#EUSpace

Linking space to user needs

Copernicus 4 SORA

Dronedge 2024, 11th September 2024

Katerina Pena & EUSPA Market Development & Innovation Drone team

EUSPA
European Union Agency for the Space Programme

EU Space Programme 2021-2027

EU Space activities **under one umbrella**

EGNOS

EGNOS "Makes navigation signals more accurate and trustable for Safety-critical applications"

Operational in **480+ airports** & helipads in 26 countries

97% of new tractors with GNSS in Europe equipped with EGNOS

Galileo

Global satellite navigation and positioning system (GNSS)

More than **4 billion Galileo receivers worldwide**

Copernicus

Earth Observation (EO) and monitoring based on satellite & non-space data

Nr. 1 world provider of space data and information (16TB/day)

GOVSATCOM

Secure satellite communications for EU governmental actors

Rapid support over crisis areas

IRIS²

Infrastructure for Resilience, Interconnection & Security by Satellites

Sovereign multi-orbit constellation

Cutting-edge technologies focused on government service

Space Situational Awareness (SSA)

Space Surveillance and Tracking (SST)

Space Weather Events (SWE)

Near-Earth Objects (NEO)

Joining forces with institutions active in the drone ecosystem to boost the use of Space

EASA
European Aviation Safety Agency

Regulatory actions
Cooperation with DEFIS/EUSPA in place

DEFIS

Space Programmes management
EGNSS services roadmap

MOVE

Drone Strategy 2.0
Drone Regulatory framework

Joint Research Centre
JRC

European Environment Agency

ECMWF
EUROPEAN CENTRE FOR MEDIUM-RANGE WEATHER FORECASTS

Copernicus entrusted entities

sesar
JOINT UNDERTAKING

MoU ongoing with SJU: coordination on R&D



EFCA

Institutional User of RPAS
EFCA-EUSPA MoU in place

EMSA
European Maritime Safety Agency

Institutional User of RPAS
EUSPA member of the RPAS group

EUROCONTROL

Framework partnership agreement
Joint actions on adoption

NEW

EUROPEAN DEFENCE AGENCY

NEW

JARUS
Joint Authorities for Rulemaking on Unmanned Systems

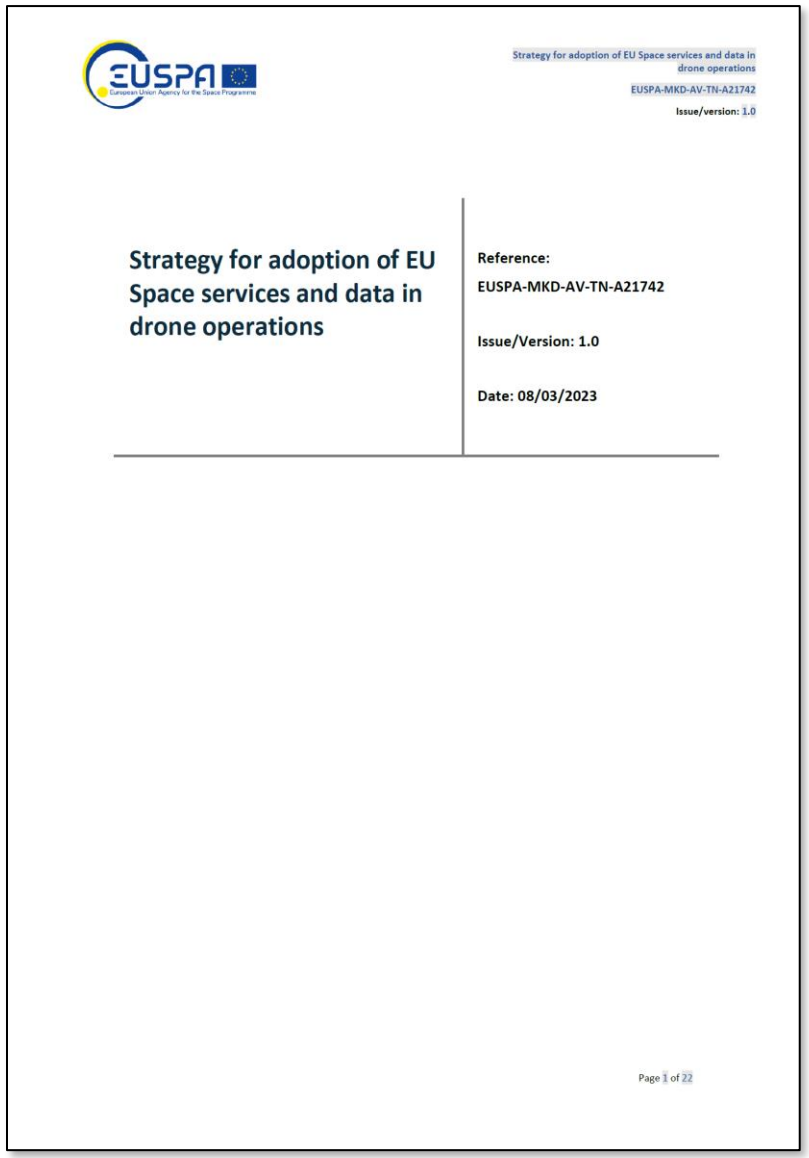
Cooperation agreement

esa

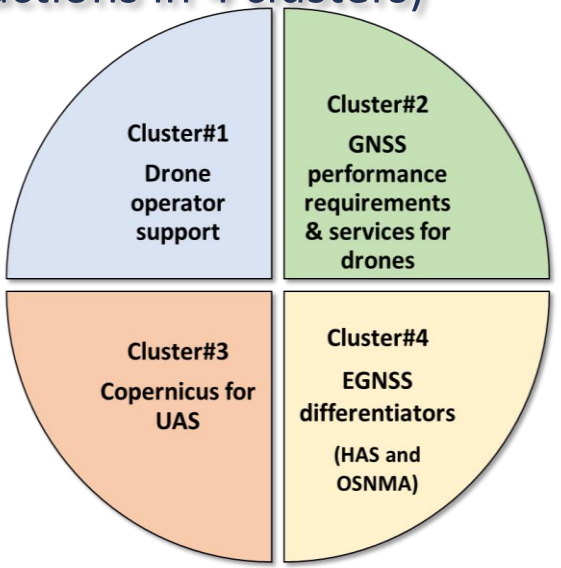
EGNSS Evolution, R&D Coordination

EUSPA AB and National experts

Strategy for adoption of EU Space services and data in drone operations endorsed by EUSPA Admin Board



- Dec 2022 – Strategy endorsed by EUSPA Admin Board in March 2023
- Activities launched in May 2023 (30 actions in 4 clusters)



- EUSPA coordination with interested entities
- Several drone workshops organized







SORA

The SORA is a methodology for the classification of the risk posed by a drone flight in the **specific category** of operations and for the identification of mitigations and of the safety objectives.

SORA Risk Evaluation and Copernicus

It is a 10 steps process starting with the description of the operation and the evaluation of **ground risk** and air risk.

Classification of the ground risk needs population density data, where **Copernicus** offers excellent contribution.



©RigiTech

SORA 2.5 accepted

JARUS Plenary Voting Members **Approved** the Publication of **JARUS SORA 2.5** in **May 2024.**

Published 18.6.2024.

EUSPA is part of WG-SRM (Safety Risk Management) and contributed in the preparation of SORA 2.5.

JARUS accepted workplan on the development of the next SORA 3.0 focused on Air Risk Assessment.

Intrinsic UAS Ground Risk Class				
Max UAS characteristics dimension	1 m / approx. 3ft	3 m / approx. 10ft	8 m / approx. 25ft	>8 m / approx. 25ft
Typical kinetic energy expected	*< 700 J (approx. 529 Ft Lb)*	*< 34 KJ (approx. 25000 Ft Lb)*	*< 1084 KJ (approx. 800000 Ft Lb)*	*> 1084 KJ (approx. 800000 Ft Lb)*
Operational scenarios				
VLOS/BVLOS over controlled ground area	1	2	3	4
VLOS in sparsely populated environment	2	3	4	5
BVLOS in sparsely populated environment	3	4	5	6
VLOS in populated environment	4	5	6	8
BVLOS in populated environment	5	6	8	10
VLOS over gathering of people	7			
BVLOS over gathering of people	8			

SORA 2.0

Table 2 – Intrinsic Ground Risk Classes (GRC) Determination

Intrinsic UAS Ground Risk Class						
Maximum UA characteristic dimension		1m / approx. 3ft	3m / approx. 10ft	8m / approx. 25ft	20m / approx. 65ft	40m / approx. 130ft
Maximum speed		*25 m/s*	*35 m/s*	*75 m/s*	*120 m/s*	*200 m/s*
Maximum iGRC population density (people/km²)	**Controlled Ground Area**	1	1	2	3	3
	< 5	2	3	4	5	6
	< 50	3	4	5	6	7
	< 500	4	5	6	7	8
	< 5,000	5	6	7	8	9
	< 50,000	6	7	8	9	10
	> 50,000	7	8	**Not part of SORA**		

- A UA weighing less than or equal to 250g and having a maximum speed less than or equal to 25 m/s is considered to have an iGRC of 1 regardless of population density.
- A UA expected to not penetrate a standard dwelling will get a -1 GRC reduction in Step 3 from the M1(A) sheltering mitigation when not overflying large open assemblies of people, see Annex B for additional details.

Table 2 - Intrinsic Ground Risk Class (GRC) determination

SORA 2.5

SORA 2.5 Regulatory package,

Annex F, chapter 3.6



Figure 17: Global Human Settlement Model Grid- DEGURBA Implementation around Paris-Widescale view

Figure 17 provides an example of the DEGURBA model applied as part of GHS-SMOD for sections of France. This snapshot is taken with a wide-scale zoom, whereas Figure 18 provides a higher-level resolution instance focused on Paris.

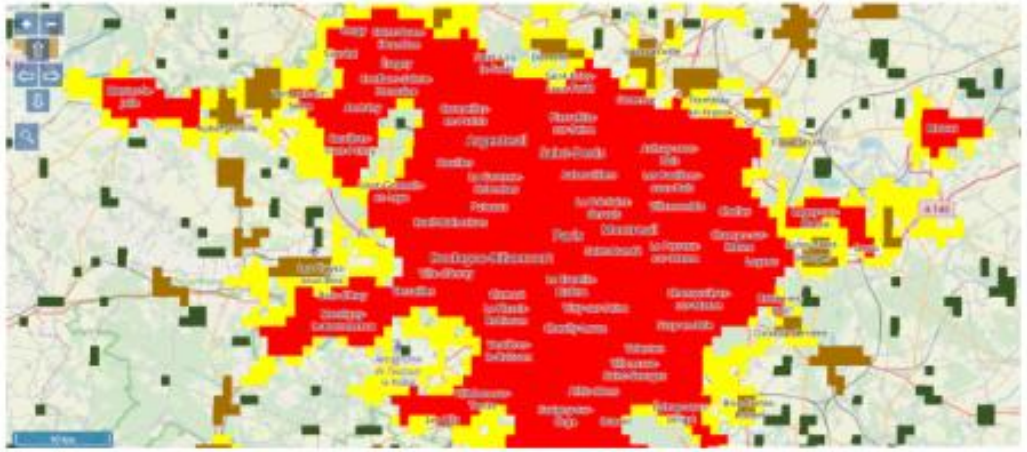


Figure 18: Global Human Settlement Model Grid- DEGURBA Implementation around Paris-Finer Resolution

EUSPA - JARUS partnership (30.5.2024)





In discussion other topics for cooperation (HAPS...)

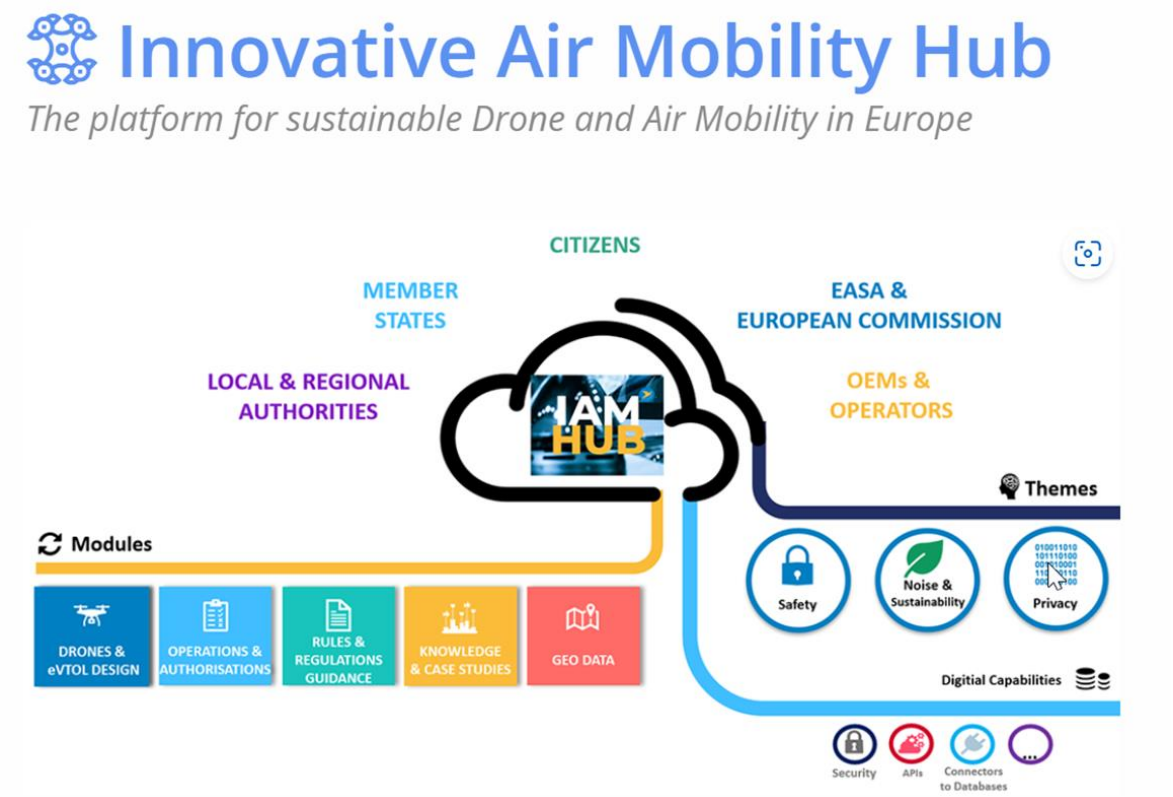
EASA Working Group Population Density

Population Density Working Groups

- **Static PD data (lead by EUSPA, support JRC)**
- Dynamic PD data (lead by EUROSTAT)

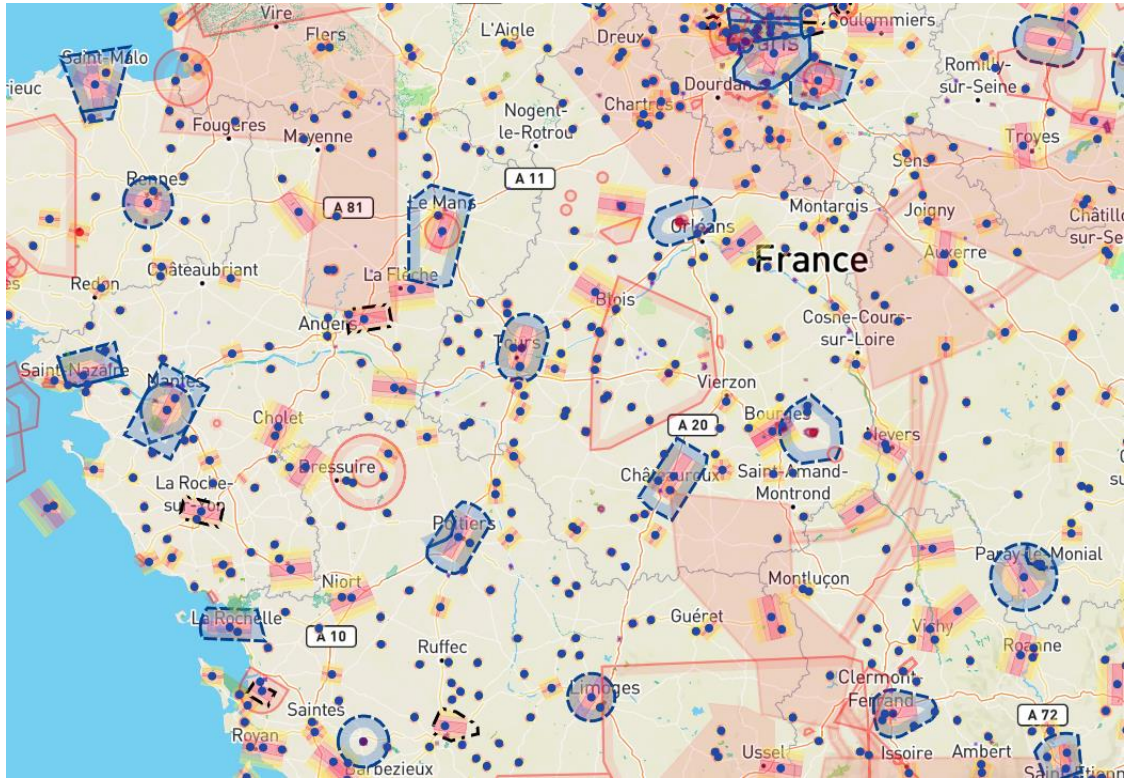
Using population density data for Ground Risk Assessment in SORA 2.5. Copernicus GHSL static data as first step, dynamic data as mitigation.

Implementation Copernicus GHSL data into Innovative Air Mobility Hub - October 2024



Copernicus GHSL for SORA demo project - 2024

- Selected **2 drone operators in two countries (Belgium and France)** to implement the Copernicus GHSL into their flight planner SW and for the preparation of SORA for their BVLOS drone delivery operations.
- 2 workshops planned with NAA's focused on the discussion about using GHSL for SORA by drone operators (also USSP) for these real operations, but also by NAA's.
- Demonstration flights planned together with assessment of GHSL in these operations based on feedback all stakeholders.



Timeline

04-12/2024

Drone operators

Helicus, Innov'ATM/Instadrone

Copernicus GHSL for SORA demo project

Planned outputs:

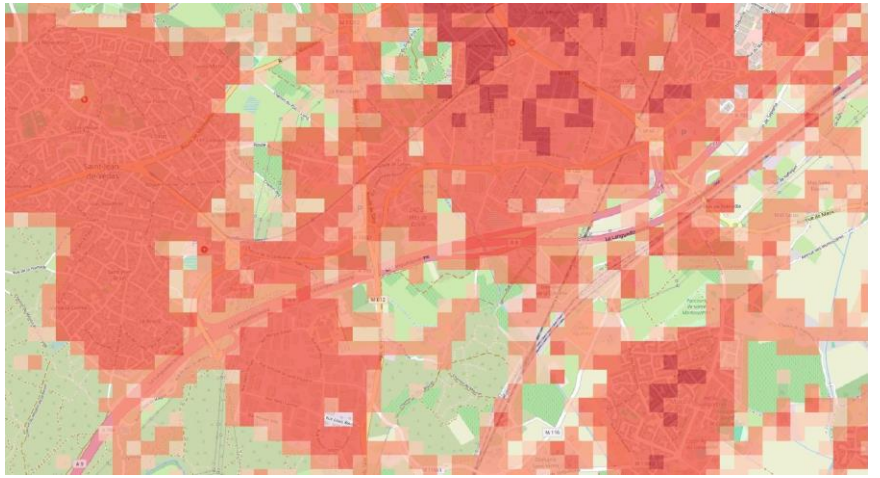
- Copernicus population density (GHSL-POP) used in SORA application&review in France and Belgium.
- Workshops and feedback from drone operators, USSP and NAA's
- Flight demonstrations
- Prototypes of tooling to view and analyse GHSL-POP in QGIS and flight planning SW (DroneKeeper)

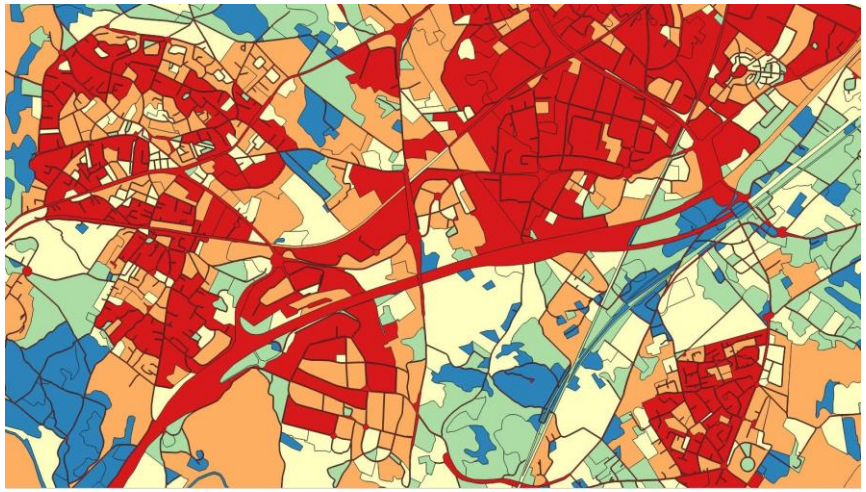
Expected outcomes:

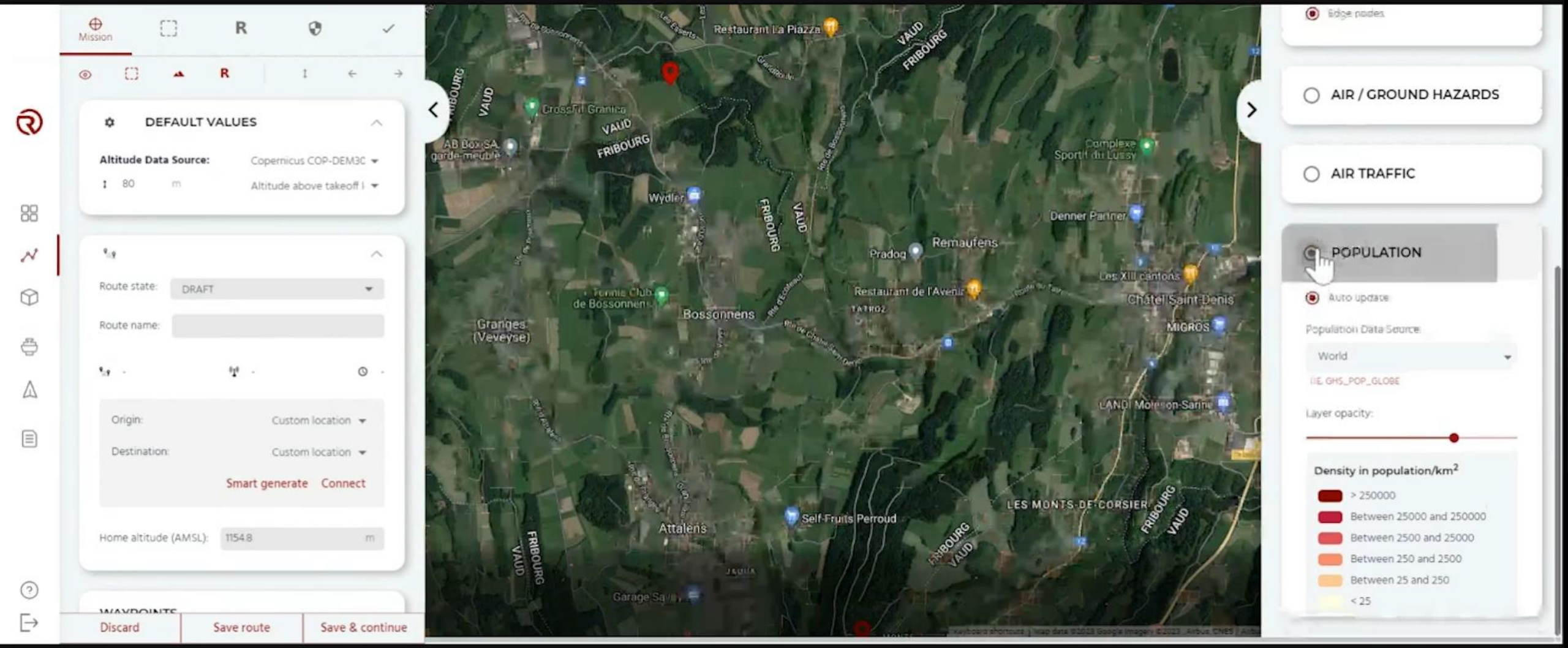
- Awareness of GHSL-POP raised in France and Belgium regulators
- Precedent of GHSL-POP as the main static population data source
- Insights on applicability of GHSL-POP and it's limits shared
- Best practice for analysis and integration of GHSL shared
- Outputs are valuable input for EASA static pop WG

Expected impact:

- Awareness, trust and evidence of fitness for purpose strengthened
- GHSL-POP recommended by NAAs across EU as the main source of static population data
- Limits of applicability of GHSL-POP understood by the community






Mission
DEFAULT VALUES
Altitude Data Source:
Copernicus COP-DEM3C
80
m
Altitude above takeoff l
Route state:
DRAFT
Route name:
Origin:
Custom location
Destination:
Custom location
Smart generate
Connect
Home altitude (AMSL):
1154.8
m
WAYPOINTS
Discard
Save route
Save & continue
Restaurant La Piazza
VAUD
FRIBOURG
CrossFit Granica
AB Box SA garde-meuble
Wydler
Denner Partner
Complexe Sportif du Lussy
Pradog
Remaufens
Les XIII cantons
Châtel-Saint-Denis
Restaurant de l'Avenir
Tennis Club de Bossonnens
Bossonnens
Granges (Veveyse)
MIGROS
Self-Fruits Perroud
Attalens
LES MONTS-DE-CORSIER
Garage Sa
AIR / GROUND HAZARDS
AIR TRAFFIC
POPULATION
Auto update
Population Data Source:
World
GHS_POP_GLOBE
Layer opacity:
Density in population/km²
> 250000
Between 25000 and 250000
Between 2500 and 25000
Between 250 and 2500
Between 25 and 250
< 25

RIGITECH

Training for drone operators

- Practical training on the integration of EGNOS and Galileo for drone operators
- Amsterdam Drone Week 2024
- Presentation available
- Preparation of video training
- Available on request



Invitation to User Consultation Platform on 8th October 2024 - SAVE THE DATE

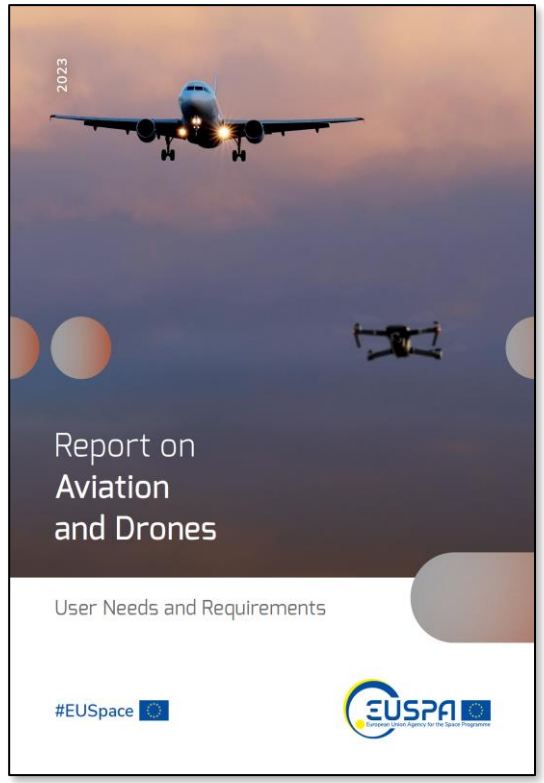
- Yearly consultation with users on needs and requirements -> bi-yearly on segment

- 8th October 2024 - consultation on Aviation & Drones segment
  - Online format
  - Agenda and registration launched on [Homepage | EUSPA UCP (euspa-ucp.eu)]



  - Outcome: Report on user needs and requirements

- Report from the last user consultation available online: [euspa.europa.eu/sites/default/files/report_on_aviation_and_drones_user_needs_and_requirements.pdf]



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Linking space to user needs

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