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"Transforming America's Air Travel"
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Chairman Babin, Ranking Member Edwards, and distinguished members of the Committee, I thank you for the opportunity to testify about the importance of the Federal Aviation Administration's (FAA) Research, Engineering, and Development (RE&D) programs to our nation's continued leadership in aviation. While I currently serve as vice president and general manager of Boeing Research & Technology, I am speaking to you today as a member of the American Institute of Aeronautics and Astronautics (AIAA), the world's largest aerospace professional society, serving a diverse range of more than 30,000 individual members and 95 corporate members.

Reauthorizing the FAA is of significant importance to AIAA members, so I am pleased that the Committee is holding this oversight hearing and that Congress is moving forward with the consideration of legislation to extend the agency's programs. An extension, at adequate funding levels, will ensure that our nation remains the world leader in aerospace innovation.

Throughout my career in the aviation sector, I have gained a great appreciation for the important role that research and development (R&D) plays in driving innovation and progress. It is imperative that as a nation we continue to make strong investments in R&D. Wherever R&D goes, innovation and economic growth follow. More than half of the growth of our nation's gross domestic product (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. According to a biennial report by the Organization for Economic Co-operation and Development (OECD), China is forecast to overtake both the European Union and the United States in R&D spending by the end of this decade. China simply makes it a national priority as it attempts to compete, match, and surpass the United States in terms of economic prowess and military capabilities. To keep our technological edge, we must keep pace with growing investments by China and other nations. Our government must continue to promote innovation and competitiveness, strengthen our industrial base, level the playing field for U.S. companies and workers, and create a public infrastructure that is second to none.

It is important to note that when we fail to invest in new R&D programs we risk losing talent and expertise that has taken us decades to cultivate. Our engineering talent is not a fixed asset. It is made up of people who need challenging new projects. And if they do not have them, they move into other industries, choose to pursue other interests, or retire. Once lost, reconstituting this asset is very difficult and will take decades.

It also is important to note that declines in government R&D funding discourage young people from pursuing careers in science, technology, engineering, and mathematics—the so-called STEM disciplines. Less spending means fewer programs and therefore fewer job opportunities for college graduates. It is no mystery why U.S. engineering ranks were wide and deep in the 1960s and 1970s. U.S. government R&D spending was at its zenith then, in part because of defense programs, but also because of the space program that excited everyone and prompted countless students to pursue STEM careers.

We are on the cusp of implementing a major advancement in transportation that could be just as exciting to students and seasoned professionals alike—a space-based air-traffic management system. Creating such a system will have the same kind of impact on air travel that the Interstate

Highway System had on surface transportation. As many of you know, the Next Generation Air Transportation System (NextGen) will enable more efficient curved approaches to landing and give pilots the ability to adjust in real time to changing weather conditions en route so that they follow the most efficient path to their destination. It will reduce our industry's environmental footprint, save time and money, and contribute to achieving energy independence. The FAA's reorganized Joint Planning and Development Office (JPDO) has stated that NextGen improvements to ground operations at airports, in proximity operations around airports, and in the high-altitude cruise environment will yield annual benefits, or cost savings, in the billions of dollars.

Despite these potential benefits, NextGen has faced significant cuts and setbacks in recent years, causing some in Congress undoubtedly to lose faith in this modernization program. If we view NextGen as a financial investment for future generations, similar to how President Dwight D. Eisenhower viewed the Interstate Highway System more than 50 years ago, now is the time for Congress to make a strong financial commitment and set a firm timetable for NextGen's completion. The return on investment for the United States will be significant and lasting.

As mentioned, NextGen will help the aviation industry save fuel and thus reduce emissions. Completing the program, in fact, is an integral part of the industry's plan for reducing global airplane carbon dioxide (CO2) emissions by 50 percent by 2050, compared with 2005 levels. Commercial aviation accounts for two percent of today's manmade global carbon emissions, but that percentage is on track to increase as air traffic grows unless NextGen is completed and other steps are taken—which I will address in a moment. According to the International Air Transport Association (IATA), cutting flight times by just one minute per flight on a global basis would prevent 4.8 tons of CO2 emissions every year, so completing NextGen is key to the aviation industry's ability to meet its environmental targets.

Sustainable biofuels are another important element of the industry's emissions reduction plan. Boeing, Airbus, Embraer, and many others in the aviation industry, plus various government agencies, have partnered to create, test, and evaluate biofuels. As the supply of biofuels increases, the price of biofuels will decline and become competitive with petroleum-based fuel, spurring airline use. We have made good progress, but still have a lot of work ahead of us. It is important

that the U.S. government continues to stay involved in both the development and commercialization of sustainable biofuels.

The third element of our industry's emissions reduction strategy is something that the aerospace sector has been doing very well since its inception—developing ever-more-efficient airplanes and engines. There are solid business reasons behind our work in that area. Airlines have always wanted greater efficiency. Now there are important environmental reasons as well for developing lighter, more aerodynamic airframes and more fuel-efficient engines.

Government has important roles to play in these efforts. It is vital that Congress continues to provide funds for long-lead research projects that lead to more efficient airframes and engines. Another critical area is ensuring that the FAA is able to keep up with and enable the pace of innovation occurring in the aerospace sector. One program designed to maximize FAA resources is already under study. Government and industry have been involved in research and development necessary to move toward a systems engineering approach to airplane and engine certification. The end result of this research would be a better, more efficient certification process; one that encourages innovation and accelerates the incorporation of innovative product enhancements that make airplanes more efficient, safer, and more comfortable for passengers.

Over the last century, the aviation sector has improved our country and our world in countless ways. The United States has been synonymous with global aviation leadership—and we can continue that legacy. But it is going to take a commitment from all of us who care about sustaining U.S. leadership. Federal R&D investments are critical to this effort because they lead to innovation and technological advancement. The United States cannot afford to rest on our laurels and simply say "remember when" research and development was a national priority.

More than 30,000 men and women belong to AIAA. They come from industry, government, and academia. Many have been involved in some of aviation's great achievements, and all of them aspire to being involved in the next big breakthrough. Many of them also rely on government funding to support the work that they do. The FAA's Research, Engineering & Development budget and the National Aeronautics and Space Administration's aeronautics research program are critical to their work. The realization of NextGen, biofuels, more efficient jet engines, and lighter, more aerodynamic airplanes all require collaboration and partnership and a reliable stream of

government investment in aviation's future. Our nation's global leadership in this key industry is at stake.

Thank you again for allowing me to come speak to you today. I look forward to discussing this topic with you further, and to answering any questions you may have for me in this regard.