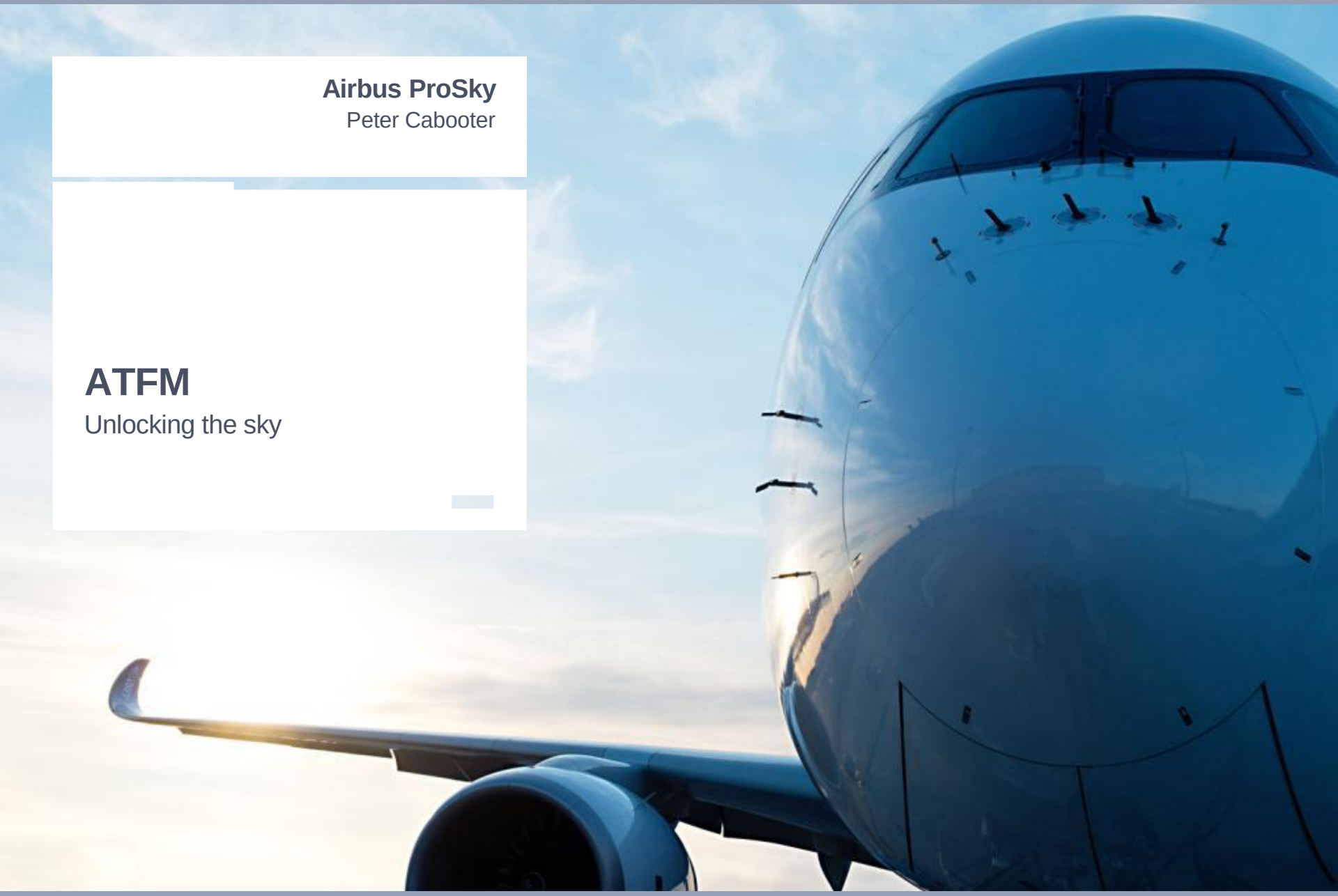
Airbus ProSky
Peter Cabooter

ATFM

Unlocking the sky



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Agenda

- Introduction Airbus ProSky
- Capacity
- Benefits of ATFM
- ATFM contributes to CDM
- Customer references & cases

Airbus ProSky Solutions to Modernize Air Traffic Management Efficiently

Increase **flow** efficiency

Increase **airspace** efficiency

Increase **ground** efficiency

ATFM / CDM

Airspace Services

Airport Solutions

An outstanding team of ATM experts

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Capacity

Capacity = many pieces of one puzzle

1. Knowing capacity and constraints

2. Capacity = maximizing usage of current capacity + increasing capacity

3. Capacity = PBN + ATFM + surveillance capabilities + tactical tools + …

Benefits of ATFM

Benefits of ATFM

- Balancing demand vs capacity AND maximizing capacity:
  - Arrivals:
    - Reduce airborne holding
    - Reduce arrival delay
  - Departures:
    - Reduce Taxi out delay
    - Reduce Push back delay
    - Improve RWY usage
    - TMA exit points

Benefits of ATFM

- Transfer airborne holding to ground delay → Reduce Fuel burn, emissions and increase safety

- Manage all recourses:
  - airspace / sectors
  - airports

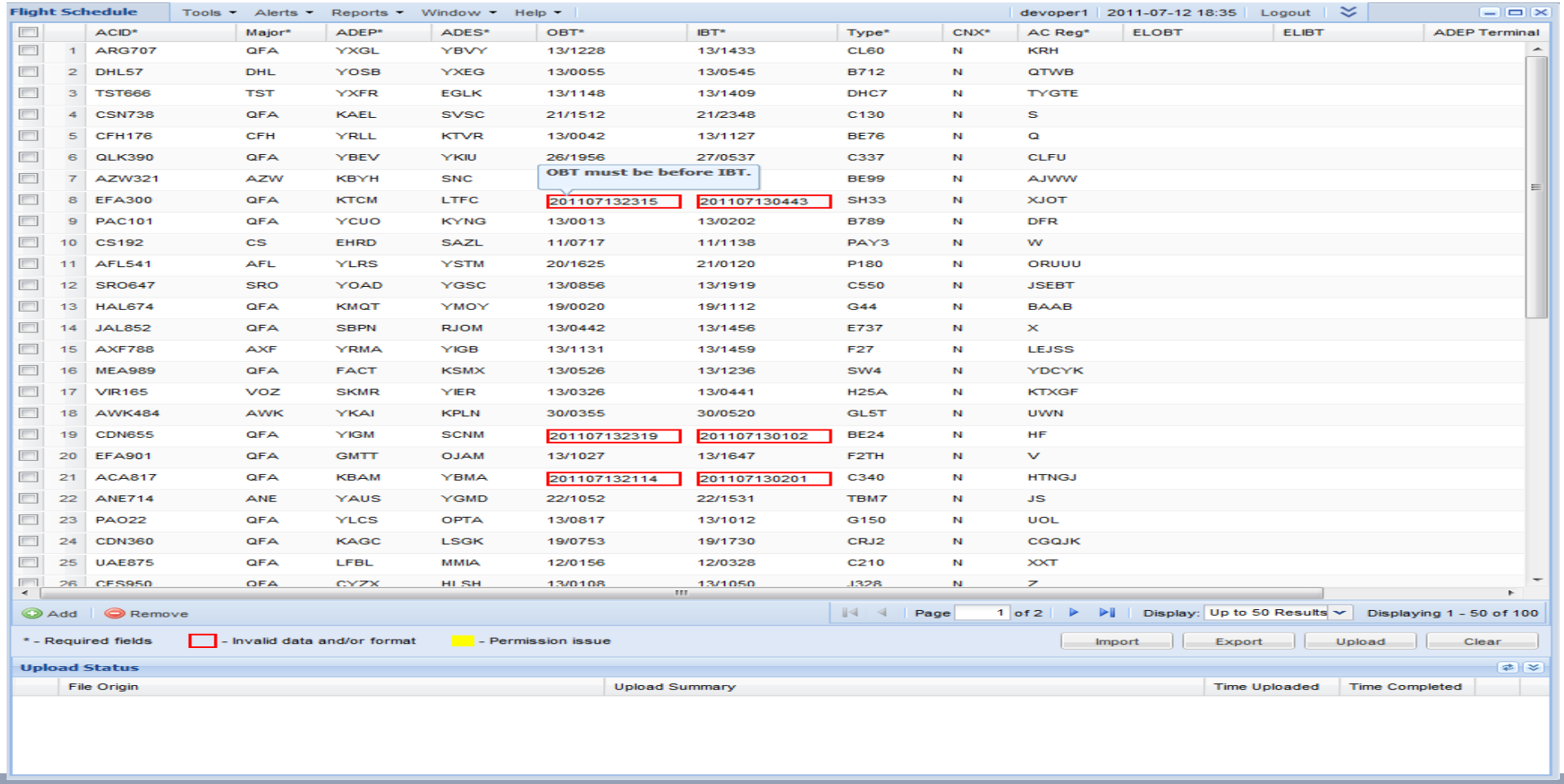
- ATFM contributes to CDM:
  - ANSP, Airport and Aircraft Operators all have access to the same information
  - Better situational awareness for better decision making:
    → Decision is taken where it needs to be taken
  - Better planning of resources

- Post-operation analysis

ATFM contributes to CDM

ATFM – Airspace User perspective – Slot swapping

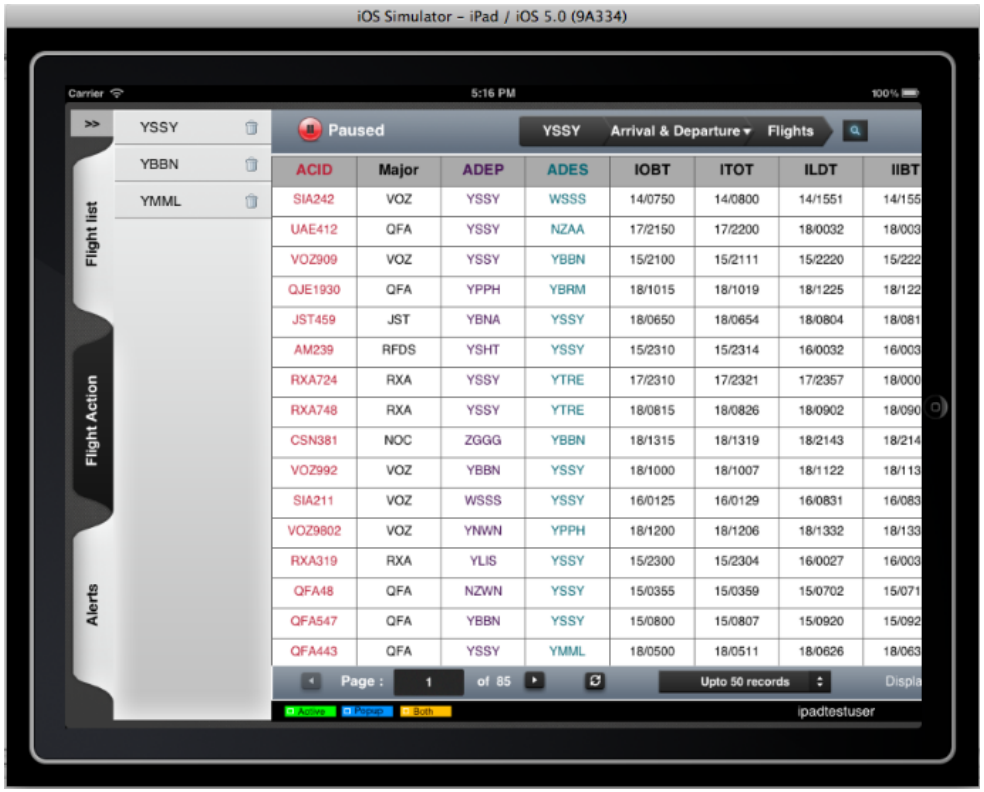
- Manage flight schedules and prioritize flights according to the operational needs within the own fleet and swap slots with other airlines



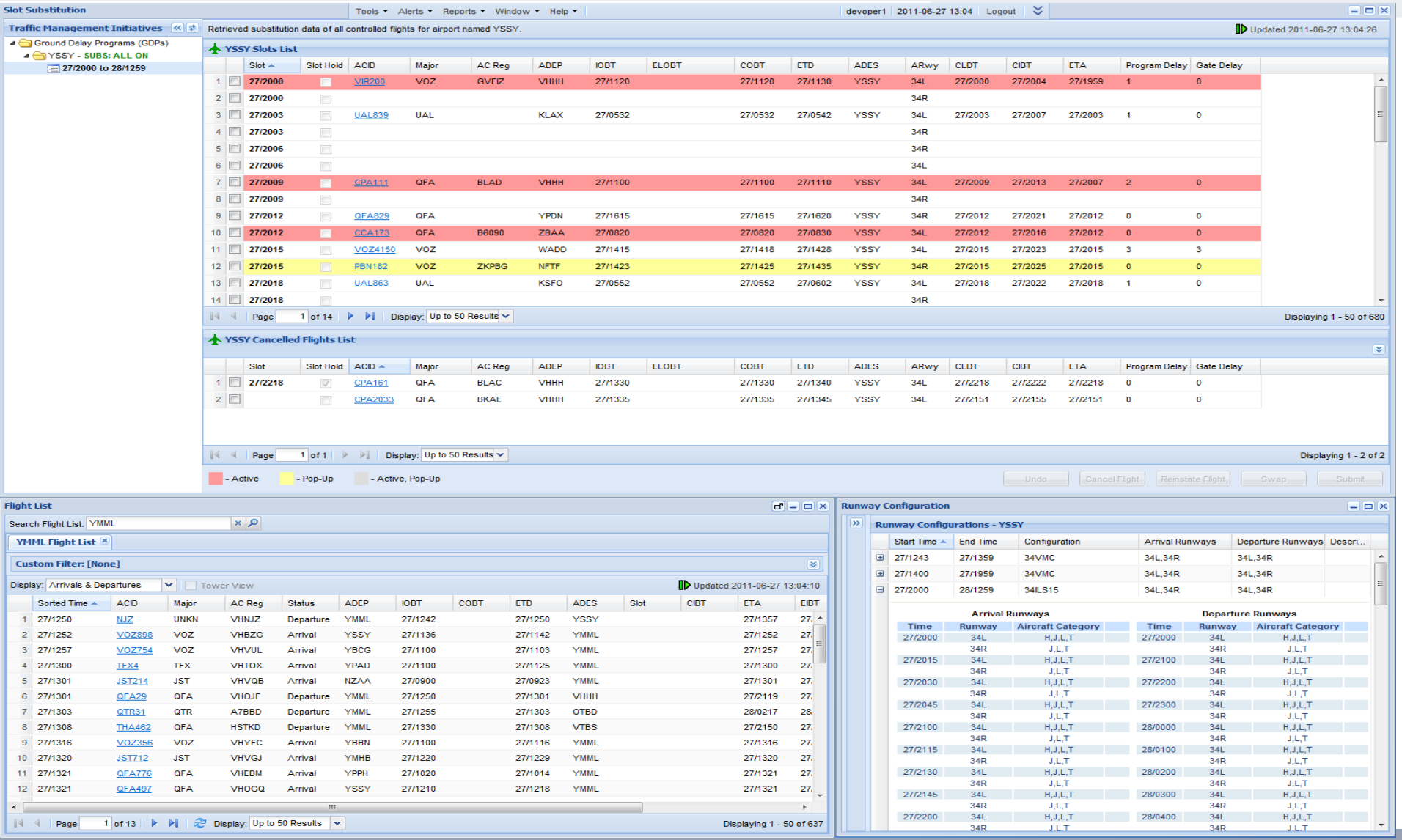
	ACID*	Major*	ADEP*	ADES*	OBT*	IBT*	Type*	CNX*	AC Reg*	ELOBT	ELIBT	ADEP Terminal
1	ARG707	QFA	YXGL	YBVY	13/1228	13/1433	CL60	N	KRH			
2	DHL57	DHL	YOSB	YXEG	13/0055	13/0545	B712	N	QTWB			
3	TST666	TST	YXFR	EGLK	13/1148	13/1409	DHC7	N	TYGTE			
4	CSN738	QFA	KAEL	SVSC	21/1512	21/2348	C130	N	S			
5	CFH176	CFH	YRLL	KTVR	13/0042	13/1127	BE76	N	Q			
6	QLK390	QFA	YBEV	YKIU	26/1956	27/0537	C337	N	CLFU			
7	AZW321	AZW	KBYH	SNC			BE99	N	AJWW			
8	EFA300	QFA	KTCM	LTFC	201107132315	201107130443	SH33	N	XJOT			
9	PAC101	QFA	YCUO	KYNG	13/0013	13/0202	B789	N	DFR			
10	CS192	CS	EHRD	SAZL	11/0717	11/1138	PAY3	N	W			
11	AFL541	AFL	YLRS	YSTM	20/1625	21/0120	P180	N	ORUUU			
12	SRO647	SRO	YOAD	YGSC	13/0856	13/1919	C550	N	JSEBT			
13	HAL674	QFA	KMQT	YMOY	19/0020	19/1112	G44	N	BAAB			
14	JAL852	QFA	SBPN	RJOM	13/0442	13/1456	E737	N	X			
15	AXF788	AXF	YRMA	YIGB	13/1131	13/1459	F27	N	LEJSS			
16	MEA989	QFA	FACT	KSMX	13/0526	13/1236	SW4	N	YDCYK			
17	VIR165	VOZ	SKMR	YIER	13/0326	13/0441	H25A	N	KTXGF			
18	AWK484	AWK	YKAI	KPLN	30/0355	30/0520	GL5T	N	UWN			
19	CDN655	QFA	YIGM	SCNM	201107132319	201107130102	BE24	N	HF			
20	EFA901	QFA	GMTT	OJAM	13/1027	13/1647	F2TH	N	V			
21	ACA817	QFA	KBAM	YBMA	201107132114	201107130201	C340	N	HTNGJ			
22	ANE714	ANE	YAUS	YGMD	22/1052	22/1531	TBM7	N	JS			
23	PAO22	QFA	YLCS	OPTA	13/0817	13/1012	G150	N	UOL			
24	CDN360	QFA	KAGC	LSGK	19/0753	19/1730	CRJ2	N	CGQJK			
25	UAE875	QFA	LFBL	MMIA	12/0156	12/0328	C210	N	XXT			
26	CFS950	QFA	CYZX	HLSH	13/0108	13/1050	J328	N	Z			

CDM – Flight crew, ground handlers, gate agents, …

- Communication of flight times including ATFM controls to mobile system stakeholders such as flight crew, ground handlers, gate agents, airport authorities, etc.



Airport view – flight lists, slot list, RWY strategy,…



Implementing ATFM

- Change of behaviour
- Human resources and Training
- Incremental steps, based on your specific situation/environment
- Include different stakeholders from the start

- Plan for the impact on your organization:
  - ANSP
  - Airlines
  - Airport

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References

CAA, ANSP & Airport Customers

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Our ATFM/CDM Customers

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Harmony in North America

FAA's challenge

- World's largest ANSP responsible for 80,000 flights/day
- In 1990, huge traffic increase brought unprecedented delays
- Limited common situational awareness and no access to delay information

The Solution

- For more than 15 years, the FAA partners with Metron Aviation on systematic approach to ATFM/CDM strategies & deployment

Benefits

- Since commissioning the Collaborative ATFM system in 1998, stakeholders have saved more than:
  - 70 million minutes of delays
  - 191million liters of fuel
  - 590 thousand metric tons of CO2 emissions
  - Over US$7.0 Billion in operating costs

Stakeholders

US AIRWAYS, WestJet, DELTA, jetBlue, American Airlines, American Eagle, spirit airlines, Virgin america, AirTran, NETJETS, Jazz, FedEx Express, SOUTHWEST AIRLINES

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Harmony in South Africa

Air Traffic Navigation Services' (ATNS) challenge

- Johannesburg airport (JNB) experienced a daily average of 350 total minutes of airborne holding
- Need to address projected demand growth during the FIFA 2010 World Cup

The Solution

- Harmony allowed ATNS to efficiently manage South African airspace during the FIFA 2010 World Cup
- Training and operations support with ATFM Subject Matters Experts on site

Benefits

Airborne holding has been eliminated at JNB airport

+US$1.2M in savings per annum for every one minute of saving at runway hold

+US$0.7M reduction in airborne hold due to weather disruption

+US$0.4M in additional fuel burn savings

= US$2.3M in total savings per annum

Stakeholders

Harmony in Australia

Airservices Australia's (ASA) challenge

- 3 million flights and traffic increasing by 3% annually
- Already experiencing demand and capacity imbalances
  - ➢ Increased airborne holding

The Solution

- Harmony (operational in Australia since March 2012)
  - Sydney, Perth, Brisbane, and Melbourne
- Training with ATFM Subject Matters Experts on site

Benefits

- **Airborne holding reduced by 33%** in peak hours representing:
  - **Average flight time reduced by 5 min** in MEL-SYD city pair,
  - **US$39M of annual fuel savings** (Sydney)
  - Equivalent to over **40,000 tonnes of CO2 reduced** per year

airservices

Stakeholders

airservices

QANTAS

Virgin australia

Jetstar

rex. Regional Express

AEROPELICAN

tiger airways.com

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Regional ATFM/CDM Proof of Concept

- Research project with Civil Aviation Authority of Singapore
  - Current ATFM concepts not applicable for Singapore's 100% international arrival traffic
  - Project initiated March, 2013 to develop operational concept for regional ATFM/CDM
- Research Objectives
  - Establish ATFM Technology Test bed based on Harmony for ANSPs
  - Engage local and regional stakeholders (Singapore and APAC)
  - HITL and concept demonstrations
  - HITLs conducted successfully in November and final report including the validated Concept of Operations delivered in January, 2014

Air Traffic Flow Management (ATFM) and A-CDM in China

Cooperate on modernizing the country's Air Traffic Management System and to implement the latest Air Traffic Management (ATM) technologies

Phase 1: HITL March 2014

- Integration with East China ATMB
- Proof of Concept for a National Flow Management System

Phase 2: Operational trial

- Standalone National System – completed August 2014
- Integrated with regional ATMB's – November 2014

中国民用航空局
空中交通管理局
Air Traffic Management Bureau.CAAC

中国南方航空
CHINA SOUTHERN

AIR CHINA

海南航空
Hainan Airlines

中國東方航空
CHINA EASTERN

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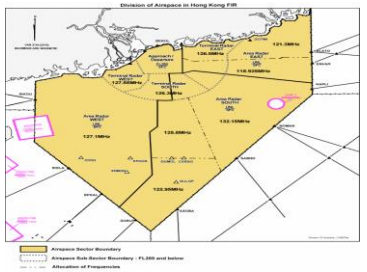
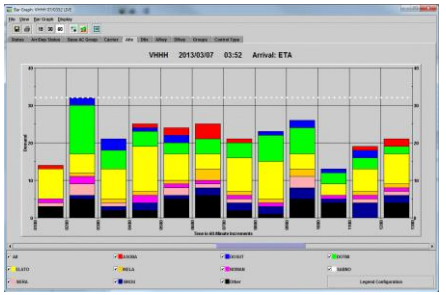
Hong Kong ATFM Trial

- Hong Kong FIR Challenges
  - HKIA accepts traffic from up to 9 different arrival fixes
  - Manual procedures currently used to smooth arrival fix demand
  - Airborne flow restrictions passed to neighboring FIRs creates potential for inefficiency and inequity



- Hong Kong CAD ATFM Trial Project
  - 8 month ATFM Trial using Harmony for ANSPs
    - Improved arrival fix and HKIA demand/capacity prediction
    - Automated tools for modeling and implementing ATFM measures
  - Outcomes:
    - Efficiency of HKIA maintained and improved
    - Improved efficiency & equity in airborne flow restrictions
    - Increased situational awareness



APAC ATFM Strategy Study for IATA – April 2014

- Project Scope
  - Survey ATFM capabilities and interoperability among APAC States
  - Develop ATFM implementation strategy for APAC
  - Communicate recommendations to ICAO and APAC states
- Project Activities
  - Based on survey inputs, collate and evaluate current ATFM initiatives among APAC States and international organizations to form coherent picture and timeline of ATFM capabilities and initiatives with focus on multi-FIR programs
  - Perform analysis and make recommendations on the establishment of sub-regional ATFM via an implementation strategy
  - Present survey findings and implementation strategy for consideration by ICAO APAC ATFM Steering Group

Colombia ATFM/CDM System - December 2013

AERONÁUTICA CIVIL
Unidad Administrativa Especial

- Aeronautica Civil Challenges
  - Volume increase at El Dorado International Airport (SKBO)
  - Current slot assignment performed manually with participation of the major airlines
  - Lack of visibility with the demand for remote regions, such as El Yopal
  - Outcomes:
    - Efficient use of resource capacity
    - Fuel and emission reductions
    - Improved visibility of demand for remote regions

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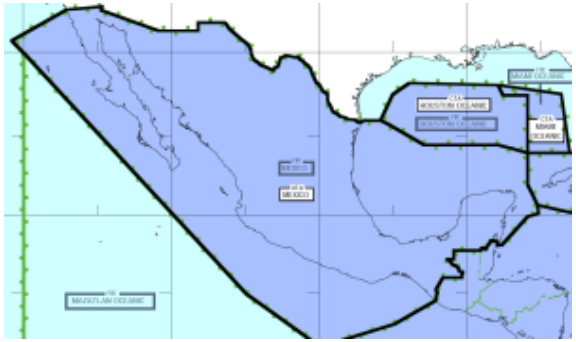
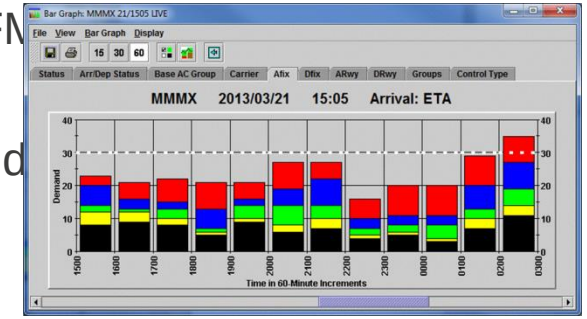
Mexico ATFM Trial

- Mexico ATFM Challenges
  - Traffic expected to double by 2025
  - Demand and Capacity imbalances at Benito Juárez International Airport, Mexico City (MMMX)



- Mexico ATFM Trial Project
  - Awarded to Airbus ProSky in Q1 2014
  - 6 month ATFM Trial using Harmony for ANSPs
    - Improved demand/capacity prediction for MMMX
    - Automated tools for modeling and implementing ATFM measures
    - CDM capabilities for SENEAM, aircraft operators, and airports



Q&A