



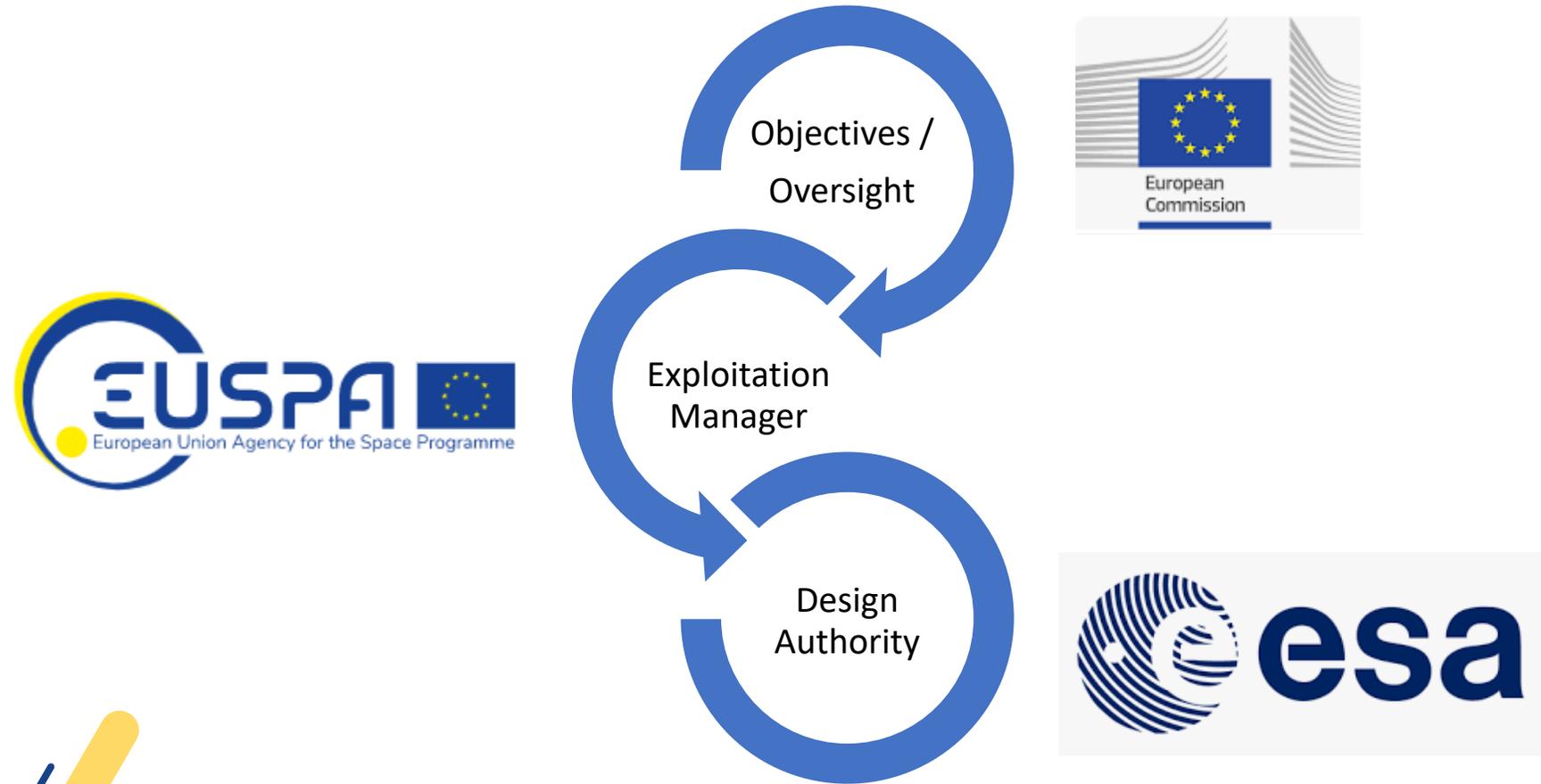
EU SPACE

EU-Japan GNSS Roundtable

15 November 2021

GALILEO and EGNOS Status Update

Partners Working Together



**Framework
Partnership
Agreement**

Galileo HAS... moved forward



MILESTONE

User Consultation Platform

- The User Consultation Platform (UCP) is a forum for interaction between users of position, navigation and time solutions and the organisations and institutions dealing, directly and indirectly, with Galileo and EGNOS. The platform serves as a key tool for gathering user requirements and validating the Galileo HAS target performance
- The UCP 2020 will be held during European Space Week on 7-11 December 2020 (<https://www.eu-spaceweek.eu/>)

Call for Expression of Interest

- Participating in the HAS SiS ICD public consultation
- Expressing interest in participating in ad-hoc HAS SiS testing campaigns
- Providing feedback on specific HAS user requirements

HAS PO Testing

HAS SiS ICD Publication

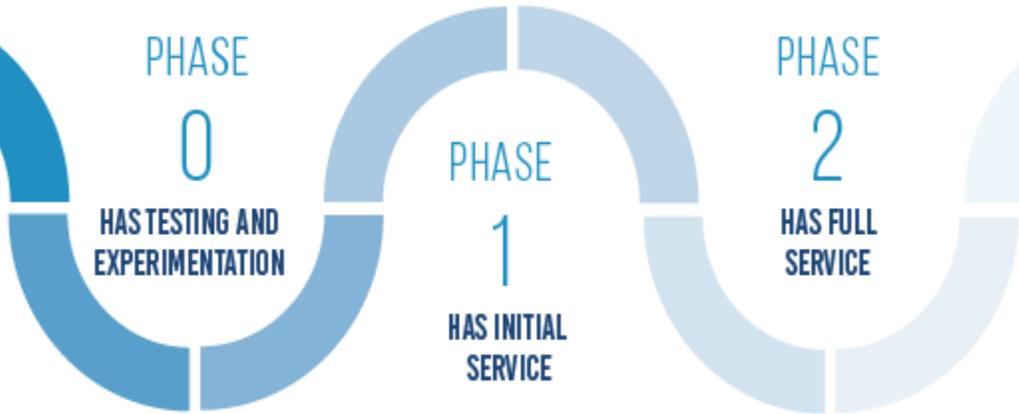
- Following the finalisation of the testing phase, the first version of the HAS message specification document is planned to be published

HAS Initial Service Declaration

- After the necessary service validation activities, the HA Service will be declared available and the HA Service Definition Document will be published

HAS Full Service Operational Capability

2020
2021
2021
2021
2022
> 2024



Validate dissemination capabilities

HAS SiS tests and experimentation

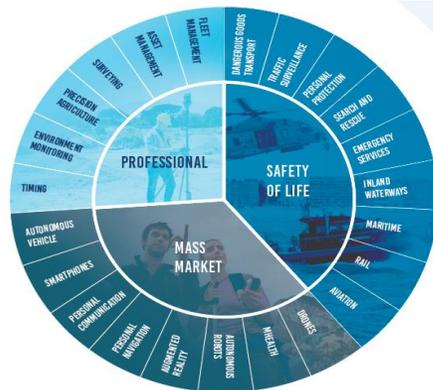
Leverage lessons learned for following phases

Use Galileo system data only (GSS)

Relaxed performance targets

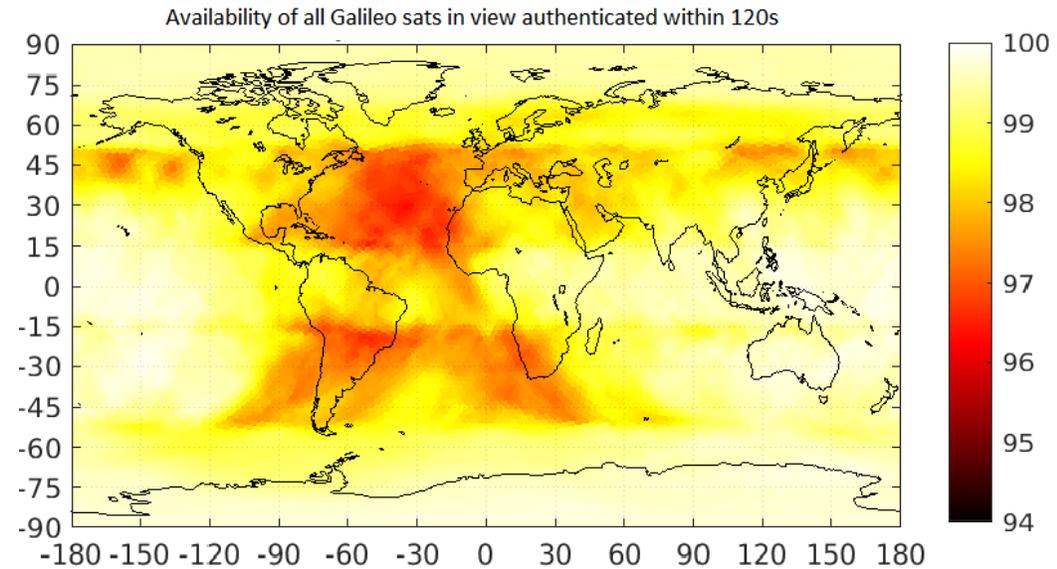
Improved design / infrastructure

Additional data (stations) to improve the performance



It's a matter of Trust

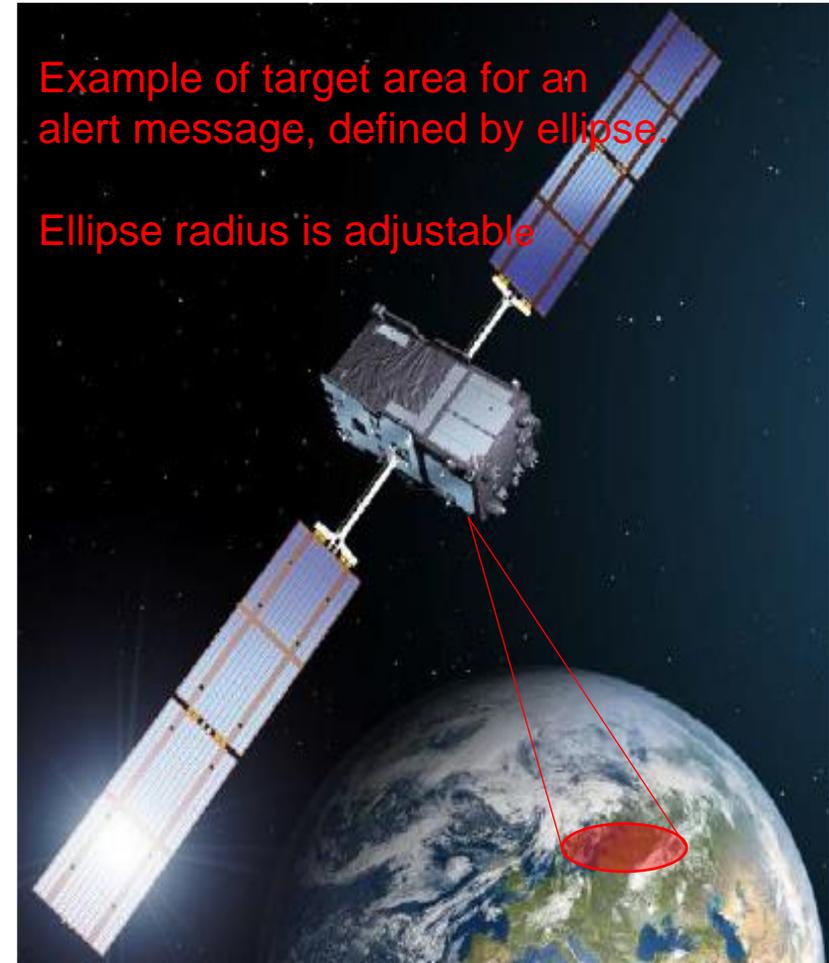
- OSNMA **over-the-air testing** since November 2020 without affecting standard OS users. Different OSNMA configurations and processes (key renewal, revocation, etc.) have been successfully tested.
 - ✓ Worldwide dissemination with up to 20 connected satellites and “cross-authentication” concept
 - ✓ No degradation of OS position, velocity and precise time (PVT) accuracy
 - ✓ Availability of authentic PVT equivalent to standard OS for users with synchronisation requirements better or equal to 30 seconds (works for receiver with time reference up to 5-min error)
- Next steps: OSNMA ICD/guidelines/keys publication and start of “Public Observation Phase”
- Commercial Authentication Service (including signal authentication) assisted concept consolidated and under prototyping



...stay tuned!

The Galileo Emergency Warning Service...

- Global coverage
- No 'mobile' connection required - Resilience to ground destruction
- Uses existing Open Service signal spare capacity
- Multi-hazard (tornadoes, earthquakes, nuclear disaster or industrial disaster, terrorist attacks, ...)
- On-demand broadcast of an alert message + associated guidance by Local Civil Protection Authorities
- Complementary to existing systems
- Reach out population in a timely manner (2-3 minutes), whatever the size of the area
- Geo-location information encoded in the message to target only the relevant population
- Synergies with Copernicus Emergency Management Service and its other system capabilities
- An interoperable solution studied in cooperation with Japan and India



SAR ...The Return

- Remote Activation of Beacons

- ✓ *Mission requirement document under formalisation*

- ✓ *EUROCAE standard approved*

- Rescue Coordination Centre (RCC) (or airline) can contact Galileo to remotely activate a beacon via the Return Link Message of Galileo

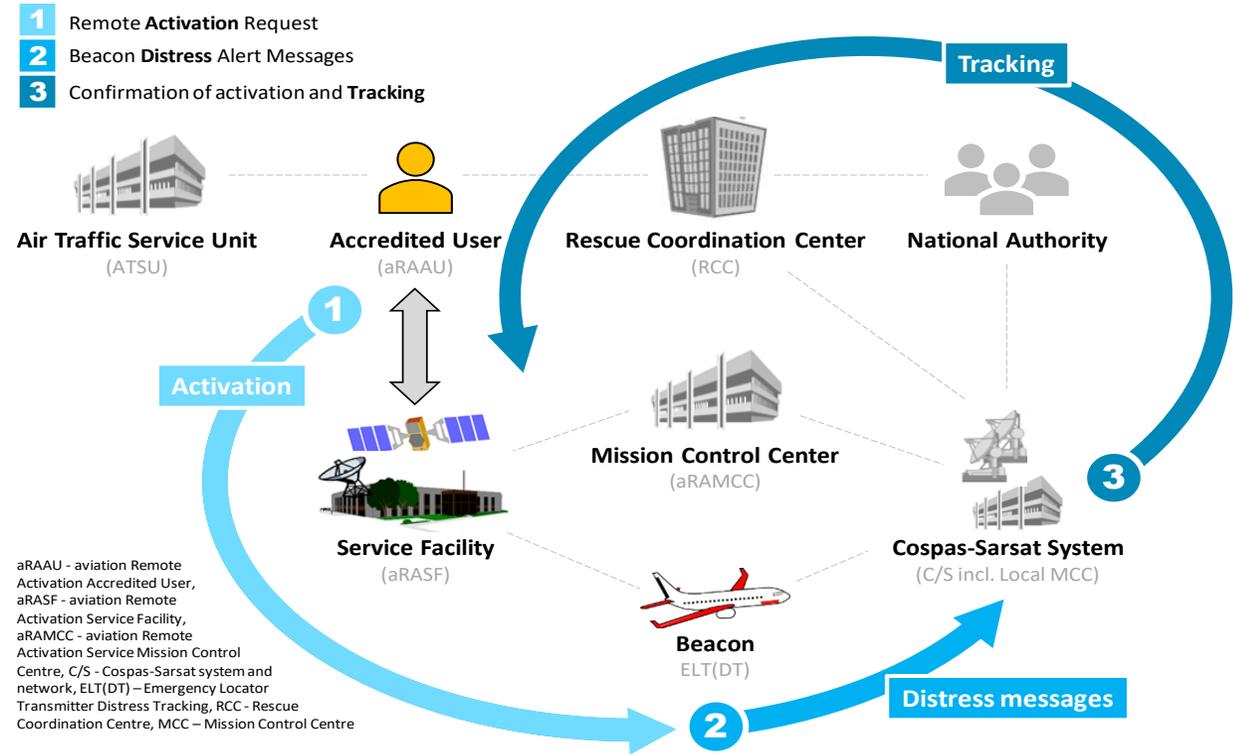
- Use cases: **Aviation**: aircraft disappearance, Un-responsive crew; **Maritime**: overdue vessel

- Two-way (distress) communication

- Enabled by the long Return Link Message; based on predefined Q&A helping the rescue mission

- Distress Position Sharing

- RCC can contact Galileo to share the position of a beacon user in distress with other nearby users



Far and Beyond



Horizon Europe
THE NEXT EU RESEARCH & INNOVATION PROGRAMME (2021 – 2027)

The block features the Horizon Europe logo and text on a light blue background. To the right, there are several circular icons in yellow and blue, representing various scientific and technological fields: a lightbulb, a person in a lab coat, a microscope, a rocket, a gear, and a molecular structure.

As One Among Others

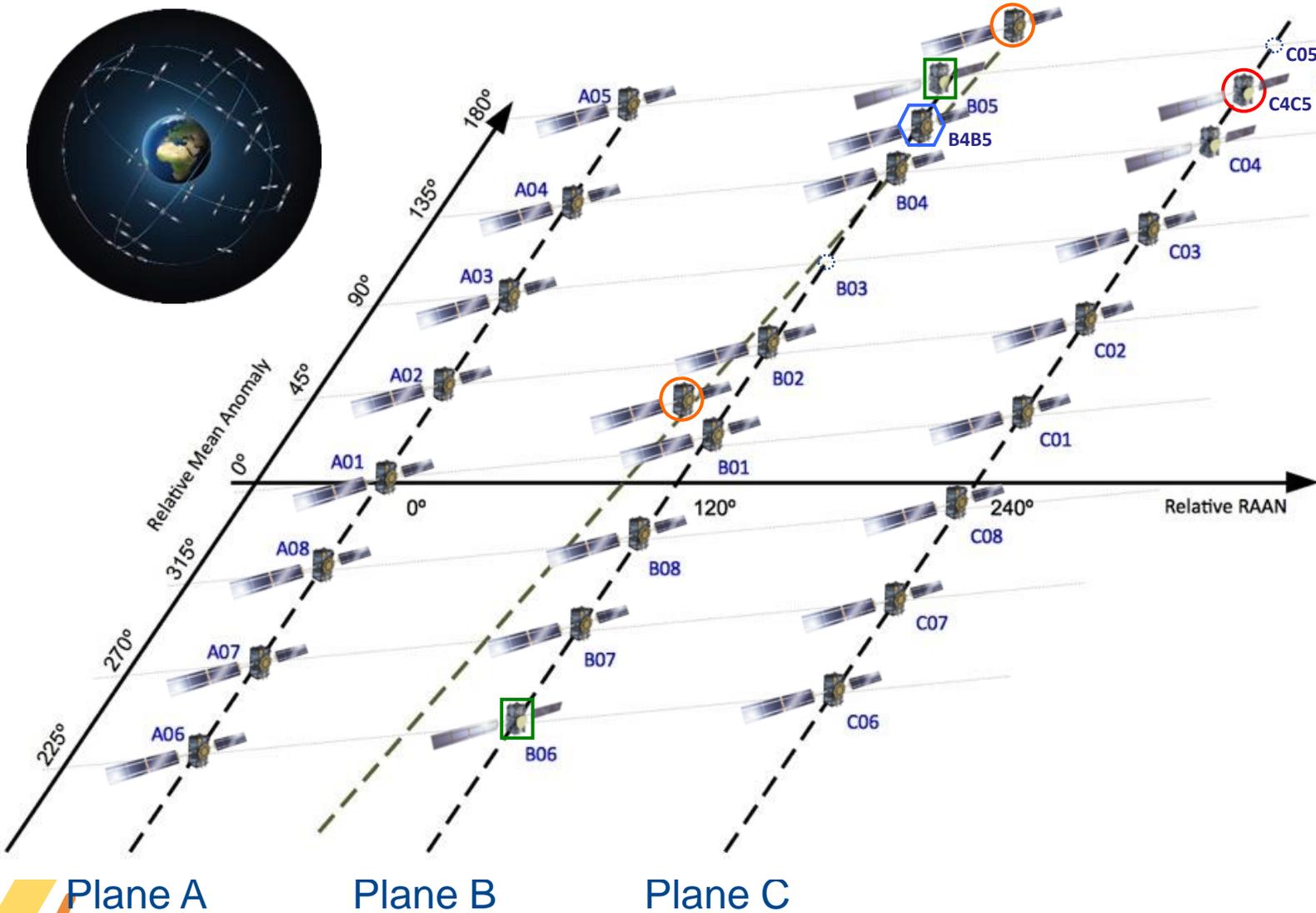
- **Bilateral Cooperation** with other core constellation providers
- Define new services collaboratively
 - SAR/Return Link Service/2-way COM
 - Emergency Warning Distribution
 - Advanced RAIM for Safety of Life
 - Authentication solutions



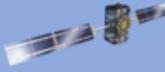
International/multi-lateral

- ITU: Coordinate and defend GNSS Spectrum
- UN-ICG: service provision and performance monitoring
- ICAO: Galileo standards adopted in Nov 2020

Galileo Constellation Status



Navigation (22 in service)
Search and Rescue (24 in service)

-  26 satellites in orbit
-  2 unhealthy (NAV P/L only)
-  1 spare
-  1 unavailable
-  2 no SAR (by design)

GSAT 104 (Spare, NAVANT failure), relocation from C05 to C4C5 completed on 12/05/2021

GSAT 204 (Spare, SAR operational), relocation from B03 to B4B5 completed on 06/05/2021

GSAT 201/202 (set to unhealthy)

L11 slots in Plane B: B03, B5B6

EGNOS OPERATIONAL SINCE 2009

-  **EGNOS** is the European SBAS system augmenting GPS signal over ECAC area
-  **EGNOS** meets stringent Aviation requirements (ICAO) for all phases of flight
-  **EGNOS** also used in a wide range of other application domains
-  **EGNOS** is fully interoperable with all other SBAS worldwide
Provides 3 services (Open Service, Safety of Life, EDAS).



Next EGNOS version (V3): Dual Frequency Multi-Constellation

- The next version of EGNOS (V3) is under preparation: augment Galileo in addition to GPS and operate in two frequency bands.
- EGNOS V3 will be rolled out in two steps:
 - V3.1 will be the legacy service available with the same ground stations of EGNOS V2 operating for V3. Single frequency, augmenting Galileo in addition to GPS (expected as from 2026).
 - V3.2 will augment Galileo signals in addition to GPS and be dual-frequency (expected as from 2027).
- Review of the performances and detailed concept review are planned as from 2022.

USE GALILEO.EU

FIND A GALILEO-ENABLED DEVICE TO USE TODAY

Galileo is Europe's Global Satellite Navigation System (GNSS), providing users with improved positioning and timing information.

Click on the icons to find Galileo-enabled devices.

