A-CDM topics Overview
Airport Collaborative Decision Making (A-CDM)

September, 2019 | Mexico City, Mexico
• 35 years Canada ATM (ATCO, manager…) Transport Canada + NAV CANADA
  • Including ATFM
  • International collaboration (USA – Europe – NAT)
• 6 years Global Head ATM & Policy – IATA HQ
• Expert to ICAO ANC / ANB
  • Task Forces (including ATFM & contingencies)
  • PBN Go Teams co-lead
  • Civ-MIL co-lead
  • Panels member (incl. ATMRPP, ATMOPS, SASP, PBNSG,
  • Contributor to GANP
• ACI A-CDM expert / instructor
• Consultant offering support within the To70 group
  (joel.morin@to70.ca)
A-CDM Basic Concepts and Main Principles

September, 2019

Mexico City, Mexico
Life of an aircraft

1 aircraft – 1 week
Traditional Civil Aviation

Airport

ATC

Airlines
Traditional Civil Aviation

- Airlines collaborated with airports on a station by station basis
- Airlines did what ATC told them to do
- Very limited coordination between ATC and Airport
  - Usually limited to local discussions
Airport CDM in the Global ICAO context

GANP

Airport Operations Improvements

ACDM

B0-ACDM  B1-ACDM  B2-ACDM
The story begins with Collaborative Decision Making (CDM) in general

La historia comienza con la toma de decisiones colaborativas (CDM) en general
Birth of Collaborative Decision Making in Aviation

- Lack of common awareness
- Conflicting goals
- In the mid 1990s FAA / NAV CANADA came to realize that they needed to communicate and collaborate with their airline customers
- Coordination telecoms with:
  - ATM
  - Airlines
  - Airport ops
  - WX
CDM Stakeholder Responsibilities

• Sharing of information, developing rules of exchange, maintaining accuracy and confidentiality
• Transparency of Decision Making
• Organizational Structure and Culture that supports the CDM process
• Compliance with and support of decisions
CDM Benefits

• Increased information flow leads to improved, real time situational awareness; shared by all stakeholders

• Common understanding and agreed to processes lead to greater system predictability

• Predictability, flexibility and input leads to a reduced impact of ATFM measures on business performance.

• Competitive users can find co-operative solutions that maximize access to system resources for all

• A review of EUROCONTROL’s A-CDM project found that 90% of the benefits came from data sharing alone
CDM Processes

• CDM applies to all points along the planning and execution timeline.
  • 2-way flow of information, including data, intent, options and agreement.

• Relevant ATM data is fused for an airspace user’s general, tactical and strategic situational awareness and conflict management.

• Relevant Airspace User operational information is made available to the ATM system

• information exchange must be iterative.
  • Party A passes information to Party B. Party B makes decisions based on received information. Party B must pass this new information back to Party A.
What is still missing?
A-CDM – bringing in the turnaround

By linking in all elements of the value chain, there is overall situational awareness and control of the results
Airport CDM as part of CDM

‘CDM’ del aeropuerto como parte del ‘CDM’
A-CDM Basics

• 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

• Airlines & Airports can leverage benefits beyond the ATM domain
NADIE TIENE TODAS LAS RESPUESTAS O INCLUSO TODAS LAS PREGUNTAS

NO ONE HAS ALL THE ANSWERS OR EVEN ALL THE QUESTIONS
A-CDM Primary Scope

ATC
ATFM
RSEQ
(AMAN)
SURF

Landing, taxi

Turn Around Operations

Taxi, take-off

Block ON
Block OFF
## Process Ownerships

### Inbound

ATM informs A-CDM of when to expect the aircraft

ATM owns the aircraft until:
- Handover to Apron Control; or,
- It stops moving

### Turnaround

A-CDM owns the aircraft for the turn
- Communicates anticipated results of turnaround to ATM
- May adjust priorities / processes in knowledge of required time objective

A-CDM hands over the aircraft at off-block OR taxiway entry (depending on where)

### Outbound

ATM owns the aircraft when it starts moving or enters the TWY system

ATM gives target times to A-CDM to meet (TSAT or TMAT)

ATM manages the departure sequence, the taxi out and beyond

ATM provides the next station with Estimated landing Time
ATM – A-CDM Information Exchange

• ATM → A-CDM: Landing Time & Taxi in time

• A-CDM calculates turnaround, and

• A-CDM → ATM: Target Off-Block Time

• ATM calculates Target Takeoff Time
  • Optionally assesses impact on ATFM network demand
  • ATFM may require CTOT which gets translated into A-CDM target time

• ATM → A-CDM: Target Time

• A-CDM evaluates and adjusts. Further coordination may occur
ACDM uses a milestone approach

ACDM utiliza un enfoque de hitos
What’s a Milestone?

A milestone is a timestamp

Each module entry | exit can be a milestone

The milestones you choose will depend on your:

- Organization
- Design
- Needs
Two main Approaches

EUROCONTROL (EUROPE)  UNITED STATES
What they have in Common

- Management of airport surface traffic flows and runway departure queues
  - Optimize airport capacity + airspace resources
  - Reduce fuel burn + emissions;

- Provision of real-time access to aircraft positioning on the aerodrome

- Timely sharing of accurate operational data among stakeholders
  - Manage airport demand

- Connectivity between aerodrome surfaces and ATFM
  - Common operational picture
What they have in Common

management of airport surface traffic flows and runway departure queues:
- optimize airport capacity + airspace resources
- reduce fuel burn + emissions;

provision of real-time access to aircraft positioning on the aerodrome,

及时地分享准确的运营数据

timely sharing of accurate operational data among stakeholders

manage airport demand

NOT ALL ANSPs APPLY ATFM
General difference between Europe and USA “A-CDM”

- European airport aprons tend to be controlled
  - A-CDM integrates the turnaround and ATC issues Start Up Time
- USA aprons are often managed by airlines
  - FAA is concerned by Maneuvering Area (TWY) entry-exit
  - Apron management responsible for delivering aircraft to transition point
Combine concepts to suit your needs

- This airport’s apron is not controlled
- Movement Area Entry | Exit Times might be better milestones for interchange with ATC
- BUT – Ground Handling Milestones data interchange might still be required
Milestone approach

- Determine significant events to track progress of flights and the distribution of events
- Define information updates and triggers
- Specify data quality
- Ensure a link between arriving and departing flights
- Enable early decision making
Forward AND Backward (Goal) Focus

I follow my process and will be ready at ...

You must takeoff at ...
and the taxi out time is...
A-CDM implementations must be tailored to the requirement ...

... and to the ATM environment

One Size does NOT fit all

The European Approach fits... Europe!
Not a Single A-CDM

Local airport operations efficiency opportunity:
• Resource management
• Improved taxi queue lengths

Bonus: ATM provides _LDT and receives updated “ETD” but no ATFM measures
Not a Single A-CDM

- ATFM Function present in ACC, TWR interfaced
- No regional ATFM collaboration in place
- ATM provides and receives movement times
- ATM issues departure constraints if required
- Airport ops / turnaround processes adapt to the constraints
Not a Single A-CDM

Regional ATFM (Network)

• ACC’s ATFM collaborates with others in a multi-FIR, regional or multi-regional context

Network Ops

• Opportunity for complex Slot Swapping and coordination

• Improved opportunity for Airline Operations Centre involvement
  (example – Europe)
Collaborative Decision Making

• 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.

• ATM community members share information related to that decision and agree on and apply the decision-making approach and principles.

• As a process, A-CDM is no different
  • Applied in Airport Environment
A-CDM Operational Principles

• A-CDM is about:
  • Sharing and exchanging of accurate, timely and usable airport data
  • Requires cultural change to support new procedures and processes
  • Benefits: Improving operational efficiency and performance for all partners

• A-CDM is NOT about:
  • Implementing a new IT system
  • Sharing commercially sensitive data
  • Blame
  • Having more meetings or discussions with no actions / results
What will A-CDM do for us?

- key enabler to improving the predictability of events and optimising the utilisation of resources and airport infrastructure.
- improved operational efficiency and reduces costs for the entire airport community.

- Enabled through improved real time information sharing between airport operator, airlines, ground handlers and air traffic control (ATC). Sharing inbound and turnaround information in a collaborative process improves predictability of subsequent events such as arrivals and off-blocks.
A-CDM is not magic!

A-CDM does NOT resolve

- Increase off-block punctuality
- Improve airspace capacity
- Demand congestion
Questions?
A-CDM from European to global models

September, 2019

Mexico City, Mexico
Evolution of A-CDM

European
FAA
Global
It began with Collaborative Decision Making in the US

• Initially led by US Air, the concept of CDM was developed in recognition that increased cooperation between the government service provider, airports and airlines could achieve solutions to existing air traffic flow problems.

• This group established three tenets of CDM:
  • Most problems have simple causes with simple solutions
  • Better information sharing eliminates a very large proportion of the problems
  • CDM can only be successful if trust is established between the partners as the first step

CDM
A-CDM Evolution

• Europe started the ball rolling.
  • Solution from 2004 -- not current globally applicable
  • Need better airline central involvement at some airports with ATFM (ATM network management) for fleet level management

• FAA has its own similar concept
  • With different interface points (milestones)
  • Greg will be explaining the FAA concept this afternoon.

• ICAO adopted the concept and broadened it
  • Global Air Navigation Plan and Aviation System Block Upgrades (ASBUs)
  • largely based on the EUROCONTROL model
A-CDM in Europe

• Presence of an ATM Network Manager
• The European airports, EUROCONTROL & the aircraft operators, work together to:
  • exchange information on best practices;
  • achieve a common understanding of A-CDM in Europe; and
  • harmonize A-CDM procedures and processes wherever possible.
• A-CDM is seen as one of the main ways to integrate airports with the entire European ATM network and may also be used to understand and predict how individual airport operations will impact such a network.
A-CDM in USA

- The US environment is different from Europe
- “Push and Start” is not an ATC function and is often managed by airlines’ apron management
- Interface is at Apron / Taxiway boundary
- More from Greg later…
A-CDM Globally

• A-CDM implementations scaled to the local needs and context:
  • Strategic Objectives
  • ATFM involvement
  • Information sharing abilities

• Interfaces with relevant ASBUs

• Information sharing between airports should be done via ATM, not A-CDM to A-CDM

• Benefits for:
  • AOs and their networks
  • Airports and their resources
  • ATM and their resources
ICAO versus Airports (and airlines) Scope

- ICAO’s scope is Civil Aviation
- Airports and Airlines are also members of the ATM Community
- BUT
  - Airport / airline stakeholders have an additional scope beyond civil aviation
- It is possible to use ACDM to achieve benefits without ATC collaboration
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
A-CDM in context
Summary

• It is a philosophy
• It is processes
• A-CDM implementations vary
• Need to be adapted to your community business needs
• Can be scaled progressively
• Needs buy-in from everyone concerned

• Is not about buying a turnkey system
Scope of A-CDM and the roles of Aviation stakeholders
airports, airlines, ANSPs (ATFM and ATM)

September, 2019   Mexico City, Mexico
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
Modern Civil Aviation

- Networks of Networks
- Trajectory-based operations
- Each domain needs information from other domains
- Each domain influences the other domains
- Success requires collaboration
A-CDM Primary Scope

Landing, taxi

Turn Around Operations

Taxi, take-off

Block ON

Block OFF
Who are the airport actors?
What are their concerns?
¿Quiénes son los actores del aeropuerto?
¿Cuáles son sus preocupaciones?
Airport ops
Operaciones aeroportuarias

Ground handlers
Apoyo en tierra

ATM

Airlines
Líneas aéreas
Airport Operators

- Gate management
- Slot management conflicts with actual ops
- Demand management
  - Runway queues
  - Ramp congestion
- De-icing
- Poor runway capacity delivery (on departure) due to inefficient sequence
Ground Handlers

- What’s my priority?
- Resource allocation
- (ramp congestion)
- Service level contracting in conflict with airport mission
- ...
ATM

- Flight plan times do not correspond to reality
- Flight non-compliance with ATC slots
- Inefficient delivery of aircraft for departure
- ...

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Airlines

- Gate and resource allocations
- Lack of awareness among internal stakeholders:
  - Pax service agents
  - Dispatch / flight ops
  - Station management
- “victim of circumstances”
  - Lack of predictability and of overall management
  - Runway queues
  - Ramp congestion
- De-icing
- …
potential benefits of mission-focused Airport CDM

beneficios potenciales de la CDM del aeropuerto centrada en la misión
A-CDM Actors

- ATM
- AO
- Airport
A-CDM Actors - AOs

- Improved fleet-wide operations / Timely performance
- System-level decisions and priorities implemented locally
- Services and agents managed with full and transparent awareness of the missions and each actor’s roles and objectives
- Optimized taxi time based on common awareness
- Improved customer experience
- Avoid excessive on-board waiting and ramp delays (and penalties!)
- Avoid surprises and minimize stress – customer retention / attraction

AO includes Ground Handlers in this example
A-CDM Actors - Airport

- More predictable gate / stand management
- Especially if ATC provides Estimated Landing Time in timely manner
- More efficient – mission oriented – Ground Handling
- Opportunity for better analytics – integrated with ATM information
A-CDM Actors - ATM

- Improved demand predictability
- ATM receives the Target Off Block Time (same as flight plan departure time) and calculates a Takeoff Time
- If constraint exists, may issue CTOT resulting in TSAT or entry into Taxiway System
- Opportunity for negotiation
- Slot Swapping
- Turnaround compression

• ATM should provide times to next airport – not A-CDM
A-CDM is about

• enabling collaborative situational awareness between ATM, Airlines and airport ops (and their related agents)

• planning operations based on ‘real’ times rather than schedules and planned ETDs

• Managing resources and priorities based on the missions

• Helping airports manage their resources (e.g. gates) in full awareness of circumstances

• Helping airlines and airports better manage customer experiences (information sharing, managing expectations)
Targeted Benefits - General

Inbound:
- More accurate arrival times enable better decisions

Turnaround:
- Improved ground handling processes
- Improved resource management

Outbound:
- Improved predictability (airline / ATC / Airport)
- Improved situational awareness in all domains
## Turnaround Process Benefits

<table>
<thead>
<tr>
<th>Ground handlers:</th>
<th>Airport operator:</th>
<th>Airlines:</th>
<th>Air Traffic Control:</th>
<th>ATM Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>• accurate in-block and pushback planning</td>
<td>• Enhanced predictability</td>
<td>• Optimized taxi times</td>
<td>• Optimized departure sequence</td>
<td>• Reduced phantom demand</td>
</tr>
<tr>
<td>• situational awareness</td>
<td>• Better managed airside operations,</td>
<td>• Reduced queuing times</td>
<td>• Reduced movement area congestion</td>
<td>• Better use of existing capacity</td>
</tr>
<tr>
<td>• resource planning</td>
<td>• Reduced apron/taxiway congestion</td>
<td>• Reduced fuel consumption</td>
<td>• optimized departure planning</td>
<td></td>
</tr>
<tr>
<td>• more proactive decisions</td>
<td>• Optimized taxi times and runway throughput</td>
<td>• Better predictability</td>
<td>• Optimized runway throughput</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Improved emissions</td>
<td></td>
<td>• Reduced tower workload</td>
<td></td>
</tr>
</tbody>
</table>
<pre><code>                                         |                                                 |                                               | • Improved safety                     |                                   |
</code></pre>

**Turnaround Process Benefits**
Questions?
A-CDM Implementation

September, 2019  Mexico City, Mexico
A-CDM Implementation Roadmap

• trigger the interest and secure the cooperation of all partners;
• write out clear objectives;
• establish a timeline with roles and responsibilities;
• write out the plan;
• start implementation;
A-CDM Implementation Roadmap

1. Create a Team
2. Set the Objectives
3. Gap Analysis
4. Convince Partners
5. MoU
6. Setup Plan
7. Implement
8. Measure Results
9. Risks and Mitigations
10. Improve

Set the objectives

Convince educate all partners

Check what is needed and what is available (perform gap analysis)

Setup CDM project plan

Sign MoU

Set the organization structure

Project risks and mitigation

Continuous improvement

How to measure success (select KPIs)
A-CDM Implementation Roadmap

Create a Team → Set the objectives → Gap Analysis

Setup Plan ← MoU ← Convince partners

Risks and Mitigations ← Implement ← Measure results

Improve
A-CDM Implementation Roadmap

Create a Team
A-CDM Implementation Roadmap

Best Practice:
• Ensure that all stakeholders are actively engaged
• Consider your national organization structure
• Engage your local ATM even if only for their awareness

Create a Team
A-CDM Implementation Roadmap

Create a Team

Set the objectives
A-CDM Implementation Roadmap

Best Practice:

• Discuss the situation
• Educate the stakeholders
• Set clear and simple objectives
A-CDM Implementation Roadmap

Create a Team ➔ Set the objectives ➔ Gap Analysis
A-CDM Implementation Roadmap

- Create a Team
- Set the objectives
- Gap Analysis

• Measure the differences between the current situation and the objectives to be met
A-CDM Implementation Roadmap

1. Create a Team
2. Set the objectives
3. Convince partners
4. Gap Analysis
A-CDM Implementation Roadmap

- Understand the shortcomings
- Understand the stakeholder drivers
- Engage with stakeholder decision makers to obtain support

Create a Team → Set the objectives → Gap Analysis → Convince partners
A-CDM Implementation Roadmap

Create a Team → Set the objectives

Convince partners → Gap Analysis

MoU
A-CDM Implementation Roadmap

- In association with Project Management Plan
- All Roles and Responsibilities must be clear and agreed by all partners
  - Technical
  - Procedures
  - Information exchange
  - Monitoring / resolution mechanisms
A-CDM Implementation Roadmap

1. Create a Team
2. Set the objectives
3. Gap Analysis
4. MoU
5. Convince partners

- actively participate and commit to implement A-CDM decisions
- cooperate in all functional specifications
- ensure the interaction between their systems and the local A-CDM platform
- provide the necessary information to the platform and require quality standards
- guarantee the presence of a representative throughout the project
  - support and control its development and implementation
A-CDM Implementation Roadmap

Create a Team → Set the objectives

Convince partners → Gap Analysis

MoU → Setup Plan
A-CDM Implementation Roadmap

- standard PMP according to your change management process
Sample A-CDM project organization
Typical Project Management Phasing

1. Create multifunctional team
2. Objectives
3. Gap Analysis
4. Alternatives Analysis
5. Select most cost effective
6. Get Management GO
7. Prepare to IMPLEMENT
A-CDM Implementation Roadmap

1. Create a Team
2. Set the objectives
3. Gap Analysis
   - Convence partners
   - MoU
   - Setup Plan
   - Risks and Mitigations
A-CDM Implementation Roadmap

- Project Risks
- Safety Risks
Project Risks

- EUROCONTROL Airport CDM Manual provides a good range of SAMPLE project risks and potential mitigations
Safety Risks

- Safety Management Systems should already be in place
- This should not be new to you
- Any operational change must be assessed in terms of potential effects on safety
A-CDM Implementation Roadmap

1. Create a Team
2. Set the objectives
3. Gap Analysis
4. Convince partners
5. MoU
6. Setup Plan
7. Risks and Mitigations
8. Implement
A-CDM Implementation Roadmap

Create a Team → Set the objectives → Gap Analysis

Setup Plan → MoU → Convince partners

Risks and Mitigations → Implement

- Follow your Project Management Process
- Ensure that all actors are included in the Implementation Plan
- Track progress for all actors
- Conduct periodic reviews
- Implementation should fall on an AIRAC date
- Conduct a final review to ensure all pieces are in place including mitigations just prior to activation
- Have staff on hand to supervise, coordinate and intervene
A-CDM Implementation Roadmap

Create a Team → Set the objectives → Gap Analysis

Setup Plan ← MoU ← Convince partners

Risks and Mitigations → Implement → Measure results

Improve
A-CDM Implementation Roadmap - Improve

- You will not get it right on Day One
- You may have decided to phase in capabilities
- The environment may change
- Conduct post implementation reviews and use the information to guide next phases
A-CDM Implementation Roadmap

We are in a continuous improvement environment
Questions?
A-CDM and Irregular Operations

September, 2019

Mexico City, Mexico
Not all irregular operations are irregular – it depends where you are
What are Adverse Conditions?

• Conditions that cause reduced capacity
• Predictable or unpredictable

Source: Eurocontrol
CDM in Adverse Condition

- Weather and associated runway and taxi-way configuration
  - Wind will determine which runway to be used
  - Impacts capacity
- Need for de-icing
- Construction and maintenance works
- Technical resource availability
  - When actual and future availability changes, there is impact on capacity
- Industrial action
  - Each CDM partner to provide any known, planned industrial action affecting their operations
Adverse Conditions

Unpredictable
• Accident
• Security Incident

Predictable
• De-icing
• Snow Clearing
• Construction
• Convective weather
• Low vis events (fog, sand)
Adverse Conditions

Unpredictable
• No advance warning
• Details are unknown but
  • Can have a contingency plan
  • Adapt to situation

Predictable
• Advance warning
• Known patterns
• Various planning scenarios can be prepared and activated
Adverse conditions

<table>
<thead>
<tr>
<th>How does it affect capacity?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Stable or variable?</td>
</tr>
<tr>
<td>• Predictable or not?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Does it affect aircraft routing and taxi times?</th>
</tr>
</thead>
<tbody>
<tr>
<td>• De-icing pad</td>
</tr>
<tr>
<td>• Construction</td>
</tr>
<tr>
<td>• Snow clearance</td>
</tr>
<tr>
<td>• Runway swaps</td>
</tr>
</tbody>
</table>
It’s about managing queues
Stakeholders Needs

- Airlines need **PREDICTABILITY**
- Airports need **PREDICTABILITY**
- ATM needs **PREDICTABILITY**
- Passengers need **PREDICTABILITY**
- Handlers and agents need **PREDICTABILITY**
Stakeholders Needs

• PREDICTABILITY
Queue Management Provides Predictability

• The queues must be defined
• The queue parameters must be defined
• A-CDM must deliver aircraft into the system based on the objective(s)
ACDM integrated with ATFM

- This process chart integrates decisions by many stakeholders:
  - Local Airport (GH)
  - The airline Ops Centre
  - Air Traffic Flow Management (ATFM)

- This requires GH to adapt priorities and resources based on external constraints
- The network plan is negotiated between airline and ATM
A-CDM in Adverse Conditions - steps

• Prepare adverse conditions or crisis plan
• Establish procedures
• Make sure that procedures are simple
• Ensure that all partners are aware and at all levels are familiar with procedures
• Appoint a coordinator
A-CDM in Adverse Conditions

- Maximise the use of available capacity during Adverse Conditions
- Pass information to all partners in anticipation of disruptions
- Facilitate recovery after disruptions
A-CDM in Adverse Conditions

• To maximise effectiveness, all local stakeholders including ATC need to collaborate

• Predictability and efficiency can be enhanced substantially
Questions?
Benefits of A-CDM
turnaround management and coordination

September, 2019  Mexico City, Mexico
Extended Flight timeline
Extended Flight timeline

- In Blocks (ACARS IN)
- Turnaround
- Off Blocks (ACARS OUT)
- Push – start – apron out
A-CDM for Airports Primary Scope

Landing, taxi

Turn Around Operations

Taxi, take-off

Block ON

Block OFF
SIMPLIFIED TURNAROUND TIMELINE
Who are your actors?

<table>
<thead>
<tr>
<th></th>
<th>Time</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAXI IN</td>
<td>10 mins</td>
</tr>
<tr>
<td>TURNAROUND</td>
<td>0.09 days</td>
</tr>
<tr>
<td>IN BLOCKS</td>
<td>0 days</td>
</tr>
<tr>
<td>DEPLANE PAX</td>
<td>15 mins</td>
</tr>
<tr>
<td>TOILET</td>
<td>10 mins</td>
</tr>
<tr>
<td>DEPLANE CARGO</td>
<td>15 mins</td>
</tr>
<tr>
<td>REFUEL</td>
<td>10 mins</td>
</tr>
<tr>
<td>EMPLANE CARGO</td>
<td>15 mins</td>
</tr>
<tr>
<td>CATERING</td>
<td>10 mins</td>
</tr>
<tr>
<td>CLEANING</td>
<td>15 mins</td>
</tr>
<tr>
<td>EMPLANE PAX</td>
<td>15 mins</td>
</tr>
<tr>
<td>OFF BLOCKS</td>
<td>0 days</td>
</tr>
<tr>
<td>OUTBOUND</td>
<td>0.02 days</td>
</tr>
<tr>
<td>TAXI OUT</td>
<td>10 mins</td>
</tr>
</tbody>
</table>

- Who is involved in your turnaround processes?
- Who needs to know what results?
- How do the information consumers find out about a process delay?
- What causes/contributes to process delays?
- How are the turnaround agents informed of priorities?
- Do competing service level agreements play a role?
Extended Flight timeline

- Takeoff from outstation
- Cruise
- Approach
- Landing (ACARS ON)
- Taxi In
- Apron Entry
- In Blocks (ACARS IN)
- Turnaround
- Off Blocks (ACARS OUT)
- Push – start – apron out
- Apron Exit / Taxiway entry
- Taxi Out
- Takeoff
Extended Flight timeline

- Approach
- Landing (ACARS ON)
- Taxi In
- Apron Entry
- In Blocks (ACARS IN)
- Turnaround
- Off Blocks (ACARS OUT)
- Push – start – apron out
- Apron Exit / Taxiway entry
- Taxi Out
- Takeoff
Extended Flight timeline + Milestones
## Flight Events vs Milestones & Status

<table>
<thead>
<tr>
<th>Flight Event Times</th>
<th>Scheduled</th>
<th>Planned</th>
<th>ATFM measure</th>
<th>ATM system estimate</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Off-block Time (OBT)</td>
<td>SOBT</td>
<td>EOBT</td>
<td>COBT</td>
<td></td>
<td>AOBT</td>
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Questions?
Exercise – A-CDM Implementation

September, 2019  Mexico City, Mexico
Task

• In multidisciplinary Groups:
  • Pick a spokesperson and a scribe
  • Pick an airport
  • Make assumptions as to level of ATFM involvement
  • 30 minutes:
    • Identify strategic objectives to be achieved by your A-CDM
    • Identify key stakeholders you will need to convince
    • Perform high level Gap Analysis between current state and objectives

• Provide arguments to decision makers to convince them to support your project

• Present (5 minutes / group + discussions)