



Public Transport Data in KDE Itinerary

Querying realtime journey data and dissecting ticket barcodes

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KDE Itinerary – A privacy-protecting travel assistant

☰ My Itinerary ⋮

📅 Sunday, 2/5/23

👤 End: FOSDEM 2020 6:00 PM

ULB - Campus du Solbosch
Av. F. D. Roosevelt 50
1050 Bruxelles
Belgium

🚆 ICE 19 6:25 PM


Departure from Bruxelles Midi on platform 9
Belgium

Arrival at Köln Hbf on platform 4 A-C
Arrival time: 2/5/23 8:15 PM
Germany

☀️ Temperature: 2.9°C / 4.5°C
Precipitation: 0.1 mm

🚆 ICE 657 8:48 PM

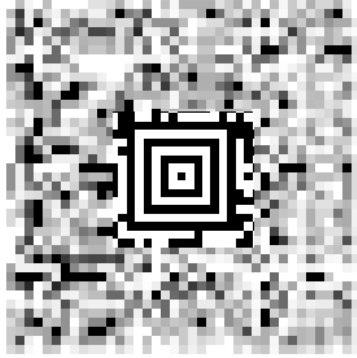
< > My Itinerary > Flight > Boarding Pass

 Seat Gate
13C A

BRUSSELS BERLIN
BRU ✈️ TXL

Flight	Date	Boarding	Class
2591	22/04/2018	20:20	CHECK

Passenger	Status
KRAUSE/VOLKER	LH



☰



Understanding Tickets/Reservations

- Machine readable:
 - schema.org annotations in emails
 - barcodes: standardized for interoperability or proprietary
- Human readable:
 - provider-specific extractor scripts



Standardized Ticket Barcodes

- Interoperability standards are a massive help!
 - IATA BCBP
 - UIC 918.3, ERA FCB, ERA TLB, ERA SSB
 - VDV eTicket
- But:
 - Closed documentation, non-public public keys
 - Operator extensions
 - Implementation and documentation are two different things



Proprietary Ticket Barcodes

- Reverse engineering often the only option
- Relies on access to a sufficient number of samples (travel document donations very much welcome!)
- Complicated by compact encoding formats and creative date/time formats
- Partially decoded: MÁV, PKP, SBB, some SNCF variants, ZSSK



KDE Itinerary – Public Transport Data

 ICE 1003 8:05 AM +0


Departure from Berlin Hbf (tief) on platform 1
Germany

Arrival at München Hbf on platform 17
Arrival time: 4/28/22 12:01 PM +11
Germany

 BRUXELLES MIDI to NH Brussels S... 8:47 PM

   0 changes

3:40 PM 1:55

 0 changes 

4:44 PM 1:51

 0 changes


5:41 PM 1:54

5:41 PM Köln Hbf 5

 ICE 12 to Bruxelles Midi (1:54) 

7:35 PM Bruxelles Midi 8

*Komfort Check-in possible (visit bahn.de/kci for more information)
Bordrestaurant*

 Select



Public Transport Data

- Unified access to a large variety of backends
- Focus on basic and abstracted data model rather than support for every operator-specific detail
- Three basic types of data/queries:
 - Locations (by name or coordinate)
 - Stopovers (arrivals/departures)
 - Journeys



Public Transport Data – Supported Backends

- Open:
 - Navitia
 - OpenTripPlanner (multiple flavors)
- Standardized protocols: TRIAS/OpenJourneyPlanner
- Proprietary:
 - Hafas
 - EFA
 - IVV ASS



Public Transport Data – Discovering Backends

- Transport API Repository
 - Github: [public-transport/transport-apis](https://github.com/public-transport/transport-apis)
- Machine-readable metadata for ~80 operators
 - API endpoints
 - Coverage area
 - Supported languages
 - Backend- or protocol-specific parameters



Public Transport Data – Line/Product Metadata

- Line icons and colors



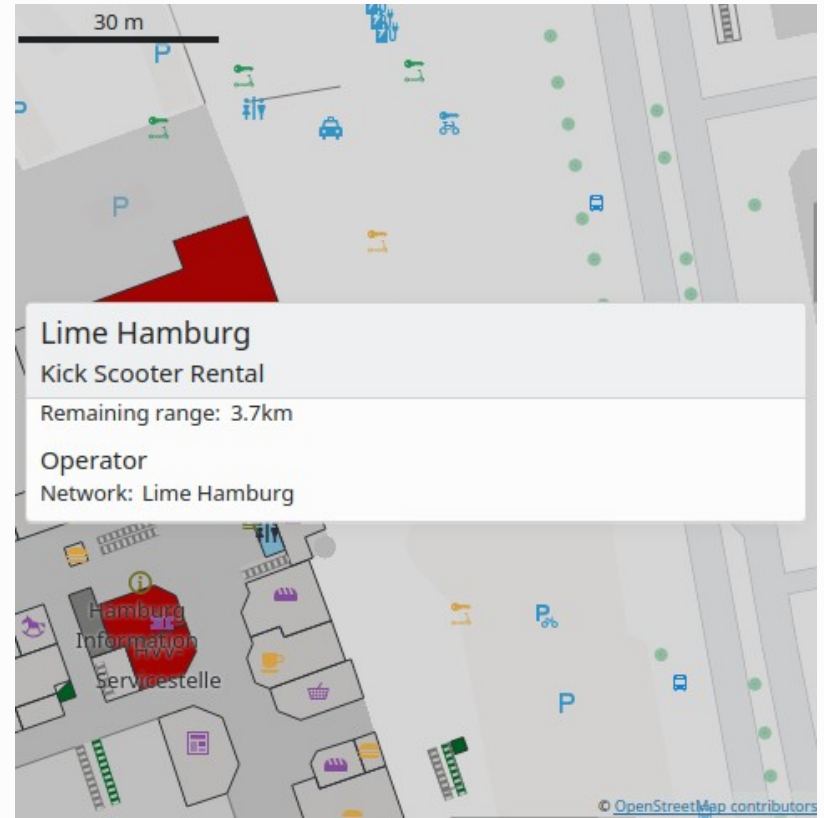
- Mode/product icons





Rental vehicles - GBFS

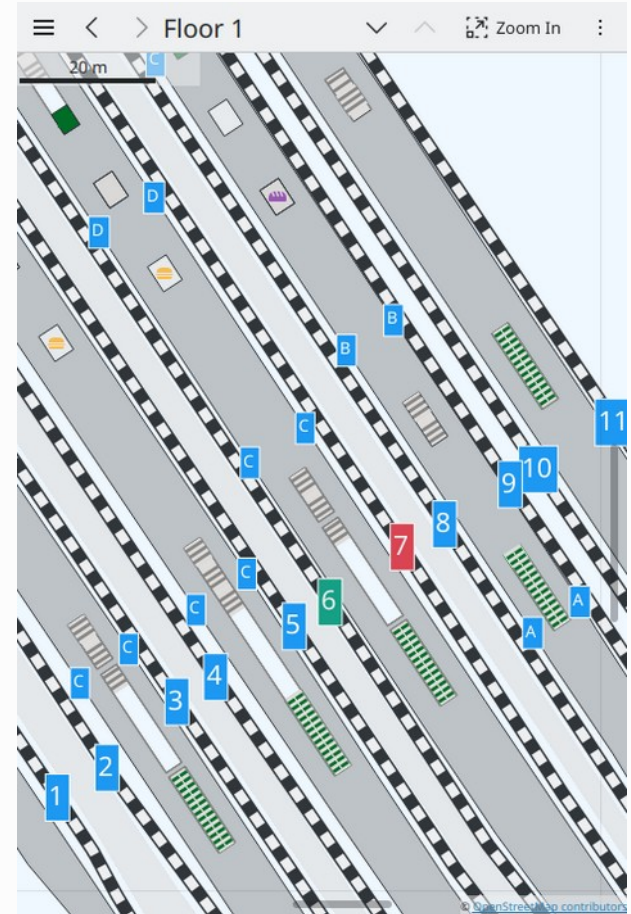
- Evolving standard with increasing level of detail
- Increasing availability in Europe and North America
- Asia?





Elevator/Escalator Status

- Uses accessibility.cloud (backend of wheelmap.org)
- Limited coverage outside of Germany





Train coach layouts

- Very limited availability
- Data model/level of detail vary a lot
- Platform sections in OSM
- In-carriage maps so far only available in human readable form

Vehicle Layout

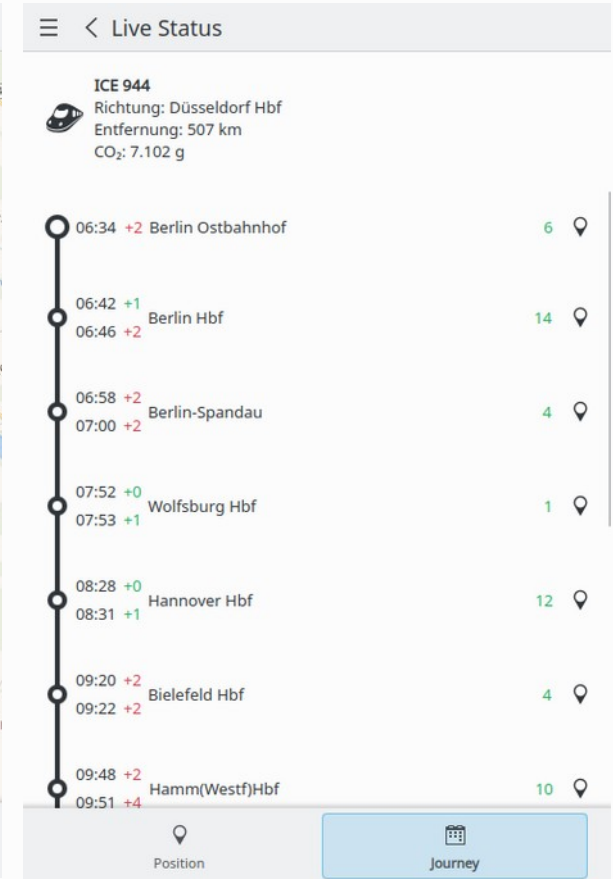
Berlin Hbf (tief) - ICE 848 - 1/31/20 1:49 PM
Platform: 4
Coach: 34 Seat: 58

Coach Number	Class	Additional Info
27	First class	
31	Second class	D
32	Second class	🔴
33	Second class	C
34	Second class	🚰 🚿
35		🚰 🚿 B



Onboard API

- Current position
- Current journey





Summary

- All of this is available in libraries for re-use
- There's much more that can be built out of this
- We are looking for:
 - Relevant APIs and data sets
 - Travel document donations
 - Documentation about ticket barcode formats, APIs, etc



Thank you!



Questions?

Meet us:
KDE stand, building K, level 2



References

- KDE Itinerary: <https://apps.kde.org/itinerary>
- KDE Itinerary code: <https://invent.kde.org/pim/itinerary>
- KDE F-Droid repository: <https://community.kde.org/Android/FDroid>
- Public transport data library: <https://invent.kde.org/libraries/kpublictransport>
- Transport API repository: <https://github.com/public-transport/transport-apis>
- Train station map: <https://invent.kde.org/libraries/kosmindoormap>
- Travel document extractor: <https://invent.kde.org/pim/kitinerary>
- Ticket barcode formats:
https://community.kde.org/KDE_PIM/KItinerary/Supported_Providers
- German Open Transport Meetup: <https://github.com/transportkollektiv/meetup/wiki>