CODA
Building the delay-analysis system for Europe

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CODA – Air traffic delays from all causes

- Origins of CODA – a voluntary system
- Regulation – move to mandatory reporting
- Delay codes – the need for standardisation
- Data collection – a central point in Europe
- Delay and related indicators – improving performance
Starting Point

The voluntary system
CODA Origin & Objective

- **Origin**
  - Set up following ECAC Ministers’ requirement after a period of severe delays in the 90’s, and operated by EUROCONTROL.

- **Objective**
  - “To provide policy makers and managers of the ECAC Air Transport System with timely, consistent and comprehensive information on the air traffic delay situation in Europe”.
Definitions

- **Delay***
  - the time lapse which occurs when a planned event does not happen at the planned time

- **Delay Measurement***
  - for an airline, delay measurement and cause assignment take place on the ramp

* EUROCONTROL Trends in Air Traffic; A Matter of Time: Air Traffic Delays in Europe (on www.eurocontrol.int/coda)
Measuring ATFM delays & delays all-causes

ATFM delay: CTOT-ETOT
Delay all-causes: OUT-STD
Original CODA system

- First printed reports - January 1997
- ATFM Data from Network Manager (then CFMU), and aggregated delay cause data from IATA and AEA
- Concentration on ATFM delay as data complete, and quickly available. ATFM reports within 10 days of month end
- 7-page text analysis
- Airline data many weeks after month end, so full reports often take up to two months to produce. Consistent and reasonably comprehensive, but not timely
- Output publicly available on internet
- Initial development and operation supported by an Advisory Group including CAA and Industry Trade Associations
Subsequent developments

- CODA product generally well received, and recognised as providing an independent analysis.
- More information now required. PRU recommendation that EUROCONTROL Agency develop proposals for a more comprehensive system.
- Aggregated data and printed reports limited speed of production.

Solution:
- Comprehensive data set received on voluntary basis direct from airlines (primary source of delay cause data)
- Detailed data collection direct from airspace users (and airports)
‘Voluntary’ reporting

- Feed of flight-by-flight operational data direct from individual airlines since 2003
  - AC-registration
  - Callsign
  - City-pair
  - Scheduled Times, OOOI-Times
  - Delay reasons (IATA delaycodes) and durations…
- Mapping, Matching and Quality Check of data
  - ISO9001:2008 certified (Lloyd’s Register)
- > 200 data partners (airlines, ANSPs & airports)
- Data coverage at some airports up to 90% of total IFR flights
- European coverage of IFR flights > 65%
- Baseline: IFR flights
Q2-2014 CODA coverage: 69% of IFR flights
CODA data partners
Regulation

The move to mandatory reporting
European Commission regulation

- SES Performance Scheme for monitoring air navigation services and network functions, entered into force on 23 August 2010
- Data to be provided for performance monitoring by
  - national authorities, airport operators, coordinators, air carriers
- Data collection delegated to CODA
  - airport operators & air carriers
Data Collection under the Regulation

- **ATC Callsign, flight rule & flight type (ICAO flight plan)**
- **Aircraft Registration & type**
- **Airport Pair**
- **Scheduled Times**
- **Actual Times (Off-Block, T/O, Landing & In-Block)**
- **Delay Times**
- **Delay reasons (up to 5 codes)**
- Runway
- Parking Stand
- De/anti-icing
- Actual Time of Cancellation
- Voluntary
  - IATA service type
  - IFPS flight plan ID
  - Fuel burn
  - Ramp weight

*Items also collected under original CODA voluntary data collection*
Delay coding

The need for standardisation
IATA Delay Codes

- **AHM730**: 74 codes + 6 optional internal
  Airport Handling Manual – Worldwide recommended practice

- **Primary delay codes**
  - Airline: 51 codes
  - Weather: 7 codes
  - Airport: 5 codes
  - En-Route: 2 codes
  - Misc.: 2 codes
  - Security: 1 code

- **Reactionary delay codes**: 6 codes
Observed delay codes

- Europe and airlines flying to Europe
  - 74 codes + 6 optional internal (IATA standard)
  - 95 codes & NO subcodes
  - 77 codes & 156 subcodes
  - 78 codes & 309 subcodes

- Non-standard codes
  - “translated” to IATA standard codes
  - Agreed conversion table with data provider

- Promote standardisation
  - Working with users of data to promote IATA delay sub-codes
  - ACI-Europe: EAPN (European Airport Punctuality Network)
  - EDAG – European Delay Advisory Group
  - IATA, AEA, ERA, ICAO etc
Data collection

A central point
CODA: Central Office for Delay Analysis

**Airports**
- *Voluntary*
- *Regulation*
  - Operational data
  - Data quality reports
  - + detailed analysis

**Airlines**
- *Voluntary*
- *Regulation*
  - Operational data
  - Data quality reports
  - + detailed analysis

**Commission**
- EC Reg 691/2010
- EC Reg 261/2004

**Research Institutions / Public**

**Associations & Other Industry Partners**
- Facts On Demand
  - + Analysis Tool

**IFPS Flight Plans**

**NOR, A-CDM, Post-Ops, …**

**Network Manager**

**CODA**
- Delay all-causes

**EC Reg 691/2010**
**EC Reg 261/2004**

**Facts On Demand**
**+ Analysis Tool**
Data on 10 Million flights per year in Europe

Airlines

Air traffic control

Airports

Flight Plans
- scheduled
- actual

Radar Data

Landings,
Take-offs
- agreed slots
- actual

PRISME Datawarehouse

Statistics

Analysis

Forecasts
CODA Data loading & Monitoring

- Automation is the key
- Increasingly pushing validation back on the supplier
Delay & related indicators

Using the delay data to improve network performance
CODA Metrics

- Departure delays and punctuality
- Arrival delays and punctuality
  - Various thresholds applied
- Excessive early arrivals
- In-depth analysis of delay reasons
- Taxi-time analysis
- CODA scheduling indicators (BTO & DDI-F)
- Reactionary delays, depth of sequence
- First Rotation Delays
- Difference between airline-reported ATFCM delays and Network Manager-recorded ATFCM Restrictions
- Operational cancellations
- Access levels
  - Provider, Industry, general public
CODA Reports

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<th>Quarterly</th>
<th>Seasonal</th>
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Reminder of principles:

- Provide benchmarks to allow operators to manage their performance
- All-causes delay based on airline (& airport) data
- Delay analysis based on IATA schedule i.e. airport slot vs EOBT or CTOT for ATFCM delays
- Industry driven indicators: scheduling indicators, taxi-times, first rotation restrictions and delays
- Feed-back loop (from post-flight to scheduling phase)
- Report on root cause of delays and not the effect/impact
More on “Delay & related indicators” during Session 1: Data and Information