

FEDERAL AVIATION ADMINISTRATION JOINT STATEMENT OF:
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ASSOCIATE ADMINISTRATOR FOR COMMERCIAL SPACE TRANSPORTATION
AND
JAY MERKLE, DIRECTOR, UNMANNED AIRCRAFT SYSTEMS INTEGRATION OFFICE
BEFORE THE SENATE COMMITTEE ON COMMERCE, SCIENCE, AND
TRANSPORTATION
NEW ENTRANTS IN THE NATIONAL AIRSPACE: POLICY, TECHNOLOGY, AND
SECURITY ISSUES FOR CONGRESS
MAY 8, 2019.

Chairman Wicker, Ranking Member Cantwell, Members of the Committee:

We are pleased to appear before you today to discuss the integration of commercial space transportation operations and unmanned aircraft systems (UAS) into the National Airspace System (NAS). For the Federal Aviation Administration (FAA), both commercial space transportation and UAS present new challenges as the technology evolves and the number of entrants expands. The FAA is committed to keeping pace with new entrants while ensuring safety and access for all users of the NAS.

Commercial Space Transportation Overview

The FAA, through the Office of Commercial Space Transportation (AST), issues licenses and permits for the launch and reentry of commercial space vehicles consistent with public health and safety, safety of property, and the national security and foreign policy interests of the United States. Congress has directed that AST's mission also includes the responsibility to encourage, facilitate, and promote U.S. commercial space transportation. These statutory mission objectives provide a framework that has proven to be beneficial both to the industry and to the American people. Our track record bears this out; while the FAA has licensed or permitted over 375 launches and reentries since 1989, there have never been any fatalities, serious injuries, or significant property damage to members of the public.

The commercial space transportation industry in the United States is dynamic, growing, and evolving. In Fiscal Year 2018, there were 32 launches and 3 reentries of commercial space vehicles for a total of 35 licensed activities—a record. For Fiscal Year 2019, we anticipate as many as 44 launch and reentry operations—potentially a single-year increase of over 25 percent in commercial space activity. As the industry continues to grow, the FAA has intensified its efforts to fulfill its commercial space transportation mission, maintaining the highest level of safety without stifling industry expansion.

Streamlining the Commercial Space Transportation Regulatory Program

President Trump, through Space Policy Directive 2¹, directed the Secretary of Transportation to streamline existing launch/reentry regulations to create an environment that promotes economic growth, minimizes uncertainty, protects safety, security, and foreign policy interests, and encourages American leadership in space commerce. This directive was well-timed in light of the challenges the FAA faces with the current commercial space transportation regulatory framework. Current regulations are based largely on Federal launch standards that were developed in the 1990s. They are often overly prescriptive and seen as a hindrance to innovation. For example, 14 CFR parts 415 and 417 address the launch of expendable launch vehicles (ELVs) and are based on standards developed nearly 30 years ago. Further, the current rules are neither streamlined nor consolidated to the extent they should be.

Although these separate regulatory parts and requirements satisfied the need of the commercial space transportation industry at the time they were issued, the industry has changed and continues to evolve. The FAA recently published a comprehensive Notice of Proposed

¹ <https://www.whitehouse.gov/presidential-actions/space-policy-directive-2-streamlining-regulations-commercial-use-space/>

Rulemaking (NPRM)² that proposes to consolidate, update, and streamline all launch and reentry regulations into a single performance-based rule—14 CFR part 450—to better fit today’s fast-evolving commercial space transportation industry. Proposed new part 450 will include regulations applicable to all launch and reentry vehicles, whether they have reusable components or not. The proposed updated rule aligns with the Administration’s goals of creating an environment that does not unnecessarily hinder industry innovation and, most importantly, preserves safety objectives without prescribing specific solutions.

Keeping Pace with Technological Advancements

The pace at which the commercial space transportation industry continues to change has resulted in an increase in both the complexity and the workload for AST. Today’s environment has required the FAA to reevaluate its commercial space structure in terms of people, processes, and tools in order to continue to fulfill the commercial space transportation mission.

Specifically, Secretary Chao recently directed AST to undertake a review and reorganization of the Office to maximize efficiencies under a streamlined regulatory regime while continuing to prioritize safety. We are currently evaluating options to realize the Secretary’s vision.

Other structural changes for AST were recently mandated by Congress in the FAA Reauthorization Act of 2018. Specifically, the Act required the Secretary to identify within AST a centralized policy office known as the Office of Spaceports to support launch and reentry sites and generally support improvement of spaceports. AST is committed to improving safety, removing unnecessary barriers to competitiveness for spaceports, and helping to ensure that the United States commercial space transportation infrastructure finds its right place in the NAS.

We recognize that spaceports have significant potential to become important economic hubs and

² <https://www.federalregister.gov/documents/2019/04/15/2019-05972/streamlined-launch-and-reentry-licensing-requirements>

have already licensed 12 non-Federal spaceports. Further, in response to the recent Congressional direction on spaceports, we are glad to report that the Spaceports Office has been stood-up and is actively working with Spaceport licensees.

Additionally, as part of AST's continual effort to improve the future of space transportation, we continue to engage with our partners in academia, industry, and government on research and development related efforts related to regulatory streamlining, space policy, finance, safety, and innovation. For example, since 2010, AST has partnered with the Center of Excellence for Commercial Space Transportation, which conducts research in a number of different areas including aerospace vehicles, human spaceflight, and aerospace access and operations.

Integration of Commercial Space into the National Airspace System (NAS)

Of the many challenges the FAA faces, integration of commercial space transportation operations into the NAS is a top priority. Commercial space transportation operations are currently treated as "special cases" in which air traffic controllers block off large sections of airspace for extended periods of time for a single launch or reentry operation. Although we have safely managed and executed this process for many years, it is unsustainable in the long run given the expected growth in commercial space transportation operations. Moreover, the current manual process is resource intensive, inefficient, and susceptible to possible errors. Under these limitations, the FAA can only support one mission at a time.

We are actively working on multiple initiatives to develop potential solutions to the issue of how commercial space transportation will grow within the NAS alongside commercial and general aviation. We are working with the FAA's William J. Hughes Technical Center in Atlantic City, New Jersey and recently stood-up the agency's first dedicated Commercial Space

Integration Lab for concept development and prototyping of new technologies that will be leveraged towards integrating commercial space transportation into the NAS. This lab currently houses our Space Data Integrator (SDI) prototype and a prototype aircraft hazard area (AHA) generator, called HRAM (or Hazard Risk Assessment Management), which the FAA's NextGen organization has developed.

Additionally, AST continues its work with the FAA's Air Traffic Organization and Project Management Organization on developing, testing, and implementing the SDI. This safety-based technology, which will automate the current manual process, will enable the FAA to track a licensed launch or reentry operation as it transitions through the airspace. When deployed, this technology will enable the FAA to safely reduce the amount of airspace that must be closed to other users and more quickly release airspace that is no longer at risk as a mission progresses.

The FAA is fully engaged in balancing the needs of all airspace users—including traditional manned aircraft, drones, commercial space vehicles, and others. We are making progress with an Aviation Rulemaking Committee (ARC) with representation across the spectrum of NAS users to address airspace access priorities. The ARC plans to provide recommendations that will improve near-term and future commercial space transportation operations and their integration into the NAS. The ARC's charter is set to expire in November of this year. We look forward to receiving the ARC's report and recommendations.

Unmanned Aircraft Systems Overview

The steady development and expansion of Unmanned Aircraft Systems (UAS) has created a dynamic change in aviation that we have not seen since the dawn of the jet age. The FAA is committed to supporting this change and to working with the UAS community to ensure

that this technology is integrated into the NAS safely and securely. UAS offer expanded capabilities in aviation with a fast pace of innovation and increasing volume of operations. For example, the progression of UAS innovation and the change in product cycles can generally be measured in months, not years. Similarly, the volume of UAS operations is outpacing manned aircraft. Currently, there are nearly four times as many UAS as registered manned aircraft.

The new dynamics that UAS bring to the NAS redoubles our focus on the safety of all aircraft operations as the FAA's first priority as we work on a number of initiatives to support UAS integration. An ongoing challenge to UAS integration is the potential for conflict between manned and unmanned aircraft. We have continued to engage in outreach to UAS operators and the public at large to educate current and prospective drone users about their safety responsibilities. Efforts such as the "Know Before You Fly" information campaign have encouraged UAS operators to understand the rules and responsibilities for flying an aircraft in the NAS. This campaign and the FAA's related work on the "B4UFLY" mobile application are bearing fruit; we are beginning to see a reduction in the number of reported UAS sightings from pilots of manned aircraft.

UAS Rulemaking

The FAA is focused on enabling an ever-expanding universe of UAS operations and capabilities. In order to allow for such operations to be conducted safely and securely, the FAA has moved forward with a number of regulatory initiatives. Together with the Department's Office of the Secretary, the FAA recently published a proposed new rule on the operation of small UAS over people.³ The proposal seeks to balance the need to mitigate safety risks without inhibiting technological and operational advances. The FAA also recently published an

³ <https://www.federalregister.gov/documents/2019/02/13/2019-00732/operation-of-small-unmanned-aircraft-systems-over-people>

advanced notice of proposed rulemaking seeking public input to identify drone safety and security issues and explore ways to mitigate risks UAS may pose to other aircraft, people on the ground, or to national security.⁴ The FAA's security partners have helped to highlight for us some of the important security and public safety questions.

Additionally, in February 2019, the FAA published an interim final rule on external marking requirements for small UAS.⁵ The rule requires small unmanned aircraft owners to display their unique identifier (registration number) on an external surface of the aircraft. Identifiers are assigned by the FAA upon completion of the registration process. Small unmanned aircraft owners are no longer permitted to enclose the FAA-issued registration number in a compartment. Going forward, the ability to remotely identify UAS operators will be a crucial stepping stone for UAS traffic management and will facilitate what we envision as high volume, safe and secure low-altitude UAS operations.

UAS Remote Identification

Congress recognized the importance of remote identification when it enacted the FAA Extension, Safety, and Security Act of 2016. That Act laid the foundation for FAA's work with operators and our security partners to realize the importance of remote identification and to reach a consensus on how to address it. More recently, the FAA Reauthorization Act of 2018 provided the FAA with additional authority to move ahead with work on universal registration and remote identification—both of which are critical to the success of commercial UAS operations and UAS integration more broadly.

⁴ <https://www.federalregister.gov/documents/2019/02/13/2019-00758/safe-and-secure-operations-of-small-unmanned-aircraft-systems>

⁵ <https://www.federalregister.gov/documents/2019/02/13/2019-00765/external-marking-requirement-for-small-unmanned-aircraft>

Remote identification is fundamental to both safety and security of drone operations. Remote identification will be necessary for routine beyond visual line-of-sight operations and operations over people, package delivery, operations in congested areas, and for the continued safe operation of all aircraft in shared airspace. It will also be foundational for the advancement of automated passenger or cargo-carrying air transportation—what is often referred to as Urban Air Mobility. From a security perspective, remote identification would enable us to connect a drone to its control station location. With universal remote identification, the FAA and our national security partners will be better able to locate a drone operator, determine if a drone is being operated in a clueless, careless, or criminal manner, and take appropriate action if necessary. The FAA is committed to establishing remote identification requirements as quickly as possible.

UAS Integration Pilot Program

In October 2017, President Trump directed the Secretary of Transportation to launch an initiative to safely test and validate advanced operations of drones in partnership with state, tribal, and local governments in select jurisdictions—the UAS Integration Pilot Program (IPP).⁶ The IPP has been a crucial step in accelerating the Department of Transportation’s and FAA’s UAS integration efforts. The goals of the program, which enjoys the participation of 9 different communities across the country, are to identify ways to balance local and national interests, improve communications with local, state, and tribal jurisdictions, address security and privacy risks, accelerate the approval of operations that currently require special authorizations, and collect data to support the regulatory development steps needed to allow more complex, routine low-altitude operations.

⁶ <https://www.whitehouse.gov/presidential-actions/presidential-memorandum-secretary-transportation/>

The FAA and the DOT have provided the IPP participants extensive technical assistance and guidance to help them better understand safety risk management and to navigate the process for obtaining approvals. Through the IPP, we are seeing many examples of what will likely become common operations. For example, in Virginia, the IPP lead participant partnered with a commercial entity to demonstrate the swift package delivery of a frozen popsicle to a child in his family's backyard in Blacksburg, VA. In Oklahoma, the Choctaw Nation and Oklahoma State University demonstrated the use of a drone to rebait feral hog traps in remote locations in an effort to find ways to minimize crop damage and provide a safer working environment for agriculture workers. In Kansas, the State Department of Transportation demonstrated the use of drones for power line inspections, and in North Carolina a drone was used to demonstrate medical package delivery operations over people at a large medical facility. These are only a few of the real-world applications for drones.

The experience gained and the data collected from the IPP will help ensure the United States remains the global leader in safe UAS integration and fully realizes the economic and societal benefits of this technology. In fact, the IPP is already paying dividends on the investment. Recently, the FAA granted the first air carrier certification to a commercial drone operator for package deliveries in rural Blacksburg, Virginia. Although the regulatory framework for broader drone operations is not complete, the IPP has helped to inform the FAA and drone operators of the extent to which operations can begin under existing rules.

UAS Integration into the NAS

The FAA's ultimate goal is to integrate, not segregate, UAS into the NAS. Given the expected volume of drone operations, drone traffic management must be automated. The basic rules for small UAS operations—14 CFR part 107—set the global standard for integration and

provided small drone operators with unprecedented access to the NAS. Under part 107, drone operators generally must secure authorization from the FAA to operate in any airspace where air traffic control is providing separation services. To facilitate those approvals, we deployed the prototype Low Altitude Authorization and Notification Capability (LAANC) at air traffic facilities to evaluate the feasibility of a fully automated solution enabled by public/private data sharing. LAANC gives drone operators the ability to request and receive near real-time response from the FAA to authorization requests, which allows operators to quickly plan and execute their flights. Air Traffic is also made aware of the locations where planned drone operations will take place. This capability alleviates the burden of individually processing requests for airspace authorizations by providing near real-time authorization—a process that previously took weeks, now takes seconds. Based on the prototype’s success, LAANC is now live at nearly 300 air traffic facilities covering approximately 500 airports, and will expand to more than 100 new sites this month.

LAANC is an important foundational step in the implementation of UAS Traffic Management (UTM). Overall, UTM is essentially a set of concepts and tools being developed by the National Aeronautics and Space Administration (NASA), the FAA, UAS operators, and UTM service suppliers to safely de-conflict and facilitate dense low-altitude drone operations. Recently, the Department of Defense, the Department of Homeland Security, and other national security partners have joined in the development of UTM concepts to support their missions. UTM is not a specific equipment system; it will be complementary to the existing air traffic management system and will not replace it. Congress granted the authority to conduct UTM research and an initial pilot program to NASA and the FAA in 2016. While the FAA continues to support the pilot program and the final stages of NASA’s UTM testing, the FAA is already

implementing foundational UTM capabilities like LAANC. As part of the FAA Reauthorization Act of 2018, Congress provided continued broad authority for UTM implementation, which will allow the FAA to continue its important work to balance the needs of all system users and ensure that drones are fully and safely integrated into the NAS.

The FAA's Center of Excellence for Unmanned Aircraft Systems—Alliance for System Safety of UAS through Research Excellence (ASSURE) is also providing the FAA with critical information to support safe and secure UAS integration. ASSURE is comprised of 15 of the world's leading research institutions, led by Mississippi State University, along with 8 affiliate universities. It focuses on research, education, and training in areas critical to safe and successful integration of drones into the nation's airspace, including UTM.

Additionally, the FAA is working diligently to implement the new statutory framework governing recreational operations of unmanned aircraft contained in section 349 of the FAA Reauthorization Act of 2018. This section provided a limited exception to the FAA rules that would otherwise apply to these operations, so long as the operation adheres to eight limitations set forth by Congress and does not endanger the safety of the NAS. Implementation of this new framework is an important focus area for the FAA this year. We appreciate Congress' efforts in this area, which will help advance our collective goal of safe and secure integration of unmanned aircraft into the NAS.

Conclusion

Throughout our history, the FAA has adapted to changes in technology and has successfully integrated new operators and equipment into the NAS. We are committed to working with Congress and all of our stakeholders to find solutions to our common challenges. Working together, we are confident we can balance safety and security with innovation. With

the support of this Committee and the robust engagement of our stakeholders, we will continue to safely, securely, and efficiently integrate commercial space and UAS into the NAS and solidify America's role as the global leader in aviation.

This concludes our statement. We would be happy to respond to any questions you may have.