



#EUSpace 



MINISTERIO  
DE TRANSPORTES, MOVILIDAD  
Y AGENDA URBANA

U   
23

# Welcome to

## SPACE FOR INNOVATION IN RAIL



13-14 September  
Madrid

## #Satellite4Rail





**Setting the Scene – Space for  
Expanding ERTMS Capabilities**



#EUSpace 



MINISTERIO  
DE TRANSPORTES, MOVILIDAD  
Y AGENDA URBANA

U   
23



## Setting the Scene – Space for Expanding ERTMS Capabilities

- Elżbieta Łukaniuk, Member of Cabinet European Commissioner for Transport
- Marcin Wojcik, Advisor to the European Coordinator for ERTMS, DG MOVE, European Commission
- Rodrigo da Costa, Executive Director, EUSPA
- Josef Doppelbauer, Executive Director, ERA
- Giorgio Travaini, Executive Director a.i., Europe's Rail JU

Moderator: **Íñigo Cruz Martínez, Policy Officer, DG MOVE, European Commission**





#EUSpace 



MINISTERIO DE TRANSPORTES, MOVILIDAD Y AGENDA URBANA



**Rodrigo da Costa**

**Executive Director, EUSPA**



**#Satellite4Rail**



# EU Space: 2021-2027

## EU Space activities under one umbrella



### EGNOS

EGNOS “Makes navigation signals more accurate and trustable for Safety-critical applications”

Operational in **400+ airports** & helipads in 26 countries



### Galileo

Global satellite navigation and positioning system (GNSS)

More than **4 billion Galileo receivers** worldwide



### Copernicus

Earth Observation (EO) and monitoring based on satellite & non-space data

**Nr.1 world provider** of space data and information (>20TB/day)



### GOVSATCOM

Secure satellite communications for EU governmental actors  
Rapid support over crisis areas



### IRIS<sup>2</sup>

**Infrastructure for Resilience, Interconnection & Security by Satellites**

Sovereign multi-orbit constellation  
Cutting-edge technologies focused on government service



### Space Situational Awareness (SSA)

Space Surveillance and Tracking (SST)  
Space Weather Events (SWE)  
Near-Earth Objects (NEO)

# ERTMS in the focus of EU Space Programme



- EGNOS and Galileo adoption in ERTMS belongs to our key objectives with the intention to:
  - Help railways innovate and digitalize signalling
  - Support reduction of ERTMS cost and its faster rollout in Europe and beyond
  - Facilitate interoperability
- The railway sector is “on the move” to reap EU Space Programme benefits
  - Rail stakeholders are actively leading R&D projects focused on adoption
  - Rail sector is forming stakeholder groups speaking with “one voice” towards the EU Space Programme
  - Rail recently initiated a concrete request for EU Space Programme services
- EUSPA activities supporting the railway effort to innovate will continue
  - R&D Programme HE
  - Fundamental elements
  - Space sector support in Rail user groups (e.g. System Pillar)
  - Continued coordination with ERA and EU-Rail to achieve our joint objective of GNSS enabled ERTMS





#EUSpace 



MINISTERIO DE TRANSPORTES, MOVILIDAD Y AGENDA URBANA



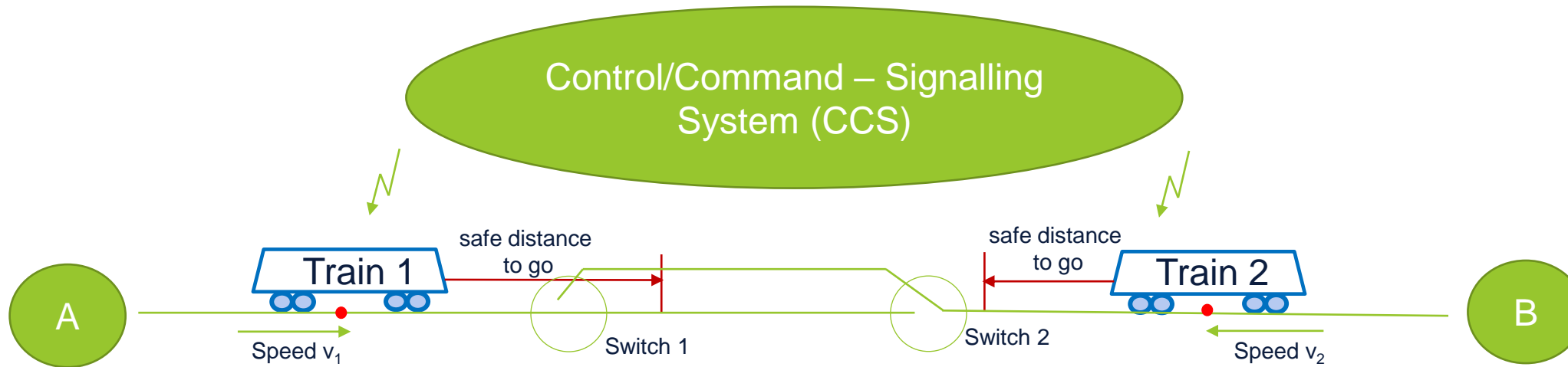
# Josef Doppelbauer

## Executive Director, ERA



#Satellite4Rail

# Satellite technology for Rail



- Key functions like **train positioning and communication** possible in a very cost effective manner

- Collaborating with our partners EUSPA, EU-Rail, the European Commission, and the European rail sector, we seek optimal solutions that also protect existing stakeholder investments



## Satellite Technology and ERTMS

- **Top priority:** One Europe, one railway: creating a unified European railway system, based on one set of clear and simple rules, is our top priority (Single European Railway Area, SERA)
- European Parliament, within its resolution of 7 July 2021 on railway safety and signaling assessing the state of play of the ERTMS deployment, indicated a need to ensure **synergies between the ERTMS and the European Global Navigation Satellite System (GNSS)** as soon as possible.



## Readiness of Satellite Technology for Rail

- Efficient and cost-effective railways shall be the backbone of Europe's sustainable transport system. Therefore, the technical solutions need to be affordable.
- Pre-requisites: an agreed architectural approach, achievable safety levels, reliable products, and a clear business case for the sector.





#EUSpace 



MINISTERIO DE TRANSPORTES, MOVILIDAD Y AGENDA URBANA



# Giorgio Travaini

Executive Director a.i., Europe's Rail JU



#Satellite4Rail



# EU-Rail, a R&I integrated Programme and a cooperation to deliver

- ❖ Adapt to changing customer requirements
- ❖ More cost-efficient solutions and services compared to today
- ❖ Need for improved performance and capacity
- ❖ Addressing workforce shortage
- ❖ Climate change adaptation and environmental sustainability
- ❖ Increased competitiveness
- ❖ Interaction with other modes, make rail central to future mobility
- ❖ Addressing legacy systems and obsolesce



# Concrete outcomes working with EUSPA, ESA and ERA

- Work is starting on requirements in EU-Rail Flagship Project “FP2-R2DATO” now.



## GNSS Augmentation for Rail based on EGNOS Work packages breakdown structure

Ref:	23E101
Version:	0n
Date:	27/07/2023



DELIVER AN **INTEGRATED EUROPEAN RAILWAY NETWORK BY DESIGN**



DEVELOP A **UNIFIED OPERATIONAL CONCEPT AND A FUNCTIONAL SYSTEM ARCHITECTURE** FOR INTEGRATED EUROPEAN RAIL TRAFFIC AND CCS/AUTOMATION



DELIVER A **SUSTAINABLE AND RESILIENT RAIL SYSTEM**



DELIVER A **COMPETITIVE, GREEN RAIL FREIGHT FULLY INTEGRATED INTO THE LOGISTICS VALUE CHAIN**



DEVELOP A **STRONG AND GLOBALLY COMPETITIVE EUROPEAN RAIL INDUSTRY**

# EUROPE'S RAIL: ONE INTEGRATED R&I PROGRAMME

## SYSTEM PILLAR

OPERATIONAL CONCEPTS

FUNCTIONAL SYSTEM ARCHITECTURE

**A SINGLE COORDINATING BODY FOR THE WHOLE SECTOR EVOLUTION**

OPEN INTERFACES TO OTHER TRANSPORT MODES AND BUSINESSES

SYSTEM REQUIREMENT SPECIFICATIONS

## INNOVATION PILLAR

*TECHNOLOGICAL AND OPERATIONAL SOLUTIONS FOR SERVICES OF FUTURE*

FLAGSHIP PROJECTS

LARGE-SCALE DEMONSTRATIONS

EXPLORATORY AND FUNDAMENTAL R&I

1

**EUROPEAN RAIL TRAFFIC AND MOBILITY MANAGEMENT**

Manage and improve rail traffic at EU level

Adjust rail traffic management in function of the mobility demand

2

**DIGITALISATION & AUTOMATION IN TRAIN OPERATIONS**

ATO implementation

Digital train operations

3

**SUSTAINABLE AND DIGITAL ASSETS**

Integrated assets testing & life-cycle framework

Zero-emission, silent rail system

4

**COMPETITIVE, DIGITAL, GREEN RAIL FREIGHT**

New digital customer interaction & innovative rail freight services

Multimodal and rail freight innovation integration

5

**REGIONAL RAIL SERVICES IN LOW DENSITY AREAS**

New system approach to regional rail services in low density areas

## DEPLOYMENT GROUP

FUTURE SOLUTIONS DEPLOYED IN A COORDINATED AND CONSISTENT WAY AT EUROPEAN LEVEL, TAKING INTO ACCOUNT ALTERNATIVE ROLLOUT SCENARIOS, BEHAVIOURAL AND ORGANISATIONAL CHANGES, SYNERGIES WITH OTHER MODES OF TRANSPORT