Aviation Weather Programs

Friends and Partners of Aviation Weather, Vision Forum 2010

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Objectives for NextGen Network Enabled Weather (NNEW) and Reduce Weather Impact (RWI)

Joint Planning and Development Office

Concept of Operations
for the
Next Generation Air Transportation System

Version 2.0
13 June 2007

NextGen
Next Generation Air Transportation System

Network-Enabled Information Access

Weather Assimilated into Decision-Making
-- 4-D Trajectory Operations

Improve Quality of Weather Information

Key Programs

- **NextGen Network Enabled Weather (NNEW)**
- **Reduce Weather Impact (RWI)**
- **Aviation Weather Research Program (AWRP)**
- **System Wide Information Management (SWIM)**
- **Other NextGen Solution Sets**
  - e.g. Collaborative ATM

NNEW

- **FAA's IT tool suite for aviation weather information dissemination**

  - Information provided from NWS' NextGen 4-D Weather Data Cube

  - Tailored information provided by value added services

  - Dissemination of Weather Translations

- **Makes available FAA weather products including FAA observations to NWS**
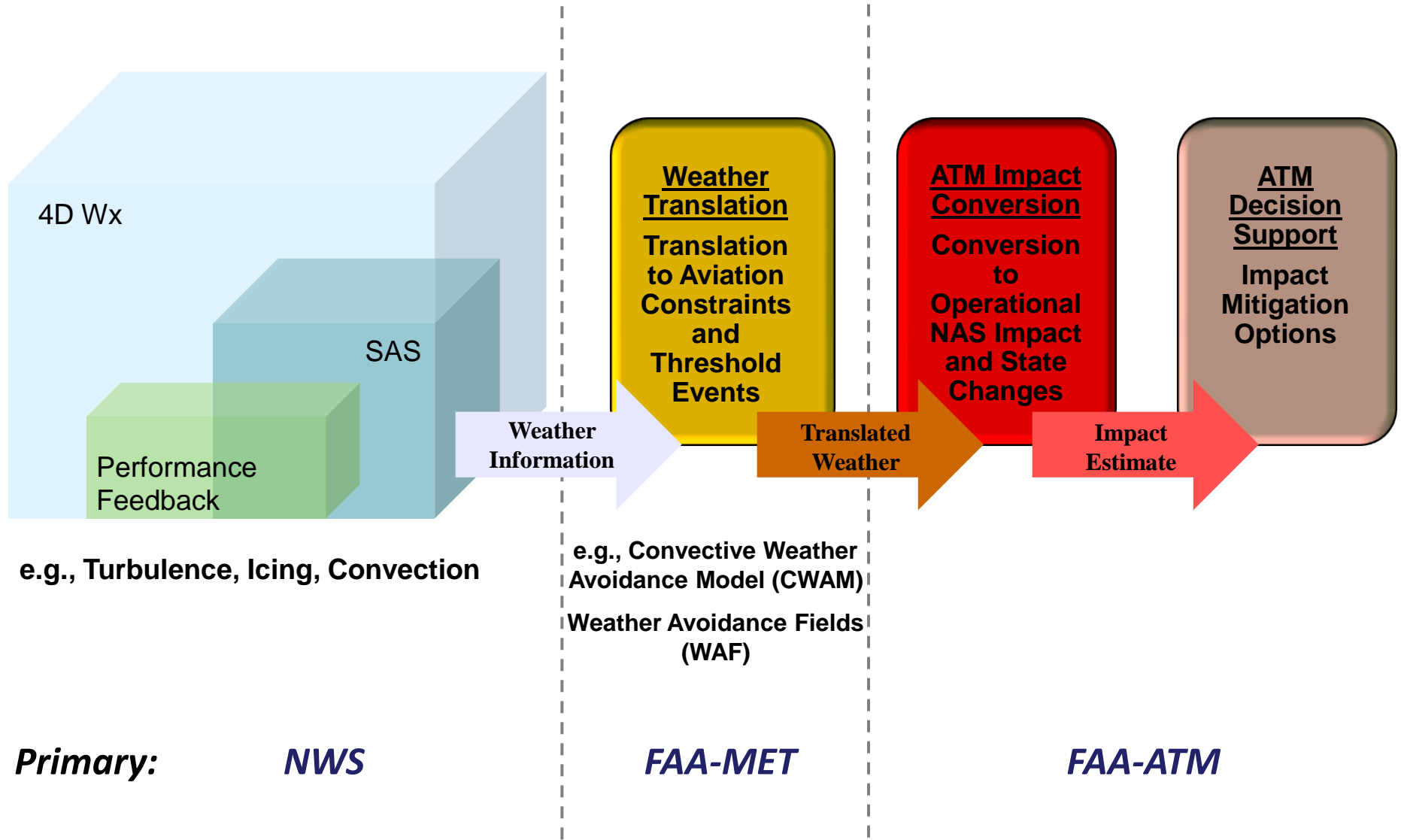
RWI

- **Pre-Investment Solution Set portfolio to develop:**
  - Improved Observations
  - Improved Forecasts
  - Translated weather information into NAS constraint and impact information for integration into DSTs

Aviation Weather Research Program

- **Research Portfolio aimed at improving state of the science for detection and forecast of aviation-relevant weather**

- **Current research thrusts:**
  - Convection
  - Turbulence
  - Ceiling and Visibility
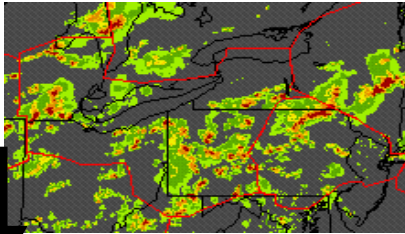 - Icing (Ground and Airborne)
  - Modeling
  - Observations
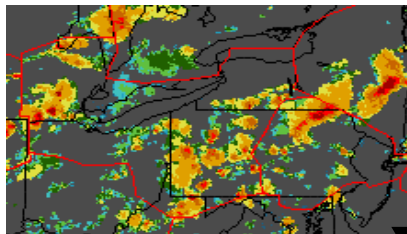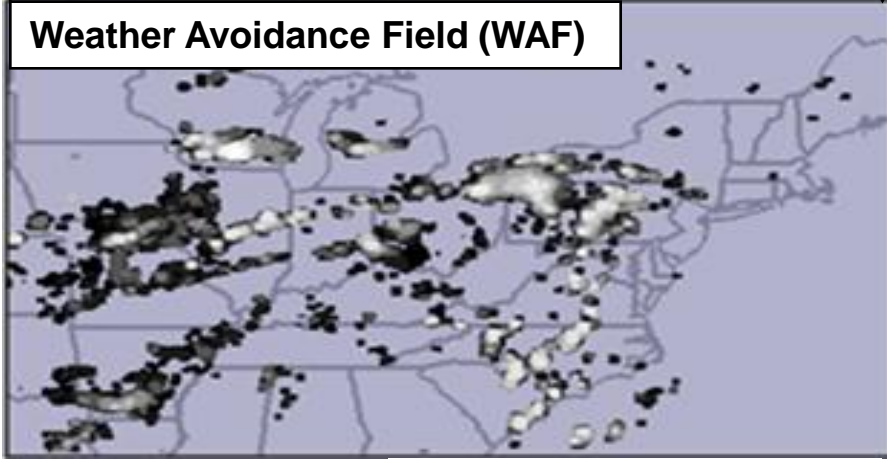
NextGen Weather Integration Concept

4D Wx

SAS

Performance Feedback

e.g., Turbulence, Icing, Convection

Weather Information →

Weather Translation

Translation to Aviation Constraints and Threshold Events

e.g., Convective Weather Avoidance Model (CWAM)

Weather Avoidance Fields (WAF)

Translated Weather →

ATM Impact Conversion

Conversion to Operational NAS Impact and State Changes

Impact Estimate →

ATM Decision Support

Impact Mitigation Options

Primary: *NWS*   *FAA-MET*   *FAA-ATM*
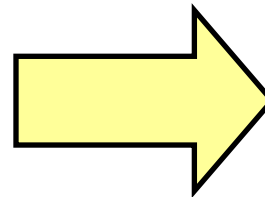
Translating Weather to Impacts

Precipitation

Echo Tops

FCAA05 2007/06/27_19:00Z

FCAA05

+20 min
+10 min
0 min
-10 min

Weather Avoidance Field (WAF)

+20 min
+10 min
0 min
-10 min

FCAA08

Pilot Deviation Prob

10 20 30 40 50 60 70 80 90 100
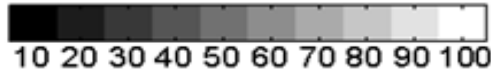
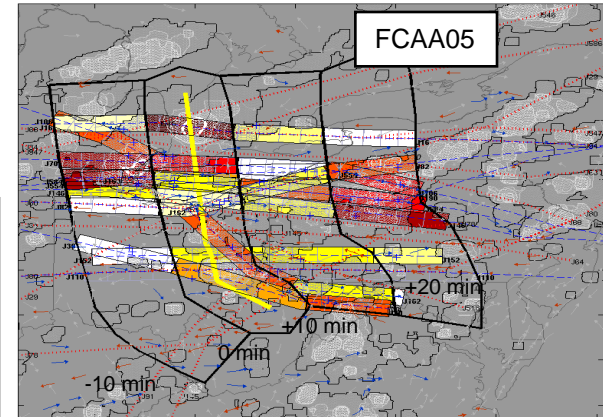**Weather Translation Techniques**

Estimated Airspace Availability
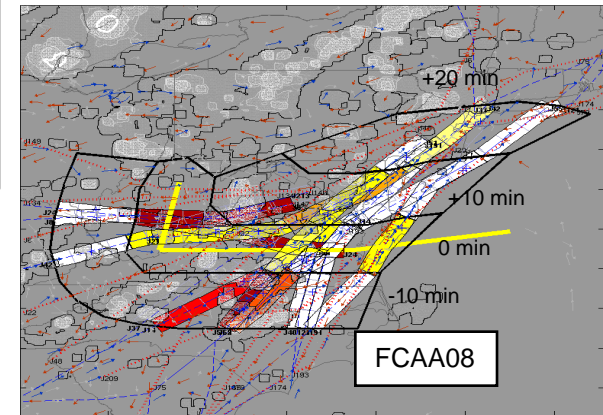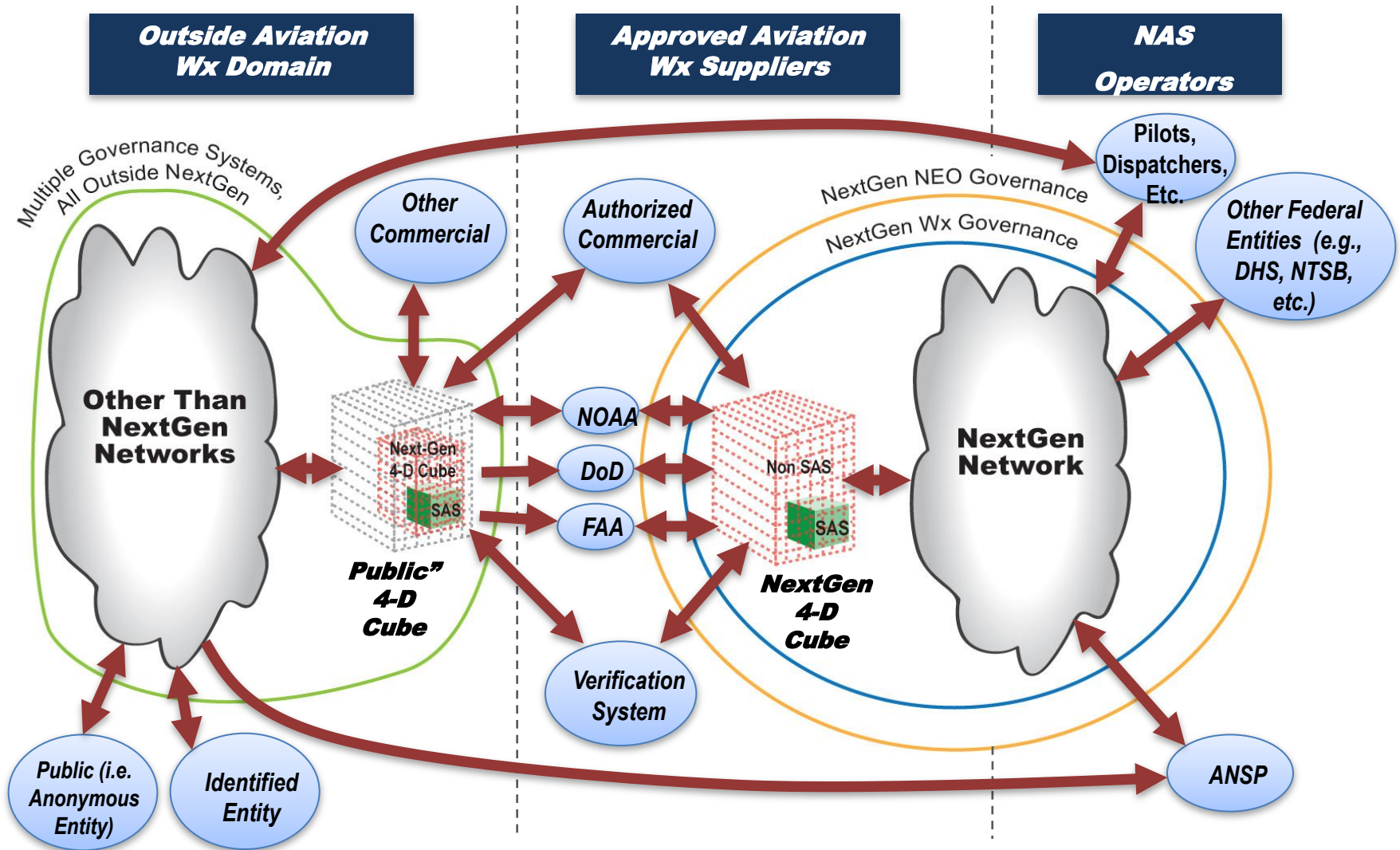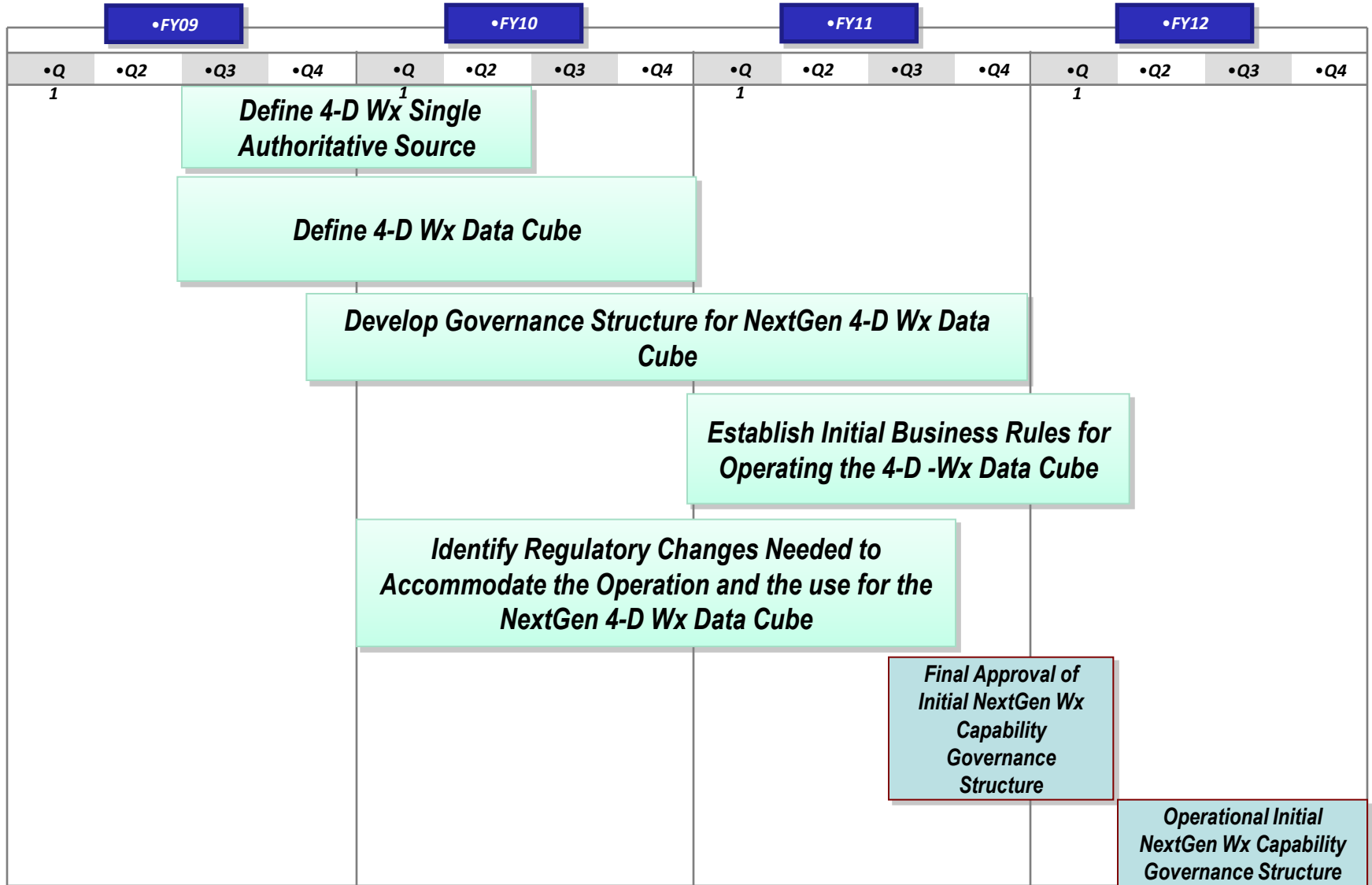
Integration Evolution

- **Near-Term – Route/Volume Data Extractor for utilization in DSTs.**

- **Mid-Term – Translations integrated into DSTs.**

  - New datasets will translate weather information into operational thresholds or NAS constraints.

- **Far-Term – Fully automated translations including advanced weather data.**

* Translations in use to support ATC decision making will be available to external users (e.g., FOC, Flight Deck) to allow for common situational awareness
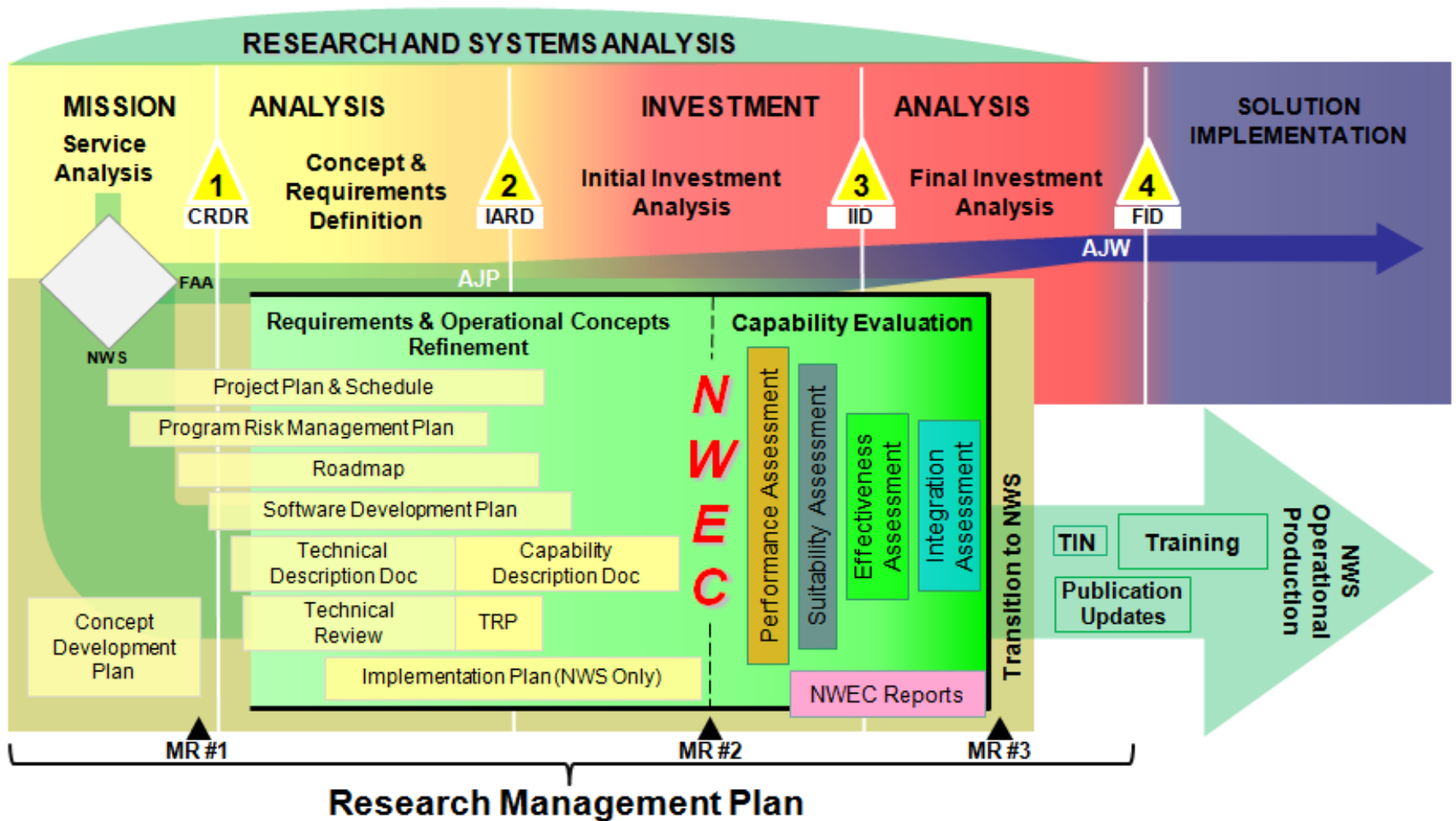
JPDO Policy Team Architecture Concept

High-Level JPDO Policy Team Work Plan

•FY09	•FY10	•FY11	•FY12
•Q1	•Q2	•Q3	•Q4	•Q1	•Q2	•Q3	•Q4	•Q1	•Q2	•Q3	•Q4	•Q1	•Q2	•Q3	•Q4

Define 4-D Wx Single Authoritative Source

Define 4-D Wx Data Cube

Develop Governance Structure for NextGen 4-D Wx Data Cube

Establish Initial Business Rules for Operating the 4-D -Wx Data Cube

Identify Regulatory Changes Needed to Accommodate the Operation and the use for the NextGen 4-D Wx Data Cube

Final Approval of Initial NextGen Wx Capability Governance Structure

Operational Initial NextGen Wx Capability Governance Structure

The RTO Process

Current and Near-Term Activities

- ## NNEW 4-D Wx Data Cube
  - FAA/NWS NNEW Capability Evaluation, Sep 2010

- ## Processing and Integration Demonstrations
  - In-situ Turbulence Demonstration, Ongoing
  - Advanced Convective Forecast Evaluation, Jun-Sep 2010
  - Wx into TBFM - NextGen Integrated Airport Evaluation, 2011

- ## Plans and Requirements
  - ATM Weather Integration Plan v2.0, Sep 2010
  - Observation Rightsizing Analysis Report, Dec 2010
  - Liquid Water Equivalent Initial Requirements, July 2010