EGNSS Service Roadmap for Unmanned Aviation

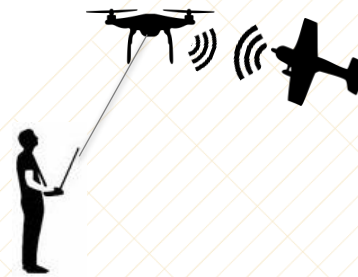## World ATM Conference - 22/06/2022

Miguel Aguilera

BENEFITS OF EGNSS FOR UAS

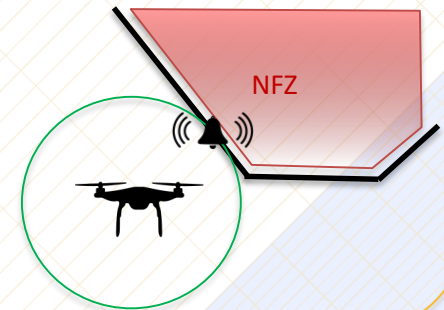Enhanced performance in challenging environments
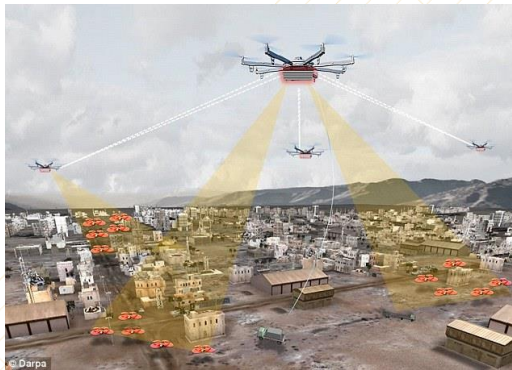
Increased accuracy and integrity for UAS applications
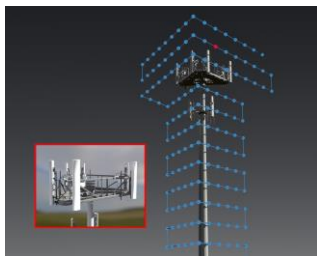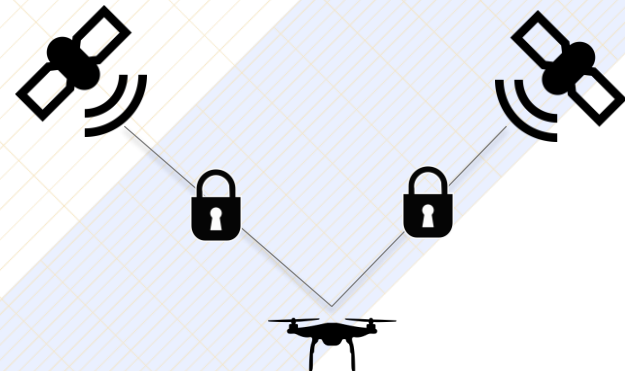
Detect and Avoid

Geo-fencing/caging

NFZ

Unprecedented high accuracy for new demanding applications

Embedded cybersecurity features

EGNSS SERVICE FOR UNMANNED AVIATION

- Rationale:

    - To foster a high level of adoption of **GNSS-based positioning and timing** in UAS

    - To promote EGNOS and Galileo **differentiators** vis-à-vis GPS (HAS, OSNMA, integrity, etc.)

    - To support the **development of U-Space** from the EGNSS Programmes

- Building blocks:

    - EGNOS and Galileo **integrated service**

    - **Phased implementation** approach

- Assumptions:

    - UAS **market development**

    - UAS **regulatory development**

    - **EGNSS usage** in UAS operations

EGNSS SERVICE FOR UNMANNED AVIATION

- Preliminary allocation of GNSS services per UAS operations category is based on the following criteria:

  - Low risk operations will make use primarily of GNSS open services

  - Medium risk operation will make use of a combination of GNSS open and SoL services, depending on the specific use case supported.

  - High risk operations will make use primarily of GNSS SoL services.

EGNSS SERVICES / UAS OPS CATEGORIES		GALILEO*				EGNOS**	
		OS	HAS	OSNMA	Support to SoL Applications[†]	OS	SOL
OPEN		✓	✓	✓		✓	
SPECIFIC	L	✓	✓	✓		✓	
	M	✓	✓	✓			✓
	H				✓		✓
CERTIFIED					✓		✓

*Alone or in combination with GPS
**With GPS
[†]Support to EGNOS V3 and ARAIM

Low Risk — OPEN, SPECIFIC L
Medium Risk — SPECIFIC M
High Risk — SPECIFIC H, CERTIFIED
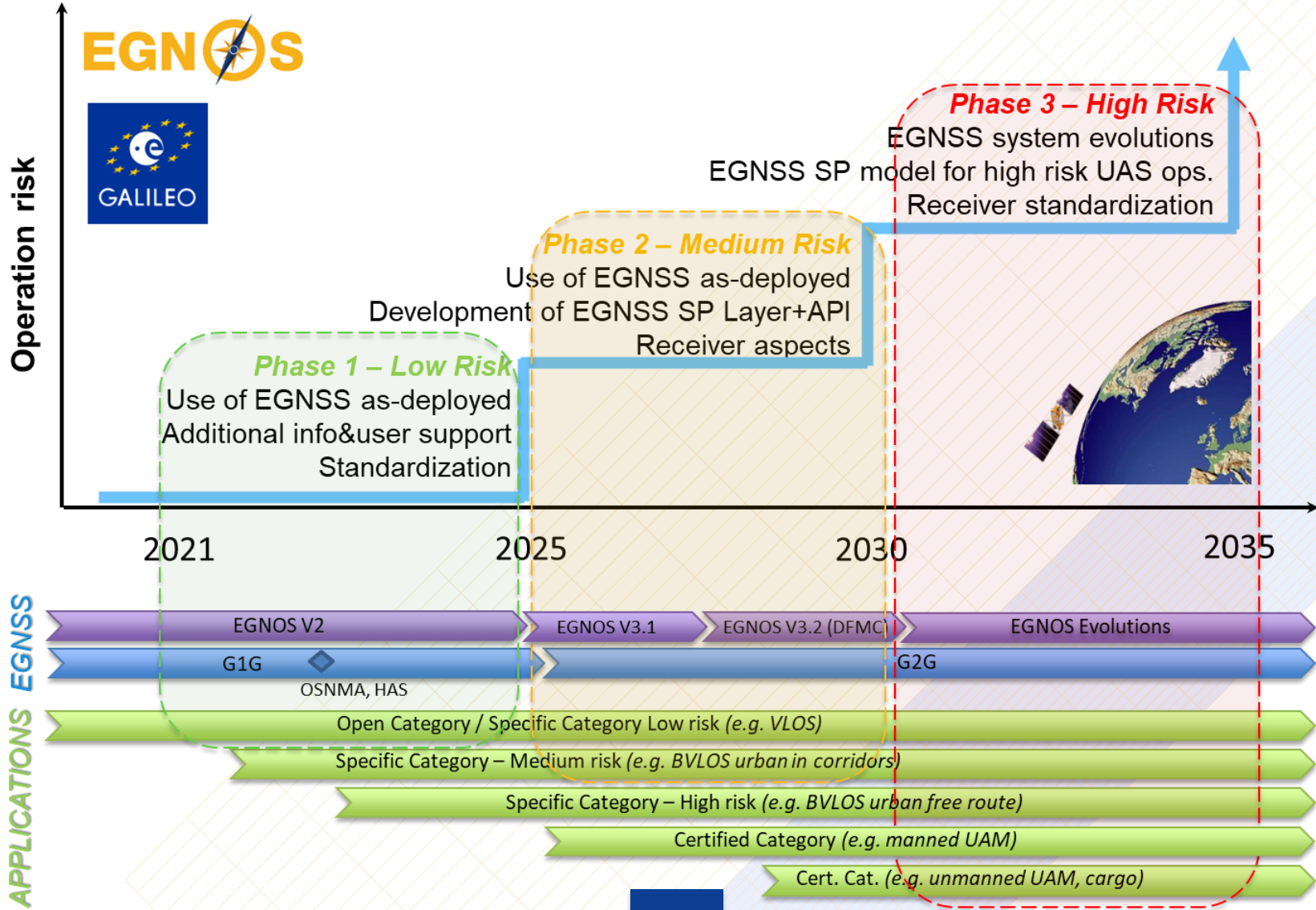
EGNSS SERVICE FOR UNMANNED AVIATION

- High-level roadmap:

CONCLUDING REMARKS

- EGNSS Programmes wishes to support the safe and secure development of U-Space providing positioning and timing solutions tailored to the market needs

- EGNSS Programmes cooperates with regulatory authorities, standardization bodies and other UAS stakeholders to implement the Roadmap

- Several projects and activities are managed by DG DEFIS and EUSPA for the Roadmap implementation
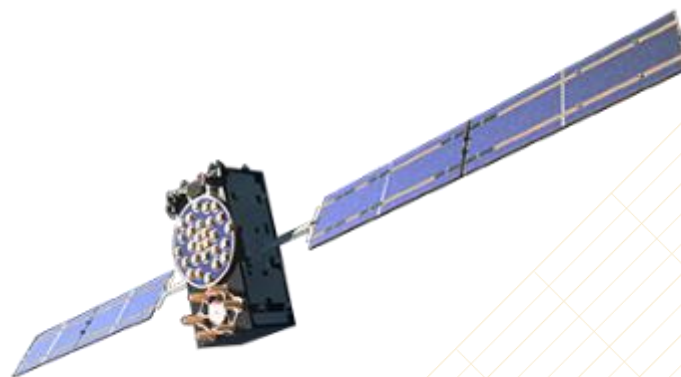
SONORA   EUGENE   DELOREAN   GAUSS   Real

REALITY   SuguS   EGNSS4RPAS

THANK YOU

https://https://ec.europa.eu/defence-industry-space

BACK-UP SLIDES

EGNSS SERVICE FOR UNMANNED AVIATION

- **Phase 1 – Support to low risk operations**

    - Use of current or already planned EGNSS services (i.e., no system evolution is required).

    - Service Provision level: information available to users should be enhanced to assist the drone community (i.e., EGNSS websites), as well as the user support channels (i.e., helpdesk).

    - Standardization: support to the development of the GNSS Guidelines which are being drafted by EUROCAE WG-105 SG62, that provides guidance on the application of SORA Operational Safety Objective (OSO) 13 for the low level of robustness.

EGNSS SERVICE FOR UNMANNED AVIATION

- **Phase 2 – Support to medium risk operations.**
  - Use of current or already planned EGNSS services (i.e., no system evolution is required).
  - Service Provision level:
    - Develop a service provision model and a liability scheme (incl. security).
    - Service commitments (i.e., SDD) - TBC
    - Evolve EGNSS API prototype in order to become an operational service
  - Standardization:
    - Standardization of the navigation function (development of a GNSS navigation operational concept and an integrity concept)
    - Assessment of user receiver aspects
    - Support to standardization of other GNSS-enabled U-Space services (e.g., detect and avoid, geo-awareness or e-identification)
    - Support to completion of the EUROCAE GNSS Guidelines for high level of robustness.

EGNSS SERVICE FOR UNMANNED AVIATION

- **Phase 3 – Support to high risk operations**
  - Potential EGNOS and Galileo system and service evolutions
  - Service Provision level:
    - Develop a service provision model and a liability scheme (incl. security).
    - Service commitments (i.e., SDD)
    - Evolve EGNSS API prototype in order to become an operational service
  - Standardization:
    - Standardization of the navigation function (development of a GNSS navigation operational concept and an integrity concept)
    - Standardization of the user receiver
    - Support to standardization of other GNSS-enabled U-Space services (e.g., detect and avoid, geo-awareness or e-identification)
    - Support to the update of the EUROCAE GNSS Guidelines for medium level of robustness.