

LL #5 RFID in Rail

10 MARCH 2022

A. GENERAL (Business case)

1. Objectives

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

2. Main emphasis

To create a demonstration and a pilot - between a Swedish paper mill and a store in France (or Spain) - to confirm and scale up the current RFID-solution to intermodal transports and to a European level. 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 data sharing of RFID-read vehicles will be proven in a multiple party context. The living lab will focus on collaboration among multiple parties and enhanced transparency with data sharing over organizational boundaries. 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 in a European context.
- 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 – intermodal terminals

5. EU Map Focus

Rail Freight Corridors no 2 and 3.

Active discussion with Denmark, Germany and France is ongoing regarding data exchange. Initial discussions with Spain (ADIF).

6. Geographical coverage

Sweden, Denmark, Germany, Spain and France.

7. Actors/SMs

- LearningWell
- Real Rail
- Swedish Transport Administration (STA)
- ScandFibre Logistics
- Kvarken Ports
- DB Netz, Bane DK, ADIF, SNCF Réseau
- ScanMed.

8. Forecast scaling outside LL

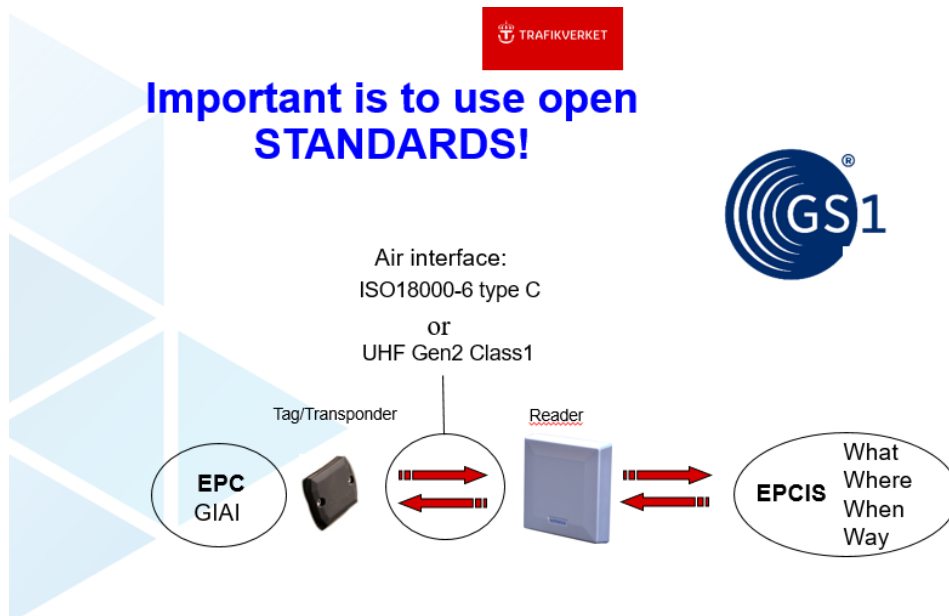
Collaboration with European Rail freight corridors in order to use them as testbeds. Potentially also Austria and Italy. The aim for the project is to exchange RFID-information in a European context.

B. TECHNICAL SETTING

9. ICT vs physical

RFID today consists of physical installations along the trackside and occasionally in terminals. There is a global standard for European rail actors. The standard is provided by GS1 and are adopted by the railway actors. The standard provides protocols, data exchange and data transfer models. Waggons 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 technology using radio for transmission of data. RFID in Rail, via GS1 a global standardisation company or federation. The GS1 standard was agreed 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.



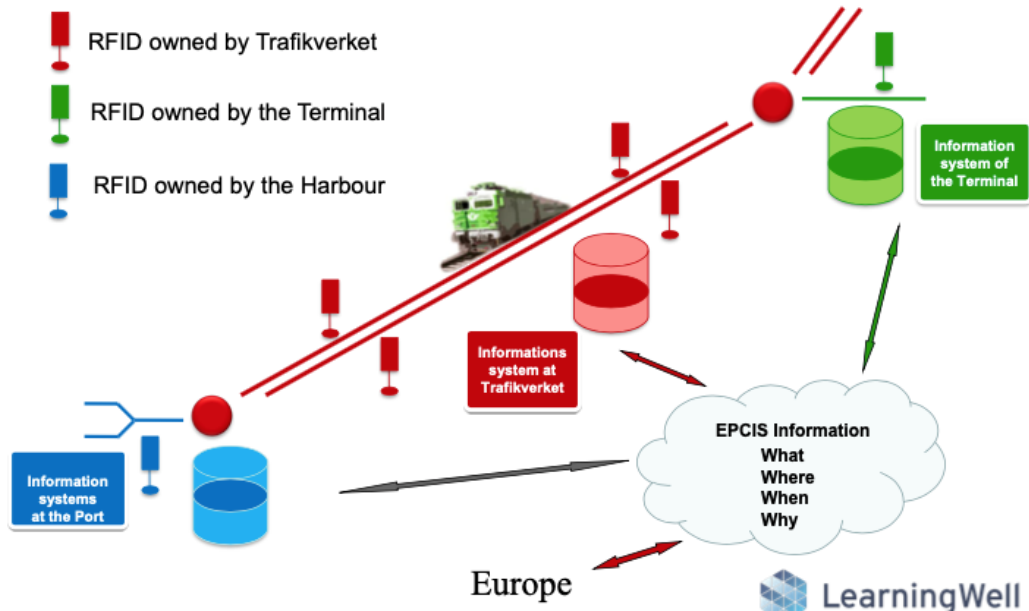
The standard uses standardised format for transmission of technical data such as tag content and air protocol (ISO 18006) allowing trust and secure solutions. The RFID-reader adds time stamp, direction and location. To access the RFID-service an organisation can plug in if tags are attached on vehicles. 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 arriving, departure, passing etc.

EPCIS – for information exchange



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 sufficient way
- Different technical choices locally, i.e. GPS instead of RFID or other solution
- Deployment timeline is slow
- How to use the information in a sufficient way in order to make operation more efficient

13. Timing

LL#05	2019				2020				2021				2022				2023			
	Q1	Q2	Q3	Q4	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 & piloting															■	■	■	■	■	■
Iteration & process analysis																			■	■
Operational trials															■	■	■	■	■	■
Feedback & scaling																			■	■

14. Contact

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