



ATM/SG/13-WP/22

**Development of TBO Roadmap
for Inclusion into the APAC Seamless ANS Plan
in support of a Harmonised Implementation
in APAC**

Presented by Thailand
on behalf of Hong Kong China, Indonesia, Japan,
Singapore, Thailand, USA, Viet Nam, CANSO,
and IATA

Introduction

APAC TBO Pathfinder

a project initiated under AAC



Define



Develop



Demonstrate

Concept of operations and requirements
for TBO in the APAC region

Regional TBO Roadmap

to harmonise TBO planning and implementation for the region

Approach for Regional TBO Roadmap

Objective

To guide APAC States/Administrations to progress **incrementally** towards the future of having a fully implemented TBO environment

- Take references from the work of relevant ICAO ANC technical panels
- Take into consideration the current progress of TBO enablers in APAC, e.g. SWIM and FF-ICE
- Align with global development, **TBO Capability Level** framework
 - An evolutionary process for TBO through gradual availability of enablers
 - Focusing on desired outcomes
 - Providing a detailed description of capabilities required
 - 4 levels

Approach for Regional TBO Roadmap

APAC TBO Roadmap

- Focusing on Level 1 and Level 2 of global TBO Capability Level framework
 - Identifying ASBU elements and implementation timelines for each level
 - Two of the key TBO building blocks: SWIM and FF-ICE
 - » APAC SWIM implementation target: 2030
 - » (Proposed) APAC FF-ICE/R1 implementation target: 2032
- Propose target implementation timeline for TBO Level 1 to be aligned with these targets

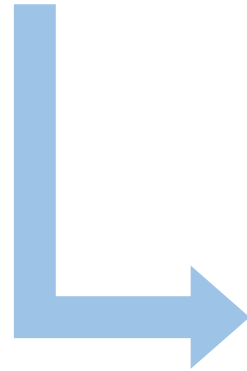
Placement of Regional TBO Roadmap

APAC Seamless ANS Plan

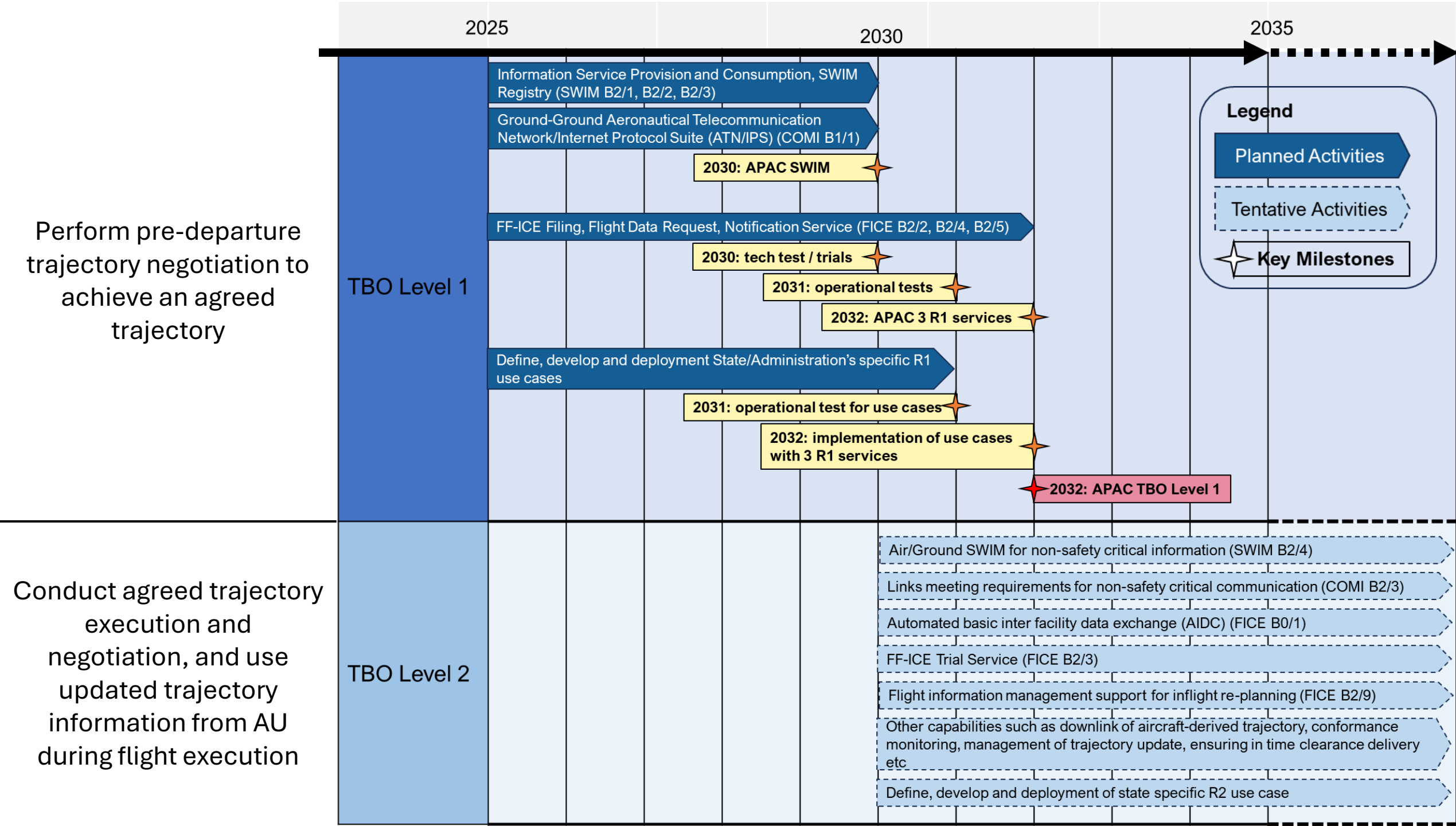
Chapter 6
Current Situation

**New Chapter
Trajectory-Based
Operations (TBO)**

Chapter 7
Performance
Improvement Plan



- A brief description of TBO
- Required capabilities for each level
- Required ASBU elements
- Timelines
- Use cases



Placement of Regional TBO Roadmap

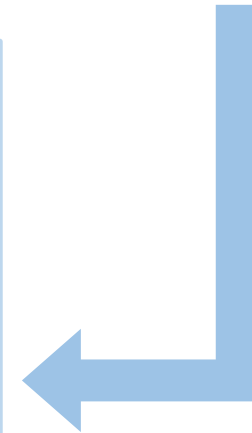
APAC Seamless ANS Plan

Chapter 6
Current Situation

**New Chapter
Trajectory-Based
Operations (TBO)**

Chapter 7
Performance
Improvement Plan

- Add the required ASBU elements to achieve TBO levels
- Place under PASL
- Based on APAC SWIM implementation target (2030) and (proposed) APAC FF-ICE/R1 implementation target (2032)
 - » Add **PASL Phase VI** (expected implementation 27 November 2031)



Consequential Amendments

to APAC Seamless ANS Plan, v4.0

Appendix C • Amendments due to the addition of Phase VI

➤ Paragraphs 1.6, 2.15, 7 and 9.1

Appendix D • Amendments pertaining to ASBU elements

➤ Paragraph 5.6

⇒ To include the ASBU elements necessary for TBO Level 1,
i.e. SWIM-B2/3 and FICE-B2/5

⇒ Priority for the ASBU elements necessary for TBO Level 1

→ If currently identified as Priority 1, remain unchanged

→ Otherwise, propose to identify as Priority 2

⇒ For DAIM-B2/1, DAIM-B2/2, and DAIM-B2/5, suggest to change to
Priority 2

Consequential Amendments

to APAC Seamless ANS Plan, v4.0



- Appendix E* • Removal of references to TBO Thread and TBO Tree
 >> Paragraphs 5.6, 7.55, and 7.68

Actions by the Meeting

Draft Conclusion ATM/SG/13-X: TBO Related Revisions for the Asia/Pacific Seamless ANS Plan			
What: That, noting the need for harmonized implementation planning of Trajectory-based Operations (TBO) to guide States/Administrations in this region, that: 1. the TBO roadmap be incorporated into the 2026 revision of the Asia/Pacific Seamless ANS Plan; and 2. a new Phase VI be included in the Asia/Pacific Seamless ANS Plan to enable reference to the TBO levels.		Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical	
Why: To ensure regional harmonization of TBO and guide States/Administrations on implementation planning		Follow-up: ☐ Required from States	
When: On adoption by APANPIRG		Status: Draft to be adopted by Subgroup	
Who: ☐ Sub groups ☒ APAC States ☒ ICAO APAC RO ☐ ICAO HQ ☐ Other:			