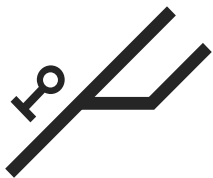


RailSys® Infrastructure Manager



Planning infrastructure in accordance with the latest requirements.

The world of railway traffic is in a constant process of change. Influenced by new technical innovations as well as new regulations and guidelines that are intended to ensure safe and effective operating processes, the requirements for reliable traffic planning software are accordingly increasing at the same time. In this sense, the **balance between manageability and transparency** of information is essential and at the heart of the **Infrastructure Manager in RailSys®**. With a clear and detailed **display of railway infrastructures** (both individual routes or entire networks) with all signals, balises, speeds, inclines, switches, level crossings, structures, and much more, the foundation for complete control of the traffic processes and flow is guaranteed with RailSys®. Meanwhile, the latest security components as well as **ETCS** are also taken into account.

With the Infrastructure Manager, the RailSys® Suite provides a powerful tool which enables **all elements of railway operations** to be displayed in a redundancy-free data model according to individual or national requirements. A **microscopically accurate schematic view** facilitates the work process, whereby the actual location of the infrastructure in **reference to GIS applications** is always guaranteed without redundancy. Meanwhile, the **graphically interactive interface** enables the user to work intuitively, while a **tabular overview** is provided in direct interaction. In addition to versatile **network view** options, **position plans** with individually adjustable labeling, legends and further plan data can also be created. These are not only displayed, but also stored in the system along with a wide range of functionalities.

In order to be able to comfortably use the advantages of the integrated data management of the Infrastructure Manager over several time sections, a **copy & paste function** is also part of the manager's range of functions. This makes it possible to combine different infrastructure areas from different views in a single data base. Accordingly, this means, for example, that various possible infrastructure scenarios are fully functional in just one environment. Alternatively, **changing infrastructure systems can be displayed with pinpoint accuracy** through different, chronologically sequential construction stages. Despite the constantly changing framework conditions of the railway infrastructure, the RailSys® Infrastructure Manager always adapts to the **latest requirements** to ensure reliable and effective planning in railway traffic.

RailSys® Web Construction Manager



Plan construction measures effortlessly,
effectively, anywhere.



Rail infrastructure and the railway network are subject to **continuous maintenance and expansion processes**. The ongoing work in active railway operations requires a detailed data foundation. This is essential for making accurate plans and obtaining precise data for further processing. It is crucial to capture all construction activities within the railway network down to the exact track level, along with their impacts.



Construction measures and projects can be recorded in the **RailSys® Web Construction Manager**. During **variant analyses**, different **closure concepts** can be examined. Additionally, further **details about the construction project** can be documented. Necessary timetable adjustments can be captured per type of service and forwarded to the Timetable Manager. To **identify bottlenecks early** in the railway network due to the interaction of construction activities on one route and simultaneous construction on the diversion route, **closure conflicts are automatically calculated**. Registered construction projects can also be time-coordinated and **bundled together**.



The results achieved can be **forwarded to the responsible construction planners** within the respective processes. Based on this, the impact on planned construction projects can be reliably reviewed, with coordination taking place directly in RailSys®. Planning for **long-term projects** as well as **short-term maintenance measures** can thus be carried out effectively, flexibly, and independently of location in the **RailSys® Web Construction Manager**. Various **reports and outputs** support the planning process. **Service interfaces** also provide the information to operational control systems. In **combination with the RailSys® Timetable Manager**, the information from the Construction Manager can be used there to develop a construction timetable.

RailSys® Web Train Path Manager



A seamless workflow for easy and efficient train path requests.

In many countries, trains from different railway companies operate on the same infrastructure. To ensure **fair competition among railway companies** while maximizing the utilization of rail infrastructure, infrastructure managers or responsible allocation bodies are required to assign capacity (train paths/paths) through a **non-discriminatory request process**.

While the fundamental principles of the request process are harmonized across Europe, specific processes and information requirements still vary within the jurisdictions of individual infrastructure managers.

The **RailSys® Web Train Path Manager** offers a user-friendly and convenient web application for train path requests. **Configurable workflows** enable the transparent handling of requests for annual timetable paths, their modification or cancellation, as well as the ordering of ad-hoc services. The Train Path Manager provides various graphical representations to support the request process (train path views, network views) as well as validation of mandatory information. In addition to conventional request procedures, the booking of system train paths or fully automated train path searches are supported. **Necessary documents**, such as working timetables, can be made available directly through the Train Path Manager.

Together with available interfaces (e.g., for sending or receiving requests according to TAF/TAP TSI), the **RailSys® Web Train Path Manager enables a fully digitized information flow between railway companies and the train path allocation bodies**.

The **RailSys® Web Train Path Manager** is fully integrated into the RailSys® system environment, allowing seamless data processing across other RailSys® components. Railway undertakings receive their timetables and **necessary documents**, such as working timetables, digitally from **RailSys®**. Features such as automated search and filter functions, the use of train path templates, and the expansion of master data catalogs further enhance the comprehensive capabilities of the **RailSys® Web Train Path Manager**.

RailSys® Web Facility Booking Manager



Comprehensive planning of assets and facilities.

Train paths are primarily requested, planned, booked, and billed for the route they take. Arrangements regarding the use of service facilities for pre- and post-trip train handling, such as stabling yards or freight loading and unloading tracks, are typically made separately from standard path requests through coordination between railway infrastructure managers and transport operators or shippers.

To optimize the planning of available capacity at these service facilities, a digital platform is now essential, enabling users to inquire about and book available space. For facility operators, this system provides the basis for calculating usage fees, which should ideally be presented transparently to shippers to assist with their own price calculations.

Service facilities include, among others, sidings, **loading facilities, refueling stations, and washing facilities.** Requests for use can be submitted via the platform-independent **RailSys® Web Facility Booking Manager**, where the infrastructure manager can then plan and manage them.

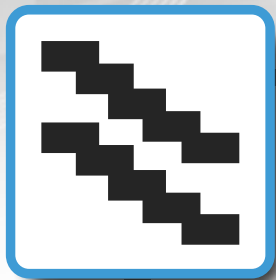
Once the contract is concluded, actual usage data, such as the start of use or the number of wagons actually stabled, is recorded and documented. This data forms the basis for generating the invoice.

All necessary communication between the user and the infrastructure manager takes place digitally via the RailSys® Web Facility Booking Manager.

The RailSys® Web Facility Booking Portal is **part of the RailSys® Software Suite** and is fully integrated into its non-redundant data structure. It **complements the path management processes** of infrastructure companies and **provides a central data repository** where all relevant planning information, and, where applicable, operational data can be consolidated.

Featuring a modern user interface, clear processing steps, and comprehensive visualization of facilities and bookings, the web application offers a comprehensive and user-friendly tool for all stakeholders.

RailSys® Timetable Manager



Reliable timetable construction even in complex problem situations.

Reliable and **efficient planning and simulation software** is essential to ensure stable timetables as well as the associated punctuality rate in railway transport. With this in mind, the **Timetable Manager** has always been **at the core of the RailSys® Suite** alongside the Infrastructure Manager. With the steadily advancing digitisation of railway operating processes, new and greater challenges and demands arise for the used planning tools. An essential element of these operating processes is the creation of the annual timetable, which contains **complex planning aspects** such as **regionally defined fields of responsibility** or **train parameters that vary over the course of the year** and which must lead to a reliable data basis for the ad hoc planning that follows immediately.



With this in mind, **various functions and tools** are available in the RailSys® Timetable Manager to display complex planning processes when creating timetables. In addition to a wide and well-established range of functions, it is also possible to **manage seasonal patterns** in the Timetable Manager. This means that trains can also be kept available as a uniform planning object even if they have **construction parameters that deviate from the standard planning** on some days of traffic (e.g. shortened routes, different tracks, different train characteristics). In addition to **a wide range of train filter options**, specific **distinguished timetabling in regionally defined fields of responsibility** - with a transparent representation of the transition situations to neighboring areas/fields - as well as a consistent and clear representation of the traffic situation around the day change at midnight are also part of the Timetable Manager. This means that all planning steps from the concept to the ad-hoc timetable can be carried out in the same planning tool and on a **uniform, redundancy-free database**, whereby the level of detail of both the representation used for the construction (macroscopic or microscopic) and the calculation (from working with raw data to microscopically exact conflict determination) can be determined depending on the respective task.



The RailSys® Timetable Manager is the ideal tool for timetabling in railway transport. With its variety of tools to create and manage timetables, it significantly increases the **flexibility and efficiency of your workflow**.

RailSys® Operations Control Center



All relevant information at a glance.

In the context of daily timetable production and actual operations, a multitude of short-term changes occur every day.

Dispatchers responsible for this require a quickly comprehensible **overview of the current operational status** to make informed decisions. This overview is generated through the tabular and graphical preparation of **train running reports**, which can be provided by train control systems or, on non-digitized branch lines, through the manual recording of **actual train data**. By **comparing the planned data with the current operational situation** and forecasts, dispatchers can be promptly informed about necessary timetable changes, which then need to be recorded and communicated.

The **RailSys® Operations Control Center** is designed as a web application and is highly flexible in its use. The application provides dispatchers with visual representations and tabular overviews of the current operational situation.

With just a few clicks, **changes to the daily timetable**, such as recording short-term train cancellations or track cancellations and modifications, can be captured and communicated in the system. This then forms the basis for both train control, which is connected via interfaces, and subsequent processes such as capacity optimization and determination of track access charges. The **RailSys® Operations Control Center** also supports the **digitization of less frequented branch lines** in manual train control operations by providing dispatchers with semi-automated recording of train movements and digital assistance for train control.

With the **RailSys® Operations Control Center**, dispatchers can be ideally supported in their daily tasks. The **full integration of the web application** into the RailSys® Software Suite allows direct access to relevant planning data from infrastructure and timetable planning, actual data, and the use of proven RailSys® interfaces to other systems.

With the **RailSys® Operations Control Center** and the other RailSys® applications, we offer new opportunities for **system consolidation**, aiming to support both small and large companies in the **resource-efficient digitization** of rail traffic management.



A solid data foundation for all future decisions.

As part of daily capacity planning, which integrates processes for coordinating construction work and managing track access request, **vast amounts of data accumulate** in IT systems, capturing the employees' operational knowledge. By **reprocessing historical data and presenting it in a user-friendly format**, it is possible to draw conclusions regarding process quality and performance, as well as gain **insights to inform future planning**. Furthermore, the continuous updating of data for such analysis enables a precise assessment of the overall system and its participants based on standardized key performance indicators.

The latest module of the RailSys® software suite consists of a data warehouse and a web application that is supplied with the most up-to-date data on a daily basis via an interface.

Data from the data warehouse is analyzed using RailSys® BI, a web application featuring configurable dashboards that provide **real-time insights into ongoing processes**.

Separating the production database from the data warehouse ensures the performance of the overall system at all times by preventing read/write processes from interfering with one another.

The seamless, single-source integration of a powerful data analysis tool like RailSys® BI into a production system like RailSys® eliminates the need for complex system integration.

Unified data handling and shared identifiers enable the **rapid analysis of data anomalies and their origins**. By using RailSys® BI, staff are spared the tedious task of manually compiling figures for internal or external reporting, allowing them to focus fully on their core responsibilities.



RailSys[®] Evaluation Manager



All relevant results of your timetable simulations quick, clear and reliable.



In order to ensure that train traffic planning can also be executed and put into reality, infrastructure projects and timetables can be checked in advance with RailSys[®] using simulations with regard to their **operational quality and the effects on clients**. On the basis of detailed infrastructure and timetable data, **conclusions can be drawn about the capacity of rail infrastructures** by simulating train operations. Additionally, **timetable and infrastructure variants can also be qualitatively assessed**. Questions such as "Is it possible to increase the set of patterns of this route without a loss of operational quality?", "What are the benefits of expanding the railway junction?" or "Can the timetable be run despite ongoing construction work?" can be answered quickly, effectively and clearly this way.

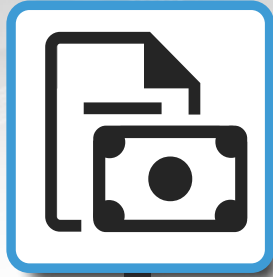


With the **Evaluation Manager**, the RailSys[®] Suite offers a comprehensive tool for the **tabular and graphical evaluation of operational simulations**. Various attributes, such as average delays, additional delays, perturbations, and much more can be displayed in **bar and line diagrams**. In this context, the **spatial dispersion of punctualities** can be visualized and route or network-related **bottlenecks** can be identified on the basis of operationally necessary unscheduled stops. In connection with a wide variety of **statistical evaluations of timetables**, the Evaluation Manager offers a big selection of various options to graphically prepare the examination results, differentiated in terms of spatial, temporal and train-specific attributes, and to underpin the according interpretation.



With its intuitive user interface the Evaluation Manager enables a more flexible, clearer and faster creation of evaluations. A clear **workflow** guides the user through the necessary settings for the generation of evaluation sheets, whereby double input of data is now a thing of the past. **Train and station selections** that have already been created are offered for reselection directly on the user interface. Additionally, **box-plot diagrams** offer a better classification of the results in terms of their simulation quality. All test results can also be created with **new evaluation folders and sheets** so that they can be output and presented immediately. Thus, all questions relevant to the planning process can be answered in the shortest amount time.

RailSys® Accounting Manager



A main hub for all accounting matters.

Rail infrastructure companies aim to provide their clients with a **transparent cost breakdown**, making a cost preview for bookable items indispensable. Oftentimes, the process which starts with a train path request through the actual train operation to the billing is not fully digitized within a rail infrastructure company. With the RailSys® Web Train Path Manager, the RailSys® Operations Control Center, and the RailSys® Accounting Manager, all interfaces between systems are digitized.

The **RailSys® Accounting Manager** provides rail infrastructure companies with a centralized hub and tool for creating and managing their invoices and accounting. **Cost components of a train journey**, such as order costs, cancellation fees, costs per kilometer, and the route costs, are managed within the client-specific pricing model. The basis for this is the request and registration of a train path or facility. In the RailSys® Web Train Path Manager, **prices are transparently communicated** already during the registration phase. After the train journey is completed, the registration data is compared with the actual data in the RailSys® Accounting Manager, and an invoice is generated based on this comparison. The **invoices are made available to the clients** in the RailSys® Accounting Manager and are sent out.

With the **RailSys® Accounting Manager** the **central process for creating and managing train path invoices** is transparently displayed and managed. Manual steps outside the RailSys® Suite can be eliminated, simplifying the workflow for both rail infrastructure companies and clients, as there now exists **a central hub for the creation and examination of billing documents**. Additionally, the detailed itemized bill lists services rendered for each train journey.