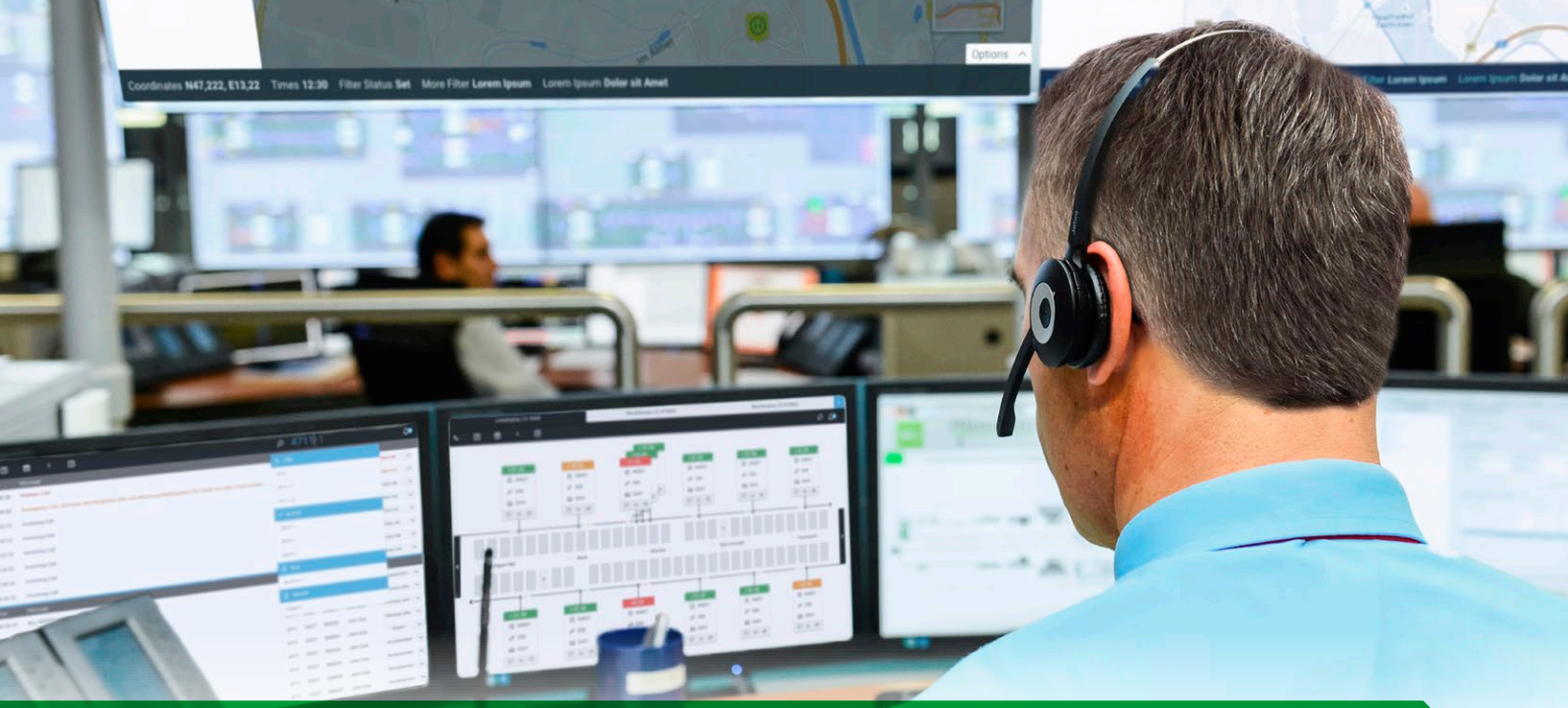


MOBILE-ITCS nextGen

The next generation Intermodal Transport Control System

init
The Future of Mobility

Future-proof, user-oriented, demand-optimized.
MOBILE-ITCS nextGen is the next generation Intermodal Transport Control System. The intelligent overall solution covers all requirements for operations control and passenger information. An ergonomic handling concept (UX design) enables dispatchers to work comfortably and quickly. Outstanding prediction quality of departure times is achieved through machine learning – ensuring the highest reliability of passenger information.

Ergonomic user concept

Future-proof database-agnostic platform

IT security by design

Public transport companies bear the responsibility for the mobility of people in their region. As an important factor in public life, they must rely on system solutions that meet the highest standards. MOBILE-ITCS nextGen is the scalable, future-proof operations control system whose extensive functions provide the basis for the work of drivers and dispatchers as well as customer service staff. With the state-of-the-art MOBILE-ITCS nextGen, they make a significant contribution to safe public transport and to the satisfaction of their passengers. During the planning and development of MOBILE-ITCS nextGen, INIT closely cooperated with a large number of experts from the fields of public transport and information technology. The result of this expert effort is a system that ensures long-term success. It enables lasting security for the public transport company and the region's entire public transport network.

MOBILE-ITCS

The next generation Intermodal Transport Control System

demand-optimized

easily extendable

future-proof

flexible

open

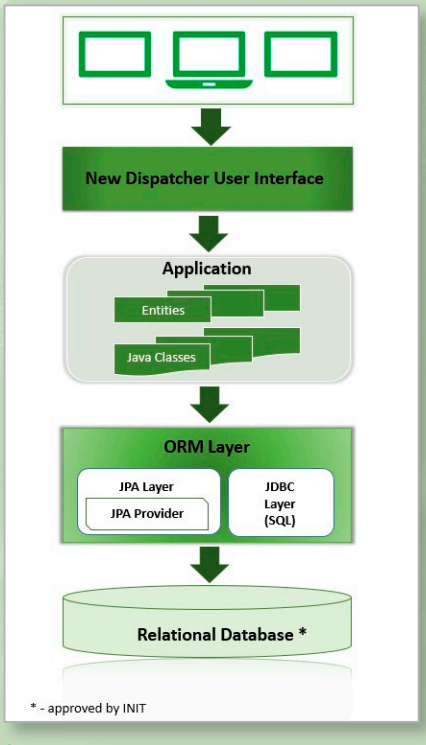
user-oriented

Future-proof

› Future-proof, database-agnostic platform

An important factor for the future security of MOBILE-ITCS nextGen is its **flexible, secure and robust architecture.** An intermediate layer (ORM layer), the Jakarta Persistance API (JPA) middleware, separates functions and the relational database. The advantage for transport companies: They can be flexible and can choose the database that suits them best from a multitude of possible databases, including one that is already in use in the company. Alternatively, the license-free database PostgreSQL recommended by INIT, can be chosen. This layer model also offers another advantage: It facilitates the integration of functional extensions.

nextGen



MOBILE-ITCS nextGen facilitates IT security and future-proofs the system thanks to its modern architecture.

Highly important: The topic of IT security has increased dramatically in importance in recent years, especially in the field of system-relevant infrastructure. An Intermodal Transport Control System is part of the public transport company's system-relevant applications. MOBILE-ITCS nextGen takes into account the technological change in IT architecture and the development environment of real-time systems as well the continuous danger of cyber attacks – with "nextGen" you play it safe in every respect. INIT is also certified according to the international standard ISO/IEC 27001:2017. This certification confirms highest possible security in development, production, implementation (= project management process), maintenance and operation of the delivered systems and services.

ISO/IEC 27001:2017 certified

high-level IT security

state-of-the-art architecture

In the control center

› Always be informed and act appropriately

With MOBILE-ITCS nextGen, the essential tasks of the control center can be handled quickly and safely. These include the **monitoring** of the vehicle fleet, **passenger information** and the **control of operations** through dispatching measures. Dispatching measures dealing with disruptions can be executed immediately. The optional semi-automated **disruption management system** can provide additional support. The comparison of the acutal vehicles' location with planning data allows an overview of the timetable situation at any time, as the ITCS is supplied with data from the planning and data management system.

› Everything in view, everything under control

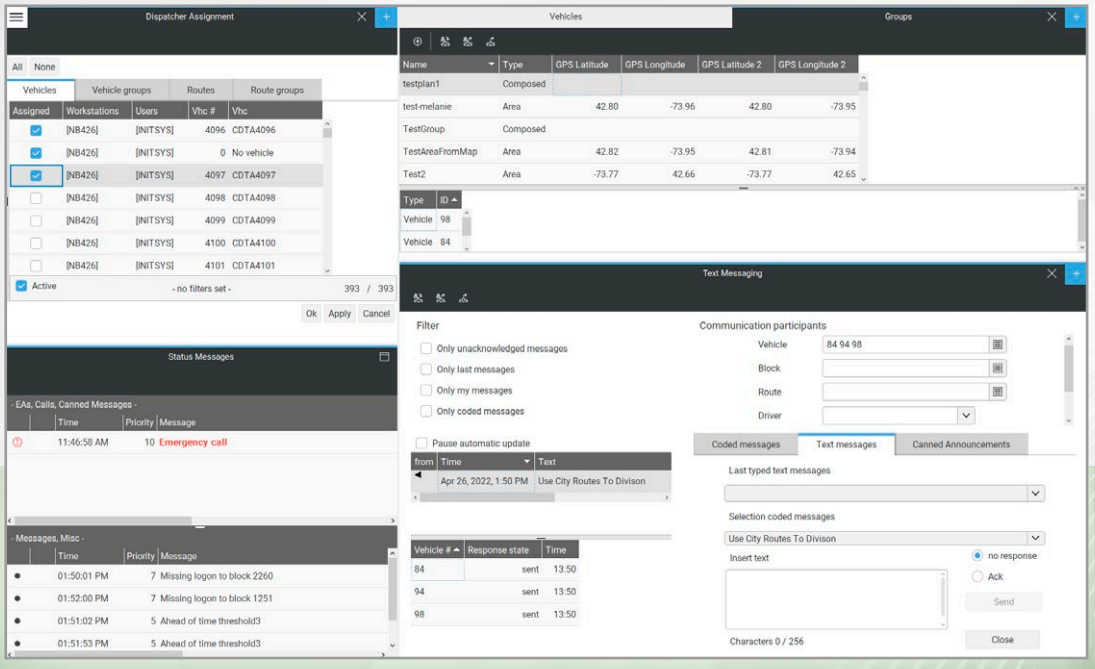
All "nerve tracts" converge in the control center. Dispatchers are therefore dependent on fast and reliable information – MOBILE-ITCS nextGen provides this in an ergonomically optimized form. Information displays and messages instanteneously alert about operational disruptions – so that necessary measures can be initiated at an early stage.

› Greater user-friendliness through UX design

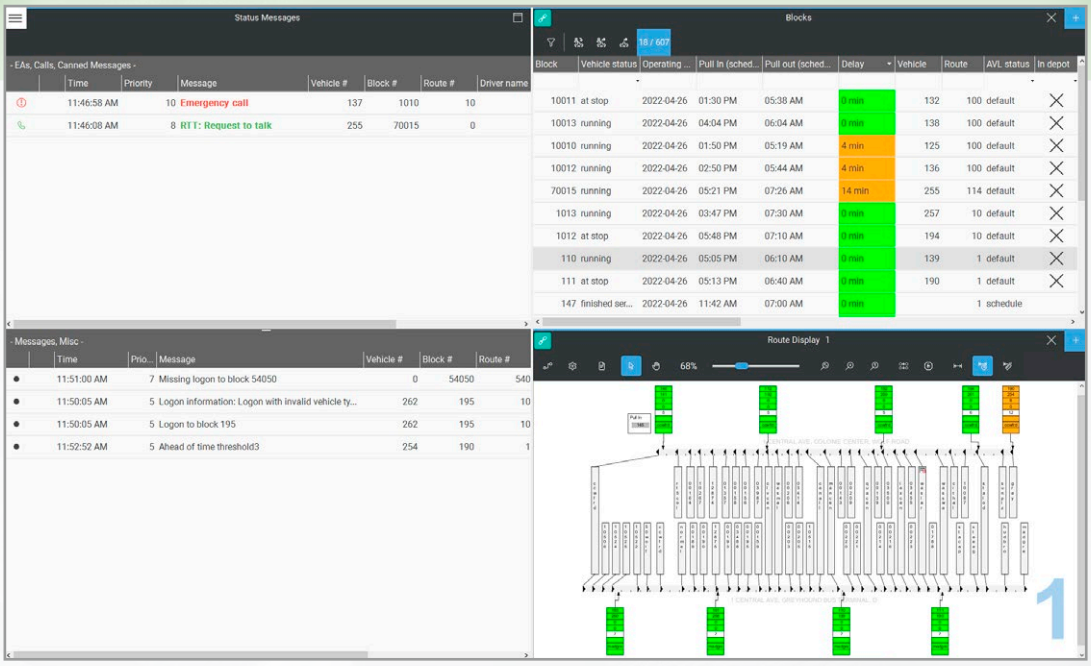
MOBILE-ITCS nextGen deploys an outstanding information architecture and an excellent interaction design. The user interface relies on an attractive color scheme that is easy on the eyes, well-arranged displays, most up-to-date usability concepts and ultimate flexibility. Countless individual configuration options, time-saving one-click actions, enhanced filter functions and improved information access enable quick and goal-oriented work.

› Easy handling, high configurability

The **Status Screen** clearly displays the status messages of the vehicles in use. Not only can numerous actions be performed via a context menu, but drivers can also be contacted quickly with just a single click via radio or text message. These one-click actions are available through the whole system, are configurable and make a significant contribution to the ease of use.



— The status display (bottom left) shows dispatchers the vehicles' status messages.



Displays can be linked with each other and get updated automatically. —

The **Quick Action Bar** at the top of the displays is also used to quickly execute actions. In the simplest way, quick actions (e.g. vehicle call) are enabled and the numerous advanced filters are operated. Additional comfort: Filters can also be used in combination.

Essential information is instantaneously available at any time – for example, via the **Detail Bar** at the lower border. Here, desired additional information is displayed (from vehicle number to driver-ID, stop position, delay to arrival time) – which can be set by each user as required.

› Linked displays, fast information

The so-called **Linked Displays** enable quick access to the required information at any given time – they can be used to flexibly link several displays with each other. The dispatchers are free to decide which displays they want to connect and which of them should be the master display. The linking can be established comfortably through a symbol in the tab bar. For example, by clicking on another block in the block list, the linked block display gets updated automatically.

Dispatchers who do not want to use linked displays also benefit from a nextGen function called **Auto Tiling**. This means that several windows are arranged automatically on the screen with equal weighting. The display can be adapted to individual needs and this set-up, including links, can even be saved.

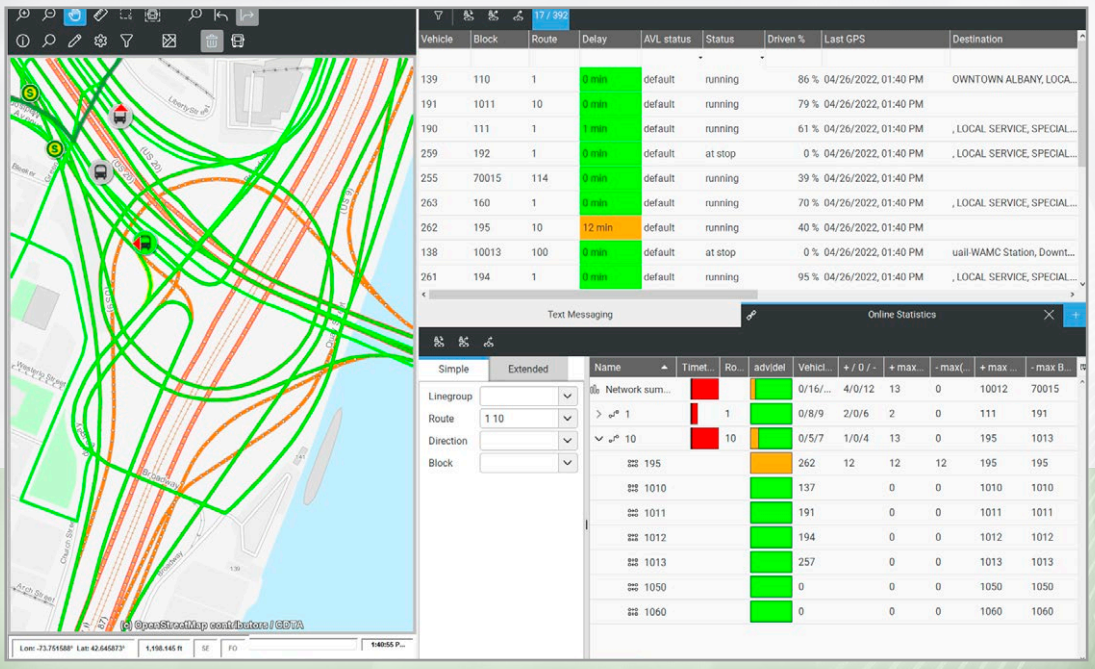
Another highlight of the nextGen user interface is the flexible **Line Display** (current and scheduled locations for one line). Numerous additional pieces of information are displayed here graphically, for example deviant routes covered by divided lines. In addition, the user is also given maximum flexibility here through filter and zoom functions.

— MOBILE-ITCS nextGen offers dispatchers a multitude of display options.

The **Detour Display** is another essential function – it shows the route sections affected by detours with details of affected lines as well as all defined detours, which can be activated immediately. The **Online statistics** display is just as important. It shows all information relevant for operations about the respective lines at a glance. Even the greatest advances or delays on a line are immediately recognizable. In addition, the ITCS also provides essential driver information, e.g. in the **Driver List**.

› User-friendly migration

Important for customers who already rely on INIT's MOBILE-ITCS: The introduction of the new user interface will happen in a user-friendly way. Initially, public transport companies can use both versions in parallel and thus enable their dispatchers to switch over comfortably. Since the elements were designed to be recognizable, a quick familiarization process is guaranteed.



— Well-arranged: vehicle list, online statistics and map.

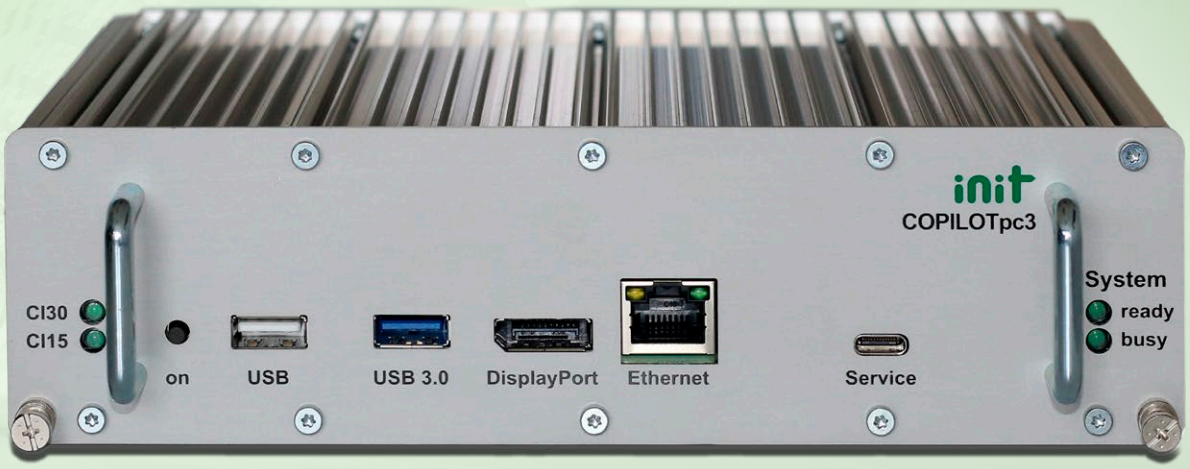
Future-proof hardware

› Powerful, future-proof hardware

Communication between the control center and the vehicle is essential for operational control. The heart of the IT infrastructure in the vehicle is the PC-based on-board computer, COPILOTpc3. The IT and communications platform covers the on-board computer functions comprehensively, organizes voice and data radio, calculates position and schedule adherence. It also provides passenger announcements and supports the use of a wide range of applications, such as vehicle diagnostics (vehicle health monitoring) and electromobility.

Vehicle communication

Calculation of position



Voice and data radio

However, data exchange must not only take place between the vehicle and the control center, but also with third-party systems. In diverse system landscapes, data exchange between autonomous systems is essential. This is why MOBILE-ITCS nextGen was designed with an open system architecture that supports various standard interfaces such as VDV or SIRI and is therefore completely **interoperable**.

The system is also **intermodal** which means that it allows dispatchers to control buses and trains and, especially in the environment of open mobility platforms, other transportation modes can also be integrated. This includes, among other things, on-demand forms of transport. In the course of the Rail-INITiative, MOBILE-ITCS nextGen will incorporate even more rail specific requirements in the future.

MOBILE-ITCS nextGen's **multi-client capability** enables several – even competing – transport companies to co-operate in a common system infrastructure.

Real-time passenger information

*An integral part of any Intermodal Transport Control System is **passenger information** in real time. Passengers expect reliable, comprehensive and omnipresent information, in the vehicle, at the stop, but of course also online. With MOBILE-ITCS nextGen, real-time information is delivered directly from dispatch for and to all information channels, including social media, apps and third-party systems. A wide range of different passenger information displays makes it possible to provide passengers with the latest information in a clear manner.*

› The most reliable predictions through machine learning

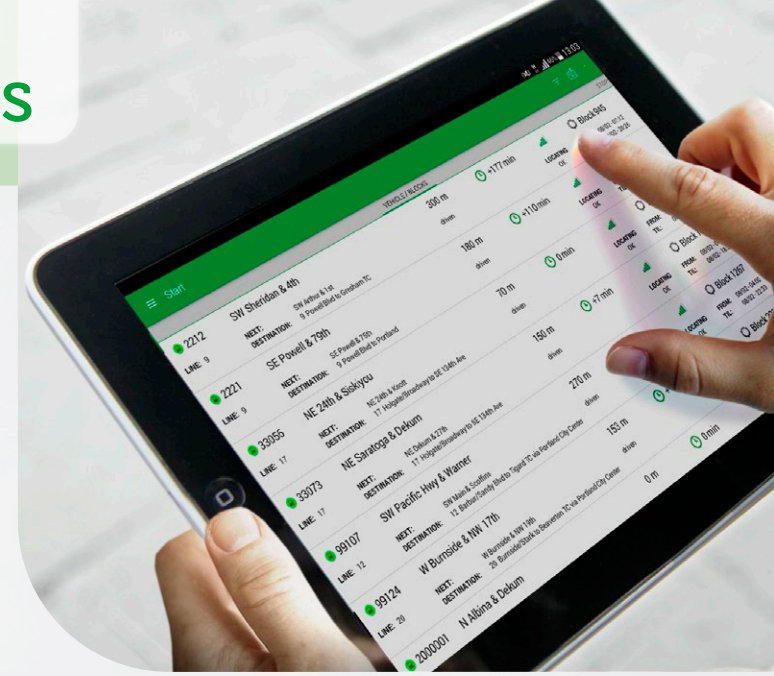
In order to calculate **departure times** as reliably as possible, machine learning is used in MOBILE-ITCS nextGen. While the previously used linear predictions depended only on planning and operational data, the state-of-the-art nextGen system goes a geat deal further. For departure time predictions, it now takes into account historical data as well as those of current operations such as the journey time of the previous vehicle. The algorithms used for this purpose are constantly refined through machine learning. To this end, the models are continuously trained.

This significantly improves the quality of the predicted departure times and therefore the reliability of the passenger information, which ensures even more satisfied passengers.

MOBILE-ITCS

Additional functions

MOBILE-ITCS nextGen is the next generation Intermodal Transport Control System. Therefore, it has features that go beyond the functional scope of the classic ITCS and takes into account the current needs of public transport companies.



Dispatching in the field with MOBILEmodi.

For example, the growing importance of e-buses in public transport has been taken into account. Displaying the State-of-Charge is a fixed part of MOBILE-ITCS nextGen, which allows for the monitoring of the remaining battery capacity of **electric buses**. Additional functionalities like dynamic range prediction can be optionally unlocked. The State-of-Charge is integrated into the main ITCS displays. In addition, dispatchers receive alerts via the status display if the charge level falls below defined thresholds.

In times of changing passenger requirements and ever-growing climate consciousness, on-demand services are becoming increasingly important. Therefore, INIT has also integrated MOBILEcall, the **management module for on-demand yet route-based service**, into the overall package. In addition, all mobility offers in the region – line-based, shared offers, demand-responsive transportation – can be optimally integrated via **mobility platforms**.

And in order to comply with a growing digitalization demand, two licences are included in MOBILE-ITCS nextGen: STOPnet2 for **real-time passenger information via the Internet**, e.g. in customer service centers, hotels or stores, and MOBILEmodi, the tablet-based **mobile dispatch application**. It can be used to document and manage incidents in the field. Dispatchers at accident scenes or events therefore have the same access to relevant ITCS information as employees in the control center.

MOBILE-ITCS nextGen is a package that meets all the requirements of public transport companies and provides an unmatched secure, reliable and powerful platform for the future.

nextGen

Fast integration of further solutions

INIT offers a wide range of solutions which, as extensions of MOBILE-ITCS nextGen, provide public transport companies and passengers with added value.

› ASSISTIVEtravel: travel assistance system for visually, hearing and mobility impaired passengers

ASSISTIVEtravel provides demand-optimized journey guidance for passengers with visual, hearing and mobility impairments and supports them at all stages of their trip. First, users create their profile according to their specific needs. Based on this setting, the app triggers specific features and adapts the user interface accordingly.

For visually impaired users, navigation is simplified and optimized using text-to-speech (read aloud function). In addition, exterior announcements can be activated at the desired boarding stop. For hearing-impaired passengers, announcements are transmitted to hearing aids via T-loops.

Before each stop, on their on-board computer, bus drivers are shown whether passengers with special needs wish to board or alight. Drivers can tell mobility-impaired passengers whether the wheelchair space is available and assist them when boarding or alighting.

— ASSISTIVEtravel is the perfect tool for passengers with visual, hearing and mobility impairments.

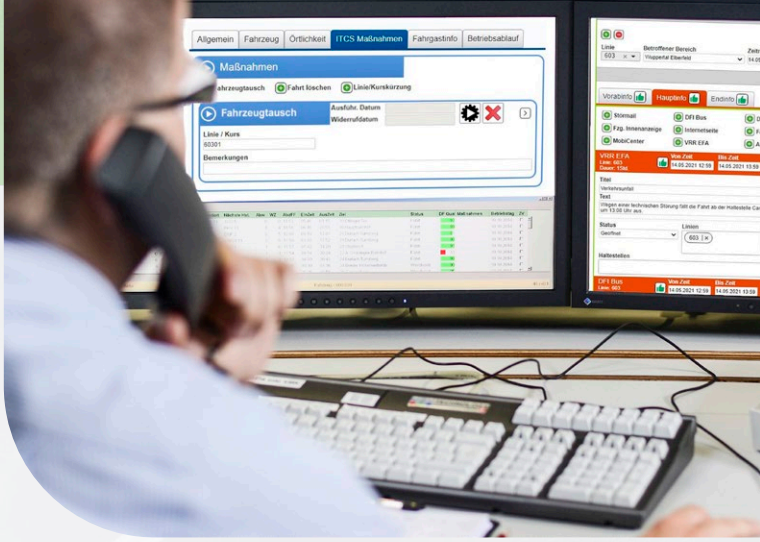
› DEPARTURESlive: passenger information app

With DEPARTURESlive, INIT's iOS and Android app, passengers access real-time passenger information quickly and conveniently. They simply select stops from a list, map or from their bookmarks, and then receive reliable information on the next departures. The app also has a journey planner which can be used to retrieve information on possible door-to-door connections including transfers and walks.

In addition, the app offers Augmented Reality using the smartphone camera. The consequence: a visualization enhanced by additional information.

› MOBILEguide: occupancy predictions for passenger information

A useful extension of the passenger information service is the notification of a trip's expected occupancy. Based on this information, passengers can switch to a less busy service if necessary. The information is provided by INIT's system for occupancy information, which not only delivers real-time information, but also takes into account typical disembarkation behavior. The information can be provided via a variety of passenger information channels, e.g. DEPARTURESlive or HandyTicketing Deutschland or the transport company's other existing channels.



RESPONSEassist integrates dispatch, passenger information and documentation.

› RESPONSEassist: semi-automated dispatching and multi-channel passenger information system

Providing passenger information consistently across all channels in seconds: This is possible thanks to INIT's system for semi-automated disruption management and passenger information, RESPONSEassist. The system integrates the processes of dispatching, passenger information and documentation of operations – the control center's essential tasks. It enables dispatchers to deal with disruptions more efficiently and generate precise passenger information, largely automatically with the help of predefined templates. With RESPONSEassist, passenger information is provided consistently via a variety of media. Information is provided via classic dynamic interior and exterior passenger information displays and even via loudspeakers using text-to-speech, via social media, internet portals, etc. There are no boundaries.

› MOBILEstatistics: analysis and statistics system

In the statistics database, operating data captured by the ITCS is combined with schedule data imported from a planning system. User-friendly results are shown in tables, diagrams and on map displays. By using dashboards, employees gain an overview on the performance at a glance for quick evaluation and reaction to any disturbances.

The realistic representation, along with the evaluation of long periods of time, serve as a solid basis for profitability reviews, performance records or service planning, allowing operational processes to be optimized.

› MOBILEforms: workflow and incident management system

Part of RESPONSEassist is MOBILEforms, which can also be integrated into the ITCS as a pure workflow and event management system. As a pure forms system, it enables the documentation of operational incidents (accident, vehicle damage, etc.) and the notification of all relevant persons. MOBILEforms obtains the operational data directly from the ITCS.

In addition, special forms optimized for use on the on-board computer can be designed to provide direct support to drivers.

In addition to these helpful tools, there is a wide range of further solutions that support public transport companies of all sizes in their work, from automatic passenger counting to traffic signal control, personnel dispatch, depot management, charge management of electric buses, and all types of ticketing – from printed paper tickets to ID/account-based ticketing.

Extensions with added value

*If you would like to know more about **MOBILE-ITCS nextGen**, please contact us at sales@initse.com. We look forward to hearing from you.*

More than 1,100 transport providers worldwide rely on our integrated solutions to support them with their daily tasks

- *Planning & Dispatching*
- *Ticketing & Fare Management*
- *Operations Control & Real-Time Passenger Information*
- *Analyzing & Optimizing*

Moreover, transport companies can also master all requirements of electromobility and set up a single sign-on mobility platform using our integrated solutions. A robust package of operational services completes the INIT offer.

INIT is the worldwide leading supplier of integrated planning, dispatching, telematics and ticketing systems for buses and trains. For 40 years, INIT has been assisting transport companies in making public transport more attractive, reliable and more efficient.

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