

HaCon – the timetable company

Joint efforts - seamless handling of cargo information



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COO HAFAS

Lars Deiterding
Director F & L

HaCon at a glance

- Software for mobility
- Established in 1984
- Owned by management and founders
- 280+ employees, 75% developers
- EUR 40Mio+ annual revenue



HaCon among the 50 Smartest Companies 2015

MIT
Technology
Review

The
Business
Issue

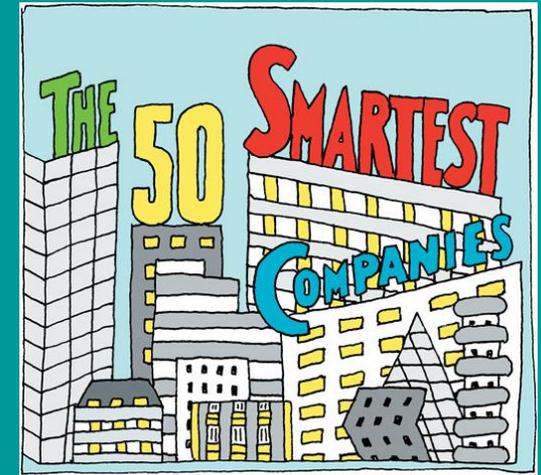
50 Smartest Companies 2015
50 Smartest Companies FAQ
Who Will Own the Robots?
Survival in the Battery Business
Biotech's Coming Cancer Cure

The New Water Cooler
Rebooting the Automobile
Slowing the Biological Clock
Cyber-Espionage Nightmare

50 Smartest Companies 2015

1 Tesla Motors	2 Xiaomi	3 Illumina	4 Alibaba	5 Counsyl	6 SunEdison	7 Tencent	8 Juno Therapeutics	9 SolarCity	10 Netflix
11 OvaScience	12 Google	13 Amazon	14 AliveCor	15 Gilead Sciences	16 Apple	17 Voxel8	18 IDE Technologies	19 Amgen	20 Aquilon Energy
21 Baidu	22 SpaceX	23 Sakti3	24 Freescale Semiconductor	25 Universal Robots	26 Bristol-Myers Squibb	27 Teladoc	28 Nvidia	29 Facebook	30 Alnylam
31 Rethink Robotics	32 Philips	33 Collectis	34 Bluebird Bio	35 ThyssenKrupp	36 Slack	37 Line	38 Improbable	39 Enlitic	40 Coinbase
41 HaCon	42 3D Systems	43 Generali	44 Intrexon	45 DNAexus	46 IBM	47 Snapchat	48 Microsoft	49 Imprint Energy	50 Uber

- MIT Technology Review – 50 Smartest Companies 2015
- HaCon ranked on place 41



HaCon Business Segments



Consulting

Technology and standardization projects

Research and innovation development to create seamless transport across all modes of transportation and across international borders

TPS

Management of rail networks

Design, manage and optimize infrastructure, time schedules and construction works for rail networks.

HAFAS

Intelligent Transportation Systems

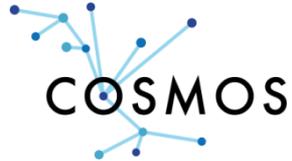
Trip planning
Passenger information
Freight routing

Fleet management
Train monitoring

Data management

Ticketing

HaCon R&D and consulting

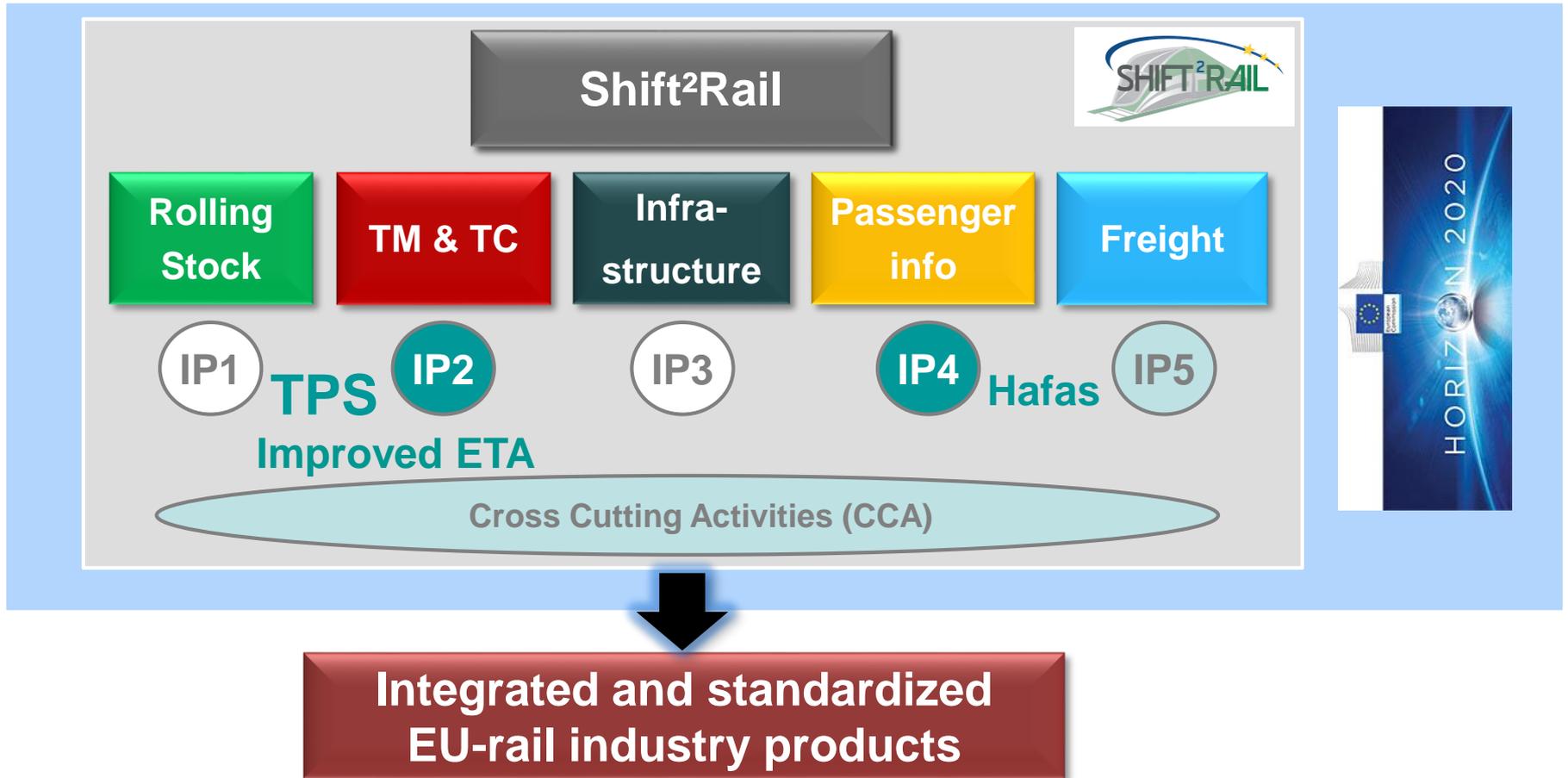


HaCon consults and researches within the scope of various European R&D projects.

The goals include:

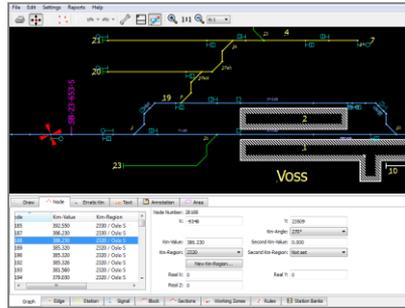
- ❖ Developing standards to exchange information between the various stakeholders of public transportation and cargo
- ❖ Develop new technology to increase convenience, safety and efficiency
- ❖ To better understand user behavior and market requirements
- ❖ To support and enable seamless travel across different modes of transportation
- ❖ To develop improved processes for transport operations

HaCon in Shift²Rail

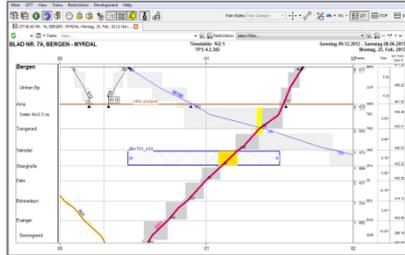


Train Planning System TPS

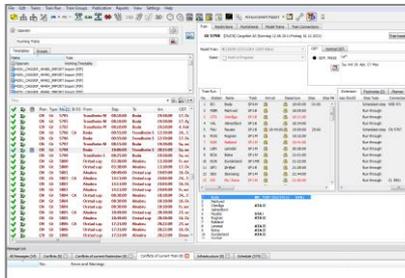
Infrastructure
Editor



Graphical
Editor



Timetable
Editor



Train No.	Route	Start	End	Stop	Speed	Category
101	101	10:00	10:10	10:10	100	Normal
102	102	10:10	10:20	10:20	100	Normal
103	103	10:20	10:30	10:30	100	Normal
104	104	10:30	10:40	10:40	100	Normal
105	105	10:40	10:50	10:50	100	Normal
106	106	10:50	11:00	11:00	100	Normal
107	107	11:00	11:10	11:10	100	Normal
108	108	11:10	11:20	11:20	100	Normal
109	109	11:20	11:30	11:30	100	Normal
110	110	11:30	11:40	11:40	100	Normal

TPS is the leading European tool to create, optimize and manage rail infrastructure and timetables.

Features include:

- Production system (long term, mid term, adhoc)
- Conflict analysis
- Simulation
- Track occupation plan / Graphical timetable
- Schedule optimization
- Infrastructure restriction management
- Coordination of maintenance measures
- Analysis of capacity utilization
- Runtime calculation including energy saving methods
- Bit/Offer management (train paths, parking infrastructure, restrictions, marshalling/shunting)
- Construction Editor



Existing use cases freight transport

Online-timetable combined transport

NETZWERK TERMINALS & AGENTUREN ONLINE-FAHRPLAN ?

Verbindungssuche

Über die Verbindungssuche erhalten Sie Fahrplandaten zum gesamten Verkehrsangebot der Kombiverkehr GmbH & Co. KG inklusive einer Schnellbilanzierung von Schadstoff-Emissionen und der Energiebilanz gemäß DIN EN 16258.

START ?

Land

Versandterminal

oder

PLZ
Land

Nach Abfahrtstag suchen ?

ZIEL ?

Land

Empfangsterminal

oder

PLZ
Land

Nach Empfangstag suchen ?

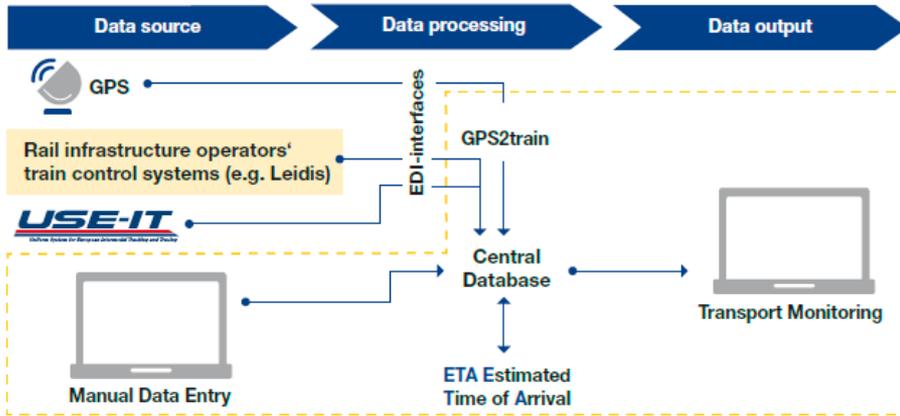
LEITUNGSWEG ?

Alle Verbindungen
 Nur Direktzugverbindungen
 Gatewayverbindungen via

[→ Gateway hinzufügen](#)

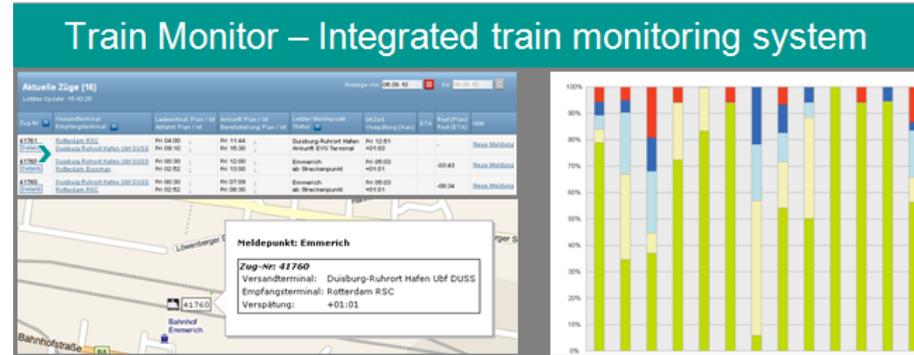
[→ Neue Eingabe](#) [→ Suche starten](#)

Real-time monitoring system

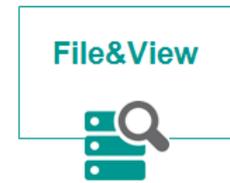


- Reliable status information
- Accurate ETA & ETD

- Various sources
- National and international



Modules:





Status quo Passenger Transportation

The human freight - Intermodal travel

- Public Transit more and more embraces the view of the passenger.
- This leads to more integration efforts
- Integration across
 - Modes of transportation
 - Operators
 - Borders



Live Map Timetables

DB NETZE

DB LiveMaps (DB Netz)

Eingelogg als **dbnetz_user** → Ausloggen

Live Fahrplan | Infrastruktur | Legende

→ Hinweise zur Version ⓘ
→ Impressum
→ Rechtliches
→ Push-Alarm
→ CSV Export

Zeit: 12:26:22 **Anzahl Züge:** 41

Darstellung

- Livefahrplan aktivieren
- Zugnummer
- Anonyme Züge anzeigen

→ Betriebsstellenfilter hinzufügen

Personenzüge	Güterzüge
<input checked="" type="checkbox"/> Fernverkehr	<input checked="" type="checkbox"/> Intermodal
<input checked="" type="checkbox"/> IC/EC	<input checked="" type="checkbox"/> Ganzzüge
<input checked="" type="checkbox"/> Nahverkehr	<input checked="" type="checkbox"/> Einzelwagenzüge
<input checked="" type="checkbox"/> S-Bahnen	

Sonstige

- Sonstige

Suche

Betriebsstellen | Zugsuche

Suche:

Abfahrt Ankunft

The map shows a network of train lines around Hannover, Germany. Key stations include Seelze, Letter, Letter Süd, Harenberg, Döteberg, Velber, Davenstedt, Limmer, Linden Nord, Linden Mitte, Linden Süd, Seelze Süd, Ahlen, Herrenhausen, Leinhausen, Burg, Hainholz, Nordstadt, Oststadt, Zooviertel, Sudstadt, and Bult. The map features various icons: red circles with numbers (3, 4, 13, 2), green 'S' icons for S-Bahnen, and purple 'N' icons for Nahverkehr. A thick black dashed line highlights a specific route through the city.

DB Netz - strecken.info
Baumaßnahmen

Einloggen

Baustellen
 Störungen

Verkehrsarten
 Personenfernverkehr
 Personennahverkehr
 Güterverkehr

Datum 12.12.2016

Zeit 12:00 Uhr

Jetzt

Anzeigezeitraum: 6 Stunden

Feineinstellung

Wirkungsgrad
schwerwiegend alle

Meldungen als Liste anzeigen

Suche:

Legende anzeigen

HaCon

Wirkungen

- Ohne Abweichung des Laufwegs
- Abweichung vom Fahrplan für Zugmeldestellen
- Sonstiges
- Fahren auf dem Gegengleis mit Zs 6
- Fahrzeitverlängerung auf Regellaufweg
- Umleitung unter erleichterten Bedingungen
- Fahren auf dem Gegengleis mit Zs 8 oder Befehl
- Streckenruhe
- Totalsperrung
- Umleitung
- Zurückhalten von Zügen
- Teilausfall
- Ausfall

HaCon

Co-modal Journey Planning – Example Austria

The screenshot displays the ASFINAG Route Planner interface. The main map shows a route from Vienna (Wien) to St. Pölten, Austria, with a highlighted path in green and orange. The route starts in Vienna, goes to Rekawinkel (Park & Ride), then to St. Pölten Hauptbahnhof, and finally to St. Pölten Hauptbahnhof (Nord X).

JOURNEY RESULTS

FROM 1040 Wien (Wien), Frankenberggasse 5
TO 3100 St. Pölten, Schwadorf 12
DEPARTURE Tu, 03.11.2015, 10:34

Car
10:34 - 11:36 67,7 km 1h 2min

Park & Ride

10:58 - 13:06 1x chg. 2h 8min

10:58 1040 Wien (Wien), Frankenberggasse 5
Car | 29,2 km | 0h 42min
Walk to car: approx. 2 min
Distance: 29,2 km
Seeking for parking space: approx. min
Walk to destination: approx. min

11:40 P+R Rekawinkel, Pressbaum
Wegbeschreibung

P+R Rekawinkel, Pressbaum

Transfer | 0h 7min

11:47 Rekawinkel Bahnhof
R 2022 Regionalzug
→ St. Pölten Hauptbahnhof
0h 38min, 10 intermediate stops

12:25 St. Pölten Hauptbahnhof
Weitere Fahrten Info

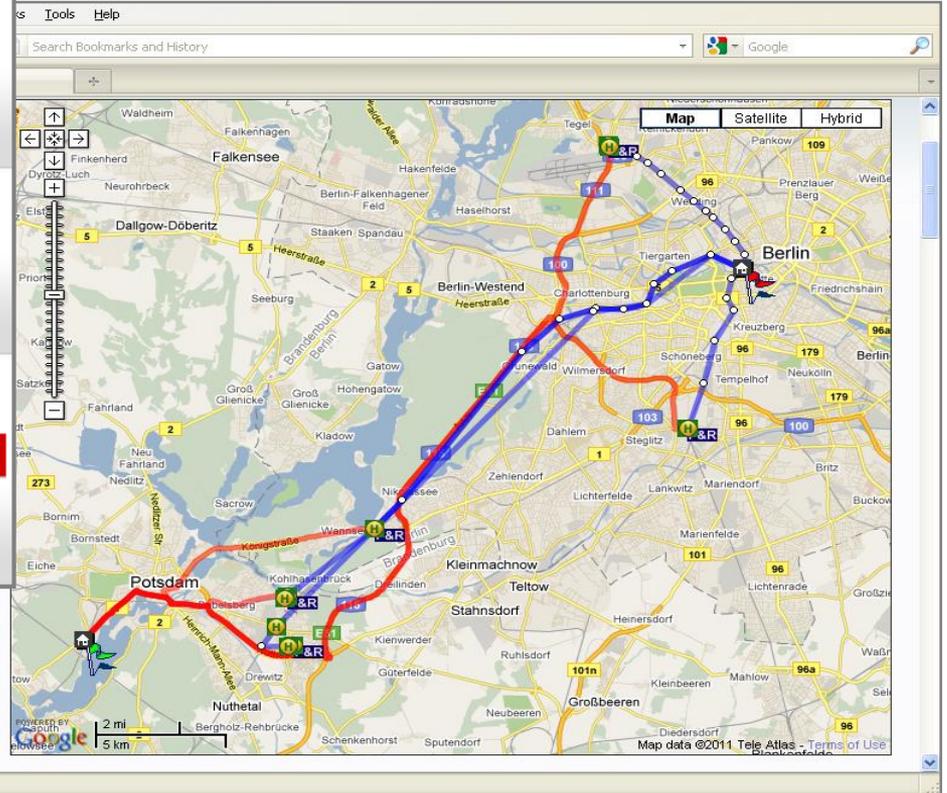
Transfer | 0h 4min

12:45 St. Pölten Hauptbahnhof (Nord X)
Regionalbus 1541
→ Pummsdorf Ort
0h 34min, 7 intermediate stops

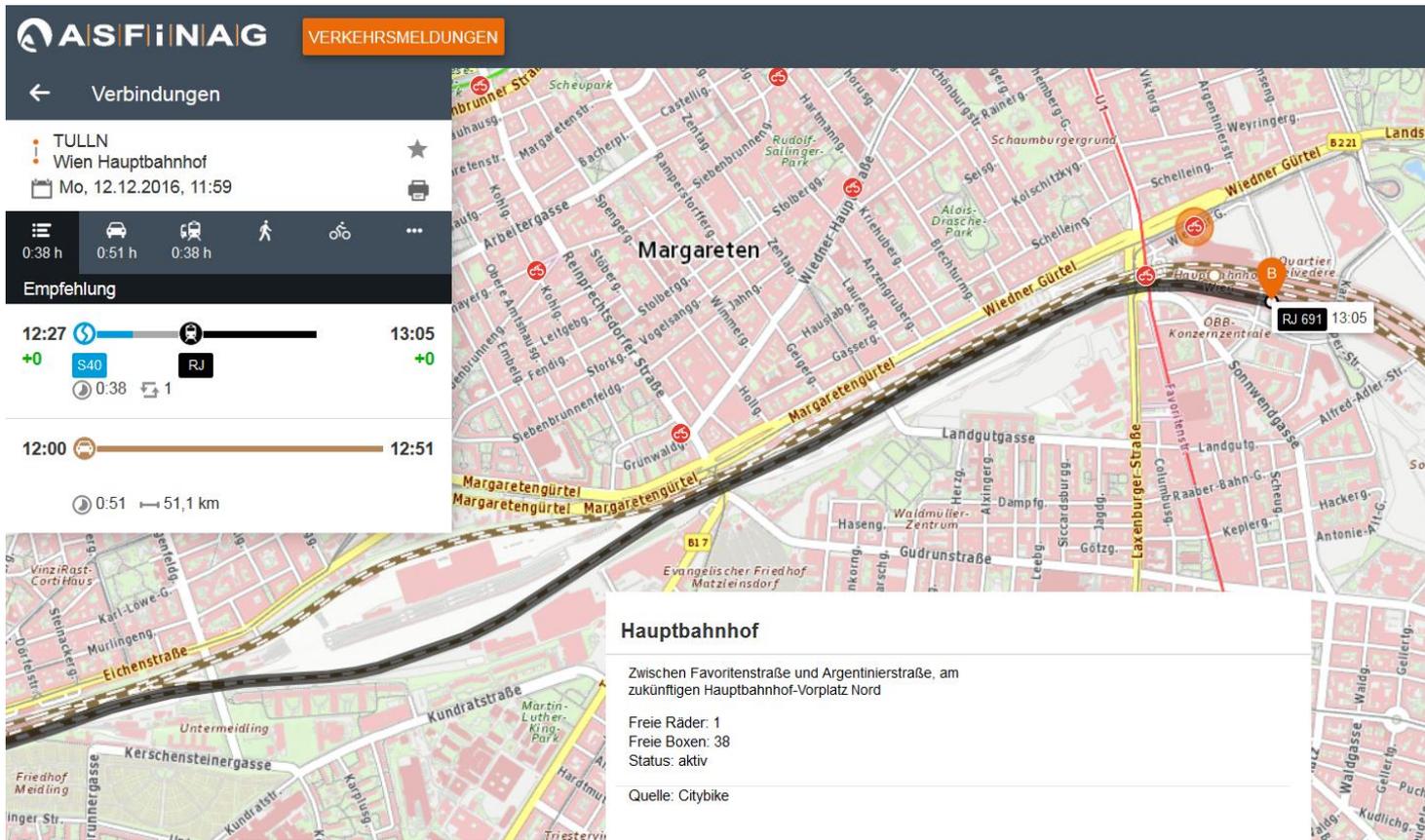
Later connection Last connection

Parking integration

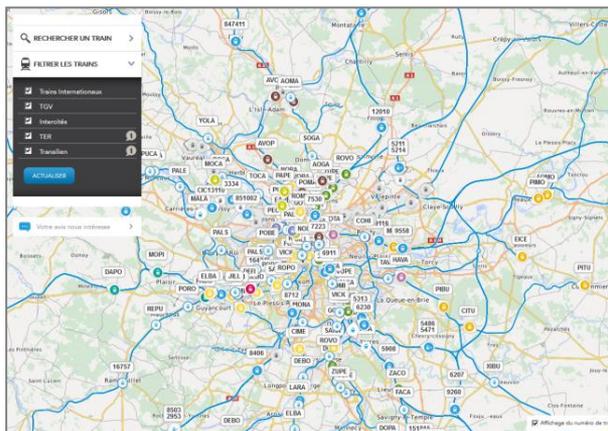
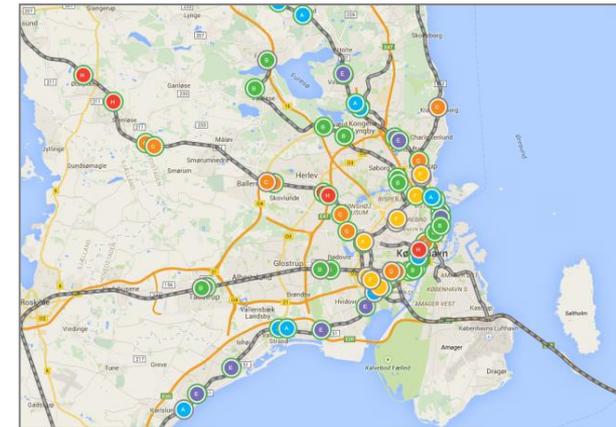
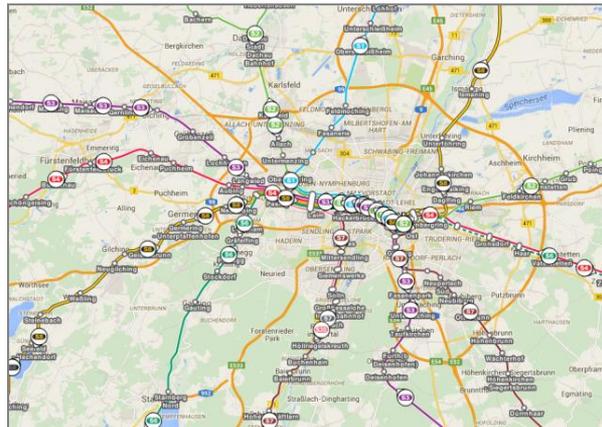
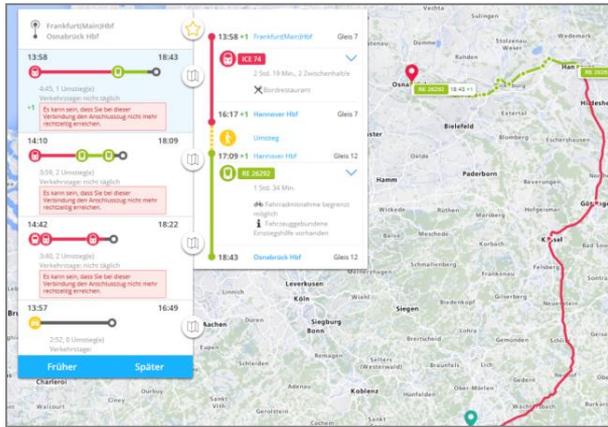
Park&Ride Parkplatz	Kapazität	Dauer
P&R P+R Priesterweg (S)	85	0:56
P&R P+R Wannsee (S)	100	0:56
P&R Keplerplatz (P 3)	150	1:08



Bike Integration

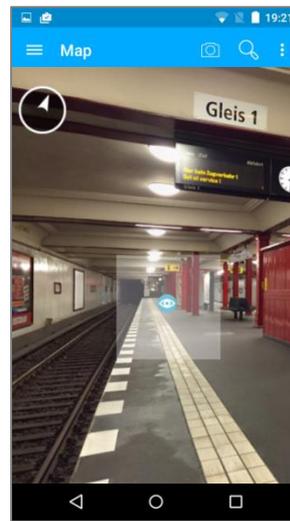
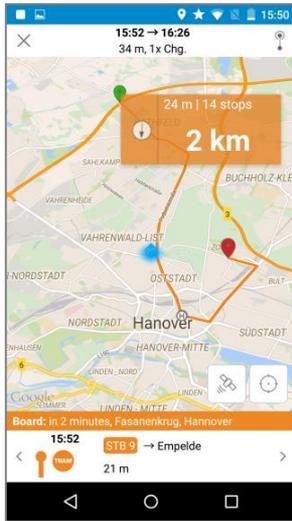


Live Map Timetables

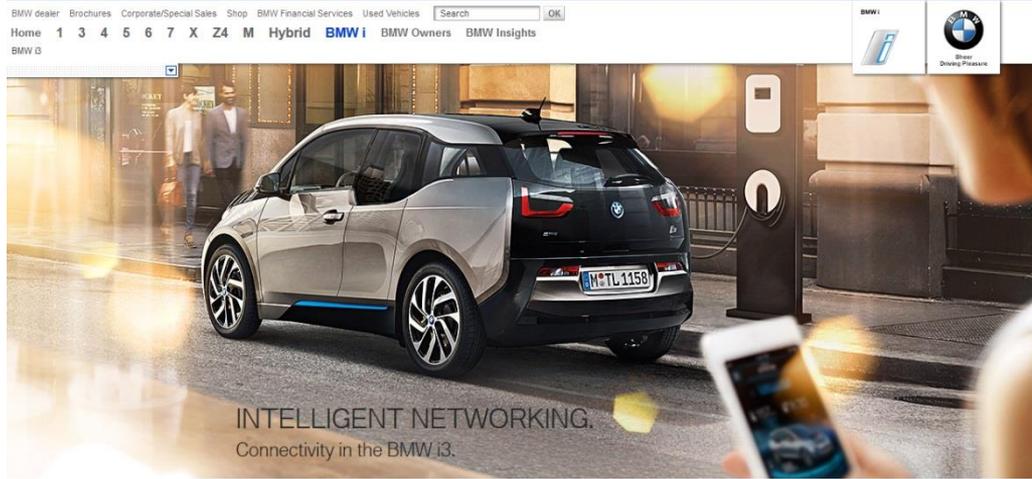


Journey Planning and beyond

Various Apps & Websites interface with different Stakeholders



Example P&R Routing with BMW i3



Some HAFAS Numbers

100.000.000

computed journeys daily

200.000.000

App-Downloads

10.000.000.000 €

yearly ticket revenue based on HAFAS computations

150

regions

25

countries

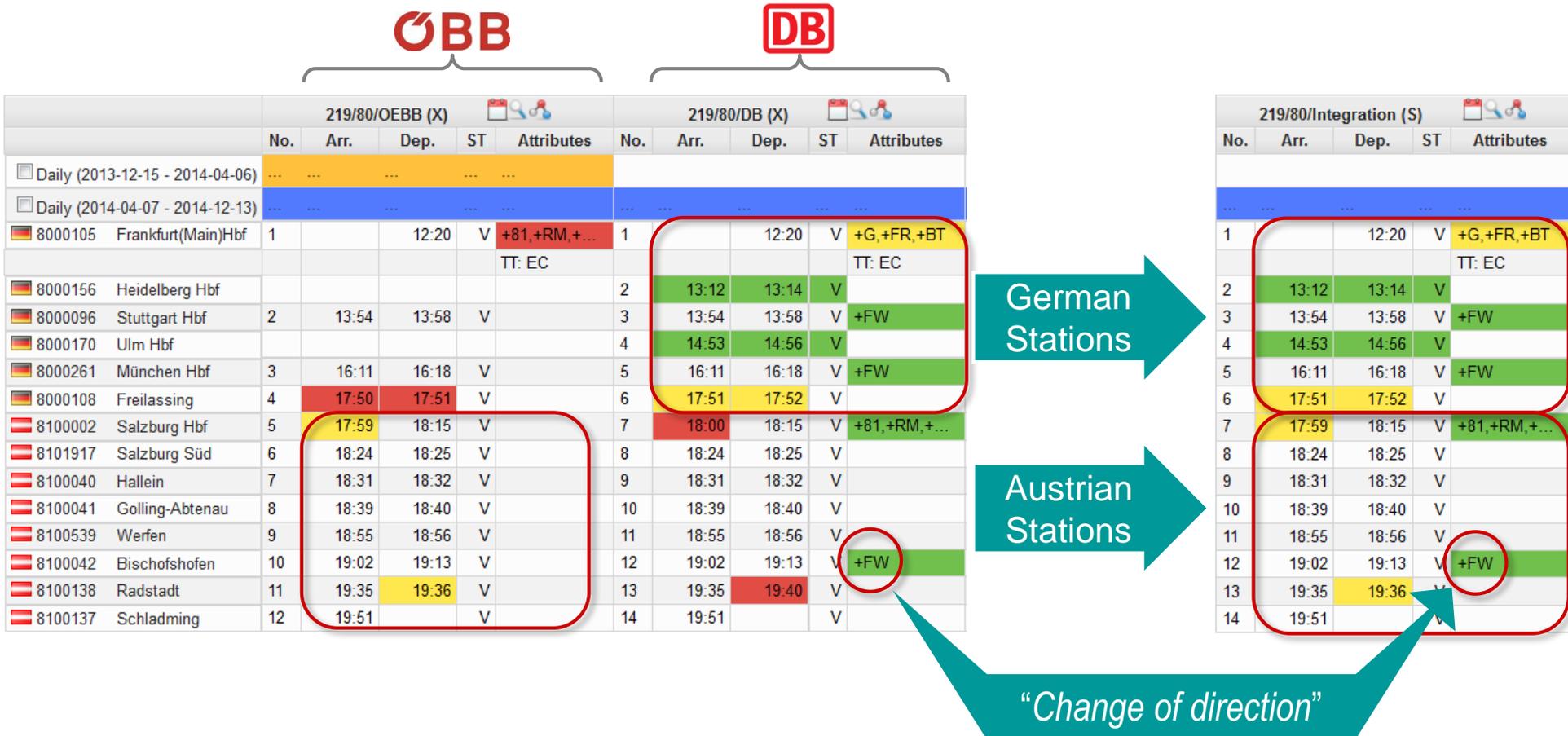
5.000.000

stops

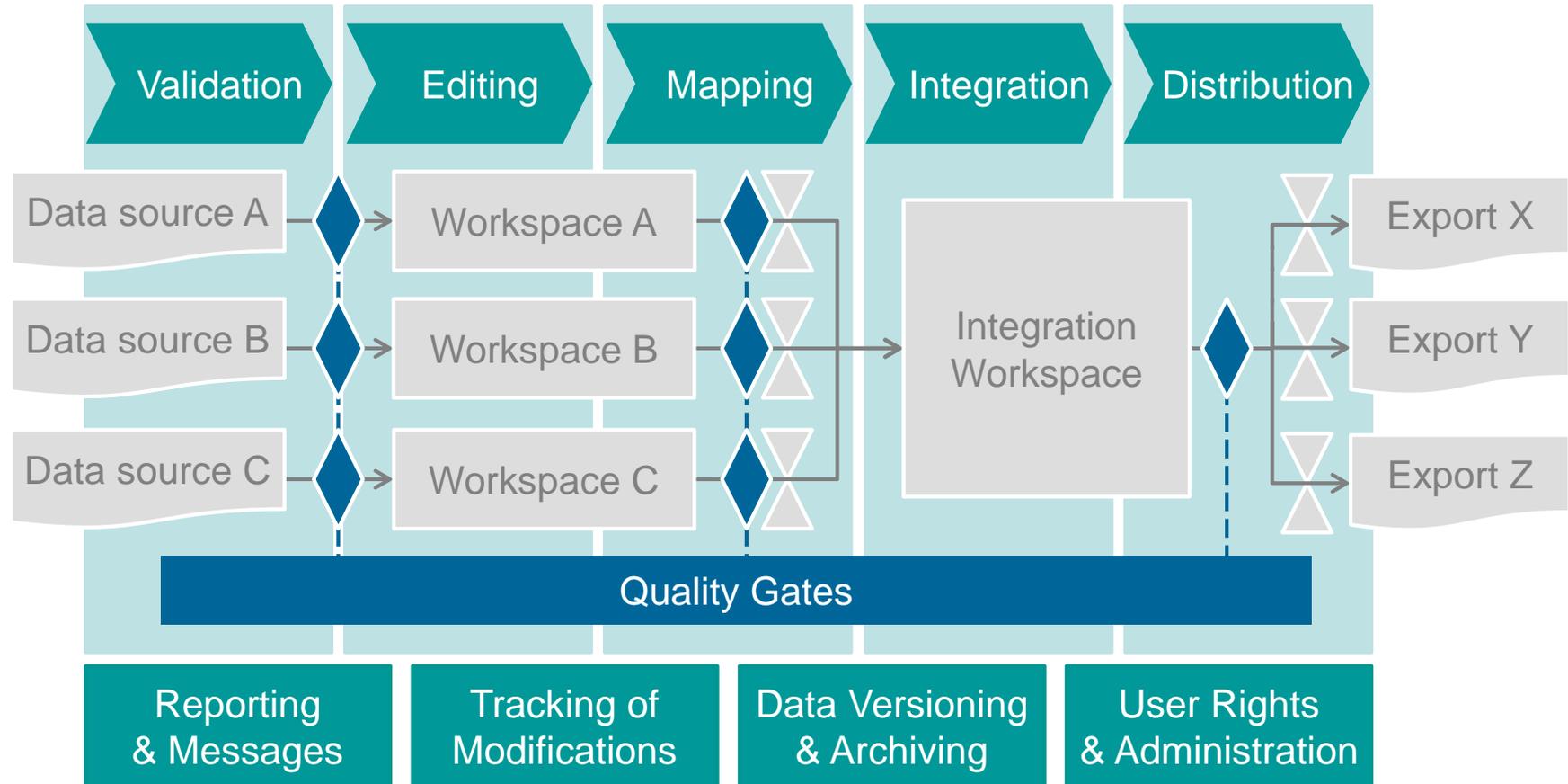


Tools

TPS-Integrator – Integrate various information sources



TPS Integrator – Data Management & Integration Tool



HIM – Disruption Management

BEWEGUNGEN NEUE MELDUNG ADMINISTRATION ZUGARCHIV AUSDRUCK REPORTS HILFE KOMMUNIKATIONSLINE

Regionsbezogene Meldung erfassen

EREIGNISZEITRAUM

von: 06.04.2018 10:31 bis: 06.04.2018 23:55
Meldung gilt: täglich
Meldung gilt an ausgewählten Tagen: von 00:01 bis 23:55

AUSWAHL DES HALTES

Halt: 
Umkreis: 1.0 km

FAHRTENGRENZUNG

Produkte / Gattungen

ICE IC IR IRB S Busse U Schiffe Straßenbahn Anrufbusse

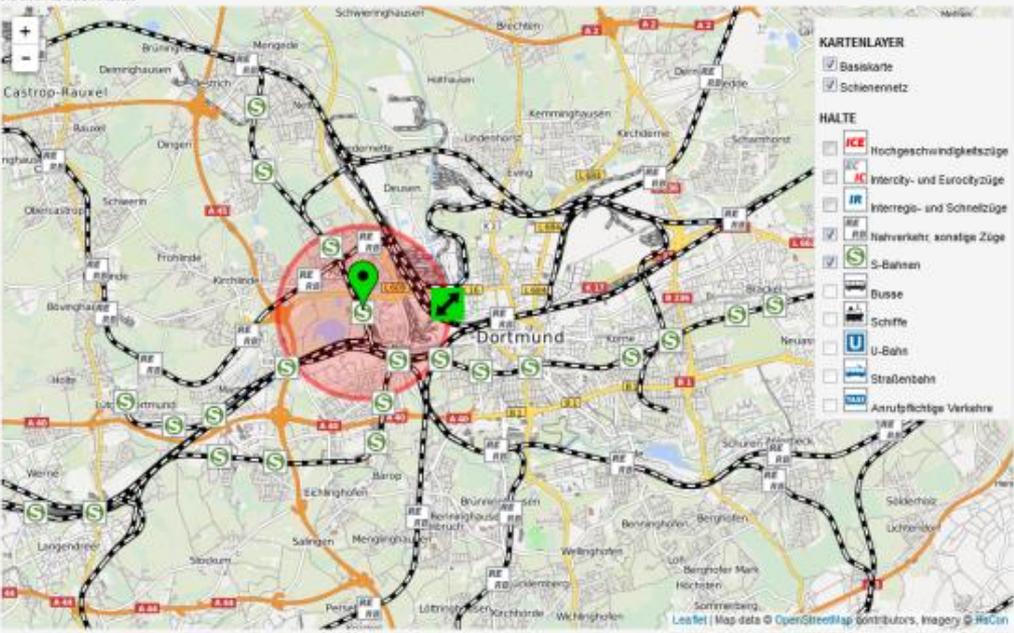
BETROFFENE FAHRTEN AUSWÄHLEN

Bitte Fahrten suchen

MELDUNGSTEXT

Meldungstext:

AUSWAHL DES HALTES



KARTENLAYER

- Basekarte
- Schienennetz

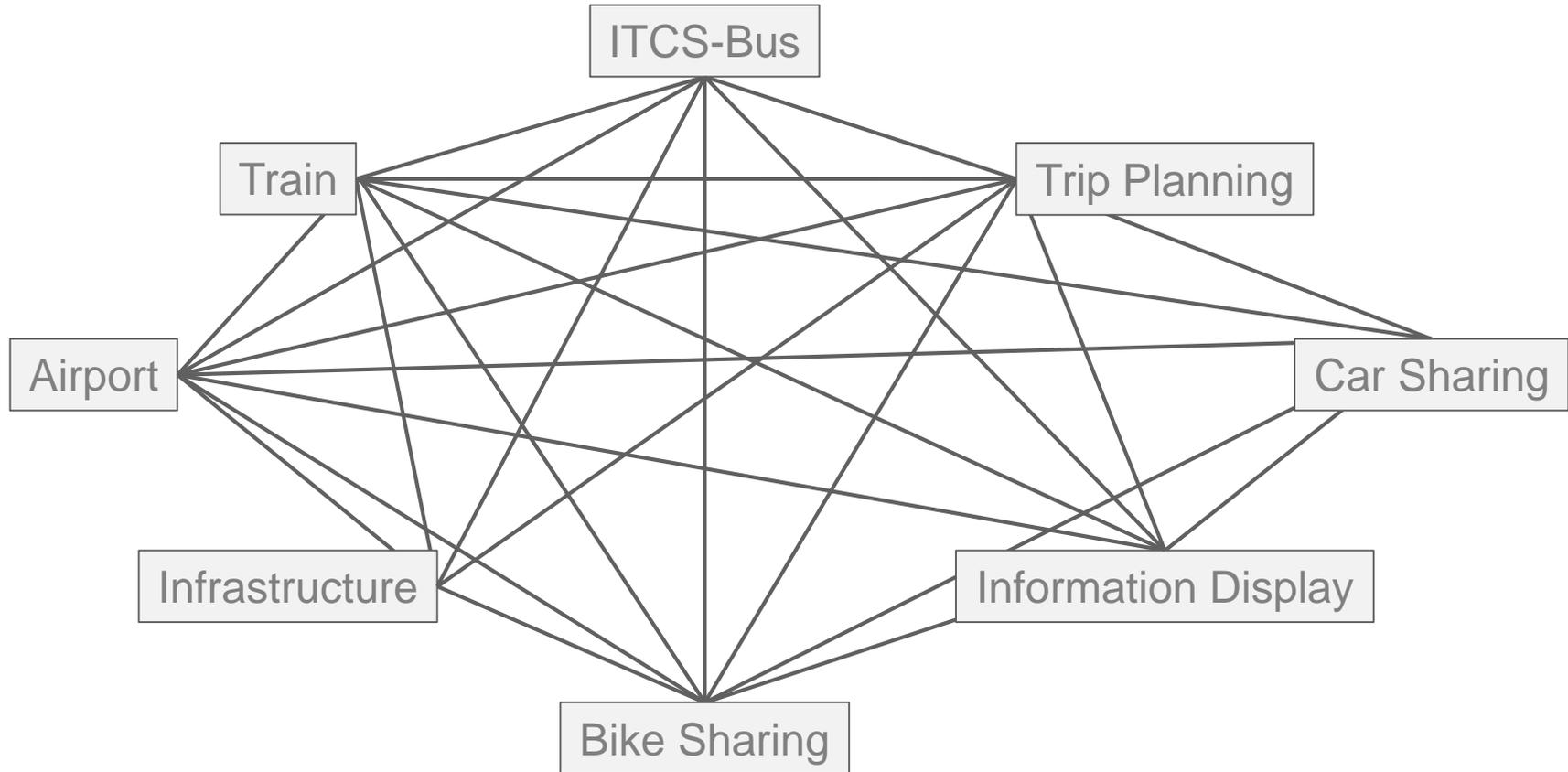
HALTE

- ICE Hochgeschwindigkeitszüge
- IC InterCity- und Eurocityzüge
- IR Interregio- und Schnellzüge
- IRB Nahverkehr, sonstige Züge
- S S-Bahnen
- Busse
- Schiffe
- U U-Bahn
- Straßenbahn
- Anrufbusse

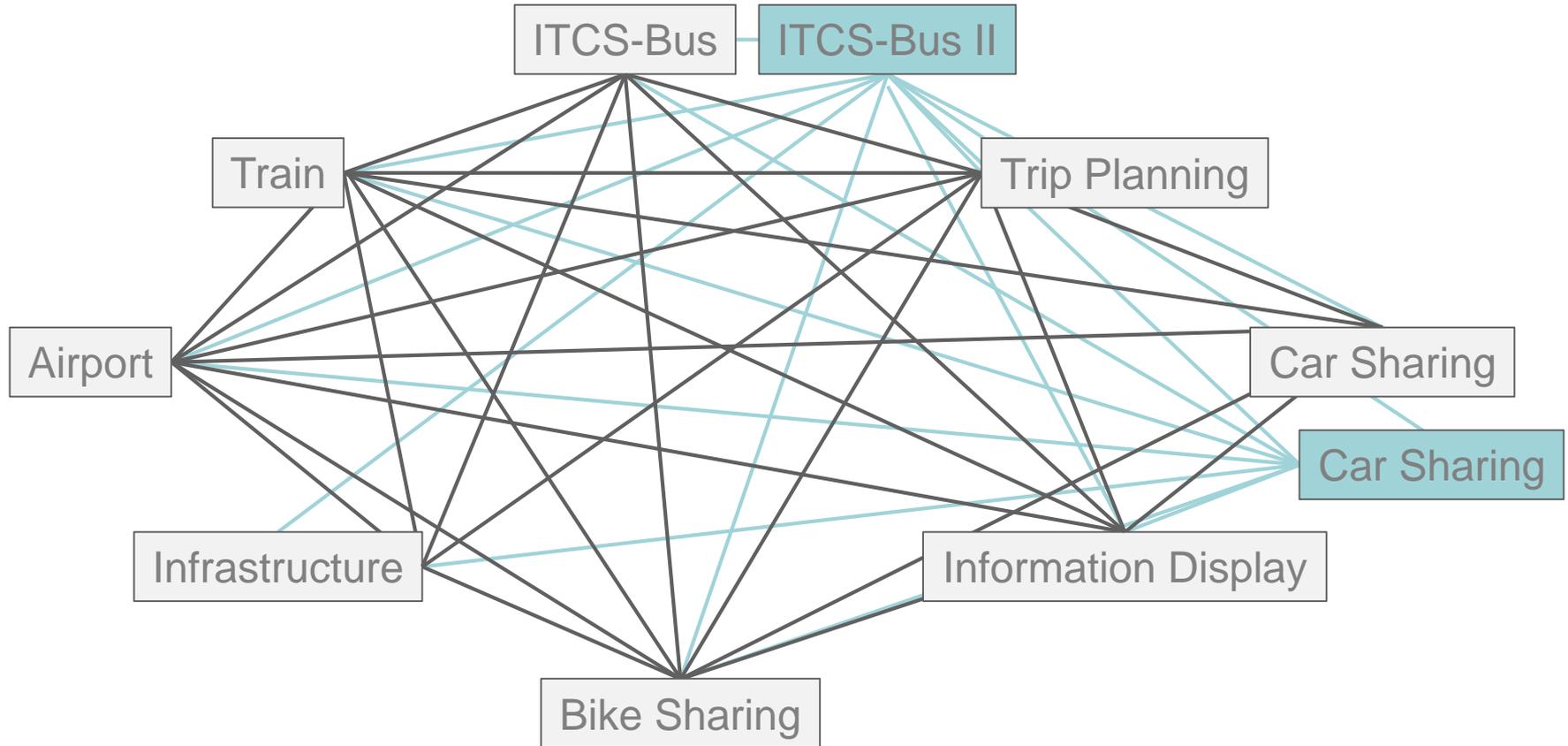
Halt: Dortmund-Weddingen
Umkreis: 1.00 km

Abbrechen

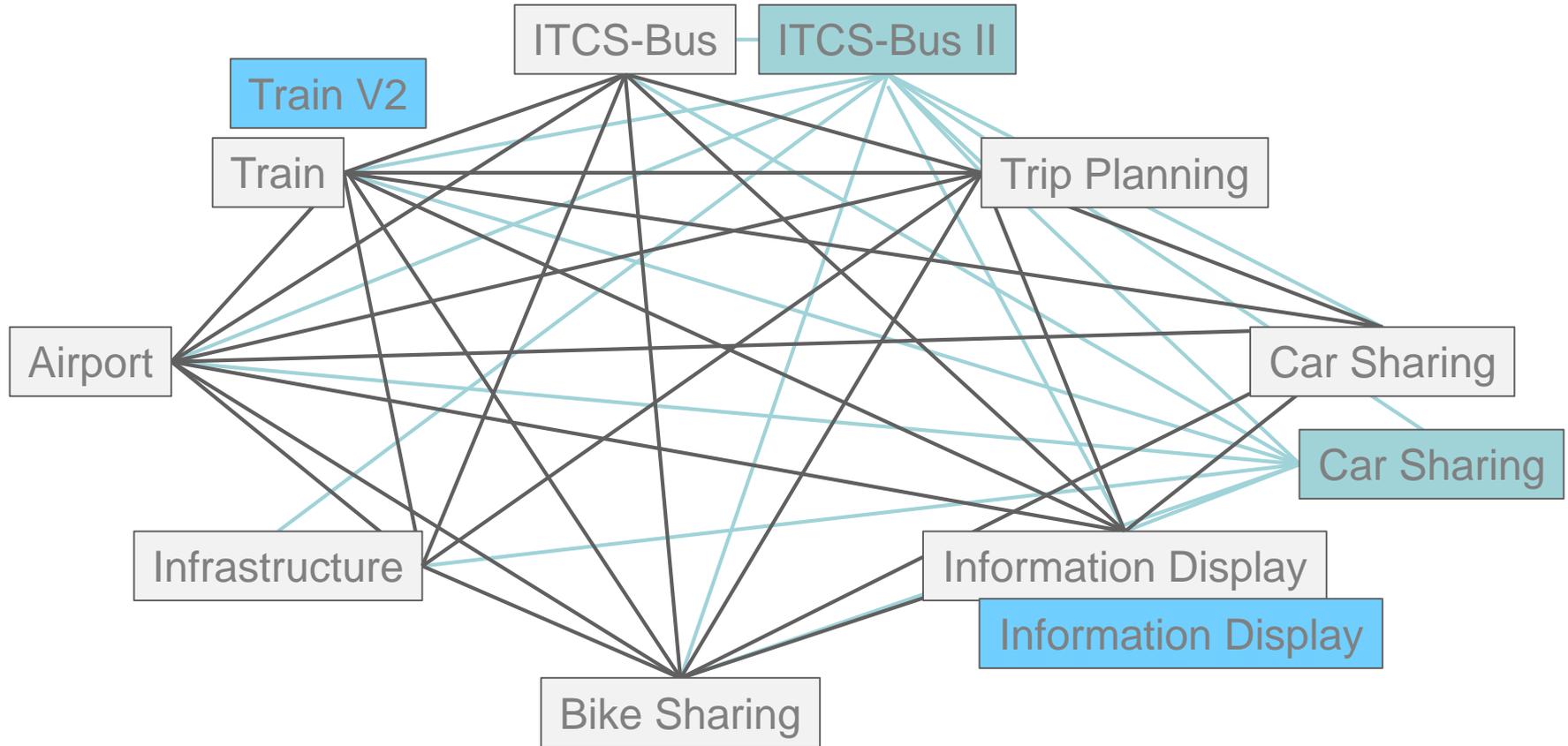
Integration challenge - Many type of Stakeholders



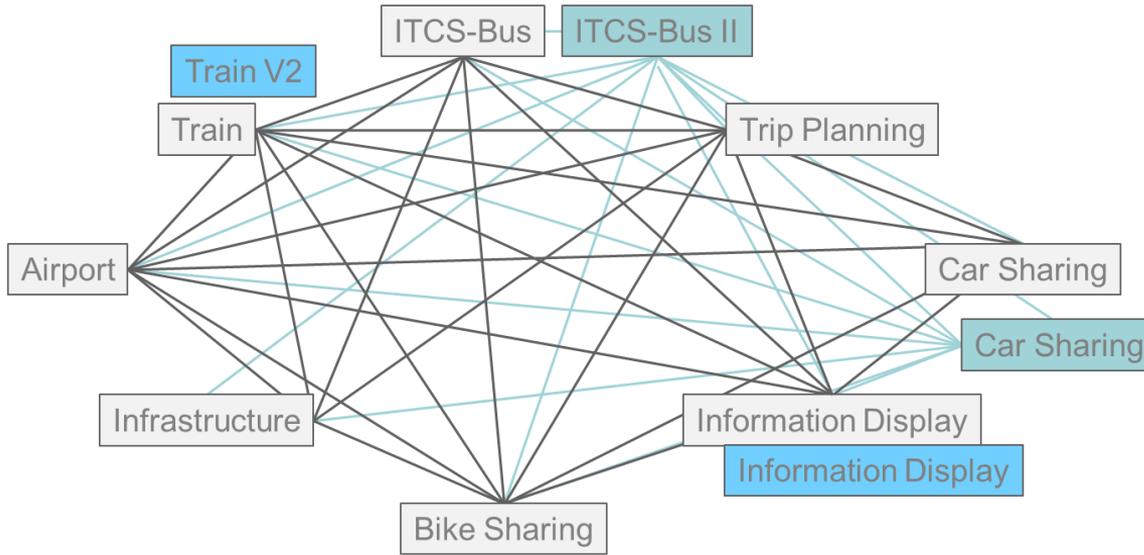
And even more operators



And technologies, versions, dialects

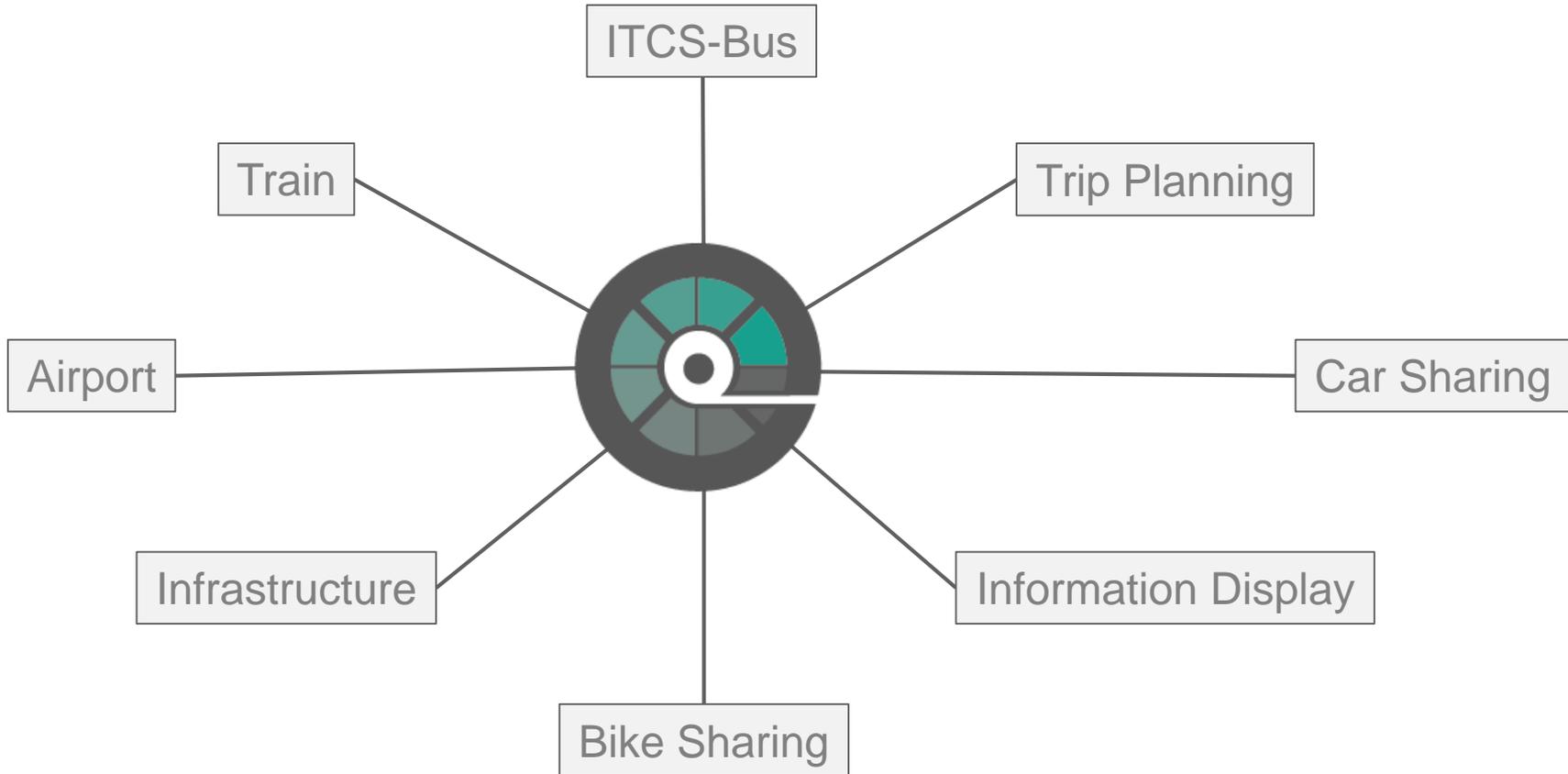


...create a challenge

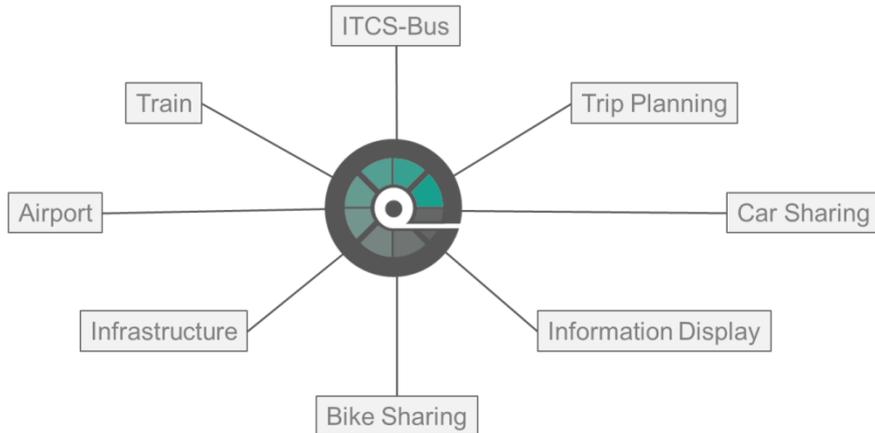


Complexity
becomes
unmanageable

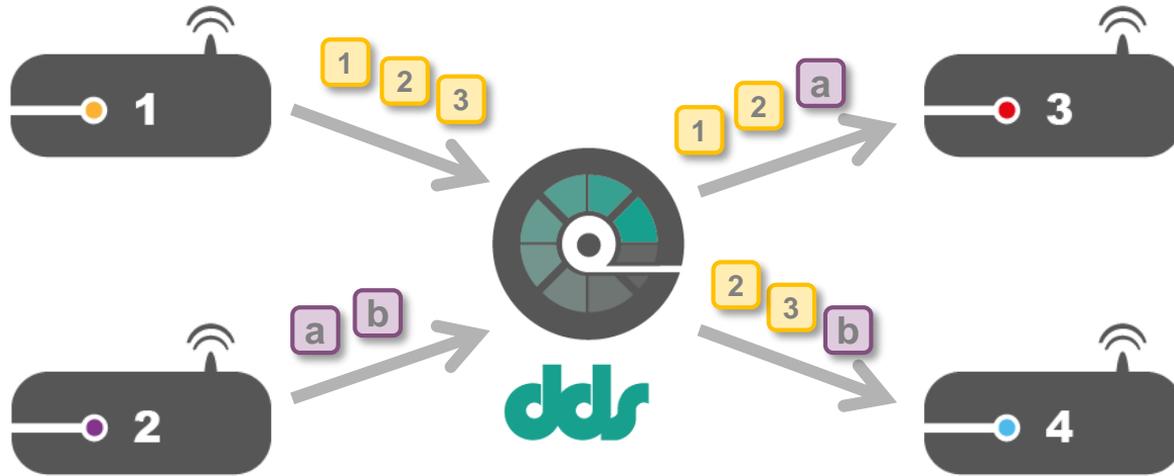
Introducing the HAFAS Real-time hub



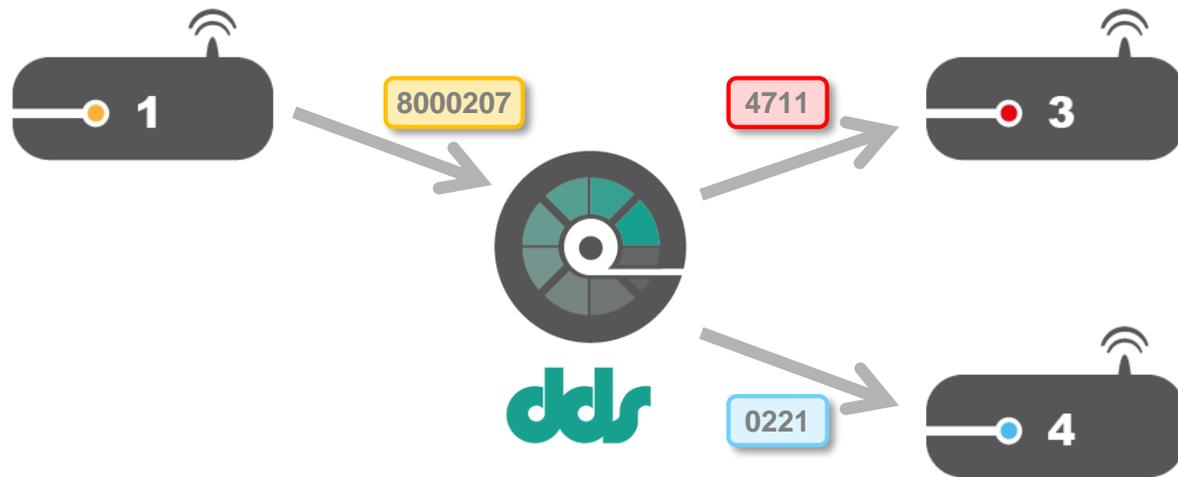
HAFAS Real-time hub



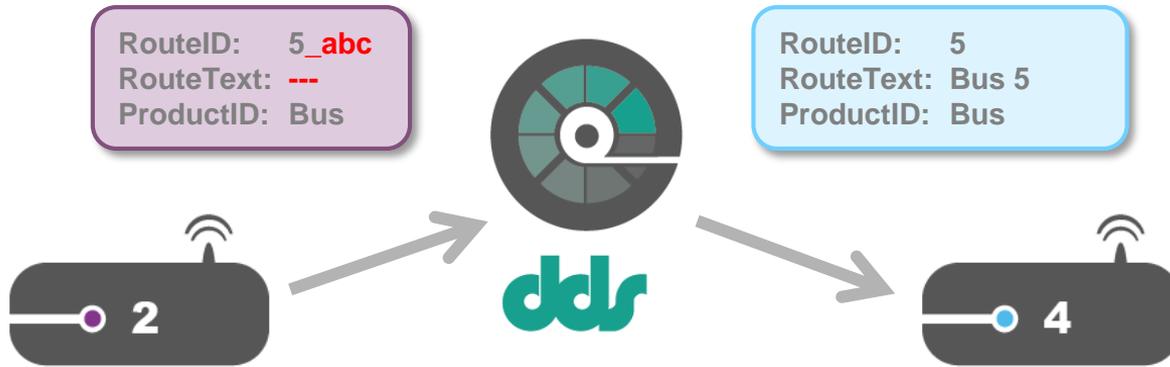
- Information broker
- Control of data flow
- Version and interface translation
- Data improvements
- Quality assurance
- Big Data hub



Control data flow



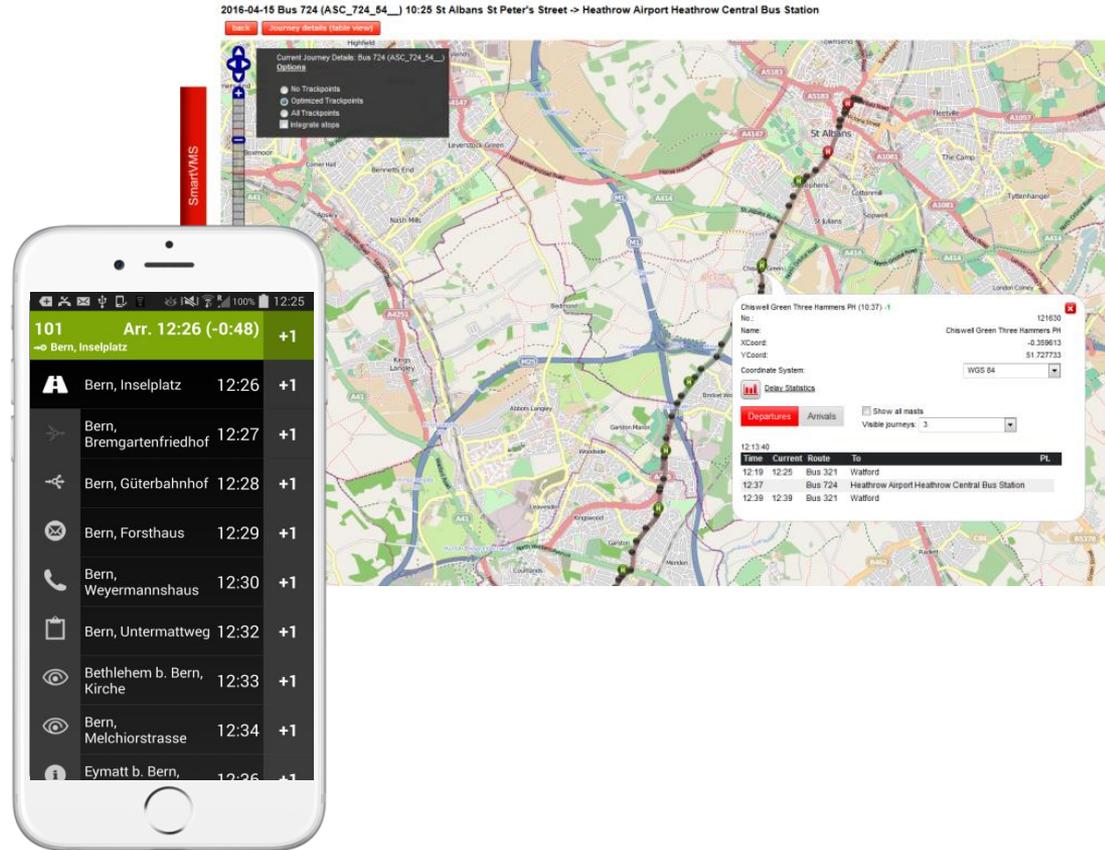
- Control data flow
- Translate content



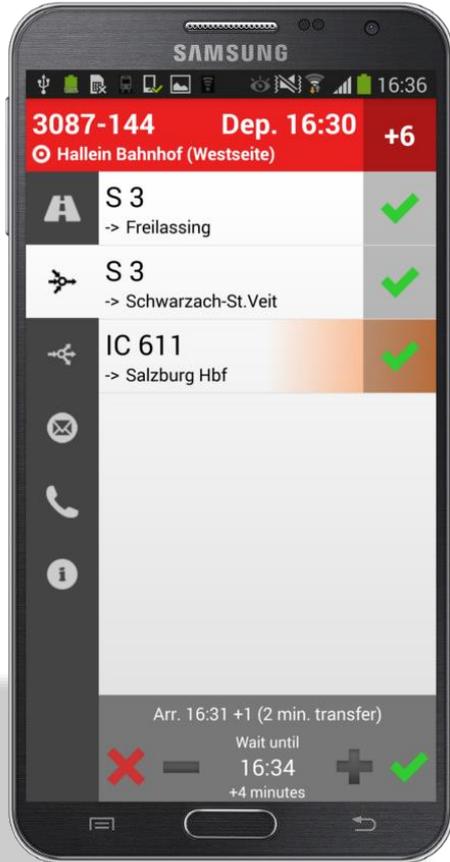
- Control data flow
- Translate content
- Improve Data
- Quality assurance

Smart VMS – Integration of Buses/Trucks

- Vehicle Management System
- Deployed with over 30.000 vehicles
- Real-Time Tracking
- Connection Protection
- Server: Control Center
- Client: App



HAFAS Smart VMS – Driver integration



- Information about delays, i. e.
- Inform others about own delay
- Receive notification about delays
- Allow to either protect or ignore connections
- Messaging with dispatch
- Navigation



Summary

Steps to be taken

Summary – Steps to be taken

- Shared information allows seamless and efficient transportation
- Exchange information with
 - Infrastructure
 - Operators
 - Terminals
 - Freight Companies
 - ...
- Manage information
 - Deal with different standards and contents
 - Manage access rights and information flow
- Build intelligent tools based on shared information

Thank you for
your attention!



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