The AIRPORT CDM

Bahrain 11-13 October 2015

Airport CDM – a definition……

Airport CDM is a proven concept which aims at improving predictability, reducing delays, optimally utilizing the available capacities and operational resources at the airport by increasing the efficiency of the individual steps of the turn-round process.

- Implementation of Airport CDM allows each Airport CDM Partner to optimize their decisions in collaboration with other Airport CDM Partners, by sharing accurate and timely information regarding preferences and constraints in a situation[A-CDM]

Objectives of Airport CDM

To:

- **Standardize** data exchange and integration
- **Understand** the “real” demand at an airport
- **Improve** predictability for all
- **Improve** situational awareness
- **Disseminate** timely and accurate airport surface operations information among partners in a standardized format

Objectives of Airport CDM – *contd*…

- **Improve** utilization of airport resources during off-nominal events, particularly diversion recovery
- **Archive** and store data to be readily available for post-operational retrieval and analysis by all Partners
- **Identify** measures and metrics which allow Partners to measure the efficiency of the airport surface operation
- **Improve** distribution and accuracy of weather reroutes during Severe Weather Avoidance Procedures (SWAP) events

Objectives of Airport CDM – *contd.*

- **Reduce** ground movement **costs**
- **Optimize/enhance** use of ground handling resources
- **Optimize/enhance** use of stands, gates and terminals
- **Optimize** the use of the airport infrastructure and reduce congestion
- **Reduce** ATFM slot wastage
- **Reduce** apron and taxiway congestion

Airport CDM Concept Elements

The Airport CDM concept defines six core elements that are based upon each other and so need to be implemented in sequentially…

Airport CDM Concept Elements

(Airport CDM) Information Sharing is essential in that it forms the foundation for all the other elements and must be implemented first.

5 **Collaborative Management of Flight Updates** enhances the quality of arrival and departure information exchanges between the Network Operations and the CDM airports.

4 **(CDM In) Adverse Conditions** achieves collaborative management of a CDM airport during periods of predicted or unpredicted reductions of capacity.

3 **(Collaborative) Pre-departure Sequence** establishes an off-block sequence taking into account operators preferences and operational constraints.

2 **Variable Taxi Time** is the key to predictability of accurate take-off in block times especially at complex airports.

1 **The Milestones Approach (Turn-Round Process)** aims to achieve common situational awareness by tracking the progress of a flight from the initial planning to the take off.

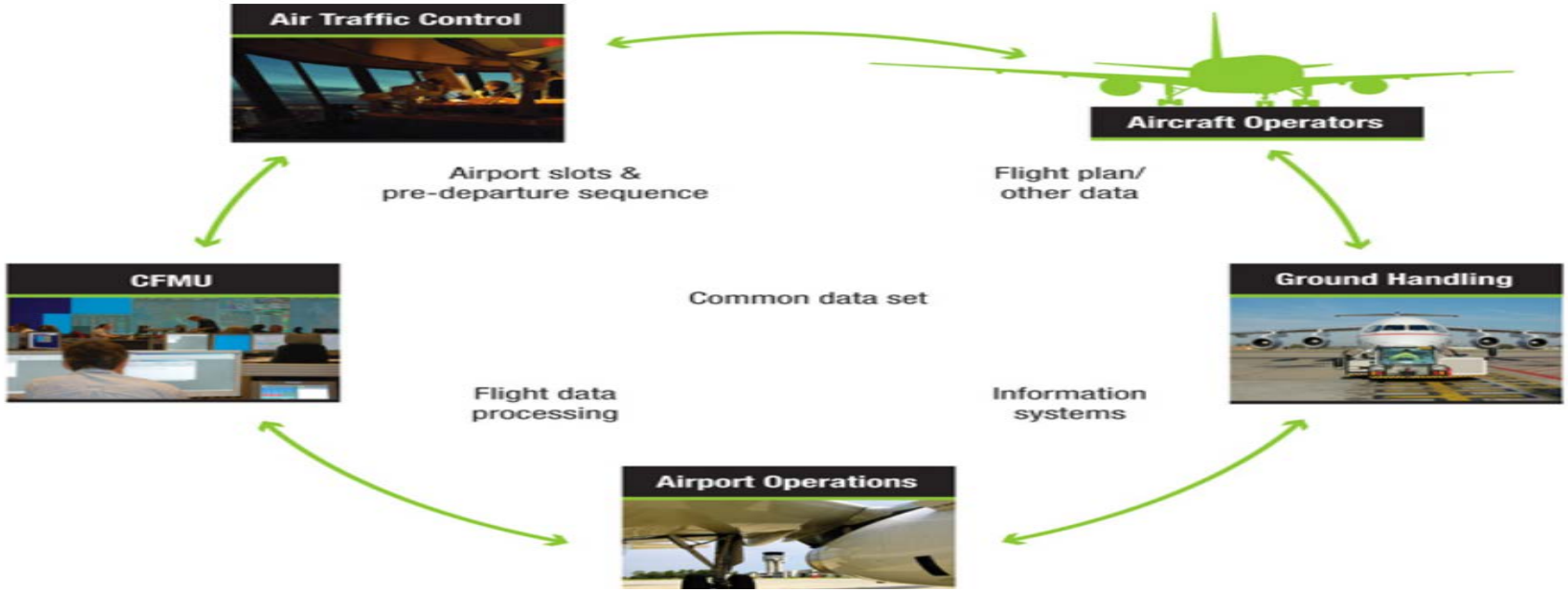
A-CDM

ACDM

Element 1: Information-sharing

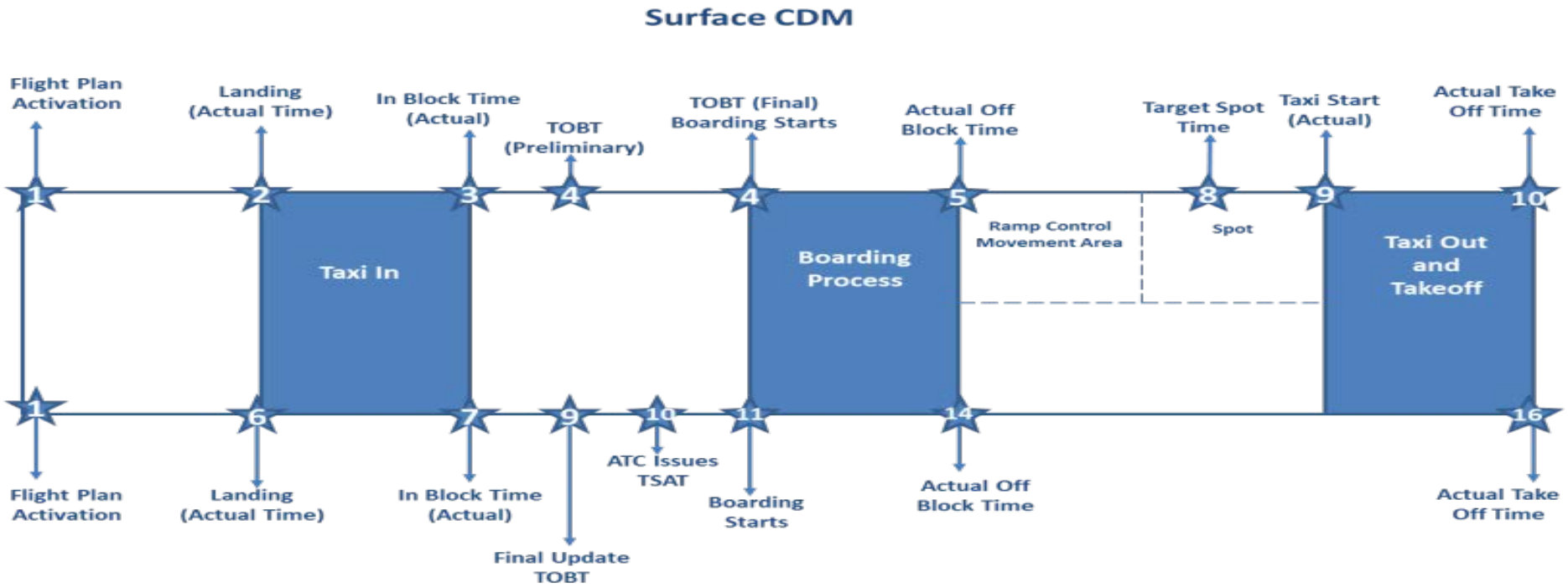
- Information-sharing is basic element that links partners together and forms the foundation for other A-CDM concept elements.
- A-CDM information-sharing underpins local decision-making by each of the partners and facilitates implementation of higher A-CDM elements by connecting processing systems and providing a single, common set of data to describe the status and intentions of each flight.

Airport CDM sharing of data



Element 2: The Milestone Approach

- The milestone approach element describes the progress of a flight from initial planning to take-off by defining milestones to track significant events.
- The A-CDM procedure links all milestones together and is the basis for the description of alerts, publication and necessary IT-system adaptations.
- The milestone approach combined with the information-sharing element is the foundation for all other concept elements


Surface CDM
Flight Plan Activation
Landing (Actual Time)
In Block Time (Actual)
TOBT (Preliminary)
TOBT (Final) Boarding Starts
Actual Off Block Time
Target Spot Time
Taxi Start (Actual)
Actual Take Off Time
1
2
3
4
4
5
8
9
10
Taxi In
Boarding Process
Ramp Control Movement Area
Spot
Taxi Out and Takeoff
1
6
7
9
10
11
14
16
Flight Plan Activation
Landing (Actual Time)
In Block Time (Actual)
Final Update TOBT
ATC Issues TSAT
Boarding Starts
Actual Off Block Time
Actual Take Off Time
A-CDM

Element 3: Variable taxi-time calculation

- At complex airports, the layout of runways and parking stands can result in large differences in taxi time.
- Instead of using a standard default value, a calculation of permutations based upon historic data or operational experience will provide a set of more realistic individual taxi times.
- The variable taxi time calculation will enable higher predictability for arriving and departing aircraft.

Element 4: Pre-departure sequencing

- Collaboratively establishes an off block sequence by publishing a target off-block time (TOBT) and related target start-up approval time (TSAT).
- The TOBT is calculated from the nominated calculated take-off time (CTOT) adjusted for the Variable Taxi Time taking into account operational capacity, traffic disposition, taxiway configuration, and potential restrictions.
- Pre Departure Sequencing facilitates regulated, steady, traffic flows towards the runways, with minimal queuing and delay at the departure holding point.

Element 5: CDM in adverse conditions

- Many events, both planned and unforeseen, can disrupt normal operations at an airport and reduce capacity to below normal operations.
- Some adverse conditions can be foreseen with scope and consequences variably predictable. Others unforeseen require reactive intervention to optimize the airport's degraded performance.
- The adverse conditions element aims to facilitate a swift return to normal capacity once adverse conditions have passed by using the improved information-sharing results from the previous elements.

Element 6: Collaborative management of flight updates

Coordination between Network Management (ATFCM) and A-CDM during the arrival/turn-around/departure process is by constant exchange of flight update messages.

The exchange includes

- **Flight Update Messages** (FUM) for arriving flights sent by the network to the CDM airport, and
- **Departure Planning Information** (DPI) messages for departing flights sent from the airport to the network.

Slot allocation is improved, CTOTs better match the TOBT reducing

Airport CDM Partners

ATC

CFMU

Aircraft Operators

Ground Handlers

Airport Operator

AIS

MET

Airport CDM - AIRLINES

INTEREST / OBJECTIVES

The main interest of the Aircraft Operator is to achieve its fleet schedule, and hence each individual flight schedule.

BENEFIT / GOALS

↗ Shorter taxi times, shorter holding before runway access, no waiting in front of occupied gate

↗ Fuel savings

↗ Reduced delays > cost savings and customer satisfaction

Airport CDM - ATC

INTEREST / OBJECTIVES

The main interest of Air Traffic Control is to have smooth flows of traffic on the surface with minimal need to delay and optimal service provided to Aircraft Operators

BENEFIT / GOALS

- ↗ More predictable traffic - therefore reduced workload
- ↗ Reduced probability of errors
- ↗ Better pre-departure sequence
- ↗ Higher service quality

Airport CDM – AIRPORT

INTEREST / OBJECTIVES

The main interest of the Airport Authority is to optimize the use of resources and available infrastructure, both on air and land side

BENEFIT / GOALS

↗ Reduced environmental impacts – noise and emissions

↗ Improved punctuality

↗ Improved gate/stand planning and management

Airport CDM - GROUND HANDLERS

INTEREST / OBJECTIVES

The main interest of the Ground Handler is to achieve the scheduled times agreed with the Aircraft Operator for each individual flight, and utilize its resources optimally.

BENEFIT / GOALS

- ↗ Better planning and use of resources – therefore less cost, more profit
- ↗ Improved customer satisfaction

Airport CDM – ALL PARTNERS

INTEREST / OBJECTIVES

To optimise ATM system performance

BENEFITS / GOALS

- ↗ Reduced apron and taxiway congestion
- ↗ Mutual understanding and trust
- ↗ Less stress on the system and the people within it
- ↗ Higher service quality with knock-on benefits to

So in Summary…. CDM is

- Common sense applied on a daily basis
- A concept requiring culture change
- Sharing of information to create a common world view
- Acting on shared information to improve decisions
- About people not technology
- Bringing benefits to all airport partners

Some Considerations for implementation

- The culture change
- The value of information
- The sensitivity of information
- Institutional aspects
- Availability of information
- System aspects
- Others?

CDM is about a culture change

CDM helps in creating common situational awareness of all partners

CDM achieves this by ensuring sharing of data

CDM requires also that action is taken based on the shared data

What we covered?

- Airport CDM benefits all airport partners
- CDM is primarily about people, not technology
- CDM requires a culture change, a different attitude to working together, breaking down the walls between partners across the board

Thank you