STATEMENT OF DANIEL K. ELWELL, DEPUTY ADMINISTRATOR, FEDERAL AVIATION ADMINISTRATION, BEFORE THE HOUSE TRANSPORTATION AND INFRASTRUCTURE COMMITTEE, SUBCOMMITTEE ON AVIATION: UNMANNED AIRCRAFT SYSTEMS INTEGRATION: EMERGING USES IN A CHANGING NATIONAL AIRSPACE, NOVEMBER 29, 2017

Chairman LoBiondo, Ranking Member Larsen, Members of the Subcommittee:

I appreciate the opportunity to appear before you today to discuss a subject that is at the forefront of aviation; Unmanned Aircraft Systems or UAS. UAS—also referred to as drones—are the fastest growing field in aviation. They are being used today to examine infrastructure, survey agriculture, provide emergency response support, examine damage caused by time or disaster, and to go places that would otherwise be dangerous for people or other vehicles. Entrepreneurs around the world are exploring innovative ways to use drones in their corporate activities. And we have witnessed a significant influx of new, casual users of UAS—people who fly drones for recreation or entertainment—into the National Airspace System (NAS). The need for us to fully integrate this technology into the NAS continues to be a national priority.

Accompanying me today is Earl Lawrence. Earl is the Executive Director of the FAA's UAS Integration Office and is responsible for facilitating all of the regulations, policies, and procedures required to support the FAA's UAS integration efforts. The Department of Transportation and FAA's vision is ambitious. We intend to fully integrate UAS into the NAS, with UAS operating harmoniously, side-by-side with manned aircraft, occupying the same airspace and using many of the same air traffic management systems and procedures. Our vision goes beyond the accommodation practices in use today by most countries, which largely rely on operational segregation to maintain systemic safety. As we work to realize this vision, UAS must be introduced to the NAS incrementally to ensure the safety of people and property both in the air and on the ground.

Two years ago, we appeared before this committee to discuss the status of the safe, incremental integration of drones into the NAS. In that time, we have made significant progress toward our goal of fully integrating this new class of aircraft and their operators. Today, I would like to highlight for you some of our accomplishments, our challenges, and our ongoing work to build upon our successes as we move forward with the next phase of UAS integration.

Small UAS Rule

At the outset, the FAA recognized that managing the safe integration of drone technology into the world's busiest and most complex airspace system would require the participation of all stakeholders—the FAA, industry, aviation groups, and our public safety and security partners, to name just a few. The FAA adopted an approach of engagement and collaboration with these stakeholders in the development of the first set of operating rules for small UAS, which forms the bedrock of the regulatory framework for full UAS integration. Because UAS technology is changing at a rapid pace, a flexible regulatory framework is imperative. Our goal is to provide the basic rules for operators, instead of specific technological solutions that could quickly become outdated. We've met this goal with the final small UAS rule (14 CFR part 107), which went into effect on August 29, 2016.

Part 107 introduces a brand new pilot certificate specific to UAS—the Remote Pilot Certificate. Unlike an airman certificate for manned aircraft issued under part 61, which necessarily has more stringent requirements, an individual can obtain a Remote Pilot Certificate under part 107 by passing an aeronautical knowledge test at an FAA-approved testing center. Alternatively, if the individual already holds a current non-student part 61 airman certificate, the individual may complete an online UAS training course in lieu of the knowledge test. Remote pilots must be 16 years of age, be able to read, speak, write, and understand English, and be in a

physical and mental condition to safely operate a small UAS. The certificate is valid for two years, after which the remote pilot must take a recurrent knowledge test. Since this rule went into effect, the FAA has issued almost 70,000 remote pilot certificates and 92% of the people who take the remote pilot certificate knowledge exam pass it.

The provisions of part 107 are designed to minimize risks to other aircraft and people and property on the ground. Among other things, the regulations require pilots to keep an unmanned aircraft within visual line-of-sight. Operations are allowed during daylight and twilight hours if the drone has anti-collision lights. The new regulation also addresses altitude and speed restrictions as well as other operational limits such as prohibiting flights over unprotected people on the ground who are not directly participating in the UAS operation.

In keeping with our goal of a flexible framework, some provisions of part 107 may be waived. Operators may apply on our Web site for a waiver to allow drones to fly in controlled airspace or at night, for example. Applicants must demonstrate that their proposed operation can be conducted safely outside of the provisions of part 107. Part 107 allows for operations in Class G airspace without prior air traffic control authorization. Operations in Class B, C, D, and surface area E airspace, all of which exists primarily around airports, may be permitted with authorization from the Air Traffic Organization (ATO) using the online waiver portal. To date, the FAA has issued 1,200 operational waivers and 11,000 authorizations or waivers for controlled airspace operations. Consistent with our risk-based approach, we are increasingly able to grant waivers for more complex operations, including one recently granted to CNN for operations over people. And we are taking steps to further streamline the waiver and authorization process.

The small UAS rule provides UAS operators with unprecedented access to the NAS while also ensuring the safety of the skies. However, it is only the first step in the FAA's plan to integrate UAS into the NAS. Consistent with our incremental approach to integration, we are using a risk-based analysis to facilitate expanded UAS operations, including operations over people, operations beyond visual line-of-sight, and transportation of persons and property.

Supporting Emergency Response

UAS have been invaluable in supporting response and recovery efforts following the widespread devastation brought about by recent hurricanes. When winds and floodwaters damaged homes, businesses, roadways and industries, a wide variety of agencies and companies sought FAA authorization to fly drones in the affected areas. We responded quickly, issuing a total of 355 airspace authorizations to ensure that those drones could operate safely.

Drones played a critical role in performing search and rescue missions; assessing damage to roads, bridges, and other critical infrastructure; and helping insurance companies act more quickly on claims coming in from homeowners. And in Puerto Rico, the FAA quickly approved the first UAS operation of its kind to provide essential communication services. We granted AT&T an exemption from part 107 to operate a 60-pound tethered drone to provide temporary voice, data, and internet service while construction crews rebuild a tower to restore permanent service on the island.

The FAA's ability to quickly authorize UAS operations after these storms was especially critical because most local airports were either closed or dedicated to emergency relief flights, and the fuel supply was low. As Administrator Huerta recently said: "Essentially, every drone that flew meant that a traditional aircraft was not putting an additional strain on an already fragile

system. I don't think it's an exaggeration to say that the hurricane response will be looked back upon as a landmark in the evolution of drone usage in this country."

UAS Integration Pilot Program

The FAA's commitment to the safe and efficient integration of UAS and the expansion of routine UAS operations requires resolving several key challenges to enable this emerging technology to safely achieve its full potential. Congress recognized a number of these challenges in the FAA Extension, Safety, and Security Act of 2016. Technical issues to ensure that a drone maintains a safe distance from other aircraft and that the pilot retains control of the drone and can comply with air traffic instructions must be addressed before UAS operations beyond visual line-of-sight can become routine. And there are additional policy questions raised by UAS use, including security, both physical and cyber, privacy, and enforcement.

To address these challenges and leverage the experience of our stakeholders, on October 25, 2017, President Trump directed the Department of Transportation to launch an initiative to safely test and validate advanced operations for drones in partnership with state and local governments in select jurisdictions—the UAS Integration Pilot Program. The results of this program will be used to improve the safe and secure integration of UAS into the NAS and to realize the benefits of this technology in our economy.

The pilot program will help tackle the most significant challenges in integrating drones into the NAS while reducing risks to public safety and security. Ultimately, it is expected to help the Department of Transportation and the FAA develop a comprehensive regulatory framework that will allow more complex low-altitude operations; identify ways to balance local and national interests; improve communications with local, state, and tribal jurisdictions; address security and

privacy risks; and accelerate the approval of operations that currently require special authorizations.

As stated in the Federal Register Notice announcing the pilot program application process, the deadline for Lead Applicants—state, local, or tribal government entities—to submit a notice of intent to participate in the program was yesterday, November 28, 2017. Private sector companies or organizations, UAS operators, public sector entities, and other stakeholders may submit a request to be on the Interested Parties List by December 13, 2017. After evaluating the applications, the Department of Transportation will invite a minimum of five government/private sector partnerships to participate in the pilot program.

UAS Airspace Authorizations and Traffic Management

Starting in spring 2017, the FAA began publishing UAS facility maps, which indicate safe UAS flight altitudes in areas of controlled airspace around airports. Part 107 operators can use these maps to submit better airspace authorization requests. This was a first step toward setting up a data exchange program with external stakeholders, and on October 23, 2017, the FAA launched a prototype evaluation of the Low Altitude Authorization and Notification Capability (LAANC). LAANC is a joint public-private initiative for the FAA to work with industry to develop the requirements for an application that automates the process for UAS operators to get authorization to fly in certain classes of airspace. In the future, operators will also be able to use LAANC to notify airports and Air Traffic Control when they want to fly within five miles of an airport, as required by the Special Rule for Model Aircraft. The initial LAANC prototype evaluation will cover 10 air traffic facilities and nearly 50 airports. A list of these facilities and airports can be found on the FAA's Web site at: www.faa.gov/uas/programs_partnerships/uas_data_exchange/airports_participating_in_laanc/.

LAANC is the first step toward implementing UAS Traffic Management (UTM). The FAA is working with NASA and industry to develop and eventually deploy a UTM concept, which will enable more routine beyond line-of-sight operations. NASA's concept specifically addresses small UAS operations, primarily below 400 feet above ground level, in airspace that contains low-density manned aircraft operations, where air traffic services are typically not provided. NASA has developed a phased approach for their UTM platform, building from rural to urban and from low- to high-density airspace. In April 2016, NASA coordinated with six FAA-selected test sites to perform phase one testing of the UTM research platform. A Research Transition Team has been established between the FAA and NASA to coordinate the UTM initiative, as the concept introduces policy, regulatory, and infrastructure implications that must be fully understood and addressed before moving forward with technology deployment.

Security and Enforcement

As Congress recognized in the 2016 FAA Extension, the security challenges presented by UAS technology require a layered and integrated government response. Addressing one challenge, the Department of Homeland Security is leading an interagency coordinated effort by federal partners, including the FAA, the Department of Justice and the Department of Defense, to identify and evaluate technologies that help detect and track unmanned aircraft movement through the NAS. We continue to work closely with our government and industry partners to evaluate these drone-detection technologies, including evaluations around airports in New York, Atlantic City, Denver, and Dallas-Fort Worth.

The potential for conflicts between manned and unmanned aircraft has become a very real challenge in integrating these new technologies into the NAS. We are seeing an increased number of drone-sighting reports from pilots of manned aircraft. This year, we've received an

average of almost 200 reports from pilots each month—over 2,000 to date—which is significantly higher than the number received in 2016 and 2015. In 2016, we received approximately 1,800 complaints, compared to 1,200 complaints the year before.

As the Federal agency responsible for the safety of the flying community, the increasing number of these reports is of great concern. As a result, the FAA has actively engaged in public education and outreach efforts, such as "Know Before You Fly" and the small UAS registration process. Sometimes, however, education is not enough. To be clear, if an unauthorized UAS operation is intentional, creates an unacceptable risk to safety, or is intended to cause harm, strong and swift enforcement action will be taken. Earlier this year, we announced a comprehensive settlement agreement with a UAS operator that flew drones in congested airspace over New York City and Chicago, and violated airspace regulations and aircraft operating rules.

One of our ongoing challenges in this area, however, is the limited amount of information available to our inspectors when they need to contact a UAS operator or take action to address a potential violation of our regulations. As Congress has recognized, identification and tracking of UAS is critical to the full integration of this technology in the NAS. As discussed further below, the FAA established an Aviation Rulemaking Committee (ARC) to develop standards and provide recommendations for remote identification and tracking of UAS this year.

Engagement with the law enforcement community also is paramount to ensuring that our airspace remains the safest in the world. In January 2015, the FAA published guidance for the law enforcement community on the UAS Web site, and has been actively engaging with law enforcement agencies at local, State, and Federal levels through a variety of channels. The goal of these efforts is to reduce confusion in the law enforcement community about how to respond to UAS events. The FAA encourages citizens to call local law enforcement if they feel someone

is endangering people or property on the ground or in the sky. Local law enforcement will then work with local FAA field offices to ensure these safety issues are addressed. We have also started a webinar series specifically geared toward educating law enforcement and other public safety officials about how to enforce unsafe or unauthorized operations, and how to fly UAS safely and legally when they need to.

Moving Forward

As we move forward with UAS integration, we need to continue to involve all stakeholders in framing challenges and finding solutions. By leveraging this expertise, we will continue to ensure that the FAA maintains its position as the global leader in aviation safety. This month, I attended a meeting of the Drone Advisory Committee (DAC). Our main goal with the DAC moving forward is to harvest the collective technical and operational expertise of its members, which include representatives from industry, government, labor, and academia. With the announcement of the UAS Integration Pilot Program, we will ask the DAC to provide us with the technical and operational recommendations we need to implement the program. In addition, the DAC will continue to assist us with determining what the highest-priority UAS operations are and how we can enable access to the airspace needed to conduct these operations.

We are also making headway with two Aviation Rulemaking Committees (ARC) tasked with making recommendations for the next critical steps in the pathway to full UAS integration: remote identification and tracking of UAS and integrating larger UAS into the NAS. This past spring, we established the UAS Identification and Tracking ARC to make recommendations about technologies that can be used to remotely ID and track UAS, and that would address some of the concerns of the law enforcement and security communities. The ARC recently concluded

its work and submitted its report to us last month; we are now reviewing the committee's recommendations and expect to publish this report in the coming weeks.

In addition, we recently convened a UAS in Controlled Airspace ARC, which will provide recommendations on integrating larger UAS into the NAS. It will develop and recommend scenarios that will encompass the most desired operations, identify gaps in research and development needed to successfully integrate larger UAS into controlled airspace, and develop and recommend up to five prioritized changes to policies and procedures that will spur integration. The ARC held its second meeting at the end of October 2017 and will continue to hold regular meetings over the next 15 months.

Before I conclude my remarks, I would be remiss if I did not acknowledge the support that Chairman LoBiondo has provided to the FAA and, in particular, the William J. Hughes Technical Center in Atlantic City, New Jersey. In its role as the core facility for sustaining and modernizing the air traffic management system, the Technical Center has been instrumental in the FAA's efforts to facilitate new entrants and users to the NAS. I thank Chairman LoBiondo for his leadership and wish him well as he retires from Congress.

Conclusion

The FAA's progress in accommodating new technologies and operations demonstrates that the agency is well positioned to maintain its status as the global leader in safe and efficient air transportation. The progress we have made would have seemed unimaginable not long ago. We know, however, that these accomplishments are only the first step. There are many important issues yet to be addressed and we will continue to work with our stakeholders as we write the next chapter in aviation history.

This concludes my statement. I will be glad to answer any questions you have.