ICAO UNITING AVIATION

ICAO Global Provisions on A-CDM

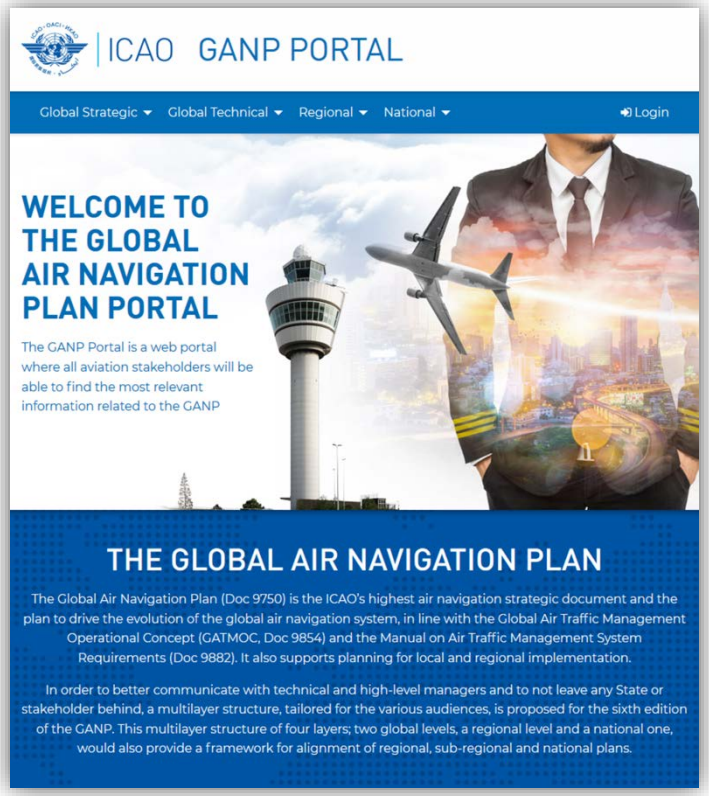
Eng. Mohamed Iheb Hamdi

ICAO MID Regional Officer for Aerodromes and Ground Aids (AGA)

A-CDM Implementation Workshop

Cairo, Egypt | 20-22 October 2019

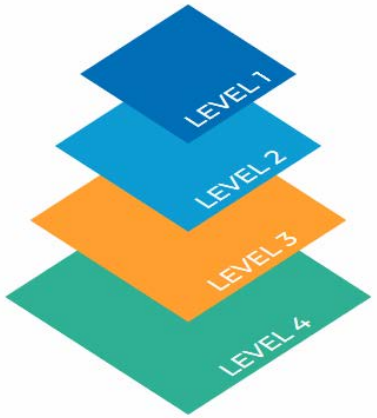
A comprehensive strategy for Air Navigation



- The *Global Air Navigation Plan (GANP)* is an important planning tool for setting global priorities to drive the evolution of the global air navigation system and ensure that the vision of an integrated, harmonized, globally interoperable and seamless system becomes a reality.
- The 40th Assembly endorsed the sixth edition of the GANP.

https://www4.icao.int/ganpportal/

Doc 9750 Global Air Navigation Plan



GLOBAL STRATEGIC

Provides high-level strategic directions for decision makers to drive the evolution of the global air navigation system towards a common agreed vision.

GANP STRATEGY

GLOBAL TECHNICAL

Supports technical managers in planning the implementation of basic air navigation services and new operational improvements in a cost-effective manner.

ASBUs & PF AN-SPA BBBs

REGIONAL

Addresses regional and sub-regional needs aligned with the global objectives.

- AFI ANP
- APAC ANP
- EUR ANP
- MID ANP
- NAM ANP
- NAT ANP
- CARSAM ANP

NATIONAL

Development by States, in coordination with relevant stakeholders, of air navigation plans aligned with regional and global plans.

NANP TEMPLATE

CBA CHECKLIST

https://www4.icao.int/ganpportal

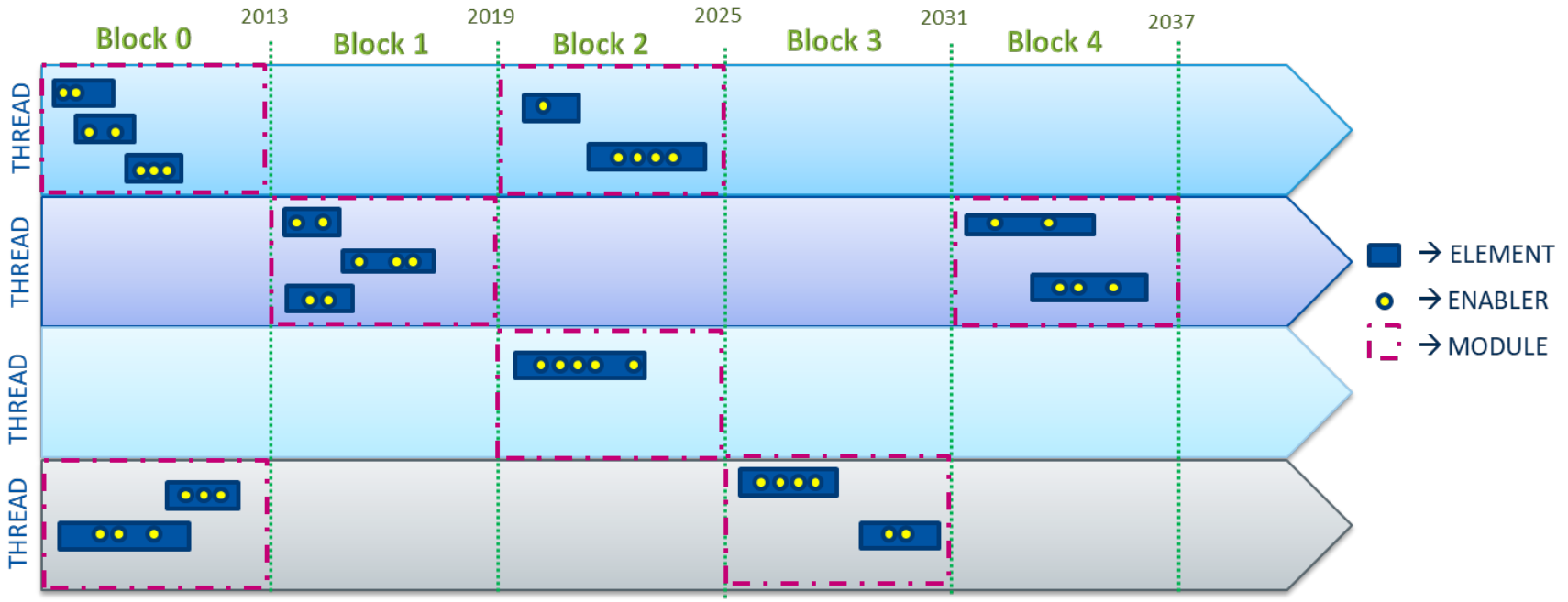
Doc 9750 Global Air Navigation Plan

Performance Improvement Areas (PIA) 1: Airport Operations

Operational Thread: ACDM

https://www4.icao.int/ganpportal

Aviation System Block Upgrades (ASBU) Framework



https://www4.icao.int/ganpportal/

Aerodrome Design and Operations Panel
A-CDM Drafting Group

- Created on 2014 (AP/3) to advance ADOP Job Card 017
- Participation of experts from China, France, Germany, Japan, UAE, USA, Sweden, ACI, CANSO, IATA and EUROCONTROL

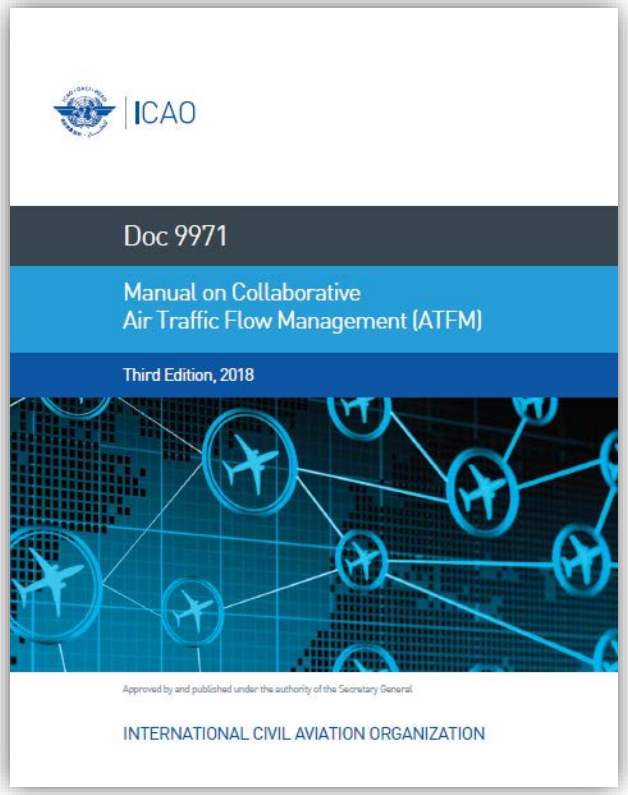
Title	Enhance airport capacity by promoting A-CDM	**Reference:**	ADOP.017.02
Source	ADOP/1		
Problem Statement	As growth in air traffic increases, airport capacity will be a significant constraining factor and such initiatives as A-CDM will play an important part in helping to utilize current capacity more effectively.		
Specific Details (including impact statements)	The use of airport collaborative decision making (A-CDM) between different partners in aviation (airports, ANSPs, aircraft operators and ground handlers, etc.) ensures coordinated effort to increase efficiency and capacity at airports. The end result of this "punctuality management" enables the turnaround process of a flight at an aerodrome to be as efficient and predictable as possible through the sharing of operations data and coordination of various service activities at airports including those in the terminal buildings (facilitation/security). Some airports at certain parts of the world are already fully or partly implementing A-CDM. Provisions need to be developed on a global basis to harmonize different approaches.		
Expected Benefit	Maximization of existing airport capacity; Reduction in apron and taxiway congestion and delays at airports; Reduced cost for airlines. Environmental gains in terms of reduction in emissions; Passenger experience improved through more accurate and timely information delivered to passenger displays and service desks.		
Reference Documents	ASBU B0-ACDM B1-ACDM,		Attachments
Primary Expert Group:	ADOP		

COMPLETED

WPE No.	Document affected	Description of Amendment proposal or Action	Supporting Expert Group	Expected dates: Expert Group	Effective	Applicability
1 3 142	PANS-ATM/OPS/Aerodromes.	Develop provisions to support A-CDM in PANS-ATM/OPS/Aerodromes.	PASG/ ATMOPSP /FLTOPSP	Dec 2016		Q4/2018
61 245	Doc 9971	Develop guidance material to support A-CDM. New/updated guidance in appropriate manuals.	PASG/ ATMOPSP /FLTOPSP	Dec 2016		
		Take into consideration facilitation and security procedures for better integration of airside/landside. Possible provisions in Annexes 9, 17 and/or related documents	ATB Panels (FALP and AVSECP)	Dec 2018	Q3/2020	Q4/2020

Initial Issue Date: 17 June 2015	Date approved by ANC: 18 February 2016	Session/Meeting: 201-8

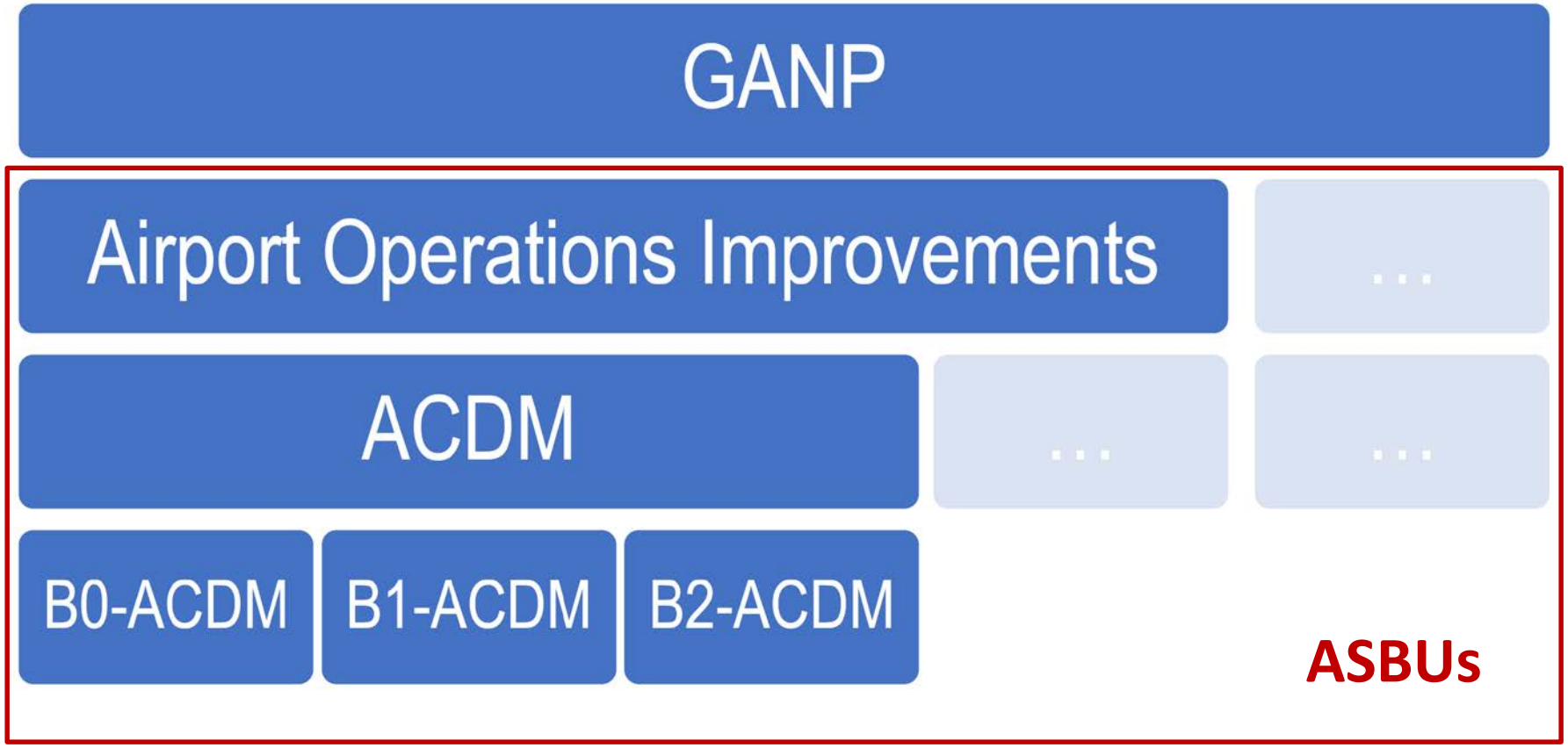
ICAO A-CDM Guidance Material



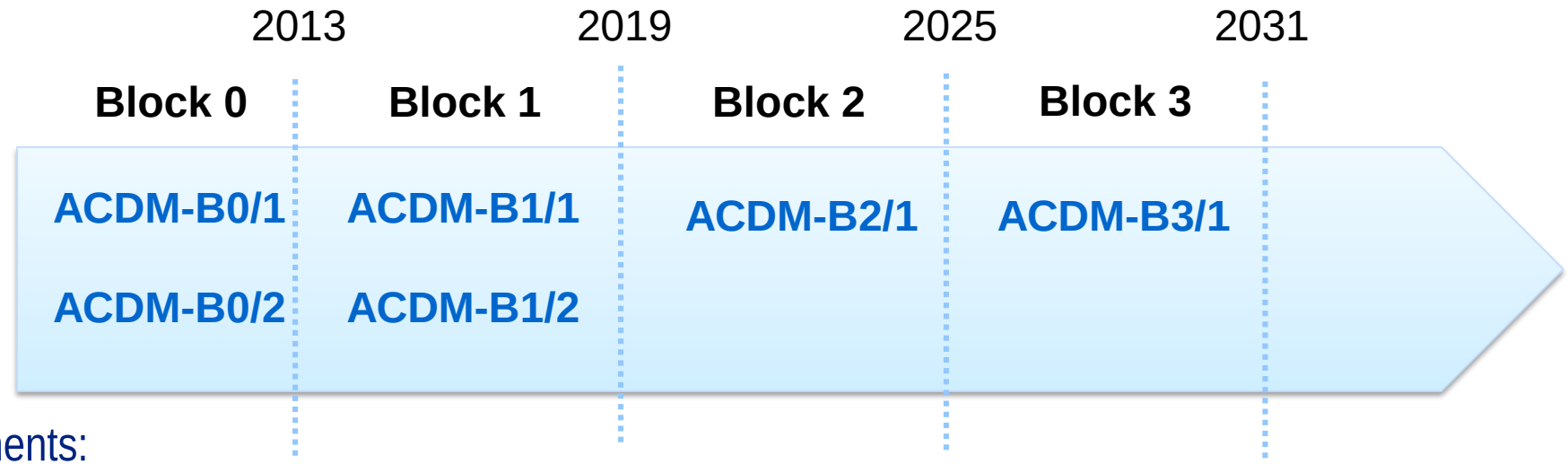
- Guidance material included in Part III of Doc 9971 *Manual on Collaborative Air Traffic Flow Management*
- Strong operational focus
- Lessons learnt and best practices
- Project management approach to implementation

Who? / What? / When? / How?

Airport CDM in the Global ICAO context



Operational Thread - ACDM



ASBU Elements:

- ACDM-B0/1 Airport CDM Information Sharing (ACIS)
- ACDM-B0/2 Integration with ATM Network function
- ACDM-B1/1 Airport Operations Plan (AOP)
- ACDM-B1/2 Airport Operations Centre (APOC)
- ACDM-B2/1 Total Airport Management (TAM)
- ACDM-B3/1 Full integration of ACDM and TAM in TBO

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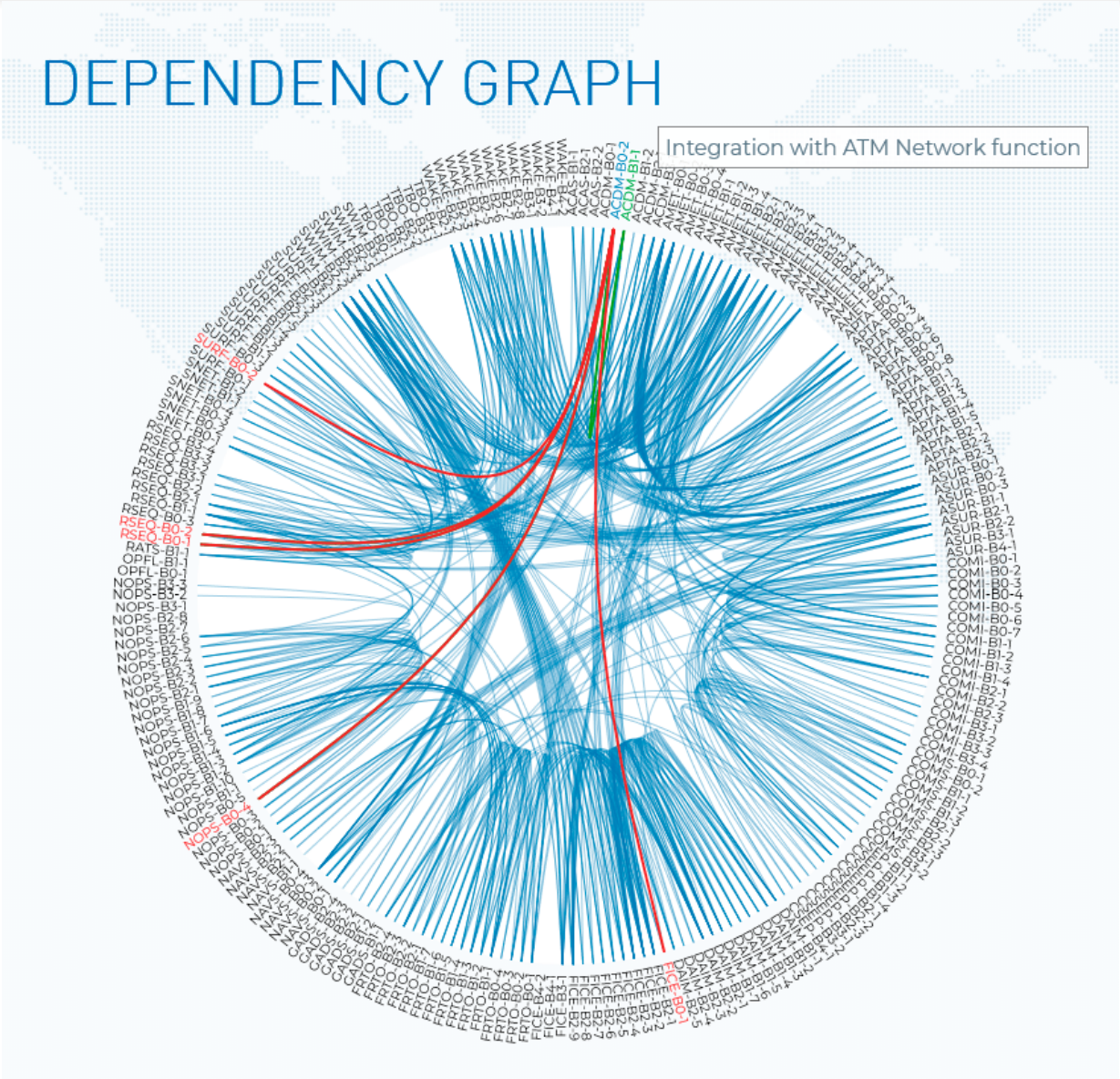
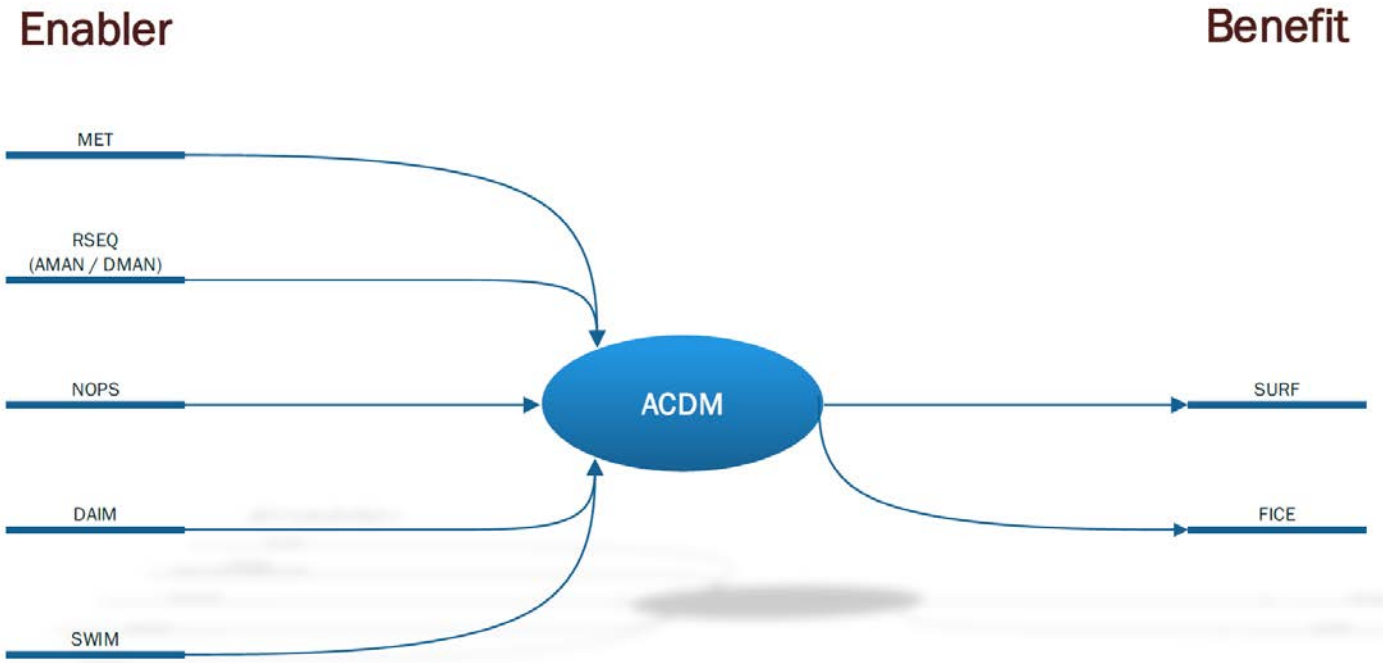
A-CDM in context



A-CDM is not

- Managing the arrival or departure sequencing: That's an ATM function
  - Runway SEQuencing ASBU
  - A-CDM function is a collaborator
- Managing the Surface routings on controlled surfaces
  - ATM function
  - SURF ASBU
- Managing the efficiency of the ATM environment
  - ATM function
  - NOPS (and beyond) ASBU



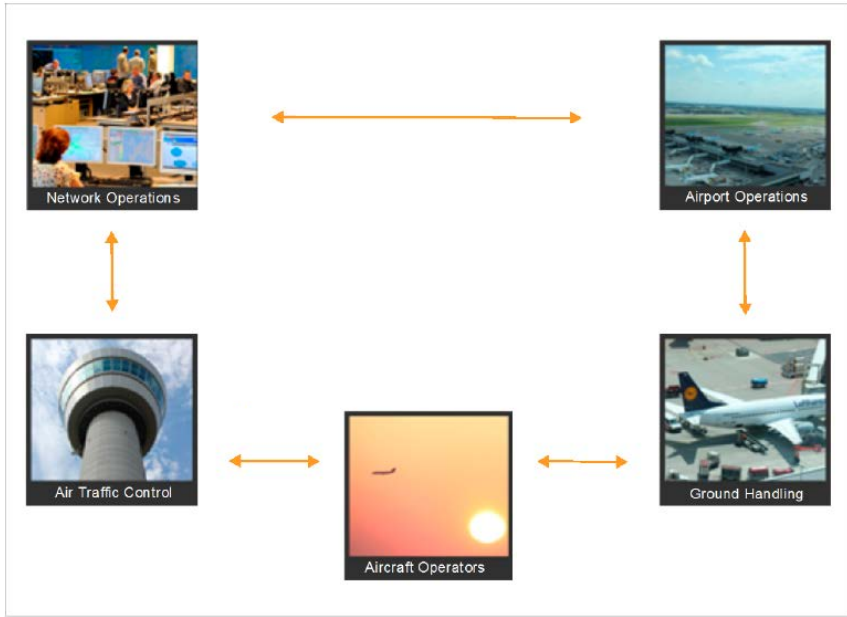
What is A-CDM

- Collaborative decision-making (CDM) is defined as a process focused on how to decide on a course of action articulated between two or more community members. Through this process, ATM community members share information related to that decision and agree on and apply the decision-making approach and principles.
- A-CDM is a set of processes developed from the general philosophy of CDM in aviation and is applied to the operations at aerodromes.

A-CDM is scalable and modular

Purpose of A-CDM

- The main objective is to generate a common situational awareness that will foster improved decision-making.
- A-CDM allows aerodromes, aircraft operators, air traffic controllers, ground handling agents, pilots and air traffic flow managers to exchange operational information and work together to efficiently manage operations at aerodromes.

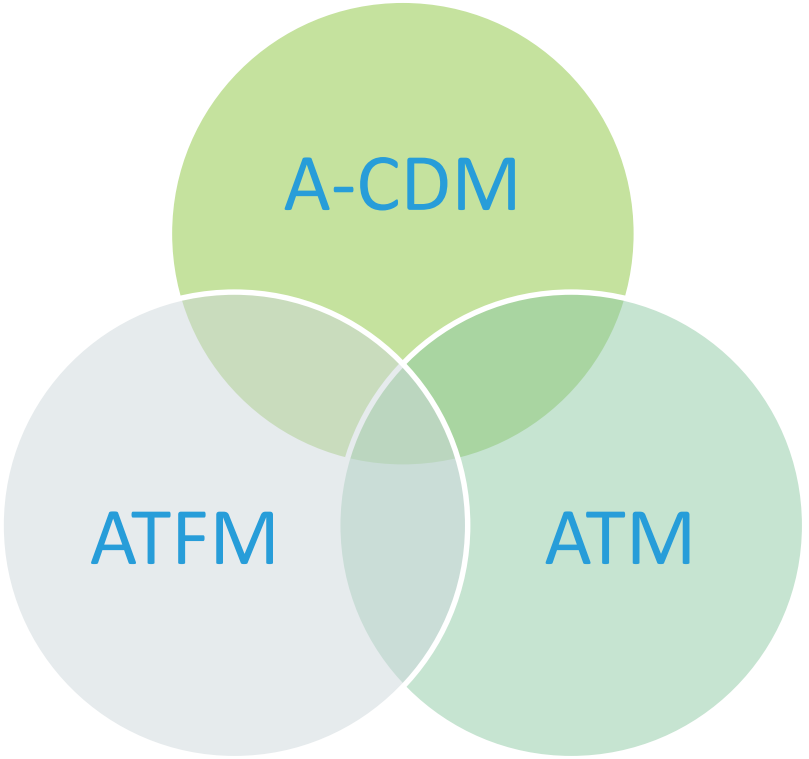


Objectives of A-CDM

- Predictability
- On-time performance
- Use of infrastructure
- Apron and Taxiway congestion

Integration

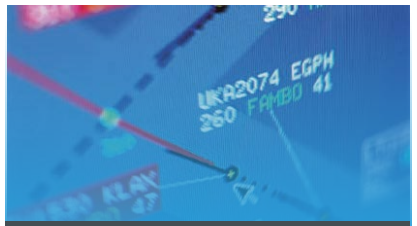
- Airport centered
- No need for any major structure
- Local project before anything else
- Can be integrated to ATM in general, and ATFM in particular (not compulsory)
- Further benefits in a SWIM environment



ACDM Regular and irregular operational activities

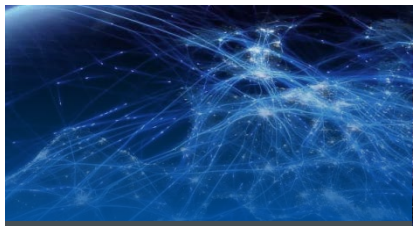
- *Regular operations*
- *Irregular operations*
  - *planned*
  - *unplanned*

ACDM Benefits



Safety

Indirect benefits for safety, providing for an overall improvement in the quality of services delivered



Efficiency

Efficient and optimized use of resource

Environment

Reduced taxi time; reduced fuel and carbon emission; and lower aircraft engine run time.

Capacity

Enhanced use of existing infrastructure of gate and stands.
Reduced workload.

ICAO GANP KPIs related to ACDM

- Departure Punctuality
- Taxi-out additional time
- ATFM slot adherence
- Airport peak capacity
- Airport peak throughput
- Taxi-in additional time

MID Air Navigation Plan (eANP), Vol II

PART II – Aerodromes / Aerodrome Operations (AOP)

2. General Regional Requirements

Aerodrome capacity management

2.13 When international aerodromes are reaching designed operational capacity, a better and more efficient utilization of existing runways, taxiways and aprons is required. Runway selection procedures and standard taxi routes at aerodromes should ensure an optimum flow of air traffic with a minimum of delay and a maximum use of available capacity. They should also, if possible, take account of the need to keep taxiing times for arriving and departing aircraft as well as apron occupancy time to a minimum. The airport collaborative decision making (A-CDM) concept should be implemented to improve airport capacity as early as possible.

https://www.icao.int/MID

MID Air Navigation Plan (eANP), Vol III

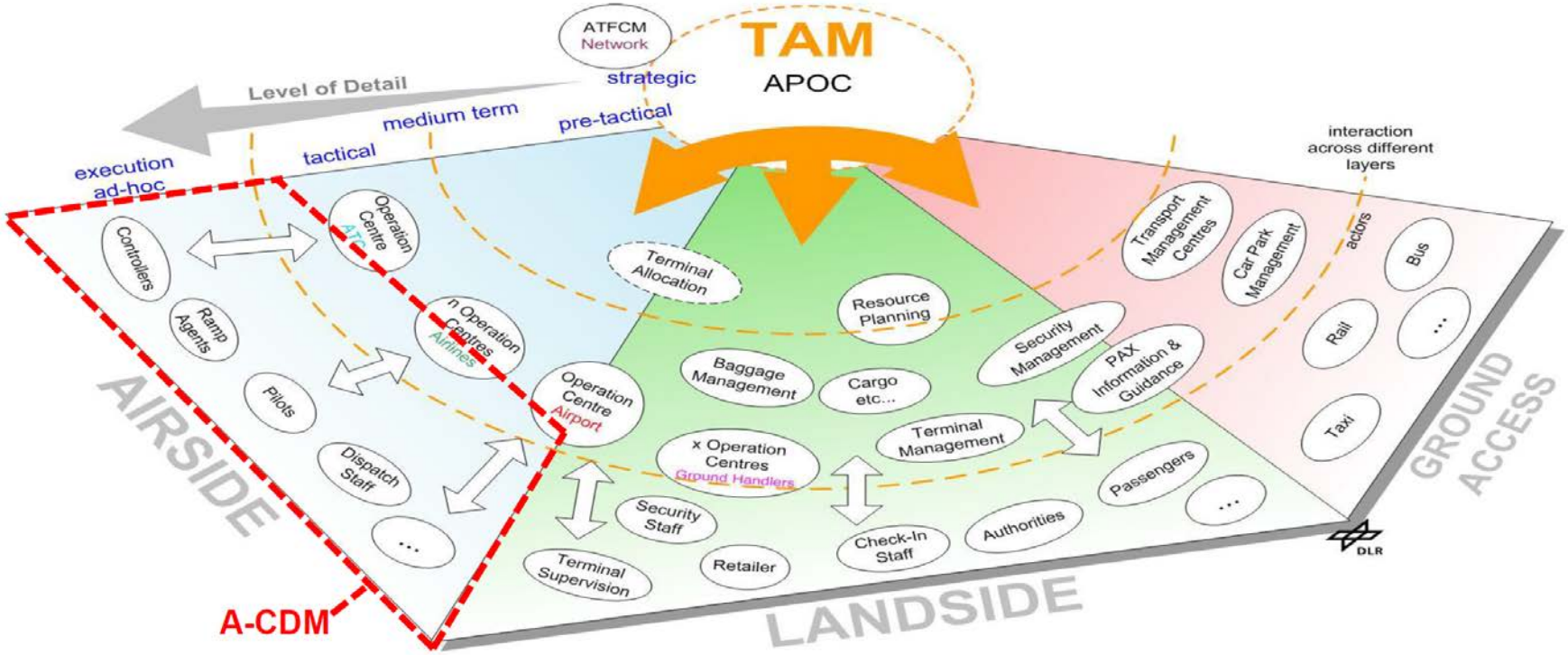
State	Aerodrome Location Indicator	ACDM IMPLEMENTATIOM ELEMENTS							
		Fundamental ACDM Elements		Other ACDM Elements				Action Plan	Remarks
		Information Sharing	Milestones Approach	Variable Taxi Time	Collaborative Management of Flight Updates	Collaborative Pre-departure Sequence	ACDM in Adverse Conditions		
1	2	3	4	5	6	7	8	9	10
Bahrain	OBBI								
Egypt	HECA								
Iran	OIII								
Kuwait	OKBK								
Oman	OOMS								
Qatar	OTBD								
	OTHH								
Saudi Arabia	OEJN								
	OERK								
UAE	OMDB								
	OMAA								

Total Airport Management (TAM)

- The Total Airport Management (TAM) concept was discussed with industry during the **Second Global Air Navigation Industry Symposium (GANIS/2).**
- While A-CDM is mainly focused on airside operations, TAM is an overarching concept for planning, coordinating and connecting airside and landside processes (such as security and border control etc.), as well as for integration of these processes with the wider ATM network, all of which influence airport capacity, and efficiency and predictability of operations.
- Include concept of:
  - airport operations plan (AOP);
  - airport operations centre (APOC).

https://www.icao.int/Meetings/GANIS-SANIS

TAM - Top-Level Operations Management



GANIS2-Airport > Panel TAM

https://www.icao.int/Meetings/GANIS-SANIS

Thank you for your Attention

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A-CDM IMPLEMENTATION BENEFITS AND CHALLENGES!

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A-CDM Implementation Workshop

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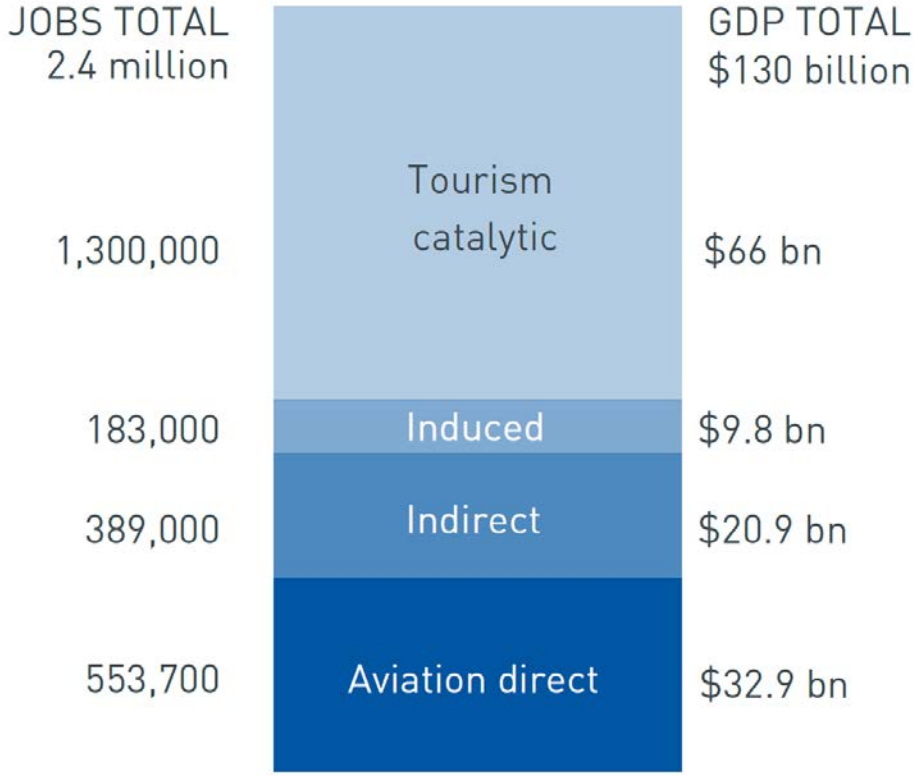
Benefits of Aviation in the MID Region

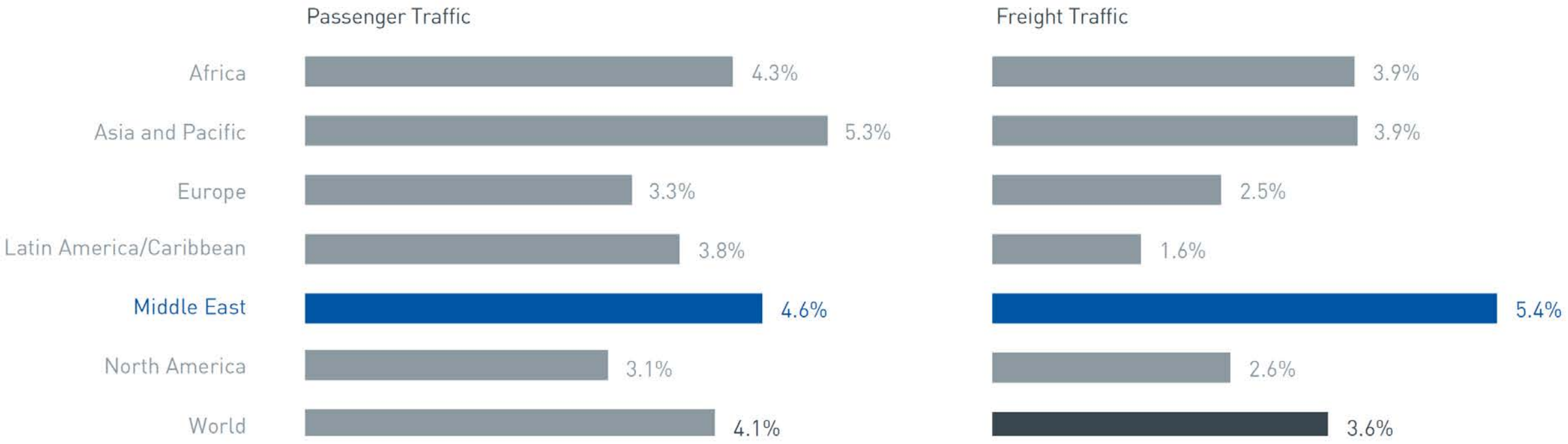
According to ICAO long-term traffic forecasts, total **passenger traffic** of the Middle East region is expected to grow by **around 4.6 per cent annually up to 2045, the second fastest growth** among all regions after Asia and Pacific. The Middle East is expected to be the **fastest growing region in terms of freight traffic growth**, and is projected to grow at **5.4 per cent annually up to 2045**.

Total jobs and GDP supported by aviation in the Middle East, 2016



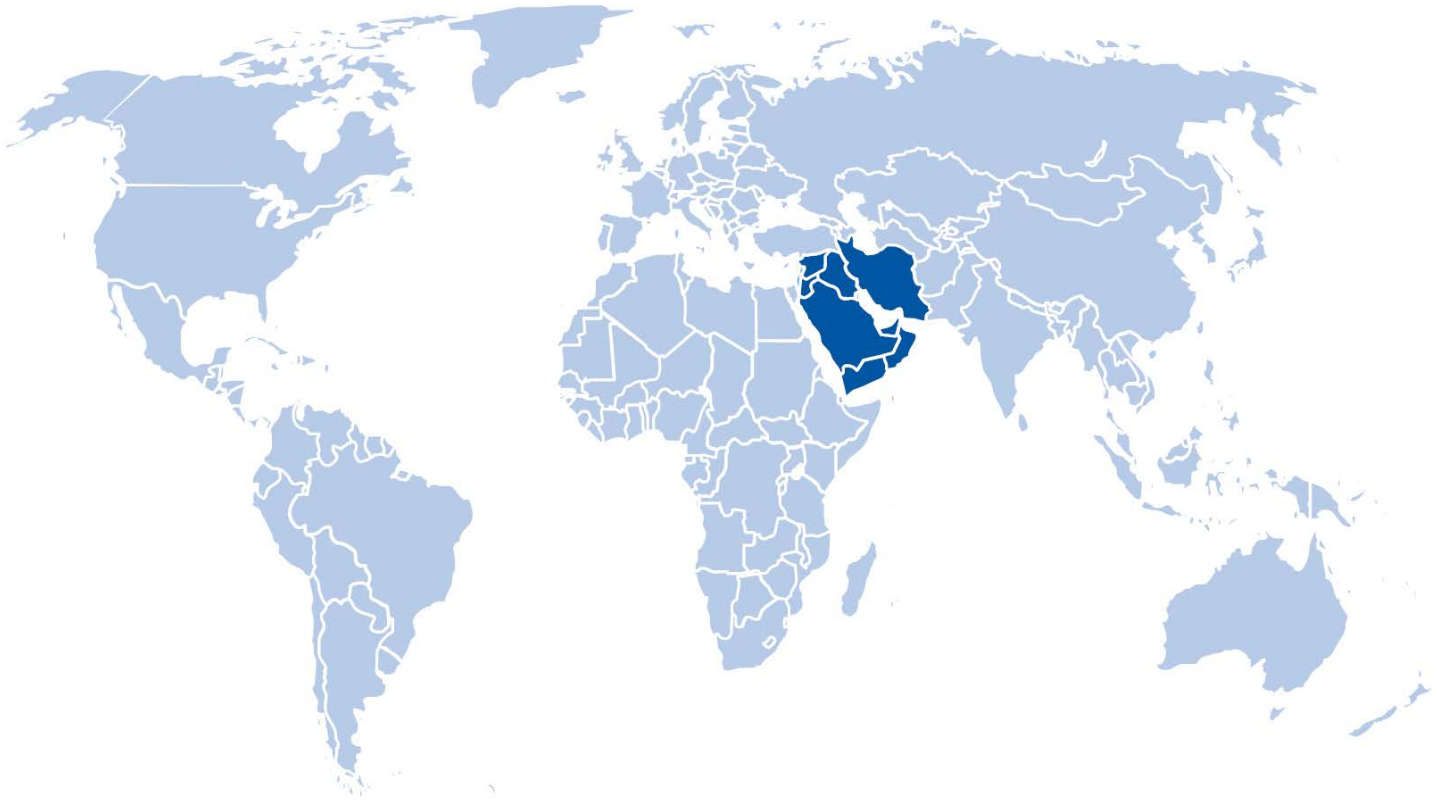
*Source: **Aviation Benefits 2019** (https://www.icao.int/sustainability/Pages/IHLG.aspx)*

Projected annual growth of total passenger and freight traffic by region up to 2045



Source: ***Aviation Benefits 2019*** *(https://www.icao.int/sustainability/Pages/IHLG.aspx)*

Challenges of Aviation in the MID Region



The growth of air transport requires a high-performing aviation system including airlines, airports and ATM.

The overall efficiency of the ATM system commensurate with the level of predicted traffic growth should be increased through improved airspace design and organization.

Moreover, individual developments in ATM and airspace capacity are **not enough: harmonization, integration and collaboration among aviation stakeholders is essential to realize the full potential of national projects.**

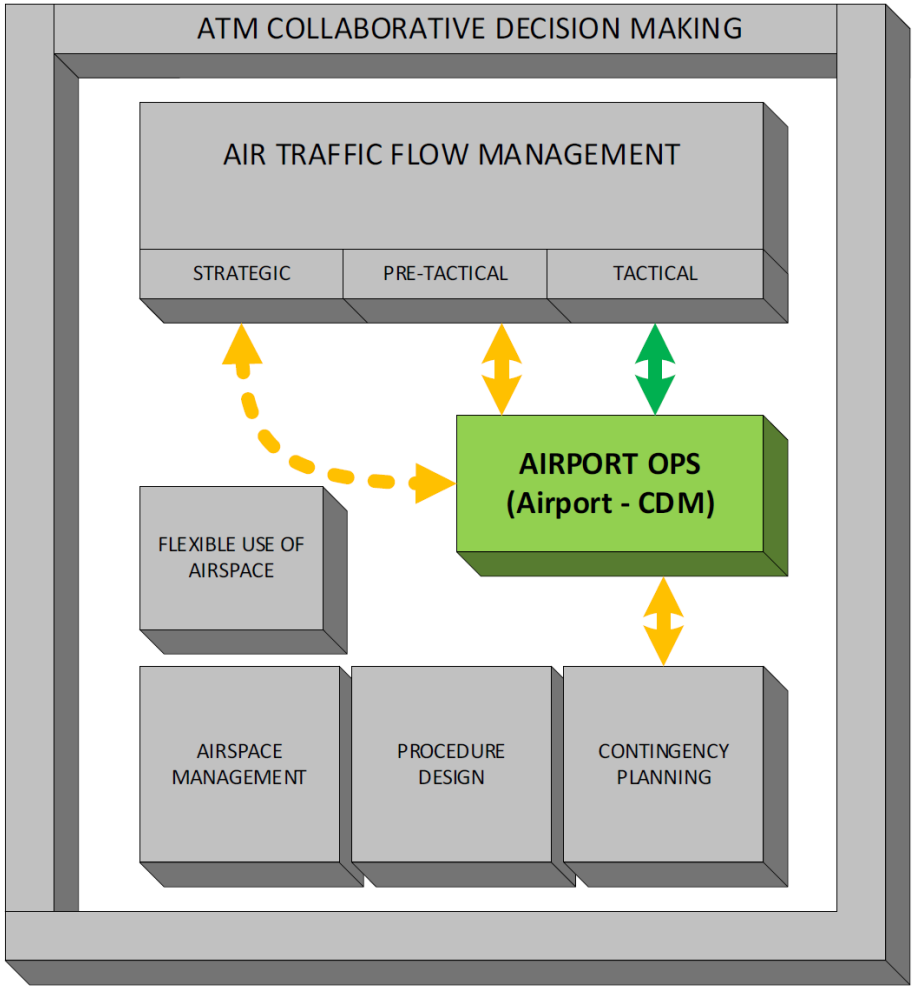
Source: ***Aviation Benefits 2019*** *(https://www.icao.int/sustainability/Pages/IHLG.aspx)*

A-CDM Implementation Benefits

Airport CDM is a part of the broader Collaborative Decision Making

- Main focus:
  - managing the turnaround of the aircraft
  - fully transparent way
  - Provides service improvements in all related domains

- Stakeholders can leverage benefits beyond the ATM domain



A-CDM Implementation Benefits

- Lack of common awareness
- Conflicting goals
- Coordination between Stakeholders

A-CDM Implementation Benefits

- Improving operational efficiency and performance for all partners by sharing and exchanging of accurate, timely and usable airport data
  - Requires cultural change to support new procedures and processes

A-CDM Implementation Challenges

Planning and implementation of an A-CDM project

- Define Objectives
  - Safety
  - Efficiency
  - Capacity
  - Environment
  - Accessibility
  - Security (?)
- Define Scope
  - How far do we interact (ACC, APP, TWR? Gate? Beyond?)
  - A-CDM operations :
    How long? Permanent? Need-to-have basis?

A-CDM Implementation Challenges

Planning and implementation of an A-CDM project

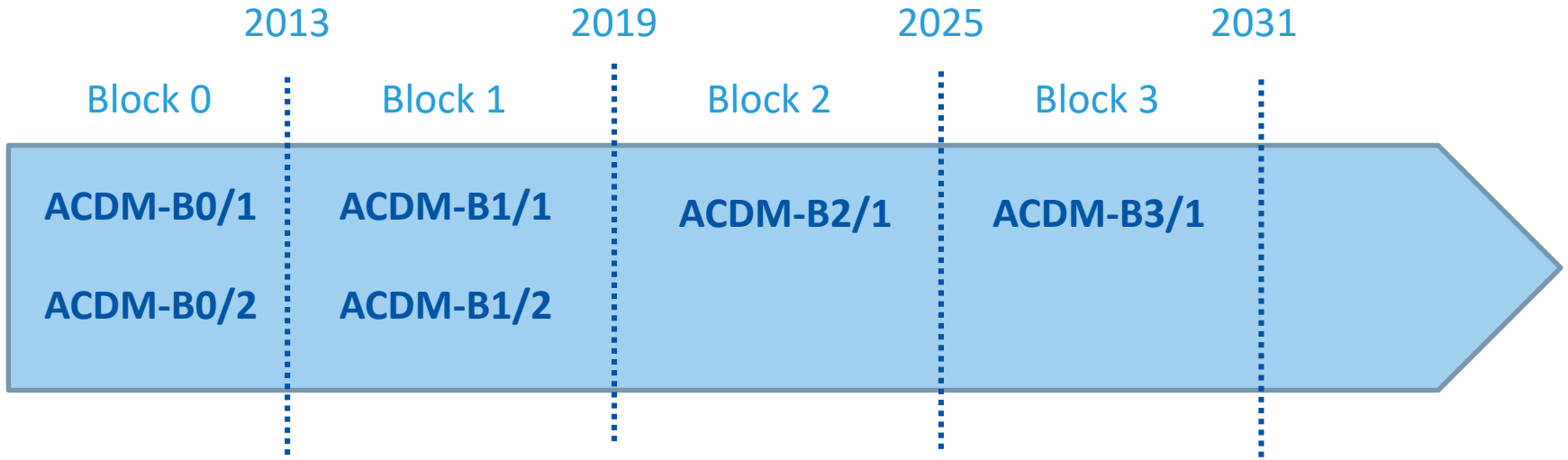
- Objectives
  - Understand A-CDM correctly
  - Create a collaborative environment between industry partners for implementation
  - Overview of implementation strategies
  - How will we measure progress?

- Questions
  - Where do we implement?
  - Who leads the process at each airport?
  - How to measure the implementation?
  - Who will validate if an airport have an A-CDM process in place?

International Events impact on Airports!

Thank you for your Attention

Sixth edition of the GANP
Operational thread - ACDM



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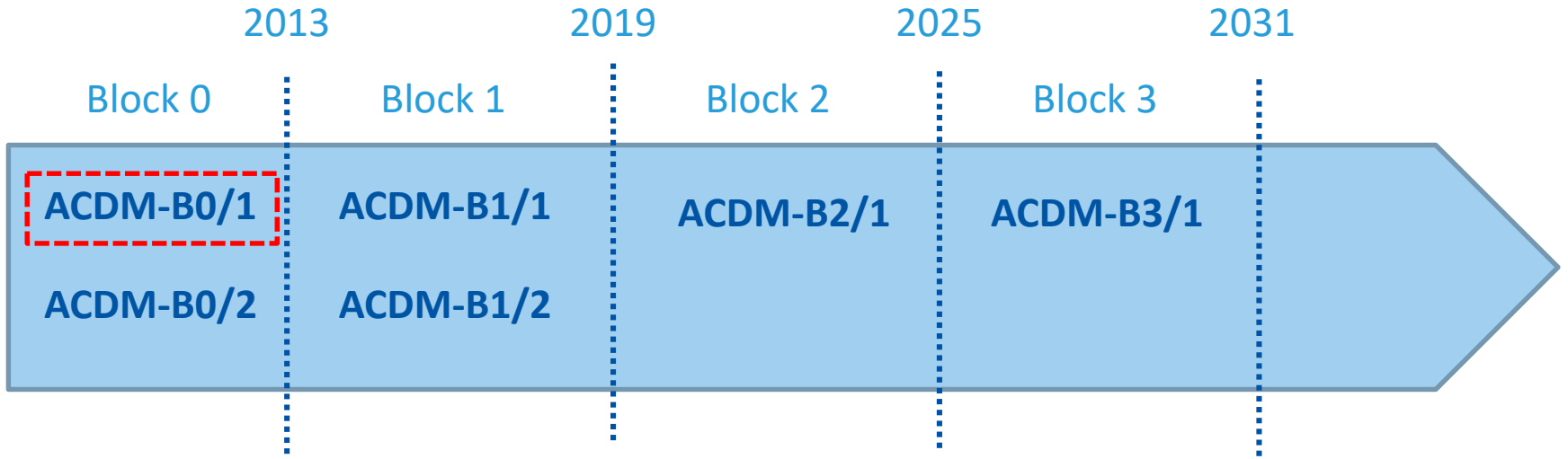
Sixth edition of the GANP
Operational thread - ACDM

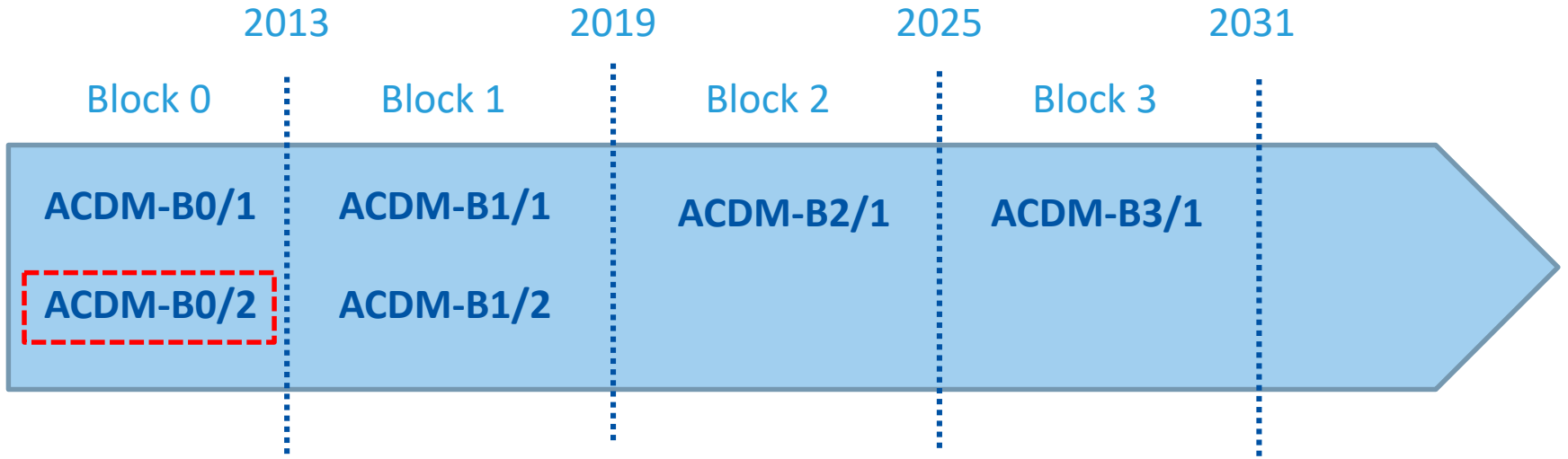


Airport CDM Information Sharing (ACIS)

Ready for implementation

First collaboration step among stakeholders involved in aerodrome operations. It consists in the definition of common specific milestones for several flight events taking place during surface operations. The stakeholders involved have to, based on accurate operational data, achieve the agreed milestones.

Sixth edition of the GANP
Operational thread - ACDM

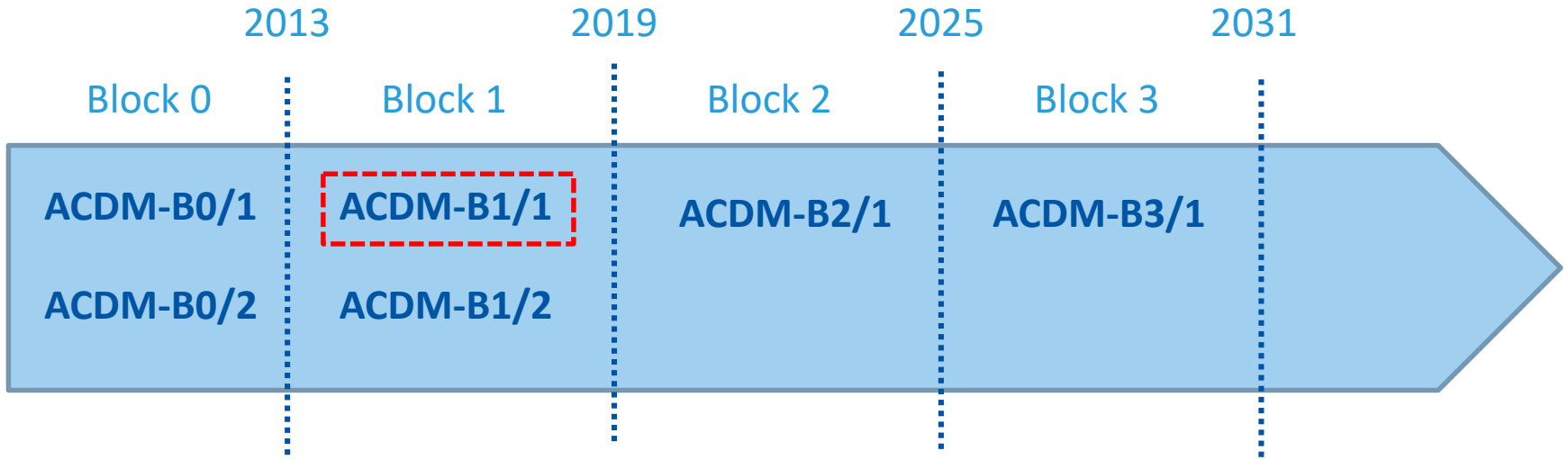


Integration with ATM Network function

Ready for implementation

Feeding arrival information from the network into A-CDM and, at the same time, coordinate specific departure milestones. The involved stakeholders have to, based on accurate operational data, achieve the agreed milestones.

Sixth edition of the GANP
Operational thread - ACDM

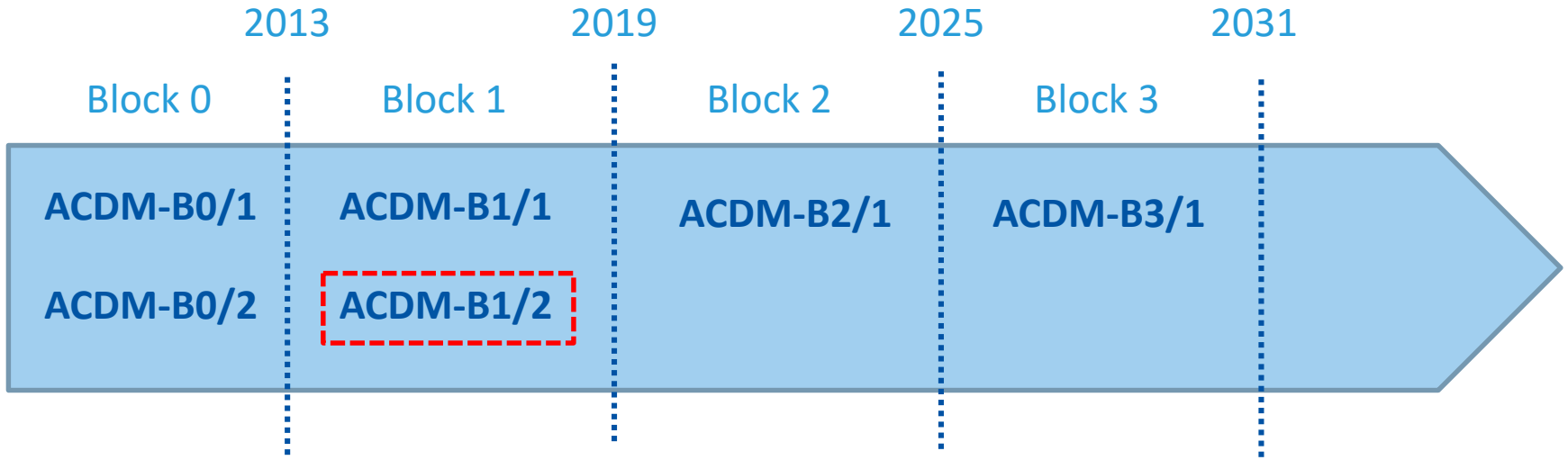


Airport Operations Plan (AOP)

Standardization

Collaborative airport operations plan which encompasses "local" airport information and shared information with the ATM network in order to develop a synchronized view for the integration of local airport operations as well as aircraft operations into the overall ATM network.

Sixth edition of the GANP
Operational thread - ACDM

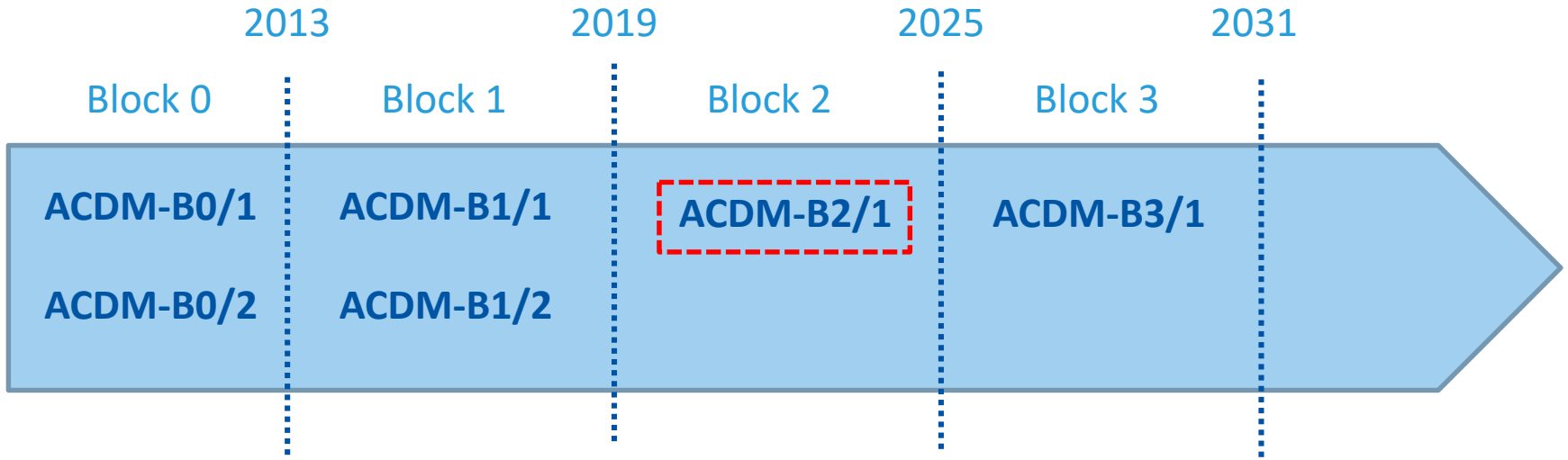


Airport Operations Centre (APOC)

Standardization

The APOC will bring stakeholders together (team) enabling them to better communicate and coordinate, to develop and dynamically maintain joint plans which are executed in their respective areas of responsibility at the airport.

Sixth edition of the GANP
Operational thread - ACDM

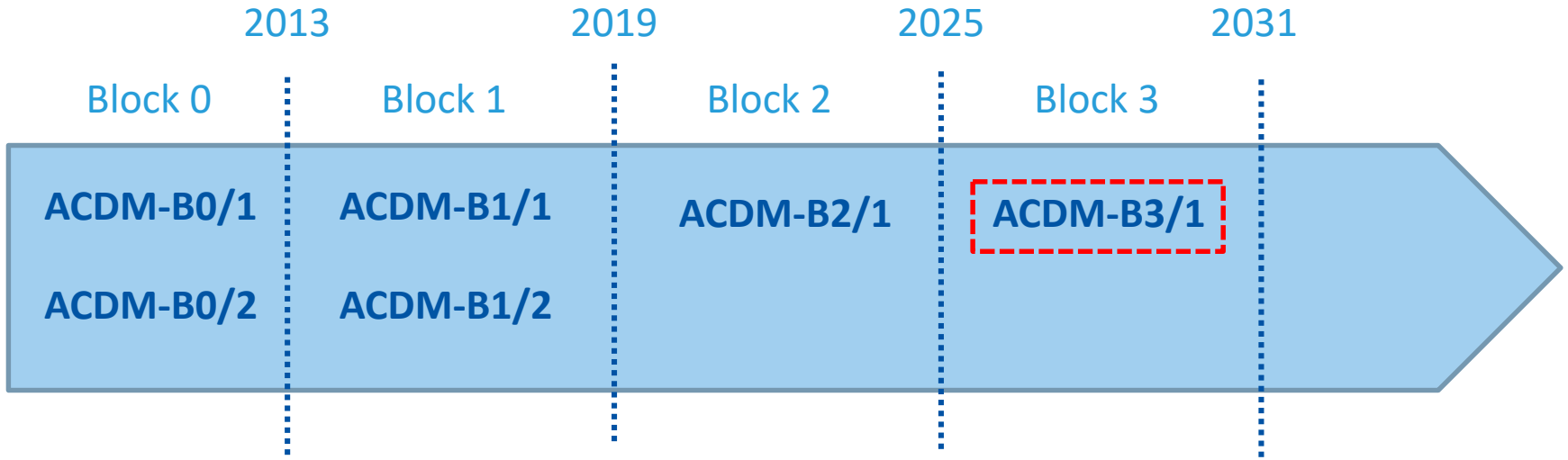


Total Airport Management (TAM)

Validation

Enhancement of the APOC with integration of the landside management aspects to support further improvement of the efficiency of the overall airport operation including passenger management. This will be achieved using the shared information and capabilities of the AOP, APOC and landside management thereby ensuring a coherent overall airport performance monitoring, decision making and steering process, addressing all phases of operations (strategic planning, through operation to post operations).

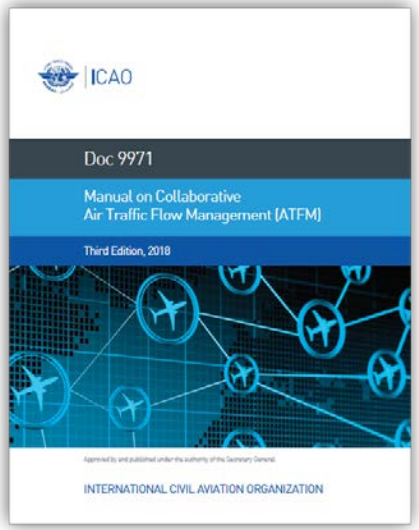
Sixth edition of the GANP
Operational thread - ACDM



Full integration of ACDM and TAM in TBO

Concept

All stakeholders are fully connected. All tactical decisions are fully synchronized and operations are fully trajectory-based. Aerodrome operations are considering the en-route to en-route view with the turnaround process, agree on, and subsequently manage the flights on the surface, to deliver expected surface event times with known impacts to the ATM system, and to ensure that the agreed trajectory is consistent with the AOP.

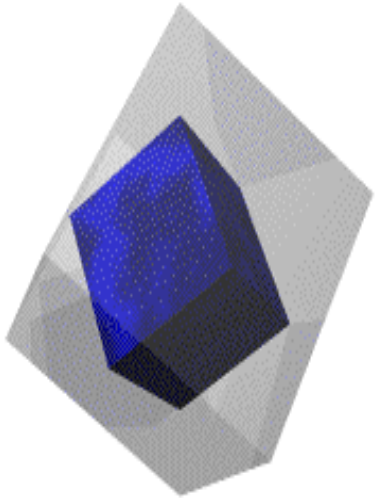


Doc 9971
Manual on Collaborative Air Traffic Flow Management
-
PART III outline

Chapter I

Description / purpose A-CDM

- A-CDM : subset of CDM
- Information sharing
- Link with ATFM
- Regular and Irregular operations
- Benefits for each player



Chapter II

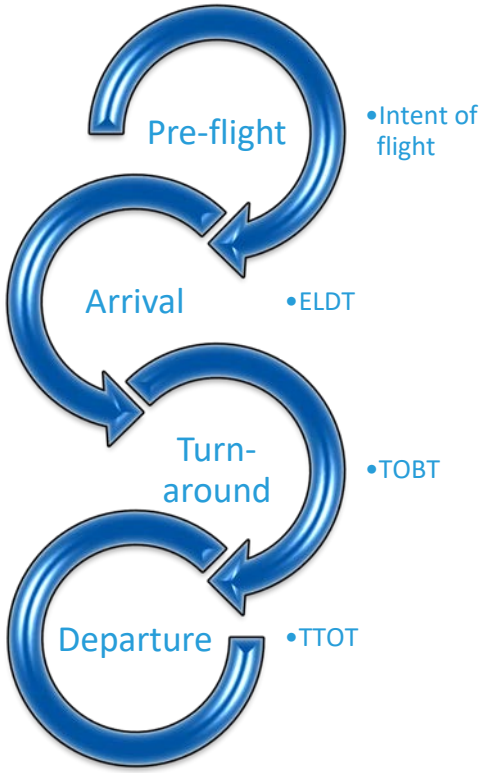
A-CDM Actors and Stakeholders

– Actors : Systematic involvement
– Stakeholders : occasional involvement

Chapter III

Methods and Tools

- Timeline (Key moments / Priorities)
- Roles and Responsibilities
- Information in A-CDM operation
  - Maintaining flow and accuracy
  - Data quality control



Chapter III

Methods & tools

- ACDM Elements
  - Variable taxi time
  - Departure Management
  - Turn-around processes, …
- Measure activity, KPI

Chapter IV

Implementation

- Implementation Roadmap
- Best practices
- Successful examples

Thank you for your Attention