



Linking space to user needs

EGNOS market and services strategy

EGNOS Workshop 2024

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EGNOS adoption at a glance

EGNOS becoming mainstream for aviation Dedicated
EGNOS
Maritime
Service in 2024

EGNOS Rail Service demonstrator kicked off

Directive (EU)
2023/2661
introducing
Galileo
differentiators
and EGNOS for
future ITS laws
and applications

82,000 km of EGNOS-enabled road tolling in Europe

956 EGNOS procedures in all MS (except CY), CH, IS, NO 27% fleet equipped

>150,000 freight wagons equipped with EGNOS in Europe

700

> 90% receiver models with EGNOS (no standard)









EUSPA supports EGNOS procedure implementation and



equipage on board

954 EGNOS based operational procedures, 67% of IRE **EGNOS** in helicopters, supporting HEMS



KLM goes for EGNOS on their new A320Neo fleet



Grant to AIR FRANCE kicked off to support LPV adoption for B777 and B787 fleet

















And dedicated free of charge market assistance tools:

- Free of charge Cost Benefit Analysis for decision to invest on LPV
- CO2 reduction analysis at airports
- Technical assistance







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

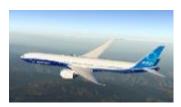
A350: since 2014

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





Supplemental Type Certificate (STC)

BoeingB737 CL/NG





De Havilland
 Dash 8-400



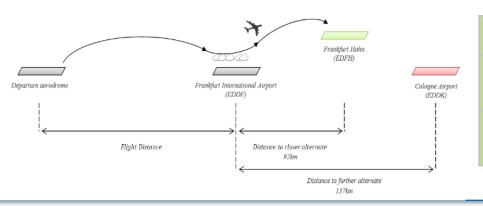


EGNOS supports Greener Aviation





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)

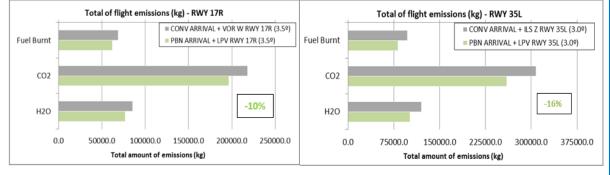


TOTAL Fuel Savings	Only for Frankfurt International Airport	27-35	(t/year)
TOTAL CO2 Savings		84-109	(t/year)
TOTAL Economic Savings		28465-37112	(\$/year)

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.











GNSS PVT for innovative aerial services



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

VTSE(95%)

HTSE(95%)

Domains of UAS and VCA operations

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

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

mission-specific needs, such as geotagged 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.











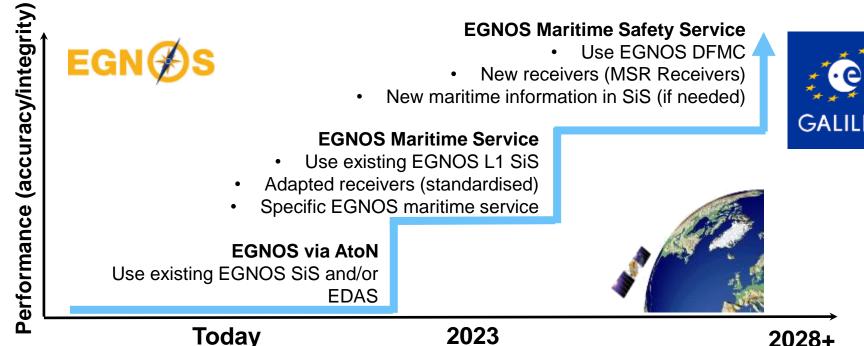


EGNOS increases efficiency of operations and safety of navigation



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

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



GALILEO

EGNOS DFMC will augment Galileo E1/E5a and GPS L1/L5 with enhanced performance over L5



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)



Step 2: New EGNOS dedicated service for maritime

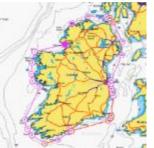


• **New** EGNOS SoL assisted service for Maritime Users (ESMAS) support operations in ocean waters, harbour entrances, harbour approaches and coastal waters in line with the operational requirements included in the **IMO Resolution A.1046** and in waters of the EU Member States and EGNOS contributing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





DOY 55
DOY 53





2021

International Electrotechnical Commission

PT 61108-7

Maritime navigation and radiocommunication equipment and systems - Global navigation satellite systems (GNSS) - Part 7: Satellite Based Augmentation Systems - Receiver Equipment - Performance requirements and method of testing

To prepare a standard for a Satellite Based Augmentation Systems Receiver Equipment

2024

2018/2019



2020

Service concept consolidated

Prototype receiver

Agreement with IHO on EGNOS Maritime
Safety Information Service (MSI)

Receiver guidelines finalised

Guidelines implemented in receiver

Service declaration

IEC receiver test performance

standard finalised

#EUSpace 🔘

Successful validation campaigns

Users need and service concept

agreed with stakeholders

IALA Guidelines G1152

Successful validation campaigns



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:

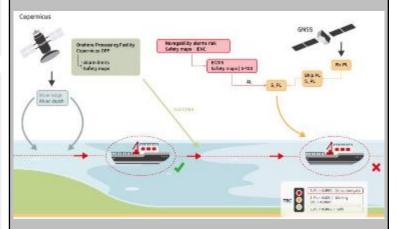
- MASS navigation
- Operation of Locks, Tugs and Pushers
- Hull to hull
- Port operations: local VTS
- Docking assistance for leisure boats
- Marine Engineering: cable and pipe laying;











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

- 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 FRTMS
- 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



GNSS Augmentation for Rail based on EGNOS Work packages breakdown structure

23E101





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









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