MENTZ

MAGAZINE
1/23

»Digitally on the Go«

Dear Readers,

The Deutschland-ticket, which allows travel on local public transport throughout Germany, is here and will transform public transport. It is the reason we chose the theme of this issue of MENTZ Magazine: fare revolution. This much has been accomplished: together we have made it easy for people to switch to public transport and the new flat rate fare. Starting on page 4, read about the range of technical solutions that were implemented to digitally integrate the 49-Euro-Ticket. We have been focusing on increasing digitization and decreasing the amount of bureaucracy for passengers when purchasing a monthly or yearly pass for public transport.

Public transport companies are upping their investments in ebuses and alternative drives. The goal is to achieve climate targets set out for the public transport sector. Our duo of DIVA and GENIOS is ensuring cleaner air and less traffic noise in the city of Mainz. On page 20, you can find out how we did it. We were also successful implementing connection registration by app: reliable connections help increase customer satisfaction with public transport, and, on Bavarian regional trains, we helped make rail travel even more trustworthy and convenient. The launch of our customer BEG's connection registration app received great media reviews. On page 8, read how our software solution has turned a somewhat protracted process, which still involve calling, into a practical and digital service that can be initiated by finger tap. Rapid exchange of information is essential for this service to work properly and is one reason why our experts work as part of various advisory bodies. The common goal is to further standardize data formats to increase the speed of exchange into the future. Global IDs are an important step in this direction. On pages 24–26, we demonstrate what we can achieve with them.

I hope you enjoy reading this issue of MENTZ Magazine!

Sincerely,

Christoph Mentz

Christoph Mentz
Managing Director
MENTZ GmbH

DEUTSCHLAND TICKET

T

he Deutschland Ticket was launched on May 1st, 2023. The policy behind the Deutschland Ticket was agreed upon by federal and state transport ministers on January 27, 2023.

Topic
Deutschlandticket

Products
MENTZ - Client shop
CiBO - Shop
Gullivr

Contact
Dr. Hans-J. Mentz,
Frank Merkel
merkel@mentz.net

Federal and state governments have made it clear that the Deutschland Ticket is intended to be offered digitally – in an app or on a chip card. A few transport companies are not able to provide digital tickets, so they will issue a paper ticket with a QR code that can be checked digitally. This paper option will only be valid during the transitional period until December 31, 2023.

Digitization provides transport operators and authorities with an opportunity to make public transport services more convenient and tailor them even further to meet people's needs. The public transport sector needs to be more active in this ongoing process and a digital Deutschland Ticket is an important step along the way.

What MENTZ Provides
Both chip cards and paper tickets have to be distributed. The solution is the barcodes in the app that are created each month.
In the past, getting a subscription ticket was a bit cumbersome. Passengers usually had to fill out a form and allow for direct debit from their bank account. A chip card needed to be issued that could be picked up at a service center or sent by mail.

A new subscription method is being launched along with the Deutschland Ticket. Customers can purchase the Deutschland Ticket in the app by selecting the subscription and the month when its validity should start. The ticket is then issued and appears promptly in the app. If the selected month is the current month, the ticket is paid immediately. If the ticket should start its validity the following month, it is paid at the beginning of the month of validity. Next month's ticket is sent directly to the app a few days before the end of each month. The period of validity is written on the ticket and in the barcode and can be read by applicable devices. Customers have the option to cancel the subscription on a monthly basis before the end of each month.

For customers, this new subscription method is easy and convenient. So much so that customers with chip cards are expected to switch to the new method in the app in due time.

MENTZ ticket shops are prepared for a large volume of transactions. In the short term, we are expecting the first 100,000 Deutschland Ticket subscriptions in the VRR ticket store. This means that the store will have to quickly process paying for 100,000 tickets with barcodes at the financial service provider. And because payments can only be made after the validity period has begun, the process may take several days. Financial service providers will set the pace in this regard. If a payment fails because of insufficient funds, we will have to immediately delete the ticket, terminate the subscription contract, and inform the customer and the transport company or authority that sold the ticket. Further handling of such exceptions is still an open question.

VDV CA or UIC Barcode
Deutschland Tickets must contain a signed barcode. Encryption is performed with a private key and decryption is done with a public key.

For the VDV CA (core application) process, the private key is supplied with so-called SAMs (secure access modules) by the VDV. The SAMs are used in smartcards, which is hardware that has to be installed in a data center. MENTZ has built its own ticket generator modules, which consist of a single-board computer with ports for 4 SAMs. The computing speed of the SAMs basically determines the time needed to generate a barcode. A SAM can sign 2 barcodes per second, which translates to a MENTZ ticket generator module having the ability to sign almost 30,000 barcodes in a single hour. Multiple modules are always utilized in parallel.
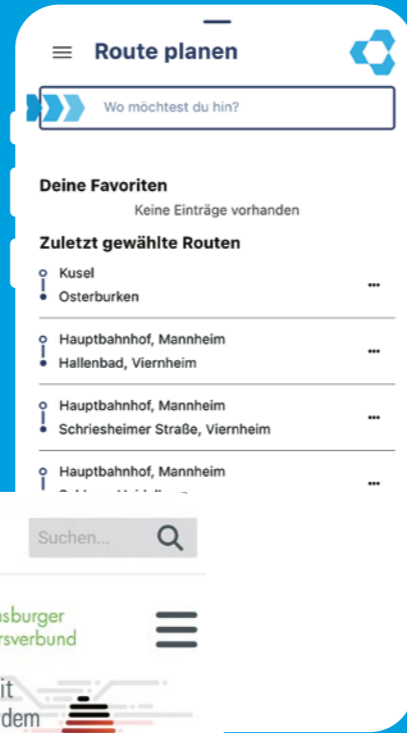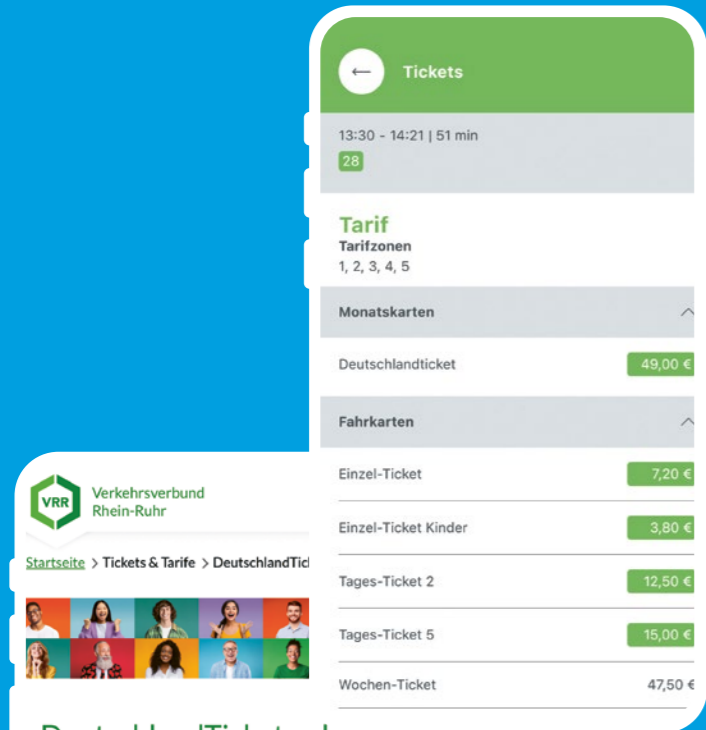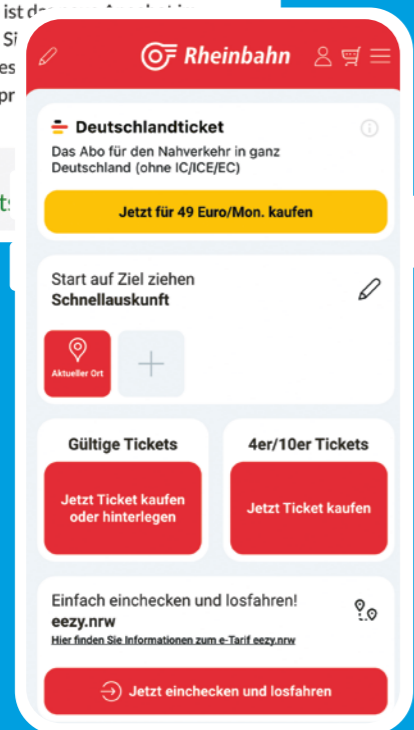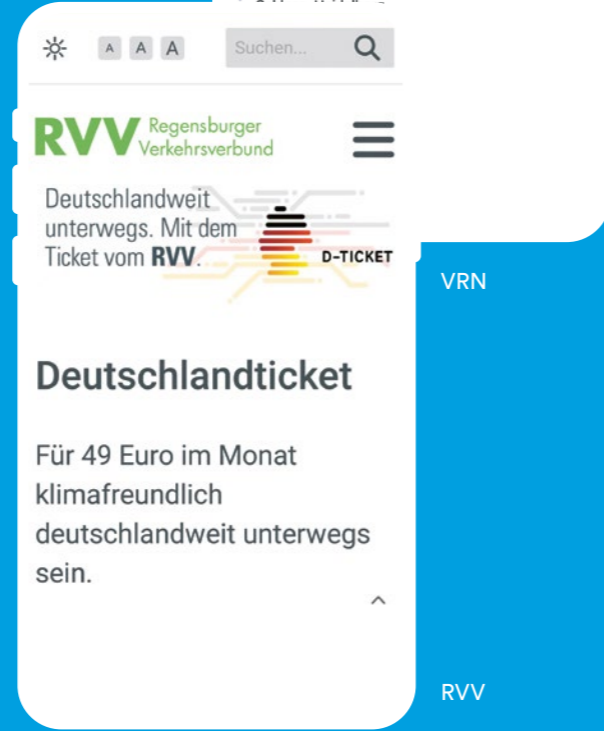
The UIC process does not require any hardware, but does use asymmetric cryptography. MENTZ can, however, create the key pairs on its own. The private key is safeguarded and the public key is made available to controllers, the Deutsche Bahn, and the Deutschlandtarifverbund GmbH. The process can be scaled as required.

Deutschland Ticket in the VRR Ticket Shop

The VRR offers the Deutschland Ticket with a
– 1st class subscription ticket (VRR) and a
– Bike subscription ticket (VRR)
– Semester ticket upgrade.

The tickets can be used together and purchased in the same shopping cart. The VRR ticket shop is used by 20 VRR transport companies and by the state-wide system mobil.nrw, which provides all NRW fares. The eesy-fare was adjusted. A passenger's trips are capped at the monthly price of a Deutschland Ticket.

Deutschland Ticket at Rheinbahn

Rheinbahn, the largest transport company in the VRR, operates its own MENTZ ticket shop. The Rheinbahn app was custom designed by MENTZ according to Rheinbahn's layout specifications. Calculation of trips and fares occurs in the VRR system.

Deutschland Ticket in the MENTZ Client Shop (MCS)

The MENTZ client shop is open to any transport company. The client shop is an affordable option for transport companies to sell tickets because the costs for the Cloud system can be divided.

Currently, the following clients work in the MCS

– Padersprinter, Westphalia fare, CA
– OWL (Eastern Westphalia Lippe), Westphalia fare, CA
– KVG Lippe, Westphalia fare, CA
– VPH Paderborn, Höxter, Westfalentarif CA
– RVV Regensburg Transport Authority, RVV fare, UIC
– AVV Augsburg Transport Authority, AVV fare, UIC
– BEG Bavarian Railways Company, all Bavarian fares, CA

All clients, except for the Padersprinter, provide the Deutschland Ticket.

Deutschland Ticket at the VRN

The VRN (Rhein Neckar Transport Authority) operates its own MENTZ ticket store. Utilizing MENTZ's Gullivr app, it offers the full range of VRN tickets, a CiBo system with best price guarantee, and now the Deutschland Ticket as well. It operates its own journey planning system. The tickets are issued with UIC codes.

Deutschland Ticket at Trier Public Utilities

Trier Public Utilities sells the Deutschland Ticket with the MENTZ Companion 5 app. It uses the VRN EFA journey planner and generates UIC barcodes.

Outlook

We can expect existing subscriptions for monthly tickets to be replaced by subscriptions with the Deutschland Ticket. In the VRR, there are currently around 1.2 million subscriptions, which could later grow to an estimated 2 million.

Deutschland Tickets will be available for school-aged children and university students. There will also be a so-called job ticket, which is paid for by employers and receives an additional discount.

Considering that tickets will need to be produced on a monthly basis, it is easy to recognize the amount of processing that the stores will have to manage. MENTZ is well equipped to do the job.

MENTZ Clientshop

VRN

VRR

RVV

Rheinbahn
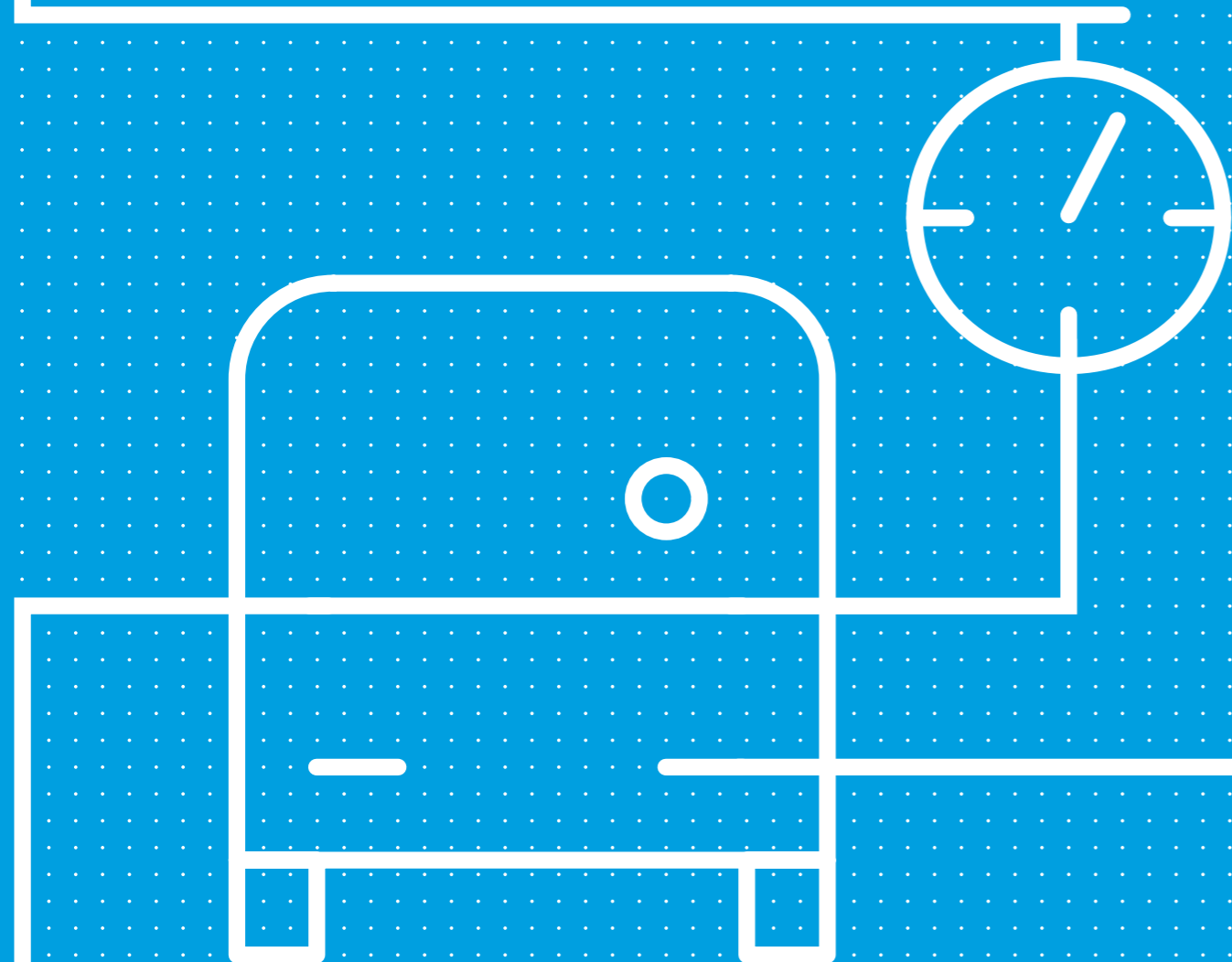
CONNECTION

A long day at work finally comes to an end. I'm on the train heading toward Nuremberg. The train should have left Munich a minute ago, but it hasn't left yet because of a delay from the previous trip. Will I still make my connection in Ingolstadt? The forecast in my app says that there will only be a two-minute delay in Ingolstadt, so things should work out. But what if the delay gets longer? It would be a shame if I missed my connection by just a minute or two. It would be great if I could inform the staff on my next train that I am on my way and would like to make the connection. Then I see a note in the app: »Registration for this connection is now possible.« I tap on it.

REGISTRATION IN BAVARIA

Topic
Connection Registration in Bavaria

Customer
Bavarian Railways Company (BEG)

Products
Gullivr, EFA central connection monitoring system

Contact
Dr. Matthias Erven

Silently launched in December 2022, but officially announced in January 2023, the »connection registration in Bavaria« project is now fully operational. It was commissioned by the Bavarian Railways Company (BEG) and implemented in cooperation with various system vendors and all rail companies that operate local trains in Bavaria. The project's goal is to enable passengers to register by app for connections anywhere in the State of Bavaria.

Registrations are forwarded to a central connection monitoring system, which automatically informs the control center of the departing train if the connection is at risk of not being made. Such connection registrations can currently be made in MENTZ's Bayern-Fahrplan app and in the Deutsche Bahn (DB) app. In addition to the app, MENTZ developed the foundational core of the project, a central connection monitoring module.

7:19 p.m.:
Actually, we left 6 minutes late, and the arrival forecast for Ingolstadt now shows a delay of 5 minutes. The connection can still be made, but I'm glad that someone knows I'm still coming.

How does registering for a connection work on the technical side?
In advance, a list of connection nodes was defined where connection registration could occur. When a journey is planned, the system automatically checks whether a possible interchange occurs at one of the connection nodes and whether a number of additional criteria are satisfied. For example, connections can currently only be made from more regional trains,

including intercity trains, to local trains of participating rail companies in Bavaria. In addition, to protect the app against misuse, the system checks whether the passenger is actually on said route and not sitting at home on a couch. If a connection is identified as feasible, a message appears when a passenger changes trains indicating that they can report the connection by tapping the app button.

Connection registration is forwarded anonymously to the core, the central connection monitoring system. It collects all connection registrations and monitors the affected feeder (arriving) – collector (departing) trains by continuously retrieving real-time data from the DEFAS platform. When a connection is at risk of not being made (when the arrival forecast for the feeder train plus the interchange time is greater than the departure time of the collector train), a message is sent to the collector train's control center. This message includes all information required to make an informed decision: how many passengers intend to transfer from one particular train to another, and how long the second train would have to wait to ensure that the connection is made. The control center is kept abreast of any and all changes – like delays or the number of passengers who intend to make the connection. Based on this information, the control center can make a sound decision. As soon as a decision has been made, it is forwarded to the central connection monitoring system. It subsequently informs the background systems of each app. A push notification is then sent to passengers.

Always Well-Informed
Passengers receive a notification shortly before changing trains, even if the connection is not at risk. This notification is generated by the central connection monitoring system.

7:28 p.m.:
The forecast still shows the same delay: the train will arrive five minutes late in Ingolstadt.

MENTZ has had to overcome a few technical challenges in cooperation with the development departments of app background systems and control centers. But the BEG and other project partners also

had to make some organizational changes: all the local rail companies in Bavaria who are involved in the project had to train their employees to adapt to the new procedure.
The new concept has made the process much shorter and simpler. Previously, passengers had to locate train personnel to inform them that they needed to make a particular connection. The train personnel had to contact their control center in addition to all their other duties. The control center then needed to inform the dispatcher for the next train, which in turn had to contact the rail network operator before a notification to wait could be issued to the engineer of the collector train. The eventual outcome of the decision process had to be communicated back to the passenger through the control center and finally by the train personnel. Now passengers can register directly with the control center using the app. If minor delays occur, it was agreed that the notification to the rail network operator could be omitted from the process.

7:48 p.m.:
Even though the forecasted delay for Ingolstadt has gone up to 6 minutes, we seem to be making good time. Everything may still work out.

On top of the primary goal of enabling passengers to register for connections, the BEG also implemented a few "hidden" improvements for passengers: a list of important connections can be defined that are automatically monitored by the central connection management system. This feature is important, for example, to ensure timely transport to school or to be aware of the last connections on a particular day. In addition, the monitored connections and their outcomes are logged anonymously. Registrations cannot guarantee that a connection can be made 100% of the time. But the BEG and its partners are able to evaluate the logged data and take missed connections into account for future timetable planning. Doing so allows them to offer passengers stable connections as frequently as possible.

Going live with the system did not signal an end to the project: the platform and the concept were designed to be transferred to other regions and/or allow other apps to
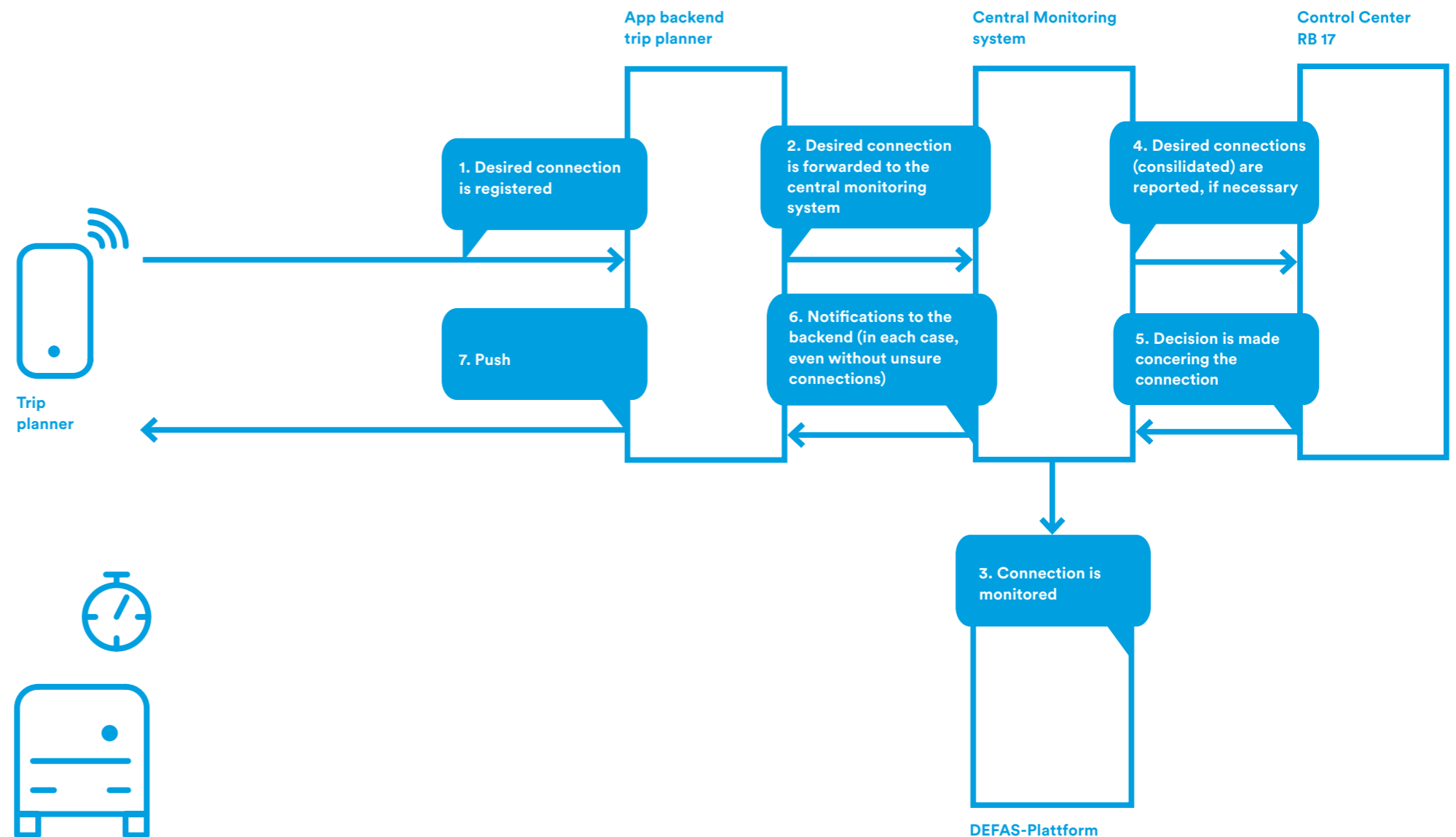
link up directly with the Bavarian platform. There are already even plans to guarantee connections from train to train and to integrate buses in the system as well. The main goal is to enable a more comfortable travel experience and to guarantee connections right where they are needed most.
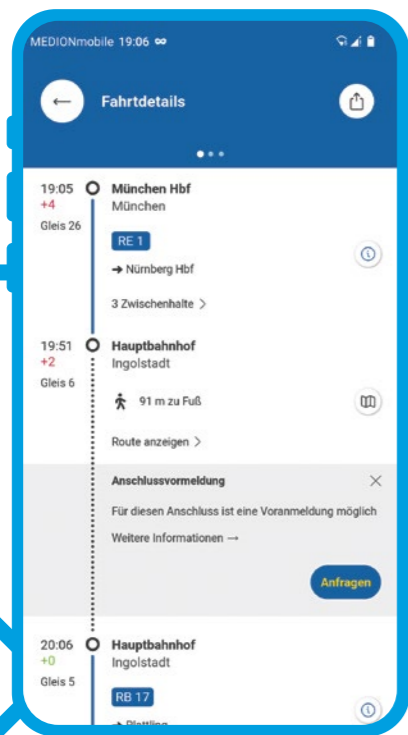
7:56 p.m.:
Shortly before arrival in Ingolstadt, a push message appears on my smartphone: "Your connection is not at risk. Expected departure of your next train at 8:56 p.m." And indeed, the delay remained the same. The control center responsible for my next train did not even have to be informed. No departures had to be modified and I made my connection anyway.

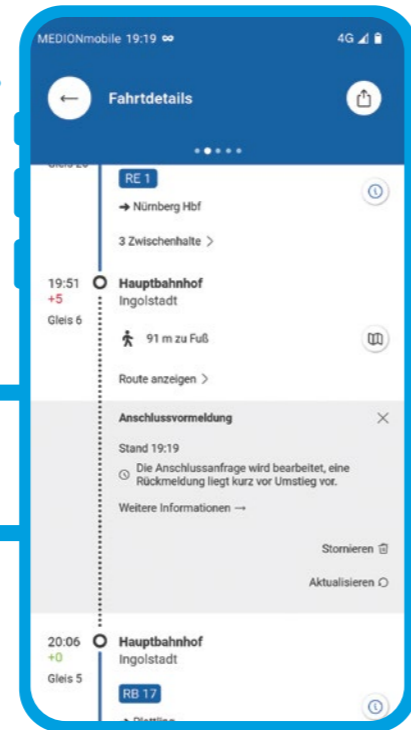More information: https://www.mentz.net/beitraege/anschlusswunsch-per-app/

»Going live with the system did not signal an end to the project: the platform and the concept were designed to be transferred to other regions and/or allow other apps to link up directly with the Bavarian platform. There are already even plans to guarantee connections from train to train and to integrate buses in the system as well. The main goal is to enable a more comfortable travel experience and to guarantee connections right where they are needed most.«

App backend trip planner

Central Monitoring system

Control Center RB 17

1. Desired connection is registered

2. Desired connection is forwarded to the central monitoring system

4. Desired connections (consolidated) are reported, if necessary

7. Push

6. Notifications to the backend (in each case, even without unsure connections)

5. Decision is made concering the connection

Trip planner

3. Connection is monitored

DEFAS-Plattform

7:48 p.m.

MEDIONmobile 19:48

Fahrtdetails

RE 1
→ Nürnberg Hbf
3 Zwischenhalte

19:51 +6 Hauptbahnhof
Gleis 6 Ingolstadt

91 m zu Fuß

Route anzeigen >

Anschlussvormeldung
Stand 19:47
Die Anschlussanfrage wird bearbeitet, eine Rückmeldung liegt kurz vor Umstieg vor.
Weitere Informationen →

Stornieren

Aktualisieren

20:06 +0 Hauptbahnhof
Gleis 5 Ingolstadt

RB 17

7:19 p.m.

MEDIONmobile 19:19

Fahrtdetails

RE 1
→ Nürnberg Hbf
3 Zwischenhalte

19:51 +5 Hauptbahnhof
Gleis 6 Ingolstadt

91 m zu Fuß

Route anzeigen >

Anschlussvormeldung
Stand 19:19
Die Anschlussanfrage wird bearbeitet, eine Rückmeldung liegt kurz vor Umstieg vor.
Weitere Informationen →

Stornieren

Aktualisieren

20:06 +0 Hauptbahnhof
Gleis 5 Ingolstadt

RB 17

7:06 p.m.

MEDIONmobile 19:06

Fahrtdetails

19:05 +4 München Hbf
Gleis 26 München

RE 1
→ Nürnberg Hbf
3 Zwischenhalte >

19:51 +2 Hauptbahnhof
Gleis 6 Ingolstadt

91 m zu Fuß

Route anzeigen >

Anschlussvormeldung
Für diesen Anschluss ist eine Voranmeldung möglich
Weitere Informationen →

Anfragen

20:06 +0 Hauptbahnhof
Gleis 5 Ingolstadt

RB 17

7:28 p.m.

MEDIONmobile 19:28

Fahrtdetails

19:05 +6 München Hbf
Gleis 26 München

RE 1
→ Nürnberg Hbf
3 Zwischenhalte >

19:51 +5 Hauptbahnhof
Gleis 6 Ingolstadt

91 m zu Fuß

Route anzeigen >

Anschlussvormeldung
Stand 19:28
Die Anschlussanfrage wird bearbeitet, eine Rückmeldung liegt kurz vor Umstieg vor.
Weitere Informationen →

Stornieren

Aktualisieren

20:06 Hauptbahnhof
Ingolstadt
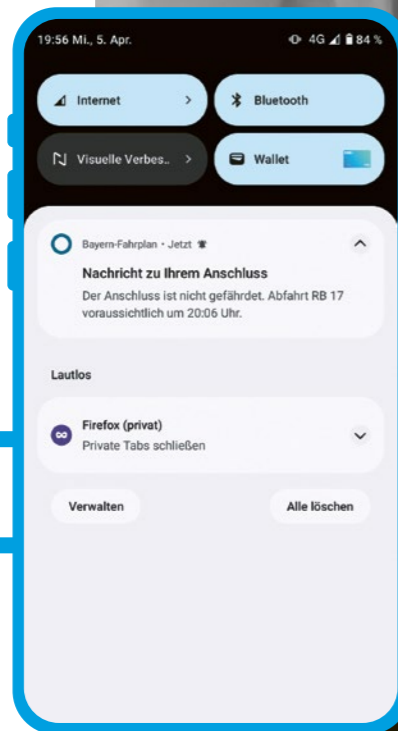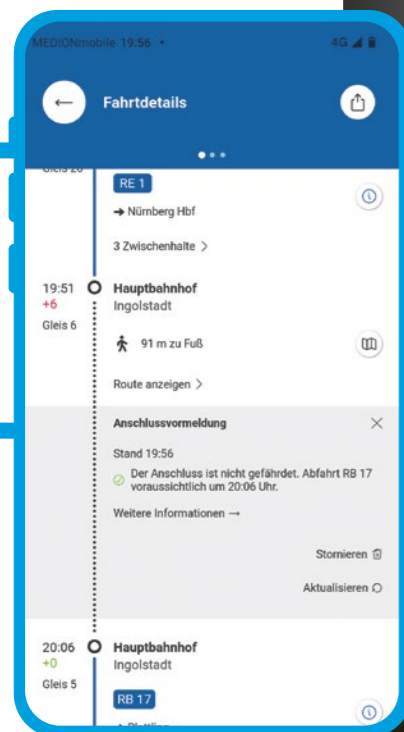
7:56 p.m.

7:56 p.m.

O n May 11th and 12th, we met up with participants at our latest DIVA / EFA user group. After meeting up in person last October, this time felt almost like routine. It was truly nice to see all our customers in person again! The neo-classical Wiesbaden Kurhaus (literally »cure house«), served as the venue for this year's user group, which was themed »the networked world of public transport.«

MENTZ NEWS

USER GROUP

Back In Person at the MENTZ User Group
Addressing the topic in his keynote, Managing Director Christoph Mentz surveyed responses to the idea of connected mobility using ChatGPT. This entry point served as an interactive role play to the many technical presentations on planning in DIVA R19 that followed. Participants were given an impression of what the future of networked planning might involve. Other talks included news about the Event Management System (EMS), measuring the quality of real-time forecasting, and practical tips to improving work with OpenSearch. The first day finished with a talk about student passes and the Deutschland Ticket. On Friday, we started with a talk on accessible transport from start to finish and its implementation in EFA 10.6. What followed was a presentation on MaaS and a demonstration of integrated booking in Gullivr using a mobility service provider. In addition to learning about and discussing technical subjects, a highlight for participants was certainly the ride on the Neroberg funicular railway. Once again, this most recent user group was a success and we would like to thank our hosts, Mainzer Mobilität. We are already looking forward to next year's event!

PESTO

In Vienna, PESTO Makes Riding Easy
In Austria's beautiful capital Vienna, passengers will soon be able to conveniently check in and out of public transport and pay the best price for their ride. After successfully demonstrating our CiBo system and submitting a convincing offer, we won the tender for a check-in/check-out system. With PESTO (a GPS-based postpaid ticketing system), Viennese passengers will always be provided with the best fare for their ride because of the CiBo backend system. All they have to do is use their smartphone app to check in, ride public transport to their destination, and then check out after exiting the vehicle. The best price for the trip is identified after it is over and is calculated on the basis of the underlying fare system. A price cap check determines whether another fare is cheaper beyond a ticket for a single trip. Besides MENTZ, other project partners include the Transport Authority for the East Region (VOR), Wiener Linien, and Wiener Lokalbahnen. We look forward to successful collaboration!

VRN

WECA

MyVRN App is Live
The new myVRN app by our customer Rhein-Neckar Transport Authority has been available in app stores since December 15 of last year. This means that passegers in the VRN region have multimodal options and can take public transport at the guaranteed best price possible. Our mobility app Gullivr makes public transport in the VRN region simple and convenient: check in, ride, check out, and only pay the actual linear distance covered by the trip. All tickets offered by the VRN can be purchased. The entire offering is supplemented by best-price guarantee to ensure that VRN customers always get the lowest fare for their trip. Users can personalize the app using a range of configuration options: home screen, favorites, and many other custom details.

Additional details about the new myVRN app can be found here (in German): *https://www.vrn.de/service/apps/companion/index.html*

Collective Success in Bristol: WECA
Last fall, following a convincing presentation in Bristol, we won a MaaS tender in the West of England with our partner Worldline. In addition to a multimodal journey planning system, a range of mobility services like Brompton bikes, voi scooters, or a taxi aggregator can be booked on the MaaS platform of this project. This is where our white-label app Gullivr enables all of these services to be used in a single app: from planning to booking and paying. In addition to the ability to pay for external mobility providers, transport tickets can be purchased in the app for in the local region using the MENTZ ticket store. This is significant because as part of the project, we are also launching our first ticket store in England! Train tickets can also be booked though the app. All payments will be handled by Worldline, because in England, a special license and accreditation is required for financial transactions involving tickets for public transport. Our

partner Worldline has both, which allows the technical and financial partners of the project to complement each other very well.

EVENTS

09.10. - 11.10.2023
APTA EXPO, ORLANDO USA

14.05. - 16.05.2024
IT-TRANS,
KARLSRUHE TRADE FAIR

05.06. - 07.06.2024
USER-GROUP, MUNICH

24.09. - 27.09.2024
INNOTRANS 2024

CLEAN AIR IN THE CITY

Mainz Mobility, the mobility brand of Mainz's Public Utility Company, has procured DIVA as a planning system for timetable, vehicle, and duty scheduling.

DIVA as a planning system for emission reduction and new drives.
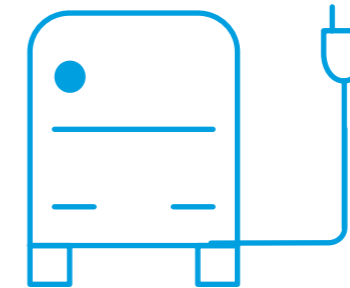
Beyond procuring a modern system to aid transport planning, the main reason for the company's interest in DIVA was the various tools that can be used for optimization. In a first step, MENTZ had to prove that DIVA could be used to perform automated and optimized vehicle and duty scheduling while accounting for various measures that would reduce emissions.

If emissions are to be reduced by using low-emission vehicles, the DIVA vehicle schedule optimization module can be parameterized to favor electric buses or hydrogen vehicles over their diesel counterparts. Parameters can be set for the vehicle's charging capacities and the management of charging options in depots or enroute in the optimization's background system. The occupancy of charging stations and required reserves are taken into account, along with the non-linear charging of vehicles.

Various charging scenarios can be calculated to reduce NOx exhaust by adding or removing charging options at final stops. "Classic block optimization" seeks to maximize productive kilometers and reduce vehicle use. In contrast, this new type of optimization finds the optimal solution for the part of the electric fleet of the overall operation from the scheduled workload. Currently, the resulting workload may require a higher frequency of empty runs when compared to conventional drives. That said, the lowest possible frequency of empty runs still remains a partial aim of the calculation.

Based on this parameterization, the DIVA system and its optimization framework GENiOS help directly limit release of nitrogen oxides. This is mainly due to the fact the resulting schedules are realistic and drivable. But it is also because they can be implemented on short notice through direct integration into the planning cycle.

In the long term, DIVA's version management also helps prevent nitrogen oxides from entering the atmosphere. Network versioning technology allows for independent planning statuses to be created in which basic network architectures can be modified. This feature also comes in handy when additional low-emission vehicles are commissioned, such as trams, or when different vehicle sizes need to be simulated.

The complete range of operational planning products, including optimization, is available for these kinds of planning network versions. Even the general costs of planning based on comprehensive vehicle and duty scheduling for the network can be determined. This is all offered in addition to the options to reduce pollutants. Mainz Mobility was faced with the immediate task of integrating the first 4 electric vehicles into its fleet and using them in their daily operations. The baselines for range, battery capacities, and charging infrastructure (depot charging) were known. Not only did the new vehicles have to be scheduled, but vehicle scheduling for the entire fleet needed to be optimized, as did the duty schedule.

This particular challenge was solved using DIVA software and the GENiOS optimization module.

We proceeded as follows:
The route options and possible empty runs of the routes tagged to be served by electric buses were routed along actual roads using a route network graph (imported from OSM data). Lengths and trip times thus refer to routed (georeferenced)

segments and not to linear distances. The WGS 84 coordinates were converted to a Web Mercator projection (MRCV = EPSG:3857) for display on an OSM background map in the DIVA journey planning modules.

On this basis, optimization was parameterized for the different tasks.

A 3-step optimization was performed to account for different priorities. This involved solving the scheduling of e-buses first and the rest of the vehicle scheduling second. Based on these two results, we performed the duty schedule optimization last.
In addition to the input data provided by the Transport Authority of Mainz, DIVA had to calculate the number of empty runs required to consistently schedule all vehicles.

The system is able to calculate the empty runs in terms of distance and time routed, and thus to provide precise, but realistic results.

The importance of precisely calculating the number of required empty runs is clearly visible in a city like Mainz that has a river running through it, especially when compared to pure linear distances, and should achieve the closest possible approximation to reality using a specified factor. In addition, we modeled the indicated charging stations and made the following technical assumptions.

Charging will only occur at the depot, with a handling of one minute, meaning the time lost during the whole procedure in addition to the actual charging of the vehicle. We have assumed the charging speed to be consistent based on the specifications. A vehicle's minimum remaining range is ensured before charging is initiated. When checking a vehicle's range, it is important to not only consider the specific operating day. E-buses also need to operate on their routes the following day.

In order to achieve the highest possible productive kilometer performance for e-buses, the variant is used where the vehicles operate an identical route on the following day, but do not have to guarantee being 100% fully charged at the beginning of the day.

DIVA supports several variants, including a requirement in which e-buses must be fully charged at the end of each operating day, or at the beginning of the same route on the following day.

A noticeable feature of GENIOS' solutions for the 4 electric blocks are the long depot exit trips. Based on the goal of scheduling "as many productive kilometers as possible," the algorithm selects the longest routes options that run from the countryside into the city, and which make for the shortest possible distance to the depot when a capacity limit has been reached.
As described above, the parameterization of the e-bus block was optimized in a man-

ner that allows them to get to a depot for intermediate charging and then to charge their batteries accordingly.

This scenario can be set for linear or staggered charging.

Using this technology, not only can e-buses be used multiple times a day, but simulations can be performed in which charging devices are installed at end points. The occupancy of charging stations is taken into account when creating vehicle blocks. Double occupancy of a charging station is not permitted.

DIVA's optimization module also accounts for timetables and does not maintain set charging times or specific charging states that need to be achieved. It calculates the charge required at this station based on the timetable and the distance to the next charging station.

The Mainz Public Utility Company successfully introduced the DIVA planning system in 2022. Currently, multiple GENIOS configurations are being jointly created by MENTZ and Mainz Mobility, and tested in live operation.
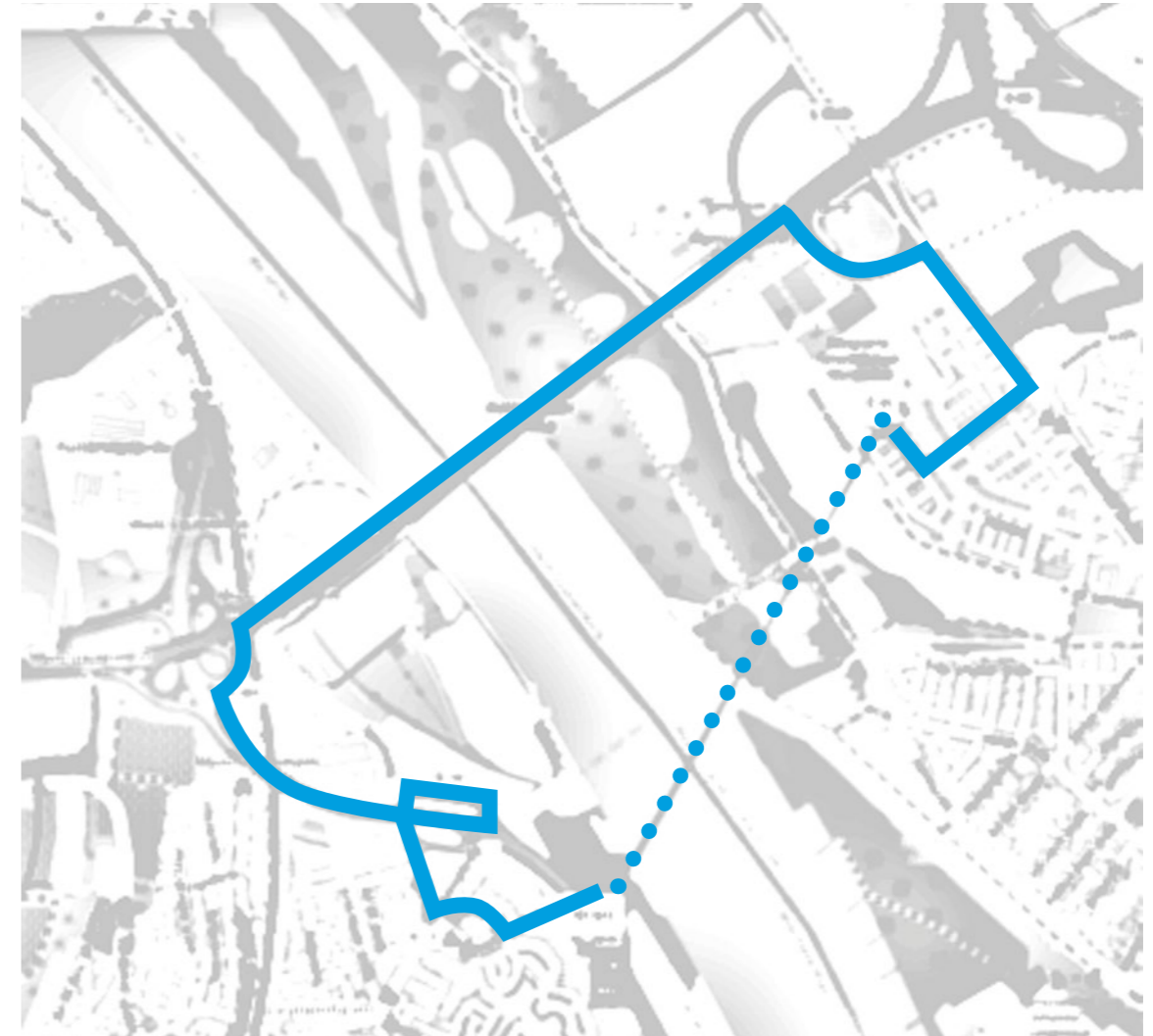

Figure 1 DIVA Web routed empty trip (solid, 4.7km) between Rüsselsheimer Allee and IGS Mainspitze compared to the linear distance (dotted, 1.4km)

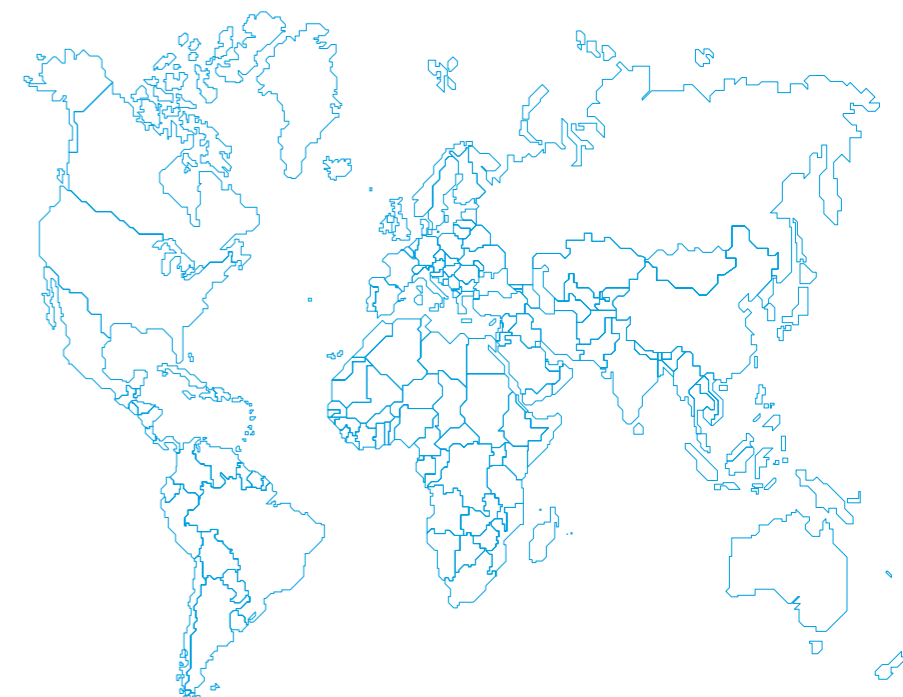**Figure 2** Map display of an e-bus block on the DIVA Client map

MENTZ WORLD WIDE

But what is a global ID exactly?

A global ID is a unique code that identifies various elements in public transport on a global level. These elements can be routes, stops, or trips.

They are used when data from different systems needs to be connected, like when importing and exporting data. In MENTZ systems, this mainly applies to the large DIVA installations where data is maintained across numerous subnets and countries. Use of global IDs can significantly reduce the amount of work required by data managers.

Global IDs also play an increasingly vital role in real-time data processing. Real-time data are supplied by external AVMs, but still have to match the TARGET data of the internal system. This process requires translation files that have to be manually maintained. It is both overly time-consuming and a potential source of error that can and should be avoided.
Most our customers are already quite familiar with global stop IDs, which have been used successfully in data maintenance for several years. When global stop IDs are properly maintained in the TARGET and ACTUAL data, it removes the need to maintain a metadata file to map stop IDs from automated vehicle monitoring systems (AVMs) to IDs used in the EFA journey planner.

In the future, the need for a metadata file for route assignment could be similarly removed when a global route ID is used in scheduled public transport services and train lines. If the trip IDs are also globally defined, trips can be more easily identified across different systems.
However, this scenario still needs to address whether, and in which cases, trips can be assigned the same ID on different days.

The situation becomes relevant if global IDs are to be used in connection with publishing TARGET and ACTUAL data in GTFS (R) format: specification already requires that the TARGET data (GTFS) and the ACTUAL data (GTFS-R) use the same IDs for stops, routes, and trips. In MENTZ systems, we resynchronize real-time data with the GTFS TARGET data before supplying it in GTFS-R format using our EFA-Feed programs to determine the proper identifiers. Using global IDs could eliminate the need for this process if the global IDs are recognized directly in EFA. The only problem is that the GTFS specification requires trip IDs to be unique for all timetable data in the dataset. This requirement is stricter

DIFFERENT COUNTRIES, DIFFERENT SYNTAX

than the one that stipulates uniqueness only within operating days, which some countries have already agreed to (see below). In such a case, trip IDs other than the global trip IDs have to be used in the GTFS data and some technical modifications are required in EFA products.

Pilot projects and other conceptual efforts have recently been initiated with several customers to make DIVA and EFA fit for comprehensive processing of global route and trip IDs. Figures 1 and 2 show how the global route IDs should be the same in both the ACTUAL data (VDV454 real-time message) and the TARGET data (Diva Web).

But until these global IDs are fully integrated in MENTZ products, several political hurdles still stand in the way, like defining a uniform syntax. One thing is for sure: different countries – different syntaxes!

The implementation and use of global IDs may sound relatively simple in theory, but the opposite is true in practice. There are different national and international standards for the most important data objects The Swiss have been particularly ambitious in defining their global IDs. The IDs have even made it into the SKI roadmap, which seeks to improve the planning reliability of public transport in data exchanges for timetable, real-time, and incident data. By 2025 (as of 2021), even the Swiss trip IDs should be fully migrated to the Swiss real-time and timetable data.Our Swiss customers are set to be the first German-speaking customers to provide a global trip ID.

As a topic of interest, global IDs are rather dynamic and it remains to be seen what developments will come next. Be assured that MENTZ will keep you up to date.

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