

Airport CDM

Steps to boost efficiency

- Milestones for efficient operations
- The economic win-win
- The change challenge
- Environmental benefits

1 Improve
planning

2 Optimise
resources

3 Save
costs



Airport Collaborative Decision Making (CDM)

is one of the five priority measures in the Flight Efficiency Plan published by IATA, CANSO and EUROCONTROL. It is also an enabler to many of the technological advances being developed by SESAR.

Studies have shown that Airport CDM offers substantial benefits for minimal investment – and that EVERYONE wins – airlines, airport operators, air traffic control, ground handlers and the air transport network as a whole.

In this guide we share the experiences and lessons learned from the pioneer airports of Brussels, Munich, Heathrow, Zurich, Barcelona and more. We also share the feedback and experiences of those who are in the early stages of Airport CDM.

So read on to see what Airport CDM could do for you, and take active steps to boost your efficiency.

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The CFMU slot negotiation 'promise'

One very real and practical benefit of completing the Airport CDM process and networking with the CFMU is more success with slot negotiations.

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Pre-departure sequencing means flights leave the stand in the optimum order - it also means the end of 'first come first served'.

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Implementing Airport CDM, lessons learnt

A number of pioneer airports have succeeded in implementing all or some elements of Airport CDM. Here are their hot tips!

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New to Airport CDM? Turn the page for an overview of what it's all about.

What is Airport CDM?



*Airport Collaborative
Decision Making
is all about*

ACTING ON SHARED INFORMATION

- Have you ever arrived at an airport and had to wait on the taxiway for an occupied stand?
- Have you arrived at a stand with no ground staff or equipment there to meet you?
- Have you boarded a flight to find yourself sitting in the aircraft for a long time before leaving the stand?
- Have you known of flights which wait until the last minute to inform that they are not ready and will miss their Calculated Take Off Time (CTOT)?

These are the visible symptoms of the problems that Airport CDM seeks to address. The causes are many:

- Insufficient or unreliable information
- No single partner has the complete picture
- Accurate information is provided too late for a partner to be ready

READ ON TO FIND OUT MORE ABOUT HOW AIRPORT CDM IS WORKING FOR OTHERS AND WHAT IT COULD DO FOR YOU...

READER QUIZ:

What does Estimated Time of Arrival (ETA) mean to you?

Write your answer here – and check the results from a recent survey at the bottom of the page.

B E N E F I T S

AIRLINES

- Shorter taxi times, shorter holding before runway access, no waiting in front of occupied gate
- Fuel savings
- Reduced delays > cost savings and customer satisfaction
- Increased capacity with the same fleet

GROUND HANDLERS

- Better planning and use of resources – therefore less cost, more profit
- Improved customer satisfaction
- Increased productivity could enable ground handlers to lower their prices

REGULATORS

- Safety and environmental benefits that can help meet EU targets

EVERYONE!

- 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 company image and customer satisfaction

AIR TRAFFIC CONTROL

- More predictable traffic - therefore reduced workload
- Reduced probability of errors
- Better pre-departure sequence
- Higher service quality
- Beneficial network effects as more airports become CDM accredited

AIRPORT OPERATOR

- Reduced environmental impacts – noise and emissions
- Improved punctuality
- Improved gate/stand planning and management
- Additional flights and passengers possible

THE ATM NETWORK

- More available en-route and airport capacity
- Improved ATFM slot adherence
- Fewer wasted slots

There are many new technologies and concepts in aviation where someone has to invest so others can reap all the benefits. With Airport CDM everyone wins.

The economic win-win

At the end of 2006, a team comprising both financial and operational experts presented the results of a new Cost-Benefit Analysis for all elements of Airport CDM. The study concluded that for every €1 invested in Airport CDM, within 10 years up to €9 would be paid back – and within 2 years the initial investment would be repaid. The study also suggested that costs of implementing and operating Airport CDM elements are lower than most people think.

Sound assumptions

The study used EMOSIA, the European Model for ATM Strategic Investment Analysis - a structured and proven methodology based on industry best practice. It also included contributions from stakeholders at several stages in the process, including the vital validation stage.

Of course, costs and benefits will be different at every airport and will depend on many factors, such as complexity of traffic, airport layout, number of participating partners or sophistication of the systems in use. This study took a Generic Airport with 280,000 movements annually, growing at 4% per year, with airport operating costs of €300M and ATC operating costs of €70M. In addition, 4 specific Cost-Benefit Analyses were produced for Barcelona, Brussels, Munich and Zurich, each with convincing results that were fed into the overall study.



High-level results for the Generic Airport:

- Expected benefits of up to €90M (over 10 years, all partners included)
- Benefit-to-cost ratio of up to 9/1
- Quick return of investment for all partners – 2 years
- Risk of financial loss is practically non-existent

There is a very strong case for implementing Airport CDM

What are the costs & benefits?

For airports and ATC, Airport CDM represents a very safe investment with very limited risk – 80% probability of a positive result. The expectation is that partners will see their initial investments within 2 years.

The overall cost of the project for all partners together is €10.86M spread over 10 years:

- €3.83M - capital investments
- €7.03M - operating costs

These costs are lower than many people expect, particularly in terms of IT improvements, which

can be delivered very cost-effectively. The main insight from the analysis and real implementations is that costs are very small compared with the benefits, but quite constant through the implementation and post-implementation phases.

While Airport CDM brings many important benefits, only some of them have direct financial impact. These, however, add up to more than €90M.

BASELINE ASSUMPTIONS USED

Airport

- The baseline operating cost for the Airport in 2006 is €300M
- The operating cost growth is equal to 4% as per annual traffic growth
- Implementation duration is equal to 3 years.

ATC

- The ATC operating cost in the Airport is €70M

Ground handling

- Operating cost growth is 4% per year
- Operating cost for ground handlers affected by Airport CDM is assumed to be between 10% and 30% of their total operating costs
- The operating costs per flight handled are between €1000 and €3000 per flight

Airline

- The baseline for annual traffic growth is 4%
- The average cost of delay per minute is €77. For sensitivity analysis purposes a high value of €100 and a low value of €50 are used
- The average delay per movement (all causes) is 10 minutes
- Benefits are achieved from the 1st year of the project and are fully achieved after 2 years

General

- 280,000 aircraft movements
- Start year 2006 - final year 2016

The economic win-win

Continued

On the benefit side, airport operators are on top, followed by airlines and ground handling companies. ATC will see the smallest quantifiable benefit, but will see major qualitative improvements in work processes.

The major benefits include:

- **Airlines** will benefit most from the implementation of Airport CDM. Fewer missed connections for passengers will mean a decrease in compensation paid. And there are reduced fuel costs due to shorter taxi times and shorter turn-round times. This has another major benefit, which is the benefit to the environment in terms of emissions and noise disturbance. Increased predictability also means schedule buffering can be reduced, which has a positive impact on airline operating costs. Overall the study found a net present value of €29.39M for airlines, with a benefit-to-cost ratio of 8.
- **Airports** will achieve better use of airport resources and infrastructure (manpower, equipment, or stands and gates) through having the right information at the right time for the right people. For example, partners receive the stand allocation 10 minutes earlier, thanks to more stability in planning. This in turn gives the ground handler sufficient time to set up a stand for an arriving aircraft: a small but important improvement due to Airport CDM. Overall the study found a

net present value of €29.9M for airports, with a benefit-to-cost ratio of 8.

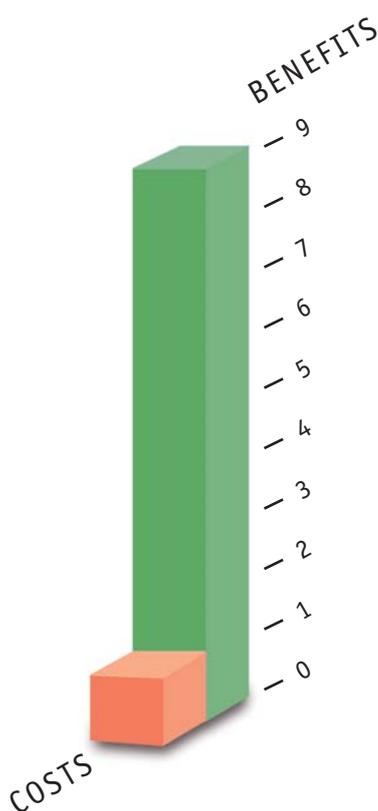
➤ **Ground handlers** will find that increased predictability enables better planning, leading to more efficient use of existing manpower and equipment with subsequent reduction in operating costs and avoidance of future operating costs. Overall the study found a net present value of €16.87M for ground handlers, with a benefit-to-cost ratio of 14.

➤ **ATC** will be also benefit from better use of resources and this will possibly lead to cost avoidance. Overall the study found a net present value of €3.79M for ATC, with a benefit-to-cost ratio of 6.

And of course, the other ‘winner’ in this equation is the passenger. The ultimate customer benefits from reduced delays, fewer missed connections, greater satisfaction from improved punctuality, and better service during periods of disruption.

The value of ‘network’ benefits

The Cost-benefit Analysis also looked at network benefits of exchanging the Flight Update Message and Departure Planning Information messages with the CFMU. The increase in the en route capacity due to connecting to the network has been estimated at 0.5%, which represents the Net Present Value of over €70M over 10 years. However, the recent Study on Airport CDM Network Impact Assessment based on Munich experience has shown that implementation of Airport CDM could





increase sector capacity within the core area by up to 4%, which equates to between 1-2 aircraft per sector.

The economic arguments for implementing Airport CDM are strong and clear. Every partner in the process stands to gain, as does the network as a whole. The investment costs are comparatively small, by aviation standards, but the quantitative and qualitative benefits and cost savings are substantial. Even if your airport is efficient today, the increasing complexity of operations can bring future problems that compromise

service quality. In the end, the longer term costs of not implementing Airport CDM can be much higher, when compared to the investment you need to make today.

For more details see the Airport CDM Cost-Benefit Analysis Document at www.euro-cdm.org

For more information on the qualitative benefits of Airport CDM see page 18: "It's about more than money".

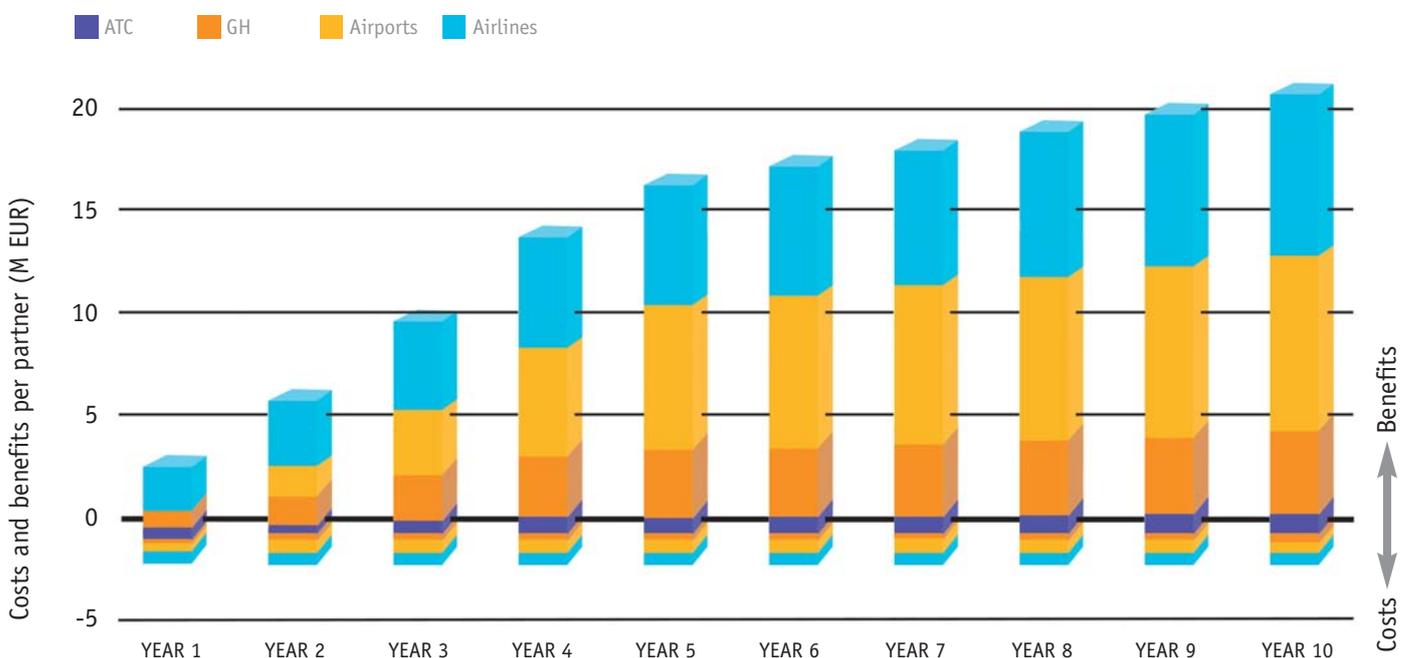
One-off Costs:

- Project definition & project management
- Procedures adaptation
- System integration
- Staff training

Operating Costs:

- Maintenance & IT Improvements
- Recurrent training
- Travel costs
- Airlines: full time function – ATC/FLOW, flight dispatch staffing

Costs and benefits summary



Airport CDM is built upon sharing a range of information between all partners and this can sometimes cause concerns. The problem is not in getting the information, nor even in distributing it. The core challenge is in developing a culture based on mutual trust and cooperation.

Sharing the information we need



Can I rely on what you say?

If operations are to become more efficient they need the best information available. To make this happen well defined Service Level Agreements and Non-disclosure Agreements should be signed between the partners in a Memorandum of Understanding. It's important to sort this out early on. It will help to ensure that partners:

- provide high quality information
- stick to their commitments
- define appropriate access levels for sensitive information
- share data only internally within Airport CDM
- leave airlines with the right to decide which information they share with their passengers and which not.

What to share

The type of information needed covers:

- airline schedules and flight planning information
- predictions, status messages and operational planning information (stand, gate, landing time, in-block time, turn-round time)
- advisories and alarms (e.g. insufficient time to complete turn-round)
- status of aeronautical aids/systems and weather situation.

In some airports CDM-like procedures are already in place, albeit using different names and definitions. A gap analysis can

To charge or not to charge? What money cannot buy...

In this commercial world it can be tempting to see information as a revenue generator. Others have tried to charge for data, but have found that when they do, the whole CDM process stops. People will always find ways to recharge back, which simply creates a cycle of resentment and mistrust, whereas CDM relies on trust and mutual benefit.

Ground handler: I'll give you a Target Off-Block Time, it will cost you €1

ATC: Fine, I'll give you a stand. It will cost you €2!

identify where additional information or action is needed. That same analysis will also help to define how to tailor existing information and processes without over-complicating things, as well as how to provide access to what is needed.

Gap analysis helps to find the answers to the following questions:

- What information do we need?
- What do we have already?
- What are we missing?
- Who do we need to share it with?

AIP or Airport CDM Portal?

When new procedures become official, they need to be published in the Aeronautical Information Publication. But experience has shown the message does not spread in the way that it should. A much more effective way of doing this is via dedicated web-based portals. As Mark Matthys from Belgocontrol explains: *“The Airport CDM portal also contains the most recent procedures and publications. The portal also proves that Airport CDM is not related to only one airport but that we are really trying to harmonise and simplify complex things.”*

I see what you see

An important part of Airport CDM information sharing is the ‘user interface’, which should be built around agreed processes and procedures involving all partners. This does not have to be a complex IT project. It can be a simple web platform, or an adaptation of an existing intranet or other system. Experience has shown that it is best if the display is the same for everyone, but with different levels of functionality. The beauty of this is that it can be made available even

ARRIVALS												
FLT ID ICAO	TYPE	REG	From	Delay	Sts	Landing S/E/A	R/W	In block S/E/A	STAND	Term	Link Flt	Remark
AZA236	A321	IBIXU	LIMC	0	SCH	1725	Z/R	1735	203	2	AZA237	
BAW317	A319	GEUPV	LFPG	-20	PTO	1533	Z/L	1550	456	4	BAW318	
BMA107	A320	GMDR	EHAM	-10	200	1522	Z/R	1526	110 H5	1	BMA108	
DLH4637	A350	DARAU	EDDF	2	300	1501	Z/R	1508	210 X	2	DLH4638	Medivac
BAY450	A319	GEUPJ	EGCC	-5	200	1450	Z/L	1510	127L H20	1	SHT9U	
UAE1	A380	A6RJL	OMBD	-70	300	1430	Z/L	1430	303	3	UAE2	Tow 512

DEPARTURES														
FLT ID ICAO	TYPE	REG	DEST	STAND	SOBT	E/T/A OBT	STS	Delay	CTOT	E/T/A TOT	R/W	ATC Take Off Order	LINK FLT	Remark
AZA237	A321	IBIXU	LIMC	203	1440	1440	TOT	0	1450	1455	27R		AZA236	
BAW318	A319	GEUPV	LFPG	456	1520	1533	200	-13	1450	1458	27R	1	BAW317	
BMA108	A320	GMDR	EHAM	110	1500	1450	200	6	1455	1458	27R	2	BMA107	
DLH4638	A350	DARAU	EDDF	210	1450	1450	200	0	1500	1458	27R	1	DLH4637	
BAY459	A319	GEUPJ	EGCC	127L	1450	1450	200	-6		1450	27L	1	SHT9U	
VIR907	A300	GVROG	KJFK	323	1455	1450	REA	-2	1502	1450	27L	2	VIR006	
SAS532	B7X7	OYYOU	EKCH	220	1500	1450	GTC	2	1455	1450	27L	3	SAS531	
EIN715	A321	EICPG	EINN	108	1455	1450	BRD	-10		1515	27L	4	EIN714	
THY1992	B738	TCJFE	LTBA	318	1415	1518	GTO	-63	1537	1537	27L		THY1991	
IBE3175	A320	ECFDB	LEMD	222	1510	1530	GTO	0	1540	1540	27L		IBE3174	
UAE2	A380	A6RJL	OMBD	303	1625	1644	SCH	-20	1655	1700	27L		UAE1	
AJM004	A343	6YJMC	LEBL	315	1655	1655	SCH	0		1715	27L		AJM003	

Prototype CDM User Interface from Heathrow showing colour flags, coding toggle, airport news section etc.

to partners off-site – to assist with planning and analysis. It can be tailored to local needs and have inbuilt flexibility for example to switch between IATA and ICAO callsigns, show towed aircraft, show news on repairs to specific airport areas and so on.

The result is a shared awareness of the SAME information that is accurate, up-to-date and reliable.

For further details on the operational aspects of information sharing, including the important ‘milestone approach’ linked to information sharing see “It’s time to build a strong foundation for airport efficiency” (pages 22 - 25).

>Top Tips< for the interface:

- Use existing equipment if possible
- Avoid multiple displays
- Create consistent look and feel
- Avoid information overload – be selective
- Show linkage of flights clearly
- How it looks may be local, but the message must be the same everywhere

Implementing Airport CDM is an opportunity to show you are being proactive in addressing environmental concerns. It should help to create good community relations.

How Airport CDM benefits the environment

A 'green' quest

Public concerns about the environmental impact of aviation are increasing. This was highlighted in a study on public attitudes to aircraft noise published in late 2007 by the UK's Department for Transport, and by other recent surveys at Zurich and Amsterdam airports. Add to this the publicity surrounding global warming and the whole aviation industry finds itself under pressure to respond.

Everyone is searching for 'green solutions' that will make an impact today. Numerous initiatives exist – but few can be implemented immediately, with direct environmental benefits. Airport CDM is one such initiative. This fact is recognised by IATA, CANSO, ACI Europe and EUROCONTROL in their Flight Efficiency Plan 2008 which urges the faster adoption of Airport CDM.

Environmental benefits of Airport CDM

- Reduced noise due to less aircraft in the taxiing queues
- Reduced engine run time on the ground -

but also the possibility to reduce number of aircraft due to improved predictability

- Reduced taxi times
- Less fuel results in increased payload
- Reduced emissions: carbon dioxide (CO₂ - greenhouse gas); oxides of nitrogen (the key air quality pollutant and greenhouse gas); particulates (important air quality pollutant)
- Reduced associated mitigation costs (noise insulation or compensation)
- Reduced risk of environmental constraints imposed by local, national, regional or international authorities

Shorter taxi times proven

Although pushing back as soon as the aircraft is ready can be psychologically satisfying for the passengers, it very often only means joining a long queue and burning more fuel while holding on the taxiway. Regardless of the cost to airlines, this also has a negative impact on local air quality and contributes to noise disturbance in the vicinity of the airport.

Following the successful implementation of Airport CDM in Munich in June 2007 **taxi times have been reduced by 10%**. Not only does this **positively affect local air quality** it also **reduces noise**. This equates to a **fuel saving of €3.6M per year**. A similar benefit can be observed in Brussels where the average taxi time **decreased by one minute**.

“Every tonne of fuel used inefficiently produces an additional 3.15 tonnes of CO₂ emissions contributing to global warming.”

Standard Inputs for EUROCONTROL Cost-Benefit Analyses

“If Airport CDM was successfully replicated at a major proportion of European airports, this would offer a potential fuel saving worth several tens of Million Euro per annum and a reduction in CO₂ of several tens of thousand tonnes per annum. Further there would be other benefits in noise and air quality impacts which are known major causes of constraint on Airports and hence the European ATM system.”

Generic CBA for Airport CDM, EUROCONTROL

By using more accurate taxi times and up-to-date readiness information, ATC can better plan the departure sequence for flights. If 50 major airports in Europe could save one minute of taxi time per flight, as Brussels has achieved, Airport CDM could save airlines 145,000 tonnes of fuel annually which would contribute to 475,000 tonnes of saved CO₂ emissions.

schedules today. These buffers help airlines in several ways: they improve the predictability of rotations by allowing for delay recovery but also help to improve the airline’s ‘on-time performance’ in the eyes of travelling public. However, they also have negative effects. They reduce resource efficiency for airlines and require additional



The key is ‘improved predictability’

Disruptions during the turn-round process and non-adherence to Air Traffic Flow Management (ATFM) slots affect the accuracy of demand calculations resulting in:

- unnecessary holding of the aircraft in the vicinity of its destination
- rerouting to longer routes
- flying at inefficient flight levels

all with subsequent impacts on fuel costs and CO₂ emissions. The inability to predict these disruptions is a primary reason for airlines incorporating ‘buffers’ into their

fuel to be taken on board. And this fuel in turn contributes to even more CO₂ emissions.

Experience with Airport CDM at the pioneer airports has shown substantial improvements in the predictability of the turn-round process, enhanced adherence to the ATFM slots, and an overall positive effect on delays. This paves the way for reducing sponging (buffering) in airline schedules which means they can take less fuel on board and reduce the weight of the aircraft. This results in financial benefits to airlines and environmental benefits for everyone.

Out of every extra 100 kg of fuel loaded on the aircraft to accommodate ‘buffers’ in schedules, 4% per hour will be burned just in carrying the weight of that fuel. IATA

Today, real-time information sharing between the Air Traffic Management system and people on the ground at airports happens only at CDM airports. They have two new automated messages; the Departure Planning Information message and Flight Update Message, which effectively 'connect' the airport to the ATM network, improving predictability for everyone.

Airports... the missing link in the ATM network



The Air Traffic Flow Management network, is not operating today as one entity. Successive flights do not depend on each other, and ground processes and en route traffic are not yet considered as parts of a time-dependent chain.

'Black holes' in the planning

In Europe the job of balancing demand and available capacity of airspace is done by the Central Flow Management Unit (CFMU). This function helps to use finite capacity effectively, and aims to avoid overloading air traffic controllers. But there is currently no link between airborne and ground flight segments and although information from the airports plays a key role in the efficient planning of the CFMU, airports are not truly integrated in the 'gate-to-gate' planning process.

Will you really be ready for take off?

The only information regarding departure times used for planning purposes by the CFMU today is Estimated Off-Block Time.

This is taken from the filed flight plans and is only updated if the delay is longer than 15 minutes. This system works fine if everything runs smoothly. But the real situation can often be very different from the plan and if anything goes wrong on the ground, the deviation is not communicated to the network sufficiently in advance. This means that downstream, those affected by the deviation are unable to anticipate the knock-on effect. So traffic bunches occur which either create unnecessary additional loading for Air Traffic Controllers or prevent capacity from being used efficiently.

How slots are wasted

Currently a 'default taxi time' is used to calculate Estimated Take Off Time and to decide whether an ATFM slot is needed.

However, for some flights this can be far from the real taxi time needed to get to the runway. This is especially true at complex airports where the difference between the default and actual taxi time can be substantial depending on the runway in use, allocated stand or traffic density. Many updates of the Estimated Take Off Time are not notified to the CFMU although they are often known early enough to revise the planning. The CFMU thus has a distorted traffic demand picture and it is not surprising that a large number of ATFM slots are wasted or unnecessarily allocated and that there is a large inconsistency between ATFM and airport slots.

Where is the aircraft?

While the CFMU today lacks accurate information on actual departure times, for their part ground handlers and airport operators similarly often have no real-time information on arriving traffic. If an aircraft arrives early, a last minute change of stand can cause increased workload and stress for all: ATC, ground handlers, airport operator as well as the flight crew. An arrival at an occupied stand can block the taxiway on the apron and result in unnecessary delay and fuel burn. Repositioning of ground handlers in a hurry also increases the risk of collision on the apron and can compromise safety.

New messages provide 'the missing link'

Airport CDM introduces two new automatic messages that provide the 'missing link'. CDM airports are connected with the CFMU

"It is proven that Airport CDM is the driver and mechanism to integrate airports into the ATM network and with this excellent demonstration from Munich Airport network benefits should become reality in the very near future."

AOE Newsletter , Summer 2007

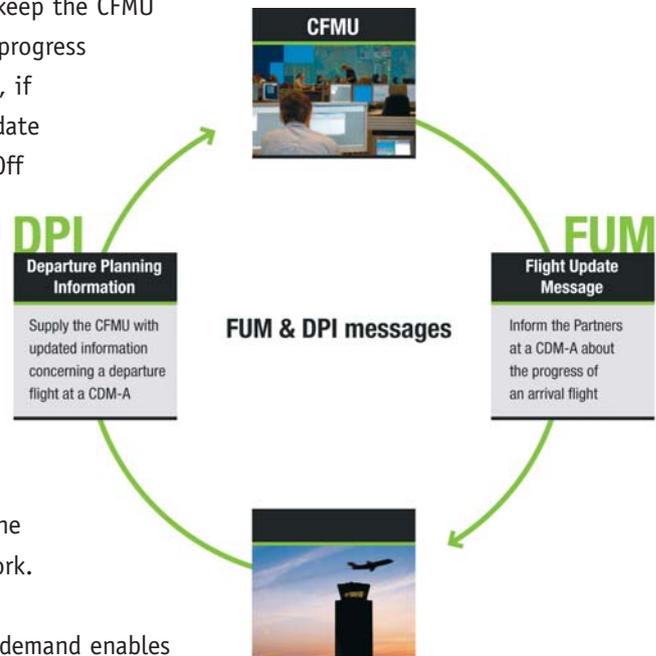
via Flight Update Messages (FUM) and Departure Planning Information (DPI) messages.

These messages keep the CFMU up-to-date with progress and enable them, if necessary, to update Calculated Take Off Time and send an FUM to the next destination airport. This all helps to improve predictability and extend the local benefits of Airport CDM to the whole ATM network.

A better view of demand enables planners to take appropriate measures (e.g. re-routing or level capping) with the potential to better use available capacity and provide more freedom of choice for airlines. Airports benefit too, because when the predictability of arrivals is improved, airport resources can be used more efficiently.

Successful trials and the first 'fully connected' airports

After successful trials, Munich became the first airport fully connected to the network on June 7, 2007. At Munich the ATFM delay has decreased compared with flights to non-CDM airports since the data exchange with the CFMU started. Other airports will soon follow.



DPI and FUM messages help to:

- Improve the accuracy of demand calculation, resulting in better use of ATC capacity
- Reduce air traffic controllers' work load - with positive safety implications
- Reduce wasted ATFM slots
- Reduce unnecessary regulations
- Improve departure predictability for the CFMU
- Improve arrival predictability for ATC, ground handlers and airport operators
- Use airport resources more efficiently
- Improve information for passengers

Delays

Capacity

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Delays

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What's your priority?



Munich and Brussels had different expectations for Airport CDM implementation: Munich is a modern, optimally designed airport with a user-friendly layout, but in need of more capacity. Whereas Brussels, like Frankfurt or Madrid, has developed over the years and has a layout that is far from ideal. Punctuality and long queues of departing aircraft waiting at holding points were particular issues at Brussels.

Every airport is different, and has different needs. The good news is that Airport CDM is totally flexible and can help to solve different problems. Even airport size or traffic volumes are not limiting factors to implementing Airport CDM. Airport CDM can help to boost operational efficiency at any airport.

Different motives

It is natural that different partners will have different views on what the most pressing issue at their airport is. Long delays disrupting efficient hub operations can be seen as the major problem by the airline, while ATC can be frustrated by de-icing procedures that consistently undermine

Typical motives to implement Airport CDM:

- User-unfriendly layout
- Limited capacity of Runway and Taxiway system
- Limited number of stands/gates
- Long winter season and inefficient de-icing procedures
- Inefficient pre-departure sequencing resulting in long waiting times and many wasted slots
- Insufficient number of personnel at smaller airports

Efficiency

Environment

Costs

Capacity

Environment

Costs

Capacity



optimising de-icing procedures. But whatever the main area that needs improving is, the basic steps of Airport CDM are always the same:

- create common situational awareness by sharing the right information at the right time with the right partners
- create a common airport information platform
- use one common vocabulary
- develop tools and procedures that are acceptable to all partners

For more information on how to build strong foundations and the relationship between the different Airport CDM elements see pages 22-25.

Whatever your priority, include ALL partners

There are many important things that you need to keep in mind when implementing Airport CDM. But one of the most crucial success factors is involvement of ALL partners at your airport. Ground handling companies and de-icing companies are often forgotten, yet without these, the system cannot work properly.

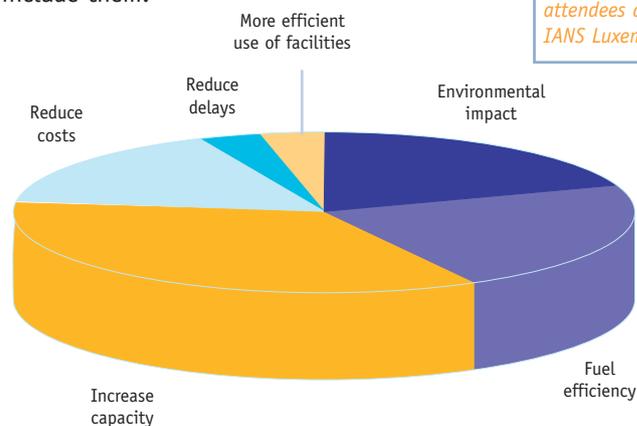
General Aviation users have a dedicated counter at Munich airport where airport personnel will help them to update the status of their flights and help them to stay in the loop.

planning of the pre-departure sequence. Depending on the main issues prevailing at the airport, the approach towards Airport CDM implementation will differ from airport to airport, allowing more attention to be paid to particular problems. But even if the focus is on improving performance in a specific area, the other partners still see the benefits of more efficient operations and enhanced communication.

Basics are the same

Airport CDM is flexible and there are several Airport CDM elements that help to deal with different issues. The Milestone Approach is focused on improving the accuracy of time predictions, Variable Taxi Time calculation will help to increase ATFM slot adherence, while CDM in Adverse Conditions is ideal for

Military users, general aviation and business jets often do not have a means of complying with the published procedures, yet they can significantly affect the efficiency of operations at the airport. Think about how you can include them.



Perceived priorities expressed by attendees at A-CDM training course, IANS Luxembourg, October 2008.

For more Lessons learnt from implementations across Europe see pages 32-33.



It's about more than money

An average benefit-to-cost ratio of 9 to 1 is a convincing argument, but Airport CDM has some additional benefits, some of which are hard to quantify in monetary terms. These are the so-called 'soft' benefits of improved working environment and improved corporate image.

"Airport CDM established a communication platform where we finally have an opportunity to meet with our partners regularly and also discuss other issues that we have."

Jiří Roubíček, Czech Airlines

Ok, now I see why you need this...

One of the most valuable 'soft' benefits of Airport CDM implementation is the creation of trust and understanding between the partners. Take Zurich, Munich, Frankfurt or Prague... If you listen to their stories they have a common thread. Communication between partners improved substantially and everybody learnt about each others' practices. It can take some time to build trust but it works.

"I was a controller for 20 years and was not aware of the duties and complexity of the dispatcher's function."

Mark Libby, FAA

By sitting together within the context of Airport CDM, the partners get to know each other and suddenly, they stop asking themselves questions such as: "Why do they need this information? What will they do with this? Why is it so important for them?" Thanks to Airport CDM, understanding partners' needs improves substantially.

"Before we started to implement Airport CDM, we had a more tower-oriented point of view. Now we understand the requirements of our partners at the airport much better"

Klaus Wehle, DFS, Frankfurt Tower

Less stress for everyone

Having to make a decision when you know you don't have a complete picture can be very stressful, and it can also affect safety. Airport CDM helps fill this gap and contributes to a better working environment for everybody, from air traffic controllers to ground handlers.

According to airport dispatchers at Swiss hub control in Zurich : *"The operation is quieter now and there is less stress for everyone. If there is a delay, we know it sufficiently in advance and can deal with it much better. In the past, dealing with these situations involved a lot of phone calls and questions for our hub controllers. Now, there*

AIRPORT CDM IMPLEMENTATION

CHECKLIST

The Airport CDM Implementation Manual (available separately)

describes in detail the recommended process of implementing Airport CDM.

This pull-out checklist is an at-a-glance introduction to Airport CDM implementation. For each of the checklist items, more information is available in the Implementation Manual.

1. Are you familiar with the Airport CDM concept?

- **If not, suggested reading includes:** Airport CDM Applications Guide, Airport CDM Implementation Manual and accompanying CD-ROM, Airport CDM website (www.euro-cdm.org), Airport CDM OCD and FRD.
- **Remember the main CDM messages:**
 - CDM is a new culture of collaboration
 - Low cost, high returns
 - Needs cooperation from all partners
 - Information must be provided free
 - Information commercially and security sensitive must be handled accordingly
 - We can only call it Airport CDM if the defined functions are used

2. Set up an Airport CDM project

- **Start a new project or incorporate into an existing one.** You can set up the Airport CDM project as part of an existing activity but there should be clear and separately identifiable objectives, responsibilities, financing and deadlines.
- **Involve all partners right from the start!** Airport CDM is all about collaboration and all interested partners must be able to contribute from day one.
- **Set the objectives!** Remember that the aim is to improve the operational situation at the airport as a whole and not only that of individual partners.
- **Do not be afraid to be persuasive.** However use good arguments and listen to others too.
- **Select the concept elements to be implemented.** While any step aimed at improving the exchange of information can be considered as a CDM step, for the identified benefits to be realised, the defined Airport CDM functionality must be implemented. If a similar functionality already exists, it may be incorporated into the implementation project.

PULL-OUT

One

AIRPORT CDM IMPLEMENTATION

CHECKLIST

PULL-OUT

- **You MUST start with the Airport CDM Information Sharing concept element.** This element provides the foundation upon which all the other elements are based.
- **TOBT must come next!** The benefits are such that it is strongly recommended to give TOBT implementation priority.
- **Make an inventory of what is needed and what is already available.** The aim is to utilise existing or modifiable resources to the maximum extent possible. Buy new only if unavoidable!
- **To enable operational use of Airport CDM, the diverse partner systems must be adapted.** In this context, adaptation means ensuring that those systems can exchange information with each other and can use that information, without endangering their core functions.
- **Make the Business Case but do not expect this to be the same for all partners.** The CBA will be driven by the Key Performance Indicators that will be agreed by all partners. Do not be reluctant to extrapolate from the positive results of other Airport CDM implementations.
- **Educate and convince all partners.** Most difficulties with Airport CDM implementation will come from its culture change aspects. Freely sharing information, protecting confidentiality together and having mutual trust are new concepts which may not come naturally. Education and persuasion by a trusted project manager and an Airport CDM Project Committee can go a long way towards resolving the problems. A good training package covering subjects such as confidentiality and how it is safeguarded is essential. EUROCONTROL offers standard and tailor-made Airport CDM training courses.
- **A Multi-Partner Project Plan: the key to success.** In view of the multitude of partners in a typical Airport CDM implementation, a formal project plan and strict adherence to it is essential and well worth the effort of creating.

3. Start implementing

- **Source your Airport CDM elements.** The various Airport CDM documents describe the minimum functionality that must be provided. It is however not specified how this should be implemented, who should develop it or



TWO



where it should be hosted. These are local decisions and require solutions that best fit circumstances and may include the development/modifications of existing systems.

- **Do not accept expensive solutions!** Airport CDM elements are not mission critical in the sense that an ATC system is. They are neither computation intensive, nor do they require complicated user interfaces.
- **Suggested implementation sequence of the available concept elements:**
 1. Information Sharing
 2. Milestone Approach
 3. Variable Taxi Time
 4. Pre-departure Sequencing
 5. Adverse Conditions
 6. Collaborative Management of Flight Updates



4. Project risks and their mitigation

- **New culture, new solutions, new and old risks.**

Airport CDM implementation projects carry risks. Airport CDM requires the close cooperation of many partners, who will have to adopt a whole new company culture of sharing and cooperating. This may include new working methods and new functionality in their systems.

- **Review the risks and plan for their mitigation.**

The Airport CDM Implementation Manual contains a list of risks that have been identified. Their suggested mitigation is also included.

5. Measuring success

- **Review agreed objectives.** Obviously, you had an agreed set of objectives. Now is the time to review them again, with the involvement of all partners, to check whether slight changes are required in view of the experience gained.

- **Agree performance indicators appropriate for the objectives.** A set of Key Performance Indicators has been included in the Airport CDM Implementation Manual. Select from these and if needed, develop additional ones and get agreement from all partners.

AIRPORT CDM IMPLEMENTATION

CHECKLIST

PULL-OUT

- **Establish performance baseline.** Improvements will need to be compared to pre-CDM operations. It is important to start measuring well in advance of implementation.
- **Airport CDM is all about sharing and openness.** There is no doubt that Airport CDM works and brings benefits. It may not always happen first time round, or to the extent expected. It is extremely important that a reporting and feedback mechanism is put in place, so that a clear and unbiased picture of the achievements (or lack thereof) is provided to all partners. A no-blame culture with dedication to Airport CDM will ensure that the feedback is used to drive all concerned towards achieving the original objectives. It will also help you celebrate successes and address failures.

6. Don't delay, get the Manual and check out the Attachments!

- In the Attachments you will find information on objectives and Key Performance Indicators, sample documents such as Memorandum of Understanding, Generic Procedures, Inventory & Compliance checklist and a list of references.

For further information visit the European CDM website www.euro-cdm.org or contact:
EUROCONTROL Airport CDM Project Team

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www.euro-cdm.org

Four

is no need for open questions about what is happening. The information is available."

Improved image of the airport

It has been proven that Airport CDM reduces environmental impact. (See pages 12-13). This in turn provides an excellent opportunity to nurture good relations with the local community, shareholders and governments.

Higher service quality due to more efficient operations can also increase the attractiveness of an airport in the eyes of airlines.

"Harmonised procedures throughout Europe and awareness for the actual flight status - that's why pilots love CDM airports."

Matthias Groppe, Lufthansa CityLine

Last but not least, efficient airports with high punctuality and better information services, particularly during periods of disruption, are always more attractive to passengers. Regular travellers will pick and choose hub airports depending on their travelling experience.

"The crew always deals with the questions such as: "Why is there a delay? When will we finally depart?" We're here for the customers and they have a right to know what is happening!"

Werner Suhner, Swiss

Positive debate

Of course, Airport CDM will not solve all problems. But it will provide a positive frame-

work to discuss them and to find solutions.

"Prior to the CDM process we had confrontation during our morning operational reviews. Now, we have discussions; all the stakeholders involved walk away with a better understanding of the operation and we use this knowledge to improve future operations"

Mark Libby, FAA



Talking to people from airports that have implemented Airport CDM highlights just how important the 'soft benefits' are. These are the benefits that give people the energy and commitment to embrace change. Selling the 'soft benefits' will help make the 'hard benefits' happen!

"The way we now discuss is completely different to how it was in the beginning. Openness does miracles. The post-analysis of problems has become more constructive and is no longer 'a blaming culture'."

Marc Matthys, Belgocontrol

Airport CDM is here to help you to:

- Improve understanding of other partners' needs
- Create an effective communication platform
- Improve the way you communicate with other partners
- Reduce workload and contribute to lower probability of errors
- Create a better working environment
- Improve customer satisfaction
- Improve the overall image of your airport
- Ensure higher quality of service

Origin	Time	Remarks
London	10:11a	Arrived
London	8:08a	Now 10:00a
London	10:13a	Now 10:00a
London	10:13a	Now 12:10p
London	12:20p	Now 12:10p
London	12:20p	Now 11:59a
London	11:25a	Now 11:45a
London	12:00p	Now 11:45a
London	12:00p	On Time
London	1:00p	On Time
London	1:00p	On Time
London	11:05a	On Time

Airport CDM is a mature concept with proven benefits and the full support of IATA, CANSO, ACI Europe, EUROCONTROL and SESAR. Each of these bodies recognises the need to increase Airport CDM implementations in Europe, particularly at the main airports that still suffer frequent delays.

Europe is pushing for

“The turn-round process links the flight and ground segments, and will include milestone monitoring, stand/gate management and apron management. Sharing turn-round information in a collaborative process will improve estimated times of subsequent events such as off-blocks and take off”.

SESAR

Just a few years ago Airport CDM was in its infancy as a concept. But it has matured quickly, proven its worth, and gained widespread support. It has been incorporated in the most ambitious plan ever written for the European ATM: SESAR (Single European Sky ATM Research). SESAR aims to eliminate today’s fragmented approach to European air traffic management, transform the ATM system and synchronise all stakeholders and network resources. The SESAR Master Plan identifies Airport CDM as a ‘key enabler’. Without it, a ‘black hole’ of information exists while aircraft are on the ground (an incomplete network); whereas

with it, the ATM network is complete, dynamic and better able to anticipate, plan and prepare.

EC support

Recognising both the maturity and importance of Airport CDM, the European Commission issued a mandate to the European Telecommunications Standards Institute to develop, in cooperation with EUROCAE, a Community Specification (CS). It sets a precedent for many that will follow and provides a means of compliance to the Interoperability Regulation. In essence, it’s a standard for implementing Airport CDM

Today’s airport problems – according to SESAR

- Poor information on expected arrival time is leading to the late arrival of ground handling agents and equipment at the gate
- Taxi process suffers from insufficient planning and poor predictability
- Turn-round not integrated into overall planning process
- Departure sequencing remains a sub-optimal ‘first come first served’ process
- Insufficient coordination between airport ground processes and Calculated Take Off Time (CTOT)
- Lack of collaborative contingency planning for disruption scenarios

ward, are you?

that meets the goals of the Single European Sky legislation. The CS should be referenced in the European Commission's Official Journal in 2009, but in the meantime the technical details can be found in the outputs of EUROCAE Working Group 69.

Globally applicable

Airport CDM is more than a European project. In fact the original inspiration for the generic CDM concept came from the USA, albeit more focused towards en route benefits. Today, recognition is increasing around the globe and CDM representatives in the US are excited by the European concept and how it applies to airports. Manufacturers and operators alike are actively exploring the options for how Airport CDM elements could be applied at US airports.

Hong Kong too is building Airport CDM functionality into its new ATC systems and processes; and even without a CFMU equivalent, it sees significant benefits from implementing the concept. In particular, Hong Kong is hoping to see significant improvements in the way it copes with the regular typhoon season.

Europe says implement

The benefits of Airport CDM have been proven at both a local level, and most powerfully

at the network level. High level support from trade associations and institutions means momentum is building and airports are being urged to take active steps towards implementation (for example, in the jointly published Flight Efficiency Plan).

However as Mark Libby, the CDM manager from the FAA, says: "To be successful, CDM must first be developed from the bottom up, not just mandated from the top down." It is pointless to wait until it 'must be done'. The earlier CDM is implemented, the more time there is for cultural change and adaptation at the operations level, and also the faster the benefits will come.



"The Commission believes that Airport Collaborative Decision Making can bring substantial benefits to the operation of the airport network as a whole if a critical mass of partners participates. It is also considered that the increased operational efficiencies would also result in obtaining welcomed environmental benefits."

An action plan for airport capacity, efficiency and safety in Europe, European Commission

“Providing information to other partners is part of everyday business for an airline. If you want to have robust and stable operations you have to share the information.”

Werner Suhner, Swiss

It's time to build a strong foundation for airport efficiency

A successfully completed milestone will trigger the decision making process for downstream events and influence both the further progress of the flight and the accuracy with which the progress can be predicted.

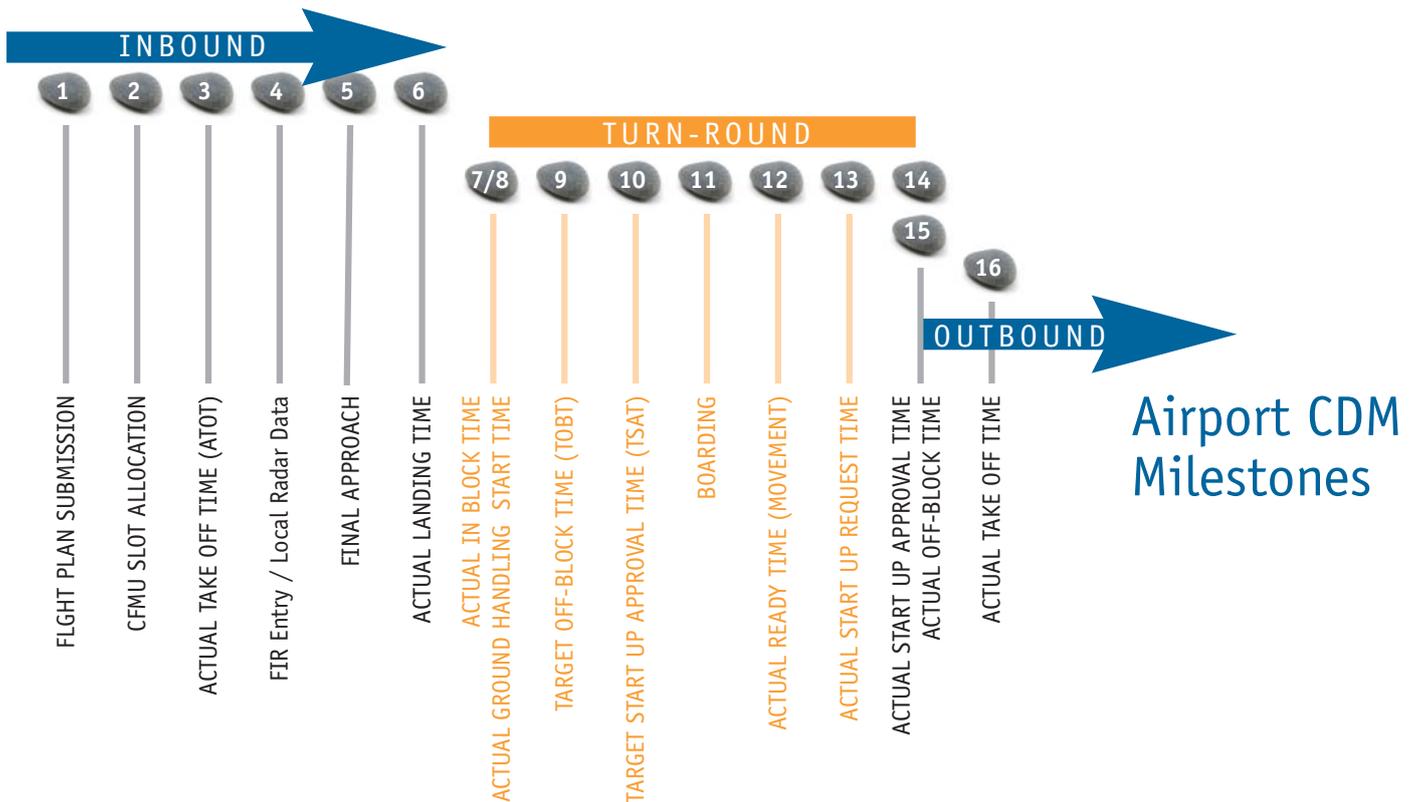
“Airport CDM is a process. Sure, you have to have the IT systems - but first, you need to know what to do with it.”

Erik Sinz, DFS Business Unit,
Munich

There are three key elements in the foundation layers of Airport CDM. Each layer brings additional benefits, and the first layer, the essential ‘groundwork,’ is information sharing between all involved partners.

The right information at the right time to the right people

Each partner has at some point a piece of information that is more up-to-date and more reliable than the estimates used by other partners; yet all too often this better information is not shared. CDM Information Sharing helps to create common situational awareness by making this information visible to those that are affected by it. Each partner has the same picture, more accurate than before, and acts on it. This in turn results in more efficient operations and better use of resources for everyone. It is as simple as that.



Airport CDM Milestones

Driven by processes and procedures, not systems

Airport CDM must be driven by procedures and processes, and then linked in to a common platform. Only well-defined procedures can ensure that those who have the best information regarding the status of the flight are responsible for informing others, and doing that in time to allow others to act on the update. Last but not least, a common vocabulary is especially important so everyone has the same understanding.

Milestones: the key to efficient operations

The whole process can be further improved by defining a set of so-called “milestones”. These represent the significant events that occur during inbound flights and following turn-round. For example, a milestone can be the take off time at the previous airport or the time when the flight is fully ready to depart from the stand. By monitoring these events and following the procedures and rules that are defined for each one of them, the partners can anticipate problems quickly when there is any deviation from the plan.

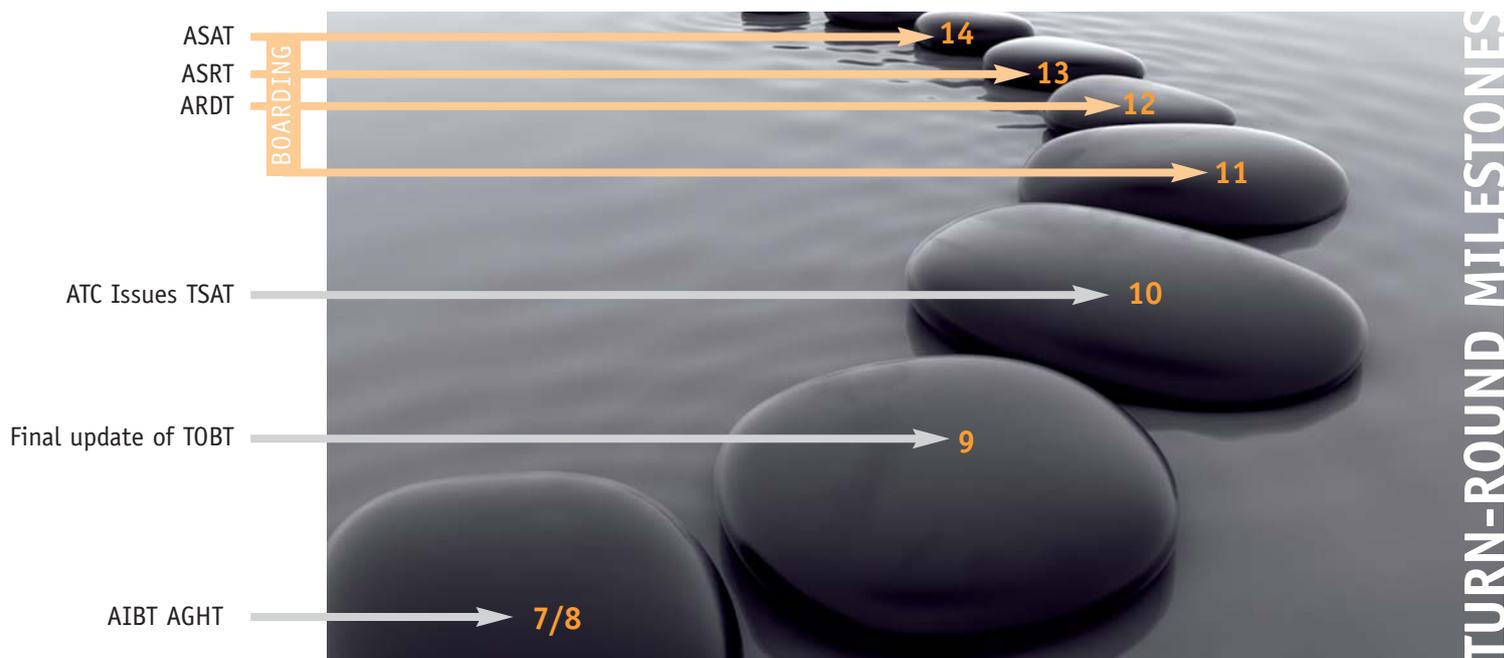
Ever heard of “Target Off Block Time” or “Target Start Up Approval Time”?

Implementations at pioneer airports have shown that two target times are essential for improving the efficiency of operations. These are called “Target Off-Block Time” and “Target Start Up Approval Time”. So, what exactly do these new times mean?

Target Off-Block Time (TOBT) represents the time that an airline or handling agent estimates that an aircraft will be ready, all doors closed, boarding bridge removed, push back vehicle available, ready to start up/push back immediately upon reception of clearance from the tower.

It is issued by the airline or handling agent and can be considered as a sort of agreement for the ready time that all partners aim to achieve. It is an important trigger for departure management.

Target Start Up Approval Time (TSAT), on the other hand, is the responsibility of ATC and informs the flight crew and other partners when an aircraft can expect to receive start up and/or pushback approval, which in turn helps them to manage the turn-round process. It takes into account the TOBT as well as the allocated ATFM slot and the traffic situation.



Experience has shown that focusing on these two target times enables airports to take a step forward in operational efficiency. It creates a commitment by partners that each will rely on – and it really works.

Lufthansa have achieved a 10% reduction in taxi fuel in Munich, plus 2-3 minutes per departure – all down to CDM.

All milestone events are monitored, and trigger alerts to prompt awareness if a problem occurs, for example if data are inconsistent or a specific milestone is not completed on time. This helps partners to

keep data current, inform others, or suspend the flight in the case of no action being taken.

Standard default taxi times are not good enough

Today default taxi times are set at most airports and typically vary from 10-25 minutes. But the reality is that some piers and gates are closer to a nominated runway than others. With Airport CDM it is possible to get a more accurate picture of the necessary taxi time for each stand relative to each runway. This results in improved predictability of In-Block Time and Take Off Time and better stand and gate planning. And since variable taxi times are calculated automatically, it also means no additional workload for controllers.

These three elements together provide the foundations for airport efficiency. They bring substantial benefits on their own, but they also provide the groundwork for other Airport CDM elements: Collaborative Pre-departing Sequencing (see pages 32-33), Adverse Conditions (see pages 26-27) and Collaborative Management of Flight Updates (see pages 28-29).

Reader quiz

Flight LX 2809 is late from its previous outstation and additional time is needed to clean the aircraft.

Actual Take Off Time = 11:20

(flight time: 45 minutes)

Estimated Taxi-In Time = 10 minutes

Minimum Turn-round Time = 40mins

Estimated Turn-round Time = 50mins

Scheduled Time of Departure/Estimated Off-Block Time in the Flight Plan = 12:40

What is the Target Off-Block Time?

Answer at the base of page 25

Airport CDM Concept Elements



5 Collaborative Management of Flight Updates enhances the quality of arrival and departure information exchanges between the CFMU 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 and in-block times especially at complex airports.



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



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



"An airport during adverse conditions? This is when Airport CDM really proves its utility."

Marc Matthys, Belgocontrol

When chaos strikes... *how to recover faster*

An airport's 'declared capacity' is calculated by taking into account the airport infrastructure, availability of resources, and sometimes even political or environmental considerations. However, this is typically done only for normal operating conditions.

"Sorry, our declared capacity is not available"

When adverse conditions hit, suddenly everything changes, and capacity reduces significantly. Even when adverse conditions are predicted, many airports still struggle to use available capacity and return to normal operations efficiently. Airports partners have developed various procedures

to deal with adverse conditions. The problem is that these methods are not equally effective and many are applied inconsistently or without coordination with other partners.

A positive impact

If all other Airport CDM elements are already in place at an airport, special Airport CDM procedures for adverse conditions can be applied. The other elements have to be implemented since adverse conditions relies on accurate information sharing based on flight progress and off-block predictions.

Examples of adverse conditions

Predictable

- Forecasted weather changes and associated runway configuration
- Need for de-icing or anti-icing
- Planned construction
- Planned maintenance works
- Unavailability of technical resources
- Industrial action

Unpredictable

- Sudden weather changes (e.g. thunderstorm)
- Equipment failures
- Accidents / incidents
- Security threats
- Undeclared personnel strikes
- Fire



Airport CDM will help you to:

- better anticipate adverse conditions and the subsequent change in capacity;
- keep airport operations as efficient as possible through prompt decision making, flexibility and adaptability;
- use available capacity and return to normal operations in the shortest possible time.

These procedures enable people to manage the situation efficiently and facilitate a swift return to normal capacity. Different “alarm levels” are defined for each category of adverse conditions with associated procedures and other necessary provisions. The impact on capacity and other partners is evaluated and all partners receive up-to-date and precise information about status and developments.

A continuous learning process

Of course, ‘organised improvisation’ is sometimes necessary, but even then pre-agreement on certain basic steps and procedures will improve the current situation. Appointing an Airport CDM Coordinator, supported by a CDM Cell composed of representatives of other partners, is in many cases the most cost-effective way to achieve the close cooperation that is so vital at these times.

“Adherence to the Airport CDM procedure is the only way to use the de-icing capacities to the full.”

EFM, Aircraft De-Icing and Towing Services at Munich Airport

Once the event is over, the same cell is responsible for post-event evaluation and learning points. The experience of CDM airports has shown that it is better to adapt existing procedures than to develop new ones; and special procedures should not substantially diverge from normal operations. This helps limit the impact on workload, training needs and changes to working habits.

It’s freezing outside

When the temperature drops, de-icing or anti-icing of aircraft might be needed. This procedure has a significant impact on turn-around and taxi time, and is often neglected in the planning process. This can significantly impact subsequent phases of the flight as well as disrupting the planning of downstream partners.

CDM in adverse conditions ensures that de-icing, whether on stand or remote, becomes part of the overall process of handling a flight. The time required for de-icing becomes visible and it can also be accounted for in the calculation of the various target times.

As Werner Suhner from Swiss says: *“CDM in adverse conditions will never solve all the problems... but sharing information with all partners definitely helps.”*

“At Brussels Airport there is now a direct phone line installed between the tower and the ground handlers; and the de-icing process includes TOBT & TSAT.”

Marc Matthys, Belgocontrol



For example, under Airport CDM:

- TOBT is 10:20 including 20 minutes for on stand de-icing
- ATC restrictions result in TSAT of 10:40
- De-icing company sees TSAT, so de-icing is planned to maximise holdover time.

One very real and practical benefit of completing the Airport CDM process and networking with CFMU is that they 'promise' that connected airports will have more slots better suited to airline needs.

CFMU slot negotiation 'promise'



Late passengers, crew waiting for catering or baggage, rush and hurry is the daily reality of a ground handler. No time to inform our own operations control centre, let alone the Airline Operations Centre. No need to delay the filed flight plan though, it will only be a 10-minute delay and will be recovered. Let's hope.

"This can be so frustrating... let's not tell anyone, they could hold us on the ground for another 30 minutes if we miss this slot ...let's hope those last two remaining passengers will appear in the next 5 minutes."

But hope doesn't bear fruit all the time. And while more and more people realise that there is no chance to meet the assigned ATFM slot this time, yet another unused window in the network system is created ... because no one told the CFMU.

How to fix a distorted picture?

The CFMU currently has a distorted traffic demand picture as a consequence of this. This results in wasted slots, unnecessary regulations and bunching of flights in some ATC sectors causing overloading of the controllers are not necessary. If more airports provided the CFMU with accurate Target Take Off Times via an automated Departure Planning Information (DPI) message, the CFMU would have dynamic sector counts which would result in enhanced management of the European airspace.



It works in Munich, why wouldn't it work elsewhere?

In Munich, assessments of Estimated Take Off Times that are exclusively based on those flight plans updated with delay messages have shown that only 40-50% of the times fall into +/- 5 minutes tolerance window, while using the Target Off-Block Time of the DPI message the accuracy increased from 58% to 80% when the DPI is based on pre-departure sequence.

If all airports achieved a similar level of predictability and adherence to regulations as that achieved by Munich, the CFMU could focus only on those 3-5% of flights that have problems.

According to a recent EUROCONTROL study assessing the network benefits of Airport CDM, this targeted activity by CFMU would

The majority of flights are now ready for take off at the runway already when their slot window starts, that means five minutes before the Calculated Take Off Time. More than 85% of flights now meet their ATFM slots.

Airport CDM Munich Results

mean that airspace could be managed much more efficiently and hourly capacity would increase by 1-2 aircraft on average in the en route sectors.

More effective in ATFM slot negotiations?

Once an airport has completed the Airport CDM process, and implemented the key Concept Elements, the CFMU will connect the airport to the network. This will bring a very real and practical benefit; significantly more success with slot extensions and slot negotiations.

Adherence to operational procedures for getting connected

- Accurate TOBT, TSAT, TTOT in place
- Procedure published in the National AIP
- Airport operating instructions for provision of TOBT
- Commitment to Airport CDM
- MoU and SLA signed by airport partners
- Minimum ATFM slot adherence





The change challenge schedule buffering an

Talk to any airport, airline, ground handler or air traffic controller involved in Collaborative Decision Making and they will tell you, *the biggest challenge is change*. For Airport CDM to happen some ingrained working practices need to stop, and new ones begin. This is **not** about increasing workload, nor about 'different jobs'. It is about changing the way we work, communicating better, and becoming more efficient.

I object!

Airport CDM implementation can stumble when any partner shouts: 'I object'. The

issues vary widely. They are rarely complex to solve. But they do require people to abandon some trusted working practices or embrace some new ways of working, as the following examples illustrate:

ATC at one airport were concerned about the Target Off-Block Time (TOBT) and Target Start Up Approval Time (TSAT) process, which is one of the fundamentals of the CDM Milestone Approach:

ATC: *This is giving us additional workload.*
 Airport CDM adviser: *Why additional? Today,*

Side by side scenarios

Today	With Airport CDM
Sponging of schedules is good for punctuality statistics, but not for efficient use of the aircraft fleet.	Airlines can reduce flight schedules, maximise the use of the fleet and potentially increase the number of rotations.
Short delays (<15 minutes) are not reported. Ground handlers fear they will lose passengers in the bar or shopping. Instead they use 'buffers' in the schedule. But late flight plan updates result in long slot delays.	With Airport CDM, one input with an updated Target Off-Block Time can make the difference. Not only for this flight, but for the next one, ready to park on the same (occupied) stand.
Ghost flight plans exist. These can be repetitive flights filed six months earlier - and not removed. Or the same aircraft with two flight plans on different routes to ascertain the restrictions..., but no-one cancels the 2nd flight plan.	Ghost flight plans will be very transparent at an early stage. This will allow sufficient time for the discrepancies to be resolved and result in more accurate and true sector counts and potentially fewer restrictions.
Airlines don't always comply with the allocated slots in a coordinated airport. Slot busting disrupts efficient resource planning and infrastructure usage.	Slot busting is very transparent. The alerting process within Airport CDM Milestone Approach gives airlines and airport authorities time to resolve the mismatch.

– ghost flights, and more...

if I'm due out at 10am, I have an 11am slot. I'll call, you'll tell me to go away, call back at 10:40. With this CDM process, we'll have a TSAT of 10:40 and I'll call you for the first time then.

Airport CDM Project Manager: *"There were complications in the beginning. The fact that the Delivery Position is also manned by non-radar controllers introduced hierarchic problems like a soldier commanding an officer."* Marc Matthys, Belgocontrol

As a ground handler, *we worried about what would happen if we opened our internal planning list to others. Also, would the airlines agree if we sent TOBT messages for their flights? In the end, a Memorandum of Understanding solved these issues. Because messages were sent 'system to system', additional workload was kept to a minimum. The change was more using the additional information, for example the pre-departure sequence for push back planning.* Former ground handler, Brussels Airport

The end of 'first come first served'

The impact of Airport CDM on the turn-round and pre-departure sequencing process means that the ATC principle of 'first call, first served' is no longer the best way to serve the customer. The new adage for ATC at CDM airports is: 'best planned, best served' – effectively these are the teams supplying

the most accurate predicted information. This principle also extends to slot negotiation with the CFMU.

ATC is responsible for sequencing departing aircraft based on the information they are working with. They publish the Target Start Up Approval Time (TSAT), which is visible to all, so everyone can work to that timeframe.

Rising to the challenge

Experience has shown that 'change challenges' can be solved by following some best practice in project planning, project management and good communication. These are dealt with in more detail in "Lessons learnt" on pages 34-35.

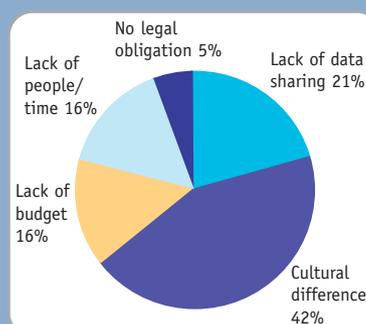


Brussels Airport gave incentives to airlines by sequencing those who provided TOBT first.

>Reader quiz<

What are the biggest barriers to progress in your organisation?

A survey of participants at an Airport CDM training course provided the following results.



One sugar or two? Expressing your preferences with Airport CDM



Goodbye to “First come first served” - Welcome to “Best planned best served”

It seems fair that those who are ready first should also be served first, and this has been true in the world without Airport CDM. But it is also true that if pilots call when they are not really ready, then capacity is wasted. While some passengers will be happy that they are finally moving, other flights can miss their slot and wait another half hour on the ground for the next available one. Sounds familiar? Slots are

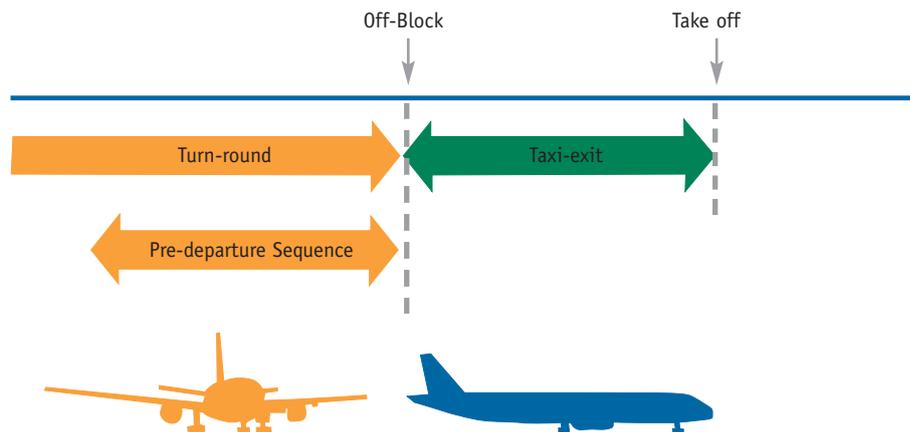
wasted, stands are not vacated on time, connecting passengers miss their flights and en route controllers have to deal with bunching of flights. With Airport CDM airlines can express their intentions and preferences in advance and can be sequenced according to the “Best planned best served” principle.

Collaborative Pre-departure Sequencing is here

With Airport CDM, pre-departure sequencing is collaborative. ATC has a complete picture of when each flight will be ready based on

Collaborative Pre-departure Sequence will help you to:

- Enhance flexibility
- Improve punctuality
- Improve slot adherence
- Improve transparency
- Improve ground handling efficiency
- Improve stand and gate management



Collaborative pre-departure sequence based on constraints and preferences

Target Off-Block Times published by airlines or ground handlers. Taking into account additional constraints such as Calculated Take Off Times and the current traffic situation allows the tower to optimise the pre-departure sequence and set the Target Start Up Approval Times accordingly. This optimised pre-departure sequence leads to more accurate Target Take Off Times. All partners, including CFMU, benefit from more transparent operations.

Which flight do you want out first?

One benefit of this procedure is that airlines have a means of expressing their priorities and preferences. As Werner Suhner from Swiss explains: *“Airlines occasionally need to swap flights because it can help to minimise the knock-on effect of delays or pending night curfews. For example, if a flight from Zurich to Geneva is delayed, it is reasonable to expect that the returning flight will also be delayed. If there are lots of connecting passengers on board, then that could also mean many missed connections and disgruntled passengers - as well as additional costs to us, the airline.”*

This is especially true for a hub airline, where some flights are more critical than others. For the hub airline it's helpful to have an opportunity to express priorities. Airport CDM allows airlines to do that, and because everybody can see the sequence, the whole process is transparent.

It doesn't end at 'off-blocks'

Although the planning of the pre-departure sequence ends when an aircraft leaves the stand it does influence the take off order. The controller will always continue to

decide the final take off sequence in order to maximise runway throughput. But, with this procedure the whole process is much more efficient and it will be an important enabler for future decision support tools.

“Best Planned – Best Served”

Last minute changes to published Target Off-Block Times cause problems for controllers, having to re-plan pre-departure sequences. This is a common occurrence that has a major effect on efficiency and potential capacity loss. To address this, some airports have introduced incentives for those airlines that comply with the procedures most of the time. If there is a free slot in the sequence and several flights are waiting for it, guess who it will be given to?

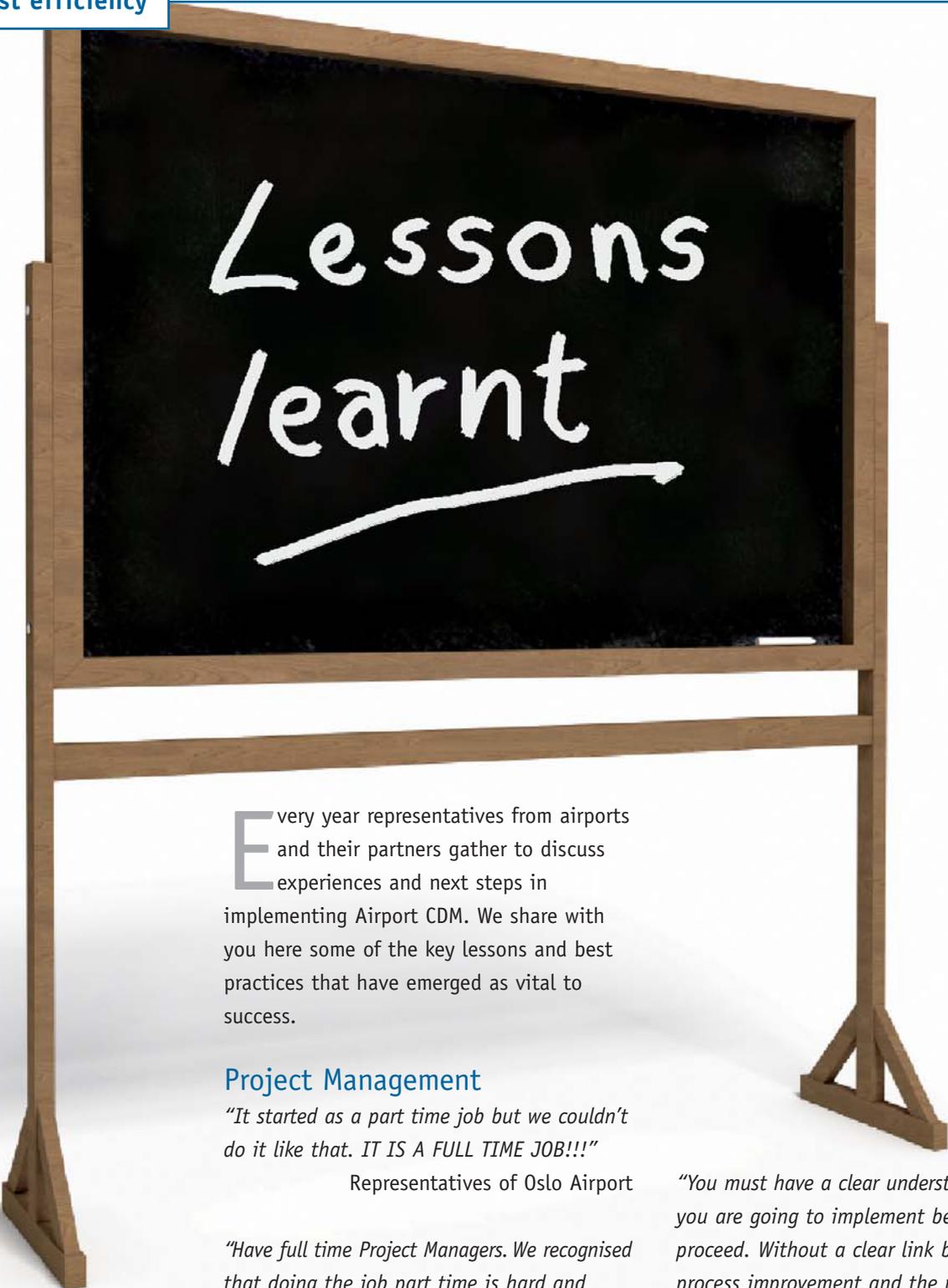
“Those airlines that play fair will have more flexibility compared to those that do not comply with the TOBT procedure.”

Erik Sinz, DFS

With Collaborative Pre-departure Sequence an airline can use TOBT to express a preference for the order of departure to ATC. This is particularly useful for an airline with two flights ready at the same time.



Lessons learnt



Every year representatives from airports and their partners gather to discuss experiences and next steps in implementing Airport CDM. We share with you here some of the key lessons and best practices that have emerged as vital to success.

Project Management

"It started as a part time job but we couldn't do it like that. IT IS A FULL TIME JOB!!!"

Representatives of Oslo Airport

"Have full time Project Managers. We recognised that doing the job part time is hard and difficult.... and don't underestimate the time it will take. Leave some time in reserve in your scheduling!"

Martin Kučera and Libor Kurzweil,
Prague Airport

It's about processes, not systems

"Airport CDM is a process. Sure, you have to have the IT systems - but first, you need to know what to do with it."

Erik Sinz, DFS

"You must have a clear understanding of what you are going to implement before you proceed. Without a clear link between the process improvement and the required information, people will remain reluctant to share this information."

Sander Niemeijer,
Airport CDM Schiphol

"Airport CDM is about process not about IT solution. The project needs to be run by operational people and not by the IT department."

Rick Mernock,
Manchester Airport

Memorandum of Understanding helps

“Strong support from the management is required and they need to understand the airport's issues related to the Airport CDM procedure.”

Stefan Hilger, FRAPORT

“When they started to talk about the issues, I found out that the issues are addressed in the MoU template. I would like to reiterate that an MoU can provide answers to all those issues.”

Henk Waltman,
Airport CDM Schiphol

“You might have a strong commitment but if there is no priority given to the project, it will not progress. You need an MoU to help you.”

Representative of Lisbon Airport

Involve all partners

“Communication and Awareness is key for a successful rollout of the programme.”

Sander Niemeijer,
Airport CDM Schiphol

“You need all the partners on board, whether it's ground handlers, caterers, refuelling companies. In the end, it's not only the airline who pushes the button. If we don't involve all the service providers, Airport CDM cannot work.”

Marcos Moura,
Users Committee, Milan Malpensa Airport

“Strong cooperation of Ramp Agents is needed for CDM to succeed.”

Martin Kučera and Libor Kurzweil,
Prague Airport

“General Aviation can have an important impact on efficient planning at an airport, yet, they are often neglected in Airport CDM process. They also often do not have means of complying with the Airport CDM procedures. You have to include GA on board.”

Marcos Moura,
Users Committee, Milan Malpensa Airport

Harmonisation

“It is important to implement Airport CDM in a harmonised way.”

Ladislav Čermák,
ANS CR

“Airlines don't want different procedures and different systems at every airport. If everybody could move in the same direction, it would be great. Standardization is the key back bone of our industry to keep our operations safe and consistent.”

Len Hearnden, IATA

Having a Cost-Benefit Analysis helps

“It could help to have a good business case. Although managers at Amsterdam didn't need it - they said they believed in benefits of A-CDM - it can help to move things forward faster, even though it takes some effort.”

Henk Waltman,
Airport CDM Schiphol

“It is surprising to see that financial problems of the airlines stop or slow down the implementation of Airport CDM. If you have a good CBA, it should help to convince the partners that Airport CDM is really beneficial, and it can help ESPECIALLY in economically difficult times.”

Representative of an airline industry



TOP TEN TIPS

- 1 Have a dedicated full time Project Manager
- 2 Establish MoU from outset
- 3 Implement Airport CDM in a harmonised way - use guidance material available
- 4 Develop your platform around the procedures and not vice versa.
- 5 Have a Project Plan with clearly defined tasks, accountability and timeframes that are realistic
- 6 Keep the activities under the CDM umbrella focused
- 7 Keep your Working Groups small and effective
- 8 Keep the same people in the team for continuity
- 9 Involve ALL partners at your airport
- 10 Train, train and train your people



For further information visit the European CDM website www.euro-cdm.org or contact:
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