



International Civil Aviation Organization

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Collaborative Decision Making (CDM)

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Objective

- **Introduce the steps for the application of the CDM concept.**



Overview

- **The need**
- **What is CDM**
- **Requirements**
- **Articulating a CDM process**
- **Development and operation**
- **Benefits**

The need

Global ATM Operational Concept

- evolution to a holistic, cooperative and collaborative decision-making environment
- expectations of the members of the ATM community would be balanced to achieve the best outcome based on equity and access.



The need

- Come to an agreed vision on the expected results
- Ensure that everyone delivers their part of (their contribution to) the required performance
- Ensure that everyone uses a compatible approach, method and terminology
- Ensure that everyone's data can be integrated and aggregated to calculate overall indicators and assess system performance at a higher aggregation level.

What is CDM?

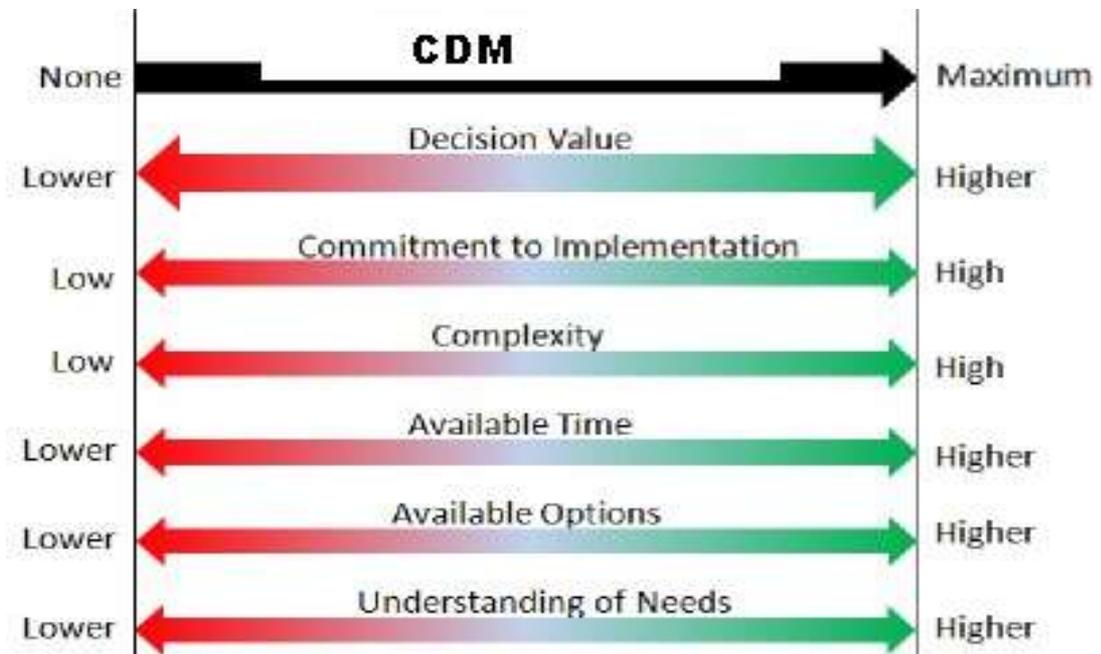
- A supporting process always applied to other activities such as Demand/Capacity Balancing
- It is not an objective but a way to reach the performance objectives of the processes it supports
- Allows all members of the ATM community to participate in ATM decisions that affect them
- Any member can propose a solution

What is CDM?

- Is not limited to any specific domain such as airport or En Route
- May apply to all layers of decision from longer-term planning activities through to real-time operations
- Requires pre-defined and agreed procedures and rules to ensure that collaborative decisions will be made expeditiously and equitably.

What is CDM?

- Increase level of collaboration when commitment to implementation or understanding of needs has to be high.
- High decision value and complexity are clear pointers toward more collaboration.



ATM Requirements

- Ensure that airspace users are included in all aspects of airspace management via the **collaborative decision making** process [R15]
- Manage all airspace, and where necessary, be responsible for amending priorities relating to access and equity that may have been established for particular volumes of airspace. Where such authority is exercised, it shall be subject to rules or procedures established through **collaborative decision making** [R18]

ATM Requirements

- Establish a **collaborative** process to allow for efficient management of the air traffic flow through use of information on system wide air traffic flow, weather, and assets [R112]
- Modify the airspace user's preferred trajectory: when required to achieve overall ATM system performance requirements; and/or **collaboratively** with the airspace user, in a manner that recognizes the airspace user's need for single-flight efficiencies [R203].

Articulating a CDM PROCESS

Identification of:

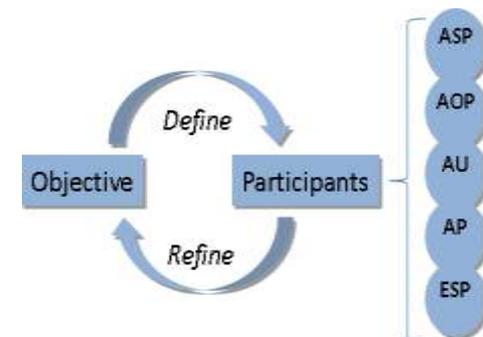
Actors – who is participating in the collaboration?

Roles & responsibilities – what functions do the actors perform and how do they interact?

Information requirements – description of requirements and standards imposed on information exchanged as part of the above interactions

Making the Decision – how is a decision made?

Rules – what are some rules constraining the behavior?



Development and operation of a CDM

Follows the following typical phases:

- CDM need identification
- CDM analysis
- CDM specification and verification
- CDM Performance Case
- CDM Implementation and validation
- CDM operation, maintenance and improvement (continuous)

CDM need identification

- Ability to influence performance in all 11 KPA
- Provides a mechanism specifically well-suited to addressing **Access and Equity** and **Participation by the ATM Community** frequently difficult to quantify.

CDM analysis

- Should make clear what decisions are to be made
- Which community members are involved (or affected)
- Which information is used in support of taking the decision(s)
- Which process(es) are followed
- How and through which means the decision making process can be improved and
- How such an improvement could contribute to a better performance.

CDM specification and verification

- The decisions to be taken, how they are reached and finalized
- The community members involved and their roles/responsibilities in the decision(s)
- Agreement on objectives (e.g., resolve congestion while minimizing impact to my operation)
- Decision making rules, processes and principles
- Information requirements including data standards, quality, frequency and deadlines.

- Justify the decision to implement the CDM process and to make the necessary investments
- It should clearly specify what the costs are and the benefits (in the relevant KPA's) that will result from the operation of CDM.





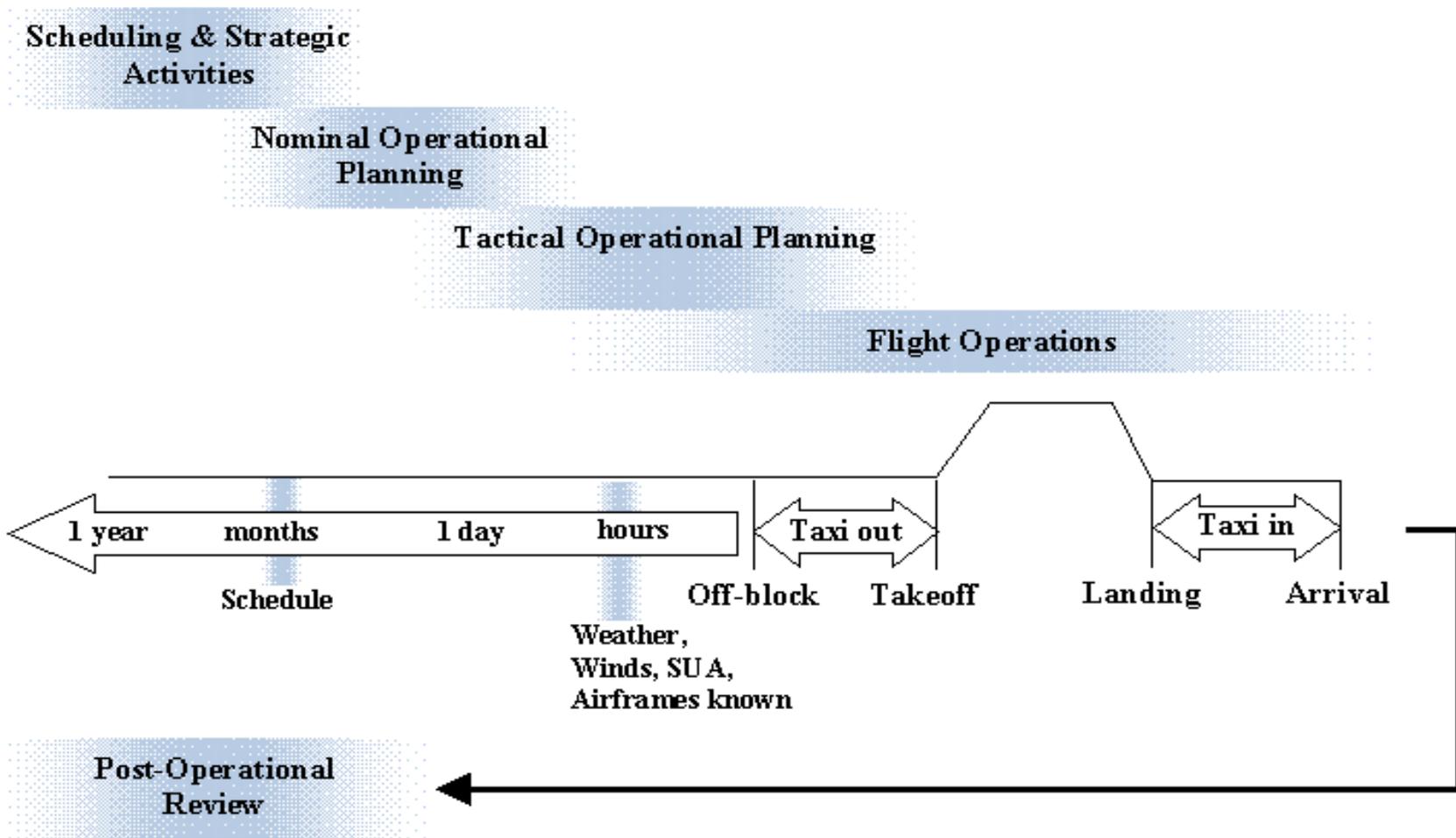
- Includes all steps to bring CDM into operation
- Includes training and informing staff
- Implementation/adaptation of systems and information networks, etc.

CDM operation, maintenance and improvement



- Continuous and shared review, maintenance and improvement process.

Areas of application



References

- *Global ATM Operational Concept*, ICAO Doc. 9854, 1st Edition 2005
- *Manual on Air Traffic Management System Requirements*, ICAO Doc. 9882, 1st Edition 2007
- *Manual on Global Performance of the Air Navigation System, Part I – Global Performance and Part II- Performance-Based Transition Guidelines*, ICAO Doc. 9883, 1st Edition 2008
- *Manual on Flight and Flow Information for a Collaborative Environment (FF-ICE)*, ICAO Doc 9965
- *CDM Manual (under review)*

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