

# LL #5 RFID in Rail

1 FEBRUARY 2023

## A. GENERAL (Business case)

### 1. Objectives

- Rail transport tracking by RFID
- Asset and Infrastructure monitoring - operational data can be provided making it possible to optimize wagon fleet and other resources
- Shorten lead times in arriving terminals due to earlier and correct information
- Platform interoperability
- Supply chain visibility
- Data sharing in a FEDeRATED way

### 2. Main emphasis

The aim is to enhance the real time information – loaded data - in rail transport to the shipping companies and other stakeholders based on an administrative standard. The project is to confirm and scale up the current RFID-solution to rail and intermodal transports on a European level. The project is to confirm and scale up the current RFID-solution to rail and intermodal transports on a European level. The data sharing of RFID-read vehicles will be proven in a multiple party context.

A business case is established. The case is wagon loads from Swedish paper mills to a warehouse in Irún, Spain and back to Sweden with consumer goods. Trafikverket and ADIF have together with the forwarder and the terminal in Irún installed readers in three sites in Irún. Two in the warehouse and one at the bridge on the border to France. The data sharing in this case is using the Spanish platform SIMPLE and the Swedish platform Deplide for testing the platform-to-platform approach.

Potentially the business case will be extended into France and Italy. Multimodal concerns will also be a vital party as well as several infrastructure managers as well as logistics companies.

### 3. Challenges

- There is lack of information in rail operation along the European corridors due to poor global exchange information systems.
- The industry is keen to get real time information along the transport chain, when RFID information will be provided the competitiveness in rail will be strengthen.

- An administrative standard for data exchange between stakeholders must be established according to Federated's principles.
- Discussions between stakeholders about global data exchange of traffic data is an issue. Main issue are the principles of "who" have access to the data and how can this be distributed in a proper way.

#### **4. Transport mode**

Rail (border crossing) and intermodal terminals.

#### **5. EU Map Focus**

Rail Freight Corridors no 2 and 3.  
Atlantic and ScanMed corridor

#### **6. Geographical coverage**

Sweden, Denmark, Germany, Spain and France.

#### **7. Actors/SMs**

- ADIF
- Swedish Transport Administration (STA)
- ScandFibre Logistics
- Railsider (Irún)
- Kvarken Ports
- Real Rail
- DB Netz, Bane DK, SNCF
- ScanMed and Atlantic freight corridors
- LearningWell
- Port of Gothenburg

#### **8. Forecast scaling outside LL**

Collaboration with European Rail freight corridors to use them as testbeds. The aim is to enlarge the pilot into one or two freight corridors where Atlantic and ScanMed are the most likely. They may also be test corridors for some automation technology in European rail.

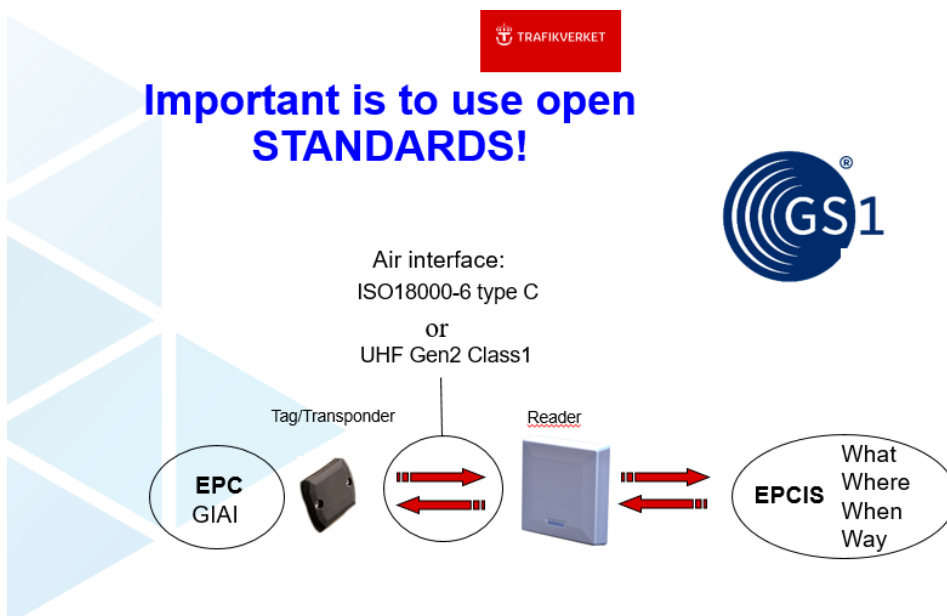
## B. TECHNICAL SETTING

### 9. ICT vs physical

RFID today consists of physical installations along the trackside and occasionally in terminals. There is a global RFID standard for European rail actors. The standard is provided by the global standardisation organisation GS1 and are adopted by the railway actors. The standard provides protocols, data exchange and data transfer models.

Waggon must be equipped with RFID-tags, one on each side. The tags are passive and don't require any energy themselves. When a vehicle with a RFID-tag is passing a reader the energy from the reader wakes-up the tag for transferring information.

RFID is a wireless/radio technology for transmission of data. The GS1 standard was agreed in 2011 between a majority of European railway infrastructure managers as a railway standard. The standard describes how the information in the tag should be structured. It also describes the air interface between the tag and the reader, and how the data format should be transferred from the reader to a server host. The data format used for that is XML.

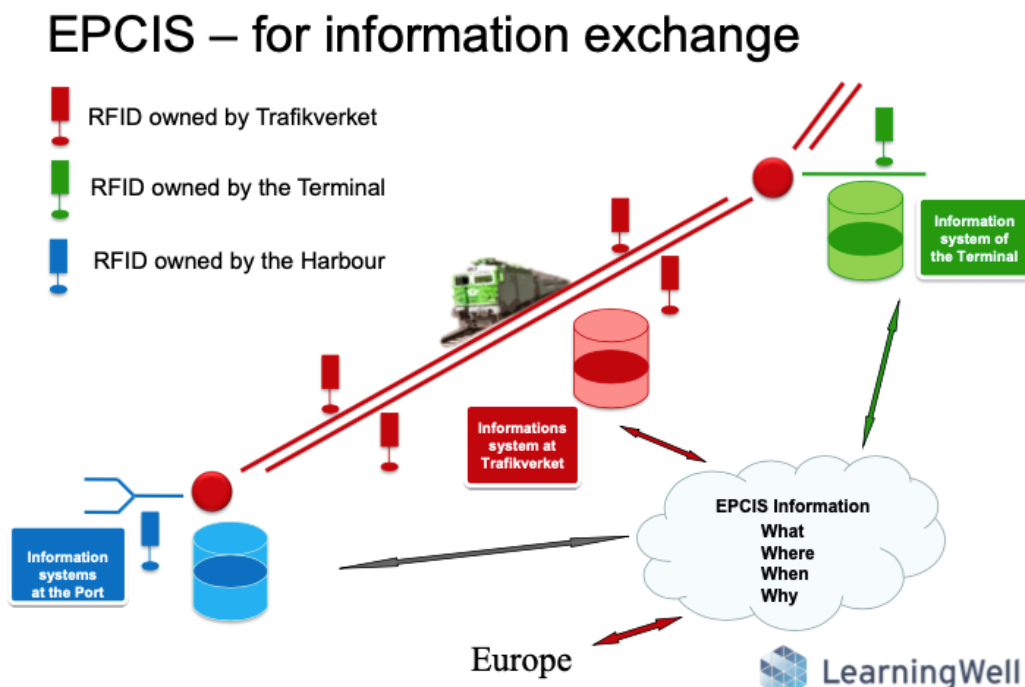


The standard uses standardised format for transmission of technical data such as tag content and air protocol (ISO 18006) allowing trust and secure solutions. The RFID-reader adds time stamp, direction and location when a tag is detected/read. When the data is read the transition of data is made by applicable EPCIS-standard allowing all stakeholders to take part of data in a technology independent way.

RFID tags will be mounted on railway vehicles, one on each side of the vehicle. Structure of the content in the RFID tag will be based on GS1 standard, concept GIAI. The RFID tag will contain a company prefix of vehicle owner/operator as well as the 12-digit EVN number for vehicle identification.

To exchange RFID information amongst stakeholders the GS1 concept EPCIS will be used. Information to be shared are:

- WHAT, vehicle identification
- WHERE, location of reading point (RFID reader installation)
- WHEN, exact time stamp in milli seconds
- WHY, activity as departure, passing etc.



This Living Lab deals with the following FEDeRATED global features:

- Findability
- Identity

## 10. DTLF implementation option

- C. Multiple platforms
- D. P2P and platforms

The main idea is to share data between the stakeholders using:

- either multiple platforms where information is shared between those or

- a P2P approach where information can be shared from a single platform directly to the final receiver.

The alternatives depends on how the involved parties choose to deal with the information.

## C. ORGANISATIONAL ASPECTS

### 11. Success factors

- Number of wagons read
- Customer satisfaction
- Geographic coverage
- Willingness to share data
- Low-cost investment
- Principles to share data (legal and physical)

### 12. Risks

- Commercial issues from data providers (freight forwarders, wagon keepers, shippers etc)
- Stakeholders not willing to share in a sufficient way
- How to use the information in a sufficient way in order to make operation more efficient

### 13. Timing

LL#5	2021				2022				2023				2024			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Preparations	■															
Planning and scoping							■									
Stakeholder engagement				■												
LL infrastructure development					■											
Testing and piloting							■									
Iteration and process analys									■							
Operational trials							■									
Feedback & Scaling										■						

### 14. Contact

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