



WORKING PAPER

THIRTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 9 to 19 October 2018

COMMITTEE A

Agenda Item 2: Enabling the global air navigation system
2.1: Aerodrome operations and capacity

NEXTT - NEW EXPERIENCE TRAVEL TECHNOLOGIES

(Presented by the Airports Council International (ACI) and the International Air Transport Association (IATA))

EXECUTIVE SUMMARY

This paper presents an overview of the International Air Transport Association (IATA)-Airports Council International (ACI) initiative to transform the ground journey using advanced technologies and procedures for integration.

Action: The Conference is invited to agree to the recommendation contained in paragraph 3.2.

1. INTRODUCTION

1.1 This paper presents the ACI-IATA initiative known as NEXTT - New Experience Travel Technologies, in the context of developing aerodrome capacity. It is described at <http://nextt.iata.org/> and is linked to www.aci.aero/NEXTT.

1.2 The initiative is envisioned to ensure that the transport of passengers, baggage and cargo will benefit from the latest technological developments aimed towards improving the customer experience reliability and efficiency. It discusses some of the most probable elements that will transform the complete end to end journey over the next 20 years, developing them from ideas to fully advanced solutions. Some progressive airlines, airports, service providers and cargo handlers are already implementing these new concepts some of which will be fully operational from as early as 2020.

1.3 The aircraft journey (concentrating on the turnaround at the airport) is a key part of this initiative, along with other elements such as: cargo, baggage, and passenger. Aircraft turnaround is a cross-domain activity involving aircraft operators, airport operators, ground handlers, and air traffic

¹ English, Arabic, Chinese, French, Russian and Spanish versions provided by IATA.

control units, etc. The emphasis of NEXTT is in the area of automating the exchange of data. Part of this stems from airport collaborative decision-making (A-CDM).

2. DISCUSSION

2.1 NEXTT is divided into the following components: (a) off-airport processing of passengers, baggage, and cargo to the maximum extent possible; (b) seamless, secure and efficient processing at the airport that is highly personalised; and (c) fully coordinated aircraft turnaround processes using the latest automation, safety and environmentally friendly technologies in order to increase predictability. It is envisioned that all three of these components will be connected via a data backbone, which will ensure real-time accessibility and decision-making for all stakeholders.

2.2 Notably it refers to A-CDM as follows: the philosophy of A-CDM and the platforms for information exchange provide a foundation and integrated approach for all operational data. With contribution from multiple sources, stakeholders are able to work from a single airport operations plan (which is linked to the airline operations plan). This plan incorporates the flow of both arrivals and departures. It is utilized for seasonal planning of resources right down to real-time decisions and all the time horizons in-between. All parties shall have access to the relevant real-time information. The entity capturing/creating each specific data item is used as the trusted, single source to provide updates to all. Although the overall A-CDM concept includes links between aircraft, pilots, airline flight operations control centres and ATM (air traffic management), NEXTT data communication extends the sharing of information to enable those on the ground to receive real-time updates on aircraft status, preferences, and supply orders. Equally, passengers and cargo customers will receive consistent information from the trusted source. This information will contribute directly to the accuracy of the turnaround requirements in greater detail, prior to the aircraft's arrival.

2.3 As systems advance, airports will benefit from airlines using trajectory-based operations, wherein the aircraft follows the most efficient route placing it in the calculated landing sequence. This is only possible via data link communications between aircraft, airline operations, and airports.

2.4 The arriving aircraft leaves the runway via the exit which optimizes the time spent on the runway and the time spent to arrive at the assigned gate/stand. Using Advanced Surface Movement Guidance and Control Systems (A-SMGCS) where needed, the aircraft is able to navigate on taxiways even when visibility is very poor. An on-board moving map displays surrounding traffic, alerts, warnings and the current airport layout including restrictions (temporary or permanent). The dynamic A-SMGCS can also adjust taxi centre line lighting, stop bars and no-entry bars depending on vehicle and aircraft movements, enhancing safety for all.

2.5 The aircraft arrival time will be highly predictable and part of the airport operations plan. The availability and movement of ground support equipment (GSE) are synchronized to match. All GSE is tracked and monitored to provide input data for the GSE management systems. These systems are responsible for routing and task allocation for each piece of equipment or service. Servicing requirements for each aircraft in terms of type and quantity of GSE and the duration of the task are precisely estimated. Machine learning (artificial intelligence) enhances the decisions to deploy equipment and staff. Optimal times for predictive maintenance and recharging of equipment are also built into these allocation plans.

2.6 Airline flight operations control centres communicate with a range of ground services, Air traffic control, airport operations control and maintenance facilities. A planned and coordinated turnaround is possible because aircraft readiness, load-planning, or weight and balance, can occur in real-time. This combines aspects such as special cargo (heavy, long, etc.), cargo loading system status as well

as advance knowledge of the next flight's requirements. To facilitate this precision turnaround operation, it is necessary to have links between airline (or their designated ground handler) passenger, baggage and cargo systems and airport systems including facilitation. This approach enables scheduling of exact times for gate open, pushback and apron, taxiway and runway use etc.

2.7 As with the arrival, the departure of the aircraft is managed by all parties accessing consistent, reliable, live information as contained within the airport operations plan. This incorporates data from multiple sources reflecting the status of passenger boarding, cargo and baggage loading, ground servicing, estimated taxi times and optimal take-off sequence, including the airline network operation. The target off-block time (TOBT) is managed to ensure optimum taxi time. Using the A-SMGCS again to provide instant visual guidance, the pilot and all airside vehicles have full visibility (in any weather conditions) of the surrounding traffic on the airfield and will be alerted to avoid any possible hazards or infringement.

3. CONCLUSION

3.1 The NEXTT initiative focuses on what could be achieved through an integrated use of advanced technologies and processes to transform the ground journey. Specifically, in the context of aerodrome operations and capacity, NEXTT will investigate opportunities for improvement of predictability of aircraft arrival, turnaround and departure, while using advances in automation, safety and environmentally friendly technologies.

3.2 Fundamental to NEXTT is real time data connectivity which will allow stakeholders with trusted access and decision-making. The potential impact of such developments should be noted by the Conference which is invited to agree the following recommendation:

Recommendation 2.1/x – Aerodrome capacity and efficiency enhancement

That the Conference:

- a) request States to note the work being undertaken by IATA and ACI; and
- b) request ICAO to track developments on NEXTT on a regular basis with a view to determine any potential need for the development of new or the review of existing standards or recommended practices.

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