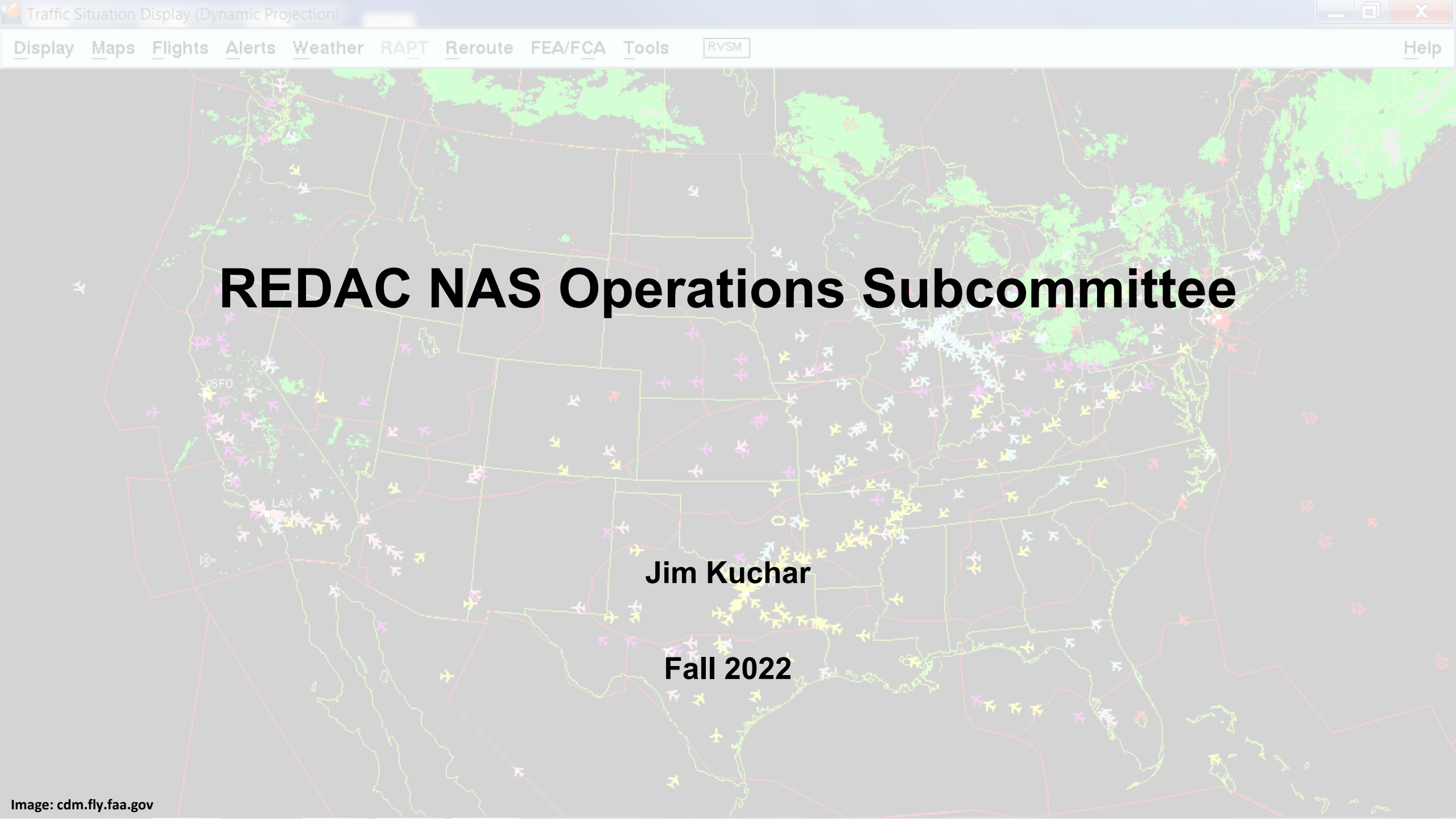

REDAC NAS Operations Subcommittee

Jim Kuchar

Fall 2022

Image: cdm.fly.faa.gov

NAS Operations Subcommittee – Fall 2022 Meeting

30-31 August 2022, virtual meeting

Agenda

- Director Remarks
- Budget overview
- Enterprise Concept Development; New Air Traffic Management Requirements
- Enterprise Human Factors; ATC / Technical Operations Human Factors
- Weather Program; Weather Technology in the Cockpit
- Flight Deck Data Exchange Requirements
- Wake Turbulence
- Runway Incursion Reduction
- Operations Concept Validation & Infrastructure Evolution
- Invited deep dives
  - Info-centric NAS and data exchange ecosystem
  - Enterprise architecture overview
  - FAA AST research alliance
  - Weather R&D for UAS / UTM / AAM
  - UAM concept overview
  - UAS integration research coordination
  - UAS COE (ASSURE) overview

NAS Operations Subcommittee Finding 1

Advanced Air Mobility Wake Research

The subcommittee received briefings on the Wake RE&D and Wake Recategorization portfolios. Work under these portfolios has been mainly focused on conventional aircraft performing conventional takeoff and landing operations at airports. Analyses have included a range of in situ wake measurement, modeling, and risk assessment activities that have led to the selection of specific wake separation criteria.

Given the potential growth of Advanced Air Mobility involving new aircraft types including Vertical Takeoff and Landing (VTOL) and/or Short Takeoff and Landing (STOL) vehicles performing new types of arrival and departure operations, there will be a growing need to understand the potential wake risks from these operations and set wake separation criteria when required. Persistent rotor wash or other effects, including interaction with nearby buildings in urban environments, may result in turbulence or upset risks to following aircraft during takeoff and landing, but these effects have not been quantified for these new aircraft types.

NAS Operations Subcommittee Recommendation 1

Advanced Air Mobility Wake Research

The NAS Operations subcommittee recommends that the FAA begin planning to execute wake RE&D efforts focused on AAM operations with VTOL and STOL aircraft performing both conventional and non-conventional approach and departure procedures.

This may include measurement campaigns to empirically understand wake effects, modeling to allow extrapolation of effects to other vehicles and conditions, and risk assessment and operational analysis to determine appropriate wake separation criteria for AAM operations. Where possible these efforts should be closely coordinated with and leverage industry development of AAM vehicles as well as ongoing NASA research. To support and plan for these activities, the FAA should begin developing an AAM wake RE&D roadmap, with associated milestones and funding targets.

NAS Operations Subcommittee Finding 2

UAS-Related Academic Research Funding Pathways

The subcommittee received briefings on the FAA's Center of Excellence (COE) for Unmanned Aircraft Systems and the UAS / AAM Integration Research Plan. The former presentation noted that the FAA has committed to send all UAS-related academic research to the COE. At the same time, the latter presentation underscored the fact that the scope and volume of potential UAS research has continued to grow rapidly and spans small to large UAS across a wide range of operational concepts.

The subcommittee noted that the requirement to fund all UAS-related academic R&D through the COE constrains the FAA's flexibility to leverage research organizations that are not associated with the COE but that have specific expertise and facilities that could accelerate, broaden, and strengthen research outcomes. While the subcommittee understands there is Congressional language requiring certain funding be allocated to the COE, there may be opportunities to leverage subawards or alternate funding vehicles to institutions beyond the COE's immediate membership.

NAS Operations Subcommittee Recommendation 2

UAS-Related Academic Research Funding Pathways

The NAS Operations subcommittee recommends that the FAA develop alternate funding mechanisms that would facilitate forming research partnerships with academic and other institutions that are not currently included in the COE for UAS.

This should include both an unbiased and open process for identifying and selecting the most effective research organization to conduct a given study along with associated efficient funding vehicles that would enable those organizations to perform research with minimal delay, overhead, or other fees.

NAS Operations Subcommittee Finding 3

Wrong-Surface Landing (WSL) Prevention Analysis

The subcommittee received a briefing on the Runway Incursion Reduction Program (RIRP) which included an outline of plans to begin research into Wrong Surface Landing (WSL) prevention in FY25 through a demonstration at the Lincoln, NE airport. It was not apparent to the subcommittee that plans were in place to conduct a fundamental analysis of surveillance performance requirements that would help inform and guide research on this topic.

NAS Operations Subcommittee Recommendation 3

Wrong-Surface Landing (WSL) Prevention Analysis

The NAS Operations subcommittee recommends that the FAA conduct fundamental analyses of surveillance performance requirements and cockpit technology requirements to support Wrong Surface Landing detection as a function of distance and geometry during approaches.

Such analyses would provide guidance toward future surveillance and alerting technology as well as help to identify candidate airports and cockpit equipage (if appropriate) for those technologies.

The subcommittee recommends these analyses be performed as soon as practical given recent WSL incidents (e.g., near-landing on a taxiway at San Francisco, CA in 2017) and accidents (e.g., mid-air collisions due to lining up toward the incorrect parallel runway at Centennial Airport, CO in 2021; North Las Vegas, NV in 2022).

Next NAS Ops Meeting: March 14-15, 2023

- **Requested documents prior to next meeting**
  - **AI/ML certification framework**
  - **Info-centric NAS CONOPS**
  - **xTM Lexicon document**

- **Requested Deep Dive topics for Spring 2023 meeting:**
  - **General Aviation and AAM future CNS perspectives**
  - **Connected FMS activities**
  - **UAM Airspace Demonstration Project status**
  - **Remote tower development status, including potential intersections with UAS and AAM research requirements**