



**FOTO35**

Future of the Ocean 2035

# Informal South Pacific ATS Coordinating Group (ISPACG) and FUTURE OF THE OCEAN 2035 (FOTO35)

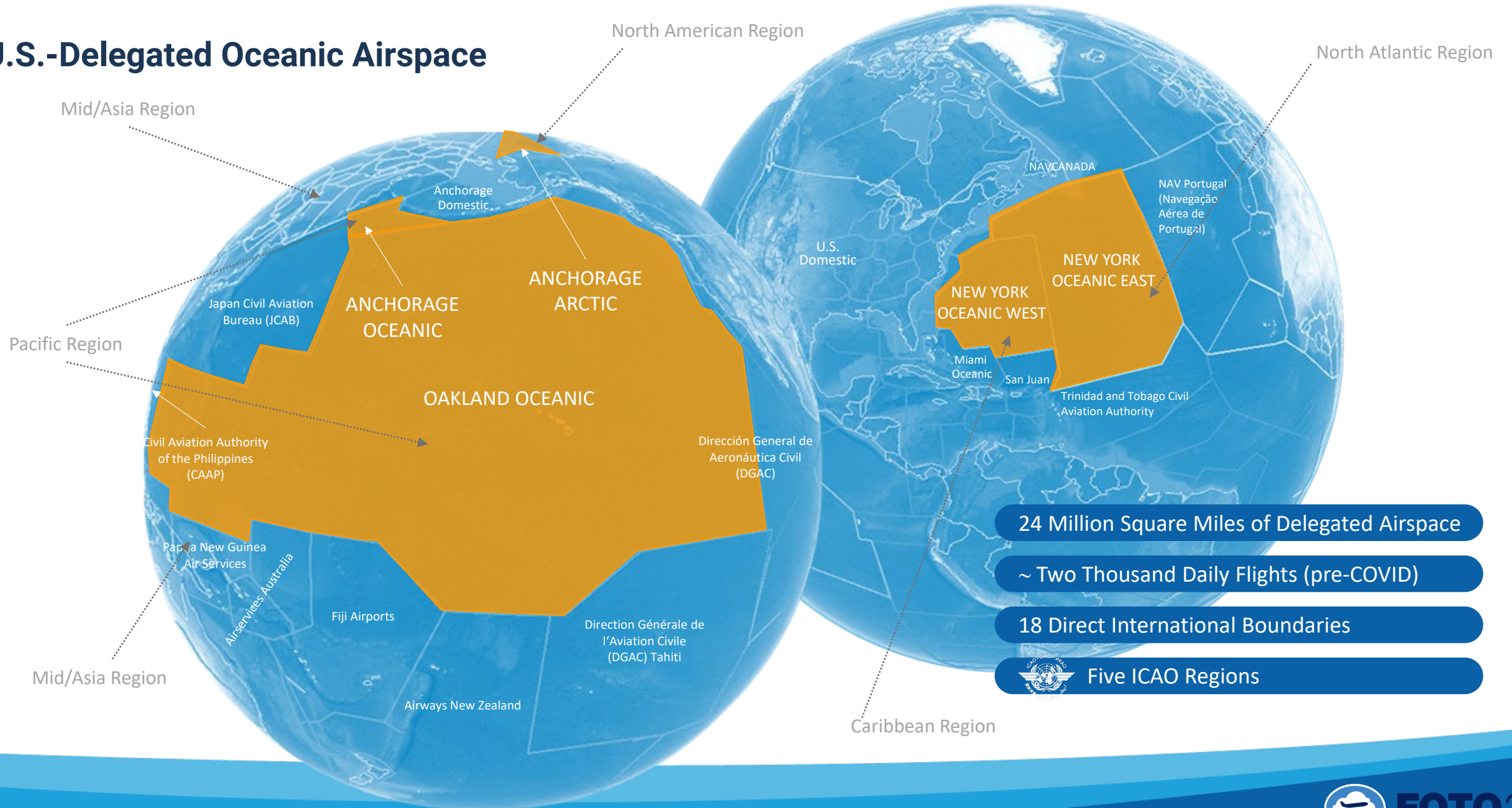
## Program Overview & Alignment

July 28, 2021



**Federal Aviation  
Administration**

# U.S.-Delegated Oceanic Airspace



# OCEANIC SHORTFALLS *and* SOLUTIONS

## Shortfalls

## Solutions

	Efficiency, Predictability, and Productivity	Capacity and Flexibility	Seamless Operations	Resilience	Environment
Shortfalls	<p>Unable to file and fly preferred altitudes, routes, and/or trajectories</p> <p>Inefficient arrivals/departures</p>	<p>Inability to integrate emerging users &amp; space operations</p> <p>Lack of integrated flow management during capacity/demand imbalances</p>	<p>Flights not able to transition smoothly as they cross international boundaries</p>	<p>Improve operational continuity during emergency scenarios and system outages</p>	<p>Lack of integrated flow management during capacity/demand imbalances between domestic and oceanic domain increases fuel burn</p>
Solutions	<ul style="list-style-type: none"> <li>✓ Seamless end-to-end solution</li> <li>✓ Enhanced trajectory-based oceanic control with Four-Dimensional Trajectory (4DT) collaborative decision making</li> <li>✓ Situational awareness</li> <li>✓ Real-time surveillance</li> </ul>	<ul style="list-style-type: none"> <li>✓ Automate, to the extent possible, emerging user air traffic services</li> <li>✓ Enhanced oceanic separation procedures</li> </ul>	<ul style="list-style-type: none"> <li>✓ Integrated domestic and oceanic trajectories</li> <li>✓ Air Navigation Service Provider (ANSP) data sharing</li> </ul>	<ul style="list-style-type: none"> <li>✓ Improved Air Traffic Management (ATM) automation system which increases resiliency, adaptability, and enables portability during emergencies</li> </ul>	<ul style="list-style-type: none"> <li>✓ Integrated domestic and oceanic trajectories</li> </ul> <p><i>* These are just a few of the current oceanic shortfalls identified by FOTO35. There are 32 total shortfalls identified.</i></p>

# FOTO35 PROGRAM GOALS



## Dynamic End-to-End Trajectory Operations “Global 4DT”

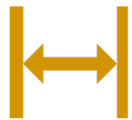
Realize efficiencies achieved by:

- Improved procedures for processing flight plans
- More frequently updated trajectories
- Leveraging weather and cost-index data



## Safely Integrate Emerging Users & Space Operations

Automate input of all emerging user and space operations data, including airspace use, planning and coordination. Establish policies, procedures and technologies to effectively integrate all users.



## Enhance Oceanic Separation Procedures

Improve operational safety and efficiency

- Horizontal-radial separation procedures
- On-demand tactical maneuver capability
- Efficient management of pair-wise aircraft performance differences

Implement real-time, low-latency voice communications and enhanced surveillance



## Implement Improved Oceanic ATM Automation


Implement automation capabilities, such as machine learning, to improve seamless, efficient and safe oceanic operations. More agile development of functionalities for ATC and users.

Increase ATM system resiliency.


# FOTO35 OUTCOMES



## Dynamic End-to-End Trajectory Operations (Global 4DT)



## Enhanced Oceanic Separation Procedures



## Integrated Emerging User & Space Operations



## Improved Oceanic ATM Automation

Near Term

Mid Term

Long Term

<ul style="list-style-type: none"> <li>• Conduct stakeholder outreach programs</li> <li>• Achieve concept consensus with industry, international ANSP partners and FAA domestic/offshore operations</li> <li>• Assess user needs</li> <li>• Conduct limited operational trials</li> </ul>	<ul style="list-style-type: none"> <li>• Achieve safety/efficiency gains in specific oceanic scenarios</li> <li>• Implement reduced separation standards and enhanced procedures, such as tactical on-demand operations</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct stakeholder outreach programs</li> <li>• Assess user needs</li> <li>• Perform an emerging user operator data sharing assessment</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct stakeholder outreach programs</li> <li>• Complete requirements for readiness decision and investment analysis and readiness decision</li> <li>• Engage industry and ANSPs</li> </ul>
<ul style="list-style-type: none"> <li>• Finalize procedures and system requirements in collaboration with industry</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and introduce improved technology and procedures based on performance requirements to safely reduce separation standards</li> </ul>	<ul style="list-style-type: none"> <li>• Increase emerging user services</li> <li>• Socialize with industry</li> <li>• Conduct trial data connections</li> </ul>	<ul style="list-style-type: none"> <li>• Complete final investment analysis</li> <li>• Continue to engage industry and ANSPs</li> </ul>
<ul style="list-style-type: none"> <li>• Implement global optimized dynamic end-to-end trajectory (4DT) operations</li> </ul>	<ul style="list-style-type: none"> <li>• Continue to implement reduced separation standards and enhanced procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Safely integrate new entrants in FAA oceanic operations and continue industry outreach</li> </ul>	<ul style="list-style-type: none"> <li>• Conduct trials, tests and implementation</li> </ul>

# FOTO35 IMPROVEMENTS AND EFFICIENCIES



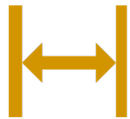
## Implement Dynamic End-to-End Trajectory Operations

- Fly closer to desired profiles
- Optimized flight plans
- Reduced fuel burn, carbon emissions/time
- Real-time data enables ability to modify flight plans/optimized flights
- More predictable flight times
- Less Delays



## Safely Integrate New Entrants & Space Operations

- Enhances services for non-conventional users
- Increases controller situational awareness
- Increases automation of non-conventional user operational data



## Enhance Oceanic Separation Procedures

- Allows more flexibility during conflict/deviation scenarios
- Maximizes benefits to all system operators based on equipage
- Increases accommodation and resolution of critical aircraft contingency scenarios
- Improves departure/arrival ATC services into remote oceanic airports



## Implement Improved Oceanic ATM System

- Increases operational efficiencies
- Enables 4DT & On-Demand Tactical Operations
- Safety with improved outage detection/ improved conflict resolution capabilities
- Reduces interface complexity/controller workload
- Increases compatibility with other systems
- Increases resiliency, adaptability, and enables portability during emergencies

# FOTO35 AND Collaborative Actions for Renovation of Air Traffic Systems (CARATS)

## ISPACG Principles

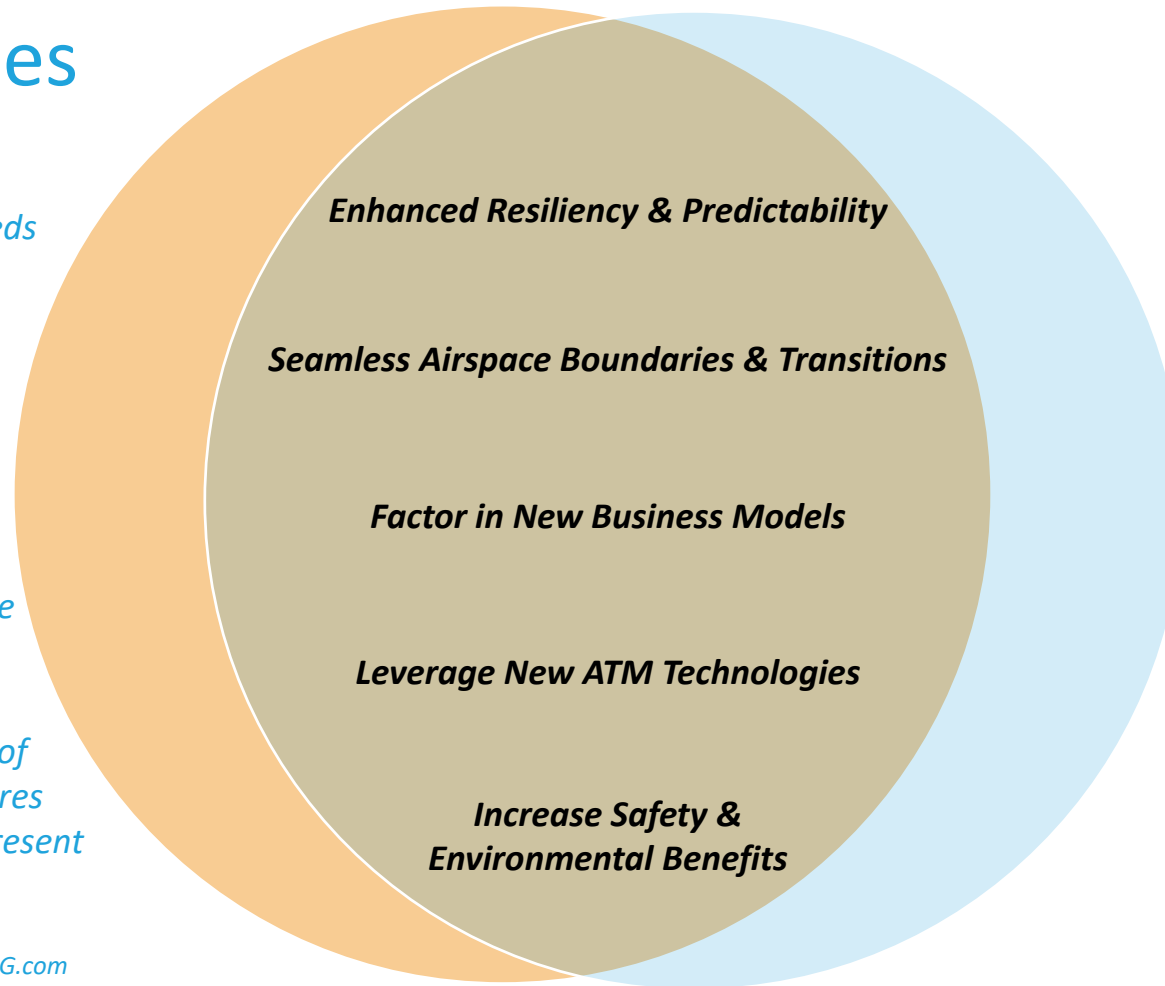
*Promote an ATS system that is responsive to and meets the needs of our customers*

*Harmonize ATS practices and procedures consistent with regional and global activity*

*Promote advantages in new technology where benefits can be derived*

*Ensure that the introduction of new technology and procedures maintains or enhances the present levels of safety*

*\*4 of 6 of the ISPACG Principles as Referenced on ISPACG.com*



## FOTO35

*Implement Dynamic End-to-End Trajectory Operations*

*Enhance Oceanic Separation Procedures*

*Integrate Emerging Users & Commercial Space Operations*

*Implement New Improved/Oceanic ATM System*

*\* All Four FOTO35 Goals are Aimed at Increasing Safety & Realizing Environmental Benefits*



# FOTO35

Future of the Ocean 2035

**We appreciate your support.**

For more information contact

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