A-CDM topics Overview

Airport Collaborative Decision Making (A-CDM)
September, 2019 | Mexico City, Mexico

A-CDM Basic Concepts and Main Principles
September, 2019 | Mexico City, Mexico

A-CDM from European to global models
September, 2019 | Mexico City, Mexico

Scope of A-CDM and the roles of Aviation stakeholders airports, airlines, ANSPs (ATFM and ATM)
September, 2019 | Mexico City, Mexico

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

A-CDM and Irregular Operations
September, 2019 | Mexico City, Mexico

Benefits of A-CDM turnaround management and coordination
September, 2019 | Mexico City, Mexico

Exercise – A-CDM Implementation
September, 2019 | Mexico City, Mexico

Joel Morin - Who am I?

- 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

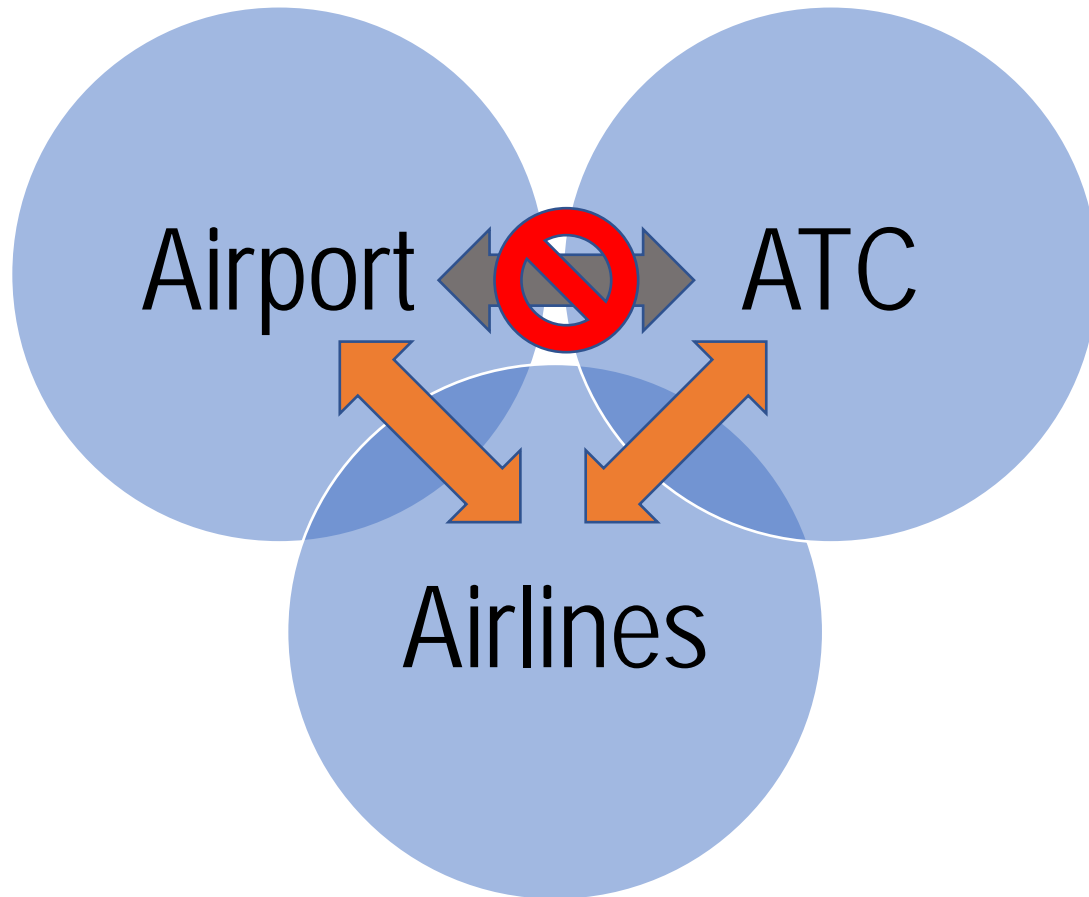September, 2019 | Mexico City, Mexico

Life of an aircraft

1 aircraft – 1 week

Traditional Civil Aviation

Airport

ATC
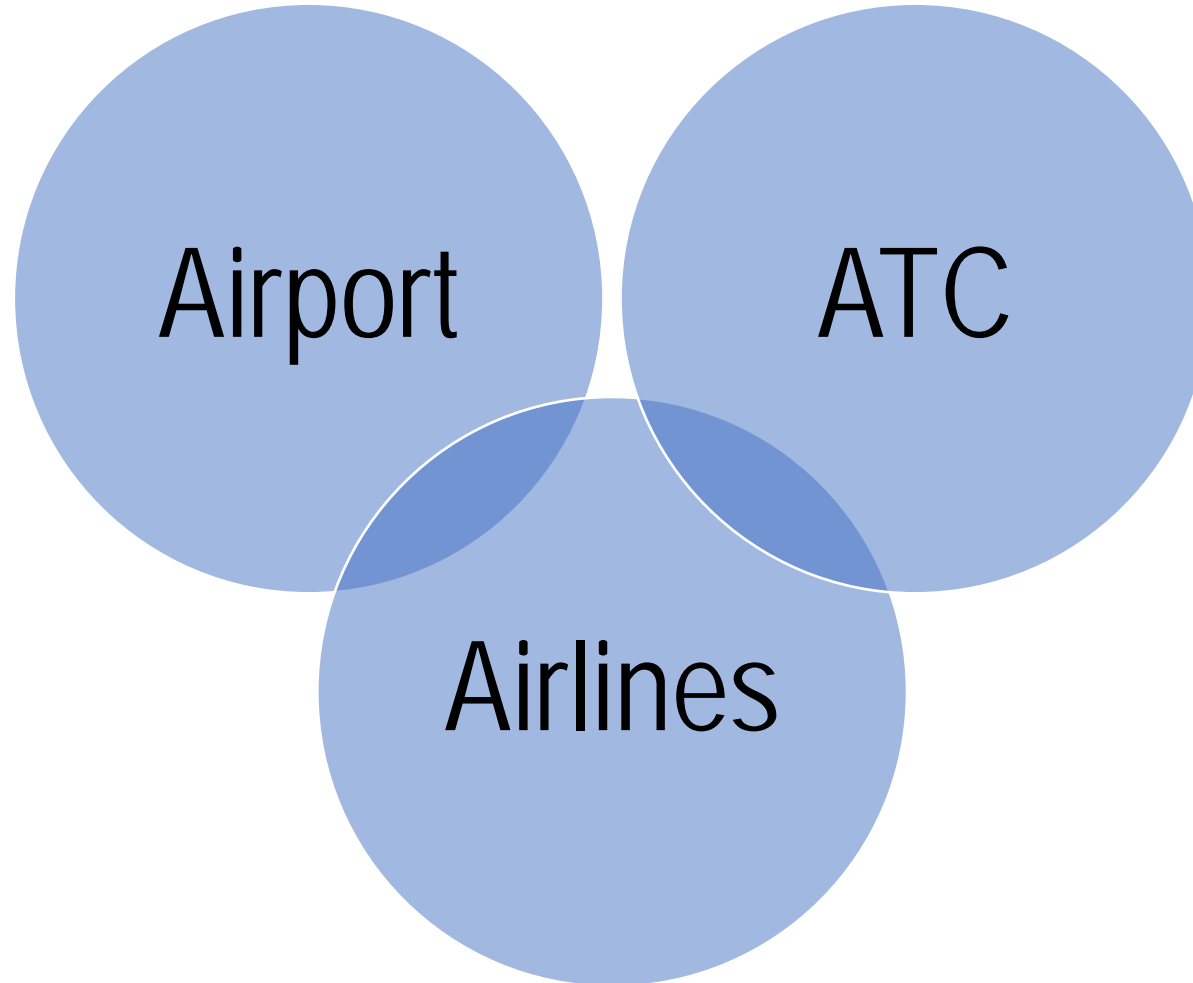
Airlines

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?
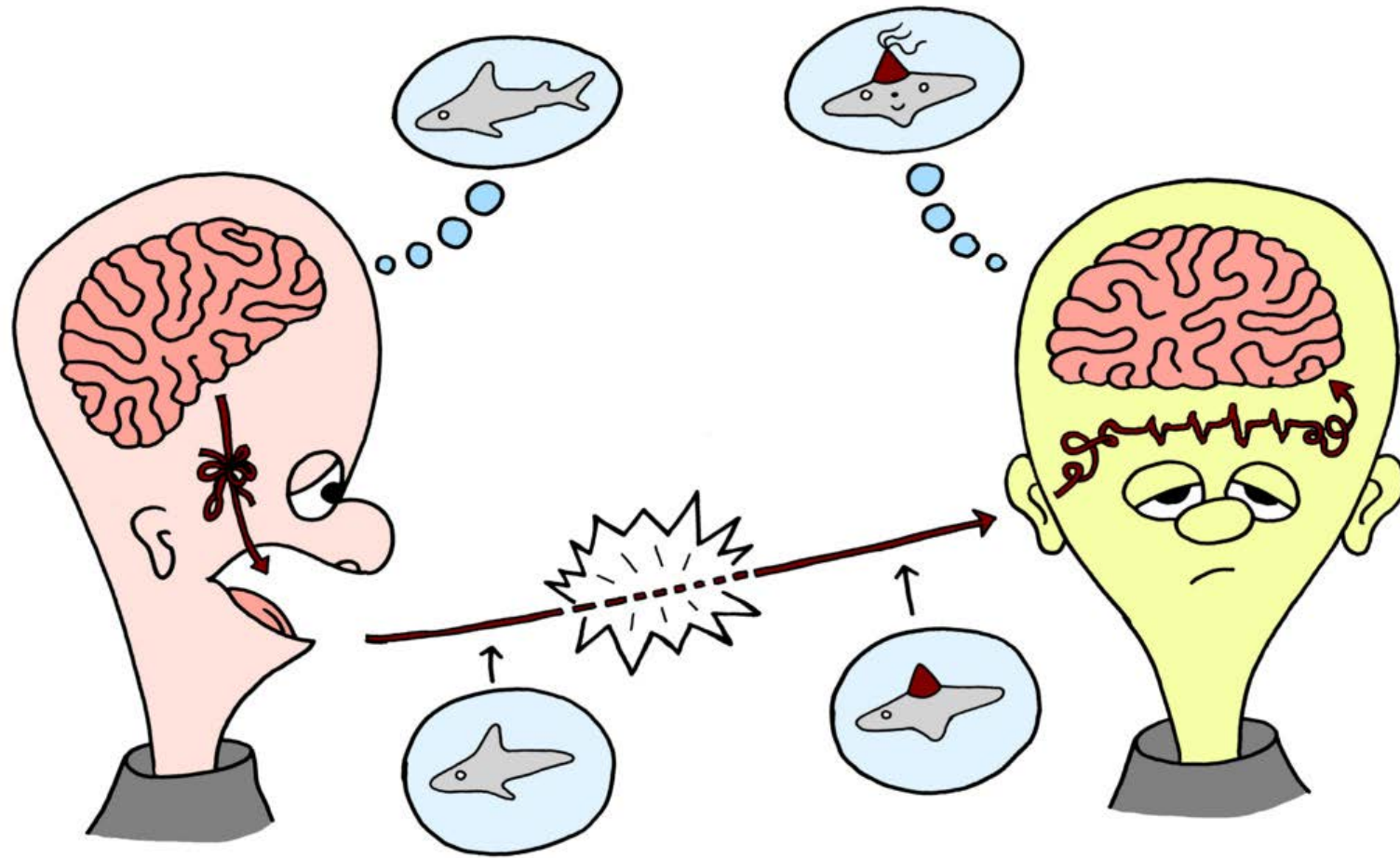
A-CDM – bringing in the turnaround

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'
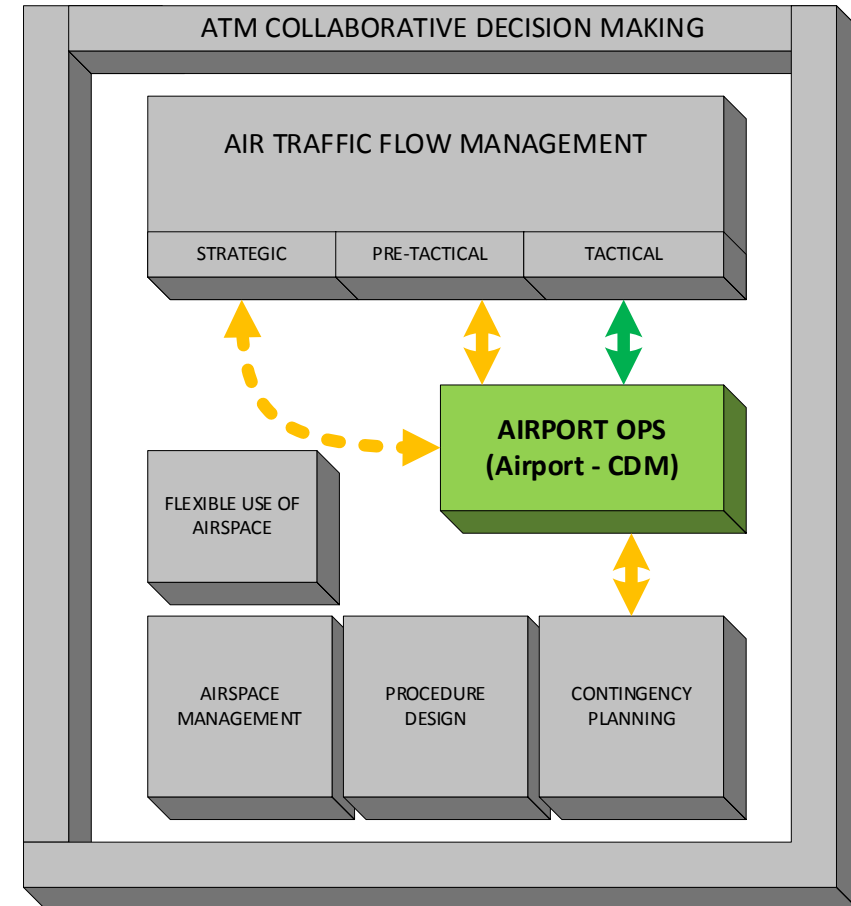
A-CDM Basics

- 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
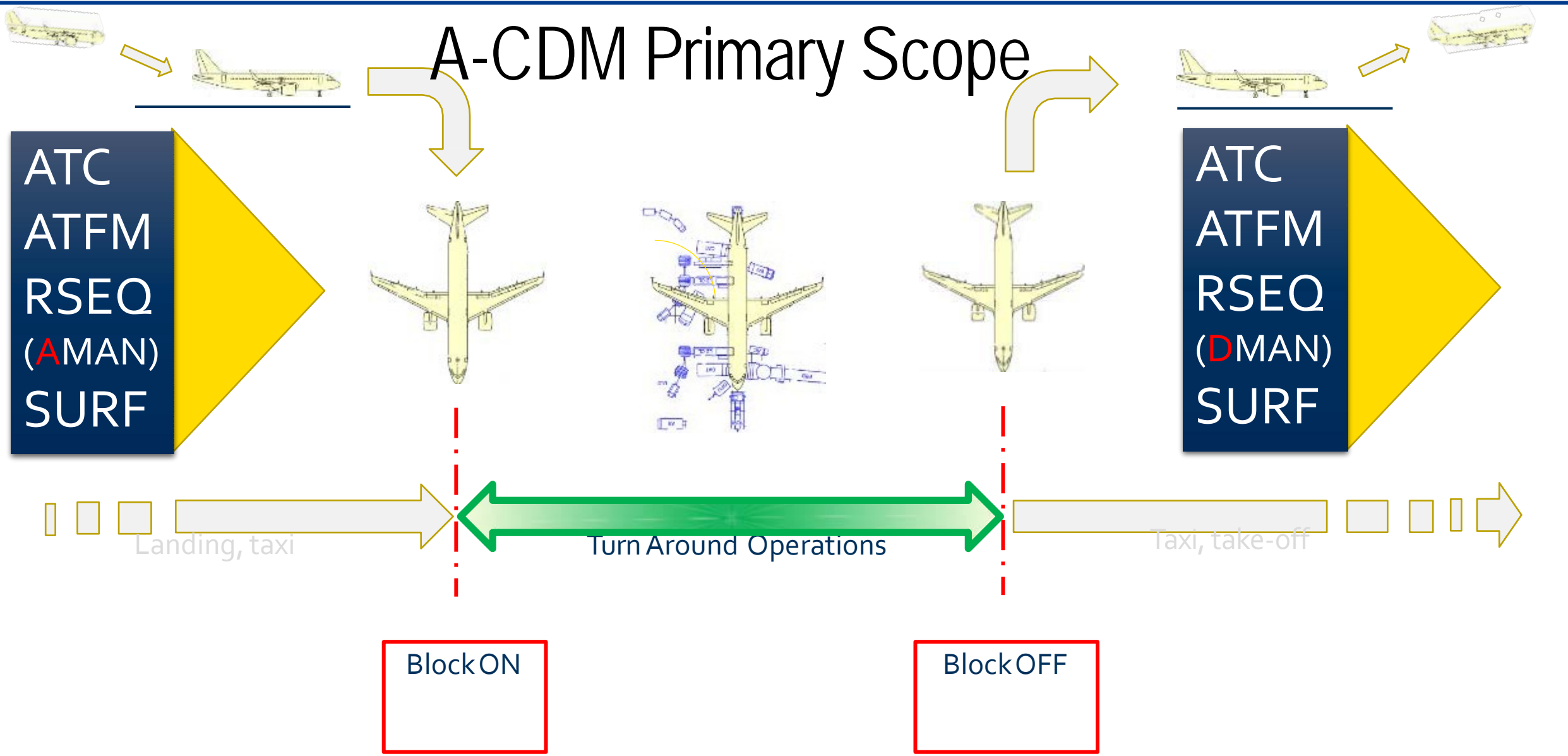- Airlines & Airports can leverage benefits beyond the ATM domain
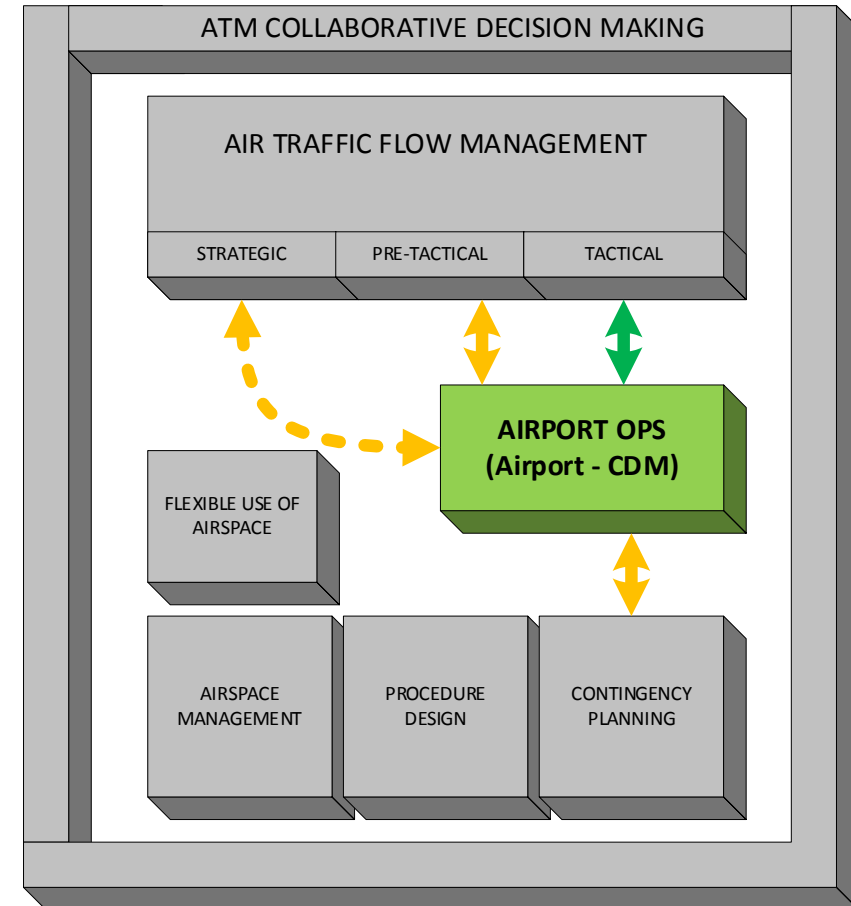
A-CDM Basics

NADIE TIENE TODAS LAS RESPUESTAS O INCLUSO TODAS LAS PREGUNTAS

NO ONE HAS ALL THE ANSWERS OR EVEN ALLTHE QUESTIONS

ATM COLLABORATIVE DECISION MAKING

AIR TRAFFIC FLOW MANAGEMENT

STRATEGIC | PRE-TACTICAL | TACTICAL

AIRPORT OPS (Airport - CDM)

FLEXIBLE USE OF AIRSPACE

AIRSPACE MANAGEMENT | PROCEDURE DESIGN | CONTINGENCY PLANNING

A-CDM Primary Scope

ATC
ATFM
RSEQ
(AMAN)
SURF

ATC
ATFM
RSEQ
(DMAN)
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

Turn Around
Operations

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
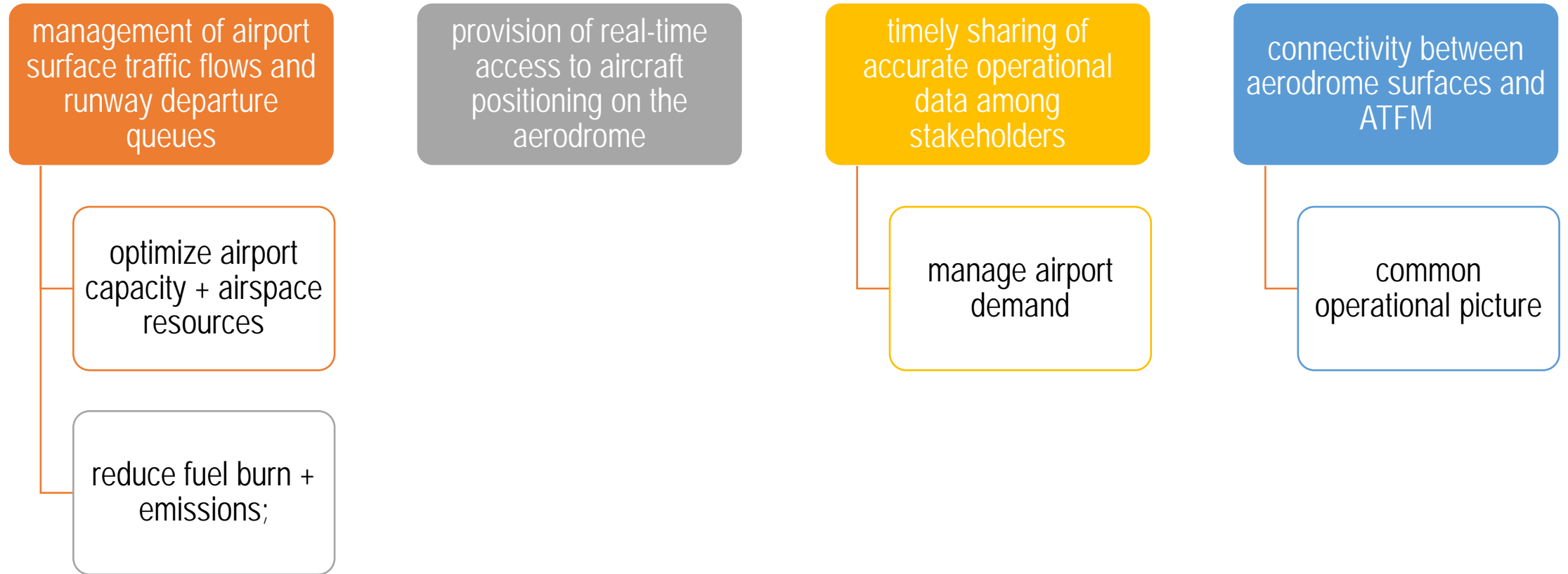- Design
- Needs

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

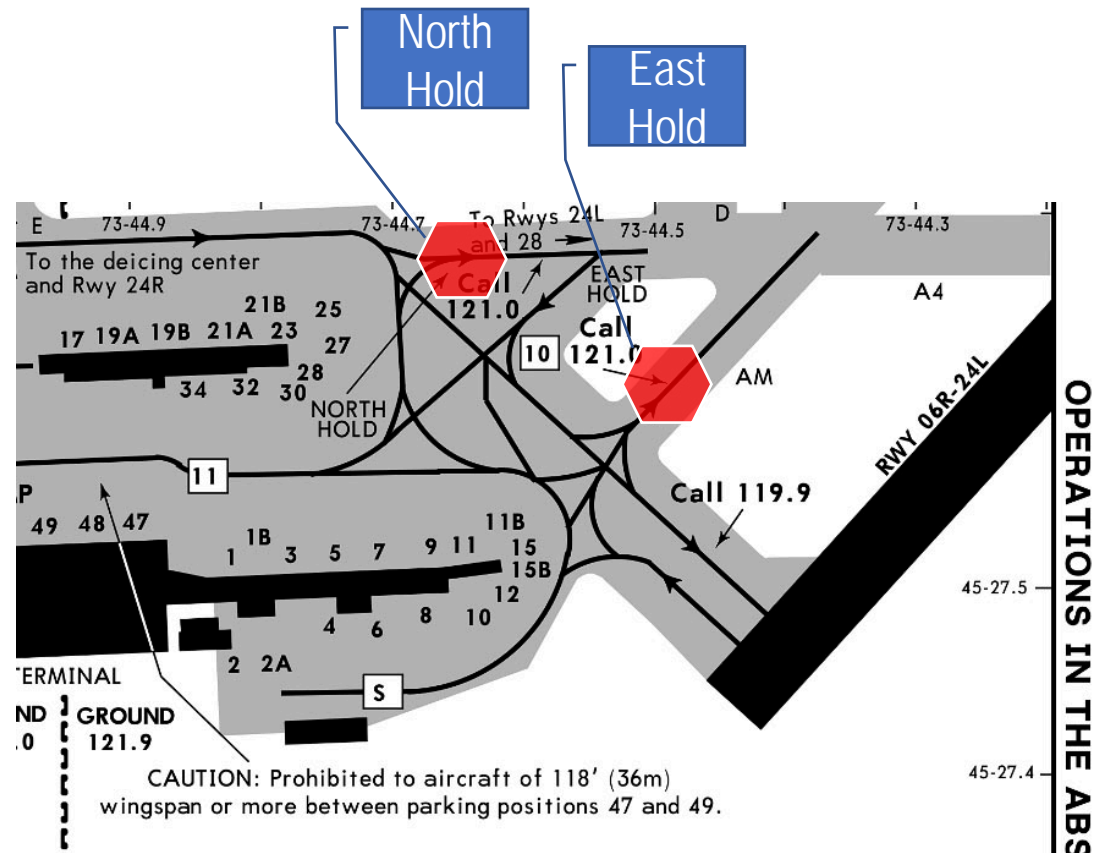**timely sharing of accurate operational data among stakeholders**

- 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,

timely sharing of accurate operational data among stakeholders

- manage airport demand

co...n ae...nd

NOT ALL ANSPs APPLY ATFM

...ure

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

North Hold

East Hold

CAUTION: Prohibited to aircraft of 118' (36m) wingspan or more between parking positions 47 and 49.

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
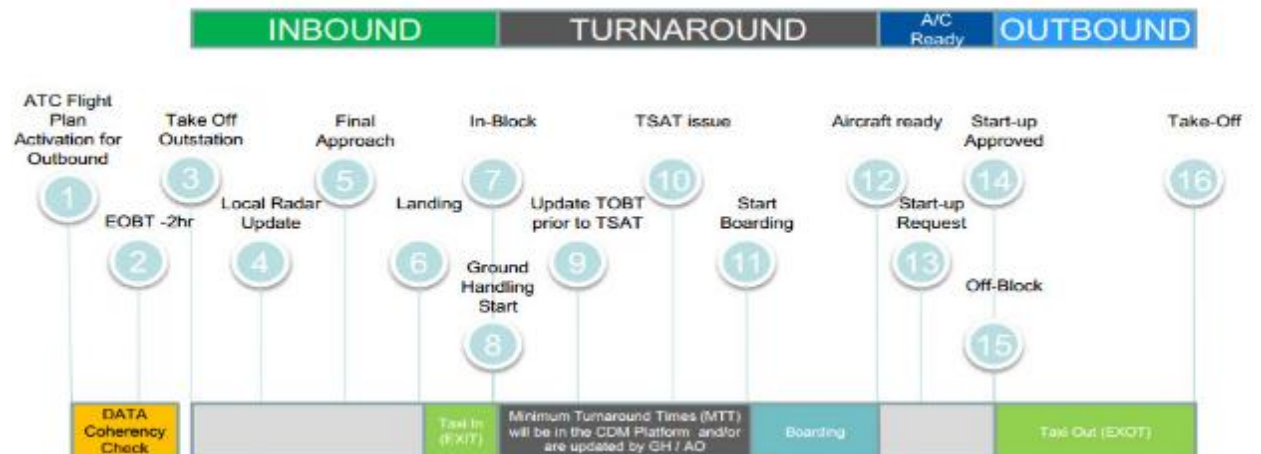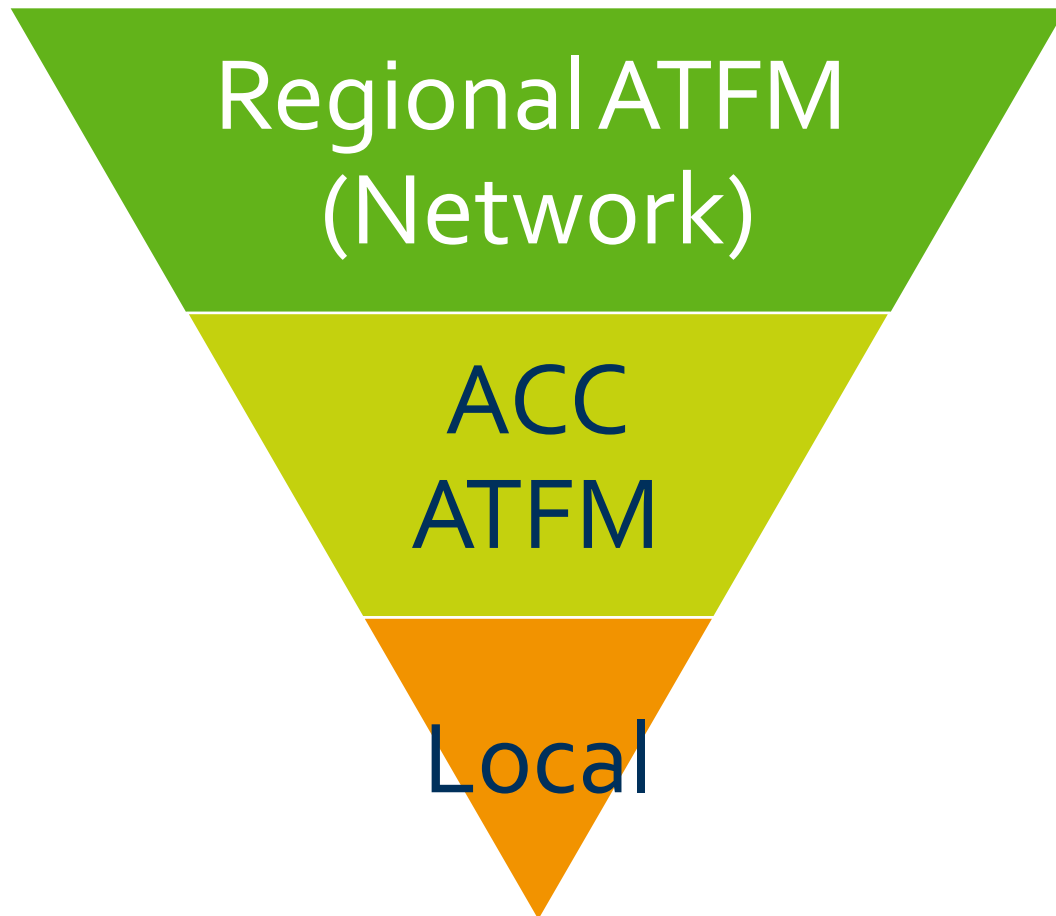
Forward AND Backward (Goal) Focus

I follow my process and will be ready at …

O F F   B L O C K

You must takeoff at …
and the taxi out time is…

Not a Single A-CDM

Regional ATFM (Network)

ACC ATFM

Local

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**

Local

Not a Single A-CDM

ACC ATFM

- 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
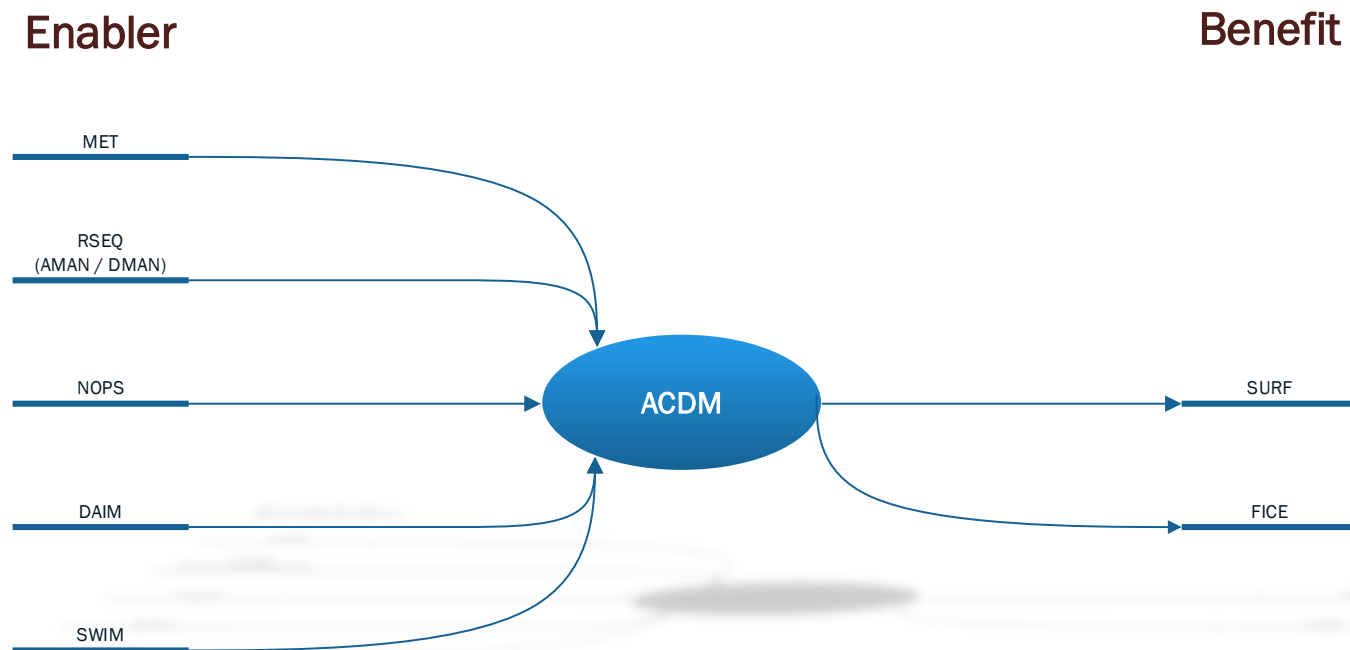- More from Greg later…

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

Enabler   **Benefit**

MET

RSEQ
(AMAN / DMAN)

NOPS   ACDM   SURF

DAIM   FICE

SWIM

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A-CDM in context

DEPENDENCY GRAPH

Integration with ATM Network function

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
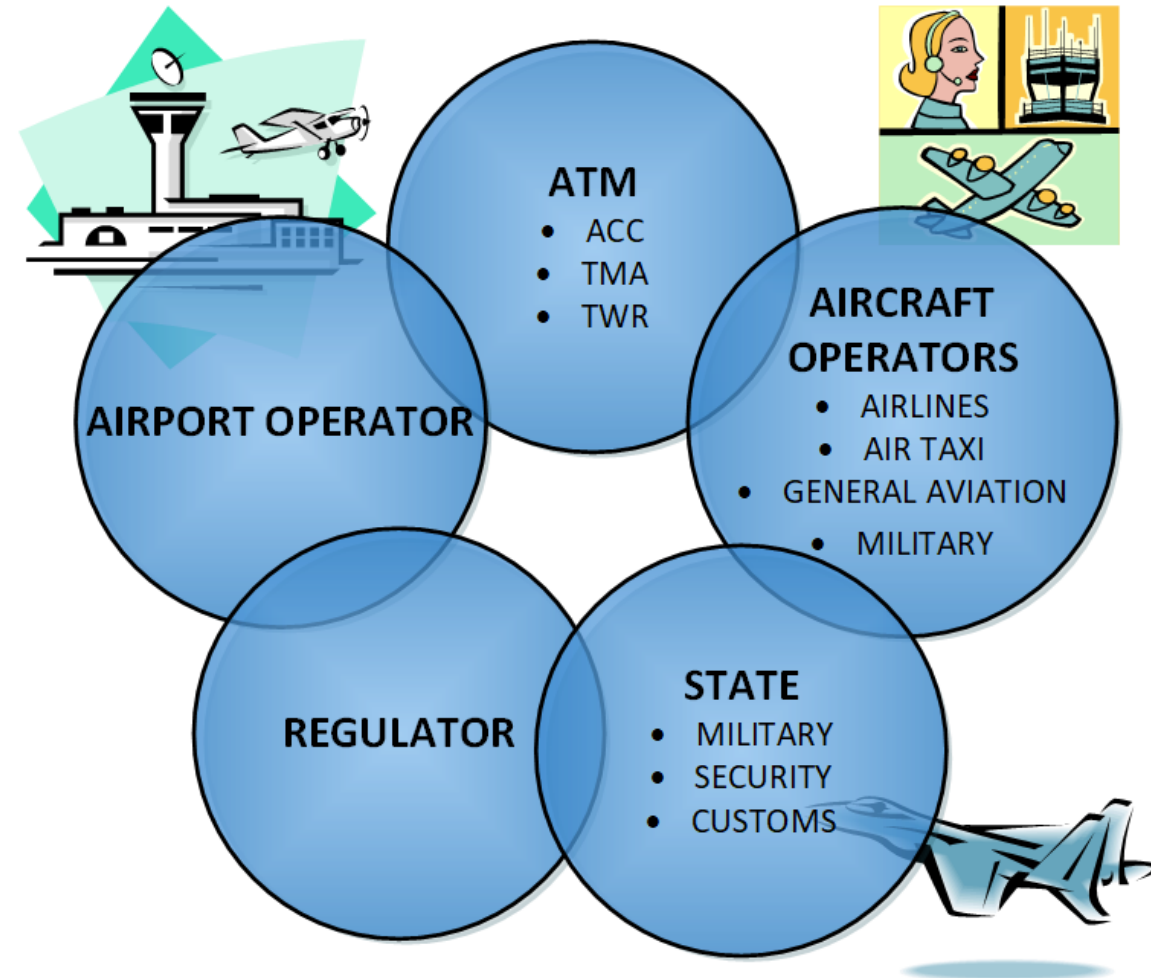
- Is not about buying a turnkey system

ATM
- ACC
- TMA
- TWR

AIRCRAFT OPERATORS
- AIRLINES
- AIR TAXI
- GENERAL AVIATION
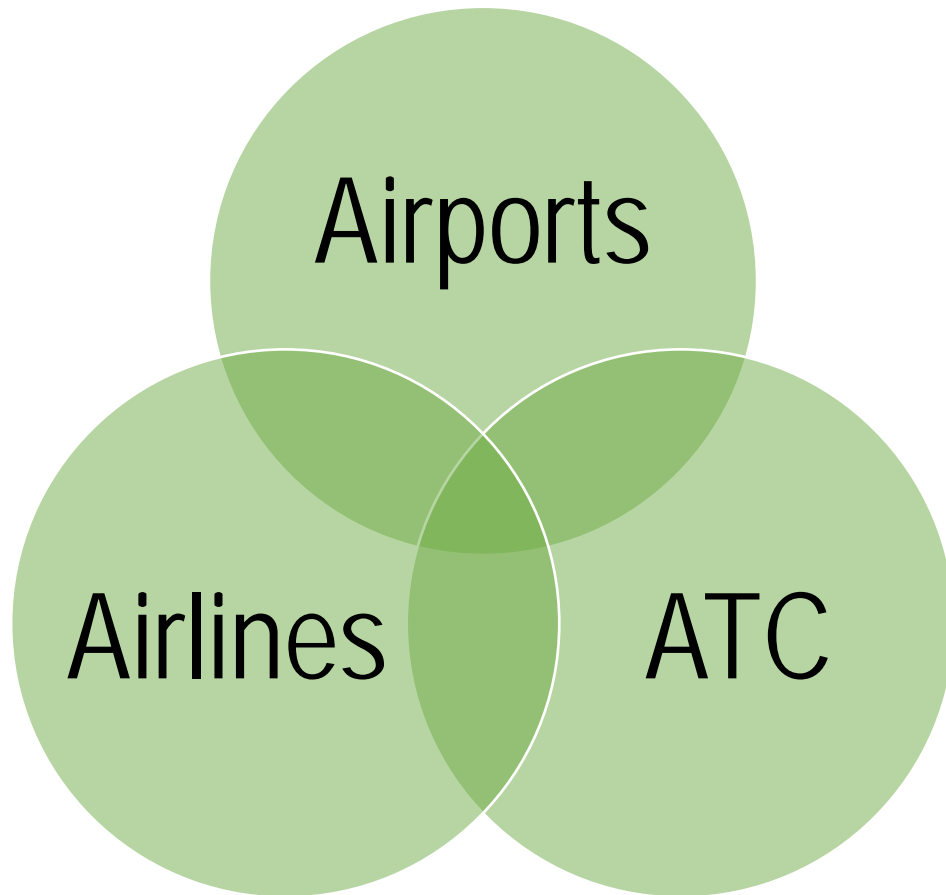- MILITARY

AIRPORT OPERATOR
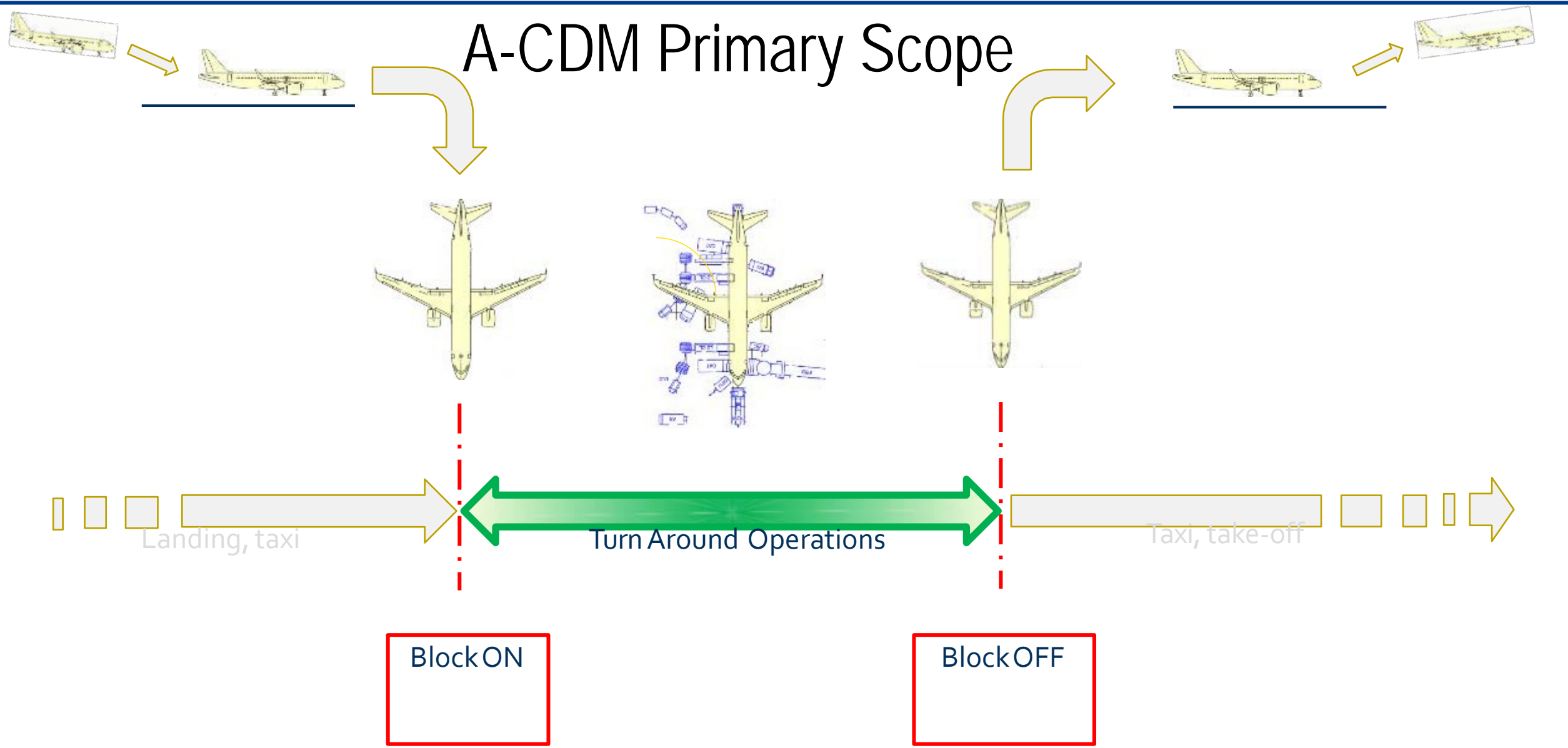
REGULATOR

STATE
- MILITARY
- SECURITY
- CUSTOMS

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

Airports

Airlines

ATC

- 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

AIRPORT

AIRLINE

AIRPORT PAX INFO

MET SERVICES

APRON CONTROL

GATE CONTROL

FIELD MAINTENANCE

AIRCRAFT MAINTENANCE

PAX SERVICE AGENTS

OPS CONTROL CENTER

ACDM

CATERING

FUELING

ACFT CLEANING

BAGGAGE

DEICE

MARSHALLING

SECURITY

BORDER SERVICES

AIRPORT CONTROL

AREA CONTROL

ATFM

AIRSIDE SERVICES

GROUNDSIDE SERVICES

ATM

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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
- …

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
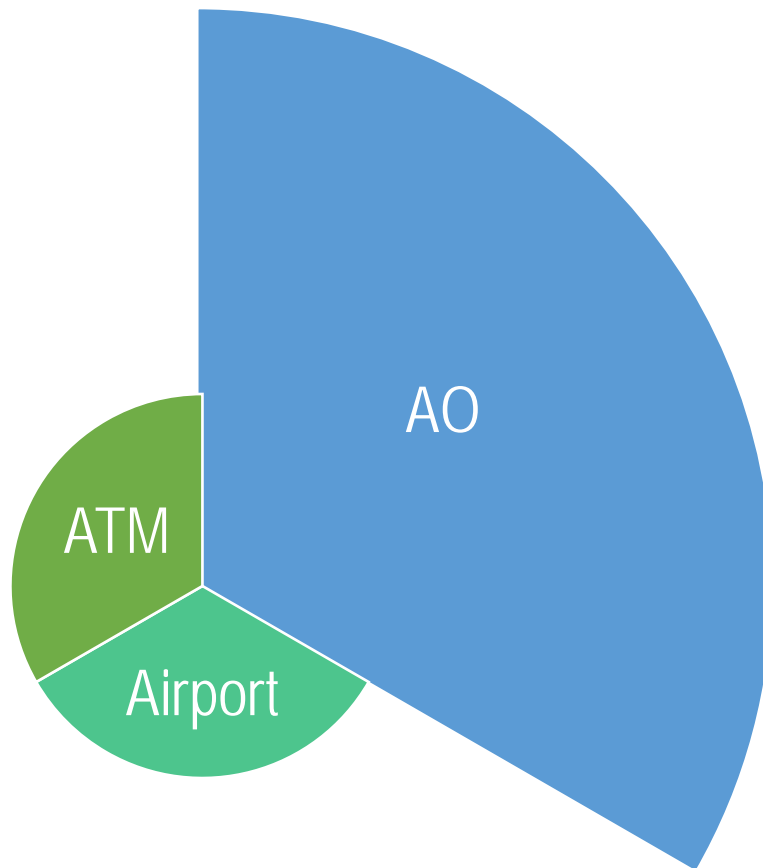 - Runway queues
  - Ramp congestion
- De-icing
- …

potential benefits of mission-focused Airport CDM

beneficios potenciales de la CDM del aeropuerto centrada en la misión

A-CDM Actors

A-CDM Actors - AOs

AO

ATM
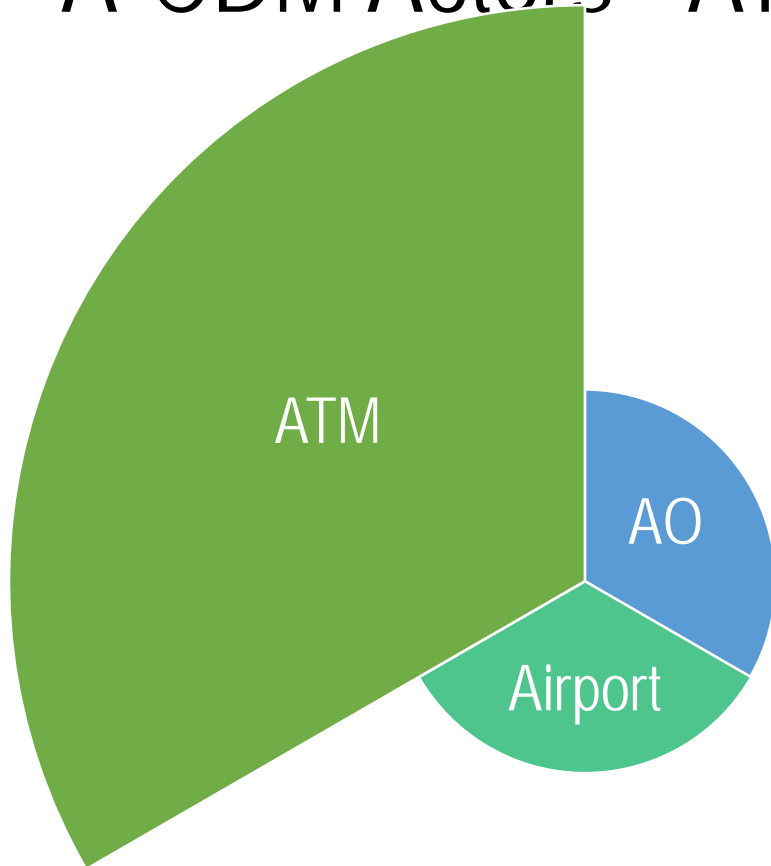
Airport

AO includes Ground Handlers in this example

- 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

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

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

- 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

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)

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

Targeted Benefits - General

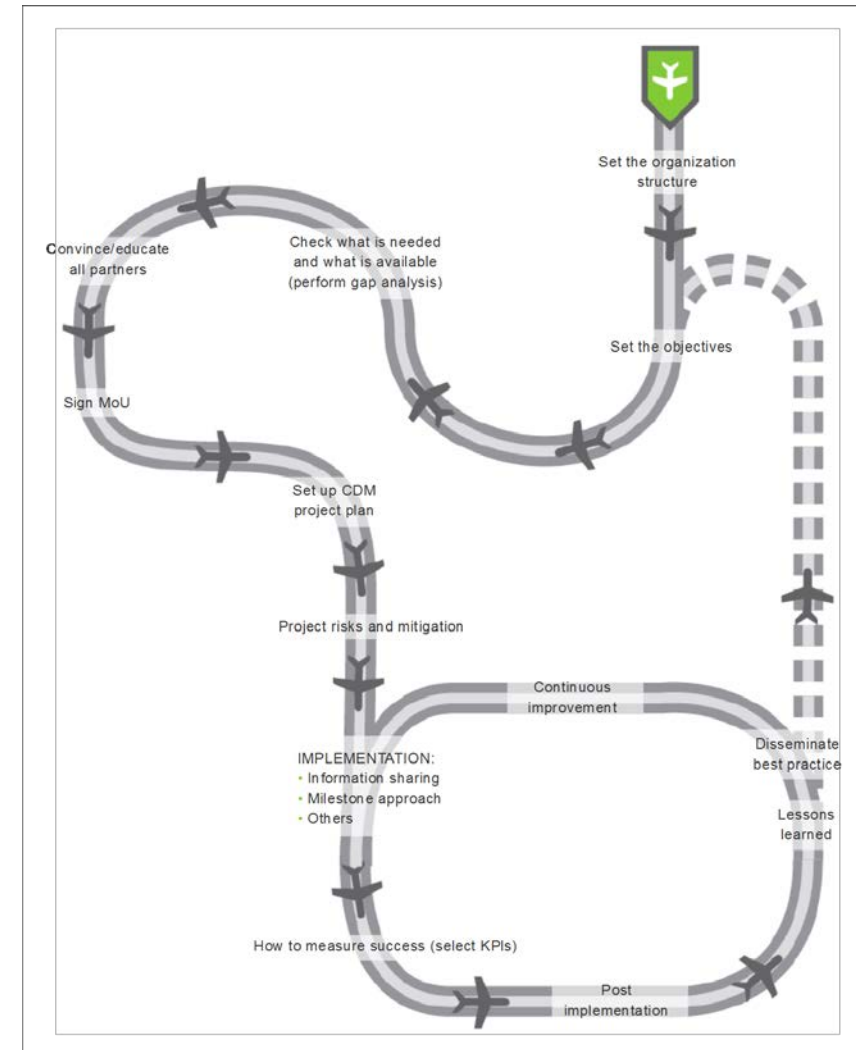| Ground handlers:	Airport operator:	Airlines:	Air Traffic Control:	ATM Network
• accurate in-block and pushback planning • situational awareness • resource planning • more proactive decisions	• Enhanced predictability • Better managed airside operations, • Reduced apron/ taxiway congestion • Optimized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

Turnaround Process Benefits

Questions?
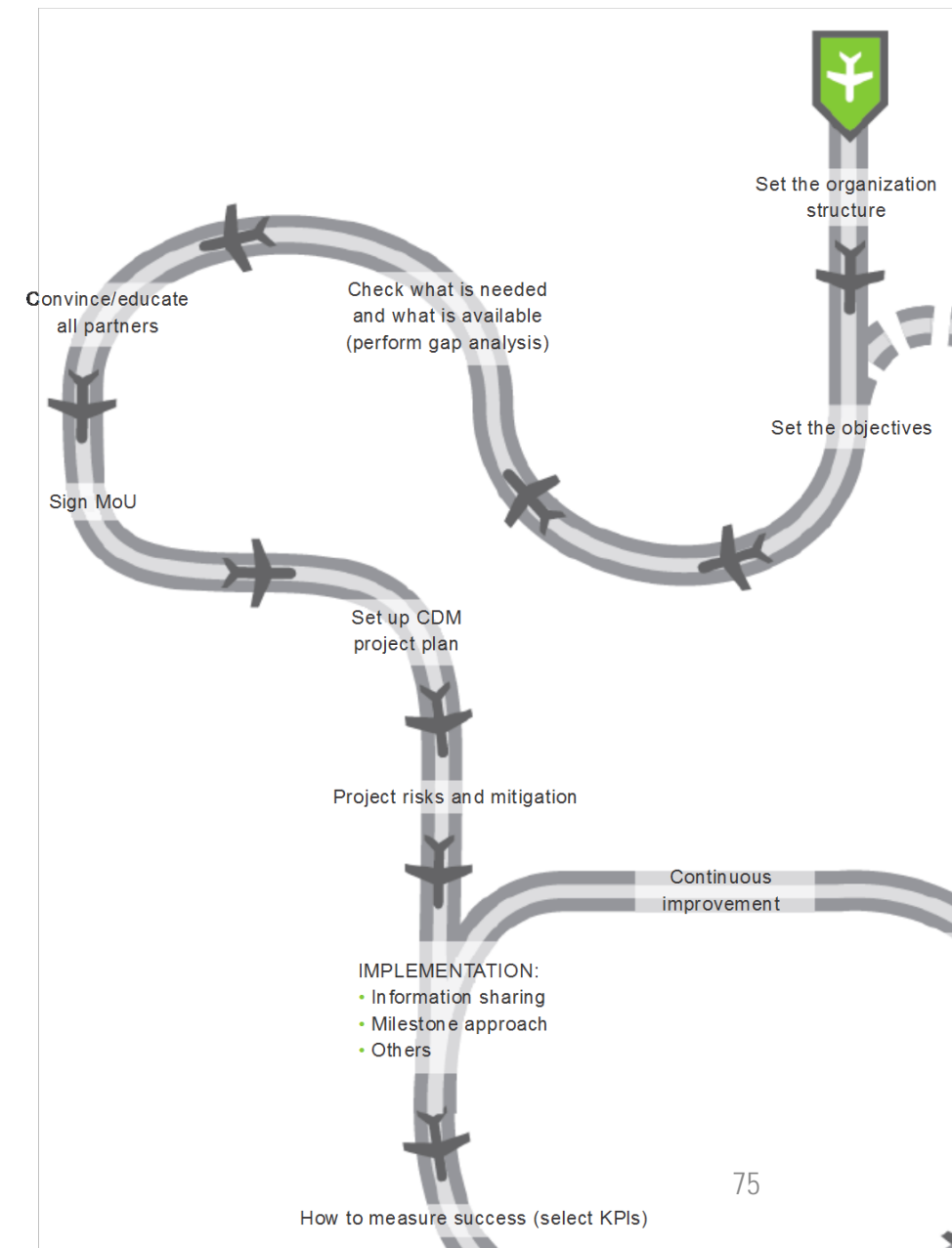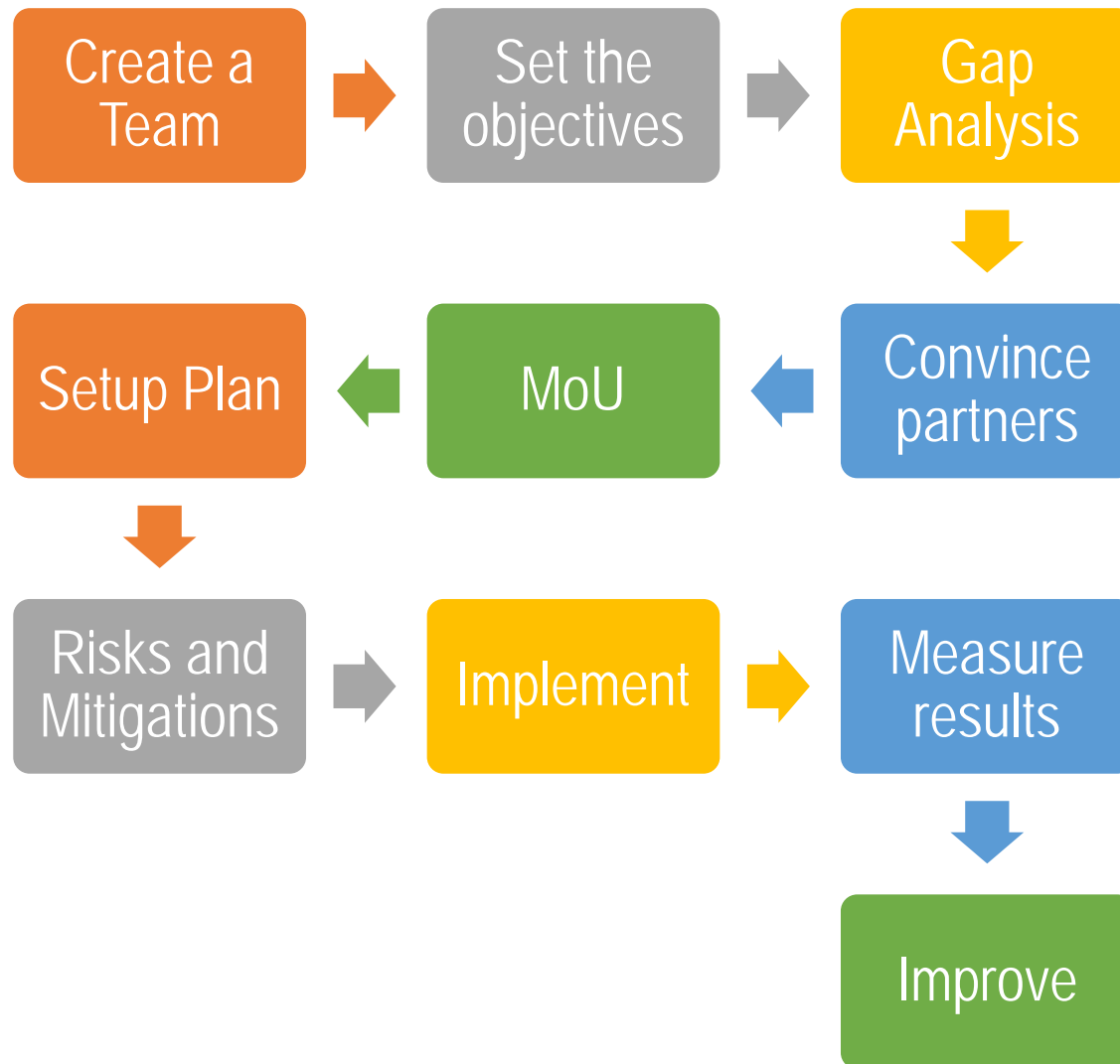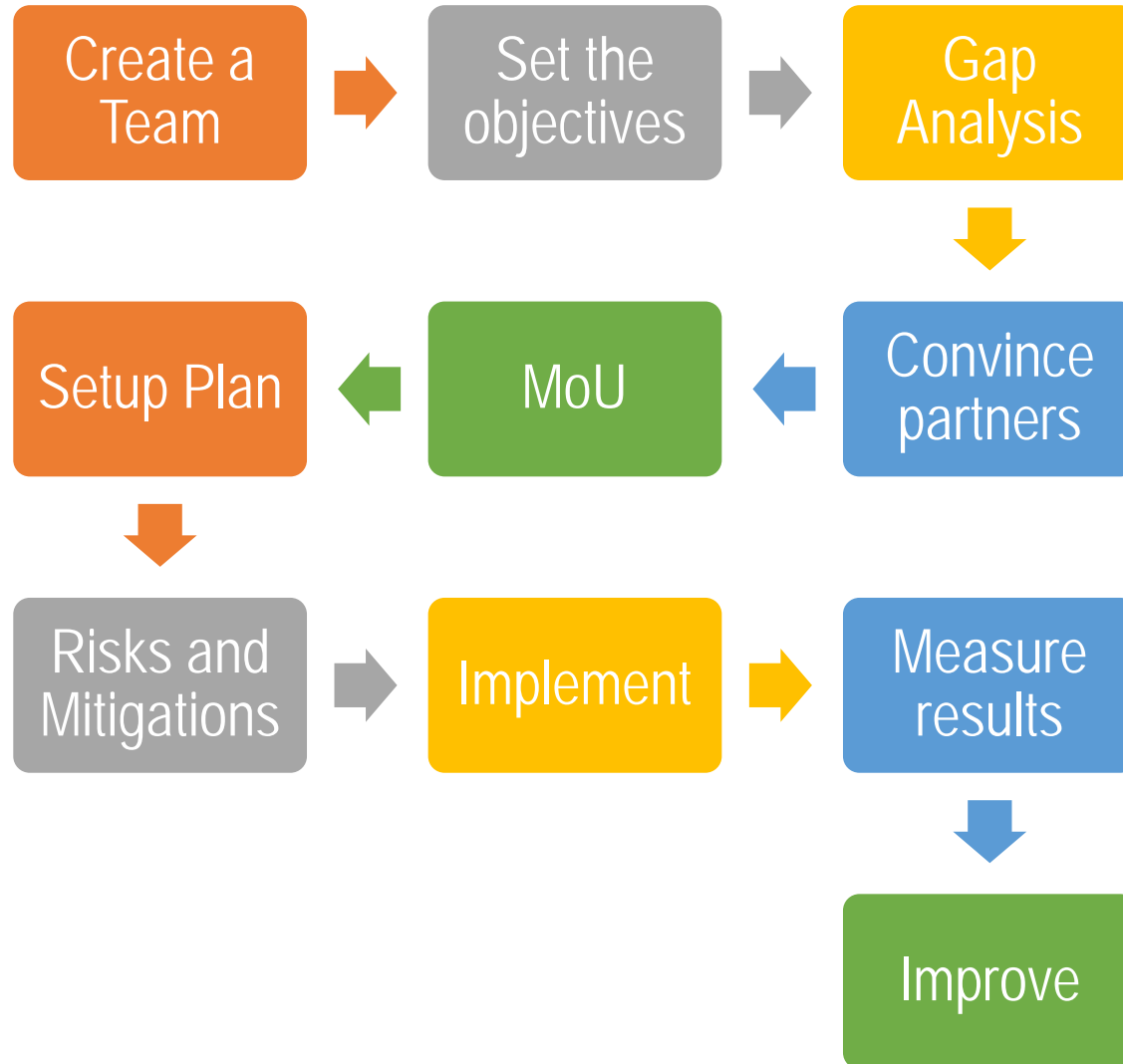
A-CDM Implementation Roadmap

- 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

```
Create a Team  →  Set the objectives  →  Gap Analysis
                                              ↓
Setup Plan  ←  MoU  ←  Convince partners
    ↓
Risks and Mitigations  →  Implement  →  Measure results
                                            ↓
                                        Improve
```


Set the organization structure

Convince/educate all partners

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

Set the objectives

Sign MoU

Set up CDM project plan

Project risks and mitigation

Continuous improvement

IMPLEMENTATION:
• Information sharing
• Milestone approach
• Others

How to measure success (select KPIs)

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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

Create a Team

Best Practice:

- Ensure that all stakeholders are actively engaged

- Consider your national organization structure

- Engage your local ATM even if only for their awareness

A-CDM Implementation Roadmap

Create a Team

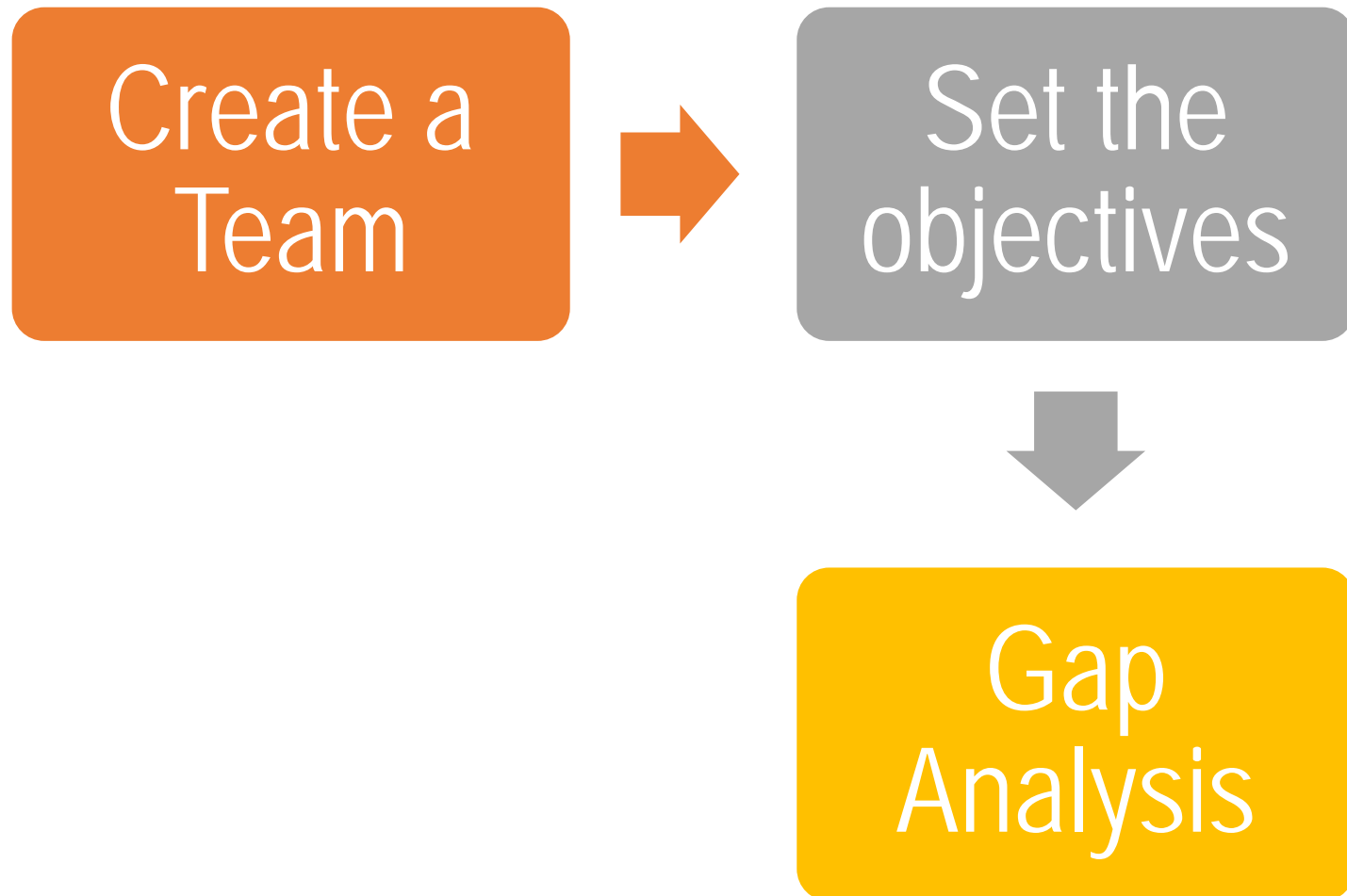Set the objectives

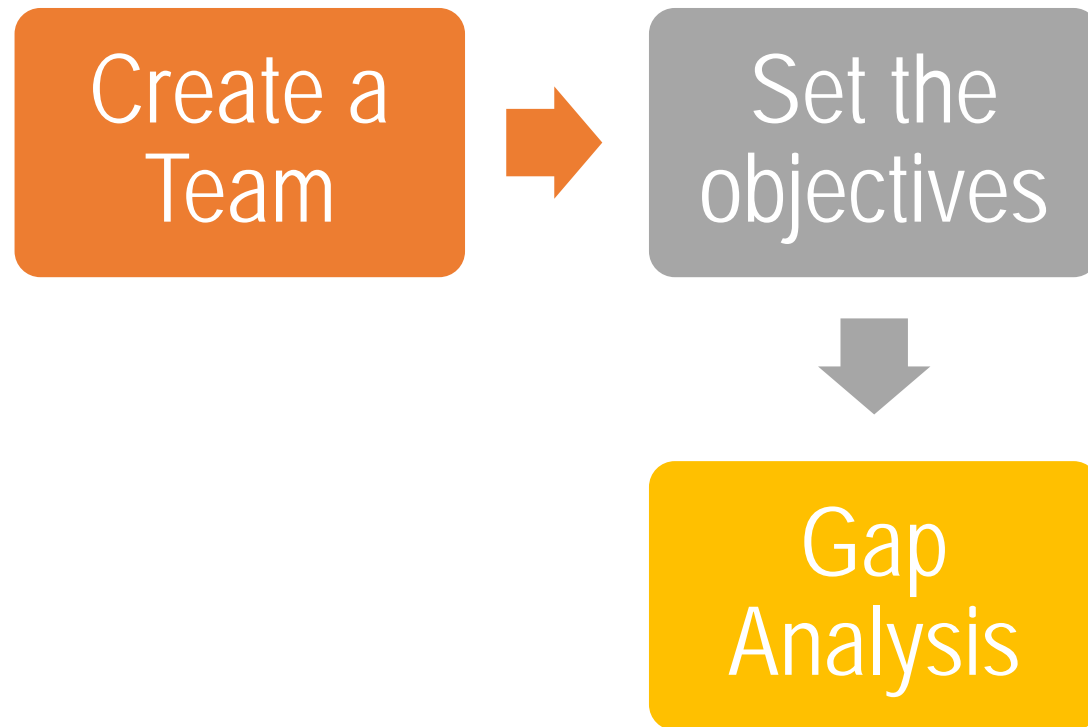# A-CDM Implementation Roadmap

Create a Team

Set the objectives

Best Practice:
- Discuss the situation
- Educate the stakeholders
- Set clear and simple objectives
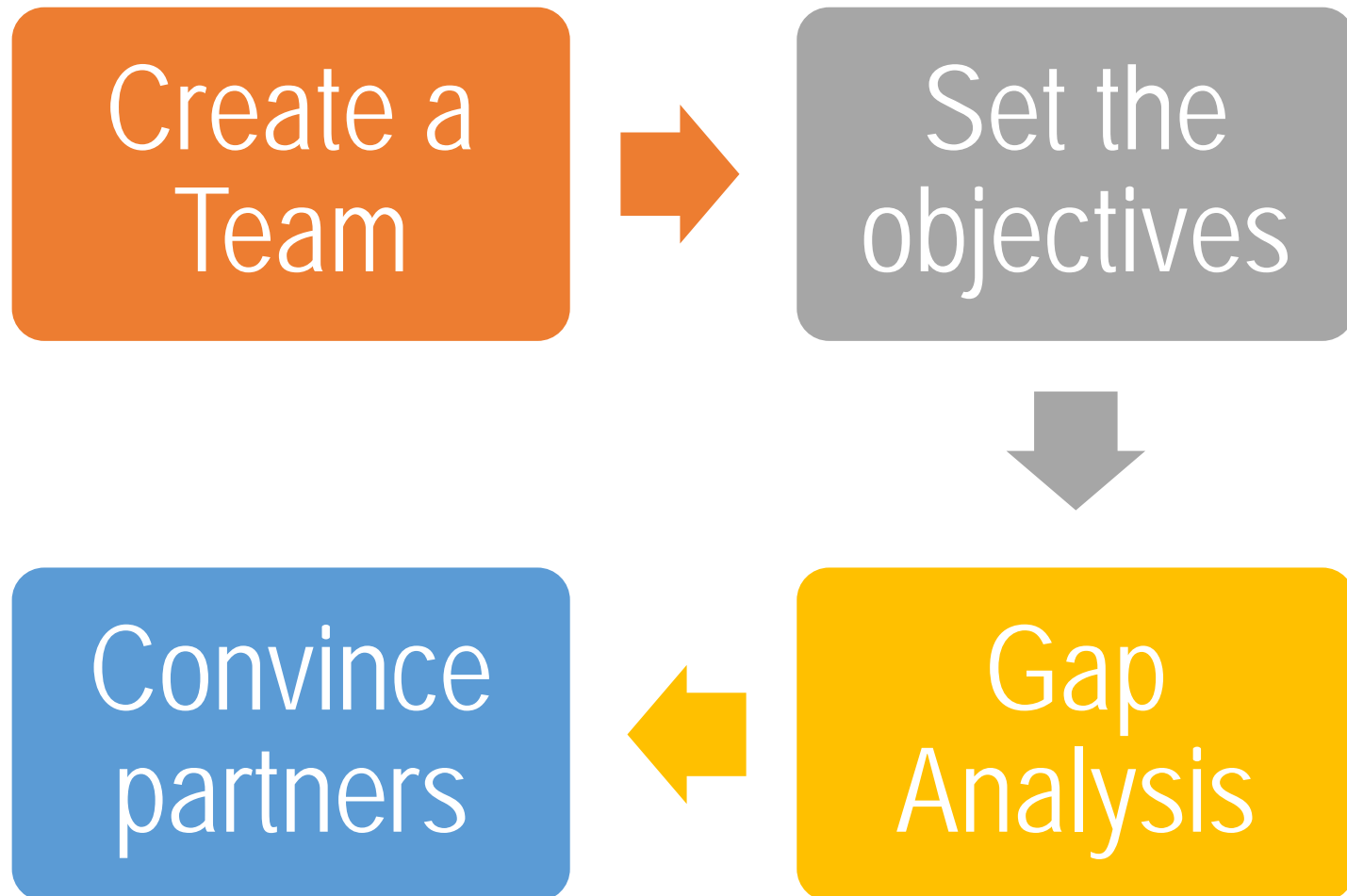
A-CDM Implementation Roadmap

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

A-CDM Implementation Roadmap

Create a Team → Set the objectives → Gap Analysis → Convince partners

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

A-CDM Implementation Roadmap

```
┌─────────────┐      ┌─────────────┐
│  Create a   │  →   │   Set the   │
│    Team     │      │ objectives  │
└─────────────┘      └─────────────┘
                            │
                            ↓
┌─────────────┐      ┌─────────────┐
│  Convince   │  ←   │     Gap     │
│  partners   │      │  Analysis   │
└─────────────┘      └─────────────┘
      │
      ↓
┌─────────────┐
│     MoU     │
└─────────────┘
```

A-CDM Implementation Roadmap

Create a Team → Set the objectives → Gap Analysis → Convince partners → MoU
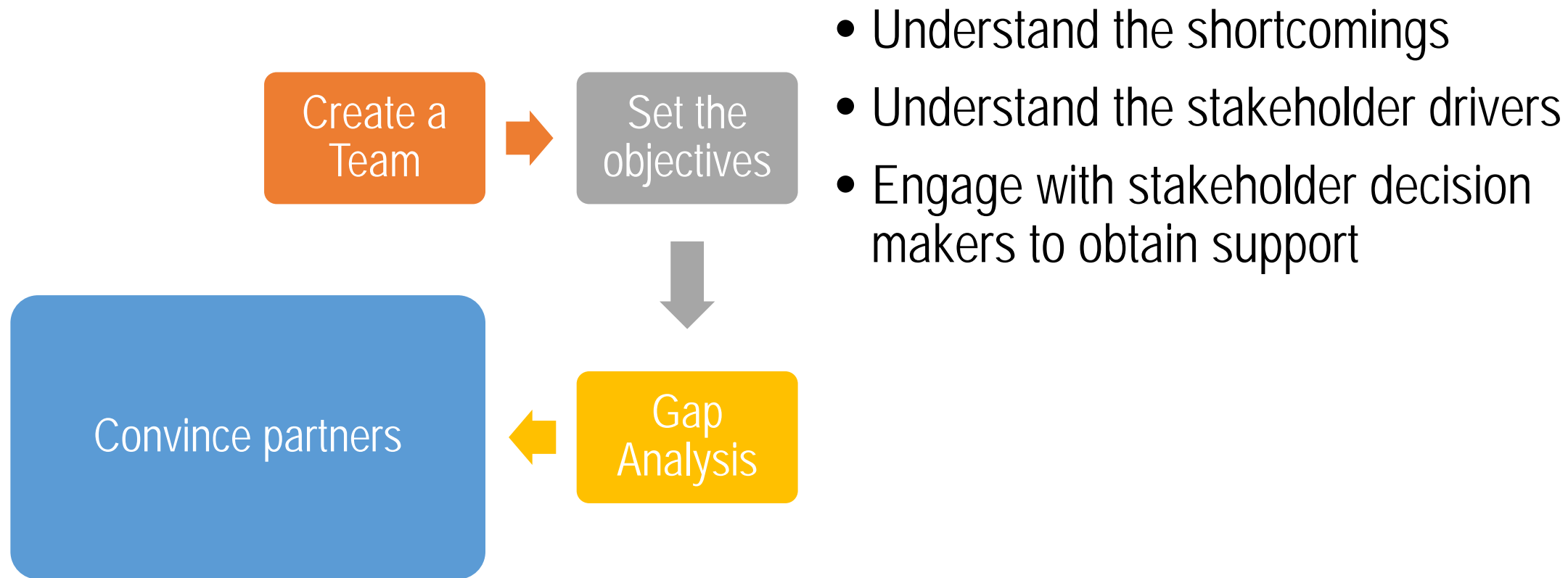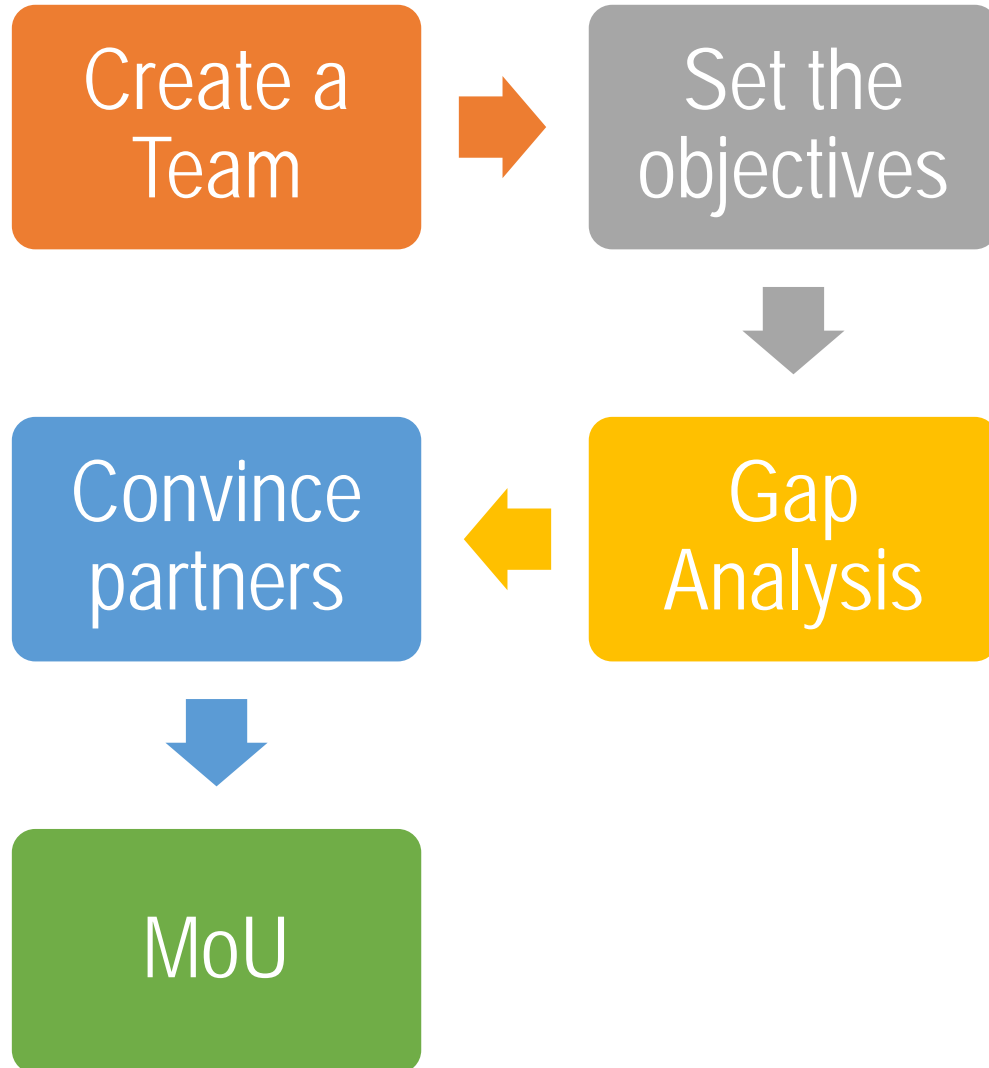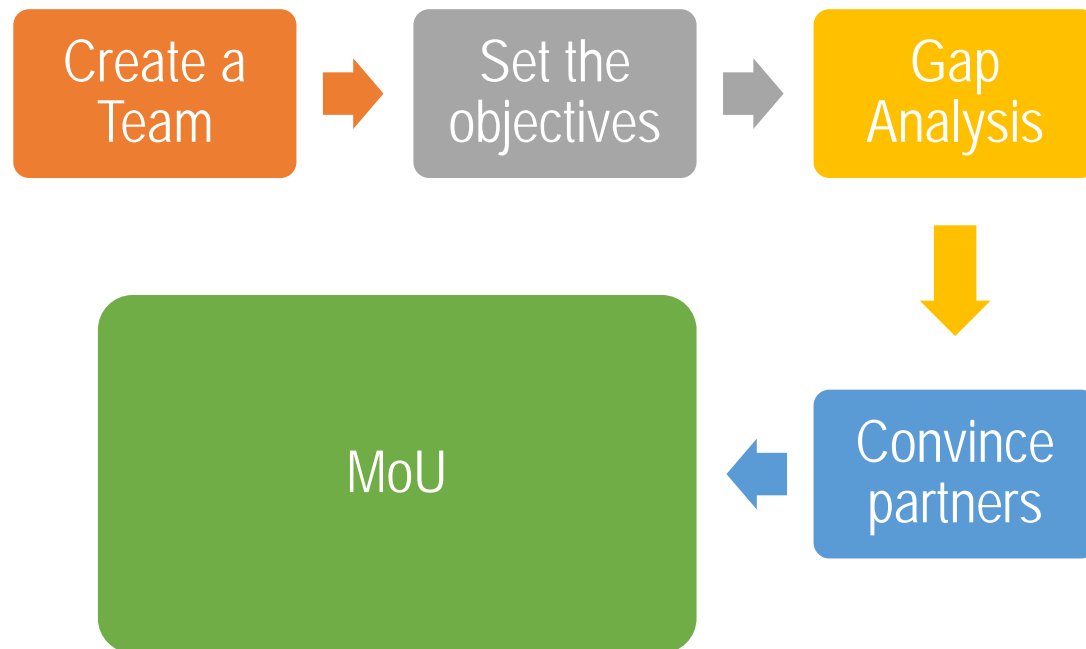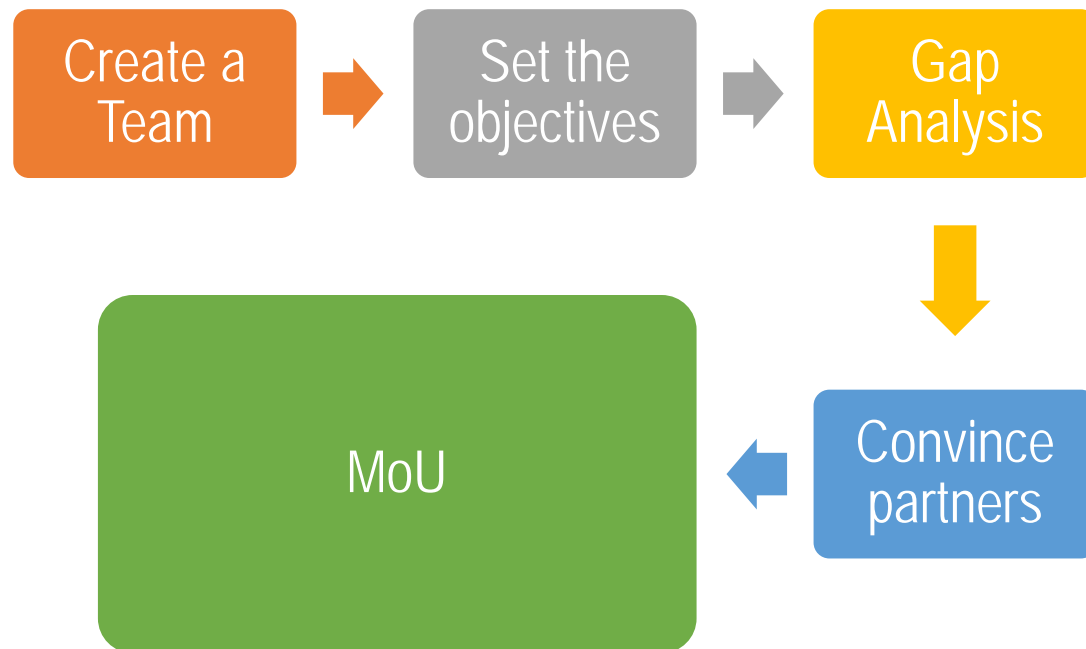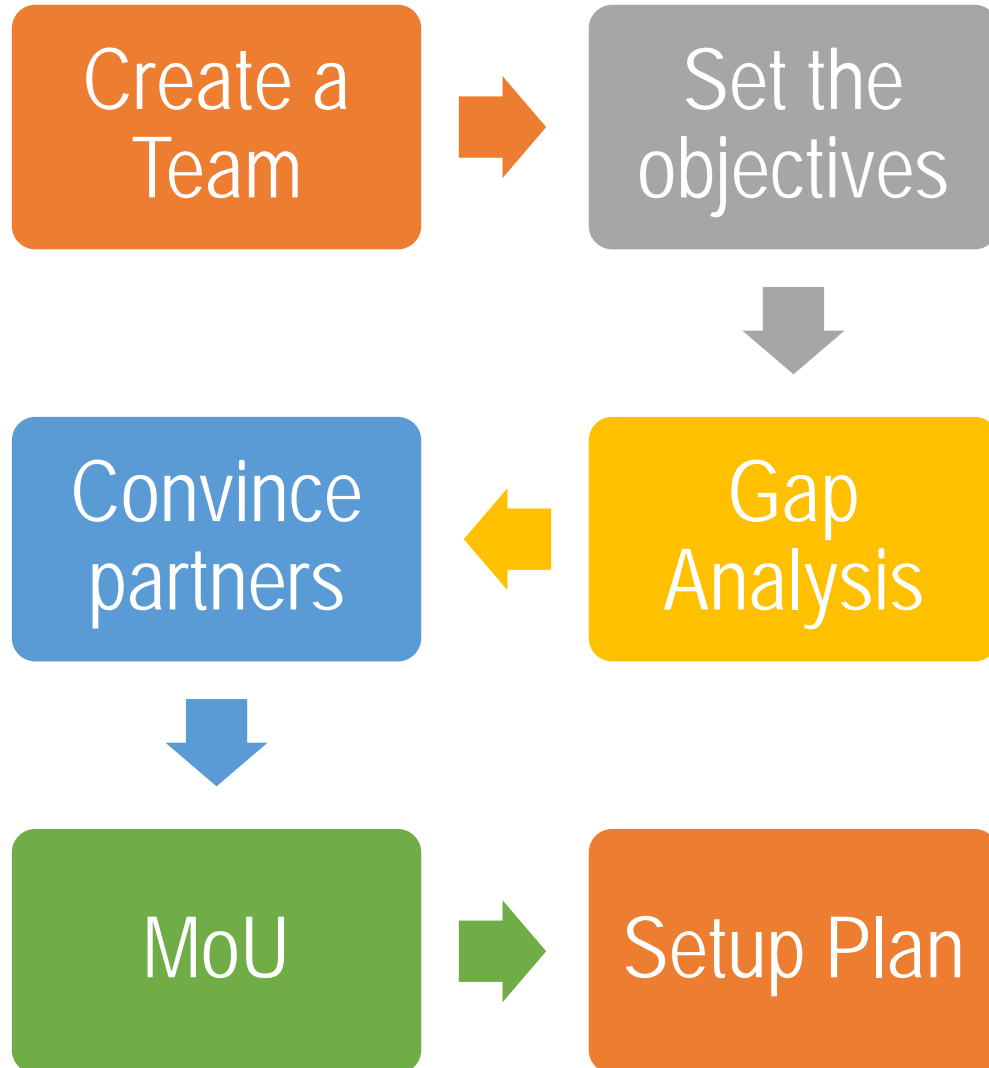
- In association with Project Management Plan
- All Roles and Responsibilities must be clear and agreed by all partners
  - Technical
  - Procedures
  - Information exchange
  - Monitoring / resolution mechanisms

A-CDM Implementation Roadmap

Create a Team → Set the objectives → Gap Analysis → Convince partners → MoU
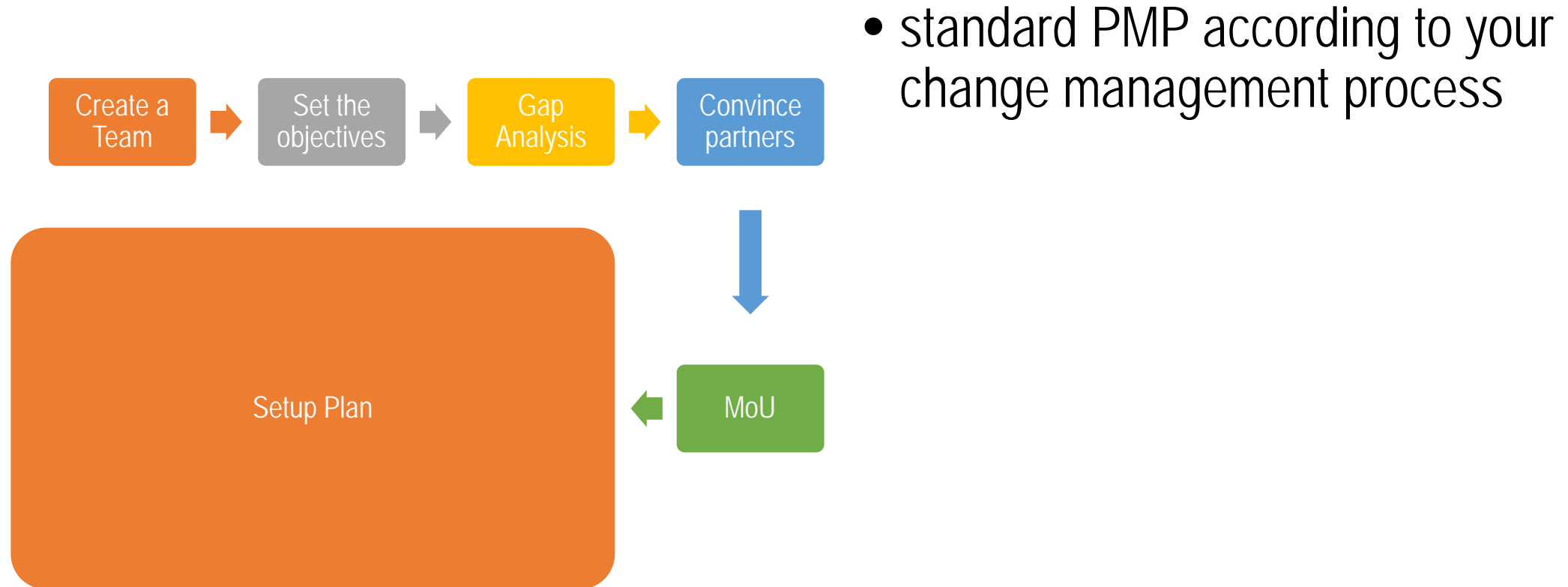
- actively participate and commit to implement A-CDM decisions
- cooperate in all functional specifications
- ensure the interaction between their systems and the local A-CDM platform
- provide the necessary information to the platform and require quality standards
- guarantee the presence of a representative throughout the project
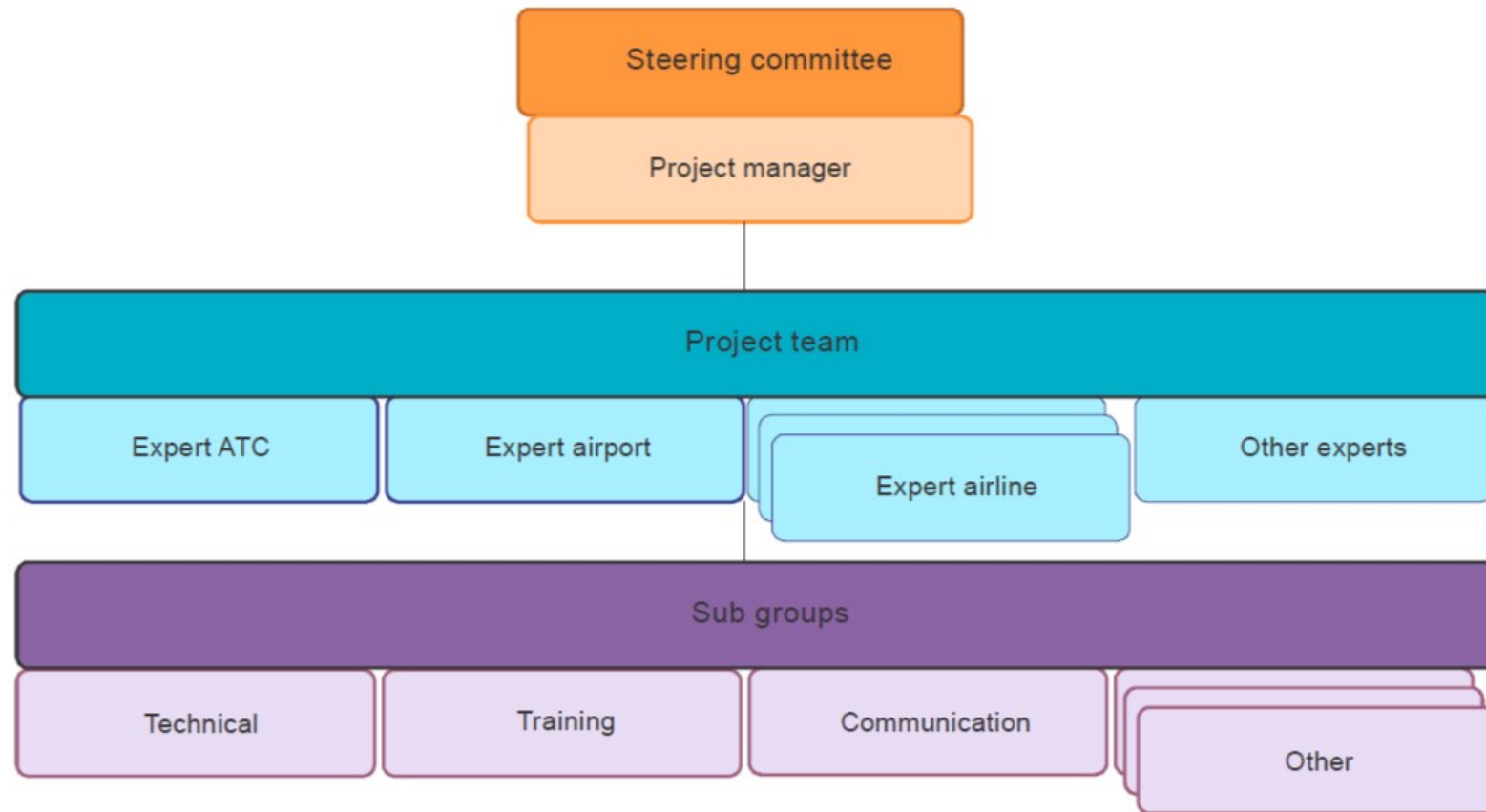 - support and control its development and implementation

A-CDM Implementation Roadmap

Create a Team → Set the objectives ↓ Gap Analysis ← Convince partners ↓ MoU → Setup Plan

A-CDM Implementation Roadmap

Create a Team ➡ Set the objectives ➡ Gap Analysis ➡ Convince partners

Convince partners ⬇ MoU ⬅ Setup Plan

- standard PMP according to your change management process

Sample A-CDM project organization

Typical Project Management Phasing

Create multifunctional team

Objectives

Gap Analysis

Alternatives Analysis

Select most cost effective

Get Management GO

Prepare to IMPLEMENT

A-CDM Implementation Roadmap

Create a Team → Set the objectives → Gap Analysis → Convince partners → MoU → Setup Plan → Risks and Mitigations
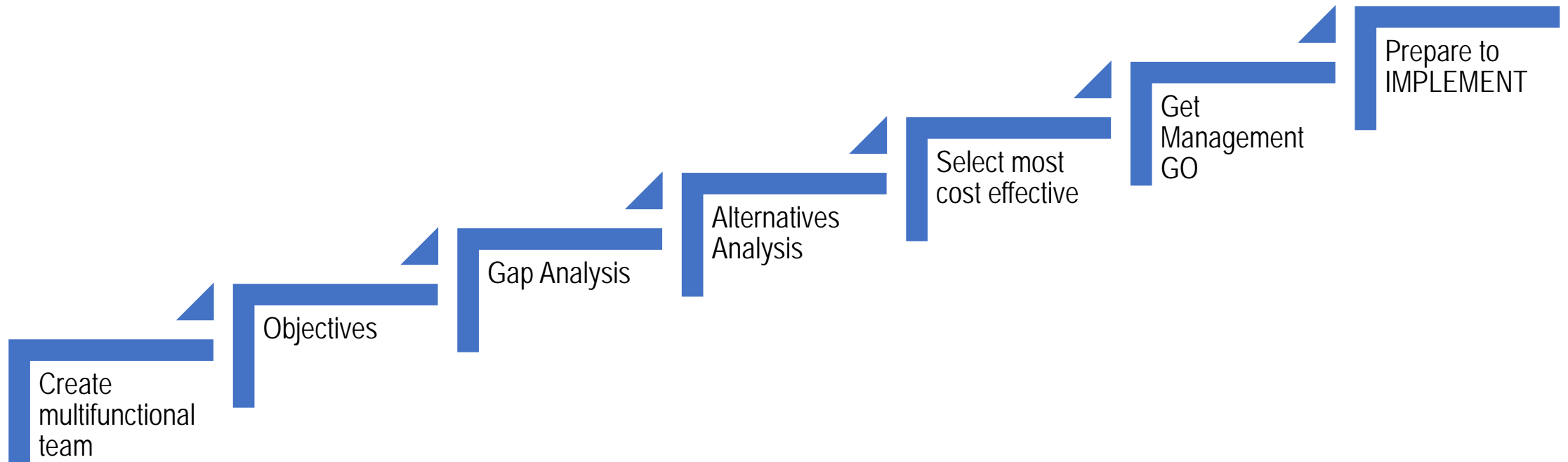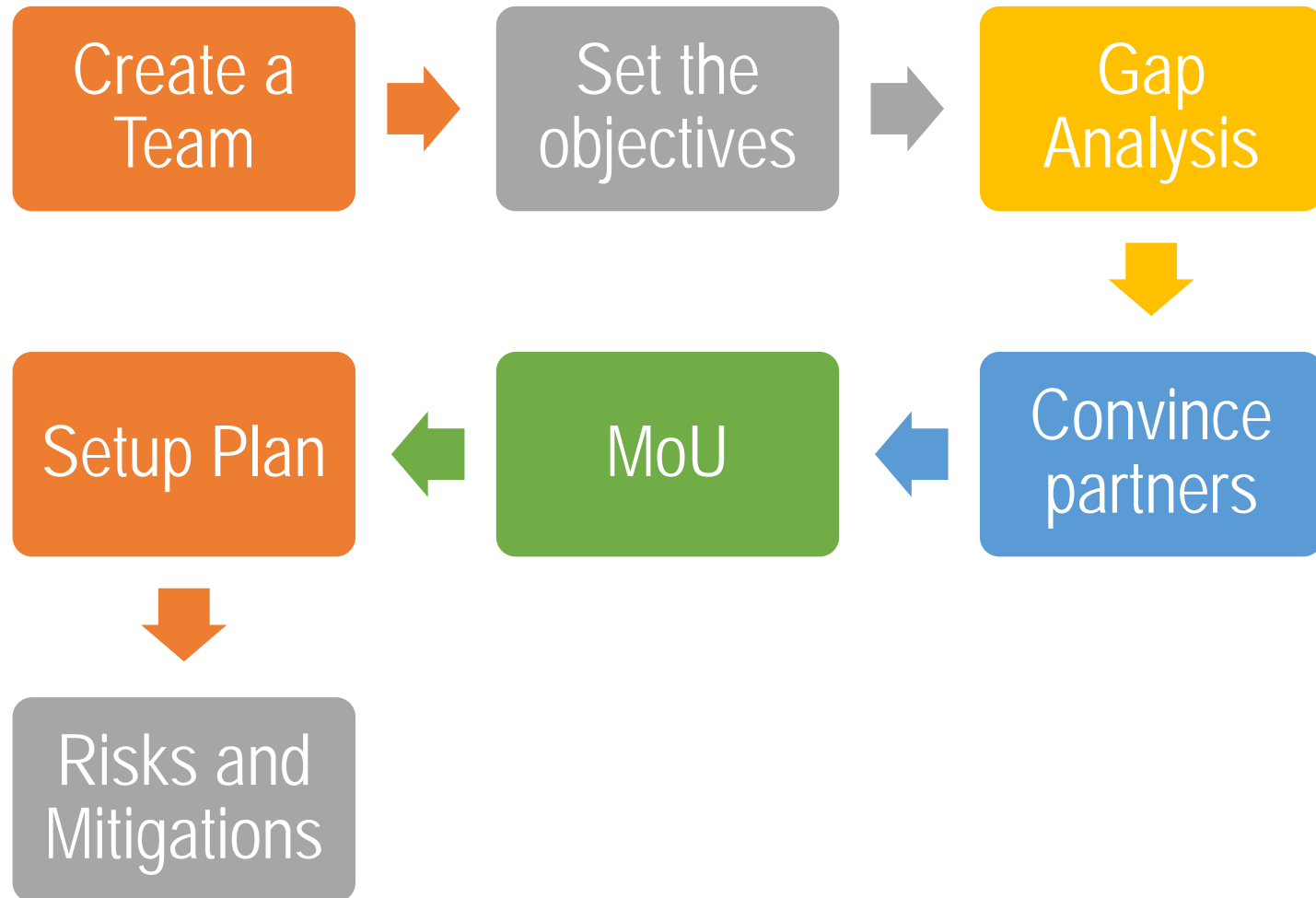
A-CDM Implementation Roadmap

- Project Risks
- Safety Risks

```
Create a Team  →  Set the objectives  →  Gap Analysis  →  Convince partners
                                                              ↓
Risks and Mitigations  ←  Setup Plan  ←  MoU
```
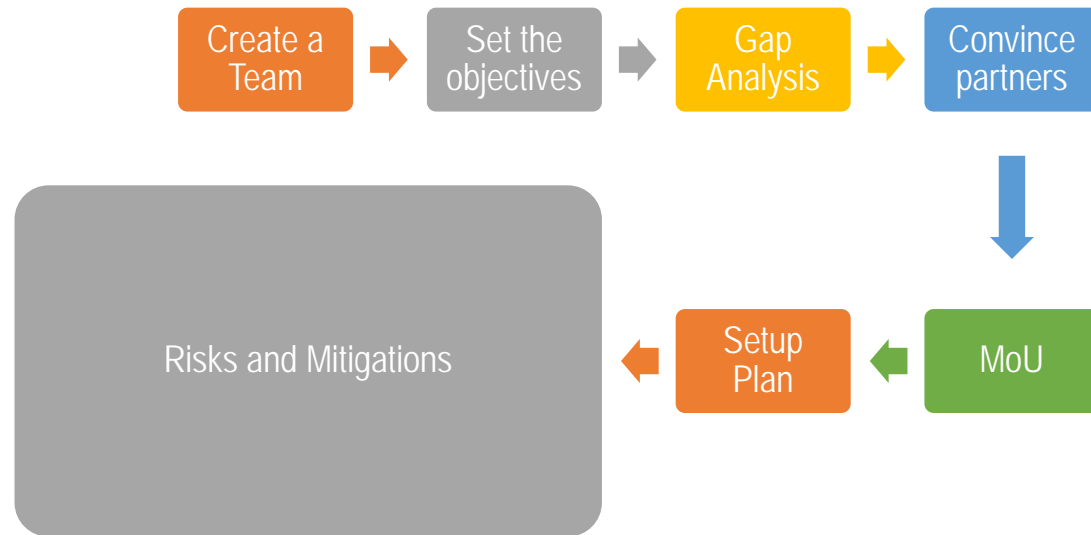
Project Risks

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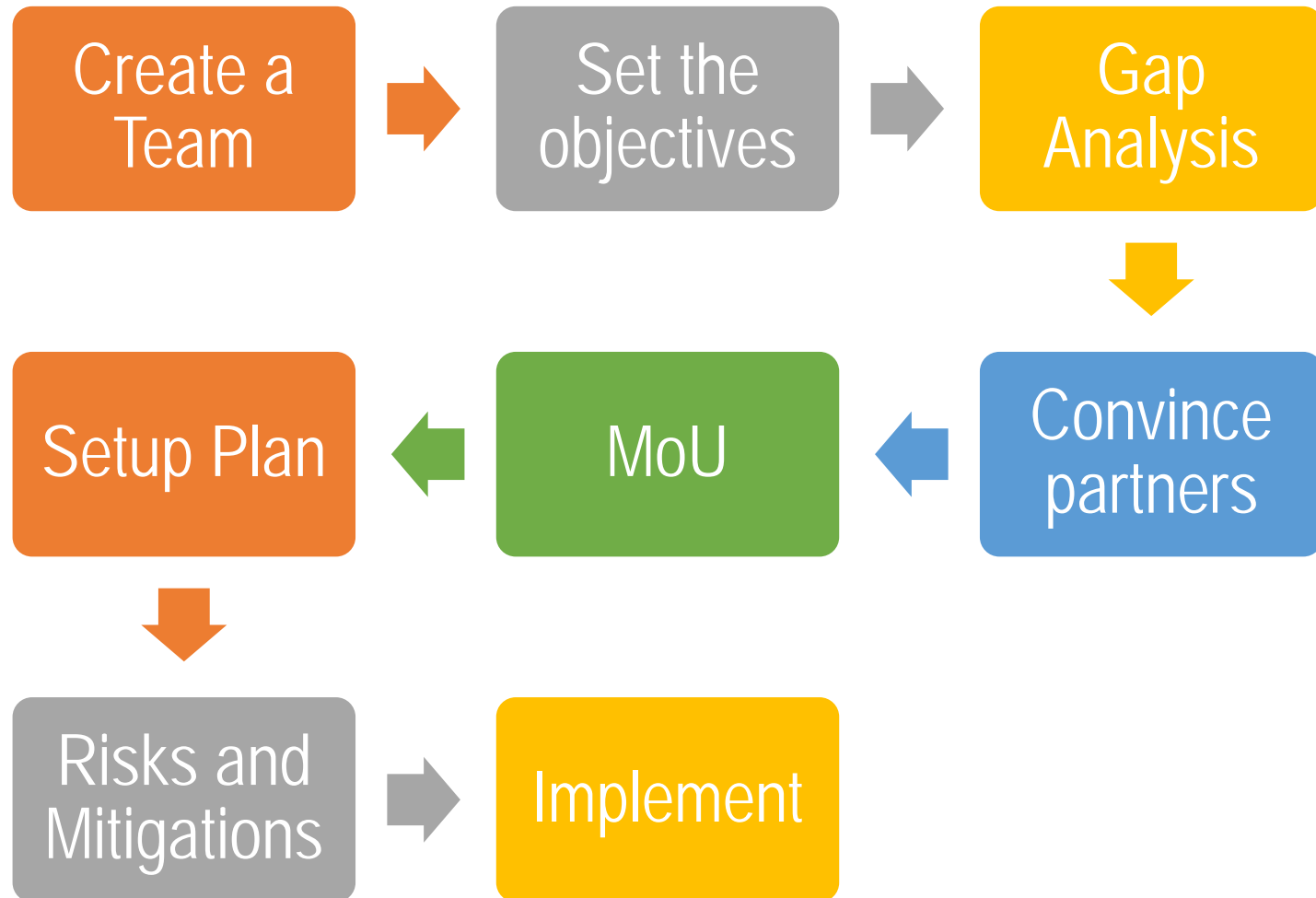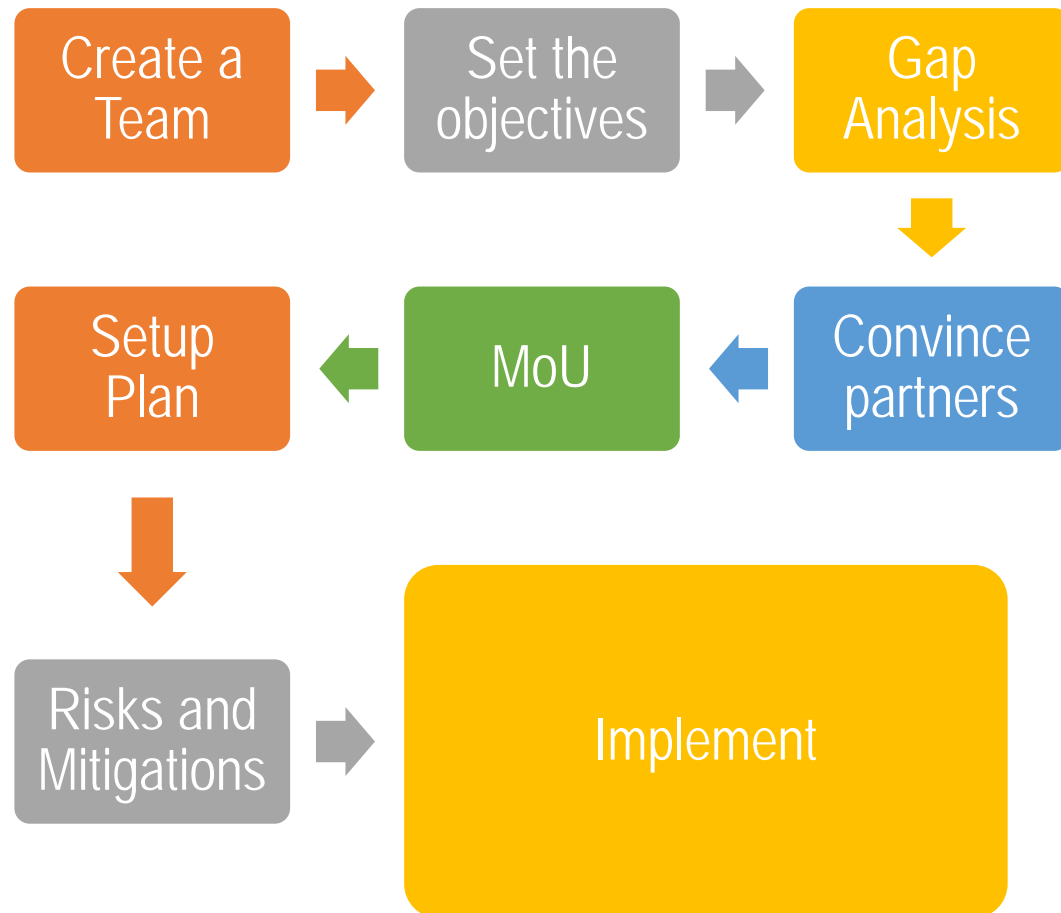

4. PROJECT RISKS & MITIGATION

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

Create a Team → Set the objectives → Gap Analysis

Setup Plan ← MoU ← Convince partners
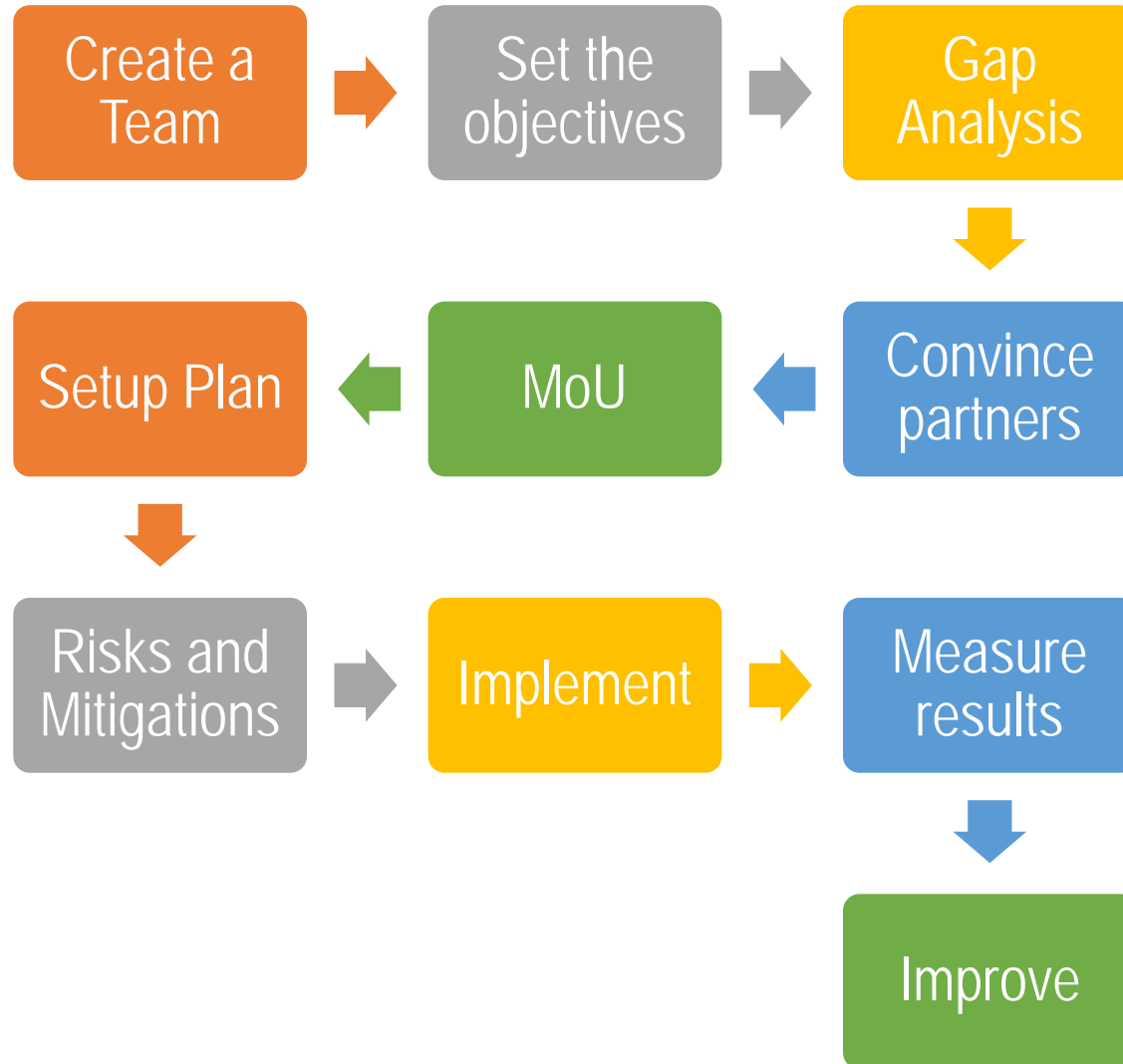
Risks and Mitigations → Implement

A-CDM Implementation Roadmap

- 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

A-CDM Implementation Roadmap - Improve

Create a Team → Set the objectives → Gap Analysis → Convince partners

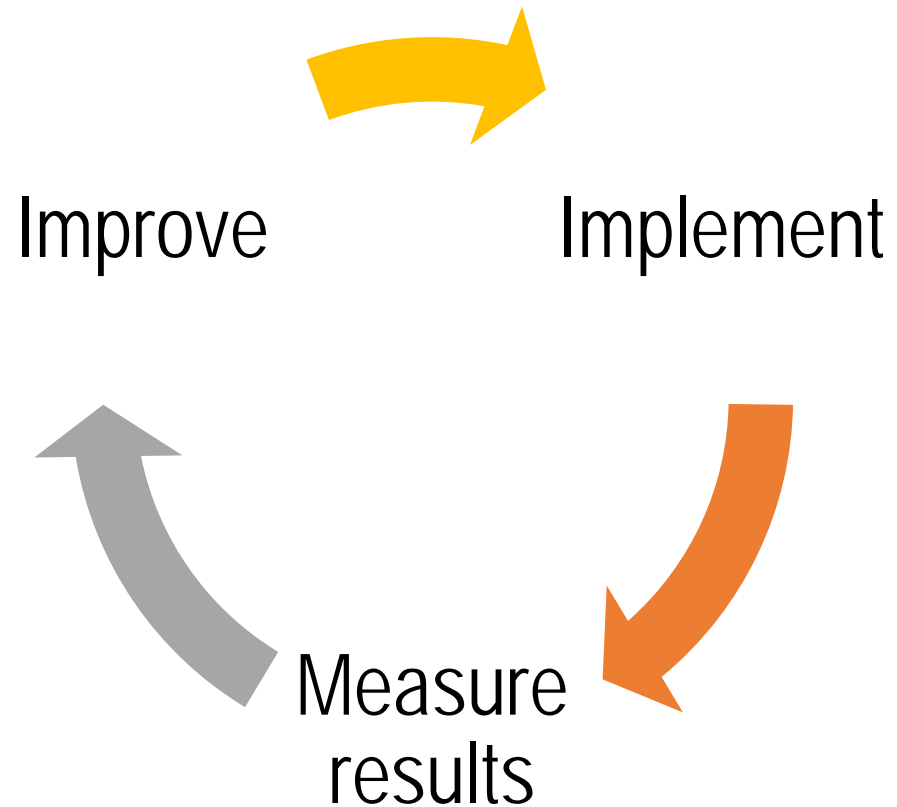Convince partners → MoU → Setup Plan → Risks and Mitigations → Implement

Implement → Measure results → 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

Improve

Implement

Measure results

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

Ground Situation Heathrow
August 2005 following severe thunderstorms

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

How does it affect capacity?

- Stable or variable?
- Predictable or not?

Does it affect aircraft routing and taxi times?

- De-icing pad
- Construction
- Snow clearance
- Runway swaps

Adverse conditions

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 Simplified Data Flow & Processes
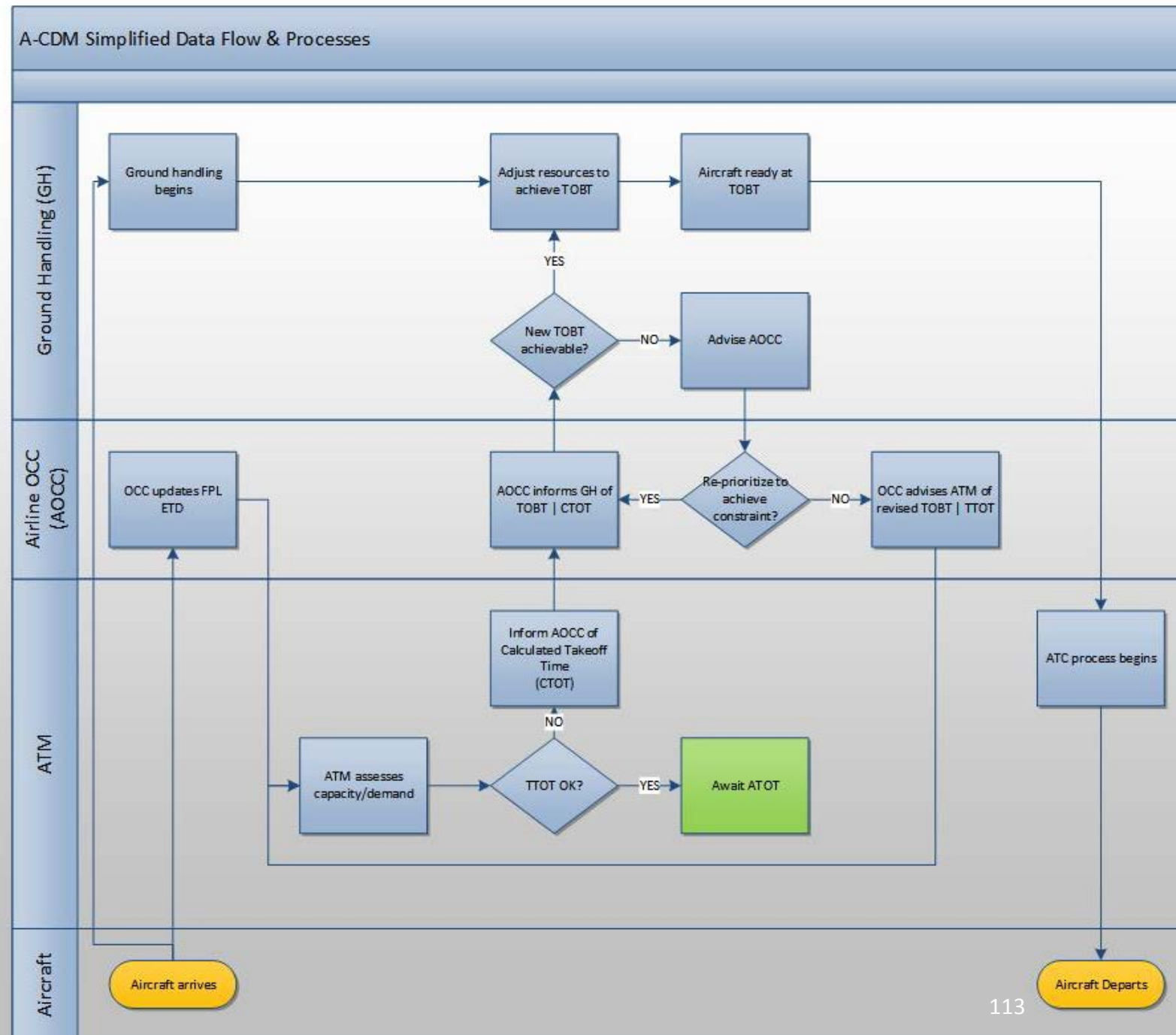
A-CDM in Adverse Conditions - steps

- 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
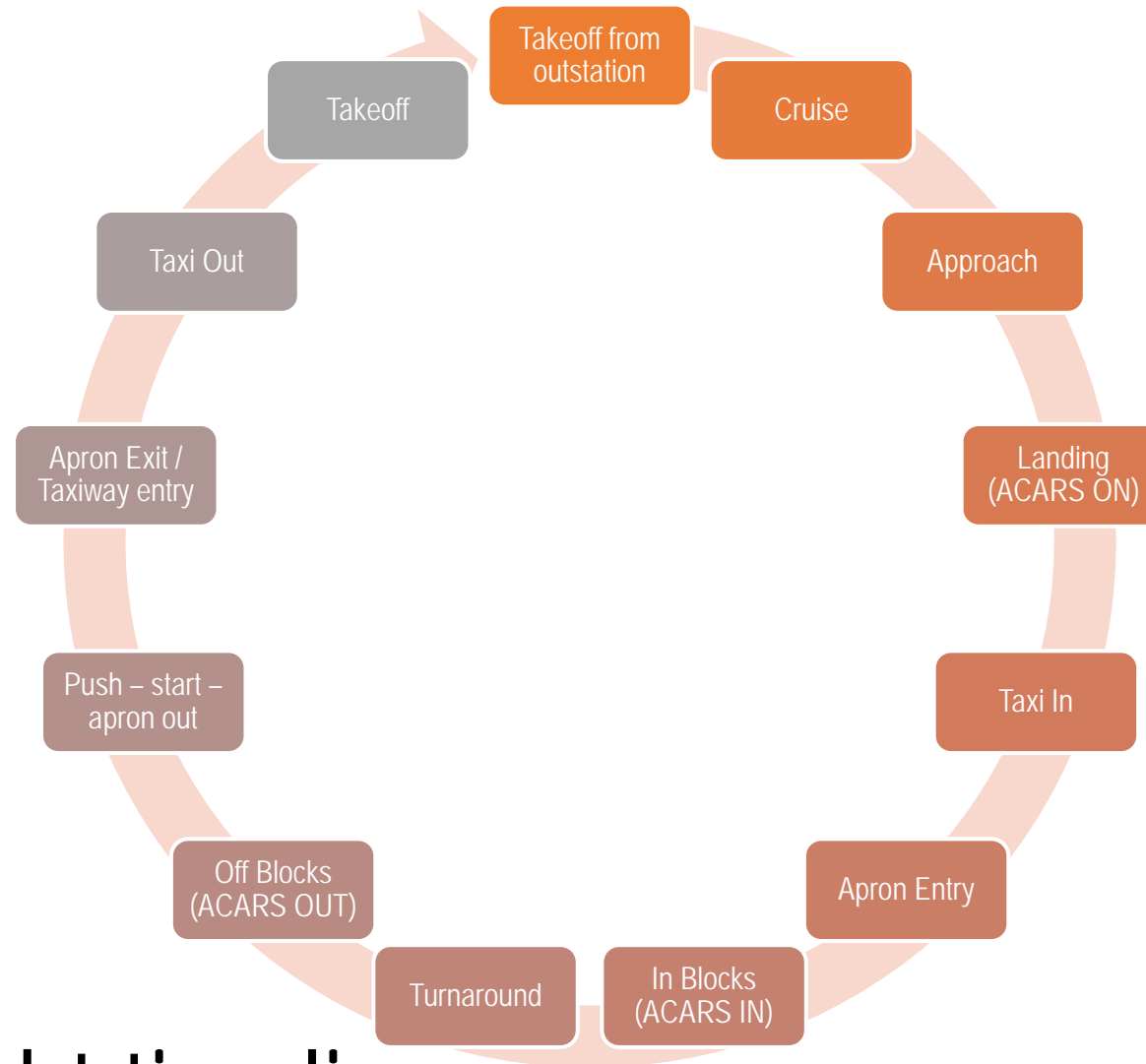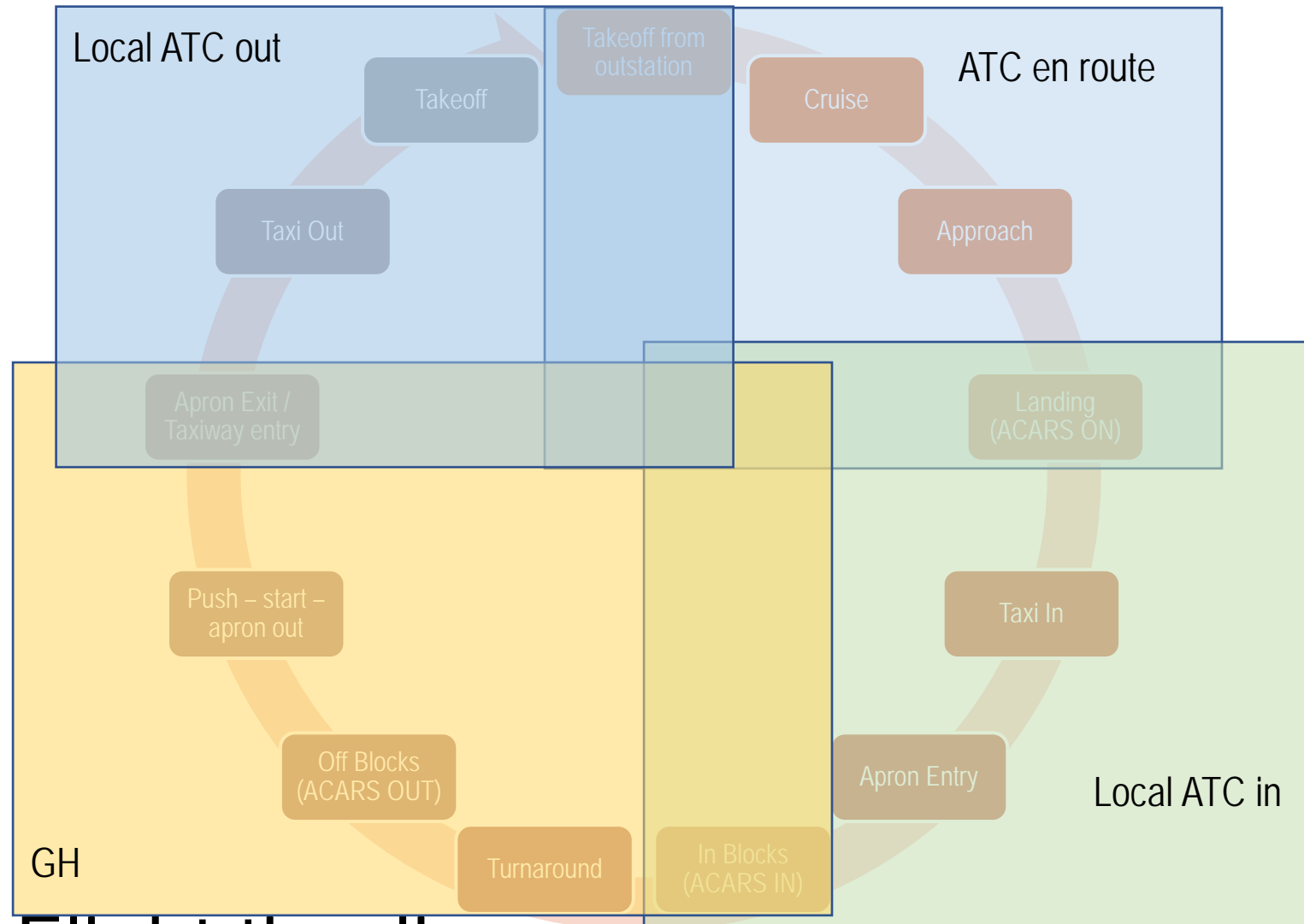# turnaround management and coordination

September, 2019 | Mexico City, Mexico

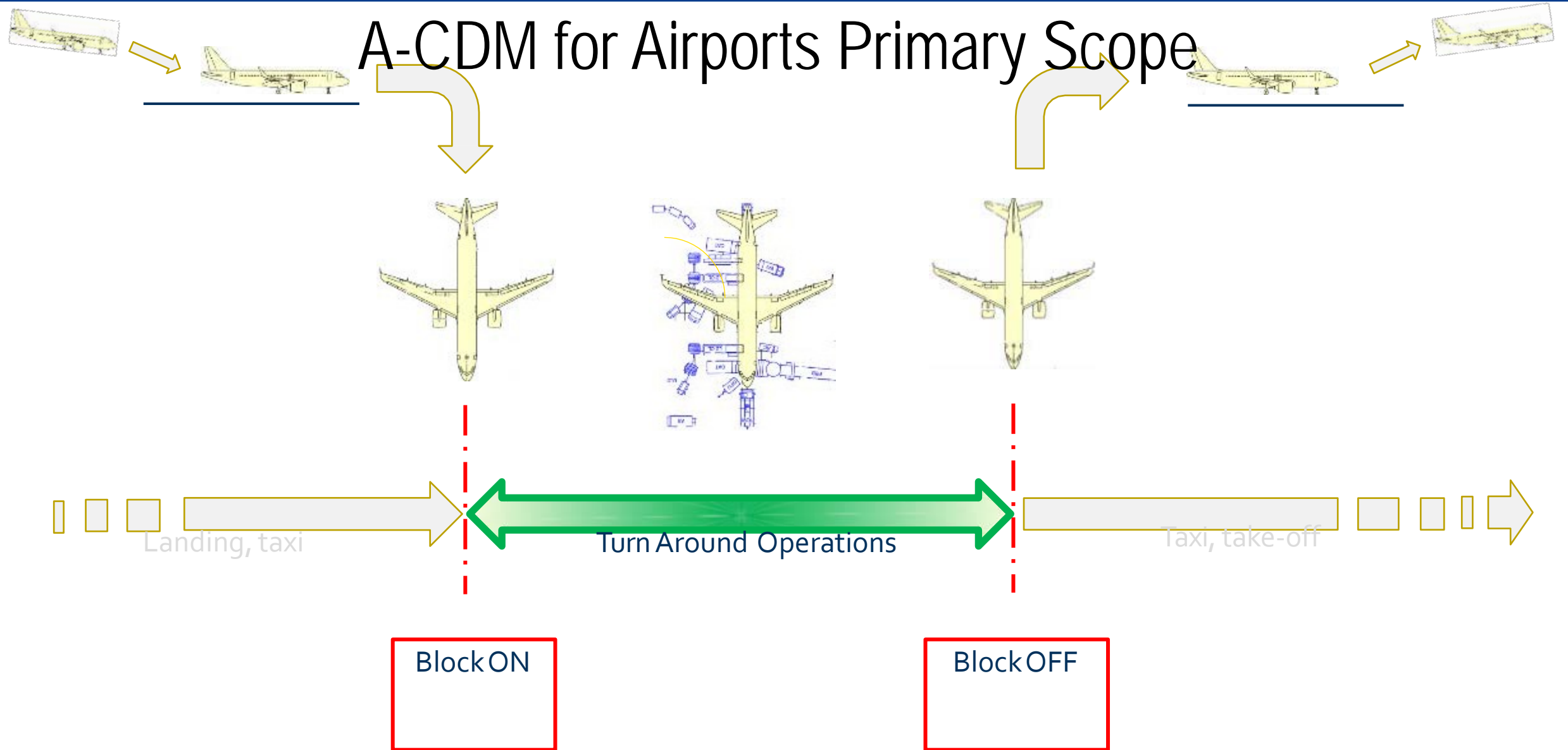# Extended Flight timeline

Extended Flight timeline

In Blocks
(ACARS IN)

Turnaround

Off Blocks
(ACARS OUT)

Push – start – apron out

Extended Flight timeline

A-CDM for Airports Primary Scope

Landing, taxi

Turn Around Operations

Taxi, take-off

Block ON

Block OFF
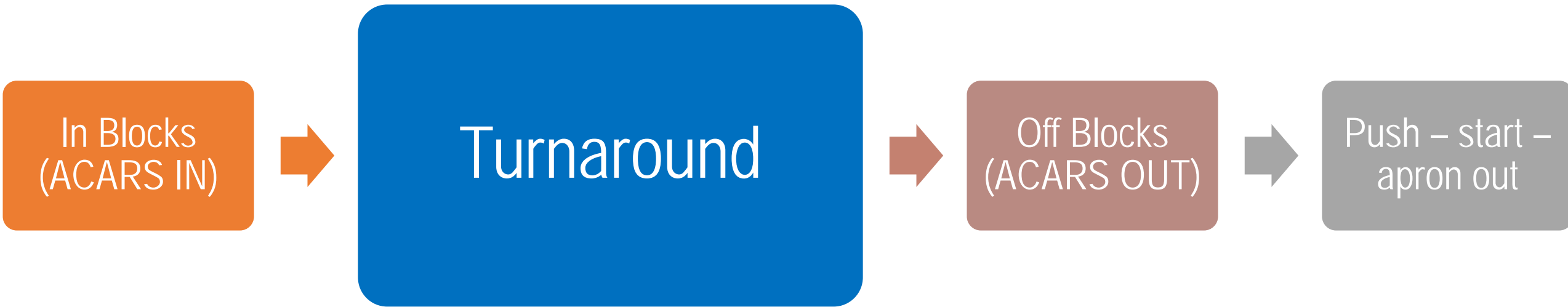
SIMPLIFIED TURNAROUND TIMELINE

Task Name	Duration
◢ INBOUND	10 mins
LANDING TIME (_LDT)	0 days
TAXI IN (_XIT)	10 mins
IN BLOCKS (_IBT)	0 days
◢ Ground Handling (_GHT)	45 mins
COMMENCE GROUND HANDLING (_CGT)	0 days
DEPLANE PAX	15 mins
DEPLANE CARGO	15 mins
REFUEL	10 mins
EMPLANE CARGO	15 mins
CATERING	10 mins
CLEANING	15 mins
PAX BOARDING (_SBT)	15 mins
DOORS CLOSED	0 days
READY FOR MOVEMENT (_RDT)	0 days
END GROUND HANDLING (_EGT)	0 days
◢ OUTBOUND	15 mins
OFF BLOCKS (_OBT)	0 days
START UP (_SAT)	5 mins
TAXI OUT (_XOT)	10 mins
TAKE OFF (_TOT)	0 days

Who are your actors?

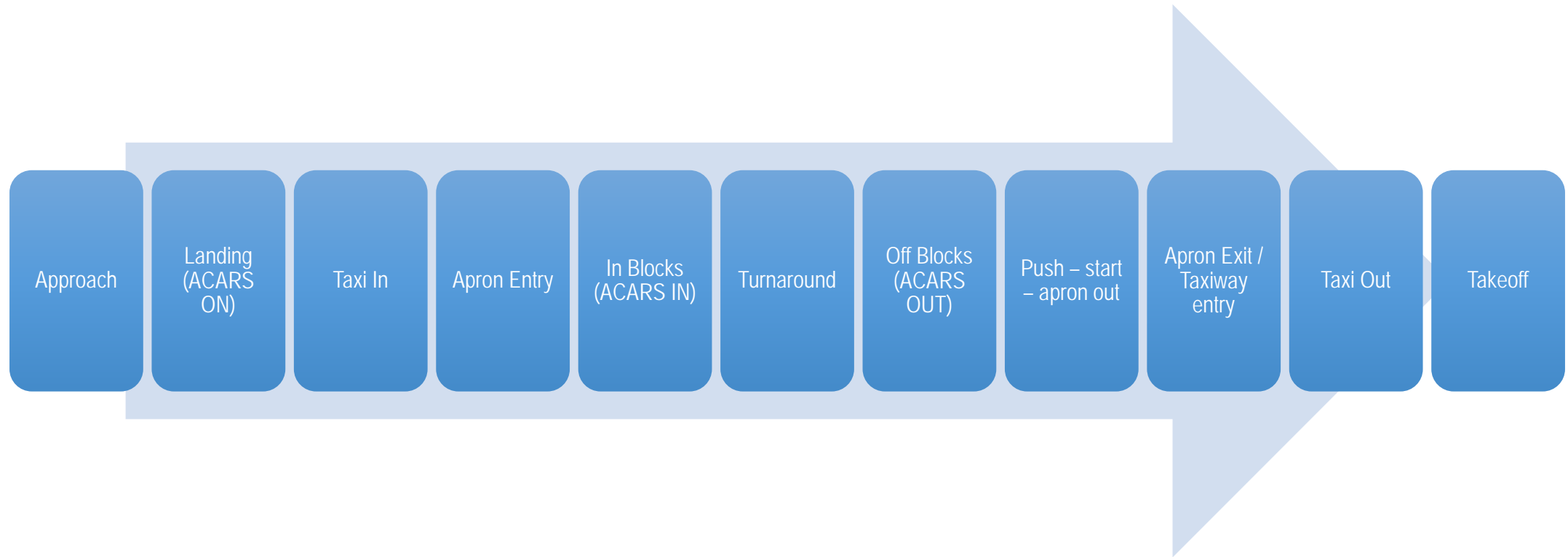|	
TAXI IN	10 mins
◢ **TURNAROUND**	**0.09 days**
IN BLOCKS	0 days
DEPLANE PAX	15 mins
TOILET	10 mins
DEPLANE CARGO	15 mins
REFUEL	10 mins
EMPLANE CARGO	15 mins
CATERING	10 mins
CLEANING	15 mins
EMPLANE PAX	15 mins
OFF BLOCKS	0 days
◢ **OUTBOUND**	**0.02 days**
TAXI OUT	10 mins

- 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
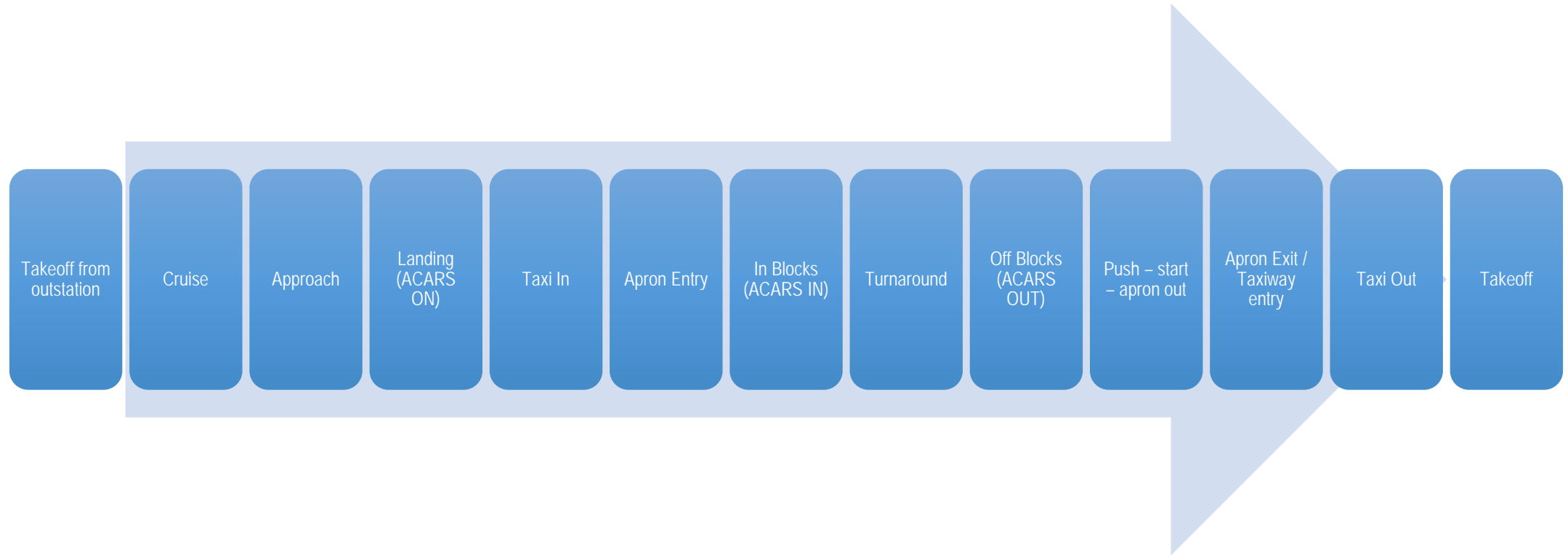
Extended Flight timeline + Milestones

Takeoff from outstation	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
xTOT	xLDT	xXIT	xMAT	xIBT	xTTT	xOBT	xSAT	xMAT	xXOT	xTOT
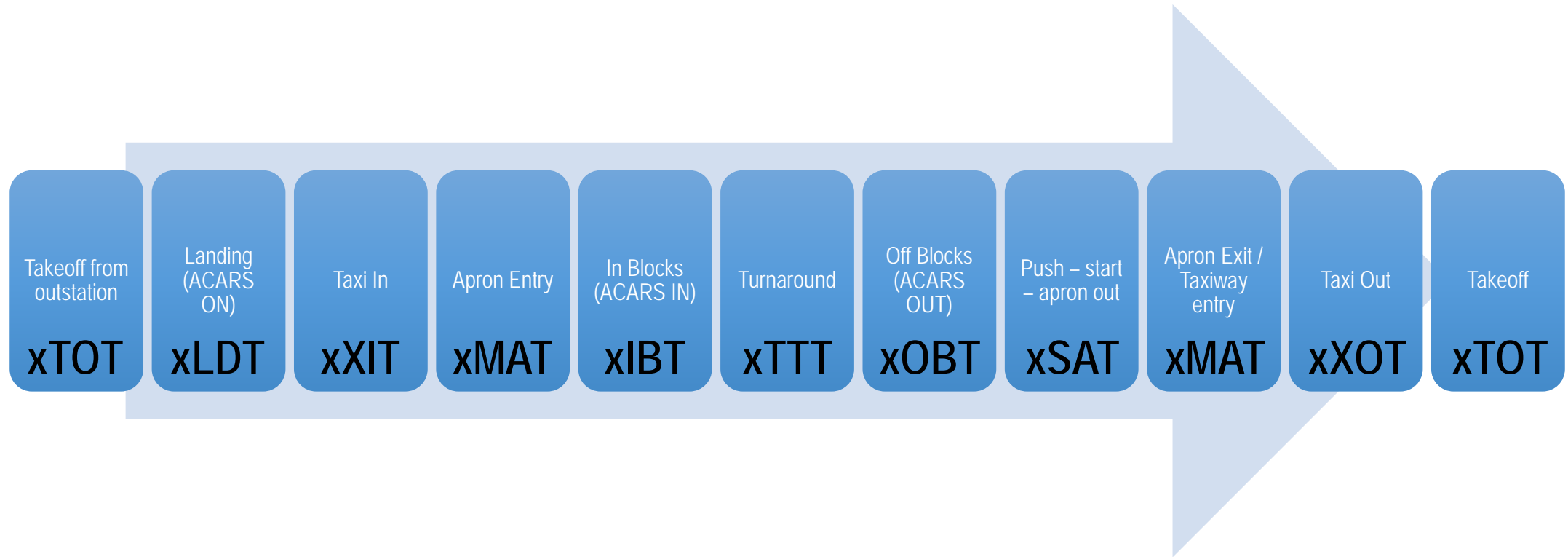
Flight Events vs Milestones & Status

Flight Event Times	Scheduled	Planned	ATFM measure	ATM system estimate	Actual
Off-block Time (OBT)	SOBT	EOBT	COBT		AOBT
Take-Off Time (TOT)			CTOT	ETOT	ATOT
Landing Time (LDT)			CLDT	ELDT	ALDT
In-Block Time (IBT)	SIBT	EIBT			AIBT
Taxi In Time					
Taxi Out Time					

A-CDM Milestone Relations in Europe and China
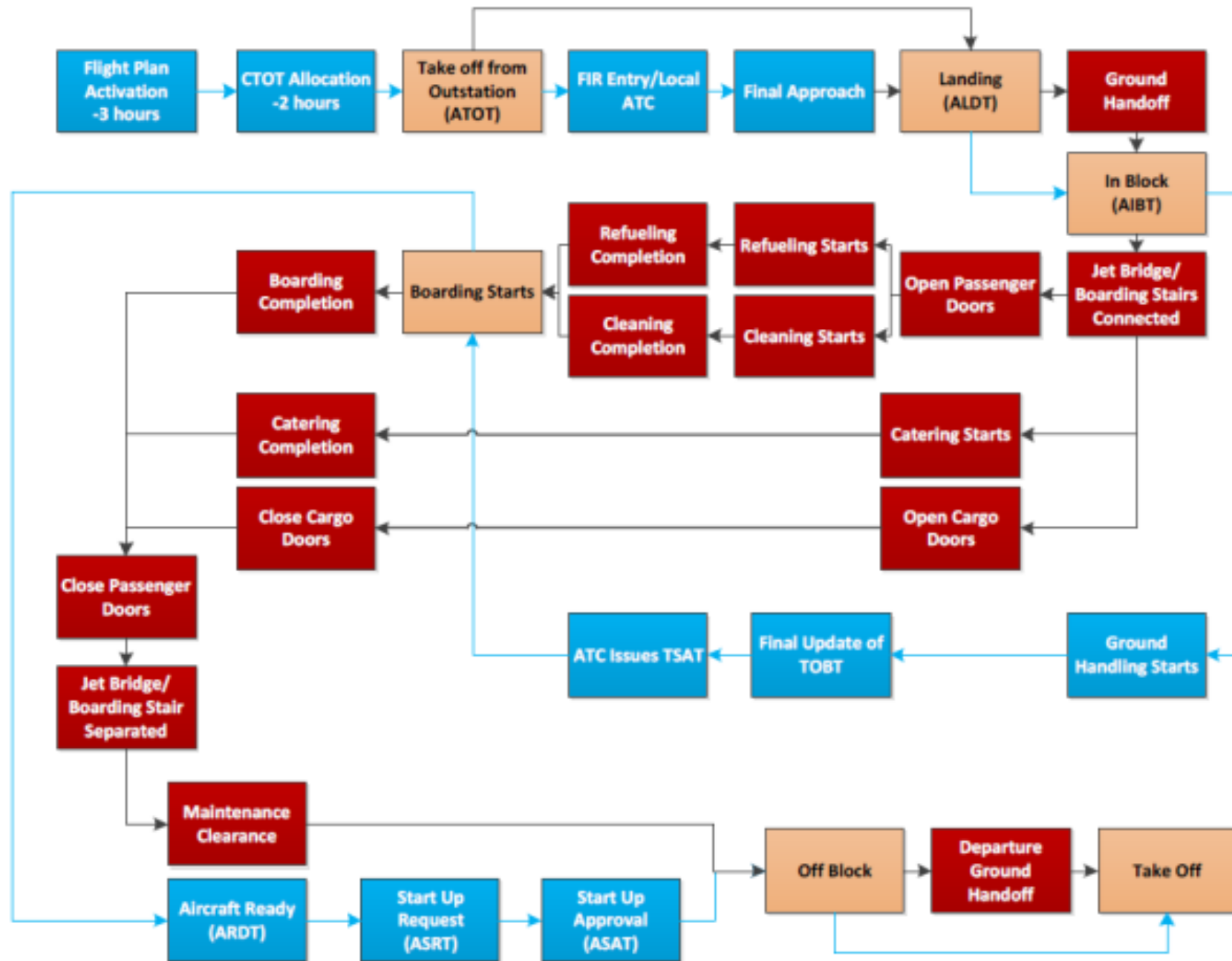
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Exercise – A-CDM Implementation

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)