

Hitachi Rail
In Europe.

TRAFFIC MANAGEMENT

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Hitachi's total railway solution is designed to manage speedy and efficient recovery of trains running from unexpected traffic disruptions. It is a well-established highly-automated system taking care of train and traffic management all the way through to the maintenance depot.

A total solution

Hitachi's total solution for railway management includes:

Traffic Management System (TMS)

Features timetable - based control as its core; integrating railway companies into a unified system. It adjusts dynamically and intelligently when traffic problems occur, exchanging information with related systems to carry out route control operations and timetabling adjustments. The system consists of:

- ▶ Railway Operations Planning System (ROP) - integrates all short-term and long-term operation planning data and operation planning processes into a unified system such as train timetables, work schedules and train crew schedules. Cloud-based tool for access from wide range of locations, such as stations, depots and crew offices. No downtime for maintenance and updating. Simple intuitive user interface.
- ▶ Traffic Control System (TCS) consists of the following sub-systems.
 - ▷ Train Graph (TG) - presents actual train path as well as predicted train path of upcoming trains in a time/distance graph, allowing operators to make timetable changes easily and efficiently, dynamically rescheduling route control.
 - ▷ Automatic Route Setting (ARS) - generates the control commands for train routes at the optimal moment and outputs these to the relevant interlockings. This state-of-the-art control technology ensures a smooth, programmed timetable.
 - ▷ Visual Display Unit (VDU) - presents real-time train location and trackside equipment status in a track layout display, allowing operators to always recognise the latest situation. VDU also enables operators to set route manually.
- ▶ Rolling Stock Management and Assignment System
Ensures maintenance activities such as cleaning, inspection and repairs are carried out efficiently and effectively. The system consists of:
 - ▶ Rolling Stock Management System - integrates various information on rolling stock maintenance, and supports to make an inspection schedule and manage the result.
 - ▶ Rolling Stock Allocation Scheduling System - supports allocating the correct rolling stock to train diagrams, taking into account factors such as formation length, servicing and maintenance cycles.
- ▶ Online Monitoring System - collects and analyse real time data from onboard devices of rolling stock to be utilised for rolling stock management and effective maintenance.

Automatic train rescheduling

Hitachi's advanced TMS system automatically and efficiently reschedules train operations in the event of a disruption. The feasibility of our system has been tested using real operation data. Here's how the process works:

- ▶ Goal-oriented simulation: Rescheduling solutions are automatically generated taking account of pre-determined rescheduling policy.
- ▶ Rescheduling modules: Multiple software modules make customising rescheduling options easier.

Benefits

- ▶ Reduces workload for traffic controller when disruption occurs.
- ▶ Supports quick decision-making for traffic controllers.