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Project META-CDM

D.2.1– Workshop 2 : Collaborative & multimodal systems to improve air passenger experience during disruptive events

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Change Log

Release	Date	Details of changes
0.1	2013-11-19	First draft
0.2	2013-12-9	All partners' contributions and edits incorporated
1.0	2013-12-19	Delivered version of the report
2.0	2014-01-22	New delivered version of the report with changes in the title

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1   Introduction

The META-CDM (Multimodal, Efficient Transportation in Airports – Collaborative Decision Making) project aims to define the future of Airport Collaborative Decision Making – a future where the passenger becomes the centre of attention. This project examines the coherence and co-ordination of the many systems that are part of delivering the traveller through an airport, primarily during disruptive events but also in everyday operation. This is done by considering both airside and landside CDM and their effectiveness. An additional dimension of this study is the analysis of the ability of alternative transport modes and communication to minimize personal disruption during crisis situations impacting air transport.

The Frankfurt airport workshop on 12 and 13 November 2013 was the second Meta-CDM workshop of a series of three. The major objective of this workshop was to present and discuss current and future concepts to improve passenger satisfaction at airports, taking into account the achieved and aspirational improvements in the Airport CDM and Total Airport Management context. In particular, this includes discussion of the requirements and contributions of the CDM community, including Airports, Airlines, ANSPs and last, but not least, the passenger.

For META-CDM, this will contribute to the use of available results to stimulate a wider sector debate, to the development of an outline for a new concept of operations and to the definition of future R&D work that contributes to efficient and intermodal transportation at airports, especially during highly disruptive events.

This report summarizes the workshop. A full agenda is given in Appendix A, a list of participants in Appendix B.

2   Session 1: Welcome & Introduction

Agenda:

10:00-10:15 Welcome (Introduction/Agenda), Isabelle Laplace, Thomas Guenther (ENAC, BARCO)

10:15-10:35 META-CDM introduction & objectives, Thomas Guenther (Barco Orthogon)

Isabelle Laplace and Thomas Gunther started the second META-CDM workshop by welcoming attendees and presenting them the agenda of the next two days.

2.1   *Thomas Guenther (Barco Orthogon)*

Thomas Gunther's introductory talk stressed that the META-CDM project must focus on passenger satisfaction: based on recent disruptive events at big airports (volcano, snow), the European commission is currently pushing to increase passenger rights. IATA states that airlines want to satisfy their customers but need to keep some flexibility in their operations, so that value should better come from global standards that foster coordination and consistency between all the different countries. Thus, the META-CDM project motivation is to improve both passenger satisfaction and the cost effectiveness of airport/airline operations: the project will identify what further R&D is needed in this domain and how regulations can strengthen "passenger friendly" airports/airlines.

Assuming that the key point is to provide decision makers with better information, and that legal requirements should drive these decisions into a more passenger oriented direction, the main objective of the META-CDM project is to extend the success of A-CDM to the management of disruptive events, in a passenger-centric approach, linking airside, landside and other transport modes. This draws together the key topics of the project:

- Concerning passenger satisfaction: analysis of passengers' expectations, ways to measure passenger satisfaction, solutions to monitor and improve it and information that should be shared with passengers.

- Concerning resilience against disruptive events: identification of risks and effects of disruption, means of communication with passengers and analysis of multimodality solutions.

Finally, the structure and the time scale of the META-CDM project were noted. This remains unchanged from that projected at the beginning of the project, targeting a third workshop and a final report in summer 2014.

3   Session 2: Irregularity management at Frankfurt Airport

Agenda:

10:35-11:05 Irregularity management at Frankfurt Airport, Meike Wasow, Gregor Weil (Fraport, Lufthansa)

11:05-11:25 Discussion

3.1   *Meike Wasow (Fraport) and Gregor Weil (Lufthansa)*

Meike Wasow opened the second session by discussing irregularity management at Frankfurt airport, in a joint presentation with Gregor Weil from Lufthansa. Under standard conditions, the Hub Control Centre offers safe and efficient terminal facilities: this centre can monitor and help passengers during their connections (for example, between terminal 1 and 2), and can communicate with them in fifteen different languages.

During crisis situations (labour disputes, bad weather conditions, volcano, systems failures or accident), many passengers have to stay (and sometimes lie) for a long time in the terminal. To manage this kind of situations, Frankfurt airport created the IRREG Centre, dedicated to handle disruption when it appears: a colour based concept allows the Fraport core team (staff of 260 members) to perform optimized passenger orientation and information through the terminal (the staff wear dedicated coloured vests, in accordance with the colours of the information panels relative to each category of problem or services to be handled). The IRREG Centre can offer basic catering, beds, brochures, and also children's entertainment (with the IRREG mascot!). Communication with passengers can be handled using iPads or mobile phones, and cameras can be used to monitor the passenger flow.

The IRREG Centre has already been deployed 5 or 6 times since its creation and was very appreciated by passengers, as it is simple to understand and makes luggage handling much easier.

At Frankfurt airport, the passenger traffic is monitored throughout the day and the terminal capacity is managed in real time: a station control view shows the incoming turnaround difficulties (aircraft delay, late landing, etc.) and the passenger connection view shows the state of each passenger transfer, classified (with different colours) as possible, difficult or impossible. Passengers whose transfer appears difficult can be provided with some special assistance during their transfer in the terminal whereas passengers whose transfer is no longer possible can be rebooked on other flights or trains.

3.2   Discussion

Meike Wasow's presentation brought out discussion of the following questions:

Who is monitoring the passenger's flow in real time? This is done by two people from the Fraport team, in the Hub Control Centre, as was later shown during the Hub Control visit.

Does the Hub Control Centre manage both terminals and all the flights of Frankfurt airport? Not really: the colours concept of the IRREG team has only been used in terminal 1, and the passengers monitored are those on Star Alliance flights, as they represent the main traffic of the airport.

Which is the proportion of the transit traffic at Frankfurt airport? 28% local, 72% transit. The high proportion of passengers in transit explains why the Hub Control Centre is so important and needs to be efficient throughout the day.

Can the system predict the number of passengers in the terminal? It does not really work like this: each passenger is monitored during his or her transfer time, according to their transfer status and to the terminal capacity.

Is the system connected with other stakeholders at the airport? It is not directly connected with the rail centre or the ATCO systems, but the Fraport team can share information with others stakeholders by phone, when needed.

Which criteria are used to measure, if passengers will reach their connecting flights or alternatives (re-booking, accommodation, etc.) must be provided? Passenger connections are only classified in three categories (possible, difficult, impossible).

Does (or should) the Fraport team inform all the passengers whose transfer appears impossible as soon as it is detected? This not necessarily a good idea, as some unexpected events or results can appear. In these situations, the main topic is to find some solutions, depending on the number of passengers, the rebooking possibilities, etc.

The presentation was followed and complemented by a visit to the Hub Control Center (HCC) at Frankfurt Airport, supported by Dr. Gerrit Klempert (Lufthansa, Director HCC).

4   Session 3 – Contributions of multimodality

Agenda:

14:00-14:20 Multimodality at Frankfurt Airport, Peter Pfragner (Fraport)

14:20-14:40 MODAIR project, Jean-François Perelgritz (EADS IW)

14:40-14:50 META-CDM Multimodality, Lynnette Dray (UCAM)

4.1   Peter Pfragner (Fraport)

Session 3 was opened by Peter Pfragner, who discussed multimodality at Frankfurt Airport. Frankfurt airport has a strategic position, with a larger population potential than the other

European hubs within a radius of 200 km around the airport. By playing a feeder role and enhancing its catchment area, the direct rail connection to the airport helps to reinforce the airport's hub position.

In addition, shifting some domestic flights with high-speed train also reveals a way to enlarge capacity while having also positive effects on the environment, with the reduction of carbon emissions.

Air/rail intermodality at Frankfurt airport has one frame thanks to the direct connection of the "Squaire building" (housing the high-speed train and the regional train stations) with the AIRail terminal in which intermodal passengers can check-in their flights.

Peter Pfragner identified 6 major challenges to be address for further improvement of multimodality at airports:

1. The complexity of integrating air and rail scheduling since both transport modes serve mainly different markets and have their own sales strategies,

2. The difficulty in providing integrated tickets (to promote seamless travel and a door to door perspective) since this requires:

    o changes in airline and train operator strategies (cooperation instead of competition) and being willing to sign code share agreements,

    o having a direct rail connection to the airport,

    o a high volume of potential intermodal passengers

3. The need to have a good physical integration between air and high-speed rail in terms of infrastructure, train frequencies, transfer time and dedicated luggage handling infrastructure adjacent to the HST Station,

4. The lack of regulatory framework in place for the integrated approach to air-rail transport so as to have specific liability rules for passengers of both transport modes,

5. The need for investment in the extension/modernisation of the European Rail Network and Trans European Railways,

6. The need to provide a harmonized and integrated passenger information system.

4.2 Jean-François Perelgritz (EADS IW)

The next presentation was given by Jean-François Perelgritz, on the ModAir project. ModAir is a 20-month CSA (Support Action) funded by the European Commission, with the following topic: "Airport-centred Intermodality and co-modality". The consortium led by EADS Innovation Work is made up of 6 European partners.

The project has three main objectives:

- Getting a clear view of the current state of intermodality and co-modality in the European airports

- Building a roadmap for future research

- Building a structured group of experts able to help choose the best ways of implementing the connectivity of airports with other transport modes.
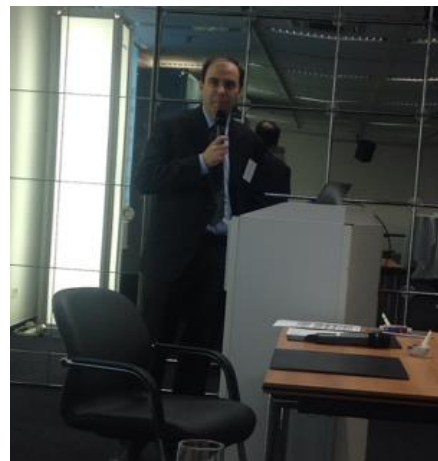
One initial task of the project consists of analysing passenger requirements in terms of multimodality. This is done by making a survey based on research studies and other passenger information sources and by analysing and evaluating the methods and variables used. Then the most relevant variables concerning co-modal passenger requirements are identified.

A second task aims at making a co-modal mapping of airports by providing an inventory of high speed train connections and transfer points as well as an inventory of European airports and their current and planned interconnectivity. A workshop was then organised in Madrid in September 2013 to validate the results and formulate requirements for the identification of R&D needs.

Information collected in both the passenger requirement and co-modal mapping of airports analyses are then used to define the objectives of the structured group of experts to be built, the European Forum on Airport Passenger Intermodality (EFAPI).

Finally the project aims to identify research and development needs in terms of:

- Single reservation and ticketing

- Luggage transfer

- Consequences on information and communication technologies

4.3   Lynnette Dray (University of Cambridge)

To end the session, Lynnette Dray gave a talk discussing the findings of the MetaCDM literature review and interview process with regard to multimodality. The literature review made in the deliverable "D.1.2 –Analysis of recent disruptions of the Air Transport System" of the META-CDM project shows mixed success for the use of multimodality in past major airport disruption. If disruption is due to bad weather conditions (such as snow), ground transportation is often disrupted too. Even if not disrupted, ground transportation can have difficulty providing enough spare short-notice capacity for accommodating air passengers and the shift from air to ground transportation (rail, bus) is mainly an alternative solution for domestic air passengers only.

The analysis of past disruptions hence shows that passengers who have chosen to shift from air to ground transport modes have usually organised this switch by themselves. Nevertheless, self-organisation of mode switching requires having suitable knowledge and equipment, and information about whether costs can be reimbursed is often unclear for passengers.

A partial substitution of some short-haul flights with High Speed Rail transport is however already in place in four European hubs (Frankfurt Main, Paris CDG, Madrid Barajas, Amsterdam Schiphol). Moreover, airlines organise often coach service for diversion response

and passenger accommodation. But ground transport providers tend to lack immediate updates on crisis information.

Some local authorities can initiate diversion routes and/or city-level control responses in the event of airport access problems. Problems remain with unifying and linking systems across organisational boundaries, so as to ensure compatibility in shared information and data.

5 Session 4 – Disruptive events and resilience of Airports - Past experiences

Agenda:

15:15-15:35 CDM state of the art and review of past disruptive events, Lynnette Dray (UCAM)

15:35-15:55 Preliminary results from the META-CDM interviews and surveys, Roger Gardner (UCAM)

15:55-16:15 Pandemics and health issues at airports, Eric Feron (ENAC)

5.1 Lynnette Dray (University of Cambridge)

In session 4 ("Disruptive events and resilience of Airports - Past experiences"), the META-CDM team provided an overview about some major project results from the literature review and interviews.

The first presentation in Session 4 was given by Lynnette Dray (Cambridge University) focussing on "CDM State of the Art and Review of Past Disruptive Events". According to the presentation title, the presentation consisted of two major parts.

The first part included a review of airside, landside and total airport CDM initiatives. The current status of Airport CDM (A-CDM) is that all major European airports have completed or have an ongoing A-CDM program. This fact emphasizes that airside CDM as defined in the A-CDM Implementation Manual is already well defined and partially established in Europe. Extension to landside processes is a key trend for future CDM, for example explored by the two recent projects TAMS (Total Airport Management Suite) and ASSET (Aeronautic Study on Seamless Transport). ASSET was a study that focussed on process improvements for terminal and turnaround processes. In TAMS, an integrated platform for common situational awareness for airside and landside processes was developed and validated. With it, integrated management of arrivals/departures, taxiing aircraft, stand and gate allocation, turnaround and boarding processes was enabled and, for instance, supported by a combined "what-if" functionality (Further information about consideration of terminal and passenger processed in TAMS was provided on the second day of the workshop in the presentation of Axel Classen).

The second part of the presentation provided an overview about disruptive effects affecting aviation. First, the particular relevance of Regulation 261/2004, which defines passenger rights and compensation in case of denied boarding, cancellation or long delays, was highlighted. Based on the US example from 2012 is becomes clear that especially weather events, such as heavy winter conditions, significantly impact aviation, including delays and disruptions in operations. Based on US and European experience over the last ten years and more it can be concluded that the most disruptive events in Europe are heavy winter conditions and volcanic ash, with snow and ice strongly affecting airport and volcanic ash affecting airspace capacity. Further major sources of disruption include: High winds, strikes, infrastructure upgrades (although the difference here is a much longer warning time, which significantly reduces disruption) and low visibility conditions. System failures and incidents/accidents may affect aviation with no warning times and are accordingly harder to plan for.

The key lessons learnt from past disruptive events are: Good relationships between stakeholders and regularly updated contingency plans are vital; information exchange with passengers could be improved; multimodality can support resilience only if other modes of transport have sufficient capacity and are not / less disrupted (which is unfortunately often the case in winter conditions). Furthermore, the costs for disruption preparation should be compared with the achievable benefits and sufficient flexibility must be enabled in contingency planning to improve efficiency of measures against disruption. Finally, the need for metrics to measure effects of disruptions onto passenger experience / passenger satisfaction was emphasized and an outlook to the final META-CDM work package was given.

5.2 Roger Gardner (University of Cambridge)

The second presentation in session 4 was given by Roger Gardner (University of Cambridge) about the key results from the META-CDM interviews, which covered airports (including Paris CDG, Frankfurt and Heathrow) airlines, Air Navigation Service Providers (ANSPs), ground transportations providers and others. It was stressed that due to their competitive situation most of the interviewees were cautious about revealing detailed information. However, the following general conclusions can

be made: Human interaction is core and key success factor of CDM and resilience; CDM as well as passenger focus are still a topic mainly to big airports (a strong correlation between airport size/capacity and CDM interest exists); the major obstacles to enabling more efficient CDM are lines of authorities/responsibilities and information source incompatibility.

Moreover, the following conclusions were drawn: Contingency planning between bigger and smaller airports requires different attention: at smaller airports difficulties are caused often by the case of diversions from bigger

airports, which may cause a significant imbalance between available capacities and demand (with very short prediction horizon). As an example, hotel and ground transport capacities (e.g. number of taxis) are very limited at smaller airports and cannot accommodate demand (at least on a short-term basis). With regard to performance measurement, it is stated that metrics exist, but tend to be confidential, and continuous performance analysis is seen as business as usual, at least as bigger airports. The smaller an airport is, the simpler the metrics are (e.g. passenger throughput). From a cost perspective, it was stated that investment is made as needed based on lessons learnt after crisis situations. Investment decisions take into account commercial reputation, but have a usually local focus than from a system lever perspective. It is mentioned that a cost benefit analysis at a system level is considered as worthwhile and may support the driving of investments to a more efficient direction. On the other hand, concerns were raised about the effects of EU regulation 261/2004.

Lynnette Dray added a brief summary about the META-CDM survey results: Extreme weather was highlighted by participants as the most important source of disruption, with the case of airports close to capacity highlighted, as these airports cannot recover as easily. Lack of poor information and collaboration, institutional barriers, available infrastructure (e.g. latest technologies) and lack of passenger data location were mentioned as the major system bottlenecks in crisis management. Coordination with ground transport and information sharing with passengers were mentioned as the

major challenges in multimodality contributions. The solutions suggested by respondents to be investigated by the project were total airport management, real-time data collection and distribution, integrated ticketing, passenger tracking and the definition of passenger experience metrics (such as door-to door journey metrics, passenger costs and weighting delays by perception).

5.3 Eric Feron (ENAC)

Finally, Eric Feron (ENAC) provided an overview about "Pandemics and Health Issues at Airports". He mentioned that this aspect was originally not addressed in the project proposal, but should be considered for crisis management, as it may affect the effectiveness of contingency and resilience concepts (e.g. separation of passenger flows in terminals).

Air transportation system is the 21st century's main vector for pandemics and all go through airports. The core messages are that "Human health (other than induced by flight safety) is closely linked to the air transportation system" and "Airports are the nexus of problems and solutions". Major examples in the past were presented, such as SARS (2002-2003), H1N1 (2009) and H7N9 (2013). Exemplary measures in the USA (Quarantine stations by jurisdiction), Switzerland (e.g. 2003 regulation) and Germany (Business Continuity Plan for Pandemic, Frankfurt Airport) underlined the relevance for contingency planning.

The following conclusions were made: unnecessary mixing of passengers should be avoided in the case of pandemics (supported by optimal ground resource management and a detailed understanding of illness propagation); training should be provided (the example of Toronto was given) and the responsibilities of authorities (including medical services) must be agreed in advance to avoid misinterpretation and confusion. Finally, the airport as a critical infrastructure for pandemic management was highlighted again.

6 Session 5 – Information sharing and decision making between stakeholders

Agenda:

16:30-16:50 Resilience of airports - Information sharing and decision making between stakeholders, Isabelle Laplace (ENAC)

16:50-17:10 Future CDM concepts - Airport performance monitoring & improvements in case of disruptive events, Thomas Guenther (Barco Orthogon)

17:10-18:00 Round table discussion - Resilience of airports and future CDM concepts

6.1. Isabelle Laplace (ENAC)

The first presentation in Session 5 was given by Isabelle Laplace, who showcased work carried out within the MetaCDM interview process on the interaction of airport CDM and disruptive events. The talk began with an introduction to the current state of play at European airports: whilst relatively few airports use A-CDM, it is widely acknowledged to increase airport efficiency and the A-CDM label projects a positive image of the airport. However, during disruption the usual A-CDM procedures are no longer relevant. Charles de Gaulle airport (CDG) during the 2010 snow event was used as a case study. For example, CDG was not provided with the information that London Heathrow airport was to close due to snow until shortly before the closure. Although CDG was operating close to capacity, it then had to accept flights diverted from Heathrow. Eventually, CDG was forced to close itself due to lack of de-icing fluid for passenger flights, but cargo providers still had remaining supplies. 4,000 passengers stayed overnight at the airport, with many complaining of receiving inadequate information. These incidents highlighted the need to improve communication between airports, between airlines and airports, and to passengers. A second case study looked at Toulouse airport during the same event. After the closure of CDG, many flights were diverted to Toulouse, which experienced problems with full aircraft parking areas and lack of information on flight status from other airports.

Following these case studies, recommendations were made on improving disruption handling in future. In the short term, better information sharing, including a single website where information from multiple airports could be accessed, was suggested. Push notifications on smartphones were suggested as a way of keeping passengers informed, and direct data links with pilots as a way of improving up-to-date information. Arrival and departure management should be linked, and all CDM performance indicators should be transparent and publically available. Whilst the implementation of CDM at airports that do not currently use it was suggested as a means of making improvements, it was noted that for this to be a success the benefits need to be clear and measurable, and that there needs to be a way of progressively getting the A-CDM label whilst being able to control the implementation cost to ensure full stakeholder buy-in.   Over the long term, the use of CDM at the network level including automated and enroute data sharing was suggested, as were better tools to reaccommodate passengers in case of disruption. Other future measures suggested included 'CDM-lite' for smaller airports – a small web portal to share information and co-ordinate on a pre-established set of procedures. Increased use of multimodality was suggested with the caveat that it must be economically viable. It was also noted that the current CDM process could be further

optimised and its impact on all stakeholders should be measured, perhaps by using past data from A-CDM airports.

Discussion after the talk focused on CDM-light – how is it defined, is it suitable for the needs of airports under normal or disruptive conditions, is it needed, and is it relevant to the needs of MetaCDM?

6.2 Thomas Guenther (Barco Orthogon)

The second presentation in the session was by Thomas Guenther from BARCO, concentrating on conclusions from the MetaCDM interview and literature review process about how the performance of airports can be measured in a more passenger-centric way. The talk began by outlining baseline assumptions about ways to improve passenger satisfaction using CDM, noting particularly that the key is to provide passengers and airlines with available information in a clear and timely way to enable them to make better decisions, and that this is already a well-established concept. It was noted that regulation may also be harmful to the improvement of this process. A brief introduction to BARCO Orthogon, and BARCO's interests in the area of airport CDM, was given.

Following this was some background on airport performance measurement. This included the ANS performance scheme and its targets, including those on ATM, environment, capacity and cost efficiency. The ATMAP indicators were also discussed, although currently the focus of these indicators is on the airside only, and they are only measured but not connected to targets. The ACI targets include landside targets and targets on productivity and cost-effectiveness. The integration of landside processes into CDM was covered, with some background on projects that have previously looked into this issue. This included a discussion of Total Airport Management (TAM). It was noted that the ultimate aim of these systems is to create an environment where airport partners can maintain a joint plan for operations. The MetaCDM project needs to make use of the work done in making these indicators and in integrating airside and landside. In particular, costs related to planning for crisis need to be related to benefits, and any indicators developed in the project to measure the success of new concepts for handling disruption need to reflect this.

Current crisis handling and the need to consider uncertainty were also discussed. Short-term handling of disruption is well-covered if predictions are reliable and procedures already prepared. Weather reports were used as an example – decision-makers faced with high levels of uncertainty may want to postpone action until more certain information is available.

In the discussion following the talk, KPIs for measuring the success of disruption handling were brought up. The need to measure the cost-benefit ratio of implementing new KPIs was noted. Similarly, KPIs are useless if the bodies compiling them don't understand or can't use the information. Network-level CDM was also discussed, including the currently-unresolved issue of which entity should be in charge.

6.3. Round table discussion

The official round table discussion in this session was omitted to allow more time for informal discussion after and around the individual talks (both in this and the previous sessions). However, an additional brief talk was given by Roger Gardner of Cambridge University on information arising from

the MetaCDM interview process which was relevant to the session topic. Discussion further continued at the workshop dinner in the evening.

Roger Gardner's presentation covered conclusions from the MetaCDM interview process about resilience and information sharing. The talk began by looking at planning for disruptive events. The existence of multiple levels of planning was highlighted, with government, local authorities, airlines and airports amongst others involved. Some of these bodies are CDM-influenced and others not. Although exercises in dealing with disruption are undertaken at multiple levels, interviewees felt that there was too little inter-agency co-ordination on exercises. Similarly, training is undertaken at multiple levels, from government-sponsored exercises to in-house airport lunchtime training modules. It was also felt that stakeholders had too little mutual knowledge of each others' constraints. The importance of media engagement was stressed, with media involvement useful for information dissemination but negative coverage potentially damaging. Interviewees were concerned about currently-minor disruption sources becoming more important in future, including cyber threats and space weather.

With regard to information sharing, stakeholders felt that it would be valuable to have web access at a European level to access and share the CDM status information of different airports, as discussed in the previous talk. The alert process for disruption was also discussed. Multiple different sources potentially provide alerts depending on the source of disruption. For example, security alerts may come from government, intelligence agencies or police and safety alerts from airlines, ANSPs or certification bodies. The issue of data conflict was highlighted, with some bodies using data intended for the same purpose from different suppliers (e.g. weather reports). In terms of downstream communication, unifying and linking systems between stakeholders was felt to be a problem, particularly at smaller airports. Some authorities are currently looking at communications strategies and how these could be improved, and this could be a useful area for the research community to engage with. Finally, the use of new technologies to enhance resilience and information sharing was discussed. Two areas were highlighted: the improvement of predictive modelling to better anticipate and deal with disruption, and the use of social media and active passenger tracking to improve disruption response and passenger satisfaction.

7 Session 6: Passenger expectations & solutions to improve passenger satisfaction

Agenda day 2:

09:30-09:50 Passenger expectations, Jean-François Perelgritz (EADS IW)

09:50-10:10 TU Dresden research aiming at CDM output improvements - Passenger expectations vs. handling processes, Oreschko (Dresden University)

10:10-10:30 Information sharing with passengers - Enabler for passenger satisfaction in case of disruptive events?, Gunnar Spies (Barco Orthogon)

10:30-10:50 Thee passenger in focus of multimodal airport management, Axel Classen

(DLR)

11:00-12:00 Round table discussion - Improved passenger satisfaction in case of disruptive events

7.1 Jean-François Perelgritz (EADS IW)

Work within MODAIR work package 2 on passenger requirements for intermodal transport was presented by Jean-Francois Perelgritz : this will provide most relevant unweighted variables concerning inter-modal passenger requirements drawing upon a literature review. Interestingly and surprisingly, all studies identified the same variables and experts endorsed the selection. A descriptive framework was devised setting out indicators, variables and sub-variables. The variables are passenger information requirements, passenger ticketing requirements, baggage, safety/security, comfort/convenience, wayfindng, accessibility and reliability.

The project identified that closer cooperation across operational boundaries for customer benefit requires applying planning, booking, ticketing, information exchange, charging, accounting and brokerage across organizational modal borders where they hardy exist at present. Thought was given to passenger requirements pre-trip, during the trip and post-trip, how information is filtered, fed to passengers and the value of total trip tickets. There is too little knowledge about what the passenger actually wants and where the benefit falls. For instance, sometimes passengers want to dispatch their bags at home and collect at destination and sometimes they want to keep them close at all times. There is no 'one-size-fits-all'. Similarly, some passengers want full support/guidance whilst others want data and autonomy to decide. Considerable work is needed to find a way through this maze and work towards tolls able to deal with these variables.

7.2 Oreschko (Dresden University)

The target perceived in the work presented by Bernd Oreschko was to extend the triangle of A-CDM connectivity to help the passenger extract valuable information and help them achieve their core journey aims (punctuality and reliability). Passenger modelling through the terminal steps of security and boarding accounts for terminal design features and how passenger information is delivered.

Aircraft boarding strategies are also modelled and airline validation undertaken. Turnaround modeling used handler interview information and field measurement covered boarding, cleaning, catering, etc and with time stamps geared to delivering a stochastic model with TOBT being a key parameter. The validity of this approach was debated with arguments made about a deterministic approach being more realistic.

There was also discussion about the merits of delivering data that enabled passengers to be more autonomous as this could erode airline flexibility to manage flows and boarding. To illustrate this, it was remarked that passengers now sometimes receive better and more precise data than handlers. Ultimately, the important point was for data to be accurate and reliable. The potential exists to extend such work into the realms of passenger shopping habits/available time and also how the airport deals with emergency exit from the terminal.

7.3   Gunnar Spies (Barco Orthogon)

Analysis presented by Gunnar Spies used experience at 'spoke' airports to assess how passengers

experience information data and how this does/could affect their journey. The ability for information/misinformation to confound the passenger was cited with examples of problems and the ability to effect contingency arrangements linked to what and when data are made available. Too little/ too late information frustrates the ability of the passenger to make value judgments about the achievability of his/her plan, especially when problems emerge with achievability of the scheduled plan. Topics to be resolved extended beyond data availability to willingness to share data and who will pay.

Additional work looked at ways in which to inform the passenger (news, FIDS, calls, web, SMS, email and apps). Different stakeholders (airlines, airports, etc) use different means but experience suggested varying levels of accuracy. Examination of travel info apps showed that data provided by these often omitted key data (gate, delay, etc) yet tended to provide unwanted information such as advertising, hotel or luggage fee information. Information was not always timely and useful tips such as about rebooking or delivering feedback were not available. More importantly, vital information about things like cancellations was often not notified. One of the main obstacles is over who pays for high quality information apps. The suggestion was made that such a role fell naturally to giants such as Google that had the reach and clout to be able to roll something out that had realistic potential to become robust and widely used. It was also noted that there were issues of passenger willingness to draw upon app/web/text services when away from their home service provider on account of roaming costs (meaning a disparity between outbound and inbound value). The viability of these services also often relied upon location tracking or personal data which people may be reluctant to divulge so there are significant trust issues to address. The question was also raised about what represented genuine meta-CDM and what represented normal customer service. Historically passengers relied upon travel agents to provide a package whereas now many travellers just want real-time data and make their choices dynamically so the business model is changing significantly.

7.4   Axel Classen (DLR)

Axel Classen provided an overview of two projects: the completed TAMS project work that related to multi-modal airport management and OPTIMODE which is an ongoing project linked to door-to-door journey times.

TAMS, which assumes that the airport is a multimodal hub, explored adding landside process chains to those of airside activities and also including the passenger in the concept with the aim of moving towards greater situational awareness, improved cost efficiency and punctuality and more proactive passenger management. Forecast approaches were used to improve the Estimated Passenger Gate Time (EPGT) and KPIs were explored in relation to cost and performance. As a dynamical system approach with 90 second updates, the aim was to move towards synchronising EPGT with TOBT. KPIs were linked to providing advice to decision-makers and defining alert thresholds. The resultant module 'Paxman' is able to monitor and predict passenger movement and synchronise with TOBT and assist in the deployment of airport resources. Benefits from better situational awareness are a smoother flow, improved punctuality, reduced waiting times and the provision of more timely information.

OPTIMODE is pursued in the context of the Flightpath 2050 goals of a maximum door-to-door journey time within Europe of no more than 4 hours. It has links to the Famous II and P-Air-Form projects. The project is based upon three configuration levels representing baseline and improvement scenarios for information provision and consequential ability for the passenger to act. The baseline relates to information provided at the airport, i.e. nowcast information, decision-support, what-ifs, effect analysis and knowledge of the passenger trajectory. The second and wider frame for information consideration is accounting for knowledge that could enable a traveler to reroute to an airport connected rail service to take a contingency route at a late stage in the outbound routing. The third and more flexible frame relates to enabling knowledge that allows a passenger to decide, at the point of departure, that another airport may be a better rerouting option. This work is ongoing and could support a framework for extending A-CDM beyond the traditional airside players.

7.5   Round table discussion

A factor identified as key to the ability to extend CDM was that key players such as airlines have to see benefit in investing in new systems and procedures and committing the supporting resources. If data could be exchanged between airlines and ground transport operators such as buses/coaches, there was potential to access passenger information earlier and broaden the catchment area for public transport access. This could be a win-win situation. It was noted that airline code-share practice offered a model for multi-modal through-ticketing. Work to examine options adopted by Madrid Barajas and other airports could be valuable.

Data reliability was recognized as a key constraint and the multiplicity of apps was considered to bewildering, as none could be considered robust. Enabling durable and reliable data services

required locational information and the weight of a major player would be needed to show that the benefits of a comprehensive service outweighed loss of privacy.

Benefits could be seen in establishing a European database or dashboard of operational status information for airports, CFMU and other key CDM stakeholders to enhance system integrity. This could apply in normal operational times and during turmoil. There would be issues of ownership and securing willingness to offer data that made it necessary to demonstrate the value of such a resource. The ground had been laid by Eurocontrol which had devised a process to follow but this remained to be taken forward. In the event that such a capability was established and shown to be robust and comprehensive, some elements could be opened to passenger view to assist with journey planning. The trend towards wider CDM had been set in train with initiatives such as SWIM but development of more passenger-facing initiatives will have to be paced realistically bearing in mind the time taken to secure take-up of A-CDM.

An interesting dynamic that arises in a move towards the gathering of more personalized information is where power becomes concentrated. Whilst the aim would be to empower the traveller to a greater degree, the release of locational and other data also vests a fair amount of power with airlines and potentially with airports. Issues of trust and control were significant but attitudes could differ between normal operations and crisis situations where, in the latter case, the balance of benefit shifts more towards the passenger.

Amsterdam's club for frequent flyers was cited as an example of the green shoots of developments that are encouraging passengers to provide personal information to a service provider and, at the same time, derive travel efficiency benefits themselves. A comparison was drawn, however, between travel on trains and buses where people retain effective anonymity and air travel which requires the provision of information for border control purposes and ticketing. It is possible that incentives for priority processing of people sharing personal data may encourage uptake. Research that timestamping passenger progress through terminals can help to refine the understanding of the obstacles to a smoother transition but little has been done to extend such analysis to the whole journey. If any arising technologies can help to unlock greater travel efficiency and resilience in times of crisis, there remains an important practical barrier, namely that any progress will be dependent upon a robust business case.

8 Final Remarks

The meeting concluded with thanks to speakers for their time and expertise and also helping to refine ideas about activities and approaches relevant to defining a new concept of operations. Attendees were thanked for their valuable contributions and Fraport was thanked for the excellent meeting accommodation and the interesting tour of the operational centre.

In the Advisory Group discussion after the meeting, the thrust of project work was endorsed. It was agreed that:

- With developing insights leading up to and during the workshop, it would be helpful to have additional time to extend some interviews with supplementary questioning and to conduct further interviews. Accordingly, an extension to the WP200 deliverable date to end February would be requested ;

- The next workshop would be held in Paris in May 2014 to allow for time to write up the final stages of WP300 and account for new information arising at the workshop prior to the scheduled project end date ;

- A project team meeting would be held in Cambridge in February to determine the key strands of WP300 concepts and to outline preliminary project recommendations.

Bibliography

Classen Axel B. (2013, November). The passenger in focus of multimodal airport management. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Dray Lynnette (2013, November). CDM State of the Art and Review of Past Disruptive Events. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Dray Lynnette (2013, November. MetaCDM Surveys. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Feron Eric (2013, November). Pandemics and Health Issues Airports. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Gardner Roger & Lynnette Dray. (2013, November). MetaCDM multimodality. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Gardner Roger (2013, November). MetaCDM WP 200 interviews. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Günter Thomas (2013, November). Airport performance monitoring & improvements in case of disruptive events. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Günther Thomas (2013, November). META-CDM Introduction & Objectives. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Laplace Isabelle, Marzuoli Aude, Feron Eric and Gotteland Jean-Baptiste (2013, November). Resilience of airports: Information sharing and decision making between stakeholders. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Oreschko Bernd (2013, November). TU-Dresden research aiming at CDM output improvements . Presentation for the second META-CDM workshop. Frankfurt Main airport.

Perelgritz Jean-François. (2013, November). Passenger requirements for intermodal transport. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Perelgritz Jean-François. (2013, November). The ModAir project. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Pfragner Peter (2013, November). Intermodal Hub Frankfurt Airport. Presentation for the second META-CDM workshop. Frankfurt Main airport.

Spies Gunnar (2013, November). Information Sharing with passengers – Enabler for passenger satisfaction in case of disruptive events? Presentation for the second META-CDM workshop. Frankfurt Main airport.

Wasow Meike & Gregor Weil (2013, November). Irregularity-Management @ Frankfurt Airport, It's all about colours! Presentation for the second META-CDM workshop. Frankfurt Main airport.

Appendix A
Workshop Agenda

Tuesday, November 12th

Session 1: Welcome & Introduction			
09:00	10:00	*Registration & Welcome Coffee*	
10:00	**10:15**	**Welcome (Introduction/Agenda)**	Laplace, Guenther (ENAC, Barco)
10:15	**10:35**	**META-CDM introduction & objectives**	Guenther (Barco Orthogon)

Session 2: Irregularity management at Frankfurt Airport			
10:35	**11:05**	**Irregularity management at Frankfurt Airport**	Wasow (Fraport) / Weil (Lufthansa)
11:05	11:25	Discussion	
11:25	*11:45*	*Coffee Break*	
11:45	**13:00**	**Visit to the Hub Control Center (HCC) at Frankfurt Airport**	Klempert / Weil (Lufthansa)
13:00	*14:00*	*Lunch Break*	

Session 3 Contributions of multimodality			
14:00	**14:20**	**Multimodality at Frankfurt Airport**	Pfragner (Fraport AG)
14:20	**14:40**	**MODAIR project**	Perelgritz (EADS Innovation Works)
14:40	15:00	Discussion	
15:00	*15:15*	*Coffee Break*	

Session 4: Disruptive events and resilience of Airports - Past experiences			
15:15	**15:35**	**CDM state of the art and review of past disruptive events**	Dray (Cambridge University)
15:35	**15:55**	**Preliminary results from the META-CDM interviews and surveys**	Gardner/Dray (Cambridge University)
15:55	**16:15**	**The operations of disease control at large hub airports**	Feron (ENAC)
16:15	*16:30*	*Coffee Break*	

Session 5: Information sharing and decision making between stakeholders			
16:30	**16:50**	**Resilience of airports - Information sharing and decision making between stakeholders**	Laplace (ENAC)
16:50	**17:10**	**Future CDM concepts - Airport performance monitoring & improvements in case of disruptive events**	Guenther (Barco Orthogon)
17:10	**18:00**	Round table discussion - Resilience of airports and future CDM concepts	
19:00		*Dinner*	

Wednesday, November 13th

Session 6: Passenger expectations and solutions to improve passenger satisfaction			
09:00	09:30	*Welcome Coffee*	
09:30	**09:50**	**Passenger expectations**	Perelgritz (EADS Innovation Works)
09:50	**10:10**	**TU Dresden research aiming at CDM output improvements - Passenger expectations vs. handling processes**	Oreschko (Dresden University)
10:10	**10:30**	**Information sharing with passengers - Enabler for passenger satisfaction in case of disruptive events ?**	Spies (Barco Orthogon)
10:30	*10:45*	*Coffee Break*	
10:45	**11:05**	**The passenger in focus of multimodal airport management**	Claßen (DLR - German Aerospace Center)
11:05	**12:00**	Round table discussion - Improved passenger satisfaction in case of disruptive events	
12:00	*13:00*	*Lunch*	

Appendix B
Attendee List

CONSORTIUM

Isabelle Laplace	ENAC
Jean-Baptiste Gotteland	ENAC
Eric Feron	ENAC
Thomas Günther	BARCO
Gunnar Spies	BARCO
Roger Gardner	Cambridge University
Lynnette Dray	Cambridge University

EXTERNAL SPEAKERS

Classen, Axel B.	DLR (German Aerospace Center)
Oreschko, Bernd	TU Dresden
Perelgritz, Jean-François	EADS IW
Pfragner, Peter	Fraport
Wasow, Meike	Fraport
Weil, Gregor	Lufthansa

OTHER GUESTS

Florian Piekert	DLR
Gero Hoppe	Inform GmbH
Manuela Knotek	Vienna International Airport
Michelle Thurgood	Birmingham Airport Ltd
Herve Breton	Thales
Yu Zhang	University of South Florida
William M. Swan	Boeing (retired)
Siobhan Corrigan	Centre for Innovative Human Systems, Trinity College Dublin
Peter Lovegrove	ATOC (Association of Train Operating Companies)
Moritz Strasser	ATRiCS GmbH
Olga Gluchshenko	DLR/Institute of Flight Guidance