Test Arena Autonomous Airport

TO ACCELLERATE MOBILITY







Advanced Digitalization Programme

- Accelerate Sweden's ability to develop and use new digital technologies and digital services in industry.
- Give Swedish industry a leading role in the digital solutions of the future.
- Work as a knowledge hub for other Swedish initiatives in the field of digitalization with participants from industry, universities, research institutes, public organisations and other actors.
- Open and transparent processes where project selection takes place in free competition.
- The programme was started in 2021 and will run at least to 2030.
- Initial budget: SEK 1,2 billions (2021–2024),
- Ambition: SEK 2 billion per year

Advanced digitalisation refers to the new opportunities arising from advanced technologies in areas such as electronics, information and communication technology, software-intensive systems, as well as open data and industrial platforms.

Why Advanced Digitalization Programme?

Other countries are making ambitious investments in advanced digitalisation and development is accelerating

Swedish public investments in digitalisation are short-term, underfunded and reactive



Sweden is lagging behind

Suboptimisation and lack of efficiency

If Sweden's industry is to maintain and strengthen its competitiveness, a cohesive force is required for digital structural transformation



Requires policy coordination and collaboration among the players

Four areas form a whole

Each area contributes individually to the programme's goals, but it is the synergies and the long-term perspective that will create the major effects.

- The areas create a strength within the programme but also spillover effects to other businesses, authorities and organisations.
- The four areas contribute to both short and long term technical solutions.

Education and Learning



Collaboration

And Why a Test Arena for the Autonomous Airport







Urban Areas

Aircrafts with different

- > Propulsion
- Fuel
- > Crew
- Automation





And new

- Reasons
- > Behaviors
- Business
- > Operators
- > Airports
- Traffic management
- Routs



Vision

The autonomous airport improves safety, efficiency, profitability and the passenger's comfort as well as contributes to increased sustainability for air travel.

Through digitalization, automation and artificial intelligence, transportation of passengers and goods from door to door respectively manufacturer to customer is performed in a reliable, secure and efficient manner.

In addition, the autonomous airport has mixed and integrated airport mgmt. (conventional and for new services) as well as provides availability as a service and infrastructure for all, incl. in sparsely populated areas.

Purpose of the Test Arena

Realization of smart, digital and environmentally friendly Advanced Air Mobility requires research and development of infrastructure for both new technology and new working methods combined with new regulations.

- Technical Research and Development
 - Digital cloud solution and a physical arena
- Demonstrations
- ➤ Tests
- Regulations and standards
- > Communications and collaborative work.



Parties

VINNOVA









RI. SE

Research Institutes of Sweden

Partners for next step: Successively and aligned with the functional gro Airport key stakeholders and customers will be International partners. Users as Transport operators and logistics com Authorities Academia Airport owners Energy companies and autorities. Social autorities. Medical, Police etc. Military.

First use case Last Mile Delivery

- Urban Air Mobility is expected to become a reality in Europe now and within next coming years.
- > New Technologies
 - Electric propulsion and enhanced battery capacity
 - Vertical take-off and landing systems
- Regulations and Standards in EU (EASA). U-Space.
- The first commercial operations to be the delivery of goods by drones and transport of passengers will be a reality.

All in all, this is a good start to an infrastructure for the project

- Big need

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- Necessary experience.



What to Focus on

- > A high number of Drones simulaneously
- Areas with many drones. Start, Landing, Around geofencing zones etc.
 4D-replanning / Simulation/ Prioritization.
- LVC-Concept. Simulated Drones combined with a few physical.
- Local 4 / 5G-network for identification, communication, positioning and navigation.
- System Safety and Graceful Degradation.
- Valid models with parameters for:
 - Quality
 - ➢ Wheather and Wind etc



Methodology

- > How to start up a project like this ?
 - Project start in Post Pandemia
 - Geographic distance of the participants
 - New relations between the parties / participants in a new constellation
- > Working methods are very important.
 - Continuous digital meetings
 - > Needs of cloud solution 24/7. Partly today
 - > WS IRL hosted by the parties
 - Two weeks with Wara-PS in Västervik



A fantastic team with good teamwork



In cooperation with WASP Wara-PS

Different backgrounds – One project

RI. Research Institutes of Sweden

Drone Center Västervik

U-space regulations Drone system Drones





Human-AI Simulation

ATM Regulations UTM-city Digital Tower Simulators



Core system Video server Integrations



Communication Positioning

> 5G 3GPP

"Last Mile Delivery System" Demonstration





Interfaces and standards



