



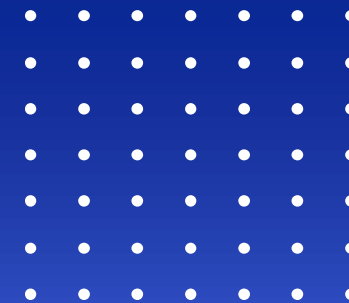
PTV GROUP

PTV xServer



# Intermodal Routing

Dr. Michael Nutto



- 01 Use Cases
- 02 Design
- 03 Best Practices
- 04 Physical networks

# 01

## Use Cases

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# Flexible use – easy integration

- On-premise solution based on API 1
- Standardized interfaces
- Alternative route planning
- Intermodal cost calculation
- Simulation
- Network analyses



Transportation modes: Road, rail, sea & inland waterways, air



Physical networks for all transportation modes



Timetables for most transportation modes included



Import tools for customized timetables available

# PTV's use case study

01

Alternative routing  
Provider check  
Monitoring

02

Network analyses  
Actual/target analyses  
Simulation

03

Cost analyses  
Intermodal cost  
calculation  
Cost comparison

04

Visualisation of  
viability, cost  
efficiency and  
sustainability

# From planning into operation



## ➤ **Tactical planning & execution**

Intermodal planning and cost calculation

Exception handling

## ➤ **Strategic planning**

Calculate alternative routings

Compare times, costs and emissions

## ➤ **Network simulation and assessment**

Compare operator and network performance

# Select the needed modes of transportation



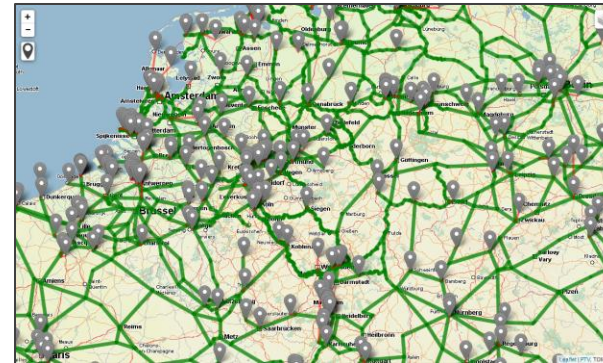
- Deep & short sea
- Rail
- Road
- Inland shipping
- Air



# Use available content and data

<b>Terminal</b>		<b>Address</b>	
EXTID	T_642	COUNTRY	NL
NAME	Rotterdam ECT Delta Terminal	POSTCODE	3089 LD
DESCRIPTION		CITY	Rotterdam
MODE	<input checked="" type="checkbox"/> Road <input checked="" type="checkbox"/> Rail <input checked="" type="checkbox"/> Inland waterway <input checked="" type="checkbox"/> Short sea <input checked="" type="checkbox"/> Deep sea <input type="checkbox"/> Air	STREET	Europaweg 875
		HOUSENR	
		LATITUDE	51.93498
		LONGITUDE	4.13457
		UPDATETIME	03.07.2015 22:14:34
		UPDATEUSER	PTV

Modus	Linienkennung	Startzeit	Start-La	Start-Ort	Ziel-La	Ziel-Ort	Auslastung
TT	TT_LINE_Lübeck-Travemünde_Trelle...	20.06.2016 11:30	DE	Lübeck-Tr...	SE	Trelleborg	<div><div></div></div>
STENA	STENA_LINE_Burg auf Fehmarn_Rød...	20.06.2016 12:15	DE	Burg auf ...	DK	Rødbyhavn	<div><div></div></div>
STENA	STENA_LINE_Sassnitz-Trelleborg_11...	20.06.2016 18:00	DE	Sassnitz	SE	Trelleborg	<div><div></div></div>
STENA	STENA_LINE_Sassnitz-Trelleborg_11...	21.06.2016 18:00	DE	Sassnitz	SE	Trelleborg	<div><div></div></div>
TT	TT_LINE_Lübeck-Travemünde_Trelle...	22.06.2016 11:30	DE	Lübeck-Tr...	SE	Trelleborg	<div><div></div></div>
STENA	STENA_LINE_Burg auf Fehmarn_Rød...	22.06.2016 15:15	DE	Burg auf ...	DK	Rødbyhavn	<div><div></div></div>
STENA	STENA_LINE_Sassnitz-Trelleborg_11...	22.06.2016 18:00	DE	Sassnitz	SE	Trelleborg	<div><div></div></div>
STENA	STENA_LINE_Lübeck-Travemünde_M...	23.06.2016 12:00	DE	Lübeck-Tr...	SE	Malmö	<div><div></div></div>
STENA	STENA_LINE_Burg auf Fehmarn_Rød...	23.06.2016 13:15	DE	Burg auf ...	DK	Rødbyhavn	<div><div></div></div>
STENA	STENA_LINE_Burg auf Fehmarn_Rød...	23.06.2016 16:15	DE	Burg auf ...	DK	Rødbyhavn	<div><div></div></div>
STENA	STENA_LINE_Lübeck-Travemünde_M...	24.06.2016 12:00	DE	Lübeck-Tr...	SE	Malmö	<div><div></div></div>
STENA	STENA_LINE_Lübeck-Travemünde_M...	25.06.2016 00:00	DE	Lübeck-Tr...	SE	Malmö	<div><div></div></div>



- Terminals
- Network
- Transport services
- Timetables
- Real costs
- Emission factors
- Restrictions
- Physical and service network provided by PTV



# Configure your transportation

Ladeinheit: 20 ft. Container

☒ begleitet ☒ Lenkzeiten berücksichtigen

Kosten Limit: 10.000,00

Zeit/Kosten-Gewichtung (%): 50

Fracht-Tarif-Tabelle: C:\Preise Zusammengefasst\_v3.csv

Max. Terminal Entfernung: 50

Transport Mode

Modus	Aktiv/Pa...	Code	Name
	<input checked="" type="checkbox"/>	TM_TTN_AIR	Timetable Air
	<input type="checkbox"/>	TM_TTN_B...	Timetable Barge
	<input type="checkbox"/>	TM_TTN_D...	Timetable Deep-Sea
	<input type="checkbox"/>	TM_TTN_RAIL	Timetable Rail

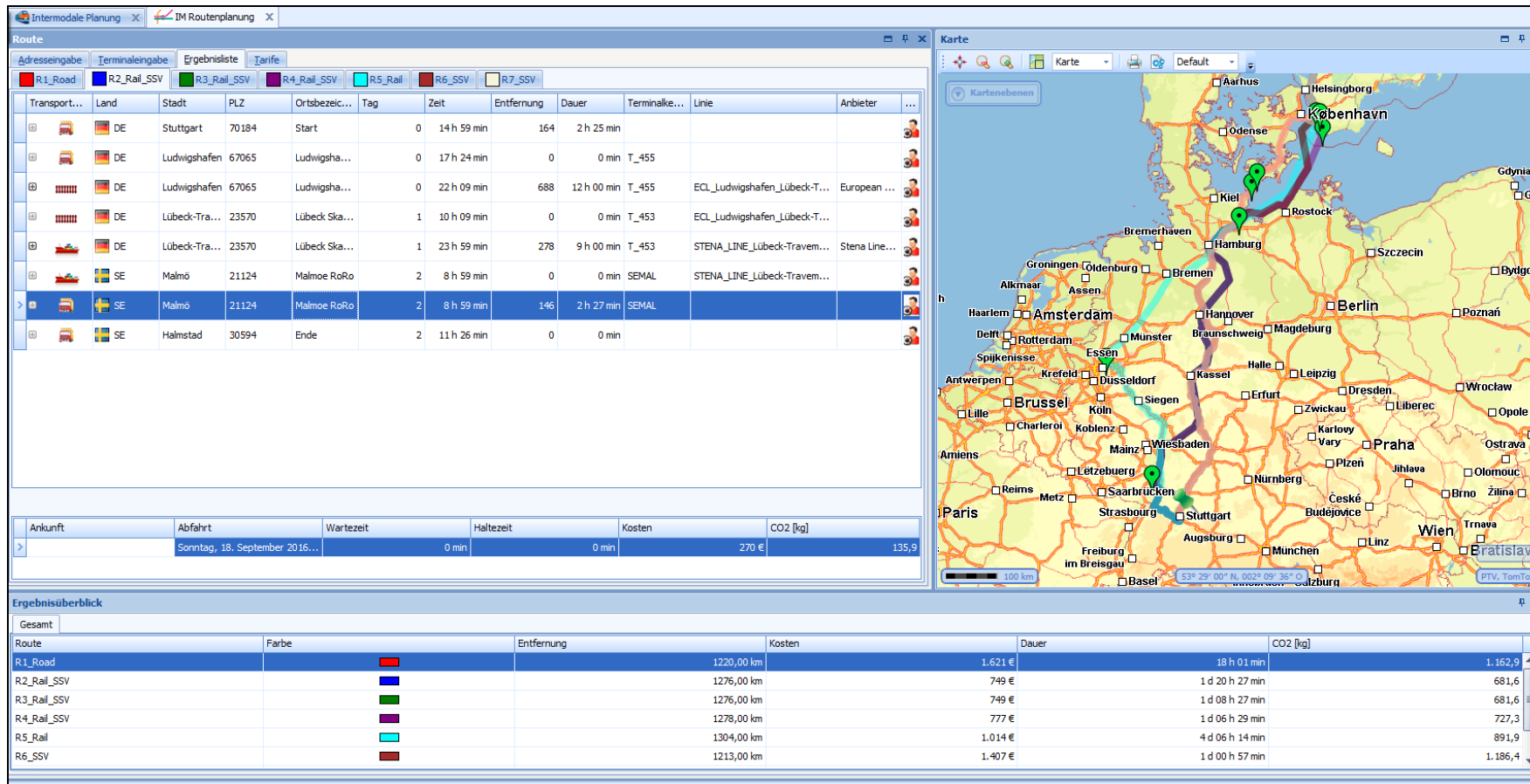
Anbieter

Code	Aktiv/P...	Name
DAWSON	<input checked="" type="checkbox"/>	A. V. Dawson Ltd
AARHUS	<input type="checkbox"/>	Aarhus Stevedore Kompagni A/S
ABERD...	<input type="checkbox"/>	Aberdeen Harbour
ABRA	<input type="checkbox"/>	Abra Terminales Marítimas- s.a.
ADREM	<input type="checkbox"/>	AD REM GROUP
APLISB	<input type="checkbox"/>	Administração do Porto de Lisboa- S.A.
PORT...	<input type="checkbox"/>	Administração do Porto de Sines- SA
APDL	<input type="checkbox"/>	Administração dos Portos do Douro e Leix...
ADIF	<input type="checkbox"/>	Administrador de Infraestructuras Ferrovi...
ADKO	<input type="checkbox"/>	Adria Kombi
ADRIA...	<input type="checkbox"/>	Adriatic Gate j.s.c.
AG_EMS	<input type="checkbox"/>	AG Ems
AGGI	<input type="checkbox"/>	Aggregate Industries
AGIL_C1	<input type="checkbox"/>	AGIL_C1
AGIL	<input type="checkbox"/>	Agility_C1

Modus	Linienkennung	Startzeit	Start-Lan	Start-Ort	Ziel-Lan	Ziel-Ort	Auslastung	Buchung	Kapazität	Anbieter
	TT_LINE_Lübeck-Travemünde_Trelle...	20.06.2016 11:30	DE	Lübeck-Tr...	SE	Trelleborg		5	10	TT-Line GmbH & Co. KG
	STENA_LINE_Burg auf Fehmarn_Rød...	20.06.2016 12:15	DE	Burg auf ...	DK	Rødbyhavn		1	10	Stena Line Freight
	STENA_LINE_Sassnitz_Trelleborg_11...	20.06.2016 18:00	DE	Sassnitz	SE	Trelleborg		4	10	Stena Line Freight
	STENA_LINE_Sassnitz_Trelleborg_11...	21.06.2016 18:00	DE	Sassnitz	SE	Trelleborg		3	10	Stena Line Freight
	TT_LINE_Lübeck-Travemünde_Trelle...	22.06.2016 11:30	DE	Lübeck-Tr...	SE	Trelleborg		2	10	TT-Line GmbH & Co. KG
	STENA_LINE_Burg auf Fehmarn_Rød...	22.06.2016 15:15	DE	Burg auf ...	DK	Rødbyhavn		1	10	Stena Line Freight

- Accompanied combined transport
- Costs per time & distance
- Freight rate
- Maximum terminal distance
- Line identifier
- Capacity
- Hours of services
- Destination

# Optimize your door-to-door routing



- Select available transportation modes
- Door-to-door or terminal-to-terminal routing
- Assign transport orders
- Consider time, cost and capacity restrictions
- Select the cost optimum routing

# 02

## Design

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Intermodal routing service seamlessly integrated



# 02

## The relevant transportation modes in Europe



### Seaport – hinterland transport

Transportation between the European seaports and the hinterland. Mainly used inland vessels or trains on the main leg. Only ISO container will be transported on these modes.



### Continental EU-transport

Transportation within the continent by using inland vessels, small sea ships or trains. Besides the ISO container, swap bodies and semi-trailers will be transported.

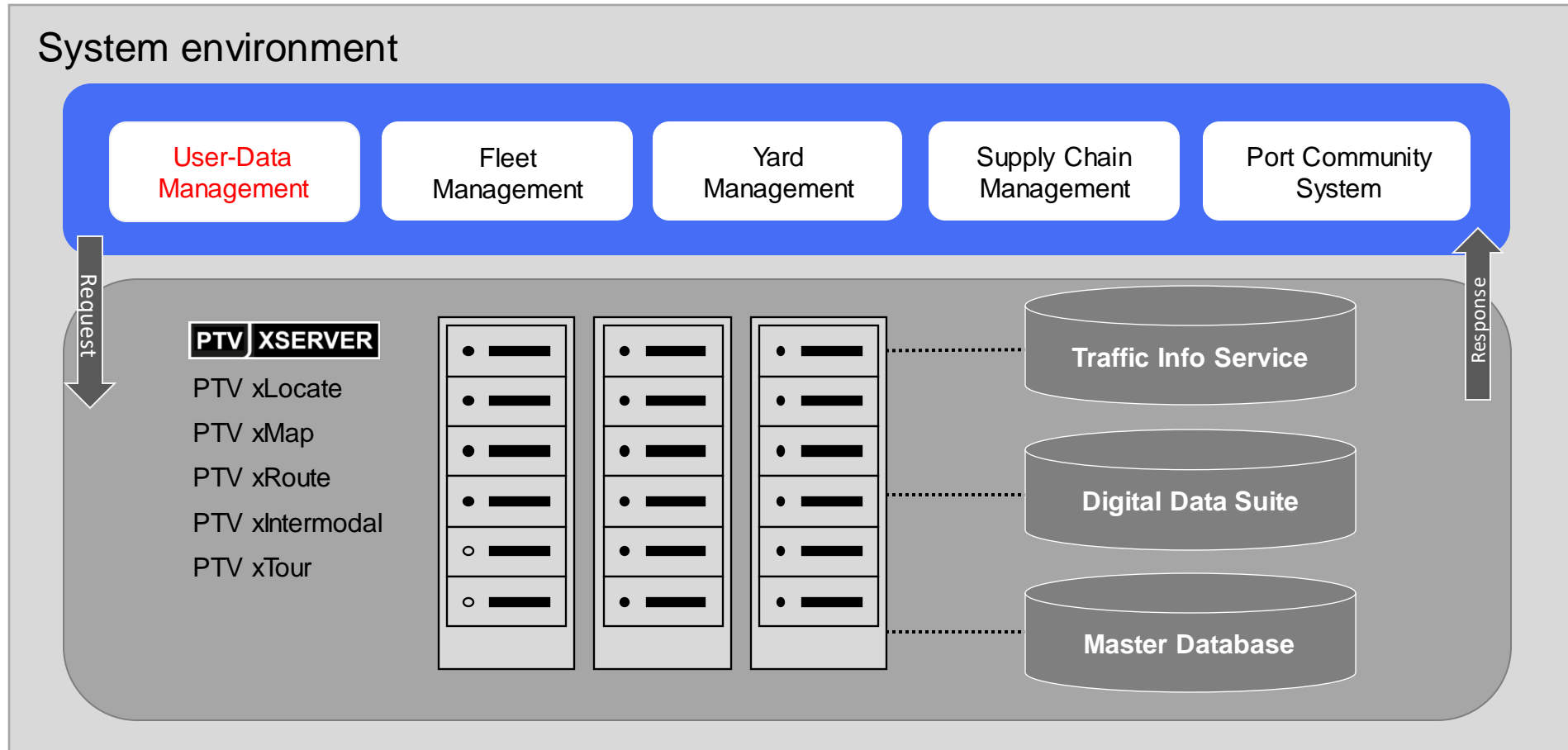


### Short sea transport

Continental traffic partly carried out by smaller sea vessels. This mode is mainly used in East and Mediterranean Sea.

# 02

## How to integrate an intermodal routing service?



[Web-Services](#)

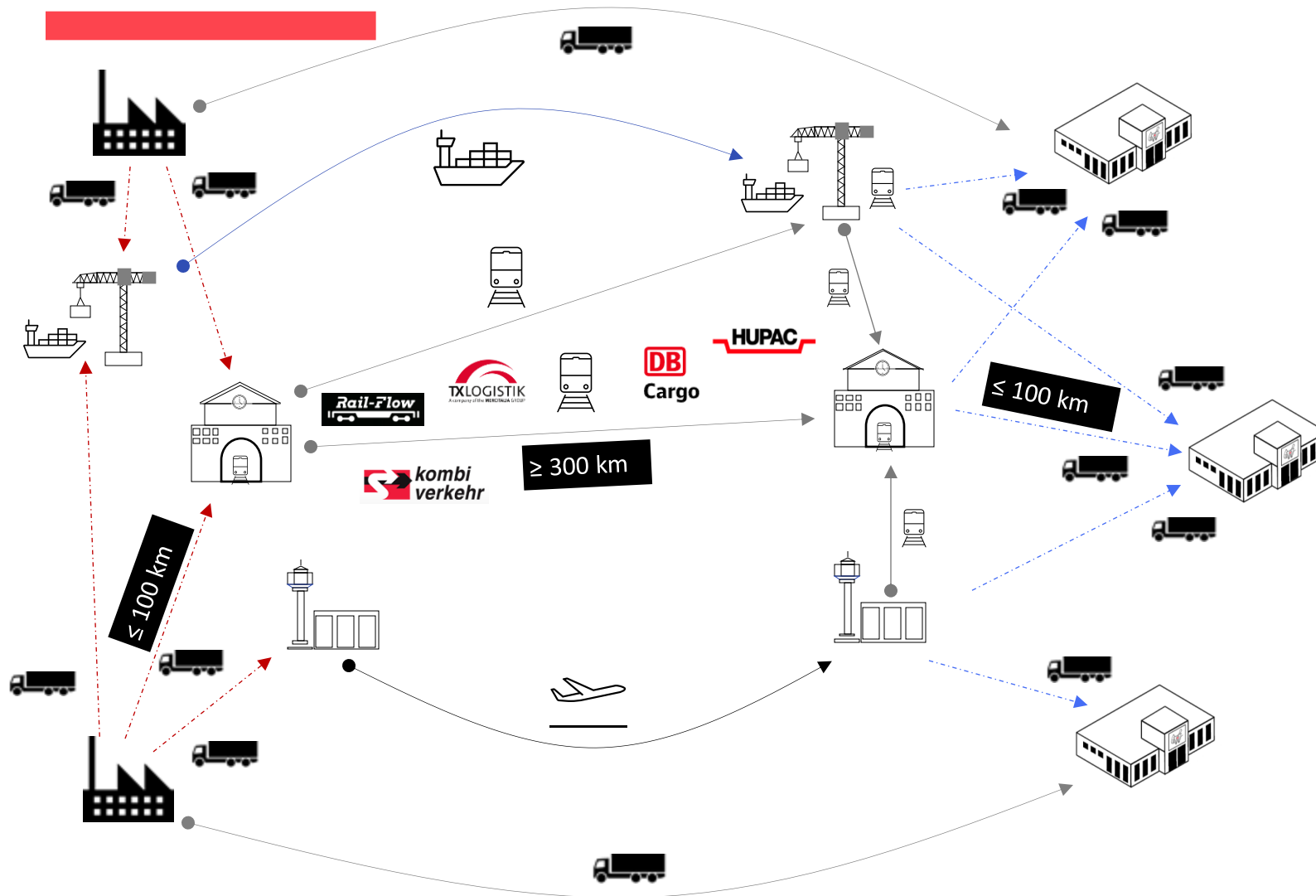
Interfaces:

- JSON
- SOAP

[Download Portal](#)

# 02

## The principle of intermodal routing



- FTL transportation
- Intermodal route planning including railway
  - 40-80%  $CO_2$ -reduction
  - Cost-neutral switch
  - < 20% market share
- Multi-commodity network flow for additional cost-savings



# 03

## Best practices

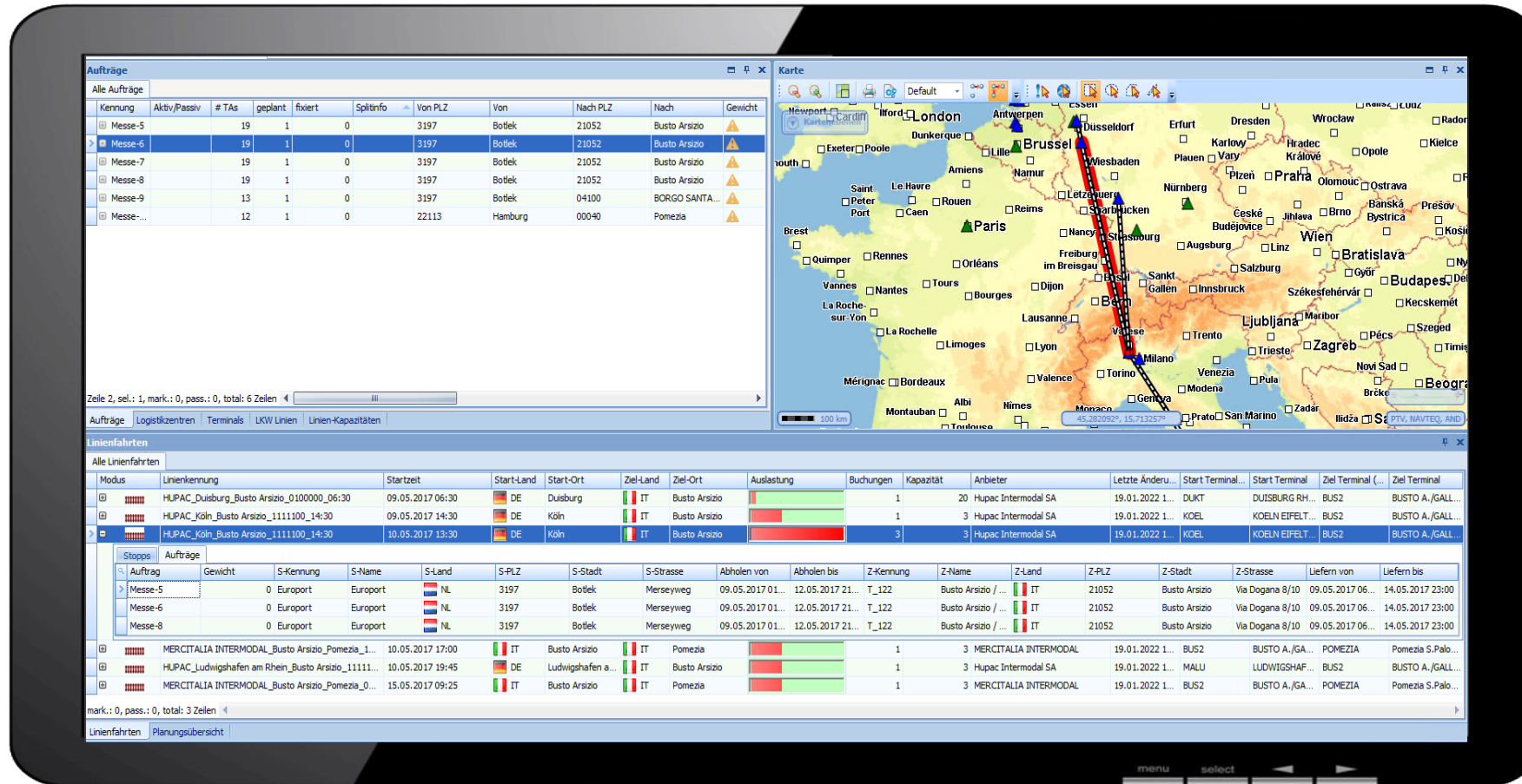
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Use of an efficient planning tool



# 03

## Increase efficiency by using PTV xIntermodal

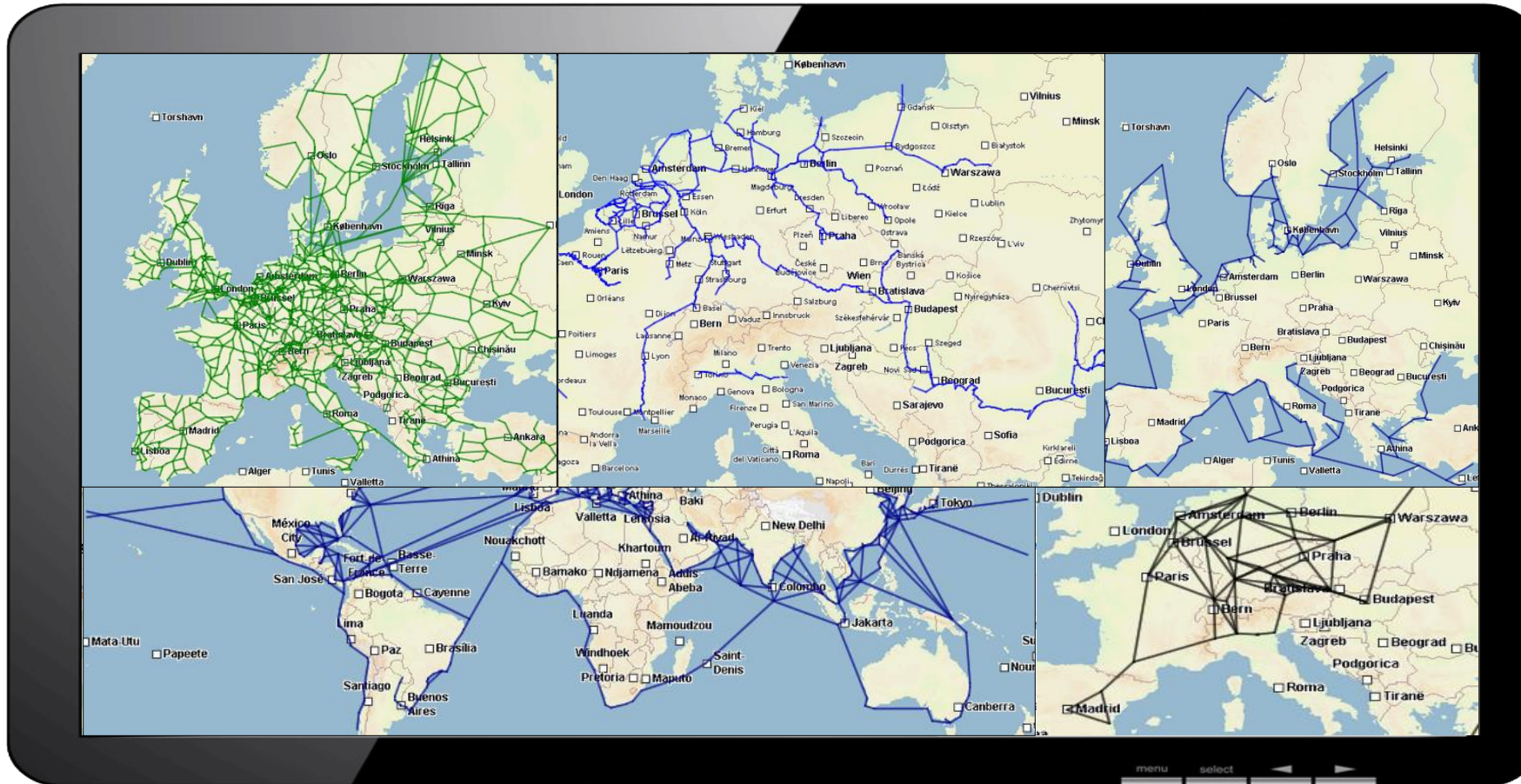


- Intermodal planning
- Cost & emissions calculation
- Network simulation and assessment
- Support for physical networks
- Planning with real-time data



# 03

## Customizing your network



- Add terminals, timetables, line operators
- Network input and nodes (already 1.800 geocoded terminals)
- European Network for trail and inland waters
- Global network for air and sea water

# 04

## Physical networks

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Already integrated and for immediate use



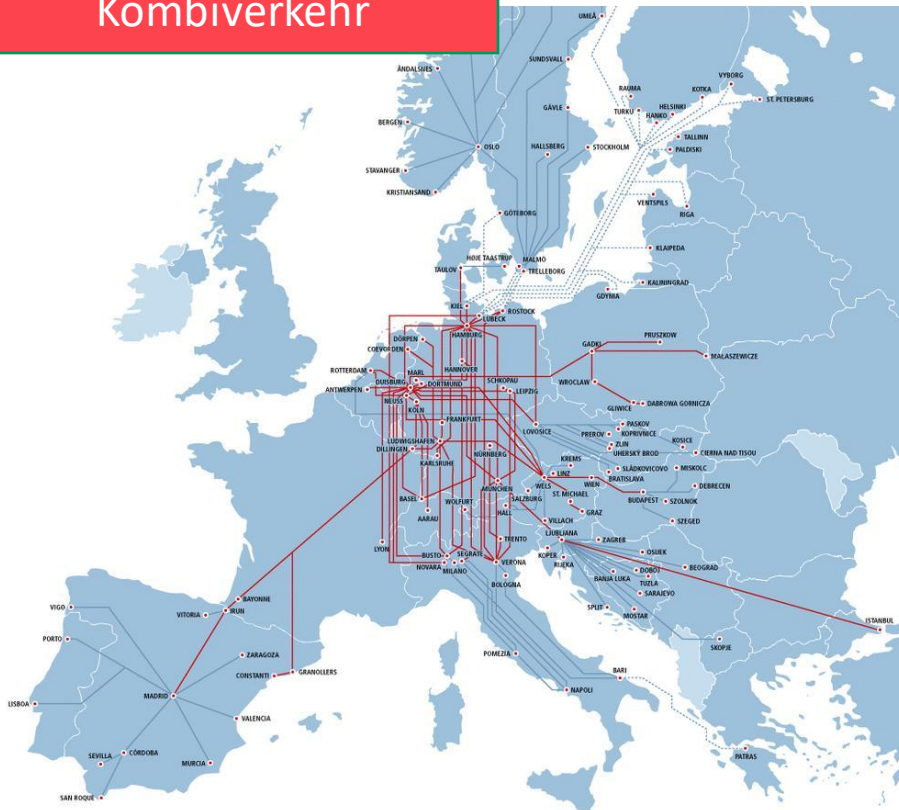


# Hupac's rail transport network

A map of Europe, Asia, and the Middle East showing the HUPAC (High-Speed Uplink Packet Access) network. The map is titled "HUPAC" in a red box at the top right. Red lines represent the network routes, connecting numerous cities across the continent. The routes are dense in Western Europe, particularly around the North Sea and the English Channel, and extend eastward through Russia, the Middle East, and into East Asia. Key cities shown include London, Paris, Amsterdam, Frankfurt, Berlin, Moscow, St. Petersburg, Beijing, Shanghai, and Tokyo. The map also shows the Mediterranean Sea, the Black Sea, and the Indian Ocean.

## Some additional rail transport networks

### Kombiverkehr



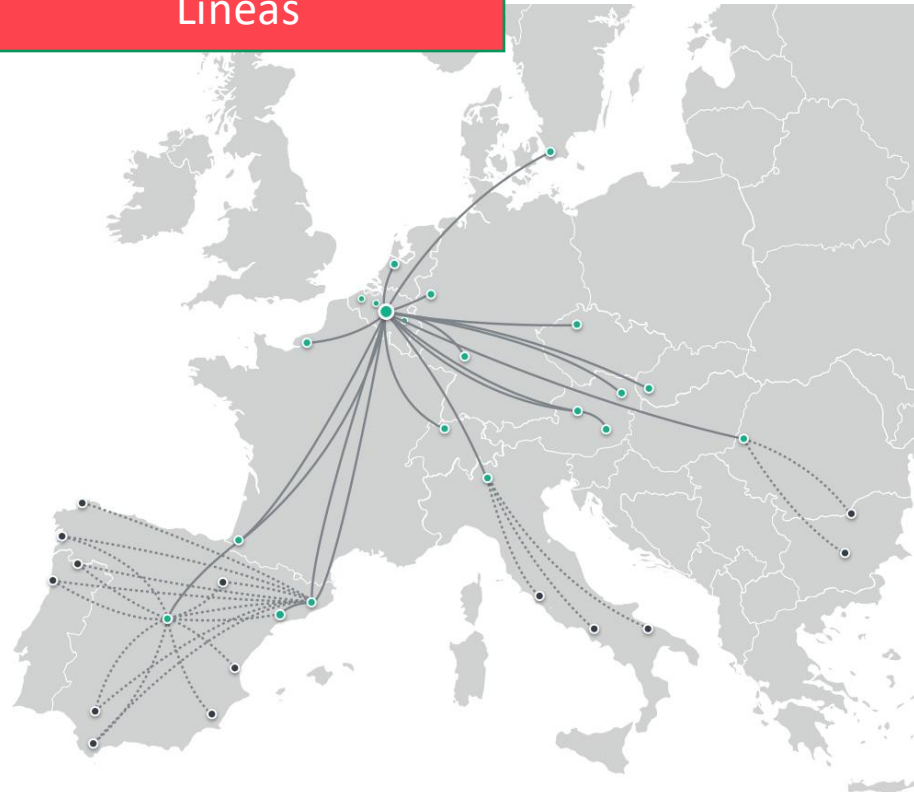
### TX Logistik





## Sea & rail transport networks

Lineas



Samskip



# 04

## Rail & barge transport networks

Contargo

Stand: 07/2020

