SAFE URBAN AIR MOBILITY FOR EUROPEAN CITIZENS

Project Overview

FINDINGS, RESULTS AND CHALLENGES

14/12/2022 Ghent - Belgium

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 101007134.

AURORA consortium

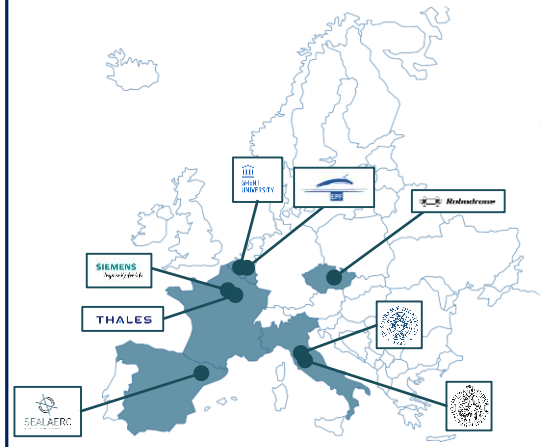
AURORA's Unmanned Aerial Vehicles

< 10 kg UAV

75 kg UAV

600 kg rotorcraft

8 partners in 5 EU states



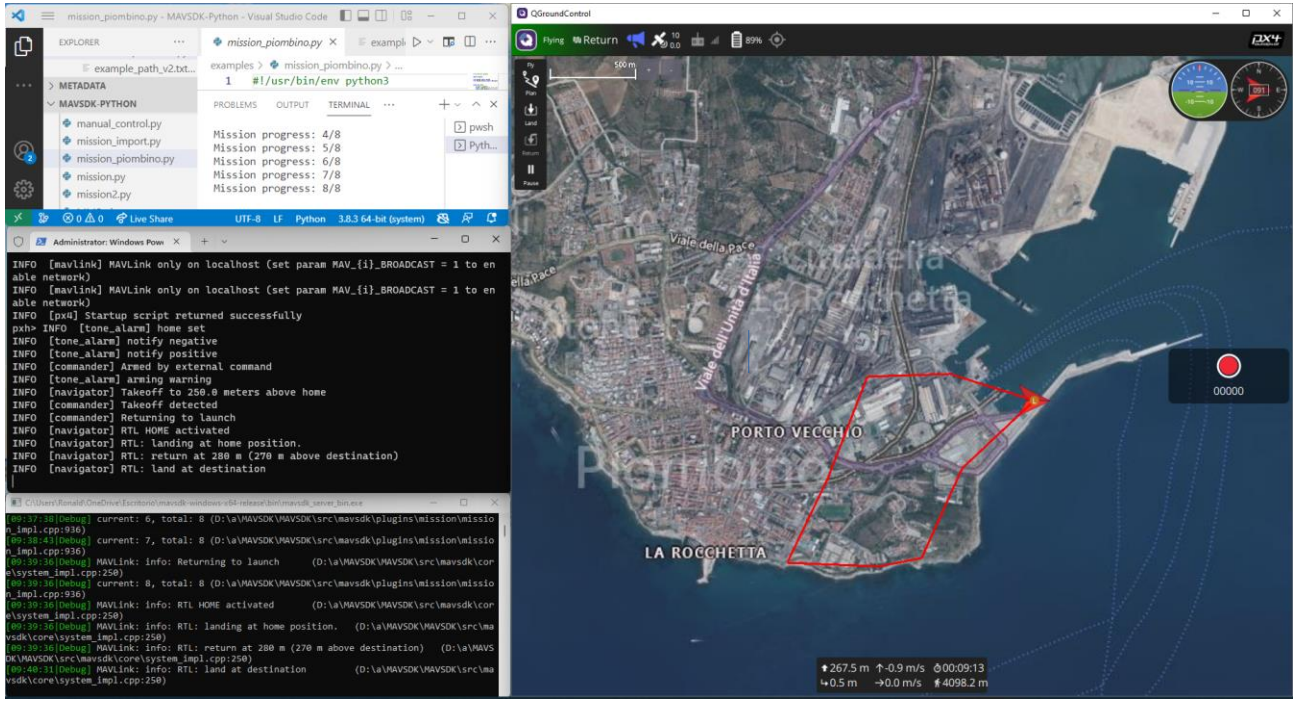
- SEAL Aero (coordinator)
- Ghent University
- European Passengers' Federation
- Thales
- University of Pisa
- University of Florence
- Robodrone
- Siemens

Starts DEC 01 2020 — Ends NOV 30 2023

Aurora demonstration and Potential locations

1. Italy (Piombino)
2. Czech republic (Brno)
3. Spain (Catalunya)
4. Virtual environment

Flight Simulation (Piombino – Italy)



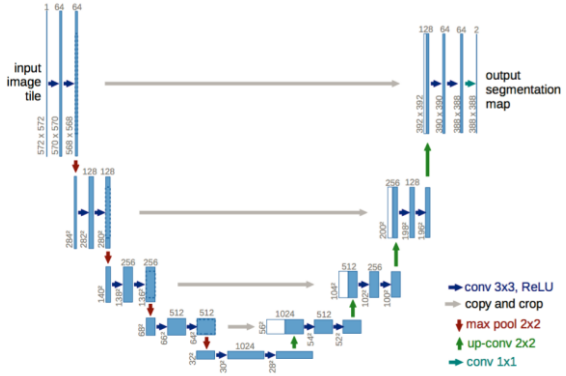
First integration of local path planner within the global path planner

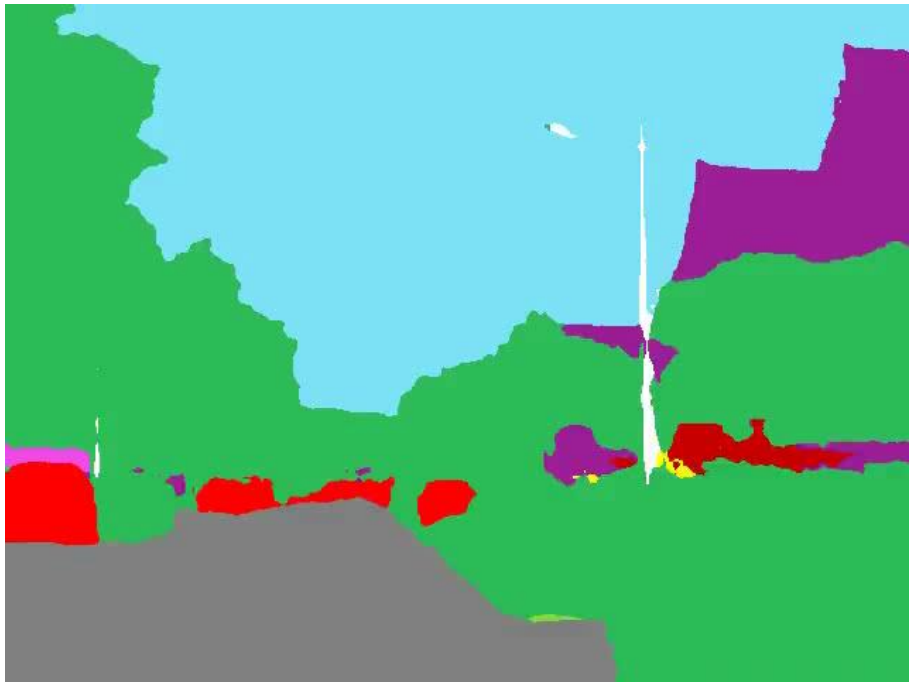
Safe autonomous guidance-navigation solution for Dynamic global flight path planning and guidance

Exchanging information among Ground Control Station And Drone

Safe landing site detection : Deep learning approach

Architecture based on Encoder/Decoder





Building (red) , Road (gray), Static car (blue), Tree (dark green), Low vegetation (green), Background clutter (black)

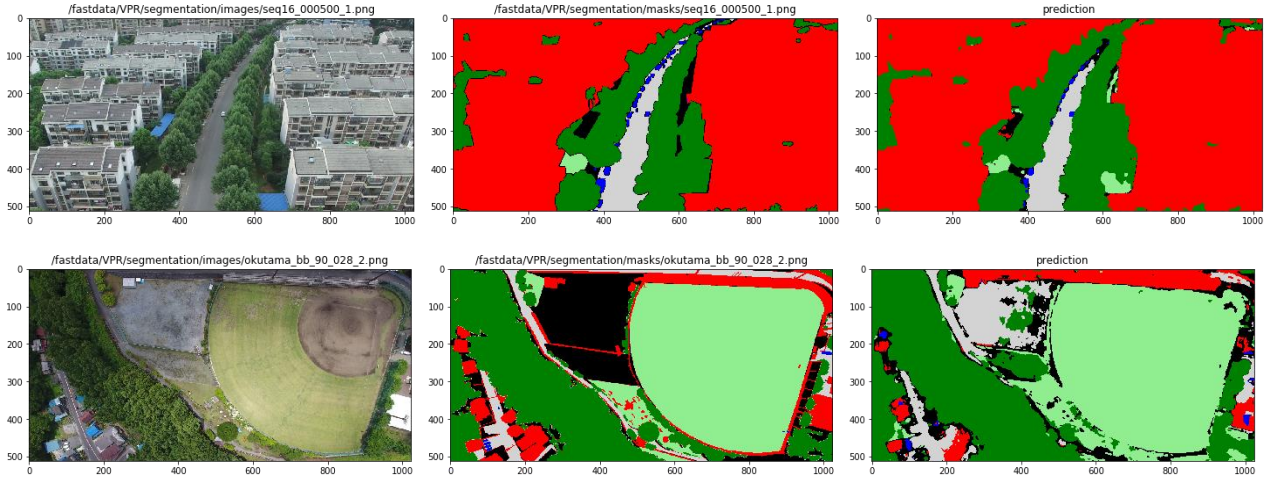
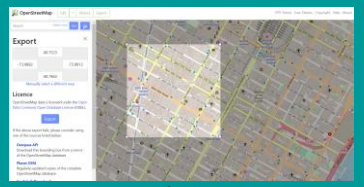


Image Ground Truth Prediction results

Safe autonomous guidance-navigation solution

Select part of a city in OSM



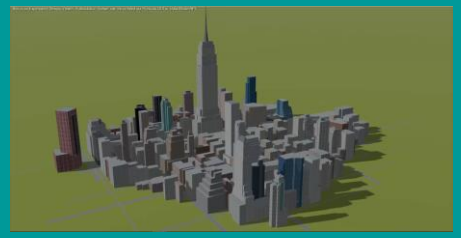
Use Blender for conversion

Use SUMO for conversion

3D buildings

Road network

Simcenter Prescan

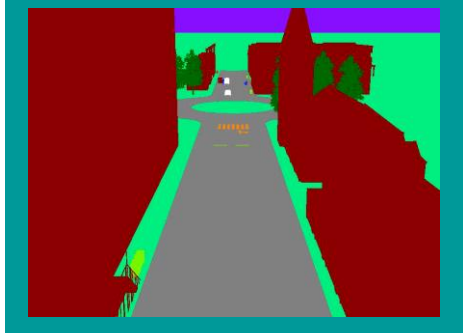


3D environment generation

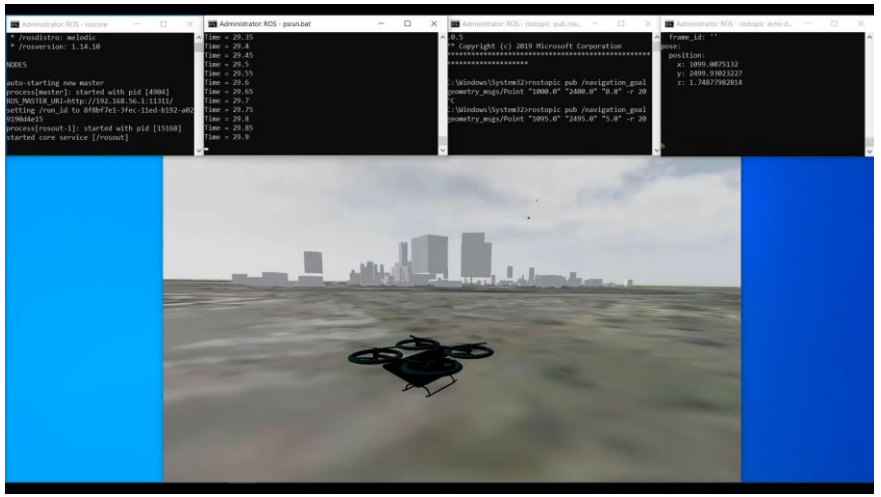
Simcenter Prescan

Image segmentation Sensor

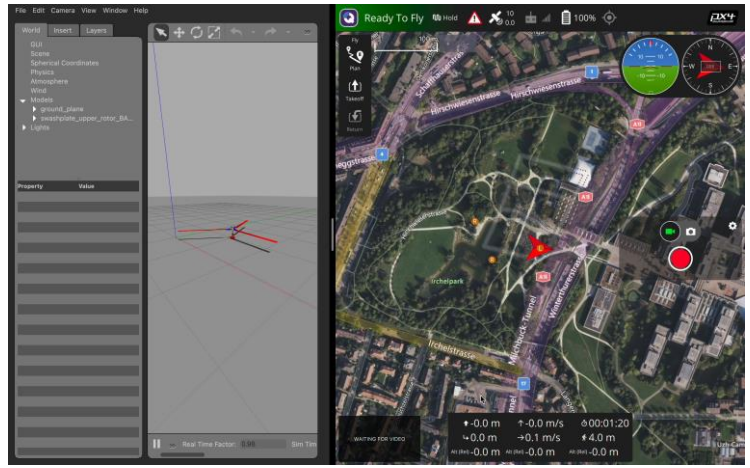
Simcenter Prescan



Synthetic environment generation for training of NN

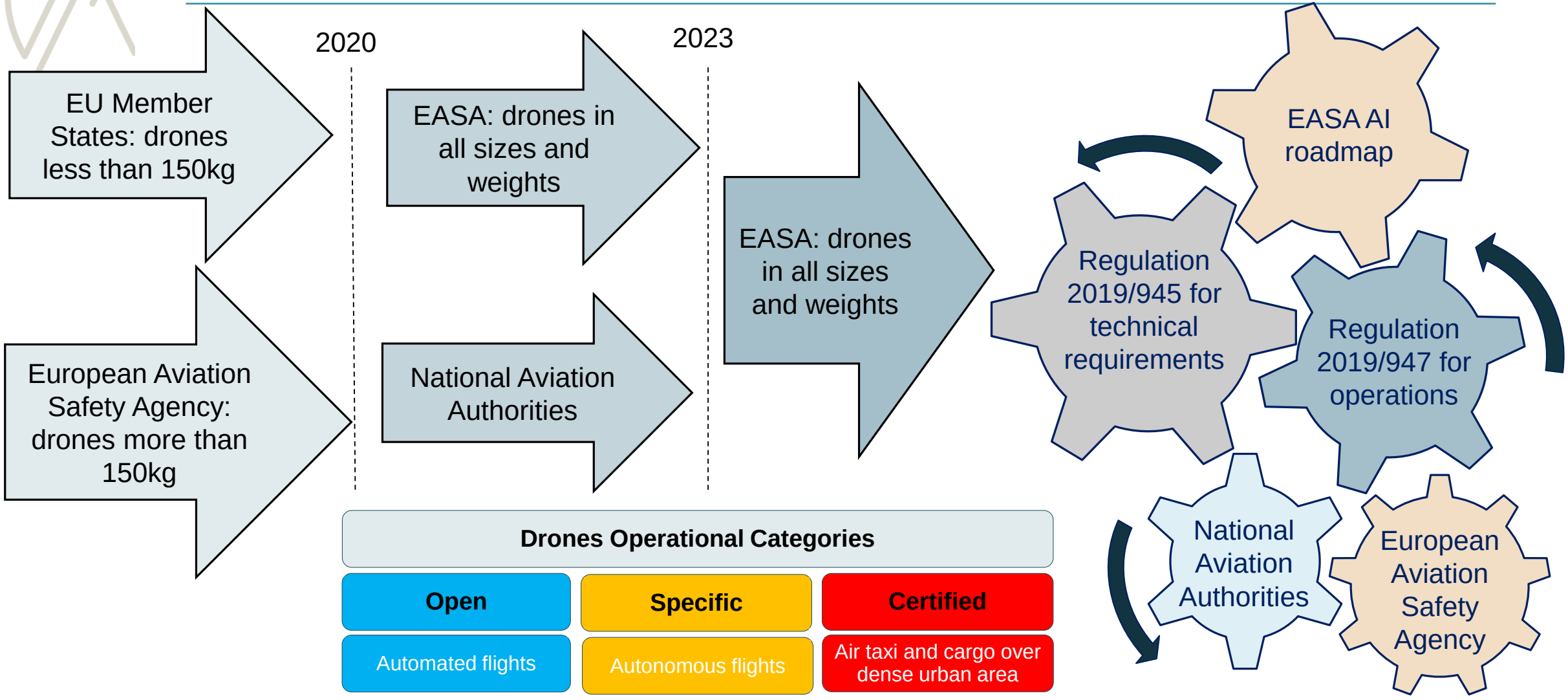


Dynamic global flight path planning and guidance



Autonomous Flight Control in Gazebo simulator

European Union Drone Regulation

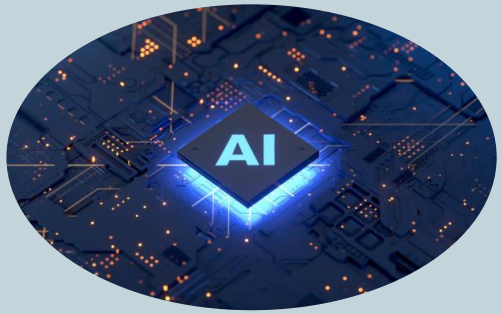


A human-centric approach to AI in aviation

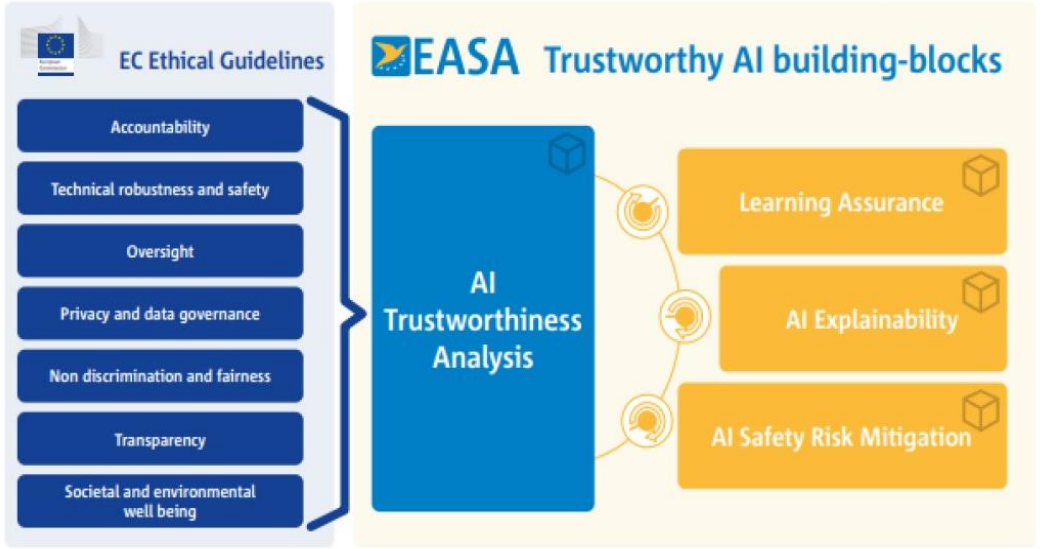
Automatic UAV

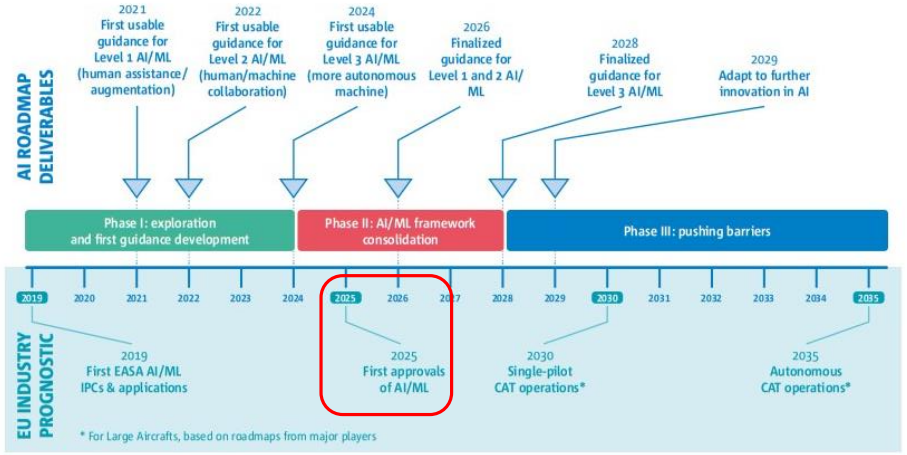
Automatic UAV flies on pre-determined routes, and the remote pilot intervenes in case of unforeseen events not programmed in pre-determined operation.

Autonomous UAV

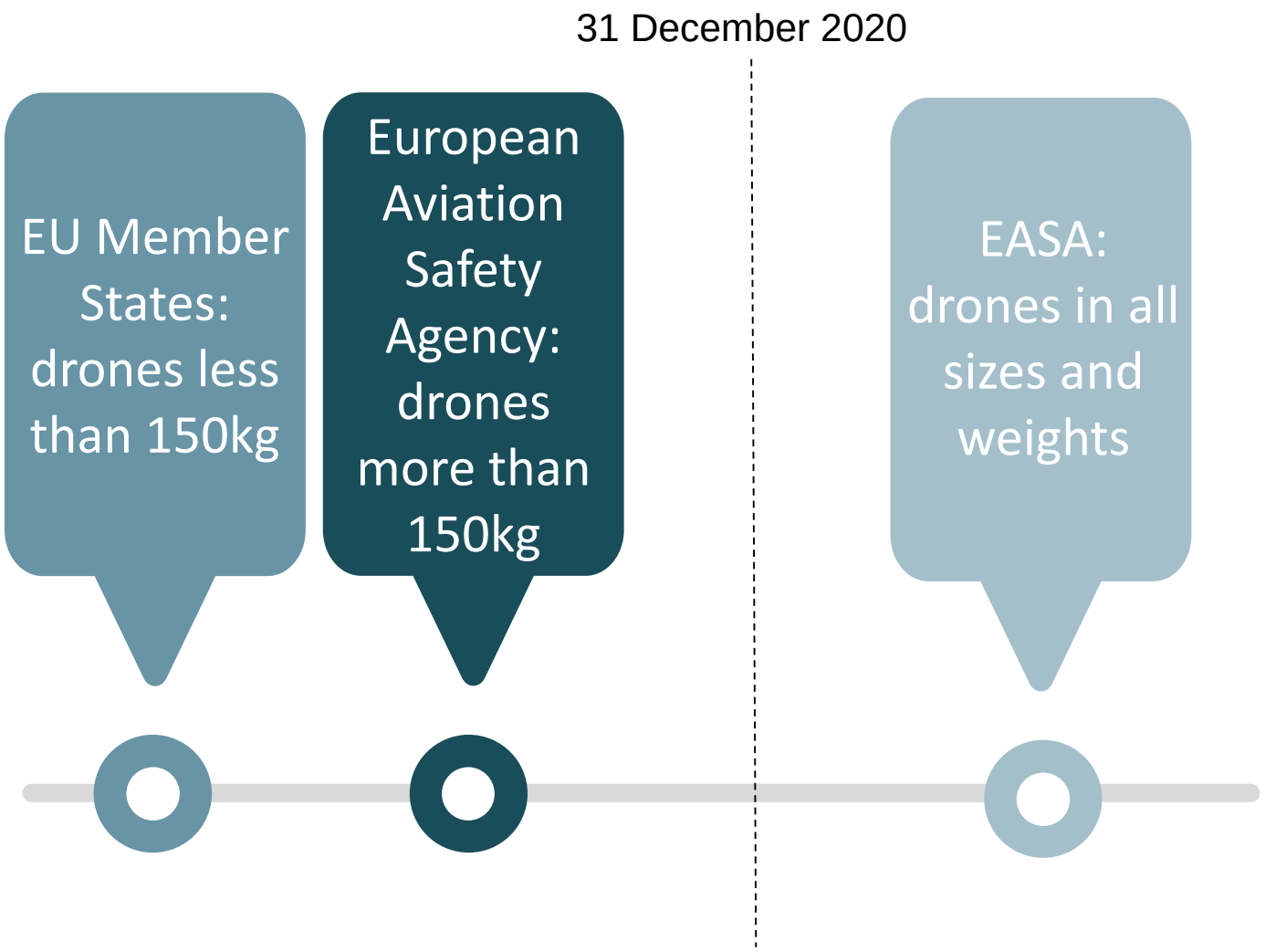


With the help of artificial intelligence, autonomous UAV must cope with unforeseen conditions and unpredictable emergencies to conduct a safe flight without the pilot's intervention.





Conclusion


31 December 2020
EU Member States: drones less than 150kg
European Aviation Safety Agency: drones more than 150kg
EASA: drones in all sizes and weights

Thank you for your attention!

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AURORA

http://aurora-uam.eu/

European Commission
Innovation and Networks Executive Agency

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