

Multifunction Phased Array Radar (MPAR)

Technology Assessment Program (TAP)

Presented to: MPAR Symposium II

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Aviation Weather Office

Prototype, Engineering, & Demonstration

William J. Hughes Technical Center

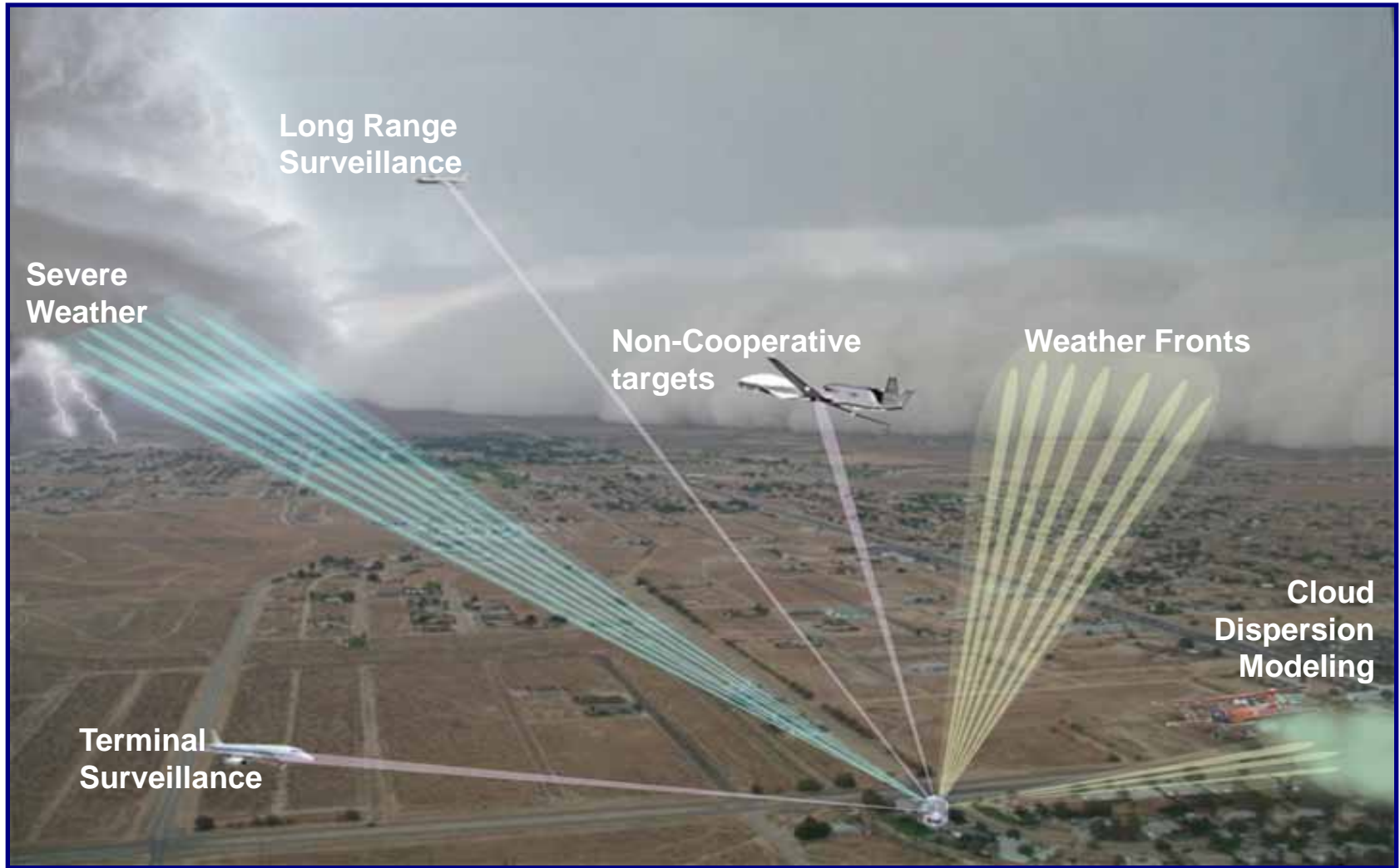
Date: 19 November 2009



Federal Aviation
Administration



MPAR Concept



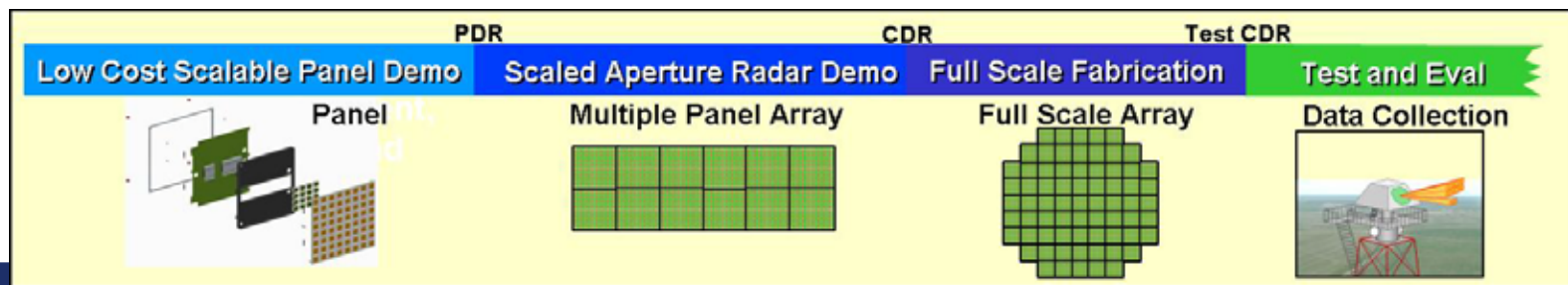
Cost Risk Reduction

Strategy/Approach

- Develop a feasible architecture for a low-cost phased array antenna
- Input from industry
- Building block approach to prototype development
- Develop array cost model

• Goals/Objectives

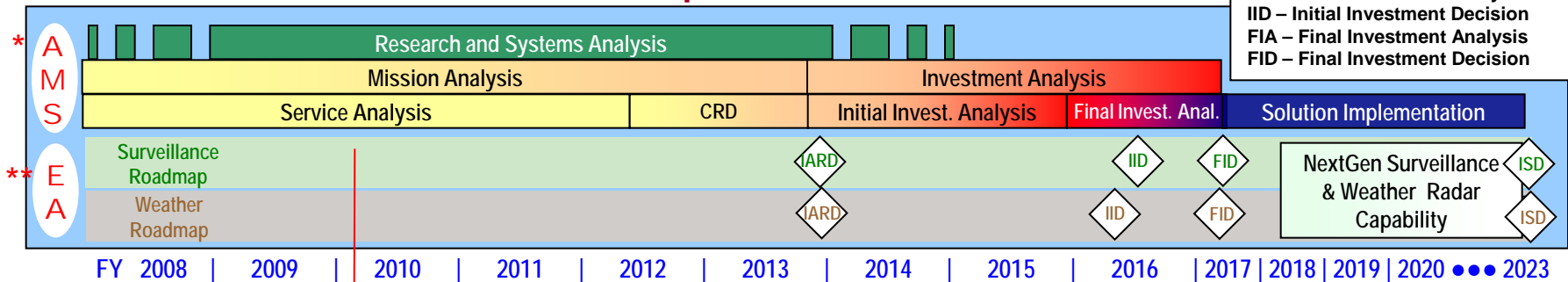
- Demonstrate affordability to support investment milestones Decisions
- Define and demonstrate a viable dual-pol implementation
- Demonstrate technology performance with COTS and commercial manufacturing /packaging



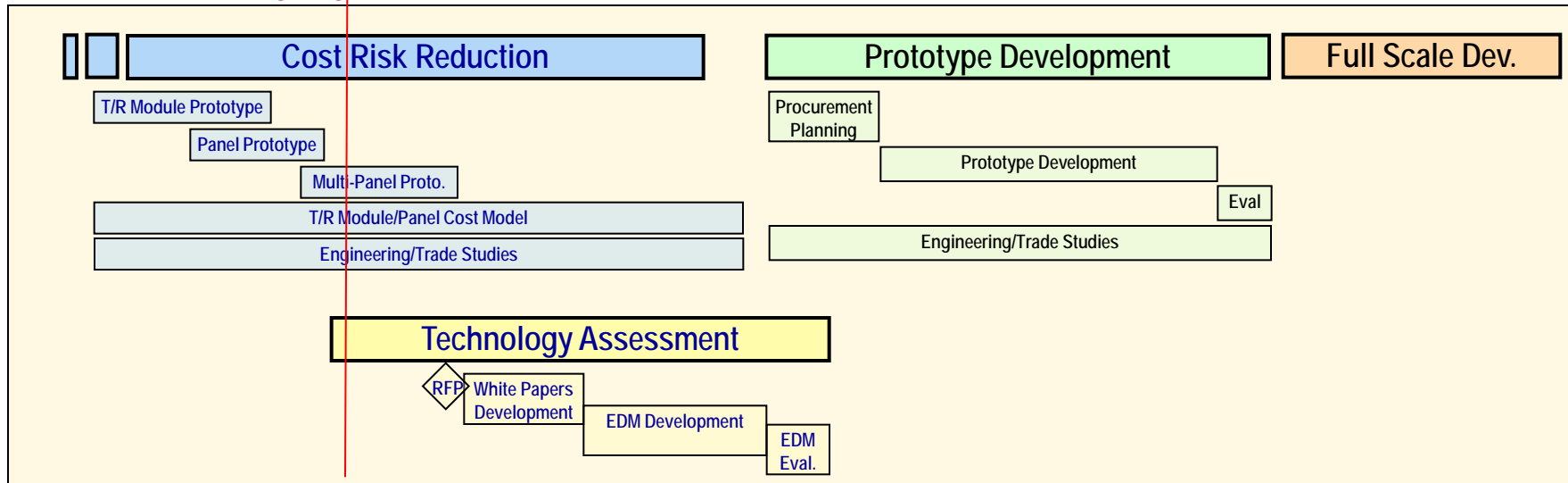
FAA MPAR Program Plan

MND – Mission Need Decision
CRD – Concept & Rqmnts Dev.
IARD – Investment Anal. Read. Dec.
IIA – Initial Investment Analysis
IID – Initial Investment Decision
FIA – Final Investment Analysis
FID – Final Investment Decision

FAA's AMS Process and EA Roadmaps



MPAR Timeline



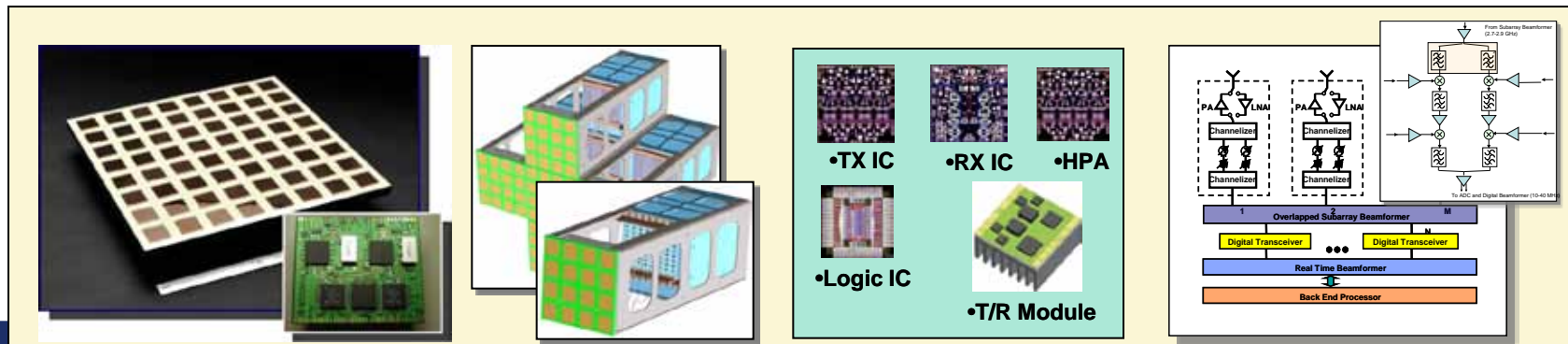
(* AMS – Acquisition Management System, ** EA – Enterprise Architecture)



Technology Assessment Program (TAP)

- **Strategy/Approach**

- Multi-agency effort
- Engage multiple industry members to obtain current state-of-the-art and cost data for phased array radar technology
- Multi-step procurement with down-selects
 1. **Qualifier** - used to select and fund White Paper Development
 2. **White Paper Development** - technology, architecture, and cost
 3. **Technology Demonstrator Development** - build subsystem demonstrators to address one or more TAP research objectives



Technology Assessment Program (TAP)

- **Goals/Objectives**

- Obtain update on current industry status on phased array technology
- Obtain information on technology cost (e.g., GaN, DBF, etc.)
- Obtain insight into how MPAR cost goals will be met (e.g., architectures, use of COTS, commercial manufacturing, packaging)
- Demonstrate technology performance of affordable solutions
- Demonstrate dual-pol performance (cross pol separation, calibration, etc.)
- Demonstrate multi-functionality capability

Technology Assessment Program (TAP)

- **Progress**

- Technology Assessment (formerly Technology Demonstration Program) Working Group established to develop strategy and approach
- Partners include National Severe Storm Laboratory (NSSL/NOAA) and the Office of the Federal Coordinator for Meteorology (OFCM); other potential candidates include DHS and DOD
- Planning and coordinating the development of an SOW and other procurement documents (e.g., technical requirements)



Questions

- ?



BACK-UP SLIDES



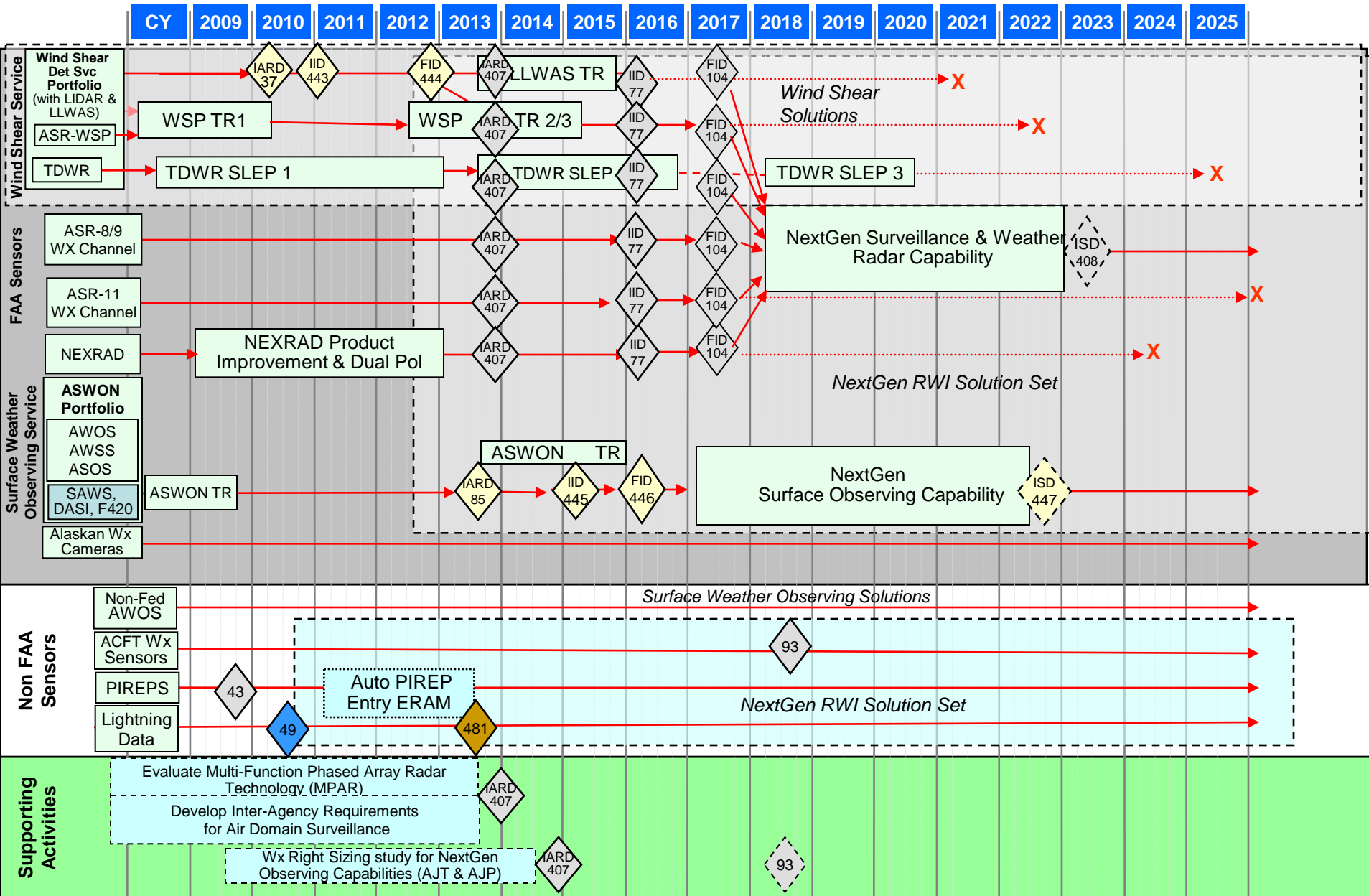
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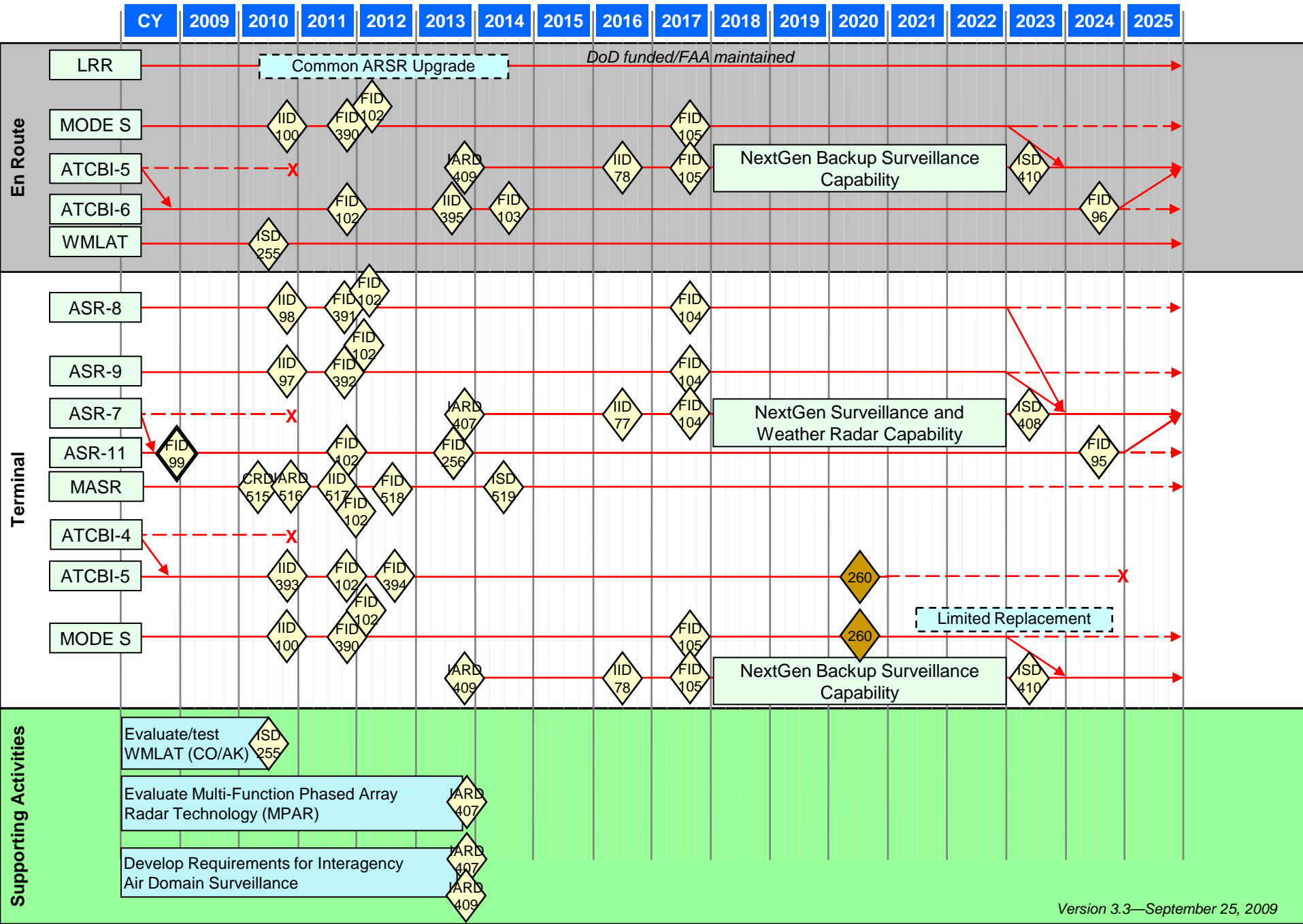
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Weather Roadmap (1 of 2)

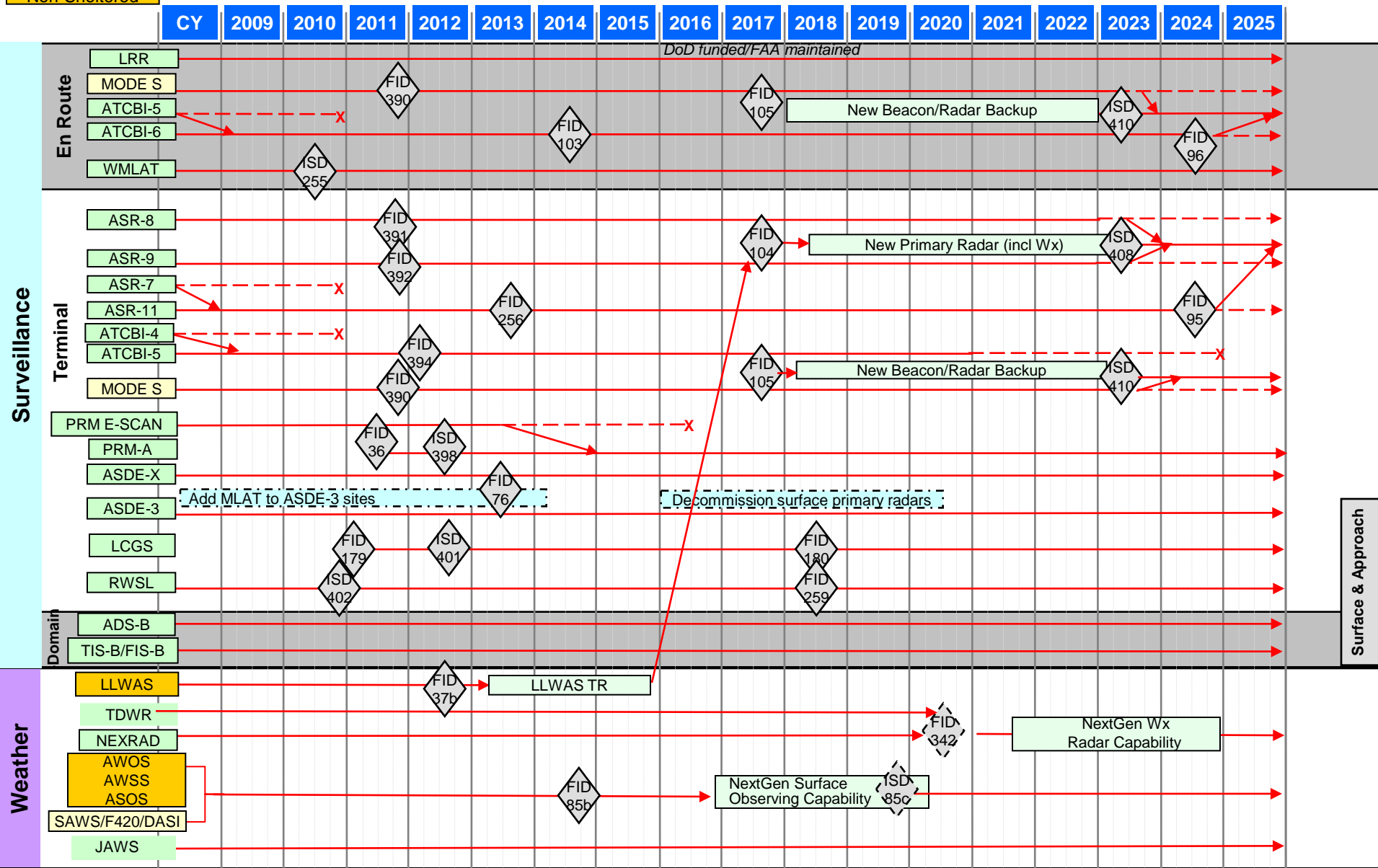


Surveillance Roadmap (1 of 2)



Facilities Roadmap—Unstaffed (3 of 3)

- Main
- Collocated
- Non-Sheltered



Surface & Approach



Key Decision Points

NextGen Surveillance and Weather Radar

- **Decision Point 407 - IARD, 2013**

(Note: Wx DP 84 series combined with those of Surveillance (407, 77, 104 & 408))

- Decisions to:

- 1) Decommission all ground-based wind shear capability (TDWR, ASR-WSP & LLWAS) but replace TDWR w/less expensive Wx radar and SLEP ASR-9/11 Wx Channel; or
- 2) SLEP ground-based wind shear except replace LLWAS w/LIDAR for dry MB Detect (if MIT/LL reports supports) & SLEP NEXRAD; or
- 3) Replace Terminal Surveillance/Wx, Wind Shear capability & NEXRAD with NextGen Surveillance/Wx capability (MPAR being researched to see if it can perform wind shear detection as well for possible alternative)

- **Decision Point 77 - IID, 2016 Q1 (*Surveillance Domain*)**

- Initial Investment Decision to implement a NextGen Surveillance and Weather Radar Capability for ATC

- **Decision Point 104 - FID, 2017 (*Surveillance Domain*)**

- Final Investment Decision to implement a NextGen Surveillance and Weather Radar Capability for ATC

- **Decision Point 408 - ISD, 2023**

- In-Service Decision for NextGen Surveillance and Weather Radar Capability

Relevant Decision Points

Terminal Radar (ASR)

- **Decision Point 95 - FID, 2024**
 - Decision for replacement of terminal primary radars (ASR-11 PSR) and removal of terminal beacons (ASR-11 MSSR)
- **Decision Point 97 - IID, 2010 Q4**
 - Initial Investment Decision for legacy radar (ASR-9) SLEP, through 2025
- **Decision Point 98 - IID, 2010 Q4**
 - Initial Investment Decision for legacy radar (ASR-8) SLEP, including weather channel, through 2025

Wind Shear Detection

- **Decision Point 37a - FID, 2010 Q3**
 - Initial Investment Decision to Tech Refresh/SLEP wind shear detection services capability of all WS systems (to address wind shear study and technologies)
- **Decision Point 37b - FID, 2012**
 - Final Investment Decision on wind shear detection services capability of all WS systems to Tech Refresh/SLEP (to address wind shear study and technologies)

Reference (deleted)

- **Decision Point 84 - IARD, 2016**
 - Decision to 1) decommission all ground-based wind shear capability (TDWR, ASR-WSP & LLWAS) but replace TDWR w/less expensive Wx radar and SLEP ASR-9/11 Wx Channel; or 2) SLEP ground-based wind shear except replace LLWAS w/LIDAR for dry MB Detect & SLEP NEXRAD, or 3) Replace Terminal Wx Surveillance, Wind Shear capability & NEXRAD with NextGen Wx Surveillance capability