



**canso**

Presentation on  
**CANSO Guide on ATFM/A-CDM  
Integration**

**ICAO APAC A-CDM Task Force #5**

Presented by: Fredrik Lindblom, A-CDM SME CANSO

# Presenter

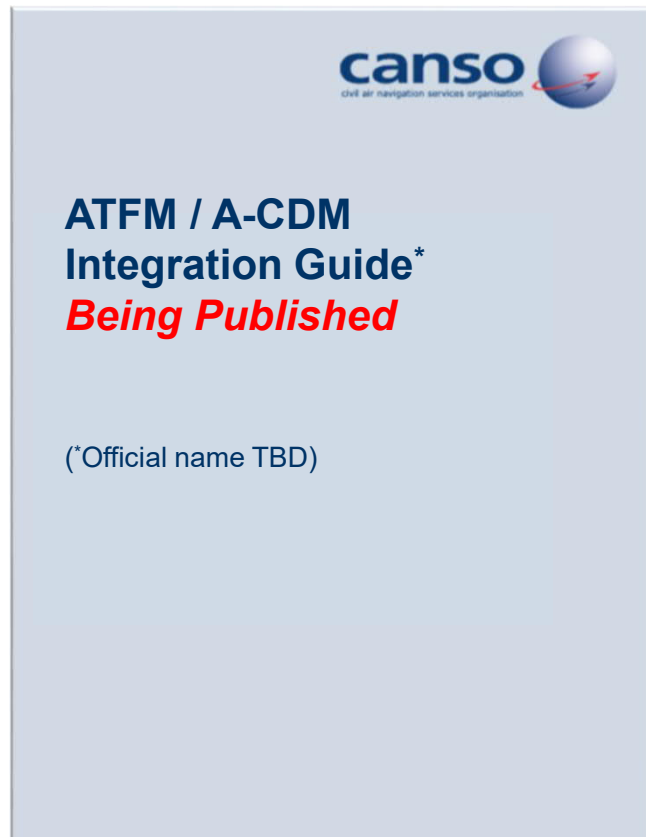


**Mr. Fredrik Lindblom**

CANSO A-CDM SME

Co-chair for the ATFM/A-CDM Workgroup

# Introduction & Presentation Topics



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  - 8.1 Stakeholder Engagement
  - 8.2 Establishment of Common Objectives
  - 8.3 Integration Planning & Execution
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# Introduction & Presentation Topics



- **Benefits of ATFM/A-CDM Integration**
- **ATFM/A-CDM Integration Concept**
- **Use Cases for AFTM/A-CDM Integration**
- **Data Quality**
- **Interoperability & SWIM**
- **FINAL WORDS + Q&A**

# ATFM / A-CDM Integration: Mutual Benefits



Enhanced flight information  
for better demand prediction



Improved ATFM slot  
adherence

**Benefits**  
*for ATFM*  
**by A-CDM**



Improved slot management  
coordination process based  
on common information



Reduced ATFM slot wastage

# ATFM / A-CDM Integration: Mutual Benefits



Enhanced information for  
better planning



Improved ATFM slot  
adherence

**Benefits  
for A-CDM  
by ATFM**

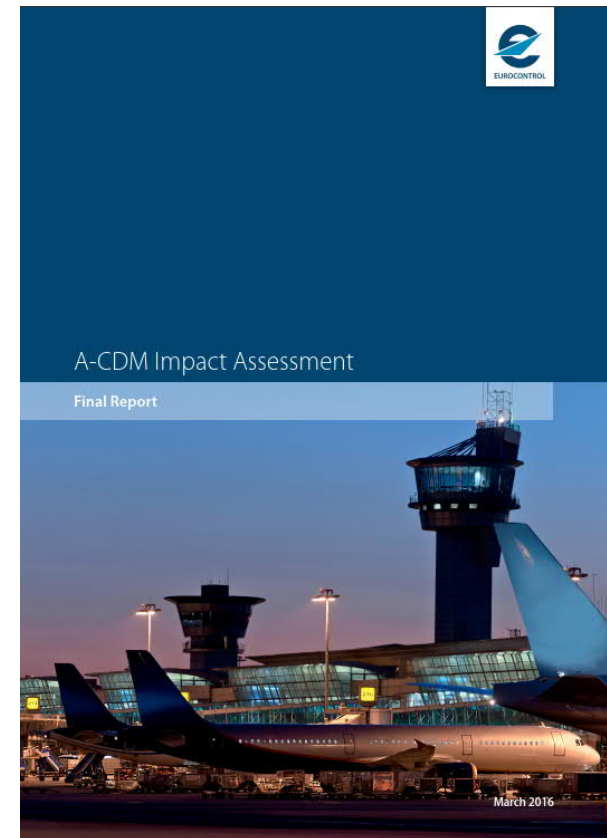
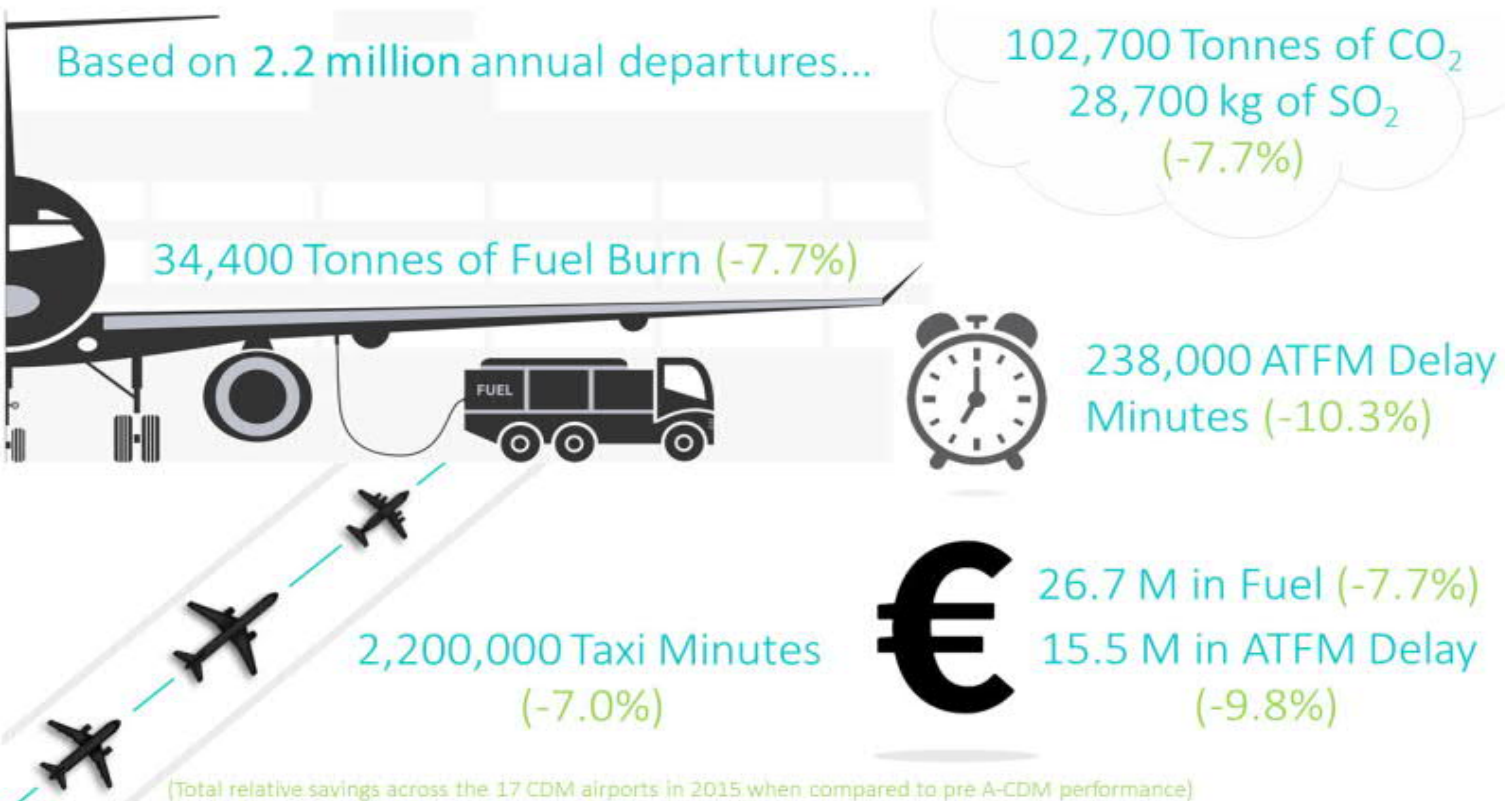


Improved situational  
awareness and predictability  
with common information



Improved ground operations  
and reduced taxi-out times

# Benefits with the Integration



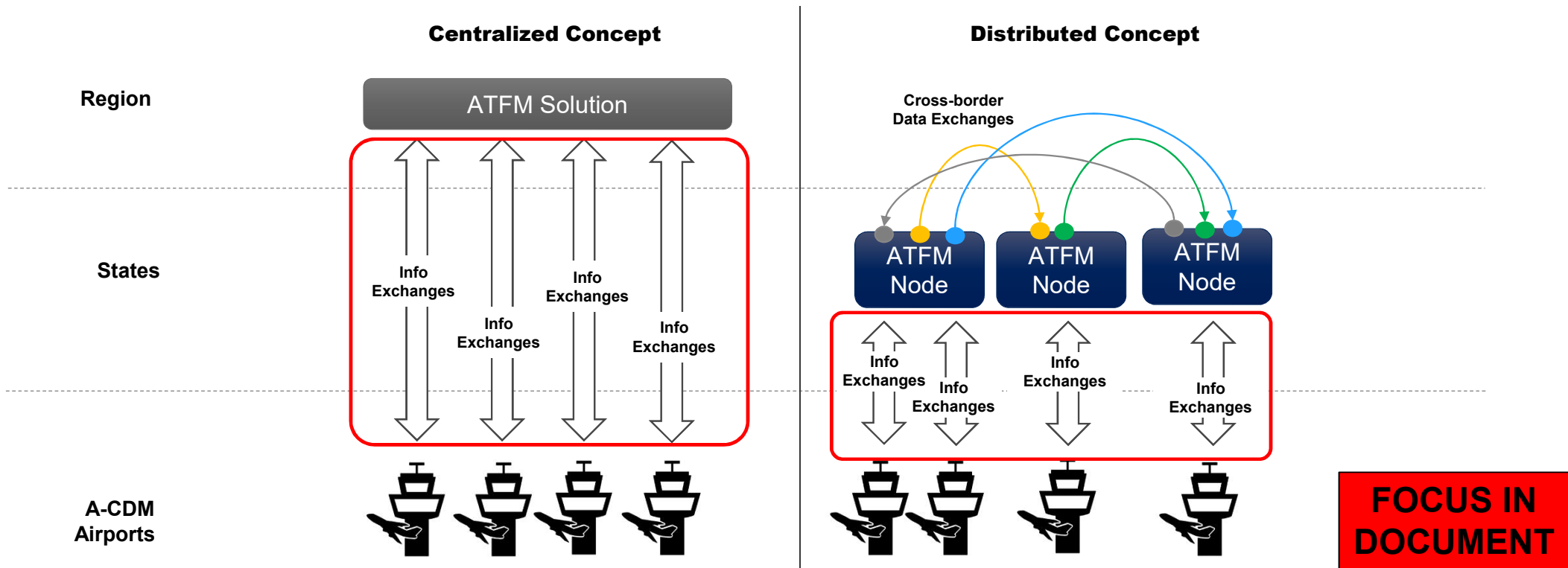
Source: EUROCONTROL's A-CDM Impact Assessment, Final Report, March 2016

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# Two different ATFM concepts



# Core conceptual principles for integration



- **The information exchanges are divided into 3 categories:**
  1. Exchange of ATFM slot information to A-CDM system (ATFM to A-CDM).
  2. Exchange of flight updates information to A-CDM system (ATFM to A-CDM).
  3. Exchange of departure information to ATFM system (A-CDM to ATFM).
- **The information exchanges to achieve integration should be scalable,** allowing a phased expansion of functionality on both the A-CDM and ATFM systems.
- **The information exchanges should be aligned with some A-CDM milestones to ensure a common “baseline” for the integration,** and with that also a common set of functionality and benefits at both A-CDM and ATFM level.
- **System-wide Information Management (SWIM) concept, with the common information exchange model such as FIXM or FIXM Extension,** is recommended to be used as the basis for information exchange as it is expected to enable most effective integration of the 2 systems.

# The information exchanges

## Exchange of ATFM Measure Information

ATFM Node



CTOTs

A-CDM Airport



## Exchange of Flight Update Information

ATFM Node



ELDTs

A-CDM Airport



## Exchange of Flight Departure Information

ATFM Node



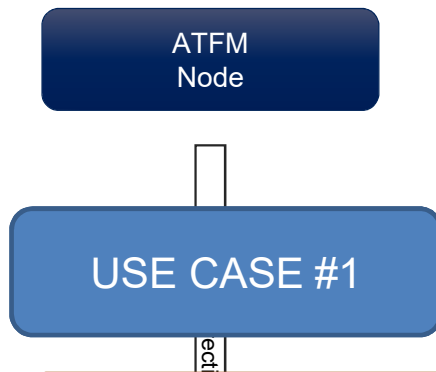
Dep. Flight Info

A-CDM Airport

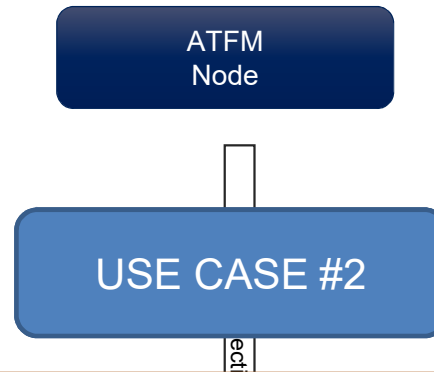


# The information exchanges

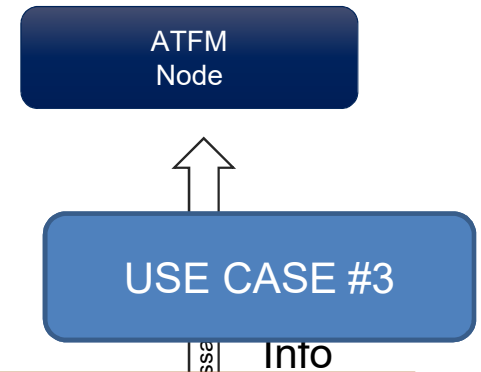
## Exchange of ATFM Measure Information



## Exchange of Flight Update Information



## Exchange of Flight Departure Information

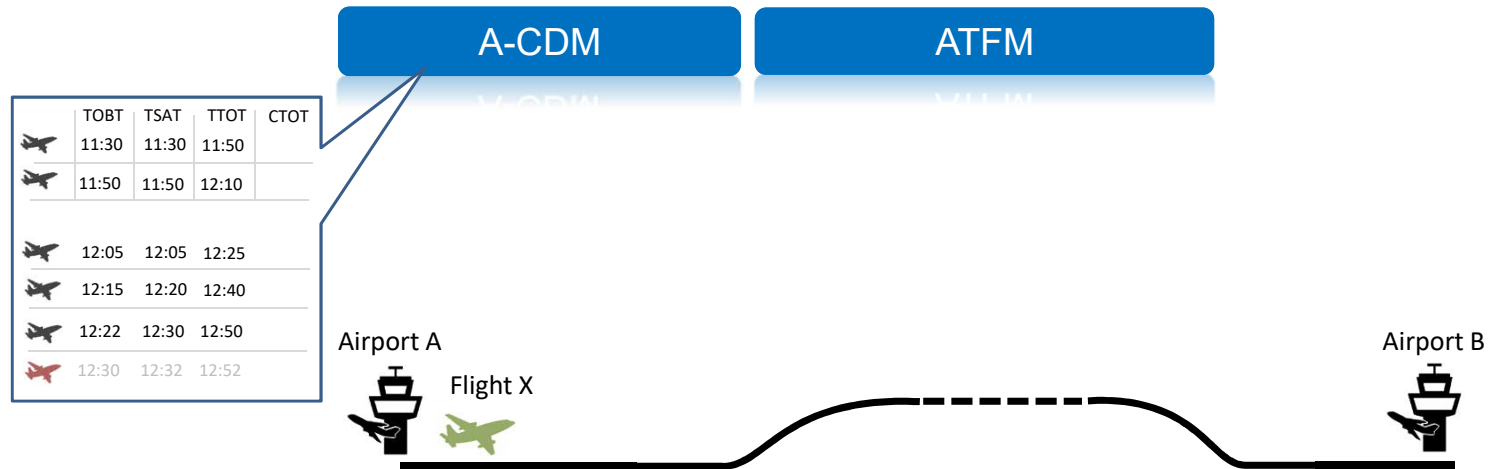


### PLEASE NOTE

- ✓ The Use Cases are at a fairly high level and serves as EXAMPLES
- ✓ More details on content, format, timing, etc. are in the document

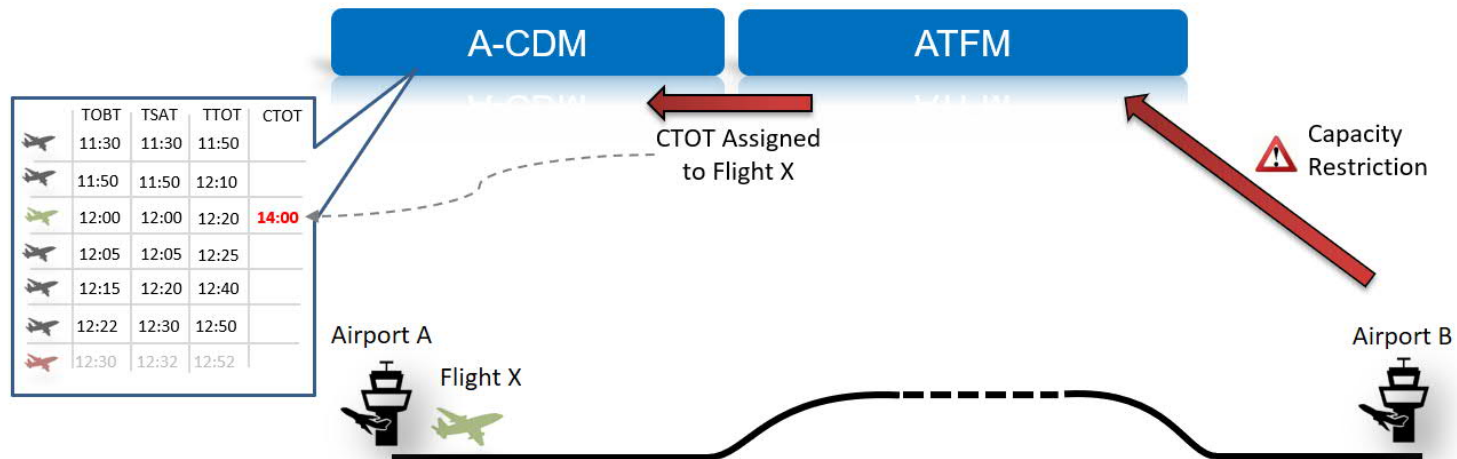
## USE CASE #1

# ATFM Measure Information



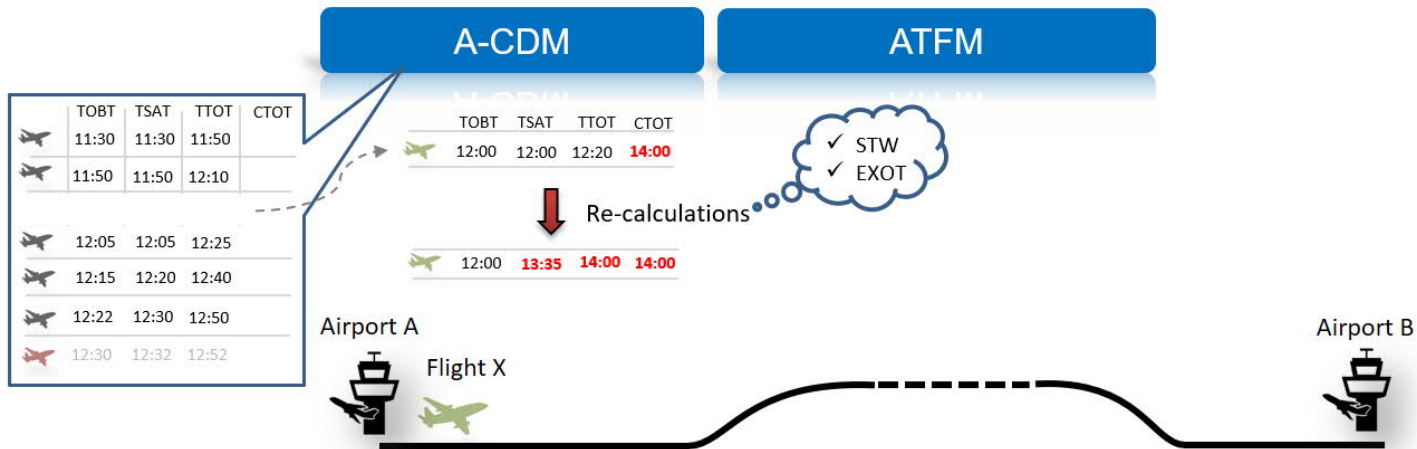
## USE CASE #1

# ATFM Measure Information



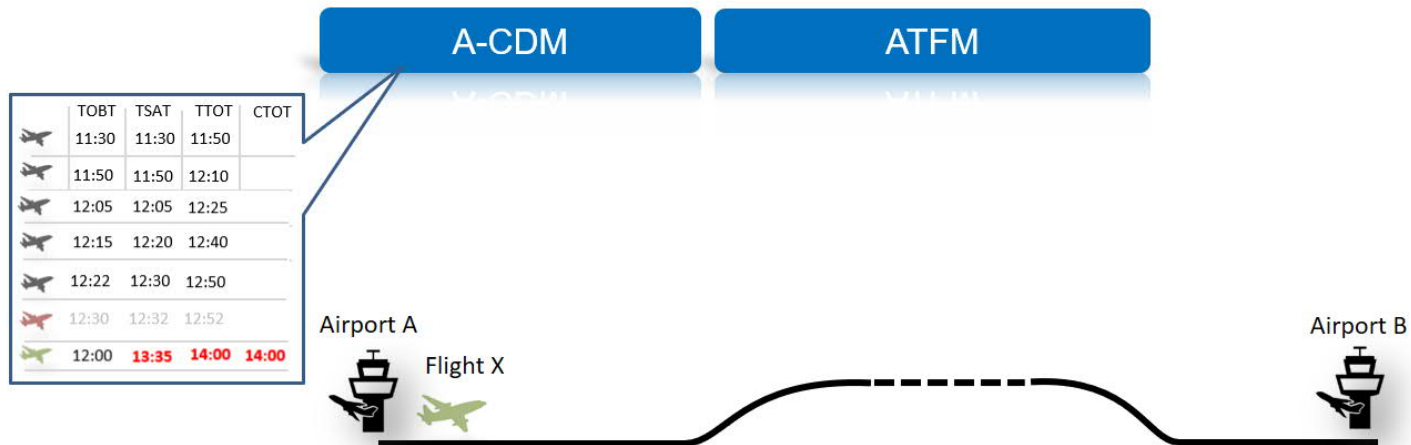
## USE CASE #1

# ATFM Measure Information



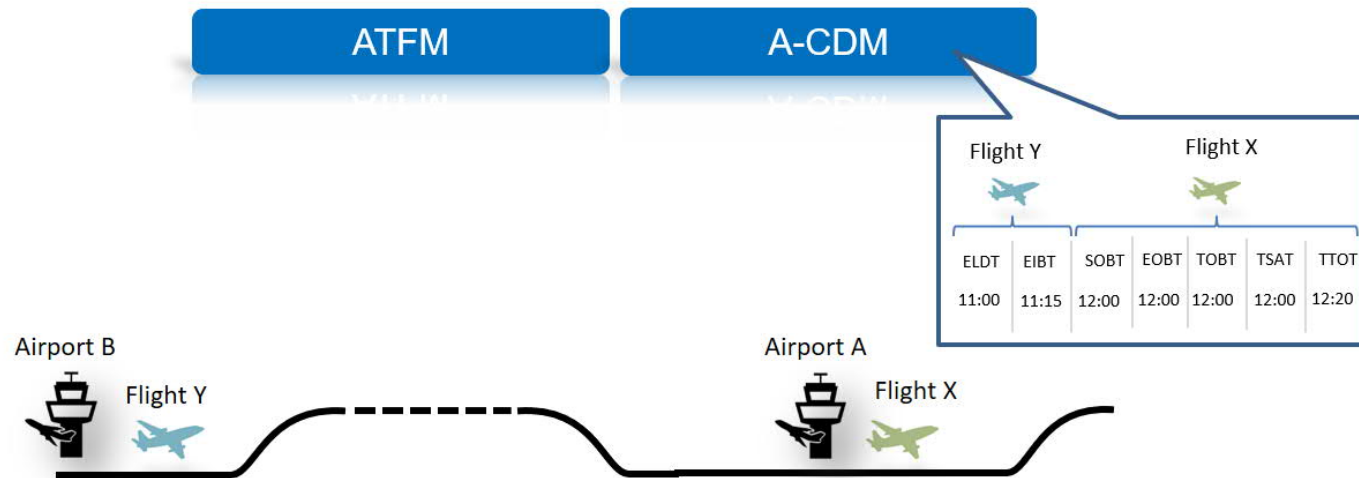
## USE CASE #1

# ATFM Measure Information



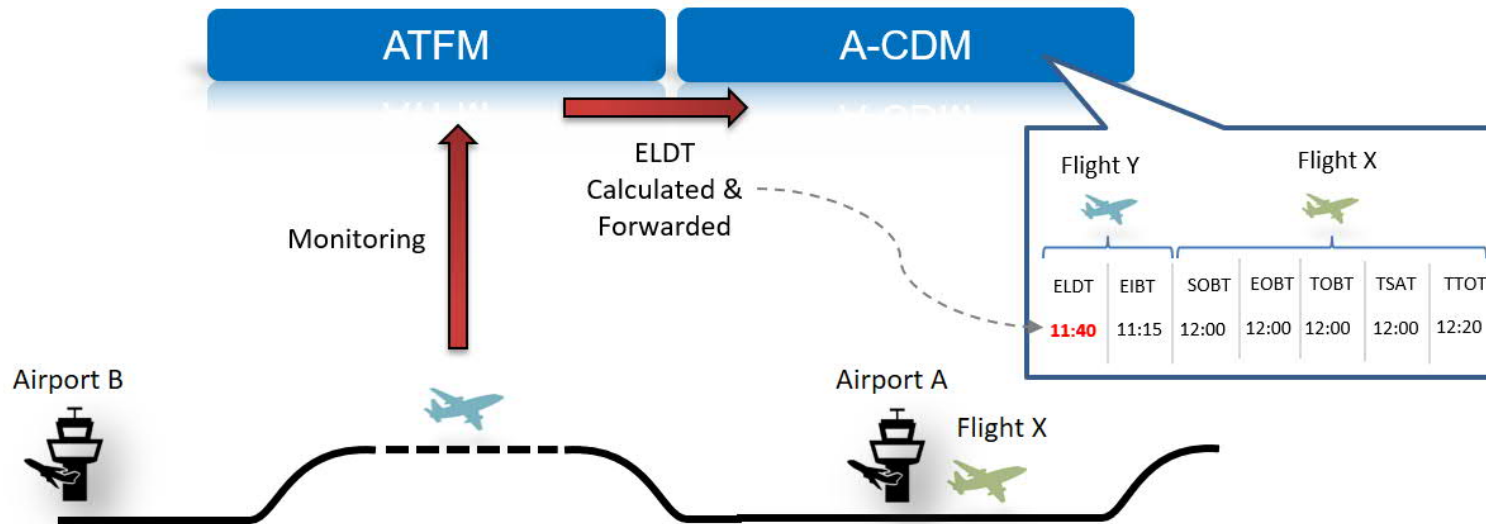
## USE CASE #2

# Flight Update Information



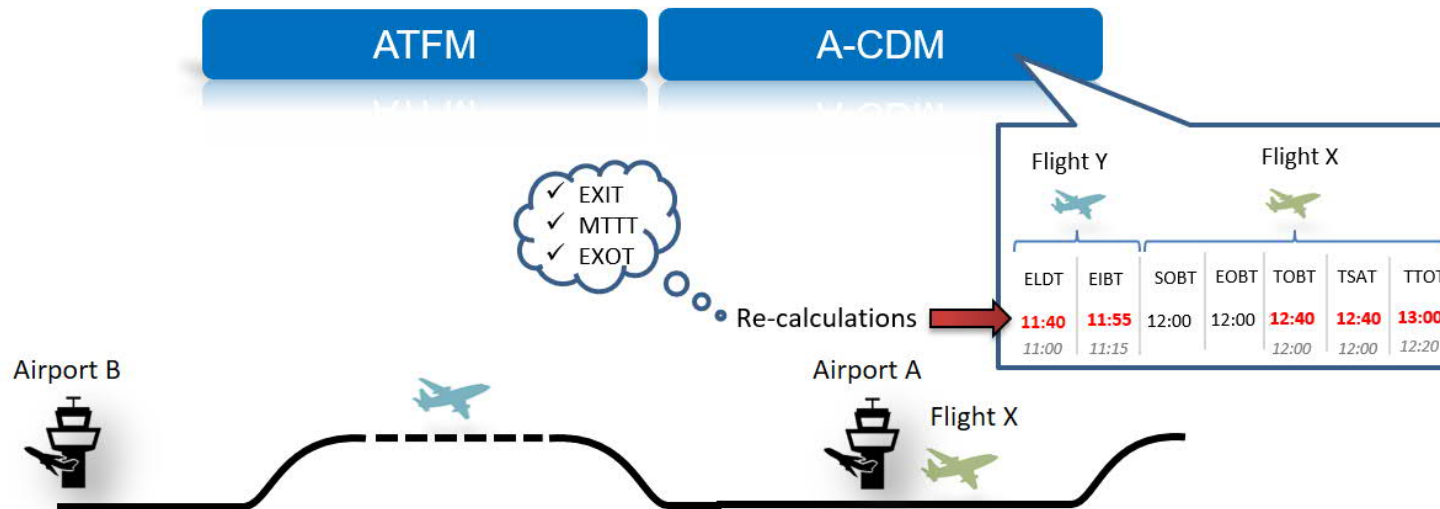
## USE CASE #2

# Flight Update Information



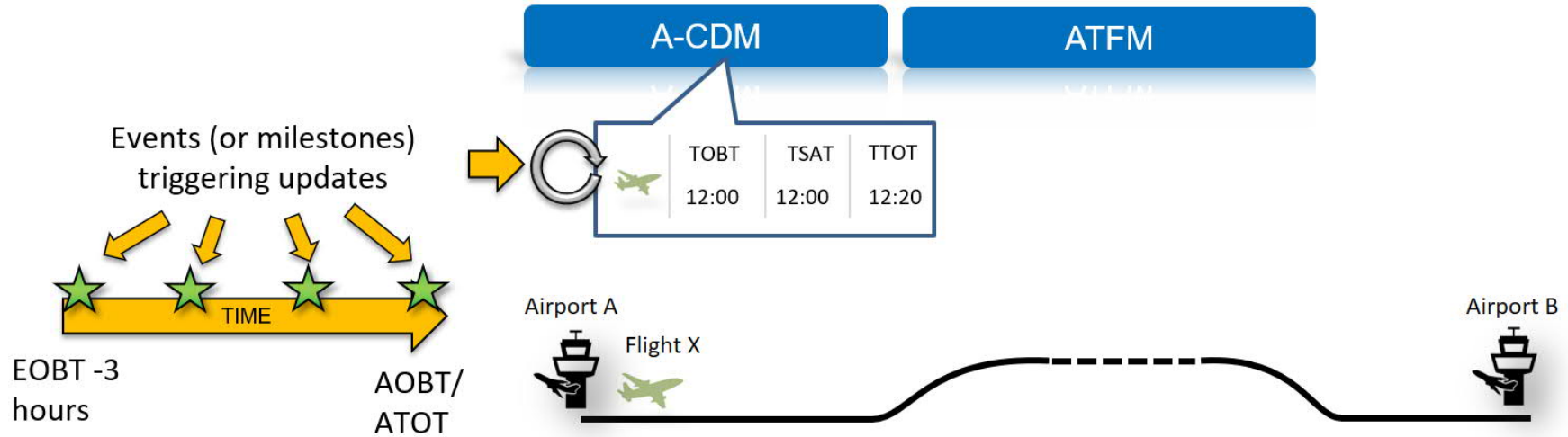
## USE CASE #2

# Flight Update Information



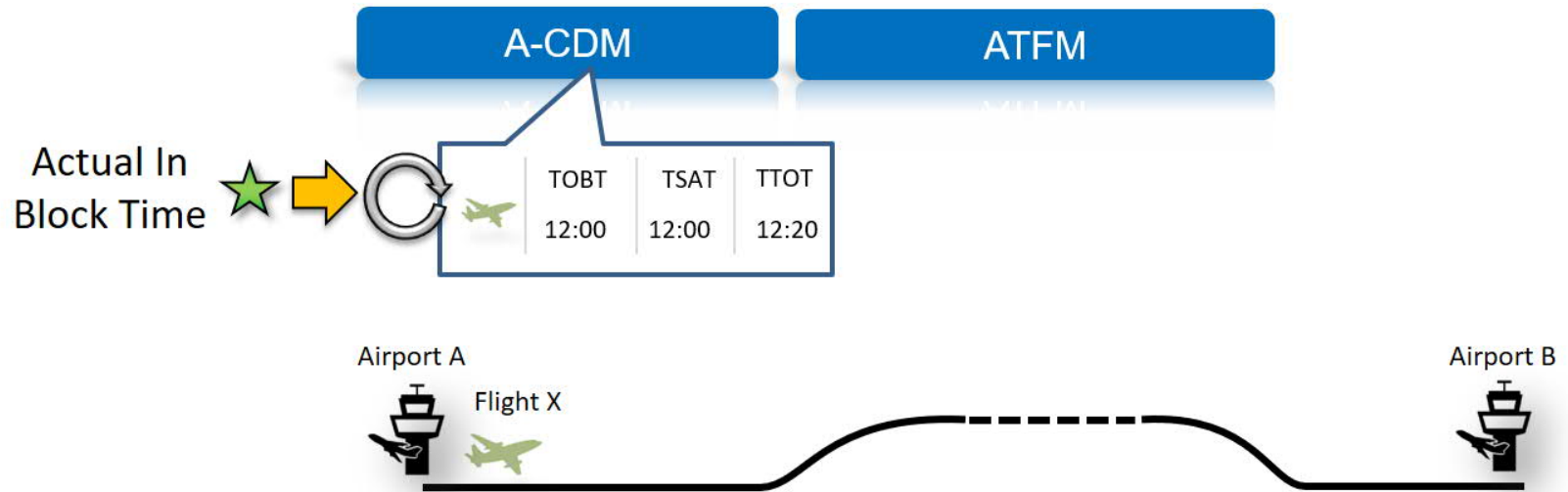
USE CASE #3

# Flight Departure Information



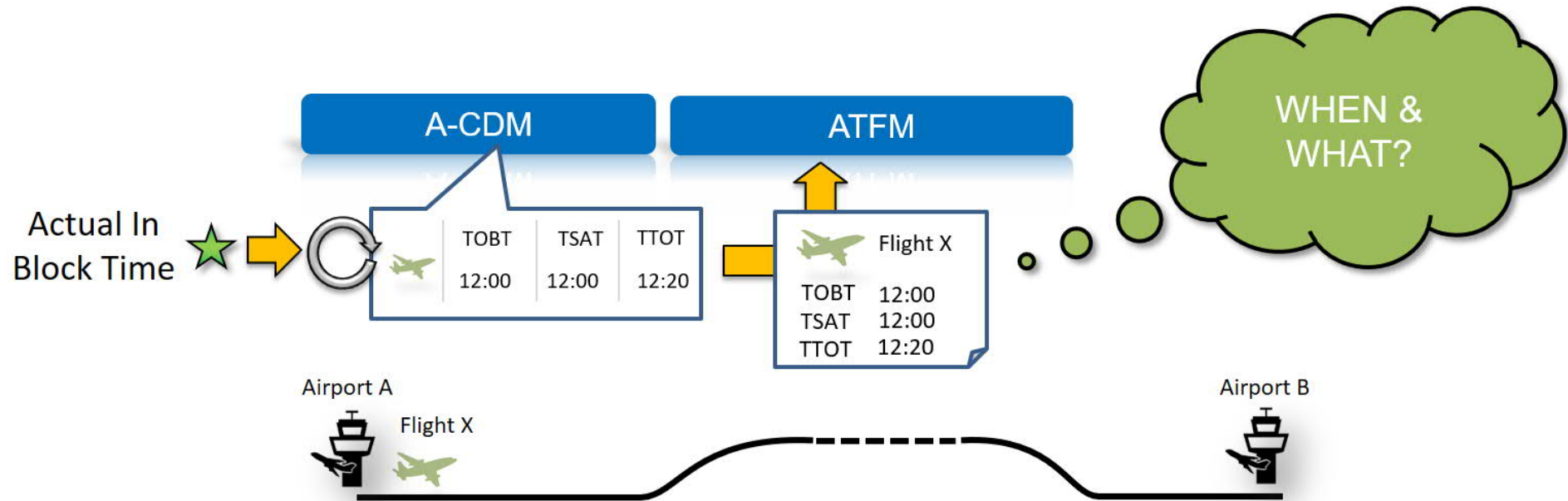
USE CASE #3

# Flight Departure Information



USE CASE #3

# Flight Departure Information



## USE CASE #3

# Flight Departure Information

- For the When & What a "DPI style" approach is adopted

A-CDM Milestones	DPI Message Name
1. Flight Plan Activated	Early DPI (EDPI)
2. EOBT – 2 Hours	Target DPI-target (TDPI-t)
3. Take-Off from Outstation	Target DPI-target (TDPI-t)
4. Local Radar Update	Target DPI-target (TDPI-t)
5. Final Approach	Target DPI-target (TDPI-t)
6. Landing	Target DPI-target (TDPI-t)
7. In Block	Target DPI-target (TDPI-t)
8 . Ground Handling Starts	Target DPI-target (TDPI-t)
9. TOBT Update prior to TSAT	Target DPI-target (TDPI-t)
10 TSAT Issue	Target DPI-sequenced (TDPI-s)
11. Boarding Starts	Target DPI-sequenced (TDPI-s)
12. Aircraft Ready	Target DPI-sequenced (TDPI-s)
13. Start Up Request	Target DPI-sequenced (TDPI-s)
14. Start Up Approved	Target DPI-sequenced (TDPI-s)
15. Off-Block	ATC DPI (ADPI)
16. Take-Off	
No Applicable Milestone	Cancel DPI (CDPI)

## USE CASE #3

# Flight Departure Information

- For the When & What a "DPI style" approach is adopted
- However, a more scalable approach is recommended to allow for more flexible implementation

A-CDM Milestones	DPI Message Name	Minimal Set
<b>1. Flight Plan Activated</b>	<b>Early DPI (EDPI)</b>	<b>Mandatory</b>
2. EOBT – 2 Hours	Target DPI-target (TDPI-t)	
3. Take-Off from Outstation	Target DPI-target (TDPI-t)	
4. Local Radar Update	Target DPI-target (TDPI-t)	
5. Final Approach	Target DPI-target (TDPI-t)	
6. Landing	Target DPI-target (TDPI-t)	
<b>7. In Block</b>	<b>Target DPI-target (TDPI-t)</b>	<b>Mandatory</b>
8. Ground Handling Starts	Target DPI-target (TDPI-t)	
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<b>10 TSAT Issue</b>	<b>Target DPI-sequenced (TDPI-s)</b>	<b>Mandatory</b>
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14. Start Up Approved	Target DPI-sequenced (TDPI-s)	
<b>15. Off-Block</b>	<b>ATC DPI (ADPI)</b>	<b>Mandatory</b>
16. Take-Off		
<b>No Applicable Milestone</b>	<b>Cancel DPI (CDPI)</b>	<b>Mandatory</b>

## USE CASE #3

# Flight Departure Information

A-CDM Milestones	DPI Message Name	Message Trigger	Message Content (Mandatory in bold)
1. Flight Plan Activated	EDPI	1. Milestone event MS1	- <b>Flight Identifier</b> - <b>SOBT</b> - TOBT - TSAT - <b>TTOT</b>
7. In Block	TDPI-t	1. Milestone event MS7 2. TTOT or TSAT significant changes, e.g. more than 5 minutes as applied in Europe 3. Change of aircraft type or registration	- <b>Flight Identifier</b> - SOBT - TOBT - TSAT - <b>TTOT</b>
9. TOBT Update prior to TSAT	TDPI-t	1. Milestone event MS9 2. TTOT or TSAT significant changes, e.g. more than 5 minutes as applied in Europe 3. Change of aircraft type or registration	- <b>Flight Identifier</b> - SOBT - <b>TOBT</b> - <b>TSAT</b> - <b>TTOT</b>
10. TSAT Issue	TDPI-s	1. Milestone event MS10 2. TTOT or TSAT significant changes, e.g. more than 5 minutes as applied in Europe 3. Change of aircraft type or registration	- <b>Flight Identifier</b> - SOBT - <b>TOBT</b> - <b>TSAT</b> - <b>TTOT</b>
15. Off-Block	ADPI	1. Milestone event MS 15 2. TTOT or TSAT significant changes, e.g. more than 5 minutes as applied in Europe 3. Change of aircraft type or registration	- <b>Flight Identifier</b> - <b>AOBT</b> - <b>TTOT</b>
No Applicable Milestone	CDPI	1. Flight Cancellation	- <b>Flight Identifier</b> - <b>SOBT</b> - <b>TOBT</b> - <b>TSAT</b> - <b>TTOT</b>

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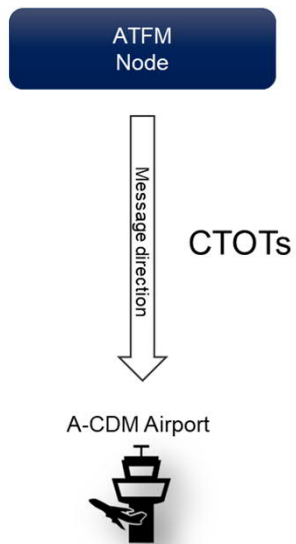
## Data Quality

***“Can I rely on  
this information  
to be accurate?”***



# Data Quality

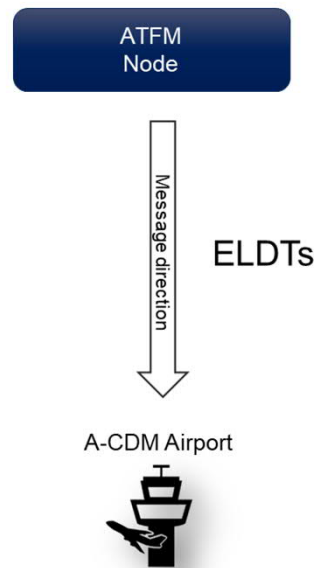
## Exchange of ATFM Measure Information



Indicator name	Formula	Target Value	Acceptable Range
TSAT+VTT inside CTOT STW	$CTOT_{[STW\ min]} < TSAT + VTT < CTOT_{[STW\ min]}$ <p>*STW = slot tolerance window or CTOT compliance window. Its value should be agreed upon among stakeholders in the network. Normally, STW are prescribed as: - STW[min] = -5 min - STW[max] = +10 min</p>	Agreed value, e.g. 100% in Europe	Agreed value, e.g. $\geq 90\%$ in Europe

# Data Quality

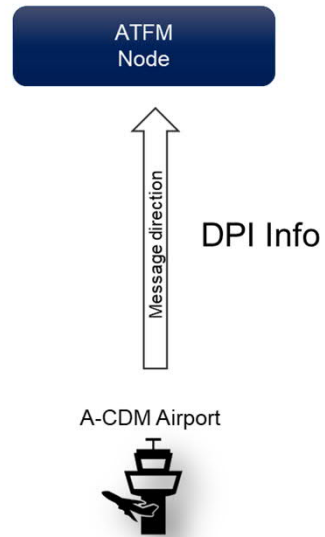
## Exchange of Flight Update Information



Indicator name	Formula	Target Value	Acceptable Range
ELDT Accuracy at Milestone 3 (MS3)	ELDT <sub>[@MS3]</sub> - ALDT	Agreed value, e.g. <15 mins	Agreed value, e.g. <=30 mins
ELDT Accuracy at Milestone 4 (MS4)	ELDT <sub>[@MS4]</sub> - ALDT	Agreed value, e.g. <10 mins	Agreed value, e.g. <=20 mins

# Data Quality

## Exchange of Flight Departure Information



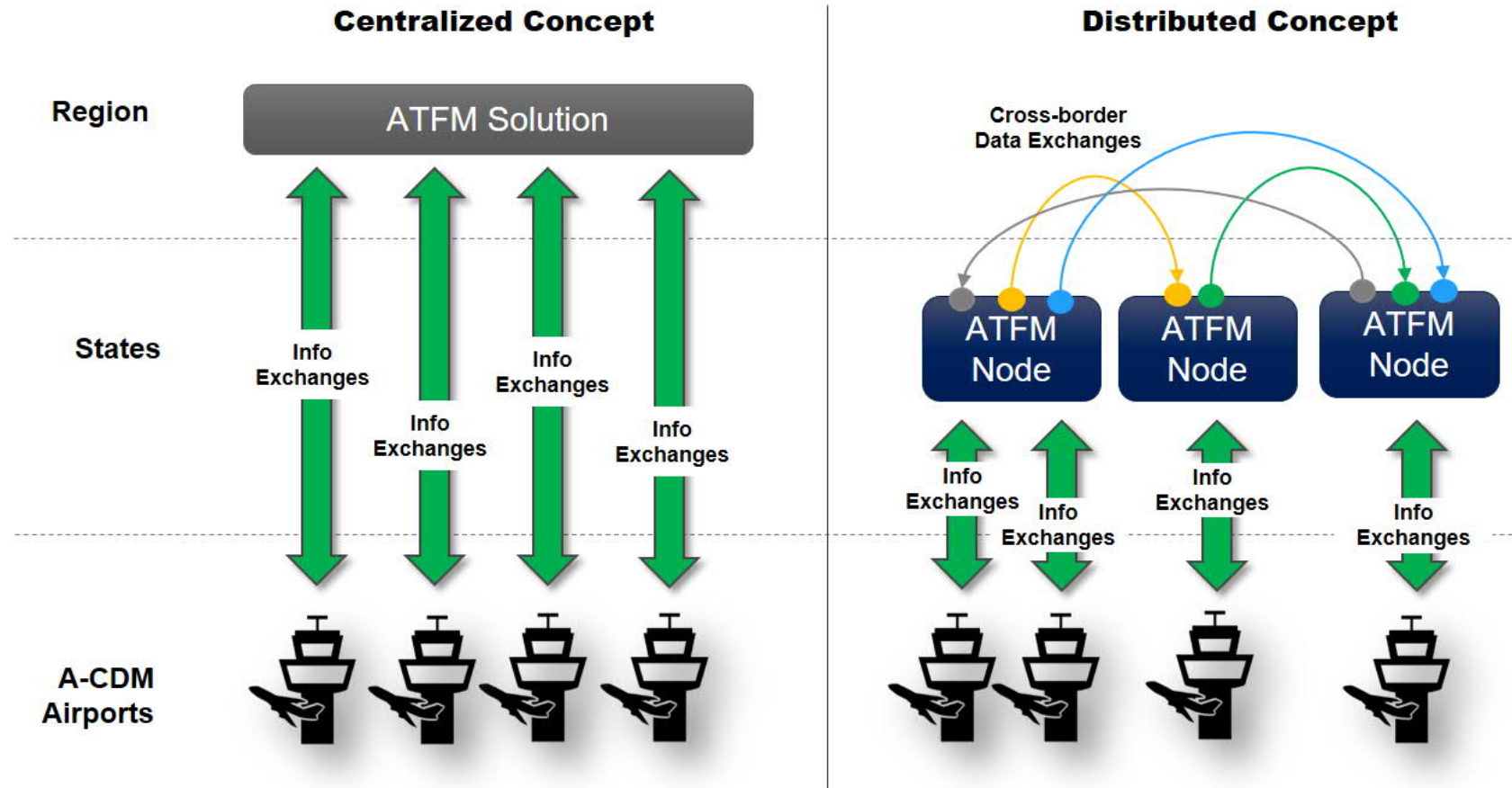
Indicator name	Formula	Recommended Target Value [min]	Recommended Acceptable Range [min]
EDPI_TTOT	$TTOT_{[@MS1]} - ATOT$	0	$\leq 15$
TDPI-t_TTOT	$TTOT_{[@MS7]} - ATOT$	0	$\leq 12$
TDPI-t_TTOT	$TTOT_{[@MS9]} - ATOT$	0	$\leq 12$
TDPI-s_TTOT	$TTOT_{[@MS10]} - ATOT$	0	$\leq 10$
ADPI_TTOT	$TTOT_{[@MS15]} - ATOT$	0	$\leq 5$

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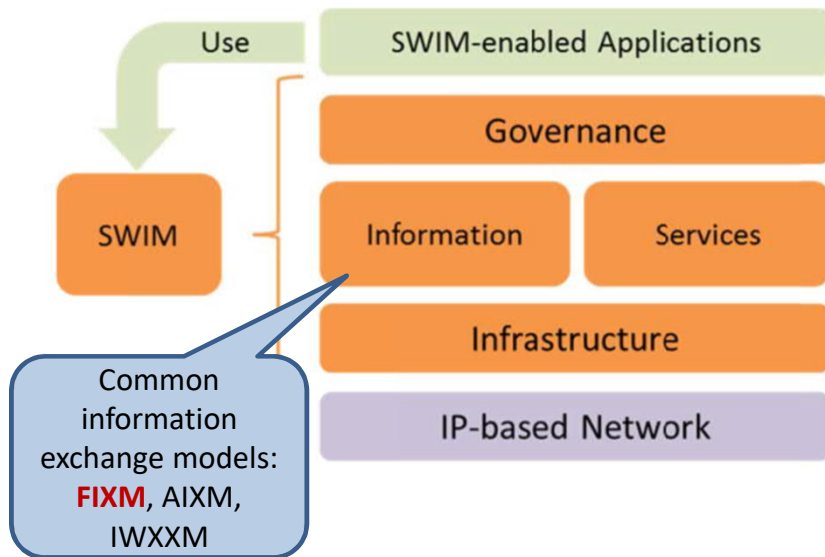
# Interoperability



# Interoperability

Information Exchange	Basic Principle	Examples of today	Ideal
ATFM Measure Information	Message exchange format should be commonly agreed among stakeholders.	<p>In Asia-Pacific, members of the APAC Multi-Nodal ATFM Collaboration have jointly developed a common standard to support ATFM message exchange via AFTN/AMHS network.</p> <p>Much of the messages are based on EUROCONTROL's ADEXP model, and are focused on messages related to GDP management.</p>	In a SWIM environment, the use of the most current Flight Information Exchange Model (FIXM) or FIXM Extension is recommended for this purpose.
Flight Update Information	Message exchange format should be commonly agreed among stakeholders.	EUROCONTROL uses Flight Update Message (FUM) for this purpose and their B-2-B Service	
Flight Departure Information	Message exchange format should be commonly agreed among stakeholders.	EUROCONTROL uses Departure Planning Information (DPI) for this purpose and their B-2-B Service	

# SWIM: Enabler for the Information Exchange



## Available Provisions

### ✓ **APAC Flow Extension 1.0.0**

- Published Jul 2019
- Extend FIXM Core v4.1.0
- Support exchange of:  
AOBT, CTOT, CLDT, TOBT, TSAT,  
TTOT, ELDT

### ✓ **US NAS Extension 4.2.1**

- Published Dec 2018
- Extend FIXM Core v4.1.0
- Support exchange of U.S. ATFM and Surface-CDM data elements

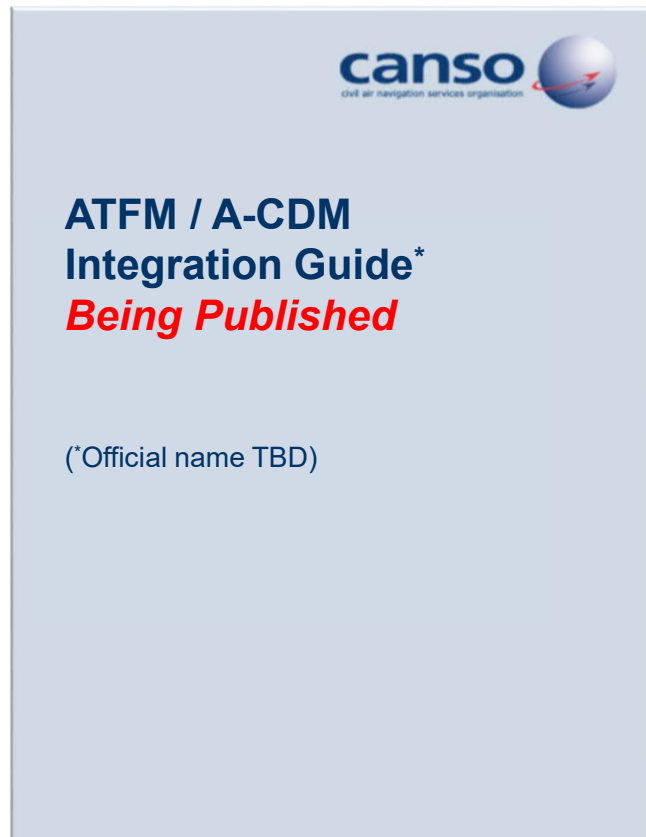
More information at: <http://www.fixm.aero>

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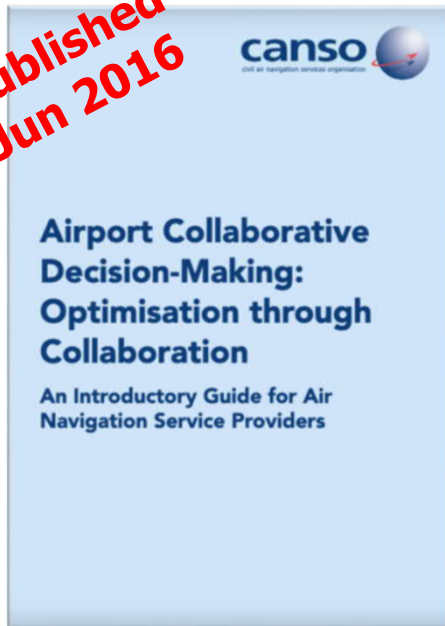
# Final Word...



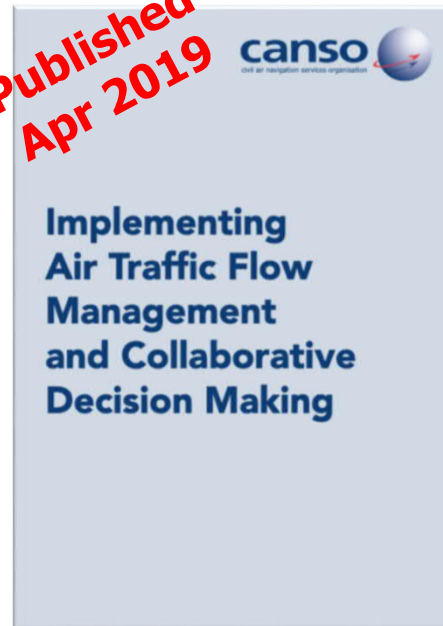
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# For More Information...

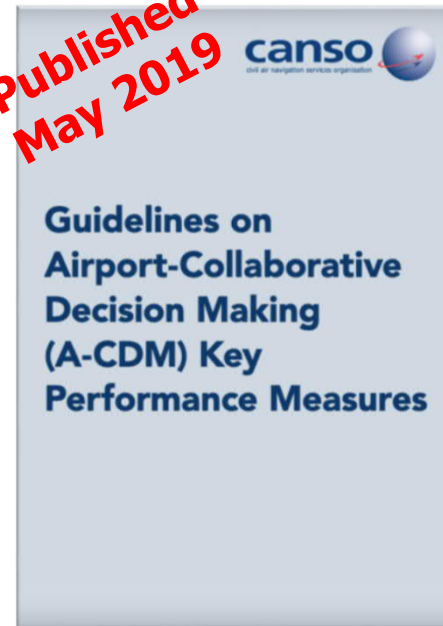
**Published  
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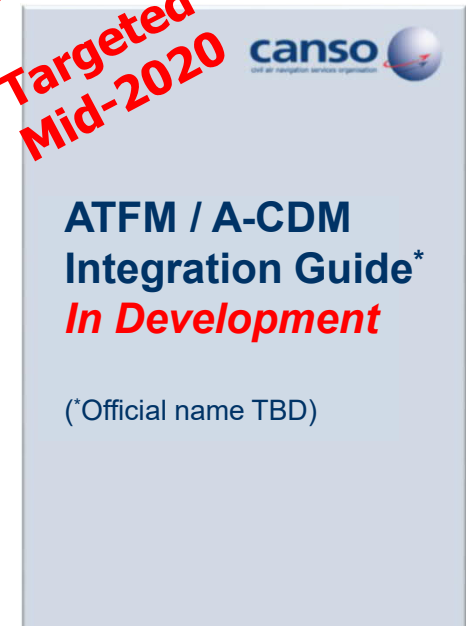
**Published  
Apr 2019**



**Published  
May 2019**



**Targeted  
Mid-2020**



...and **DON'T TO FORGET!**

- ✓ ATFM and A-CDM can exist independently but **INTEGRATION will give the full benefits**



# Q & A





**For any questions/comments:**  
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