



## THE DEPOT AS THE CONTROL CENTRE

Planning is an essential part of deploying any fleet efficiently

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**E-mobility is transforming transport operators' planning requirements. Whether it is vehicle working schedules or charging processes, tasks are becoming more complex both on the road and in the depot.**

The introduction of battery-powered e-buses is causing a real headache for many transport operators. This is not only due to the low range of these vehicles compared with diesel-powered buses – as fleet management requirements grow, so too does the complexity of planning and dispatch operations.

“Before transport operators can deploy electric buses across the board, they need to address the repercussions on day-to-day operations,” explains René Rothe, e-mobility product manager at IVU. “Ideally, they should perform a comprehensive feasibility analysis before any tangible plans go ahead and assess the impact that individual changes will have on the company in a financial and operational sense.”

Determining which parameters will have the biggest impact requires high-performance mathematical algorithms such as the planning and dispatch solutions offered by IVU.suite. In addition to optimising ongoing operations, these solutions also allow transport operators to calculate different scenarios such as the number of e-buses required for an existing vehicle working schedule and the consequences for duty sche-

duling. This enables them to accurately assess any costs that might arise – and improve their efficiency in advance.

#### A control system for the depot

The creation of heterogeneous fleets is also transforming process administration and management in the depot. This is because existing processes are mostly designed around diesel vehicles and do not accommodate the requirements of e-buses and their long charging times. Which is why it is important for transport operators to make their depot processes transparent and clearly structured if they are to deploy all vehicles as efficiently and cost-effectively as possible. What they need is a control centre for the depot.

“Parking dispatch is one of the core tasks of a depot control system – particularly when electric buses come into play,” explains René Rothe. “Ultimately, it comes down to utilising a scarce resource as efficiently as possible to avoid process disruptions and ensure reliable operations.”

This is the reason why IVU.vehicle, for example, links depot management directly with vehicle working dispatch. This allows dispatch managers to allocate parking spaces straight away and factor in charging times for electric buses. They can also see immediately when a vehicle is blocked due to a scheduled or unscheduled





Matthias Rust, CTO

**Dear readers and IVU customers,**

It suddenly seems as if everything is changing. E-mobility is transforming our industry more than other technologies that have come before. Transport operators are having to adapt processes that have been in place for decades, completely redevelop their plans and reconfigure whole depots. The specific repercussions are only just becoming clear.

One thing's for sure: the importance of the depot, which has long been the mainstay of all transport operations, will continue to grow. Everything now depends – more than ever before – on perfect timing. It is no longer enough to simply manage processes locally. The modern depot needs to be integrated into overall plans. Which is why our cover story in this issue is devoted to the depot as the control centre.

When it comes to battery technology for electric buses, there is probably no better expert than Prof. Sauer from RWTH Aachen University – which is why some media outlets are already calling him the “battery pope”. In the interview on page 3, he talks about the current state of the art and takes a look at the future of e-mobility. This issue also contains lots more new information about our projects and developments.

You will get an advance opportunity to check some of them out on 18/19 March 2019 at our user forum in Berlin. I look forward to meeting you there and talking with you about the future of transport!

Best regards

Matthias Rust

maintenance stay and is not available for vehicle working schedules. Depot management normally decides how to allocate parking spaces automatically.

**Charge and energy management**

The question of where drivers parked their buses may have played only a minor role in the past, but it is now an essential consideration for electric vehicles. The time required to charge an electric bus exceeds the time it takes to refuel a diesel bus many times over; in addition, the position, output and number of available charging stations are restricted. Operators therefore have to plan precisely when each vehicle needs charging to ensure that it is available for upcoming vehicle working schedules.

Nowadays, this planning usually takes place the day before. This is because the limited grid capacity means that a depot has only a certain amount of the maximum energy or total purchase volume available to charge electric buses. The charging capacity therefore has to be managed accordingly throughout the day. If changes occur during day-to-day operations, plans have to be rethought. The control centre for the depot is a real-time system – just like an ITCS on the road.

An integrated system is especially ideal for this, as René Rothe emphasises: “Depot processes are always interconnected with vehicle working schedules. This determines where a vehicle goes and when it is charged. So it makes sense to integrate this specific control system into the dispatch environment.”

**Coordinating with the maintenance workshop**

Even the maintenance workshop is now playing a part in daily and weekly dispatch processes. Both sides are only able to respond quickly, such as in the face of short-notice disruptions, if they communicate with each other closely – and ideally digitally. Service intervals also need to be observed and maintenance capacities taken into account. It disrupts processes if a bus is currently working or is stuck at the charging station when it is scheduled for servicing. If there is any doubt, workshop employees work overtime or vehicle working schedules cannot go ahead.

This is why it is crucial for all parties involved to remain in the information loop when it comes to what the requirements are and what capacities are available. With this in mind, depot management liaises between the maintenance workshop and vehicle working dispatch. It coordinates parking times, parking spaces, workshop service intervals and vehicle working schedules – all with the aim of greater transparency. Both sides – the maintenance workshop and dispatch – know exactly at any given time what activities are planned for a vehicle and can adapt their own plans accordingly.

“A depot is like its own cosmos,” adds René Rothe. “Just like with revenue services, dispatch managers need to keep track of all movements and actions so that they can react at short notice, where required. For this, they require a suitable control system – in this case, one designed for the depot.”

THE **DEPOT** OF TOMORROW HAS ITS OWN **CONTROL CENTER**



# ‘PLANNING WILL BE MORE COMPLEX’

**Many transport operators are currently investing in battery-powered buses or are planning to deploy these soon. Is the time now ripe for this technology?**

From a technical point of view, it is. In parts of China, whole cities are now already completely electrified. However, the fact that the large European manufacturers in particular are only just commencing production could result in short-term capacity shortages.

**The range of electric buses is currently still limited. How does battery technology need to change to enable it to achieve the same range as current combustion engines?**

From an operational point of view, it is possible to make it through the day relatively well with the current ranges. If you have a range of around 200 km and manage to take the bus out of service once a day, let's say for one hour, to recharge, you can travel 400 km per day.

After all, generally speaking, not all local transport buses are on the road the entire day, but rather there are peak hours with extremely high bus frequencies and times with lower bus frequencies. If recharging is properly integrated into operations, today's technology takes you a long way already.

**Is it actually possible to fully charge a battery-powered bus in one hour?**

Yes, it is relatively harmless for the battery. Of course, the charging stations have to be designed for 150 to 200 kW, but that is totally feasible. It is also more efficient than recharging at the final stop. This would require a much higher output in an even shorter time. It would also need a charging station at every final stop. By contrast, withdrawing the buses from circulation from time to time in the course of the day would require only a handful of charging stations in the city.

**What would the repercussions for the electrical infrastructure be, if there were only electric buses left?**

From the perspective of the power grid, extremely incalculable and irregular loads are more difficult than anything else. However, more often than not it is possible to make a fairly reliable prediction on when which buses will be recharged and how often. This can also be easily integrated into energy trading. Power grid structures are always expensive if operated only at peak times. If you start to recharge the

first buses straight after the early morning traffic, you will get a very even load that can also be mapped very well to the power grids.

**For transport operators, this will mean more elaborate planning.**

Definitely, it will be more complex. Compared with today, transport operators will have more to consider and they will also have to incorporate the infrastructure. This represents at least one additional element alongside the driving times and duty schedules of the individual drivers. Of course, we also need to rethink public transport. We need new ideas and fresh intelligence to plan schedules with a 'rest time' built in for the bus. This is the challenge.

It is the role of companies such as IVU to support transport operators with the suitable tools to create this kind of intelligent schedule. In the future, I am certain that with the corresponding systems, we will see the same amount of traffic on the road as we do today.

**Let's stick to the topic of the future. When will the last diesel bus be decommissioned?**

This will probably happen sooner than you might expect. In the lorry sector, it is expected that by around 2030 battery-powered lorries will be cheaper than those with diesel engines. I think that this change will happen even sooner in the bus sector, partly because there is significant political pressure here.

Besides eliminating local emissions in city centres, electric buses have many other advantages, including the fact that they are quiet and require less maintenance, because their powertrains are much simpler than those of conventional vehicles. In local public transport, where buses are constantly on the road, electromobility is also a lot more cost effective than cars. This means the amortisation is very close to the achievable optimum.

In addition, global emissions are, of course, at issue. In this respect, it is clear that there is no alternative to electromobility.

## DR DIRK UWE SAUER

has been a professor at RWTH Aachen for over 15 years. During this time, his research on battery technology has also encompassed vehicles.

His activities include advising companies on the switch to e-mobility and the German federal government on the energy transition.



Prof. Dirk Uwe Sauer, RWTH Aachen



# PROMOTING INNOVATION

Whether ground-breaking new developments or minor technological progress – continuous innovation is a key characteristic of public transport. Which is why IVU engineers work day after day to get a head start on adapting the IT systems in buses and trains to future requirements – always bearing in mind the need to make life easier for our employees. For this purpose, they

constantly ask relevant questions such as: Is there a quick and easy process that would allow dispatch managers to create fair duties? Which new tools can be used to simplify vehicle working scheduling and what is the best way for planners to respond to short-notice changes? New solutions are continuously generated this way. We present three of them here.

## IVU.RAIL: STRAIGHTFORWARD TRANSPORT PATH MANAGEMENT

Rail transport requires long-term planning of all operational resources: Transport paths need to be ordered from the infrastructure operator, and vehicle and personnel availability needs to be checked in advance. At the same time, volatile conditions such as short-notice transport path changes throw up challenges for planners and dispatch managers. IVU.rail's integrated transport path management feature, available from release 18.3 onwards, helps them to tackle this highly complex task by allowing them to view the latest timetable (planned and published by the infrastructure operator) in IVU.rail and incorporate it into operational timetable and vehicle working scheduling.

The new module has an option for importing transport paths into IVU.rail via interfaces without any lock conflicts occurring – in other words, regardless of whether the relevant timetable data is currently being edited or not. This means that multiple users can work on a transport path without blocking the import option. The system also provides a transport path history at the same time. This helps planners to analyse transport path changes – i.e. between ordered and received transport paths or in the event of transport path updates due to railworks – before relaying them to the scheduled trains.

An integrated conflict model also makes planners aware of technical conflicts between a train and a scheduled transport path. Timetable planners can determine manually whether to adjust the train and its journeys to the transport path accordingly, enabling changes to be traced easily. The adjustment process itself is automatic, rather than having a manual process that is prone to errors and time-consuming. The graphical dispatch view displays and filters emerging vehicle dispatch conflicts automatically using a colour code. This allows dispatch managers in the control centre to keep track of current conflict situations at all times.



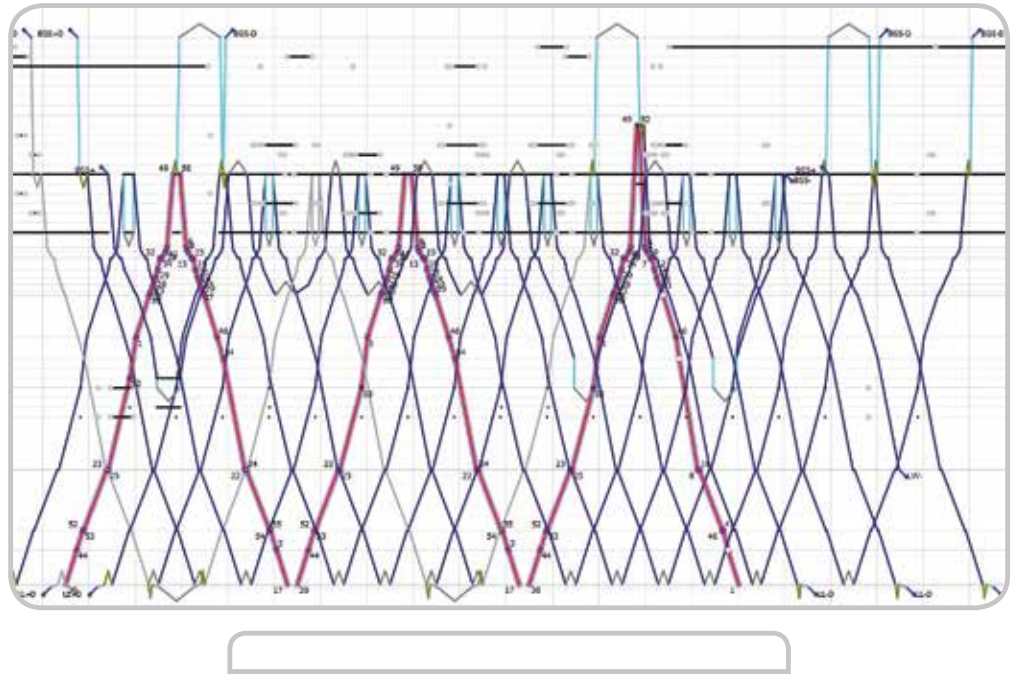
# LINE GRAPH FOR VEHICLE SCHEDULING

Efficient, fast, resource-saving: IVU.rail helps railway company planners with the entire vehicle working scheduling process – from daily train deployment through to multi-day vehicle working scheduling including maintenance and service times. There are numerous automated features, powerful optimisation components and a sophisticated rule system, which all help to make the process easier.

From release 18.2 onwards, the line graph feature of IVU.rail’s vehicle working scheduling makes planners’ work processes even more straightforward. This clearly arranged visualisation of routes and times makes it easy to edit both the timetable and the interrelationships between journeys and vehicle working schedules. Planners can ascertain the situation at terminals at a single glance, resolve crossing conflicts and gain an overview of the headway situation. In addition, the graph now also displays track and occupancy information. Various automatic features for track occupancy planning – based on rules to select tracks depending on timetable characteristics – also help planners to perform all track occupancy assignments efficiently.

The line graph can be adjusted flexibly to suit individual requirements: Stops in the stop sequences can be moved manually or automatically, colours can be configured based on various criteria, and the route axis and time axis can be interchanged. The feature also works synchronously at all times with the other graph and table views used for vehicle working

scheduling. Planners can therefore refer quickly and easily to the depiction that offers the best solution for every planning situation.



# A “TIME MACHINE” FOR IVU.CREW

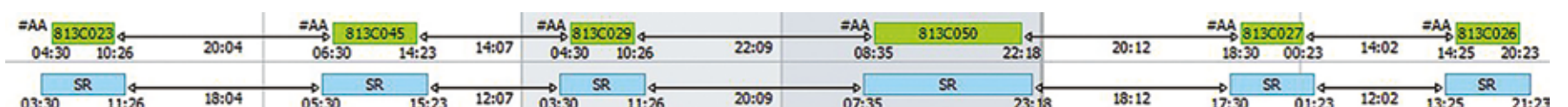
The task of personnel dispatching is to ensure that the right employees are in the right place at the right time, taking all requirements into consideration. Factors for consideration include not only individual employee qualifications, absences and duty requests, but also collective wage requirements and statutory provisions. IVU.crew gives dispatch managers a constant overview of all these requirements.

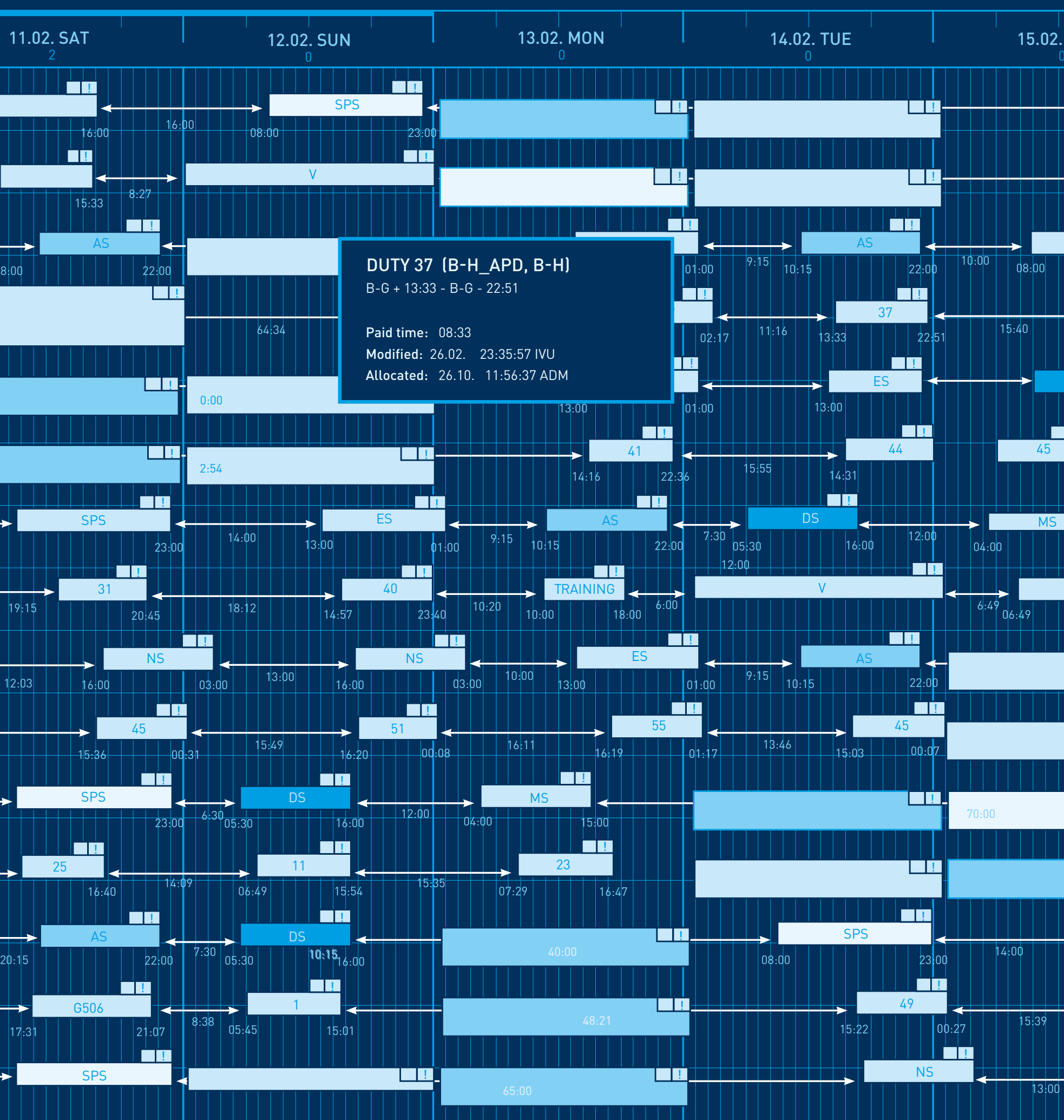
Under the current collective wage agreement, all German railway companies are obliged to inform employees of their shift patterns in advance and are allowed to make duty changes only within the framework of the specified shift pattern. IVU’s new release 18.2 for its personnel

management software now also helps operators to formulate shift patterns and duty start and end times. Thanks to freely configurable rules and the integrated rule editor, these rules can be stored directly in IVU.crew. This allows the system to make sure that the dispatched duty and previously published shift pattern are in alignment. From release 18.3 onwards, the automatic personnel dispatch function (APD) also takes into account collective agreements on shift patterns and helps to further optimise the dispatch process.

From release 18.2 onwards, dispatch managers are also able to make use of another new function in IVU.crew: the “time machine”. This makes

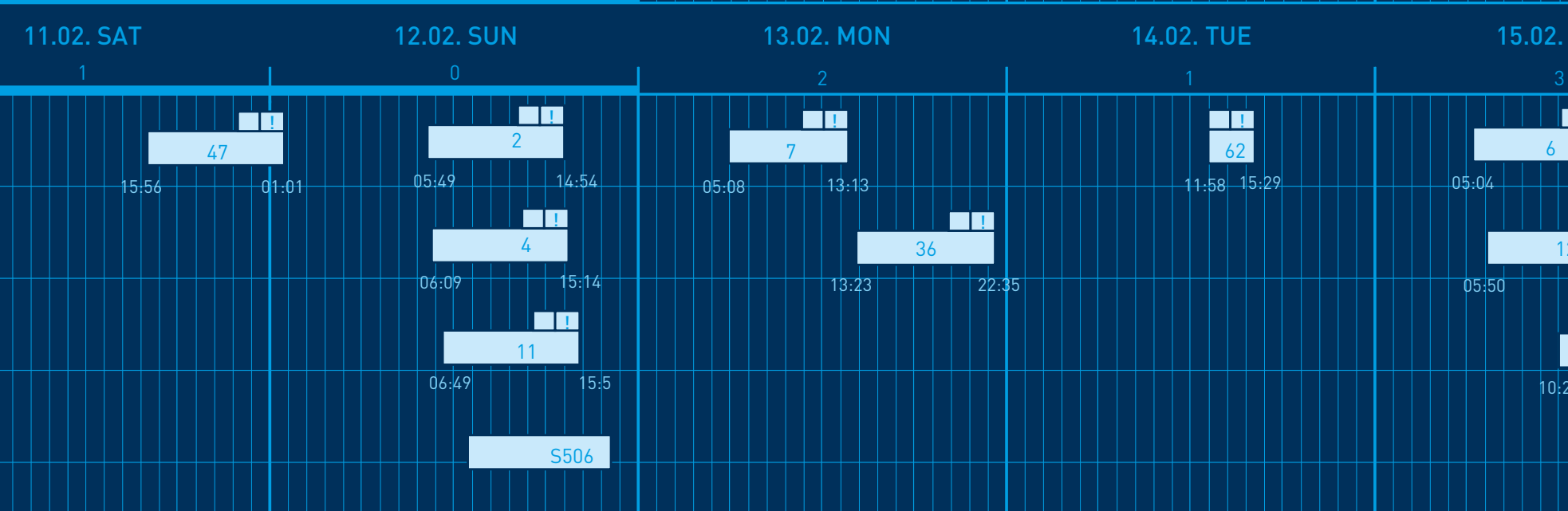
it possible to effortlessly recreate previous driver allocations based on an allocation history. This can be useful, for example, if existing allocations are overwritten accidentally during a bulk allocation process. It does not matter how far back the allocations are, and dispatch managers can also recreate allocations as a bulk operation for a large number of employees and over long timeframes.

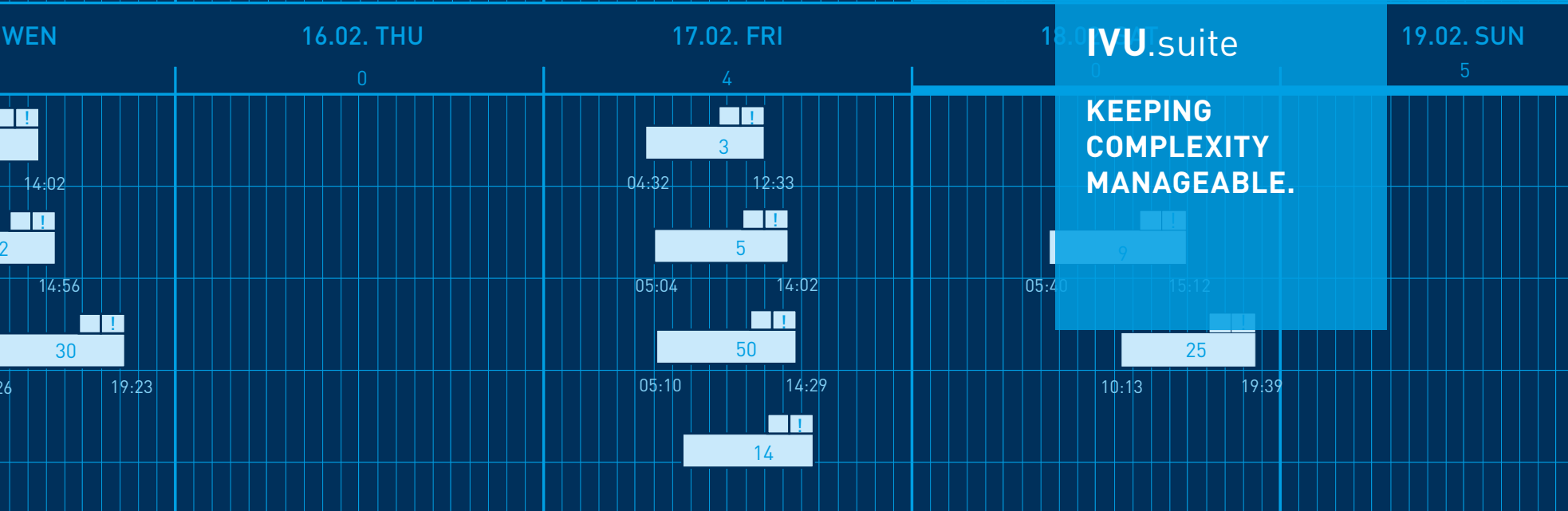
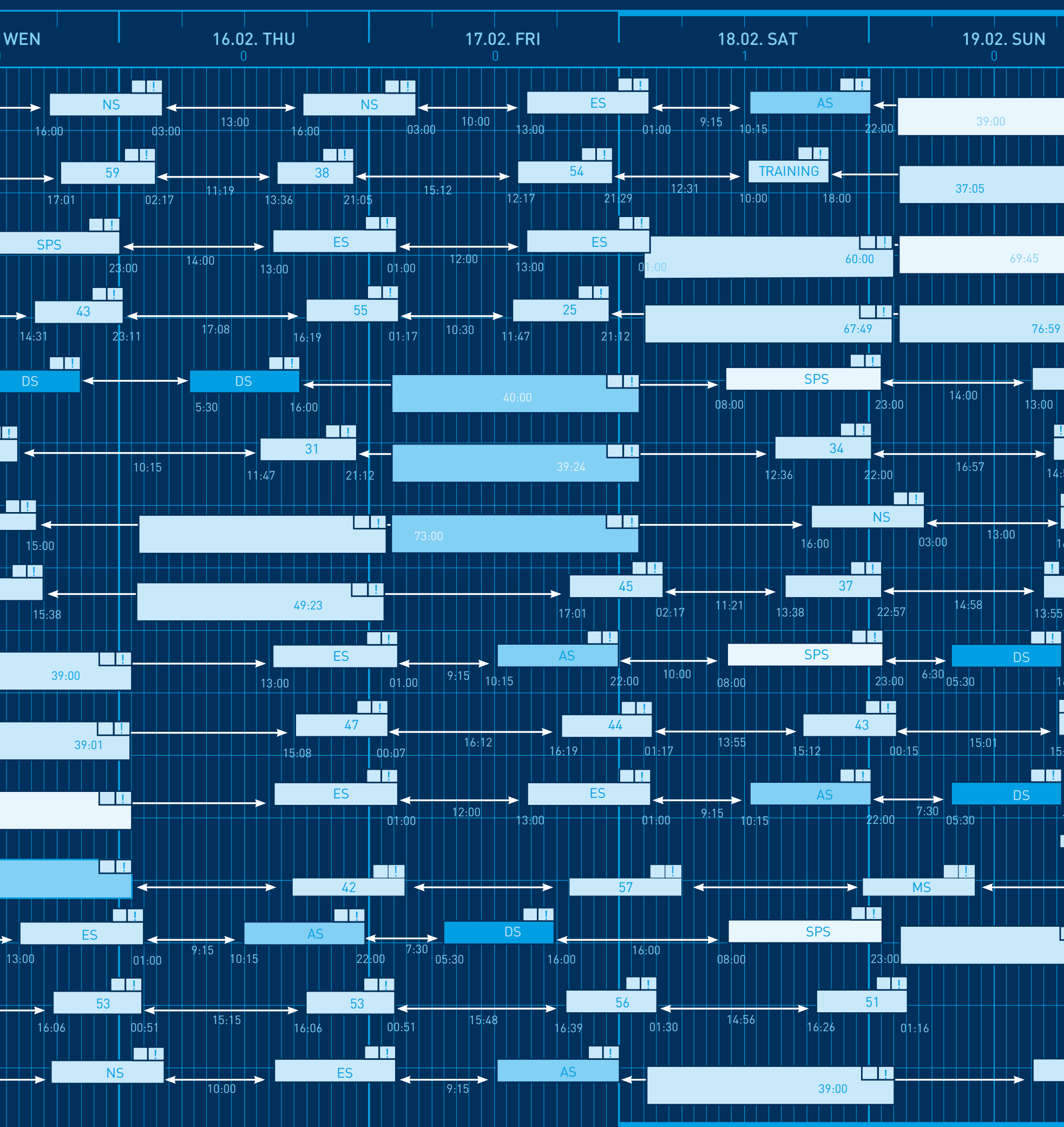




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**IVU.suite**  
**KEEPING  
 COMPLEXITY  
 MANAGEABLE.**



# TICKETING CAN DO MORE

The most important objective of a transport company is to make local transport services as attractive as possible. This includes giving passengers a convenient and transparent ticketing process. Practical e-ticketing systems for local and long-haul transport are on the rise. They not only give a much greater scope for setting fares, but are also easier for passengers to use.

Whether conventional tickets or electronic ones – IVU.suite’s ticketing products give transport operators control over ticket sales. Our ticketing devices IVU.ticket.box and IVU.validator have now received the highest recognition in the e-ticketing segment with official VDV-KA certification, and the first-ever IVU.ticket.app has been launched in Detmold.

## MOBILE TICKETING FOR DETMOLD

Smartphone instead of change: Stadtverkehr Detmold passengers can now use their mobile device to buy tickets and validate trips. This service is based on the IVU.ticket.app from IVU and UrbanThings.

Stadtverkehr Detmold operates eight routes across the city centre, conveying around 5.5 million passengers per year. Using the SVDsmart app, customers buy a ticket directly on their smartphone. When boarding, they simply hold the digital QR code in front of the reading device to validate their ticket. Customers just need to register once before making their first purchase. The company can then easily manage the accounts and invoices in the fare management system IVU.fare.

“The app has proved to be a highly attractive product for Stadtverkehr Detmold and is ideal for offering simple smartphone-based mobile ticketing,” said Wolfgang Janz, Managing Director of Stadtverkehr Detmold GmbH. “With the envisaged upgrades, the app will soon become the key element of Stadtverkehr Detmold’s digital sales strategy.” From May 2019, a check-in/be-out solution will make boarding even easier: Passengers will simply scan a code in the entrance area to validate themselves. There will be no separate ticket transaction. Instead, IVU.fare will automatically calculate the lowest fare on the basis of the best-price model.

“Our IVU.ticket.app is a simple, low-cost introduction to mobile ticketing, particularly for small and medium-sized transport operators,” says Bastian Dittbrenner, the division manager responsible at IVU. “They can use it to create a modern service for their customers, even if the transport association does not offer a corresponding solution.”

**THE MOBILE TICKETING APP WILL BECOME THE KEY ELEMENT OF STADTVERKEHR DETMOLD’S DIGITAL SALES STRATEGY**





# IVU: REFERENCE FOR E-TICKETING

Certification from VDV eTicket Service GmbH confirms that the ticketing solutions of IVU are fully VDV-KA-compliant. This means that our hardware and software is now also officially compatible with the Germany-wide e-ticketing standard.

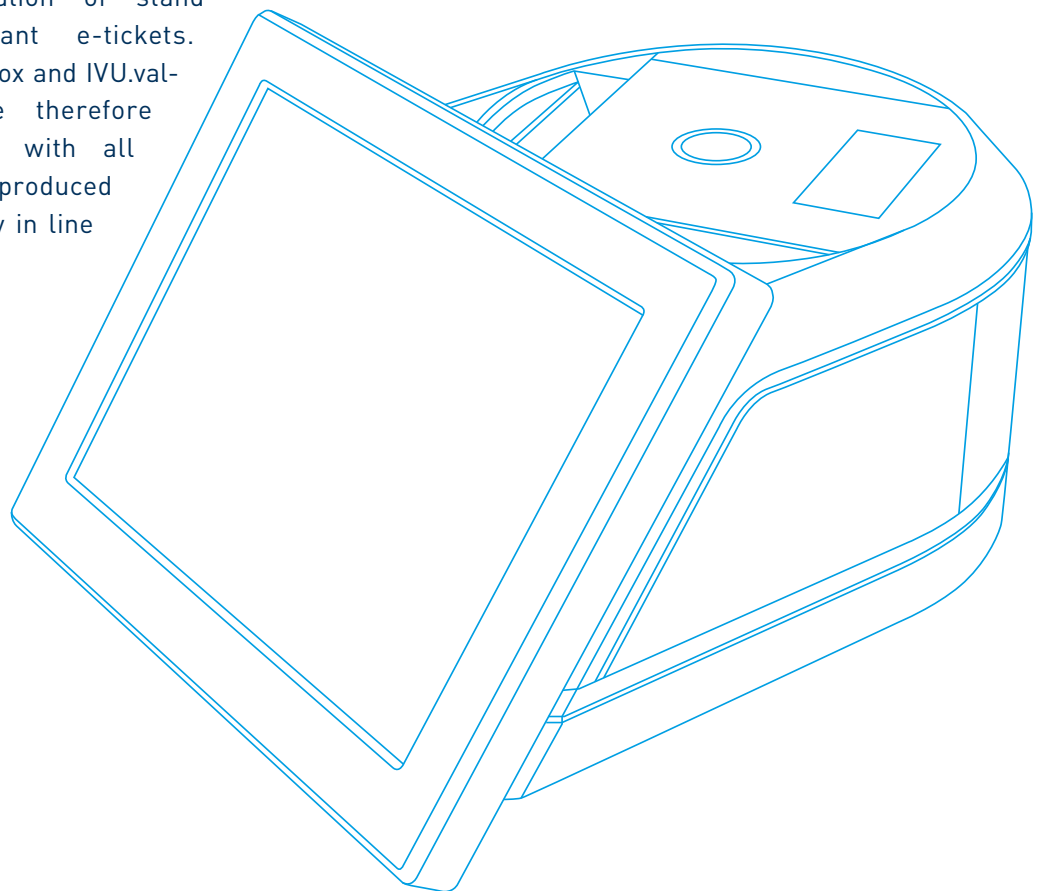
To obtain the prestigious certification, the IVU devices IVU.ticket.box and IVU.validator with the sales software IVU.ticket went through realistic applications involving the validation and issue of eTickets. They passed all tests with flying colours: from the issue of a single ticket with or without multiple authorisation to sale of express tickets as recorded trip authorisations and from cash, prepaid card and account-based payment to the validation of smart cards and barcodes – IVU solutions are prepared for every scenario.

System organisation, such as the processing of blacklists, activation of emergency keys or handling of invalid SAMs, also fully meets the requirements of the VDV-KA standard.

“Along with the associated application software, the IVU devices went through the entire certification process without any complaints,” says Elke Fischer, Head of Standardisation at VDV eTicket Service GmbH. “As a result, we successfully certified two combined devices for issue and validation of standard-compliant e-tickets. IVU.ticket.box and IVU.validator are therefore compatible with all eTickets produced in Germany in line

with VDV-KA and can be used to sell and validate them.”

Together with the central fare management and settlement system IVU.fare, the devices map the entire ticketing process at a transport operator. IVU.ticket.box and IVU.validator are inherently prepared for the use of e-ticketing and can be implemented quickly and easily – with no additional adaptations.



## QUALITY ASSURANCE VIA APP

What data does an e-ticket include? How long is it valid? Why does the reading device report an error? The eTicketinfo 2.0 app from the electronic fare management North Rhine-Westphalia competence centre provides answers.

The free app allows electronic tickets – barcode tickets and smart cards – to be read quickly and easily. All that is required is a current Android smartphone that has a camera and supports NFC. Thus, transport associations and companies as well as passengers can now check what is stored on an electronic ticket. eTicketinfo analyses the data using the VDV-KA standard and gives a structured overview of the contents. For example, users can see at a glance how long and in which region a ticket is valid and what

data is stored. This ensures transparency.

The app also allows ticket blanking data to be shown. For example, suppliers can use this to analyse defective tickets and check whether data structures conform to the applicable standards. In particular, this makes eTicketinfo suitable for quality assurance, for example when it comes to introducing new tariff products, sales systems or smart cards.

“With eTicketinfo 2.0, we are providing our partners – associations and transport operators in North Rhine-Westphalia and their customers – with a simple tool to check the data integrity of electronic tickets,” says Gabriele Dorweiler, project manager at KCEFM.

[Here you can download the app from the Google Playstore](#)



# MAKING PROJECTS A SUCCESS

IVU collaborates closely with its customers, to ensure that projects are a joint success. To achieve this aim, we plan and undertake projects on time, consulting with our customers on a continuous basis. This close collaboration benefits not only the transport operators themselves, but also – particularly – their passengers, with IVU solutions offering them better and

more reliable services. We recently added NETINERA, one of the largest private local transport companies in Germany, as a customer. Qbuzz and Busland have also expanded their collaboration with IVU of late. We take this as a huge compliment and an incentive to build on our positive and long-term customer relationships going forward.

## NETINERA CHOOSES IVU.RAIL



NETINERA, a company of the Italian national railway FS, will plan and dispatch vehicles and employees of its rail companies using IVU.rail.

As one of the largest private public-transport companies in Germany, NETINERA operates numerous regional railways, which together account for a market share of around 5% of German regional rail passenger transport. With 358 trains and more than 4,600 employees, the NETINERA Group covers 52 million train kilo-

metres per year. Switching to IVU.rail will facilitate the planning and dispatch of vehicles and employees in the future.

IVU.rail provides powerful optimisation components for this. Extensive automation and proposal functions make planners' work easier. A flexible rule system takes account of complex operational and collective wage requirements in the respective subsidiaries. In addition, a mobile employee portal incorporates staff directly in dispatch.

"We were impressed with IVU.rail: The system covers all our requirements as standard and enables a continuous work flow for our planning and dispatching," says Jost Knebel, Managing Director of NETINERA. "Thus, we are optimally positioned for the continued successful development of our company."

"NETINERA has an excellent reputation as a company with a strong quality ethos, and we are very much looking forward to our collaboration in the future," says Martin Müller-Elschner, CEO of IVU. "NETINERA's decision for IVU.rail underlines our position as the leading supplier of integrated resource planning systems for railways." As well as NETINERA, all major German rail companies rely on IVU's standard solution, including DB Regio, Transdev, Abellio and National Express.



### STANDARD SOLUTION FOR REAL-TIME DATA.

The IVU solution connects Busland to external information systems.

On electronic displays, online and via app: Since 2018, passengers of Busland AG will have access to the latest departure time information at any time and from anywhere. Within just ten months, we have supplied a complete system for fleet management and passenger information.

Busland AG operates a more than 200-kilometre long bus network with 18 routes and more than 600 stops in Emmental and Oberaargau. The company has been planning and dispatching its vehicles and driving personnel using the IVU.suite since as far back as 2014. To further improve fleet management and passenger information, we have now implemented a complete real-time data system for Busland in accordance with the VDV (Association of German Transport Companies) implementation specification for public transport in Switzerland (RV ÖV CH).

## IVU RECEIVES ITxPT LABEL

The aim of the ITxPT Association, which is part of the UITP, is to implement a comprehensive standard for IT in the public transport sector. IVU shares this vision. As one of the pioneers for uniform protocols throughout the industry, we joined the network last year. Following extensive tests, the ITxPT inspection body awarded the IVU on-board computers, IVU.box and IVU.ticket.box, the prestigious ITxPT label, thereby providing official confirmation that the IVU devices and software comply with the standard's specifications.

By codifying communication protocols and hardware interfaces in depth, the ITxPT standard makes differing IT systems fully compatible, thereby reducing the degree of risk encountered in the tendering, project planning and implementation of IT solutions for the public transport sector. IVU is sharing experiences and best practices with other members of the association in various work groups to jointly devise a standardisation strategy.



INFORMATION TECHNOLOGY  
for PUBLIC TRANSPORT

## IVU AND QBUZZ CONTINUE THEIR COLLABORATION

After taking over the Groningen-Drenthe and Utrecht regions, the Dutch transport company Qbuzz acquired another concession on 9 December 2018 – and once again it is relying on the integrated standard solution from IVU. In the concession area Drehtsteden, Molenlanden und Gorinchem (DMG) we installed a complete system for fleet management of 156 buses.

“We are convinced that we have found the best solution for our concession with the IVU systems,” explained Gerrit Spijksma, Managing Director of Qbuzz. “The quick implementation and on-time delivery in particular confirmed that we had made the right decision. Thanks to the stan-

dardised interfaces, the system integration worked without a hitch, meaning that all buses were able to commence operation on time.”

To ensure this, the IVU engineers equipped all 156 Qbuzz vehicles with sturdy and user-friendly IVU.box.touch on-board computers within just a few weeks. The IVU.cockpit control software displays the timetable situation to the driver, informs passengers and handles the voice and data communication with the control centre. The ITCS IVU.fleet provides a clear overview of the current traffic situation and the locations of all vehicles in the Qbuzz control centre and forwards all data to IVU.control for statistical evaluation.

“We have been partnering with Qbuzz successfully for a long time and we are delighted that the company has decided to use our systems again for this concession,” said Martin Müller-Elschner, CEO of IVU Traffic Technologies. “This order strengthens our position in the Dutch market and emphasises that we are ideally positioned with our integrated standard solution.”





## SAVE THE DATE

### ElekBu

5–6 Feb 2019, Berlin

### IVU User Forum

18–19 Mar 2019, Berlin

### Connecticum

14–16 May 2019, Berlin

### UITP Global Summit

9–12 Jun 2019, Stockholm

### Hypermotion

26–28 Nov 2019, Frankfurt

# AT HOME IN SWEDEN

Complex and extremely liberalised – the Swedish transport market is one of IVU’s home markets, and rightly so. Our integrated software solutions and leading optimisation components help transport companies to deploy their resources efficiently. Our Swedish customers are SJ, MTR Nordic, Transdev Sverige and Samtrafiken.

## Acquiring concessions

“Efficiency is key when competing for concessions,” explained Dr Sebastian Wahle, division manager for international railway projects at IVU. “Every additional vehicle schedule means added costs. At the same time, companies want to offer regular connections and a high-quality service.”

This includes companies such as MTR Nordic, which has been operating the Pendeltåg in Stockholm since 2016. Each day, around 300,000 passengers use this service to commute from the suburbs to the capital and back. MTR uses IVU.rail to configure trains in a flexible manner for peak hours and separate them afterwards. The integrated optimisation engine helps planners to create efficient vehicle working schedules. At the same time, the automatic personnel dispatch function ensures balanced duty schedules and helps the 1,500 or so employees handle disruption management.

SJ, Sweden’s largest national railway company, also relies on IVU’s optimisation expertise. The former state railway company operates a large section of the vast long-haul railway network, which stretches from Copenhagen to Narvik. IVU.rail’s integrated duty and vehicle working scheduling feature allows SJ to deploy vehicles

and personnel in the best way possible. Its optimisations and intelligent suggestions allow planners to maintain a constant overview – especially when faced with short-notice changes – and to quickly find solutions that are suitable and in line with the rules.

## Optimisation breeds success

Transdev Sverige is another long-haul transport operator; it operates the Snälltåget, which runs from Åre via Stockholm to Malmö – and in the summer months sometimes even as far as Berlin. The company also operates several regional train connections and bus concessions. For day-to-day train planning purposes, but particularly also for invitations to tender, IVU.rail’s optimisation function generates considerable savings by calculating extensive “what if” scenarios and helping to produce cost-efficient tenders.

Samtrafiken, too, keeps a constant eye on public transport efficiency. The service company coordinates Sweden’s entire public transport network. With the help of IVU.pool, it merges all of Sweden’s timetable data from more than 130 private and public transport companies servicing over 60,000 stops, harmonises this information, and makes it available to connected information and ticketing systems. This results in more straightforward and more efficient travel planning for passengers.

“We feel at home in Sweden,” said Sebastian Wahle. “We want to extend our activities here still further going forward. Ultimately, it always comes down to one thing: giving passengers the best service.”

## IMPRINT

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