

ECHO ConOps

HAPS Operations

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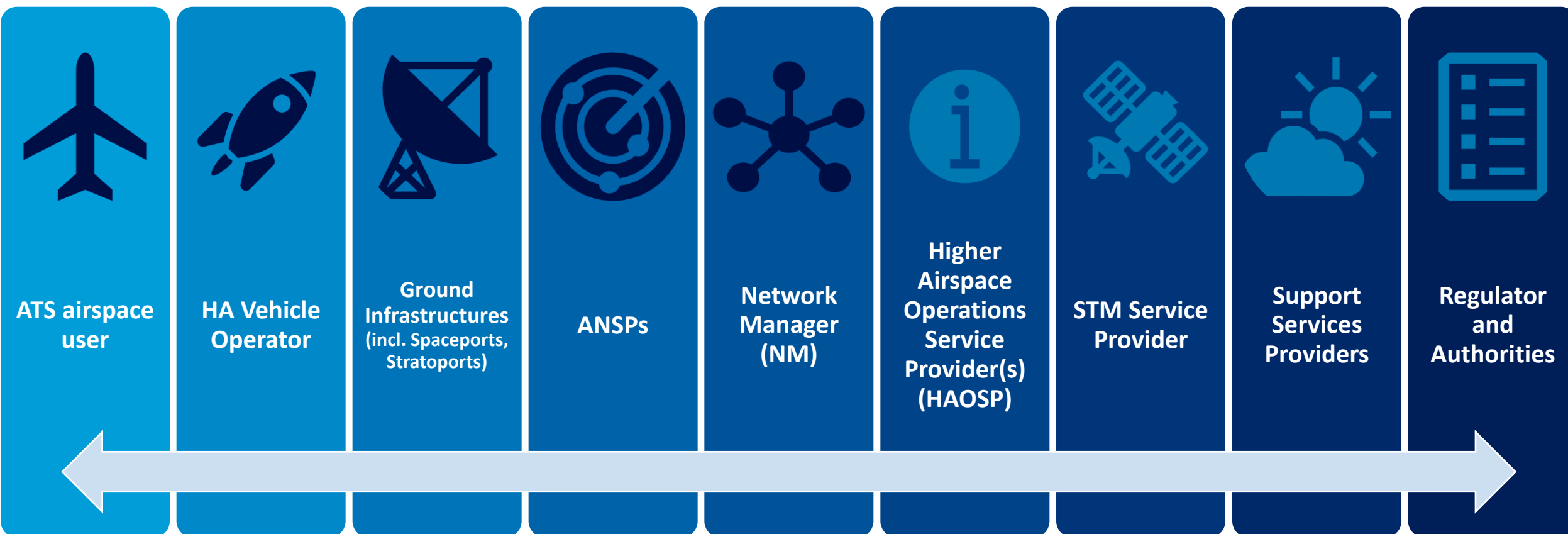
ECHO Workshop 3, Brussels, 6th December 2022

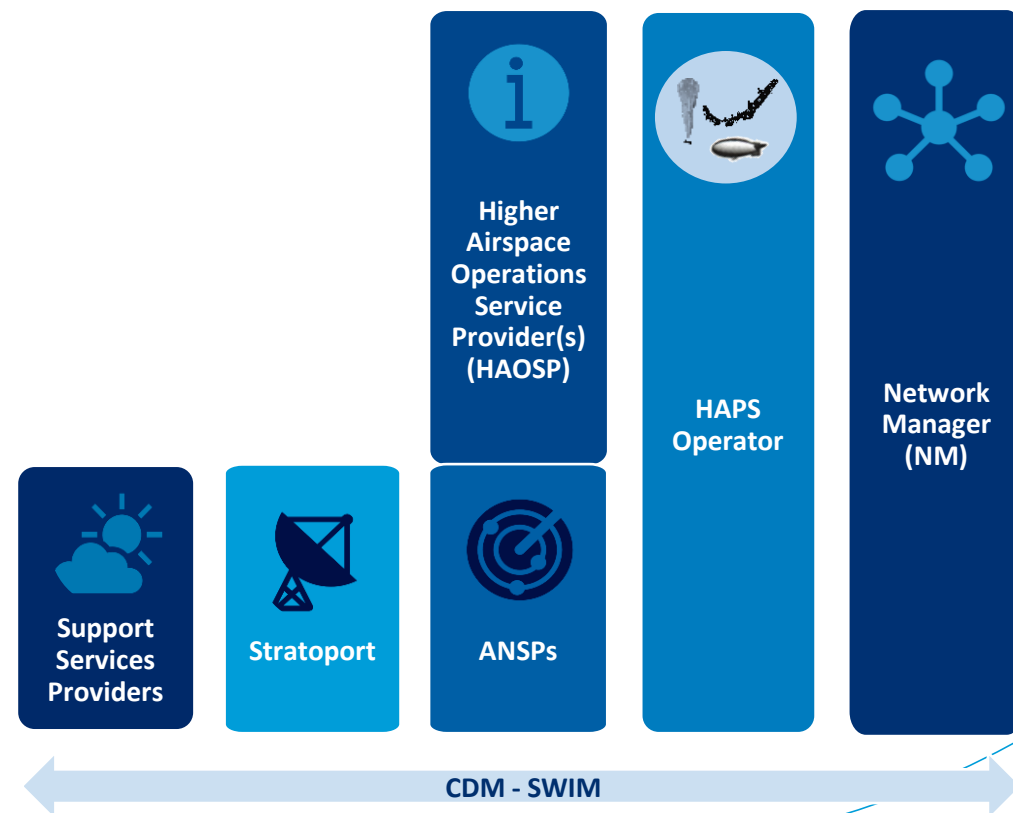
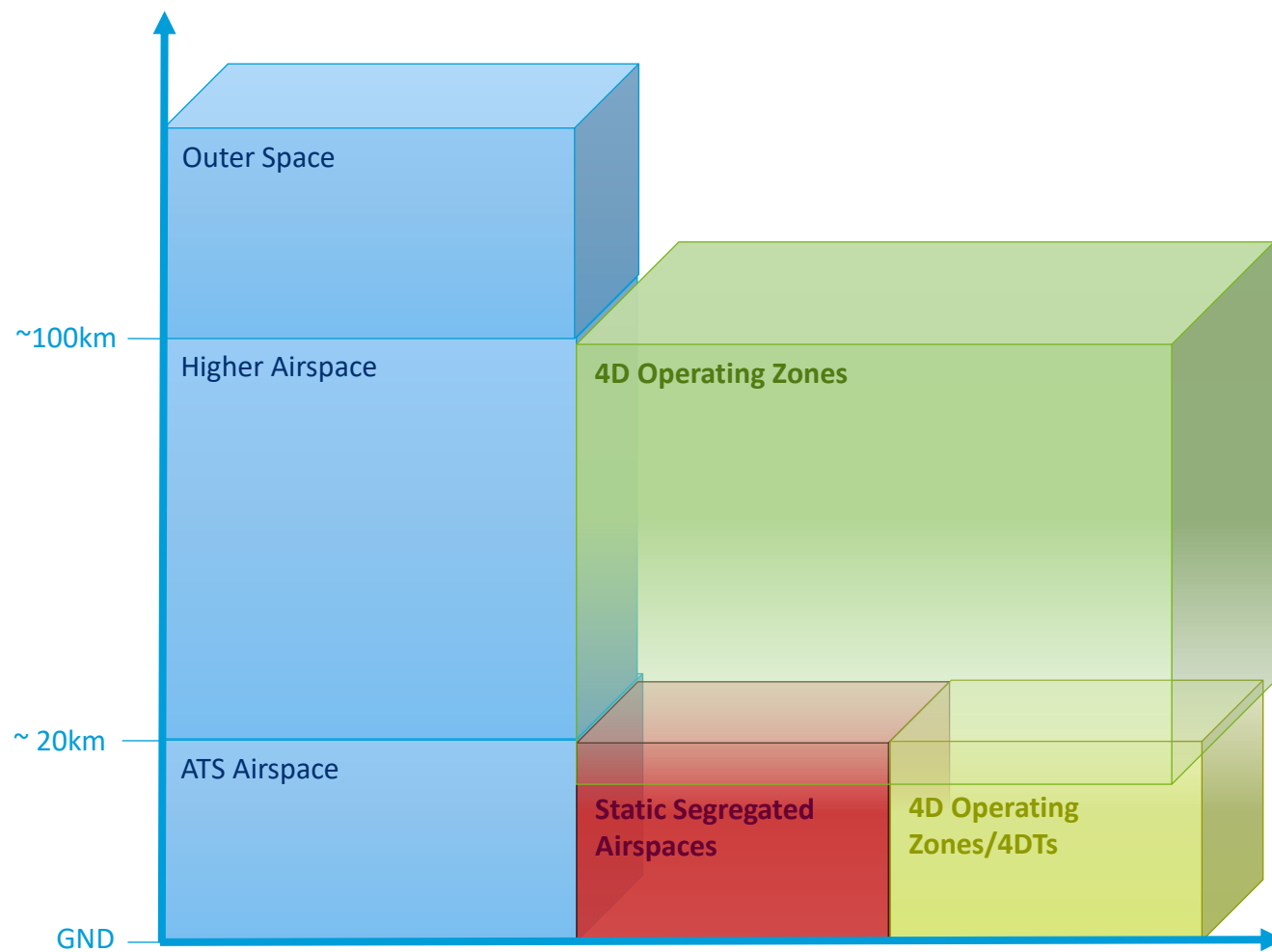
Main actors of the ECHO ConOps

HAPS operations in the target ECHO concept








Example use cases aligned with demand scenarios

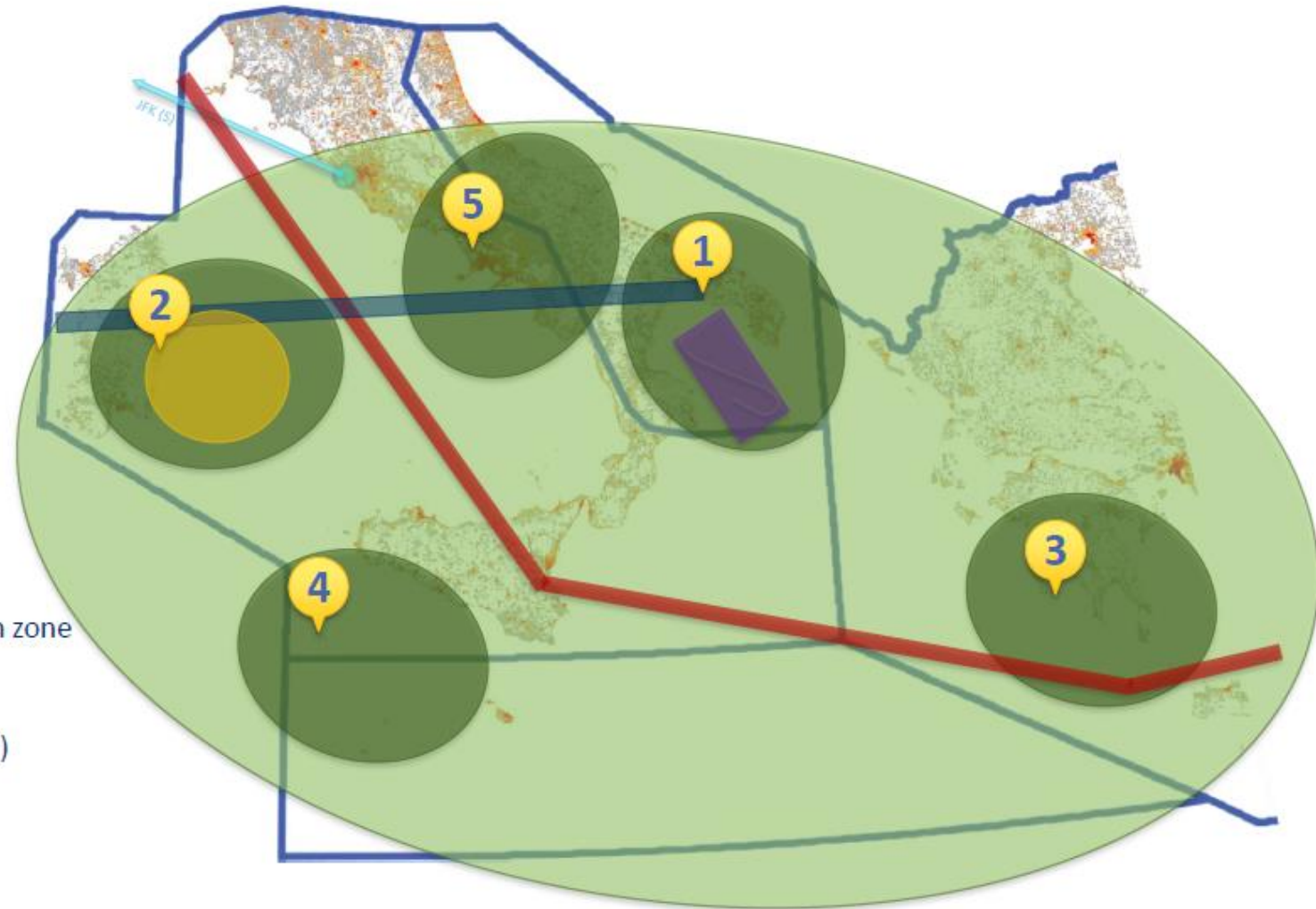
Main Actors in the Target ECHO ConOps

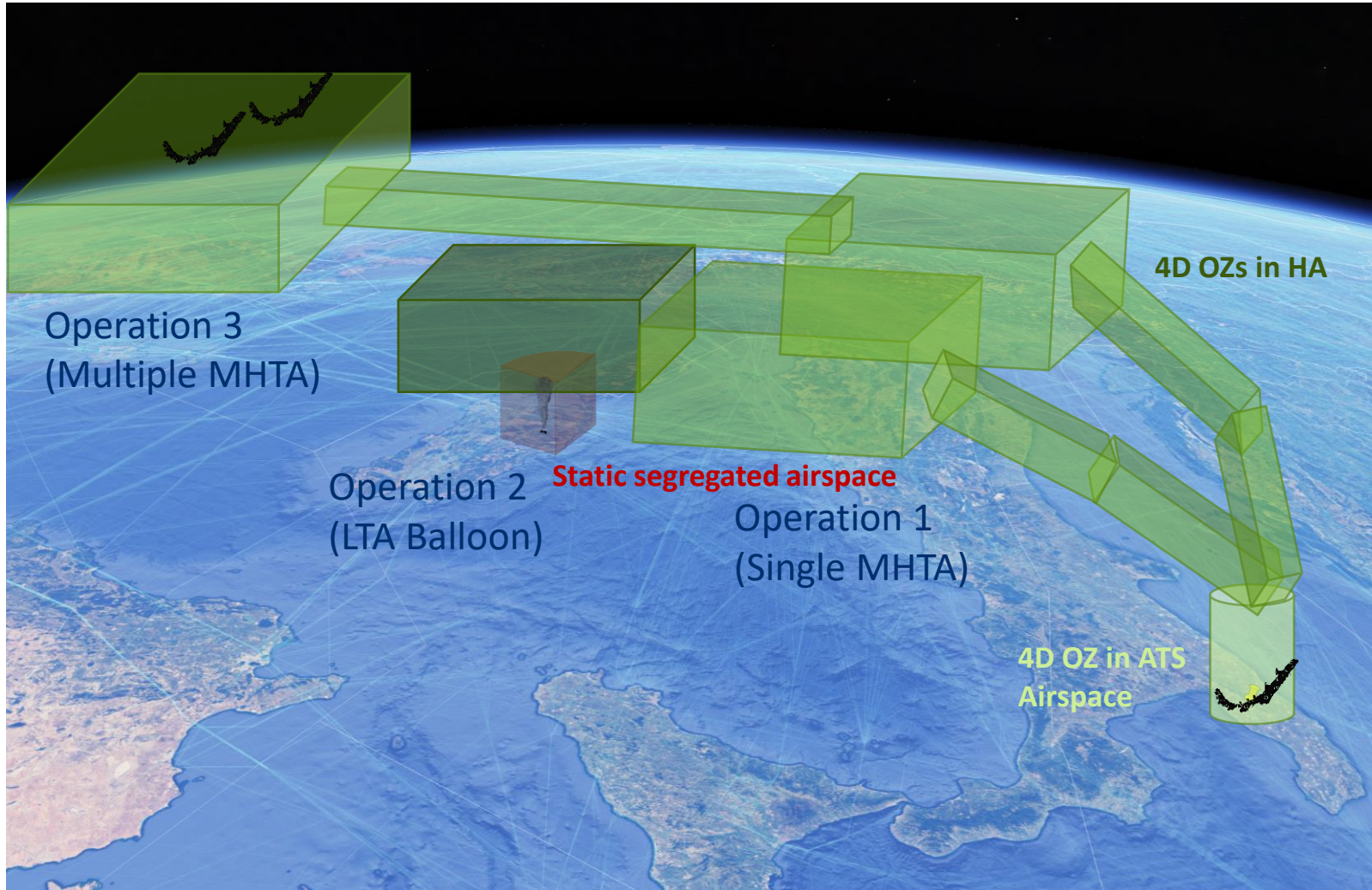




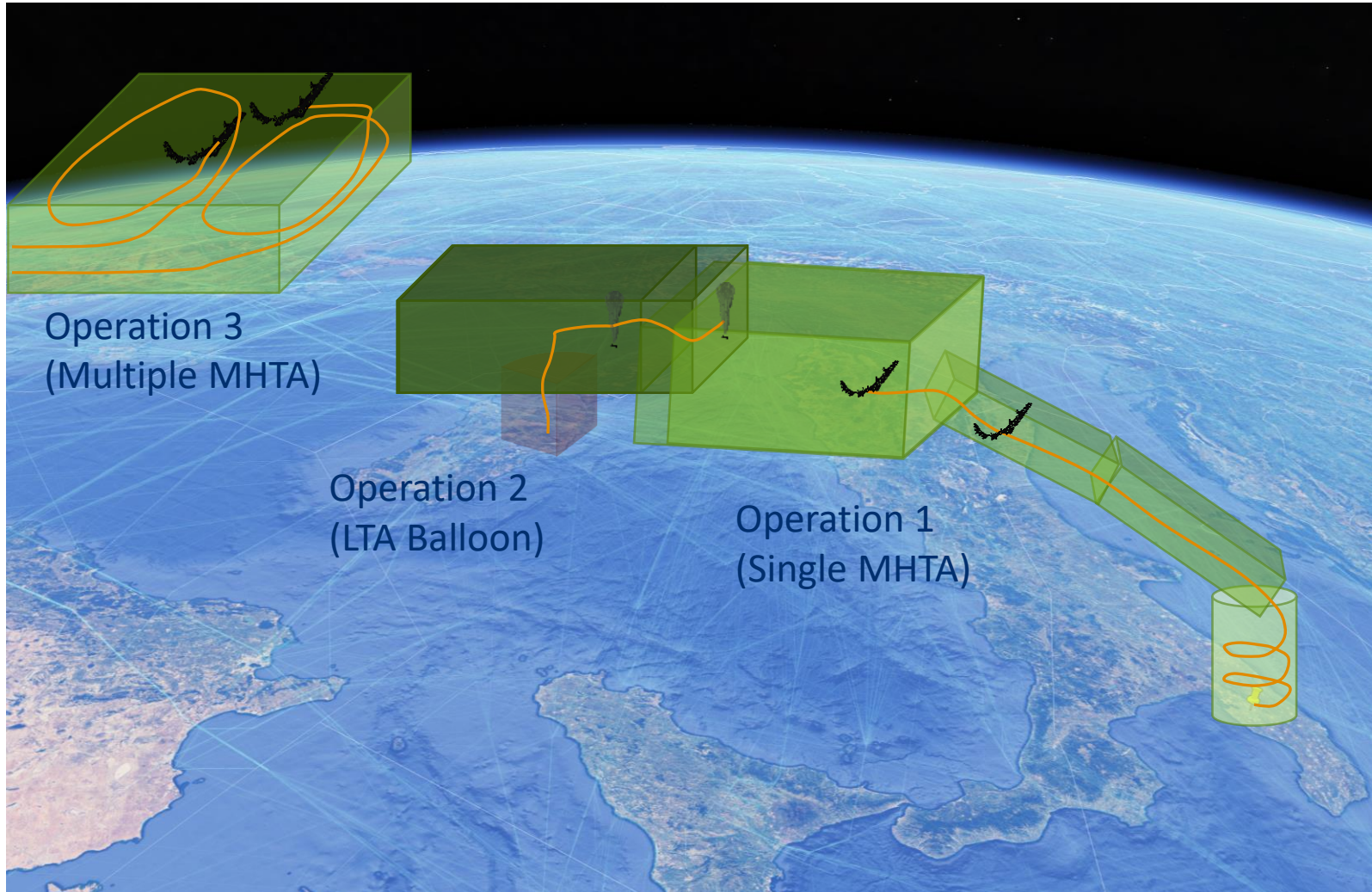
Scenario: HAPS Operations in the Mediterranean

- 1 Spazioporto di Grottaglie, IT
 - 2 Salto di Quirra, IT
 - 3 Koroni, GR
 - 4 Pantelleria, IT
 - 5 Capua, IT
-  Air-launch restricted area
 -  Re-entry module corridors
 -  Sounding rocket operating zone
 -  HAPS vertical operation / transition zone
 -  HAPS operating zone
 -  Super-/Hypersonic operations (S/H)
 -  Military HALE UAS corridors





- HAPS Operators plan their missions and get them approved
 - Full mission planning: launch, transition to HA, operations within HA, return from HA and recovery
 - Operator (supported by HAOSP if needed) engages in CDM processes with NM and ANSPs to agree static restricted volumes/4D trajectories/4D Operating Zones
 - Operator considers applicable restrictions and supplementary information, e.g. meteo
- 4D Operating Zones may include multiple vehicles



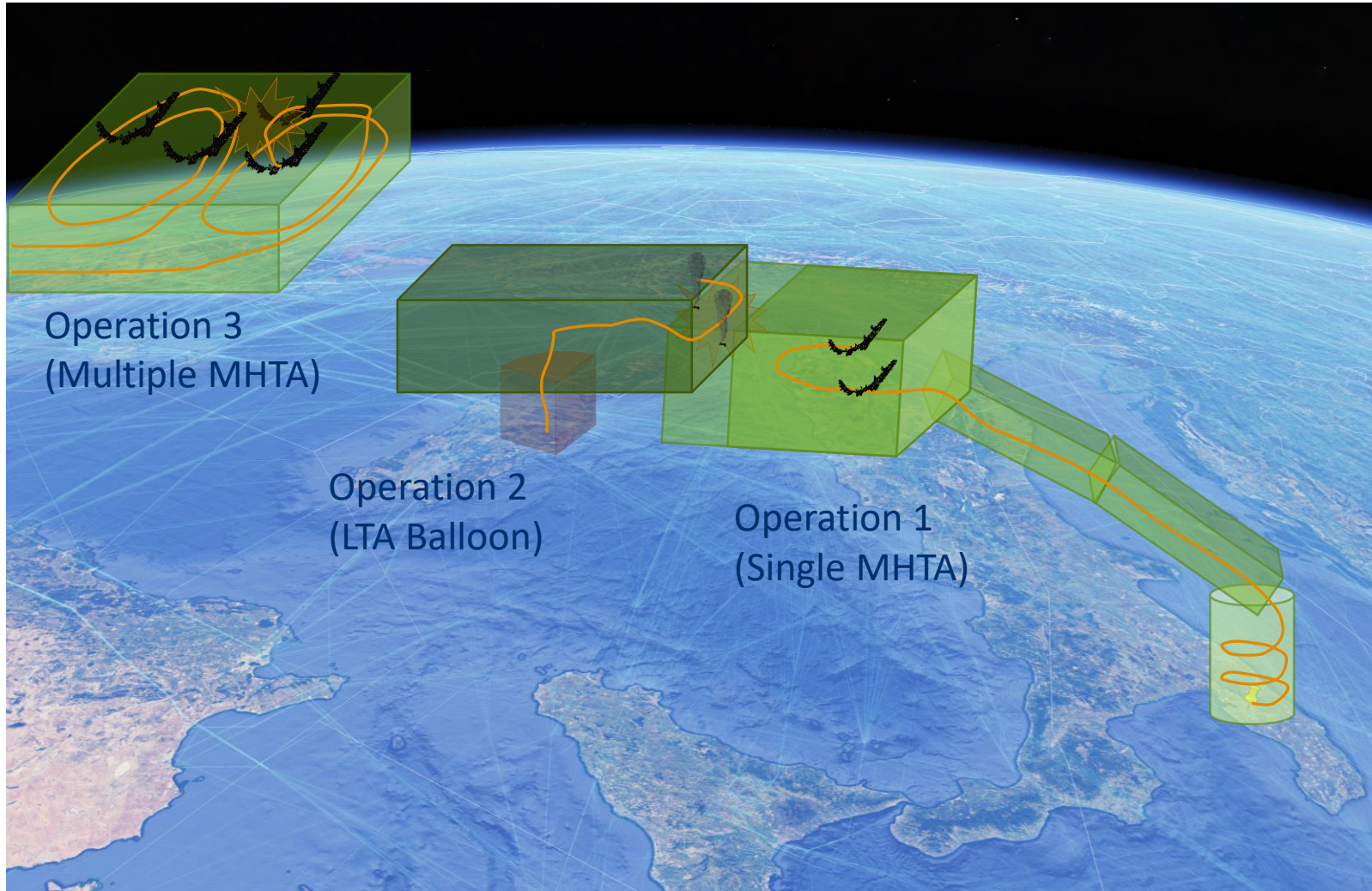
- Transition to HA

- Strategic and tactical deconfliction managed by ANSP (Operations 1 and 2)
- 4D Operating Zones/4DT/Restricted zones

- Operations in HA:

Strategic Deconfliction

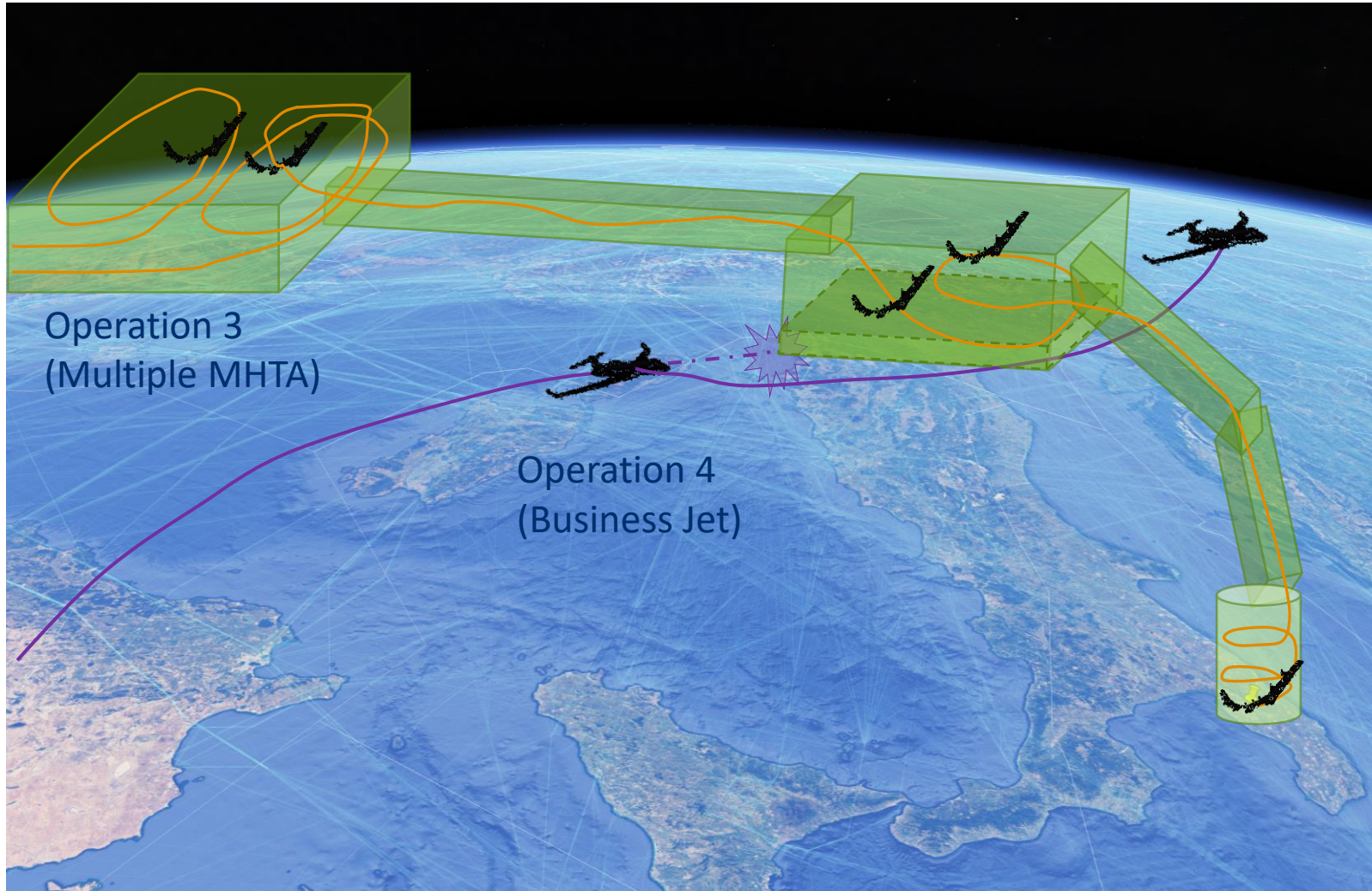
- In response to intent changes
- Operators (supported by HAOSP where necessary) interact through CDM with NM/ANSP in the loop
- Resulting in agreed updates to 4D Zones, which are known to NM/ANSPs and other operators (Operations 1 and 2)
- Operation 3: Separation assurance delegated to users within the 4D Operating Zone (supported by HAOSP if needed)



• Operations in HA:

Tactical Deconfliction

- HAOSP monitors adherence to 4D Operating Volumes
- HAOSP coordinates deconfliction maneuvers with other users, e.g. according to pre-defined rules, and informs NM/ANSP as required (Operations 1 and 2)
- Operation 3: Within a 4D Operating volume tactical separation is handled by the operator (supported by HAOSP)



• Operations in HA:

Lower Boundary Operations

- 4D Operating Zone extended into ATS Airspace, e.g. for energy management operations
- ANSP separates IFR traffic from 4D operating Zone

• Transition and Recovery

- Managed by ANSP

- Focus on the target ConOps
 - Nominal HAPS Operations according to the target ConOps
 - Leverage 4D Operating Zones
- Foundation for further work
 - How do we keep the momentum and advance towards implementing and refining the ConOps? What should the R&D priorities be? What elements of the ConOps should we start to mature and validate?

THANK YOU FOR
YOUR ATTENTION