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RFID
Radio Frequency
Identification for
Rail Traffic



TRAFIKVERKET

Swedish Transport Administration

Definitions – RFID

RFID – Radio Frequency IDentification

- Is a technology for wireless communication between a reader and a transponder/tag

RFID can be split into **active** and **passive** systems:

- Active systems have a battery in the transponder/tag
- Passive systems have no battery in the transponder/tag

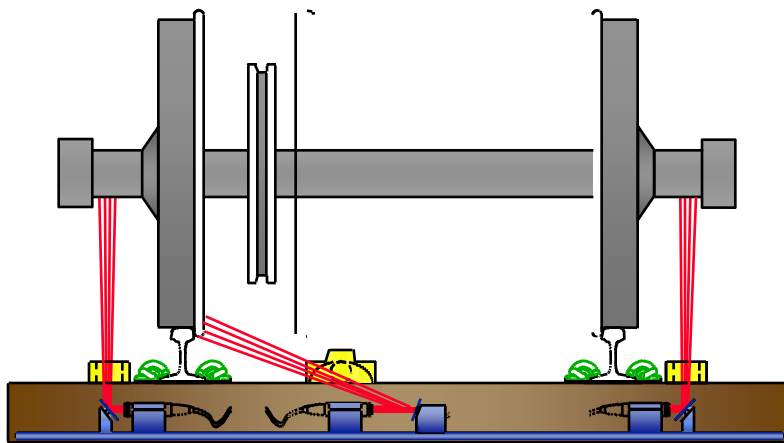
RFID Proof of Concept (period 2005-2008)

- RFID testing for many years with active and semi active solutions
- About 500 wagons has been tagged
- Great results with RFID reading (but no real application developed)

Suppliers has been:

Tagmaster Adage (Amtrac/Transcore)

One area of interest with RFID are detector measurement and wagon ID!



Heat detection



Detector

TSI rolling stock — freight wagons

EU legislation for rail transport in Europe

- RFID transponders/tags are not mandatory
- Two passive transponders/tags per wagon, mounted on the left side
- ISO 18000-6 type A air interface
- Reads the individual tag ID/wagon ID, date and time
- Speeds up to 30 km/h

Rail traffic in Europe

- 60-70% of wagons in Sweden come from other European countries

Need:

- European standard for RFID system
- Standard for information exchange



RFID demands for a pre-study

Mr Andersson's wish list:

- Speed over “160” km/h
- Open standard
- Potential EU-standard
- Easy to maintain
- Competitiveness
- Robust
- Possible to use in other transport systems



Pre-study :

➤ Upgrade TSI

- Upgrade air interface standard to ISO 18000-6 type C
- Speeds up to max speed of the wagon
- Not just for shunting yards but also trackside detection
- Recommend RFID transponder/tag on rolling stock – freight wagons

➤ Position paper

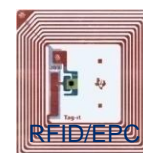
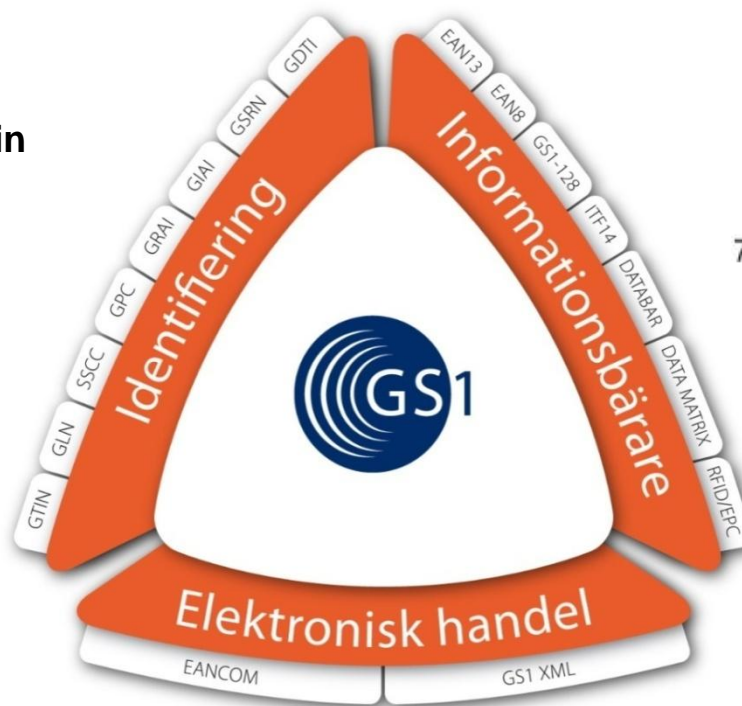
- Finland (RHK) and Sweden (BV)
- EIM – ERA – Commission

Published on EIM website: www.eimrail.org/techpapers.html

GS1 – a standards body

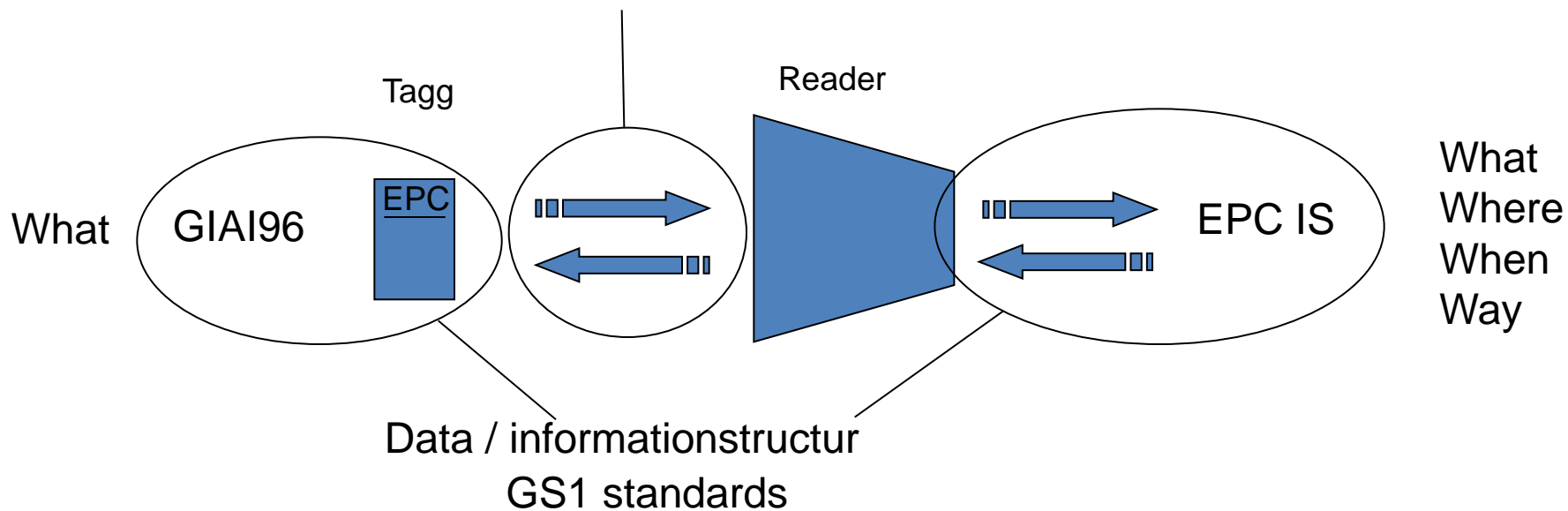
- ✓ Owned by its member organisations
- ✓ 1.3 million customers
- ✓ Offices in 108 countries - operations in 145 countries

GS1 Transport
One of five prioritised GS1 projects
Swedish Rail Project – rail in general



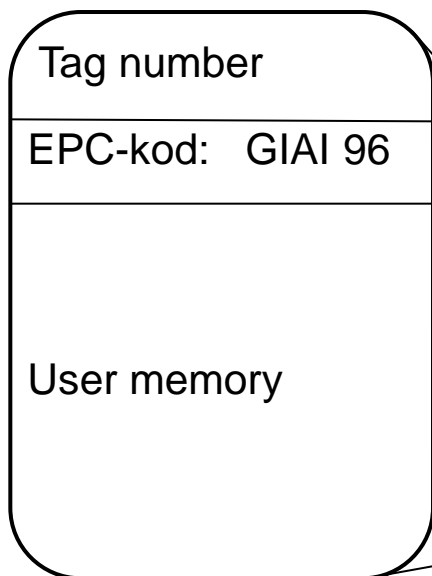
STANDARDS

Air interface:
ISO18000-6 typ C
UHF Gen2 Class1



EPC

Transponder/tag



(Header, FilterValue, Partition, Company Prefix, Individual Asset Reference)

Company prefix, A/B + Wagon number

1/2 + 12 diggits



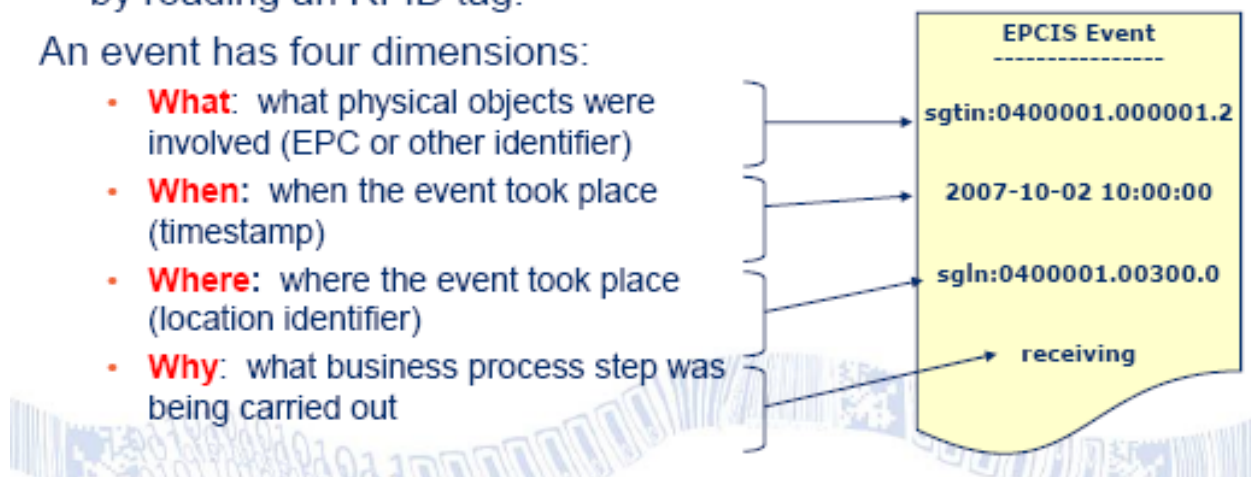
EPCIS

EPCIS Data consists of **events**, each of which records something that happened in the real world.

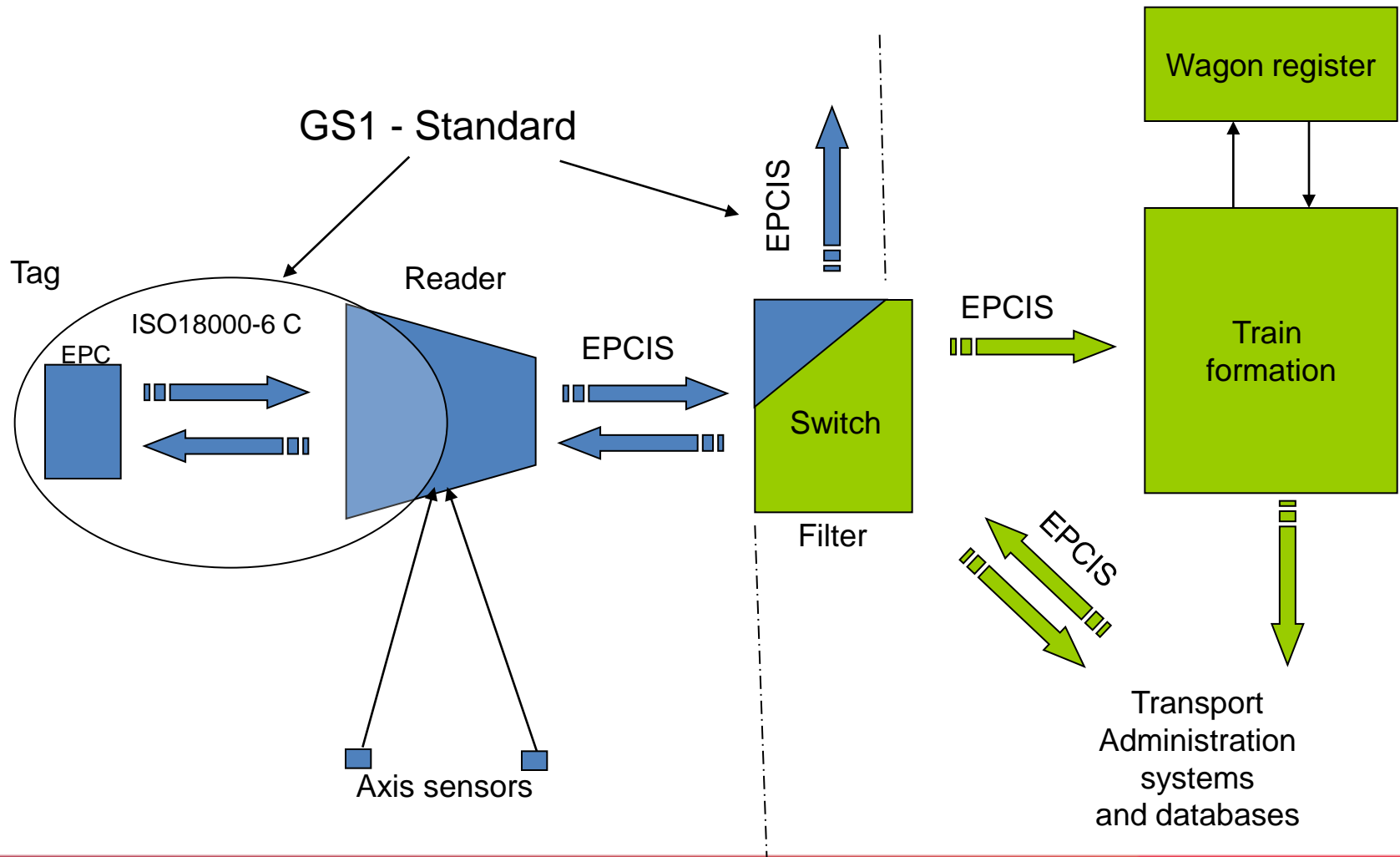
Often, though not necessarily, triggered by reading an RFID tag.

An event has four dimensions:

- **What:** what physical objects were involved (EPC or other identifier)
- **When:** when the event took place (timestamp)
- **Where:** where the event took place (location identifier)
- **Why:** what business process step was being carried out



Conceptual structur – RFID

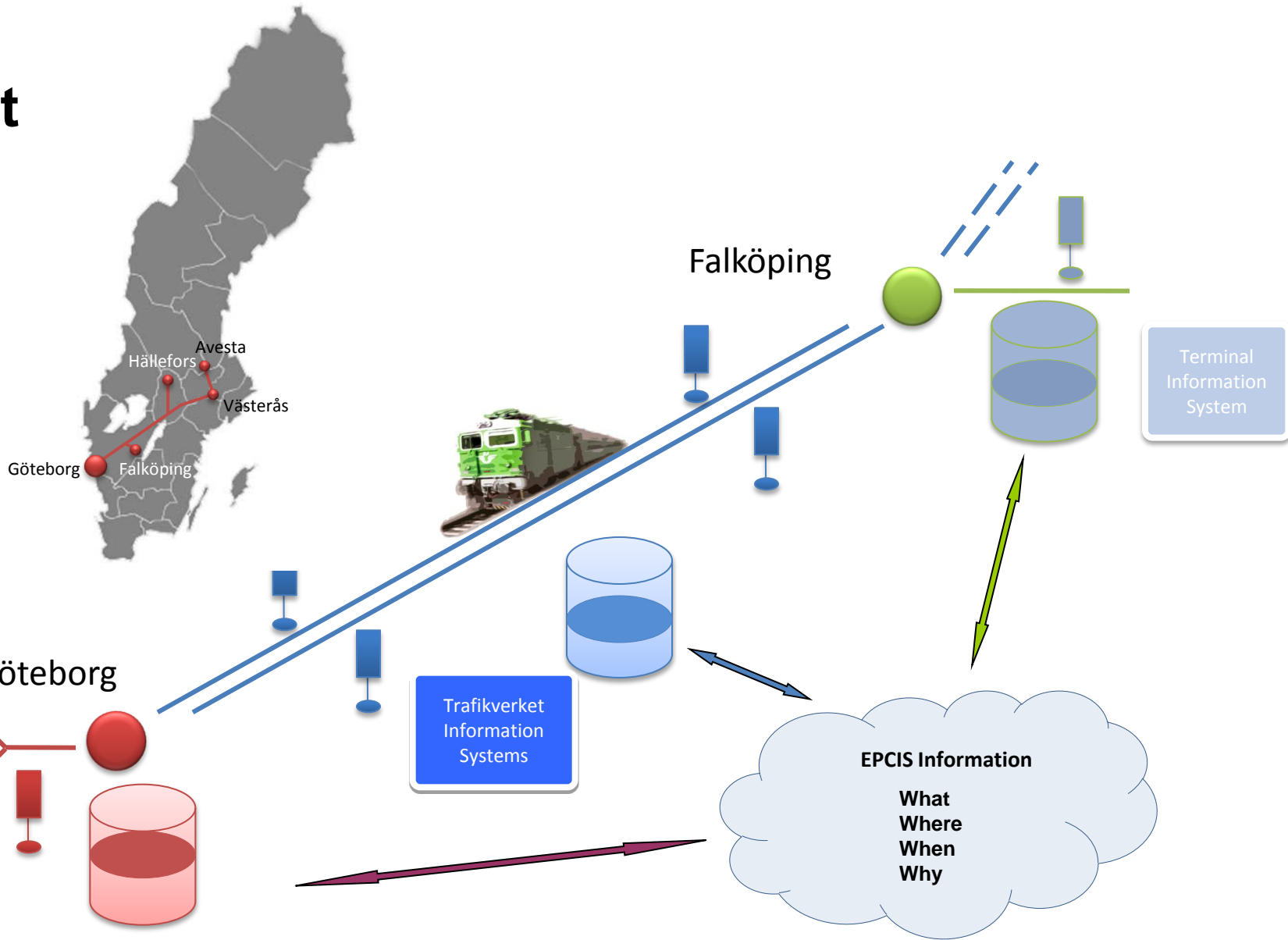


Axis sensors



Identify vehicles without transponders
Speed measuring
Direction

Pilot



Ongoing RFID projects:

SSAB: Steel billet train Luleå - Borlänge *Active RFID*

SCA: Paper wagons Munksund - Holmsund – *Semi-active RFID*

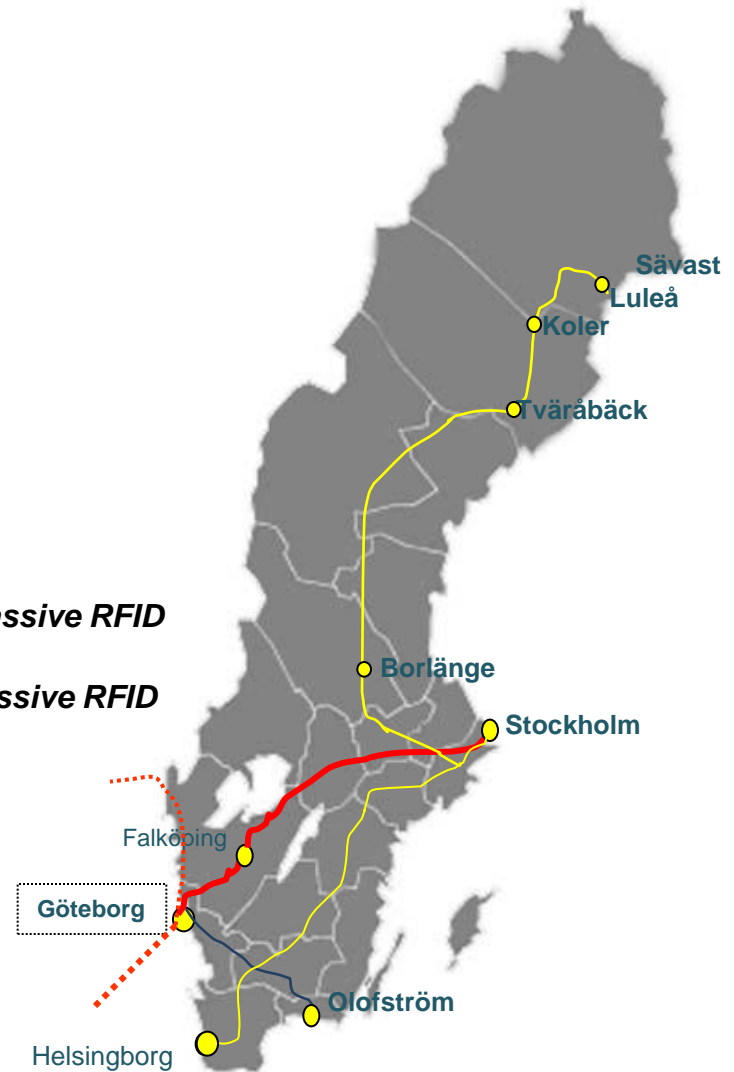
Inland terminal: Falköping - Göteborgs hamn - *Passive RFID*

Posten: Post train Stockholm – Göteborg – *Passive RFID*

Volvo: Train shuttle Olofström – Göteborg – (Gent) - *Passive RFID*

Green Cargo: Intermodal transports Helsingborg – Stockholm – *Passive RFID*

SJ: X2000 “high speed” train Stockholm – Göteborg 200km/h - *Passive RFID*



Why RFID for railways?

- Enables intermodal transport
 - Track and trace wagons and freight across the whole of Europe
 - Better use of resources
 - Lower freight costs
 - Reduced environmental impact
 - Correct charging
-
- Proactive wagon maintenance based on input from trackside detectors
 - Lower costs for track maintenance, less disruption of traffic
 - More efficient shunting
 - Correct train assembly

Deployment in Sweden

- Build an infrastructure of 500-700 RFID readers along Swedish Transport Administration's tracks
 - Major junctions/stations
 - Shunting yards
- Requirements specification for procurement of RFID readers 2010
- Limited installation and deployment 2010
- Full roll-out of RFID readers 2011-2013

Future:

Transport Administration

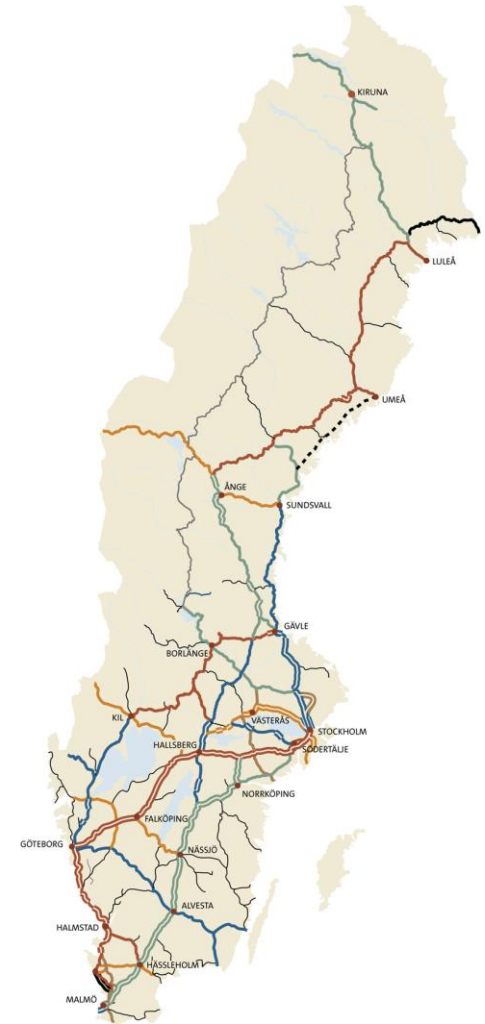
- Will build the infrastructure with 500-700 readers
- Will strive for a European standard

Railway companies / operators

- Wagon owners will tag their own wagons

Market

- Than it's up to the market to get use of the information provided to develop new services and business





Thank you!
Gunnar

Any questions?
-just find me or Lennart,
we will be around until lunch tomorrow!