

# What does the future hold for aerospace in Washington?



If you want to predict the future, look to Washington among the top five bellwether states, as described by John Naisbitt in his hit 1982 book *Megatrends*. This prediction was driven by Washington state's history of social invention, technology innovation and start-up culture, creating iconic brands by many companies in several sectors, recognized around the world, many of which were not even known when he wrote the book 35 years ago. It arguably started with the manufacturing of aircraft early in the twentieth century requiring product innovators, highly skilled engineers and craftsmen and the ecosystem that supported them.

This gave rise to the foremost global aerospace cluster, the world's epicenter of aerospace, which now directly employs 124,575 skilled and highly paid workers, with another 294,000 indirect jobs supporting them.<sup>1</sup> Our long aerospace innovation history is both a competitive advantage as well as a challenge.

Washington has a world class, highly skilled workforce and possesses operational incumbency that is very difficult to replace and compete with. Our aerospace innovation culture gave birth to the engineering sciences that created the environment of software innovation in life sciences, gaming, personal

computing, internet shopping and related industries that have often made Washington the go-to place for next-generation industry talent. Our state government has provided support to aerospace companies that must work in an increasingly competitive market through business and occupation tax relief, better vocational and higher education support, more business friendly unemployment and workers' compensation taxes, and highway infrastructure improvements.

Along with this concentration of next-generation skills, the Pacific Northwest is often considered a desirable place to live and work, with cultural, civic, outdoor activities and other amenities that are cited among the many advantages Washington has.

On the other hand, a bit of history is worth examining. In the past, we faced the challenge of complacency with outdated tax policies that assessed our crown jewel aerospace companies with a tax burden that was heavy on manufacturing industries, as global competition was heating up. The reality of global competition wasn't fully appreciated by many at the time, resulting in a NIH (not invented here) syndrome by some in government and organized labor.

We could have faced the unintended consequence of a slow loss of our aerospace leadership in Washington had decisions gone the other way in 2003, when the final assembly site location was decided for the new aircraft program, or in 2014, when the labor

agreement was finalized and the new long range aircraft derivative program was established here.

Along came technology development which started to automate factory jobs, when at the same time there were calls for wage gains, resulting in labor strife and workforce tensions. In addition, we found that other states were willing to give away the farm in order to attract our aerospace operations to move to their locations, promising a "right to work" labor environment, low tax burdens, better infrastructure and lower cost of wages, housing and living.

Exhortations at the time from the popular press about Washington being among the "best places to do business" rang hollow for aerospace, as Alabama, Texas, Oklahoma, North Carolina and South Carolina captured aerospace site selection decisions, leaving Washington largely in the minus column.

<sup>1</sup> Deloitte estimates based on data from US Bureau of Labor Statistics, US Office of Personnel Management, and US Census Bureau



built, but in the design and manufacturing processes on the shop floor. Robots, driven by sophisticated software, are now doing riveting. Airplanes are now able to fly themselves and passengers are connected with inflight Wi-Fi for communications, business and entertainment. All of this takes a highly educated workforce, with skills and experience in product development and software engineering.

The key to Washington's aerospace future is to promote, develop and sustain

a highly skilled and competitive workforce that can create the innovations of tomorrow. The key skills for the future, among others, will likely be product and technology development, software design, product testing and certification, digital supply chain operations, and quality engineering.

We will be competing not only with other states, but with other industries in our own state such as life sciences, software and high technology for the engineering and software graduates from our higher education institutions.

Manufacturing jobs are needed for composites, subassembly, final assembly and testing, but many of these tasks are becoming automated with the increased use of 3D printing and additive manufacturing, automated riveting and robotic quality testing.

The future for aerospace in Washington will rely less on making parts cheaper, and more on making them better. For



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With success comes challenges. As we have discovered, manufacturing is portable, with work packages able to relocate with relative ease. But skilled workers living in a highly desirable location are hard to move or incent to move to greener pastures. In addition, with such high demand for skilled workers, our region is experiencing an unprecedented influx of people driving up the cost of housing, wage rates and highway congestion.

The reality is that Washington is a magnet and highly attractive location for aerospace largely due to its workforce, creativity and talent. This is likely true not only for aerospace, but also for the new economy software engineering based industries that are increasingly driving our economies, especially in the Puget Sound region, more so than ever before.

This is just at a time when aerospace is becoming more software intensive, not only in the products that are

example, aircraft of tomorrow could rely partially or fully on electric propulsion, with higher comfort for passengers, on aircraft controlled more with software, from its navigation and health monitoring systems to next-generation inflight entertainment and communications.

Aircraft will likely be made with less labor content to reduce the purchase price by airline operators, with increased use of automation and robotics. Aircraft will likely need to be produced that require less maintenance and upkeep, with parts that last significantly longer on wing. All of this would require an experienced and highly skilled workforce in the disciplines of tomorrow as described, in design and software engineering and in related fields.

Thus, the future of aerospace in Washington should focus

*Continued on page 22*

## Blue Origin

*Continued from page 11*

capsule and propulsion module. These are usually small quantity orders that require fast-turnaround parts.

“More than half of our business comes from Blue, and more than half of our employees are dedicated to Blue projects,” McNeeley said. “We’ve been able to make several capital improvements because of Blue’s business. We work with them closely, and that close proximity and hands-on time is critical to our business and definitely impacts the bottom line.”

While Blue Origin operates facilities in multiple states, Washington is our home. It’s one of the most innovative states in the nation and a huge proponent of progress in the aerospace industry. We salute the state policymakers who also recognize this and have taken action over the years. Their business-friendly legislation has allowed us to stay here, and more importantly, supported the rapidly growing commercial space sector.

Now, we aim to expand the discussion. We look forward to engaging with our governor, state legislators and local government officials to show them first-hand how continued business-friendly legislation will help us carry on our mission to ensure America’s leadership in the technology and aerospace sectors. 

## Symbiotic Sectors Nurture

*Continued from page 17*

Bloomberg recently ranked Washington #1 in the US for science, technology, engineering and math (STEM) education concentration. To meet the growing demand for skilled workers, we continue to forge strong public-private alliances to develop and maintain leadership in our most powerful competitive advantage—our people.

A massive, highly skilled tech and advanced manufacturing workforce built upon our aerospace tradition is the proud, shared resource that strengthens communities all over the state.

Raw carbon fiber is produced in Pierce County, precision crafted into composite parts in Sedro Wooley, and recycled in Port Angeles with the help of machines made in the Kent Valley. The largest composite aircraft wing in the world is produced in Everett, more new planes roll off Renton assembly lines than anywhere else in the world while commercial and military aircraft structures are designed, fabricated, maintained, repaired and overhauled in Spokane, and planes are flight tested for FAA certification in Moses Lake. Researchers in a state-of-the-art lab in Frederickson advance the world of composite materials, which may inspire a new unmanned aerial system from Bingen, that will aid a grower in Yakima County or a defense company near JBLM.

Our aerospace sector provides a historical model for collaborative innovation and leadership. It’s also a blueprint for future success. In this emerging era of the Internet of Things (IoT), machine learning, augmented/virtual reality (AR/VR) and so many intriguing possibilities, Washington is primed to grow existing and new businesses from all over the world, right here at home. 

## AEROSPACE IN WASHINGTON

*Continued from page 19*

on educating and nurturing the workforce of tomorrow, as well as re-skilling those that have been laid off. State government leaders should consider supporting expanded class sizes of our higher education and vocational institutions to deliver curriculum in systems integration, software design, coding, and testing, industrial and quality engineering.

Just as seen in the case of the automobile, personal computer or mobile phone manufacturing industries, aerospace is not immune to the inevitable march of commoditization.

Thus, success will be in building better products with more functionality at a lower price point—better before cheaper. In order to maintain our regional aerospace leadership for tomorrow, education matters. The world is watching us. John Naisbitt in his Megatrends book predicted as much. 

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