"Leading the Second Century of Flight"

Jim Albaugh, Executive Vice President, The Boeing Company
Woodrow Wilson Center for International Scholars

September 18, 2012
Washington, D.C.
Remarks as prepared

Thank you, Jane, for that warm welcome, and thank you for your service to our country. [*Jane Harman, Wilson Center Director, President and CEO*]

I've known and worked with Jane Harman for many years. When I lived in California and ran defense and space programs at Rockwell and Boeing, Jane Harman was my congresswoman. She has always understood the importance of a strong defense, and she's always fought for the resources and policies to keep America safe.

I also want to thank Kent Hughes and the team here at the Wilson Center for organizing this program.

This is National Aerospace Week …

- It's a time to recognize how the aerospace industry contributes to America's national security, economy and competitiveness;
- A time to celebrate our success and look to the future.
- We have hundreds of companies carrying our message to the Hill this week.

Aerospace is more than an industry. It's a force for good in the world.

- We help drive the global economy.
- We're good stewards of the environment.
- We bring people together, connect our world, and promote an understanding of different cultures and points of view.

Today, the United States leads the world in aerospace. We build the world's most efficient and capable commercial airplanes. Our weapons systems and satellites are unmatched. And our manned space program was recently second to none. It pains me that we're walking away from it.

America's Aerospace Leadership Is Threatened

I'm here today because I believe America's leadership in aerospace is threatened, and with it, our nation's security, economy and future. Unless we, as a country, step up to this challenge, I fear that the benefits we've enjoyed from aerospace may flow to other countries, leaving our economy weaker and our nation less secure.

Unfortunately, as I listen to the discussions here in Washington, D.C., I don't hear an awareness of what's at stake, a sense of what's required or a commitment to act before it's too late.

While other countries are investing aggressively in aerospace and defense, we are doing the opposite. We are so focused on what to cut; we are forgetting how to grow.

The Pentagon faces reductions to its budget that are staggering by any measure -- half a trillion dollars to date – and perhaps even more through sequestration.

While competing nations have set clear goals and are executing on them, we are in danger of letting our industrial base atrophy, pushing R&D overseas, allowing our infrastructure to decay, and losing critical capabilities, all at our own peril.

Fortunately, we still have time to reverse course. We can still lead the world in the second century of flight, and it's in that spirit that I'm here today.

Woodrow Wilson

I'm grateful to the Woodrow Wilson Center for having me because this institution has always brought people together to solve problems. Your namesake -- President Woodrow Wilson -- took steps to ensure America's leadership in aviation back when it was a new and uncertain endeavor.

In 1915, just 11 years after the Wright Brothers' historic flight, Europe took the lead in aviation.

On April 2, 1915, President Wilson appointed members to a new organization, the National Advisory Committee for Aeronautics. Its mission was to "… to supervise and direct the scientific study of the problems of flight with a view to their practical solution…"

The N.A.C.A. led to new standards in engine cowlings, airfoil design, supersonic flight and rocketry. In 1958, it was folded into a new agency, NASA, with a stronger focus on space.

One test pilot who made the transition from N.A.C.A. to NASA was Neil Armstrong. When he died last month, America lost one of the great men of the 20th century…. a man who showed what America can accomplish when we dare to do great things.

Today, America is once again at a crossroads – just as in President Wilson's day and in the late 1950s.

My Path to Engineering

I've been part of the aerospace industry for a long time, but I have to admit that my path to this field wasn't exactly linear. I grew up in a small town on the Columbia River in Washington State. I went to a small liberal arts college planning to study history. I switched to math and physics and pursued a graduate degree in civil engineering because I wanted to build dams.

Unfortunately, I hadn't done my research. It turned out that all the good sites for dams were already taken, so I became a rocket scientist instead. Rocket science and dams have a lot in common. Both are about flow and stress. But instead of fluid flows in dams, you have gas flows in rockets.

Fundamentals of Engineering

Early on I learned the fundamentals of engineering:

- The numbers are what they are, and they have to be right.
- Human lives and business plans depend on it.
- Engineering is not a profession for the impatient or faint of heart.
- There are no shortcuts. Not in engineering…not in anything worth doing.
- And engineering is a noble profession…it makes the world a better place to live.

Joining the Aerospace Industry

I was fortunate to join the aerospace industry in the final quarter of a remarkable century. To me, American aerospace defined the 20th Century. It helped win World War II. It brought the world closer together with commercial air travel. It changed the way we communicate with commercial satellites. And, of course, it changed forever how we look at the world around us when man first walked on the Moon.

I believe aerospace will define the 21st Century as well. The question is, will it be American aerospace?

I hope so, but it's not a given. It will require us to make the right decisions on policies affecting our industrial base, research and development, our workforce, and the environment.

State of Aerospace Today

It begins by understanding the current state of our industry. It is vibrant, challenging and rapidly changing.

Looking ahead, we see a strong and growing commercial market.

- $4.5 trillion over the next 20 years.
- Demand for 34,000 new passenger airplanes and freighters.

It's a market many countries and companies covet – and every day, globalization, competition, changing military threats, budget pressures, and demographic shifts are reshaping the landscape.

The traditional duopoly between Boeing and Airbus is over. We're facing competition from China with Comac, Russia with Sukhoi, Canada with Bombardier, and Brazil with Embraer. Not all of the new entrants will be successful, but some of them will.

America's proud legacy in aerospace does not guarantee our leadership tomorrow… our leadership is not an entitlement. We always have to be looking over our shoulder and making the decisions necessary to maintain our leadership position.

With economies in Europe and elsewhere in turmoil, governments are looking for revenue wherever they can find it. And increasingly, they are turning to aviation. We're seeing policies that would tax air travel, divert money from critically needed infrastructure, and impose regional regulations in place of industry-wide solutions. Flying out of Heathrow, for example, you are seeing taxes and fees making up 25% of the cost of a ticket. This, on an airline industry that is forecast to make only half a percent profit this year.

If the goal is to grow the economy and improve our world, these policies are moving us in the wrong direction.

Aerospace Creates Jobs

If you want to create jobs and boost trade, aviation is part of the answer. The aerospace industry has fueled the U.S. and global economies -- and improved the lives of countless people.

Our industry is one of America's largest exporters. It supports millions of jobs – not only at Boeing, but at suppliers, airlines and airports around the country.

Globally, aviation supports more than 56 million jobs and contributes $2.2 trillion in economic activity about 3.5% of the world GDP. If you include tourism and other businesses enabled by air travel the number is even higher.

If you add up the value of goods transported by air, it represents 35% of all international trade.

I've shared some international figures. Let me turn closer to home for a moment and talk about what our industry's growth has meant to Boeing.

Last year, Boeing Commercial Airplanes hired 12,000 people as we increased our production rates to meet global demand. Many of those new hires were in Charleston, South Carolina, where in less than three years we constructed a factory to produce the 787.

In April, we rolled the first airplane out of that factory, and a few weeks later, it flew for the first time.

Those were great days...historic days.

Just as important as the rollout and flight is the impact on the lives and families of the 6,000 people we have hired there. It has transformed their lives and enriched their communities. It has connected them to something big and important.

Those men and women now belong to an exclusive fraternity – a fraternity of workers who have built one of the most complex machines in the world – ***a commercial airplane.***

And not just any airplane but the 787 Dreamliner, the first new airplane of the 21st century, an airplane that others will be measured against for decades to come. It's an airplane that won the Collier Trophy, our industry's most prestigious prize, awarded for the greatest aeronautical achievement in 2011.

Industrial Base

These workers are joining our industry at a critical time – a time when America's industrial base is threatened.

Think about what a strong industrial base has meant for our country. It was the "arsenal of democracy" that equipped us to win World War II and the Cold War. It put a man on the moon. It made America the worldwide leader in space, commercial aviation, and defense.

But a strong industrial base is not a given. It's a product of the right policies, investments and priorities – and of time.

With our current direction, we risk breaking a continuum of capability that's taken us decades to build.

To be a viable prime contractor and an integrator of very complex systems, you have to understand how to do both development and production.

- You have to do R&D.
- You have to take R&D into detailed design.
- You have to transition detailed design into production.
- You have to have a healthy supply chain,
- And you have to support your products.

With no new starts in the Department of Defense, we are jeopardizing our ability to do development defense programs and losing our capability to transition design into manufacturing. If this happens, we will lose that continuum I just spoke of.

Once this development capability is gone, it will be difficult to rebuild. That was one of the problems we had on the 787 program. We had not done a new development program since the 777, and we paid the price as a result.

I fear that our country will wake up some morning and ask for a capability, only to find that no company has the necessary skills to do the program.

Space

In space, I see the same troubling direction. The demise of the Space Shuttle program cost thousands of very experienced engineers their jobs. Without clear direction and investments, we're going to lose the intellectual capital it's taken us 50 years to develop.

Just as we're beginning to see a return on our investment in the International Space Station, we've been reduced to hitching a ride from the Russians.

For the first time since 1962, we do not have the ability to put an American in space.

It's ironic that when the Russians were penniless, they kept their program alive and we helped them. But today we are walking away from our own program.

While we're seeing some momentum commercially, it is no substitute for what we are giving up.

Sequestration

These risks to our industrial base will grow worse unless Congress and the White House reach an agreement on budgets and prevent sequestration.

Much has been written about the impact of sequestration on the defense budget; it would be severe. But civil agencies face cuts just as deep.

A recent AIA study showed that sequestration would put more than 2 million American jobs at risk when cuts are applied across defense and civil agencies.

Many of these civil agencies enable commerce and are critical to our customers and our day-to-day operations. Cuts in FAA operations alone could cost up to 132,000 aviation jobs according to another AIA report.

Sequestration wouldn't just affect big companies like Boeing. The cuts would ripple across our supply chain hurting small and medium-sized suppliers as well. That's why it's important for the government to address these budget issues in a balanced way.

But preserving our industrial base requires more than preventing cuts. First and foremost, we need a strategy.

Industrial Strategy

Most every nation that is serious about sustaining and strengthening its aerospace industry has an industrial policy. But when it comes to maintaining key Defense and Space capabilities here in the U.S. -- our only strategy is one of market forces. In my mind, it is not clear, coherent or comprehensive enough.

I'm not saying we need a policy that defines specific outputs and production, or that we should build things that aren't needed. But we do need to start the dialogue about a strategy to ensure the long-term viability of our defense industrial base. I think that starts with identifying key enabling technologies and ensuring we keep design teams together, even if it's at a low level to support them.

Getting this right is critical to our long-term economic and national security.

Level Playing Field

Part of the strategy must also ensure that we play by the same rules – on both sides of the Atlantic and Pacific.

The United States won an important decision in the WTO Airbus trade case. We risk this being a paper victory unless it is backed up with strong, swift enforcement. To me, anything less risks the reputation of the WTO and a rules-based trading support, which we all fought so hard to establish.

R&D

We also need to invest in research and development. Wherever R&D goes, innovation and economic growth follow.

Studies have shown that more than half the growth of America's GDP is due to technological innovation. Yet U.S. government R&D as a percentage of our GDP has fallen by 60 percent since 1964.

By contrast, China's R&D investment is the fastest growing of all advanced countries.

Clearly, the U.S. government plays an important role in supporting research on high-risk technology that will not have commercial applications for decades. Our national labs provide a critical service here, and they need to be funded.

In addition, we need to reinstate the U.S. R&D credit, which expired last year. Until we have more scientists and engineers running our country, I'll keep coming back to D.C. to remind folks that aerospace drives our economy, our security and our global leadership.

It's worth noting that in China – a nation investing so heavily in its future – both the current leader and his heir apparent are engineers.

Workforce

In addition to the areas I've already addressed, we also need to focus on the demographics of our workforce.

About half of Boeing's employees will be eligible to retire by 2015.

Not all of them will, and we are hiring new people all the time, but our country is simply not producing enough engineers and technicians, with the right skills, to meet the demand.

It's contributing to what I call the "intellectual disarmament" of our country. Along with reduced R&D spending, I believe this puts us at risk. The question is, how can we ensure a strong pipeline of skilled workers?

STEM

Much has already been said on how we need to focus on STEM education in our schools, so I won't belabor this point.

We need great teachers and a rigorous curriculum, but we have to start by inspiring the next generation with big, bold ideas. You have to wonder why American students are not embracing engineering as enthusiastically as they are in other parts of the world.

My view is that engineers are not celebrated in this country as maybe they should be.

On a visit to Russia, I toured the Novodevichy Cemetery in Moscow. And what stood out, beyond its tranquility and beauty, was the honor it bestowed upon its scientists, mathematicians and engineers. Their gravesites were among those of noted writers, artists and heads of state.

There was Andrei Tupolev, Sergey Ilyushin and Pavel Sukhoi. All famous airplane designers.

It made me wonder—when was the last time I saw a mathematician, scientist or engineer gracing the cover of a national magazine or the front page of a metropolitan newspaper in America?

Young people around the world are looking for the same thing – a career that challenges them, allows them to grow and reach their potential, and connects them to something greater than themselves.

We can attract tomorrow's engineers by capturing their imagination and letting them be part of an exciting mission that will shape the future ... just as my generation was drawn into aerospace by President Kennedy's call to land a man on the moon.

I think there are very compelling missions for this generation.

They will rebuild this country's and the world's infrastructure ... and will change aerospace in untold ways.

They will save the Spaceship we are all on together, our planet Earth.

This generation will find the solutions to healthcare, energy independence and global warming.

Environment

That brings me to a final point I want to make about issues shaping the future of American aerospace.

We know that growth in our industry can't come at the expense of the environment.

That's why Boeing is designing and building more efficient aircraft for our customers and supporting the development of 21st century Air Traffic Management systems.

Commercial aviation accounts for 2 percent of today's man-made global carbon emissions. But with air traffic more than doubling in the coming decades –we need to do more to reduce its impact on the environment.

Globally, our industry has set targets for carbon-neutral growth by 2020 and a significant reduction in CO2 emissions by 2050.

This focus is validated every day when I talk to our airline customers. They worry about many things, but two of them always top the list: profitability and their environmental

footprint. Both are closely tied to the consumption of fuel, which comprises up to 40% of an airline's operating costs.

At Boeing, we're committed to make each generation of airplanes greener with improved aerodynamics, lightweight materials like composites and more efficient engines. Believe it or not, 75% of the R&D at our company directly impacts the environment.

Our industry has never waited for government to take the lead on this issue … to tell us to make our planes more fuel efficient. We've done it on our own because it's the right thing to do.

Over the last 50 years we've improved the efficiency of our airplanes by well over 70% since the 707, the plane that launched the Jet Age. We just spent billions of dollars making one type of airplane…the 787…20% more efficient than the airplane it replaces.

Just imagine if we could have that same kind of impact on every airplane flying. We can come pretty close if we adopt a space-based air traffic management system, also known as NextGen.

NextGen

In my lifetime, there have been three major strides in transportation.

- The first was the Interstate Highway System.
- The second was commercial air travel.
- The third was GPS.

I think the fourth great stride will be air traffic management. If we deploy NextGen, it will be the interstate highway system of the sky.

Airlines will have more control of ascent and descent, be able to route their airplanes more efficiently from point to point, reduce our industry's environmental footprint, save time and money, and improve our dependence on foreign oil.

But the road ahead will not be easy. While there's a lot of talk in D.C. about helping the environment and improving America's energy independence, with NextGen, there is a chance to move beyond the talk and make significant progress.

Conclusion

Throughout my lifetime, the aerospace industry has improved our country and our world in countless ways. The U.S. has led the pack -- and we can continue to do that. But it's going to take a commitment from all of us who care about sustaining American leadership.

As I mentioned earlier, when talking about President Wilson, 1915 was an important year for technology and innovation. Alexander Graham Bell made the first transcontinental phone call. Albert Einstein introduced his Theory of Relativity. And President Wilson named 12 individuals – from government, defense and industry – to serve as unpaid advisors to a new government committee.

Those individuals created a national focus on the future of aviation.

Today, 97 years later, we need another group of leaders to step forward and lead. It's a role that all of us can play. And if we do, American aerospace will continue to lead the world in the second century of flight.

Thank you for inviting me to speak with you today.