



AirNav Indonesia

ESTABLISHMENT OF INDONESIA NETWORK MANAGER

***ICAO APAC RSO
Beijing 29 Agustus 2018***



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LIST OF PRESENTATION



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1. ATFM Global CONOPS, ASBU & Regional Reference
2. Current situation
3. ATFM in IMANS
4. Implementation Strategy
5. Modes of Operation Concept
6. Proposed Function and Timeline





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ATFM Global CONOPS, ASBU & regional reference





ATFM CONCEPT



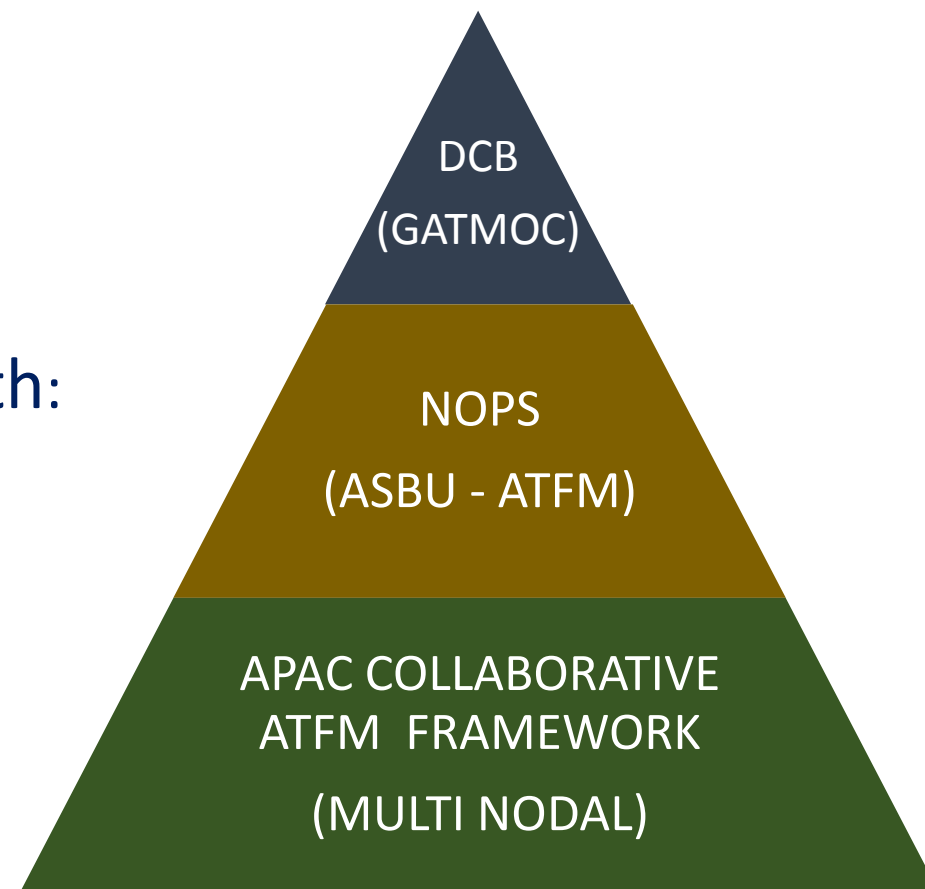
- ICAO Doc 9426 ATS Planning Manual:

$$\text{ATM} = \text{ATS} + \text{ATFM} + \text{ASM}$$

ATS = ATC + FS

ASM = Airspace design + FUA

- Indonesia ATFM implementation align with:
 - Global ATM Operational Concept (Doc 9854) → *demand/capacity balancing* (DCB) element
 - Global Air Navigation Plan (Doc 9750) – ASBU - NOPS (*Network Operation*) module
 - Asia Pacific framework for collaborative ATFM (Multi Nodal)





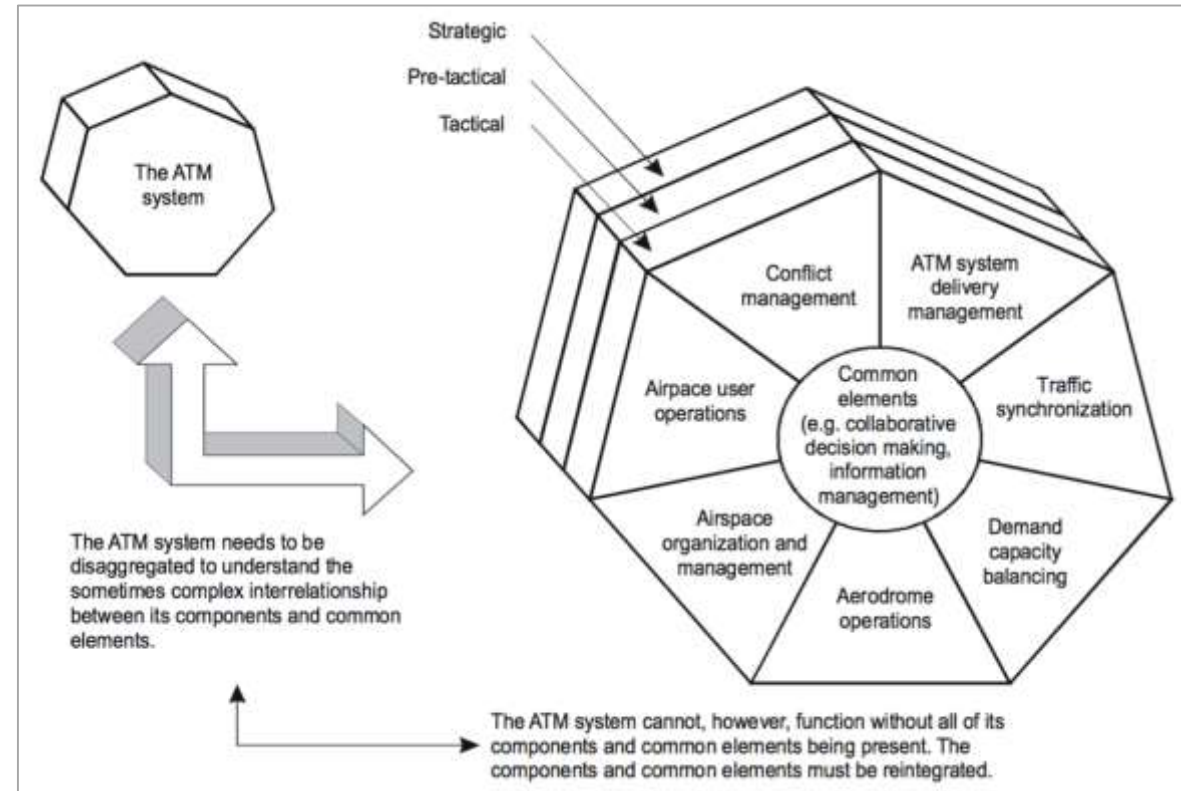
ATFM ON GLOBAL ATM OPERATIONAL CONCEPT



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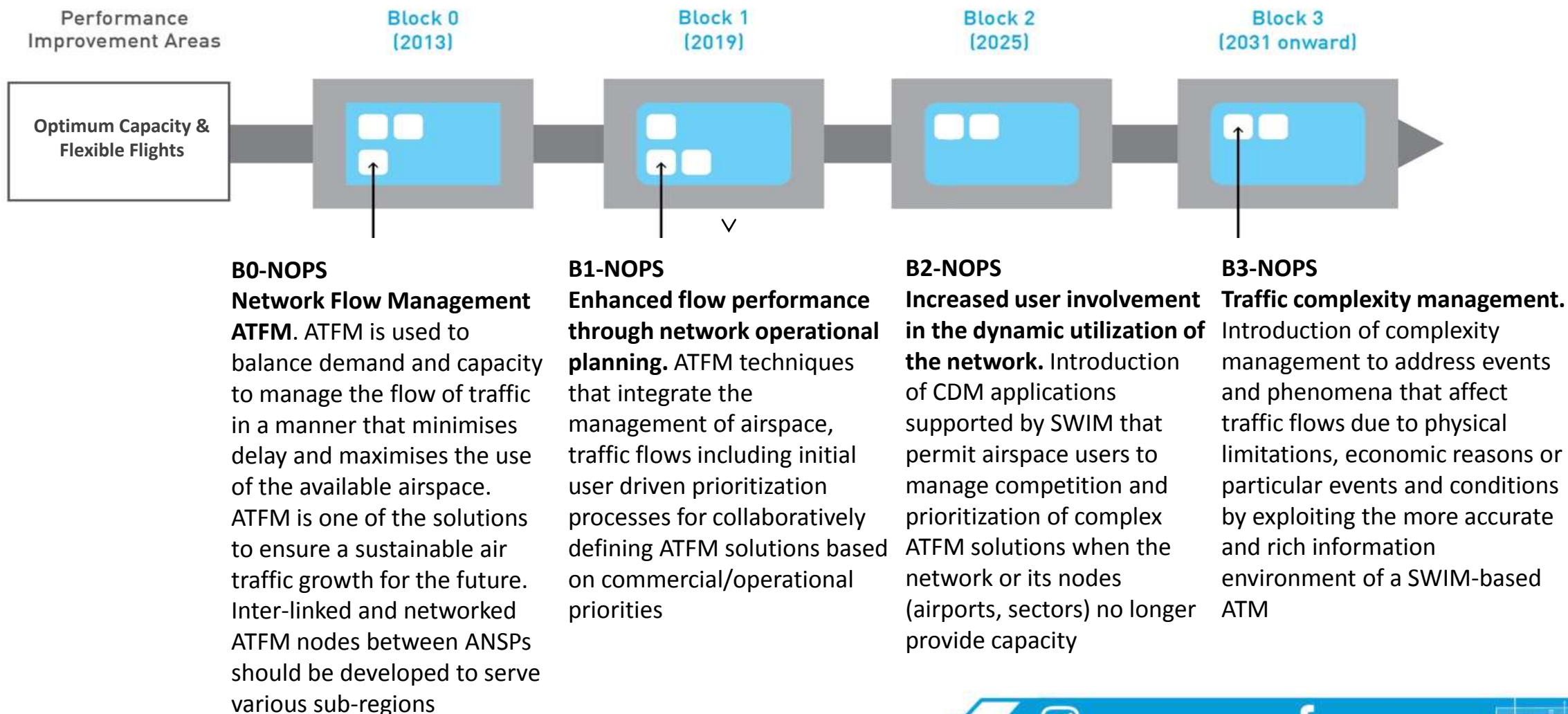
Demand and capacity balancing will be integrated within the ATM system, undertaken in 3 phases:

- **STRATEGIC STAGE.** demand and capacity balancing will respond to the *fluctuations in schedules and demands, including the increasing globalization of traffic patterns, as well as the seasonal changes of weather and major weather phenomena.*
- **PRE-TACTICAL STAGE.** demand and capacity balancing will *evaluate the current allocation of ATM service provider, airspace user and aerodrome operator assets and resources against the projected demands.*
- **TACTICAL STAGE.** *demand and capacity balancing will focus more closely on demand management to adjust imbalances. It will consider weather conditions, infrastructure status, resource allocations, and disruptions in schedules that would cause an imbalance.*



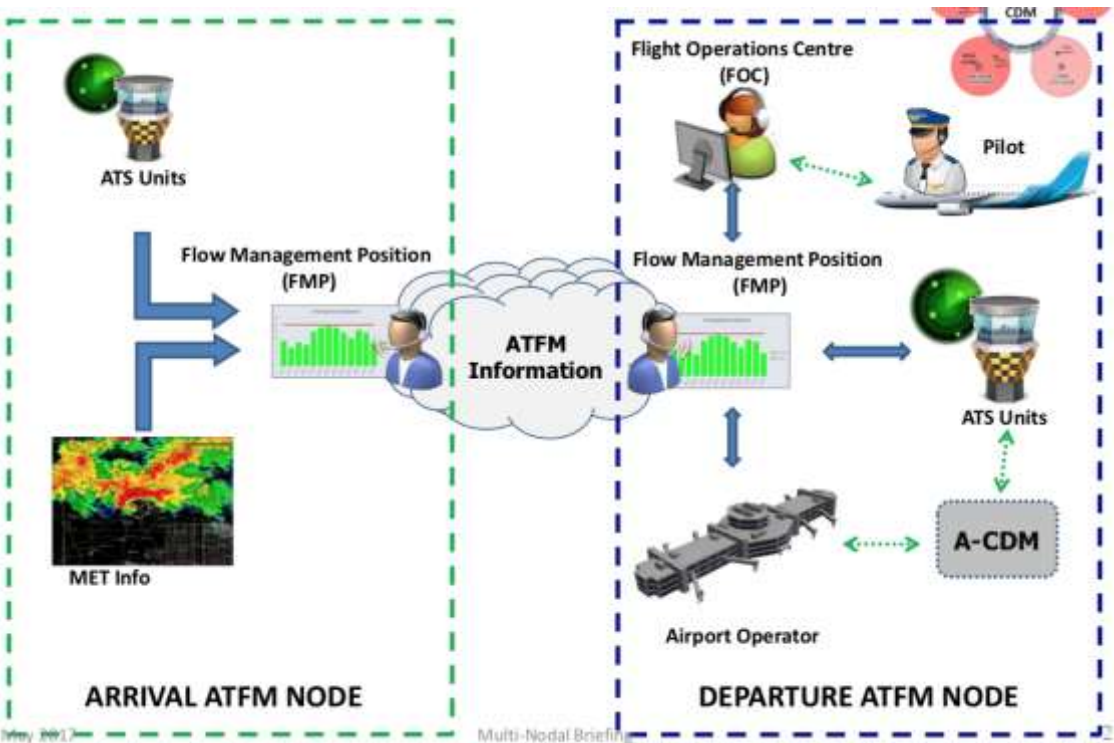


NETWORK OPERATIONS (NOPS) - ASBU PIA 3





ASIA PACIFIC COLLABORATIVE ATFM FRAMEWORK (DISTRIBUTED MULTI NODAL)



- Each ANSP operating an independent, virtual ATFM/CDM node supported by an interconnected information sharing framework.
- A-CDM mechanisms, especially at busy airports, can supplement ATFM in the CDM process.
- Air traffic flow could then be effectively managed between participating ANSPs through agreed set of business rules for key stakeholders.
- Concept of Operation will allow inclusion of international flights and airborne flights
- Accords greater flexibility to airspace users to manage delays through collaboration and negotiation with ANSPs and Airport Operators within existing ATC procedures and constraints



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CURRENT SITUATION

www.airnavindonesia.co.id



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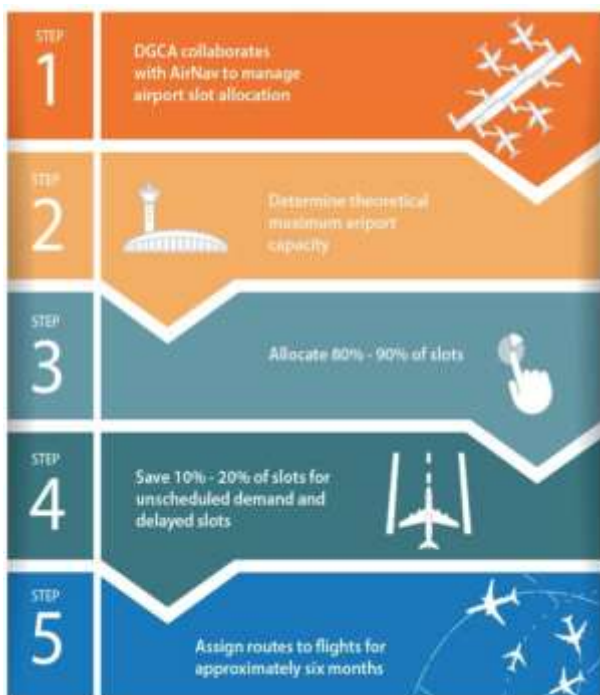


AIRPORT SLOT MANAGEMENT



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- Airport slot at 35 airport managed by IASM at strategic phase and AirNav using Chronos application in tactical phase
- However dynamic capacity to manage tactical event such as thunderstorm has not been introduced



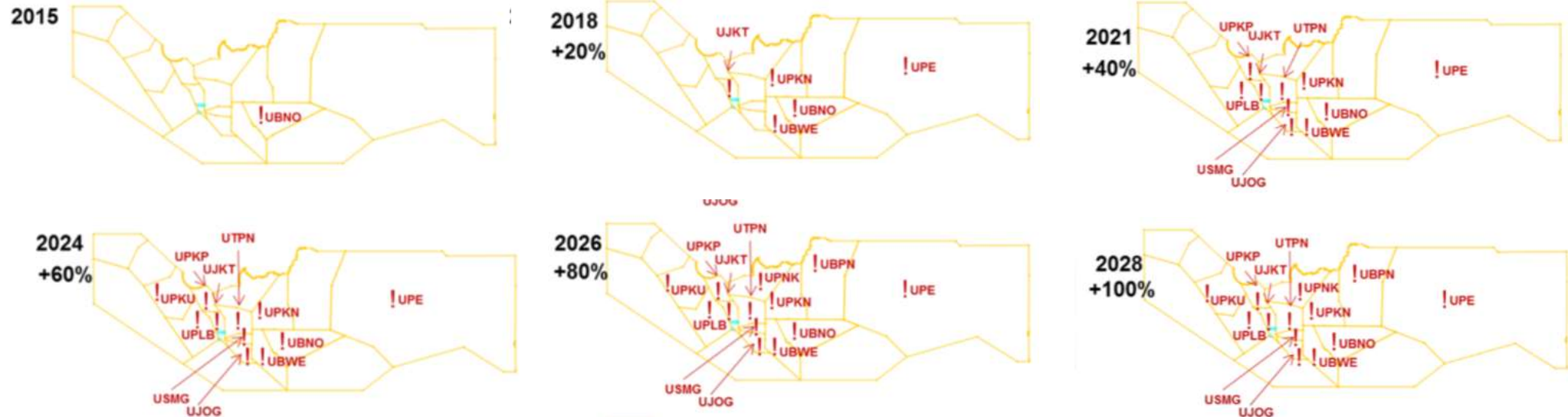


AIRSPACE



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- No formal system/mechanism to predict demand issues for a specific volume of airspace
- A method for determining sector capacity has been developed (DORATASK, Pessimistic method) but need to be validated
- Prediction of traffic growth:



! Sectors with demand > capacity





POSITION ON APAC REGIONAL ATFM FRAMEWORK



- Level 2 - Regional ATFM framework (distributed multi nodal)
 - Soekarno-Hatta (CGK), Juanda (SUB) and Ngurah Rai (BLI) received CTOT from SIN, BKK and HKG

- Compliance data

AIRPORT	Compliance
Soekarno – Hatta (CGK)	50%
Juanda (SUB)	67%
Ngurah Rai (BLI)	72%

- Procedures & mechanism differs among these airports





SUPPORTING INFRASTRUCTURE



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- Flight plan center
- Command center





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ATFM IN IMANS





IMANS AT A GLANCE



- Indonesia Modernization Air Navigation System (IMANS) is AirNav Indonesia initiative to modernize national air navigation system that aims to achieve high levels of safety, service and efficiency.
- IMANS will implement a modern, safe, secure, efficient, environmentally friendly, and harmonized air navigation system and an operation that will support and enhance growth in the region during 2018 – 2028 timeframe .
- IMANS consist of 3 (three) categories:





PLANS PER CATEGORY



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CATEGORY 1 Meeting Near-term Operational Needs	CATEGORY 2 Strengthening Organization & Institutional Capabilities	CATEGORY 3 Strategic and Political Programs
<p>Execute an integrated program through establishing a dedicated Change Management Office (CMO)</p>	<p>Develop Data Driven Analysis Capabilities to assess service quality and perform Cost-Benefit analysis for increasing service fee</p>	<p>Socialize IMANS Program: In country promotion and international promotion</p>
<p>New Jakarta Automated Air Traffic System (JAATS II) is a jump start that will establish the foundational automation capabilities to achieve the needed changes.</p>	<p>Start internal data architecture development project</p>	<p>Establish internal research and development capabilities to work on aviation problems that disproportionately affect Indonesia</p>
<p>Near-term airspace changes especially the one that enable WIII (CGK) airport capacity enhancement</p>	<p>Start in-house capability (tools, facilities, people) building projects</p>	<p>Intensify AirNav participation in regional ICAO programs</p>
<p>Enhance in-country ATFM /CDM system by establishing airspace demand/capacity baseline and prediction. Start with Jakarta and Ujung Pandang Center</p>	<p>Perform quick assessment of AirNav cybersecurity</p>	



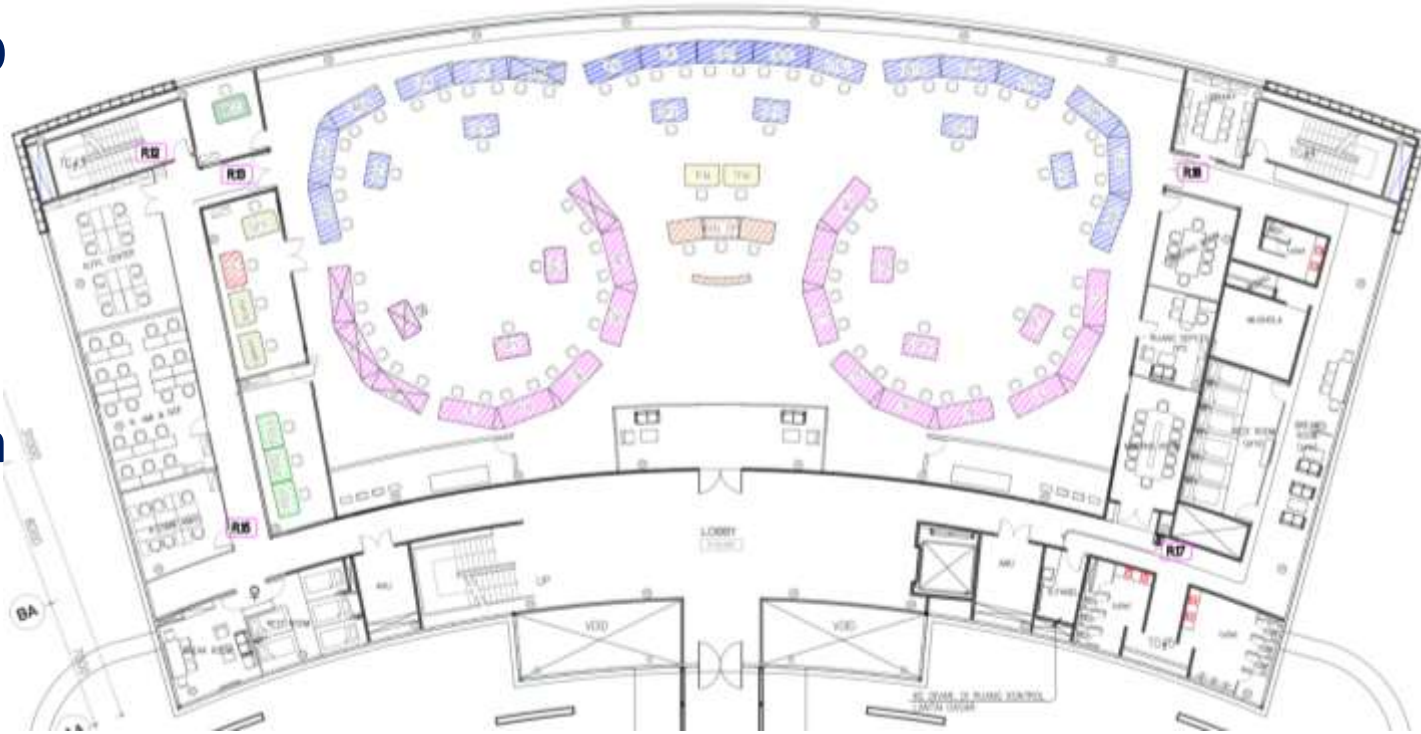


JAATS II



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- Jakarta Automated Air Traffic System II (JAATS II) will be a jump start to accommodate traffic growth and technology for the next 5 – 10 years
- JAATS II component consist of:
 - New Air Traffic Control automation system (ATCAS) for Jakarta FIR
 - Aeronautical Information Management and Meteorological and Information Display System (AMI)
 - Air Traffic Flow Management system (ATFM)





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IMANS ATFM CONCEPT OF OPERATION

- Ability to monitor status and demand (P3- NOPS-B0)
- Continuous evaluation of demand and capacity data to identify constraints. (P3-NOPS- B0)
- Dynamic constraints such as weather impacts are available and integrated into ATFM capacity estimations. (P3- NOPS-B0, P2- AMET- B1)
- Ability to develop strategies to mitigate constraints using tools that enable the effective application of traffic management initiatives. (P3-NOPS- B0)
- *Traffic Flow Management System (TFMS)*
- Integrated with AMAN and DMAN





IMANS ATFM CONCEPT OF OPERATION



- Ability to monitor status and demand (P3-NOPS-B0)
- Continuous evaluation of demand and capacity data to identify constraints. (P3-NOPS- B0)
- Dynamic constraints such as weather impacts are available to AirNav personnel and are integrated into ATFM capacity estimations. (P3-NOPS-B0, P2-AMET- B1))
- *Traffic Flow Management System (TFMS)*:
 - Area Control Center
 - High density TMA
 - Tower
- Integrated with AMAN and DMAN





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IMPLEMENTATION STRATEGY

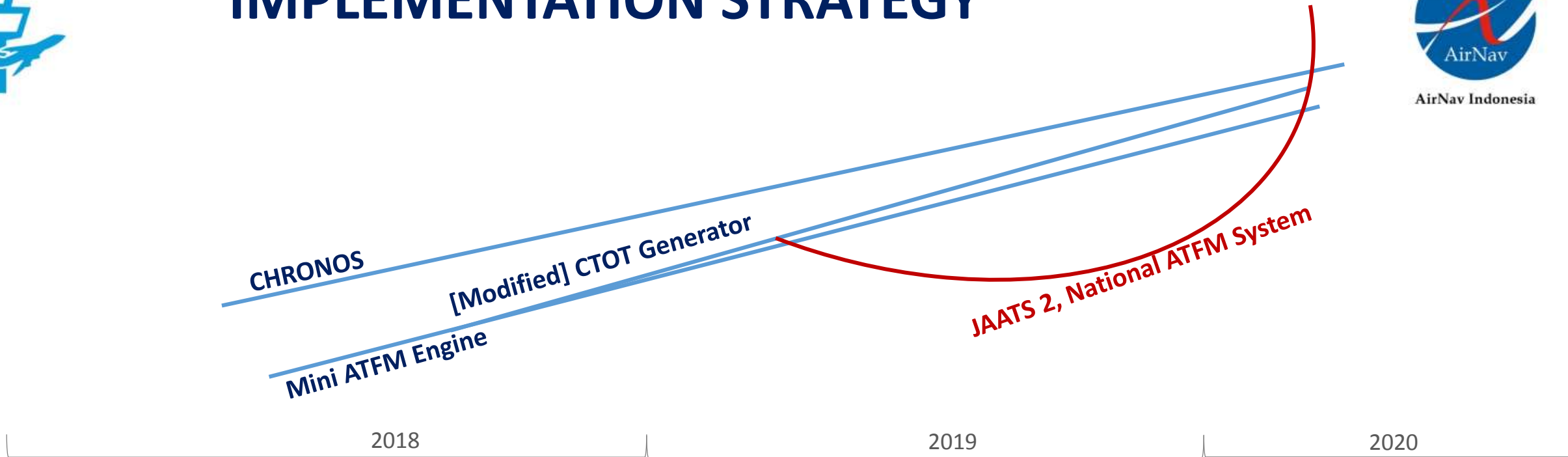




IMPLEMENTATION STRATEGY



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- Enhancing Chronos to support system and structure changes
- Develop Mini ATFM engine with capability to predict traffic demand
- Consolidate personnel and infrastructure
- Prepare for operation of national ATFM with new ATFM system





CHRONOS
Slot Application Online



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- Chronos will continue manage airport slot allocation
- Chronos will be enhance with some feature:
 - Multi airport
 - Better algorithm
 - Interfacing with DG FA online and airport operator's AOCC
 - Board messaging
- Sentralised Chronos to support future system changes
 - Consolidate ATFM Center personel 24H
 - Prepare for dynamic capacity (runway) operation





MINI ATFM ENGINE



- Simulating 3D volume of all ACC sectors in UPG and JKT FIR that can measure traffic rate of entry :
 - Validating airspace capacity measurement
 - Define airspace demand/capacity baseline
- Operating in 3 modes: strategic, pre-tactical and tactical
- With 3 deep view:
 - Bird-eye view: dashboard, show all sectors in Indonesia airspace
 - Bar-chart: show demand/capacity selama 24 jam
 - List of flight
- Produced [modified] CTOT – TOBT/TSAT and CTO – CLDT
 - Web based application → display in Tower and airspace user





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MODES OF OPERATION CONCEPT





STRATEGIC PHASE



- Period 6 months to 7 days before flight
- Demand data:
 - Summer/winter schedule from IASM for domestic flight
 - FCIS (DG Air Transport Dept. system) for enroute and internasional flight
 - Historical
 - OAG
- Data all factors that affect capacity :
 - NOTAM or airport: event, overlay, WIP
 - ACC/FMP: sector configuration, ATC availability
 - Meteorologi: climate
 - Military: operation plan
- Publish *Network Operation Plan*
 - airspace & runway, sektorisasi dll.

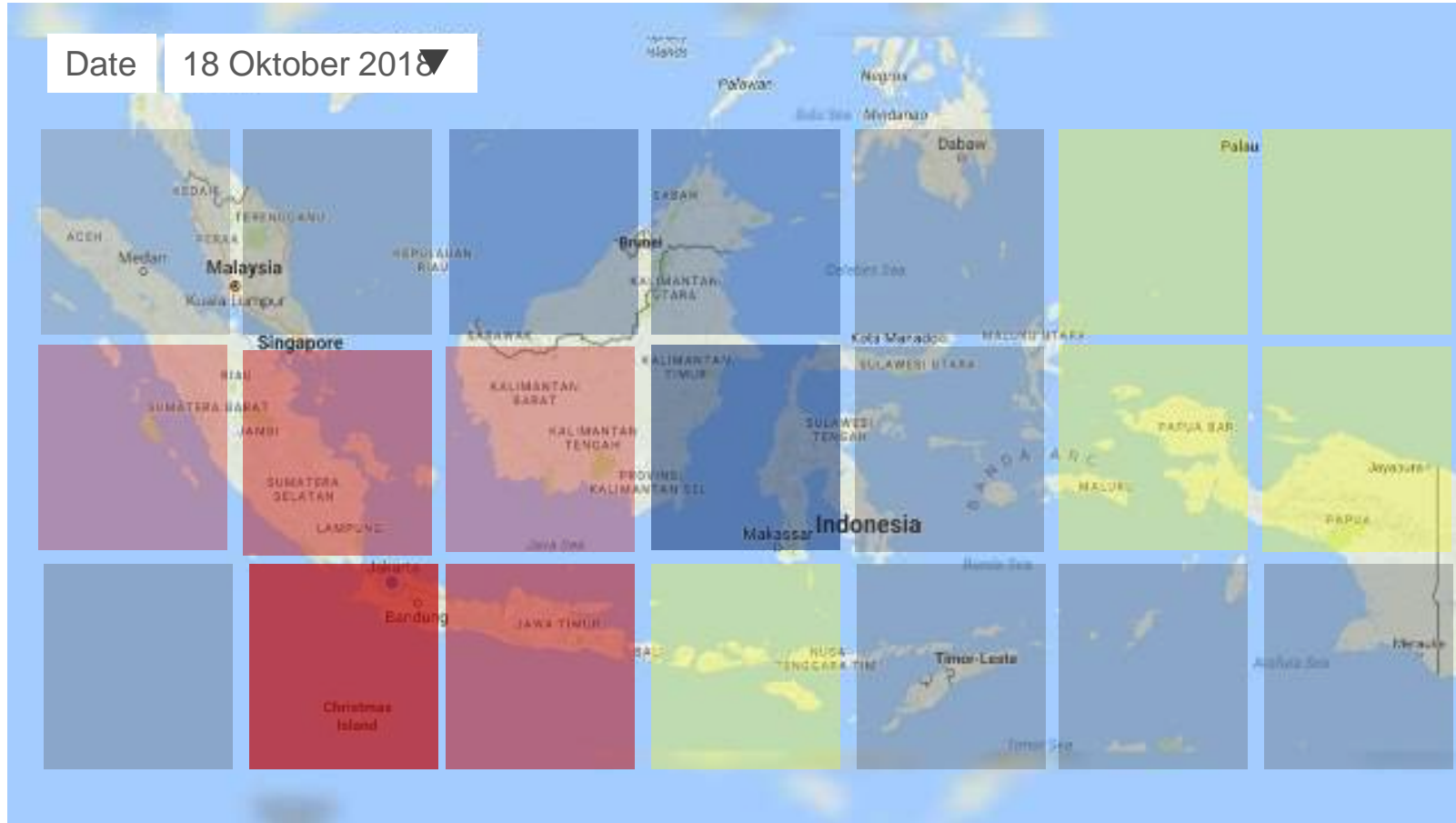








DASHBOARD - BIRD EYE VIEW



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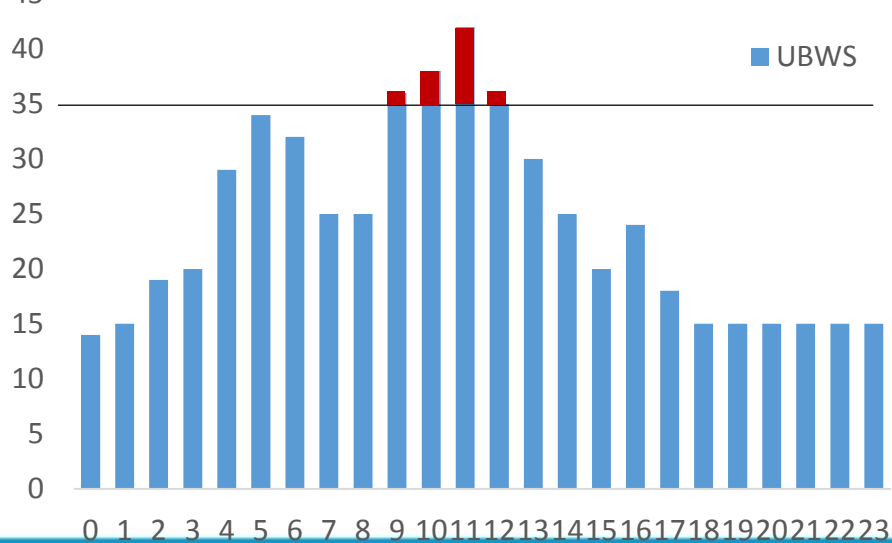
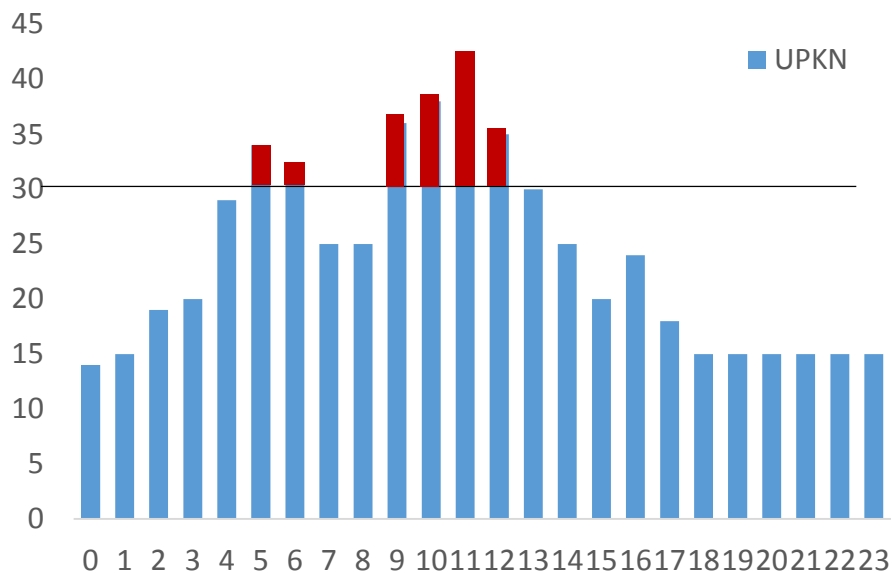
-  More than 20 times (hours) over capacity
-  10 - 20 times (hours) over capacity
-  1 - 10 times (hours) terjadi over capacity
-  No over capacity





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BAR CHART AND LIST OF FLIGHT VIEW



Set Sector: UWM Date: 2018-08-24

Time Range: 00:00 - 01:00

PROCESS CLEAR

Sector: UWM

Time	Sim/Call All Ports	Sim/Call Port
00:00:00		
00:00:05		
00:00:10		
00:00:15		
00:00:20		
00:00:25		
00:00:30		
00:00:35		
00:00:40		
00:00:45		
00:00:50		
00:00:55		
00:01:00		

Total : 45

Legend:
 (v) - similar call sign all ports of flight number
 (*) - similar call sign the port
 (x) - similar call sign the L20





PRE-TACTICAL PHASE



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- From 6 days to 1 day before flight
- Demand data:
 - Flight plans
- Data all factors that affect capacity :
 - NOTAM: event, overlay, WIP
 - CTOT from Outside ATFM Center (Multi Nodal)
 - ACC/FMP: sector configuration, ATC availability
 - Meteorologi: forecast
 - Military: detailed of operation plan
- ATFM Daily Plan



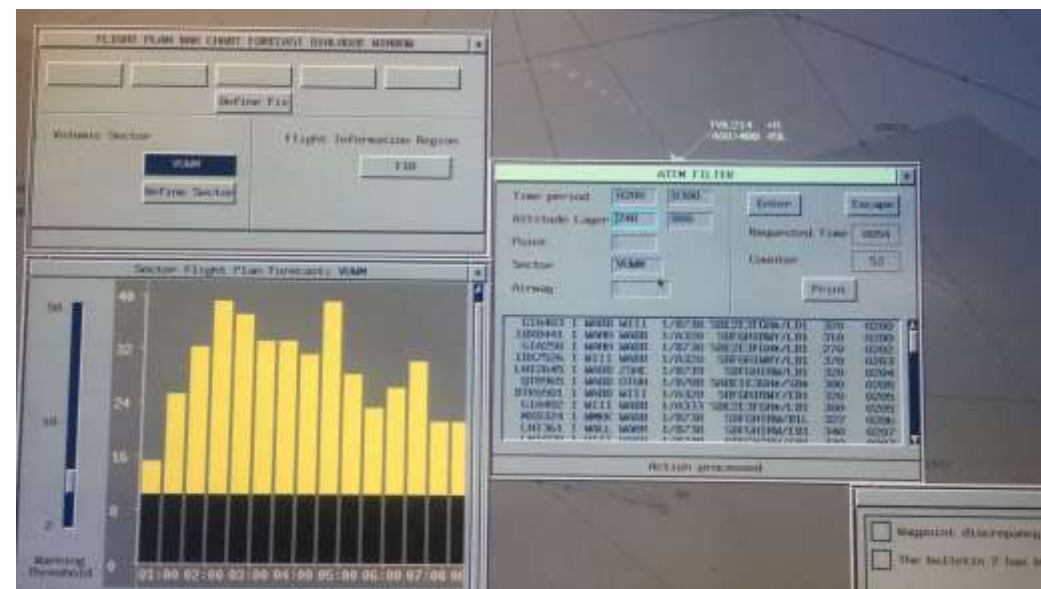


TACTICAL PHASE



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- On the day of operation
- Realtime demand data:
 - AFTN Messages (DEP, ARR, ETO, CHG, etc)
 - AIDC
 - Data Surveillance
- Data that affect capacity:
 - ATC unit
 - Military Coordination Center (MCC)
 - Meteorology
- Utilising Mini ATFM Engine and Topsky ATFM feature (in UPG ACC)

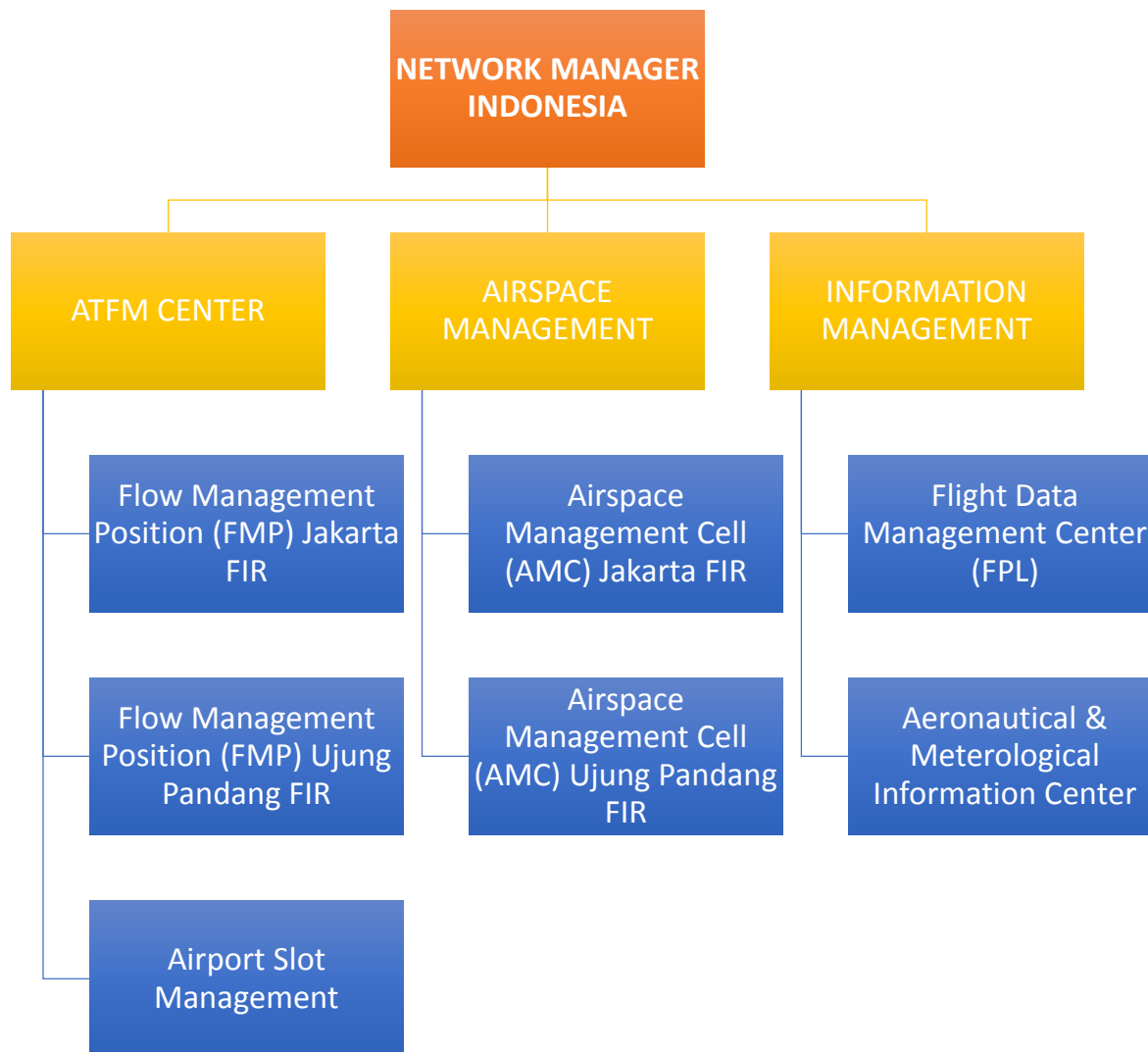




PROPOSED FUNCTION



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Thank you,
inputs are welcome 😊

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