



*Rail Planning and Scheduling Solution*  
*Planning for success in a changing market*



## OPTIMIZE FOR SAFETY, PUNCTUALITY AND PROFITABILITY

### Key Advantages

The Quintiq Rail Planning and Scheduling Solution stands alone as the only complete solution for railroad companies that delivers comprehensive, accurate and flexible passenger rail planning. It offers exclusive capabilities that enable your organization to:

- **Improve customer service** – Maximize on-time train arrivals. Successfully meet service level agreements for punctuality.
- **Ensure safety** – Schedule drivers with the correct route and traction knowledge. Comply with safety regulations regarding rest periods, work hours and maximum continuous driving time.
- **Promote employee satisfaction** – Decrease absenteeism and staff turnover by factoring employee preferences into crew shift schedules and planning for route diversity through link generation and crew bidding.
- **Increase profitability** – Balance your schedule. Reduce the number of empty trains and ensure employees end shifts at their home depots.
- **Boost productivity** – Optimize your workforce to perform the same schedule with fewer employees. Precisely match employee skills with demand.

### COPING WITH INCREASING COMPLEXITY ON THE RAILS

Running a railroad company is an increasingly complicated business. Daily operations revolve around safety and interoperability issues, timing locomotive maintenance and cleaning, and frequent last-minute schedule changes due to delays and accidents. All these issues must be dealt with within a rigid timeframe, with short reaction times because of escalating network utilization and an increased number of service providers. Overcoming these operational challenges requires highly accurate and flexible planning and scheduling. Such intelligent planning makes it possible to move from stress-laden reactive planning to confident, proactive planning – turning the complexity into a competitive edge.

### THE ADVANTAGE OF INTEGRATED PLANNING

The Quintiq Rail Planning and Scheduling Solution surpasses the capabilities of traditional solutions by optimally integrating all rail resources, including the rolling stock and your workforce, into a cohesive, flexible plan. Based on the most sophisticated optimization engine available today, the Quintiq solution covers multiple planning horizons and coordinates all the necessary planning parameters. The result: improved employee satisfaction, assured safety levels, excellent operational performance and optimized decision making.

NICO LOUTER,  
MANAGER ICT  
RAILION NEDERLAND:  
"Railion Nederland is extremely pleased with the planning solution from Quintiq and Ab Ovo. Planning in rail transport is very dynamic and complex, because there are many short term changes in the planning process and a large number of very diverse constraints in planning and executed orders: With the Quintiq planning solution we are able to take this into account in real-time. This software is no doubt the best choice as far as price, quality, flexibility and speed of implementation is concerned, currently available on the market for the railway business."



## FUNCTIONAL SCOPE - Rail Planning and Scheduling Solution



### A COMPLETE SOLUTION FOR ALL YOUR PLANNING NEEDS

Quintiq covers every planning horizon:

- Operational planning – Confidently handle last-minute schedule changes and disturbances.
- Short-term planning – Optimize your workforce while complying with labor contracts and safety regulations. Schedule drivers with the correct route and traction knowledge.
- Long-term planning – Optimally create balanced unit and crew diagrams.
- Strategic planning – Compare what-if scenarios and perform Key Performance Indicators (KPI) analyses to verify planning quality.

LEO GOODWIN,  
COMMERCIAL DIRECTOR  
FIRST TRANSPENNINE  
EXPRESS:

"First searched long and hard for a single advanced planning and scheduling solution that best enables each train operating company to become more efficient. We were very impressed with Quintiq's professionalism, delivery and ability to adapt to the specific needs of each of our train operating companies. Quintiq's solutions will help each company deliver improved reliability."

### UNIQUE, THREE-LAYER ARCHITECTURE



#### Quintiq Standard Software Layer

All Quintiq solutions, regardless of the company's specialization, contain this layer, which makes up 80% of each solution. As the standard Quintiq Application Suite, this layer contains most of the planning functions, including the Windows and web user interfaces, the real-time knowledge engine, the integrator that connects Quintiq with other systems, and Quintiq optimizers.

#### Industry-specific Layer

Accounting for 10-15% of the solution, this layer contains all data specific to the Rail industry.

#### Customer-specific Layer

This fully customizable layer includes all the information about and knowledge of your company's unique production environment and processes. It accounts for 5-10% of the solution.

### A PERFECT FIT FOR TODAY AND TOMORROW

Because every railroad has its own specific planning preferences and requirements, having a planning and scheduling solution customized to your organization's needs is essential. The Quintiq

Rail Planning and Scheduling Solution is a fully configurable solution based on the uniform Quintiq technology core. The solution can be modified to contain all rail constraints and planning preferences relevant to your organization. And because the Quintiq solution is flexible, it will meet your future



planning and scheduling needs, supporting even rapid and substantial growth. This gives you the best of both worlds: the perfect fit of a tailor-made solution with the long-term scalability and upgrade benefits of a standard solution.

### HANDLE REAL-TIME DISTURBANCES WITH CONFIDENCE

Quintiq provides the flexibility you need to confidently handle daily, last-minute scheduling disturbances – locomotive accidents and breakdowns, unexpected track maintenance and unscheduled employee absences – so customer service levels can be maintained. For example, when a driver unexpectedly calls in sick, the system is able to provide a list of available employees who have the necessary route and traction knowledge.

This also applies to the rolling stock. When a disturbance occurs – and often it happens outside your area of control, with a different railroad company running on the same track, or due to changes in multi-modal connections or customer demands – Quintiq assists in immediately rectifying the problem. For instance, because the Quintiq solution provides an overall view of accessible resources, when a replacement locomotive is needed, the planner can search the system for suitable rolling stock available in neighbouring regions.

In addition, this sophisticated solution mitigates the effects unforeseen disturbances have on the long term plans so you can reach important business goals.

### MAXIMIZE YOUR HUMAN CAPITAL WHILE IMPROVING EMPLOYEE SATISFACTION

For railroad companies, locomotive drivers and crew are the most challenging and expensive resource to optimize. When creating crew diagrams, Quintiq optimizes your human capital while taking into consideration drivers' shift preferences and ensuring the drivers possess the necessary route and traction knowledge. Planners can enter employee preferences into the system and are notified when a violation of these preferences occurs. The result is improved employee satisfaction and optimized employee and resource utilization.

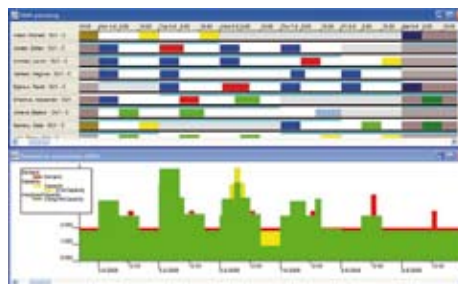
### MASTER INTEROPERABILITY ISSUES

Governments and railroad companies are doing everything they can to make train travel safe, secure and punctual. However, with technological advances to improve safety come interoperability problems between the rolling stock and the tracks. When creating unit diagrams, the Quintiq solution takes into account constraints related to unit compatibility with the tracks, eliminating interoperability issues.

### SUPERIOR ANALYTIC CAPABILITIES FOR ACCURATE DECISION MAKING

With shrinking reaction times, decision making must be done quickly and accurately. To measure the quality of planning decisions, Quintiq compares operational performance to resource utilization, employee satisfaction, customer service levels and other Key Performance Indicators (KPIs). You know instantly the quality of any plan. For example, before bidding on a new tender, you can know how the contract will affect operations by performing scenario analyses to discover the hidden costs and benefits.

Moreover, Quintiq offers a veritable treasure chest of management information based on your business data and analyses of deployment, availability and planning trend sets. The user-friendly interface makes interaction between the planner and the system direct, fast and intuitive. Individual planners choose the visualization according to their specific planning requirements, creating insightful displays of data that enable them to make informed and effective decisions.



The systems supports the planner in optimally matching supply and demand.

### KEY FEATURES AND BENEFITS:

- **Resource utilization optimization** – Optimally schedule your rolling stock.
- **Workforce planning and scheduling** – Schedule drivers and crew while taking into consideration skills, certifications, and route and traction knowledge.
- **Balance assignments** – Reduce the number of empty trains; ensure crews end shifts at their home depots.
- **Employee preferences support** – Increases employee satisfaction, retention and efficiency.
- **Daily operational control** – Confidently handle real-time disturbances and schedule changes.
- **Reporting and management data** – Receive valuable data to support accurate decision making.
- **Customizable interfaces** – Meet the different planning needs of multiple planners.
- **KPI analyses** – Gain insight into the effects planning has on business goals.