

# ASEAN ATFM Implementation: Progress and Roadmap

ARISE Plus Workshop # 1  
10 – 12 September 2018  
Bangkok, Thailand



# Outline

- The Guidance: ASEAN ATM Master Plan
- The Project: Distributed Multi-Nodal ATFM
- The Road Forward: ASEAN ATFM Implementation Support Team





# The Guidance: Plans and Frameworks Guiding the Development

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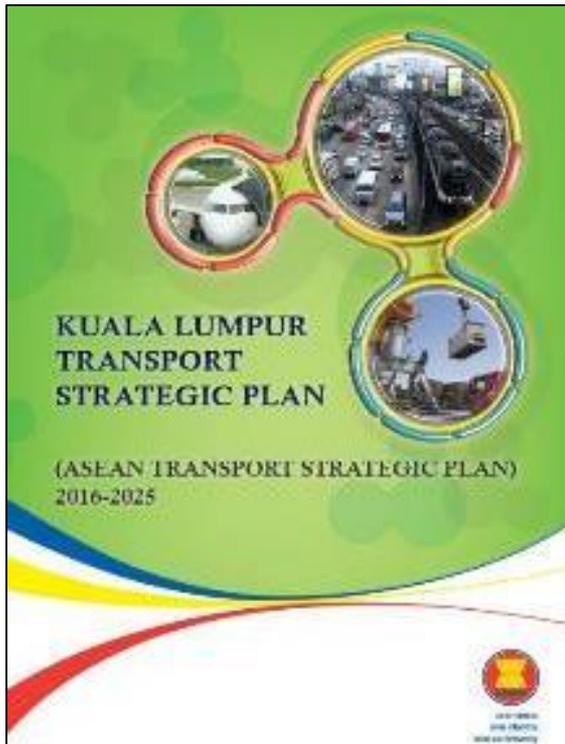
# High-Level Strategy

## ASEAN Transport Strategic Plan 2016 – 2025

- Strengthening ASEAN Single Aviation Market
- Enhancing ATM efficiency and capacity through Seamless ASEAN Sky

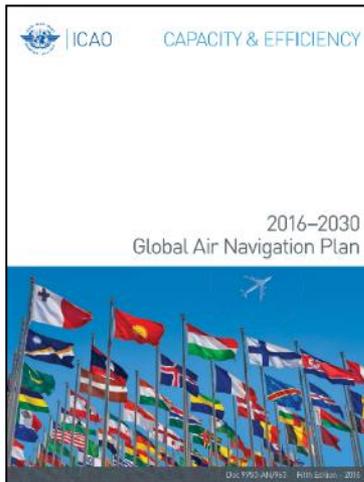


*Main goal:  
Develop ASEAN ATM Master Plan*



# Hierarchy of Plans

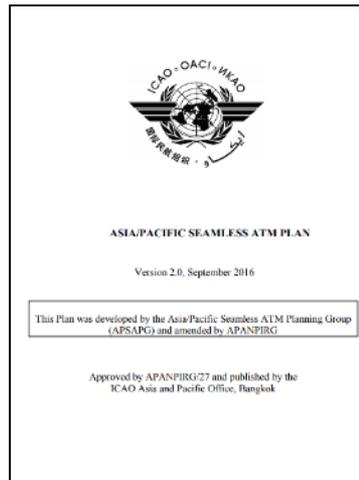
## ICAO Global Air Navigation Plan (DOC 9750)



5<sup>th</sup> Edition of the GANP, covering 15-year strategic plan, including the introduction of the Aviation System Block Upgrades (ASBU)



## ICAO Asia Pacific Seamless ATM Plan



Version 2.0, endorsed by APANPIRG/27 September 2016



## ASEAN ATM Master Plan



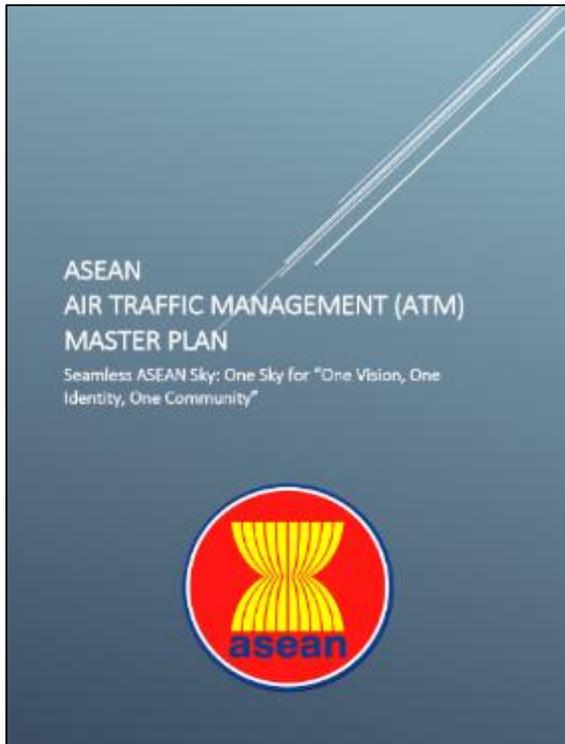
Adopted at the 23<sup>rd</sup> ASEAN Transport Ministers Meeting in October 2017



# ASEAN ATM Master Plan

## ASEAN ATM Master Plan

- Toward Seamless ASEAN Sky with **Future ATM Vision**
- Performance-based approach toward harmonized implementation of ATM enhancements



# Future ATM Vision



## Traffic Synchronisation

- Arrival/Departure Management (AMAN/DMAN)
- Performance-based Navigation and Ground-based Augmentation System (GBAS)



## Airport Integration and Throughput

- Airport Collaborative Decision Making (A-CDM)
- Increased Runway Throughput through Optimised Wake Turbulence Separation
- Safety and Efficiency of Surface Operations
- Optimisation of Approach Procedures including Vertical Guidance



## Network Collaborative Management

- Network Operations Planning



## Moving from Airspace to 4D Trajectory Management

- Traffic Synchronisation and Trajectory-Based Operation
- Continuous Descent Operations
- Continuous Climb Operations
- Enhanced En-Route Trajectories and Optimised ATS Routing



## System Wide Information Management

- Increased Interoperability, Efficiency and Capacity through Ground-Ground Integration
- System Wide Information Management
- Integrated Meteorological Information
- Digital Aeronautical Information Management



## Conflict Management and Automation

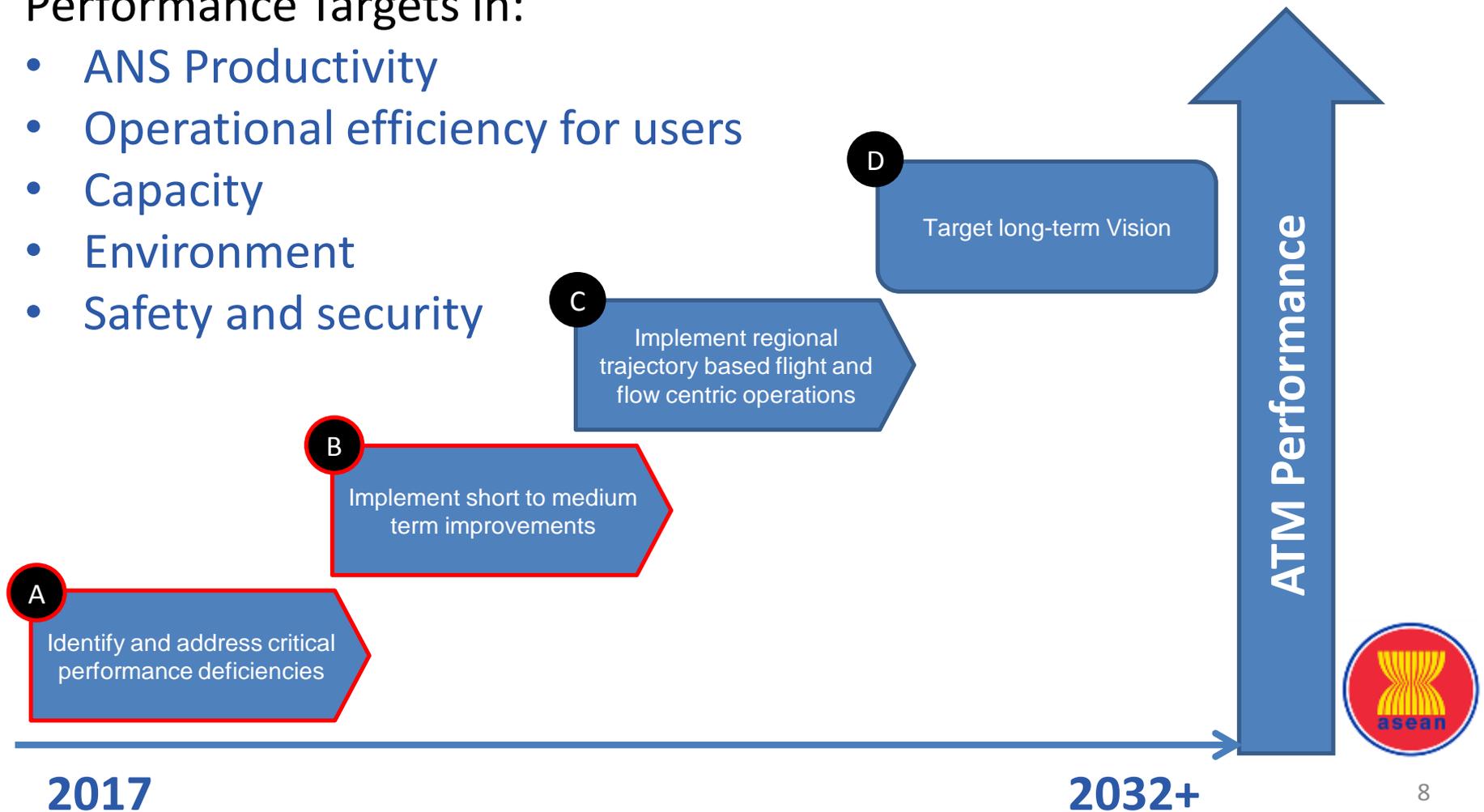
- Collision Avoidance System
- Air Traffic Situational Awareness and Interval Management



# Performance-Based Approach

Performance Targets in:

- ANS Productivity
- Operational efficiency for users
- Capacity
- Environment
- Safety and security



2017

2032+



# Implementation Phases

Implementation Phases	ASEAN Proposed Implementation Time Frame	ASEAN Proposed Target Completion Date
Phase I	From 1 January 2018 to 31 December 2020	<b>31 December 2018</b>
Phase II	From 1 January 2018 to 31 December 2022	<b>31 December 2020</b>



# Prioritized Elements

## Required ASEAN-Wide Harmonized Implementation

Initiatives	Expected Benefits
Performance Based Navigation (PBN) Routes	Enhance enroute efficiency and increase airspace capacity
<b>Air Traffic Flow Management (ATFM)</b>	<b>Balance traffic demand and capacity for both cross-border and domestic</b>
ATS Inter-facility Data Communication (AIDC)	Lower ATC workload across border and provide smooth FIR transition
Aeronautical Information Management (AIM)	Enable PBN, ATFM, and cross-border transition
Common Aeronautical Virtual Private Network (CRV)	Provide infrastructure for information exchange through IP-based network

# Prioritized Elements

## ATFM Implementation Expectations

Phases	Target Completion	Expectations
Phase I	31 Dec 2018	All Member States to achieve <b><u>Level-2</u></b> capability in the Multi-Nodal ATFM Network → <i>Established local procedure to comply with ATFM measures distributed by other States</i>
Phase II	31 Dec 2020	All Member States <b>with major aerodromes</b> to achieve <b><u>Level-3</u></b> capability in the Multi-Nodal ATFM Network → <i>Established procedure balance demand-capacity with ATFM measures</i>

# Prioritized Elements

## First-Priority Initiatives

Initiatives	Focus Area	Seamless Plan / ASBU Ref
PBN Approach	Terminal	110 / B0-APTA
ATS Surveillance	Enroute	180 / B0-ASUR
ADS-C/CPDLC		280 / B0-TBO
ATS Surveillance with Data Integrated		270 / B0-ASUR
Airborne Safety Systems		170 / B0-ACAS
Civil/Military Use of SUA		360 / B0-FRTO
Strategic Civil/Military Coordination	Civil/Military Cooperation	370 / Regional
Tactical Civil/Military Coordination		380 / Regional

# Human Performance

***“Improving human performance and optimizing people element in a complex system”***



Designing the right technology



Ensuring that the people have the right procedures and training



Organizing the people into the right roles and responsibilities



Managing the change and transition process



# Human Performance

## Phase 1

## Phase 2



The Right  
Technology

Assess the  
needs for  
ATFM system

Ensure  
functional  
ATFM support  
system



The Right  
Procedure and  
Training

Develop  
procedure to  
facilitate ATFM  
compliance

Develop  
procedure to  
perform ATFM



# Human Performance

## Phase 1

## Phase 2



The Roles and Responsibilities

Define roles of  
ATS units and  
stakeholders

Define roles of  
ATFMU, ATS  
units, and  
stakeholders



The Transition  
Process

Manage change and transition to  
new process, procedure, and  
communication flow



# Progress Monitoring

## Implementation Reporting

Report progress to ASEAN Transport Ministers through:

- ATM Strategic Planning Group (ATM SPG)
- Air Transport Technical Cooperation / Air Transport Working Group (ATTC / ATWG)

## Annual Assessment of Implementation Progress

- Highlights critical issues, trends, evolutions
- Assesses reasons for delayed implementation
- Proposes remedial actions



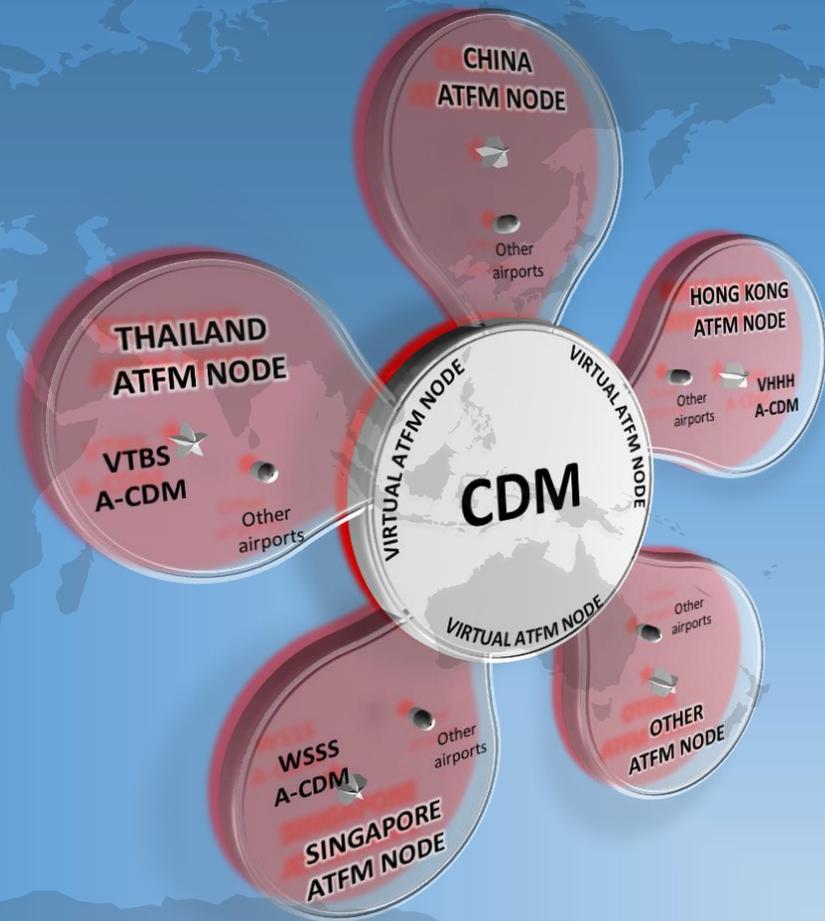


# **The Project:** Building a Distributed Multi-Nodal ATFM Network in Asia-Pacific

ARISE Plus Workshop # 1  
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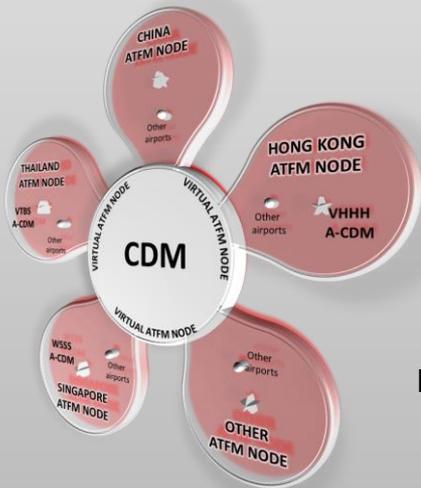


# *Distributed Multi-Nodal ATFM Project A Reminder...*



**ARISE Plus Workshop # 1**  
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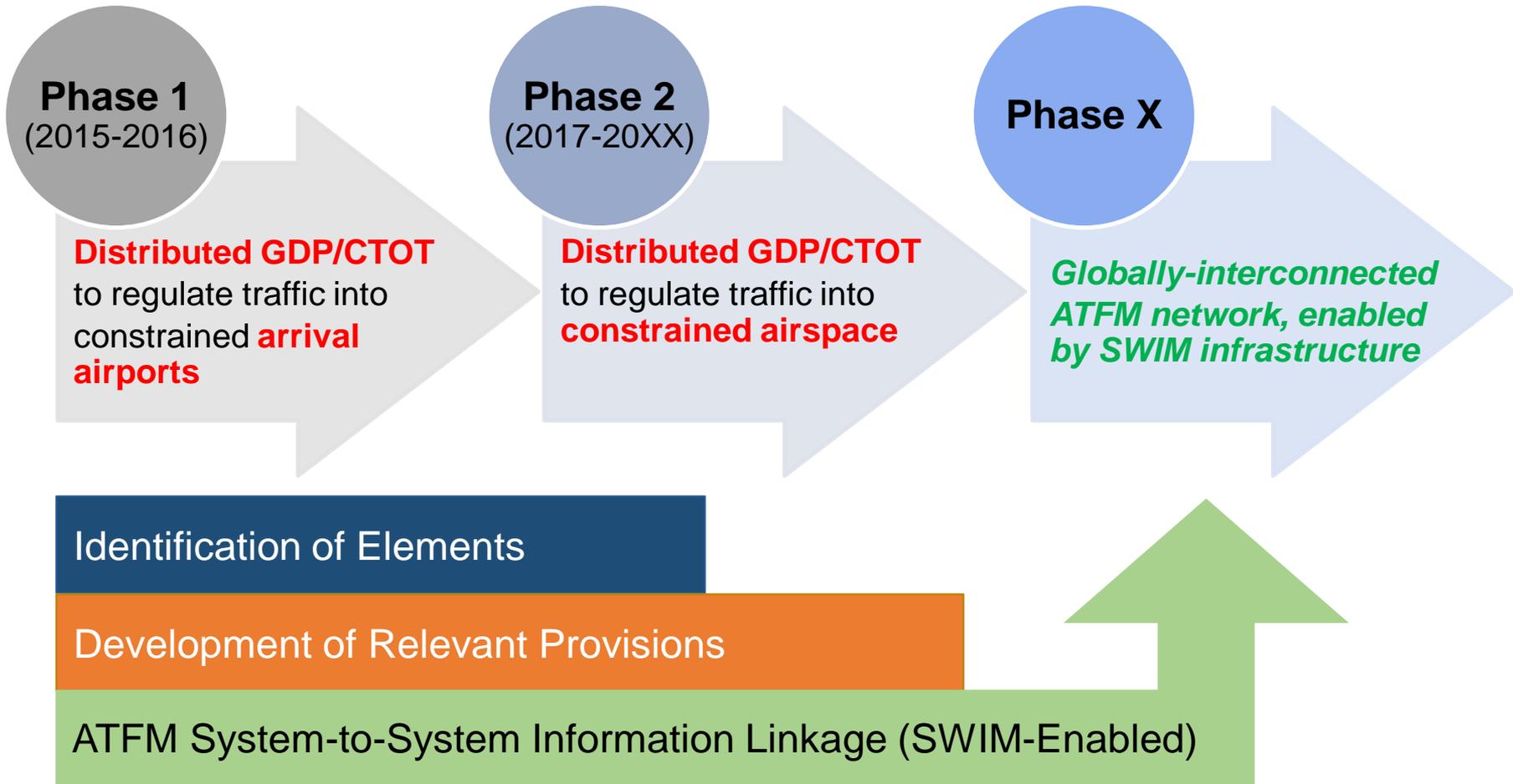
# *Introduction*



**DISTRIBUTED MULTI-NODAL AIR TRAFFIC FLOW MANAGEMENT**



# How We Approach The Project: *Multi-Phase Work*

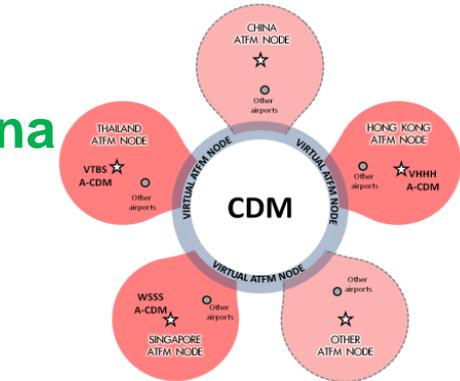


# Who The Members Are: *Tiered Participation*

## Level 3 ATFM Nodes

*Generate, Distribute, Comply to CTOT*

- China
- Hong Kong China
- Singapore
- Thailand
- Cambodia



## Level 2 ATFM Nodes

*Receive and Comply to CTOT*

- Indonesia
- Malaysia
- Myanmar
- Philippines



## Level 1 ATFM Nodes

*Observers*

*(\*\*soon to upgrade)*

- Lao PDR
- Viet Nam\*\*

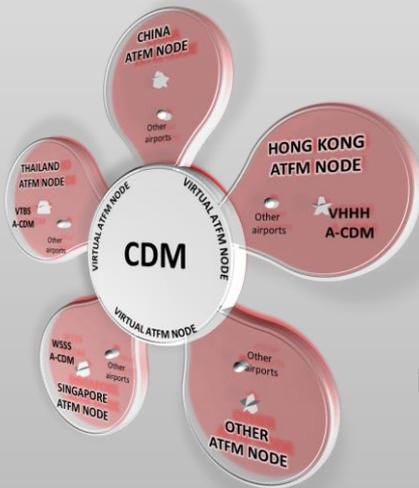


**DISTRIBUTED MULTI-NODAL ATFM NETWORK**



# *Phase 1*

## *Airport ATFM Programs*



**DISTRIBUTED MULTI-NODAL AIR TRAFFIC FLOW MANAGEMENT**

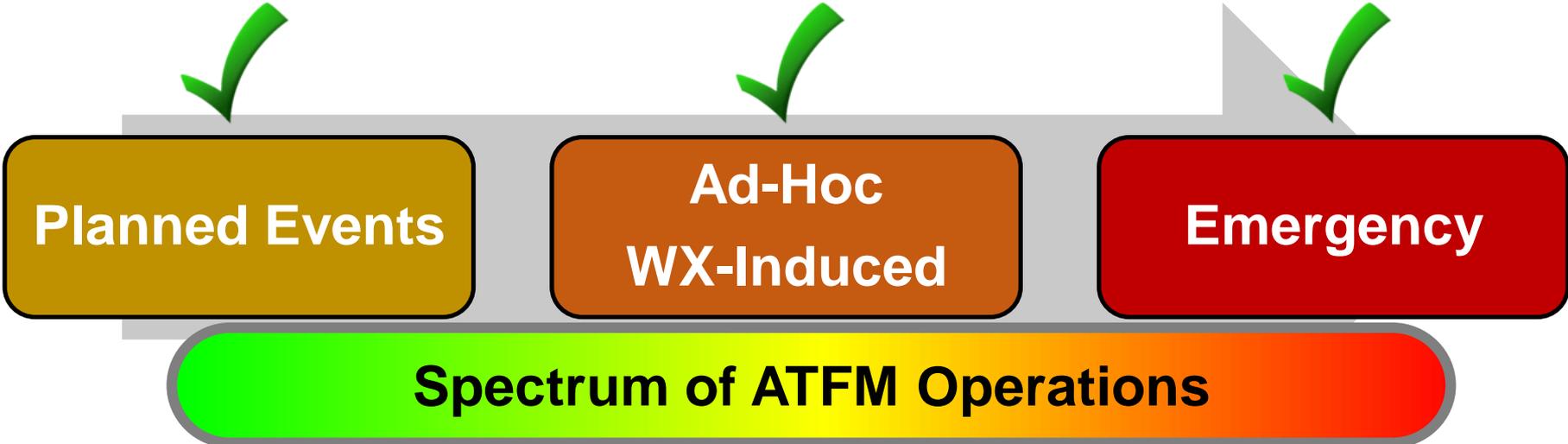
# Phase 1 Key Objective & Work Plan

**Distributed GDP**  
for  
Constrained / Congested **Arrival Airports**

Phase 1 Stage 1	Phase 1 Stage 2	Phase 1 Stage 3
<i>Communication Linkage and Information Exchange Protocol Design</i>	<i>Procedure Development and Demonstration Flights</i>	<i>Progressive implementation effort</i>
ATFM System-to-System Information Linkage		
Stakeholder Engagement		



# Key Achievements



Validated procedures for distributed GDP  
Proven benefits for constrained airports  
Increased awareness for cross-border ATFM  
Contribution to APAC States' ATFM readiness



# *Phase 2*

## *Airspace ATFM Programs*



**DISTRIBUTED MULTI-NODAL AIR TRAFFIC FLOW MANAGEMENT**

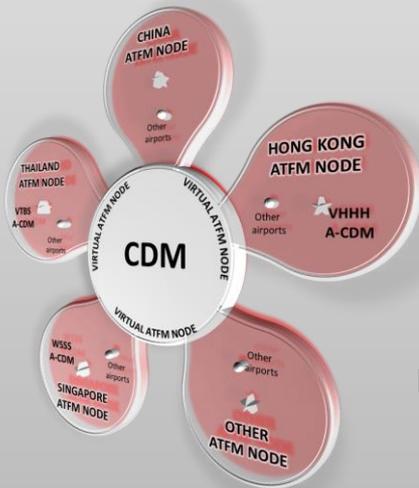
# Phase 2 Key Objective & Work Plan

**Distributed GDP** (+other measures)  
for  
Constrained / Congested **Airspace Volume**

Phase 2 Stage 1	Phase 2 Stage 2	Phase 2 Stage 3
<i>Airspace Demand-Capacity Assessment Capability</i>	<i>Procedure Development for Single-Constraint DCB</i>	<i>Procedure Development for Multi-Constraint DCB</i>
ATFM System-to-System Information Linkage		
Stakeholder Engagement		



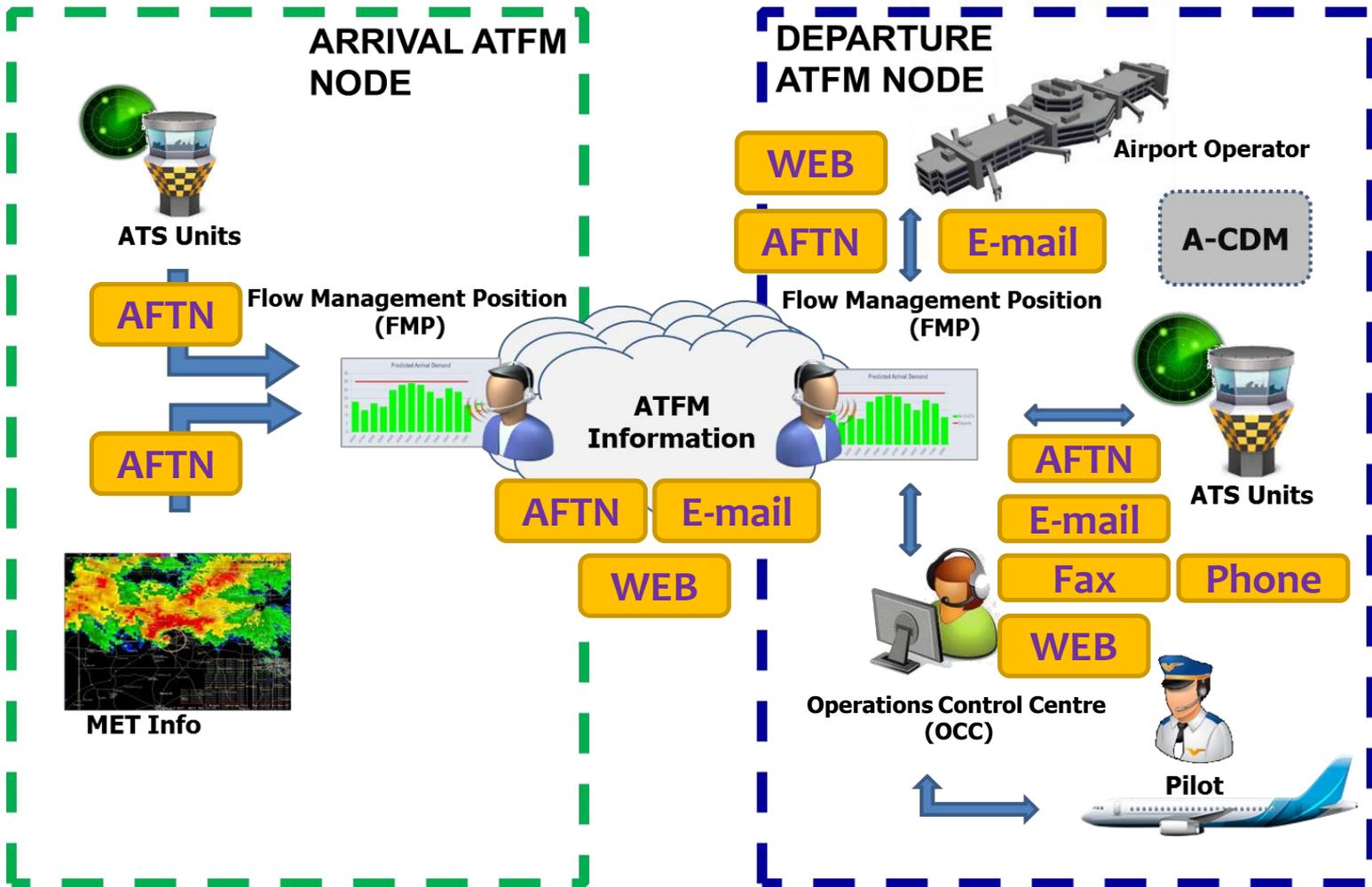
# *Technical Work Toward ATFM-on-SWIM*



**DISTRIBUTED MULTI-NODAL AIR TRAFFIC FLOW MANAGEMENT**

# Multi-Nodal ATFM Communication Today

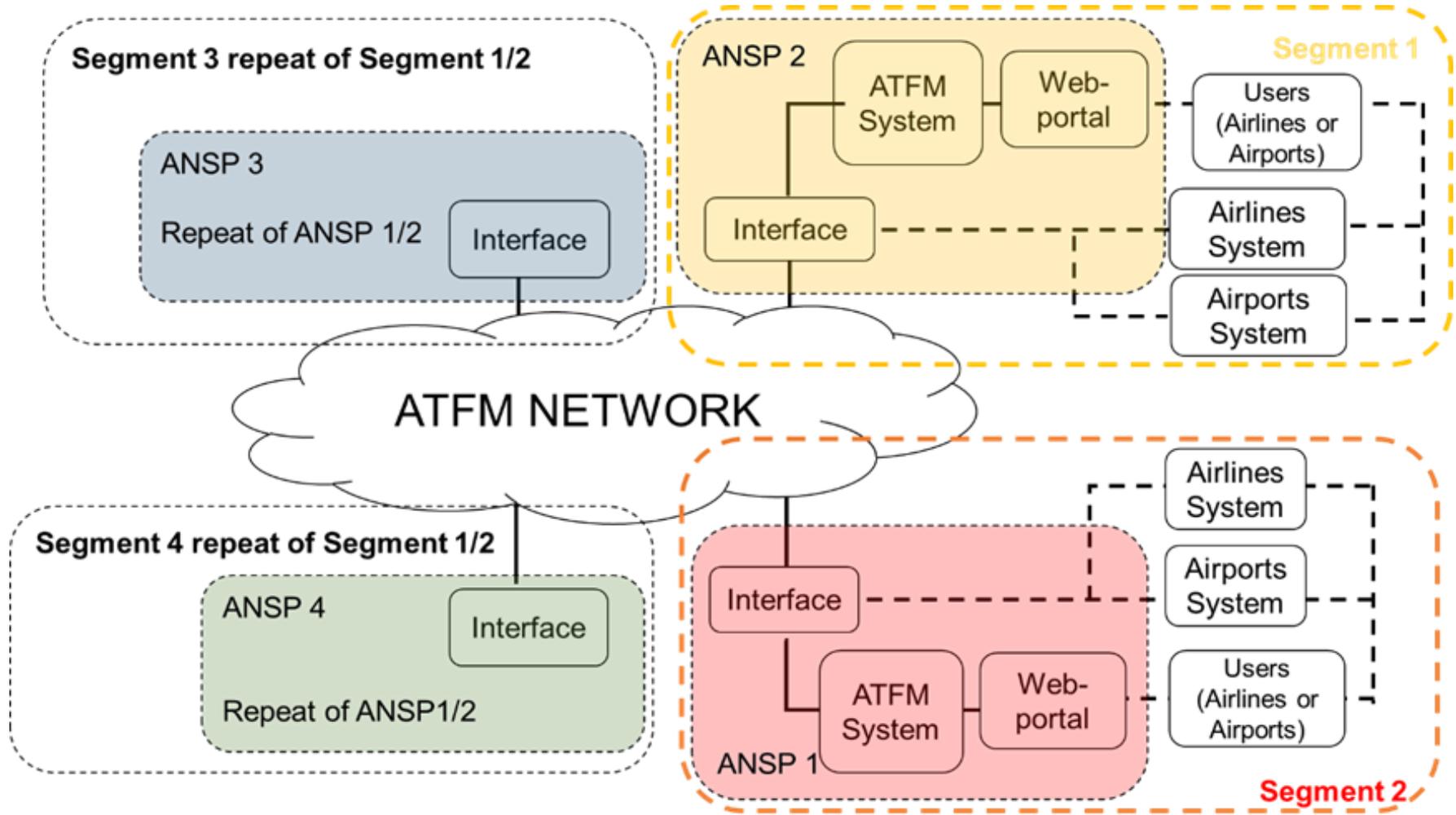
MET Info      ADP      Flight Info      ATFM Measure



DISTRIBUTED MULTI-NODAL ATFM NETWORK



# Multi-Nodal ATFM Communication **Tomorrow**



# Technical Subgroup Main Tasks

## Identify NEEDS

- ✓ Required data elements
- ✓ Operational scenarios

- ✓ Demand Monitoring
- ✓ GDP Activation – Congested Airport
- ✓ CTOT Management
- GDP Activation – Congested Airspace

## Develop Infrastructure

- ✓ Map with FIXM provisions (v4.1)
- ✓ Initial FIXM extension (CTOT, CLDT)
- Connection, system, operational tests

## Influence Provisions

- Coordinate with APAC SWIM TF
- Engage FIXM CCB
- Drive suitable provisions





# The Road Forward: Enhancing ATFM Capability in ASEAN

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# Implementation Leads

- Appointed by ASEAN ATM SPG to lead the support for Member States in the implementation

Initiatives	Lead / Co-leads
PBN Routes	Cambodia & Lao PDR
<b>ATFM</b>	<b>Singapore &amp; Thailand</b>
AIDC	Malaysia
AIM	Singapore & Thailand
CRV	Singapore & Thailand



# Current ATFM Implementation Status

AMS	Phase 1 1 Jan 2018 to 31 Dec 2020			Phase II 1 Jan 2018 to 31 Dec 2022		
	Expected Starting Date	Expected Completion Date	Progress	Expected Starting Date	Expected Completion Date	Progress
BRUNEI	To be provided	To be provided		To be provided	To be provided	
CAMBODIA	Started	31-Dec-17	100%	Started	31-Dec-20	
INDONESIA	26-Jun-16	31-Dec-17	100%	26-Jun-16	31-Dec-18	
LAO PDR	28-Dec-18	31-Dec-20	30%	31-Dec-20	30-Dec-22	None
MALAYSIA	Started	Completed	100%	01-Dec-19	3rd Quarter 2020	
MYANMAR	Started	31-Dec-19		Started	31-Dec-20	
PHILIPPINES	02-Apr-18	01-Nov-18		01-Nov-18	01-Nov-19	
SINGAPORE	Started	01-Apr-17	100%	Started	30-Sep-17	100%
THAILAND	Started	31-May-17	100%	Started	30-Sep-17	100%
VIETNAM	Started	31-Dec-18		Started	31-Dec-20	

Updated :



As of Oct 2017



As of Jul 2018



# ASEAN ATFM Implementation Support Team

## Core Idea

- Support team to aid ASEAN Member States in ATFM implementation
- Target: *ALL* ASEAN Members States supporting ATFM as Level-2 by 2018

## Work Strategy

- Co-Lead: Singapore & Thailand
- Kick-Off Session: 24 August 2018, Bangkok
  - **Develop a roadmap for harmonized ATFM implementation among ASEAN Members**



# Prioritized Elements for ATFM Phase 1

## ATFM Operations Training

### What's Available?

- ICAO Doc 9971 – Manual on Collaborative ATFM
- Asia-Pacific Regional Framework for Collaborative ATFM
- CANSO Guidance on ATFM Implementation (*to be published*)

### What's Missing?

- Personnel training syllabus – ATFMU, ATS Units, Stakeholders
- Qualified instructor(s)
- Implementation case study



# Prioritized Elements for ATFM Phase 1

## Regulatory Framework Development

### What's Available?

- High-level policy / regulation for ATFM by most States
  - CAAS Manual of Standards for ATS
  - AIP Thailand ENR 1.9
  - *etc..*

### What's Missing?

- How to regulate:
  - What's needed, what's not needed?
  - Reconciling ATFM against other existing regulations



# Prioritized Elements for ATFM Phase 2

## ATM Resource Capacity Assessment

### What's Available?

- ICAO Doc 9971
  - Appendices II-B, II-C
- EUROCONTROL Capacity Assessment and Planning Guidance

### What's Missing?

- (Scientific) method to determine “operational” capacities



# Preparation 2<sup>nd</sup> ATM Workshop of ARISE+ : The Implementation of ATFM

- AirNav HQ in Tangerang City, Indonesia
- 24 – 26 September

## Task list

- States to Identify and share details of what's missing / confusing in the (ATFM portion of) ASEAN ATM Master Plan





# Questions?

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