Implementation, goals and operational experiences of A-CDM system

A-CDM

Airport **C**ollaborative **D**ecision **M**aking

Increasing airport effectiveness

Decreasing delays

Forecast of flight events

Optimization of resources

ACI Europe, Eurocontrol, IATA

Problem analysis

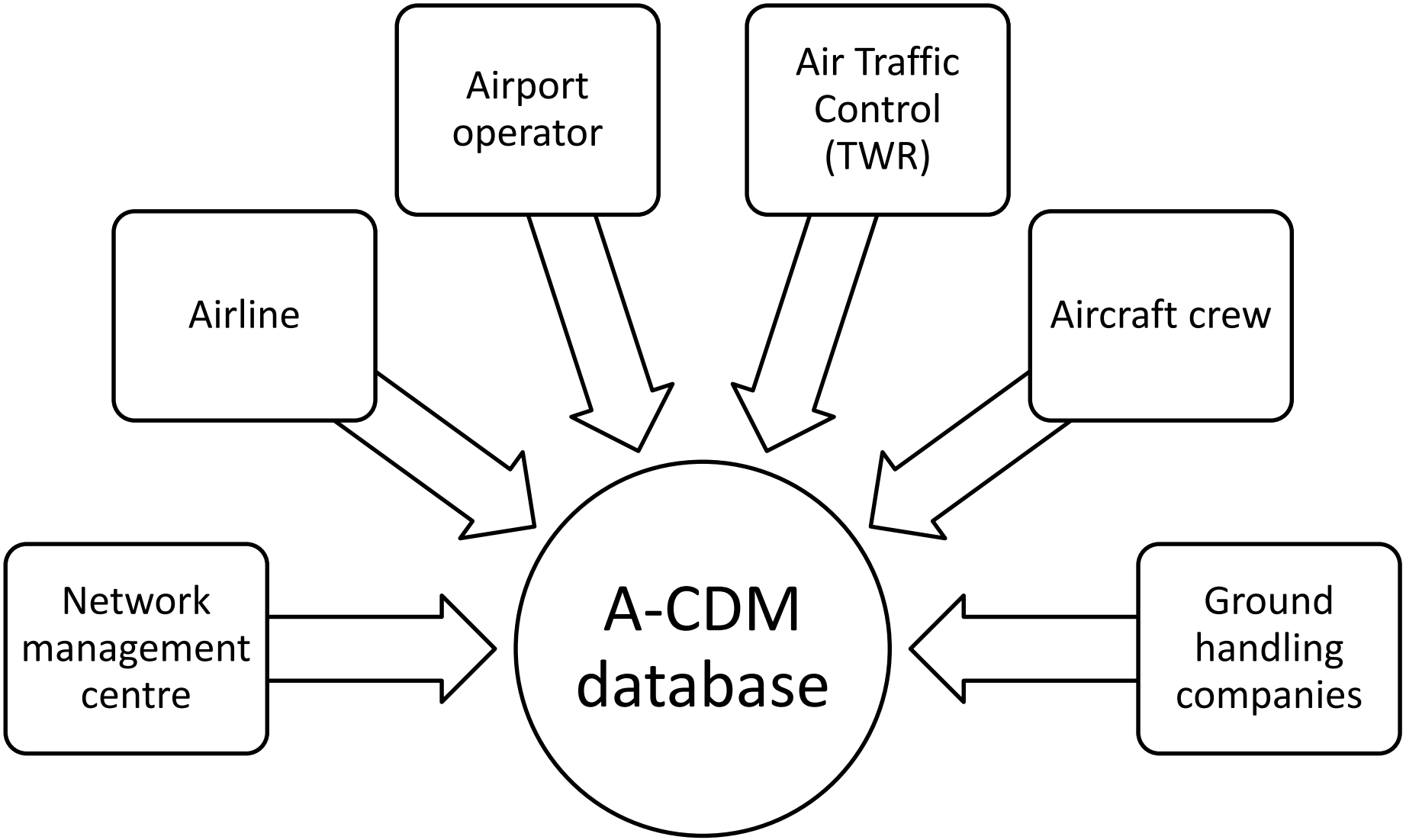
- Increasing volume of air traffic
- Limited capacity of airports:
  - Aircraft stands
  - Runway holding position
- Communication problems with other stakeholders
- Not efficient network management
- Not efficient slot management (CTOT -5/+10)
- „Traffic jams”

Solution

- Cooperation with stakeholders
- Common database
- Common „language”
- Early decision making
  (between EOBT-3 hours ans EOBT-40 minutes)

- CDM airports build a network, where the events are know for the members of the network

Solution


Airport operator
Air Traffic Control (TWR)
Airline
Aircraft crew
Network management centre
A-CDM database
Ground handling companies

Difficulties of implementation

Unfavourable conditions:

De-icing

- It is essential to determine the exact duration of de-icing and integrate it into turnaround time.
- De-icing time can affect other milestones
- De-icing places could be:
  - On aircraft stand
    - In this case, it is part of the turnaround time
    - TOBT contains expected de-icing time
  - Other stand
    - VTT OUT contains expected de-icing time

Advantages

Increasing airport effectiveness

- Better capacity utilization
- Less delay, more punctual fligts
- Less fuel consumption
- More stable traffic flow
- Better forecast for on-block/off-block time
- Less taxi time, less holding time

Better environmental indicators

- Less pollution
- Noise reduction

Increasing network effectiveness

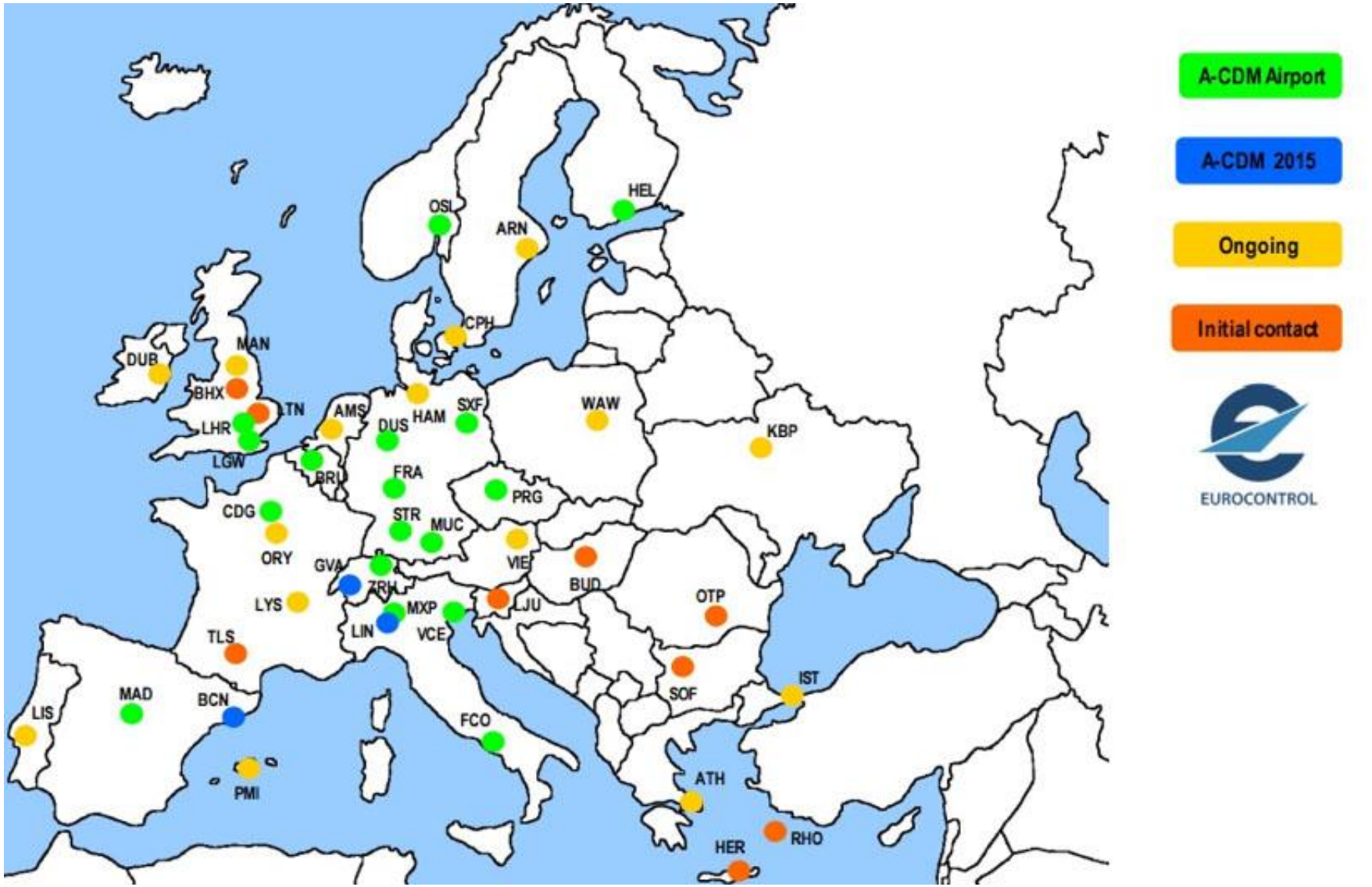
- Better slot management
- Less restriction

Advantages

Who benefits from the implementation of A-CDM ?

- Airline
- Airport
- Ground handling companies
- ATC
- Passenger

Operational experiences



Forrás: EUROCONTROL

Operational experiences

Brussels

- Decrease of CO_2, NO_x emission and fuel consumption
- Decrease of taxi time (average of 3 minutes)

Munich:

- Decrease of taxi time with 10%
- Fuel savings

Frankfurt:

- Better runway exploitage
- More punctual departures, more stable TOBT

Thank you for your attention!

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Information management system of A-CDM

Definitions

Main abbreviations

- TOBT – Target Off Block Time (by GH, updated in case of manual data entry, e.g. 5 minutes difference)
- TSAT – Target Start-Up Approval Time (calculated by information system e.g. shifting in case expected holding time)

Normally TOBT=TSAT

- TTOT – Target Take Off Time
- VTT – Variable Taxi Time (VTT IN, VTT OUT) depends on: runway usage, aircratd stand, aircraft category, LVP)
- AOBT – Actual Off Block Time
- AIBT – Actual In Block Time
- MTT – Minimum Turnaround Time (depends on airlines)
- DPI – Departure Planning Information (forwarded to network management centre automatically, connection between airport and management centre)
- FUM – Flight Update Message (coming from network management centre)

Definitions

Target Off Block Time (TOBT)

- Forecasted time by airport operator or ground handling company. When aircraft is ready for departure, doors are closed, jetties are removed, push-back tug is ready, aircraft is ready for push-back and engine start.

Target Start-Up Approval Time (TSAT)

- Expected clearance time of push-back/engine start. It takes into consideration TOBT, CTOT and actual traffic.

Definitions

Calculation of Variable Taxi Time

In order to change stardard VTT time. It has 2 components:

VTT IN and VTT OUT

VTT IN

- It takes into consideration the location of runway exit, taxiing route and aircraft stand position. EIBT is more punctual by using VTT IN.

VTT OUT

- Calculated by the determination of taxiing route between aircraft stand and the appropriate runway threshold. It is important whil determining TTOT.

Target Take Off Time (TTOT):

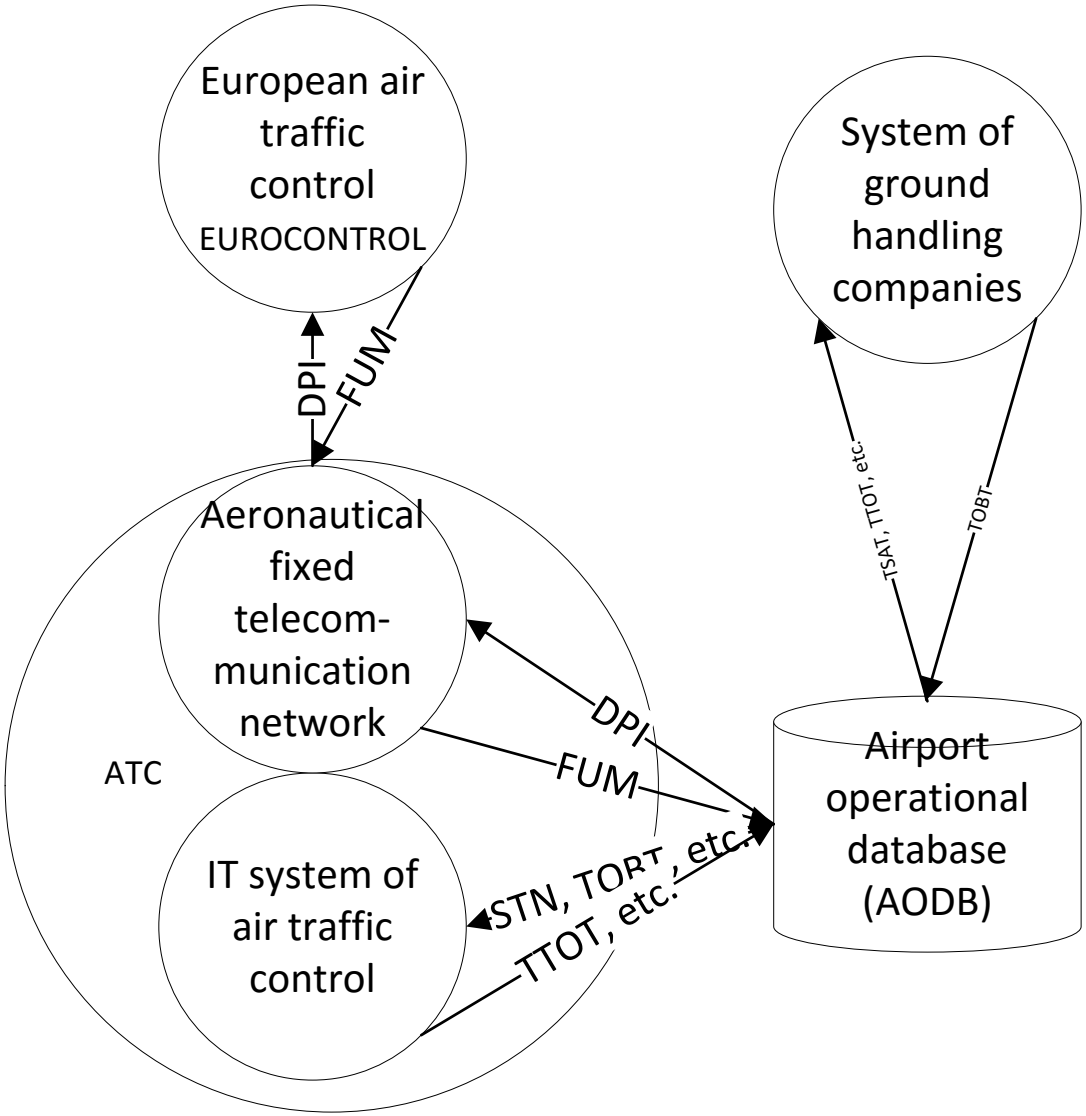
TOBT + VTT OUT = TTOT

Definitions

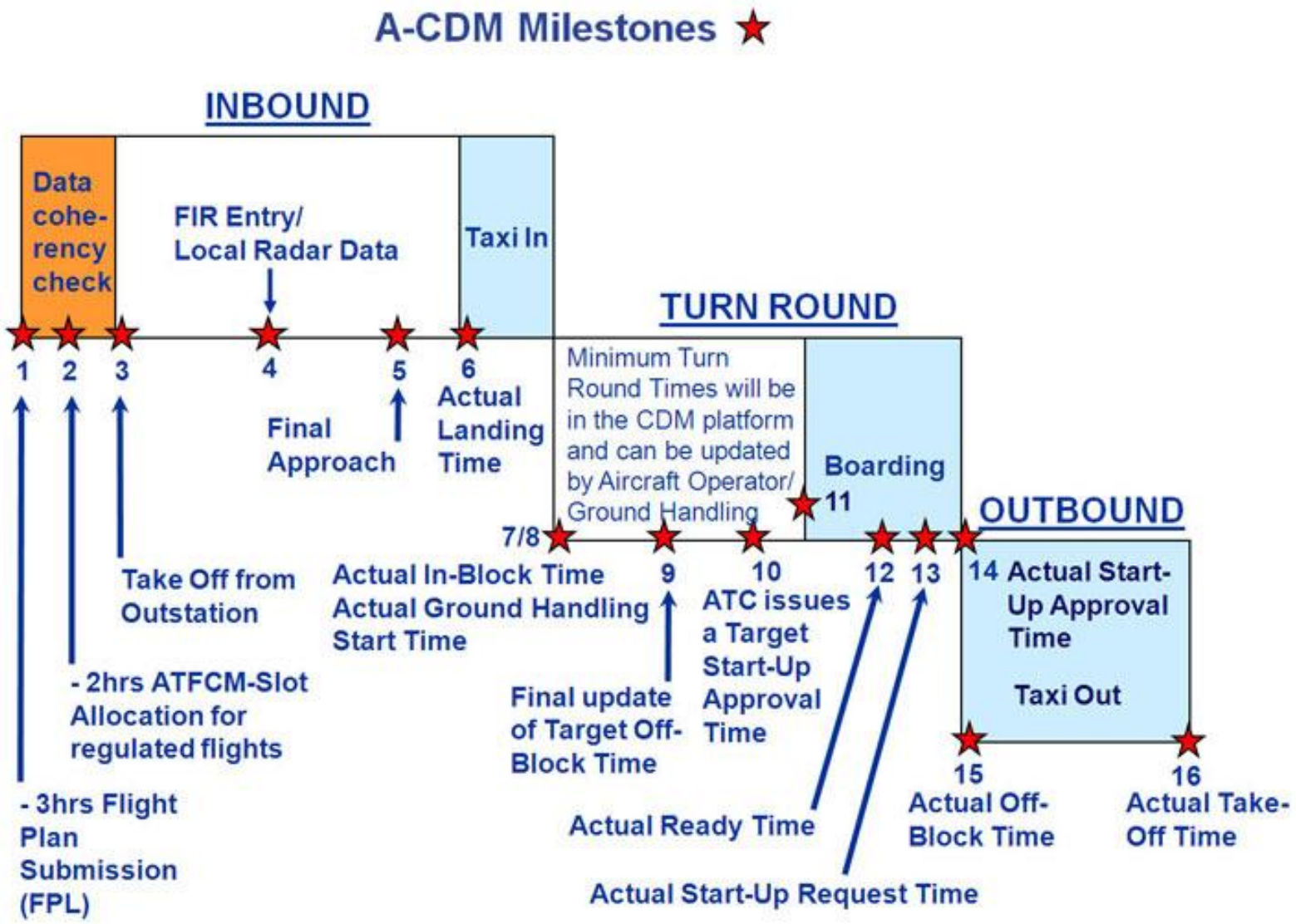
DPI and **FUM** messages

- **Departure Planning Information** (DPI) : Network Management Centre is supported by DPI messages directly from airport CDM database. It ensures real-time flight information prior to departure.
- Parallel to this FUM (**Flight Update Messages)** messages are received from Network Management Centre that contain the expected arrival time of incoming aircrafts. It supports planning of departure aircraft handlings.

Operation of A-CDM



Operation of A-CDM, Milestones



Source: www.munich-airport.de

Milestones

M1 – ATC Flight Plan activation (EOBT-3hrs)
M2 – update of FPL data(EOBT-2hrs)
M3 – TAKE-OFF (ATOT – FUM)
M4 – Local Radar Update (more punctual than FUM)
M5 – Final Approach
M6 – LANDING (ALDT, VTT IN)
M7 – In Block (AIBT)
M8 – Ground handling starts (MTT)
M9 – Update of TOBT before TSAT
M10 – TSAT issue (TSAT)
M11 – Boarding
M12 – Aircraft Ready
M13 – Start Up clearance request
M14 – Start Up approved (ATC gives the push back clearance)
M15 – Actual Off Block Time (VTT OUT)
M16 – Actual Take Off Time (ATOT)

Thank you for your attention!

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