

Supporting  
European  
Aviation



# CORUS-XUAM – 2<sup>nd</sup> Stakeholder Workshop

*Developing U-space for Urban Air Mobility (UAM);  
WP10 Demo with a focus on the relevant vertiport operations*

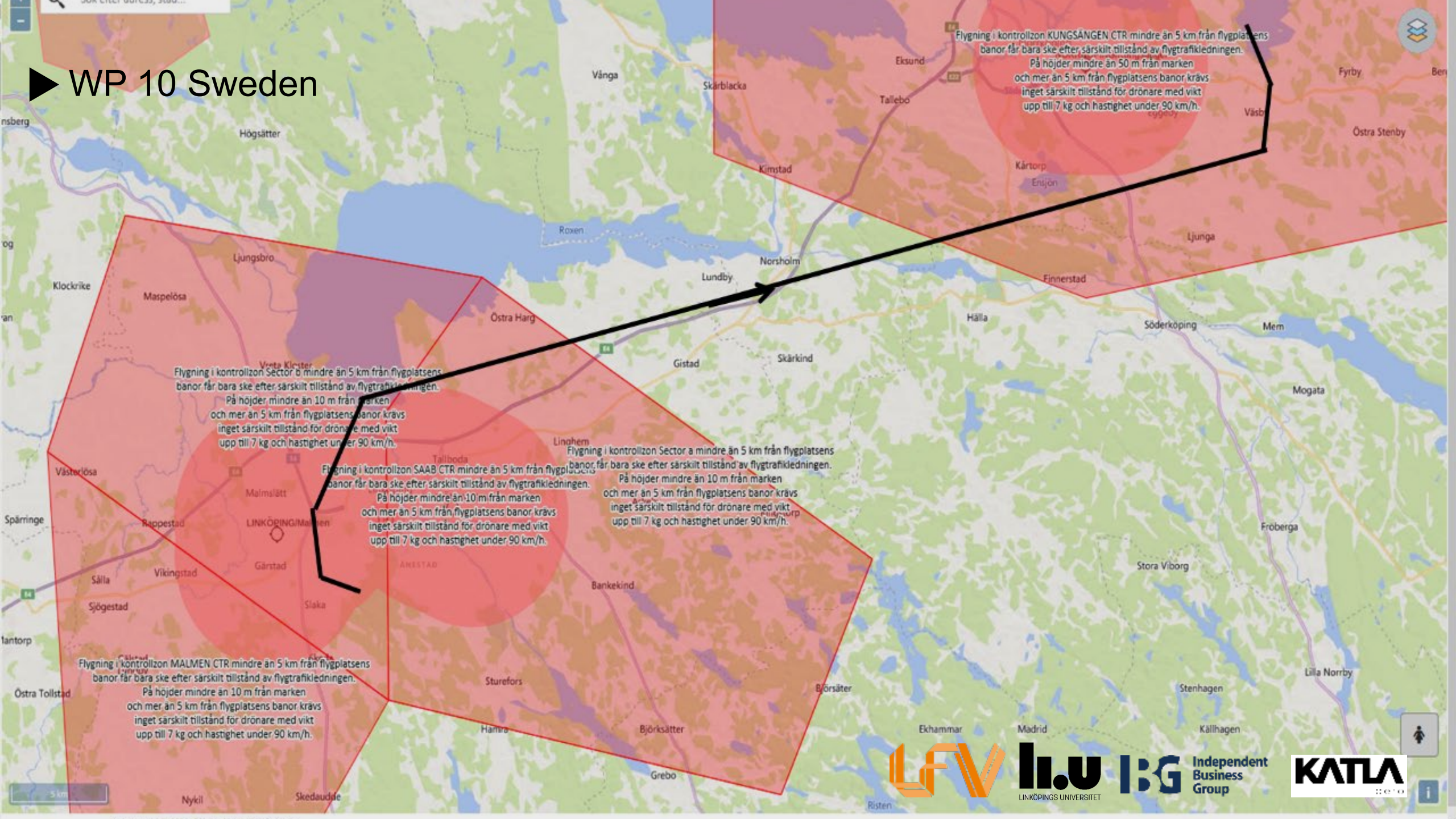
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PM Automation, UAM & Human  
Performance

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Founder & owner

15 March 2022



# WP 10 Sweden

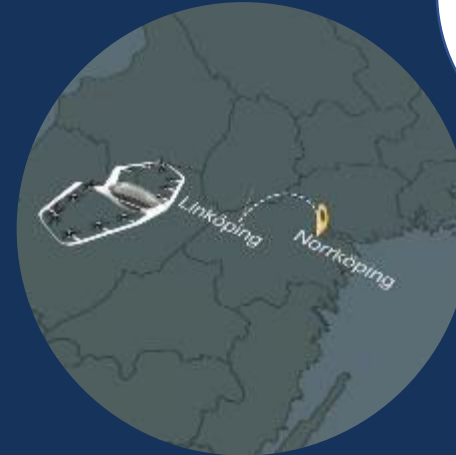


Independent Business Group

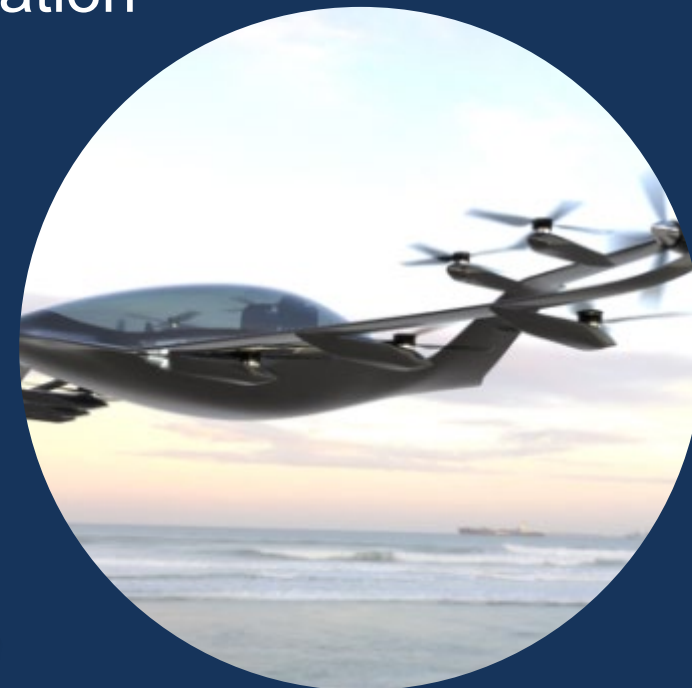


▶ CORUS – autonomous Inter-city flight between Linköping and Norrköping (50 km)

- UAM flight between two cities
- Seamless transition two UTM Systems
- Autonomous flight 50km
  - One actual (LiU and Industry)
  - Mixed with virtual flights (LiU)
- Vertiport in city and airport Environment
- Definition CONOPS intercity UTM (LFV)
- Flight (s) Start at Linköping Science Park and ends at Norrköping Airport (NRK)
- Involvement of the municipalities and regional authorities



# ► SORA – Operational Concept – Social Impact & Communication



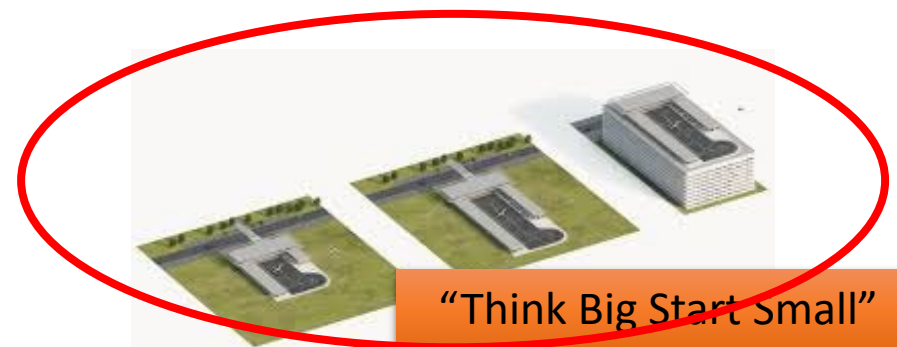


2021-11-29 CORUS XUAM Workshop with the municipality members of Norrköping and Linköping. The Regional Council / Strategic planning also participated together with LFV LiU and IBG.

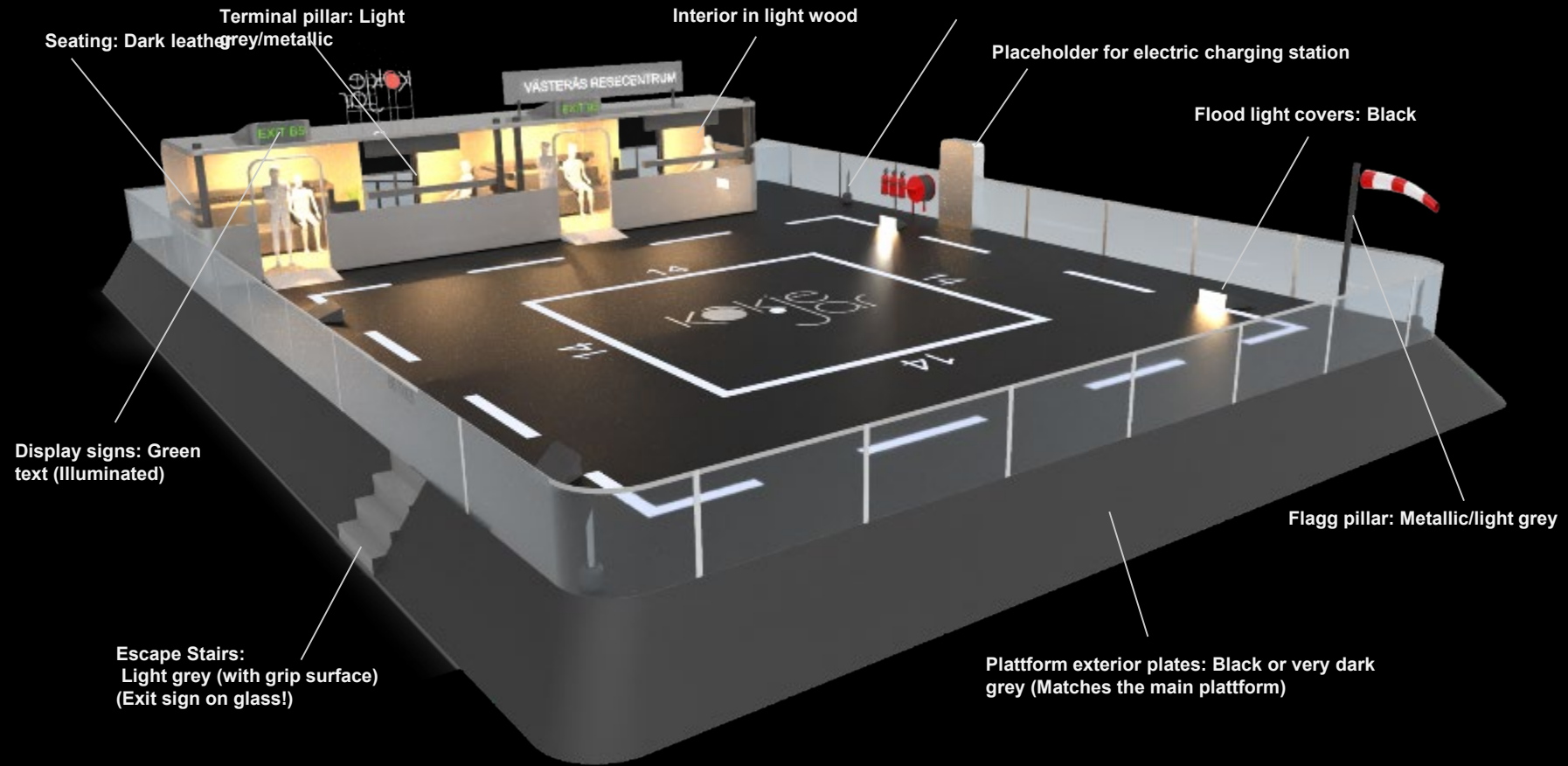




### London Vertiports – A Masterplanning Approach



“Think Big Start Small”







# From

NO INFRASTRUCTURE  
— TRAIN WITHOUT RAIL



From

NO INFRASTRUCTURE  
— TRAIN WITHOUT RAIL



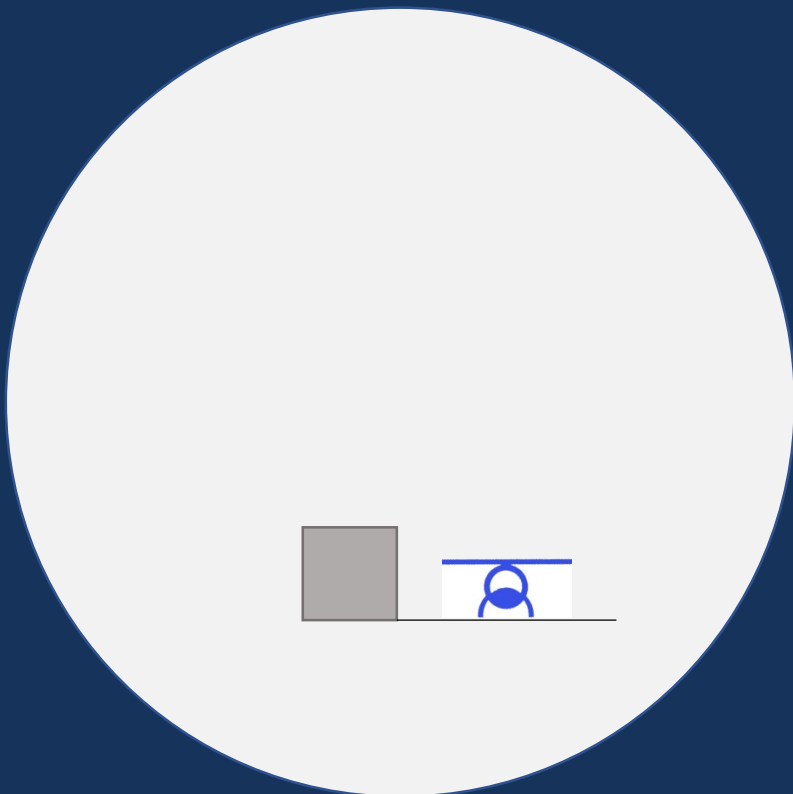
To

FULL INFRASTRUCTURE  
— MODERN AIR ROADS



## ► Demand / Capacity Challenge

What do we do when **demand** is higher than capacity?



What do we do when a **Vertiport** is located within a controlled airspace (e.g. Airport)



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What do we do when a **Vertiport** is located within a controlled airspace (e.g. Airport)




## ► Challenge – on demand is unpredictable

### How to ensure predictable Vertiport operations?

- The availability of a Vertiport (or specifically TLOF) platform need to be known in order to predict touchdown and take-off times.

### How to ensure a seamless transition from uncontrolled to controlled airspace?

- Procedurally how are eVTOL/Drones managed when entering a controlled airspace? Technically how is data processed? How are clearances given (UTM/U-Space vs ATM)? What data is exchanged between Vertiport Operator, USSP/ANSP and eVTOL/Drone operator?

An aerial view of a city with a futuristic vertiport. The vertiport features a large, flat, dark surface with yellow and green markings, including a circular landing area. Several eVTOL aircraft are visible on the ground and in flight. The surrounding city has modern buildings and green spaces. The text is overlaid in yellow on the right side of the image.

Predicted Touchdown and Take-off times is crucial to make arrival times known to passengers and especially vital multimodal trips combining modes of transport.



1

ATC Flight Plan Activation for outbound

2

EOBT – 2hr

3

Take-Off Outstation

4

Local Radar Update

5

Final Approach

6

Landed

7

Ground Handling Start

8

In Block

9

TOBT confirmation

10

TSAT issue

11

Start Boarding

12

Aircraft Ready

13

Start-up Request

14

Start-up Approved

15

Off-Block

16

Take-Off

A-CDM Procedures for enabling predictability of the turnaround and start-up of a flight

## ► Key definitions – Vertiport context

### Target Off-Block Time (TOBT):

- The time that an **Vertiport Operator** estimates that an **eVTOL/Drone** will be ready, all doors closed, ready to start up immediately upon reception of clearance **from the USSP or ANSP (Tower)**

### Target Start Up Approval Time (TSAT):

- The time provided by **ANSP/USSP** taking into account TOBT and / or the traffic situation that an **eVTOL/Drone** can expect start up approval



## ► Summary

To be able to transition between U-Space and ATM / ATS a common set of definitions need to be used where procedures can be aligned.

*“A-CDM is implemented around the world with a defined set of definitions and procedures that can be applied for the eVTOL market.”*

**TOBT/TSAT process will give necessary predictability over the availability of a Vertiport TLOF**

*“TOBT can be provided by the Vertiport Ground handler and TSAT can be provided by USSP or ANSP depending on if it is in controlled or uncontrolled airspace.”*

Society in the loop is key to successful introduction of U Space services

**Vertiport → Enrichment of the Airport services → place in society / add value to the community / integrated in mobility and sustainability strategies / connects to multimodal services et m.**

Starting point for learning about impact from vertiport functionality should be to evaluate CORUS XUAM operational concept.

