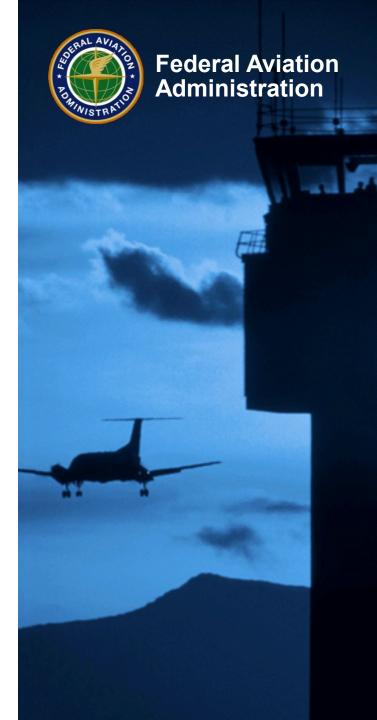# REDAC / NAS Ops

Review of FY 2022 Proposed Portfolio

Wake Turbulence – RECAT
BLI Number: 1A04B
CIP Number: G06M.02-02

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March 25, 2020

Federal Aviation Administration

Wake RECAT
FY22 BSLI 1A04B CIP G06M.02-02

Benefits to the NAS Users & Airports:
– Additional airport capacity during Instrument Meteorological Conditions – achieved with runway throughput increasing wake risk mitigating solutions and without additional airport infrastructure investments
– Increased NAS capacity of the NAS air corridors – achieved by more throughput efficient en route wake mitigating separation solutions

Program success determined by:
– Delivery of design recommendations and prototype algorithms for wake risk mitigating solutions that will safely increase throughput capacity of airport runways and enable the safe use of Interval Management, TBS, & TBO Operational Improvements
– Delivery of supporting technology transfer (TT) documentation to the FAA engineering development organization (AJM) and conduct of workshops with AJM to complete the (TT)

Wake RECAT/BLI #: 1A04B
Overview Capabilities

People:
- Wake Turbulence Research & Dev. Program Manager: Jillian Cheng (ANG)
- Other federal resources: AIR Wake CSTA, Volpe Center wake data collection support staff, AJM-24/25 2nd level engineering staff
- SMEs: former AIR Wake CSTA/NASA program manager, former branch manager for AFS-450,

Organizations/Laboratories:
- Volpe NTSC: data collection and analysis, safety case development
- MITRE/CAASD: solution development, benefits analysis
- MIT/LL: wind and weather data analysis and weather algorithms development
- CSSI: en-route wake data analysis and concept exploration
- RTCA, EASA, ICAO, EUROCONTROL
- WJHTC automation engineering laboratories

RECAT Accomplishments in FY19/20

(note: RECAT was not funded in FY19 – work has been accomplished with residual FY18)

- Refined concept the terminal area single runway dynamic Total Wind (TW) wake risk mitigation by performing trade off analyses of complexity versus estimated increased benefit to NAS Users & capacity constrained airports

- Developed an initial parameterized TW Wind Forecast Algorithm (TW-WFA) for use in determining TW thresholds that would allow incremental reductions in wake spacing between aircraft types

- Determined candidate airport to be the focus for defining how the TW dynamic wake separations would be applied by controllers

Anticipated Development in FY21/22

Planned Activities

- Acquire, configure and maintain wake track data collection instrumentation sites and associated data storage facilities
- Plan for and conduct a WTHTC controller simulation of the TW wake separations being used at a candidate airport
- Finalize the terminal area TW dynamic wake risk mitigation solution design requirements documentation after review of the controller simulation results & obtaining review/feedback from the NAS User, controller and pilot communities on its design and associated cost/benefit/safety assessments
- Finalize the TW Wind Forecast Algorithm (TW-WFA) prototype design documentation
- Initiate prototype development of advanced algorithms that use weather/wind observed (including aircraft based observations) and NWS forecast model data to support ATC's use of dynamic wake separations in the terminal area and in the en route airspace

Anticipated Development in FY21/22

Expected RECAT Products

- Design requirements for the TW dynamic wake risk mitigating solution to enable increased airport single runway throughput

- Benefit and safety assessment documentation for the TW solution

- Design documentation for the prototype TW-WFA developed as part of the TW solution

- TW solution technology transfer workshops with AJM engineering

- Wake track data collection instrumentation sites and associated data storage facilities acquired, configured and maintained

Emerging FY22 Focal Areas

- Assess how wake risk mitigating technology-aided solutions can be incorporated into controller DSTs to enable the "wake safe" use of Interval Management, Time Based Operations, Trajectory Based Operations, and 3 NM everywhere

Wake RECAT F&E

Development Requirement

- Translate the concepts coming from wake research into solutions that will safely provide additional airport and air corridor throughput for NAS users by developing safe, more capacity efficient dynamic wake risk mitigation procedures and separations for use by ATC in managing daily ATC operations

Outputs/Outcomes

Products:
- Design requirements documentation for the TW Solution
- Benefit and safety assessment documentation for the TW Solution
- Design documentation for the prototype TW-WFA
- TW Solution Technology Transfer workshops with AJM
- Wake track data collection instrumentation sites and associated data storage facilities acquired, configured and maintained

FY 2022 Planned Development

- Acquire, configure and maintain wake data collection sites and data storage facilities
- Finalize TW solution design requirements documentation
- Finalize the TW Wind Forecast Algorithm (TW-WFA) prototype design documentation
- Initiate prototype development of advanced algorithms that use weather/wind observed (including aircraft-based observations) and NWS forecast model data

Funding ($M)

FY 2020	FY 2021	FY 2022	FY 2023
1.5	2.0	2.5	2.5