RAILSIM®

Rail and Mass Rapid Transit Simulation and Modeling Software

SYSTRA

www.systra.com/usa/

RAILSIM® SOFTWARE SUITE

For more than 30 years, RAILSIM®, SYSTRA's proprietary, state-of-the-art simulation modeling software for the rail and transit industry has provided information and data to operating staff and engineering teams throughout North America and abroad to manage rail systems effectively. RAILSIM is designed to simulate all facets of rail systems, as well as the interactions of trains with infrastructure, control systems, and complex rail network operations.

RAILSIM can simulate all aspects of passenger and freight rail systems, specializing in commuter light rail, heavy rail or high-speed rail. SYSTRA can also customize and enhance the RAILSIM Software Suite to meet the unique needs of a rail and rapid transit operation.

The RAILSIM Software Suite is composed of multiple modules that simulate and analyze specific features of rail and rapid transit systems relating to operations, signal engineering, and electric traction power networks. This includes the examination of power demand, consumption, and system performance, as well as alternatives analysis for track outages, existing and future infrastructure configurations, and engineering designs. The software can be used to develop and achieve data collection and information to support essential business decisions and requirements.

- Schedules and Operating Plan Development
- Alternatives Analyses
- Equipment and Rolling Stock Performance
- Network Operations (Delay & Performance Analysis)
- AC and DC Electric Traction Power Systems
- Signal Systems Designs

RAILSIM® MODULES

RAILSIM® Train Performance Calculator (TPC) generates detailed and performance characteristics of a single train operating over a specified alignment. This performance data includes time, distance, velocity, and acceleration, among many types of output. It also supports 'customized runs,' where it is possible to specify individual run segments of acceleration, speed maintenance, coasting, and/or braking. In conjunction with the Rolling Stock Editor and Train Composition Library, the TPC can be used to model runs of locomotives and rolling stock to examine performance characteristics and operating plan requirements.

RAILSIM® Headway Calculator (HDC) automates signal clearing time (minimum supportable headway) processing for fixed block wayside and/or cab signal/ Automatic Train Control (ATC) train control designs. Used in conjunction with the RAILSIM TPC and RAILSIM Editor, HDC provides records of entrance and clearance times for all defined track circuits for end-to-end runs. Combining this information with the user-specified information on control lines, headway reports can be generated that detail the aspect and/or code rate restoration times behind the train for each speed command.

RAILSIM® Safe Braking Distance Calculator (SBC) calculates safe braking distances for worst-case signal design purposes. The SBC works as an extension of RAILSIM Editor (through the Track Profile Editor) and RAILSIM TPC. In addition to the normal reports available for a TPC run, the Safe Braking Distance Report displays an overview of the safe braking run with the worst-case train composition and required braking distance. RAILSIM can be used to analyze any number of defined train compositions from several signals or designated locations.

RAILSIM® Report Generator (RG) supports the other modules in the software suite with data and information produced by RAILSIM applications to generate as many as 30 types of output reports.

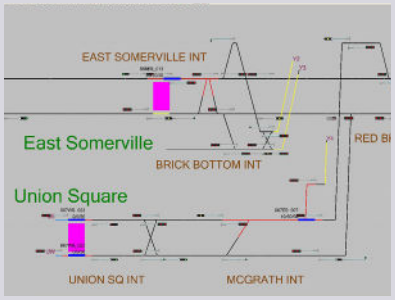
RAILSIM® Signal Engineer (SIG) allows for design and analysis of rail and rapid transit signal systems.

RAILSIM® Network Simulator (SIM) is used to analyze full-system operations of even the most complex rail networks. RAILSIM's Network Simulator lets you run your rail network in a simulated environment to benchmark current operations and test modifications (design, equipment and/or operational) under consideration. Run-time animation shows train movement, and performs data logging for each train, station, interlocking, and other features of the rail network. Recorded data can be sorted and summarized using the RAILSIM RG.

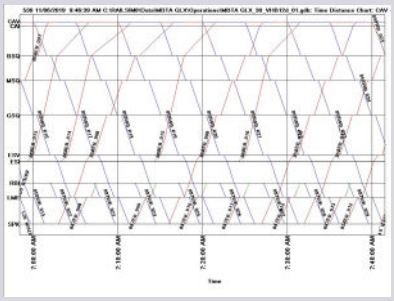
RAILSIM® Load Flow Analyzer (LFA) analyzes the traction power loads, potentials, and regenerative braking receptivity on a given DC or AC power system supplying power for the operation of electrified rail systems under prescribed operating conditions. RAILSIM's LFA uses train operations and unconstrained electrical load requirements derived from RAILSIM's TPC, as well as pertinent user-defined parameters (such as substation locations and feeder line parameters), to generate a physical plant representation of the electric network. RAILSIM LFA also accommodates user-specified train operational information (including varied train schedules and operating plans, locations, consists, and power consumption), as well as substation and feeder systems. RAILSIM LFA simulates the electric load throughout the network, providing results such as total power consumption, peak power loads, substation loads, feeder currents, train voltages, and rail potential.

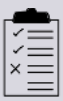
RAILSIM® Editor (EDT) is used to develop the most complex rail system infrastructure models (track and signal system). This module allows for the network to be displayed in either geographic or schematic representations of the system. Using the network model, track and signal system charts can be generated along with full operating plans.

NETWORK SIMULATOR

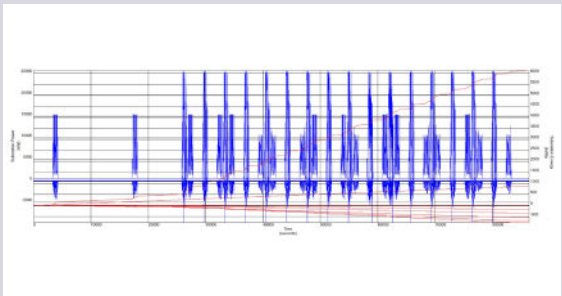


REPORT GENERATOR





LOAD FLOW ANALYZER



RAILSIM® ADVANTAGE

SYSTRA, a global leader in the application of rail operations simulation for planning and engineering challenges, has performed a wide range of ridership, capacity, travel time improvement, passenger flow, and electrical network analyses using the RAILSIM® Software Suite. Operations analysis capabilities at SYSTRA run the gamut from conceptual sketch planning of physical improvements to comprehensive Major Investment Studies and Alternatives Analysis to detailed engineering. Unique in the field of operations analysis, SYSTRA's analytical tools can move seamlessly from conceptual to final design and biddable documents using the same software packages.

SYSTRA's professionals have performed rail simulation and operations analyses for many of the major commuter rail and freight operators in North America, including:

- LIRR Mainline Corridor Third Track Study
- Amtrak Northeast Corridor Master Plan Study
- PANYNJ PATH World Trade Center Station Operations Study
- NJ TRANSIT Portal Bridge Capacity Study
- NYCT 6th Avenue Line Operations Simulations
- SFMTA Rail Core Capacity and Reliability Study
- MTA New York East Side Access Grand Central Terminal and Tunnels Capacity Study
- WMATA Systemwide Traction Power Load Flow Study
- CTDOT Shore Line East Systemwide Traction Power Load Flow Study
- MTA C&D Penn Station Access AC and DC Traction Power Load Flow Study
- DRPA/PATCO Systemwide Traction Power Load Flow and Wayside Energy Storage Study

1991 Version 1

1st Licensed
- Data Editor
- LRT Simulator
- Report (9 Reports)

1992 Version 3 Expanded

- Edit Program
- Simulate Program
- Train Performance Calculator
- Signal Designer
- Report (Additional)

1996 Version 5

Windows Format
- Data Editor
- Graphic Editor
- Simulate Program
- Report

1997 Version 6

- RAILSIM® Established
- Train & Infrastructure Graphics Added
- Edit Program
- Simulate Program
- RAILSIM® Train Performance Calculator

2004 Version 7
2007 Version 8

- RAILSIM® Train Performance Calculator
- RAILSIM® Editor
- Track Profile Editor
- RAILSIM® Network Simulator
- Headway Add-on
- Safe Breaking Add-on
- Signal Design Add-on
- Load Flow Analyzer DC AC
- Report Generator

2010 Version 8.1

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- Compatibility with Wi
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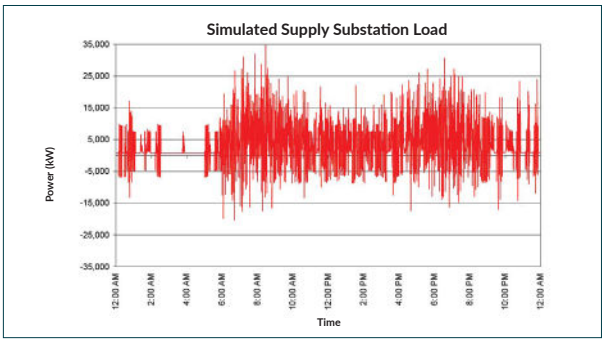
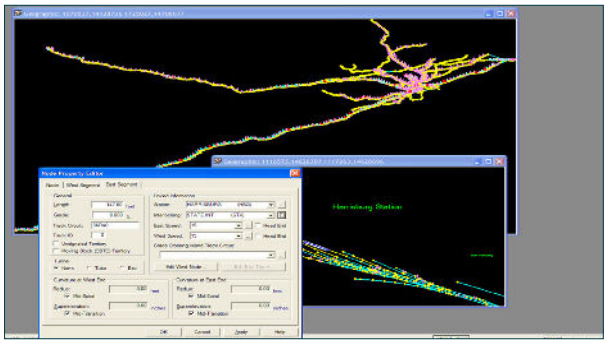
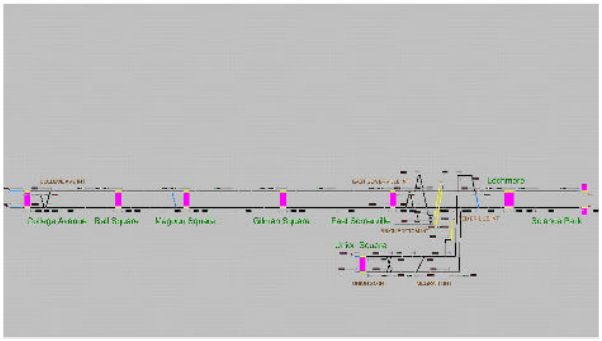
PROJECT PORTFOLIO



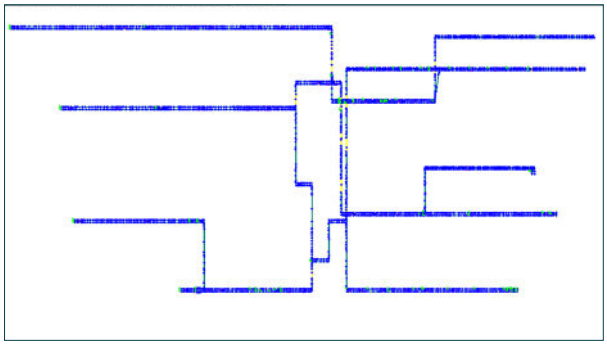
ConnDOT and MNR New Haven Line Traction Power Study



Amtrak Northeast Corridor Energy Use and Capacity Study



MBTA Green Line Extension Operations Analysis



WMATA Systemwide Traction Power Load Flow Study

RAILSIM® TIMELINE

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2014

- Better Graphics
- Improved Functionality
- Enhanced Features
- Superior Charts, Reports and Graphics

2014

- RAILSIM® Train Performance Calculator
- RAILSIM® Editor
- Track Profile Editor
- Rolling Stock Editor
- Train Composition LIbrary
- RAILSIM® Network Simulator
- Load Flow Analyzer DC AC

2020

- Compatibility with Windows 10
- Improved Funcitonalities

2023

- AC Load Flow Module Enhancements

SYSTRA USA is home to people who work daily to solve technical challenges. We are designers, engineers, architects, and construction managers for public transportation, education, and housing authorities. Through our work, we facilitate access to employment, education, and leisure.

With nearly 200 employees nationwide, we have been a trusted partner to public agencies and operators throughout the United States since 1985. Commitments to safety, the environment, quality, and ethics form the basis of SYSTRA's daily activities.

Part of SYSTRA Group, a world-leading engineering and consulting firm, SYSTRA USA is supported by 9,000 employees worldwide. We are shaped by our shareholders, SNCF (French National Railway) and RATP (Paris Metro operator). These strong ties allow us to draw on the expertise of talented engineers and innovative solutions developed by pioneers of newly developed technologies.

Using a collaborative approach built on the firm's value of *Connected Teams*, SYSTRA provides our clients and partners access to the best skills worldwide via sharing information, tools, best practices, and processes.

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