

800 Independence Ave., S.W. Washington, DC 20591

U.S. Department of Transportation Federal Aviation Administration

April 16, 2024

The Honorable Maria Cantwell Chair Committee on Commerce, Science, and Transportation United States Senate Washington, DC 20510

Dear Chair Cantwell:

As required by the Federal Aviation Administration (FAA) Reauthorization Act of 2018, Public Law 115-254, Section 372, the FAA is pleased to provide the enclosed Report to Congress: Unmanned Aircraft Systems Safety Enforcement.

Section 372 directs the FAA to establish a pilot program to use available remote detection or identification technologies for safety oversight, including enforcement actions against operators of unmanned aircraft systems (UAS) that are not in compliance with applicable Federal aviation laws, including regulations, and submit a report on:

- the number of unauthorized unmanned aircraft operations detected in restricted airspace, including in and around airports, together with a description of such operations;
- the number of enforcement cases brought by the FAA or other federal agencies for unauthorized operation of unmanned aircraft detected through the program, together with a description of such cases;
- recommendations for safety and operational standards for unmanned aircraft detection and mitigation systems; and
- recommendations for any legislative or regulatory changes related to mitigation, detection, or identification of UAS.

A similar letter has been sent to the Ranking Member of the Senate Committee on Commerce, Science, and Transportation and the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure.

Sincerely,

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Michael G. Whitaker Administrator



800 Independence Ave., S.W. Washington, DC 20591

U.S. Department of Transportation Federal Aviation Administration

April 16, 2024

The Honorable Ted Cruz Ranking Member Committee on Commerce, Science, and Transportation United States Senate Washington, DC 20510

Dear Ranking Member Cruz:

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A similar letter has been sent to the Chair of the Senate Committee on Commerce, Science, and Transportation and the Chairman and Ranking Member of the House Committee on Transportation and Infrastructure.

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Michael G. Whitaker Administrator



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U.S. Department of Transportation Federal Aviation Administration

April 16, 2024

The Honorable Sam Graves Chairman Committee on Transportation and Infrastructure U.S. House of Representatives Washington, DC 20515

Dear Chairman Graves:

As required by the Federal Aviation Administration (FAA) Reauthorization Act of 2018, Public Law 115-254, Section 372, the FAA is pleased to provide the enclosed Report to Congress: Unmanned Aircraft Systems Safety Enforcement.

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Michael G. Whitaker Administrator



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U.S. Department of Transportation Federal Aviation Administration

April 16, 2024

The Honorable Rick Larsen Ranking Member Committee on Transportation and Infrastructure U.S. House of Representatives Washington, DC 20515

Dear Ranking Member Larsen:

As required by the Federal Aviation Administration (FAA) Reauthorization Act of 2018, Public Law 115-254, Section 372, the FAA is pleased to provide the enclosed Report to Congress: Unmanned Aircraft Systems Safety Enforcement.

Section 372 directs the FAA to establish a pilot program to use available remote detection or identification technologies for safety oversight, including enforcement actions against operators of unmanned aircraft systems (UAS) that are not in compliance with applicable federal aviation laws, including regulations, and submit a report on:

- the number of unauthorized unmanned aircraft operations detected in restricted airspace, including in and around airports, together with a description of such operations;
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A similar letter has been sent to the Chairman of the House Committee on Transportation and Infrastructure and the Chair and Ranking Member of the Senate Committee on Commerce, Science, and Transportation.

Sincerely,

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Michael G. Whitaker Administrator



Federal Aviation Administration

REPORT TO CONGRESS:

Unmanned Aircraft Systems Safety Enforcement

FAA Reauthorization Act of 2018 (Pub. L. No. 115-254) – Section 372

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I. BACKGROUND

Section 372 of the FAA Reauthorization Act of 2018 (Pub. L. 115-254, "the Act") directs the Federal Aviation Administration (FAA) to "establish a pilot program to utilize available remote detection or identification technologies for safety oversight, including enforcement actions against operators of unmanned aircraft systems that are not in compliance with applicable federal aviation laws, including regulations." Section 372 also directs the FAA to "establish and publicize a mechanism for the public and federal, state, and local law enforcement to report suspected operation of unmanned aircraft in violation of applicable federal laws and regulations" and submit an annual report to the appropriate committees of Congress on:

- The number of unauthorized unmanned aircraft operations detected in restricted airspace, including in and around airports, together with a description of such operations;
- The number of enforcement cases brought by the FAA or other federal agencies for unauthorized operation of unmanned aircraft detected through the program, together with a description of such cases;
- Recommendations for safety and operational standards for unmanned aircraft detection and mitigation systems; and
- Recommendations for any legislative or regulatory changes related to mitigation or detection or identification of unmanned aircraft systems (UAS).

The FAA conducted market research and supported UAS detection events from November 2018 through February 2021 to provide information, best practices, and requirements on existing or proposed mechanisms and processes for reporting suspicious or hazardous UAS activity and detection systems operated federally and by private industry. Initially, the FAA identified select groups (airports, sports stadiums, and some law enforcement agencies) interested in partnering with the FAA to share data from their UAS detection systems. Additionally, the FAA considered methods, services, and data frameworks to accurately exchange reporting information with these partners in a timely fashion. However, certain criminal provisions of Titles 18 and 49 of the United States Code (U.S.C.) effectively limit the FAA from engaging in UAS detection and mitigation activities, with the exception of the Section 383 Airport Research Program described below.

The FAA does not have the specific legislative relief necessary to use certain available detection technologies for the purposes identified in Section 372. For example, systems that detect and track UAS often use radio-frequency (RF) capabilities, which may capture or record the communications passed between a UAS and its ground control station. Such RF-based capabilities may implicate certain provisions of federal law.¹ While some other currently available technologies, such as RADAR, electro-optical, infrared, and acoustic systems, may not implicate the relevant criminal provisions in Titles 18 and 49, Section 372 does not provide the FAA with statutory relief from relevant conflicting federal laws.

¹ See the "Interagency Legal Advisory on the Application of Federal Laws to the Acquisition and Use of Technology to Detect and Mitigate Unmanned Aircraft Systems," issued on August 17, 2020, which is available at: <u>https://www.faa.gov/uas/resources/C_uas/media/Interagency_Legal_Advisory_on_UAS_Detection_and_Mitigation_Technologies.pdf</u>

Although Congress, in Section 383 of the Act, granted the FAA relief from various provisions in Titles 18 and 49 for UAS detection and mitigation testing, that relief is limited to the Airports Research Program detailed in Section 383 of the Act.² In accordance with that authority, the FAA is testing and evaluating at least 10 technologies or systems that could detect and mitigate potential safety risks posed by unmanned aircraft at 5 airports. This work is in process, and its results will inform the plan required under Section 383 for certifying, permitting, authorizing, or allowing deployment of technologies or systems for the detection and mitigation of UAS.

In addition to testing at airports under Section 383, the FAA continues to coordinate with federal security partners, including the Departments of Homeland Security, Defense, Justice, and Energy on UAS detection and mitigation activities, which are expected to further inform the FAA's implementation efforts under Section 383.

The FAA anticipates that many of the underlying technologies and systems tested under Section 383 are representative of those systems and technologies that will be used to detect unauthorized UAS in and around flight-restricted areas, including near airports, should Congress determine to provide express authority to additional entities (beyond the Departments of Homeland Security, Defense, Justice, and Energy) to use UAS detection systems notwithstanding potentially conflicting federal criminal laws.

This report covers the period from the passage of the Act through Super Bowl LV in February 2021. Operating within the available statutory environment as described earlier—ability of mature technologies and concepts of employment—the FAA established a Section 372 pilot program that involved collaboration with security partners, the Department of Homeland Security (DHS), and the Federal Bureau of Investigation (FBI), entities authorized to utilize available UAS detection, tracking, monitoring, and identification technologies. The Section 372 pilot program collects the number of unauthorized UAS detections and evaluates enforcement actions against operators of UAS that do not comply with applicable federal aviation laws and regulations. Under this partnership, the FAA collected detection data on potential non-compliant UAS operators during Super Bowls from 2019–2021. The FAA utilized relationships with federal security partners who have statutory relief under 6 U.S.C. § 124n, *Protection of certain facilities and assets from unmanned aircraft*, to meet the requirements under Section 372 of the Act.

This report serves as the initial approach used to inform current efforts to advance UAS detection and potential statutory changes that would enhance the quantity and quality of data available for future reporting to Congress. Currently, there are limited systems employed at airports and military airfields due to the uncertainty of the legal, regulatory, and technological standards. However, the FAA participated in an interagency working group to develop the Administration's legislative proposal as part of the Domestic Counter-UAS National Action Plan. That proposal expands UAS detection-only authorities for federal security partners and State, local, tribal, and

² Section 383 created a new section 44810 in title 49 U.S.C. *See* 49 U.S.C. 44810(g) exempting the FAA from Section 46502 of title 49 (commonly known as the prohibition on aircraft piracy), section 32 of title 18, U.S.C. (commonly known as the Aircraft Sabotage Act), section 1031 of title 18, U.S.C. (commonly known as the Computer Fraud and Abuse Act of 1986), sections 2510-2522 of title 18, U.S.C. (commonly known as the Wiretap Act), and sections 3121-3127 of title 18, U.S.C. (commonly known as the Pen/Trap Statute), for purposes of Section 383.

territorial (SLTT) law enforcement agencies, airports, and critical infrastructure owners. These expanded UAS detection-only authorities are expected to enhance the identification of UAS in unauthorized areas, enhance data sharing among stakeholders, assist with the evaluation of UAS incidents for potential enforcement, and close critical gaps in existing law that currently impede government and law enforcement from protecting the American people and vital security interests.

II. PILOT PROGRAM FOR UAS DETECTION AND IDENTIFICATION, AND REPORTED INCIDENTS

In October 2019, the FAA established a pilot program. The FAA collaborated with various federal, state, and local agencies over a three-year period (2019–2021) and collected detection and identification data to inform Agency enforcement activities. The FAA conducted the pilot program at the events listed in Table 1: *Pilot Program Locations*.

Activity	Event/Temporary Flight Restriction	Location	Date
Exercise	Defense Advanced Research Projects Agency (DARPA) Aerial Dragnet	San Diego, CA	10/21/2019 - 10/24/2019
Exercise	Philadelphia Lincoln Financial Field	Philadelphia, PA	11/24/2019 - 12/14/2019
Data Collection	Super Bowl LIII	Atlanta, GA	01/26/2019 - 02/03/2019
Data Collection	Super Bowl LIV	Miami, FL	01/25/2020 - 02/07/2020
Data Collection	Super Bowl LV	Tampa, FL	01/30/2021 - 02/07/2021

Table 1: Pilot Program Locations

The program included real-time data collection during five public events, as well as participation in two UAS-focused security exercises. The FAA observed and recorded suspected UAS violations in restricted airspace at these selected events, which included three consecutive Super Bowls in Atlanta (2019), Miami (2020), and Tampa (2021).

The DARPA project was designed to research UAS detection in an urban environment, and the exercise at Lincoln Financial Field looked at DARPA's UAS detection and response concept of operations. The Lincoln Financial Field event had no UAS detections due to adverse weather conditions, resulting in no UAS operations to detect. Both events were informative and reaffirmed earlier conclusions that there is no single system or technology adequate for complete detection coverage, particularly in an urban environment.

Table 2 shows the total number of UAS detected within the temporary flight restrictions (TFR) across three Super Bowls. Because each host city presented unique geography and TFR configurations, deducing trends across the three Super Bowls is difficult. However, the total number of Unmanned Aircraft (UA)³ detected within the TFRs reflects the interest generated among UA operators by high-profile sporting events, as well as the degree of non-compliant drone traffic drawn to these venues.

³ Unmanned Aircraft means an aircraft that is operated without the possibility of direct human intervention from within or on the aircraft. Unmanned Aircraft System means an unmanned aircraft and its associated elements (including communication links and the components that control the unmanned aircraft) that are required for the operator to operate safely and efficiently in the NAS. (49 U.S.C. § 44801)

Super Bowl LIII, LIV, LV, LVI, LVI							
Atlanta (2019)	Miami (2020)	Tampa (2021)	Total				
47	96	93	236				
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Table 2: Super Bowl Number of UA Detections in the TFR⁴

The FAA worked with DHS, FBI, and other federal agencies to support UA detection capabilities at the Super Bowls in Atlanta, Miami, and Tampa. Due to growing concerns about the UAS threat, the FAA and federal security partners increased UAS threat detection capabilities in the four Super Bowls following the one in Atlanta.

Detections doubled in the two years after the Super Bowl in Atlanta. This increase in detections was the result of an increase in both the number of TFRs and the number of days the TFRs were active in Miami and Tampa, as well as improved detection equipment and reporting protocols.

III. UAS ENFORCEMENT ACTIONS

For the purposes of this report, the FAA compiled enforcement pilot program activities for the Super Bowls that took place from 2019 through 2021. As previously outlined, the FAA supported the FBI's UAS detection and mitigation efforts at these three Super Bowls. Super Bowl LIII in Atlanta (2019) generated 21 FAA regulatory investigations, resulting in 21 legal enforcement actions. Super Bowl LIV in Miami (2020) generated 82 FAA regulatory investigations. The FAA initiated 38 legal enforcement actions involving UAS flights at the Super Bowl in Miami. The FBI initiated criminal investigations against 3 of the identified operators in Miami. The FBI and U.S. Attorney's Office (USAO) charged all 3 individuals. The FBI also seized 10 UAS at the Super Bowl in Miami. Super Bowl LV in Tampa (2021) generated 41 FAA regulatory investigations. The FAA initiated operators. The FAA initiated 25 legal enforcement actions against 2 of the identified operators. The FBI also initiated a criminal investigation against 1 unidentified operator. The FBI and USAO have charged 2 of these individuals. The FBI also seized the suspect UAS in all 3 criminal investigations.

IV. RECOMMENDATIONS FOR SAFETY AND OPERATIONAL STANDARDS FOR UNMANNED AIRCRAFT DETECTION AND MITIGATION SYSTEMS

While there are some promising UAS detection technologies currently available—RADAR, electro-optical, infrared, and acoustic—there is not a single technology known to the FAA today that ensures a high probability of detection by itself. Most detection systems appear to overly rely on UAS emitting known communications signals. Most detection systems rely on a pre-loaded "library" used to detect and decode known signals. If a UAS emits an unknown signal or does not emit signals, these systems may have limited to no effect. Initial observations suggest that a system-of-systems approach may be necessary. Additionally, finding the remote pilot in real-time has been a challenge. Mandatory registration, introduced in 2016, is expected to increase safety and security oversight by matching a UA to its owner. Remote ID will enable authorities to connect a suspect UAS to its control station location, as well as identify the registered owner. When Remote ID is fully operationalized, the FAA, its security partners, and

⁴ Data collected by the FBI in conjunction with the FAA at each Super Bowl location.

State and local law enforcement will have the means to distinguish between compliant and noncompliant operators, thus supporting threat discrimination.

As for the safety and effectiveness of UAS detection and mitigation systems, the FAA's ongoing Airport UAS Detection and Mitigation Research Program initiated pursuant to Section 383 of the Act includes testing at least 10 UAS detection and mitigation technologies or systems at 5 airports.⁵ This work is in progress, and the test results are expected to yield additional findings regarding the effectiveness of UAS detection systems at airports. These findings will inform the plan for the certification, permitting, authorizing, or allowing of the deployment of UAS detection and mitigation technologies or systems, which is required under Section 383.

V. RECOMMENDATIONS FOR ANY LEGISLATIVE OR REGULATORY CHANGES RELATED TO MITIGATION OR DETECTION OR IDENTIFICATION OF UNMANNED AIRCRAFT SYSTEMS

Under Section 383 of the Act, the FAA is testing and evaluating at least 10 technologies or systems that could detect and mitigate potential safety risks posed by unmanned aircraft at 5 airports. This work is in process, and its results will inform the plan required under Section 383 for the certification, permitting, authorizing, or allowing deployment of technologies or systems for the detection and mitigation of UAS. The FAA believes this work is critical to ensure that any entities authorized by Congress to acquire or use UAS detection and/or mitigation systems, notwithstanding other potentially conflicting federal laws, do not adversely impact the NAS.

As previously discussed, the FAA has contributed to an interagency effort, as part of the Domestic Counter-UAS National Action Plan, to develop an Administration legislative proposal, which reflects the Administration's recommendations for legislative changes related to UAS detection and/or mitigation authorities. This proposal includes, among other things, renewal and expansion of detection and mitigation authorities for DHS and DOJ, "detection-only" authorities for SLTT law enforcement agencies, and owners/operators of airports or other critical infrastructure, as well as the establishment of a pilot program for SLTT law enforcement agencies to conduct UAS mitigation under direct oversight of DHS/DOJ.

VI. CONCLUSION

The FAA has worked closely with our federal security partners to integrate UAS detection and mitigation technologies or systems, ensuring that they do not adversely impact the safety and efficiency of the NAS. Central to these efforts, as described earlier, is the multi-phased project established by Section 383. The FAA remains constrained in its ability to evaluate fully most UAS detection systems outside the confines of the Section 383 Research Program. Nevertheless, the FAA believes the comprehensive work the Agency is undertaking pursuant to Section 383 will also inform future reports under Section 372.

⁵ FAA, Airport Safety and Airspace Hazard Mitigation and Enforcement (Section 383), available at <u>https://www.faa.gov/uas/critical_infrastructure/section_383</u>.