STARS

SATELLITE TECHNOLOGY
FOR ADVANCED
RAILWAY SIGNALLING

27th November 2018

Introduction to STARS project, Technical Objectives & Challenges

Jose Bertolin, Project Manager (UNIFE),

Bernhard Stamm, Project Technical Leader (SIEMENS)

This project has received funding from the European Union's Horizon 2020 research and innovation program under grant agreement No. 687414

AGENDA

09:30 – 10:00	*Registrations*
10:00 – 10:10	Welcome by Daniel Lopour, Project Officer (GSA)
10:10 – 10:30	Opening Remarks Philippe Citroen, Director General (UNIFE)
10:30– 10:50	**Introduction to STARS project**, Technical Objectives & Challenges, Jose Bertolin, Project Coordinator (UNIFE), Bernhard Stamm, Project Technical Leader (SIEMENS)
10:50 – 11:20	**Stars Summary results,** issues for future investigation, Bernhard Stamm, Project Technical Leader (SIEMENS)
11:20 – 11:30	*Coffee Break*
11:30 – 12:00	**Processing of the measured data**: Characterization of the Railway Environment from GNSS signal reception perspective, Tools and Techniques considered for processing measured data and use cases, Lubor Bažant (AZD Praha)
12:00 – 12:30	**EGNOS Technology Feasibility Study**: Identification of EGNSS target performances to possibly meet railway safety requirements, GNSS performance assessment, EGNSS service evolutions for rail applications and ETCS impact assessment, Marc Gandara (Thales Alenia Space)
12:30 – 12:45	**Impact Analysis**: Economic evaluation of the introduction of EGNSS technologies into the railway network and RoadMap for the implementation of the EGNSS solution, Claudio Brenna (Universita Commerciale Luigi Bocconi)
12:45 – 13:15	**Questions & Answers**

AGENDA

14:00 – 14:20	**Preparation of the STARS measurement campaign**: Assumptions, Identification of the parameters to measure and selection of the representative lines, Salvatore Sabina (Ansaldo STS)
14:20 – 14:40	**STARS measurement campaign**: Installations, Management of measured data and results, Andres Manuel Pazos Morantes (SIEMENS)
14:40 – 15:10	**Linked H2020 projects:** future foreseen activities within Shift2Rail Innovation Programme 2, Salvatore Sabina (Ansaldo STS)
15:10 – 16:00	**Questions & Answers**
16:00 – 16:15	**Closing remarks**, Daniel Lopour (GSA)

Introductory remarks

More Frequent Use GNSS Technology

Aviation Use Case of Success

Surveying Tracks

Passengers Information System

Railway APP no directly safety critical

Application of GNSS in railways into the safety domain

Why use GNSS in Safety Critical Railway Applications

01 ETCS (EUROPEAN TRAIN CONTROL SYSTEM)

System rolled out around Europe to replace more than 20 national legacy systems. Also extended all around the world (ETCS standard).

02 REDUCE TRACKSIDE INFRASTRUCTURE

Eliminate the Eurobalises used as position reference markers replacing them by the Virtual Balise concept

03 BENEFITS

- Reduce cost of Signaling
- Increase availability
- Reduce Maintenance requirements
- Exposure to thefts
- Vandalism

04 APPLICABILITY BASED ETCS

- Low Density secondary lines in Europe
- Solution Universal applicable (ETCS standard)

Origin STARS project

GSA funded project to investigate GNSS usage into safety critical applications.

No previous public investigation on thoroughly true environmental impacts on GNSS performance

Industry proposed:

1. Measurement campaign
2. Data analysis
3. Realistic Investigation of GNSS achievable performance in railway environment

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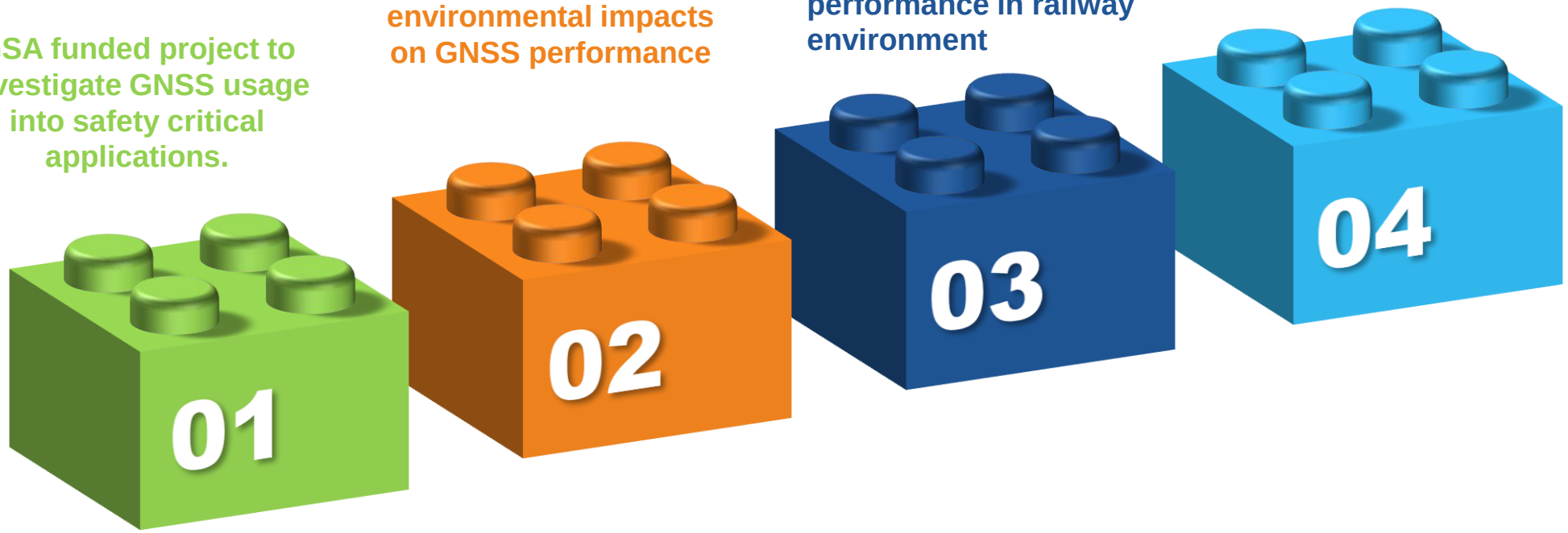
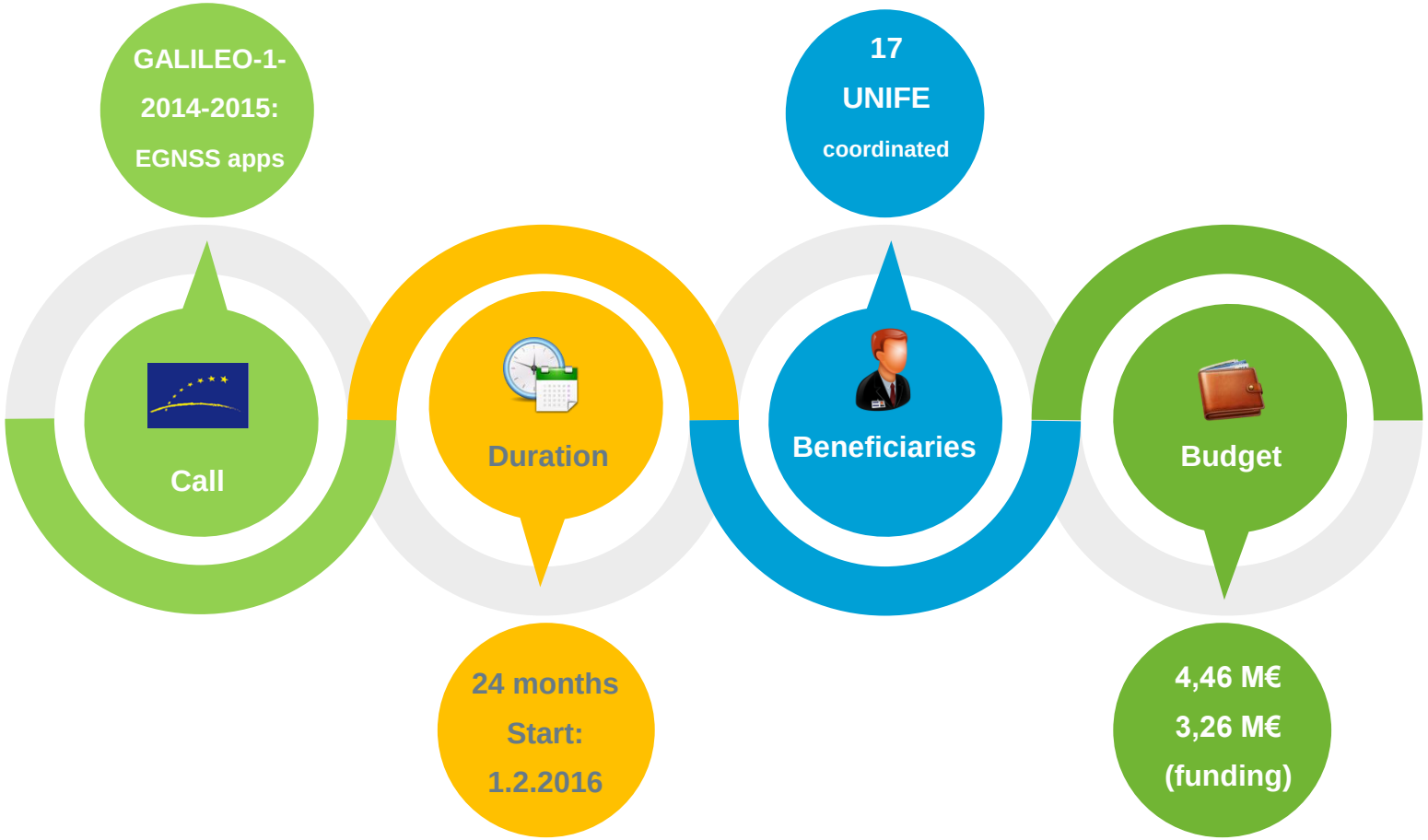


Basic figures about the STARS project



STARS Project Consortium

STARS Coordinator

unife
THE EUROPEAN RAIL INDUSTRY

Signaling Companies

SIEMENS
Ansaldo STS
A Hitachi Group Company
THALES
BOMBARDIER
the evolution of mobility
AŽD PRAHA
ALSTOM

Space Industry

ThalesAlenia Space
a Thales / Leonardo company
TELESPAZIO
a LEONARDO and THALES company

Consultancy & Specific Expertise

ineco
RadioLabs
RINA

Research Centers

IFSTTAR
CAF
CONSTRUCCIONES Y AUXILIAR DE FERROCARRILES - INVESTIGACION + DESARROLLO
Technische Universität Braunschweig
Università Commerciale Luigi Bocconi
UNIVERSITY OF WEST BOHEMIA

Key project objectives

To develop a **universal approach to predict the achievable GNSS performance in a railway environment**, especially for safety critical applications within ERTMS and to determine the necessary evolution of ETCS to include GNSS services

To **quantify the economic benefits** through reduction of cost, which will increase market appeal of ERTMS

Expected results

- **To predict performance** in the railway environment in terms of accuracy, availability and safety
- **To achieve interoperability** between equipment of different suppliers
- To **allow inclusion of GNSS into ERTMS**

Overall structure of the STARS work-plan

Project management

- **WP1** - Project management and coordination (**UNIFE**)

GNSS Measurement Campaign

- **WP2** - Preparation of campaign (**Ansaldo STS**)
- **WP3** – Field measurement, data collection (**SIEMENS**)

GNSS Data Analyses and Performance Evaluation

- **WP4** - Data post-processing (**AZD Praha**)
- **WP5** - EGNOS technology feasibility study (**TAS**)

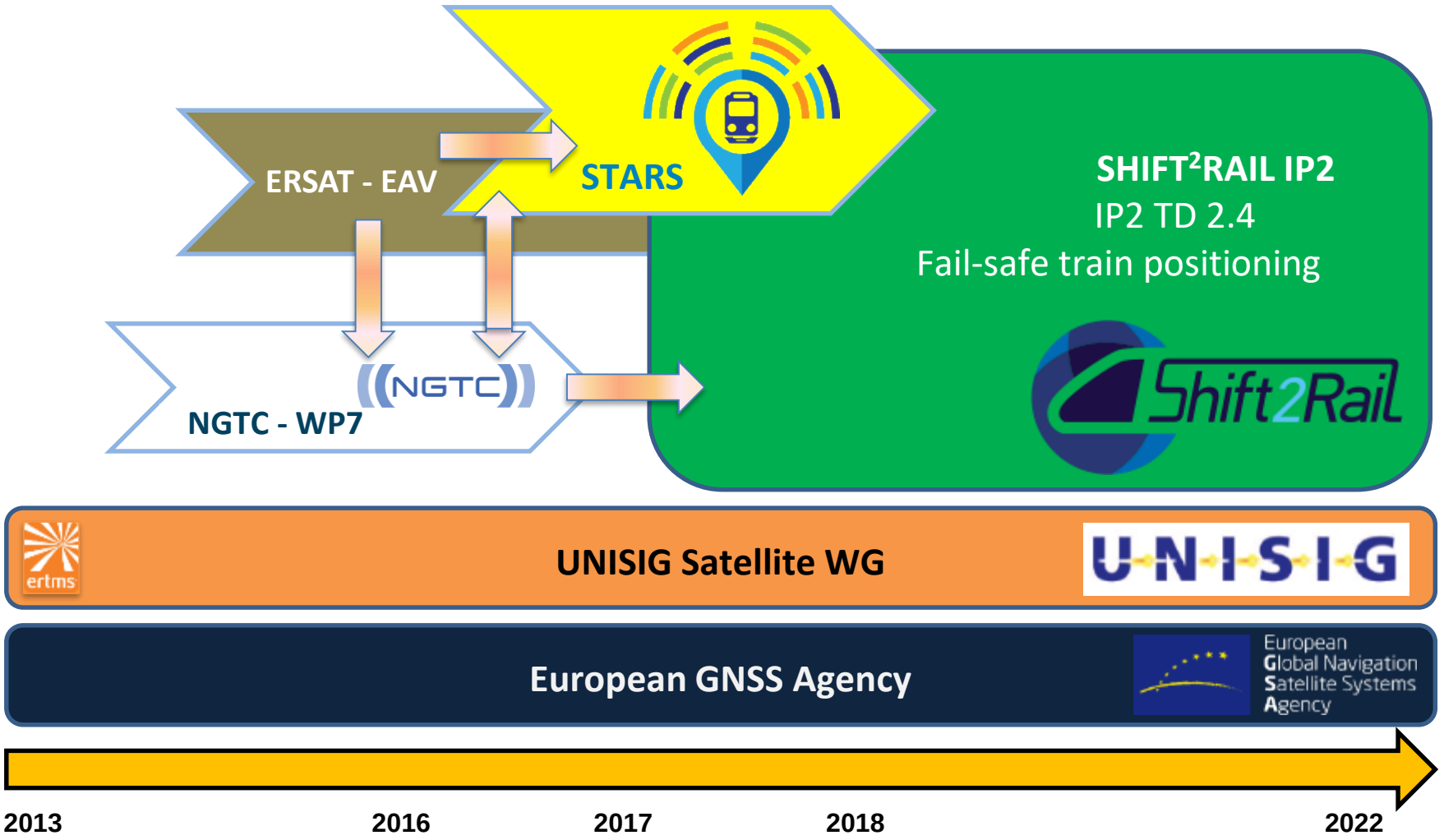
GNSS Economic Evaluation

- **WP6** - Impact analyses (**Bocconi University**)

Communication

- **WP7** - Dissemination and exploitation (**UNIFE**)

Major links between STARS and other projects / initiatives



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Thank you for your attention!

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European
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