

Using HAFAS Smart VMS as ETA Management Platform



HaCon Ingenieurgesellschaft mbH

Lars Deiterding
Executive Director

35 years ... in the field of digitalization of transport that is a long time

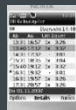
With **HAFAS** digitalization of rail started



1984
Foundation of **Hannover Consultants HaCon**

TPS

First microscopic network model with timetable planning and simulation



HAFAS
Extended to first multimodal journey planner

Mid 90s

Freight comes into the game (KV Connection search, siding search, shunting management, ...)



European and multi-modal integration **TPS Integrator, Merits, EVA+**

2006

Train Monitor is the first monitoring system for national and international train services – since then in operation

Apps, Apps, Apps

Push Notifications, Tickets, ...



TPS Online

allows improved TMS decisions based on real time simulations

2019

Real-time system for **ETA** predictions



1980s



1990s



2000s

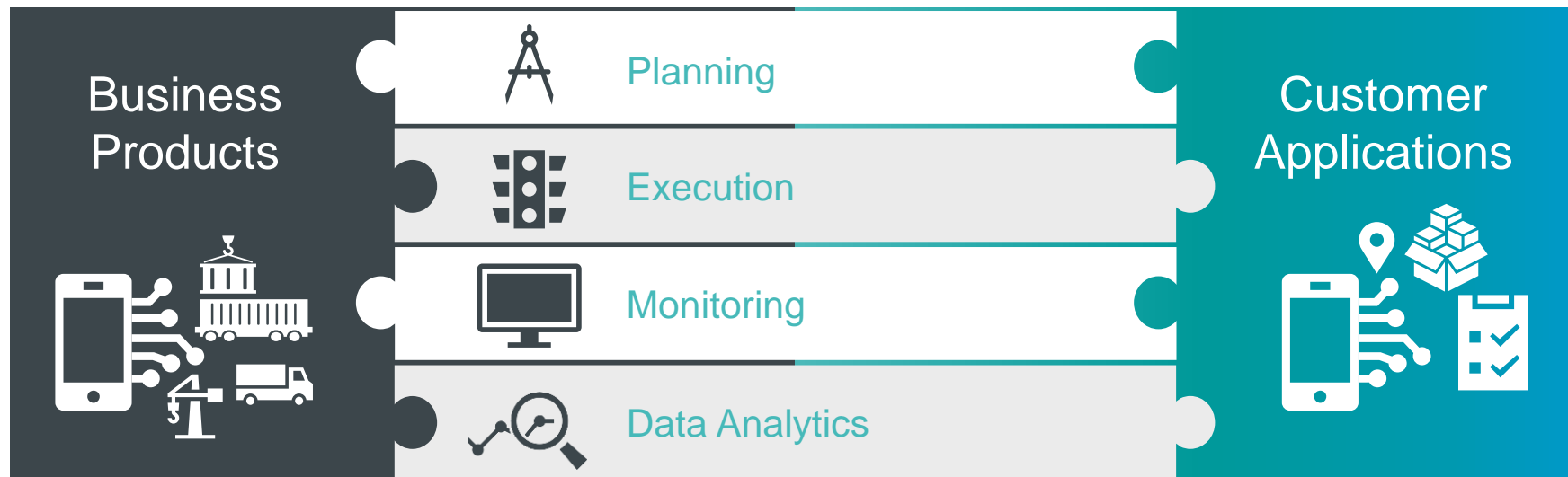


Recently

Combined Power of HaCon for mobility



SIEMENS



... also in the logistic sector ...



Better Service

Improve operations

- Deploy effective incident response measures in time
- Reduce bottlenecks and under-utilization
- Improve hub-processes for services
- React in real-time and improve quality
- Help the railway-system to become more reliable

Insights

Understand and predict

- Possibilities for capacity optimization
- Effect of measures on selected KPIs
- Quality of Hubs for intermodal transports
- Events and their effects on transportation
- Incidents and how the logistics chain is affected



Data

Make the most of your data

- Timetables and capacities
- Incident and delay information
- Real-time data from operations
- Health status information of assets
- Associated systems (e.g. staff)

Analytics

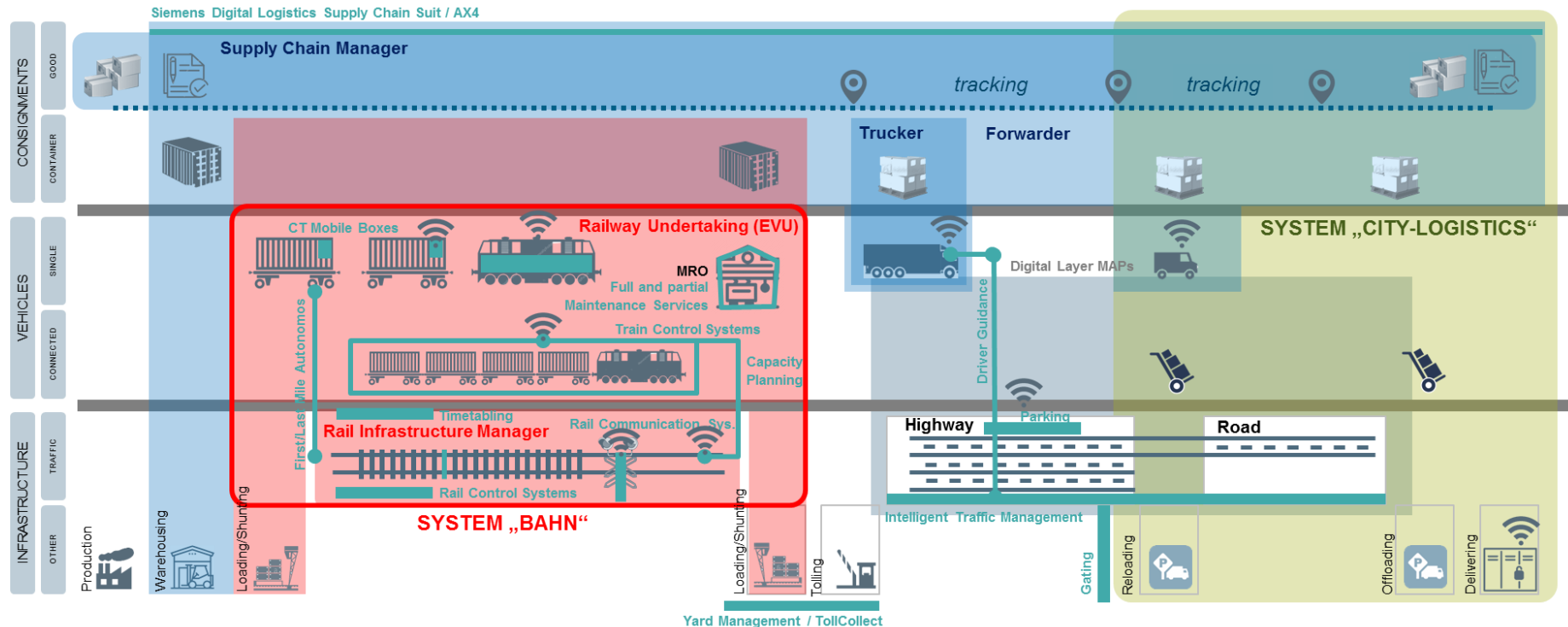
Elaborate and evaluate data

- Data fusion from relevant sources
- Geospatial Deep Learning
- Artificial Intelligence
- Transfer Learning
- Extreme Gradient Boosting

Strategy – Operational excellence of transport services

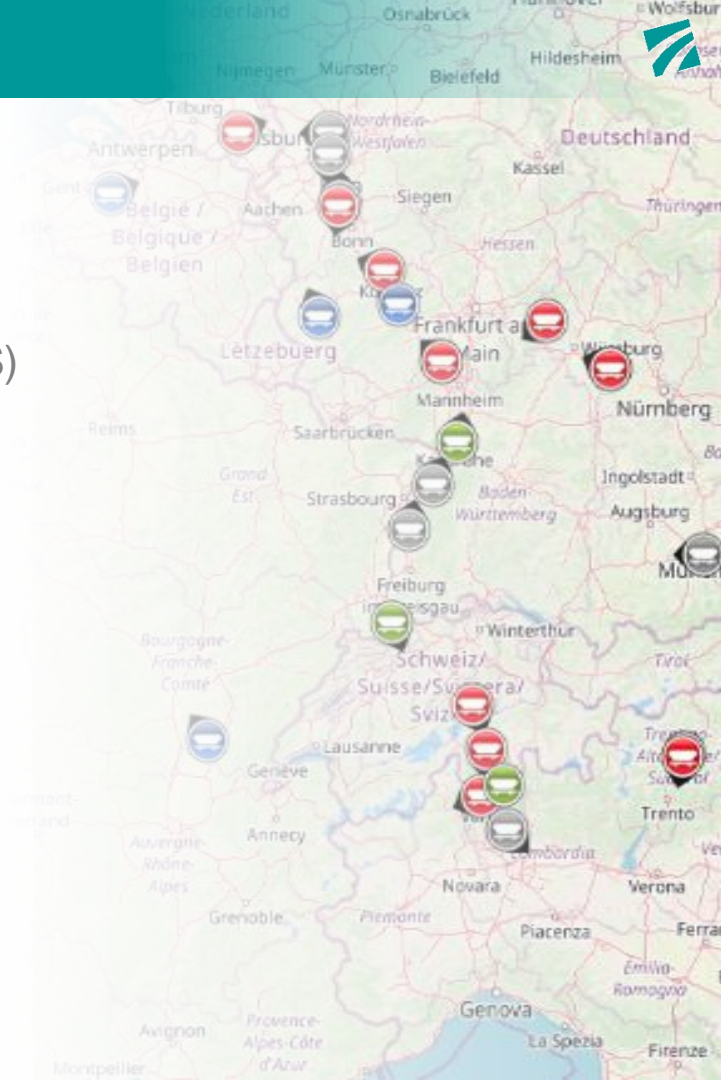


Rail operations as part of the supply chains ...



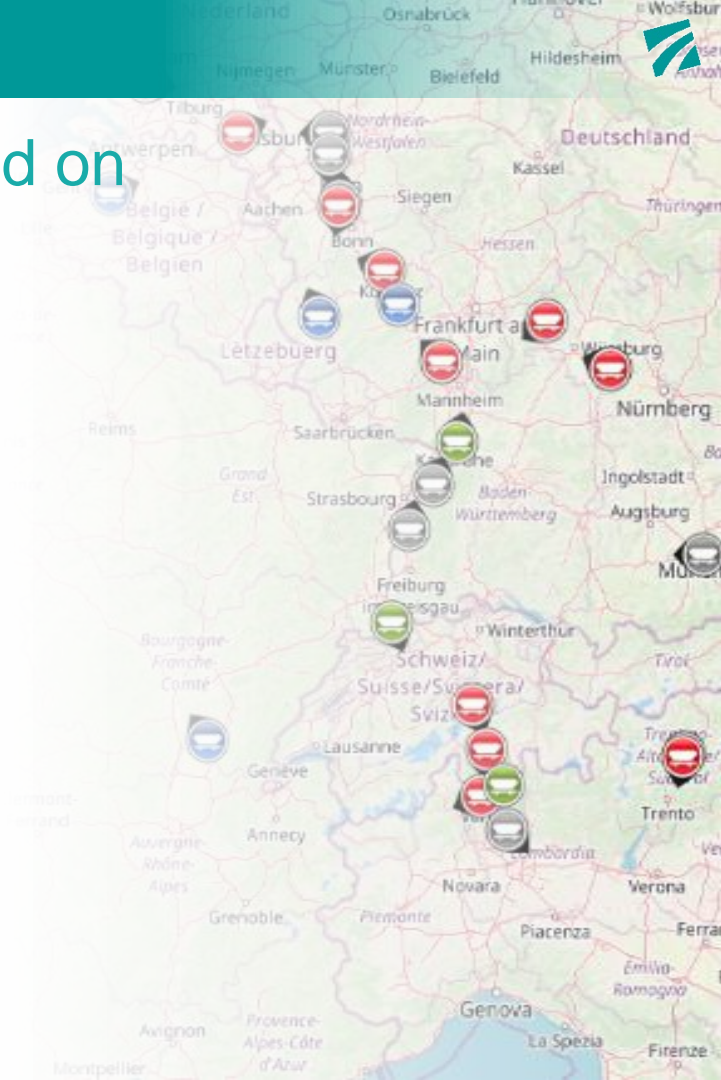
Rail freight is international

- European wide online Traffic Management Solutions (TMS) is recommendable but implementation will take time ...
 - Connect appropriate national TMS if available ...
 - Handle international rail services, even if one of the countries has not appropriate (national) online TMS
 - ...
- ➔ Intermediate solution required
- ➔ Integration and validation platform



New **ETA Management Platform** based on standard product **HAFAS SmartVMS**

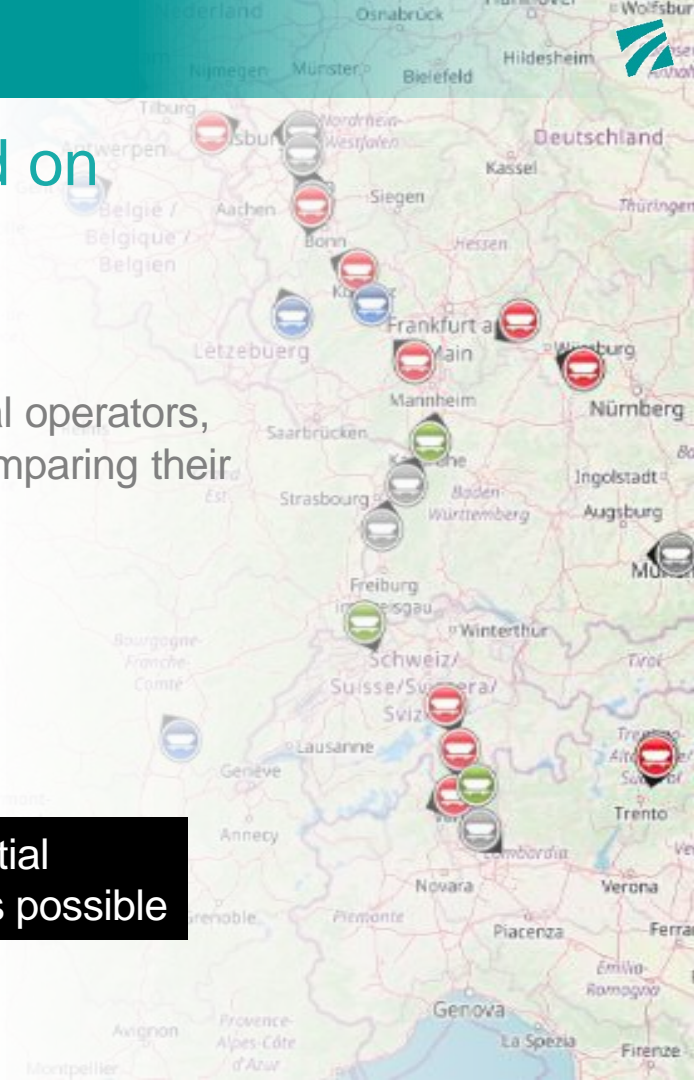
- All trains – national and international – in one system
- All kind of data sources
 - Simplified IM data via TIS
 - GPS data
 - Detailed direct IM data
 - Manual entries
- Special functions dedicated for the needs of the operations control centers and dispatchers
- Control Center view, Map and trains views, Arrival boards, Messaging functions, Archives
- Highly reliable for the usage as productive system



New **ETA Management Platform** based on standard product **HAFAS SmartVMS**

- Additional functions developed, tested and improved within the ELETA project; integrating trains from various intermodal operators, own and other different ETA calculations and calculating/comparing their accuracy
- Evaluation of the ETA accuracy to understand different approaches and methodologies
- Analysis of the development of the ETA accuracy over the time the train is running

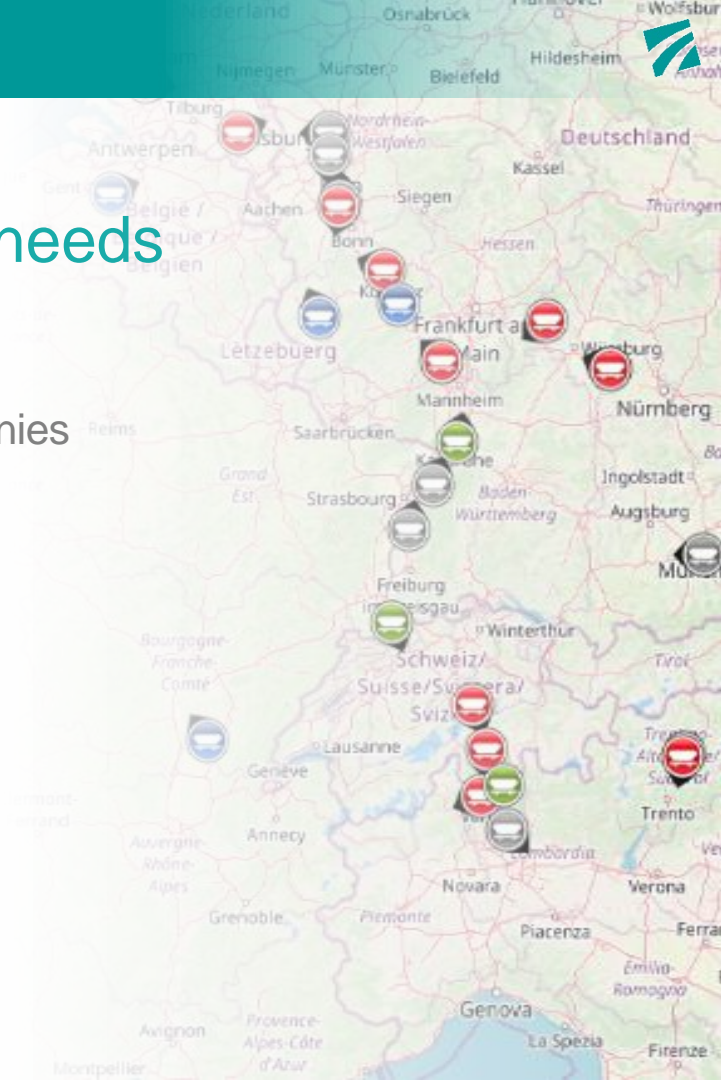
The system itself is ready for productive use based on the initial proposal – customizing and connection to existing systems is possible



Different points of view and respective needs

Dispatcher and other operational staff of

- Infrastructure Manager
- Railway Undertaking
- Shunting Operator
- Terminal Manager
- Intermodal Operator
- Last mile trucking companies
- LSP
- Forwarder
- Authorities
- Scientists



Flexible evaluation possibilities

Online functions for dispatcher

Analysis functions for planers and (IT) developers

Accuracy development

Deduction of specific focus points

Accuracy comparison

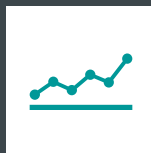
...



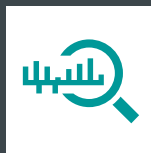
Deviation of ETA versus ATA in minutes



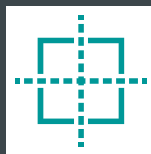
Relative to remaining run time or absolute



Median or average

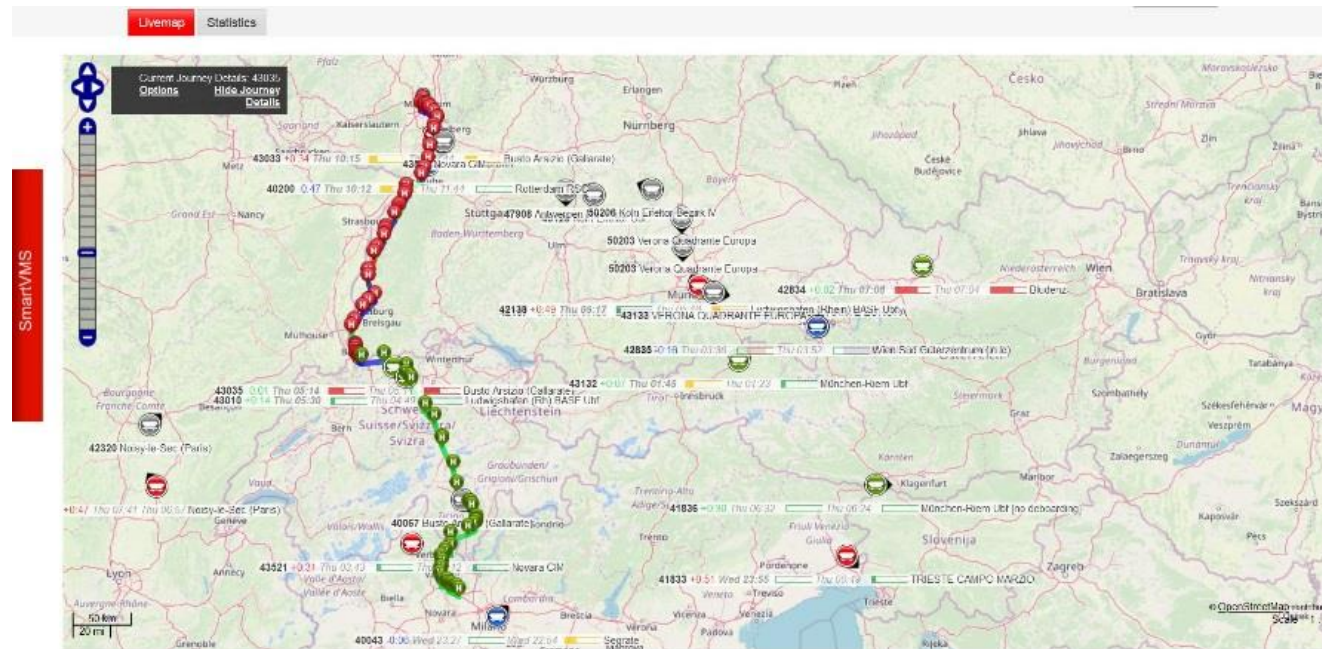


Percentage of ETA predictions reaching a defined deviation range



ETA this train from different providers including accuracy indication (past) and input data quality

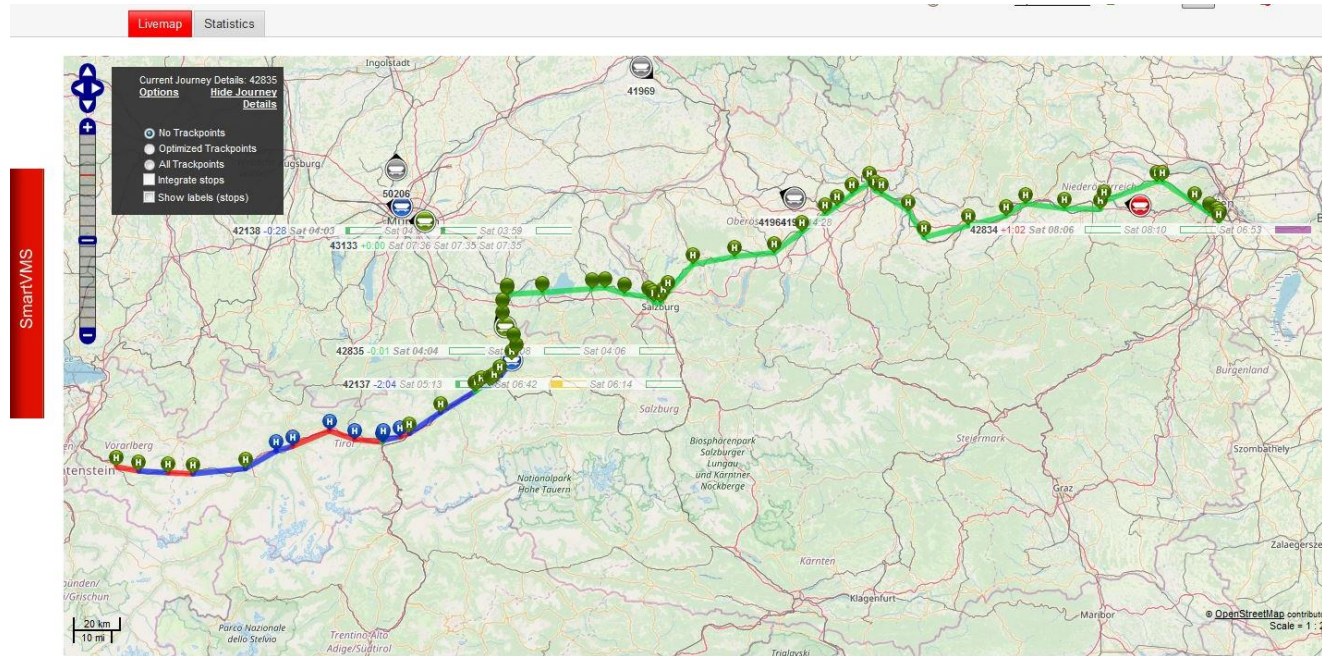
Flexible evaluation and display possibilities



- Online functions for dispatcher
- Accuracy development
- Deduction of specific focus points
- Accuracy comparison
- ...

- □ □

Flexible evaluation and display possibilities



- Online functions for dispatcher
- Accuracy development
- Deduction of specific focus points
- Accuracy comparison
- ...

Flexible evaluation and display possibilities

SmartVMS

Livemap **Statistics**

Journeys Lines Realtime data IDs

last update: 2019-10-30 23:36:38 **Refresh Data**
☒ Auto Refresh

FILTERS (41 / 41 ~ 100.0 %) Number of entries per page: 50 **Reset all filters**

Train Nr

Current Delay to

Start terminal

End terminal

☐ Journeys - early (Delay < -1 min)
☐ Journeys - on time
☐ Journeys - delayed (Delay > 30 min)

Match status ☐ matched only ☐ unmatched only ☒ all journeys

Realtime status ☐ with realtime information ☐ without realtime information ☒ all journeys

Train Nr	Date	Start terminal	End terminal	Start terminal departure (SCHEDULE)	Start terminal departure (REALTIME)	End terminal arrival (SCHEDULE)	End terminal arrival (REALTIME)	Current Delay	ETA HaCon (IM Exit)	ETA IM (IM Exit)	ETA Syntioo (IM Exit)	ETA Parallel (IM Exit)
43674	2019-10-30	Busto Arsizio (Gallarate)	Rotterdam RSC	Wed 04:59		Thu 01:13	Thu 04:14	+3:01	Thu 04:14	Thu 02:23	Thu 04:13	Thu 04:13
43522	2019-10-30	Novara CIM	Rotterdam RSC	Wed 05:03	Wed 04:38	Thu 07:55	Thu 08:54	+1:13	Thu 08:09	Thu 08:38	Thu 09:24	Thu 08:54
42138	2019-10-30	VERONA QUADRANTE EUROPA	Ludwigshafen (Rhein) BASF Ubf	Wed 15:33	Wed 16:10	Thu 04:33	Thu 05:21	+0:50	Thu 05:20	Thu 05:18	Thu 05:18	Thu 05:21
42320	2019-10-30	Novara Boschetto Ubf	Noisy-le-Sec (Paris)	Wed 13:26	Wed 13:14	Thu 06:54	Thu 07:41	+0:47	Thu 07:41	Thu 06:57	Thu 07:51	Thu 07:41
43120	2019-10-30	Verona Quadrante Europa	Köln-Eifelhof Ubf	Wed 03:33	Wed 03:19	Thu 00:55	Thu 01:42	+0:47	Thu 01:42	Thu 01:48	Thu 01:42	Wed 11:36
41833	2019-10-30	München-Riem Ubf (no boarding)	TRESTE CAMPO MARZIO	Wed 13:19		Wed 23:49	Thu 00:02	+0:41	Wed 23:55	Thu 00:49	Thu 00:41	Thu 00:02
43033	2019-10-30	Ludwigshafen (Rh) BASF Ubf	Busto Arsizio (Gallarate)	Wed 22:17		Thu 09:44	Thu 10:14	+0:34	Thu 10:14	Thu 09:44	Thu 10:18	Thu 10:08

- Online functions for dispatcher
- Filter and sorting functions to focus on trains which require attention
- Accuracy display
- Accuracy comparison

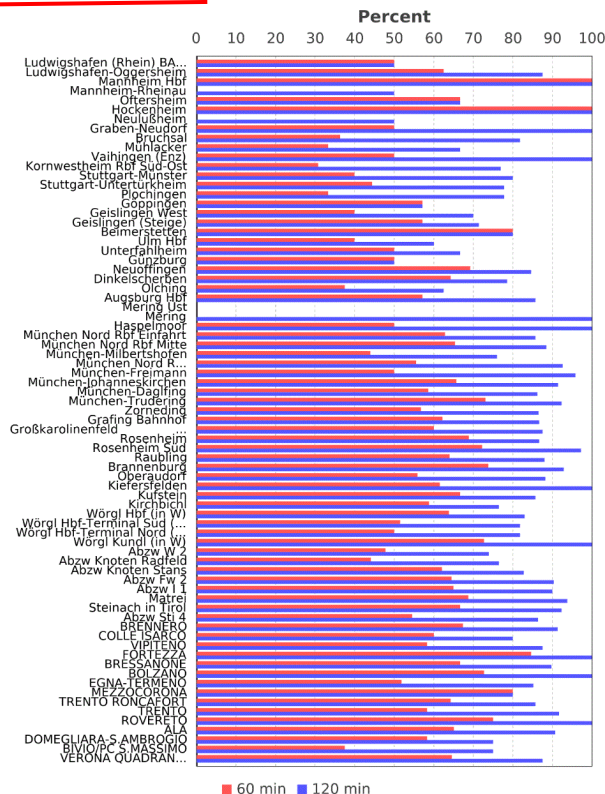
Special Analysis Graphs developed for ELETA



Line 42137 (ETA IM)

2019-08-01 - 2019-10-24

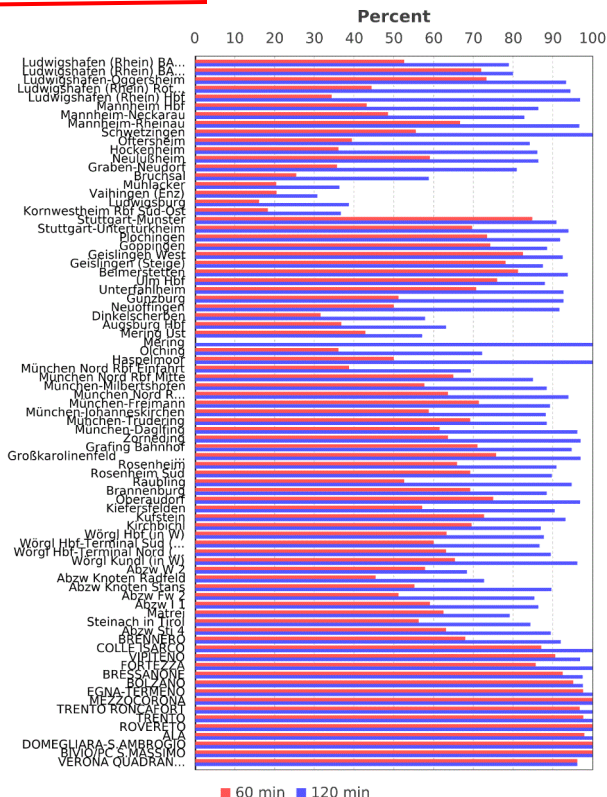
x percent of the journeys for line y had deviation of less than m minutes



Line 42137 (ETA HaCon)

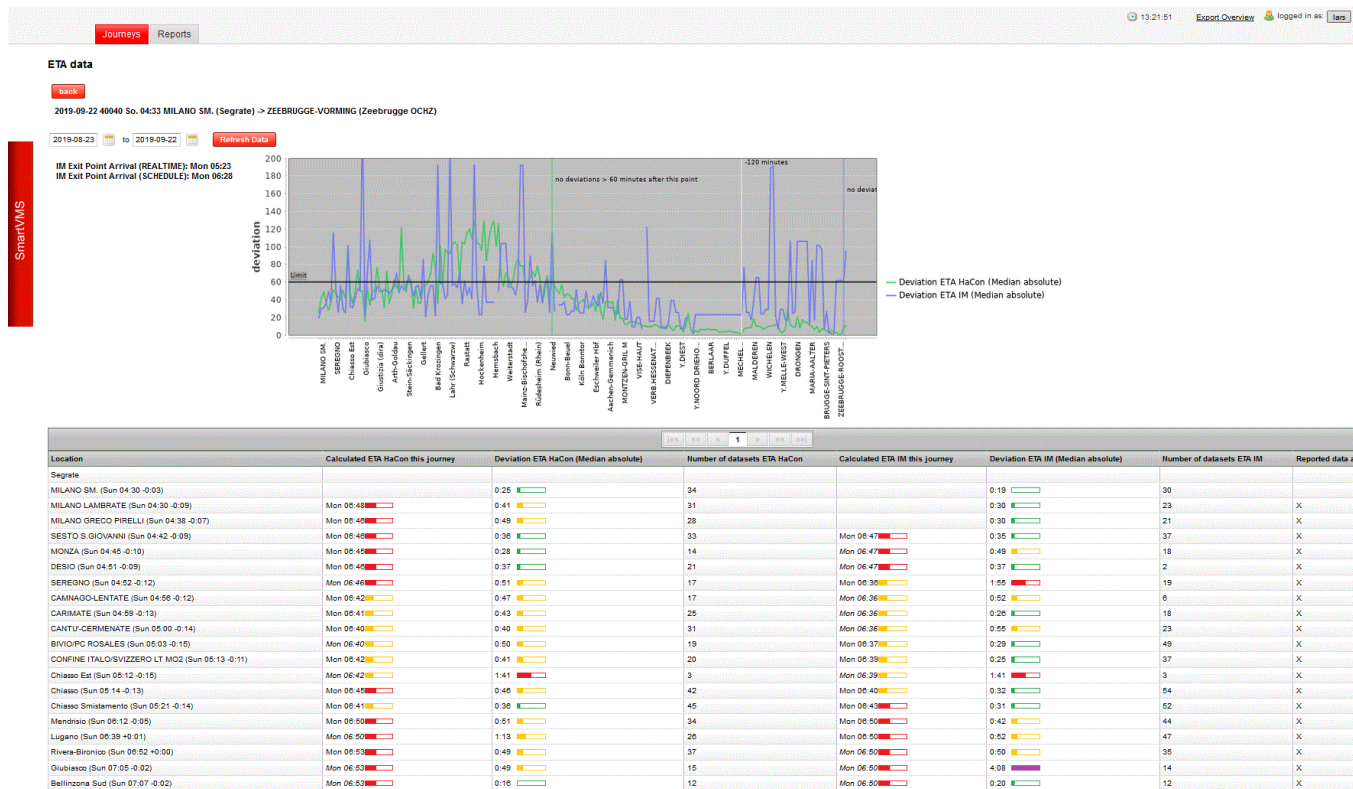
2019-08-01 - 2019-10-24

x percent of the journeys for line y had deviation of less than m minutes



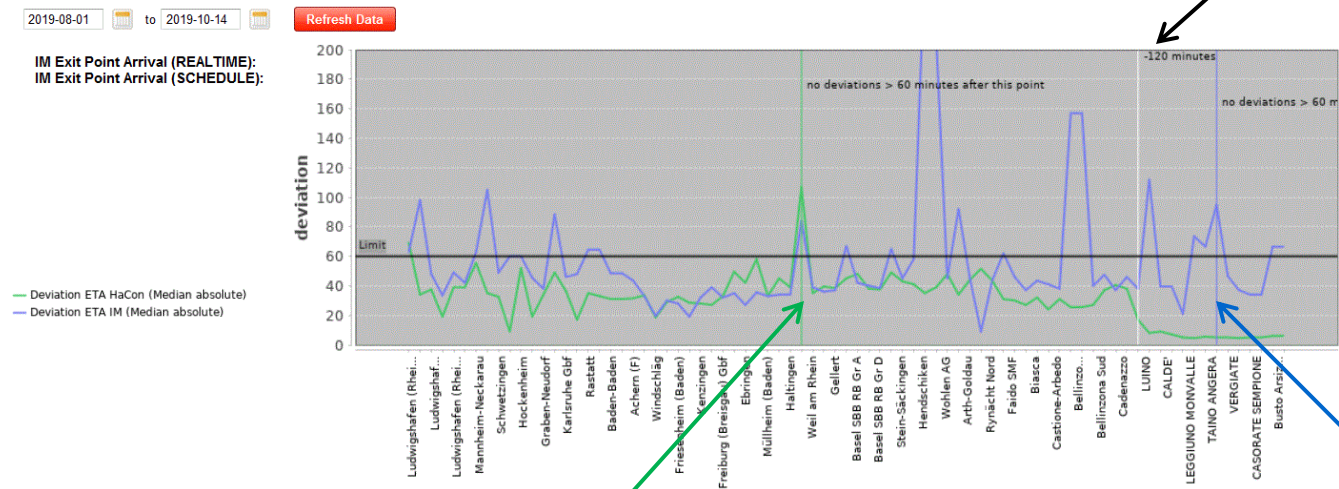
- Analysis functions for planers and (IT) developers
- Accuracy development
- Deduction of specific focus points
- Accuracy comparison

Special Analysis Graphs developed for ELETA



- Analysis functions for planers and (IT) developers
- Accuracy development and comparison between providers
- Deduction of specific focus points

Flexible evaluation and display possibilities



- Analysis functions for planers and (IT) developers
- Accuracy development and comparison between providers
- Deduction of specific focus points

Last point in the train run at which the median of the deviation of the ETA prediction of HaCon is higher than 60 minutes.

Last point in the train run at which the median of the deviation of the ETA prediction of the IMs is higher than 60 minutes.

Flexible evaluation and display possibilities

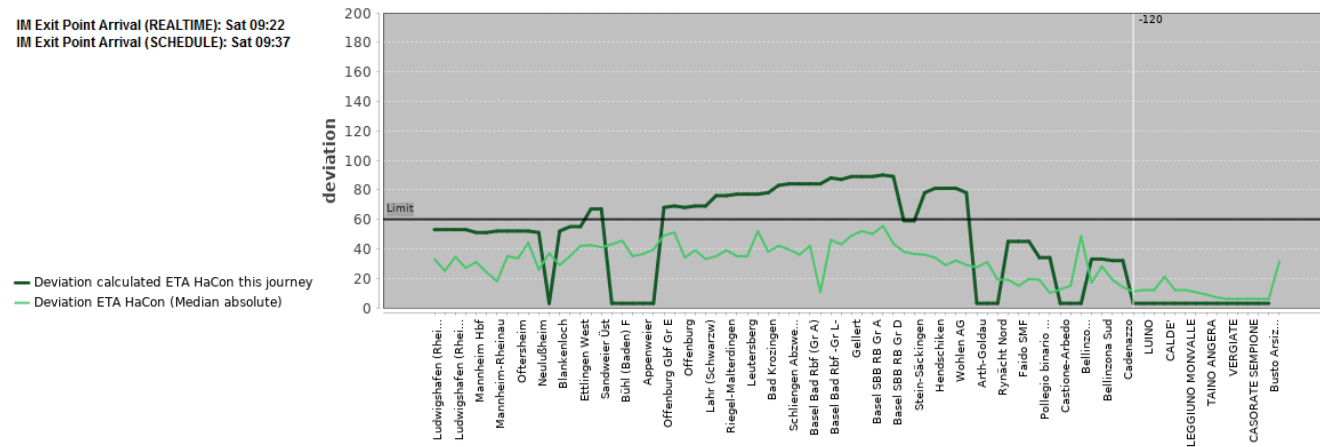
TA data

back

2019-08-23 43033 Fr. 22:17 Ludwigshafen (Rhein) BASF Ubf (Ludwigshafen (Rh) BASF Ubf) -> GALLARATE (Busto Arsizio (Gallarate))

IM Exit Point Arrival (REALTIME): Sat 09:22

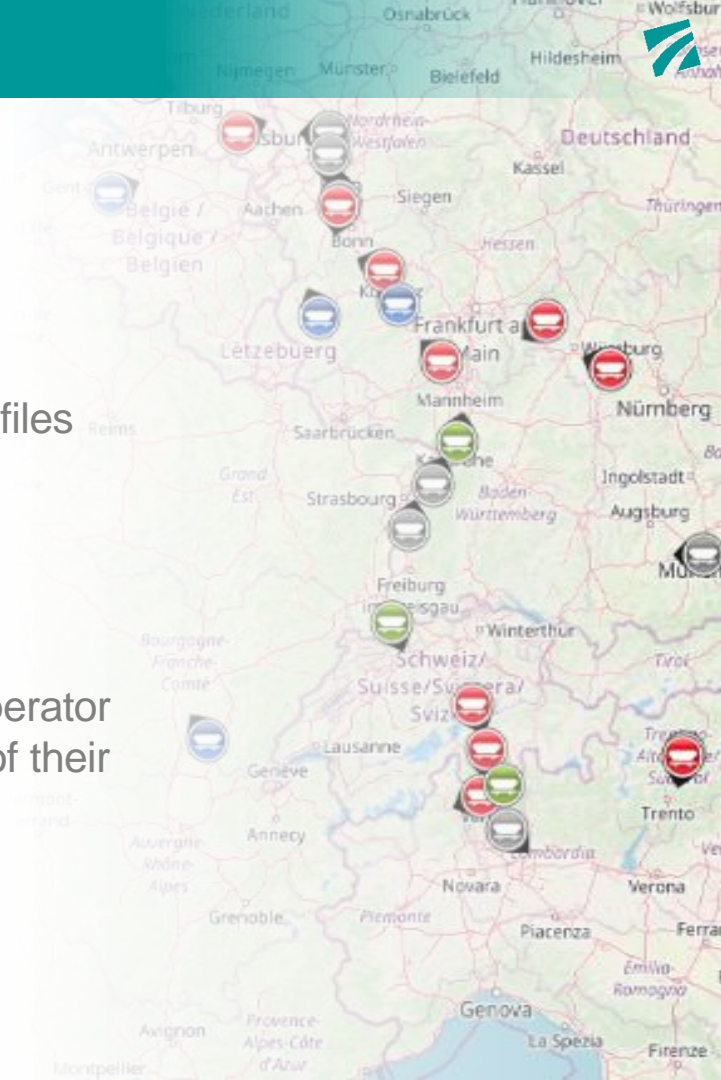
IM Exit Point Arrival (SCHEDULE): Sat 09:37



- Analysis functions for planers and (IT) developers
- Accuracy development and comparison between this journey and the median (or average) for a selected period

The basic system

- Performance figures and data volumes designed for large scale productive usage
- Wide scope of basic functions for various different user profiles
- Easy adaptable to specific user needs and preferences, just by online own configurations
- Complete product - integrating control centers as well as drivers (interaction via SmartVMS App)
- Basic SmartVMS App used in a pilot for a large terminal operator to inform truck drivers via push notification about the ETA of their loading unit
- ...

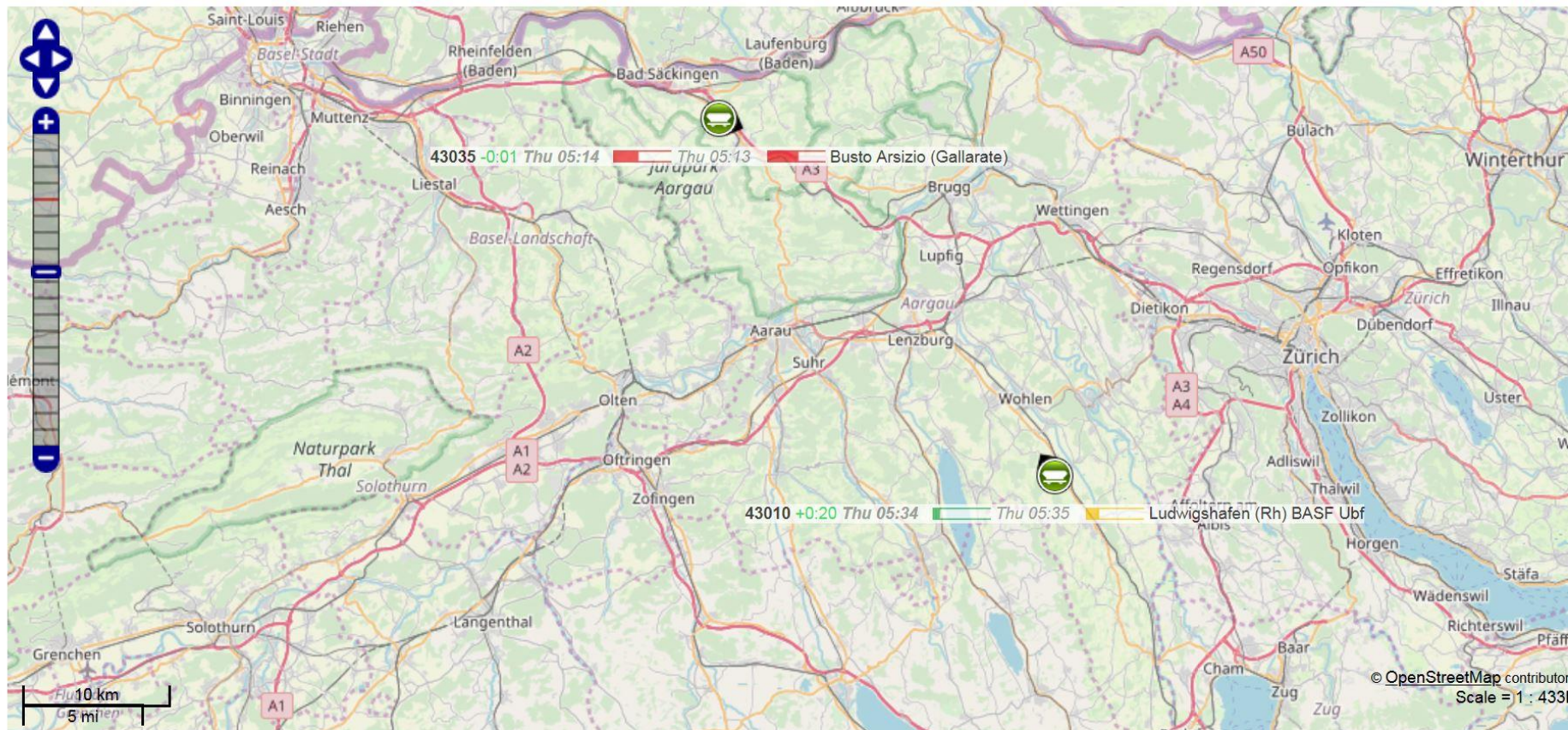


Map view



Livemap

Statistics



© OpenStreetMap contributors
Scale = 1 : 433

Detailed train run in the archive



SmartIMS

Journeys

Reports

Archive - Journeys

13:11:37

Export Journeys

logged in as [user]

Logout

test update: 2019-10-28 13:08:07

Refresh Data

Number of entries per page: 50

Refresh

Use paging

CSV Export

Export

<Selected profile>

Manage profiles

2019-09-01

40040

Start terminal departure (SCHEDULE) to

Start terminal departure (REALTIME) to

End terminal arrival (SCHEDULE) to

End terminal arrival (REALTIME) to

Delay (Journey has to satisfy one of the conditions)

☐ Journeys - early (Delay < -1 min)

☐ Journeys - on time

☐ Journeys - delayed (Delay > 30 min)

Details

Details

Map View

Export XML

2019-10-09 40040 M: 04:33 Segrate -> Zeebrugge OCHZ (Scheduled)

No.	Stop Number	Stop Name	Longitude	Latitude	Arrival (SCHEDULE)	Arrival (REALTIME)	Departure (SCHEDULE)	Departure (REALTIME)	Delay	Delay info (arrival)	Delay info (departure)	Delay corrected (departure)
1	9900024	Segrate	9.278475	45.481085			2019-10-09 04:33	2019-10-09 04:30	-0:03		not specified	
2	8301702	MILANO SM	9.269931	45.475107	2019-10-09 04:39	2019-10-09 04:34	2019-10-09 04:39	2019-10-09 04:30	-0:09	not specified	reported	
3	8301701	MILANO LAMBRATE	9.237342	45.484932	2019-10-09 04:39	2019-10-09 04:34	2019-10-09 04:39	2019-10-09 04:34	-0:05	reported	reported	
4	8301326	MILANO GRECO FIRELLI	9.214465	45.512718	2019-10-09 04:45	2019-10-09 04:47	2019-10-09 04:45	2019-10-09 04:47	+0:12	reported	reported	
5	8301325	SESTO S. GIOVANNI	9.239275	45.541088	2019-10-09 04:51	2019-10-09 05:01	2019-10-09 04:51	2019-10-09 05:01	+0:10	reported	reported	
6	8301322	MONZA	9.273254	45.577781	2019-10-09 04:55	2019-10-09 05:04	2019-10-09 04:55	2019-10-09 05:04	+0:09	reported	reported	
7	8301320	DESIO	9.218501	45.620112	2019-10-09 05:00	2019-10-09 05:08	2019-10-09 05:00	2019-10-09 05:08	+0:08	reported	reported	
8	8301318	SEREGNO	9.232265	45.64601	2019-10-09 05:04	2019-10-09 05:10	2019-10-09 05:04	2019-10-09 05:10	+0:06	reported	reported	
9	8301316	CAMMAGLIATE	9.133472	45.68642	2019-10-09 05:08	2019-10-09 05:14	2019-10-09 05:08	2019-10-09 05:14	+0:06	reported	reported	
10	8301315	CARIMATE	9.107205	45.697095	2019-10-09 05:12	2019-10-09 05:16	2019-10-09 05:12	2019-10-09 05:16	+0:04	reported	reported	
11	8301313	CANTÙ-CERMENTE	9.099295	45.716234	2019-10-09 05:14	2019-10-09 05:18	2019-10-09 05:14	2019-10-09 05:18	+0:04	reported	reported	
12	8301052	BIVIO/FC ROSALES	9.080822	45.706045	2019-10-09 05:18	2019-10-09 05:21	2019-10-09 05:18	2019-10-09 05:21	+0:03	reported	reported	
13	8301303	CONFINE ITALO/SVIZZERO LT MO2	9.073361	45.807708	2019-10-09 05:24	2019-10-09 05:30	2019-10-09 05:24	2019-10-09 05:30	+0:06	reported	reported	
14	8515393	Chiasso Est	9.036838	45.529955	2019-10-09 05:27	2019-10-09 05:28	2019-10-09 05:27	2019-10-09 05:28	+0:01	reported	reported	
15	8505307	Chiasso	9.031453	45.532194	2019-10-09 05:27	2019-10-09 05:33	2019-10-09 05:27	2019-10-09 05:33	+0:06	reported	reported	
16	8505309	Chiasso Sniatamento	8.999083	45.536518	2019-10-09 05:35	2019-10-09 05:41	2019-10-09 05:35	2019-10-09 05:41	+0:06	reported	reported	
17	8505305	Mendrisio	8.978606	45.859122	2019-10-09 05:37	2019-10-09 05:39	2019-10-09 05:37	2019-10-09 05:39	+0:22	reported	reported	
18	8505300	Lugano	8.948883	46.005497	2019-10-09 05:38	2019-10-09 05:39	2019-10-09 05:38	2019-10-09 05:39	+0:21	reported	reported	
19	8505216	Riviera-Bironzo	8.932882	46.129884	2019-10-09 05:52	2019-10-09 05:52	2019-10-09 05:52	2019-10-09 05:52	+0:25	reported	reported	
20	8505214	Chiasso	9.003578	46.17382	2019-10-09 07:07	2019-10-09 07:29	2019-10-09 07:07	2019-10-09 07:29	+0:22	reported	reported	
21	8516453	Bellinzona Sud	9.023453	46.189021	2019-10-09 07:09	2019-10-09 07:33	2019-10-09 07:09	2019-10-09 07:33	+0:24	reported	reported	
22	8505213	Bellinzona	9.029512	46.19543	2019-10-09 07:10	2019-10-09 07:34	2019-10-09 07:10	2019-10-09 07:34	+0:24	reported	reported	
23	8516454	Bellinzona Collegamento	9.034914	46.199691	2019-10-09 07:12	2019-10-09 07:35	2019-10-09 07:12	2019-10-09 07:35	+0:23	reported	reported	
24	8505239	Bellinzona S. Paolo	9.034874	46.203602	2019-10-09 07:17	2019-10-09 07:37	2019-10-09 07:17	2019-10-09 07:37	+0:20	reported	reported	
25	8505212	Castione-Arbedo	9.041404	46.235248	2019-10-09 07:36	2019-10-09 07:36	2019-10-09 07:36	2019-10-09 07:36	+0:14	reported	reported	
26	8515171	Olviata (dina)	8.982183	46.233527	2019-10-09 07:44	2019-10-09 07:59	2019-10-09 07:44	2019-10-09 07:59	+0:15	reported	reported	
27	8518307	Pollegio binario di sorpasso	8.951081	46.359403	2019-10-09 07:47	2019-10-09 08:19	2019-10-09 07:47	2019-10-09 08:19	+0:32	reported	reported	
28	8518304	Faido SMF	8.810633	46.497837	2019-10-09 08:00	2019-10-09 08:32	2019-10-09 08:00	2019-10-09 08:32	+0:32	reported	reported	
29	8518303	Sedrun SMF	8.779191	46.688584	2019-10-09 08:13	2019-10-09 08:44	2019-10-09 08:13	2019-10-09 08:44	+0:31	reported	reported	
30	8518298	Rymkelt Nord	8.65846	46.883058	2019-10-09 08:29	2019-10-09 08:29	2019-10-09 08:29	2019-10-09 08:29	+0:31	reported	reported	
31	8505113	Altshof	8.631506	46.875743	2019-10-09 08:31	2019-10-09 09:01	2019-10-09 08:31	2019-10-09 09:01	+0:30	reported	reported	
32	8505004	Arth-Goldau	8.549488	47.049154	2019-10-09 09:08	2019-10-09 09:23	2019-10-09 09:08	2019-10-09 09:23	+0:15	reported	reported	

Detailed train run in the archive



SmartVMS

Journeys

Reports

Archive - Journeys

13:12:37

Export Overview

logged in as: [User]

Logout

last update: 2019-10-28 13:08:07

Refresh Data

FILTERS

Number of entries per page: 50

Date

2019-09-01

Train Nr

40040

Start terminal departure (SCHEDULE)

to

Start terminal departure (REALTIME)

to

End terminal arrival (SCHEDULE)

to

End terminal arrival (REALTIME)

to

Delay (Journey has to satisfy one of the conditions)

Journeys - early (Delay < -1 min)

Journeys - on time

Journeys - delayed (Delay > 30 min)

Date

Train Nr

Start terminal (SCHEDULE)

2019-10-27

40040

Segrate

2019-10-27

40040

Segrate

2019-10-25

40040

Segrate

2019-10-25

40040

Segrate

2019-10-24

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Segrate

2019-10-24

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2019-10-17

40040

Segrate

Details

32

8505004

Arth-Goldau

8.549488

47.049154

2019-10-09 09:08

2019-10-09 09:23

2019-10-09 09:08

2019-10-09 09:23

+0:15

reported

reported

33

8502202

Rotkreuz

8.43047

47.141752

2019-10-09 09:27

2019-10-09 09:37

2019-10-09 09:27

2019-10-09 09:37

+0:10

reported

reported

34

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Wohlen AG

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2019-10-09 09:50

2019-10-09 09:57

2019-10-09 09:50

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+0:07

reported

reported

35

8502239

Dotikon Umspannanlage

8.249167

47.362922

2019-10-09 09:59

2019-10-09 09:59

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+0:07

reported

reported

36

8502211

Hendschiken

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2019-10-09 09:55

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reported

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37

8502237

Lupfig

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+0:08

reported

reported

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Stein-Säckingen

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47.541592

2019-10-09 10:29

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+0:04

reported

reported

39

8500021

Pratteln

7.690811

47.522681

2019-10-09 10:45

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reported

reported

40

8500152

Basel SBB RB Gr E

7.689976

47.528468

2019-10-09 10:47

2019-10-09 10:50

2019-10-09 10:47

2019-10-09 10:50

+0:03

reported

reported

41

8500153

Basel SBB RB Gr F

7.655016

47.533601

2019-10-09 10:50

2019-10-09 10:53

2019-10-09 10:50

2019-10-09 10:53

+0:03

reported

reported

42

8500154

Basel SBB RB Gr G

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47.538131

2019-10-09 10:53

2019-10-09 10:56

2019-10-09 10:53

2019-10-09 10:56

+0:03

reported

reported

43

8500044

Basel SBB RB Nordkopf (Abzw)

7.632372

47.539632

2019-10-09 13:33

2019-10-09 13:33

2019-10-09 13:33

2019-10-09 13:33

+1:39

reported

reported

44

8500045

Gellert

7.615454

47.549206

2019-10-09 13:36

2019-10-09 13:36

2019-10-09 13:36

2019-10-09 13:36

+1:39

reported (projected)

reported (projected)

45

8010050

Basel Bad Bf

7.6082

47.567796

2019-10-09 13:39

2019-10-09 13:39

2019-10-09 13:39

2019-10-09 13:39

+2:55

reported

reported

46

8020882

Weil am Rhein

7.608398

47.593999

2019-10-09 13:42

2019-10-09 13:42

2019-10-09 13:42

2019-10-09 13:42

+2:58

reported

reported

47

8014374

Haltingen

7.611796

47.612904

2019-10-09 13:46

2019-10-09 13:46

2019-10-09 13:46

2019-10-09 13:46

+2:56

reported

reported

48

8019371

Schliengen Abzweig Rbt/NBS

7.572001

47.7687

2019-10-09 14:00

2019-10-09 14:00

2019-10-09 14:00

2019-10-09 14:00

+3:08

reported

reported

49

8017198

Mühlheim (Baden)

7.599597

47.810001

2019-10-09 14:04

2019-10-09 14:10

2019-10-09 14:04

2019-10-09 14:10

+3:08

reported

reported

50

8010475

Bad Krozingen

7.697904

47.919903

2019-10-09 14:15

2019-10-09 14:15

2019-10-09 14:15

2019-10-09 14:15

+3:05

reported

reported

51

8012669

Ebringen

7.7681

47.960301

2019-10-09 14:19

2019-10-09 14:19

2019-10-09 14:19

2019-10-09 14:19

+3:10

reported

reported

52

8016332

Leutensberg

7.777602

47.967096

2019-10-09 14:20

2019-10-09 14:20

2019-10-09 14:20

2019-10-09 14:20

+3:09

reported

reported

53

8013382

Freiburg (Breisgau) Gbf

7.840001

48.016196

2019-10-09 14:25

2019-10-09 14:25

2019-10-09 14:25

2019-10-09 14:25

+3:10

reported

reported

54

8016879

Riegel-Malsbenden

7.770598

48.151996

2019-10-09 14:41

2019-10-09 14:42

2019-10-09 14:42

2019-10-09 14:42

+3:11

reported

reported

55

8015479

Kenzingen

7.764199

48.194398

2019-10-09 14:46

2019-10-09 14:46

2019-10-09 14:46

2019-10-09 14:46

+3:09

reported

reported

56

8015993

Lahr (Schwarzw)

7.835304

48.340598

2019-10-09 15:01

2019-10-09 15:01

2019-10-09 15:01

2019-10-09 15:01

+3:09

reported (projected)

reported

57

8013479

Friesenheim (Baden)

7.855197

48.381499

2019-10-09 15:04

2019-10-09 15:04

2019-10-09 15:04

2019-10-09 15:04

+3:21

reported

reported

58

8018080

Offenburg

7.946797

48.476497

2019-10-09 15:13

2019-10-09 15:13

2019-10-09 15:13

2019-10-09 15:13

+3:20

reported

reported

59

8010264

Appenweier

7.973504

48.541903

2019-10-09 15:20

2019-10-09 15:20

2019-10-09 15:20

2019-10-09 15:20

+3:18

reported

reported

60

8010022

Achern

8.065302

48.633997

2019-10-09 15:30

2019-10-09 15:30

2019-10-09 15:30

2019-10-09 15:30

+3:18

reported (projected)

reported (projected)

61

8010580

Baden-Baden

8.190899

48.790302

2019-10-09 15:44

2019-10-09 15:44

2019-10-09 15:44

2019-10-09 15:44

+3:22

reported

reported

62

8018645

Rastatt

8.2157

48.860597

2019-10-09 15:50

2019-10-09 15:50

2019-10-09 15:50

2019-10-09 15:50

+3:24

reported

reported

63

8013095

Ettlingen West

8.387799

48.947002

2019-10-09 16:00

2019-10-09 16:00

2019-10-09 16:00

2019-10-09 16:00

+3:24

reported

reported

64

8015378

Karlsruhe Gbf

8.424798

48.996703

2019-10-09 16:07

2019-10-09 16:07

2019-10-09 16:07

2019-10-09 16:07

+3:24

reported

reported

65

8011331

Blankenloch (Transit stop)

8.464701

49.065297

2019-10-09 16:52

2019-10-09 16:52

2019-10-09 16:52

2019-10-09 16:52

+2:49

reported (projected)

reported (projected)

66

8013885

Graben-Neudorf (Transit stop)

8.4905

49.162302

2019-10-09 17:05

2019-10-09 17:05

2019-10-09 17:05

2019-10-09 17:05

+2:49

reported (projected)

reported (projected)

67

8017566

Neulandheim (Transit stop)

8.530098

49.291999

2019-10-09 17:23

2019-10-09 17:23

2019-10-09 17:23

2019-10-09 17:23

+2:49

reported (projected)

reported (projected)

68

8014964

Hodenheim (Transit stop)

8.536903

49.317501

2019-10-09 17:26

2019-10-09 17:26

2019-10-09 17:26

2019-10-09 17:26

+2:49

reported (projected)

reported (projected)

69

8018093

Offenheim (Transit stop)

8.579197

49.373603

2019-10-09 17:35

2019-10-09 17:35

2019-10-09 17:35

2019-10-09 17:35

+2:49

reported (projected)

reported (projected)

70

8019617

Schweitzingen (Transit stop)

8.578496

49.383401

2019-10-09 17:36

2019-10-09 17:36

2019-10-09 17:36

2019-10-09 17:36

+2:49

reported (projected)

reported (projected)

71

8016758

Neu-Edingen/Mhm-Friedrichsfeld

8.579997

49.448402

2019-10-09 17:45

2019-10-09 17:45

2019-10-09 17:45

2019-10-09 17:45

+3:10

reported

reported

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operator (SCHEDULE)

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Detailed train run in the archive



SmartVMS

Journeys

Reports

Archive - Journeys

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Export Overview

logged in as tars

Logout

last update: 2019-10-28 13:08:07

Refresh Data

FILTERS

Date

2019-08-01

Train Nr

40040

Start terminal departure (SCHEDULE)

to

Start terminal departure (REALTIME)

to

End terminal arrival (SCHEDULE)

to

End terminal arrival (REALTIME)

to

Delay (Journey has to satisfy one of the conditions)

Journeys > early (Delay < -1 min)

Journeys - on time

Journeys - delayed (Delay > 30 min)

Number of entries per page

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Details

72	8010614	Lützeladshsen	8.649196	49.627004	2019-10-09 18:02	2019-10-09 21:07	2019-10-09 18:02	2019-10-09 21:07	+3:05	reported	reported	
73	8020909	Weinheim (Bergstr) Hbf	8.065502	49.6538	2019-10-09 18:04	2019-10-09 21:09	2019-10-09 18:04	2019-10-09 21:09	+3:05	reported	reported	
74	8014760	Hemsbach	8.649702	49.690503	2019-10-09 18:07	2019-10-09 21:12	2019-10-09 18:07	2019-10-09 21:18	+3:05	reported (projected)	reported	
75	8014778	Heppenheim Nord	8.630903	49.647398	2019-10-09 18:11	2019-10-09 21:24	2019-10-09 18:11	2019-10-09 21:24	+3:13	reported	reported	
76	8010778	Bensheim	8.616799	49.681402	2019-10-09 18:13	2019-10-09 21:27	2019-10-09 18:13	2019-10-09 21:27	+3:14	reported	reported	
77	8012083	Darmstadt-Eberstadt Nord	8.629896	49.823702	2019-10-09 19:28	2019-10-09 21:43	2019-10-09 19:28	2019-10-09 21:49	+3:18	reported	reported (projected, corrected)	X
78	8012071	Darmstadt Hbf	8.629797	49.872801	2019-10-09 19:34	2019-10-09 21:49	2019-10-09 19:34	2019-10-09 21:49	+2:16	reported	reported	
79	8012070	Darmstadt Gbf	8.629802	49.879704	2019-10-09 19:34	2019-10-09 21:52	2019-10-09 19:34	2019-10-09 21:52	+2:16	reported	reported	
80	8020948	Weienstadt	8.579296	49.909701	2019-10-09 19:39	2019-10-09 21:58	2019-10-09 19:39	2019-10-09 21:58	+2:19	reported	reported	
81	8014068	Groß-Gerau Ost	8.494797	49.923401	2019-10-09 19:43	2019-10-09 22:02	2019-10-09 19:43	2019-10-09 22:02	+2:19	reported	reported	
82	8014067	Groß-Gerau	8.485997	49.924803	2019-10-09 19:43	2019-10-09 22:02	2019-10-09 19:43	2019-10-09 22:02	+2:19	reported	reported	
83	8017407	Nauheim (b Groß-Gerau)	8.449896	49.942098	2019-10-09 19:46	2019-10-09 22:04	2019-10-09 19:46	2019-10-09 22:04	+2:18	reported	reported	
84	8016707	Mainz-Bischofsheim Überltg I	8.394001	49.973102	2019-10-09 19:51	2019-10-09 22:09	2019-10-09 19:51	2019-10-09 22:09	+2:18	reported	reported	
85	8016705	Mainz-Bischofsheim Ostseite	8.383798	49.978999	2019-10-09 19:53	2019-10-09 22:10	2019-10-09 19:53	2019-10-09 22:10	+2:17	reported	reported	
86	8016704	Mainz-Bischofsheim Mitte	8.373704	49.985202	2019-10-09 19:54	2019-10-09 22:13	2019-10-09 19:54	2019-10-09 22:13	+2:17	reported	reported	
87	8016709	Mainz-Bischofsheim Westseite	8.3628	49.990703	2019-10-09 19:56	2019-10-09 22:15	2019-10-09 20:23	2019-10-09 22:23	+2:19	reported	reported	
88	8016706	Mainz-Bischofsheim Pbf	8.364799	49.994002	2019-10-09 20:25	2019-10-09 22:25	2019-10-09 20:25	2019-10-09 22:25	+2:00	reported	reported	
89	8016713	Mainz-Kastel	8.282904	50.006704	2019-10-09 20:31	2019-10-09 22:34	2019-10-09 20:31	2019-10-09 22:34	+2:03	reported	reported	
90	8021101	Wiesbaden Ost Gbf	8.296799	50.040701	2019-10-09 20:35	2019-10-09 22:36	2019-10-09 20:35	2019-10-09 22:36	+2:01	reported	reported	
91	8012856	Eltville	8.121601	50.027604	2019-10-09 20:51	2019-10-09 22:52	2019-10-09 20:51	2019-10-09 22:52	+2:01	reported	reported	
92	8019114	Rüdesheim (Rhein)	7.915398	49.978896	2019-10-09 21:10	2019-10-09 23:10	2019-10-09 21:10	2019-10-09 23:10	+2:00	reported	reported	
93	8016465	Lorch (Rhein)	7.812804	50.040297	2019-10-09 21:21	2019-10-09 23:21	2019-10-09 21:21	2019-10-09 23:21	+2:00	reported	reported	
94	8014588	Kastel	7.649002	50.187099	2019-10-09 21:59	2019-10-09 23:38	2019-10-09 21:59	2019-10-09 23:38	+1:39	reported	reported	
95	8017979	Oberlahnstein Gbf	7.613603	50.294197	2019-10-09 22:12	2019-10-09 23:52	2019-10-09 22:12	2019-10-09 23:52	+1:40	reported	reported	
96	8017978	Oberlahnstein	7.603903	50.300004	2019-10-09 22:12	2019-10-09 23:53	2019-10-09 22:12	2019-10-09 23:53	+1:41	reported	reported	
97	8020554	Vallendar	7.610097	50.399604	2019-10-09 22:20	2019-10-10 00:00	2019-10-10 00:00	2019-10-10 00:00	+1:40	reported	reported	
98	8017602	Neuwied	7.473101	50.431399	2019-10-09 22:27	2019-10-10 00:07	2019-10-10 00:07	2019-10-10 00:07	+1:40	reported	reported	
99	8018828	Rheinbrühl	7.333301	50.489497	2019-10-09 22:39	2019-10-10 00:15	2019-10-10 00:15	2019-10-10 00:15	+1:36	reported	reported	
100	8016415	Linz (Rhein)	7.279004	50.669303	2019-10-09 22:49	2019-10-10 00:21	2019-10-09 22:49	2019-10-10 00:21	+1:32	reported	reported	
101	8012996	Erpel (Rhein)	7.241503	50.581996	2019-10-09 22:52	2019-10-10 00:23	2019-10-09 22:52	2019-10-10 00:23	+1:31	reported	reported	
102	8020477	Unkel	7.219704	50.602698	2019-10-09 22:55	2019-10-10 00:25	2019-10-10 00:25	2019-10-10 00:25	+1:30	reported	reported	
103	8018860	Rhönndorf	7.209897	50.658098	2019-10-09 23:00	2019-10-10 00:30	2019-10-09 23:00	2019-10-10 00:30	+1:30	reported	reported	
104	8011470	Bonn-Beuel	7.127601	50.738498	2019-10-09 23:13	2019-10-10 00:37	2019-10-09 23:13	2019-10-10 00:37	+1:24	reported	reported	
105	8020363	Troisdorf	7.150496	50.813603	2019-10-09 23:20	2019-10-10 00:44	2019-10-09 23:20	2019-10-10 00:44	+1:24	reported	reported	
106	8020368	Troisdorf Vorbahnhof	7.1245	50.82219	2019-10-09 23:22	2019-10-10 00:45	2019-10-09 23:22	2019-10-10 00:45	+1:23	reported	reported	
107	8013946	Gremberg Personalwechselstation Süd	7.057701	50.894299	2019-10-09 23:48	2019-10-10 00:53	2019-10-09 23:48	2019-10-10 00:53	+1:09	reported (projected, corrected)	reported (projected, corrected)	X
108	8013945	Gremberg Personalwechselstation Nord	7.047498	50.903	2019-10-09 23:49	2019-10-10 00:53	2019-10-09 23:49	2019-10-10 00:53	+1:04	reported	reported	
109	8013943	Gremberg Nord	7.019299	50.913904	2019-10-09 23:51	2019-10-10 01:00	2019-10-09 23:51	2019-10-10 01:00	+1:09	reported	reported	
110	8015681	Köln Bonntor	6.958397	50.915801	2019-10-09 23:57	2019-10-10 01:15	2019-10-09 23:57	2019-10-10 01:15	+1:18	reported	reported	

CSV-Export

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Detailed train run in the archive



Journeys

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Archive - Journeys

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Report Overview

logged in as jans

Logout

last update: 2019-10-28 13:08:07

Refresh Data

FILTERS

Number of entries per page: 50

Date: 2019-08-01

Train Nr: 40040

Start terminal departure (SCHEDULE): to

Start terminal departure (REALTIME): to

End terminal arrival (SCHEDULE): to

End terminal arrival (REALTIME): to

Delay (Journey has to satisfy one of the conditions)

☐ Journeys - early (Delay < -1 min)

☐ Journeys - on time

☐ Journeys - delayed (Delay > 30 min)

Details

111	8016720	Köln West Wf	6.939196	50.948702	2019-10-10 00:01	2019-10-10 01:21	2019-10-10 00:01	2019-10-10 01:21	+1:20	reported	reported	
112	8016732	Köln-Ehrenfeld Gbf	6.893099	50.949097	2019-10-10 00:08	2019-10-10 01:28	2019-10-10 00:04	2019-10-10 02:00	+1:20	reported (projected)	reported (projected)	
113	8016110	Hornum	6.713297	50.916304	2019-10-10 00:58	2019-10-10 02:12	2019-10-10 00:58	2019-10-10 02:12	+1:18	reported (projected)	reported (projected)	
114	8012328	Oornfeld	6.626102	50.882498	2019-10-10 01:02	2019-10-10 02:18	2019-10-10 01:02	2019-10-10 02:18	+1:18	reported (projected)	reported (projected)	
115	8012610	Düren Pbf	6.480297	50.807697	2019-10-10 01:11	2019-10-10 02:27	2019-10-10 01:11	2019-10-10 02:27	+1:16	reported (projected)	reported (projected)	
116	8013024	Eschweiler Hbf	6.251899	50.813504	2019-10-10 01:24	2019-10-10 02:40	2019-10-10 01:24	2019-10-10 02:40	+1:16	reported (projected)	reported (projected)	
117	8020006	Stolberg (Rhein) Gbf	6.219196	50.784599	2019-10-10 01:27	2019-10-10 02:43	2019-10-10 01:27	2019-10-10 02:43	+1:16	reported (projected)	reported (projected)	
118	8010015	Aachen-Rothe Erde Gbf	6.1232	50.774401	2019-10-10 01:33	2019-10-10 02:49	2019-10-10 01:33	2019-10-10 02:49	+1:16	reported (projected)	reported (projected)	
119	8010016	Aachen-Rothe Erde Pbf	6.114004	50.768702	2019-10-10 01:36	2019-10-10 02:52	2019-10-10 01:36	2019-10-10 02:52	+1:16	reported (projected)	reported (projected)	
120	8010002	Aachen Hbf	6.091199	50.767497	2019-10-10 01:38	2019-10-10 02:54	2019-10-10 01:38	2019-10-10 02:54	+1:16	reported (projected)	reported (projected)	
121	8010010	Aachen West Pbf	6.074299	50.777996	2019-10-10 01:46	2019-10-10 03:38	2019-10-10 02:36	2019-10-10 04:02	+1:52	reported	reported	
122	8010012	Aachen-Gemmerich	6.033002	50.7568	2019-10-10 02:47	2019-10-10 04:10	2019-10-10 02:47	2019-10-10 04:10	+1:23	reported (projected, corrected)	reported (projected, corrected)	X
123	8800859	MONTZEN-FRONTIERE	6.021595	50.753429	2019-10-10 02:48	2019-10-10 04:10	2019-10-10 02:49	2019-10-10 04:10	+1:21	reported	reported	
124	8800197	BOTZELAER	6.010404	50.747253	2019-10-10 02:50	2019-10-10 04:11	2019-10-10 02:50	2019-10-10 04:11	+1:21	reported	reported	
125	8800867	MONTZEN-GRIL Q	5.963282	50.717715	2019-10-10 02:55	2019-10-10 04:17	2019-10-10 02:55	2019-10-10 04:17	+1:22	reported	reported	
126	8800950	MONTZEN-EST	5.965342	50.718524	2019-10-10 02:55	2019-10-10 04:18	2019-10-10 02:55	2019-10-10 04:18	+1:23	reported	reported	
127	8800339	MONTZEN-GRIL N	5.950544	50.721409	2019-10-10 02:56	2019-10-10 04:18	2019-10-10 02:56	2019-10-10 04:18	+1:22	reported	reported	
128	8800334	MONTZEN-GRIL M	5.926993	50.728745	2019-10-10 02:58	2019-10-10 04:20	2019-10-10 02:58	2019-10-10 04:20	+1:22	reported	reported	
129	8801771	*GRENS VLAANDEREN-WALLONIE L24	5.901056	50.73448	2019-10-10 02:59	2019-10-10 04:21	2019-10-10 02:59	2019-10-10 04:21	+1:22	reported (projected)	reported (projected)	
130	8801028	REMERSDAAL-BLOK 12	5.888833	50.740547	2019-10-10 03:01	2019-10-10 04:28	2019-10-10 03:01	2019-10-10 04:28	+1:27	reported	reported	
131	8800242	SINT-MARTENS-VOEREN-BLOK 10	5.816506	50.74693	2019-10-10 03:06	2019-10-10 04:32	2019-10-10 03:06	2019-10-10 04:32	+1:26	reported	reported	
132	8801772	*GRENS WALLONIE-VLAANDEREN L24	5.777924	50.748521	2019-10-10 03:09	2019-10-10 04:35	2019-10-10 03:09	2019-10-10 04:35	+1:26	reported (projected)	reported (projected)	
133	8801508	YBERNEAU	5.712007	50.74206	2019-10-10 03:13	2019-10-10 04:38	2019-10-10 03:13	2019-10-10 04:38	+1:25	reported	reported	
134	8801038	VISE-HAUT	5.699116	50.743945	2019-10-10 03:15	2019-10-10 04:38	2019-10-10 03:15	2019-10-10 04:38	+1:23	reported	reported	
135	8801197	YVISE-HAUT	5.694478	50.74426	2019-10-10 03:16	2019-10-10 04:39	2019-10-10 03:16	2019-10-10 04:39	+1:23	reported	reported	
136	8801308	RACC-VISE-CBR	5.691152	50.743244	2019-10-10 03:20	2019-10-10 04:42	2019-10-10 03:20	2019-10-10 04:42	+1:22	reported	reported	
137	8800119	BASSENGE	5.611939	50.756521	2019-10-10 03:25	2019-10-10 04:46	2019-10-10 03:25	2019-10-10 04:46	+1:21	reported	reported	
138	8801542	YGLONIS	5.533804	50.752323	2019-10-10 03:30	2019-10-10 04:50	2019-10-10 03:30	2019-10-10 04:50	+1:20	reported	reported	
139	8801779	*GRENS WALLONIE-VLAANDEREN L34	5.52175	50.757375	2019-10-10 03:30	2019-10-10 04:50	2019-10-10 03:30	2019-10-10 04:50	+1:20	reported (projected)	reported (projected)	
140	8801426	VERHESSENATIE-AUTOTRANSPORT	5.484993	50.772513	2019-10-10 03:33	2019-10-10 04:53	2019-10-10 03:33	2019-10-10 04:53	+1:20	reported	reported	
141	8801151	TONGEREN	5.473936	50.784172	2019-10-10 03:34	2019-10-10 04:54	2019-10-10 03:34	2019-10-10 04:54	+1:20	reported	reported	
142	8800157	BILZEN	5.509183	50.868689	2019-10-10 03:44	2019-10-10 05:03	2019-10-10 03:44	2019-10-10 05:03	+1:19	reported	reported	
143	8800233	BILZEN-WUKSPOOR	5.507151	50.878433	2019-10-10 03:44	2019-10-10 05:04	2019-10-10 03:44	2019-10-10 05:04	+1:20	reported	reported	
144	8801985	YROOIRIEWEG	5.507313	50.878085	2019-10-10 03:45	2019-10-10 05:05	2019-10-10 03:45	2019-10-10 05:05	+1:20	reported	reported	
145	8801509	BEVERST	5.50054	50.881085	2019-10-10 03:46	2019-10-10 05:06	2019-10-10 03:46	2019-10-10 05:06	+1:20	reported	reported	
146	8800324	DIEPENBEEK	5.410004	50.911414	2019-10-10 03:52	2019-10-10 05:11	2019-10-10 03:52	2019-10-10 05:11	+1:19	reported	reported	
147	8800523	HASSELT	5.326181	50.931119	2019-10-10 03:59	2019-10-10 05:18	2019-10-10 03:59	2019-10-10 05:18	+1:19	reported	reported	
148	8800526	HASSELT-AFLOS L 35	5.302827	50.936935	2019-10-10 04:02	2019-10-10 05:21	2019-10-10 04:02	2019-10-10 05:21	+1:19	reported	reported	
149	8801637	YWEST DRIEHOEK HASSELT	5.286494	50.937980	2019-10-10 04:03	2019-10-10 05:22	2019-10-10 04:03	2019-10-10 05:22	+1:19	reported	reported	
150	8801061	SCHULEN	5.188079	50.963354	2019-10-10 04:10	2019-10-10 05:28	2019-10-10 04:10	2019-10-10 05:28	+1:18	reported (projected, corrected)	reported (projected, corrected)	X

CSV-Export

Export

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operator (SCHEDULE)

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... ETA is just at the beginning ...

ELETA is just one step in our strategy, as:

- Operational excellence is very important for all actors
- Resource and asset optimisation is key
- Better integration in supply chains is needed
- Reliability a must - to gain back trust
- ETA gets even more important in the broader context of digital twins and automation...

Lessons “confirmed”:

- Further direct data sources needed to limit inefficiencies due to incomplete (processed) data from intermediate systems
- Whole system has to be taken into account, and the proper combination of various components and data sources is vital

ETA is key for the future
and we will further invest in it!



Thank you for
your attention!



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