

RRTM-C

Rail Road Transportmanagement - Cargo

IPIC 2023

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THE PROJECT

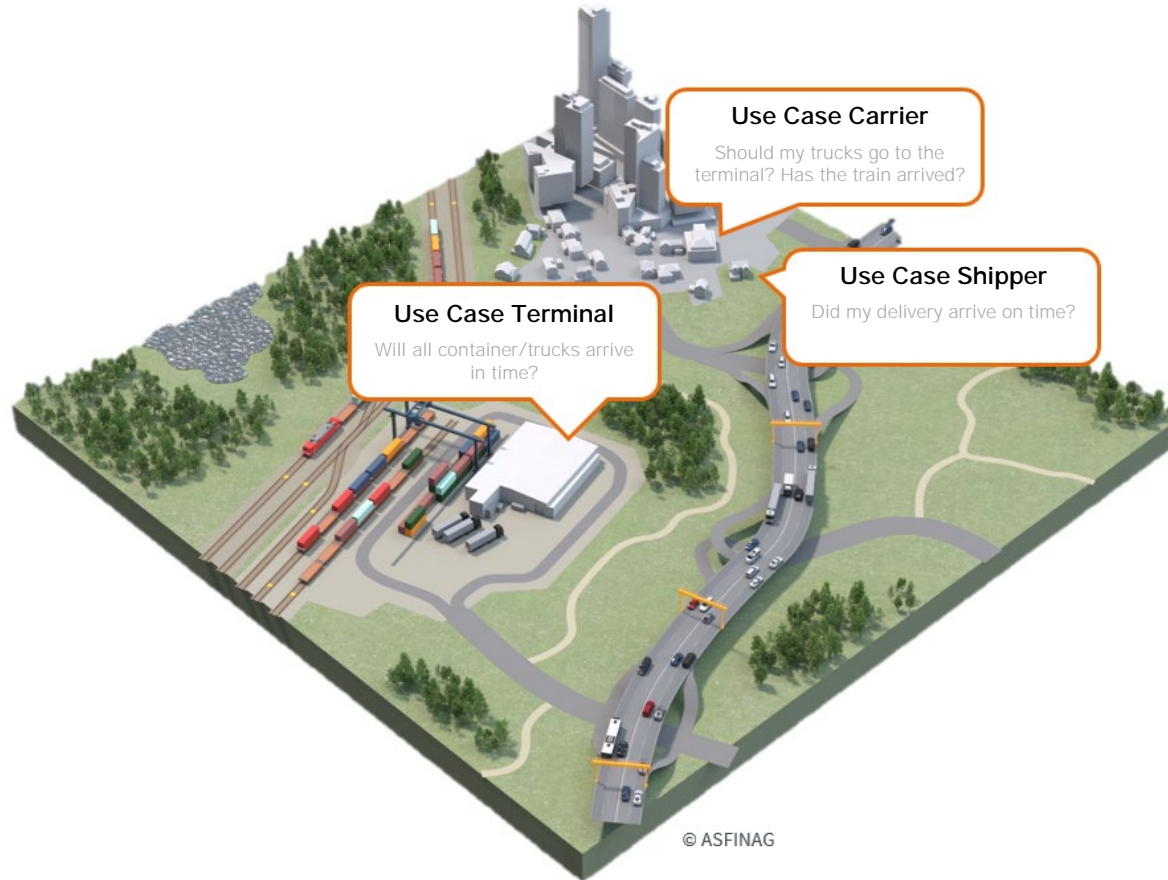
- *RRTM-C* – Rail Road Transportmanagement - Cargo
- Implementation project in the program „Logistikförderung 2019-2023“
 - Funded by Austrian Federal Ministry for Climate Action, Environment, Energy, Mobility, Innovation and Technology and
 - managed by Austrian Railway Infrastructure Agency (SCHIG)
- Partners
 - Asfinag Mautservices GmbH (Lead)
 - AIT Austrian Institute of Technology GmbH (AIT)
 - Austrian Federal Railway ÖBB Infrastruktur AG
 - Venz Logistik GmbH
- Duration: February 2020 till December 2022

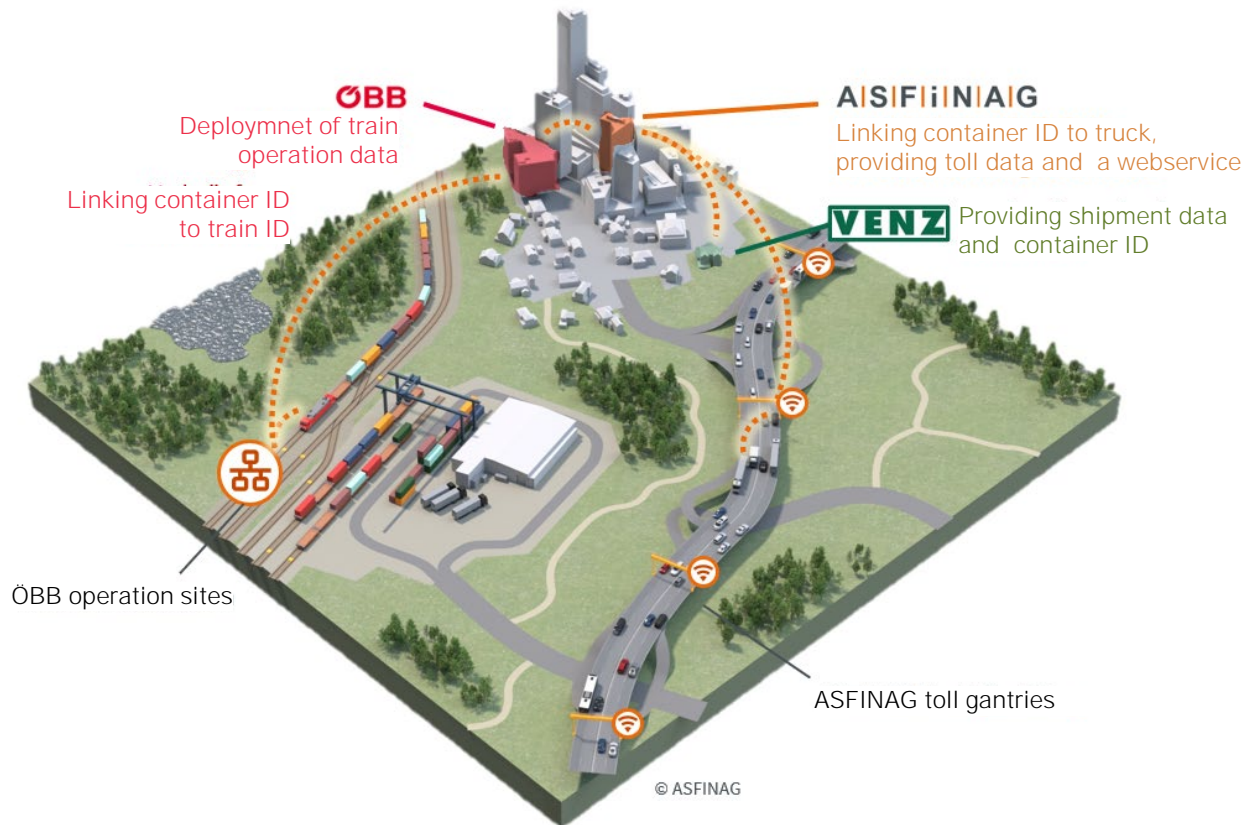


 Federal Ministry
Republic of Austria
Climate Action, Environment,
Energy, Mobility,
Innovation and Technology

GOALS

- Development and implementation of a closed information chain along multimodal goods transports
- Using only implemented data sources and information systems of the partners
 - Road: transport waybills, toll data, etc
 - Rail: transport waybills, rail operation data, terminal management data
- Main result:
 - Creation of continuously updated ETA of the containers at transport mode switching points
 - model for optimising terminal operation based on these ETA







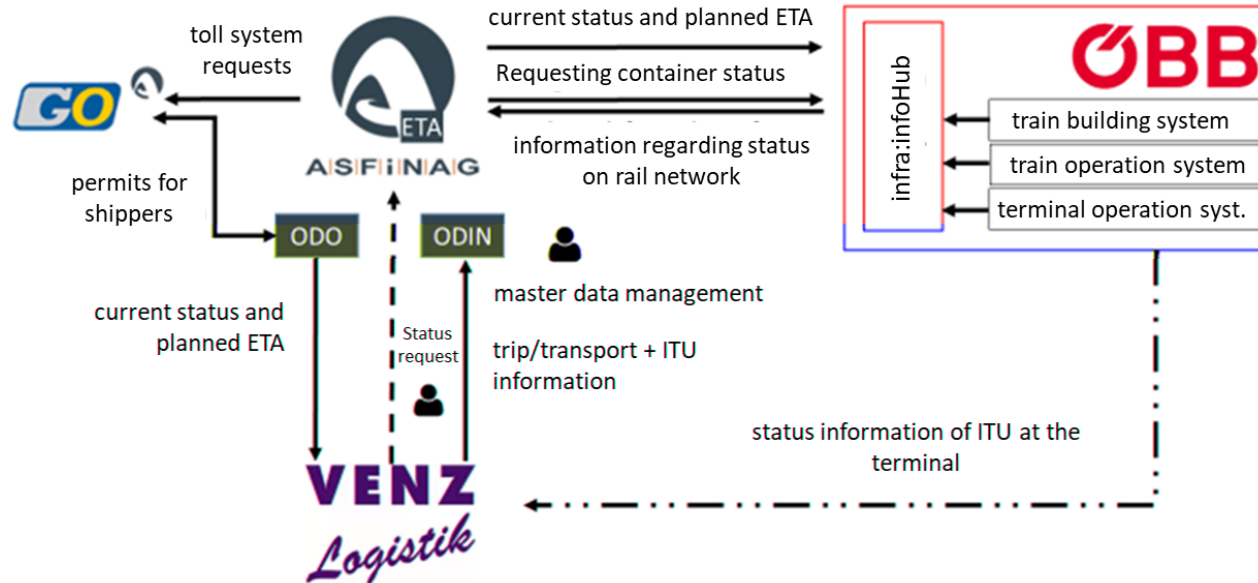
RRTM-C architecture



action by user in the web platform



email



current status

estimated time of arrival
whole transport

status multimodal
transport chain

master data of
each transport

The screenshot displays the RRTM-C Rail4load Transport Management - Cargo Tracking interface. The interface is divided into several sections:

- Table View:** A table listing transport status with columns for Frachter, Kennzeichen, Zug#, and Status. The table shows various transport status entries, including "Status Test LKW in Zukunft, Zug in Zukunft" and "Status Test LKW angekommen, Zug in Zukunft".
- Map View:** A map showing the route of the transport chain, with a red circle highlighting the "am 09.06.2022 am Zielgantry erfasst" location.
- Details View:** A detailed view of the transport chain for Zug# 42835, showing the status "W-2104C (Status Test LKW angekommen, Zug in Zukunft)". It includes a timeline of events: "Start LKW: Lager 137 am 08.06.2022", "Ankunft LKW: Zuckerfabrik am 09.06.2022", and "Start Zug: Wien Süd Güterzentrum (in)".

Red circles and lines highlight specific features: the "current status" label points to the table; the "estimated time of arrival whole transport" label points to the "am 09.06.2022 am Zielgantry erfasst" location on the map; the "status multimodal transport chain" label points to the "am 09.06.2022 am Zielgantry erfasst" location on the map; the "master data of each transport" label points to the "Stammdaten" button in the details view.

map view of available and
planned route data

details of available and
planned route data

The screenshot displays the ASFINAG RRTM-C tracking interface. The top navigation bar includes 'Konfiguration', 'Historie', and 'Tracking'. The main content area shows a table of train schedules with columns for date, time, and status. The selected train is Zug# 42835, starting from Bludenz. The status shows it is slightly delayed but has caught up. The map below the table shows the train's current location near Imst-Pitztal.

Status	Stammdaten
1 Start Zug: Bludenz (ZugNr: 42835) am 01.08.2022	17:55 ✓ 18:15
Bludenz	17:55 18:15 ✓
Dalaas (Ankunft)	18:12 18:30 ✓
Dalaas (Abfahrt)	18:15 18:30 ✓
Wald am Arlberg (Ankunft)	18:21 18:35 ✓
Wald am Arlberg (Abfahrt)	18:22 18:40 ✓
Unbekannter Bahnhof (Ankunft)	18:40
Unbekannter Bahnhof (Abfahrt)	18:41 19:01 ✓
Flirsch (Ankunft)	18:44 19:03 ✓
Flirsch (Abfahrt)	19:00 19:03 ✓
Schönwies (Ankunft)	19:22 19:23 ✓
Landeck-Zams (Ankunft)	19:14 19:17 ✓
Schönwies (Abfahrt)	19:47 19:24 ✓
Imst-Pitztal (Ankunft)	19:54 19:31 ✓

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- train on the way, left slightly delayed, has caught up and is now a little earlier in Imst
- truck last mile run currently status unknown da noch nicht gestartet

TEST RUN AND EVALUATION

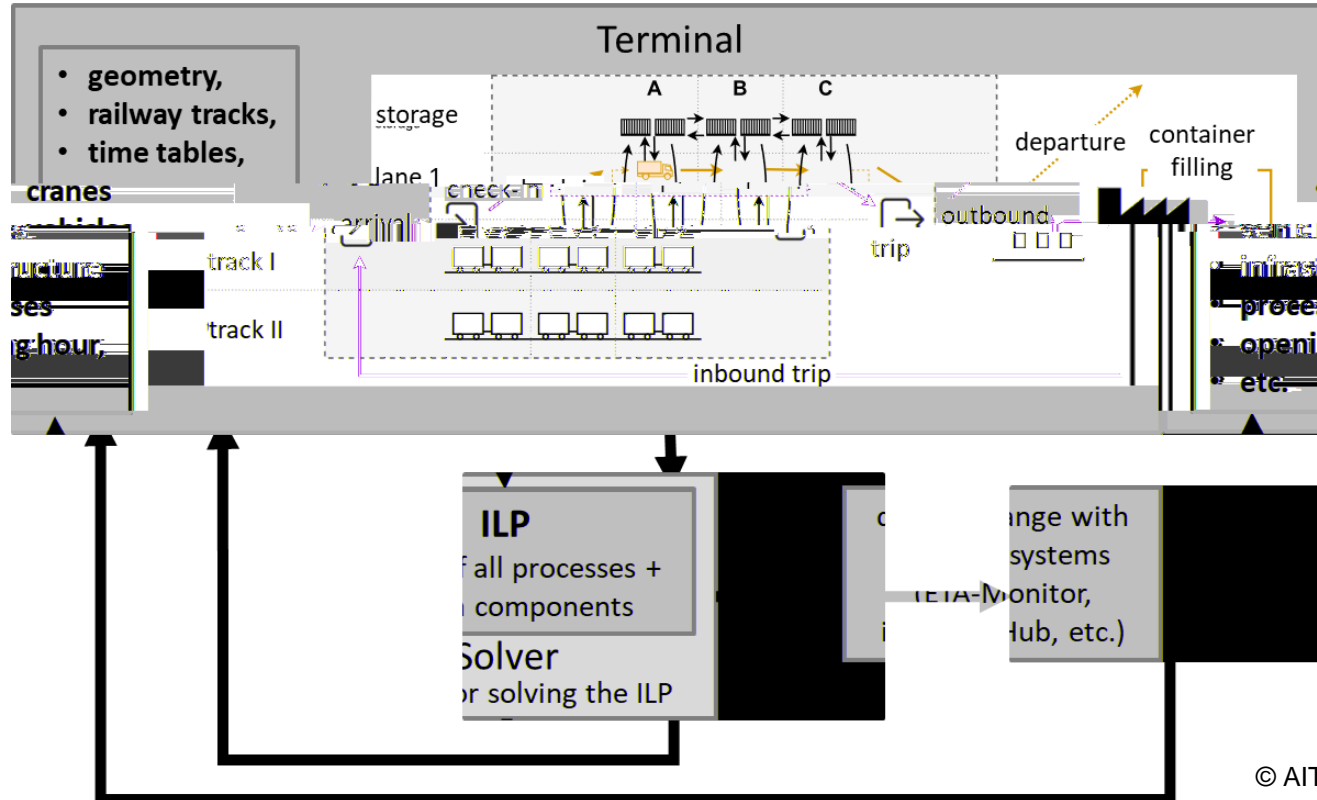
- field tests July and September 2022
 - real production data from
 - shipper companies Containerdienst Hämmerle and Fa. Venz,
 - Infrastructure operator Asfinag (tolling system) Mautsystem and ÖBB Infra
- results
 - Edge Cases
 - loading and unloading points very far from motorways (no toll data □ no ETA)
 - very long delay times
- problems with tracking:
 - incorrect master data
 - Last minute changes of
 - trucks → wrong licence plate number on trucks
 - trains → wrong train number
 - Incorrect starting and arrival times,
 - starting and end points of transports

OPTIMISATION FRAMEWORK

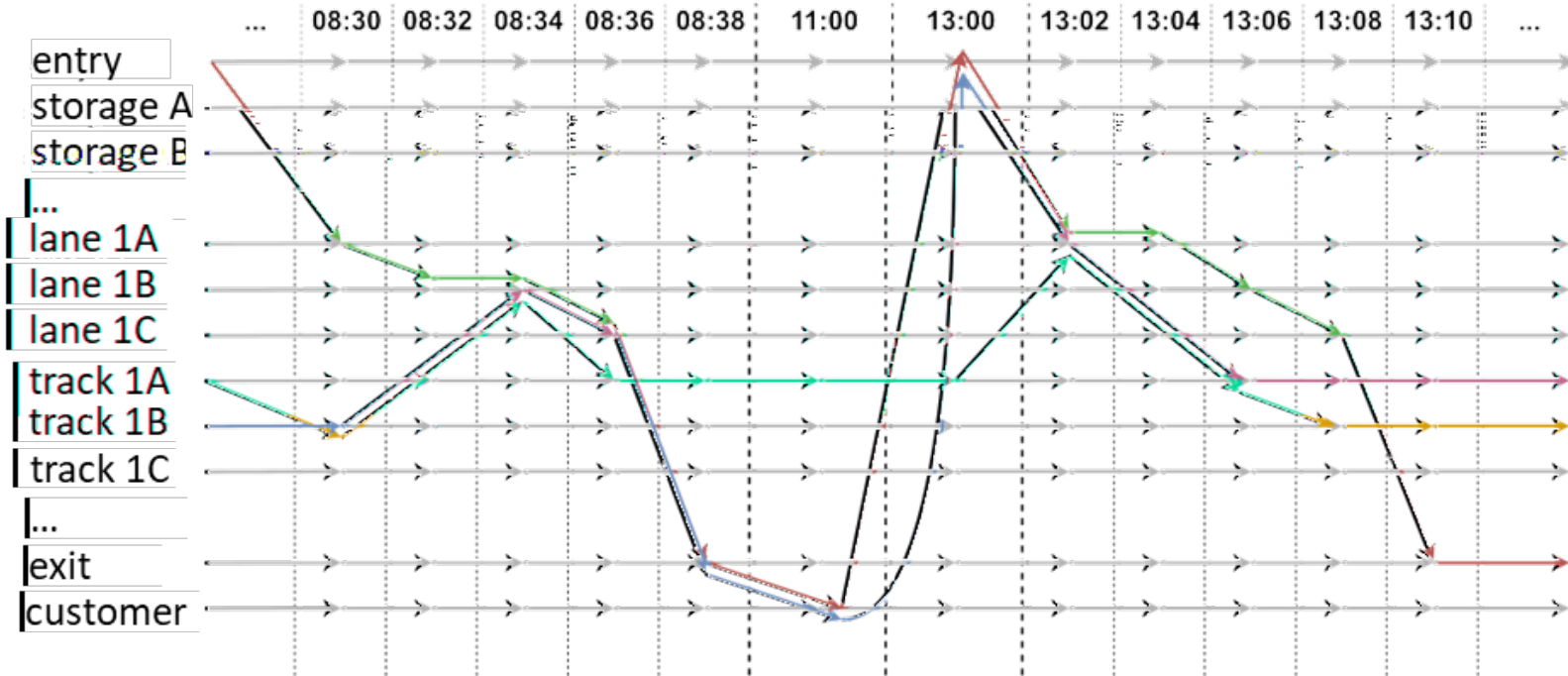
- Modeling of all processes at the Terminal Vienna South
- Development of an ILP-Terminal-Model with
 - geometry (road and rail),
 - container data,
 - time tables,
 - real starting and arrival information



ILP-MODEL WORK FLOW



ILP-MODEL WORK FLOW



OPTIMISATION FRAMEWORK

- ILP-Model possibilities
 - scalable and adaptable for each future terminal
 - testing scenarios with
 - different grade of information availability
 - different demands and capacities
 - changes in infrastructure

THANK YOU FOR ATTENTION!



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