

Linking space to user needs

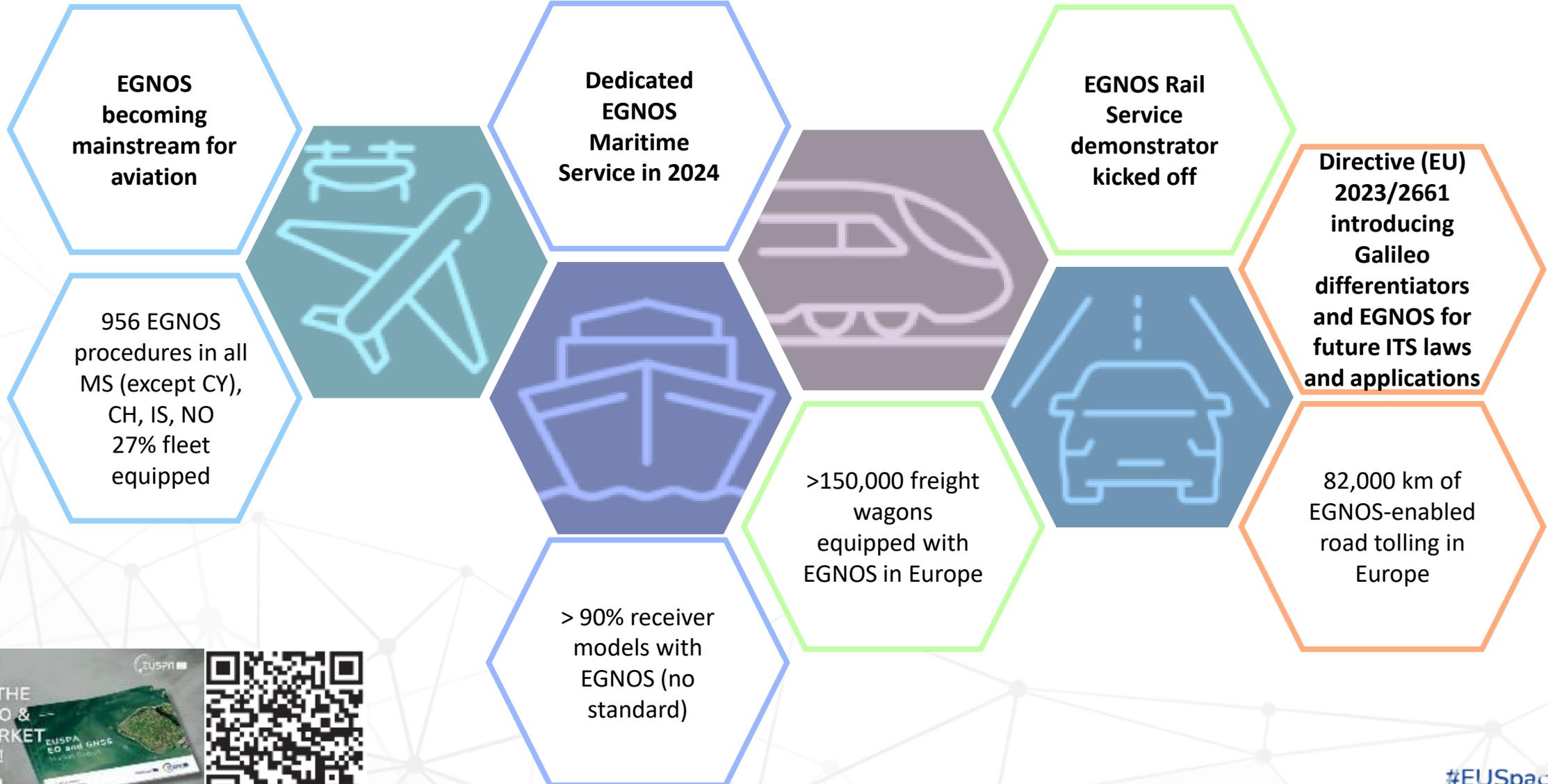
## EGNOS market and services strategy

EGNOS Workshop 2024

Carmen Aguilera, Market Downstream and Innovation, EUSPA



# EGNOS adoption at a glance



UNLOCK THE LATEST EO & GNSS MARKET INSIGHTS!





# EGNOS avionics available for most common models

- **Forward fit:** EGNOS Offered as “line-fit” for 90 aircraft models
- **Retrofit:** More than 250 STCs and 80 SBs available for LPV on about 200 different aircraft models

## Line-fit

- A350: since 2014
- A220: since 2016
- A320: since 2021
- A330: since 2022
- A380: since 2022



Boeing B777-9 (option)  
Boeing 737 (ongoing)

Details on the [STC/SB tool](#)

## Service Bulletin (SB)

- Airbus A350



- ATR 42-600/  
ATR 72-600

- Embraer E-jets



## Supplemental Type Certificate (STC)

- Boeing  
B737 CL/NG



- De Havilland  
Dash 8-400

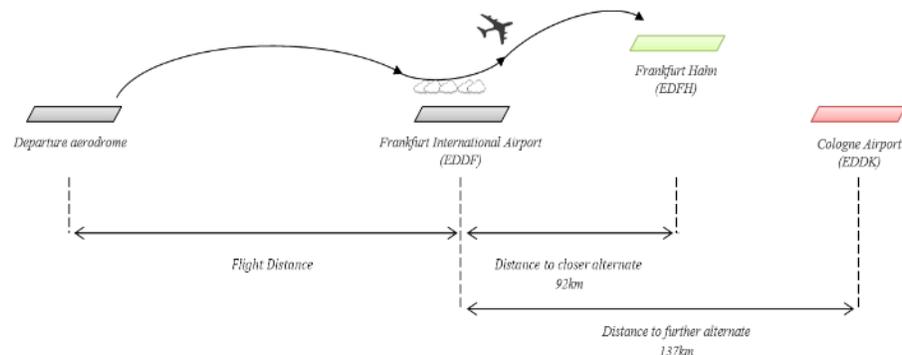


# EGNOS supports Greener Aviation



Lufthansa

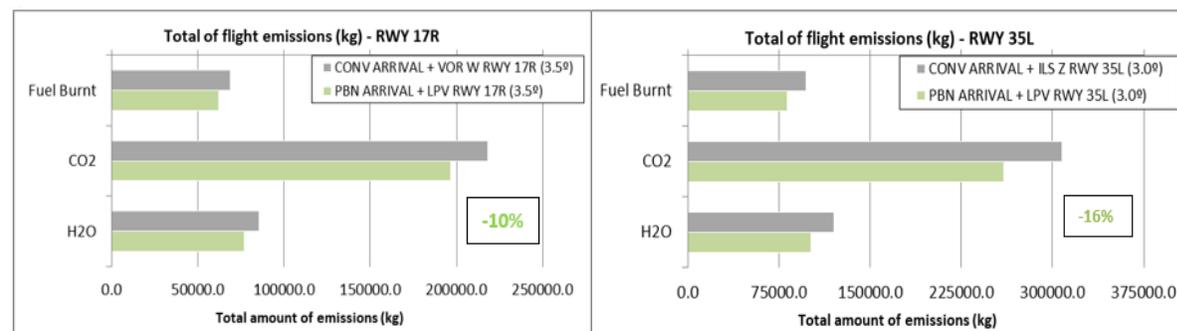
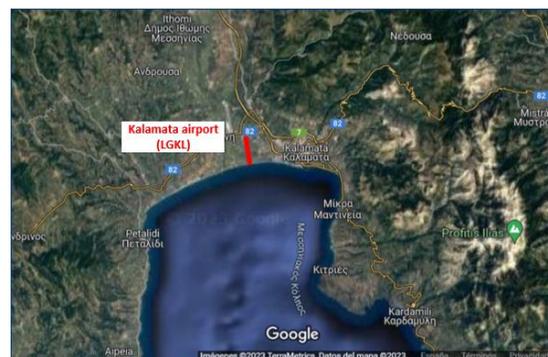
Theoretical estimation of **reduction of fuel consumption and CO2 emissions** thanks to LPV onboard and closer alternate (lower destination alternate planning minima in accordance with new EASA Fuel Management Rules)



TOTAL Fuel Savings	Only for Frankfurt International Airport	<b>27-35</b>	(t/year)
TOTAL CO2 Savings		<b>84-109</b>	(t/year)
TOTAL Economic Savings		<b>28465-37112</b>	(\$/year)

## Kalamata Airport (LGKL), Greece (RWY 17 and 35)

Track reduction, less fuel consumption and CO2 emissions by the theoretical implementation of LPV compared to conventional navigation.



Online Environmental tool available in the [EGNOS User Support Website](#).





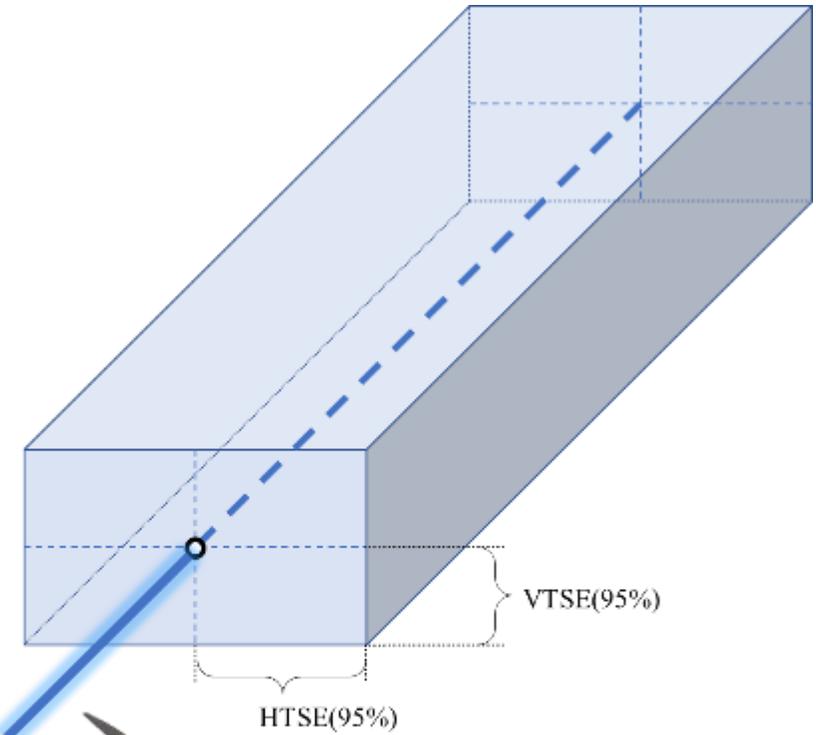
# GNSS PVT for innovative aerial services



Domains of UAS and VCA operations

**GNSS PVT plays a central role for UAS and VTOL operations.**

position determination for navigation, to fly an intended trajectory within and outside U-space airspace, in all risk categories.



reporting of positioning for e-identification, geo-awareness and collision avoidance functions.



mission-specific needs, such as geo-tagged images/data collected with other sensors/payload onboard drones.

**EGNOS is already integrated in most commercial receivers for UAS**

- Now, improved positioning accuracy with EGNOS corrections;
- Next step: enhanced reliability thanks to EGNOS integrity (alerting mechanism for UAS is work in progress).



# EGNSS for VTOL-capable aircraft (VCA)



- **UAM, including air-taxis, offer a complementing safe, cleaner and faster mode of transport in cities**
  - Creating 90,000 new jobs, demand of around 9200 VTOL aircraft in Europe by 2035.
- Flight corridors – safety for people in the air and on the ground.
- No navigation requirements yet, but GNSS is at the heart of the avionics.
- Ongoing work at EUSPA:
  - SAMVA project: PBN tailored to airtaxis; flight trials with Ehang 216 in Lleida airport in 2024.
  - DELOREAN project: Conops for urban air mobility and urban air delivery.
  - Potential new RNP concept tailored to airtaxis.

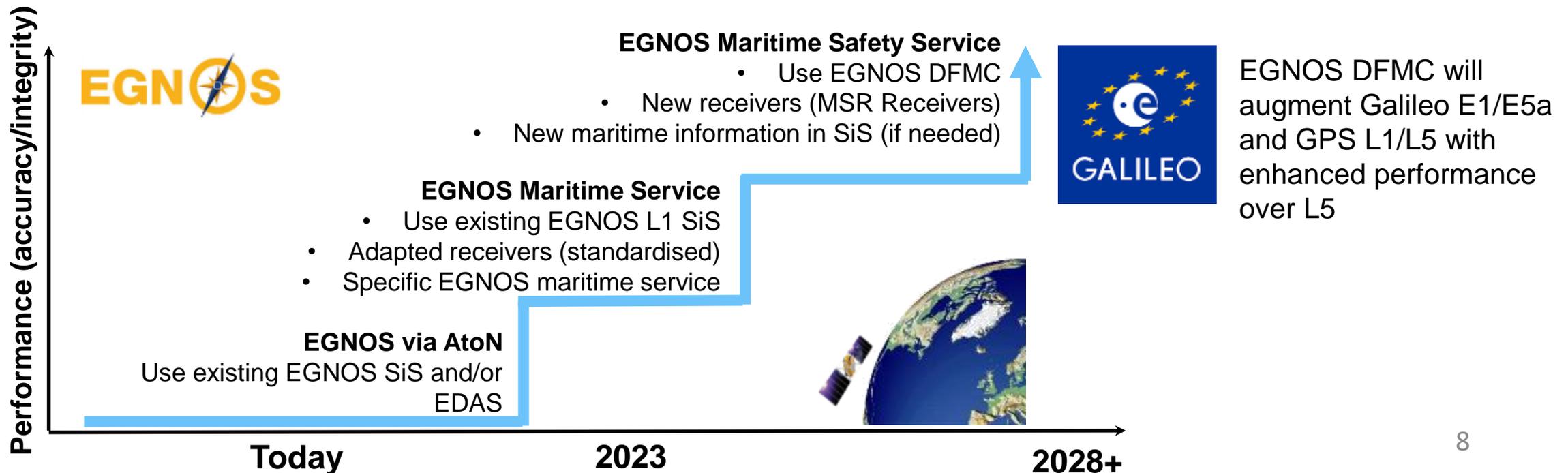




# EGNOS increases efficiency of operations and safety of navigation

In the case of Merchant Shipping, EGNOS adoption is based on 3 steps:

1. Use of EGNOS corrections retransmitted via existing AtoN
2. Use EGNOS L1 SiS directly with adapted receivers
3. Use EGNOS DFMC with new DF receivers

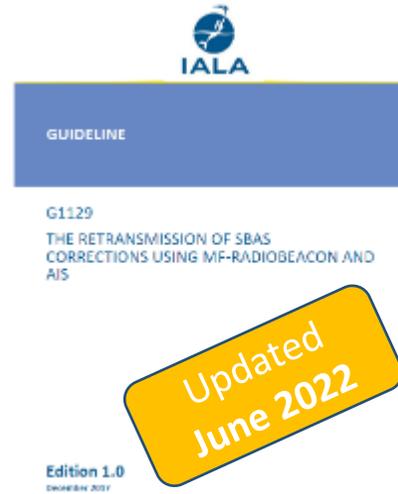




# Step 1: Cost-effective Retransmission of EGNOS Corrections



**Obsolescence**  
**Of existing DPGS infrastructure**  
**High Costs (OPEX & CAPEX)**  
*\* Situation depends of each country*



**Option 1: EGNOS-based Virtual Reference Stations**

**Option 2: EDAS DGPS Corrections**

- ✓ **Flexibility and scalability**
- ✓ **Transparent for users.**
- ✓ **Reduced infrastructure (→CAPEX/OPEX)**

**Inland Waterway use of EGNOS for Tracking and Tracing**

**Duration:** October 2022 to September 2024

**Aim:** EGNOS integration in IWW infrastructure in Hungary, Germany and Spain to improve safety of navigation.

**Tests:** Danube (HU), Spree-Oder Waterway (DE), Guadalquivir (ES)

User Need\*

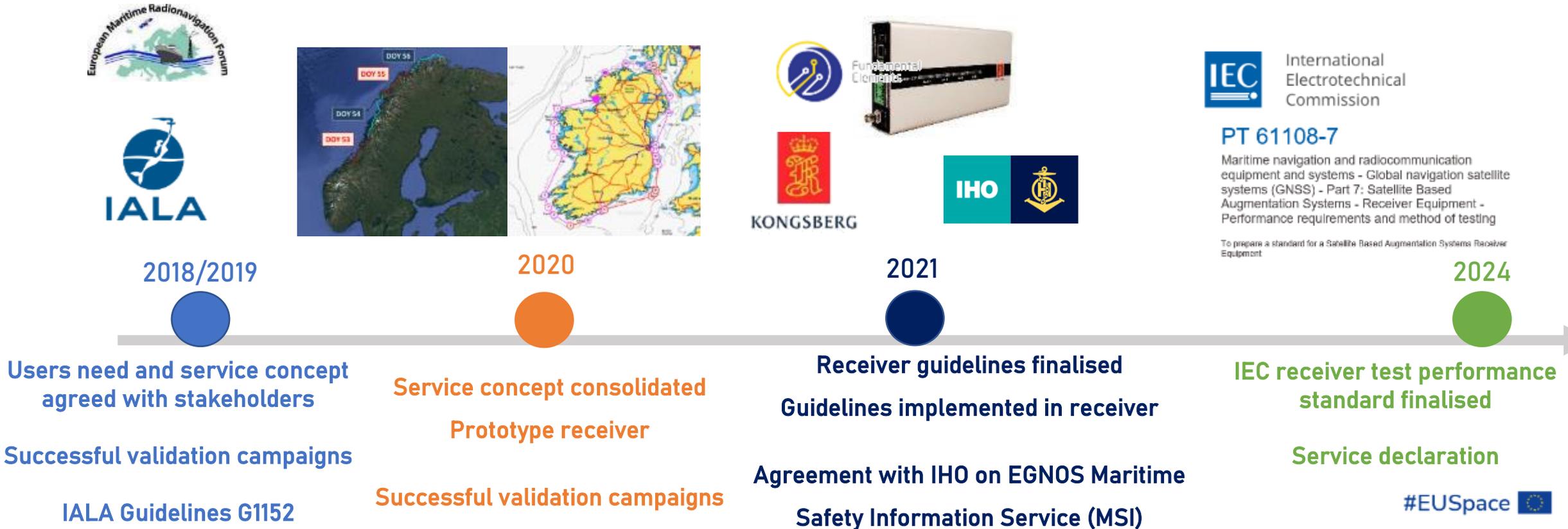
Design & Feasibility

Implementation



# Step 2: New EGNOS dedicated service for maritime

- **New** EGNOS SoL assisted service for Maritime Users (ESMAS) support operations in ocean waters, harbour entrances, harbour approaches and coastal waters in line with the operational requirements included in the **IMO Resolution A.1046** and in waters of the EU Member States and EGNOS contributing countries





# And Beyond: EGNOS supports safe and Green Autonomous navigation at sea and inland waterways

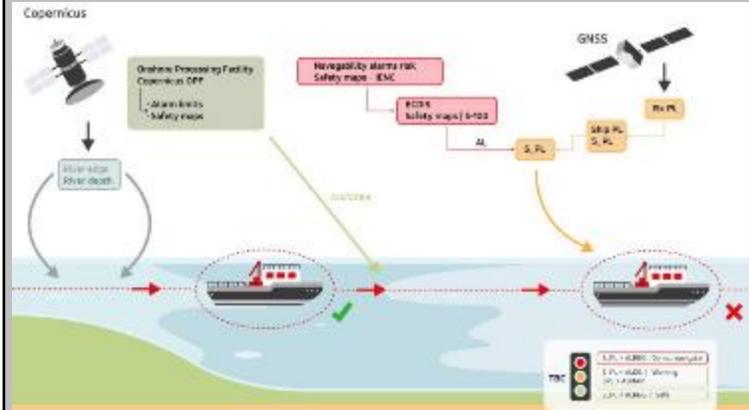
Started  
January 2024

EGNOS accuracy and integrity benefit a range of applications:

- MASS navigation
- Operation of Locks, Tugs and Pushers
- Hull to hull
- Port operations: local VTS
- Docking assistance for leisure boats
- Marine Engineering: cable and pipe laying;



## New European Parliament Pilot Project on Space for autonomous vessels: AVIS, with EC DG MOVE



**Duration:** 37 months

**Aim:** Use of EGNSS, including EGNOS, and Copernicus to improve navigation of autonomous vessels along Europe's inland waterways.

**Tests:** Germany, Hungary and Romania



# Moving forward to integrate EGNOS in ERTMS

REF: AWP/2023/5416893 - 04/06/2023

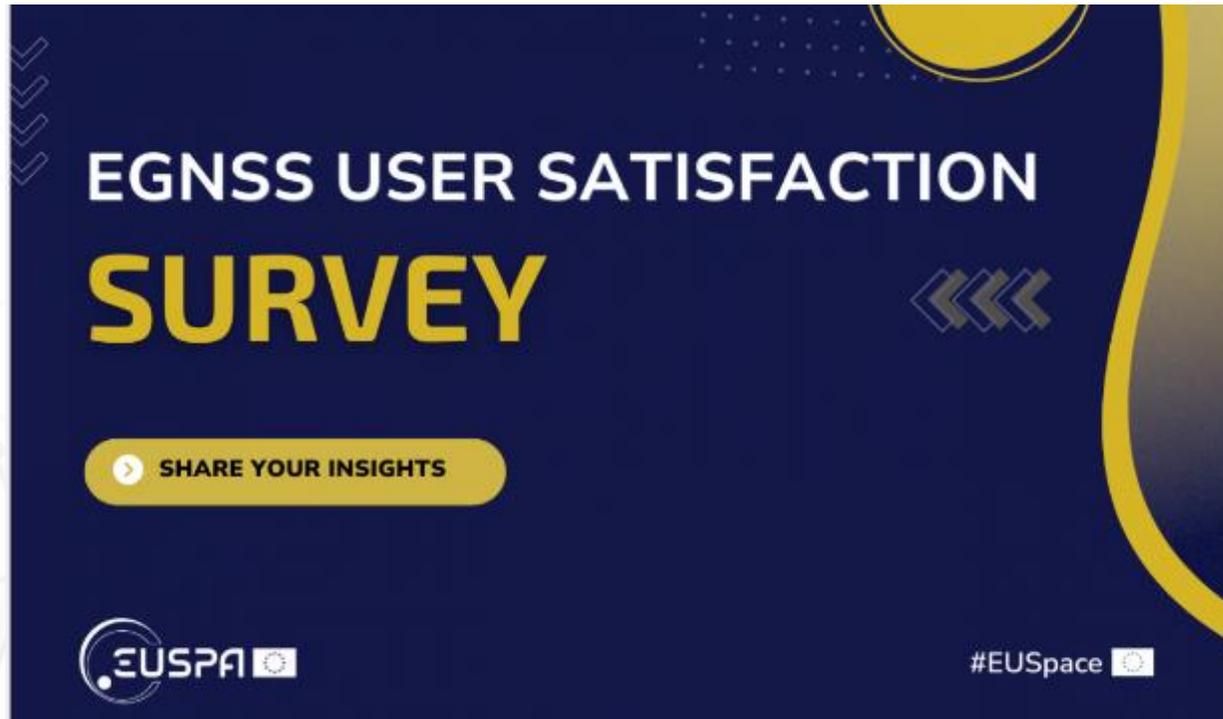
- 2-year **EGNOS for Rail** initiative kicked-off with more than 50 rail decision makers, including EUSPA, Europe’s rail Joint Undertaking, EU Agency for Railways, ESA and rail stakeholders
  - Deliver the EGNOS Service demonstrator to EU-Rail in 2025
  - Elaborate and start implementing the sectorial technical roadmap for GNSS inclusion in ERTMS
  
- **Users: 2-day training** organized for ERTMS Users Group to provide an overview of EGNOS for rail safety-relevant applications at the GNSS Service Center, in November 2023, supporting the activities to be carried out within the **EGNOS for Rail** initiative



<b>GNSS Augmentation for Rail based on EGNOS</b> <b>Work packages breakdown structure</b>	
Ref:	23E101
Version:	0n
Date:	27/07/2023



Help us to shape the EGNOS you need:  
EGNOS and Galileo User satisfaction survey is open





Linking space to user needs

Get in touch with us

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