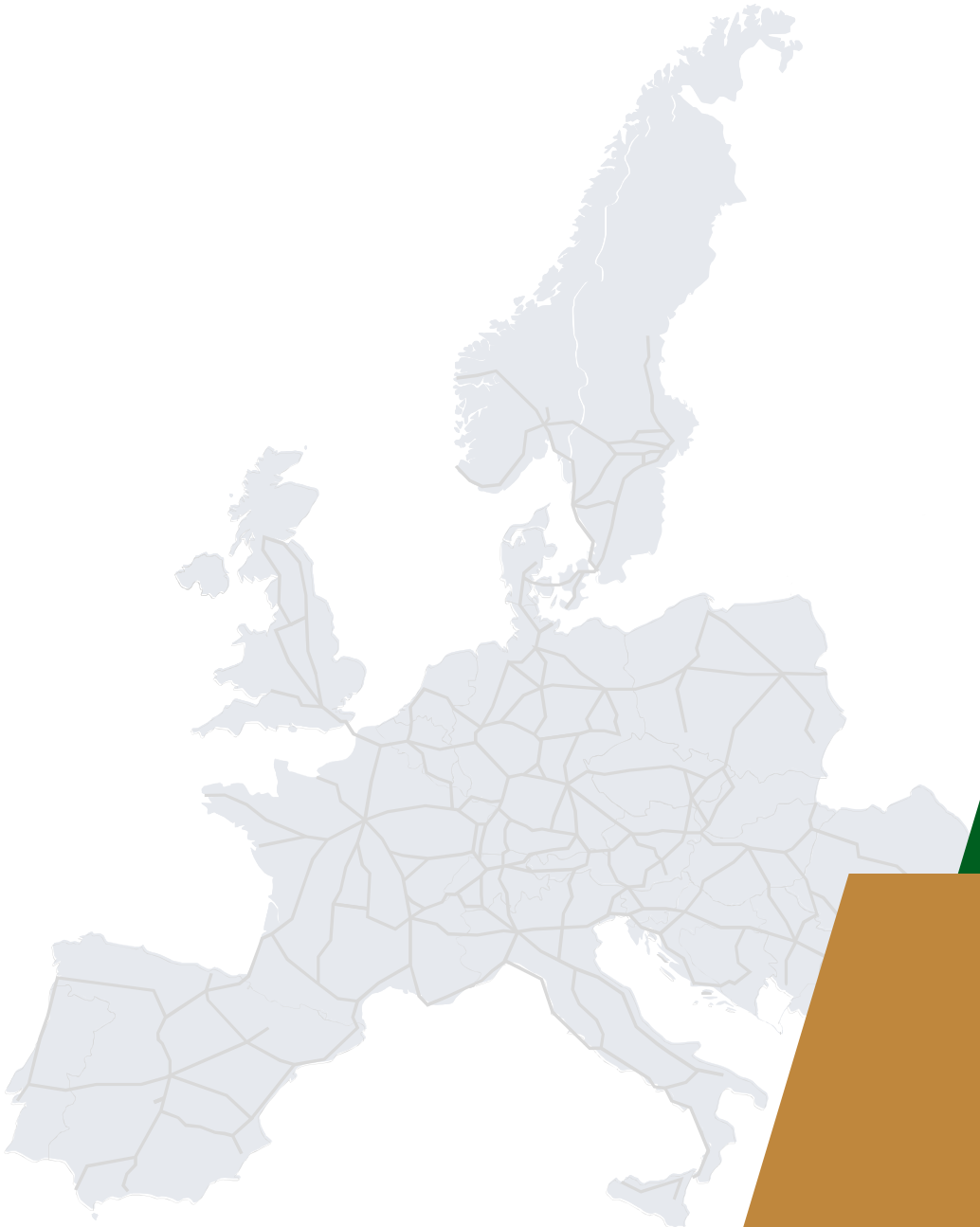
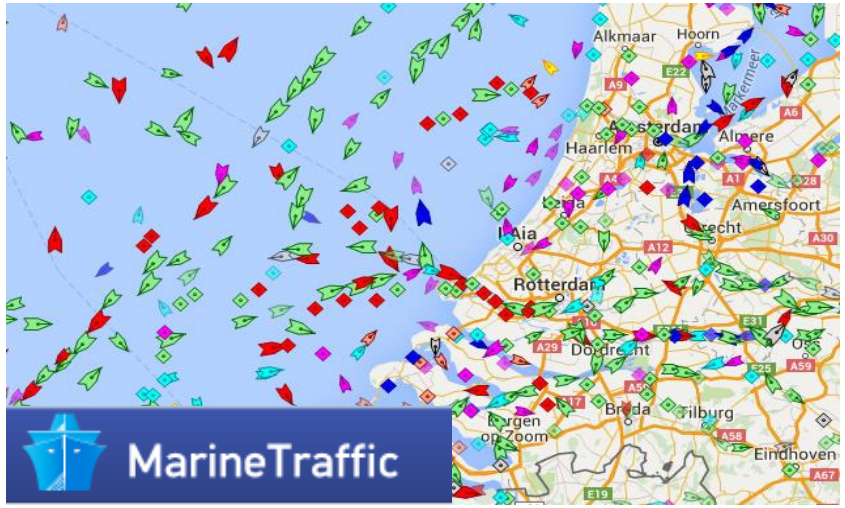


Real time data in railways, special focus ETA

18 October 2017

Estimated Time of Arrival (ETA)

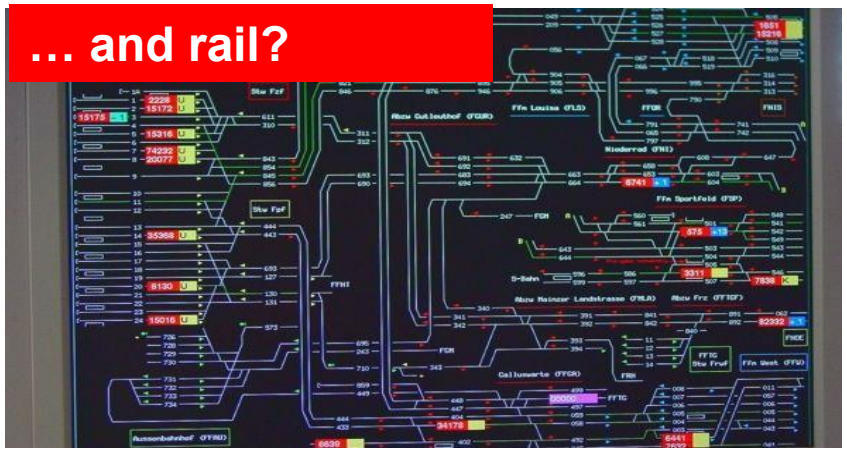
Sharing of train tracking information and estimated time of arrival (ETA)



Market needs:

> Real time tracking and tracing
> ETA Estimated time of arrival
> Open data platforms

Truck navigators



… and rail?

Project Train Tracking Info & ETA

What is the current status?

No guaranteed access to information

- The partners involved in a train run do not have guaranteed access to train (wagon) tracking and forecast information
- Contractual agreement between all involved partners are required (high administrative burden, legal uncertainty)
- No standardised technical interfaces between all partners

Low quality of information

- Forecast information do not involve all partners
- Forecast information are often just based on a time-shifting
- Quality of data and calculation algorithm are poor
- Forecast information from previous partner are not considered by the next IM
- Some international trains are not be linked always (estimated above 25%)

Common Sector Statement

The Common Sector Statement requires that:

1. Under the protection of confidentiality clauses,
2. IM and RUs agree to make information on estimated time of arrival available (for handover points and final destination)
3. to their contract partners, including terminals and intermodal operators,
4. for optimising the use of resources such as rolling stock and terminal capacity, and to provide freight forwarders and shippers with up-to-date information about the status of their freight and an estimated time of arrival.

Project aims

1. Enable sharing of tracking information between all partners involved in a single train run, via TIS Train Information System (“Where is the train?”)

2. Offer estimated time of arrival data to all partners involved in a single train run, via TIS Train Information System (“When will the train arrive?”)

3. Achieve high quality output: ETA communicated to the following partner of the train run is reliable
    1. All partners calculate their own part of the ETA
    2. TIS shall be the common platform and measuring the quality of the ETA at defined points and directions

4. Step-by step introduction with volunteering RFCs, IMs, RUs, terminals, contractors for defined connections, and subsequent spreading to the network

5. Speed of action: first milestones by 2017

Organisational set-up – Overview

with the support of

Task Force (Steering)
CER (Maier), ERFA (Tonndorf), KNV (Toet), RFCs (de Mol, Sellnick, Geubelle), RNE (Reisinger), UIRR (Schultze), DG Move, Ministries

«ELETA» Project (CEF application)

Project coordinator: Ad Toet
Project partners: Cemat, Hupac, IFB, Kombiverkehr, RCA, UIRR,
Involved RUs: Blogistics, BLS, DB, RCA, Trenitalia, SBB
Involved terminals: ca. 20
Technical partner: RNE

Advisory Board
to assist the project partners
RUs, terminals, IMs

RNE Project (CEF application)

Project coordinator: RNE Harald Reisinger
Project partners: IMs, Members of the TIS Advisory Board

System provider for TIS
- Including Terminals to TIS
- Measuring the quality of ETA
- Using TAF TSI Standards like
  - Reference Files
  - Defined Messages
  - Common Interface

Legal Unit

ERA, DG Move (Buy, Padoy), Ministries (Groot, Haller, Ilik, Nagel, Swartenbroekx)

Short Term: TIS Advisor Board
Long Term: open

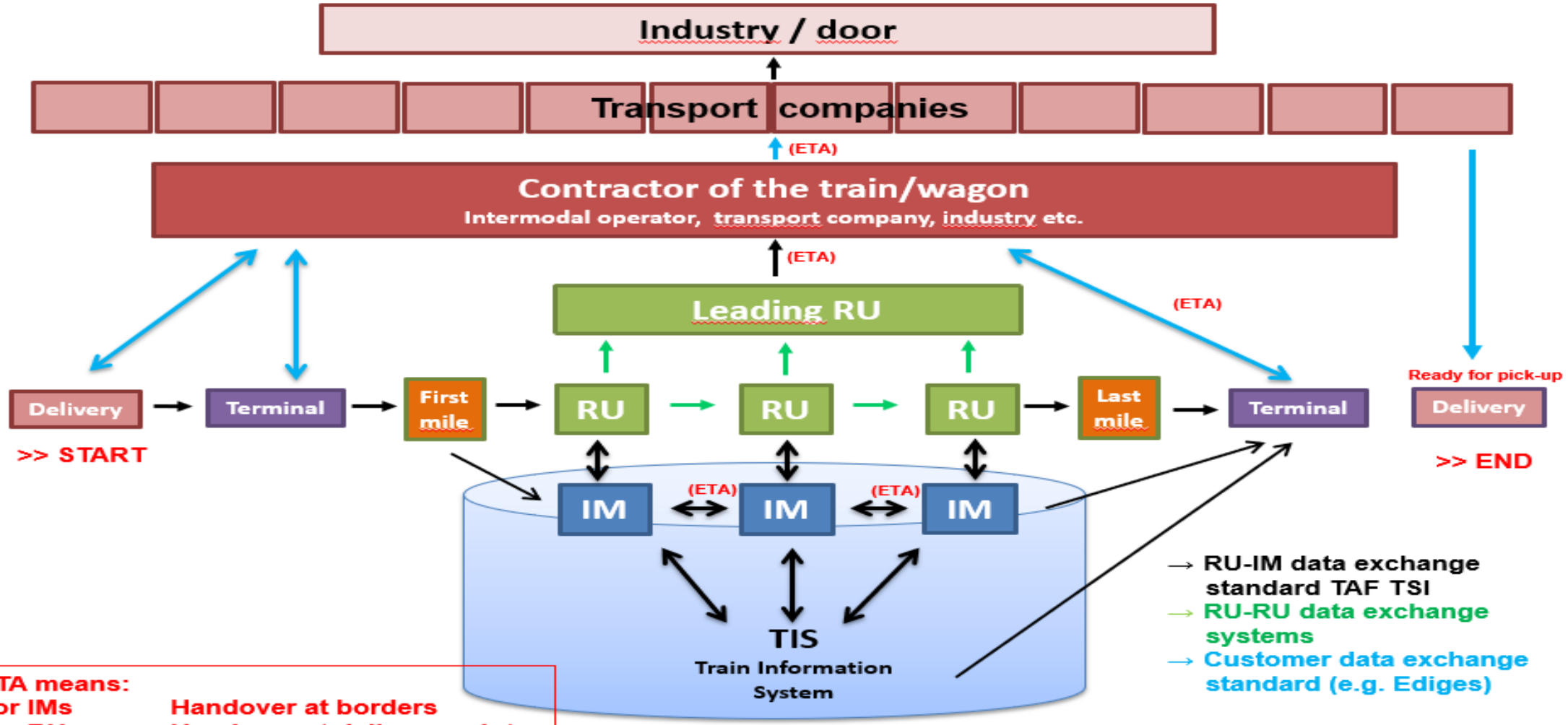
RFC1 project «ETA Terminal/Shunting RUs»
Duisport, others

Situation TODAY

with the support of

1. IMs provides ETA data based on simple time shifting.
2. RU do not feed data into TIS.
3. Data sharing is fragmented and non-standardised.
4. Some RUs do not disclose tracking data with other RUs and the contractor of the train.
5. The contractors of the train/wagon do not have access to TIS. Only terminals have (based on voluntary contracts).
6. TAF-TSI defines data exchange between RUs, IMs and wagon keepers. Terminals and Contractors of the train are excluded.
7. TIS uses a reference number linked to a path; link to train gets lost in case of rescheduling. Project “Train Identifier”: 2021

Situation TODAY



Situation TOMORROW

1. All partners involved in a train run have access to tracking and ETA data.

2. All involved partners share train tracking data and ETA data.

3. All partners involved in a train run feed their ETAs into TIS.

4. All partners plan ahead and share their ETA with the following partners, who can plan ahead as well.

5. The leading RU communicates tracking and ETA data to the Contractor of the train.

6. The Contractor exchanges information with the terminal and communicates “ready for pick-up” to the transport company/industry

ELETA/RNE timeline

February 2017: ELETA and RNE submitted individual project proposals for funding to INEA (CEF Call 2016) – Supported by the ETA project, TAF TSI SC and the ministries included in the legal unit.

7 March 2017: Brussels – General Assembly of Project Applicants for ELETA

4 April 2017: Vienna - Meeting ELETA/RNE on process definition

- Definition of cooperation with RNE on ETA actions
- Position of ELETA stakeholders (RU's) as regards to exchange of TIS-data
- Linkage through RNE with TAG-RFC 1 action Last mile data exchange

7 June 2017: München: process definition – project stakeholders

26 June 2017: Busto/Milan: Southern terminals – terminal management

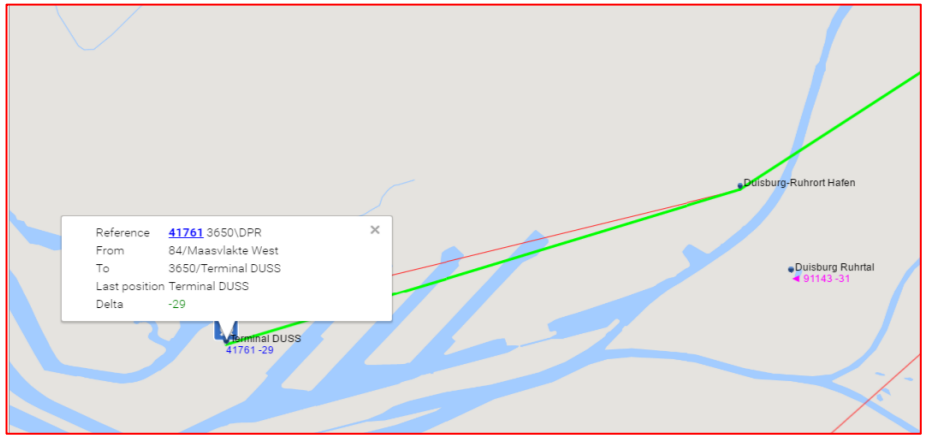
28 June 2017: The Hague: Northern terminals – terminal management

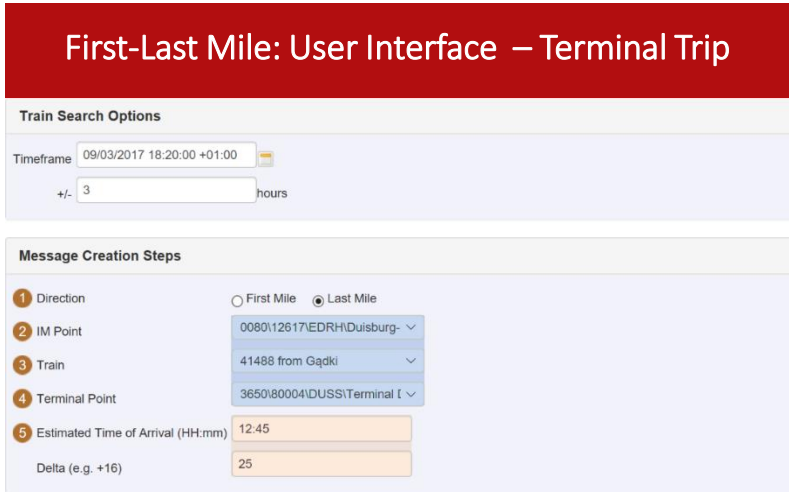
6 October 2017: Meeting of the ETA task force in Brussels

RNE RailNetEurope

ELETA preliminary findings

- *Permissions/authorisation for sharing data. (RNE framework agreement)*
- *Intermodal operators and some terminals not linked to TIS.*
- *Change of train numbers at borders (there is no unique train numbering).*
- *Terminals and their (common) user interfaces (the sector has invested in costly work arounds)*
- *Showing the whole train journey (not only the IM network/network entry/exit point)*





TIS - Terminal trip

First-Last Mile: Messages and Facilities – Terminal Trip

TIS - Messages along the whole Train Journey

First Mile Traction Type (Shunting Trip or Train Loco)		**Train Journey**	**Last Mile Traction Type** (Train/Shunting Trip or Train Momentum Energy)	
Terminal	Terminal Trip	Network IM	Terminal Trip	Terminal
				
Loading completed	Forecast Running advice	Path Details – Forecast - Running advice – Delay Codes – Path Section Modification - Interruption	Forecast Running advice	Ready for Unloading

Terminal: First-Last Mile – Summary

Management Summary

Network Configuration (Terminal environment and transfer points)
- The Terminal Network can be set up in TIS
- Precondition: RICS company code of the Terminal Infrastructure and Terminal Railway Undertakings

Train Portfolio
- National and international trains, provided by the IM involved (25 Infrastructure Manager)

Message portfolio of the Terminal (manual input at the moment)
- Train Running Information (actual time)
- Forecast Message (Prognosis Time of Arrival)
- Loading Status (Ready to unload – inbound)
- Loading Status (Loading completed – outbound)
- Train Delay Code (optional)

Loading status: TAF TSI Message “Train Ready” to be modified and used

User Interface modifications:
- Existing smart and simple interface for desktops and mobile devices will be adapted accordingly

Accuracy of forecast in TIS

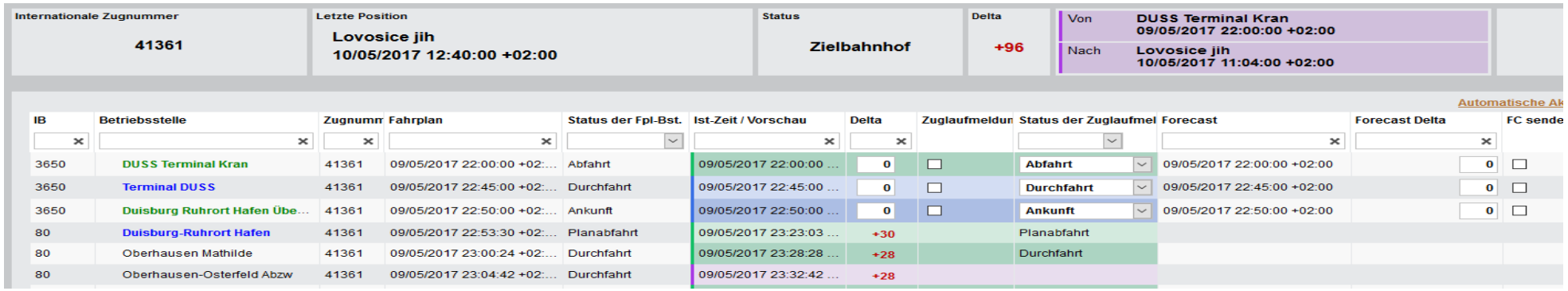
ETA – new TIS Approach

Current status:

TIS can process fore cast messages from the IM. This messages are generated and calculated on a national IM view. Even if the forecast messages are being exchanged between IM's, these information is not taken into account.

TIS Application: Till the very last TIS version, the forecast information, provided by the IM has been taken into account to generate the preview for points in the future on the Train Info page. As the forecast is exchanged between the IM but almost not taken into account, the data displayed in TIS was in most of the cases not useable. Therefore the information was split in different columns and do not influence the results anymore.

Picture TrainInfo page with separated info



Internationale Zugnummer	Letzte Position	Status	Delta	Von / Nach
41361	Lovosice jih 10/05/2017 12:40:00 +02:00	Zielbahnhof	+96	Von: DUSS Terminal Kran 09/05/2017 22:00:00 +02:00 / Nach: Lovosice jih 10/05/2017 11:04:00 +02:00

Automatische Ak

IB	Betriebsstelle	Zugnumm	Fahrplan	Status der Fpl-Bst.	Ist-Zeit / Vorschau	Delta	Zuglaufmeldun	Status der Zuglaufmel	Forecast	Forecast Delta	FC sende
3650	DUSS Terminal Kran	41361	09/05/2017 22:00:00 +02:...	Abfahrt	09/05/2017 22:00:00 ...	0	☐	Abfahrt	09/05/2017 22:00:00 +02:00	0	☐
3650	Terminal DUSS	41361	09/05/2017 22:45:00 +02:...	Durchfahrt	09/05/2017 22:45:00 ...	0	☐	Durchfahrt	09/05/2017 22:45:00 +02:00	0	☐
3650	Duisburg Ruhrort Hafen Übe...	41361	09/05/2017 22:50:00 +02:...	Ankunft	09/05/2017 22:50:00 ...	0	☐	Ankunft	09/05/2017 22:50:00 +02:00	0	☐
80	Duisburg-Ruhrort Hafen	41361	09/05/2017 22:53:30 +02:...	Planabfahrt	09/05/2017 23:23:03 ...	+30		Planabfahrt			
80	Oberhausen Mathilde	41361	09/05/2017 23:00:24 +02:...	Durchfahrt	09/05/2017 23:28:28 ...	+28		Durchfahrt			
80	Oberhausen-Osterfeld Abzw	41361	09/05/2017 23:04:42 +02:...	Durchfahrt	09/05/2017 23:32:42 ...	+28					

ETA – Evaluation of Forecast Messages

Most of the IMs have their internal algorithms for forecast calculation within their network. However, for trains coming across the border from another IM, they have to rely on the information (forecast) sent by the previous IM.

For this reason, it is important to know, how reliable forecasted delays of the previous IM are, especially those forecasts sent for the border points.

It is planned to calculate indicators, that describe how reliable forecasted delays at certain locations are. If forecasts are known to be reliable, the next IM can base their own forecasts on those (reliable) delay values from the previous IM. If forecasts are known to be unreliable, the next IM can simply ignore those forecasts.

Forecast accuracy indicators shall be calculated on location level, since accuracy may differ for different (border) point within an IM.

Every points shall have a quality indicator for the provided forecast information based in the direction.