FINDINGS & RECOMMENDATIONS: SUBCOMMITTEE ON AIRPORTS SUMMER 2018 MEETING Atlantic City, NJ | August 20, 2018

The Subcommittee on Airports of the FAA's Research, Engineering, and Development Advisory Committee (REDAC) met on August 20, 2018, at the FAA's William J. Hughes Technical Center in Atlantic City, New Jersey.¹ The Subcommittee had the opportunity to review the progress of the FAA's Airport Technologies Research Program and provide comments regarding the Program's priorities.

The Subcommittee felt that good progress had been made across the Program's portfolio of 19 research project areas (RPAs) as shown below.

Safety & Planning RPAs	Pavement RPAs
 S1 Airport Planning & Design S2 Airport Safety Data Mining S3 Aircraft Rescue & Firefighting S4 Wildlife Hazard Mitigation S5 Visual Guidance S6 Runway Surface Safety Technology S7 Airport Safety & Surveillance Sensors S9 Airport Research Taxiway S10 UAS Integration at Airports 	 P1 National Airport Pavement Testing Facility P2 National Airport Pavement Materials Research Center P3 Field Instrumentation & Testing P4 Advanced Materials P5 Pavement Design & Evaluation P6 Non-destructive Testing Technologies P7 Software Program Development and Support P8 Extended Pavement Life
Airport Noise & Environmental RPAs*	New/Enhanced Facilities
 N1 National Noise Survey N2 DNL & Metrics Evaluation N3 Sleep Disturbance N4 Noise Mitigation N5 Operations E1 Environmental Tools and Guidance 	Fire Safety Building Pavement Lab Extension Photo Laboratory
 Airport noise and environmental RPAs are being co-managed by the FAA Offices of Airports and Energy & Environment. 	

The Subcommittee remains supportive of the Program's ongoing work and future research directions, which continue to emphasize foundational research to support (1) advisory circulars and design guidance promulgated by the FAA Office of Airports, (2) airport infrastructure enhancements currently eligible or prospectively eligible for federal grant funding under the Airport Improvement Program, and (3) U.S leadership in areas of airport safety, planning, and airport infrastructure.

The Subcommittee reviewed draft FAA responses to its Fall 2017 and Spring 2018 recommendations and agreed that these recommendations could be closed pending the FAA Acting Administrator's approval of these responses.

¹ The Subcommittee had originally planned to meet on both August 20 and 21, but shortened the meeting due to a FAA Runway Safety Call-to-Action Meeting that took place on August 21.

The Subcommittee remains very concerned about ongoing pressure to reduce in FAA research and development funding.²

Findings and Recommendations

The following findings and recommendations were developed during the Subcommittee's deliberations. The Subcommittee does not believe that any of these require consideration by the FAA Acting Administrator.

FINDING 1: The Subcommittee remains pleased that the FAA's Airport Technology Research Branch has begun researching safety and design standards for commercial spaceports, but continues to feel that more substantial outreach is needed with the concurrent efforts of commercial airspace aviation rulemaking committees (ARCs), principally the Spaceport Categorization ARC.

RECOMMENDATION 1: The Subcommittee recommends that the FAA's Office of Airports together with the Airport Technology Research Branch directly coordinates with the Spaceport Categorization ARC and, to the extent it is pertinent, the Airspace Access Priorities ARC to ensure that their research informs (and is informed by) the ARCs.

FINDING 2: The Subcommittee was pleased to receive an update regarding the FAA's Cybersecurity R&D Plan and learn more about how various FAA R&D programs are expected to support it. We agree with the FAA that there needs to be more awareness and involvement from airports in the development and refinement of this Plan.

RECOMMENDATION 2: The Subcommittee recommends that the FAA work with the Subcommittee members and other subject matter experts at airports to ensure that the FAA Cybersecurity R&D Plan appropriately reflects airport operators' roles, responsibilities, and involvement in aviation cybersecurity in the United States.

FINDING 3: Over the past year, several U.S. States and municipalities have been focusing their attention on environmental contamination by per- and polyfluoroalkyl substances (PFAS), classes of fluorinated hydrocarbon molecules that can lead to adverse health outcomes in humans.³ In addition to their potential toxicity, most forms of PFAS do not readily breakdown in the environment and bio accumulates in those that are exposed to the substances.

One of the areas that PFAS is used is in aqueous film-forming foam (AFFF) which is used to suppress and extinguish aircraft fuel fires. Under current FAA regulations, certificated airports are required to use fluorinated AFFF because of the high level of performance AFFF provides (e.g., ease of dispensing via current ARFF equipment, fire knockdown times, fire burn-through times).⁴ This said, over the last decade there have been numerous fluorine-free foams (3F) that have come onto the market and are being used at airports around the world.

² Since the Subcommittee met in August, the FAA Reauthorization Act of 2018 was enacted, providing R&D funding stability—at least from the perspective of Congressional authorizations—for Federal Fiscal Years 2018 through 2023, subject of course to future Congressional appropriation legislation.

³ <u>https://www.epa.gov/pfas/basic-information-pfas#health</u>

⁴ Since the Subcommittee met, the FAA Reauthorization Act of 2018 was enacted. The Act includes a provision that requires the FAA to allow use of non-fluorinated foams provided they meet appropriate performance standards.

Research into the performance of these new foams has been spotty and often seems to be vendor-sponsored, leaving considerable uncertainty about the efficacy of these foams. There are also are a number of questions about the foam performance standards that the FAA useswhich are taken from Military Specifications-that make it challenging to evaluate whether the safety benefits associated with AFFF outweigh the potential environmental hazards associated with PFAS. The Airport Cooperative Research Program's (ACRP) Report 173 does state that fluorine-free foams meet the requirements of the International Civil Aviation Organization for fire extinguishing performance. The ACRP Report 173 also finds, "Fluorine-free foams have been shown to not have the same performance as their fluorinated counterparts. They are currently not able to provide the same level of fire suppression capability, flexibility, applicability, and scope of usage as AFFF firefighting foams. An analysis of the performance of two available fluorine-free foams found that they would need to be replenished three times more often than AFFF to provide the same level of fire protection." The report also states, "Further research is warranted on whether AFFF alternatives available outside North America can or should be acceptable (e.g., through specification requirement changes, product approvals, or advances in foam development)."

In addition, the Subcommittee notes that there are other areas in which the FAA can assist airports in limiting release of PFAS into the environment—specifically through reducing the need for or eliminating entirely ARFF equipment testing procedures that require discharge of PFAS-containing AFFF into the environment. Research into technologies and procedures would reduce the need for and quantity of AFFF released during ARFF equipment testing, inspections, and training has been underway under RPA S3 for several years and includes the evaluation of alternative foam proportioning system testing systems and revisions to ARFF equipment certification tests.

RECOMMENDATION 3: The Subcommittee strongly recommends that the FAA expedite completion of ongoing research efforts relating to foam proportioning systems. The Subcommittee also strongly encourages the FAA to revisit firefighting foam research and ensure that there are scientifically-based mechanisms/testing protocols for evaluating fluorine-free foams in the civil aviation sector, ideally using the newly-commissioned and state-of-the-art fire testing facility at the FAA Technical Center.

We also recommend that the Airport Technology Research Programs perform a gap analysis of research regarding the health and environmental hazards associated with fluorinated AFFF use at airports and work with the Subcommittee to determine how these gaps can be addressed either within or externally to the these FAA Research Programs.

FINDING 4: The Subcommittee appreciates the direction the FAA is receiving from the U.S. Department of Transportation regarding the alignment of FAA research with DOT's broader strategic research priorities. We additionally note that ongoing research associated with unmanned aircraft systems and commercial space appear to be areas where there is significant existing alignment between FAA and DOT/Trump Administration priorities *and* directly involve airport research interests. Research into the facilitation of transcontinental supersonic aircraft operations, pavement research focusing on extending longevity of runways, taxiways, and aprons, and many of the airport safety research projects currently underway within the Airport Technologies Research program are similarly situated.

RECOMMENDATION 4: The Subcommittee recommends including discussions of the alignment of the Airport Technologies Research program with broader DOT and FAA strategic research goals in each of our face-to-face meetings.

FINDING 5: The Subcommittee found that the shortened agenda for this Subcommittee meeting—although driven by events beyond the Subcommittee's control—did expedite discussion of key program topics and kept research program discussions at a more appropriate strategic level than prior meetings. In addition, the incorporation of web/teleconference access to the meeting ensured broader participation of Subcommittee members than would have been otherwise possible.

RECOMMENDATION 5: Although we do currently plan to meet for two days at our March 2019 meeting, the Subcommittee recommends continuing the precedent set at the Summer 2018. This includes organizing the agenda for this meeting to focus on strategic reviews of Airport Technologies Research Program, its connections with other FAA research programs—notably the Environment & Energy Research Program, and alignment with DOT research priorities.

We understand that this would come at the expense of more comprehensive and detailed reviews of individual research projects. To ensure that reviews of projects of particular interest are not missed, the Subcommittee proposes to identify 4-5 projects for deeper technical discussion in collaboration with the FAA Research Program leadership a month or so prior to each face-to-face meeting.

The Subcommittee also recommends that the FAA continues to provide web/teleconference access for Subcommittee members that are unable to attend the meeting in person either due to financial or time constraints.

Future Meetings

The Subcommittee's next meeting will take place at the FAA Technical Center in Atlantic City on February 26-27, 2019.