1ntegrated

**The themed magazine for
IT systems in public transport**

The art of **digital transformation**

SMART – EFFICIENT – AUTOMATED

Integrated IT systems
for digital transformation in public transport

With over 60% of the world's population estimated to be living in urban centres by 2030, mobility will soon no longer resemble what it does today. Cities are sprawling, everyday journeys are becoming more diverse, and public transport is right at the heart of it all. In the meantime, digitalisation and artificial intelligence have become indispensable.
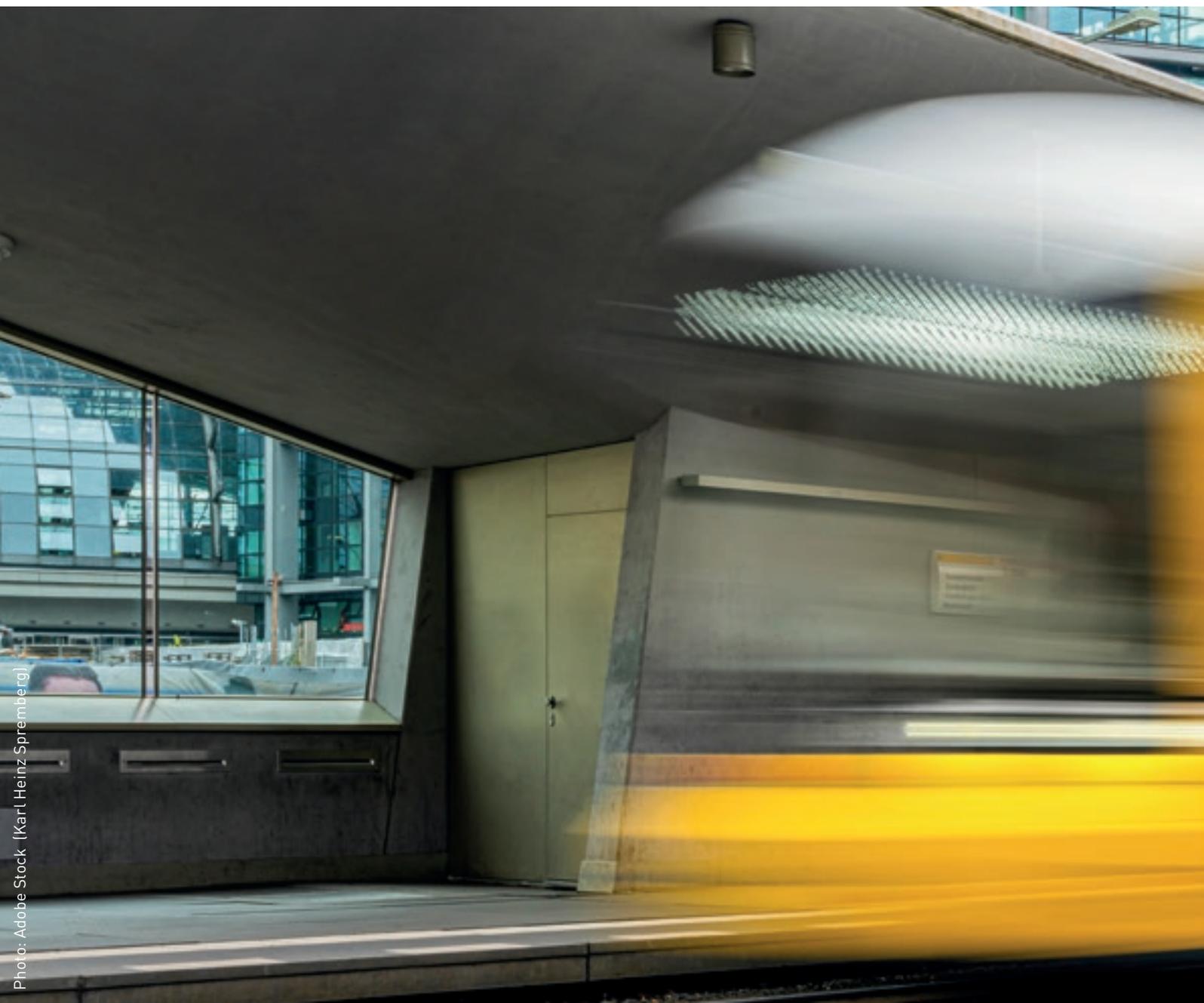
Digital solutions make fleets controllable, pool information in the control centre, and ensure that everything integrates seamlessly. At the same time, the perspective of passengers is moving even more into the spotlight: anyone who is on the go wants to board easily and reach their destination reliably – preferably contactless, intuitively and without detours.

This is precisely where our new <neo> product world comes in. As a well established software company who provides IT solutions for public transport, we are con-sistently thinking ahead in terms of digital systems. Our <neo> products rely on a cloud-first architecture and combine intelligent automation with intuitive, web-based interfaces, all while concentrating on what really matters. Our focus here is on the user's perspective.

The following articles show how these approaches are proving themselves in day-to-day operations: from automated vehicle dispatch at ESWE Verkehr in Wiesbaden, to Account-Based Ticketing at Klagenfurt Mobil, through to the latest generation of on-board computers at Bahnen der Stadt Monheim. Digital device management at Südwestdeutsche Landesverkehr and the web-based control centre at go.on also show how new digital structures are making transport companies fit for the future.

IVU. SYSTEMS FOR VIBRANT CITIES.

Overview

Data-driven thinking
How much artificial intelligence is in IVU products?

Artificial intelligence (AI) is changing the rules of the game in the development of software products. Between automation, data-driven decisions and growing complexity, the question arises as to how AI can be used sensibly without replacing proven expertise. So how is IVU using artificial intelligence today? How does the interaction between AI, optimisation algorithms and human expertise work? And where are the limits? Dr Falko Hagebölling, Head of Public Transport Development, and Bastian Dittbrenner, Head of Public Transport Division at IVU, discuss these topics in detail.

Artificial intelligence is one of the most discussed topics in the industry at the moment. What role does AI play in product development?

HAGEBÖLLING: The use of artificial intelligence is advancing rapidly. In software development, it has long been an integral part of providing support. We are able to gain good experience from simple suggestions, from new approaches for functional product ideas to deriving code from UX designs. This takes the pressure off our development team. But one thing is for certain: quality can suffer without the watchful eye of human expertise. Implementing AI in a targeted, appropriate manner is therefore crucial.

DITTBRENNER: Wherever AI is already working reliably today, new functions with real added value are arising, such as automatic translation of communication between the control centre, drivers and passengers. Messages in the passenger information system can also be generated automatically based on data available in the control centre. We are also working on assistance functions where users can input text to retrieve information or detach actions.

To what extent does AI contribute to enhancing or supplementing optimisation algorithms used in IVU products?

DITTBRENNER: Our optimisation solutions are the product of decades of development, supported by experience, mathematical excellence, and a strong connection between science and industry-specific knowledge. Of course, we are keeping a close eye on the areas where AI would be a useful addition to our procedures or open up new approaches. AI is currently no substitute for our established algorithms, but it is a valuable addition in other areas. For us, optimisation and AI are not contradictory, but complementary.

HAGEBÖLLING: The specific application always determines which solution is the right one. This is precisely where it becomes clear that AI-based optimisers require significantly more computation time and hardware resources, even with comparatively simple data models, in order to achieve similar results.

This is neither economical nor sustainable. We are therefore monitoring this development very closely. As soon as definite added value is yielded for our customers under realistic conditions, we will integrate appropriate approaches directly into our products.

Where does IVU rely on internal AI use to streamline processes and simplify collaboration with customers?

DITTBRENNER: We started to implement AI in our internal processes early on. One example is an IVU chatbot that helps us to find the right information fast in extensive documentation and knowledge sources. AI also relieves our experts when it comes to creating documentation.

HAGEBÖLLING: Early deployment was important to develop a realistic understanding of the strengths and weaknesses of AI in addition to efficiency gains. We are currently working on further chatbots for customer service, which will be enriched with IVU-specific knowledge. However, these solutions will only go live in the company once we can ensure that issues such as hallucinations are ruled out. Reliability is our top priority.

What expectations or requirements do IVU customers have regarding AI use and how does product development fulfil these requests?

HAGEBÖLLING: During conversations with our customers, we find that they share our fascination for AI and want to utilise the opportunities that are available today or in the foreseeable future. Simultaneously, they are very aware of the challenges, whether from their own experience or from the discussion surrounding the topic. As a reliable partner, we evaluate opportunities and risks on the basis of our industry knowledge and IT expertise.

DITTBRENNER: The decisive factor is that customers can benefit from competitive advantages at an early stage without taking unnecessary risks or incurring unnecessary costs. Common prototypes, internal testing of new technologies and developing targeted AI solutions exactly where they provide tangible technical assistance, have proven their worth. $\rightarrow$

How can AI and human expertise work hand in hand to make mobility smarter?

DITTBRENNER: AI can significantly simplify access to complex systems, potentially even using natural language. This shortens training times and speeds up productivity amongst new personnel. Simultaneously, AI processes enormous amounts of data and takes into account numerous influencing factors, which significantly improves forecasts for individual or entire travel chains.

HAGEBÖLLING: We see similar effects when systems learn from past situations and derive suggestions based on large amounts of data, for example in the event of a disruption or to control the prompt in on-demand transport.

What opportunities and developments do you expect from using AI – both for IVU and for the entire public transport sector?

HAGEBÖLLING: The development of AI over the past few years has been astonishing. Supported by a high level of attention and extensive investment, new opportunities are constantly arising, for example for greater efficiency, targeted support and faster implementation.

DITTBRENNER: I also see great long-term potential, for example in improved occupancy of transport services, optimal deployment of electric buses or the control of autonomous fleets. There are also topics such as fraud prevention, security technology, and intelligent parking space planning for complex depot situations. But we shouldn't focus too much on current boundaries. Computer specialist Roy Amara put it aptly: "We often overestimate what technology can do in the short-term and underestimate what it will change in the long-term." AI will continue to develop strongly, but we will still need real buses, real trams, and real experts with natural intelligence.

Dr Falko Hagebölling has a doctorate in communications engineering and has acquired a deep technical understanding and a broad view of complex systems in his professional life in various roles as a developer, to an IT and organisational consultant, to CIO. Building on this experience and enthusiasm for public transport, he leads the development of the Public Transport business area as a member of the Managing Board.

Bastian Dittbrenner has a degree in industrial engineering from TU Berlin and has been working for IVU in various positions for 20 years. His experience from numerous digitalisation projects for bus and rail, in cities, regional and long-haul transport, in Germany and abroad, as well as with the entire IVU product portfolio, gives him a comprehensive view of the transport industry as Head of the Public Transport Division.

Intelligent depot and charging management
at ESWE in Wiesbaden

Implementing electromobility takes more than just purchasing new e-buses. It requires foresight, team spirit, and digital tools in the background. ESWE Verkehrsgesellschaft mbH in Wiesbaden shows what is needed if change is to take place on more than just paper. In an interview with Managing Director Marion Hebding, we find out how this is achieved and what role integrated depot and charging management plays in this.

Electromobility not only means a change in technology – it changes entire operating processes. Why is the switch to e-mobility so central to ESWE Verkehr and how are you shaping this transformation process in concrete terms?

For ESWE Verkehr, the switch to electromobility is an integral part of our company's strategy. As a municipal transport company, we are adopting an exemplary role for the state capital Wiesbaden and

making a central contribution to the urban climate and sustainability goals.

For quiet and emission-free public transport, we are combining the expansion of the charging infrastructure with a forward-looking depot concept and consistent further development of our operating processes.

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For this transformation to succeed, we need highly trained employees and transparency about what is happening in the company and the situation in the depot so that we can organise the change step by step while keeping an eye on daily operations.

The interaction between charge scheduling, vehicle dispatch, and operational deployment is complex. What support does IVU's integrated depot and charging management system provide to seamlessly control these workflows?

The integrated depot and charging management system is the central control centre for our daily operations management. The system combines charging requirements, vehicle working scheduling, and vehicle availability. This makes it possible to precisely control which vehicle charges when and where – tailored to its range, vehicle type, and the current network load. The software automatically suggests suitable charging windows and parking spaces, making everyday life much easier for our employees.

Video about depot and charging management at ESWE.

Simply scan the QR code:

The close integration between the on-board computers and the IVU.pad employee app also simplifies daily work: parking spaces are assigned automatically and damage can be reported to the control centre while the trip is still ongoing. This means that the maintenance workshop knows where it is needed before the vehicle returns. Simultaneously, the system enables predictive operational control, for example if bottlenecks or deviations become apparent at an early stage.

How does the digital control centre solution make everyday operations management easier and what added value do your teams experience in daily operations?

The largest added value of the digital control centre lies in its transparency. It provides a full picture of the current operating situation of our bus fleet at all times. Disruptions, vehicle availability, and states of charge with accurate range forecasts are centrally bundled and visible at a glance. This allows our employees to react in a targeted manner, swap vehicles or adapt load times. Communication with driving personnel and the maintenance workshop takes place in the IVU system directly, which reduces the number of prompts and makes action faster. This increases operational safety and ensures more reliable timetable planning, which is also felt by our passengers.

A particular advantage for the availability of the electric bus fleet is the forward-looking charging forecast. Even if a vehicle does not send a signal temporarily, the system remains able to act: it provides calculations using the last known value and incorporates it into planning. This allows the control centre to maintain an overview at all times and dispatch more safely. →

ESWE
VERKEHR

Employees: **approx. 1,100**
Vehicles: **270 busses (119 e-busses)**
Distance of bus routes: **approx. 700 km**
Passengers: **approx. 59 million per year**

IVU's integrated system landscape creates the basis for highly automated vehicle dispatch.

What is your goal with this and what difference will it make to the company in future?

Our goal is not only to manage electromobility intelligently, but also to integrate our entire fleet, from electric to diesel buses. The foundation for this is a common database in connection with an integrated positioning system. This allows us to keep track of all vehicles in the depot and line operation. Messages back to the control centre as well as duty and vehicle working information can be prepared quicker and simpler in future. This saves time, reduces misunderstandings and promotes acceptance among our drivers.

At the same time, we are testing and continuing to develop integrated vehicle working scheduling in order to optimise vehicle workings with system support and make vehicle deployment even more efficient. The standardised database enables decisions to be made and changes to be communicated clearly.

In the long-term, ESWE Verkehr is expanding its future-proof system, which optimises the use of resources, automatically resolves conflicts, simplifies communication and ensures that every vehicle is in the right place at the right time – regardless of its propulsion system.

Photo: ESWE Verkehrsgesellschaft mbH (Jana Kay)

Marion Hebding has a degree in public administration and has many years of experience from various management positions in the Deutsche Bahn Group, including as Managing Director and Head of Human Resources at DB Regio Bus Mitte. At ESWE Verkehrsgesellschaft mbH in Wiesbaden, she was initially responsible for the commercial departments, and since December 2023 she has been the sole Managing Director and also responsible for the operational and technical departments.

Ticketless bus travel
Klagenfurt relies on Account-Based Ticketing

Paper is a thing of the past, fare zones are history: public transport in Klagenfurt is breaking new ground. Klagenfurt Mobil GmbH (KMG) relies on an Account-Based Ticketing (ABT) system that makes access to public transport as simple as boarding and alighting the bus itself. In this interview, Managing Director Hansjörg Schusser talks about the path to implementation, IVU's role, and how the system supports the shift towards modern mobility services.

How do you see the future of ticketing in public transport?

Ticketing is about to change fundamentally. We are saying goodbye to the classic ticket and moving in favour of a digital, invisible companion that makes mobility as simple as possible. The system automatically recognises who is travelling and calculates a suitable price afterwards. Fares, zones or apps are no longer relevant – technology is taking over.

What prompted the public transport operator Klagenfurt to opt for Account-Based Ticketing?

Residents of Klagenfurt are on the move in diverse ways: some people commute daily, others spontaneously hop on the bus or combine different modes of transport. This vibrant mix requires a ticketing system that adapts to people's behaviour. Account-Based Ticketing enables exactly that. It puts the needs of passengers at the centre and works in the background in a flexible, reliable and simple way.

We as a transport company are also benefitting from the changeover. Ticket sales will be less complicated, and inspections more efficient. At the same time, thanks to anonymised data, we are learning more about how our passengers travel and can target our services more precisely. This makes public transport more attractive. Travelling by bus is not only becoming easier, but also more sustainable: less paper, fewer resources, each trip a little greener. I am convinced that ticketing systems like this are a key to the mobility of tomorrow.

How do you involve passengers and employees in the implementation of ABT?

For us, the introduction of Account-Based Ticketing is far more than just a technical project. It is a joint process of change. That is why we rely on timely, clear and transparent communication on our buses, the website and social media.

Our passengers can try out the new system in a test phase before the start and give feedback. Highly trained employees are on hand to answer any questions with straightforward materials and personalised advice. Flyers, short videos and FAQs provide additional help to minimise any initial hurdles.

How does ABT change access to public transport for customers?

Above all, it's getting simpler. If you travel by bus in Klagenfurt, you do not need to worry about fare zones or ticket types in future. Passengers can board, check in, and set off.

All trips appear in an overview in your personal customer account. If you want to set off spontaneously, simply board the train without purchasing a ticket beforehand. And because we don't want to exclude anyone, cash payment and classic tickets are still an option.

For the technical implementation, you rely on one of IVU's software solutions. What were the most important criteria when selecting the system?

It was crucial for us that the software system was reliable, secure and customer-friendly. It must integrate seamlessly into our existing workflows. Equally important was data protection. Handling sensitive customer data requires care and responsibility. Simultaneously, user-friendliness for passengers and employees plays a large role. IVU has the necessary expertise for this. Its many years of experience in public transport convinced us. We have a partner by our side who speaks our language and is reliably accompanying us on our path to digital mobility.

Since September 2023, **Hansjörg Schusser** and Wolfgang Hafner have jointly managed Klagenfurt Mobil GmbH (KMG). Schusser's specialist background in the transport industry and transport technology, supplemented by further education in production, logistics and environmental management at the University of Klagenfurt, lays the basic foundation for his task: to make KMG fit for the future.

Photos: Klagenfurt Mobil GmbH (Madlin Peko)

Employees: **approx. 300**
Vehicles: **82 busses**
Distance of bus routes: **272 km**
Passenger km: **approx. 32 Mio.**

Control centre to go.on

From individual solutions to a system with a mobile control centre

As a private mobility provider in Ostwestfalen-Lippe, go.on Gesellschaft für Bus- und Schienenverkehr mbH transports around 7 million people safely through the region every year, deploying more than 500 buses to do so. At the start of 2025, the public transport company switched its IT landscape to the IVU.suite, relieving it of various individual solutions. The new web-based control centre IVU.fleet [essentials] has recently been added to complete this system and creates new possibilities for daily operations. In this interview, Dirk Hänsgen, Managing Director at go.on, explains why an integrated system is so impressive in day-to-day work and why the new web-based control centre fits in particularly well with the decentralised structure of his company.

Dirk Hänsgen was born in Paderborn in 1966 and managed his parents' bus company for 22 years with revenue services, occasional trips and journeys. Since 2018, he has headed the go.on Gesellschaft für Bus- und Schienenverkehr. In 2025, he also began managing ArGe ÖPNV Gütersloh with around 160 vehicles.

Employees: **approx. 800**
Vehicles: **500 busses**
Number of bus routes: **250**
Passengers: **approx. 7 million per year**

The switch to the IVU.suite signifies an important step in go.on's digital development – away from individual IT solutions and towards an integrated system. What tipped the scales in favour of this decision?

The starting signal was given when the company won a tender in the Gütersloh district. The allowance for regional bus transport not only opened up new routes for us, but also the opportunity to re-organise our IT landscape. Instead of continuing to work with a wide range of individual solutions, we made a conscious decision in favour of an integrated system. The components interlock seamlessly because they come from a single source as an end-to-end IT solution. In this way, we avoid disruptions in the interfaces, facilitate integration, and create the foundation for a digital operating process. Almost all modules are now live. Next, we would like to expand cashless payments and integrate automatic passenger counting systems to continually improve our processes.

With these projects, you can continue to develop your digital processes step by step. The next step is to introduce the web-based control centre solution IVU.fleet [essentials]. This enables flexible, location-independent work in the control centre. What prompted you to expand your standing control centre with this compact version?

Our company structure is decentralised. In addition to the central control centre, route bundle managers coordinate daily transport in various regions. We have introduced four web-based control centres so that they have quick access to current operating data at all times. IVU.fleet [essentials] fulfils precisely this need and supports the teams on-site. In addition, new tenders always demand digital read permissions for ITCS systems. This is another reason why we rely on this flexible solution, which enables access from anywhere.

Digitalisation is not only changing systems, but also ways of working. How are you guiding your employees in this change process?

Change only succeeds if people are supported in the process. This is especially true when well-established processes suddenly work differently. We therefore rely on structured online training courses to provide our employees with targeted support. The changeover to IVU's digital solutions went smoothly overall. Only the data migration and connection of external interfaces were time-intensive. Our employees found their feet quickly and are now routinely working with the new system. We are currently just about to introduce IVU.plan planning software. The familiarisation process will be challenging, but we are convinced that with the right support we will also master this step.

‹neo›

The new product world

The new ‹neo› product world expands the IVU.suite with web-based IT solutions featuring intelligent automation and an intuitive user interface – for a more efficient working day in public transport.

Discover all ‹neo› products at:

www.ivu.com/**neo**

IVU.plan [essentials] – Intuitive planning tool

The compact, web-based planning tool for the entire process – from quotation to productive operation. With its lightweight architecture, intuitive operation and all essential functions, transitioning to digital planning is quick and simple.

PLANNING

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IVU.data – Smart data management

IVU.data automatically converts operating data into valuable insights. The cloud-based solution integrates, analyses and visualises information from a wide range of systems – for a comprehensive overview, better decisions and smooth processes.

ANALYSIS

**IVU.crew.live and IVU.fleet.drivers –
Flexible duty control on operating days**

This solution for efficient duty editing allows
duties to be controlled on the operating day
itself. Dispatchers in the control centre can
react ad hoc to delays, absences or operational
disruptions without neglecting the effects on
the personnel side when making decisions.

**IVU.fleet [essentials] –
Compact and mobile control centre**

The web-based, streamline control centre solution.
All control centre functions are bundled in a clear,
modern one-screen view. An integrated dashboard
provides full transparency of the current operatio-
nal status in real time.

**IVU.fleet [advanced] –
Fully equipped control centre**

IVU.fleet [advanced] is the web-based control centre
system for highly complex deployment scenarios.
The intuitive user interface equipped with powerful
functions enables vehicle operations to be monitored
efficiently. Intelligent assistants support employees in
evaluating situations and reacting quickly.

**IVU.incident –
Efficient incident management**

In the event of unexpected incidents, control
centres maintain an overview even in stressful
situations. Thanks to automatic documentation of
all measures, incident management is simplified.
The web-based solution bundles information
in a simple-to-use interface, leads employees
through all processes in a structured manner
and offers predefined actions.

eo>

■ OPERATIONS

**Account-Based Ticketing –
Smart ticketing solution**

Hop on, check in and set off. With ABT passen-
gers use a payment card or smartphone, and
accounting is completed automatically in the
background – without the need to register or
select a fare.

**IVU.realtime [advanced] –
Rapid passenger information**

IVU.realtime [advanced] automated sophisticated
passenger information. Messages are centrally
recorded, structured and displayed as detailed
passenger information. This allows increasing
requests for the scope and timeliness of informa-
tion to be fulfilled quickly and reliably.

**IVU.devices –
Central device management**

IVU.devices provides full control over vehicle
technology – web-based, centralised and mobile.
Devices and peripherals can be monitored and
controlled, and errors can be troubleshooted
remotely. For smooth device management with-
out unnecessary downtime.

Digital evolution in public transport

A glance at the new IVU product world <neo>

The digital transformation in public transport places high demands on IT systems and the employees who work with them on a daily basis. IVU is setting a new benchmark with the <neo> product world: web-based, cloud-capable and easy to use in everyday operations. In conversation with Dr Hanna Schachel and Dr Edith Olejnik from IVU's Managing Board, it quickly becomes clear what <neo> is all about: solutions for users who manage many tasks simultaneously and therefore rely on an overview, simple operation and a focus on the essentials.

Focus on user experience as a guiding principle

"The user experience is clearly at the centre of <neo>," says Dr Hanna Schachel, Head of Public Transport Projects, starting off the conversation. The colours, icons and arrangement of user interfaces follow a clear concept. The paths in the system are closely based on the actual processes in the company. "From reporting an incident to processing it in the control centre, everything is interlinked," says Schachel. Cross-product processes eliminate the need to switch between different systems.

Dr Edith Olejnik, Head of Services Public Transport, adds: "<neo> deliberately focuses on automation and simplification through intuitive operation and self-explanatory workflows." Instead of complicated workflows, buttons and display screens guide you step by step through each task. This not only makes everyday work easier, but also enables new employees to get started quickly and confidently – an important aspect against the background of the increasing shortage of skilled labour.

Cloud-first with a clear view of the future

There is a very clear guiding principle behind <neo>: web-based applications, cloud-first architecture and Kubernetes as a modern operating platform.

Photo: IVU Traffic Technologies AG (Sven Peter)

Dr Edith Olejnik (Head of Services Public Transport) holds a doctorate in economics and has been working for IVU since 2022. She focuses on excellent customer service and is therefore responsible for customer service and account component management for all bus and tram customers. Prior to this, she held various management positions in international specialist mechnical engineering.

"Our web solutions run directly in the browser, require no installation and scale flexibly in the cloud," explains Olejnik. Updates are automatically uploaded to the system, significantly reducing the effort required by the traffic company.

Schachel also confirms that this approach is in tune with the times: "A look at current tenders shows how much cloud and web solutions are now in demand. At the same time, we are experiencing how much our customers appreciate the improved user experience and easier service." The outlook is bright: the <neo> product world is growing continuously and paving the way for purely cloud-based solutions. In Scandinavia in particular, SaaS models – software that comes from the cloud and is used as a service – are noticeably gaining more importance. "We are well prepared for this with our products and want to play an active role in shaping this path," says Schachel.

Photo: IVU Traffic Technologies AG (Bernd Brundert)

Dr Hanna Schachel (Head of Projects Public Transport) holds a doctorate in economics and has been working at IVU since 2019. After holding various positions within the company, she has been responsible for the Project business for all bus and tram customers since 2024. The introduction of efficient IVU products and focussing on customer satisfaction are at the heart of her remit.

[essentials] variants for small and medium-sized public transport companies

Part of the <neo> product world modernises tried-and-tested IVU solutions. The web-based control centre IVU.fleet [essentials] is based on the established control centre solution IVU.fleet. The [essentials] variants bundle central functions, provide a clear overview and deliberately reduce complexity. In combination with hosting in IVU.cloud, the technical effort required is also reduced. "We offer a streamlined, high-performance IT solution, especially for small and medium-sized public transport operators," explains Schachel.

Simultaneously, <neo> also stands for new product offerings, such as IVU.devices for device management or Account-Based Ticketing for simple account-based travel authorisation, e.g. by credit card. With IVU.crew.live and IVU.fleet.drivers, efficient duty editing is available on the operating day. This enables ad hoc reactions to delays, absences or operational disruptions in the control centre without neglecting the effects on the personnel side when making decisions.

Positive feedback from practical experience

The first <neo> projects have been met with very positive feedback. One example is the IVU.incident incident management system, which monitors incidents in vehicle operations from the first note to processing in the control centre. Long-standing IVU customers in particular experience this closed process chain as significant progress compared to earlier structures.

The diversity of the industry remains in focus. City services, regional providers and networks of bus, rail and other mobility services have different requests. There is no single, universal product scope. "This is why it is particularly important for us to stay close to our customers during the product launch," emphasises Olejnik. Feedback from practical experience is incorporated directly into further development.

A new generation of IT solutions is arising step by step: with intelligent, automated workflows, intuitive web interfaces and the clear goal of sustainably increasing efficiency and flexibility in public transport.

Devices under control
Digital device management at SWEG

With 500 on-board computers on buses in various locations, Südwestdeutsche Landesverkehrs-GmbH (SWEG) is pursuing the goal of future-proofing its device management. To this end, the web-based software solution IVU.devices was recently introduced as part of a pilot project. In this interview, Timo Remlinger, Head of Digitalisation, Application Software and Sales Technology, talks about the role of digital tools and how digital device management should help to relieve employees and rethink processes.

Digitalisation has long been more than just a buzzword. How far along is SWEG to achieving a fully networked operating environment?

With the introduction and conversion of several software and hardware products, SWEG has launched a comprehensive digitalisation campaign and is now on target to achieving it. The tasks are complex: on the one hand, the requests from transport contracts are increasing, and on the other hand, political and ecological expectations are growing. Passenger demands are also increasing in terms of information and communication. Simultaneously, economic pressure remains high. To master this balancing act, we are completely rethinking our company's processes and expanding our infrastructure.

How do you currently manage the large number of devices that are used on board your vehicles?

This task is like walking a tightrope, especially given the large number of our locations Baden-Württemberg and over 500 on-board computers

SWEG

Employees: **over 1,800 (entire group)**
Vehicles deployed: **520 buses,**
125 rail vehicles, 6 locomotives
Head office: **Lahr (Black Forest)**

can be operated more intuitively, making daily work easier.

What do you expect from IVU.devices in daily operations?

The IT solution is planned to reduce the workload of our drivers, our maintenance workshops and our employees in the bus control centres by largely automating fault rectification and reducing the coordination effort. Simultaneously, we are creating more transparency throughout the company because relevant data is available centrally. This enables us to relieve heterogeneous legacy processes and position ourselves for the future as a centrally responsible specialist department.

If in future you can recognise and pass on disruptions or maintenance requirements during the trip, how will this change your processes?

Ideally, the maintenance workshop gets all the information it needs to repair the vehicle before it arrives and can react immediately. Some things can even be resolved remotely without anyone having to intervene on site. Today, as the responsible department, we are often the last to find out about a problem. With IVU.devices, we can break this sequence and resolve disruptions faster, in a more targeted manner, and more efficiently in future. The new device management system not only simplifies the administration of on-board computers, but also changes the communication channels and all associated processes.

Timo Remlinger studied industrial engineering at Offenburg University of Applied Sciences. He has been working for SWEG since April 2015. In July 2019, he took over as head of the staff division Digitisation, Application Software and Sales Engineering. In this position, he is responsible for all of SWEG's commercial and company software and hardware solutions across the Group.

installed. So far, this has only been possible because individual colleagues have a wealth of experience and coordination within the team works smoothly. With the software-based device management system IVU.devices, additional on-board computers and peripheral devices such as validation machines or routers can be easily integrated that need to be integrated and managed remotely.

IVU's device management relies on a web-based architecture. What advantages do you see in this?

For us as the SWEG Group, the focus is on the company's own data centre. We host our systems ourselves, so the architecture of the software is of secondary importance. We were particularly impressed by the new, visually appealing user interface design. In comparison to other software modules, this application

MODERN ON-BOARD SYSTEM SOLUTIONS
FOR YOUR VEHICLE FLEET

IVU.ticket.box

The IVU.ticket.box is the compact all-in-one on-board computer for deployment in the vehicle operation of buses and ships as well as for stationary use at ticket sales points. Thanks to the integrated ticket printer and reading device, it enables both ticket sales and ticket inspection.

IVU.box.touch

The IVU.box.touch on-board computer offers the same range of functions as the IVU.ticket.box, but without driver-operated ticket sales and ticket inspection. Thanks to its robust casing, the device can be easily mounted on a mounting plate for optimum operability.

IVU.box.panel 10"

The IVU.box.panel on-board computer was specially developed for bidirectional operation in trams as an operator terminal for personnel. In this execution as a 10-inch version.

IVU.box.panel 7"

The 7-inch version also adapts flexibly to the requirements of modern driver's cabs in trams.

For decades, IVU's on-board systems have been transforming the way transport companies operate. As the digital control centre in buses, trams and trains, they connect ticketing, inspections, control centre communication, and all relevant vehicle systems into a powerful overall solution. Our advanced technology sets the standard for effective operations and maximum customer satisfaction worldwide.

IVU.box.gateway

For buses, the IVU.box.gateway is the ideal addition for seamless networking of all vehicle components. The gateway ensures seamless communication in the vehicle, continuously converts important data and supports comprehensive vehicle control.

IVU.box.railgateway

The IVU.box.railgateway was specially designed for networking vehicle components in trams. It also enables network separation in carriage and train networks via VLAN technology.

IVU.validator

IVU.validator is a stationary ticketing device for buses and trams and enables passenger-operated ticket sales in accordance with the VDV core application and Account-Based Ticketing. Passengers can choose between check-in/check-out and timed fares. This reduces waiting times, optimises passenger flow and improves the travel experience.

IVU.handheld

The ticket inspection device IVU.handheld is a mobile ITCS solution. As a portable control terminal, it enables the validation of e-tickets and paper tickets. With the integrated card reader and an optional ticket printer, the IVU.handheld can also be used as a mobile sales terminal.

Digitalisation is not a stand-alone project, but an attitude

The on-board computer as part of Monheim's mobility strategy

Bahnen der Stadt Monheim have long made a name for themselves with their consistent digitalisation, autonomous driving and seamless integration of mobility services. The municipal public transport company in Monheim on the Rhine is rethinking mobility. One person who is playing a decisive role in shaping this path is Frank Niggemeier-Oliva. In this interview, the managing director explains how digital systems make everyday life noticeably easier for passengers and employees and why the new generation of the IVU.ticket.box plays a central role in this.

Photo: Tim Kögler

Bahnen der Stadt Monheim are regarded as pioneers in the digitalisation of operating processes and have always shown courage in breaking new ground – for example with the early introduction of autonomous driving. What drives you to continue to explore new travel paths in digital development?

Standing still is not an option for us; we want to actively shape the future. As a medium-sized transport company, we understood early on that progress only arises if you are ready to leave familiar paths. Digitalisation is a core strategic issue in this regard: it creates efficiency, transparency and accessibility. We make decisions based on data, not on instinct. This is particularly crucial for efficient public transport. People take centre stage – whether as employees or customers. Digital solutions are planned to make mobility in Monheim seamless, intuitive and barrier-free and to improve the quality of our operations. This is why digitalisation is a continuous transfor-

BAHNENMONHEIM

Employees: **approx. 160**
Vehicles: **49**
Timetabled services: **approx. 2 million km per year**
Passengers: **approx. 4.23 million per year**

mation process and is a fixed part of our corporate strategy.

Speaking of pioneering roles – with the IVU.ticket.box G3 on-board computer, you opted for a modern solution in your vehicles at an early stage. What prompted you to transfer to the new generation of on-board computers, the IVU.ticket.box G5?

Our consistent customer focus is our top priority: public transport today must function as intuitively as other digital services. Among other things, the IVU.ticket.box G5 enables contactless payment and scanning of digital tickets, making it simple to use. For us as the operator, it means more robust systems, fewer disruptions and better data for operational control. It is future-proof. Thanks to the modular structure, we can continue to expand the hardware and software in a flexible manner. As an innovation customer, we liaised with IVU from the start and were able to contribute practical experience in the field test. All vehicles have been retrofitted since August 2025. An important component of our overall digital strategy.

What are the advantages of the new generation of ticket box for drivers, the control centre and passengers?

For drivers, the ticket box provides a better overview and makes their everyday work easier: with planned/actual departure times, delay forecasts and an intuitive user interface. In the future, we are thinking about a map function for detours or real-time connection information. The control centre benefits from simple device replacement, for example thanks to separate SIM solutions. The devices are lighter, which simplifies maintenance and handling. Our passengers are noticing the progress, for example, in the smaller, more resource-efficient tickets and better service thanks to a more reliable system.

In a way, the on-board computer is the heart of the vehicle, but it only expands its full potential with the right software in the background. What are the advantages of a seamlessly integrated combination of software and hardware solutions for Bahnen der Stadt Monheim?

This combination is crucial. We think in systems, not in individual parts. Integrated systems help us to connect all operating processes – from dispatch through to ticketing and passenger information. For example, with the IVU.fare software, the driver can view the accounting data directly in the vehicle. The new WiFi connection ensures stable and fast data transmission. We manage timetables, vehicle workings, displays, announcements and communication with traffic lights via the central control centre. This saves time and brings clarity to operations.

What makes you individually proud when you look at the digital development of your transport company?

I am proud of the fact that we have left behind the image of local transport that is often considered old fashioned and have established ourselves as a modern mobility provider. This can be seen, for example, in our app: a ticket platform has become a digital mobility companion – soon also with multimodal city bike integration. We operate our own bike hire system, intelligently linked to the Monheim Pass, which provides access to numerous services across the city. And we have created a digital sales system that combines bus and bike travel. However, I am particularly proud of the attitude of our employees: our colleagues think with us, take new travel paths and embrace change. This openness and innovative strength in the team are the real reason for our success.

Photo: IVU Traffic Technologies AG

Photo: Tim Kögler

Frank Niggemeier-Oliva studied Applied Informatics at the University of Duisburg-Essen and acquired his Executive MBA at the renowned Vienna University of Economics and Business. He worked in the energy industry for many years and has held various management positions in national and international contractors. He has been Managing Director of Bahnen der Stadt Monheim since 1st April 2021.
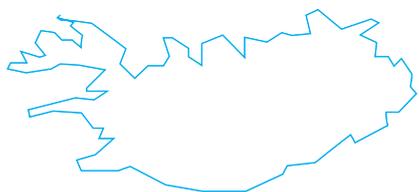
Video about the conception and production of the G5 ticket box

Simply scan the QR code:

Made in Germany
Deployed internationally

DB *Regio*

DB Regio Straße is the largest bus operator in Germany with via 561 million passengers DB Regio Straße relies on the IVU.suite to provide a single system for comprehensive planning and dispatch in all operating regions.

DE LIJN

The Belgian transport company **De Lijn** operates more than 3,200 buses and around 400 trams in Flanders, including the famous Kusttram along the Flemish coast. With the IVU.suite products, De Lijn was able to set up a demand-orientated fleet management system.

PostAuto

With around 2,400 vehicles, **PostAuto** carries around 135 million passengers across the Swiss landscape each year. The company relies on the standardised IVU.suite solutions for all planning and scheduling tasks.

Birmingham

Delft

Hannover

Aachen

Frankfurt am Main

Paris

Olten

Madrid
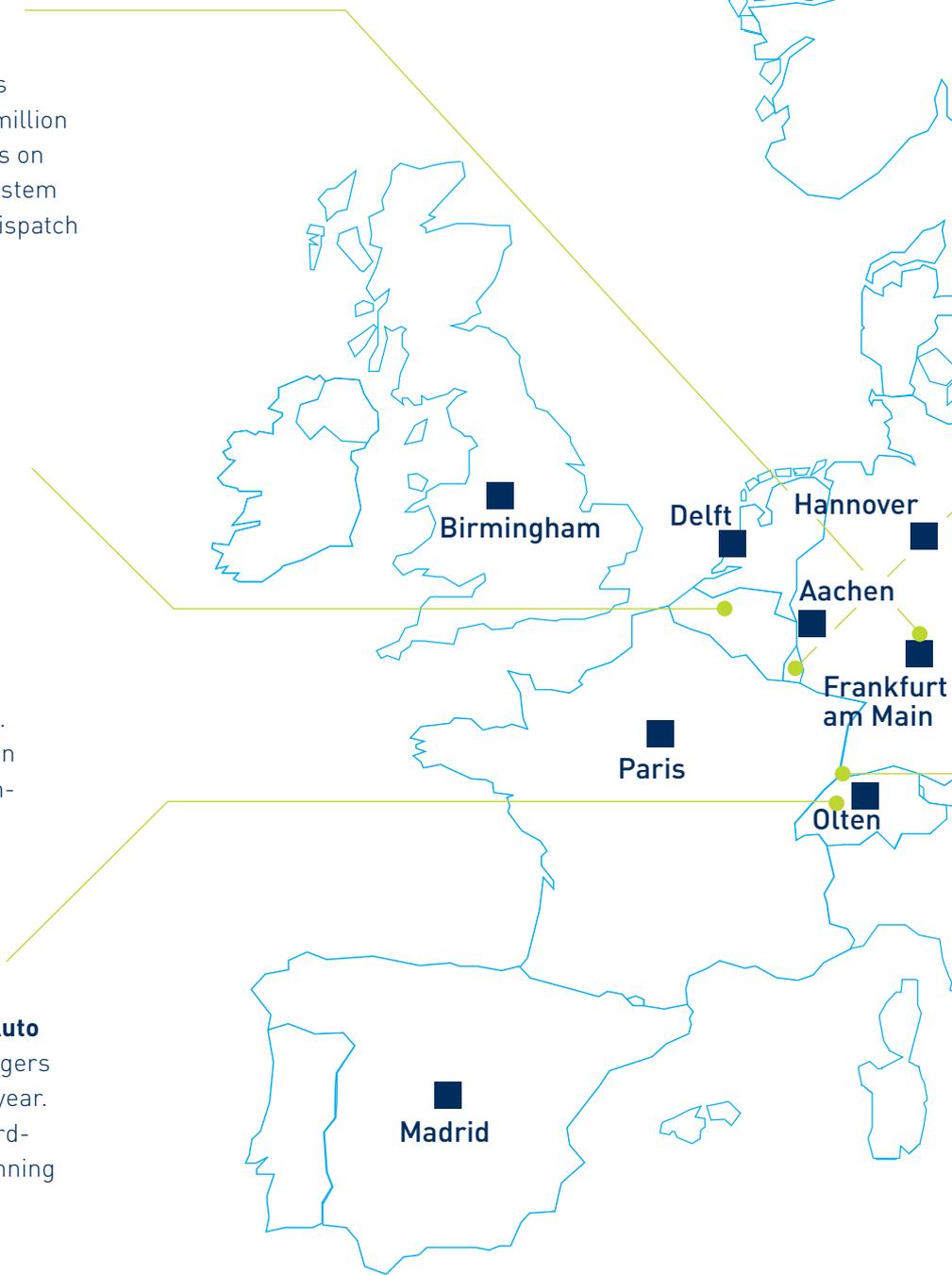
■ IVU locations

Autobus de la Ville de Luxembourg operates a dense traffic network with 31 routes in the city of Luxembourg and its surrounding area. The transport company relies on the IVU.suite for intelligent depot and charging management for its growing fleet of electric buses.

Basler Verkehrs-Betriebe controls its entire diesel and e-bus fleet with around 120 vehicles using the IVU.suite depot management system. The integrated charging management system ensures that e-busses' state of charge is optimised.

The **Wiener Linien** rely on products from IVU for all vehicles. With fleet control and dynamic passenger information from the IVU.suite – for city transport with tram and bus

Since 2021, **Autolinee Toscane**, a wholly owned subsidiary of the French **RATP-Dev**, has adopted responsibility for comprehensive public transport in the central Italian region Right from the start, the public transport operator relied on the IVU.suite to efficiently plan and deploy vehicles and personnel.

Stockholm

Berlin

Leipzig

Budapest

Vienna

Rome

Istanbul

ACHIEVING SUCCESS TOGETHER

IVU.suite

The IVU.suite is IVU's standard solution. Thanks to its modular structure, it can be customised precisely to individual requirements. Only the parts that the customer needs are used.

IVU.integration

In today's interconnected world, software products never run in isolation. IVU.integration assures that all systems work together optimally and data flows smoothly – from the correct printout of timetables via the connection of on-board computers and external products, right through to evaluations and statistics.
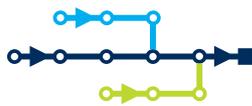
IVU.xpress

Every transport operator has their own identity and own ways of working. The IVU.xpress implementation process allows the the IVU.suite to operate quickly and efficiently in any environment. This ensures plannable project execution from the start of the project and system design to the final roll-out.

IVU.cloud

IVU.cloud allows IVU to take on full technical operations management for IVU.suite – from hosting and maintenance through to installation of updates. High-performance, highly available, assured and reliable: IVU.cloud remains fully scalable, for example for new links or routes. This ensures flexibility.

IVU.service

Successful IT projects are based on trust. IVU places great value on this. In both urban and regional transportation, we provide customers with support throughout the entire project – and beyond. After successful initial operation, customer service is always available as a contact partner to ensure that all vehicles always reach their destination.

IVU.consult

The IT consultancy service IVU.consult supports transport companies in targeted planning, introduction and optimisation of software. From consulting to the complete takeover of services: IVU.consult GmbH customers benefit from expertise in all aspects of the processes and special features of IT systems in public transport.

IVU.solutions

The standard software IVU.suite fulfils the needs of transport companies all over the world. To this end, IVU.solutions develops customised software solutions, such as interfaces to third-party systems or the development of complete modules that are tailored to the exact needs of individual transport companies.

IVU.suite training courses
Learn. Apply. Develop.

Our standard training courses offer a quick introduction into the complexity of the IVU.suite – whether for new team members or advanced users. Interactive e-learning self-study courses enable flexible and individualised learning and can be combined with face-to-face training if required.

Why IVU.academy is worthwhile

- High-quality standard training

- Direct application thanks to interactive exercises

- Self-directed learning: own pace and individual organisation of learning units and recurrences

- Fast availability: online, editing whenever and wherever

- Training courses directly from the manufacturer

- No travel expenses for e-learning courses

- Participation certificate

IVU.academy
Training courses for IVU.suite

"The IVU.academy provides you with a comprehensive portfolio of e-learning courses and face-to-face training. Whether for the induction of new employees, the introduction of IVU software or to refresh existing knowledge – our learning formats provide the necessary know-how about the IVU.suite in a targeted and efficient manner."

Jakob Gierl
Head of IVU.academy

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