Federal Aviation Administration

REDAC / NAS Ops

Operations Concept Development & Infrastructure (ATDP)

BLI Number: 1A01C

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Operations Concept Development & Infrastructure - ATDP

Why is this program necessary?

- The FAA is proceeding with NAS modernization for the National Airspace System. Concept development and validation is necessary to investigate specific concept elements underpinning these artifacts, and to drive out operational and technical requirements and implications for human factors, training and procedures. Without this, uncertain, unreliable, and potentially non-viable and non-beneficial changes to the NAS could occur. Ultimately, this program ensures that enhancements to the NAS are operationally sound and that sufficient risk mitigation activities for new concepts are completed. This program contributes to the FAA's support for RTCA, a non-profit association that develops standards based on manufacturers, government, and aviation operator inputs. RTCA also recommends operational improvements to increase the efficiency of air transportation. The development of standards and global harmonization activities across the ATM community is essential to successful concepts and requirements development. This program contributes to the FAA's support for RTCA, a non-profit association that develops standards based on manufacturers, government, and aviation operator inputs. RTCA also recommends operational improvements to increase the efficiency of air transportation.

- ATDP also;
  - Investigates specific concept elements
  - Drives out operational and technical requirements and implications for human factors, training and procedures
  - Assesses the interaction of changing roles and responsibilities of NAS service providers and pilots, airspace changes, procedural changes and new mechanized systems for distributing weather, traffic and other flight related information
  - Tests the assumptions behind common situational awareness and distributed information processing

Operations Concept Development & Infrastructure - ATDP

What are the benefits to the FAA

The activity supports the FAA's Strategic Initiatives by delivering benefits through technology and infrastructure; Concept validation supports development, analysis, and simulation of new concepts to assess requirements and to evaluate the impact of the concept on system capacity, efficiency, safety and human performance. Evaluation criteria include the following:

- Impact/Improvement to Air Traffic Service Providers, airspace users, and automation that could increase capacity,
- Impact/Improvement on airspace structure which may increase productivity and hence capacity,
- Impact/Improvement on communication, navigation, and surveillance (CNS) requirements to support the FAA's efforts to reducing cost, increasing capacity and efficiency and;
- Impact/Improvement on automation, display, and facility configuration elements to increase productivity and hence capacity.

What determines program success

Success is measured by the completion of the goals identified in multi-year plans developed for each activity. Initiatives that successfully complete all the project goals identified are then presented as candidates for acquisition.

Operations Concept Development & Infrastructure – ATDP / BLI Number: 1A01C Overview Capabilities

People:

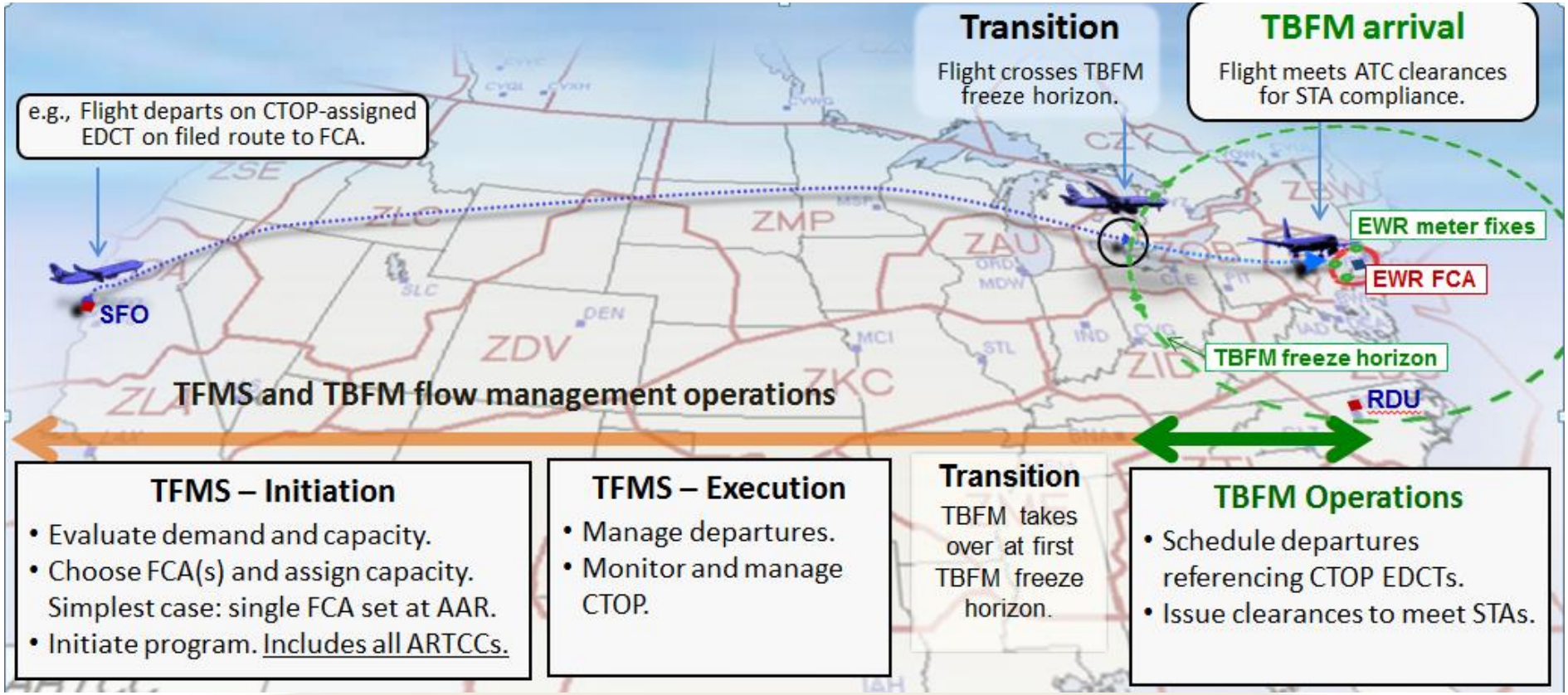
- Program Manager: Maureen Keegan
- Subject Matter Experts: Traffic Managers, ATC, Discipline Experts, Airspace User Community
- Research Partners: ANG, NASA, Mitre, Lincoln Labs, Volpe, Academia

Laboratories:

- MITRE
- Tech Center
- DAB Test Bed
- NASA
- Volpe

Focus Area

- Improved TBFM/TFMS Data Integration
  - Objective: Explore the use of the TFMS toolset to strategically pre-condition demand into TBFM
  - Leverages on-going research by NASA



Focus Area

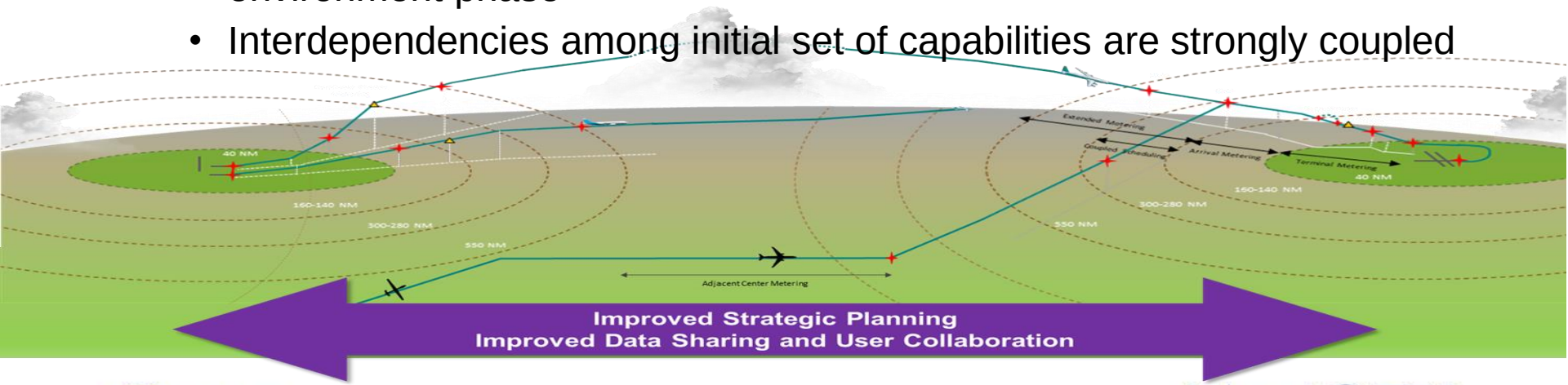
- Improved TBFM/TFMS Data Integration
- Status:
  - Development of Use Cases for a near-term capability is on-going. Final delivery planned for this summer.
  - Developing plan for the execution of a near-term capability.

Initial TBO Gap Analysis

- TBO Vision → Time-Based Management (TBM) + PBN

  "TBO is an ATM method for strategically planning, managing, and optimizing flights throughout the operation by using TBM, information exchange between air and ground systems, and the aircraft's ability to fly precise paths in time and space." - *FAA Vision for TBO*

- Focus on delivery of capabilities for approximately next 5 years (~2022)
  - Accounts for budgeted implementation waterfalls of key capabilities
  - Initial set of capabilities enable the first comprehensive TBM environment phase
  - Interdependencies among initial set of capabilities are strongly coupled



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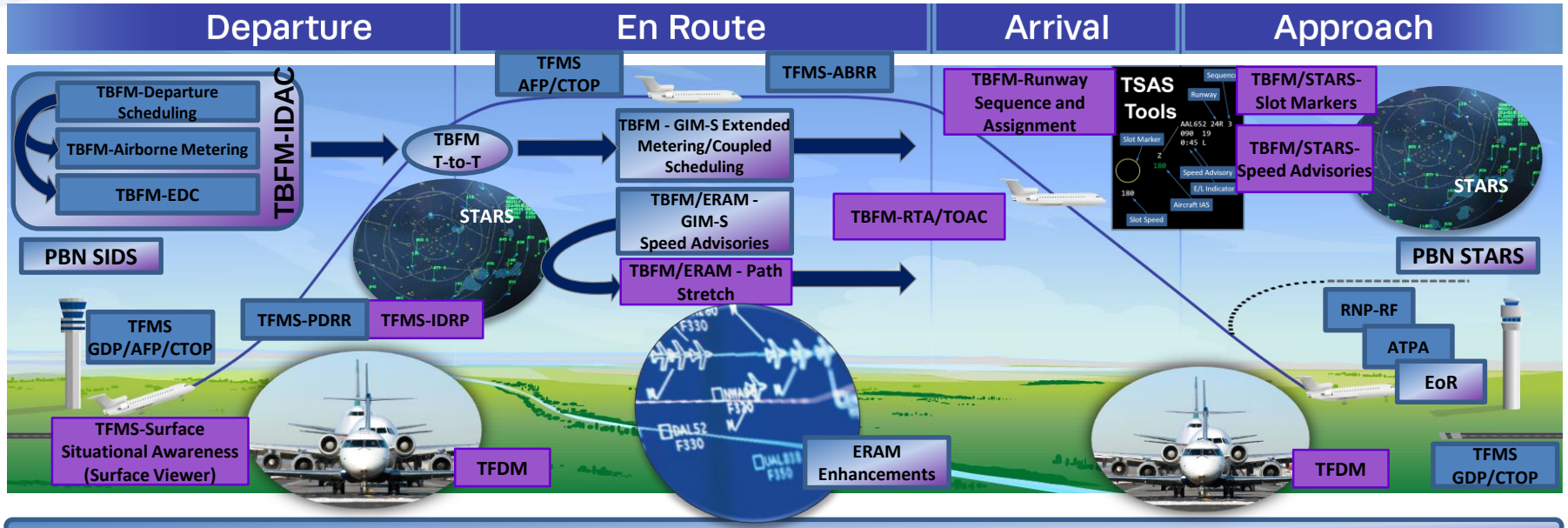
TBO Capabilities Sequencing by Domain
Operational Context

Existing Capability | *In-Process Deployment* | *2019+ Deployment*

PERTI Processes and Procedures



PBN Equipage

Data Communications

Weather Information – NextGen Weather Processor (NWP) /Common Support Services-Weather (CSS-Wx)

TFMS – Improved Demand Predictions (IDP)

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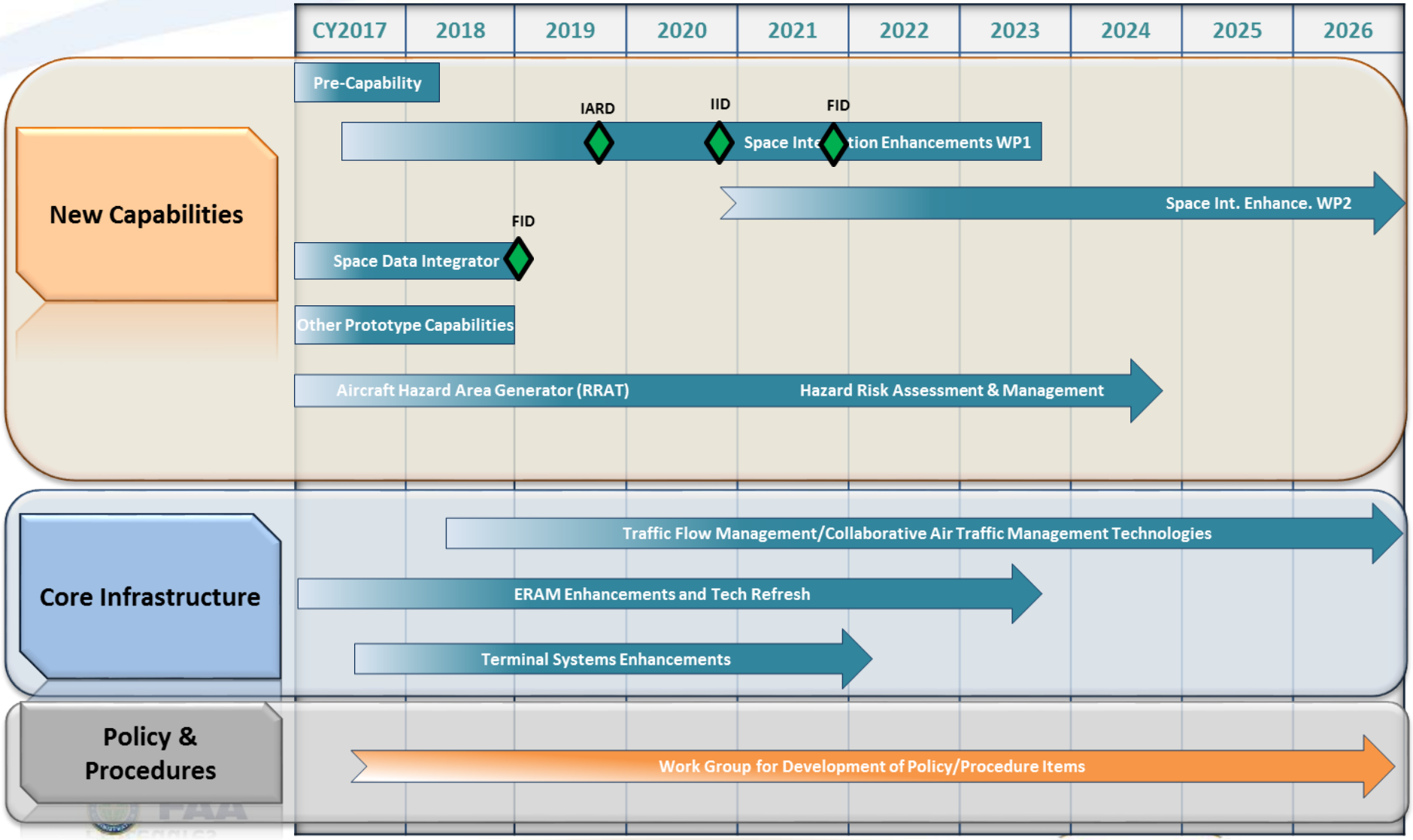
Space Integration Enhancements

- **Goal: Leverage work to date to develop ATO capabilities, services, systems and procedures to integrate space operations into the NAS**
  - Support the acquisition process by addressing shortfalls from preliminary Shortfall Analysis Report (pSAR) 2015 and Validation
  - Phased investment approach integrating various stakeholders, current capability efforts, and future identified capabilities
  - Leverage extensive efforts/research conducted by NextGen (ANG), System Operations (AJR) and the Office of Commercial Space Transportation (AST)
  - Prioritize operational capabilities for Space Integration Enhancements Work Packages

Strategy


CY2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
New Capabilities
Pre-Capability
IARD
IID
FID
Space Int tion Enhancements WP1
Space Int. Enhance. WP2
FID
Space Data Integrator
Other Prototype Capabilities
Aircraft Hazard Area Generator (RRAT)
Hazard Risk Assessment & Management
Core Infrastructure
Traffic Flow Management/Collaborative Air Traffic Management Technologies
ERAM Enhancements and Tech Refresh
Terminal Systems Enhancements
Policy & Procedures
Work Group for Development of Policy/Procedure Items

Space Integration Enhancements Next Steps (from last report out)

Program Activities

- Complete conceptual solutions/ capability identification effort
- Prioritize with stakeholders conceptual solutions/capabilities
  - AJM, AJR, AJT, AJV, ANG, AST, NATCA, others
- Initiate CONOPs development/validation
  - leveraging ANG Space Vehicle Operations concept work
- Update Enterprise Architecture artifacts

Collaboration/Outreach Activities

- Finalize resource needs and source(s)
- Continue stakeholder engagement

Prioritization Background

Objective: Develop a prioritized list of conceptual solutions in preparation for the Space Integration Enhancements Investment Analysis

- Utilizing SME input, provide an independent, cross domain perspective for the relative priority of the operational needs.
- Analyze SME input and apply weighting schema to determine the prioritized list of conceptual solutions.

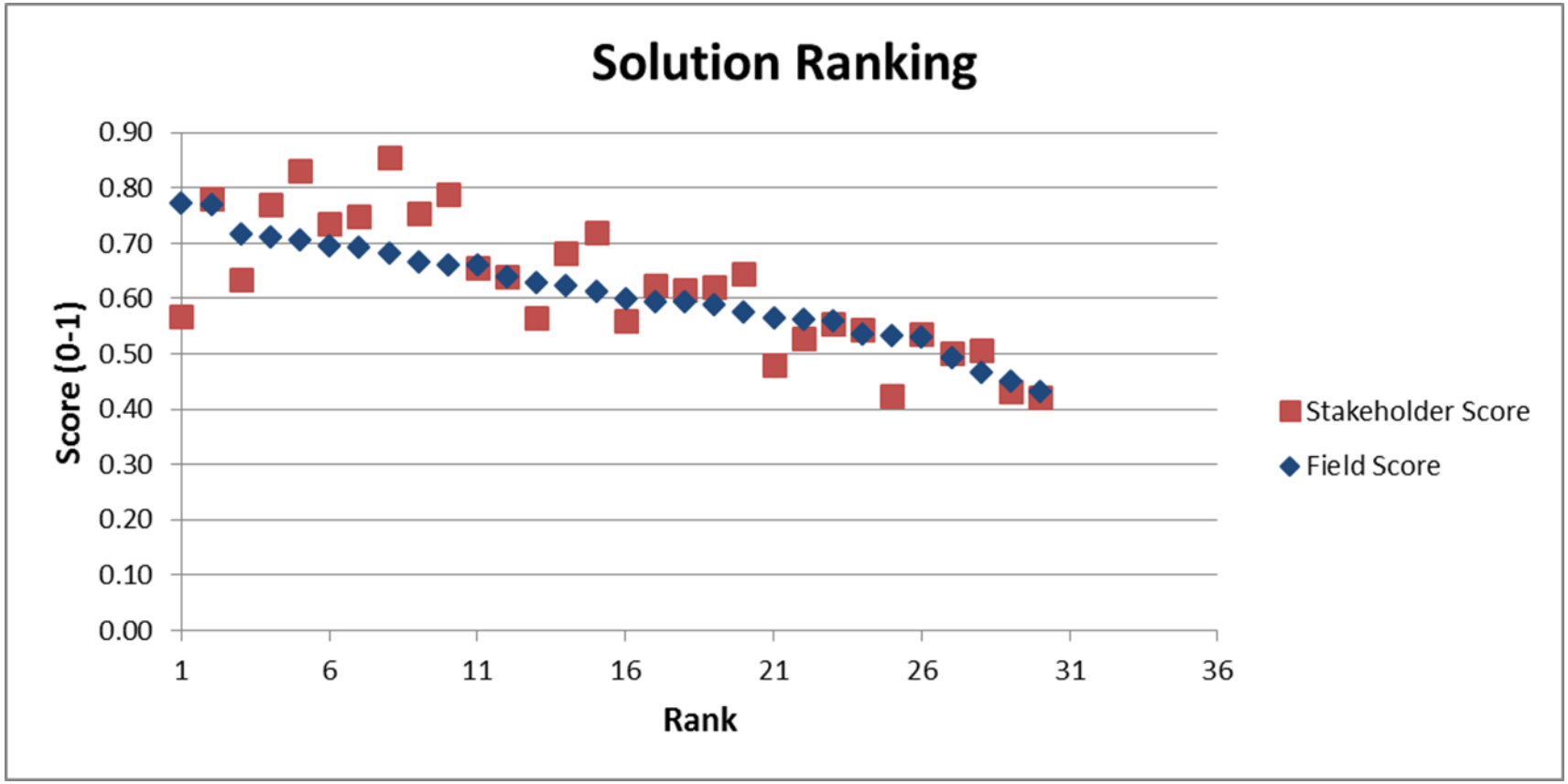
Operational Focus Group

Facility	Participants
NATCA National Office	1
ZMA Miami Center	3
SCT Southern California TRACON	1
ZLA Los Angeles Center	2
ZDC Washington Center	3
ZOA Oakland Center	2
F11 Central Florida TRACON	2
ATCSCC Command Center	3
AJV-7	2

HQ Stakeholder Focus Group

Office	Participants
NextGen (ANG-B, ANG-C)	2
Program Management Office	1
ATCSCC Command Center (AJR-1100)	1
Office of Commercial Space	1
Office of Safety	1
Airports	1
Air Traffic Operations	1
Office of Procedures (AJV-8)	1
Office of ATO Space Integration (AJV-0)	1

Prioritization Results



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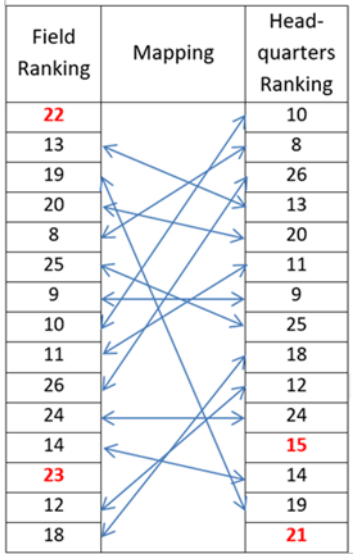
Differences in Field and HQ Inputs

- **Perspective of the Field personnel is largely "day of operation"**
- **Perspective of Headquarters is primarily "planning, approval, and strategy" of operations**
- **There are 13 Conceptual Solutions that are shared in the Top 15 priority of the two groups, these are recommended for WP1**

Field Ranking	Mapping	Head-quarters Ranking
22		10
13		8
19		26
20		13
8		20
25		11
9		9
10		25
11		18
26		12
24		24
14		15
23		14
12		19
18		21



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Questions?