SAFIR-Med

SAFE AND FLEXIBLE INTEGRATION OF ADVANCED U-SPACE SERVICES FOCUSING ON MEDICAL AIR MOBILITY

Milan Rollo
CTO, AgentFly Technologies

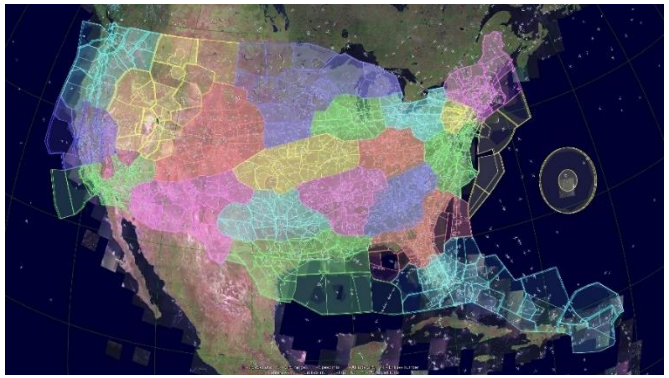
Dronedge 2022

EUROPEAN PARTNERSHIP

Co-funded by the European Union

AgentFly Technologies – Company Profile

- R&D company in the domain of AI, robotics and aerospace based in Prague



- Large-scale fast-time simulation framework
  - ATM including models of human cognitive behavior
  - UAS supporting SW / HW in the loop
  - UTM combining heterogeneous aircraft and services



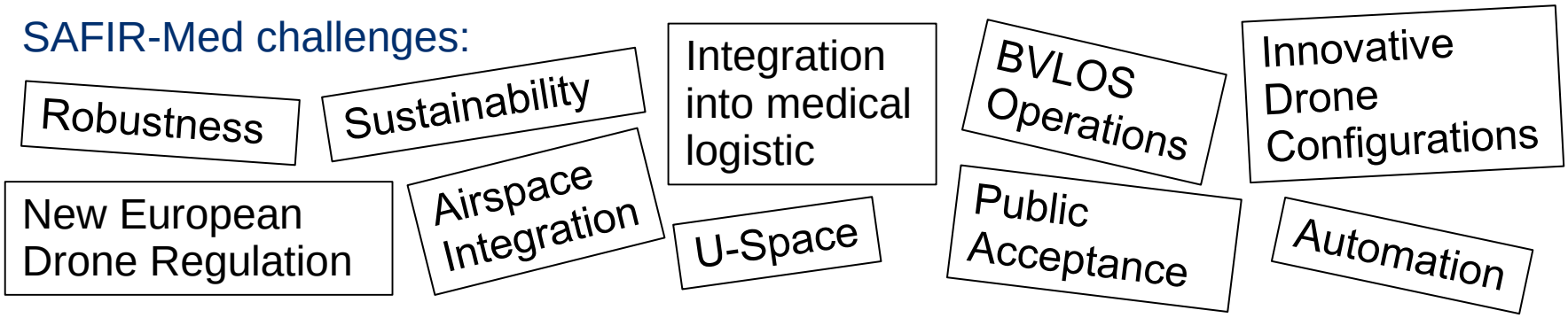
- Drone operator
  - Industrial applications
  - Application of advanced algorithms
  - Improving simulation models

SAFIR Med

Within the SAFIR-Med innovation project a European consortium of Urban Air Mobility (UAM) experts from industry, academia, municipalities, aviation authorities and politics is doing pioneering work on

"How can fast, safe and efficient delivery of urgently needed medical goods become a life-saving routine, even across national borders?

SAFIR-Med challenges:



demonstrated in real-world urban scenarios

- DronePort, Sint-Truiden (B)
- Antwerp (B)
- MAHHL Cities, UAM Region Aachen (D) and Heerlen (NL)

and in simulations

- Athens, Greece
- Prague, Czech Republic

SAFIR Med

17 partners
(8 EU countries)

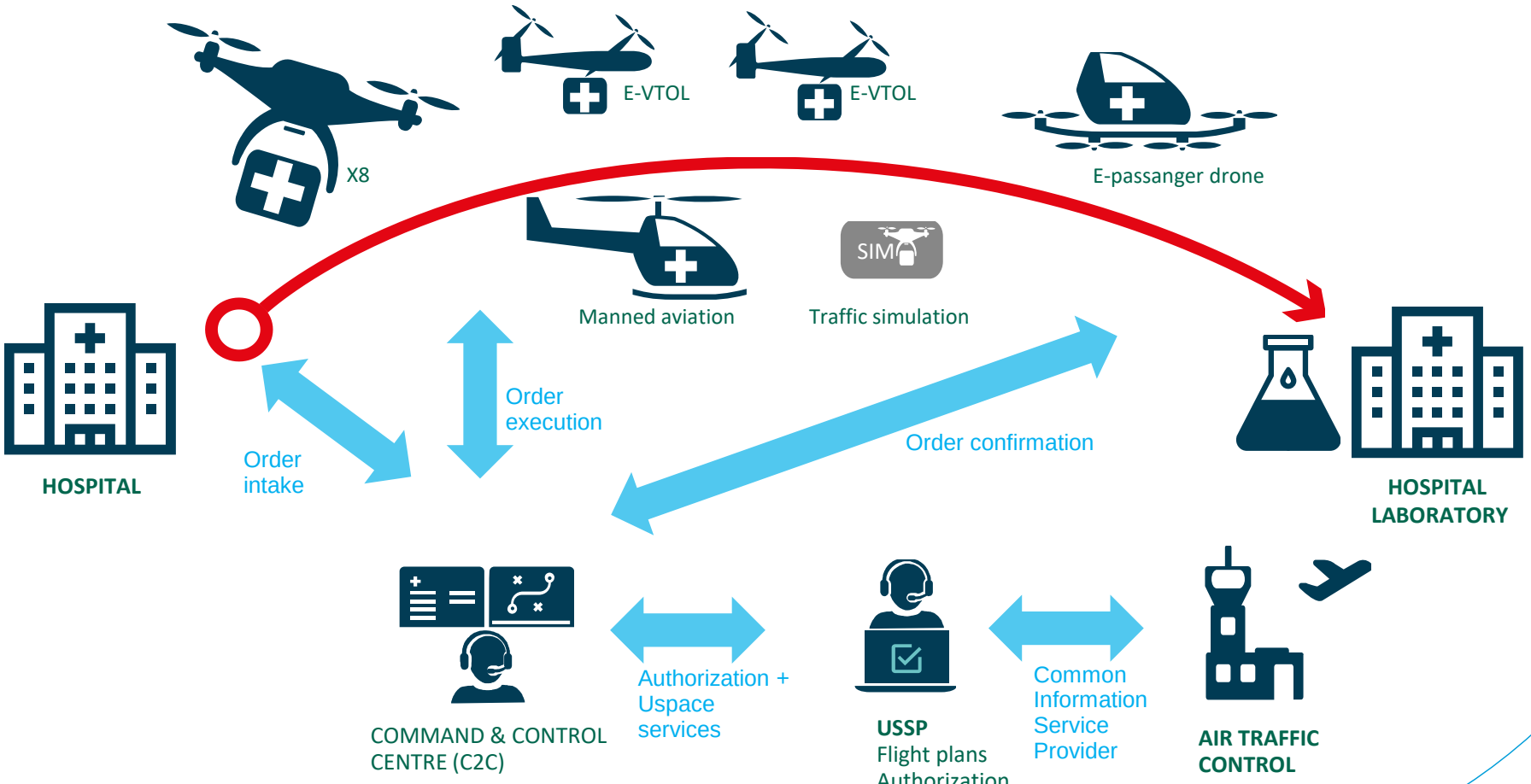
12 Advisory Board members (international)



sesar
JOINT UNDERTAKING

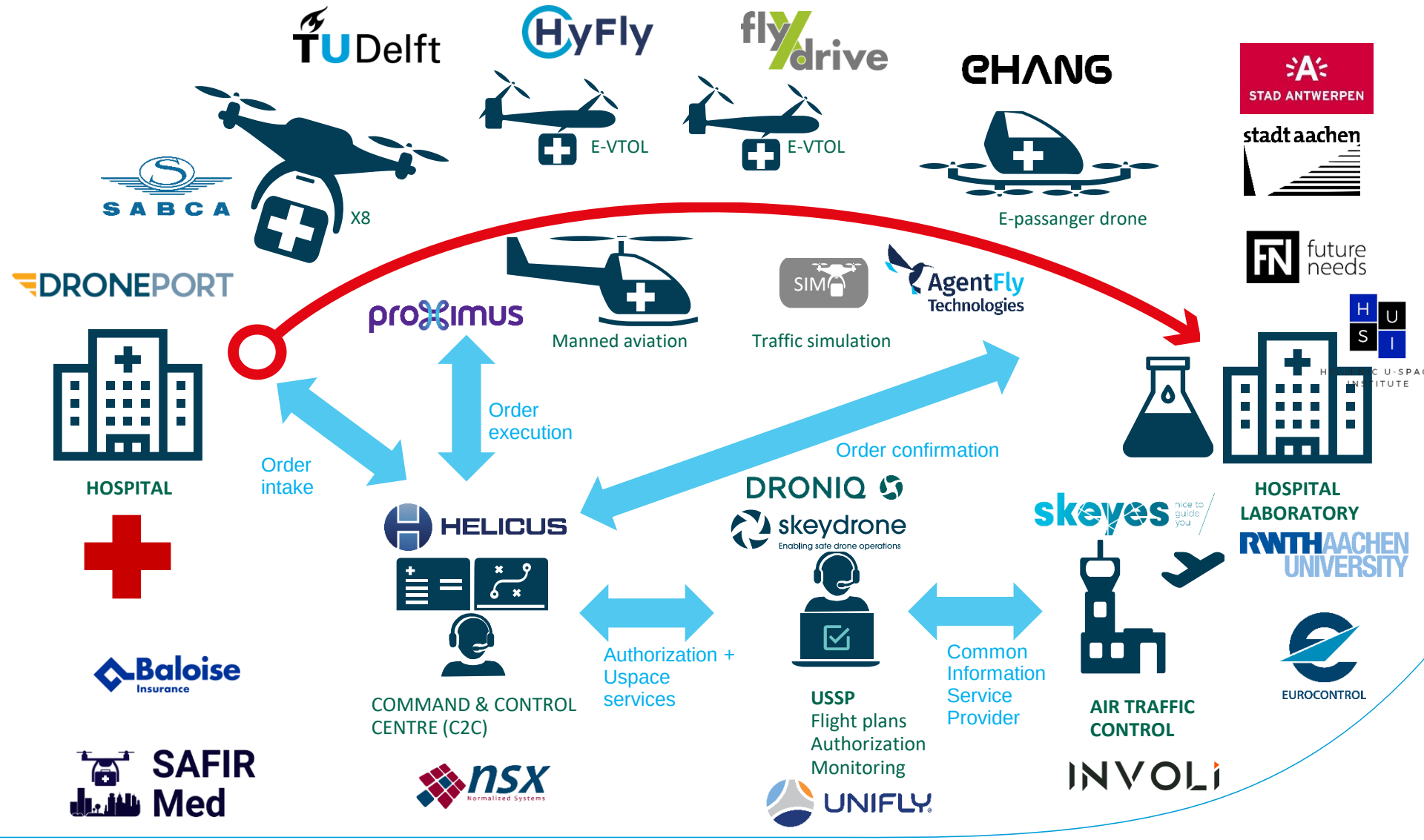
SAFIR Med

SAFIR-Med, an integrated ecosystem



SAFIR Med

SAFIR-Med, an integrated ecosystem



SAFIR-Med Achievements – flights in action

Task	Description
WP1	Requirements, Architecture & Use Case Scenarios
WP2	Innovative U-Space Services & ConOps per location
WP3	Infrastructure Adaptations & Demonstration preparation
WP4	Integrated Use Case Demonstration & TRL Validation
WP5	Performance Assessment & Recommendations
WP6	Project management, Dissemination & Business Sustainability
WP7	Ethics (equals proposal Task 6.3 moved to separate WP7)

SAFIR-MED | flyXdrive TW-Neo – Medical Transport

Hybrid Configuration
- VTOL
- Efficient fast forward flight

Connection to U-Space Services
- Droniq HiD
- Involi tracker

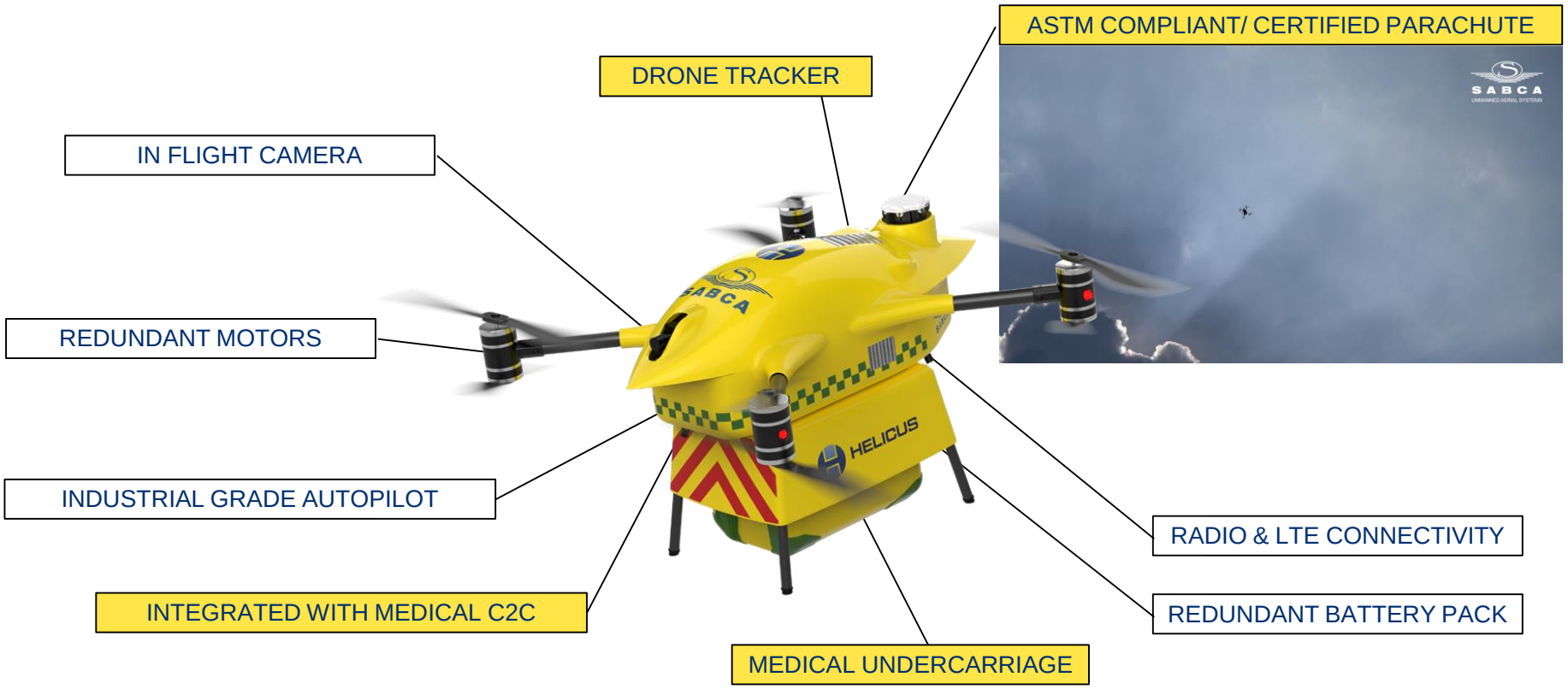
Airspace Awareness
- FLARM
- ADS-B in



Redundant communication
- Dual mobile network
- Satellite communication
- Direct data link

Highly automated flight controller
- Path controller with low deviation
- Safety functions
- Wind estimation

Interfaces to Mission Control
- flyXdrive GCS
- Mission provider (C2C)


ASTM COMPLIANT/ CERTIFIED PARACHUTE
DRONE TRACKER
IN FLIGHT CAMERA
REDUNDANT MOTORS
INDUSTRIAL GRADE AUTOPILOT
INTEGRATED WITH MEDICAL C2C
RADIO & LTE CONNECTIVITY
REDUNDANT BATTERY PACK
MEDICAL UNDERCARRIAGE
SABCA
HELICUS

Other Platforms



EHANG

TU Delft





HyFly

SAFIR Med



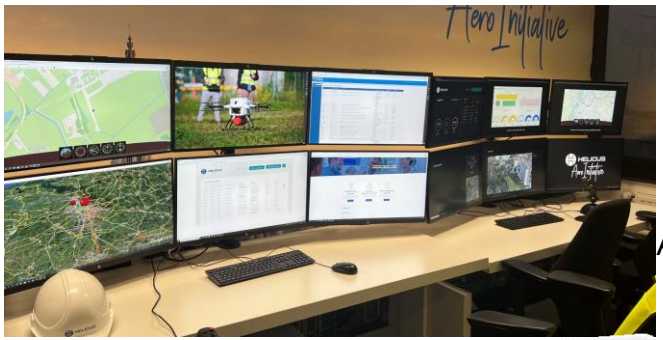
INVOLI's technology
to detect air traffic and
provide situation awareness

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Command and Control Center

Route planning and creation





Asset management (incl. UAV, DCP, payloads)

Automated flight approval





Logistical tracking

Automated pre- and post flight checks

USSP / ATC communication

Remote Pilot cockpit

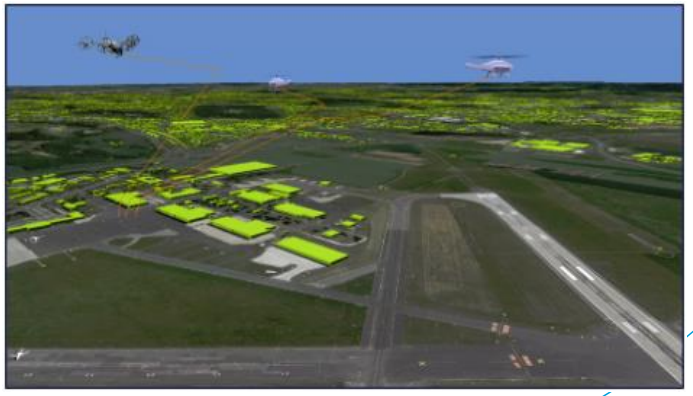
Digital twin of the real world

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Simulations

- Wide possibilities of adaptation
  - Various types of aircraft
  - Airspace and ground models
  - Simulation of services
- Rapid development of scenarios
  - Traffic generators
  - Historical replays
- Execution
  - Large-scale – thousands of simultaneous aircraft
  - Fast-time – hundreds of simulation runs
- Airspace Capacity Assessment
  - Tactical, ATM, communication, social

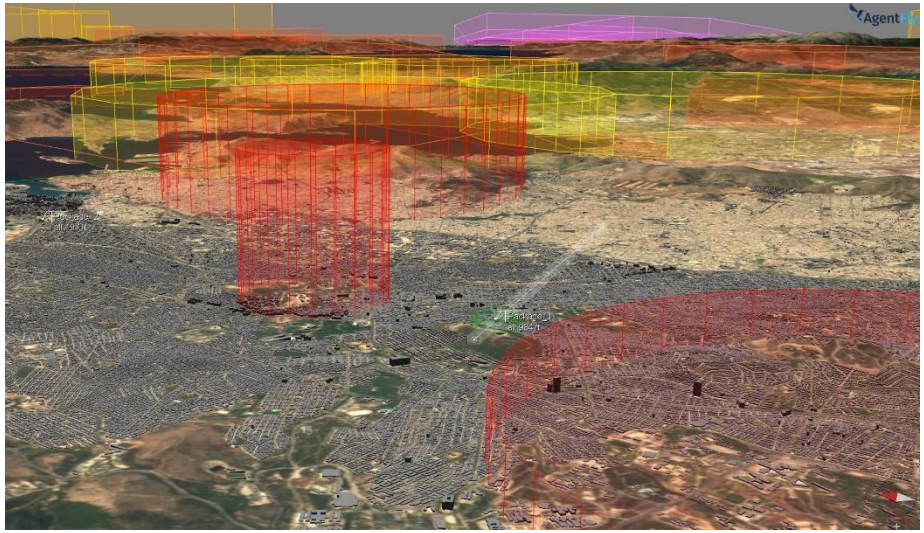


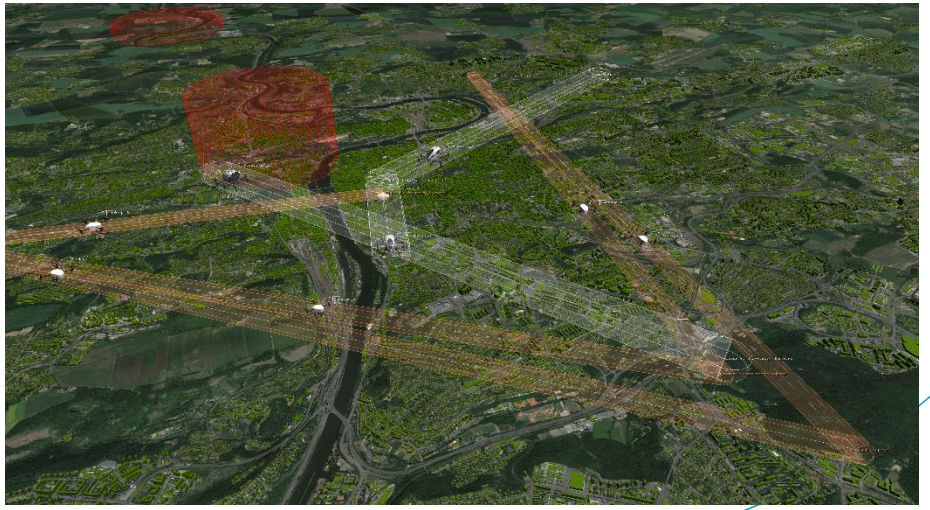


Simulations

- Simulation adaptation
  - Digital twins of aircraft
  - Digital twins of UTM services
  - Locations setup
  - Traffic generation

- Simulation locations
  - Antwerp
  - Aachen
  - Athens
  - Prague





SAFIR-Med Achievements – flights in action

3/10/2019	First urban medical flight (national legislation)	SAFIR
31/12/2020	EU Drone legislation (2019/945-947)	SAFIR Med
02/04/2021	Submission request Ops Authorisation (Registered)	
17/06/2022	Ops Authorisation obtained (Operator level)	
06-07/2022	Submission Art 13 in NL and DE	
21/07/2022	First BVLOS flight over populated Area (Antwerp)	
Last weeks	BLVOS populate flights Antwerp	
Upcoming	Flights MAHHL (Aachen and Heerlen)	
26/01/2022	U-space Service & Rapid authorisation	SAFIR Ready

The first European BVLOS flight over city



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