

ESA COMMERCIALISATION DAYS TRANSPORTATION

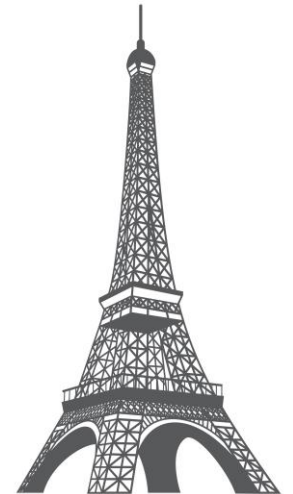


***Session 2 - Rail transportation and space
Positioning, signalling, connectivity, automation, security and
predictive maintenance***

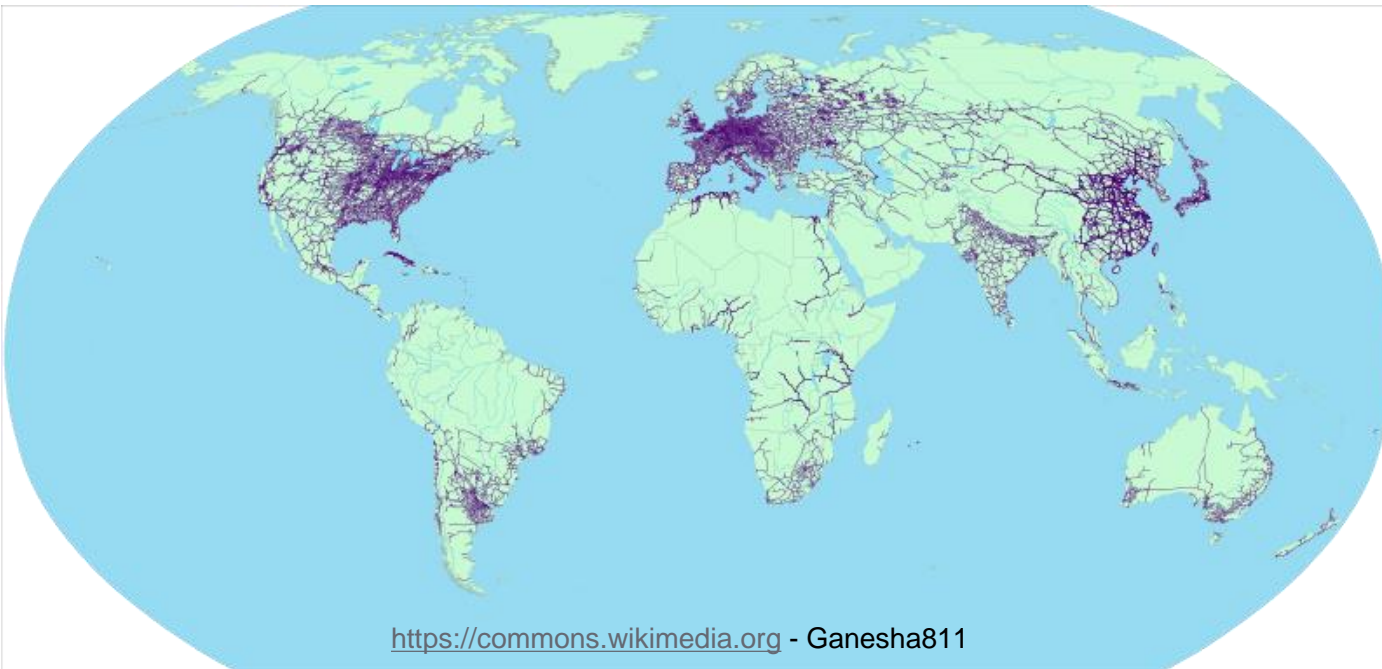
Railway in a nutshell:

- **3 trillion** passenger-kilometres travelled across the world per year
- **10 trillion** freight tonne-kilometres are travelled around the world.

(Source: UIC)



Designed by macrovector / Freepik



<https://commons.wikimedia.org> - Ganesha811

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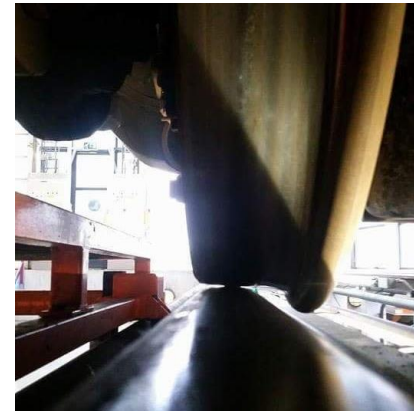
- **80,000** locos, light rail monotractors, multiple units... (1)
- **1.1 million** kilometers of railway in the world

(1): EU

Let's see two major properties of railways :

- World champion in energy efficiency !

Thanks to efficient train and rail-wheel mechanical properties



- Amazing traffic flows !

in a tiny space,
even at high speed

Thanks to the guiding principles

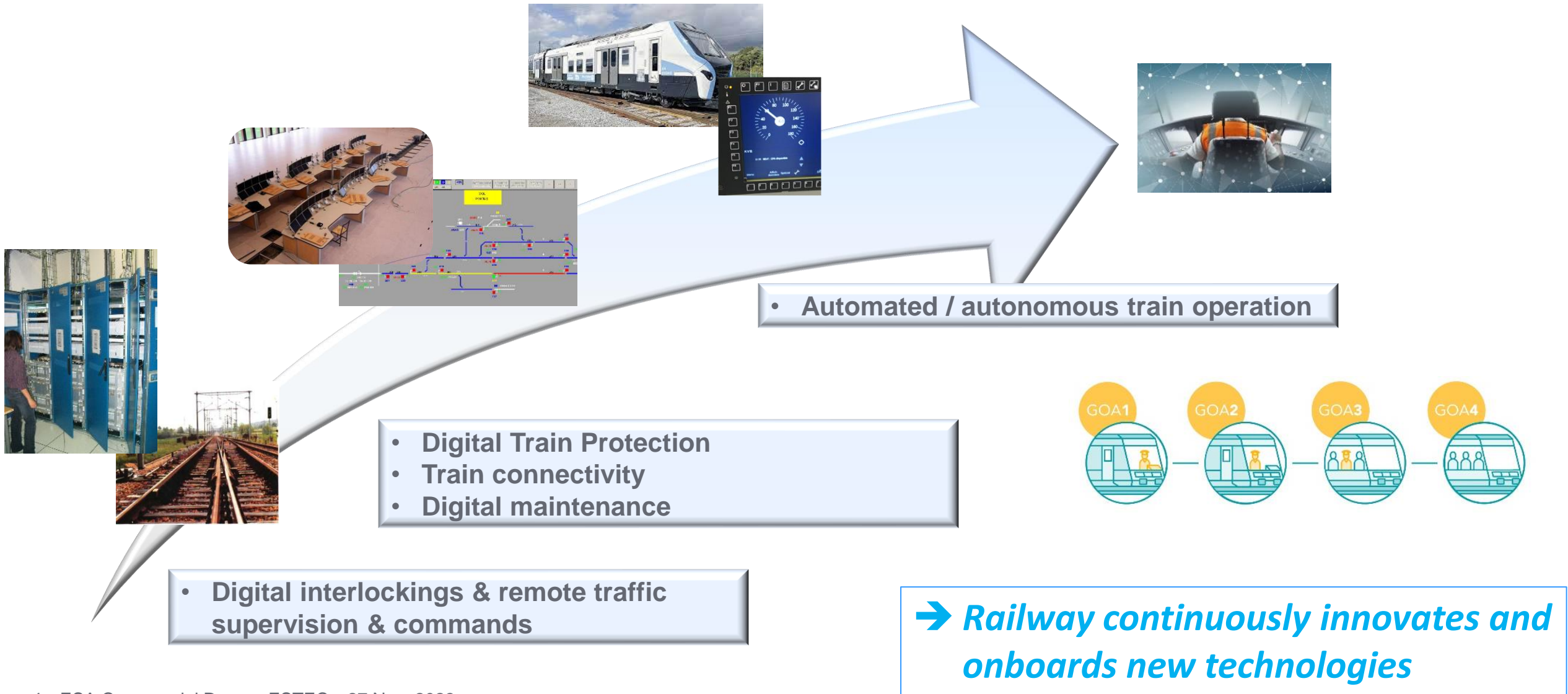


Lionel Mollard



➔ *A system with good “genes” that goes through the centuries !*

Examples from the past decades in signalling



A summary of ERRAC 2050 Vision - rail's contribution to meet society's needs

Rail helps to support society's needs

Rail is an effective catalyst for generating economic growth in Europe

Rail helps to protect the environment

- **Connecting Europe's territories, markets and people,**
- Offering comfortable, **safe and secure** travel for everyone
- Providing highly **skilled jobs** and innovation
- Fostering Europe's **RDI investment**
- **Sustainable mobility** for passengers and freight
- **Energy efficiency** for urban and long-distance travel

➔ *A vision that meets our society needs, a vision that needs innovations*



Master Plan and Multi Annual Work Plan (March 2022):

*“The long-term vision for rail transport envisages rail transport as the **backbone of the future mobility** in a multimodal context, as presented in the ERRAC Rail 2050 Vision.*

*Furthermore, it foresees that new opportunities for **radical changes in the transport system** will appear.”*

→ A system wide vision, introducing “Technical enablers” based also on space technologies

Logistics & Traffic regulation

Fleet -mngt
ATS/TMS
(...)

Infrastructure monitoring

Vegetation
Landsliding
(...)

Communication

Voice
Data
(...)

Signalling & Train control

ERTMS
ATO
(...)

Asset mngt & Maintenance

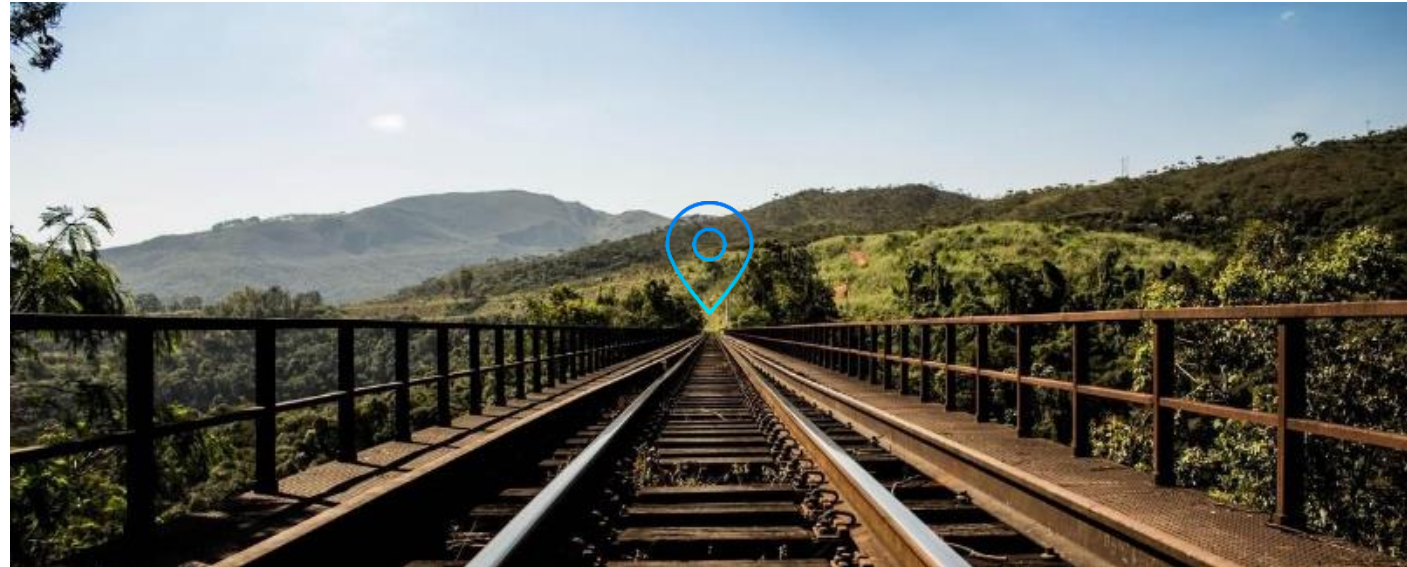
Predictive maint.
Level crossing
(...)

Railway application illustration



Example of a Space & Rail joint application

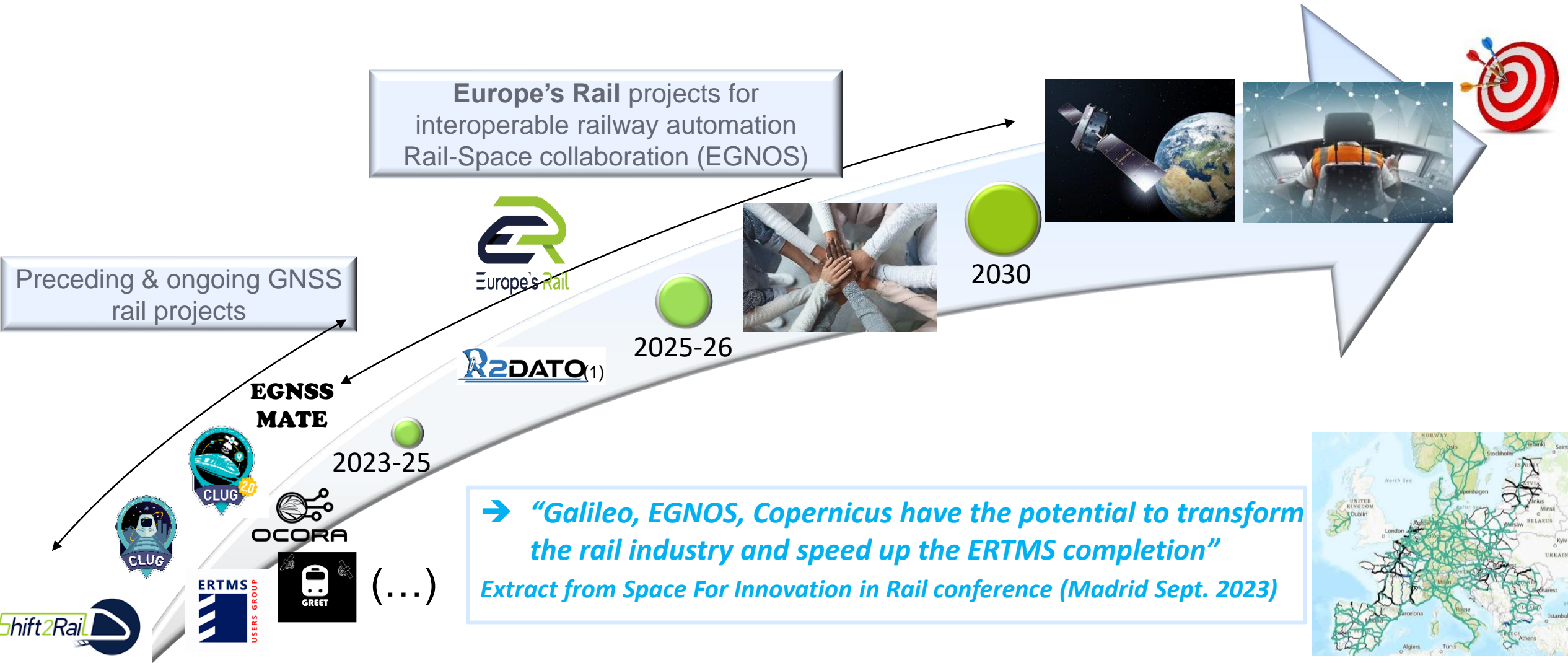
The absolute safe train positioning



➔ Major railway functions and performances rely on (safe) train localisation



Our vision: Europe's rail projects to foster the usage of GNSS for ERTMS



Thank you for your attention

