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PSI

EDITORIAL

Dear readers,

the electrification of the public transport bus fleet remains in full swing. To achieve the stated public transport climate goals, the Federal Ministry of the Environment has subsidized the purchase of electric buses with approximately 300 million Euro. However, in the coming years, new registrations for e-buses must increase annually by 60 % if Germany is to achieve the EU targets of reducing emissions by 2030 by up to 50 percent.

In this transformation process, transport companies are not only challenged to replace their fleets and create a new infrastructure, but also to apply their expertise, adapt operational processes and introduce new technologies. While dispatching systems already provide the necessary functions, companies in the implementation phase are struggling with the transition on the ground and

with a lack of real-time data from vehicles. In our title story, we'll examine these factors in detail.

Regional rail and local transport will continue to grow in importance in the coming years. This requires the supply to match this growth. Can proven solutions from the long-distance transport sector be adapted to local transport, or will the assumed easy transfer of control systems fail to materialize?

We examine this question in our piece on page 11.
Our subsidiary Moveo also has fresh developments to report: A new driving license scanning solution saves transport companies and their drivers effort and additional travel – a win-win situation for both sides. To protect the drivers of the Münchener Verkehrsbetriebe from Corona, Moveo quickly deployed an app which now allows drivers to register for service directly from the vehicle. Read about this and more on pages 14 and 15.

We hope you enjoy reading it!

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Successive changeover to emission-free public transport

Megatrend e-mobility: A driver for change

The transition to emission-free public transport is the explicit goal of many cities and transport companies. But it is anything but easy. This paradigm shift requires transport companies to embark on a comprehensive transformation process, taking into account both complex structures and a multitude of operational and dynamic interactions. But only those companies that develop new expertise and prepare employees for their future roles in a timely manner will be successful.

When transport companies decide to integrate e-buses into their public transport networks, the transition is usually made in small steps. There are many reasons: Many manufacturers are not yet able to deliver large orders of e-buses at once. The required technical innovations are also still significant, forcing companies to minimize their risks. Until the transition has been completed, old and new vehicles will be operated in parallel.

This in turn means that new and old IT solutions will be operated and integrated in parallel. This is especially challenging for new control systems. As a complete solution, the PSIebus depot and charging management system not only harmonizes load logistics, dispatch control and vehicle scheduling, but also takes energy supply into account. Using intelligent algorithms, the system continuously checks which vehicles are best suited to which open blocks.

Range is paramount

The most important factor is the (remaining) range of a vehicle, or rather, the battery's charge level. The factors that influence this extend far beyond the distance travelled by a vehicle. As a rule, the battery type determines the overall performance or range of a vehicle. At the same time, performance decreases over time, which the AI algorithms incorporate into its forecasts.

The same applies to temperature sensitivity. The outside temperature and the corresponding demands on the heating and cooling system also influence battery performance, which in turn also depends on the battery type. Ultimately, this means that every vehicle is unique. As a result, the spe-

cifics of each individual vehicle are considered when planning charging, dispatching and calculating maximum possible ranges.

New technology needs people

Initial practical experience has demonstrated how important it is to integrate employees from the beginning of the project. Because, as in many other industries, people are at the heart of the change management process. The transition's success stands and falls with the people involved. With electromobility, requirements are shifting towards electrical engineering and IT, especially in the garages. For example, electrically powered bus data is read and configured exclusively using diagnostic software and mobile PCs. You could say that the computer mouse is replacing the wrench.

Not every employee is ready or able to change roles. The same applies for dispatchers. Even in small fleets of e-buses, paper-based scheduling is no longer possible due to the dynamic, complex interactions. The required calculations and planning are carried out exclusively by software systems. In this integrated system, dispatchers will take on the no less important role of supervisor, intervening only in the event of deviations.

Companies are therefore challenged to motivate their employees early for the operational transition and to prepare them for new tasks in a timely manner, for example through training.

Step-by-step emission-free

Few companies start out with greenfield development in electromobility. The transition is therefore only possible when accomplished step-by-step. Companies are therefore challenged to integrate new and legacy systems, but above all to introduce employees to new tasks with tact and sensitivity. At the same time, intelligent IT solutions such as the complete system PSIebus are already being used successfully. When operating diesel and electric fleets in parallel, it not only ensures efficient and safe processes, but can also often compensate for a lack of technological maturity.

Load planning, dispatching and vehicle scheduling will in future be carried out by modern software systems without exception.

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Interview: The Mobility Manager in conversation with Eric Nöh

Potential for new energy concepts

Eric Nöh gathers daily insights into the current challenges of public transport. We talked with him about where he currently sees the greatest need for action and the greatest potential in the area of electromobility.

Eric Nöh, Head of Sales Public Transport

The transition to emission-free public transport is picking up speed. But we haven't reached the finish line yet. Which areas do you see as having the most potential?

I am certainly not revealing any secrets when I say that there is still a lot of room for improvement in the ongoing development of the drive technologies themselves. Today, IT systems have some ability to intelligently compensate for the lack of technological maturity. I'm thinking, for example, of the range problem, but also of the provisioning of interfaces for collecting vehicle data in real-time. In the future, project structures can be simplified and processes can be made even more efficient. But I also see enormous potential in the ongoing development of energy concepts.

Could you elaborate a little on the last point? What will future energy concepts in public transport look like?

To get an idea of where the journey could lead, let me briefly cover how things are currently. Charging concepts today are based on currently available electricity grid capacities. For example, PSIebus uses artificial intelligence techniques to forecast the total energy required to charge the vehicle fleet during the day. The calculations include fixed master data from individual vehicles, but also factors that change daily such as outside temperature or battery age.
Without these calculations, operation at the current technical level of the drive systems would hardly be possible. Nevertheless, the buses return to the depot with a remaining charge thanks to deliberate safety buffers. This will probably not change even if direct interfaces to vehicle data allow even more precise calculations. In the future, exciting topics will therefore be grid feed-in and the question of whether and how companies can utilize unused charge capacity within the framework of a Vehicle-to-Grid concept (V2G). Ideas include supplying power to their own depot or resale to third parties.

Are there already concrete projects for these topics?

Absolutely, and the PSI Group is also involved in various projects with the Electrical Energy division.

PSIebus forecasts the entire daily energy demand for the e-buses.

For example, in the area of intelligent charging and load management, we are working on systems for the intelligent control of primary operating reserve. However, low demand shows that at this point, the solutions are still far ahead of the market. At the same time, however, we certainly see that these topics are slowly moving onto the agenda of ongoing customer projects. Despite this discrepancy, PSI is already in discussions with various distribution network operators in Germany and is helping to shape the first pilot projects on these topics.
One advantage is already emerging here for companies which are still part of the network of municipal utilities in which transport operators and energy providers have the same parent company. Either way, customers benefit from the strength and overall competence of PSI. This applies both in public transport and in the energy supply sector when e-mobility projects are combined with local distribution network operators across transport operations.

News: Depot and charging management system ensures operation of e-buses

PSIebus successfully controls new e-bus fleet

The depot and charging management system PSIebus, which has been in operation at the Alsterdorf depot of Hamburger Hochbahn AG (HOCHBAHN) since October 2019, successfully controls their new e-bus fleet. The system charges the buses daily with a capacity of around five megawatts and sends them charged, cleaned, maintained and preconditioned as required on the appropriate blocks according to their remaining range. In the medium term, the first bus depot in Germany designed entirely for e-mobility will have the necessary charging technology and power supply for 240 buses.

Until full e-bus operation, the system ensures in parallel operation with diesel and electric buses that all vehicles start their trip on time and arrive safely back at the depot. The vehicles are dispatched within seconds, with the use of e-buses being prioritized higher.
An integrated charging management controls the entire energy requirement of the depot and monitors and controls the individual chargers. The system is optimized so that the vehicles are reliably ready for operation at the beginning of the shift and the HOCHBAHN can obtain the energy required for the electric buses.

PSIebus avoids unnecessarily high peak loads. This saves costs in the expansion of the power grid and guarantees stable public transport operations.
HOCHBAHN is the second largest public transport company in Germany with four metro lines, 250 metro vehicles, 110 bus lines, almost 1000 buses and around 1.2 million passengers every day.

Zero emission in Hamburg. This is how the HOCHBAHN controls its e-bus fleet. With PSIebus.

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News: Intelligent data exchange between depot and charging management system

PSI develops open interface

When converting diesel-powered buses to electric buses, the requirements for a depot management system change for many transport companies. In order to monitor and control the charging processes, the system must be able to exchange data with the required load and charging management system via an open interface. PSI Transcom developed this necessary interface as part of a project with Hamburger Hochbahn AG, which has already proven in productive bus operation with various electric vehicle and charging station manufacturers. In the future, the interface is planned to be transferred to a standard as VDV document 463.

In the depot management system (DMS), the processed operational data is evaluated taking into account disposition, supply and repair of the respective vehicles.

The calculated charging request is transferred to the load and charging management system (LMS). Conversely, the LMS provides information on vehicles, charging infrastructure and charging management to the DMS in a timely and correct way so that it can reliably carry out operational planning.

PSI Transcom has been pursuing the goal of converting interfaces into a standard for years in order to ensure competitiveness and investment security and to enable customers to freely select their suppliers.

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Product Report: PSI Vehicle Data Center collects vehicle data and analyzes it using AI

Using data to reduce costs

Data is the oil of the 21st century. Who hasn't seen this claim somewhere? But is it the raw material oil that's useful, or is it more the products that can be created from it? A similar distinction can be made with data.

Have you ever thought about using your vehicle data to lower operating costs? Data generated by vehicles includes routes (with route profiles), passenger numbers, fuel consumption and tyre pressure. This list can be continued indefinitely. So how can this data produce a practical benefit with a monetary value?

Centralized platform records and analyzes vehicle data

The central platform PSI Vehicle Data Centre helps to collect and evaluate vehicle data. Installing it in your cloud instance or your on-premises system ensures that the data stays in your company. The platform uses qualitative labelling, a particular type of machine learning.
This makes it easy to begin applying AI-based methods.

Analyzing how KPIs are correlated helps classify business process data, which enables the software to recognize connections and learn from the raw data.

The data is displayed in cleanly designed dashboards or transferred across interfaces to your existing IT systems like those used in garage management.

Avoid costs resulting from defects and unnecessary bus maintenance

This makes it possible to implement timely maintenance, avoiding costs caused by defects and unnecessary maintenance. Here, it is important to achieve a high predictive accuracy for defects and to trigger as few false alarms as possible.

Use case pneumatic system

The pneumatic system is a critical element in almost every bus. Compressed air produced for this purpose is critical to the functionality of the brake and transmission systems. A defect can lead to significant damage, total failures and, as a result, extremely high costs. Often, extensive maintenance is required to prevent such defects.
A large number of sensors are installed in every bus which record the current state of the various vehicle components. The PSI Vehicle Data Center is there to analyze the sensor data using a machine learning model, predicting whether a defect in the pneumatic system can be expected.

The PSI Vehicle Data Center makes it possible to optimally develop the potential for reducing operating costs through intelligent data collection and processing.

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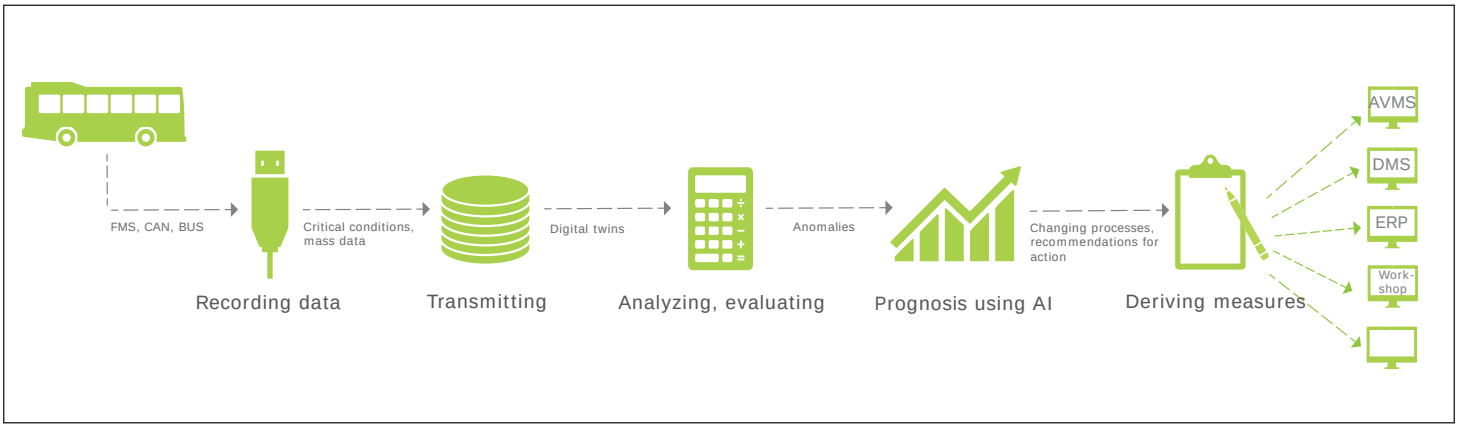


The PSI Vehicle Data Center recognizes correlations from the raw vehicle data and learns from them.

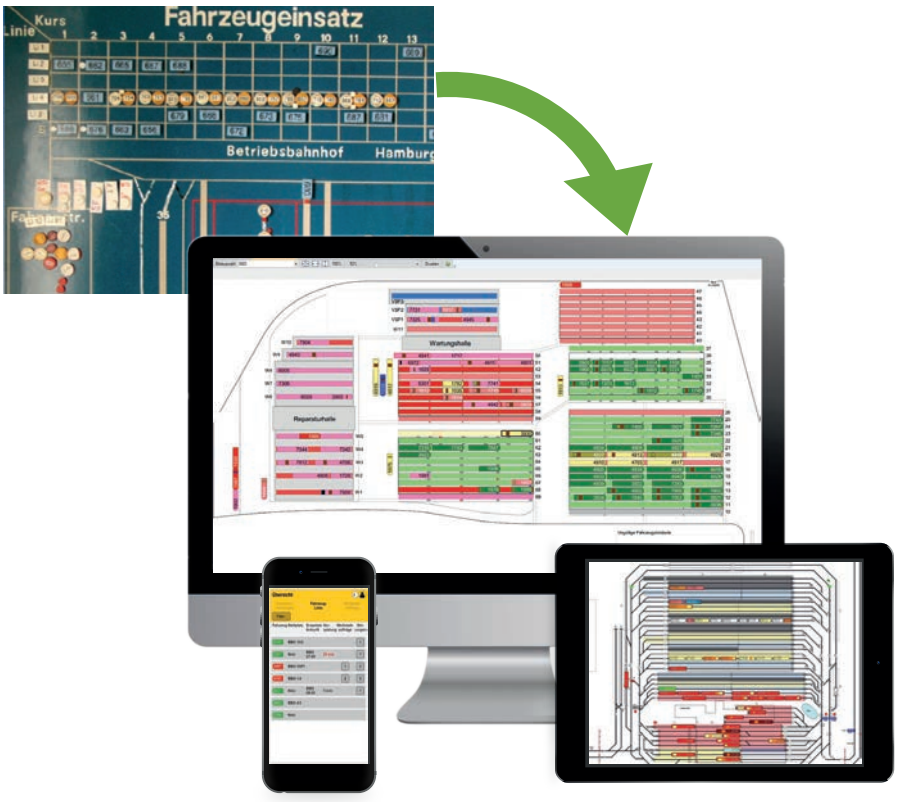
Product Report: Your guide for the introduction of a depot management system (DMS)

Five steps to your depot management system

When it comes to a depot management system, many companies look forward to see process improvements and reduced work effort. While the benefits of a DMS are obvious, decision-makers are often unclear about how to go about introducing one. However, a structured implementation strategy can easily deal with these uncertainties. The right checklist makes the path to a new DMS much easier.

How long does it take to introduce a DMS?

Every DMS implementation is as unique as the company where it is being implemented. Factors such as the number and size of the depots, interfaces, available resources and capacities, and cross-depot processes can significantly affect the implementation time. The existing structure is critical. For example, if many processes have already been digitized and mapped using internal tools, existing relationships, methods and procedures must be considered and discussed by the provider and the company. Here, customers can benefit from PSI's years of market experience, which allow PSI to draw upon many existing systems and references, including finished software modules, eliminating the necessity to rewrite or defining many specifications. A rule of thumb is: A realistic project timeline for completely new introductions or replacing older systems is one to one-and-a-half years.



From the magnetic board to a modern software system.

How much work will it mean for my employees?

In an ideal world, a company's DMS project manager would be dedicated exclusively to the project during the introduction. However, these skilled employees are usually also needed for other activities and are involved in day-to-day business. Experience has shown that to avoid delays, 75 percent of working time should be reserved for the DMS implementation.

There are also costs associated with the key users who must hold, prepare and follow-up on internal training, as well as create training documents. During the hot phase of the project, they should therefore reserve about of 50 percent of their time for a successful introduction – although time demands can vary greatly week-to-week.

What are the pitfalls when introducing a DMS?

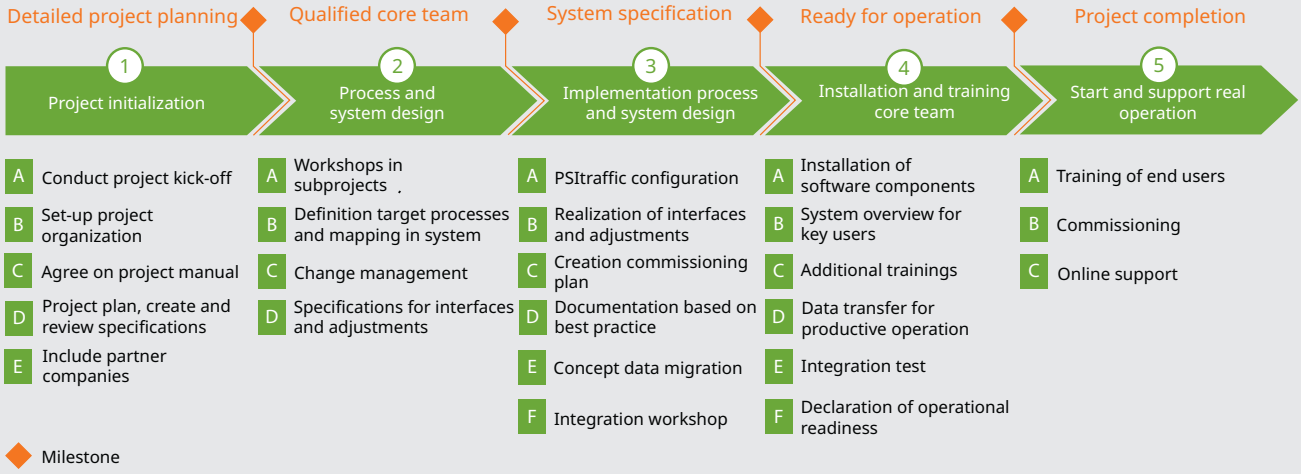
Avoiding errors is more important than correcting them. DMS projects have already failed or been seriously delayed because of the following easily avoided pitfalls. Together with their provider, companies can easily avoid:

Unclear goals

Companies should clearly defined objectives before beginning with the implementation. They must answer the question of what is to be achieved with the new DMS.

The five project phases

Introducing a DMS system is usually accomplished into five phases. In reality, some of the phases tend to overlap. Nevertheless, they are extremely helpful as guideposts and a checklist.



Underestimated complexity

Process and system design can be lengthy when requirements are complex. The question of how many functions will be introduced at once can also influence the time required. For example, if all processes – from the commercial department to production – are mapped with a DMS, the project will be correspondingly complex. A certain willingness to compromize on the part of the supplier and the company is required. This includes accepting that standard-capable products cannot model every individual process.

Poor change management

Over the course of the project, it becomes ever more apparent what is truly necessary. This often diverges from the requirements defined at the beginning of the project. There is a change case that needs to be facilitated. Solid change management and creativity are needed on both sides to find solutions that work for both sides.

Talking at cross purposes

Make the effort to become a well-practised team with your provider. Finding a common language takes time. Terms often do no have the same meaning across different IT solutions. Similarly, colleagues in production and IT may have different names for the same thing. The requirements from the performance specification should therefore be jointly discussed in detail.

Poor data quality

Data migration can be quite complex and take a long time if data with the required quality is not available.

What can companies do to ensure quick implementation?

Before the project kicks off, companies should think very carefully about the goals of a DMS implementation and develop a solid IT strategy. Which steps are to be taken, and when? For this, it is advisable to carefully analyze the current state, and based on this, to define how processes should be developed in the future.

Timely internal discussions create a shared understanding throughout your company. Different departments should discuss the processes which affect them and reach an agreement before the project begins. It is not necessary for the provider to supervise this process in a cost-intensive manner. It can focus on its core competencies and map and optimize the desired processes.

Finally, the necessary resources for implementing the project must be made available. The success of a project stands and falls with a motivated project manager who has the backing of management. Key users with expert knowledge and an understanding of IT and the ways systems interact contribute to both a speedy introduction, as does (partially) releasing employees involved in the project from their everyday responsibilities.

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Product Report: The limits of standardization

Why local public transport has special requirements

Whether regarding the questions of pollution levels or urban congestion: Regional and local transport will continue to grow in importance in the coming years. To meet these needs, the supply must grow accordingly. The expansion of infrastructure is only one option – especially since it requires a long-term horizon for planning, approval, and construction. By contrast, one popular idea is increasing the schedule frequency by shortening the time between trains.
But what about the required technology? Can systems like those already in service in the newly constructed networks in Asia or South America be used? Or will control systems like those developed for long-distance transport be used here?

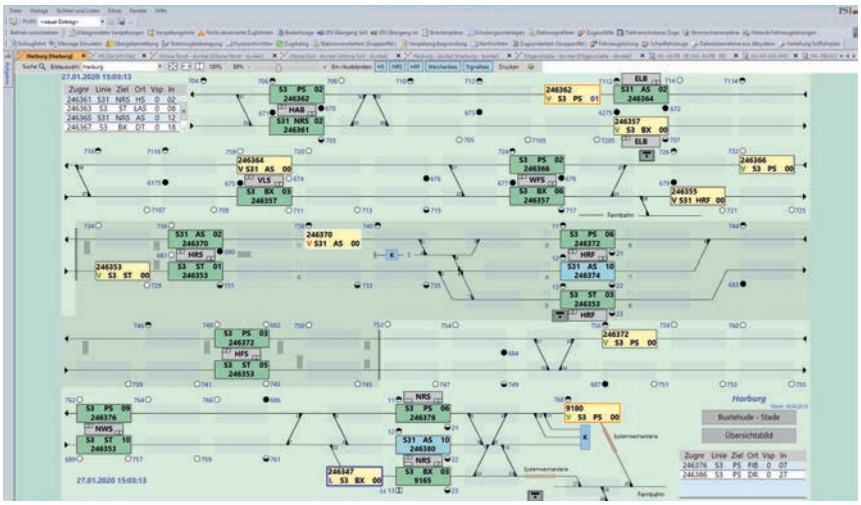
Operators, cities, and municipalities are desperately seeking efficient solutions to quickly and reliably serve continuously growing passenger numbers. Since the construction of new infrastructure is time-consuming and costly, the preferred solution in an urban context is to increase the frequency of trips. But here, too, there are limiting factors. These include vehicle procurement and recruiting and training additional drivers. And finally, increasing the frequency of trips quickly pushes existing technology to its limits. For this reason, automated driving – including the (partial) automation of complex control processes – is attracting increasing attention from public transport system operators.

Demands, primarily from the area of standardization, are pushing for the adoption of proven solutions from the long-distance transport sector. However, assumptions that the transfer of control systems from one area to another would be easy have proven false. One important factor is that in most cases, the infrastructure is not completely new; local and regional transport systems have significant differences from long-distance transport that must be reflected in the control systems.

Short routes and journey times

The main difference to long-distance transport is the shorter distance between stations and the resulting significantly shorter travel times. This causes many differences and additional challenges for the control systems. For example, travel times and the length of stops at stations, i.e. the time for passenger changes, are often the same. Long-distance systems rarely consider junctions with increased passenger volumes. As a result – unlike with long-distance transport – even small irregularities very quickly lead to operation no longer being on-time due to the lack of buffers to absorb delays.

For control systems to function reliably even on the shorter routes and when trains are running at high frequencies, precise and frequent vehicle tracking is required. Satellite positioning has improved considerably in recent years thanks to the various systems GPS, GNSS and Galileo, but it cannot be used in tunnels or in the covered viaducts of the underground railways. The use of balises in the track or RFID tags on the platforms is viewed as a promising solution. A balise is an information carrier mounted in the track – a magnetically coupled transponder. It transmits data to the vehicle when the train passes over it, enabling information to be transferred from the track to the vehicle at specific points.



An operations screen for train monitoring at the control room.

Vehicle tracking systems like this can also be used to implement partially or fully automated operation based on GoA0 to GoA4 operations.

Disruptions require fast reactions

Of special importance in local transport is the fact that, as a rule, there are no alternative routes in case of disruptions. This is another major difference to long-distance transport that must be considered in control systems for dispatching. Combined with the high frequency of operations, a correspondingly faster reaction in the event of disruptions is required. This applies equally to decision-making and passenger information. Specialized control systems can provide valuable services, e.g. by shortening decision-making times with the help of templates for typical disruptions.

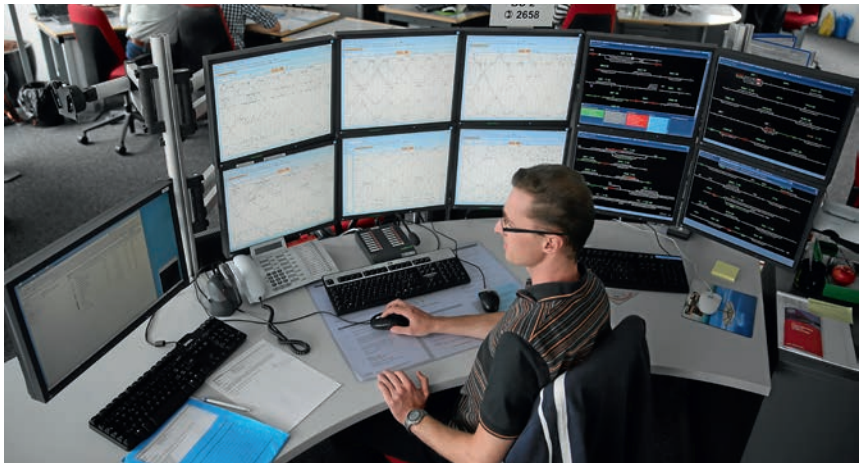
To be able to react quickly, operators must be able to set priorities quickly. The systems must swiftly provide the required overview, and operation should require just a few clicks. An important part of this is ensuring that relevant dialogues for these decision-making processes remain current by utilising live data and that possible subsequent conflicts are immediately visible in a preview in dispatching to prevent subsequent conflict.

Finally, great potential remains to be discovered by applying AI technologies. With their help, decisions and their effectiveness can be recorded over a longer period and then evaluated to improve processes.

Infrastructure and train operation from a single source

One great advantage is the still common special ownership situation in local transport. In contrast to long-distance transport, it is taken for granted that metros and trams are owned and operated by a single entity. Often, this advantage is already no longer present in the local transport of regional railways operated by the main railways.

The close integration of infrastructure and operation creates significantly simplified organisational structures in networking and equipping tracks, stations, tunnels, etc. This makes it easier to design an end-to-end IT system – from data collection and vehicle tracking, to vehicle control, to operational procedures and passenger information. Since operations and infrastructure are unified, dispatching systems can often even directly access the signal box data. This, in turn, simplifies train tracking and enables routes to be switched without delay – using secure and certified interfaces. Here, functional and operational safety remains within the signal box.



All information must be available as early and clearly arranged as possible in order to make the right decisions.

Reliable passenger information systems for commuters and tourists

Finally, the unique features of urban public transport must also be reflected in the functions of passenger information systems. Crucial for both local and long-distance transport: the foundation for a high-quality information system is the consistent tracking and control of vehicles. In long-distance transport, the main concern is the correct display of the position on the platform, for example the location of the car with the booked reservation, or where the dining car is located.

A modern passenger information system for local public transport must above all provide reliable information about the actual next journey and its terminal station, and this includes much more than just displaying the next train's arrival on a display. Both possible and required is the accurate display down to the occupancy level of each compartment or car, for example to identify barrier-free boarding positions. The consistency of information across all display and announcement media, apps and social media channels of public transport companies is also growing in importance.

The Rhätische Bahn not only transports commuters, but also tourists from all over the world on its routes.

The Rhätische Bahn shows how it's done

The Rhätische Bahn (RhB), for example, has demonstrated what such a dispatching system with integrated passenger information system can achieve in regional transport. Its network comprises around 100 commercial stations and stops. Along its routes, the Swiss transport company transports not only commuters, but also international tourists. It must fulfill the varying demands of its diverse passengers.

To achieve this, the RhB relies on a multilingual dispatching and passenger information system from PSI. The system has a modular design which reflects the importance and size of each station. Of special significance is the current introduction of shuttle vehicles and coupled trains, which make it possible to implement new operational models.

The coupling of vehicles in traction units is increasingly common in regional transport. Doing without purely locomotive-hauled trains makes it possible to provide good service even in less frequented areas – with just a few additional drivers. This new form of operation also poses special challenges for dispatching and passenger information: the most important task is assigning the partial trains to their respective destinations.

Another challenge is handling the individual partial train components in case of delays. Specifically, that means dispatchers must have clear and prompt information to make correct decisions and provide passengers with precise information. TFT overhead displays are used to provide information on the coupled train formations. The current train formation is imported through an interface to the car management system and displayed to passengers (1st class, 2nd class, dining cars, etc.). Sector information is determined according to the actual train composition and displayed (which part of the train with which destination stops in which sector). Here, the passenger information system reacts completely automatically to scheduling changes (e.g. change of sequence at the coupling station or different train length) and provides the driver with the necessary information about the new stop point in the station.

Their own systems

The desire to adopt existing, proven standard control systems is more than understandable. However, a look at practical experience reveals significant differences between local and long-distance transport – especially when considering that it is rare to be dealing with completely new infrastructure. Local transport therefore requires its own standard systems, specially adapted to meet its specific challenges. From a technical point of view, there are no hurdles to this approach.

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News: New technology in an old wrapper

Modern TFT displays at Hamburg's Elbbrücken

The new „Elbbrücken" S-Bahn stop began operation at Hamburg's Elbbrücken at the end of 2019. PSI supplied six train destination displays for the new station. What's special: Instead of purchasing new equipment, existing displays were gutted and then equipped with modern TFT monitors. In this way, existing technology and infrastructure could be used, at the same setting an example for sustainability.

S-Bahn Hamburg wanted to present even more extensive content than before in a new, modern layout. With the support of the long-time PSI partner ib datentechnik and the company Bahnbau Lüneburg, a concept for the conversion was developed that began with the construction of a prototype. The results convinced the S-Bahn Hamburg and led to the commissioning of the pilot project. The existing display housings were completely gutted and repainted. A PSI stop computer with two TFT monitors was installed and wired into each housing. The conversion kit also included a climate control system.

Data is supplied by the information and reporting system (IMS) provided by PSI via a network connection with the stop computers.

The new station, and with it the new displays, was ceremonially commissioned in December 2019.

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The station Hamburg Elbbrücken – the new change in Hamburg.

STATION HAMBURG ELBBRÜCKEN

The Hamburg Elbbrücken station is an important junction and transfer point between the underground and the Hamburg S-Bahn in the Elbbrücken center, a sub-district of HafenCity. The two stops are connected by a pedestrian bridge spanning about 70 meters. Every day, 470 S-Bahn trains stop here, and up to 20,000 passengers change trains, thereby reducing the load on Hamburg's main station.

Product Report: Reduced workload for dispatchers and employees

Driving license check without visual inspection

Anyone who employs drivers or provides company vehicles to employees is required to regularly check driving licenses. This usually requires a visual inspection, which involves effort by employees and dispatchers. With the scanning solution integrated in the Profahr personnel planning system, these inspections can be completely eliminated.

Driving license checks are a routine task for the personnel dispatcher. This is especially true for public transport companies. If you want to be on the safe side legally, it is best to perform this inspection twice yearly. After all, the vehicle owner can be subject to fines or even imprisonment for up to one year for failing to perform the inspection according to § 21 StVG. But the usual visual inspection – and manual data updates, if necessary, mean a lot of work – especially for personnel dispatchers. The larger the company, the greater the effort. Inspections also mean an extra trip for already busy drivers if they have to present their driving licences in person at Human Resources.

Win-win-situation for dispatchers and drivers: the driving license check.

A legally compliant scanning solution saves time and effort

When using the personnel dispatcher Profahr, visual inspections can be omitted thanks to a legally-compliant scanning solution integrated in the driving license control module. If a driver logs into a driver terminal, for example, to view the current schedule, duty roster changes or other information, an automatically generated request to scan his driver's license appears – in accordance with the configured deadline.

The scanner is located close to the terminal. In the next step, the driver checks the information displayed. This includes: name, driving license number, the driving license classes, and the expiration date. Only after confirming the correctness of the data does the driver trigger their transmission to Profahr. First, the system checks the document's authenticity by recognizing the security features. In the next step, it compares the data with the employee's stored master data. If the validation is positive, the scanned information is documented, the dates for the next inspection are determined, and the appropriate internal follow-up appointments are set. The system lists data that could not be validated or whose validity could not be determined in the dispatcher's Profahr screen for additional manual processing.

Advantages for everyone

The driving license control module saves dispatchers multiple steps and spares employees additional travel thanks to the integrated, legally-compliant scanning solution. Last but not least, transport companies benefit as employers. Because they have another argument when looking for skilled personnel and young talents: An integrated modern, digital software solution that simplifies everyday work.

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News: Update for mobile registration of shift begin to comply with social distancing rules

Contactless driver registration

The Münchner Verkehrsgesellschaft mbH (MVG) has asked Moveo Software GmbH to update the registration at the begin of shifts because of the current COVID-19 infection risk and the corresponding social distancing rules. Instead of using the terminal in the common room, drivers can now register the start of their shift using mobile devices.

The Münchner Verkehrsgesellschaft has been using the Profahr personnel scheduling system since 2009. Until now, drivers have registered for duty in a staff room using the web-based employee communication terminal. "It's normal for many drivers to meet in this room between shifts – a situation that we wanted to change as quickly as possible due to the risk of infection with COVID-19 and the applicable distancing rules. That's why we asked Moveo for a quick alternative solution," explains Andreas Pass, Head of Trip and Duty Scheduling.

> *Thanks to the quick and uncomplicated help provided by Moveo, the new work instructions could be implemented without delay and we were able to quickly implement another valuable measure to protect our employees.*
>
> **Andreas Pass**
> Head of Trip and Duty Scheduling, MVG

Drivers can now also register for duty via mobile devices.

Within just a few hours of the request, Moveo provided the activation codes for the mobile phone-based employee communication solution. Using the app, which was quickly available for download for both Android and iOS devices, drivers can now register for duty directly from the vehicle. Internal company documents, private messages and duty schedules can also be displayed.

In addition to Profahr operational personnel dispatching and the terminal and mobile phone solutions for employee communication, Stadtwerke München relies on other Profahr modules, for example, for the preferred duty roster, holiday optimization, private messages, taxi dispatching, appointments and events, or document management.

MVG was founded as a wholly owned subsidiary of SWM and has been responsible for the underground, bus and tram services since 2002. Transport services are provided on behalf of MVG by its parent company Stadtwerke München GmbH (SWM), and in the bus sector by private cooperation partners as well (www.mvg.de).

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News: Synergy between software for transport, energy trading and network control

E-mobility and the future of the energy industry

Climate change and the inextricably linked energy transition are increasingly dominating reporting. They are also beginning to drive infrastructure development and new business models. These far-reaching topics bring with them an increased focus on electromobility as an important lever for the CO2 -neutral economy.

In the past, the German automotive industry was successful because it consistently took a design-to-market approach. But this business model is threatened: More strict legislation, new emission taxes and new urban concepts are exerting unavoidable pressure on this successful model.

Being responsible for around 20 percent of emissions, the mobility sector and its shift to electromobility is an important building block for a CO2 -free economy and the energy transition. Against the background of a forecast increase of 29 percent in the number of passenger kilometres travelled by 2030, the importance of this transition becomes clear.
Driving this transition forward requires solving challenges on two fronts simultaneously. While the public discussion has focused on electric cars and the expansion of the charging network, the move to e-mobility also has far-reaching but less-visible consequences for the energy industry – both in terms of utilization and control of power grids, as well as newly emerging business models in this area.

E-vehicles in the foreground of the discussion.

The challenges span the entire value chain of the energy industry. Data analysis, planning and dynamic control play a central role in many processes.

The driving forces described earlier exert great pressure to innovate while promoting the emergence of new business models and market roles.
For charging station operators, it is essential not only to manage the highly volatile loads on the power grid, but also to integrate the retrieved load profiles and volatile EEG power generation in a controlled way in accordance with the process.

Data Analytics and AI to control the overall system

The dynamic nature of the mobility sector requires new approaches to both energy consumption forecasting and actively influencing consumption.

There is also a resulting need to further increase the flexibility of energy produced by industrial plants and ecologically-designed neighbourhoods and to synchronize it with consumption in terms of both time and location. Location plays an overriding role in avoiding excessive network loads. The increasing electrification of local public transport and, in the future, of the logistics sector, brings with it significantly higher energy requirements and peak loads in the distribution grid, which will further increase the requirements. A complex overall system is the result. Balancing its goals requires potent data analytics and AI with proven algorithms.

With its integrated software products for transport, energy trading and network control, PSI provides comprehensive solutions to meet these emerging challenges and is also involved in forward-looking research projects. New, innovative control solutions for balancing the energy requirements of neighbourhoods and transport logistics are being developed and tested in the iP4MoVE project.

Some of the changes associated with the challenges and solution models will have a major impact on our way of life, while others will go largely unnoticed.

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News: Effects of the Corona pandemic on the environment and transport

How is mobility changing in Smart Cities?

For decades, mobility in conurbations has been seen as the driver of growth and development. Because urban infrastructure is increasingly reaching its limits, optimization through integrating control and modern IT systems is of great importance for the economy and the environment. To reduce traffic congestion in cleaner city centres, a digitalization strategy must include extensive integration and modern traffic planning. What does this mean in the time of Corona?

Transport networks in modern cities regulate the flow of people and goods, ensuring the delivery of basic services. Today, transport is controlled remotely using electronic control systems supported by IT and connected by the Internet and mobile communication lines. As a result, many systems are interdependent and complex, and failures can quickly have serious or even critical consequences.

Corona: Chance für die Mobilität?

Essential: Maintaining critical infrastructure

In extreme crises, maintaining critical infrastructures is the top priority. For example, providing energy for electricity, gas and water, the health sector, but also for the transport sector. PSI has been providing specialized software solutions for operators for over 50 years.

Positive environmental effects

The Corona crisis has forced many companies, and even entire industries, to grind to a partial – and sometimes complete – halt. The consequences of this are reduced energy requirements, dimished air traffic and noise, reduced logistics services, and mobility that in some cases has come to a complete standstill. The environment reacted quickly. In some cities around the world, both less CO2 (carbon dioxide) and reduced NO2 (nitrogen oxide) have been measured.

Short-term effect or long-term impact?

However, mobility has already begun to increase, and many citizens are also using their own cars as a precautionary measure. In the coming years, a significant increase in traffic pollution is now expected. According to an ADAC survey, up to 25 percent of those polled intend to avoid public transport in the future. This is not in the interest of cities and communities. But there are opportunities for public transport operators to optimize route planning, which will help them to act economically in the face of new legal regulations on social distancing and the resulting reduced utilization of bus and train capacity.

Intelligently controlling traffic flow

One ray of hope: The Federal Government plans to use a portfolio of economic stimulus programmes and subsidies to support the economy and mobility. Smart Cities and municipalities can also benefit from this. For aspects such as sustainability, traffic flow optimization and balancing potentially conflicting goals, the German Mobility Award-winning software PSIroads/MDS offers concrete solutions. It enables the optimal combination and control of existing and new decision-relevant parameters in traffic management. This not only provides municipalities with suggestions for direct traffic control, but also helps to indirectly correct past errors in urban planning. Traffic management can be used more flexibly than ever before, thus helping to optimize traffic and conserve resources.

Further benefits of the Smart City software can seen in a demo application.

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News: Keolis, SWB, WSW choose PSItraffic, rnv expands system

New orders from Germany and France

Keolis controls and charges e-buses with PSIebus

As part of a Europe-wide tender to successively introduce emission-free buses, the French transport company Keolis S.A. has contracted PSI Transcom to deliver the depot and charging management system PSIebus for the approximately fifty electric buses at the Vélizy depot near Paris. The system will ensure the safe and efficient dispatching of electric buses, manage ongoing energy demand, and ensure that the specified charging capacity at the depot is not exceeded. Headquartered in Paris, the Keolis Group has around 65,000 employees worldwide and transports over three billion passengers each year. It operates a public transport network on behalf of 300 transport authorities with around 364 km of subway lines, 985 km of tram lines and 7000 km of rail lines and 21,650 buses.

SWB Verkehrs-GmbH orders depot management system

As part of the "2017-2020 Immediate Action Programme for Clean Air" initiated by the federal government, the city of Bonn has developed a portfolio of measures to improve public transport and reduce nitrogen dioxide pollution. In this context, the municipal transport Stadtwerke Bonn Verkehrs-GmbH (SWB) has commissioned PSI Transcom with implementing PSItraffic/DMS. In the future, the system will monitor and control about 200 buses and 100 light rail and tram wagons at three depots across the company and prepare the planned transition to electric vehicles.

Stadtwerke Bonn, depot in Friesdorf.

SWB operates bus, light rail and tram services in Bonn and the surrounding area with 214 buses and 100 trams.

WSW mobil will control 300 buses with PSI DMS

WSW mobil GmbH (WSW) also relies on PSI's depot management system. In the future, it will monitor and control about 300 buses at two depots across the company. In addition, the DMS will digitalize and automate almost all processes and support WSW's planned switch to vehicles with alternative drives.

As a subsidiary of Wuppertaler Stadtwerke, WSW organizes public transport in Wuppertal and the surrounding area and caries over 90 million passengers a year. To achieve this, WSW operates the Wuppertaler Schwebebahn suspension railway and a bus network comprising 66 lines, operating around 300 vehicles.

Rhein-Neckar-Verkehr adds e-module to its system

PSI is currently implementing the PSItraffic/DMS for 120 buses and 200 trams at Rhein-Neckar-Verkehr. As the electric buses are acquired, the system will be expanded with an e-module for the new vehicles. In the future, the e-buses will be stationed at three depots. To support the integration of electromobility at rnv, a video-supported training program for employees will be implemented in addition to the technical implementation.

rnv operates the light rail, tram and bus lines in Mannheim, Heidelberg and Ludwigshafen, which are also shareholders on a pro rata basis. In Southern Hessen, it operates V-Bus GmbH, which has almost 80 lines and the longest continuous meter-gauge network in Germany.

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News: Jost Geweke joins the PSI Transcom team

Expansion of the Swiss business

Jost Geweke has added his power to our sales team since the beginning of April 2020. As Business Development Manager, he will expand the business in Switzerland and other European regions.

He stresses: „I'm happy to be joining the PSI Transcom team. I know PSI and its employees as customer-oriented, focused and ready to fight, collegial and open.

For the last eight years, I have been working on topics related to bus and rail companies. AVMS and ticketing have been my daily topics ever since. Before that, I worked for years in the energy industry. I'm very familiar with energy and grids. Now electricity and buses come together at our customers' depots. This is where the two related themes of my professional life meet.

I like that, and it brings me joy. This is where I can make contributions to benefit both PSI Transcom and its customers, where I can create value. I look forward to working with you."

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Events: New date for the InnoTrans

Delayed but not cancelled

Like almost all large events this year, InnoTrans, the leading international trade fair for transport technology, cannot be held due to the corona crisis.

However, from **April 27-30, 2021**, we will be back at our usual location in **Hall 2.1, Stand 520**.

Would you like to receive all updates about the fair or make an appointment? Just send us a short message at innotrans@psi.de.

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Mobility Manager

Also online: The Mobility Manager and further magazines for companies in the energy and production sectors.

PSI-Blog

Here you can find more contributions on mobility, energy, AI, production and logistics.

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