the 50 states in per capita spending on higher education. The state consistently spends more money on higher education than the national average. In 2006, per capita state and local government spending on education was more than $100 above the national average.

In 2007 alone, Washington's higher education institutions conferred almost 1,000 engineering degrees in aerospace-related disciplines (electrical, mechanical, computer, aerospace, industrial, and materials engineering). Washington institutions also offer programs uniquely focused on the industry, including:

- **University of Washington:** Master in Aerospace Engineering in Composite Materials and Structures, Master in Applied Mathematics, and special programs offered in Everett in Global Integrated Systems Engineering, Aircraft Composite Structural Analysis and Design, Aircraft Composite Materials and Manufacturing, Modern Aircraft Structures.
- **Washington State University:** Masters in Material Science Engineering, Certificate in Sustainable Design and Manufacturing, Certificate in Electrical Systems for Airplanes.
- **Central Washington University:** MBA in Supply Chain Management, Flight Technology.
- **Seattle Pacific University:** Masters in Business Administration (offered in Everett at Boeing).

The UW's 4,000 member faculty has won six Nobel Prizes, two Pulitzer Prizes and two National Book Awards. There have been five National Medal of Science winners and 13 MacArthur Fellows. As reported in *The Economist*, China's Shanghai Jiao Tong University ranks the UW number 16 among the world's leading universities. *U.S. News & World Report* ranks the UW as the 11th top public university in the nation. Every year since 1974, UW faculty has been awarded more federal research funding than any other public institution in the country.

applied research

Washington has invested more than $21 million in aerospace and other applied research programs. The Washington Technology Center's Research and Technology Development program awards grants annually to Washington researchers in partnership with a company. The competitive process includes ranking by specialist committees, on which Boeing is represented by four people. The program is a great example of the partnerships that exist between Boeing and Washington.

Some of the projects funded by the program include:

- **Boeing and HEATCON Composite Systems:** Pre-Repair Thermal Mapping and Leak Detection, to improve the efficiency of composite-structural repairs.
- **Insitu** (now a wholly-owned Boeing subsidiary)**:** a three-phase RTD award recipient. In phase 3, UW tested flight software in a geophysical survey UAV.
- **dB Systems:** With UW developed and tested a new approach to voice recognition, to be used for controlling various avionics instruments during noisy in-flight conditions.
- **StressWave:** With a UW researcher optimized a new automated process, which makes fastener holes more resistant to fatigue.

stem (science, technology, engineering & mathematics)

In December 2007, Governor Gregoire announced a far-reaching Math and Science Initiative with the following goals:

- Recruit and train 750 new math and science teachers.
- Establish a bonus structure for nationally certified teachers who teach math and science in challenging schools.
- Align the state math curricula with international standards.
- Increase access to scholarships in STEM fields.

early childhood education

One of Governor Gregoire's first initiatives was to create the Department of Early Learning in 2006. According to the Annie E. Casey Foundation's Voices for America's Children report, Washington's early childhood landscape has "become much more exciting and dynamic" as a result. It cites the following accomplishments:

- $51.2 million to expand full-day kindergarten.
- $34.1 million for a pre-kindergarten program serving low-income families.
- $5 million for a pilot program that implements a Quality Rating and Improvement plan.


City of Seattle

Strong Broad-Based Support

Washington's business, government, education and non-profit leaders place the highest priority on strengthening the aerospace industry here, and are working as a team on innovative solutions to the challenges faced by Boeing and the aerospace industry.

More than 130 companies and organizations — labor, business, education and non-profits — joined together in the Washington Aerospace Partnership to be advocates for the aerospace industry. Top regional leaders, including the presidents of the State Labor Council and the Greater Seattle Chamber of Commerce, co-chair the Partnership.

Washington has a clearly articulated agenda for maintaining and improving its competitiveness as a center for the aerospace industry. The agenda is being advanced by local, state and federal government officials, non-profit organizations, trade associations and businesses.

- Improving education across the board, starting with K-12.
- Coordinating our community colleges and universities so that we produce graduates with the skills needed by aerospace companies.
- Supporting improved relations between labor and management.
- Moving expeditiously on transportation improvements that will keep people and freight efficiently moving throughout region.
- Advocating for Boeing-built refueling tankers.

Mt. Rainier

Best Quality Of Life

Site selection for any major company, business line or production facility is not just about its own particular need at the moment. It's also about the area's overall attractiveness to its workforce, health care, job opportunities for family, education, transportation, air service, and much more. Washington offers a greater variety of these attributes, at a higher quality, than any other site.

Washington's high quality of life attracts top talent from around the world and the overall well-being of its residents result in more productive workers. Employees — from rank and file laborers to research scientists — want to live in Washington and raise their families here. They love the clean air and water, the mountains and lakes, and the safe and friendly communities.

Washington Ranks Highly in Quality of Life — *ranking among the 50 states*

	WASHINGTON	SOUTH CAROLINA	NORTH CAROLINA	TEXAS	CALIFORNIA	KANSAS
2008 CNBC Top States for Business	9	39	38	22	4	33
Gallup-Healthways 2009 Well-Being Index	13	40	30	16	17	7
State Rankings 2009 Most Livable States award	18	49	42	37	30	17


City of Bremerton

Summary

Washington provides Boeing with everything it needs to continue making the world's best airplanes at a competitive cost, with the lowest possible risk.

Washington's business climate is consistently rated among the top tier states for business. Our business taxes on aerospace compare favorably with those in our competitor states. We have a healthy and sustainable Unemployment Insurance fund.

Washington provides Boeing with the lowest production risk of any location. All necessary plant and equipment are in place in Everett to efficiently begin 787 production on two lines. Our deep and strong aerospace cluster provides Boeing with flexibility and stability in process development. Learning efficiencies can easily be translated between the two productions lines. And Moses Lake is a good alternative, if Boeing needs to diversify away from its Everett plant.

Washington's workforce is bigger, more highly trained, and far better experienced than that of our competition. With over 80,000 people working in the aerospace industry, and thousands of others with aerospace experience, Washington's talent pool is unmatched by any competing state.

Washington's government is stable and is dedicated to providing the infrastructure our economy needs. Our elected officials at all levels are strong advocates for the needs of our aerospace industry. Even through these difficult economic times, we are investing billions of dollars in our transportation infrastructure, with an emphasis on Boeing's home region, the central Puget Sound.

Finally, Washington offers Boeing's workers the highest quality of life of any competitor state. Objective analysts regularly rank Washington among the most livable states. This quality of life attracts top talent, improves the well-being of our residents, and increases worker productivity.

Because of this unique combination of exceptional quality, experienced workers and competitive cost, Washington offers Boeing the most attractive site for the second line of the 787.

Boeing can site a second 787 assembly line in Washington with confidence that the world's best airplanes can be built at a competitive cost.