The passenger within
Performance Based Airport Operations

META-CDM

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Meta CDM
Multimodal, Efficient Transportation in Airports and Collaborative Decision Making

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COOPERATION

Classification of this presentation

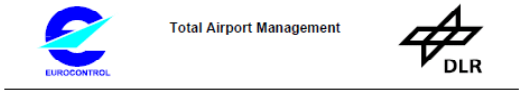
- How can disruptive/crisis events seen from a passenger perspective be incorporated / be part of Performance Based Airport Operations (PBAO)?
  - Measures are needed to desribe and evaluate the performance of the whole travel (ground and air) seen from the perspective of the passenger.
    - Which existing measures are suited?
    - Which new measures are needed?
    - How can these measures be incorparted in PBAO?

Overview

- KPIs for enabling performance based airport operations as defined by the TAM-OCD
- KPAs and Focus Areas used in Episode 3
- KPIs defined within the ATMAP framework
- KPIs that were adjusted, detailed or added by the TAMS project
- KPIs derived from ASSET
- Evaluation of the presented KPIs for META-CDM
- KPAs/KPIs for META-CDM and possibilites for R&D

KPIs derived from TAM-OCD (1)

TAM-OCD, Version 1.0 public



- **Performance-Targets**
  - Punctuality (t), Following IATA definition, 15min criterion
  - Throughput (t), Aircraft (or Passengers) per time
  - Emission (t), Gaseous and Noise
  - Cost / Efficiency (t)
  - Predictability (t)
  - Stability of Operations (t)
  - Safety is not compromised nor weighted in any case; therefore it is not a parameter to be set.

TOTAL AIRPORT MANAGEMENT
(Operational Concept & Logical Architecture)
Version 1.0

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KPIs derived from TAM-OCD (2)

- **Flow-Targets**
  - Capacity (t)
  - Demand (t)
  - Flow (t)
  - Queue (t)

  All these parameters can be considered or planned for the airport, for arrival/departure, for individual airport resources (RWY, TXWY, Apron,…) or a combination of these possibilities.

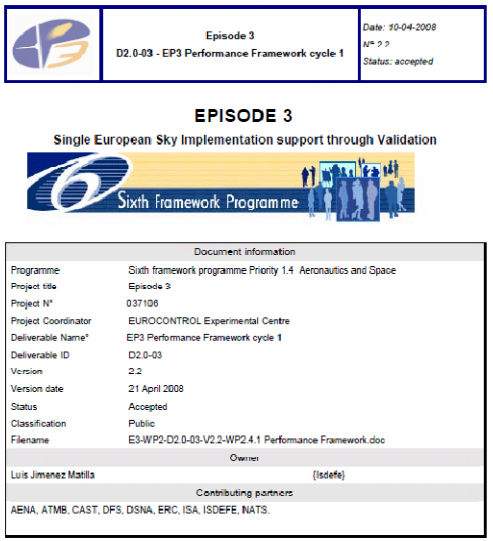
KPIs derived from TAM-OCD (3)

- **Resource-Event-Targets**
  - Resource-Configuration-Targets
    - E.g. RWY in mixed or segregated mode,
  - Operation/Flight Targets
    - E.g. target time to complete boarding, locations are bound to the target times to associate target times with the resources to be used. Can be converted into a resource usage view

KPAs and Focus Areas in Episode3 (1)

Episode 3
D2.0-03 - EP3 Performance Framework cycle 1

- Capacity (Operational Perf.)
  - Airspace, Airport & Network Capacity
- Efficiency (Operational Perf.)
  - Temporal, Fuel & Mission Effectiveness
- Flexibility (Operational Perf.)
  - Business Trajectory update for scheduled and non scheduled flights
  - Flexible access-on-demand for non-scheduled flights
  - Service location flexibility
  - Suitability for military requirements



Episode 3
D2.0-03 - EP3 Performance Framework cycle 1
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EPISODE 3
Single European Sky Implementation support through Validation
Sixth Framework Programme

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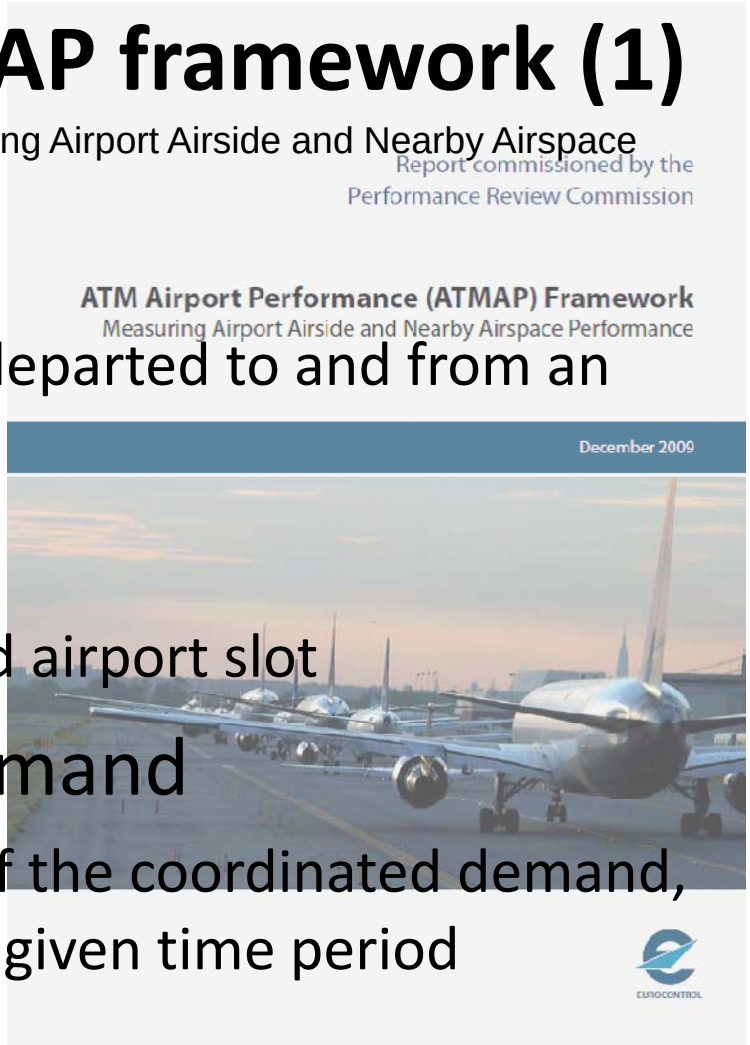
KPAs and Focus Areas in Episode3 (2)

- Predictability (OP)
  - On-Time operation
  - Service Disruption Effect
  - Knock-on effect
- Safety (Societal Out.)
  - ATM-related safety outcome
- Environment (Societal Outcome)
  - Environmental constraint management
  - Best ATM Practice in Environmental Management
  - Compliance with environmental rules
  - Atmospheric Impacts
  - Noise Impacts

KPIs defined in the ATMAP framework (1)

ATM Airport Performance (ATMAP) Framework Measuring Airport Airside and Nearby Airspace Performance, 2009



- Handled traffic
  - Number of flights arrived and departed to and from an airport in a given time period
- Coordinated demand
  - Number of flights with assigned airport slot
- Coordinated cancelled demand
  - Number of cancellations, out of the coordinated demand, per 1.000 flight operations in a given time period

KPIs defined in the ATMAP framework (2)

- Airport Declared Capacity
  - Average number of airport slots per hour
- Service Rate
  - 1% percentile of the numbers of movements per 10-min rolling hours in busy periods
- Arrival Punctuality
  - Percentage of flights arriving no more than 15 minutes (alternatively 3 min) late compared to scheduled arrival times

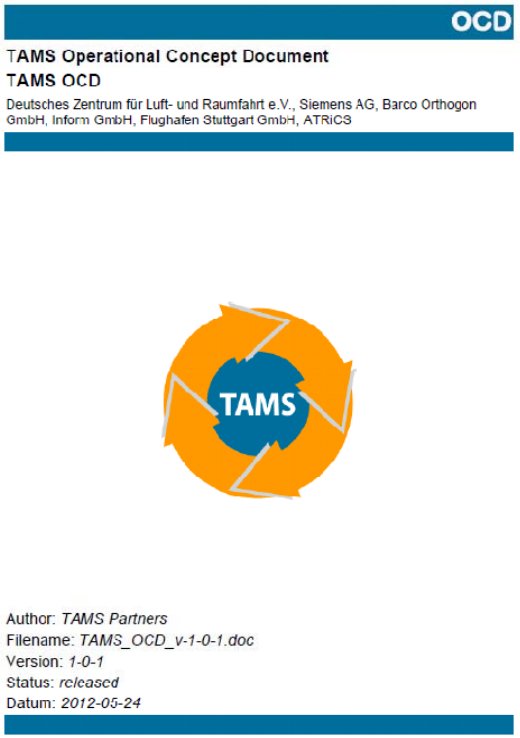
KPIs defined in the ATMAP framework (3)

- Departure Punctuality
  - Percentage of flights departing no more than 15 minutes (alternatively 3 min) late compared to scheduled departure times
- Early arrivals
  - Percentage of flights arriving 15 minutes or more ahead of schedule
- Departure delay causes
  - Percentage of contributory cause to departure delays (based on airline reported IATA delay codes)

KPA&Is detailed or added by TAMS project (1)

TAMS-OCD, Version 1.01 released

- Traffic Volume & Demand
  - Handled Traffic (ATMAP)
  - Handled Pax (detailed for TAMS)
- Capacity
  - Airport Declared Capacity (ATMAP)
  - Slot Compliance (A-CDM Manual)
  - Terminal Capacity (detailed for TAMS)


OCD

TAMS Operational Concept Document

TAMS OCD

Deutsches Zentrum für Luft- und Raumfahrt e.V., Siemens AG, Barco Orthogon GmbH, Inform GmbH, Flughafen Stuttgart GmbH, ATRiCS

TAMS

Author: *TAMS Partners*
Filename: *TAMS_OCD_v-1-0-1.doc*
Version: *1-0-1*
Status: *released*
Datum: *2012-05-24*

KPA&Is detailed or added by TAMS project (2)

- Punctuality
  - Arrival Punctuality (A-CDM Manual & ATMAP)
  - Departure Punctuality (A-CDM Manual & ATMAP)
  - Early Arrivals (ATMAP)
  - Departure Delay Causes (ATMAP)
  - Waiting Time at Runway (detailed for TAMS)
  - Boarding Punctuality (detailed for TAMS)
  - Passenger Connectivity (detailed for TAMS)

KPA&Is detailed or added by TAMS project (3)

- Efficiency
  - READY Reaction Time (A-CDM Manual)
  - Aircraft Stand & Pax Gate Freezing Time (A-CDM Manual)
  - Level of Service (LoS) (defined for TAMS)

KPA&Is detailed or added by TAMS project (4)

- Predictability of
  - Stand allocation accuracy: EIBT (A-CDM Manual)
  - Stand allocation accuracy: EOBT (defined for TAMS)
  - TOBT/TSAT Predictability to AOBT/ASAT (A-CDM Manual)
  - TOBT/TSAT Predictability to EOBT (defined for TAMS)
  - TTOT Predictability (defined for TAMS)
  - ELDT Predictability (defined for TAMS)
  - EPTG Predictability (defined for TAMS)

KPA&Is detailed or added by TAMS project (5)

- Environment
  - Noise / Emission on ground (A-CDM Manual)
  - Emission from ground vehicles (defined for TAMS)
  - Airport infrastructure energy efficiency (defined for TAMS)
- Safety
  - Number of aircrafts queuing on sequence (A-CDM Manual)
  - Number of safety incidents (A-CDM Manual)
- Security
  - Number of security incidents (defined for TAMS)

KPIs derived from ASSET (1)

e.g. D_1.3_ReportOfPerformanceParameters.pdf

- Time:
  - process time (POA)
    - duration
    - waiting time (Duration/Variance)
    - service time (Duration/Variance)
  - overall process time
    - variance
  - walking time and transportation time
    - duration
  - variance

KPIs derived from ASSET (2)

- Financials:
  - fix costs
  - variable costs
  - investments
  - revenue

KPIs derived from ASSET (3)

- Supporting parameters that were regarded as important to be assessed qualitatively are:
  - space consumption
  - robustness
  - level of Service
  - security level
  - safety level
  - privacy constraints
  - compatibility
  - effort of implementation
    - operational
    - time

Evaluation of the presented KPIs for META-CDM

- KPIs defined for PBAO so far are not focusing on the perspective of the passenger
- The KPIs should be extended to include the whole travel (including non-air transport).
  - E.g. How is the airport connected to public transportation?
    - Airport shuttles, train to a major train station, etc.
    - Reachability by car, parking lots, etc.
    - Transfer time to/from the terminal, e.g. from parking

META-CDM passenger focused KPA/KPI (1)

- Accomplishment
  - Prizing (Ticket, extra charges, shops, restaurants etc.)
  - Duration of whole travel (door to door)
  - Punctuality
  - Connectivity (& Is there a plan B?)
  - Compensation (Hotel, bus/train transfer, refund etc.)

META-CDM passenger focused KPA/KPI (2)

- Comfort
  - Accommodation (Seating, snacks, newspaper, etc.)
  - Accommodation during disruptive events
  - Guidance (What to do next? Where to go? Etc.)
  - Reachability (transfer time, etc.)
  - Waiting time (time wasted in queues etc.)

META-CDM passenger focused KPA/KPI (3)

- Quality of Service (service personal)
  - Friendliness
  - Communication (Language)
  - Courtesy / Liability
  - Reliability
  - Timeliness of information
  - Service time

META-CDM passenger focused KPA/KPI (4)

- Safety
  - Incident / Accidents
    - Not only number of incidents / accidents for this airline, but although circumstances like bad weather, bad news from other airlines etc.
  - Health
    - E.g. contaminated cabin air
  - Security
    - E.g. risk of hi-jack, sky marshal

META-CDM passenger focused KPA/KPI (5)

- Trust / Image (Publicity & Experience)
  - Safety (Will I reach my destination alive?)
  - Service (Will the airline provide good service?)
  - Security (Will my personal data be treated confidentially?)
  - Connectivity (Will I reach my destination today?)
  - Timeliness (Will I arrive in time?)
  - Lagguage (Will it be lost / its transfer delayed?)

Influence of passenger focused KPI on PBAO

- Passenger focused KPI are mostly important for an airline, but some are although relevant for an airport as well.
  - How is in general the connectivity at an airport during a certain time of the year?
  - Will it be possible to catch an alternative mode of transportation?
  - Is the site interesting (e.g. near to town), thus could I do anything interesting if my flight is cancelled?

Derived research activities in META-CDM

- Examples for derived research activities:
  - Catalogue of critical times for air fare for each airport (to enable the airlines to make better recommendations for the passenger)
  - Study on the weighting of paramenters to measure the performance from passengers´point of perspective
  - Development of Passenger CDM (to put the passenger at the heart of PBAO)

Questions?

- Ask, ask, ask…