Intelligent Urban Transport Systems

E-mobility in public transport

IT-TRANS 2020: Exhibitors present digital solutions for urban mobility (Part 4)

Karlsruhe/Brussels, January 8, 2020 – **One of the key factors for achieving climate protection targets is having a strong public transport system. As well as generally expanding public transport, it is of crucial importance to switch to emission-free modes of transport such as in bus fleets. In its Clean Vehicles Directive, the EU therefore requires public authorities to purchase a minimum quota of clean buses. This means that, as of 2021, at least 45 percent of buses must use alternative drives or run on natural gas or synthetic fuels. This quota will be increased to 65 percent as of 2026.**

Using buses with electric drives rather than conventional combustion engines would reduce noise pollution as well as cutting down substantially on emissions that are harmful for the climate and human health. As Martin Schmitz, Technical Director of the Association of German Transport Companies (VDV), which has more than 600 member companies from the public passenger and rail freight transport sector, explains: “Around 315 electric buses are currently being used in Germany, with a further 750 on order. However, the difficulties involved in supplying power to depots and getting approval for building charging infrastructure in densely built-up urban areas are continuing to hamper the switch to e-mobility. After all, as well as the vehicles themselves, it is primarily a question of infrastructure and new operational processes.”

Range calculation takes into account weather conditions, traffic jams and route characteristics

Swiss company Trapeze is showcasing special solutions for e-bus fleets at IT-TRANS. The Trapeze Smart Monitor allows the vehicle status to be monitored. The system provides real-time information on all the available vehicle data such as battery charge level and possible range in hours or kilometers. The technical status of the vehicle is also recorded automatically and communicated to control room and workshop. The ongoing range calculation additionally takes into account factors influencing energy consumption such as weather conditions, uphill and downhill sections and repeated stopping and starting on account of traffic jams and diversions. In this way, the smart software solution simplifies operational processes, making it possible to plan vehicle deployment more

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efficiently, to exclude range risks and also to reduce operating costs by optimizing workshop processes and maintenance.

New at IT-TRANS: Control center simulates e-bus route planning

The Future Mobility Lab is a new feature at IT-TRANS 2020. Among other things, a control room will be set up to simulate how electric and autonomous vehicles are integrated into a transport system that also features vehicles with drivers. The control center will be set up by the Swiss exhibitors Trapeze. The software for the integrating the self-driving vehicles in the control system is being supplied by its subsidiary AmoTech. “We will be using the control center to show you the challenges involved in managing a complex transport system. If vehicles with drivers are en route at the same time as self-driving vehicles it is important, for example, to decide – with support from the software – which bus will reach a particular stop first. In the case of driverless vehicles, information is needed as to how passengers get their tickets, how many passengers are in the vehicle and whether they are all ok”, explains Matthias Keller, Director Corporate and Marketing Communications, Trapeze Switzerland GmbH. Visitors to IT-TRANS can observe the various vehicles on the monitors in the control center, watch the dispatchers at work and ask them questions. One of the vehicles in the traffic management system at the control center is a self-driving minibus from the manufacturer easymile which AmoTech will demonstrate live on a demonstration route.

INIT presents a total solution for introducing e-buses

From the economic point of view, e-buses should be on the road for as long as possible. The eMOBILE-PLAN planning and simulation system from Karlsruhe-based software house INIT enables routes and scenarios to be simulated to determine the most appropriate options. The planning tool is only one element in the eMOBILE product suite, however. At IT-TRANS, INIT is presenting its smart solutions for charging and depot management, scheduling, range forecasting and control of e-bus fleets in ITCS.

COSware with automatic scheduling and intelligent fuel management

COSware smartBMS from IT-TRANS exhibitor COS makes it easier for dispatchers at the depot to handle e-mobility. The software provides dynamic range forecasts, taking into account different factors such as weather, topography and passenger volumes. The system determines charge durations, including load balancing, documents changes regarding the state of charge and analyses aging processes concerning the battery’s state of health. COSware also covers all other depot management tasks, such as automatic dispatching,

intelligent maintenance planning, fuel management and location tracking. With COSware smartIMS, service technicians at the workshop can record such things as mileage and tire tread depth directly on the vehicle and report defects; regular control intervals are updated automatically.

E-mobile ride pooling with Via

ViaVan is re-engineering public transit, from a regulated system of rigid routes and schedules to a fully dynamic, on-demand network. ViaVan's BerlKönig service, in partnership with the Berliner Verkehrsbetriebe (BVG), is the largest public sector on-demand ride pooling project. Around half the fleet comprises electric vehicles, for which Via has developed new charge tracking algorithm, allowing drivers to see when they need to charge the vehicle. The New York based company has also developed comprehensive planning tools which ensure that despite charging cycles and vehicle replacements the service is never undersupplied in its operating area. The BerlKönig project won the 2019 Public and Urban Transport Strategy Award sponsored by the International Association of Public Transport (UITP). UITP is a co-organizer of IT-TRANS.

IVU.suite combines all vehicles in one interface

The IVU.suite enables operational factors such as charge management and charging times, ranges, route lengths, overnight and opportunity charging to be optimized, and electric buses to be seamlessly integrated in planning, scheduling and control. IVU.rail, the integrated standard system for railways, helps to make efficient use of rolling stock. The vehicle and maintenance optimization system automatically takes into account predetermined service intervals and planned maintenance. In the event of a fault, a suggestion function recommends a suitable replacement vehicles and routes. IVU.rail also optimizes personnel deployment. The IVU.crew planning solution provides support in all personnel deployments and ensures that employees are where they are needed.

Coverage monitoring facilitates efficient use of resources

Verkehrsautomatisierung Berlin GmbH (VAB) also supports intelligent and demand-driven planning for e-bus fleets with IT solutions. The objectives are fast handling capabilities in daily operations and a reduction in administrative effort. Electromobility influences numerous operational processes at the depot and in the route network. VAB's smart charging management solution in combination with range monitoring ensures eco-friendly and efficient use of resources. Proven technologies can be seamlessly integrated for

preconditioning vehicles, for example in the form of demand-led control of vehicle preheating.

Practical optimization software for electric buses

Mentz, a Munich based company, is showcasing its GENIOS family at IT-TRANS for the first time. The program core integrates the latest research results from the fields of artificial intelligence, evolutionary algorithms and graph theory. The GENIOS family currently includes optimizations for electric buses, integrated and sequential duty and vehicle scheduling, duty rosters, personal duty scheduling, route planning to supply stops with printed timetables, and connection planning. Parameters such as legal requirements and operational agreements can be set or even redefined by the user on the application's interface. Similarly, performance indicators to monitor optimization processes and solution proposals can be created through modular design.

Data-based decisions for information and cost transparency

Pure Vision Systems is consistently focusing on big data throughout its line of products and services, thus keeping public transport future proof and competitive. Typical applications include continuous recording of vehicle positions and meta data, information on fuel consumption and routes driven (relevant for e-mobility applications) and the creation of the basis for differentiated controlling. Data from all the on-board vehicle systems such as IBIS, passenger counting systems and vehicle CAN are recorded synchronously on the central system platform, processed and forwarded to backend systems. Depending on intended data usage, the data is processed either in real time or transferred to backend systems using block transfer.

Photos and captions

Trapeze caption: The smart software solution simplifies operational processes, making it possible to plan vehicle deployment more efficiently, to exclude range

risks and also reduce operating costs by optimizing workshop processes and maintenance.
Copyright: Trapeze

Via caption: The BerlKönig project won the 2019 Public and Urban Transport Strategy Award presented by the International Association of Public Transport (UITP), a co-organizer of IT-TRANS.
Copyright: Via

IVU caption: The IVU.suite enables transport companies to plan and deploy diesel and electric buses efficiently.
Copyright: IVU

VAB caption: Exhibitors like VAB present their coverage monitoring software for electrical vehicles at IT-TRANS.
Copyright: VAB

Pure Vision caption: Accurate real-time information on every vehicle, right down to the meter – in this case on the Aktiv Bus in Flensburg. This enables vehicles affected by traffic jams and other hold-ups to be quickly identified, informed and re-routed.
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IT-TRANS, International Conference and Exhibition on Intelligent Urban Transport Systems, made its debut in Karlsruhe in 2008. Within a short period of time, the event – which is held every two years – established itself as the sector's most important platform to be dedicated to sustainable, digitally networked urban mobility. The next IT-TRANS will be held from 3 to 5 March 2020 at Karlsruhe Trade Fair Centre.

Organiser: International Union of Public Transport (UITP) and KMK
Sponsors: Trapeze, INIT, Scheidt & Bachmann, Cityway, Luminator Group, Systemtechnik, Clever Devices, Atron, moovel, IVU, PTV, AMCO and LIT Transit
Patron: Andreas Scheuer, Federal Minister of Transport and Digital Infrastructure (BMVI)
Strategic partners: Transport associations VDV (Germany), ASSTRA (Italy), ITS Spain, TechnologyRegion Karlsruhe, Karlsruhe Transport Authority and Karlsruhe Profile Region for Mobility Systems
Trade fair: Approx. 270 exhibitors on 28,000 square metres
Conference: 150 speakers in 30 sessions with practice-oriented presentations, panel discussions and workshops

Further information: www.it-trans.org, Twitter and LinkedIn