

ATM-Weather Integration Gap Analysis

Friends and Partners of Aviation Weather

Claudia McKnight

August 25, 2015

The contents of this material reflect the views of the author and/or the Director of the Center for Advanced Aviation System Development. Neither the Federal Aviation Administration nor the Department of Transportation makes any warranty or guarantee, or promise, expressed or implied, concerning the content or accuracy of the views expressed herein.

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 1

Building block of AWI – Sensors, Observations, Radar, Forecast Models, etc.

■ Translation/Constraint Identification 2

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)

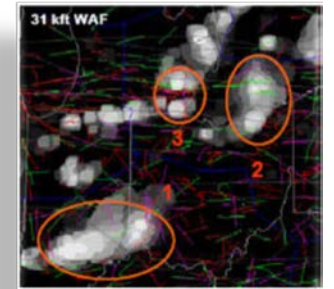


Photo: MIT-LL

■ Impact 3

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

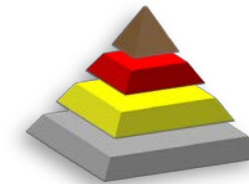
■ Mitigation 4

Provides ranked strategies/solutions developed based on probabilities and risk vs. gain

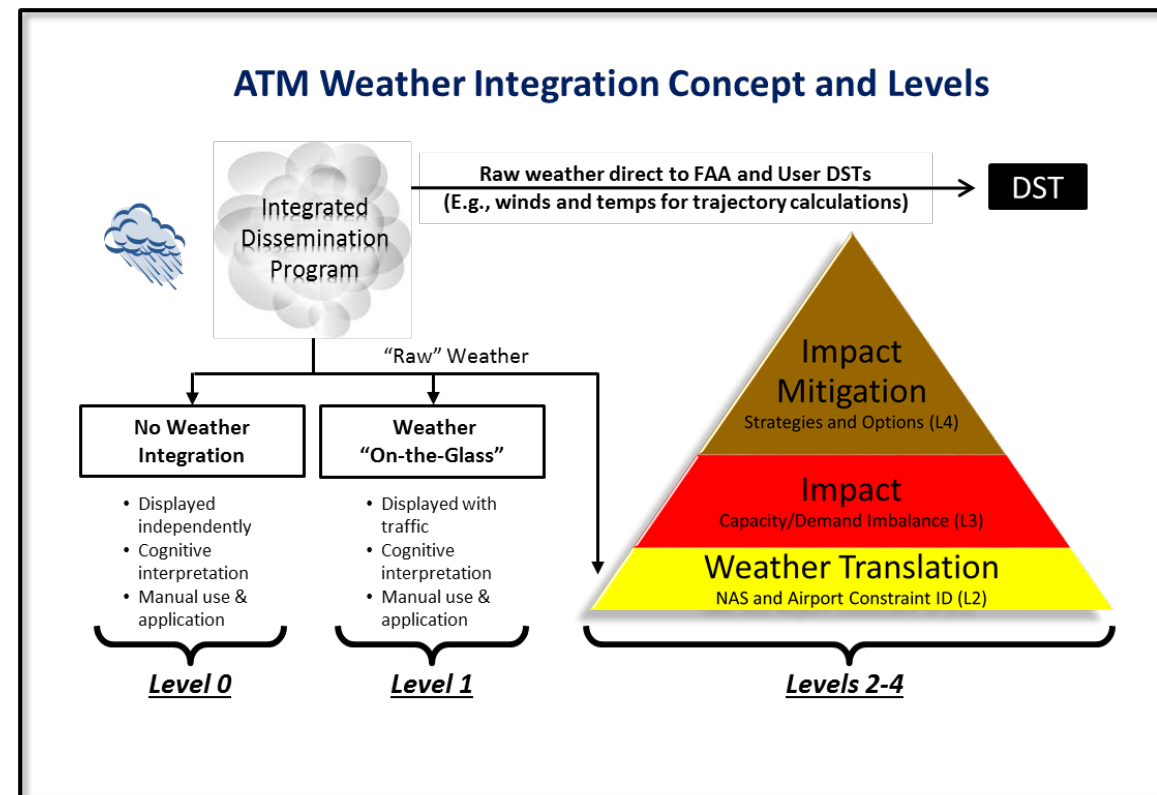


Photo: NWS

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



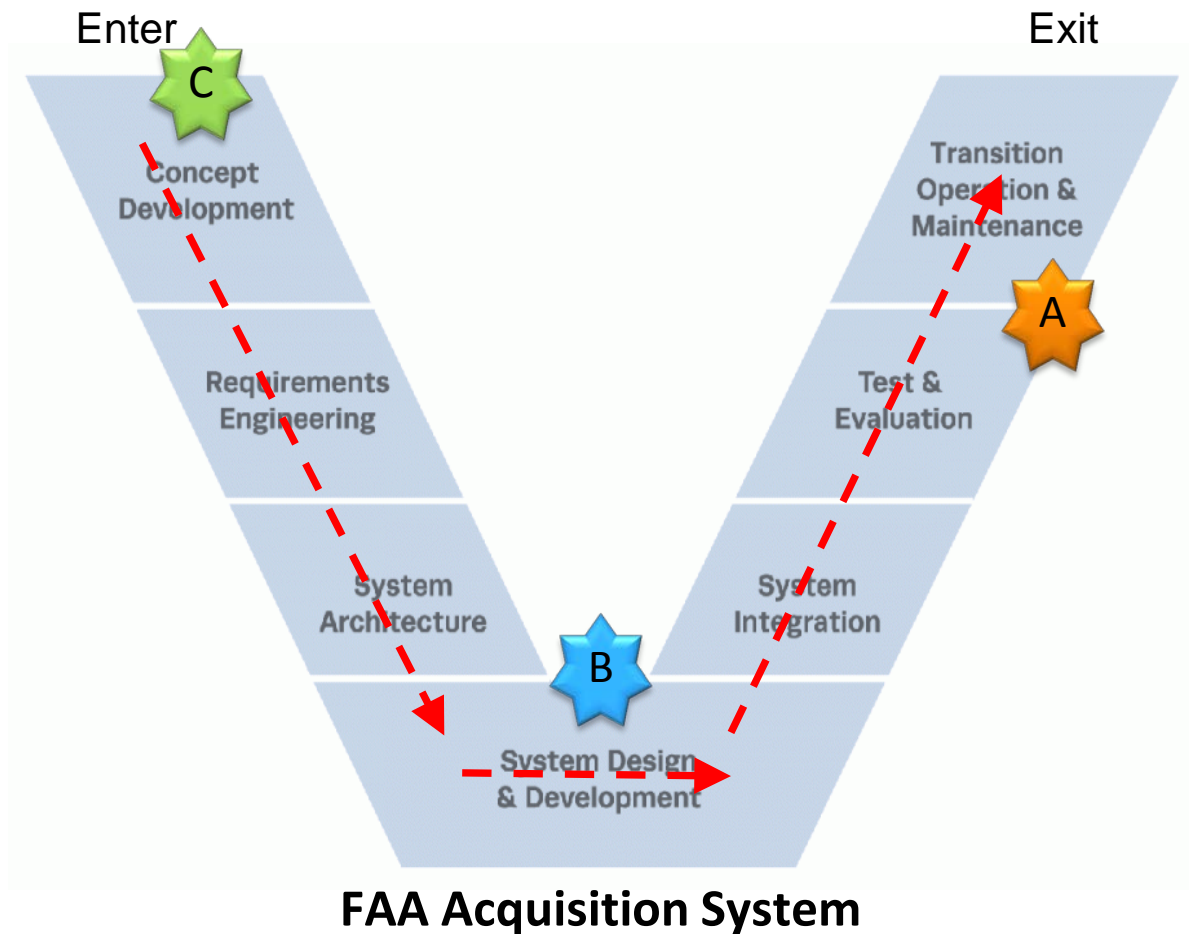
What is the NAS Segment Implementation Plan (NSIP)?




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

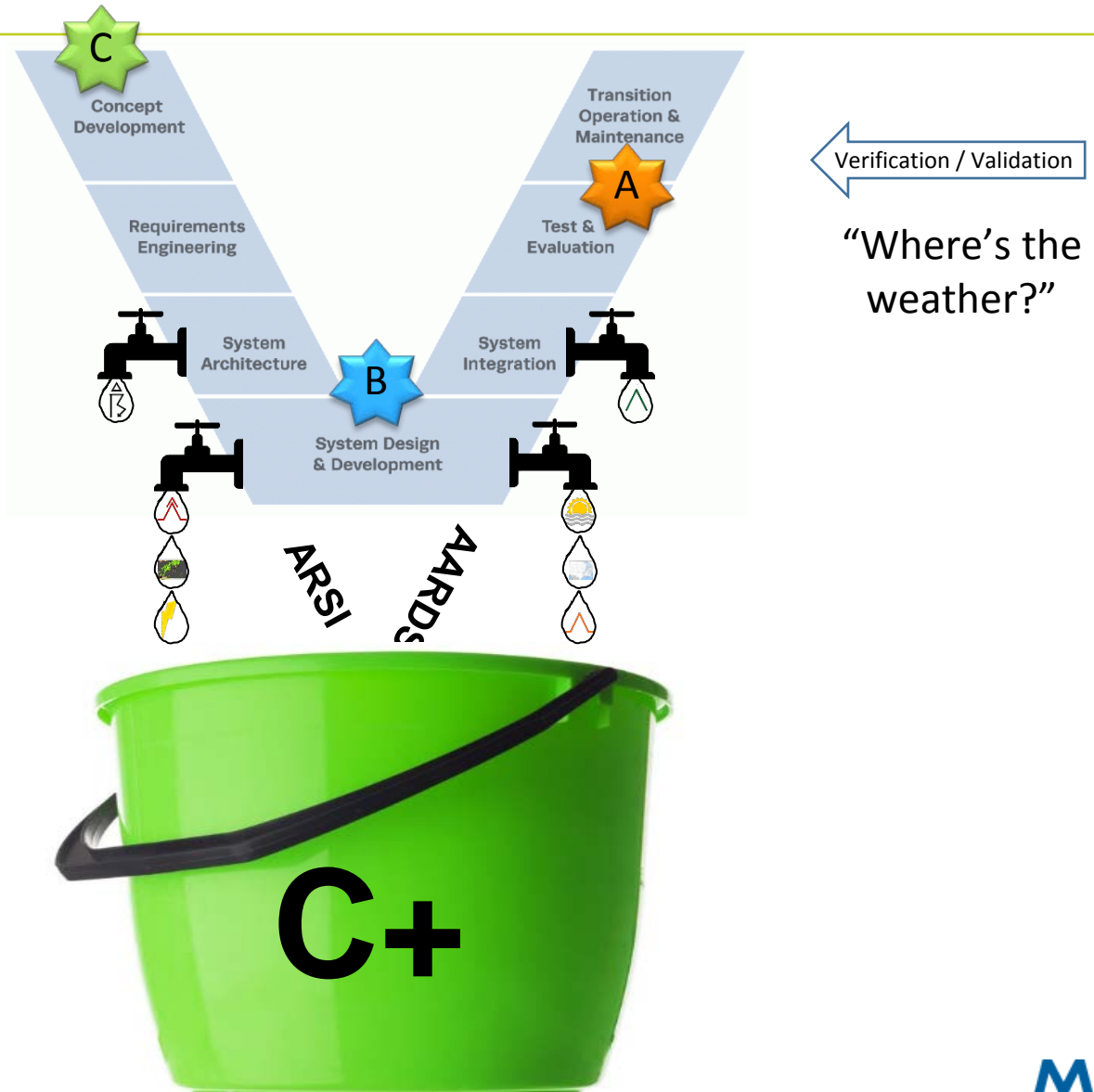


Segment		
	2010-2015	The train has left the station
	2016-2020	The train is about to depart
	2021-2025	The train is now boarding

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?

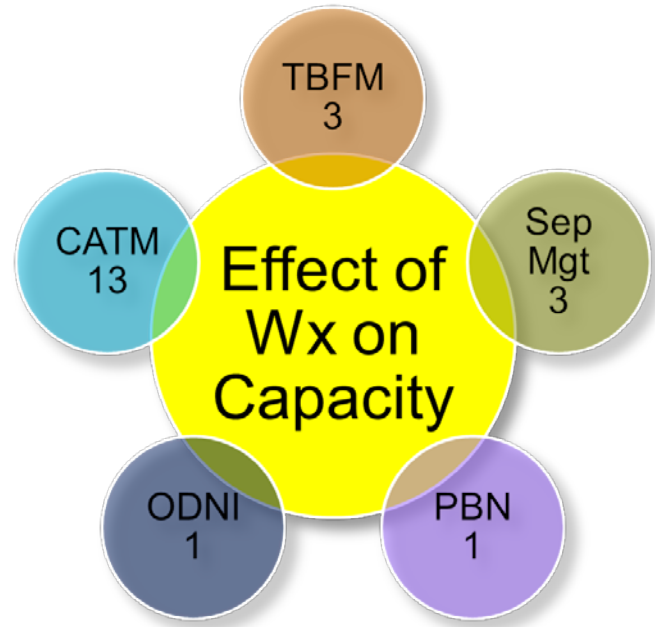


Common Weather Needs



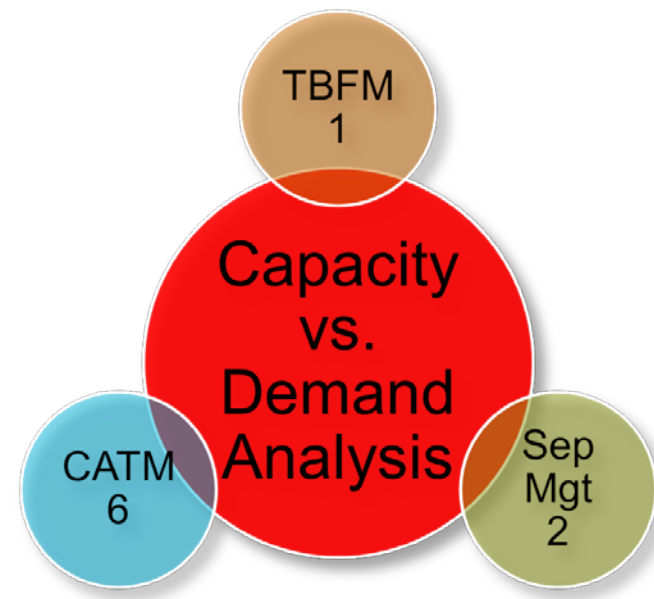
22

TRANSLATION



21

IMPACT



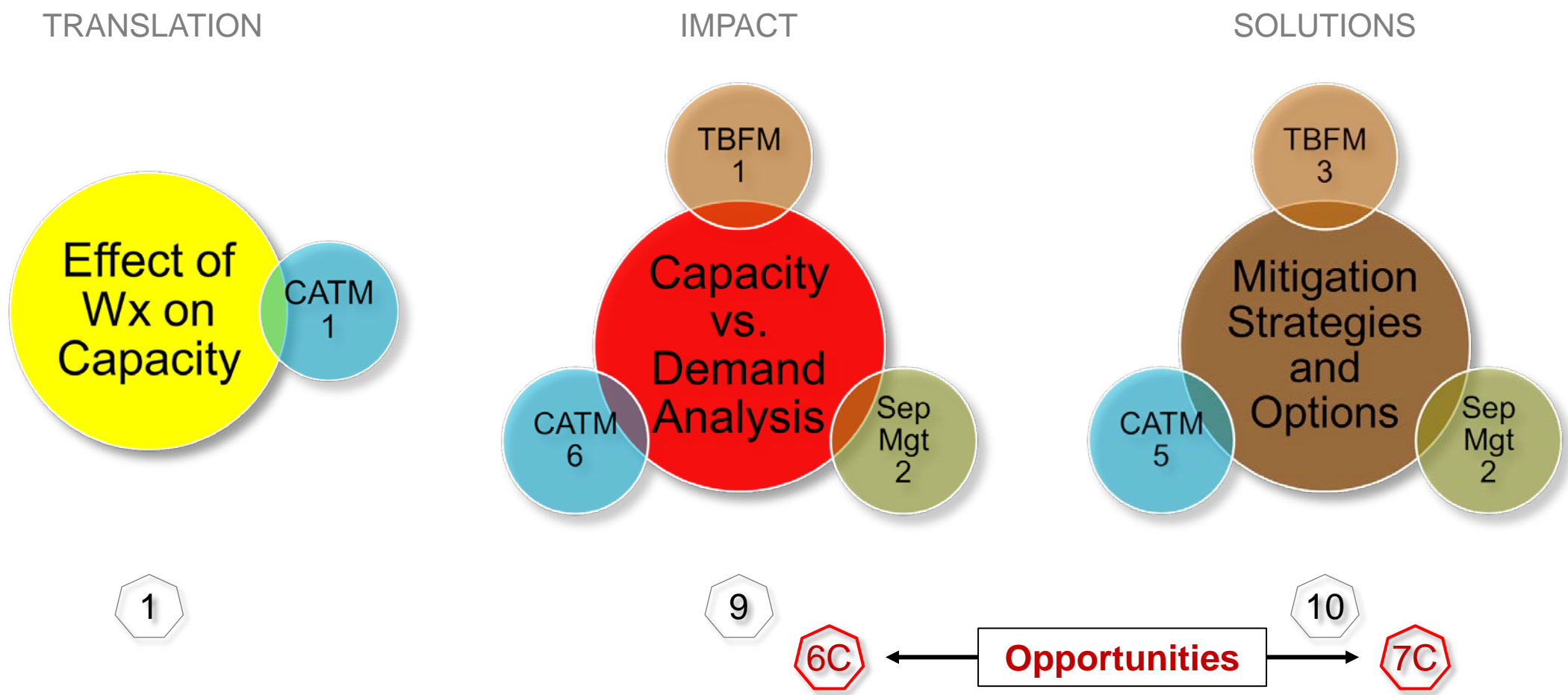
9

SOLUTIONS



10

Where are the Gaps?



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.*

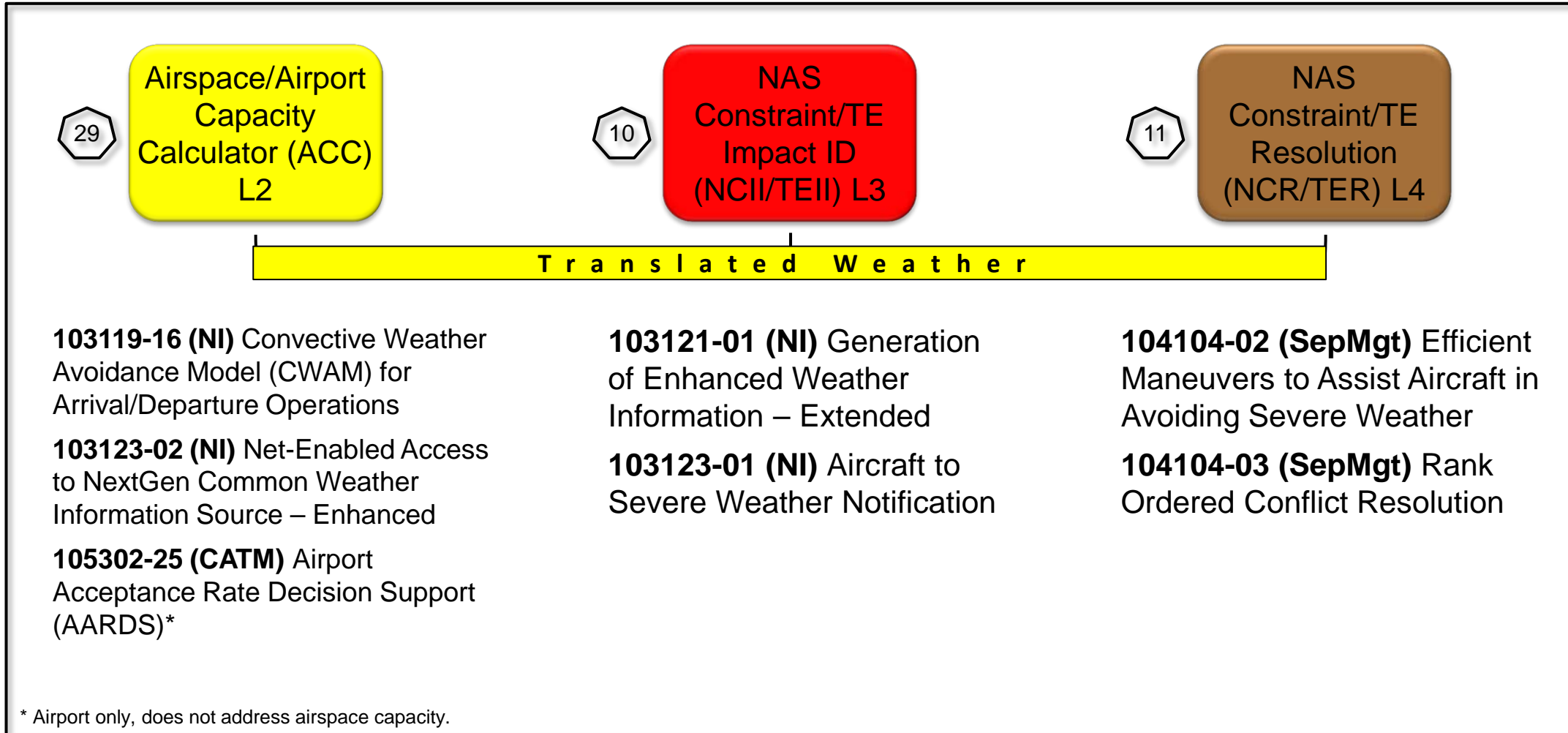
■ Opportunity

- 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

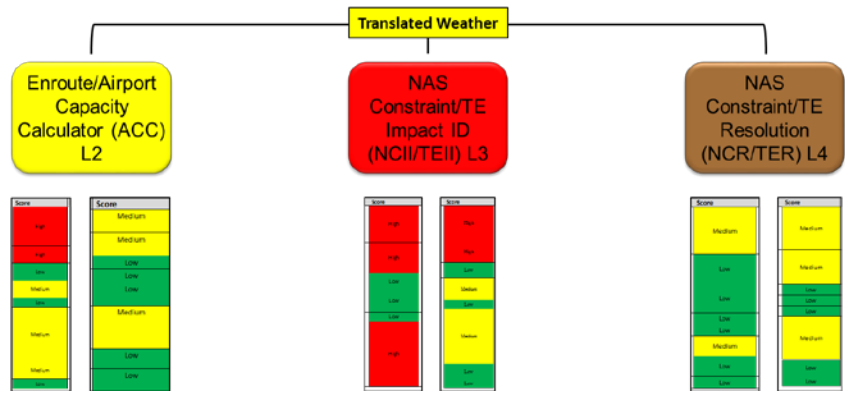
- 103121-01 Enhanced Weather Information – Extended (C)
- 103123-01 Aircraft-to-Severe Weather (C)

Increments that could provide the basis for Common Weather Functions



Next Steps

- Review Readiness Assessment for key increments



- Quantify severity of gaps



- Develop and propose feasible solutions



Questions/Discussion



The contents of this material reflect the views of the author and/or the Director of the Center for Advanced Aviation System Development. Neither the Federal Aviation Administration nor the Department of Transportation makes any warranty or guarantee, or promise, expressed or implied, concerning the content or accuracy of the views expressed herein.

Approved for Public Release: 15-2707. Distribution Unlimited. © 2015 The MITRE Corporation. All rights reserved.

