U.S. Department
of Transportation
**Federal Aviation
Administration**

Office of the Administrator

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

September 7, 2023

The Honorable Patty Murray
Chair, Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Chair Murray:

This letter is the Federal Aviation Administration's (FAA) Report to Congress on the progress and activities conducted by the FAA on the possible use of Foreign Object Debris (FOD) technologies at airports. The FAA submits this letter in response to the 2019 Appropriations Public Law (Pub. L.) 116-6, House Report 115-750 (House Report 115-750), and the 2022 Appropriations Pub. L. 117-103, House Report 117-99 (House Report 117-99).

House Report 115-750 encourages the FAA to (1) continue working with industry to identify new technologies as they continue to evolve concerning the detection and mitigation of FOD and requests the FAA to (2) report on the potential use of automated technologies that could serve as a viable replacement to manual inspections currently required by law for airport certification under Title 14 of the Code of Federal Regulations part 139.

House Report 117-99 requests the FAA to (1) prioritize its engagement with airports based on the number, frequency, and severity of FOD incidents and operational complexity and (2) conduct an analysis of documented FOD sources, amounts, materials, locations, and time of day.

Over the last 20 years, the FAA has worked actively with industry, researching and evaluating the development of various FOD detection technologies for airports. As a result, the FAA has developed an extensive knowledge of these systems and their limitations. To document its research activities, the FAA has produced several reports over the years. Some of these reports are attached as an enclosure to this letter report.

Based on two decades of experience and research activities, the FAA provides the following assessment:

Four types of FOD detection systems were evaluated and used for the development of Advisory Circular (AC) 150/5220-24, *Foreign Object Debris Detection Equipment*. In 2022, the FAA began a study to assess if drones could be used as FOD detection systems and to understand the limitations, if any, of such detection systems. If warranted, results from this study could be used to update AC 150/5220- 24.

At this time and based on the research, current FOD detection technologies can provide some value to detect FOD on runways and as a possible means to monitor certain airfield conditions, such as wildlife activity. Two comparative studies (References 1 and 3 in the enclosure) involving airports with FOD detection systems installed for at least one runway found that, over a period of 12 plus months, airport staff were able to detect and collect more FOD in runways instrumented with a FOD detection system when compared to a runway that was only visually inspected by the human eye. A noteworthy portion of what was perceived as detected FOD was wildlife. The FAA will continue to investigate the effectiveness of FOD detection systems as a wildlife management tool as well.

From a financial perspective, and over a life cycle of 12 years, a cost-benefit study (Reference 6 in the enclosure) completed in 2021 has shown that FOD detection systems offer value to airports and airlines.

However, in addition to assessing proper FOD monitoring of the airfield, airport certification inspections also entail many requirements, such as the rating of paint markings in the field, an inspection of airfield signs, an assessment of the pavement surface, and many other elements listed under 14 CFR Part 139. These automated technologies currently are not capable of performing the inspections of the many elements required under Part 139; and therefore, are not a viable replacement for manual airport certification and safety inspections at this time.

The FAA will continue to research and evaluate other new technologies, such as the use of drones, to conduct certain airfield inspections, which, when sufficiently mature, might help airports with meeting requirements under Part 139. Whether automated technologies will be able to fully replace manual airport inspections will also depend on the acceleration of parallel technologies, such as artificial intelligence and improved sensing capabilities. At this time, from a technical aspect, these are not viable replacements for manual airport certification and safety inspections.

The FAA will also conduct outreach to aviation industry organizations to help identify airports with high frequencies of FOD. The FAA also encourages airport sponsors and stakeholders to submit any collected FOD data to its FOD database, available at https://fod.faa.gov.

A similar letter has been sent to the Vice Chair of the Senate Committee on Appropriations and the Chairwoman and Ranking Member of the House Committee on Appropriation.

Sincerely,

Polly Trottenberg

Polly Trottenberg
Acting Administrator

Enclosure

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

September 7, 2023

The Honorable Susan Collins
Vice Chair, Committee on Appropriations
United States Senate
Washington, DC 20510

Dear Vice Chair Collins:

This letter is the Federal Aviation Administration's (FAA) Report to Congress on the progress and activities conducted by the FAA on the possible use of Foreign Object Debris (FOD) technologies at airports. The FAA submits this letter in response to the 2019 Appropriations Public Law (Pub. L.) 116-6, House Report 115-750 (House Report 115-750), and the 2022 Appropriations Pub. L. 117-103, House Report 117-99 (House Report 117-99).

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House Report 117-99 requests the FAA to (1) prioritize its engagement with airports based on the number, frequency, and severity of FOD incidents and operational complexity and (2) conduct an analysis of documented FOD sources, amounts, materials, locations, and time of day.

Over the last 20 years, the FAA has worked actively with industry, researching and evaluating the development of various FOD detection technologies for airports. As a result, the FAA has developed an extensive knowledge of these systems and their limitations. To document its research activities, the FAA has produced several reports over the years. Some of these reports are attached as an enclosure to this letter report.

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A similar letter has been sent to the Chair of the Senate Committee on Appropriations and the Chairwoman and Ranking Member of the House Committee on Appropriations.

Sincerely,

Polly Trottenberg

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Acting Administrator

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800 Independence Ave., S.W.
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September 7, 2023

The Honorable Kay Granger
Chairwoman, Committee on Appropriations
House of Representatives
Washington, DC 20515

Dear Chairwoman Granger:

This letter is the Federal Aviation Administration's (FAA) Report to Congress on the progress and activities conducted by the FAA on the possible use of Foreign Object Debris (FOD) technologies at airports. The FAA submits this letter in response to the 2019 Appropriations Public Law (Pub. L.) 116-6, House Report 115-750 (House Report 115-750), and the 2022 Appropriations Pub. L. 117-103, House Report 117-99 (House Report 117-99).

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Polly Trottenberg

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Acting Administrator

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800 Independence Ave., S.W.
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September 7, 2023

The Honorable Rosa L. DeLauro
Ranking Member, Committee on Appropriations
House of Representatives
Washington, DC 20515

Dear Ranking Member DeLauro:

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Sincerely,

Polly Trottenberg

Polly Trottenberg
Acting Administrator

Enclosure

Selected FAA Technical Reports Evaluating FOD Detection Technologies

Published Reports

1. 2015 – Foreign Object Debris at a Large International Airport
   https://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/Airport-Safety-Detail/foreign-object-debris-characterization-at-a-large-international-airport

2. 2012 - Performance Assessment of a Hybrid Radar and Electro-Optical FOD System
   https://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/Airport-Safety-Detail/performance-assessment-of-a-hybrid-radar-and-electro-optical-foreign-object-debris-detection-system

3. 2011 - Performance Assessment of a Radar-Based Foreign Object Debris System
   https://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/Airport-Safety-Detail/performance-assessment-of-a-radar-based-foreign-object-debris-detection-system

4. 2011 - Performance Assessment of a Mobile, Radar-Based Foreign Object Debris System
   https://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/Airport-Safety-Detail/performance-assessment-of-a-mobile-radar-based-foreign-object-debris-detection-system

5. 2011 - Performance Assessment of an Electro-Optical Based Foreign Object Debris System
   https://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/Airport-Safety-Detail/performance-assessment-of-an-electro-optical-based-foreign-object-debris-detection-system

6. 2022 – Foreign Object of Debris Detection System Cost-Benefit Analysis
   https://www.airporttech.tc.faa.gov/Products/Airport-Safety-Papers-Publications/foreign-object-debris-detection-system-cost-benefit-analysis