

X-Team D2D Extended ATM for Door-to-Door Travel

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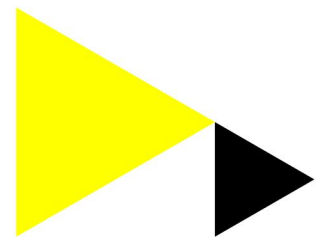
Publication date

2020

[Link to publication](#)

Citation for published version (APA):

Mujica Mota, M. A., el Makhloufi, A., Bagamanova, M., & DiVito, V. (2020). *X-Team D2D Extended ATM for Door-to-Door Travel*. Poster session presented at SESAR INNOVATION DAYS 2020 (virtual event).

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[POSTER]

X-TEAM D2D Extended ATM for Door-to-Door Travel

Project description

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Abstract—This poster aims presenting the project X-TEAM D2D, Extended ATM for Door-to-Door Travel, which has been funded by SESAR JU under the call SESAR-ER4-10-2019: ATM Role in Intermodal Transport. This document is the abstract of the intended poster and specifies the expected contents, as outlined in the sections reported below.

Keywords- *Multimodality, Air Traffic Management (ATM), Door to Door operations, Urban Air Mobility (UAM), U-Space, ConOps, Intermodal Transport, Passenger Experience, Surface Transport, Simulation*

I. PROJECT OBJECTIVES

X-TEAM D2D project aims at defining, developing and initially validating a Concept of Operations (ConOps) for a seamless integration of ATM and Air Transport into an overall intermodal network, including other available transportation modes (road, rail, water). This will contribute to significant enhancement in door-to-door connectivity, supporting to the ACARE SRIA FlightPath 2050 goal of enabling connection in up to 4 hours between any location in Europe. The project provides and validates a ConOps for seamless door-to-door mobility in urban and suburban (up to regional and country-wide level) environment, targeting as scenario the connection of a metropolis with the surrounding area (up to country-wide level) and taking into account the transportation and passengers service scenarios envisaged for the next decades, according to

baseline (2025), intermediate (2035) and final (2050) time horizons.

The developed ConOps will encompass the integration of the transportation platforms, including innovative ones as Urban Air Mobility, into overall intermodal transport system thanks to innovative seamless mobility as a service including ATM concepts. The ConOps will be preliminarily evaluated against existing, specifically defined and applicable KPAs and KPIs, which implement both qualitative and quantitative performances assessment approach. In addition, X-TEAM D2D will develop a simulation-based approach for validating the proposed ConOps, considering the most relevant elements of the transport in the future, such as interfaces mode-mode, high-level network model, passenger-centric paradigm. Also, a description of the semantic values of future KPIs and a diagnosis of the inefficiencies of the ConOps will be provided.

First, from the passengers' perspective, the project will address the door-to-door journey variability, since it will be fundamental for assessing the feasibility and value of the developed ConOps. In this perspective, the analysis of data will enable to identify the areas where the travel is not as smooth as expected, benefitting also from the support of relevant stakeholders involved in the project Advisory Board and Passengers Advisory Group.

Then, from the ATM and air transport perspective, the integration of the different modes of transport, including the flight segment into an overall intermodal transport network, will increase the importance of predictability of the ATM indicators for the seamless passenger travel. It will be necessary to envisage not only the best solutions for integrating air vehicles and infrastructures with other transport modes, but also the best solutions to integrate ATM and U-Space services into an overall mobility as a service information system. Particular attention will be devoted to the implementation of the Urban Air Mobility paradigm and technology, which is considered as a fundamental element of the integration of vertical transport in the overall intermodal transport network.

For what concerns the surface transport, rail transport related aspects will be considered, allowing to identify potential areas of improvement and potential issues that might need to be addressed in the future to improve multimodal transport efficiency. Road transport and future transport modes will be also considered, taking into account the foreseen technological advancements in terms of availability of autonomous vehicles, also under car sharing business model, for surface mobility.

II. PROJECT METHODOLOGY

The study logic implemented in the project is based on three main phases, as outlined in the following.

- Definition of reference scenarios, according to baseline (2025), intermediate (2035), final (2050) time horizons, performing definition of reference transport scenarios for Door-to-Door (D2D) mobility, identification of bi-directional relationship among ATM and other transport modes, identification of specific use cases, identification of barriers as well as technological enablers for the integration of ATM and air transport into overall intermodal transport system.
- Design of ConOps for infrastructures and services integration according to baseline (2025), intermediate (2035), final (2050) time horizons, addressing mobility infrastructures integration with ATM and mobility services integration with ATM. This phase of the study is aimed to provide analysis of D2D mobility demand in the urban and extended urban and regional scenarios, design of ConOps for integrated Urban and Extended Urban transportation system including ATM and for mobility as a service including ATM, definition of the criteria and procedures for the management of the evolutionary process towards the envisaged paradigm shift, identification of technological enablers for implementation of mobility as a service including air transport, in terms of bidirectional exchange of information among ATM and other available mobility services. In addition, preliminary high-level analysis of the legal, economic and regulatory aspects related to the implementation of the proposed ConOps of mobility as a service including ATM will be addressed.

- Performances considerations and preliminary validation, performing analysis of the limitations and opportunities arising from the integration of ATM into an overall seamless urban and extended urban and regional transport system, covering the strategic, pre-tactical and, more in particular, tactical flow management phase, defining overall integrated transportation system performance indicators and identifying specific ATM contribution to overall system performances. Preliminary validation will be carried out by means of simulation of the feasibility of the proposed ConOps.

Based on the above outline, X-TEAM D2D represents an innovative project proposing an integrated view, from the network design to the assessment and operations planning, addressing uncertainty and possible future requirements in operations design, developing reproducible and customizable models, and finally paving the way to a decision support system to be used by all stakeholders of a multimodal transport service.

ACKNOWLEDGMENT

X-TEAM D2D project has received funding from the SESAR Joint Undertaking (JU) under grant agreement No 891061.