



# ICAO SWIM Work Shop Mini Global Demonstrations

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**FAA**

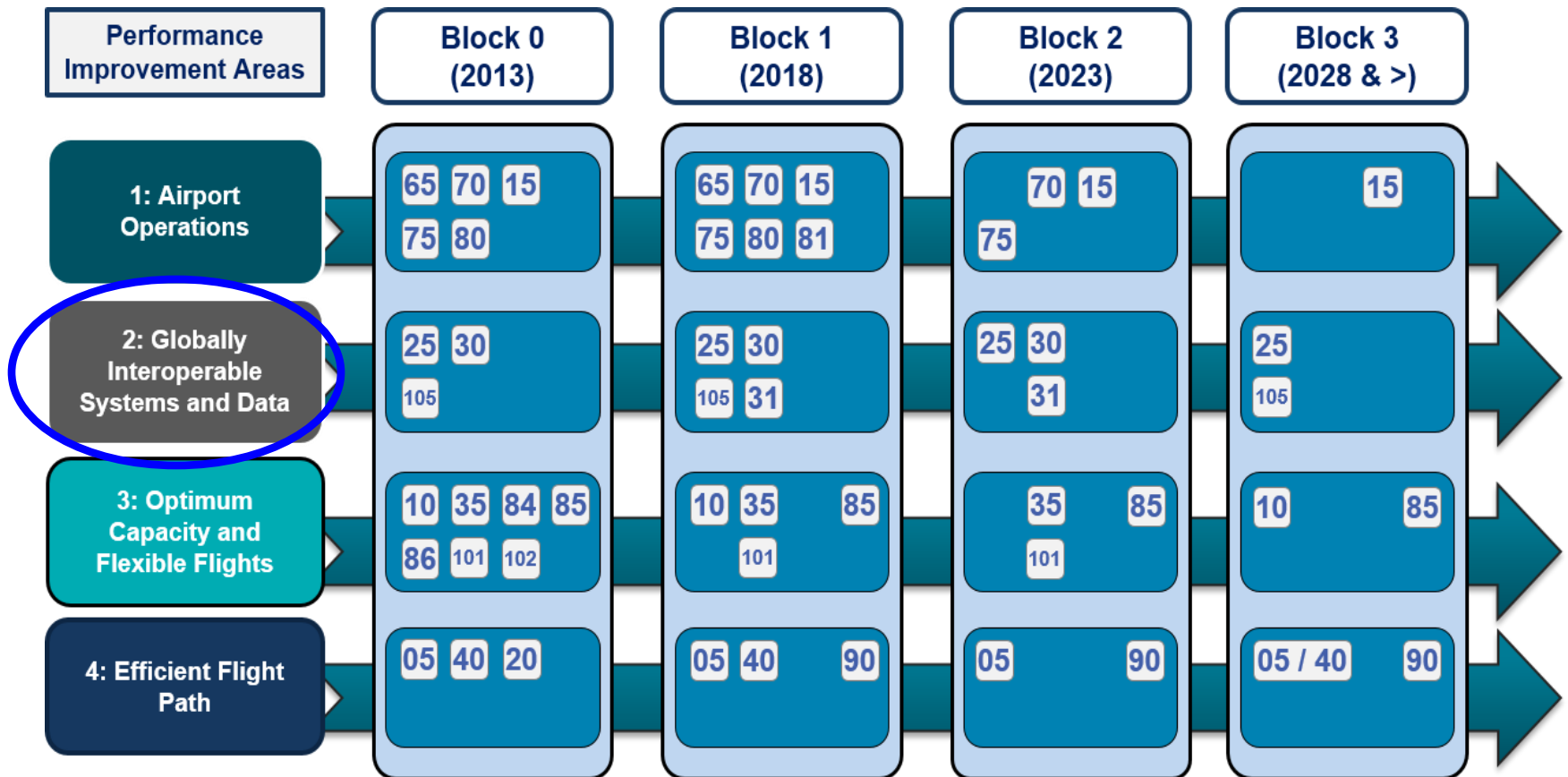
# Global Coordination

- Seamless information exchange across Flight Information Regions (FIRs) is essential for operators and air navigation service providers (ANSPs)
- Global Interoperability is a major component of ICAO's future roadmap



# Aviation System Block Upgrades

Mini Global demonstrations support Global Air Navigation Plan (GANP) and Aviation System Block Upgrades (ASBUs) goals



# ICAO's Vision for SWIM

- SWIM is an integral part of the *Global Air Navigation Plan* (GANP) (Doc 9750) and is covered in a number of the aviation system block upgrades (ASBU) modules
- The Manual on Air Traffic Management System Requirements (Doc 9882) explicitly identifies the implementation of SWIM as a requirement for the future ATM System
- The Manual on SWIM Concept (Doc 10039) provides a vision for interoperable global information management while addresses the transition to a mixed operational environment



# Mini Global Demonstrations

The Mini Global Demonstrations seek to advance collaborative flight information exchanges utilizing SWIM and established standards amongst ANSPs and Airspace Users worldwide

- Supports ultimate goal of seamless interoperability and harmonization
- Provides mechanism for ANSPs and Airspace Users to support the validation of systems and processes, to enhance efficiencies in their ATM systems



# High Level Objectives

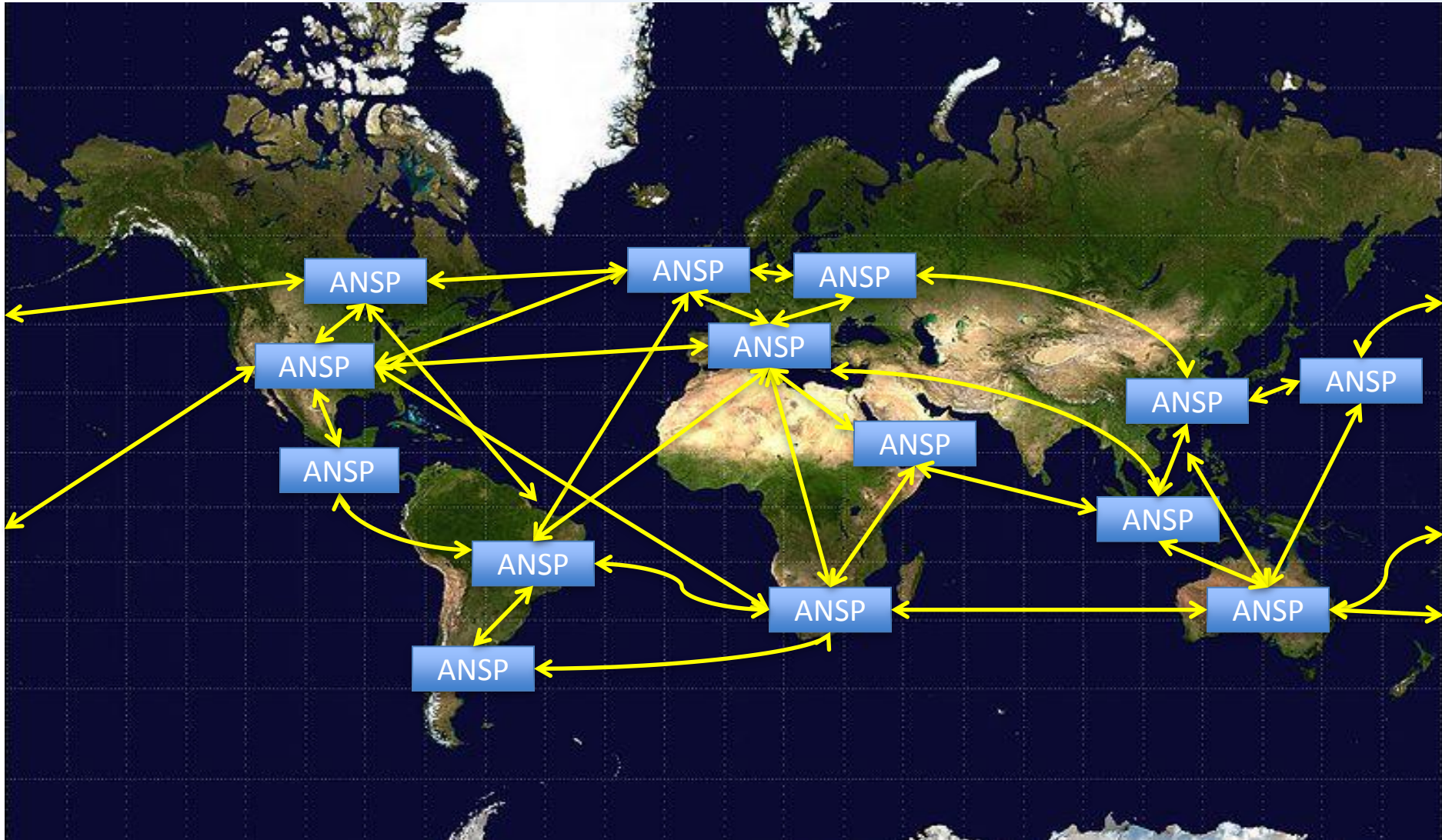
- Demonstrate the applicability of global exchange models to a broader international aviation community
  - Utilize FIXM, AIXM, and iWXXM standards
- Evaluate how these standards will address multiple disparate international systems
  - Different levels of maturity
  - Different levels of data model fidelity
  - Recommend updates to the standards
- Identify and convey the operational value that can be achieved through global interoperability and harmonization
- Support validation of ICAO Flight and Flow-Information for a Collaborative Environment (FF-ICE)

# Mini Global Demonstration Phases

- Mini Global I Demonstration (September 2014)
  - Aimed to reduce the use of antiquated and proprietary data exchange methods
  - Evaluated the effectiveness of the emerging global exchange models amongst international ATM systems
  - Technical demonstration with enhanced capabilities to showcase the technology and readiness for regional and inter-regional SWIM implementations
- Mini Global II Demonstration (April 2016)
  - Focus on operational value to stakeholders by executing real world, complex operational scenarios
  - Showcase a implementation solution that aligns with ICAO's Global SWIM concept
  - Address observations/lessons learned from Mini Global I

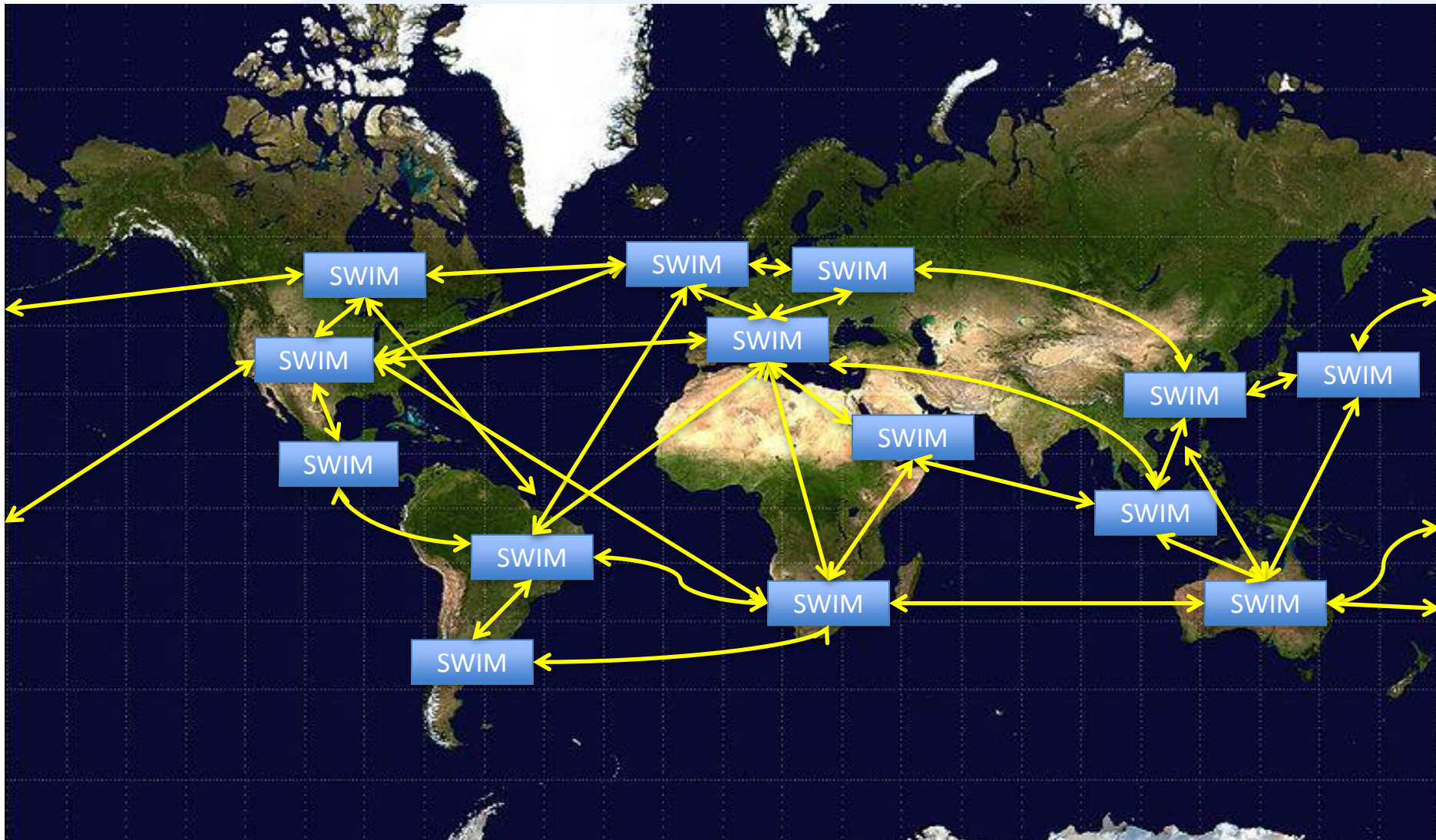


# Point-to-Point Information Exchange Today



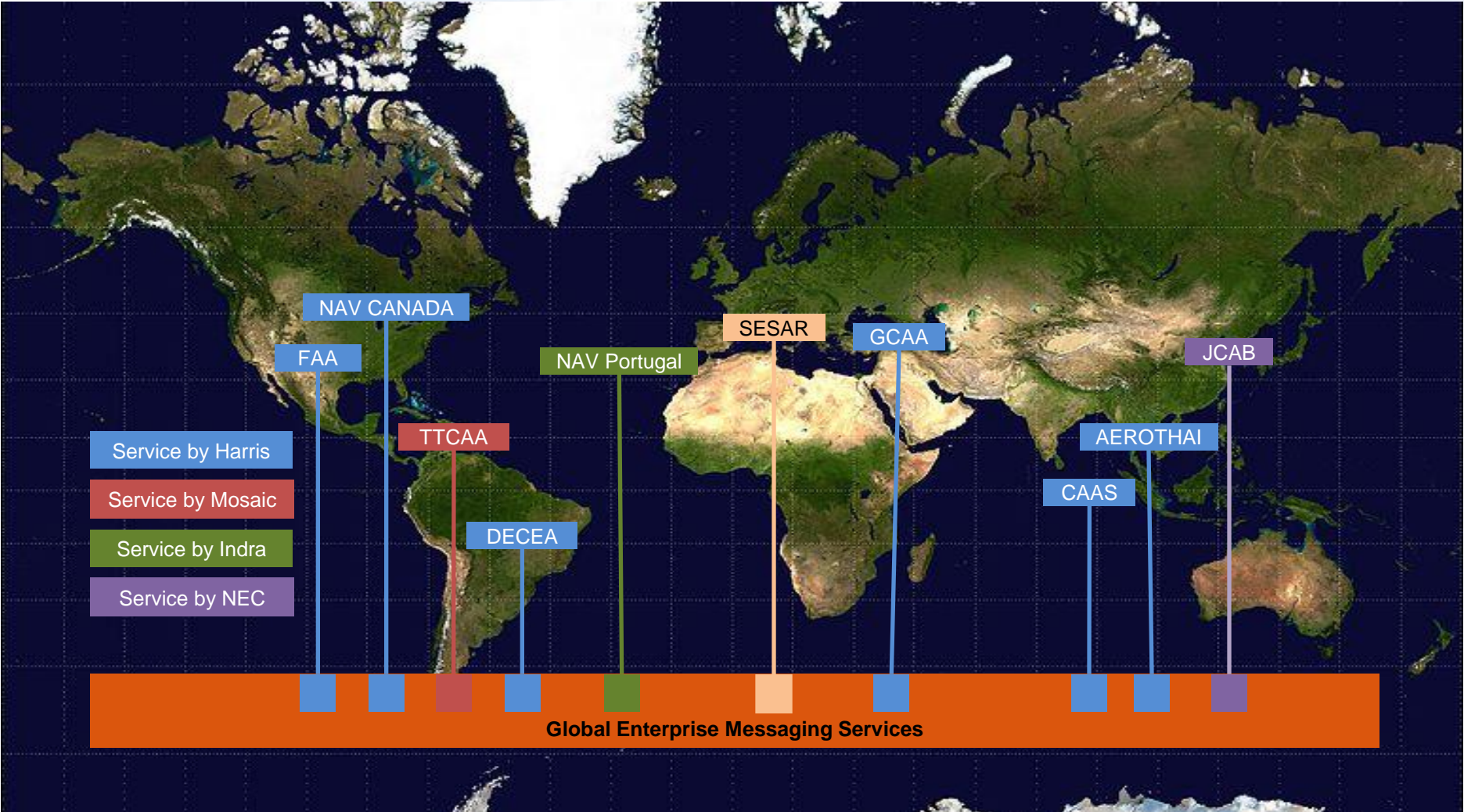


# Point-to-Point SWIM Exchange Tomorrow





# Mini Global II GEMS

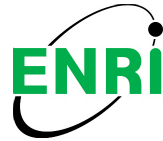
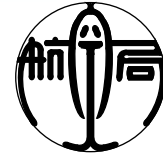


# Mini Global II Focus

- Global EMS (GEMS) Interoperability
  - Integrate regionally diverse EMS service providers
- Standards/Governance/Business Rules
  - GEMS WG chartered to address interoperability between EMS providers
- Extending International Partnerships
  - Continue to foster new international partnerships
- Developing and Executing Complex Use Cases
  - Implement FIXM 3.0.1, AIXM 5.1, and iWXXM 1.0
- Developing New Applications
  - Promote development of applications to benefit global aviation
- Providing Recommendations to Global Exchange Standards



# Mini Global Demonstration Partners



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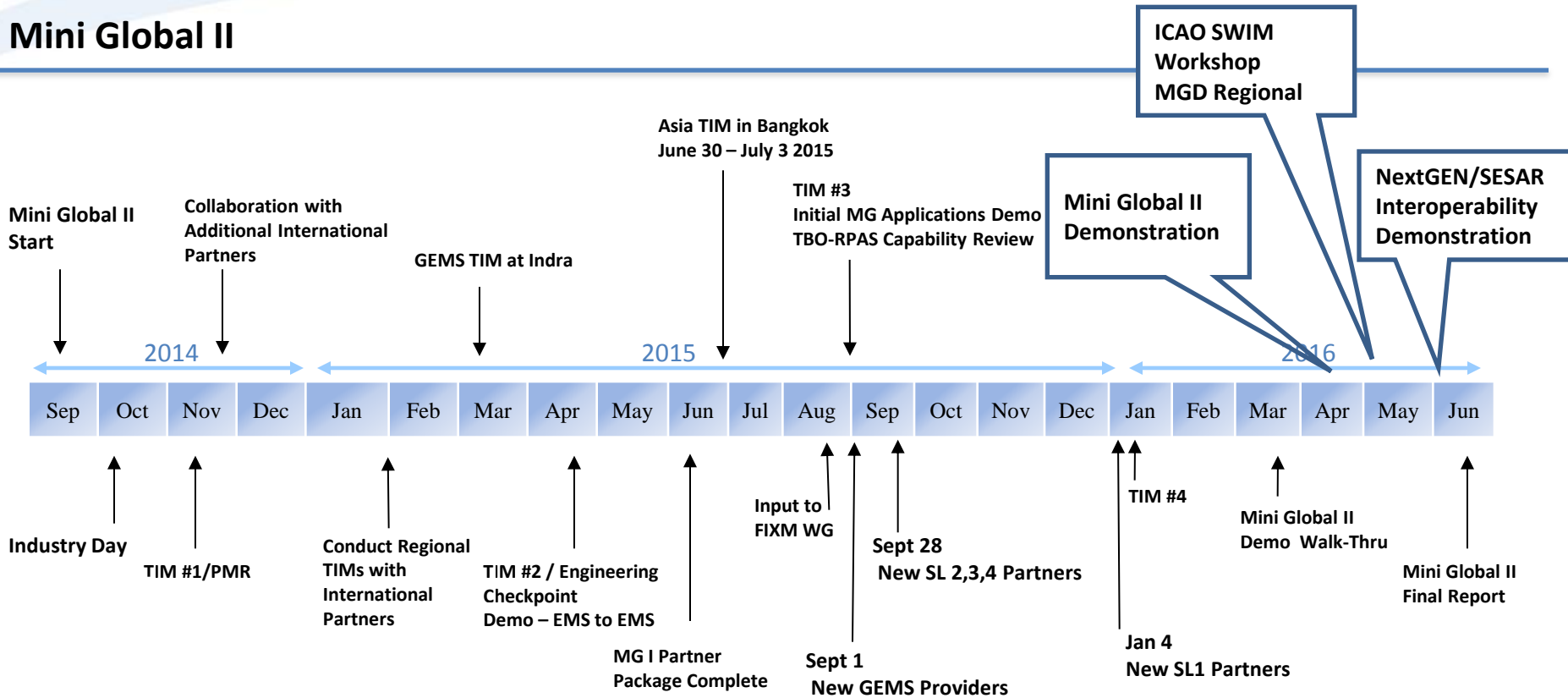
# NextGen / SESAR Interoperability Demo

- Focused on a collaborative interoperability demonstration between FAA and SESAR
- Follows Coordination Plan (CP 5.3) scope that covers the FAA-SESAR collaboration as part of SWIM demonstrations of global nature
- The interoperability demonstrations will be conducted:
  - as part of the Mini Global II demonstration in April 2016 (location FTB)
  - a SESAR demonstration planned for June 2016 (location Rome)
- FAA and SESAR teams are currently developing joint operational scenarios, data services, and architecture for the demonstrations



# Events Schedule (2014 -2016)

## Mini Global II



# Demo Observations / Lessons Learned

- Global need for SWIM is a fact. Interest in collaboration on SWIM has been tremendous.
  - Multiple demonstrations across the globe – Florida, Bangkok, and Rome
- Globally seamless information exchange is critical in meeting predicted air transportation growth
- Mini Global II demonstrates the use of GEMS model as one implementation of the ICAO Global SWIM Concept
  - Diverse SWIM implementations working together to enhance operations
- "Loosely coupled" infrastructure allows stakeholders to evolve at different rates – while maintaining interoperability
- Discussions on technological improvements without operational context will continue to be challenging

# Demo Observations / Lessons Learned

## - Global Integration

- As a global community we need to discuss several topics at a global level as it impacts all stakeholders
  - ✦ Messaging standardization
  - ✦ Connectivity
  - ✦ Metadata definitions and enforcement
- Business rules should be agreed upon globally and easily accessible to the community
- The use of extensions by ANSPs may create challenges in international data exchange
- Implementation guidance on AIXM is required for interoperability
- Utilization of widely used, mature, open source messaging protocols eases global adaption and communication
- Enhancements to registries are needed to facilitate service discovery and international data exchange

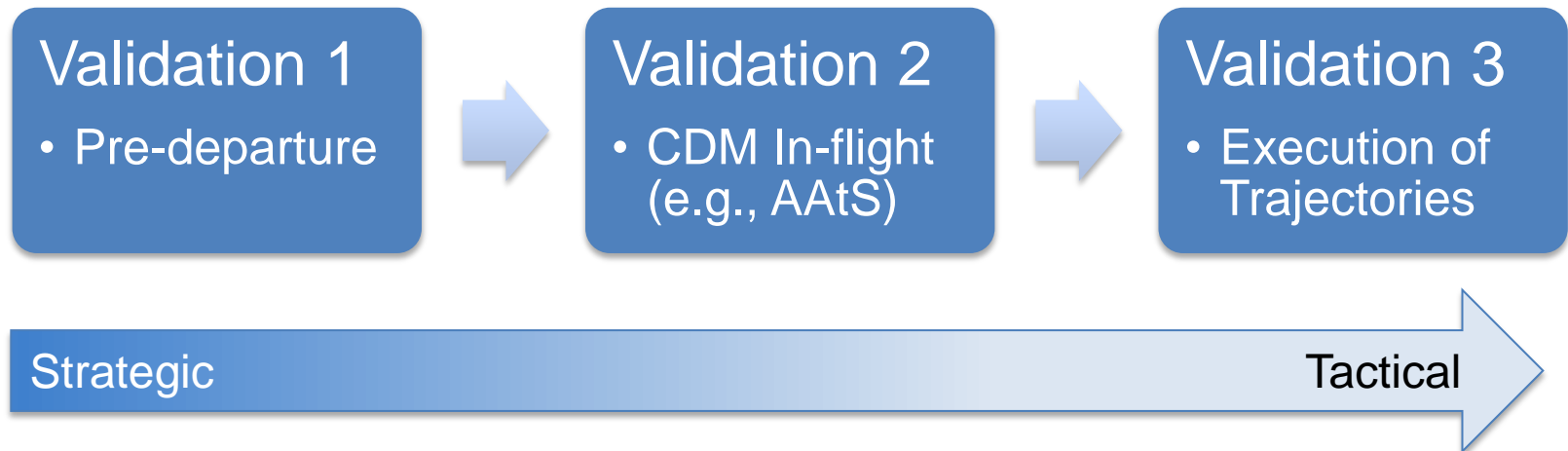


# Next Phase (2016 -2018)

- With the Mini Global II demonstration:
  - ✦ Illustrated operational viability of a globally connected environment
  - ✦ Showed value of global collaboration on technical and operational processes, procedures, and standards
- The next phase:
  - ✦ Build upon results and lessons learned from Mini Global II
  - ✦ Utilize the global SWIM environment to validate future operations in ASBU Block 1
  - ✦ Critical component of the Block 1 timeframe is the flight information exchange evolution as described in FF-ICE

# Next Phase (2016 -2018) cont.

- Validating operational procedures and implications of ICAO FF-ICE



# ICAO's FF-ICE Step 1: Flight Planning and Submission

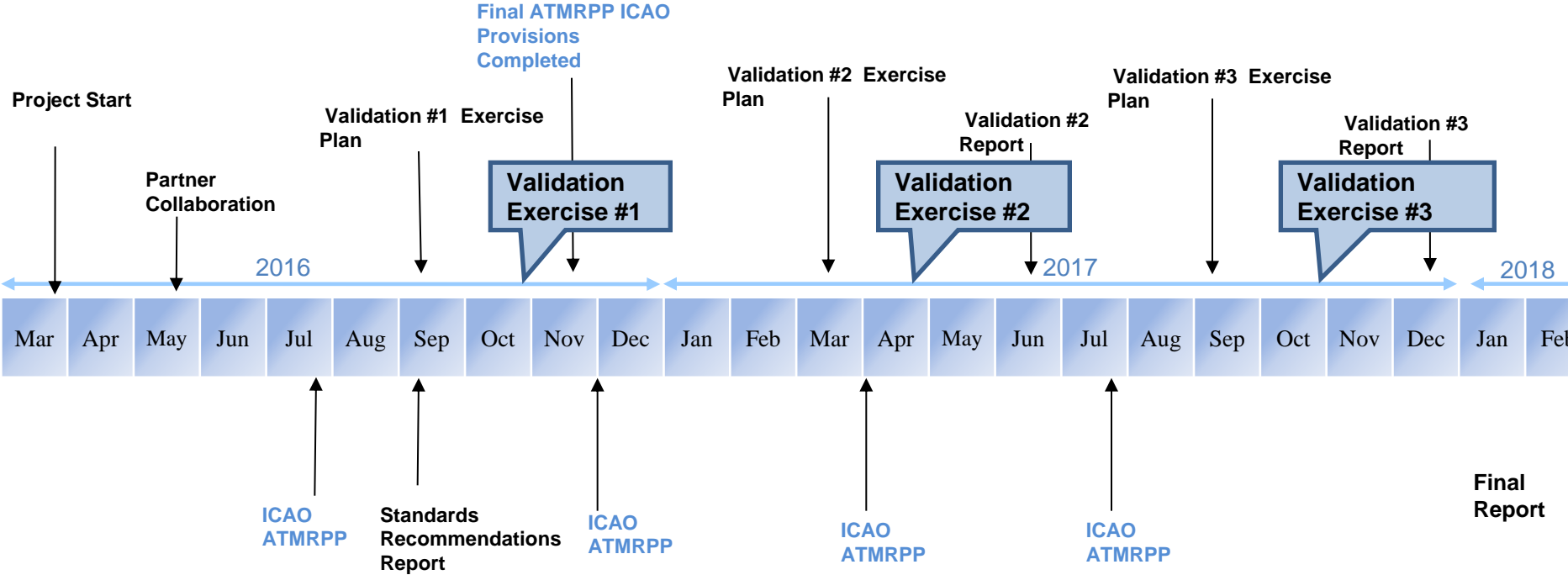
- Focused on pre-departure phase
- Future ATM Capabilities to be validated
  - ✦ Flight plan submission and feedback
  - ✦ Flight specific constraint identification
  - ✦ Enhanced flight information exchange
- Focus on flight plan negotiations between ANSPs and Airspace Users
  - ✦ Mixed environment – both ANSP and Airspace Users
  - ✦ Maintaining current operations for legacy users

# Validation Stakeholders

Role	Operational Functions	Technical Capability
Airspace User	Dispatch / Fleet Management	Flight Planning Systems
	Pilot / Flight Deck	ANSP Interfaces
	General Aviation	FOC / Flight Deck Interfaces
		SWIM Access Point Provider
ATM Service Provider	Traffic Management	Flight Data Processor
	Air Traffic Controller	Flight Plan Feedback System
		ATM Operational Systems
		SWIM Access Point Provider



# Proposed Schedule (2016 -2018)





**FAA**

Next**GEN**



















