A1 - RightTrack™

MANAGEMENT INFORMATION & PLANNING SYSTEMS

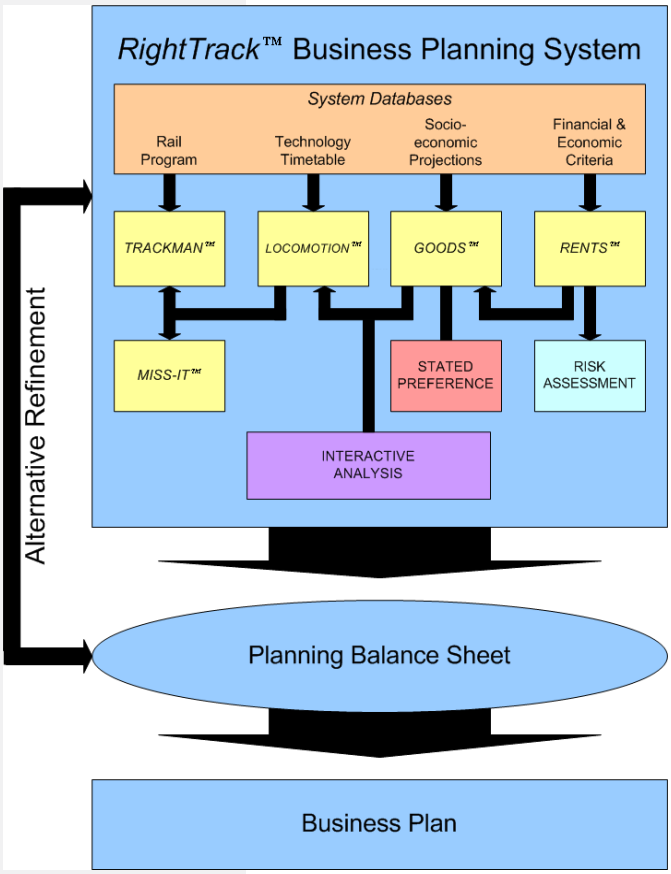
RightTrack™

Business Planning System

TEMS developed the *RightTrack*™ system to address problems that are unique to the passenger rail business. *RightTrack*™ is a suite of interactive analytical tools that enables users to assess a wide range of demand, revenue, technology, service, capital investment, and right-of-way issues to determine optimal business solutions.

RightTrack™ generates accurate and critical infrastructure, operations, and financial information integral to informed decision making. The *RightTrack*™ system enables transportation planners to:

- Develop realistic operating strategies that relate ridership and revenues to a specific level and quality of service
- Rapidly evaluate and re-evaluate differnet route (speed), technology (speed), operations (service levels), and ridership (fare) options
- Identify the capital investment needed to maintain track and other infrastructure at the optimum level for a given rail service
- Interpret traveler behavior to determine the level and quality of service that creates incentives for train use
- Maximize ridership and revenues while minimizing costs by achieving a balance among service, operations, and infrastructure investment
- Evaluate projects in terms of their financial return, user benefits, increase in jobs, income, and development opportunities that will accrue.



The *RightTrack*™ system is designed to interface with condensed profiles, timetables, track condition, and other databases already in existence. The system incorporates an "Interactive Analysis" that allows a wide range of demand, revenue, technology, service levels, capital investment, and right-of-way condition issues to be assessed by a "what-if" evaluation of possible options. In this way, "fatal flaws" can be identified and more favorable options developed.

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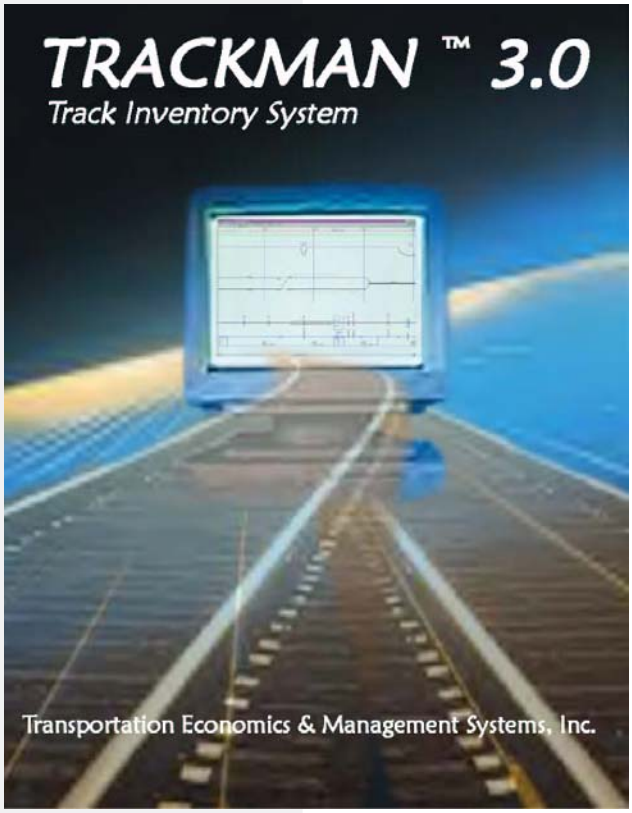
TRACKMAN ™

Track Inventory System

Transporation Economics & Management Systems, Inc. (TEMS) created the *TRACKMAN*™ inventory and assessment system to analyze track infrastructure and estimate the cost of upgrading for various scenarios. The system stores—on a milepost-by-milepost basis—information track condition and track geometry such as curvature, gradient, and turnouts; information on structures such as bridges, crossings, and stations; and maximum operating speeds. *TRACKMAN*™ contains a database of the unit costs of infrastructure components for engineering improvements, which allows the user to identify an infrastructure upgrade program and accurately forecast the cost. The database covers a wide range of improvements for track, curves, bridges, earthworks, grade crossings, signaling, fencing, station, and other facility costs. The database allows for infrastructure improvements to both branch and mainline operations as well as conventional, intermediate, and high-speed train operations.



The *TRACKMAN*™ system allows the user to review and "walk" the base track infrastructure of a corridor and to pinpoint needed improvements. The system allows for review not only of upgrade locations but also of the associated capital cost, generating a detailed "shopping list" of improvements and costs. The *LOCOMOTION*™ program also enables users to prioritize improvements in terms of time saved per dollar invested. A wide range of reports are available from *TRACKMAN*™ including the location of curves, bridges, crossings/crossovers, track speed restrictions, signals, stations/terminals, turnouts, track type, sidings, yards, and gradients.

The *TRACKMAN*™ system has been widely applied in North America including Midwest Regional Rail System (3,000 miles), Ontario-Quebec Corridor (1,000 miles), Boston to Washington Corridor (1,000 miles), Virginia Statewide Rail System (1,000 miles), New York Statewide Rail Plan (1,500 miles), Illlinois Statewide Rail Plan (1,000 miles), Florida High-Speed Rail Study (500 miles), Edmonton-Calagary High-Speed Rail Study (200 miles).

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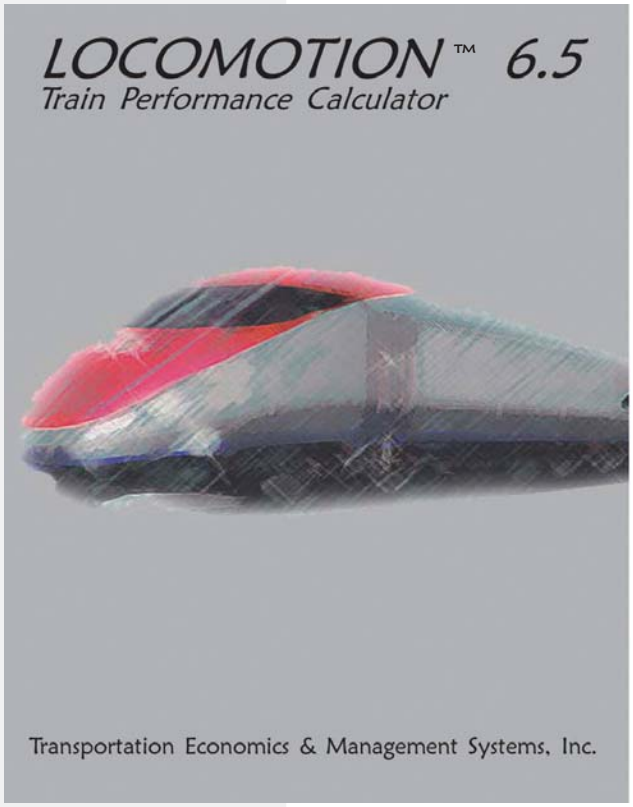
LOCOMOTION™

Train Performance Calculator

TEMS' *LOCOMOTION*™ system provides the rail operations planner with a highly sophisticated, yet easy-to-use tool for creating and analyzing rail operations schedules. *LOCOMOTION*™ provides a single, easily accessible source of detailed information on rail corridor characteristics and attainable train speeds. The system provides a framework for simulating and evaluating train technologies by enabling users to describe their overall performance considering acceleration and deceleration profiles in relation to the track structure, permissible speeds, and gradients. With *LOCOMOTION*™ it is possible to model rail corridors, create timetables for different train technologies, and produce speed profiles and operating diagrams. *LOCOMOTION*™ interfaces with TEMS' *TRACKMAN*™ system, which produces a complete graph profile for a given route and allows track improvements to be evaluated and prioritized for different technologies. Strategic timetable planning can significantly improve train utilization and minimize train set costs.The *LOCOMOTION*™ system provides a facility for developing and adjusting timetables, allowing the user to assess how operating schedules can be arranged to maximize ridership (in conjunction with TEMS' *COMPASS*™ program), optimize train consist size, and minimize train set requirements. *LOCOMOTION*™ is a user-friendly Windows™-based system that interacts with other TEMS software systems.



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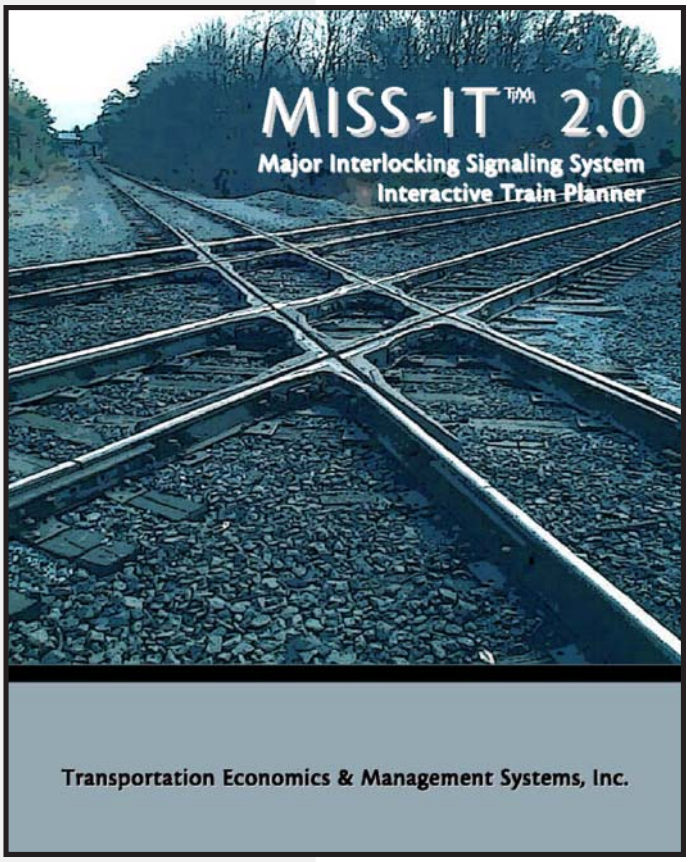
MISS-IT ™

(Major Interlocking Signaling System-Interactive Train Planner)
Conflict Resolution Model

The *MISS-IT*™ program is an event-based track capacity model designed to increase rail system efficiency. The system provides train conflict resolution based on an individual railroad's dispatch policy. The system draws together track infrastrucure data stored within *TEMS' TRACKMAN*™ system and the timetables generated within the *LOCOMOTION*™ program to determine the location of train meets for a specific corridor. *MISS-IT*™ utilizes data on existing infrastructure, such as sidings and double-track, and makes decisions regarding individual train delays and prioritized procedures based on a predetermined dispatch logic.



MISS-IT™ tests the effects of additional infrastructure, signaling systems, or revised operating and dispatch practices on a given route and determines if these changes will create or alleviate bottlenecks within the system. The system measures delay by train, train group (bulk, local, passenger, intermodel) and shows how the infrastructure, signaling, or operating changes mitigate the delay in base or future years. As a result, a "hold harmless" analysis can be made to show the effect of new trains on an existing train schedule. The system is capable of displaying train movement on the track in an animated graphics mode.

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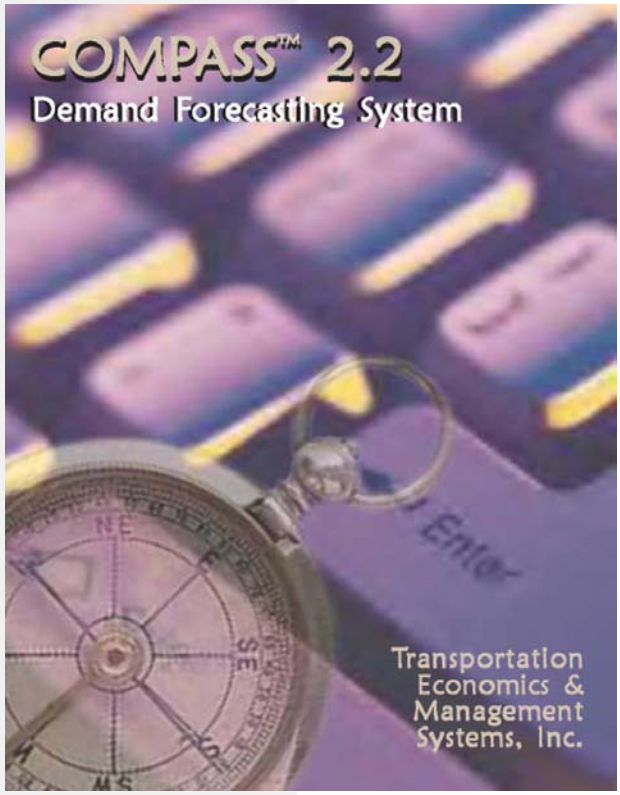
COMPASS ™

Demand Forecasting Model System

COMPASS™ is a comprehensive strategic policy planning tool designed by TEMS to assist in corridor planning for rail, highway, air, and transit. Outputs include traffic forecasts; revenue estimates; and rail, highway, air, and transit marketshares over a given time frame under a variety of conditions. *COMPASS*™ provides planners with the flexibility to evaluate any set of implementation scenarios against any desired set of socioeconomic, network, and competitive mode conditions. The system and its derivatives have been set up for a number of Departments of Transportation including Illinois, Michigan, Wisconsin, Minnesota, New York, and Ontario, as well as Amtrak, British Rail, London Transport, B.C. Ferries, and the Chicago Transit Authority.



The *COMPASS*™ model consist of a three-step analysis process that estimates:

- Total market growth by all modes and purposes of travel
- Induced demand due to changes in quality of service offered by any mode (air, bus, rail, auto)
- Modal split/Route split model that estimates market or route shares using a hierarchical mode choice analysis of any mode.

A key metric of the *COMPASS*™ model is "generalized cost." The generalized cost function allows time, cost frequency, and service attributes to be combined into a single metric that can show how changes in speed, frequency, or fare will affect the use and marketshare

A key feature in developing a generalized cost model is the collection of stated-preference or revealed behavior data that fully quantifies the trade-offs that individuals make between travel characteristics (time, cost, comfort, reliability). Once quantified, these factors are used to calibrate the *COMPASS*™ models and to determine the structure and value of the generalized cost function for each mode.

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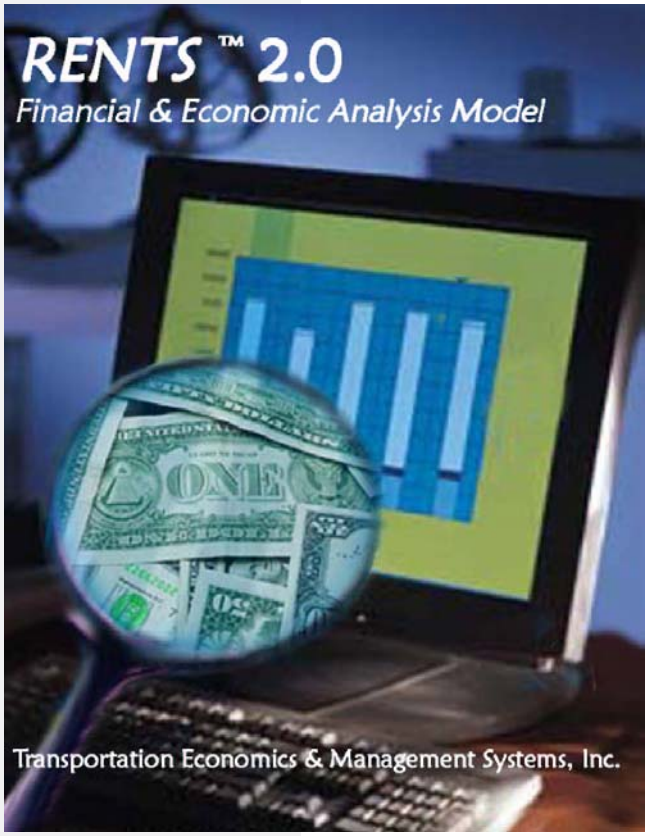
RENTS™

Financial and Economic Analysis Model

RENTS™ is a companion system designed to work with *COMPASS*™. *RENTS*™ uses forecast information to carry out detailed financial, economic, and community evaluations. The output provides estimates of financial return (NPV and IRR); economic return (Gross and Net Consumer Surplus NPV); and communtiy benefits (changes in household income, employment by sector, property values, and population).



Results are presented in both tabular and graphic forms. The graphic output uses a color display in which benefits are presented by zone or region and color-coded by absolute values or percentage change to allow the evaluator to easily grasp overall trends. It is the ideal package for evaluating alternative infrastructure investment plans, quantifying both the level and distribution of benefits associated with a specific project.

RENTS™ has been used in a wide range of studies carried out by TEMS, including the Midwest Regional Rail System Study, Tri-State High Speed Rail Study, Virginia Statewide Rail Passenger Study, Portland-Boston Intecity Rail Study, Southern Ontario Passenger Strategy Study, Greater Rockford Airport Development Study and Master Plan, Toronto International Airport Terminal Three Development Plan, Quonset Point-Davisville Port Study, and Stansted International Airport Master Plan Study.

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