



# MARKET PLACE SEMINAR

INLAND HUBS: KEY TOWARDS

RAIL FREIGHT

CORRIDOR DEVELOPMENT

## Paperless Consignment Order Digital Freight Train

Market Place Seminar,

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DUISBURG, GERMANY  
14-15 SEPTEMBER 2017



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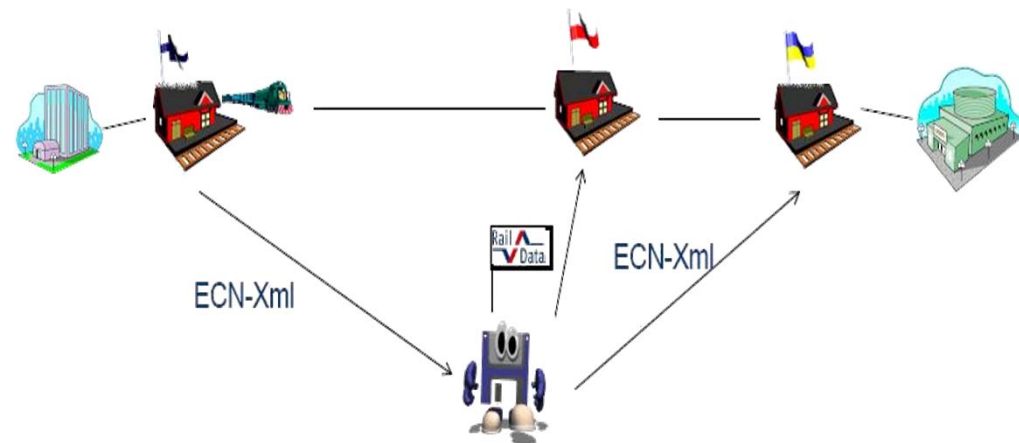
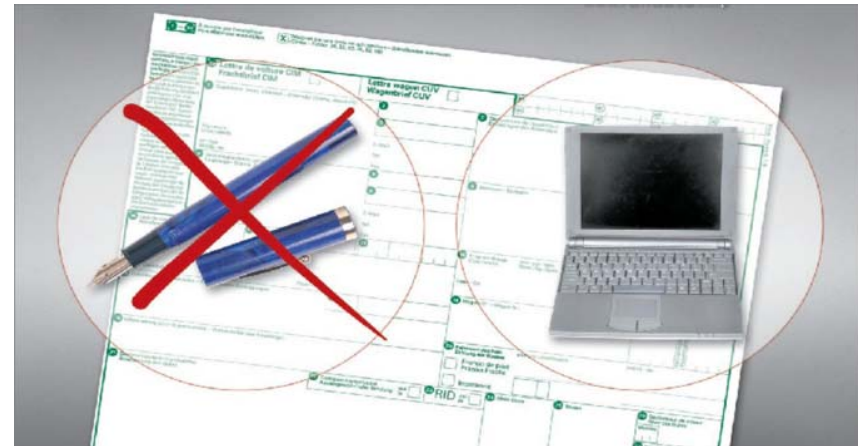
## PAPERLESS CONSIGNMENT NOTE



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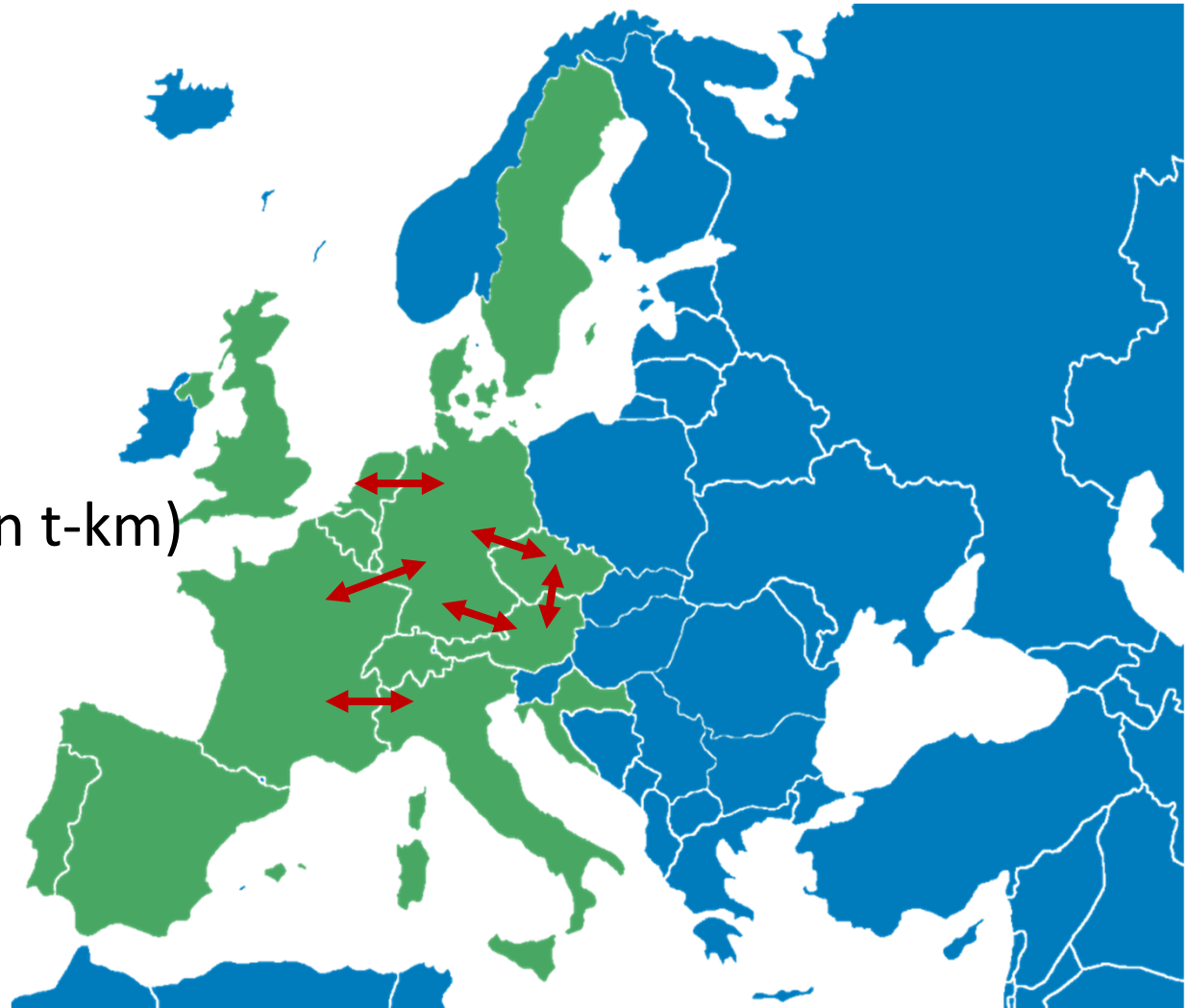
## What is the Paperless Consignmentment Note

- Single data capture
  - For all involved parties
- Paperless transport
  - Independent and ahead of train movement
- Data available
  - Anytime
  - Anywhere
  - Electronic or paper



## Where

-  Orfeus RUs  
(80% of European t-km)
-  ECN Corridors



## Next steps

- Substitute carrier
  - Simplified message flow (**available end 2017**)
- Pilot implementations for
  - Intermodal transports
  - Trilateral transports
- SMGS : Common CIM-SMGS message format
  - With CIT and OSJD
  - For Eurasian corridors



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
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## DIGITAL FREIGHT TRAIN







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## Intelligent Assets for Freight Wagons

Main Use cases	Short term Sub Use Cases and Data Types: Implementation <u>within current project</u>				
<b>Tracking &amp; Tracing</b> 	<b>Last known position*</b> <ul style="list-style-type: none"> <li>[GNSS position]</li> </ul>	<b>Positions in time interval*</b> <ul style="list-style-type: none"> <li>[GNSS position list]</li> </ul>	<b>Mileage*</b> <ul style="list-style-type: none"> <li>[meters]</li> </ul>	<b>Estimated time of arrival</b> <ul style="list-style-type: none"> <li>[UTC time stamp]</li> </ul>	<b>Ident. of delays</b> <ul style="list-style-type: none"> <li>[UTC format]</li> </ul>
<b>Brake Monitoring</b> 	<b>Monitoring brake valve</b> <ul style="list-style-type: none"> <li>[pressure]</li> </ul>	<b>Monitoring hand brake</b> <ul style="list-style-type: none"> <li>[hand brake on / hand brake off]</li> </ul>			
<b>Shock detection</b> 	<b>Detection of shunting shocks*</b> <ul style="list-style-type: none"> <li>[shunting shock detection]</li> <li>[UTC time stamp of shock]</li> <li>[GNSS position]</li> </ul>		<b>Automatic derailment detection</b> <ul style="list-style-type: none"> <li>More, repetitive vertical shocks within short time period</li> <li>Time stamp first shock</li> <li>GNSS position</li> </ul>		
<b>Weighting / (Over) Load detection</b> 	<b>Loading state*</b> <ul style="list-style-type: none"> <li>[Loaded / unloaded / unknown]</li> <li>[UTC time stamp]</li> </ul>	<b>Uneven load detection</b> <ul style="list-style-type: none"> <li>[uneven load detected]</li> <li>[percentage]</li> <li>[GNSS position]</li> </ul>	<b>Overload condition detection*</b> <ul style="list-style-type: none"> <li>[Overload detected]</li> <li>[UTC time stamp of detection]</li> <li>[GNSS position]</li> </ul>	<b>Loading shock detection*</b> <ul style="list-style-type: none"> <li>[loading shock detected]</li> <li>[UTC time stamp of shock]</li> <li>[GNSS position]</li> </ul>	<b>Weighting</b> <ul style="list-style-type: none"> <li>[kg]</li> <li>[UTC time stamp of detection]</li> <li>[GNSS position]</li> </ul>
<b>Load surveillance (inside wagon)</b> 	<b>Temperature</b> <ul style="list-style-type: none"> <li>[°C]</li> <li>[GNSS position]</li> <li>[UTC time stamp]</li> </ul>	<b>Humidity</b> <ul style="list-style-type: none"> <li>[%]</li> <li>[GNSS position]</li> <li>[UTC time stamp]</li> </ul>	<b>Door surveillance</b> <ul style="list-style-type: none"> <li>[door open / door closed]</li> <li>[door number]</li> <li>[GNSS position]</li> <li>[UTC time stamp]</li> </ul>		

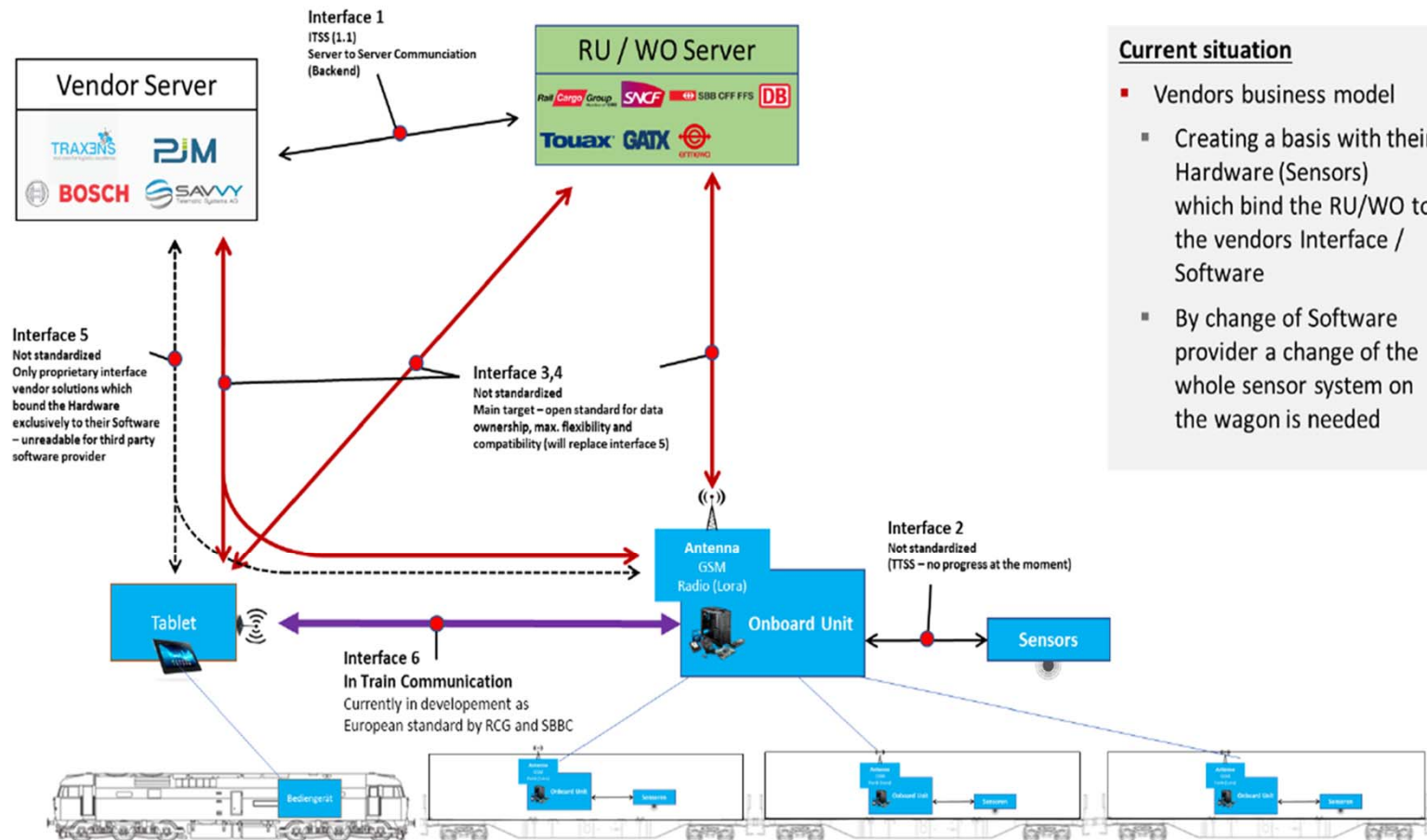
## Intelligent Assets for Freight Wagons

Main Use cases	<u>Long term Sub Use Cases and Data Types: Implementation out of current scope</u>			
<b>Automatic Brake test</b> 	<b>Capturing of train formation</b> <ul style="list-style-type: none"> <li>[list of wagon numbers]</li> </ul>	<b>Train integrity check</b> <ul style="list-style-type: none"> <li>[Integrity check passed / integrity check failed]</li> </ul>	<b>Automatic brake test</b> <ul style="list-style-type: none"> <li>[Brake test passed / brake test failed]</li> <li>[GNSS position]</li> </ul>	
<b>Shock detection</b> 	Automatic derailment detection <ul style="list-style-type: none"> <li>More, repetitive vertical shocks within short time period</li> <li>Time stamp first shock</li> <li>GNSS position]</li> </ul>			
<b>Condition based maintenance</b> 	Monitoring of wear down <ul style="list-style-type: none"> <li>Brake blocks</li> <li>Replace by demand</li> </ul>	Monitoring of technical condition <ul style="list-style-type: none"> <li>Distributor valves</li> <li>Slack Adjuster</li> </ul>	Identification of components <ul style="list-style-type: none"> <li>Traceability / LLC control</li> </ul>	Flat spot detection <ul style="list-style-type: none"> <li>Axle ID</li> <li>Time stamp first detection</li> <li>GNSS pos. first detection</li> </ul>
<b>Active Control</b> 	Temperature inside/outside the wagon (eg. humidity) <ul style="list-style-type: none"> <li>Active control of a fan or lid</li> <li>Time stamp</li> <li>GNSS position</li> </ul>			



## Interfaces

### Interfaces for Sensors in Freight Railways - Current Situation and Strategical Approach



#### Current situation

- Vendors business model
  - Creating a basis with their Hardware (Sensors) which bind the RU/WO to the vendors Interface / Software
  - By change of Software provider a change of the whole sensor system on the wagon is needed

## Objectives

- Interoperability
  - Any wagon
  - Any where
  - Any sensor provider
- In collaboration with Wagon Keepers and Shippers to create a win-win situation