

Lo sviluppo dello U-Space in Italia – verso il volo autonomo

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ECARO - Egnos Civil Aviation Roadmap
Giovedì 24 Giugno 2021
Evento Webinar



Critical success keys for U-space

Obtaining the most accurate information about the UAV position and attitude anywhere in the world and in all weather conditions is a fundamental factor in unmanned aerial vehicles

Precise coordination among UAS in the air, together with individual **high precision and secure positioning** are key for the safety of the operations and therefore for U-Space

U-Space helps control, manage and integrate all RPAS in the VLL airspace to ensure the **security and efficiency** of UAS operations



Increased levels of efficiency, reliability, safety and security in RPAS operations are key enabling features to foster the European RPAS regulation and market development and their full acceptance by the European society



D-Flight

D-flight is a company of the **ENAV Group** and pursues the development and provision of services for the management of low-altitude air traffic for **remotely piloted aircraft** (U-Space) and all other types of aircraft that fall into the category Unmanned Aerial Vehicles (UAV), called Drones, and any related activities.

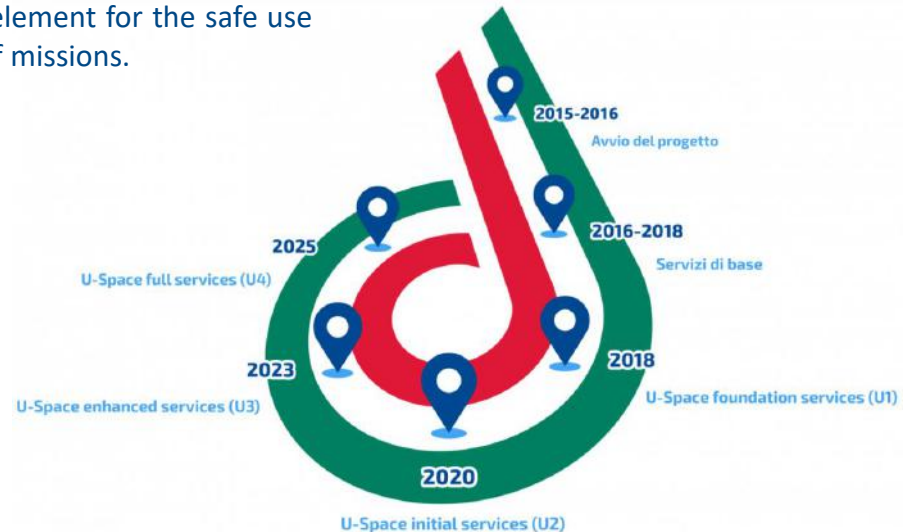
The company is owned by an industrial partner selected through a public tender procedure, consisting of **Leonardo S.p.A. and Telespazio S.p.A**



ENAV, with **d-flight**, is at the forefront for the **construction of U-Space in Italy**, the airspace below 120 meters considered as the key element for the safe use of drones in every context and for everyone the types of missions.

U-Space services evolve in parallel with the drone automation level and **guarantee** advanced forms of interaction with the environment (including manned and unmanned aircraft) through the exchange of information and digital data

In line with what has been developed and proposed by the European Commission and by Sesar JU with the **U-SPACE Blueprint document**

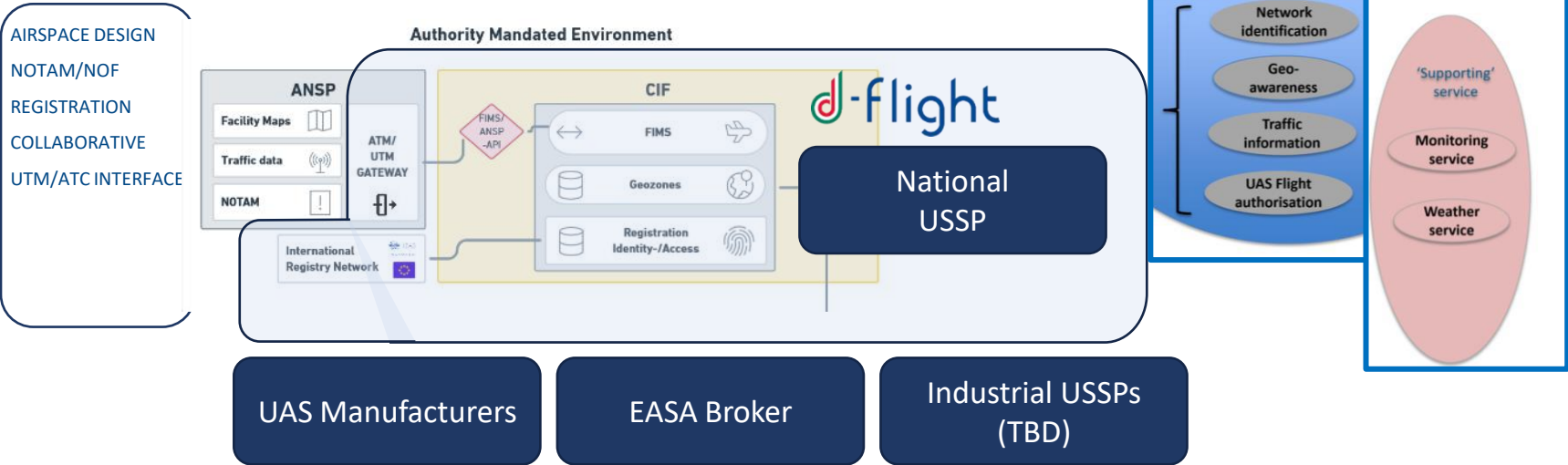


D-flight is the Italian U-Space Service Provider

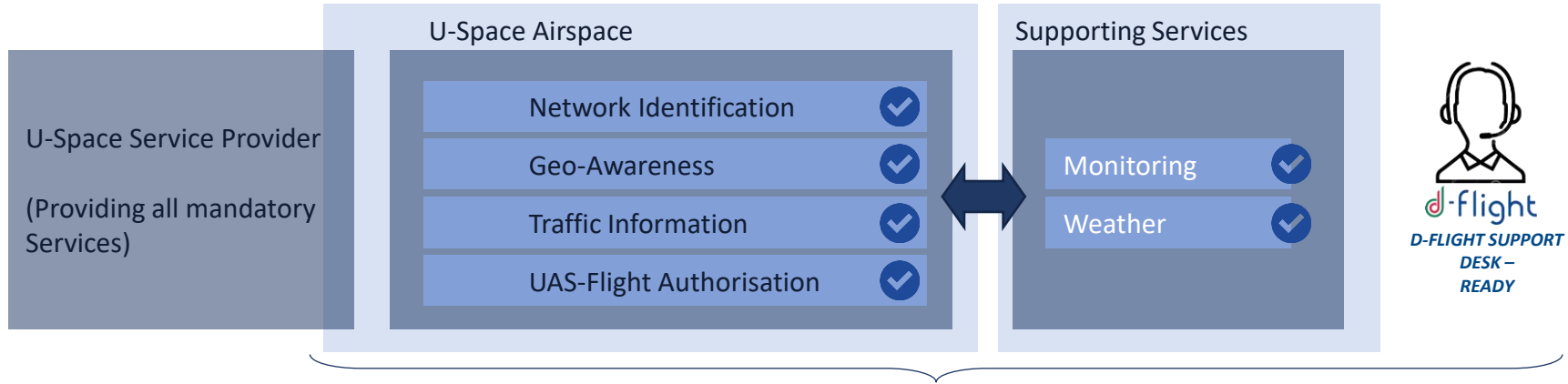
On behalf of the Member State, through National CAA, having regard to the obligations of EU 2019/947 (specifically art. 14 and 15):

- National Registry of UAS Operators and its interoperability with EASA broker
- Presenting UAS Zones

UAS Operators



D-flight U-Space Service Provider



Strategic Deconfliction:

- Drone Operation Area (DOA) per Open Cat./No ATM-09 - READY
- Drone Operation Plan (DOP) per Specific Cat. /ATM-09 - READY
- DOA/DOP Activation/Deactivation & Tracking - READY
- DOP Validation and submission for Approval/Authorisation – Q1 2021

Situation Awareness & Traffic Picture - READY

Conformance Monitoring – Q2 2021

Alerting – Q2 2021

Recording & Playback – Q3 2021



Networking e-identification

- ICD compliant with standard (draft) EUROCAE ED-282
- for distribution - READY
- Track simulator - READY
- Mobile device Apps and Web-App Tracker - READY

Critical success keys for U-space

U-space relies on existing, new and future infrastructures & technologies

Technical Capability Levels (TCL)



TCL 1

- Remote Population
- Low Traffic Density
- Rural Applications
- Multiple VLOS Operations
- Notification-based Operations

TCL 2

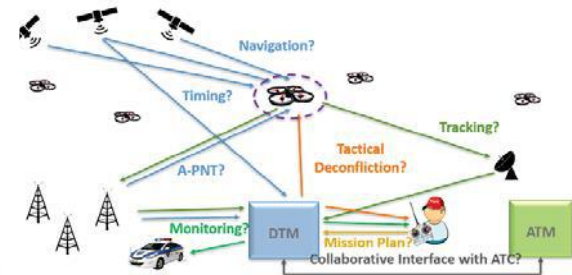
- Sparse Population
- Low-Mod Traffic Density
- Rural / Industrial
- Applications
- Multiple BVLOS Operations
- Tracking and Operational Procedures

TCL 3

- Moderate Population
- Moderate Traffic Density
- Suburban Applications
- Mixed Operations
- Vehicle to Vehicle Communication
- Public Safety Operations

TCL 4

- Dense Population
- High Traffic Density
- Urban Applications
- Dense BVLOS Operations
- Large Scale Contingency Management



Source: "Terra" – an applied research project co-funded by SESAR

- Communication system is required for the tracking of drones, data and instruction transfer between drones, operators and UAS service supplier, and also vehicle-to-vehicle communication among advanced UAVs and manned aviation

Communication System Provider



Source: Global UAS Traffic Management (UTM) System Market, BisResearch, 2019

Precise Positioning In RPAS Operations

According to the 2019 GSA's GNSS Market Report survey, almost **50%** of **drone users** expect a **horizontal accuracy** of below **10 cm** and **38%** a **vertical accuracy** of below **10cm**. This increased performance is **critical** for multiple drone applications and is not achievable without any GNSS signal augmentation.

- **GNSS** has become a **'must have'** for drone operators for high accuracy positioning in many applications in particular in outdoor environments and also to be compliant with Regulations (tracking, monitoring, geo-awareness/geo-tagging to avoid obstacles or no fly zones)



	Precision Farming		Infrastructure monitoring		Goods delivery		Buildings inspection	
5G POSITIONING SERVICE ACCURACY (5G Positioning Service Level 2-7), ≈99% service availability	H 0,2-1m	V 2m	H 1-3m	V 0,2-3m	H 0.2m	V 0,2m	H 0,2-3m	V 2m

Need of Cooperative PNT solutions for below 10cm pos. accuracy



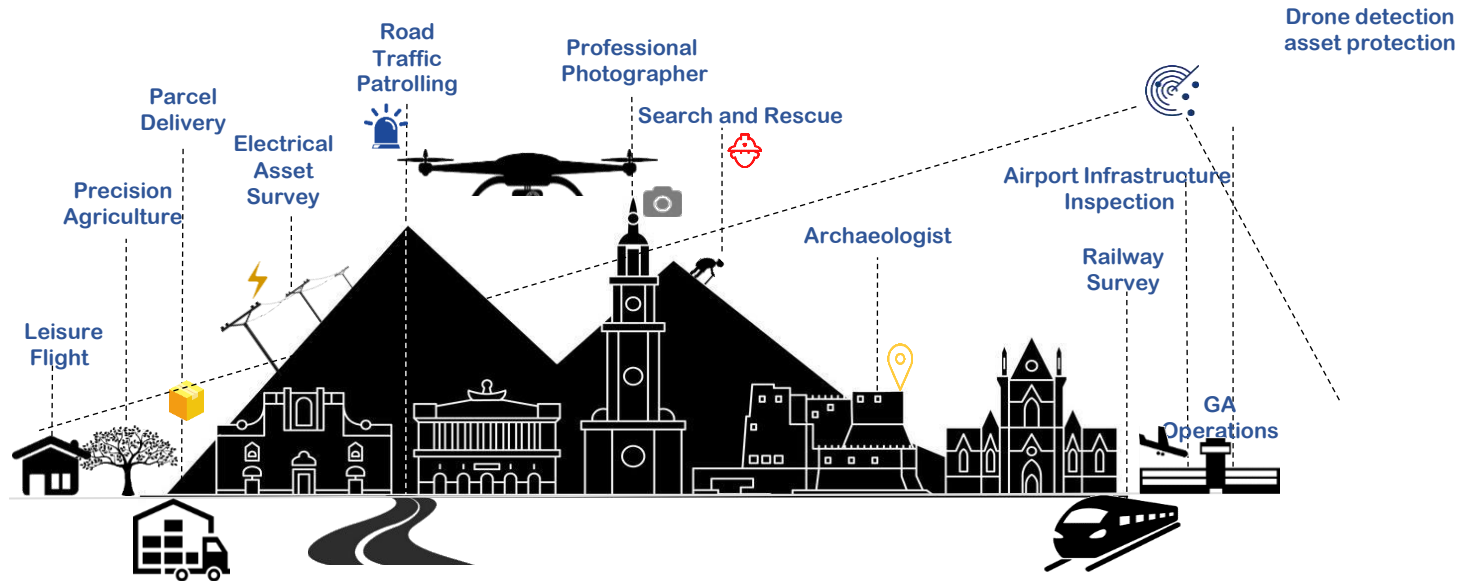
The **urban environment** and the safety-based drone operations can **pose various challenges** to the reception/performances of GNSS signals



What we have done and what we are doing...

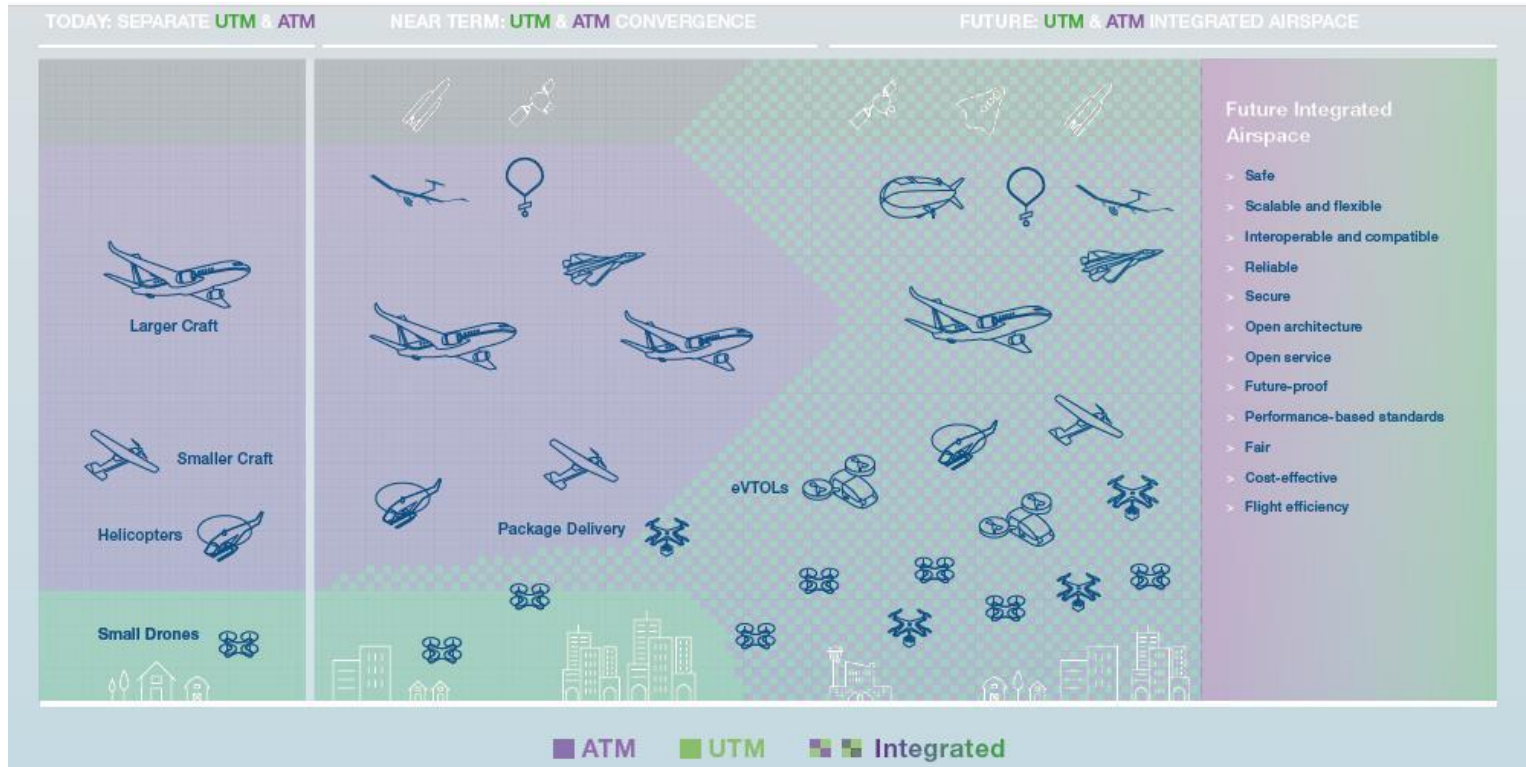
D-Flight has collaborated and is collaborating with various players to evaluate the possible development and efficiency opportunities arising from the use of Drones in different contexts and sectors.

We have demonstrated through the platform, how the implementation of D-flight services ensures a safe flow of drones pursuing specific commercial or recreational purposes, fully integrated with manned aviation and in all types of environments.



Evolution of the ATM vs UTM service

ENAV's investment in D-Flight represents an opportunity to ensure both an efficient management of the integration path envisaged between the ATM sector and the UTM sector and for the provision of all the new services characterizing this sector.





THANKS FOR YOUR ATTENTION

CORPORATE PRESENTATION

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