Your Local Partner for Railway Projects
Anywhere in South East Asia

Railway Simulation & Timetable Planning
Engineering & Maintenance

- CONSULTING
- SIMULATION
- PLANNING
- ENGINEERING
- PRODUCTS
- TECH SUPPORT
Consulting Service for Railway Traffic Planning
Simulation Studies and Timetable Planning

Specialized in Railway Simulation and Timetable planning.

With 20 years of experience in railway signalling and 15 years of experience in railway simulation, Rail Systems Engineering has the perfect background to understand Railway Operators and the supplying Industries that build the infrastructure for future train operations.

As the South East Asian representative for OpenTrack simulation software and Viriato timetable planning we also have the perfect tools and partners to handle simulation and planning tasks of any size. Our team of engineers offers full support to our clients for any simulation and planning task.

Listed are some possible operational challenges where Rail Systems Engineering can support its clients with consulting, simulation and planning.

Timetable Construction

New lines are being built, existing lines are being extended and additional services are added to lines. All these changes bring a change in the timetable with it. New timetables can be constructed and tested through simulation well before the new timetable is implemented.

To attract passengers to use a train service, timetables have to be easily understood. Clocked timetables allow passengers to take the train without consulting timetables first. We can support our clients in building up clocked timetables for their Network.

Temporary operation arrangements and working possessions

Even though only valid for a limited period of time, disturbances through maintenance and works on the track bring a big challenge to the operator. Properly planned temporary arrangements may allow the operator to run the full service capacity in such situations.

Critical situations may occur in case of system failures, such as train malfunction, signalling failure or any external influence that cause a section of line to be temporarily out of service. Pre prepared emergency scenarios might help operators to run the train service even under such circumstances.
Capacity Investigations and Planning

Rail traffic is constantly increasing; investigating the available capacity of current railway lines forms the first step in planning into the future. We follow the UIC standardized way of capacity evaluation.

Looking into the future, we can evaluate where additional line capacities are needed to cope with the future demand. Through simulation we can evaluate what measures are needed for the capacity increase and compare available options.

Feasibility Studies

Improving public transport is in almost every government’s priority list. From the first idea to the start of the construction of a new line it’s a long way. Simulation of the proposed line and its options form an integral part of the feasibility study. In a structured approach we can evaluate the pros and cons of the options and give the decision makers a well-founded opinion.

Signalling Systems – Design & Verification

Railway Simulation lies in the interface of Operation and Signalling. This interface has to be verified and tested well ahead of the construction of the line; a simulation is usually the only way to show that the system design can fulfill the contractual requirements.

Many infrastructure project contracts require a simulation a part of the contract, usually to be supplied by the turnkey supplier.

The type of interlocking and the design of the Signalling-and ATP system make a great impact on the final performance of the railway. Often railway systems are being run at the limit of their capacity. Simulation studies show in detail the impact of design and design changes.

Old ATP systems can no longer cater for today’s traffic demands. They are being replaced with modern global standard systems like ETCS. We can show operators in detail how the implementation of a new system will change the performance, as well how operational rules have to be adapted to make full use of the suggested benefits.

Our Simulation Projects

- Timetable Construction
- Timetable Verification
- Capacity Investigations
- Infrastructure Planning and Dimensioning
- Possession Planning
- Signalling Design Verification

Capacity Investigations and Planning

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OpenTrack - The Software

OpenTrack is a state of the art simulation software, designed for Operations Departments, Project Planning and Government consultants to conduct study of Operations, Timetables, as well as Line and Signaling Layout verification.

OpenTrack is a planning and simulation tool developed by The Swiss Federal Institute of Technology Zurich and is supplied to over 116 organizations in 24 different countries.

Simulation

OpenTrack allows user-defined trains to fulfil the specified timetable on track layouts.

- Graphical visualization on rail operation
- Localizing capacity bottleneck
- Evaluating how disturbances affect the network as a whole
- Evaluating impact of different ATP systems
- Evaluating and designing signalling systems
- Optimizing rolling stock scheduling

Evaluation

OpenTrack performs a variety of different evaluations using the simulation data. These evaluations can be made on several different perspectives, for example, per train, per route and per station.

- Route conflict detection
- Tractive effort
- Power consumption
- Delay scenarios

OpenTrack core applications

- Runtime Simulation
- Headway Simulation
- Signalling Design Verification
- System Design Verification
- Power Usage Studies
- Train capacity Verification
- Timetable verification
- Track Layout Optimization

OpenTrack is used by

- Railway Operators
- Railway Project Suppliers
- Engineering Consultants
- Universities and Research
Viriato Timetable Planning Software

SMA Viriato Software is a powerful integrated timetable planning tool and is used worldwide, with references in many of the major European Railways such as SBB, DB and SNCB.

Viriato allows the user to optimize the railway network planning process by following functionality;

- Timetable Planning
- Graphic Timetable
- Customer Timetable
- Running Time Calculator
- Conflict Detection
- Interfaces to other Systems (e.g. Ticketing, Traffic Management)
- Capacity Analysis

Implementing a new timetable planning tool for an operation railway is not an easy task to do. Rail Systems Engineering will do the entire implementation for our clients:

Implementation Process
- Specify requirements
- Setup the system to current operational layout
- Train software usage and planning techniques
- Implement all interfaces to other systems
- Ensure seamless switchover to Viriato system

We support in:
- planning future timetables
- planning new timetable strategies
- implementing clocked timetables

OpenTrack and Viriato Software License

Rail Systems Engineering is the South East Asian representative for both, OpenTrack and Viriato.

A software license includes:
- One year Support and upgrades
- Initial training

Services:

For both our software products we provide the full scope of services:

- Sell the License
- Setup the system
- Setup the project
- Initial Training
- Assistance during Project execution
- Software Service
Sharing Timetable Data

Once a timetable is produces it’s usually shared for collaboration with partners and colleagues or it is transferred to other tools for further usage. Often the timetable is base input of other system for their functionality. We can prepare your data for the target system of your need.

RailML

RailML is a standard Data Interchange format for Railway Data. It makes data interchange between tools and system easy. And since UIC declared RailML their standard for data interchange its popularity has much increased.

Our tools OpenTrack and Viriato use RailML as standard data format for their output.

Data Interfaces

Where a tool or system is not capable of understanding RailML we can provide custom data-interfaces to allow data interchange.

- Convert Timetable data to propriety formats
- Filter, sort or modify data for different applications
- Validate Data
- Visualise Data

Analyse Operational Data

We can analyse your operational data, visualise it and use it as input for further traffic planning.

Data Management

- RailML competence
- Data Conversion
- Data Interfaces
- Data Visualization

RailML Tools

- **RailOscope**
  Visualisation and collaboration tool
- **RailVivid**
  UIC’s visualisation tool

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**Timetable Data**
Simulation of Railway Power Supply Systems

In addition to the operations Simulations we can also provide power simulation. We do in-depth studies of Load Flow and Energy consumptions on the systems, from Substation, including the Feeder systems all the way to the train.

Power Simulation

Power Simulations are done with OpenPowerNet an add-on software to OpenTrack.

It takes into account:
- Simulation of all common AC- or DC- railway power systems
- Representation of entire electrical network structure
- Precise consideration of electromagnetic coupling
- Exact modelling of the trains propulsion system

Calculated results will be explained and discussed in a report.
- Minimum and Maximum pantograph voltage
- Number, location and proposed capacity (rms values for power and current) of the traction substations and corresponding feeder and return feeder cables.
- Capacity of the contact line system (rms values for currents) including contact wire, messenger wire, negative feeder, running rails.
- Calculation of energy consumption of the entire 25kV network, of each substation or of exemplarily for different train categories.

![Diagram of railway power supply systems](image-url)
Rail Systems Engineering was founded in 2008; we are located and registered in Kuala Lumpur Malaysia. The company’s main focused service area is South East Asia (all ASEAN countries), Korea and Taiwan!

We are South East Asian representative for the following companies:

sma+viriato  OPENTRACK

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