TESTIMONY OF THE HONORABLE ERIC K. FANNING

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HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE

"THE COST OF DOING NOTHING: WHY INVESTING IN OUR NATION'S INFRASTRUCTURE CANNOT WAIT"

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Chairman DeFazio, Ranking Member Graves, and the rest of the Committee, thank you for the opportunity to be here today. I am Eric Fanning, President and CEO of the Aerospace Industries Association (AIA).

AIA represents the dynamic aerospace and defense (A&D) industry that keeps our nation secure and has been moving, connecting, and inspiring people for over a century. It's an industry that brings different interests together, fostering the bipartisanship that leads to real action. Like you, we understand that aerospace and defense is at the heart of the American economy, generating $865 billion in sales and a trade surplus of $86 billion in 2017 – the largest of any U.S. exporting sector. Moreover, our industry is supported by 2.4 million dedicated employees – representing nearly 20 percent of the nation's manufacturing workforce – who are responsible for the continuous stream of innovations that improve American lives. We're proud that modern life is and will always be shaped by the innovation we create.

Introduction

AIA is celebrating its 100th year as not only the voice for America's aerospace and defense, but also a bipartisan convener where people – from different regions, backgrounds, and yes, even political parties – can come together to get things done on a number of important topics, including today's focus on infrastructure.

It is no secret that our nation's infrastructure is outdated. In 2017 the American Society of Civil Engineers gave America's roads a D, bridges a C+, and infrastructure overall a D+.[1] Congestion is at record highs. Environmental concerns are growing with the record number of cars and trucks idling and with people spending more time in their vehicles than ever. Our infrastructure is failing our nation's citizens, so I applaud the Committee for taking on this essential issue.

As all of today's panelists know, we need to redouble our investments in traditional infrastructure. While some may not expect aerospace to be a voice for this investment, our industry also relies on roads, rail, airports and bridges every day. We know the importance of building and maintaining our traditional infrastructure networks.

[1] "America's Grades." *ASCE's 2017 Infrastructure Report Card*, American Society of Civil Engineers, www.infrastructurereportcard.org/americas-grades/.

But we also have a vision for the future that will change the way people will move – and change how we conceptualize infrastructure. Going forward, the definition of infrastructure must extend beyond roads, rail, airports and waterways to include our National Airspace System (NAS) – to include the skies above us.

We have considered aviation infrastructure before, but historically it has been limited to improving airports, creating and implementing systems like NextGen, and modernizing air traffic control systems generally. These are critical to keeping planes on time and our airspace safe. But the next innovation in the way goods and people move through the air has been in the works for years and is now edging toward reality.

As you know, part of this involves Unmanned Aircraft Systems (UAS) – or drones – which will soon be integrated into the NAS. We are already using drones in a number of ways, from news imagery to responding to forest fires. But companies are on the cusp of the next step of this new technology, and in the coming years, it will be commonplace to use drones for delivering goods, maintaining and repairing pipelines, and surveying damage during natural disasters.

But the not-so-far-off future will also require us to rethink the way that people move as well, and that is what I will focus my testimony on today.

Urban Air Mobility (UAM) is a concept that will change the way people connect with each other and travel through on-demand passenger transportation services. Imagine how much simpler a daily commute could be if you could bypass traffic, potholes, and construction by flying over them. Now imagine how many more options those who are elderly or disabled will have with this new technology. The benefits are not only evident, but expansive – improving the lives of millions.

In addition to the benefit of increased mobility for its users, UAM will also supplement our existing mode of surface transportation and provide urban areas an important option that will help ease congestion on our roadways (which costs more than 1 percent of GDP globally)[2], reduce strain on existing public transportation networks, and provide environmental benefits.

Last year, the average commuter in Washington D.C. spent 82 hours sitting in traffic.[3] During that same time, our roads and bridges became more worn down. As this Committee well knows, the U.S. Department of Transportation estimates that our roads and bridges need an estimated $800 billion in repairs and then an additional $150 billion per year for upkeep.[4]

Now what if a considerable amount of traffic was lifted, literally, up into the sky. That's the potential relief UAM can mean for our infrastructure, not to mention the amount we spend on

[2] Bouton, Shannon, et al. "Infrastructure for the Evolution of Urban Mobility." McKinsey & Company, www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/infrastructure-for-the-evolution-of-urban-mobility.
[3] Anderson, Tom. "Endless Commutes Cost You $960 a Year." CNBC, 10 Aug. 2016, www.cnbc.com/2016/08/09/commuters-waste-a-full-week-in-traffic-each-year.html.
[4] "The State of U.S. Infrastructure." Council on Foreign Relations, www.cfr.org/backgrounder/state-us-infrastructure.

upkeep. So while UAM will not replace traditional means of transportation it will serve to complement it in highly congested urban areas.

How did we get here?

UAM is not a new concept, and the technology to allow for it has slowly advanced – through cooperation between industry and government – over the decades.

In 1941, the helicopter hit full scale production. This technology revolutionized the concept of "Vertical Takeoff and Landing" or VTOL.

In the 1950s, the U.S. began to implement the most complex air traffic control system in the world, now known as Air Traffic Management (ATM). This system measured all aerospace above 400 feet and changed the way people were able to move around the country. It still allows the Federal Aviation Administration (FAA) to safely handle over 43,000 flights per day[5] and means more new technologies can be safely tested.

Since then, industry has embraced the challenge of making UAM a reality, and today more than 70 companies worldwide are working on it.

More recently, NASA and the FAA have laid the ground work for an air traffic system under 400 feet with the Unmanned Aircraft System Traffic Management concept (UTM). The FAA built on this work with the Low Altitude Authorization and Notification Capability (LAANC) system, making the approval process easier for airspace authorizations on unmanned systems. These two systems – working together with the ATM – will ensure that all aircraft are managed safely and efficiently. This is an example of agencies seeing the need before the technology was available and then starting the work to get us there – it's that kind of drive that defines American ingenuity and success.

Congress has played an important role, working with the FAA on the rewrite of regulations under CFR Part 23. The Part 23 rewrite means that manufacturers of aircraft could use consensus standards to meet airworthiness standards, ensuring that certification will not only be cheaper, but also possible for new types of aircraft. In addition, while the FAA Reauthorization Act of 2018 may not have addressed UAM specifically, it did address critical topics like integration of new technologies into the NAS, push DOT forward with regulations on systems for UTM, and begin to look at new regulatory concepts for emerging technology.

Future UAS rulemakings will also pave the way for safe airspace integration of emerging technologies like UAS and UAM. New rulemaking on "Remote ID" will allow UAS to be tracked in real time. Rules on "Operations Over People" and "Beyond Visual Line of Sight" are also critical to ensuring that UAS – and eventually UAM – will be fully integrated into the NAS and able to operate freely, safely, and securely.

[5] "Air Traffic By The Numbers." *FAA Seal*, 26 Nov. 2018, www.faa.gov/air_traffic/by_the_numbers/.

All of these partners working together have laid the groundwork for this new addition to aviation.

What is happening today?

Today, many regions of the world – facing surface congestion and infrastructure strain – are focused on making UAM a reality. As mentioned above, more than 70 companies have begun work in this area, with newer startups joining traditional aviation companies – like Bell Helicopter, Boeing, and Embraer[6] – to push the boundaries of what is possible. In 2018, over $1 billion was invested in UAM[7], and companies have announced partnerships with various cities and states around the world. While there are differences among various business models, they are all focused on getting this technology operational as soon as safely possible, and as soon as the regulatory environment allows them to do so.

Every day there seems to be another exciting news story on the topic. For example, last month, Bell Helicopter released its design concept for their new tilt-rotor "Nexus" air taxi.[8] It features six tilting rotors to take off and carry it through the air. Bell hopes to have this design in place for widespread release to the public by the mid-2020s. Boeing also made headlines this year with their first public unmanned UAM test flight. Their all-electric aircraft has a range of 50 miles.[9]

While these are just two recent examples, there are many more just like them – and not just in the U.S. In the incredibly competitive global aviation market, other nations and their industries are investing time, resources, and money to gain the technological and market advantage in this emerging sector of aviation.

Unfortunately, right now the United States is lagging behind much of the world. For example, the European Aviation Safety Agency (EASA) has already released a draft "special condition" for a path to aircraft certification for eVTOL.[10] Unless we take action, it could be the Europeans defining the regulations the world follows, not the United States.

There are also many companies currently conducting test flights throughout Europe and partnering with cities through the European Union's UAM Initiative of the European Innovation Partnership on Smart Cities and Communities (EIP-SCC).[11]

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[6] See example photos attached to this statement.

[7] Wolfe, Frank. "Vertical Flight Society: More Than $1 Billion Already Invested in EVTOL Companies." Rotor & Wing International, 3 Jan. 2019, www.rotorandwing.com/2019/01/03/vertical-flight-society-1-billion-already-invested-evtol-companies/.

[8] Lavars, Nick. "Bell Bounces into CES with a Tilt-Rotor Air Taxi Concept." New Atlas - New Technology & Science News, 8 Jan. 2019, newatlas.com/bell-nexus-tilt-rotor-air-taxi/57921/.

[9] Banse, Tom. "Boeing Subsidiary's Self-Flying Air Taxi Makes First Flight." Oregon Public Broadcasting, Boise State Public Radio/Idaho Public Television, 28 Jan. 2019, www.opb.org/news/article/self-flying-taxi-boeing-company-aurora-flight-sciences/.

[10] "Proposed Special Condition for VTOL." EASA, www.easa.europa.eu/document-library/product-certification-consultations/proposed-special-condition-vtol.

[11] Butterworth-Hayes, Philip. "Urban Air Mobility Takes off in 64 Towns and Cities Worldwide." *Unmanned Airspace*, 17 Dec. 2018, www.unmannedairspace.info/urban-air-mobility/urban-air-mobility-takes-off-63-towns-cities-worldwide/.

Starting in 2017, Dubai tested both UAS flights beyond visual line of sight and even Aerial Taxi flights.[12] They're working to roll out UAM by 2020.[13]

Singapore is also recognizing the potential benefits of UAM. In March 2017, their Ministry of Transport revealed that they would begin conducting test flights with the hope of having them ready by 2030.[14]

And in 2017, Brazil launched an on-demand helicopter pilot program to test the demand and promise of UAM.[15]

These are just a few examples of the many nations taking a forward leaning approach towards this new technology.

In the United States, companies have conducted many test flights, and multiple cities have announced plans to partner with companies to facilitate a UAM roll out in the near future. These cities have also begun to study and invest in infrastructure improvements that will allow UAM operations to take place. Various companies have also announced aggressive timelines showing when they expect to roll out the technology to consumers.

These announcements are exciting, but there is still no national regulatory framework in place for UAM operations. While the United States may be taking a more calculated approach to certification and integration of UAM into the NAS, moving too slow risks other nations staking claim to global leadership in this area.

As I mentioned before, industry and government have worked together as partners to lay the groundwork for advancement in this area. For example, AIA and the General Aviation Manufacturers Association (GAMA) have worked closely with the FAA to build on the agency's current work on UAS. We believe U.S. industry and government are up to the task and will continue to work together on crafting technology-based standards on UAM. But now is the time to take the next step and ensure UAM becomes a reality with America leading the way.

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[12] Butterworth-Hayes, Philip. "Roland Berger: 'Close to 100,000 Passenger Drones Flying by 2050.'" *Unmanned Airspace*, 23 Nov. 2018, www.unmannedairspace.info/urban-air-mobility/roland-berger-close-100000-passenger-drones-flying-2050/.

[13]Butterworth-Hayes, Philip. "Urban Air Mobility Takes off in 64 Towns and Cities Worldwide." *Unmanned Airspace*, 17 Dec. 2018, www.unmannedairspace.info/urban-air-mobility/urban-air-mobility-takes-off-63-towns-cities-worldwide/.

[14] Amour-Levar, Christine. *How Airbus' Flying Taxis Could Be The Next Great Idea For Singapore's Congested Roads*. Forbes Magazine, 5 Feb. 2018, www.forbes.com/sites/christineamourlevar/2018/02/04/singapore-air-show-airbus-flying-taxi/#7848ce0a1bd2.

[15] Fuller, S.L., and S.L. Fuller. *Brazilians Might Soon Hail a Helicopter Like an Uber With New Airbus Start-Up*. Rotor & Wing International, 24 Aug. 2017, www.rotorandwing.com/2017/04/06/airbus-a3-launches-beta-urban-air-mobility-helo-service-brazil/.

How do we get there?

Full integration of UAM is not an "if," but a "when." There are still some major steps needed to get there, particularly if we intend to continue leading the world.

First, it is essential that we continue to modernize the airspace's critical infrastructure, along with roads, transit systems, airports and waterways.

Second, we need to continue to work on a regulatory path forward for UAM. As I've mentioned, there is no framework currently in place. This will take collaboration between industry and all levels of government. Today's regulatory environment is also a challenge. AIA applauds efforts to ease the regulatory burden on businesses, but the so-called "one in, two out" rule[16] makes it difficult for any agency to release new regulations, even if they are needed to usher new technology into the marketplace or assist in addressing the nation's surface transportation gridlock.

Third, we must also ensure that technology is not stifled by regulations. Any future standards should be performance-based – establishing a level of performance that must be achieved through the airplane's design – for both the operations of the aircraft and the design. This would allow industry to continue to innovate, without being unnecessarily constrained by regulations.

The FAA's aviation standards were developed before UAM was even an idea, which is why it is hard to fit UAM into any specific FAA box as it exists today. There are also many unanswered questions that must be addressed. For example, how will these aircraft be categorized—will they be rotorcraft, fixed-wing aircraft, or something else? What performance standards will they need to be considered certified? These are just two examples, but they underscore the need for the strong partnership between the government and industry to continue this discussion and reach proper decisions.

Future UAS rulemakings will be critical to ensuring operations of UAM as well, especially the rules on "Remote ID," "Operations Over People," and "Beyond Visual line of Sight." These will set standards that enable UAS and UAM to operate as safely and securely as possible. AIA urges this Committee to carefully monitor the status of these rulemakings and ensure the Administration moves swiftly forward with the rules to enhance operations of these emerging technologies in the NAS.

Fourth, integration among UTM and ATM systems is needed. There is only one airspace to share, regardless of the height at which an aircraft – manned or unmanned – operates. Once UAM is fully operational, aircraft will need to constantly broach the airspace dividing line between UTM and ATM control systems (currently 400 feet altitude). Full integration of the two systems is the only way to ensure the safety of the aerospace, pilots, and passengers.

[16] "Presidential Executive Order on Reducing Regulation and Controlling Regulatory Costs." *The White House*, The United States Government, www.whitehouse.gov/presidential-actions/presidential-executive-order-reducing-regulation-controlling-regulatory-costs/.

Fifth, industry also needs certainty when it comes to spectrum allocations. Regardless of the design or external features, these aircraft will require spectrum to operate – not to mention some form of traditional aviation safety equipment. The aviation industry is excited about the promise of 5G, but it must be rolled out in a safe way for both traditional and emerging forms of aviation.

For example, AIA and our members are concerned with the possibility of the 3.7-4.2 GHz spectrum band being reallocated for 5G, because of the high potential for interference with aircraft radio altimeters. This critical aviation system, that operates in the adjacent 4.2-4.4 GHz frequency band, is vital to providing altitude data for safe landings not only for every commercial aircraft, but also for many helicopters and private aircraft. Prior to any reallocation of spectrum, the FCC and industry must work together to test the impacts of the new devices on both that specific band as well as any adjacent spectrum band.

Finally, there must be collaboration between all levels of government for UAM to succeed. Industry will continue to work with the federal government to set the standards and rules that will govern operations. However, local governments and their partners also have a key role in that process. Cities and states will need to update their infrastructure to allow for takeoffs and landings of the aircraft. Buildings, parking garages, and other surfaces could be repurposed to allow for UAM operations, but only with the active involvement of local governments. Before there is widescale operational use of UAM, cities will also need to work with industry and focus on developing emergency landing sites and other safety procedures. To take advantage of these emerging technologies, we ask states, cities, and counties to begin these analyses in their local areas. While widespread UAM flights may be a few years away, cities and states must begin preparing for them now.

Because the future of American infrastructure is coming – and sooner than you think—through airbuses that provide an alternative to our commuter rails and rush hour drives; the new line of ambulances that arrive faster and more safely because they can fly over traffic; and the long-distance air transportation that connects rural and urban communities like never before.

Conclusion

The aviation industry is on the verge of a technological innovation that will revolutionize the way we move goods and people. Much like Henry Ford did with the Model T and the Wright Brothers did with the first flight, UAM technologies will change people's lives – and our world – for the better.

And UAM is just part of this new world. I've already mentioned the role UAS and drones will play, but there are so many other new innovations with their own impact, from the supersonic planes that will be managed by new and improved air traffic systems to the commercial space flights that will make us rethink airports around the world – and beyond.

This vision is not theoretical; it will happen. But in order for America to be the leader that gets us there, we must recommit to our partnership between industry and government, including of course, the U. S. Congress.

Industry and Congress have a historic relationship based in bipartisan cooperation. Just look to the formation of NASA's precursor, the National Advisory Committee for Aeronautics. Created in 1915 by an act of Congress, the committee worked with industry leaders – like Orville Wright, a founding member – towards achieving one shared mission: the advancement of aerospace science, an innovation to benefit our country.

Over 100 years later, we have a new Congress and new industry leaders, but our mission is still the same: to imagine, to innovate, and to create the next generation of aerospace technology that will build a better world for the American people. Whether through Urban Air Mobility or any of the other incredible innovations coming from our industry, we look forward to not only continuing our partnership, but strengthening it over the next 100 years and beyond.

Thank you.

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Example Photos:

Bell Helicopter
Nexus Air Taxi

Boeing
Passenger Air Vehicle

Embraer
Air Taxi