



EGNOS for rail applications

ERSAT project

EGNOS Service Provision Workshop
Copenhagen, 28-30 September 2015



Francesco Rispoli

About us: Ansaldo STS



Ansaldo STS is a leading technology company operating in the global Railway & Mass Transit industries, providing signalling systems and complete turnkey solutions worldwide.





AnsaldoSTS is a leader in ERTMS Level 2 and has provided more than 50% of the Signalling Technology for all High Speed lines* worldwide.

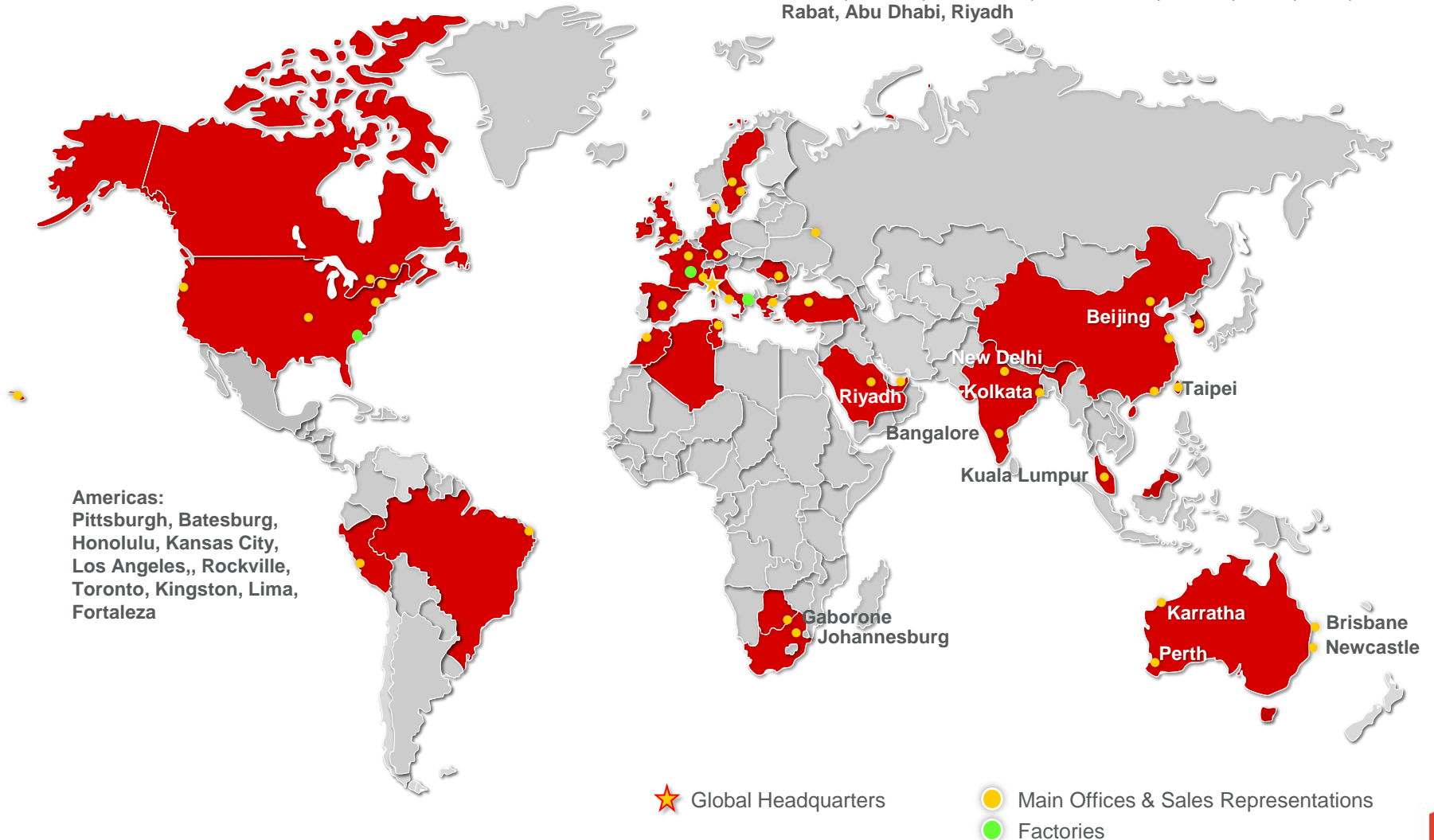
MOVE WITH US

* Reference excludes Japan

Worldwide Presence (total 2014 headcount : 3,799 p)

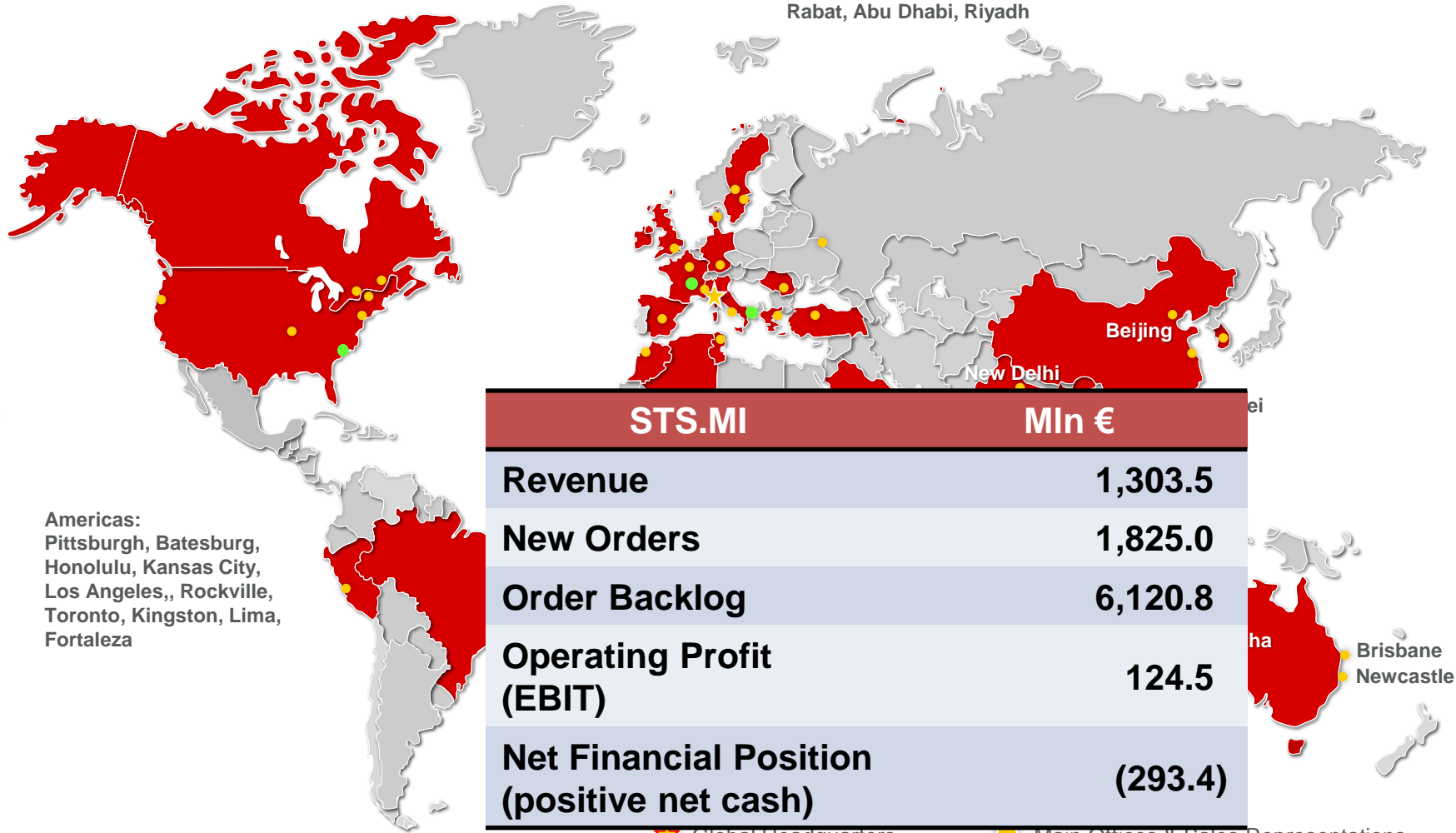
Europe, North Africa & Middle East:
Genoa, Naples, Turin, Potenza, Paris, Riom, Copenhagen, London, Madrid, Munich, Stockholm, Thessaloniki, Ankara, Tunis, Oran, Rabat, Abu Dhabi, Riyadh

Americas:
Pittsburgh, Batesburg,
Honolulu, Kansas City,
Los Angeles,, Rockville,
Toronto, Kingston, Lima,
Fortaleza



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STS.MI	Mln €
Revenue	1,303.5
New Orders	1,825.0
Order Backlog	6,120.8
Operating Profit (EBIT)	124.5
Net Financial Position (positive net cash)	(293.4)

 Global Headquarters
  Main Offices & Sales Representations
 Factories

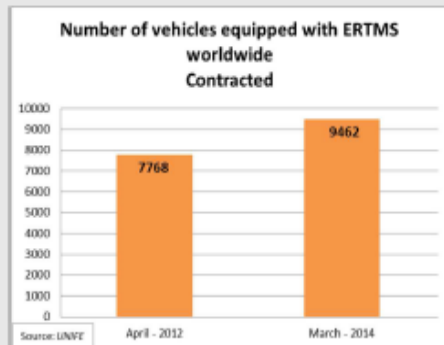


ERTMS: a common railways signalling system with global penetration

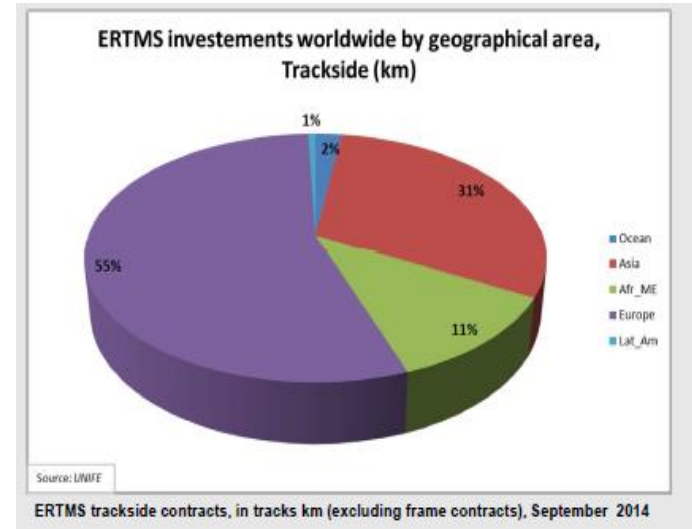


Worldwide ERTMS Investment

- Total track km: **76100**
- **42** Countries are using ETCS trackside

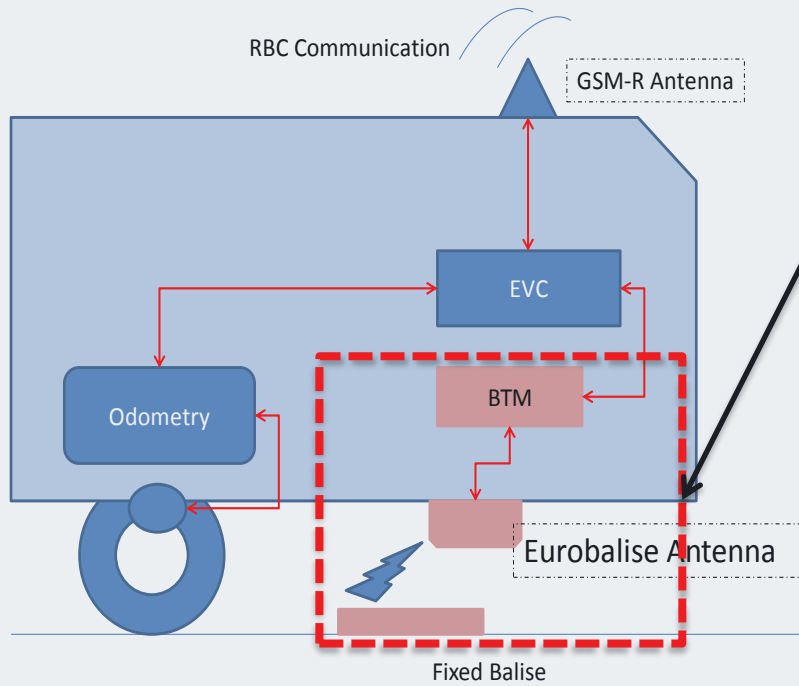


- Total No vehicles: **9462**
- **39** Countries are using ERTMS vehicles



Game changing

ETCS

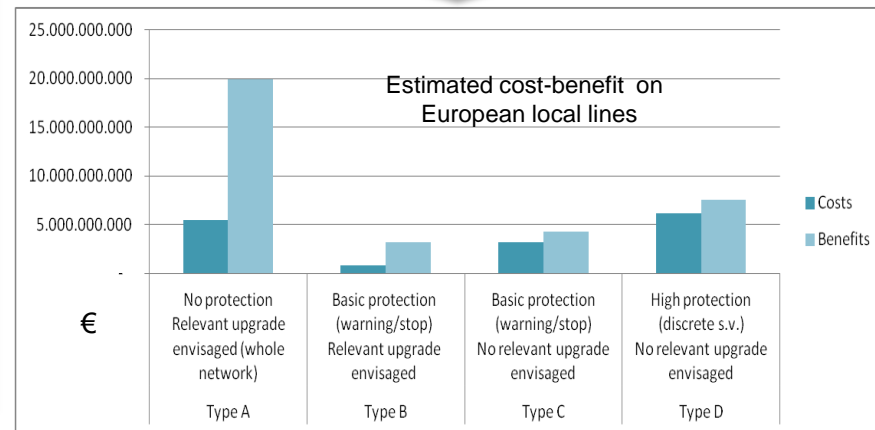


AS-IS

EGNSS



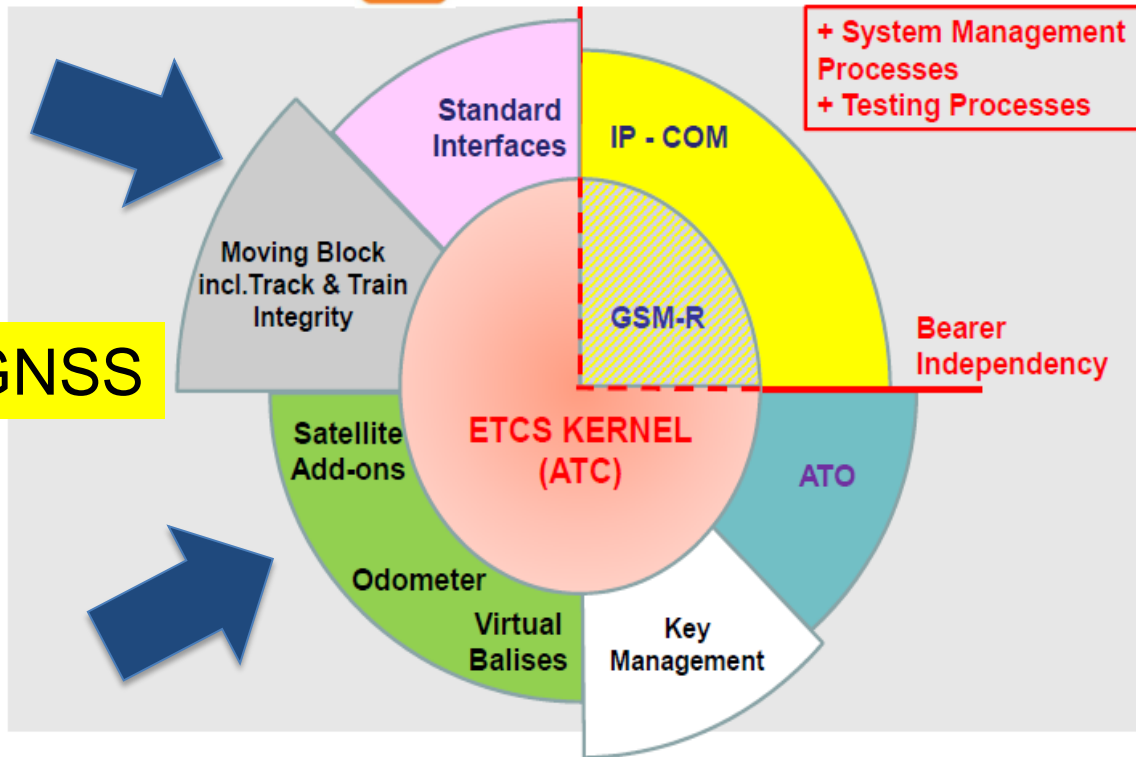
TO-BE



ERTMS Evolution Plan



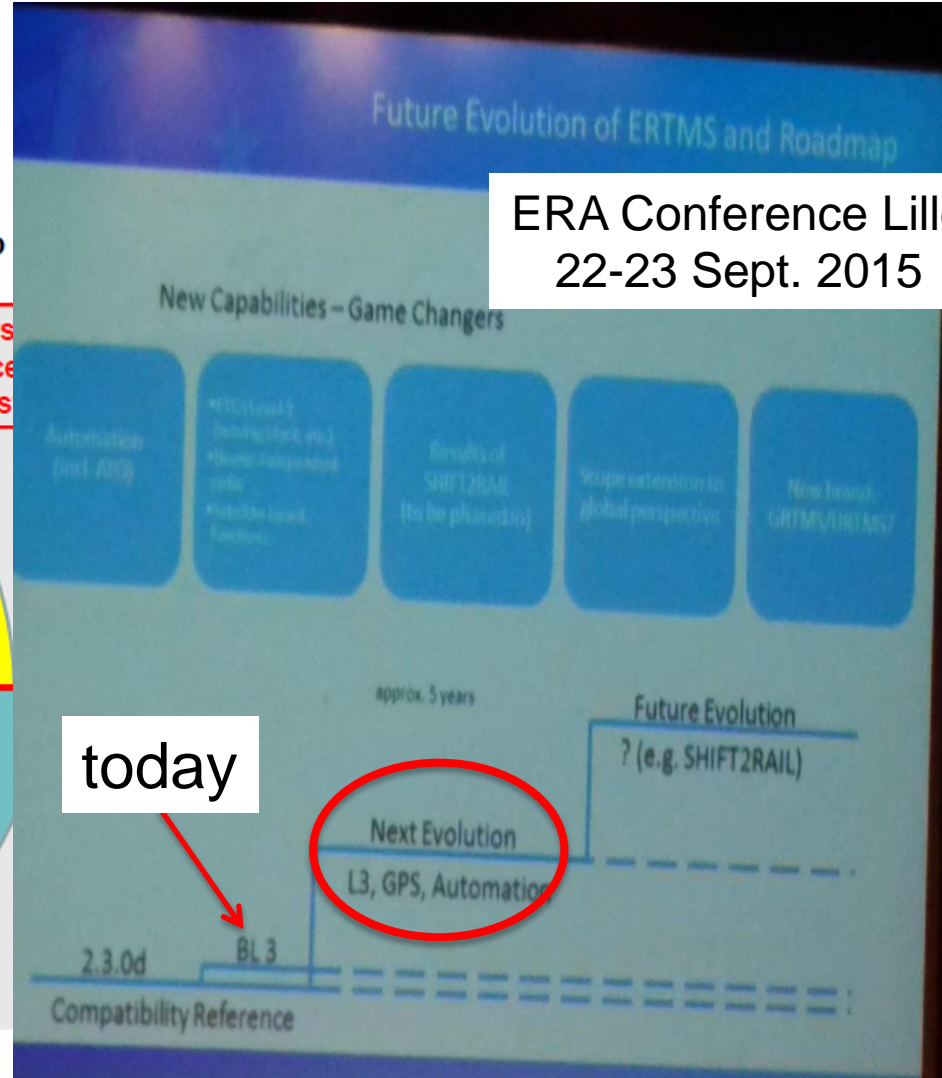
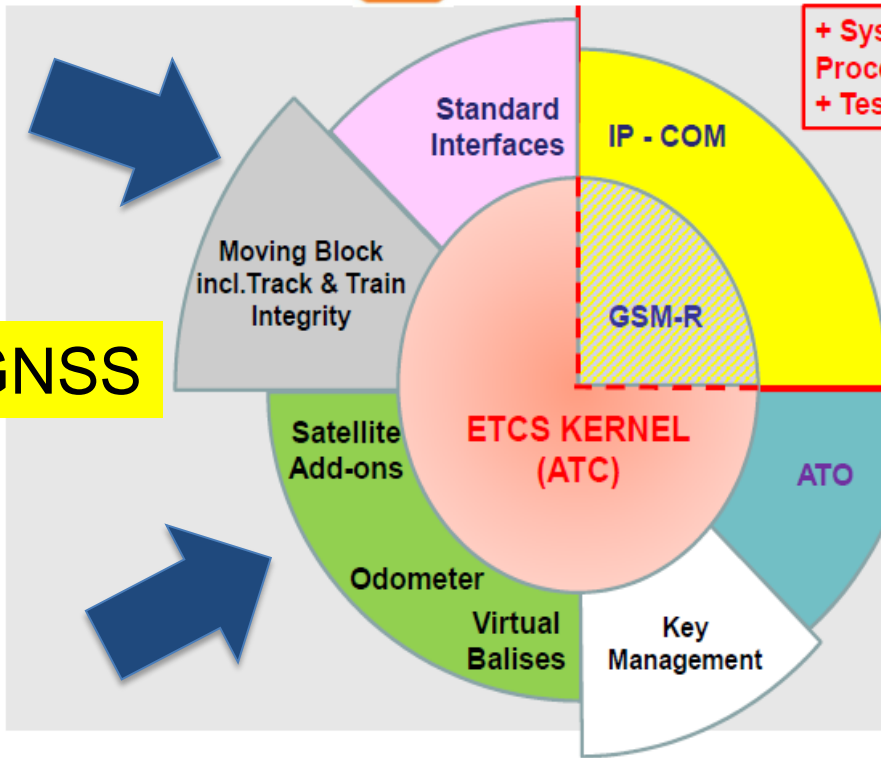
From ETCS & GSM-R to ERTMS Global



ERTMS Evolution Plan

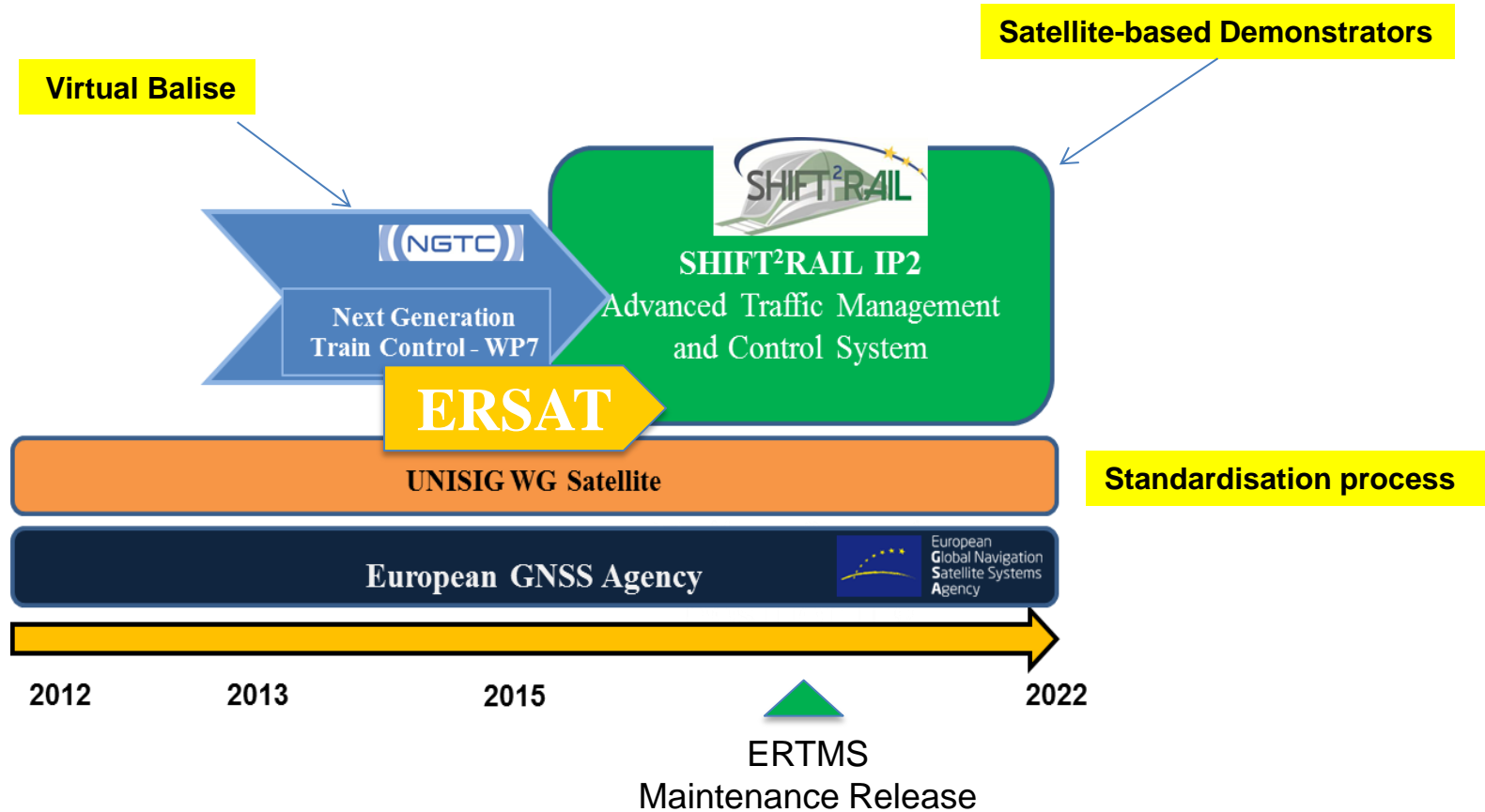


From ETCS & GSM-R to





European context



ERTMS in Italy : Obligation and Opportunities

ERTMS (ETCS+ GSM-R)

High Speed Network

Level 2
(Baseline 2)
Without fallback



10 years In Operation and
always in Evolution

2016 UpGrading 230d Ro Na
2016 Treviglio Brescia
2018 Roma Firenze
2020 Brescia - Verona

High Density Urban Nodes

Level2 /Level 3
(Baseline 3)
Overlapped to
National CCS



In realization

2018 :
HD Rome and Milan
Node (headway
2'30sec)

**Virtual Section by
Train Integrty
Detection**

Freight & Passenger Tent-T Corridors

Level 1/Level 2
(Baseline 3)
Overlapped to
National CCS



In realization

2015 Pilot Line Corr D
2016:Ranzo Luino, Domo
Iselle
2017: Domo Novara
2018:Milano Chiasso
2020 Novara -Villa
Opicina; Fortezza Verona;
Milano Genova

Low density Lines

Level2 /Level 3
(Baseline 3)
Satellite &
Public Bearer

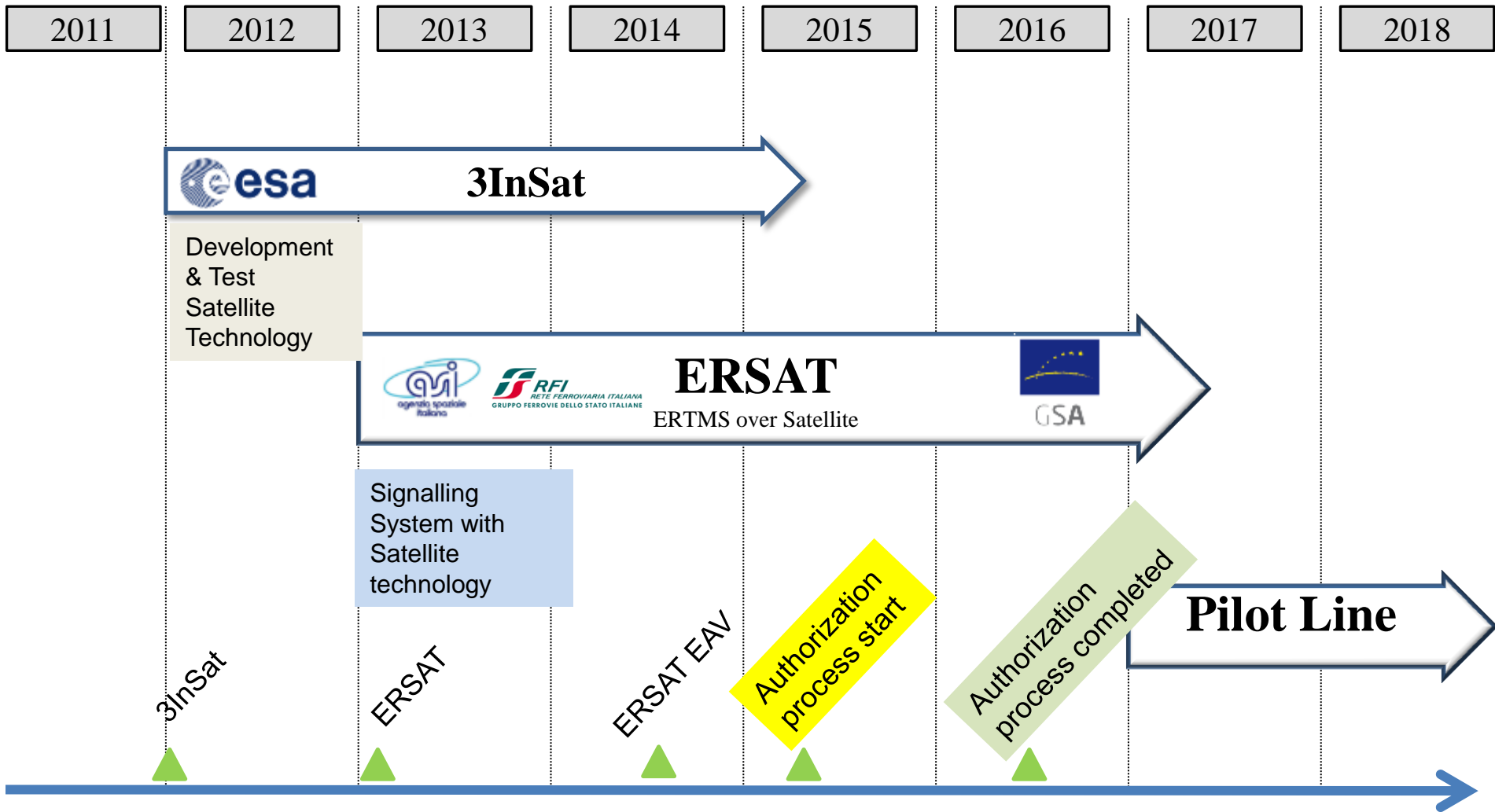


Pilot Line
in Sardinia

2017

**ERSAT merging two
EU project (Galileo and
ERTMS) for
Interoperable Virtual
Balise
concept**

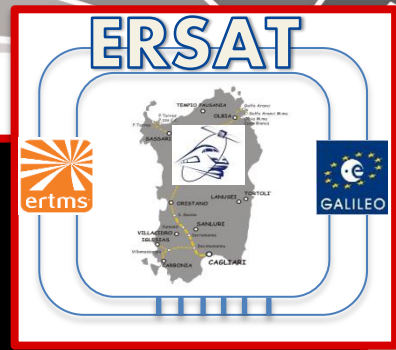
Roadmap





ERSAT EAV at a glance

- The first European platform for developing and validating EGNSS applications compatible with the ERTMS evolution
- Verification & Testing environment in a real scale ERTMS railways scenario to contribute to the standardization process
- Open Architecture based on multiple GNSS constellations, EGNOS, integrated with local augmentation networks and signal of opportunity positioning systems
- Regional and local railways lines target application to provide sustainable solutions for the modernization of old and costly to operate networks
- International team representing all the value-chain sectors
- Strong synergy among EGNOS-GALILEO and ERTMS, two pillars of the European industrial policy



 Ansaldo STS
A Finmeccanica Company

Partner



Supporting partner



ERSAT

Enhanced Railway Signalling Application

**Multi-
bearer
TLC
solution**

ERTMS

Satellite-based enhanced localisation

Multi constellation

**Local Area Trusted
Augmentation
service**

**Localisation in
GNSS-denied areas**

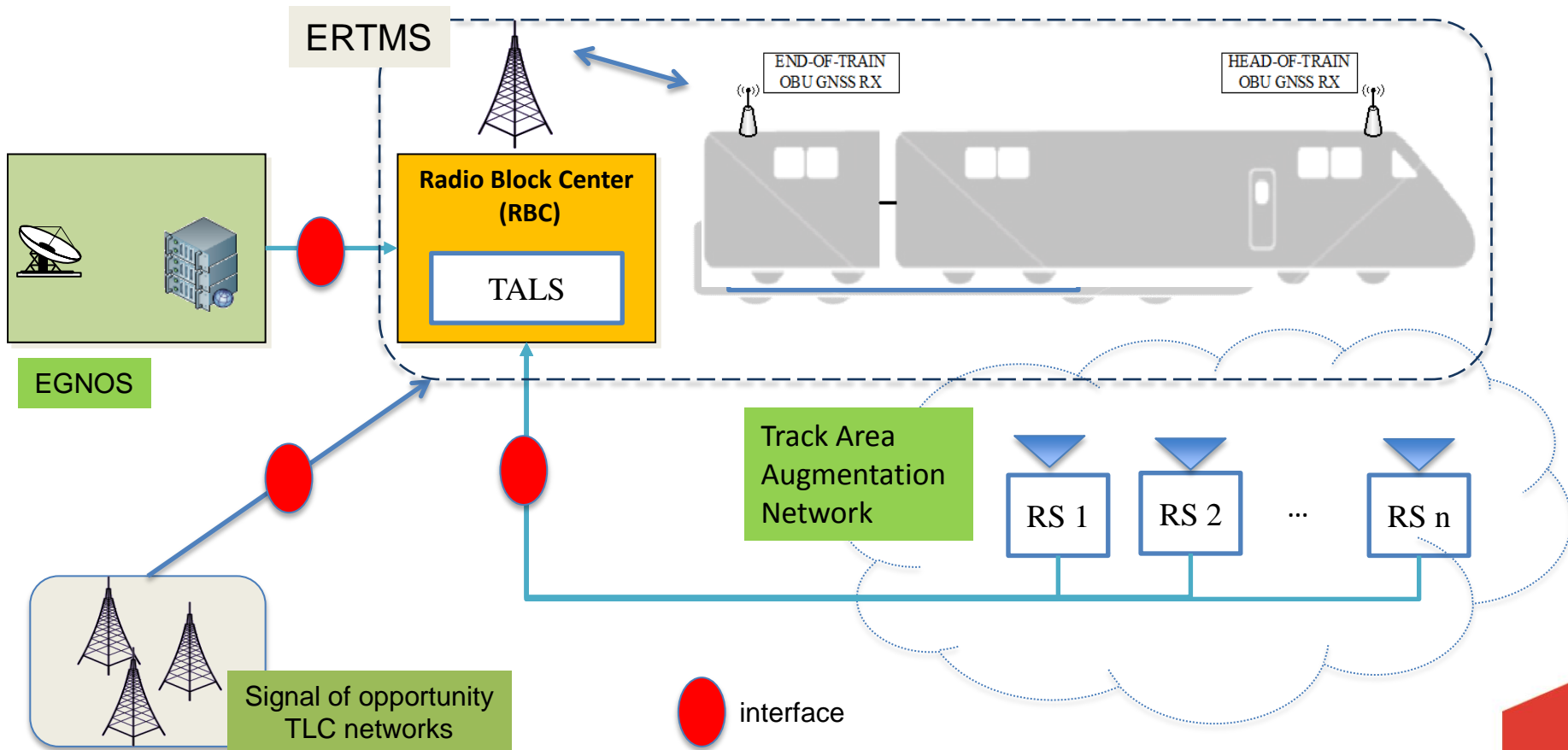
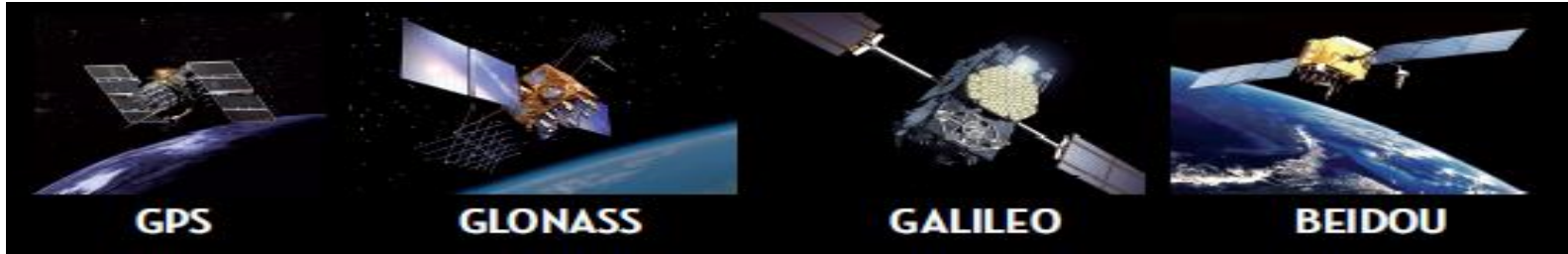
EGNSS-based localisation

EGNOS

**Galileo
Early
Services**

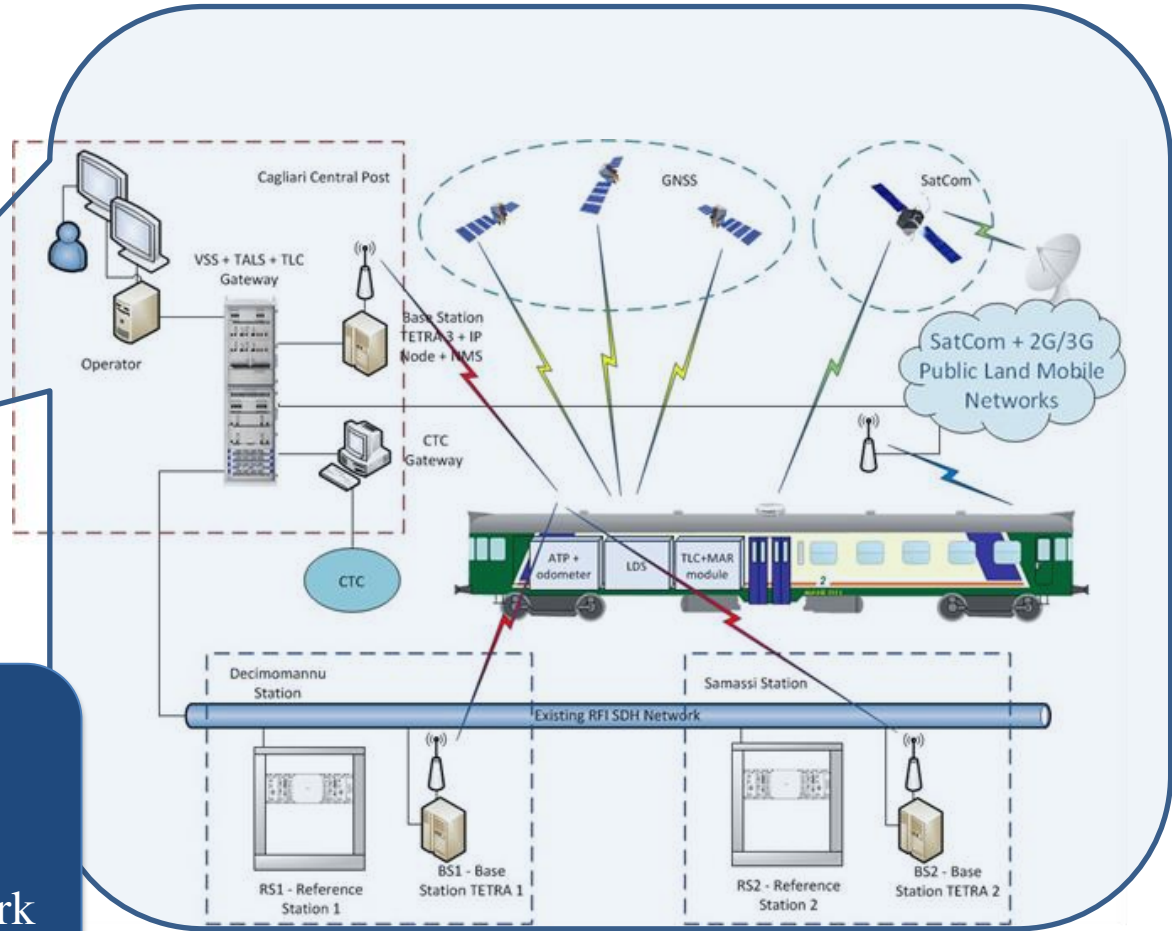


Reference architecture



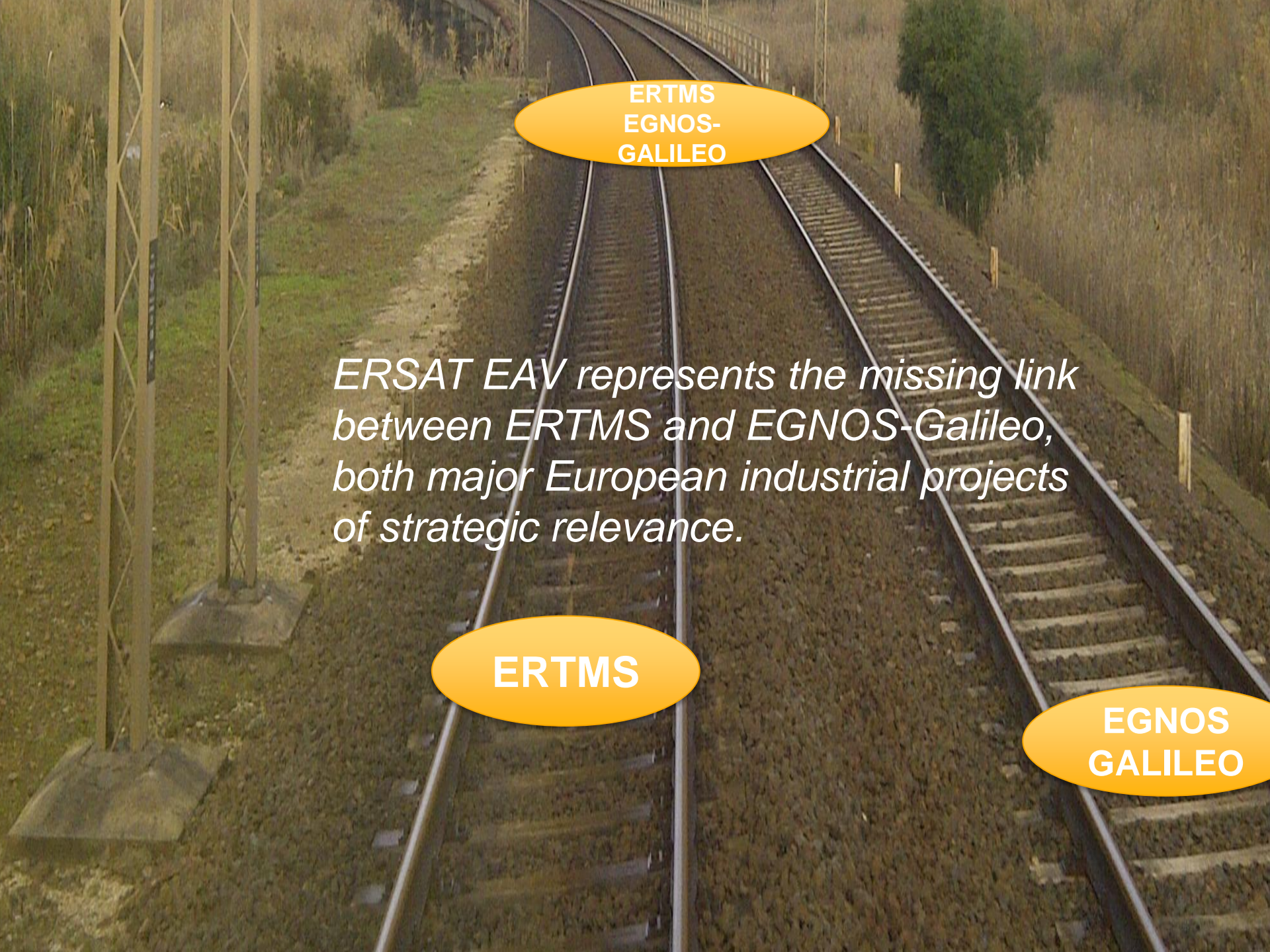


Test Bed in Sardinia



Assets

- ETCS L2 signalling
+ GNSS + TLC
- EGNOS + Loc.Network



ERTMS
EGNOS-
GALILEO

*ERSAT EAV represents the missing link
between ERTMS and EGNOS-Galileo,
both major European industrial projects
of strategic relevance.*

ERTMS

EGNOS
GALILEO