



H2020 project funded by



HORIZON 2020

**Patrizio Vanni (Project Coordinator)**

***EGNOS Annual Workshop  
Athens, 3 October 2017***

This project has received funding from the European GNSS Agency under the European Union's Horizon 2020 research and innovation programme under grant agreement No 687198

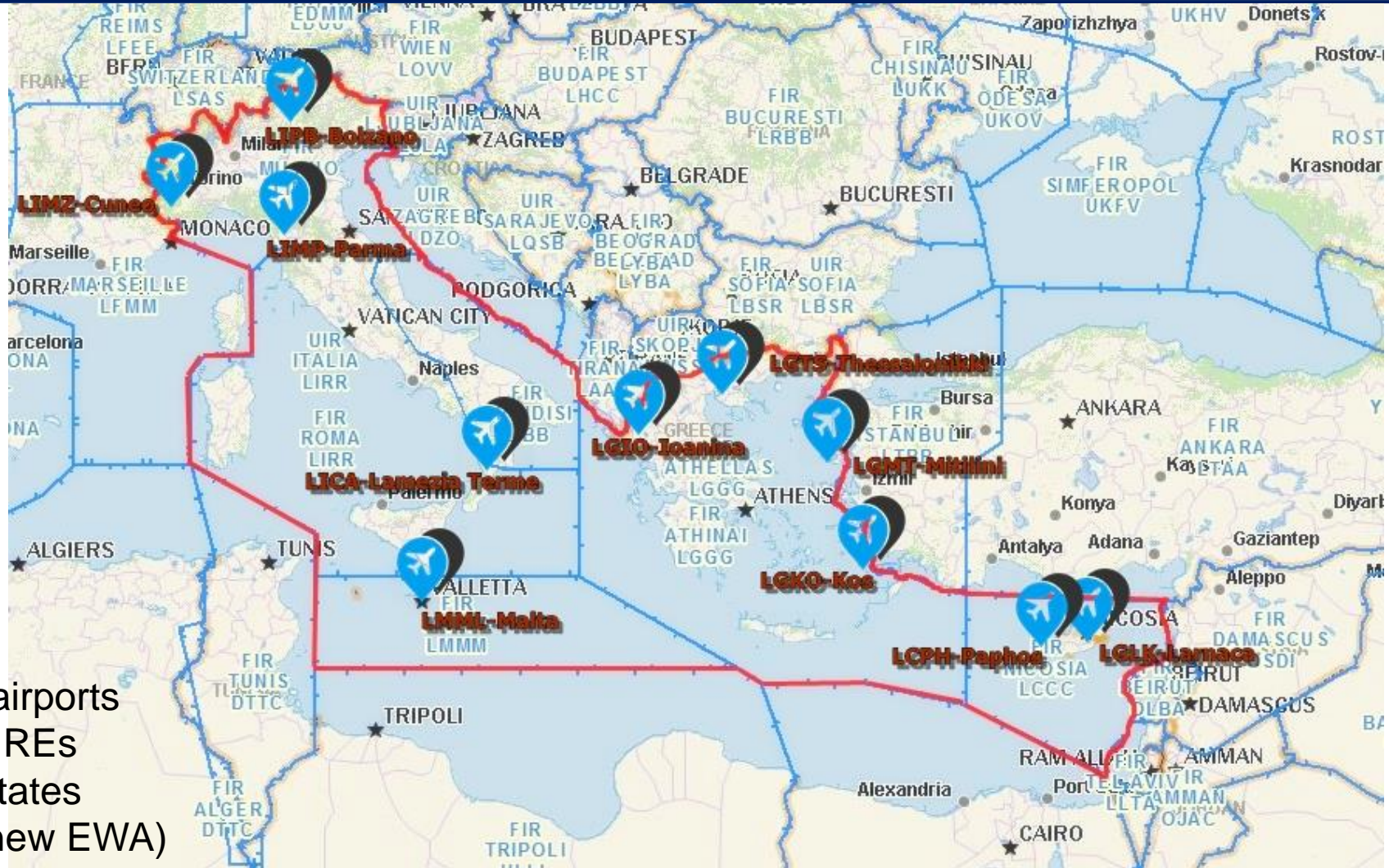


**bluemed.aero**

## PROMOTING EGNSS OPERATIONAL ADOPTION IN BLUEMED

- Started: 1 January 2016 (30 months)
- Overall budget: €2.304.181 (70% fundings by GSA)
- Consortium:
  - ENAV (Coordinator)
  - HCAA
  - MATS
  - DCAC
  - IDS





11 airports  
15 IRES  
4 States  
(3 new EWA)

- **Advanced PANS-OPS:**
  - Audience: Procedure designers having received at least Basic PANS-OPS training
  - Objective: Allow States to design and periodically review RNAV procedures
  - COITL sessions during the design of procedures
  - Duration: 2 weeks
- **ATCO Training:**
  - Audience: Local ANSP Instructors
  - Objective: Allow ANSP to organize the training for ATCO on RNAV procedures in autonomy
  - Duration: 2 days
- **Non-ATCO Training:**
  - Audience: Local ANSP Instructors
  - Objective: Deliver general GNSS training to non operational staff
  - Duration: 2 days

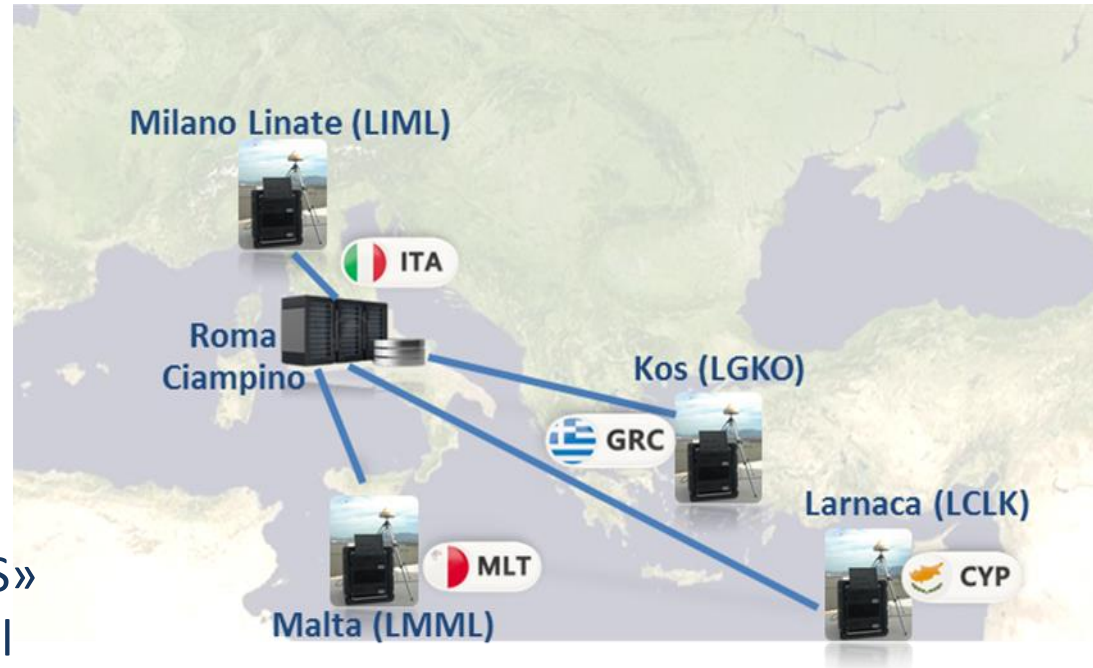


- RNP APCH is the PBN specification dealing with approach procedure dealing with GNSS (EGNOS, GPS and in future Galileo)
- Required by ICAO Assembly Resolution A37/11 on PBN global goals
- Included in Pilot Common Project (only for 24 airports)
- EASA PBN IR (LPV mandate in Europe by 2024 TBC)
- ICAO baseline:
  - ICAO EUR Doc025 «RNP APCH Guidance Material»
  - ICAO Doc8168 Procedures of Air Navigation Services - Aircraft Operations (PANS-OPS)
  - ICAO Doc9906 Quality Assurance Manual for Procedure Design and Training
  - ICAO Doc9613 PBN Manual
  - ICAO Doc9849 GNSS Manual
  - Annex 10 Vol.I SARPS

*OCH	LPV	LNAV/VNAV	LNAV	Existing
LGMT 14	741-753-761-772	1140	1140	1840 VOR/DME
LGMT 32	1631-1643-1655-1667	1177	1177	None
LGTS 34	957-965-973-982	981-993-1001-1012	1098	1278 VOR/DME
LGKO 14	250	250-255-266	338	508 VOR
LGKO 32	250	279-291-299-310	397	507 VOR
LGIO14	1099-1111-1119-1130	1029-1041-1049-1060	1342	None
LGIO14 5%	819-831-839-850	839-851-859-870	1162	None
LGIO32	750-762-770-781	750-762-770-781	863	1242 VOR

- Benefits for all airports in terms of vertical guidance and reduced minimas

- Set up of a regional GNSS Performance Monitoring Network that verifies GNSS performances
- Enable the operational acceptance of GNSS as navigation infrastructure and record relevant GNSS data
- Reference material:
  - ICAO Annex10 «GNSS SARPS»
  - ICAO Doc9849 GNSS Manual



- All local stations already deployed and integrated with EDAS data
- Central elaboration unit test bed under validation
- First reports produced

# Generic benefits

H2020 project funded by HORIZON 2020

Development of **end-to-end application**

RNP APCH

Clear **commercial intent**

Airports

Airlines

**Innovative**, beyond state-of-the-art

Regional cooperation (FAB)

GNSS Monitoring

Build on mature **business concepts**

Aviation need

Provide **public benefits**

Accessibility

Safety

Contribute to the **adoption** of Galileo, EGNOS and EDAS

Approaches with EGNOS

GNSS monitoring using EDAS

Take into account relevant **standards and regulations**

ICAO documents

SES regulations



# Thanks for your attention



[patrizio.vanni@enav.it](mailto:patrizio.vanni@enav.it)



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# HCAA

## EGNOS implementation plans and activities

ALEXANDER DESYLLAS  
Navigation Systems Section  
HCAA Air Navigation Systems and Infrastructure (CNS) Division



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# **HCAA WELCOMES ALL EGNOS Yearly WORKSHOP PARTICIPANTS in ATHENS.**



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## HELLENIC CIVIL AVIATION AUTHORITY

is a **PUBLIC ENTITY** under the Greek Ministry of Infrastructure and Transport, autonomously directed by its Governor and Deputy Governors.

**HCAA / AIR NAVIGATION SERVICES GENERAL DIRECTORATE** is the **ATM/ANS Provider (HANSF)**. It's mission is the *management* and *control* of the National Airspace with the provision of **ATS, CNS** and **AIS** as bundle of Services, (Law :3913/2011)



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Until April 2017, a total of 45 National Airports were managed and operated by HCAA.

The management and operation of 14 of them, commencing from April 2017, were contracted to **FRAPORT- GREECE consortium** for the next 40 years. The Air Navigation Services Provision however, and relevant Functions, Systems and Infrastructure, remain fully under the jurisdiction and control of **HCAA/Air Navigation Services General Directorate**.





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**Fraport-Greece** is now responsible for operating, managing, upgrading and developing the 14 major regional airports, among which, **3** are mainland Gateways (**Thessaloniki, Kavala and Aktion**) and 11 are located in the Greek Islands **Chania(Crete), Corfu, Kefalonia, Kos, Mykonos, Lesvos, Rodos, Samos, Santorini, Skiathos, and Zakynthos**.



Combined, the 14 Greek regional airports served more than 25.3 million passengers in 2016.



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## HCAA HOSTING AND SUPPORTING THE EGNOS RIMS

One of the Ranging and Integrity Monitoring Stations (RIMS) is hosted in  
**ATHENS.**

**RIMS -ATH** successfully integrated in the operational platform on  
9/10/2012 with a positive impact in the performances  
measured in the NE Mediterranean region close to Greece.

- **RIMS-ATH** is supported from a team of 6 HCAA ATCEPs who have received proper training for 1<sup>st</sup> level maintenance.
- A two-level maintenance support is provisioned under a contract with ESSP, lasting until 2021. Proactive maintenance applied according to instructions (Working Orders) issued from ESSP. Reactive maintenance – on-call facility to fix a problem with a 3-hour and 6-hour response time agreed during weekends and holidays, respectively



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## **HCAA HOSTING AND SUPPORTING THE EGNOS RIMS**

Under the EGNOS exploitation programme and the foreseen system and operation evolutions towards the EGNOS next generation (EGNOS V3), **GSA** is exploring the re-use of RIMS sites (including the **RIMS-ATH**) for technical feasibility and compatibility with the EGNOS V3, through Site surveys.

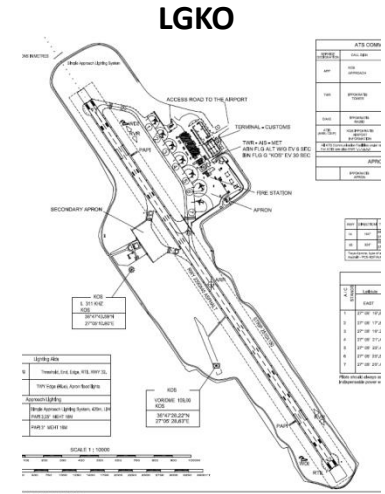
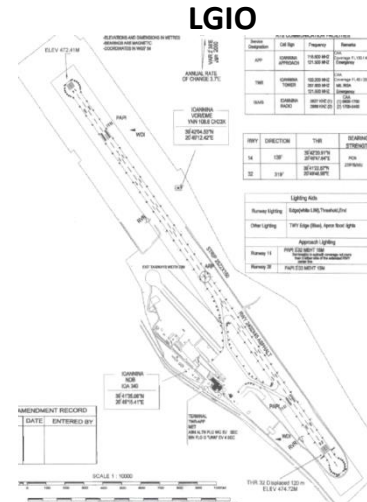
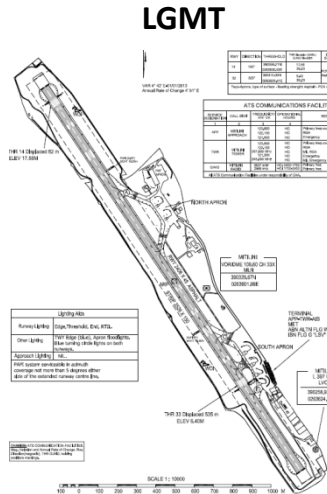
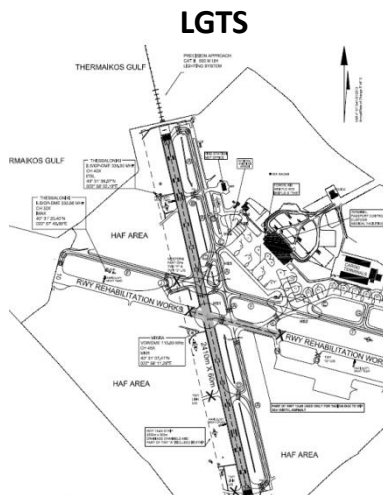
Such a survey has already been completed at RIMS-ATH in  
July 2017.





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## THE BLUEGNSS PROJECT and the HCAA Participation



Although the orientation of the runways is alike to all four airports selected, similarities stop here.

Diverse airport proximity environments and terrain challenging conditions make the selection of these airports an ideal exercise to investigate, develop and validate RNP APCH procedures with a vast variety of accessibility and safety issues.



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## PROJECT CURRENT STATUS regarding HCAA

**Ioannina** IREs:14-32 Procedures Flight validated August  
2017. Challenging terrain

**Kos** IREs:14-32 Procedures Flight validated  
August 2017

**Mitilini.** IREs:14-32 planned for October 2017.  
Challenging airspace

**Thessaloniki** IRE:34 planned for October 2017

All GNSS monitoring stations including Monitoring station in KOS  
Airport already deployed and integrated with EDAS data .  
Central elaboration unit test bed under validation  
First reports produced



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# **Expected benefits of HCAA participation to the BLUEGNSS Project**



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- 1. Specialized Training offered within the BLUEGNSS programme, will enable HCAA procedure designers to apply and use soft tools, methods and processes on the design, review and maintenance of GNSS RNP APCH procedures;*
- 2. Participation to the BLUEGNSS Project disseminates EGNSS culture, among HCAA ATCO and NON ATCO staff as a BLUEMED partner, evenly, on common grounds and practices*
- 3. Implementing a regional EGNSS Monitoring Network and data recording capabilities in support of the validation of RNP APCH and of the introduction of EGNOS/Galileo for aeronautical applications, simultaneously satisfies ICAO guidelines for safety oversight (GNSS Monitoring) and data recording, on Local and BLUEMED FAB level*
- 4. Accurate Design and Validation of RNP APCHs is a fundamental enabler for the exploitation of EGNSS in the aviation domain, promoting the ultimate goal of making EGNOS/GALILEO as the “dominant means of Air Navigation”*



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## Direct benefits in terms of:

- Safety, enabling Continuous Descent Final Approaches;
- Airport accessibility, enabling the possibility of precision approaches for both RWY ends on airports that do not have other than conventional NPA infrastructure, such as **Mitilini, Kos** and **Ioannina**) or for one RWY end not supported by ILS, such as **Thessaloniki**.



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## HCAA complementary contributing actions and activities promoting EGNSS Operational Use

# 1. The NATIONAL PBN ACTION PLAN



A yearly revised action  
Plan including Short ,  
Medium and Long Term  
PBN procedures  
Implementation.  
*Last edition 2016*



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**HCAA complementary contributing actions and activities  
enabling new EGNSS Procedures Implementation.**

## **2. The Procurement of a new PBN Procedures**

**Design software tool, co-funded by the  
INEA CALL CEF 2014**

Enabling HCAA procedure designers  
develop and review Among Others GNSS RNP APCH  
procedures

- Call for tender completed
- Under Technical/Financial Evaluation
- Contract to be signed by the end of 2017.



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**HCAA complementary contributing actions and activities  
enabling new EGNSS Procedures Implementation.**

**3. The HCAA Flight Inspection  
Aircraft console equipment upgrade  
for PBN LPV, LNAV –VNAV  
Inspections/Validations**

Flight Inspection system manufacturer's proposal under evaluation





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Thank you