

U-SPACE

UAV INTEGRATION IN CONTROLLED AIRSPACES
CHALLENGES AND EVOLUTIONS FOR AIR NAVIGATION SERVICE PROVIDERS

BCDC & ID2MOVE WORKSHOP

04th of October 2022

member of FABEC

skeyes nice to
guide
you

Current situation for skeyes (Air Navigation Service Provider)

❖ Regulatory environment

- EU Regulation 2019/945 of 12th March 2019 on UAS systems and 3rd country operators of UAS
- EU Regulation 2019/947 of 24th May 2019 on the rules and procedures for the operation of unmanned aircraft

❖ Air Navigation Service Provider (ANSP)

- Provides Air traffic control services to manned aircraft within controlled airspaces, especially within CTRs managed by skeyes
- Provides Air information service, on demand, to manned aircraft within uncontrolled airspaces

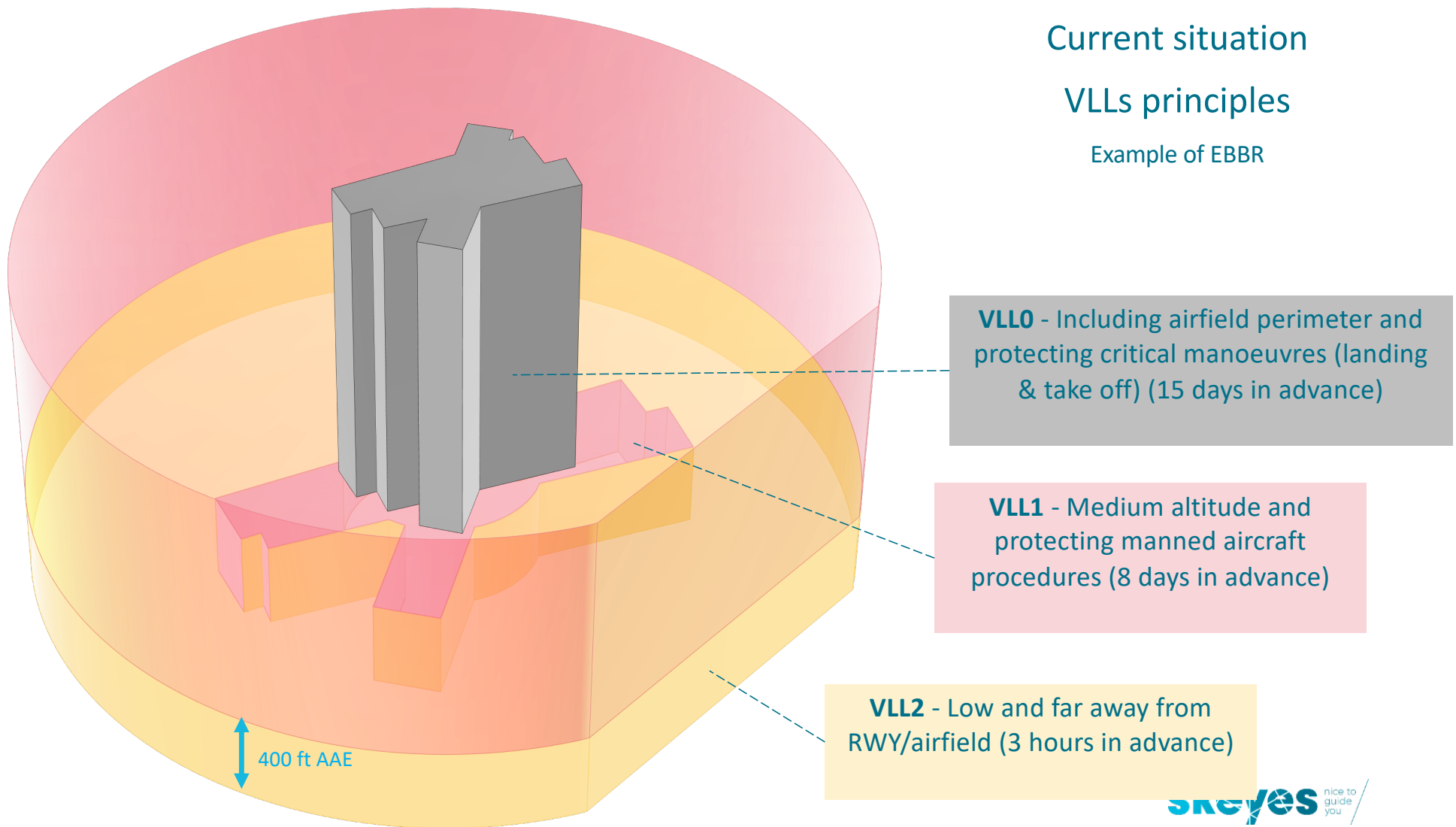
❖ Handling drones in CTRs managed by skeyes and EBKT RMZ

- No services provided to drones, but segregation of activities with manned aviation
- Concept of operations with drones based on establishment of UAS geographical zones - VLLs. In short, rules are :
 - ✓ No drones in the vicinity of the airport or in RWY axis extensions (VLL0 & 1), except if requested sufficiently in advance for coordination and authorisation by the authorities concerned
 - ✓ No drones above 400 ft AAE (VLL0 & 1), except if requested sufficiently in advance for coordination and authorisation by the authorities concerned
 - ✓ Otherwise (VLL2), planification 3 hours in advance and authorised by default, except if cancelled by ATCOs when deem necessary. ATCOs on working position can see drone's area of operation, not the drone

Current situation

VLLs principles

Example of EBBR



2022

TOTAL OPS (8months) :6958

OPEN category : 4663

SPECIFIC category : 2290

REGION	ALL	specific	open
EBAW	2226	821	1405
EBBR	2654	844	1810
EBCI	452	156	296
EBKT	241	97	139
EBLG	871	245	626
EBOS	514	127	387
Total	6958	2290	4663

2021

TOTAL OPS (8months) : 6961

OPEN category : 5215

SPECIFIC category : 1747

REGION	ALL	specific	open
EBAW	2193	456	1738
EBBR	2593	751	1842
EBCI	461	142	319
EBKT	412	116	296
EBLG	505	125	380
EBOS	797	157	640
Total	6961	1747	5215

Challenges & evolutions to integrate drone operations

Challenges, current situation

❖ Handling numerous and complex UAS operations at the same location and time

- Avoiding risk of collision is the responsibility of drone pilot, in conformity with EU REG 2019/947. Harder to achieve !
- No services (help) provided to unmanned aircraft to be compliant with the obligation aforementioned

❖ Integration of BVLOS flights

- In compliance with EU REG 2019/947, UAS shall be able to avoid any risk of collision with other aircraft
- But, no “certified” technology available yet to fulfil this obligation
- BVLOS flights are considered as “special operations”, therefore, performed within segregated airspace → huge impact for other airspace users

Challenges & solutions to integrate drone operations

Evolutions, future situation → U-space airspaces

❖ Implementation of a new concept

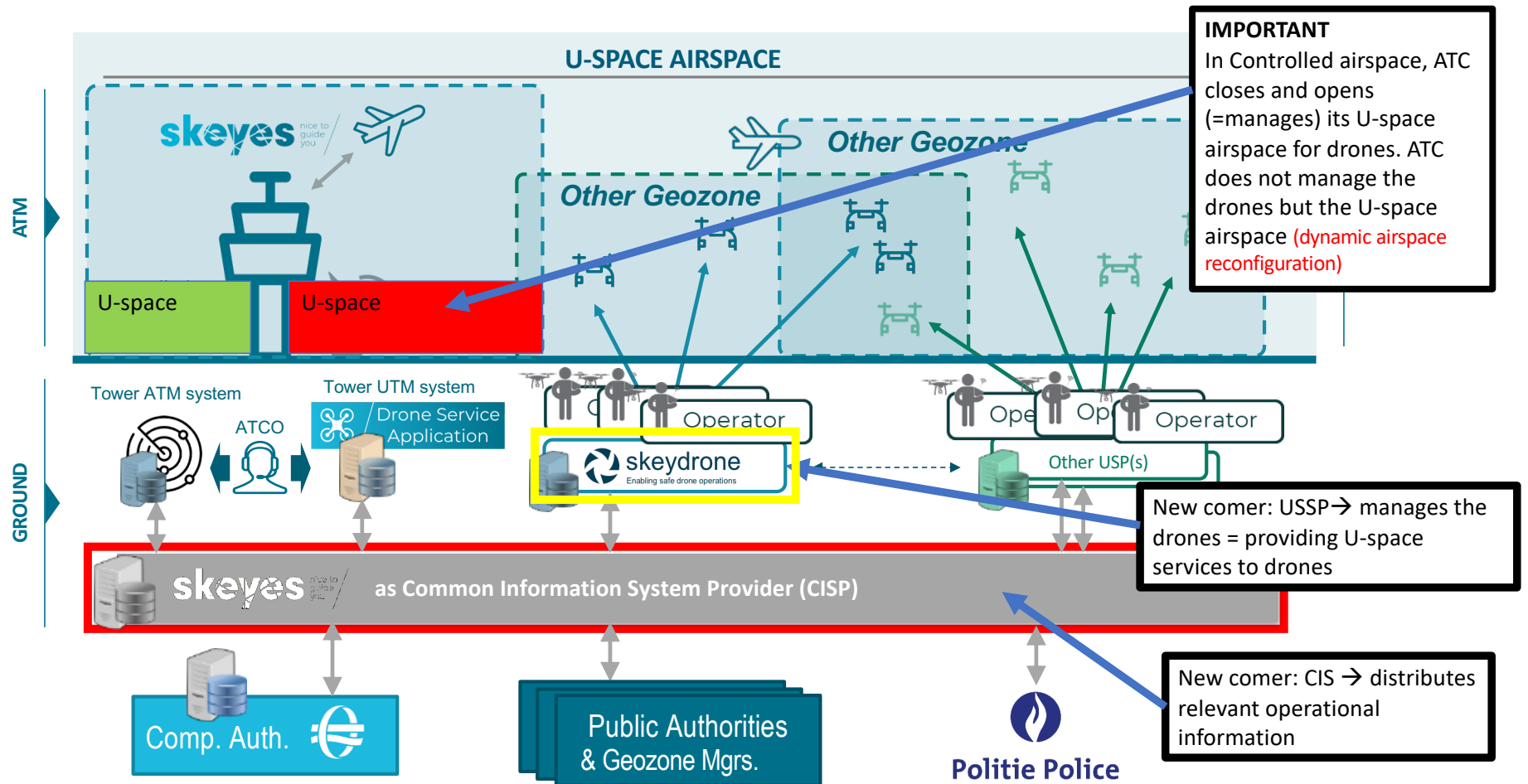
- For safe integration of UAS into the aviation system, including BVLOS UAS flights
- Introduction of additional requirements in order to ensure safety of operations for all users
- New obligations for existing stakeholders (e.g. UAS operators, ANSPs), but also for new comers (USSP, CISP)

❖ New regulations applicable from 26th of January 2023

- EU Regulation 2021/664 on a regulatory framework for the U-space
 - ✓ Defining U-space airspace concept. Based on risk assessment, the State should designate a UAS geographical zone as U-space airspace
 - ✓ Defining the tasks performed by USSP and CISP
- EU Regulation 2021/665 amending EU reg 2017/373
 - ✓ Introducing new obligations for ANSPs to ensure safe drone operations within controlled airspaces (distribution of traffic information data, dynamic U-space airspace reconfiguration)
- EU Regulation 2021/666 amending EU reg 923/2012
 - ✓ Creating new obligations for manned aircraft to be conspicuous when accessing to U-space airspace established in uncontrolled airspace

Future

U-space landscape



U-space implementation : respective roles of ANSPs & USSPs

❖ **Skeyes will be ANSP for manned aircraft *and* will be Airspace manager**

- Providing clearances to manned aircraft avoiding **areas within the designated U-space where UAS operations can take place**
- Defining and sharing the **areas within the designated U-space where UAS operations can take place** (Dynamic U-space airspace reconfiguration)
- No services provided to drones, but segregation of activities with manned aviation via segregation of airspace

❖ **USSP will provide U-space services to UAS within U-space airspace**

- **UAS flight authorisation service** : accept flight authorisation request if the flight is
 - ✓ free of intersection with other UAS flights
 - ✓ free of any airspace constraints and temporary airspace limitations (Dynamic U-space airspace reconfiguration)
- **Network identification, Geo-awareness, traffic information services**, supporting the UAS flight authorisation service
- **Weather information, conformance and monitoring services**, as additional services that can be imposed by competent authority when creating the U-space airspace

→ No UAS flight authorisation will be validated in areas within the designated U-space where UAS operations **can't** take place

U-space implementation :

New function for ANSP in controlled airspace

- ❖ U-space concept based on segregation of airspace between drones and manned aircraft
- ❖ Dynamic U-space airspace reconfiguration
 - *EU reg 2021/664 : It means the temporary modification of the U-space airspace in order to accommodate short-term changes traffic demand, by adjusting the geographical limits of that U-space airspace*
 - *EU reg 2021/665 (modifying EU reg 2017/373) : temporarily limit the area within the designated U-space where UAS operations can take place in order to accommodate short-term changes in manned traffic demand by adjusting the lateral and vertical limits of the U-space airspace*
- ❖ Operational procedures to fulfil this new function
 - Need time to change the structure of U-space airspace, however it will be as dynamic as possible (AMC/GM suggest 10 to 15 minutes)
 - When dynamically changed, necessity to share this new structure in a timely manner and consolidated way with all parties concerned, **through USSPs**
 - Supported by new tools developed with **high level of automation**

U-space implementation : a smooth transition will be needed

Current vision

❖ **More a drone is close to the airfield, more critical is the risk against manned aviation**

- VLLs concept remains consistent
- Thus, no need to change the Ministerial Decree about Geozones

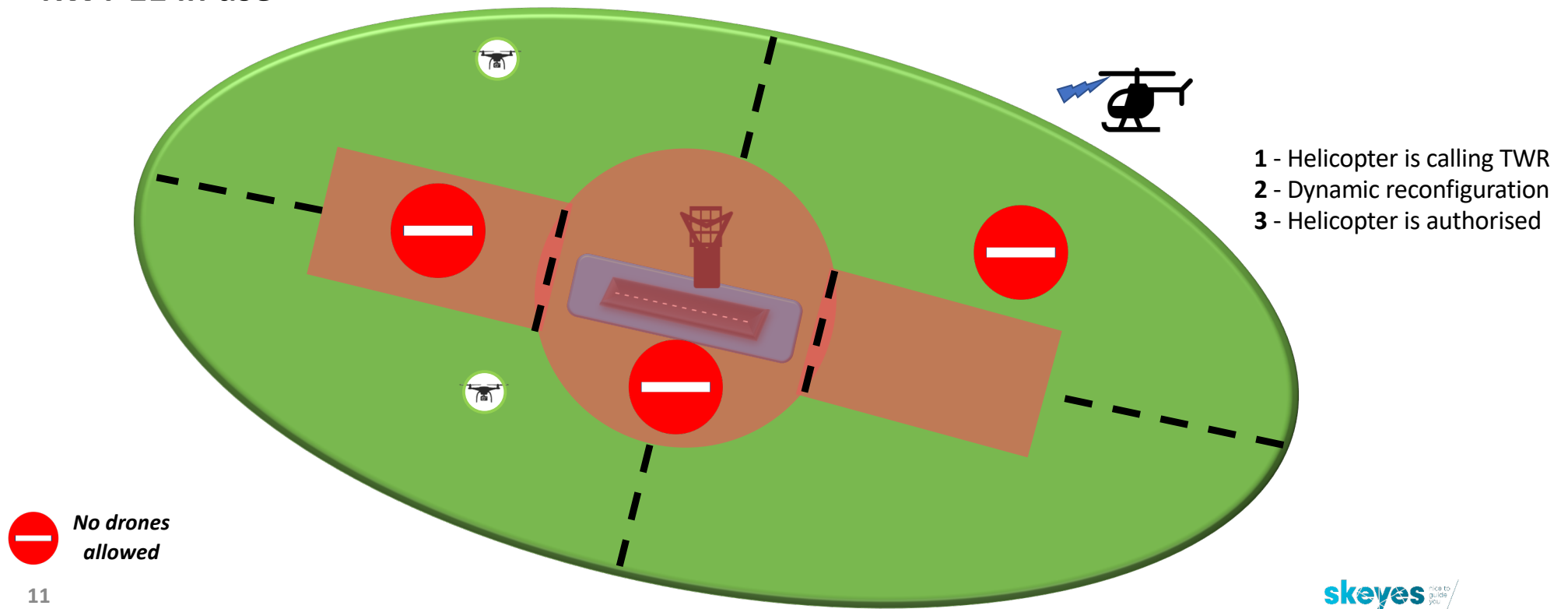
❖ **Designation of U-space airspace based on current VLLs**

- U-space concept, especially Dynamic U-space airspace reconfiguration, applicable from ground to 400ft AAE. Above 400ft AAE, coordination currently required will likely remain → *to be confirmed*.
- Subdivision of U-space airspace to define areas where UAS operations can take place, should be simple and based on well known limits of current VLLs → *at least, at the beginning*

U-space : dynamic reconfiguration of airspace (basic illustration)

Fictitious airport
RWY 11 in use

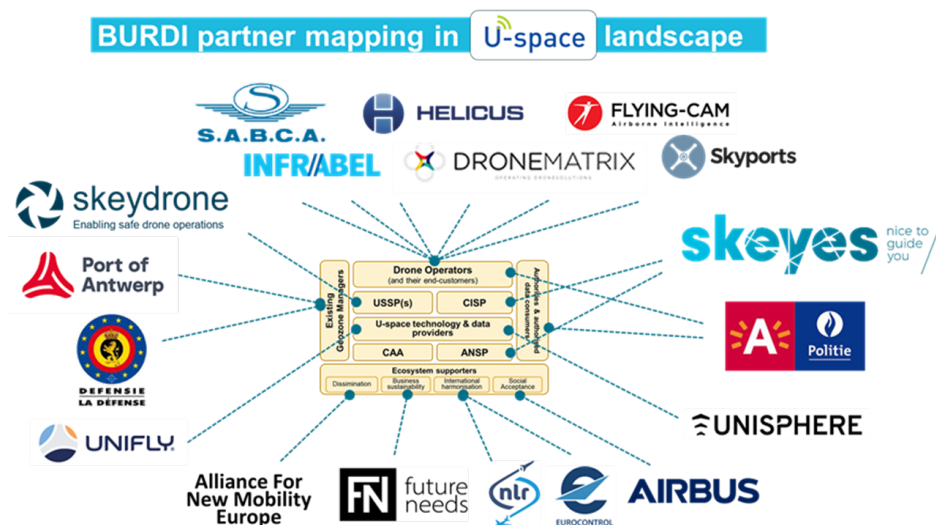
U-space airspace from ground to 400 ft AAE



U-space implementation : Way forward for skeyes

❖ BURDI Project

- EU project, coordinated by skeyes
- 18 partners (see the map below)
- Duration : November 2022 to July 2025
- Objective : validation of envisaged solutions (vision) and U-space airspaces implementation



ADVISORY BOARD

- ASTM
- BCAA (BE CAA)
- City of Antwerp
- FFACM, Walloon General Leisure Aviation
- IL&T (NL CAA)
- Proximus
- VIVES University of Applied Sciences
- VVMV, Flemish General Leisure Aviation

Q & A?

member of FABEC

skeyes nice to
guide
you