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### Simulation Studies, Timetables and Operation Concepts





















Rail Systems Engineering Sdn Bhd is specialised in Railway Simulation and Timetable planning. The company is based in Kuala Lumpur. We provide simulation studies, consulting in operational planning and training for our clients.

Rail Systems Engineering uses the Simulation Software **OpenTrack** for Railway Simulations. The add-on software **OpenPowerNet** is used for Power Simulations. Timetable planning tool **Viriato** is used for feasibility Studies and Operational timetables.

**Simulations performed by Rail Systems Engineering Sdn Bhd or where we had significant involvement in the setting up and running the simulation:**




Railway	Client	Project Description	Year
North South High Speed Line		<b>Pre-feasibility study of line capacity, Vietnam</b> We verify the line capacity of the proposed North South High-Speed Line in Vietnam for each construction phase.	2022 
North South High Speed Line		<b>Pre-feasibility study of timetable concepts, Vietnam</b> We verify the feasibility of timetable concepts (different headways) on the proposed North South High-Speed Line in Vietnam.	2022 
		<b>Divre III and IV, South Sumatera</b> Line capacity study of Divre III and Divre IV lines. A total of 660 km of single and double track with a mixed traffic service of passenger and freight trains.	2022 
		<b>Supply, Training and Support</b> Supply and train OpenTrack Simulation software and support for the Ministry of Transportation in Indonesia.	2021 
		<b>Line C, Prague Metro</b> Search for possible gains in headway if the line is resignalled to CBTC.	2021 
		<b>Successful completion of ATO GoA2 project (Phase 1)</b> We have successfully retrofitted our RSE ATO onboard unit on a train without ETCS and the train is now running automatically from start to stop	2021 
		<b>Scopes of work for the feasibility study of ATO GoA4 on Betuwe Line (Holland)</b> Provide consultancy service to define the frameworks required to start an ATO GoA4 project	2021 
		<b>Sub second simulation for Cross Zurich network</b> Verify the gain in line capacity from Zurich Oerlikon to Zurich Loewenstrasse when the route setting time is optimised to as close as sub seconds.	2021 
		<b>Digital Twin for Industrial Product development</b> As part of the ATO GoA2 for ETCS L1/LS Rail Systems Engineering is developing a digital Twin system to test the ATO Onboard Unit under simulated system, by using OpenTrack with API. Simulation allows for real time data to be provided to the system under test.	2019 
		<b>Operations Simulation, ATO GoA2</b> Operations Simulation for ATO GoA2 project as part of Swss MOT's SMARTRAIL 4 Initiative.	2018 
		<b>Express Rail Link – Node Capacity Study KL Sentral</b> Verify the train capacity of KL Sentral station with regards to implementation of possible new services.	2018 

Railway	Client	Project Description	Year
		<b>KL LRT Line 3</b> In partnership with <b>IFB</b> (Institute fuer Bahntechnik – Dresden) Power Study and Simulation for 36km long LRT from One Utama to Klang (CBTC)	2018 
MANILA MRT-7		<b>Operations Simulation, Failure Mode Analysis Report</b> Simulation Studies and Failure Mode analysis for Ricardo's Project "Manila MRT-7"	2017 
		<b>Supply, Training and Support</b> Supply and train OpenTrack Simulation software and support Bangkok Expressway and Metro. (Operator of Blue Line and Purple Line)	2017 
		<b>Supply, Training and Support</b> Supply and train OpenTrack Simulation software and support SRTET – Airport Rail Link Bangkok to Suvarnabumi Airport. Build-up of Simulation Model of complete Airport Rail Link Line	2017 
		<b>Supply, Training and Support</b> Supply and train OpenTrack Simulation software and support for Ricardo Korea.	2017 
		<b>Timetable Planning System</b> Supply fully configured Timetable Planning and Simulation System for the complete KTMB network. Including Viriato and OpenTrack software, server and workstations, training and support. (ongoing)	2017/18 
		<b>Supply, Training and Support</b> Supply and train OpenTrack Simulation software and support Rail Solutions Engineering for an MRT project.	2017 
		<b>SRT electrification greater Bangkok</b> Power simulation of SRT's greater Bangkok area as part of an electrification Study. "Hua Hin - Pak Nam Poh – Bangsue - Nakhon Ratchasima – Pattaya" In partnership with <b>IFB</b> (Institute fuer Bahntechnik – Dresden).	2016 
		<b>Northern &amp; North Eastern Double Tracking</b> Standard Operations Plan and Simulation for SRT's "Pak Nam Poh – Den Chai" and "Khon Khaen – Nong Khai Double Tracking"	2016 
		<b>HS Kunming - Rayong</b> Study of operation of the southern section of Kunming – Rayong standard gauge line: Nakhon Ratchasima to Rayong and Bang Sue. Mix freight operations with fast and high speed passenger trains. Study of overtaking, entry and exit the HS line.	2015 
		<b>Bangkok Yellow line – Reversing Study</b> Detailed study about train reversing at Ratchada Terminal station.	2015 
		<b>Bangkok Grey Line – Rolling Stock</b> Analyse operations of the 23km Monorail and determine the number of Rolling Stock needed.	2015 
		<b>KL LRT Line 3</b> Concept Study Operations Plan and Simulation for 36km long LRT from One Utama to Klang (CBTC)	2015 
		<b>Metro Seoul – Gimpo Line</b> Build up a simulation model for the new Gimpo Line of Metro Seoul. (CBTC)	2015 
		<b>Timetable Ipoh – Padang Besar</b> Generate a timetable Ipoh Padang Besar section for traffic management system at SCC Bukit Mertajam.	2014 

Railway	Client	Project Description	Year
	VAST	<b>Bangkok Yellow line – Runtime simulation</b> Runtime simulation of Bangkok’s Yellow line monorail. Simulation with updated data in accordance to the project progress and additional design information.	2014 
	Global Rail	<b>KLSR – Braking curve verification</b> Simulation to verify braking curves of different train types at specific locations.	2014 
	HDC 아이콘트롤스	<b>AREX (Korea) – Extension to Terminal 2</b> Airport link to Incheon International Airport, Simulation of the extension from Terminal 1 to upcoming terminal 2. Key elements: 3 services (Commuter, Express, High Speed) and 2 different signalling / ATP systems (ETCS Level2 and TVM 430) on one line.	2014 
		<b>THSR (Taiwan) – Extension to Nangang</b> Taiwan High Speed Rail, extension from Taipei station to Nangang Station. Key elements: 4 minutes interval train service, including the entry and exit at the terminal station Nangang. The Simulation is carried out to confirm on the contractual design requirement.	2014 
	VAST	<b>Bangkok Yellow line – Runtime simulation</b> Runtime simulation of Bangkok’s Yellow line monorail to verify running time. Simulation at early project stage with limited information available.	2013 
		<b>KL MRT Line 1 – Power Simulation</b> In partnership with <b>IFB</b> (Institute fuer Bahntechnik – Dresden) Power Simulation Study for Kuala Lumpur’s MRT Line 1.	2013 
		<b>Express Rail Link – Extension to KLIA</b> Extension of the ERL line from KLIA 1 to KLIA 2. Simulation done to verify the new timetable with the extended service. Verify running time and track allocation at the airport terminals.	2013 
	Global Rail	<b>KLSR – add. Detail verification</b> Simple simulation to verify some specific scenarios as an addition to the simulation study done previously.	2012 
	Global Rail	<b>KLSR – Design Verification / Timetable</b> Re-Signalling of Kuala Lumpur Sentral area. Extensive simulation study to verify the new signalling design including signal locations. Proof the contractually required headway/train interval through the KL area (SPK – KL Sentral – Simpang Batu) and propose a timetable.	2011 

## Academic Support

Rail Systems Engineering Sdn Bhd is supporting universities and academic works, by supplying OpenTrack, teaching masters and PhD students and academic research members.

Railway	Project Description	Year
	<b>Mahidol University, Nakhon Pathom, Thailand</b> Supply OpenTrack Simulation software, give training and support to masters and PhD level students and give support for their thesis projects.	2015 
	<b>Korea National University of Transportation, Uiwang-si, Korea</b> Supply OpenTrack Simulation software, give support for their users (Students and Academic Staff).	2017 