ATM-Weather Integration Gap Analysis

Friends and Partners of Aviation Weather
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Outline

- Review of ATM-Weather Integration (AWI)
- What is the NSIP?
  - Why a Gap Analysis?
- What we found
The Components of ATM-Weather Integration (AWI)

- **Raw Weather**  
  Building block of AWI – Sensors, Observations, Radar, Forecast Models, etc.

- **Translation/Constraint Identification**  
  Takes raw weather (e.g., radar returns) adds information (e.g., pilot deviation models) and *translates* it into airspace and airport capacity (permeability and arrival/departure rates)

- **Impact**  
  Adds traffic to the identified constraint/reduced capacity to determine impact (location, location, location)

- **Mitigation**  
  Provides ranked strategies/solutions developed based on probabilities and risk vs. gain
The Levels of ATM-Weather Integration (AWI)

- Level 0 – No Integration
- Level 1 – Weather on the Glass
- Level 2 – Translation
- Level 3 – Traffic Impact
- Level 4 – Full Integration
What is the NAS Segment Implementation Plan (NSIP)?

FAA's blueprint for achieving NextGen

- Organized into Portfolios
  - Operational Improvements (OI’s)
  - Increments
- Broken into Segments
  - A (2010-2015)
  - B (2016-2020)
  - C (2021-2025)
The NSIP and FAA Acquisition System

Segment

- **2010-2015**: The train has left the station
- **2016-2020**: The train is about to depart
- **2021-2025**: The train is now boarding
Why a Gap Analysis?

Weather is leaking out of the system...
- Weather is hard
- Budgets are tight
- Concepts are immature
Our Task: ID ATM-Weather Integration Gaps w/in NSIP

- Weather information provided by NAS Infrastructure Portfolio
- Weather needs of all operational NSIP Increments with a dependency on weather
What’s our Goal?
Common Weather Needs
Where are the Gaps?

TRANSLATION

Effect of Wx on Capacity

CATM 1

1

IMPACT

Capacity vs. Demand Analysis

TBFM 1

CATM 6

Sep Mgt 2

9

SOLUTIONS

Mitigation Strategies and Options

TBFM 3

CATM 5

Sep Mgt 2

10

Opportunities

6C

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Airborne Reroute

- **105208-21, CATM, Segment Bravo**
  - ...Allows a traffic manager to propose trajectory modifications to meet flow constraints for an airborne flight to the appropriate sector controller for action. The trajectory adjustments identify to the controller all the constraints on the requested route of flight and the proposed route.

**Opportunity**
- Level of Integration – description suggests that it will need to identify NAS Constraints and Assess Impact
  - Planned Level: L0
  - Suggested Level: L3

**Applicable NI Increments**
- 103121-01 Enhanced Weather Information – Extended (C)
- 103123-01 Aircraft-to-Severe Weather (C)
Increments that could provide the basis for Common Weather Functions

- **Airspace/Airport Capacity Calculator (ACC) L2**
- **NAS Constraint/TE Impact ID (NCII/TEII) L3**
- **NAS Constraint/TE Resolution (NCR/TER) L4**

1. **103119-16 (NI) Convective Weather Avoidance Model (CWAM) for Arrival/Departure Operations**
3. **105302-25 (CATM) Airport Acceptance Rate Decision Support (AARDS)**
4. **103121-01 (NI) Generation of Enhanced Weather Information – Extended**
5. **103123-01 (NI) Aircraft to Severe Weather Notification**
6. **104104-02 (SepMgt) Efficient Maneuvers to Assist Aircraft in Avoiding Severe Weather**
7. **104104-03 (SepMgt) Rank Ordered Conflict Resolution**

* Airport only, does not address airspace capacity.
Next Steps

- Review Readiness Assessment for key increments
- Quantify severity of gaps
- Develop and propose feasible solutions