International Civil Aviation Organization

Thirteenth Meeting of the Air Traffic Management Sub-Group (ATM/SG/13) of APANPIRG

Singapore, 25 – 29 August 2025

Agenda Item 5: ATM Systems (Modernization, Seamless ATM, CNS, ATFM)

DEVELOPMENT OF TRAJECTORY-BASED OPERATIONS (TBO) ROADMAP FOR INCLUSION INTO THE ASIA/PACIFIC SEAMLESS ANS PLAN IN SUPPORT OF A HARMONISED IMPLEMENTATION IN APAC

(Presented by Thailand, on behalf of Hong Kong China, Indonesia, Japan, Singapore, Thailand, United States of America, Viet Nam, CANSO and IATA)

SUMMARY

This paper proposes an Asia-Pacific (APAC) TBO roadmap for inclusion into the *Asia/Pacific Seamless Air Navigation Services (ANS) Plan*. The proposed roadmap will provide guidance for States/Administrations in the region with a pathway towards the implementation of TBO, by detailing the required enablers and timelines to achieve the appropriate TBO capability levels that are being defined at ICAO. The proposed content will be aligned with related developments at the global level and regularly updated through the *Asia/Pacific Seamless ANS Plan* review cycle.

1. INTRODUCTION

1.1 The APAC TBO Pathfinder ("Pathfinder") project was initiated under the APAC ANSP Committee to define, develop and demonstrate the concept of operations and requirements for TBO in the APAC region. One of the key deliverables of the Pathfinder project is to develop a TBO roadmap for APAC, to harmonise TBO planning and implementation efforts for this region.

1.2 The progress of the Pathfinder project was previously updated at the ATM/SG/12 meeting in September 2024 (WP/17 on "Towards Harmonised Realisation of the ICAO Global Trajectory Based Operations (TBO) Concept in the Asia and Pacific Regions"). The meeting also discussed the need to develop a comprehensive regional roadmap for TBO for incorporation into the *Asia/Pacific Seamless ANS Plan* to facilitate a cohesive and efficient implementation across the region.

1.3 Over the last few months after ATM/SG/12, the Pathfinder project team has developed a draft TBO roadmap for APAC, to be considered for inclusion within the *Asia/Pacific Seamless ANS Plan*.

2. DISCUSSION

2.1 In developing the draft TBO roadmap for APAC, the Pathfinder project has considered:

i) the approach for the TBO roadmap;

ii) the placement of the TBO roadmap within the *Asia/Pacific Seamless ANS Plan*; and

iii) the consequential amendments required within the *Asia/Pacific Seamless ANS Plan*.

Approach for the TBO Roadmap

2.2 The primary objective of the TBO roadmap is to guide States/Administration in the APAC region to progress incrementally towards the future of having a fully implemented TBO environment. The content of the proposed TBO roadmap takes references from the work done at the global level through the relevant ICAO Technical Panels of the Air Navigation Commission to ensure interoperability with other regions. The roadmap also takes into consideration the relevant progress made on enablers for TBO in the APAC region, such as System Wide Information Management (SWIM) and Flight and Flow Information for a Collaborative Environment (FF-ICE), taking into account the work of the contributory bodies of APANPIRG.

Aligning with Global Developments

2.3 Globally, the ICAO ATM Requirements and Performance Panel (ATMRPP) has developed a framework to define the TBO capabilities by levels. The purpose of this framework is to:

i) demystify the TBO concept;

ii) illustrate the evolutionary nature of TBO implementation;

iii) provide inputs to the Global Air Navigation Plan (GANP); and

iv) ensure interoperability.

2.4 The latest draft of the framework (from ATMRPP/WG/46 held in April 2025) contains four levels of TBO capabilities, which aims to describe an evolutionary process for TBO through the gradual availability of enablers such as FF-ICE, air-ground trajectory synchronisation and connected aircraft. The global TBO Capability Level Framework is focused on the desired outcome and provides a detailed description of the capabilities required at each level. Details for Levels 1 and 2 have been developed according to the required capabilities and potential use cases, whereas Levels 3 and 4 would be developed through future work of ATMRPP.

2.5 The APAC TBO roadmap will focus on Levels 1 and 2 for now, adopting similar descriptions of the detailed capabilities and relevant use cases for this region. It provides guidance by identifying relevant Aviation System Block Upgrade (ASBU) elements and implementation timelines for each TBO capability level. This provides clear guidance for States/Administrations that wish to achieve the various TBO levels and enable harmonised TBO implementation across the APAC region.

Aligning with Regional Implementation Progress

2.6 Two of the key building blocks to enable TBO are SWIM and FF-ICE. These are also the key capabilities required at TBO Level 1. The APAC region has been very active in progressing the implementation of SWIM and FF-ICE through the APAC SWIM Task Force and APAC FF-ICE Ad-Hoc Group, respectively. The target implementation timeline for TBO Level 1 could therefore align with the SWIM implementation target of 2030 set by the APANPIRG and the FF-ICE Release 1 (FF-ICE/R1) implementation target of 2032 proposed by the APAC FF-ICE Ad-Hoc Group.

Placement of the TBO Roadmap within the Asia/Pacific Seamless ANS Plan

2.7 The proposed TBO Roadmap can be incorporated into the *Asia/Pacific Seamless ANS Plan* in a new chapter between Chapter 6 “Current Situation” and Chapter 7 “Performance Improvement Plan”. This would create a logical flow where Chapter 6 describes the current operational environment, and the new chapter on TBO Roadmap provides the transformation pathway. Subsequently, Chapter 7 would detail the means to achieve the specific performance improvements. The new chapter would contain a brief description of TBO, the required capabilities for each level, required ASBU elements, timeline and use cases. **Appendix A** presents the proposed write-up.

2.8 To guide States/Administrations with the planning of TBO implementation, the required ASBU elements to achieve the various TBO levels should be reflected within the current Chapter 7 "Performance Improvement Plan" as well. In the *Asia/Pacific Seamless ANS Plan Version 4.0*, operational improvements are expected to be implemented in five phases:

a) Phase I – expected implementation by 12 November 2015 (past);

b) Phase II – expected implementation by 07 November 2019 (past);

c) Phase III – expected implementation by 03 November 2022 (past);

d) Phase IV – expected implementation by 27 November 2025; and

e) Phase V – expected implementation by 23 November 2028.

2.9 TBO Level 1 is envisaged to be achieved with the minimum implementation of SWIM and selected FF-ICE/R1 services. The target implementation timeline considers two key milestones: the SWIM implementation target of 2030 and the FF-ICE/R1 implementation target of 2032. To accommodate the TBO implementation blocks, it is necessary to extend the Performance Improvement Plan by adding Phase VI (November 2031), maintaining the regular three-year duration from the previous phases. Further phases (beyond Phase VI) can be included in future when more detailed timelines are available for the other TBO levels.

2.10 The required capabilities and ASBU elements for TBO Level 1 are thus proposed to be included in the new Phase VI (27 November 2031), excluding elements that have already been included in earlier phases. Moreover, as the APAC Seamless ANS Plan differentiates between *Preferred Aerodrome/Airspace and Route Specifications (PARS) and Preferred ANS Service Levels (PASL)*, it is considered more appropriate to categorise these ASBU elements for TBO Level 1 under the PASL. This is because the implementation of TBO enablers is of greater relevance to ANSPs and aircraft operators, aligning more closely with service level considerations than with airspace and route specifications. This would also be consistent with current descriptions of elements in the SWIM, COMI, and FICE threads. **Appendix B** presents the proposed write-up for TBO under PASL Phase VI.

Consequential Amendment to Asia/Pacific Seamless ANS Plan v4.0

2.11 With the proposal for the new chapter and the addition of Phase VI, there will be consequential amendments to other sections of the *Asia/Pacific Seamless ANS Plan* to ensure consistency.

Amendments due to the addition of Phase VI

2.12 Amendments would be required in paragraphs 1.6, 2.15, 7 and 9.1 with the introduction of Phase VI. **Appendix C** presents the proposed amendments.

Amendments pertaining to ASBU Elements

2.13 Within the proposed APAC TBO Roadmap in **Appendix A**, ASBU elements have been identified as necessary to achieve TBO Levels 1 and 2. Paragraph 5.6 of the *Asia/Pacific Seamless ANS Plan Version 4.0* provides a list of ASBU elements and their implementation priority for APAC. Some of the ASBU elements identified as necessary for TBO level 1 are missing from Paragraph 5.6 and should be included, as Priority 2. This includes SWIM B2/3 and FICE B2/5. For ASBU elements that are already in Paragraph 5.6, their Priority level should minimally be Priority 2 as the harmonized implementation of TBO capabilities would bring benefits to the region. If they are currently designated as Priority 1, this should remain unchanged as there are other performance improvement plans driving their implementation. However, elements currently assigned as Priority 3 should be elevated to Priority 2 to support the implementation of TBO.

2.14 In addition, DAIM ASBU elements are considered information benefit for the implementation of TBO. It is suggested that the priority level of DAIM B2/1, B2/2 and B2/5 be changed to Level 2. **Appendix D** presents the proposed changes to paragraph 5.6 of the *Asia/Pacific Seamless ANS Plan Version 4.0*.

Removal of references to TBO Thread and TBO Tree

2.15 With the introduction of the TBO Capability Level Framework and the removal of TBO thread and TBO tree in the upcoming 8th Edition of the GANP[1], paragraphs 5.6, 7.55 and 7.68 of the *Asia/Pacific Seamless ANS Plan* which contain references to the TBO thread and TBO tree should be removed. **Appendix E** presents the details.

Proposal

2.16 With the global developments on the TBO Capability Level Framework, and the regional progress on related building blocks such as SWIM and FF-ICE, it is timely for APAC to have a TBO roadmap to provide a harmonised pathway to guide States/Administration on the implementation of TBO. The roadmap will ensure interoperability within this region and with other regions as it is aligned to global developments. It is proposed that the ATM/SG and APANPIRG consider the roadmap developed under the Pathfinder project for inclusion into the 2026 revision of the *Asia/Pacific Seamless ANS Plan*, and that the roadmap be updated regularly to ensure that the latest global and regional developments are considered in a timely manner.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the approach taken for the development of the APAC TBO roadmap;

b) discuss and agree to the **Draft Conclusion ATM/SG 13-X: TBO Related Revisions for the Asia/Pacific Seamless ANS Plan**; and

c) discuss any relevant matters as appropriate.

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<table>
<tr><td colspan="3">Draft Conclusion ATM/SG/13-X: TBO Related Revisions for the Asia/Pacific Seamless ANS Plan</td></tr>
<tr><td colspan="2">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.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To ensure regional harmonization of TBO and guide States/Administrations on implementation planning</td><td colspan="2">Follow-up: ☐Required from States</td></tr>
<tr><td>When: On adoption by APANPIRG</td><td colspan="2">Status: Draft to be adopted by Subgroup</td></tr>
<tr><td colspan="3">Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:</td></tr>
</table>

[1] The 8th Edition of the GANP is scheduled for endorsement at the 42nd Session of the ICAO Assembly (A/42) in September 2025.

PROPOSED TEXT FOR NEW CHAPTER IN THE ASIA/PACIFIC SEAMLESS ANS PLAN ON TRAJECTORY BASED OPERATIONS ROADMAP

Trajectory Based Operations (TBO)

7.1 TBO is fundamental to realise the ICAO Global ATM Operational Concept. It is envisaged to deliver benefits across multiple Key Performance Areas: Efficiency and Predictability, Capacity, Flexibility, Participation by the ATM Community and Global Interoperability (as detailed in the TBO Concept Document). TBO is an evolutionary process which is aligned to the deployment of the ASBUs. As States/Administrations implement the key capabilities progressively, they can expect to see operational benefits.

7.2 ICAO has developed the TBO Capability Level Framework which defines the TBO capabilities based on the gradual availability of enablers such as SWIM, FF-ICE, air-ground trajectory synchronisation and connected aircraft. A total of four levels have been envisaged. Level 1 focuses on pre-departure trajectory negotiation while Level 2 focuses on the trajectory execution and negotiation, as well as the use of trajectory information from airspace users during flight execution. Level 3 and 4 will focus on TBO clearances and be advised by future work as research and development efforts are still ongoing. Operational benefits are expected with the implementation of each TBO level and hence States/Administrations should start planning for the implementation of the capabilities required for Levels 1 and 2.

a) TBO Level 1: Perform pre-departure trajectory negotiation to achieve an agreed trajectory

Elaboration of required capabilities	➢ ASPs and AUs collaborate to develop an agreed trajectory during pre-departure stage, with ASPs providing restriction and constraint feedback for AUs' consideration. ➢ ASPs and AUs utilise globally standardised information exchange models along with globally interoperable information services when sharing ATM-related information to achieve an agreed trajectory. ➢ Exchange information between ASPs and units within a single ASP to reduce discrepancies in trajectory predictions.
ASBU elements required	States/Administrations should implement the following SWIM and FICE elements to achieve TBO Level 1. Available FF-ICE services should be made known via the SWIM registry, consistent with SWIM B2/3. COMI B1/1 should also be implemented as a technology enabler to SWIM. **SWIM: SWIM-B2/1, SWIM-B2/2, SWIM-B2/3** **FICE: FICE-B2/2, FICE-B2/4, FICE-B2/5** **COMI: COMI-B1/1**
Timeline	The timeline of implementation for TBO Level 1 is driven by the regional works at the APAC SWIM Task Force and the APAC FF-ICE Ad-Hoc Group. SWIM Task Force **2030:** Implement APAC SWIM (**SWIM-B2/1, SWIM-B2/2, SWIM-B2/3, COMI-B1/1**) in accordance with Doc 10199 (Procedures for Air Navigation Services – Information Management (PANS-IM)), Doc 10203 (Manual on the System-Wide Information Management (SWIM) Implementation) and Doc

	10039 (Manual on the System-Wide Information Management (SWIM) Concept). States/Administrations should refer to the regional guidance materials as well as the regional SWIM technical infrastructure architecture developed by the Task Force. FF-ICE Ad-Hoc Group **2030:** Commencement of technical tests and trials involving eAUs and cross-border eASP interactions. **2031:** Begin operational tests to identify and resolve any issues. **2032:** Implement selected FF-ICE/R1 services (**FICE-B2/2, FICE-B2/4, FICE-B2/5**) in accordance with Doc 9965 (Manual on Flight and Flow — Information for a Collaborative Environment) Vol. I and Vol. II. States/Administrations should refer to the regional FF-ICE/R1 implementation framework developed by the APAC FF-ICE Ad-hoc Group when planning for their FF-ICE/R1 implementation. It should also be noted that the implementation of the three identified FF-ICE/R1 services would ready a State/Administration for the global sunset of FPL2012 which is set to be 2034.
Use Cases	Performing TBO entails the sharing of trajectory information for a common view, the managing of trajectory information using collaborative decision making, and the use of the common trajectory across relevant stakeholders. The identified ASBU elements enable States/Administrations to perform the sharing and managing of trajectory information. The usage of trajectory information would however, differ for different States/Administrations, depending on the relevant use cases. In order to gain operational benefits, States/Administrations can consider the example use cases below which describe how the trajectory information made available in TBO Level 1 could be utilized. It is important that the capabilities identified for TBO Level 1 be used purposefully to support use cases to gain operational improvements and benefits, and to be considered as performing TBO. Otherwise, the implementation of the said capabilities would only enable exchange of more precise information in a timely, seamless and automated manner, without actual operational enhancements. Use case A – Sharing of trajectory details and updates for ASPs' improved ATM planning With the capabilities implemented at this level, AUs are able to collaborate with ASPs to reach an agreed trajectory that conforms to most, if not all, published restrictions and constraints. This shared and continuously updated agreed trajectory improves situational awareness for both ASPs and AUs. ASPs should use the detailed trajectory information within the agreed trajectory to better plan ATM resources, such as assessing flow measures and sector combinations. AUs should leverage the automated constraint checking capability to alleviate dispatcher workload and to propose the desired trajectory that best suits their business objectives while complying with all the restrictions and constraints. Use case B – Actions arising from ASPs' sharing of restrictions and constraints With the capabilities implemented at this level, ASPs are able to directly inform AU's individual flights about restrictions and constraints (including but not limited to restrictions related to airspace, airport and meteorological conditions)

	via digital means and automation. The collaboration and negotiation of agreed trajectories with AUs allows AUs to state their trajectory preferences and ASPs to provide the corresponding assessments, resulting in greater certainty of AUs flying the agreed trajectories. This would enable better use of ATM resources by the ASPs and reduce planned fuel requirements for the AUs. Use case C – Collaborative flight planning to manage ATFM measures With the capabilities implemented at this level, ASPs are able to provide feedback on ATFM measures and flight-specific constraints directly to AUs via digital means and automation. In the same way, AUs are also able to provide all relevant ASPs with information on how they plan to meet the imposed constraints. A flight could be subjected to restrictions/constraints imposed by more than one ASPs. Through collaboration and negotiation with multiple ASPs, an AU can counter-propose alternative trajectories (such as changes in routing or flight timing) to meet the imposed restrictions/constraints. The eventual agreed trajectory becomes the common plan referenced by all stakeholders. This strategic planning approach reduces the need for tactical ATC intervention. AUs can reduce their planned fuel requirements while ASPs can better allocate resources during peak or complex traffic flows, thereby improving traffic handling efficiency.

b) TBO Level 2: Conduct agreed trajectory execution and negotiation, and use updated trajectory information from AU during flight execution

Elaboration of required capabilities	➢ ASPs and AUs monitor conformance of flight to the agreed trajectory during execution and adjust ground trajectory prediction continuously to reduce uncertainty in aircraft position in-flight. ➢ ASPs and AUs maintain an up-to-date agreed trajectory. ➢ AUs provide aircraft-derived trajectory data to ASPs to improve local/ground trajectory prediction and for conformance monitoring. ➢ ASPs conduct re-evaluations of agreed trajectories during flight execution to ensure compliance to restrictions and constraints. ➢ ASPs and AUs collaborate to revise the agreed trajectory strategically while the flight is in progress (in-flight negotiation). ➢ ASPs and AUs manage and share agreed trajectory updates with downstream ASPs and other stakeholders (e.g. airports) to allow them to update their predictions. ➢ ASPs provide clearances to the flight in time to enable the aircraft to execute the agreed trajectory.
ASBU elements required	A few ASBU elements of SWIM, FICE and COMI threads have been identified as necessary to achieve TBO Level 2. However, as related topics for TBO Level 2, such as the guidance for implementation of FF-ICE Release 2, is still work in progress by ICAO ATMRPP, the list below should be reviewed in the next update to capture the latest requirements. **SWIM: SWIM-B2/4** **FICE: FICE-B0/1, FICE-B2/3, FICE-B2/9**[1] **COMI: COMI-B2/3**

[1] The ASBU under the 8th edition of the GANP is scheduled for endorsement at the 42nd Session of the ICAO Assembly (A/42). Following the endorsement, the numbering of the FICE-B2/9 element may need to be updated.

Timeline	The required ICAO provisions for TBO Level 2 are being developed. Regional forums are thus focused on capabilities required for TBO Level 1 (i.e. SWIM and FF-ICE/R1). The timeline of implementation for TBO Level 2 will be set later when the required provisions and/or guidance are available.
Use Cases	Similar to TBO Level 1, States/Administrations should make use of the capabilities in this level to support use cases in order to gain operational improvements and benefits, and to be considered as performing TBO. Use case A – Monitoring of agreed trajectory As flights operate, they may encounter deviations from the agreed trajectory due to tactical actions. With the capabilities implemented at this level, AUs and/or ASPs can provide continuous updates to the agreed trajectory to maintain a consistent plan for all stakeholders. This enables ASPs to adjust demand forecasts and update ATM plan in response to the changes. ASPs can also re-allocate resources in downstream sectors and at destination aerodrome. Re-evaluation performed by ASPs will allow AUs to obtain up-to-date assessments on the agreed trajectory and engage in negotiations early if necessary. Use case B – Dynamic amendment of trajectory in-flight to comply with updated restrictions With the capabilities implemented at this level, AUs can continue the collaboration and negotiation with ASPs in-flight to revise the agreed trajectory when new restrictions or constraints arise. (Note that the negotiations should only affect the trajectory beyond the ATCO's horizon of interest and should not involve the ATCO). This proactive management of flight trajectory allows AUs to factor in their trajectory preferences while considering the new restrictions or constraints. ASPs can adjust their ATM plan based on the revised agreed trajectories, reducing the need for tactical ATC intervention. All stakeholders enjoy a higher predictability on flight timings and operations. Use case C – Use of aircraft-derived trajectory to improve management of arrivals With the capabilities implemented at this level, AUs can provide timely aircraft-derived trajectory updates to ASPs. ASPs can use details such as planned top-of-descent and descent profile to allow more efficient descent paths for individual flights, as well as to refine the arrival sequence and subsequent departures. This improves runway throughput efficiency and reduces fuel consumption.

7.3 **Figure 14** below provides an overview of the implementation roadmap for TBO Levels 1 and 2. The implementation timeline for TBO Level 1 is largely driven by regional activities while no timeline has been provided for TBO Level 2. Details for TBO Level 2 will be included and updated when the related provisions are mature and when this region progresses on those activities. The roadmap will be reviewed regularly in accordance with the review cycle of the Plan.

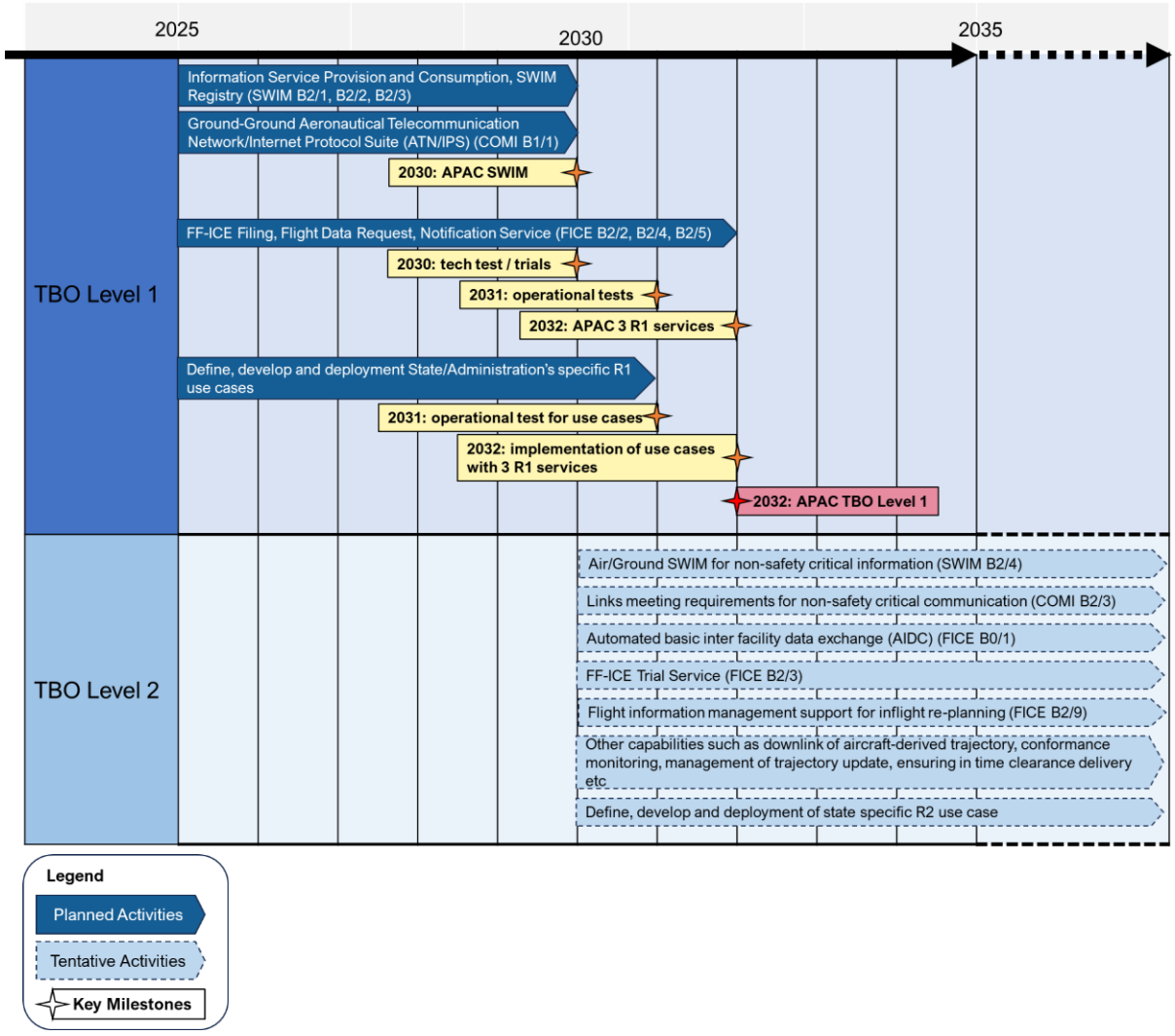

Figure 14: Overview of Implementation Roadmap for TBO Levels 1 and 2

PROPOSED TEXT FOR ASIA/PACIFIC SEAMLESS ANS PLAN CHAPTER 7 PHASE VI

PASL Phase VI (expected implementation by 27 November 2031)

Trajectory Based Operations

7.73 As indicated within the TBO Roadmap, for States/Administrations to achieve TBO Level 1, the following SWIM, FICE and COMI enablers should be implemented: SWIM-B2/1, SWIM-B2/2, SWIM-B2/3, FICE-B2/2, FICE-B2/4, FICE-B2/5, COMI-B1/1. Except for **FICE-B2/5**, the other enablers have already been included under earlier PASL phases. States/Administrations should implement **FICE-B2/5** to be TBO Level 1 capable. The implementation of this element would also facilitate the sunset of FPL2012.

PROPOSED AMENDMENTS TO THE ASIA/PACIFIC SEAMLESS ANS PLAN WITH THE INTRODUCTION OF PHASE VI

Paragraph	Amendments required
1.6	The operational improvements addressed in the Plan are expected to be implemented in phases: • Phase I – expected implementation by 12 November 2015 (past); • Phase II – expected implementation by 07 November 2019 (past); • Phase III – expected implementation by 03 November 2022 (past); • Phase IV – expected implementation by 27 November 2025; ~~and~~ • Phase V – expected implementation by 23 November 2028; and • Phase VI – expected implementation by 27 November 2031.
2.15	PARS and PASL were/are expected to be implemented in ~~five~~ six phases: Phase I by 12 November 2015 (past); Phase II by 07 November 2019 (past); Phase III by 03 November 2022 (past); Phase IV by 27 November 2025; ~~and~~ Phase V by 23 November 2028; and Phase VI by 27 November 2031.
7	This version of the Plan, is structured under the following phases: • Phase II – expected implementation by 07 November 2019; • Phase III - expected implementation by 03 November 2022; • Phase IV – expected implementation by 27 November 2025; ~~and~~ • Phase V – expected implementation by 23 November 2028; and • Phase VI – expected implementation by 27 November 2031.
9.1	Section 7 (Performance Improvement Plan) provides milestones and timelines for a number of elements in the PARS and PASL Phase II, III, IV, ~~and~~ V and VI being effective 07 November 2019, 03 November 2022, 27 November 2025, ~~and~~ 23 November 2028 and 27 November 2031 respectively. Phase I elements that had not been completed as of 2019 were moved to Phase II.

PROPOSED AMENDMENTS TO THE ASBU BLOCKS AND PRIORITY IDENTIFIED FOR APAC REGION WITHIN THE ASIA/PACIFIC SEAMLESS ANS PLAN

The table below contains the identified ASBU elements required for TBO Level 1 and DAIM ASBU elements that provide information benefit for TBO. The proposed amendments to Table 1 within paragraph 5.6 of the Asia/Pacific Seamless ANS Plan are highlighted with grey shading.

Functional Category	Element	Description	Priority	Responsibility for Review	Proposed Amendments
Information	SWIM-B2/1	Information service provision	2	ATM SG CNS SG	No change
	SWIM B2/2	Information service consumption	2	ATM SG CNS SG	No change
	SWIM B2/3	SWIM Registry	2	ATM SG CNS SG	New inclusion
	FICE-B2/2	Filing Service	2	ATM SG CNS SG	No change
	FICE-B2/4	Flight Data Request Service	2	ATM SG CNS SG	No change
	FICE B2/5	Notification Service	2	ATM SG CNS SG	New inclusion
	DAIM B2/1, B2/2, B2/5	Integrated aeronautical information service in a SWIM environment in support of enhanced operational ground and air decision-making processes for all phases of flight	~~3~~2	ATM SG	Propose changing priority to 2
Technology	COMI B1/1	Ground-Ground Aeronautical Telecommunication Network/Internet Protocol Suite (ATN/IPS)	1	CNS SG	No Change

REMOVAL OF REFERENCES TO TBO THREAD AND TBO TREE IN THE ASIA/PACIFIC SEAMLESS ANS PLAN

The following reference to TBO thread and TBO tree should be removed from the respective paragraphs within the Asia/Pacific Seamless ANS Plan.

<table>
<tr><th>Para</th><th>Proposed Amendments</th><th>Remarks</th></tr>
<tr><td>5.6</td><td>
<table>
<tr><th>Functional Category</th><th>Element</th><th>Description</th><th>Priority</th><th>Responsibility for Review</th></tr>
<tr><td>~~Operational~~</td><td>~~TBO-B0/1~~</td><td>~~Introduction of time-based management within a flow centric approach (PASL 7.52)~~</td><td>~~2~~</td><td>~~ATM SG CNS SG~~</td></tr>
<tr><td></td><td>~~TBO-B1/1~~</td><td>~~Initial Integration of time-based decision-making processes (PASL 7.55, 7.68)~~</td><td>~~2~~</td><td>~~ATM SG CNS SG~~</td></tr>
<tr><td></td><td>~~TBO-B2/1-B2/2~~</td><td>~~Pre departure trajectory synchronization and extended time-based management across multiple FIRs.~~</td><td>~~3~~</td><td>~~ATM SG CNS SG~~</td></tr>
</table>
</td><td>Removal of all TBO elements from Table 1</td></tr>
<tr><td>7.55</td><td>All ACCs operating within FIRs where demand may exceed capacity should operate systems that enable, where applicable, Short Term ATFM measures, Enhanced NOPS Planning, Enhanced integration of airport operations and NOPS planning, Enhanced Traffic Complexity Management, Full integration of ASM with ATFM, Initial Dynamic Airspace configurations, Enhanced ATFM slot swapping, Extended Arrival Management, ATFM Target Times and Collaborative Trajectory Options Programme consistent with NOPS-B1/1 to B1/10 ~~supporting the integration of time-based management within a flow centric approach, consistent with **TBO-B0/1** and **TBO-B1/1**~~.</td><td>Removal of the sentence referencing TBO elements.</td></tr>
<tr><td>7.68</td><td>All ACCs operating within FIRs where demand may exceed capacity should operate systems that enable, where applicable, collaborative network operations planning, further integration of airport operations and NOPS planning, multi ATFM slot swapping and airspace user priorities consistent with NOPS-B2/1-5 ~~supporting the integration of time-based management within a flow centric approach, consistent with **TBO-B0/1** and **TBO-B1/1**~~.</td><td>Removal of the sentence referencing TBO elements.</td></tr>
</table>