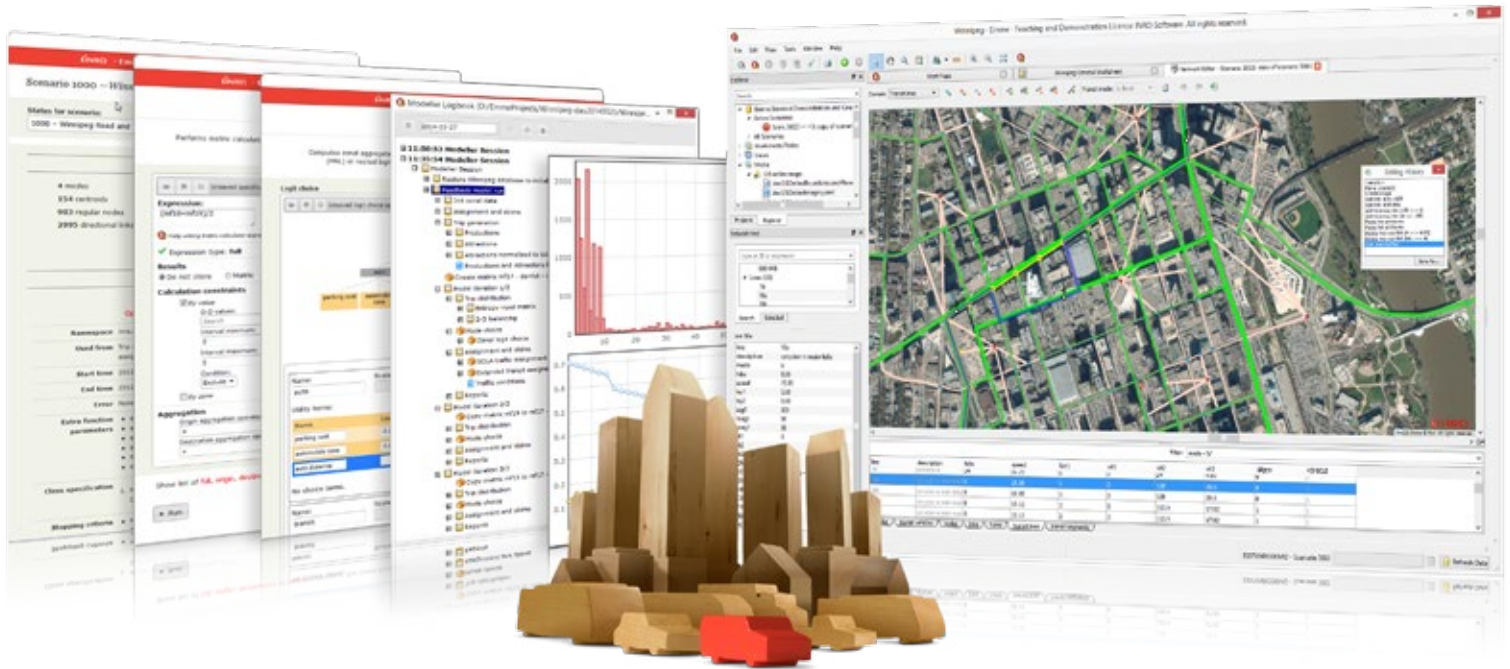# Emme 4
A better way to model

INRO

The Evolution of Transport Planning

Emme is a complete travel demand modelling system for urban, regional and national transportation forecasting. Emme is used in over half the world's most populous cities and runs some of the world's most complex transportation forecasting models.

Make your city a model city. Whatever the planning application.

TRAVEL DEMAND FORECASTING. Implement virtually any zonal-aggregate travel demand model with any feedback structure, generation, distribution and choice models, trip chaining, capture multimodal and truly integrated traffic and transit network performance, power leading activity-based models, and more.

TRANSIT PLANNING. Evaluate changes to transit service lines, itineraries, frequency and quality of service, complex fare schemes, transit service competition or fare integration, crowding on transit vehicles and stations, walkability/accessibility, park-and-ride, kiss-and-ride impacts, transit system design and more.

TRAFFIC PLANNING. Evaluate road network expansion and management schemes, toll schemes and toll revenue forecasts, accessibility studies, junction delay, traffic demand management, critical infrastructure, freight and good movements, bicycle traffic and more.

ECONOMIC, EMISSIONS AND ENVIRONMENTAL ANALYSES. Apply flexible, customized procedures for cost/benefit and other project ranking schemes, analyze demographic service quality, cold starts, vehicle operating conditions and other sources of traffic emissions, justify transit spending, compare demand management techniques, perform investment grade infrastructure evaluation, and more.

The world's most trusted transportation planning software.

Reinvented.

A better way to model. Key benefits of Emme 4.

CREDIBILITY AND TRUST. The world's most trusted algorithms and procedures, designed to work rigorously and on large models. Emme powers some of the world's most complex transport models. Published, peer reviewed and highly regarded procedures tempered by hands-on application and modern computing.

TRANSPARENCY. Uncompromised access to network topologies, delay functions, transit services and access connectors means there is nothing to get between the analyst and clear interpretations of model details. Full network editing on native model representations.

OPENNESS. Think outside the box with model procedures that are always easy to adapt to local needs. Beat lock-in with data that can be easily exported to open formats. Play nice with Windows or Linux OS, and share licenses on local networks with floating licensing.

A BETTER WAY TO MODEL. A true component-based application framework for travel demand modeling and transportation forecasting. Rapidly build and deploy complete models. Refreshing new user interfaces provide excellent usability, and transition to modern Python scripting for maximum productivity.

SMART ANALYSIS AND GREAT VISUALS. The quickest, most complete scenario comparisons. Compare anything, including network topologies and values, matrices or charts. Over 100 maps, charts and tables. Rich GIS Basemaps from included online services, or any existing ArcGIS raster, vector or server content.

TECH SUPPORT. The industry's best software support services—plain and simple. Talk to our users and see. Unlimited telephone hotline and email contact included.

Everything you need for world-class transportation forecasting

Modeller—Easily prepare and run models

Groundbreaking usability, model clarity, reuse and automation. The acclaimed flexibility and performance of Emme via a refreshing user interface and an amazing new component-based system that lets you build, deploy, maintain and run transportation forecasting models better than ever.

see pages 6-8
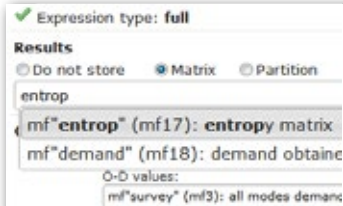
Standard Toolbox—Modelling matters

Leading traffic and transit assignments, unmatched traffic and transit path analysis, the best demand adjustment framework, the only mathematically rigorous congested transit assignment procedures, powerful network and matrix calculators and much more. Modelling matters, and the difference is always in the details.

see pages 6-7
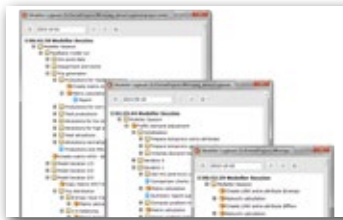
Logbook—Never get lost in a model again

Bring clarity to even the most elaborate model systems. Explore model structure, not just network structure, in stunning hierarchical detail that unfolds while models run. Then review, revise and re-run any step for iterative model development.
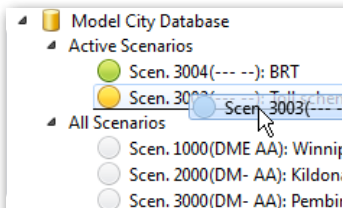
see page 9

APIs—Transition easily from UI to scripting

Rapidly build and deploy complete applications using any Modeller Tool. Extend the framework with new tools, your own UIs and access hundreds of new API services for network, matrix and database access.

see page 9

Desktop—Map, edit, and compare planning scenarios

Make informed planning decisions with dynamic maps, charts and reports that are always up-to-date. Because you always see the same networks as your models do there are never any secrets to cloud your judgment. At-a-glance scenario comparisons and network differences help to make data clear and actionable.

see pages 10-11

For years the most advanced modellers in the industry have relied on Emme's flexible, open modelling approach to easily leverage established techniques or to adapt and innovate to new model applications with unrivaled flexibility.

Today, Emme offers something new that may surprise you—a revolutionary new application framework called Emme Modeller that makes transport models easy, fun and efficient to use, that promotes true model transparency, and that offers seamless transition between interactive use and brand new scripting and model development.

Updating to Emme 4?

Moving to Emme 4 couldn't be easier. Whether you are updating from Emme 3, or from an older version of EMME/2, your database, worksheets, models and macros will all work. You won't need to port your model, and you can continue working like before. And when you are ready to explore new features, take a look at our highly-regarded training courses.

New to Emme?

Emme has never been easier to use, or as powerful. Learn more about all the improvements to the Emme Desktop, the Emme Prompt and the Emme Database, or read how Emme Modeller, the Emme Logbook and the Emme APIs provide a better way to model.

### Try Emme free for 30 days
Visit www.inrosoftware.com/emme

What's New in Emme 4.1

Emme 4.1 introduces a 64-bit native version, new traffic assignments, multithreaded transit assignment, new and improved transit line editing, quick and easy basemaps, easy legends, worksheet layer transparency, new network find and distance measure tools, dramatic performance optimizations and more.

Emme 4.1 introduces the **Network Expansion Add-on** to increase the maximum permitted network size beyond practical limits for all-streets networks, statewide or national models, etc.

The **Dynameq Add-on for Emme** (coming soon) provides access to Dynameq mesoscopic traffic simulation and DTA.
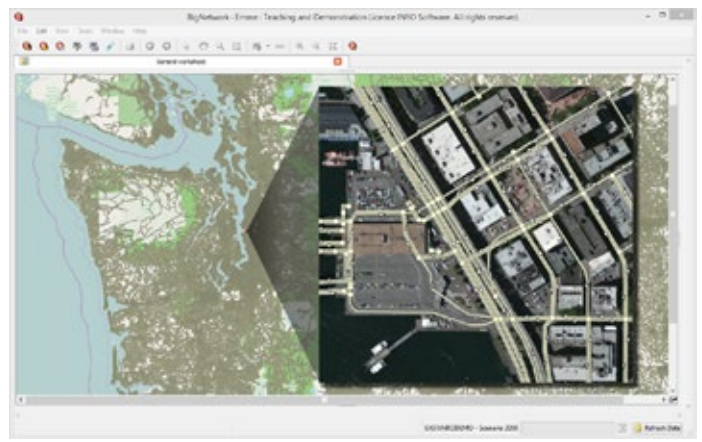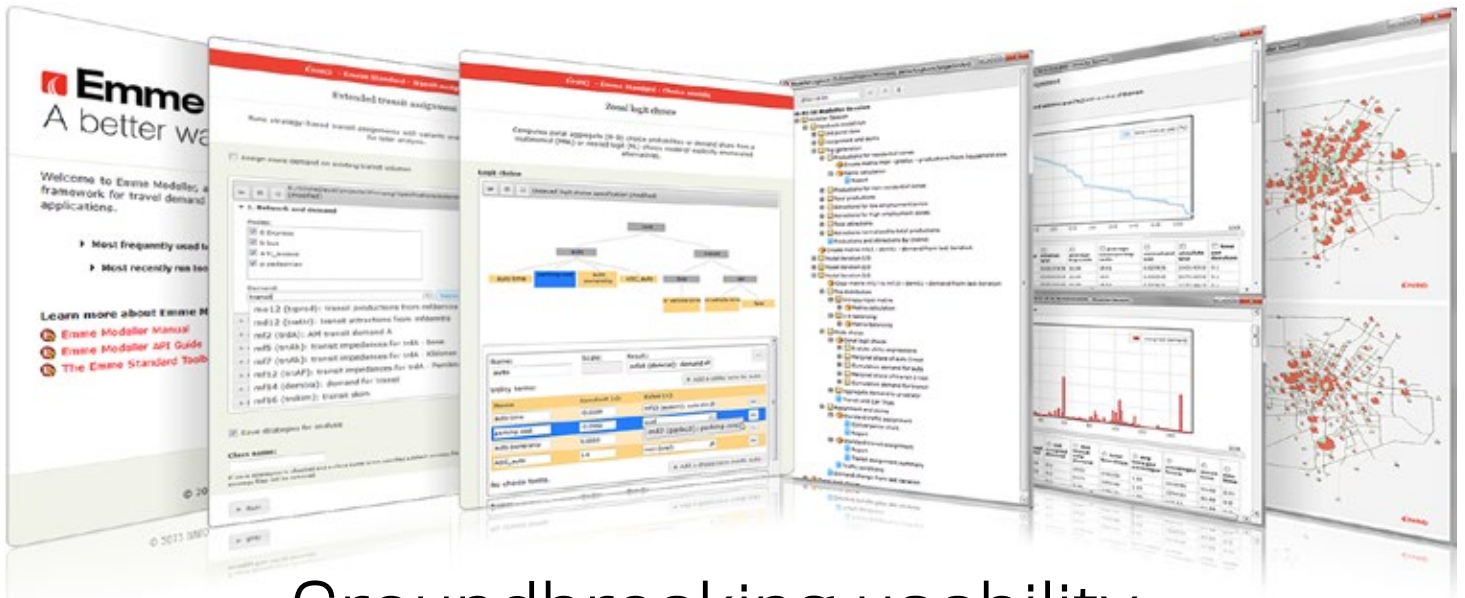
Groundbreaking usability, model clarity and performance.

Emme Modeller

THE ACCLAIMED FLEXIBILITY AND PERFORMANCE OF EMME via a refreshing user interface and an amazing new component-based system that lets you build, deploy, maintain and run transportation forecasting models better than ever.

Emme Modeller is an application framework for travel demand forecasting, transportation planning and related applications that lets you:

- Prepare and run model procedures easier than ever before with a refreshing and easy to use new interface.
- Rapidly build and deploy applications from 100+ clear, re-usable transportation forecasting components. The Emme Standard Toolbox represents and enhances the acclaimed Emme modelling system in clean, modular and scriptable components.
- Script the same model components that you use interactively and transition easily from interactive use to automation.
- Run and then review tools, or re-run with different arguments. Build new workflows from historical runs, weeks or months ago.
- Visualize model runs like never before with stunningly clear hierarchical displays that update as models run.
- Develop new model procedures and utilities to extend the framework using hundreds of new services and APIs. New Emme APIs for Python provide a complete alternative to Emme macro programming, and beyond.

Emme Standard Toolbox

MAKE YOUR MODEL A BETTER MODEL. The acclaimed performance and unique flexibility of Emme via a library of clean, modular and re-usable transportation forecasting components. The Emme Standard Toolbox provides 100+ tools to get started quickly, with everything needed to build a virtually unlimited variety of zonal aggregate demand models, trip chaining models, multi-modal network models and related analyses. All included in one great package.

THE GOLD STANDARD. The Standard Toolbox contains a comprehensive suite of tools to perform powerful network and matrix calculations, leading traffic and transit assignments, unmatched traffic and transit path analysis, the best demand adjustment framework, the only mathematically rigorous congested transit assignment procedures, efficient evaluation of choice models and trip chaining models, open and transactional data management and much more. Modelling matters, and the difference is always in the details.

MODELLING UNLIMITED. And because the Standard Toolbox works in the Modeller application framework, each of the 100+ tools are provided with easy-to-use interfaces, reporting, logging, drag-and-drop workflows and scripting built-in. So there are never any limits on their use and you can use, re-use, build on them, or mix and match with any other tools you create, even those you author yourself.

A GREAT WAY TO LEARN. The transparency of the Standard Toolbox makes it a great way to learn about modelling, and maybe part of the reason Emme training has been described as " a modelling course that uses software" not just "software training." Read more for a list of some of the most popular Emme applications, both elementary and complex or contact us at info@inrosoftware.com to discuss other applications.
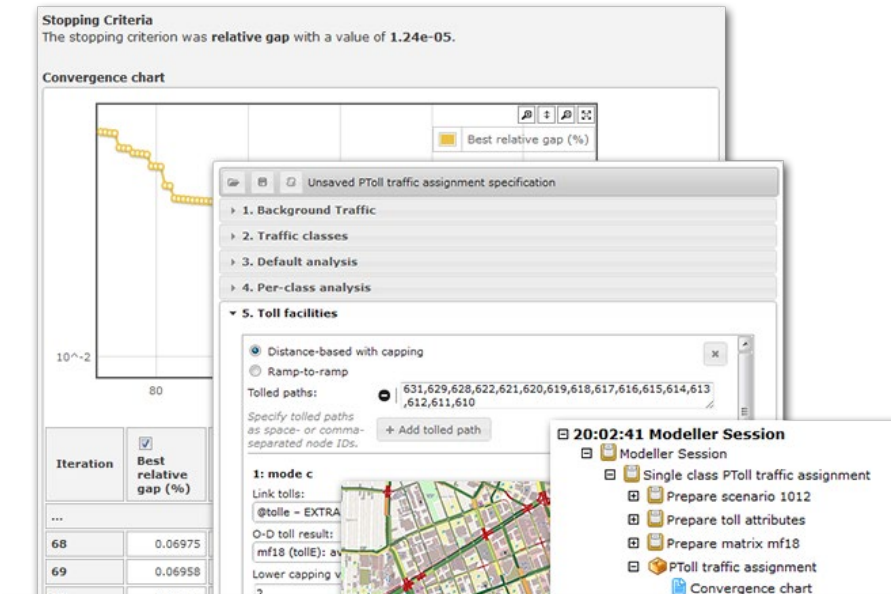
Private transport modelling

Comprehensive and leading traffic assignment and analysis capabilities permit a wide range of popular applications and support countless user extensions and applications.

PTOLL TRAFFIC ASSIGNMENT TOOL. Adds tolling features to the faster-converging SOLA traffic assignment, including distance-based toll capping and explicit support for ramp-to-ramp tolls.
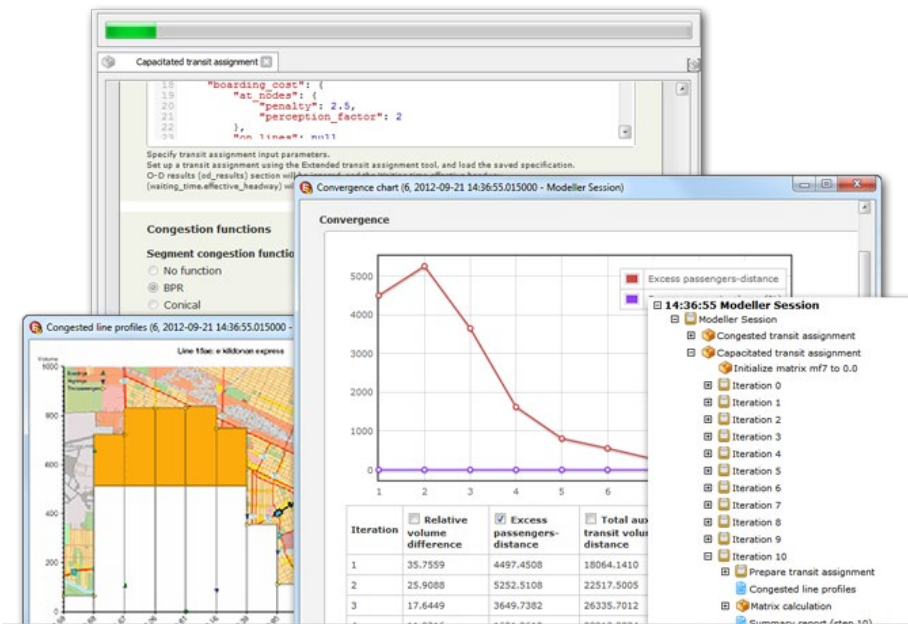
Public transport modelling

Unmatched transit assignments and analysis capabilities, with the efficiency, rigor and stability for the world's most demanding applications.

CONGESTED TRANSIT ASSIGNMENT TOOL. Models crowding and discomfort on vehicles, or strict capacity limits and increased waiting at stops. Efficient and rigorous solutions. No need to be concerned about heuristics. Performs well even on the largest networks.
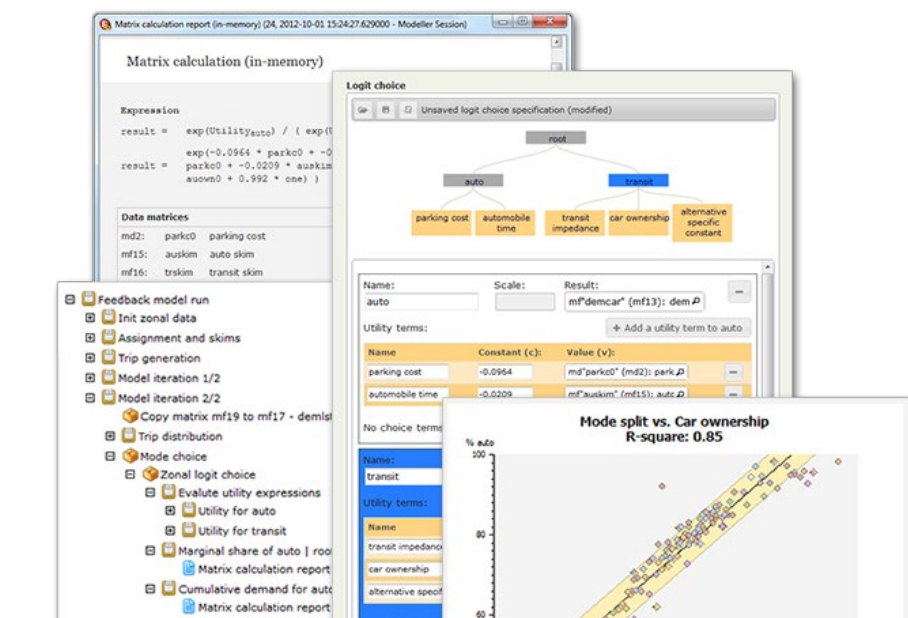
Demand and choice modelling

Implement virtually any zonal-level travel demand model, work efficiently with trip chains, easily specify choice models, and access the world's best demand adjustment tools for traffic and transit applications.

ZONAL LOGIT CHOICE TOOL. Easy graphical specification and choice share computations for multinomial and nested logit zonal aggregate choices.
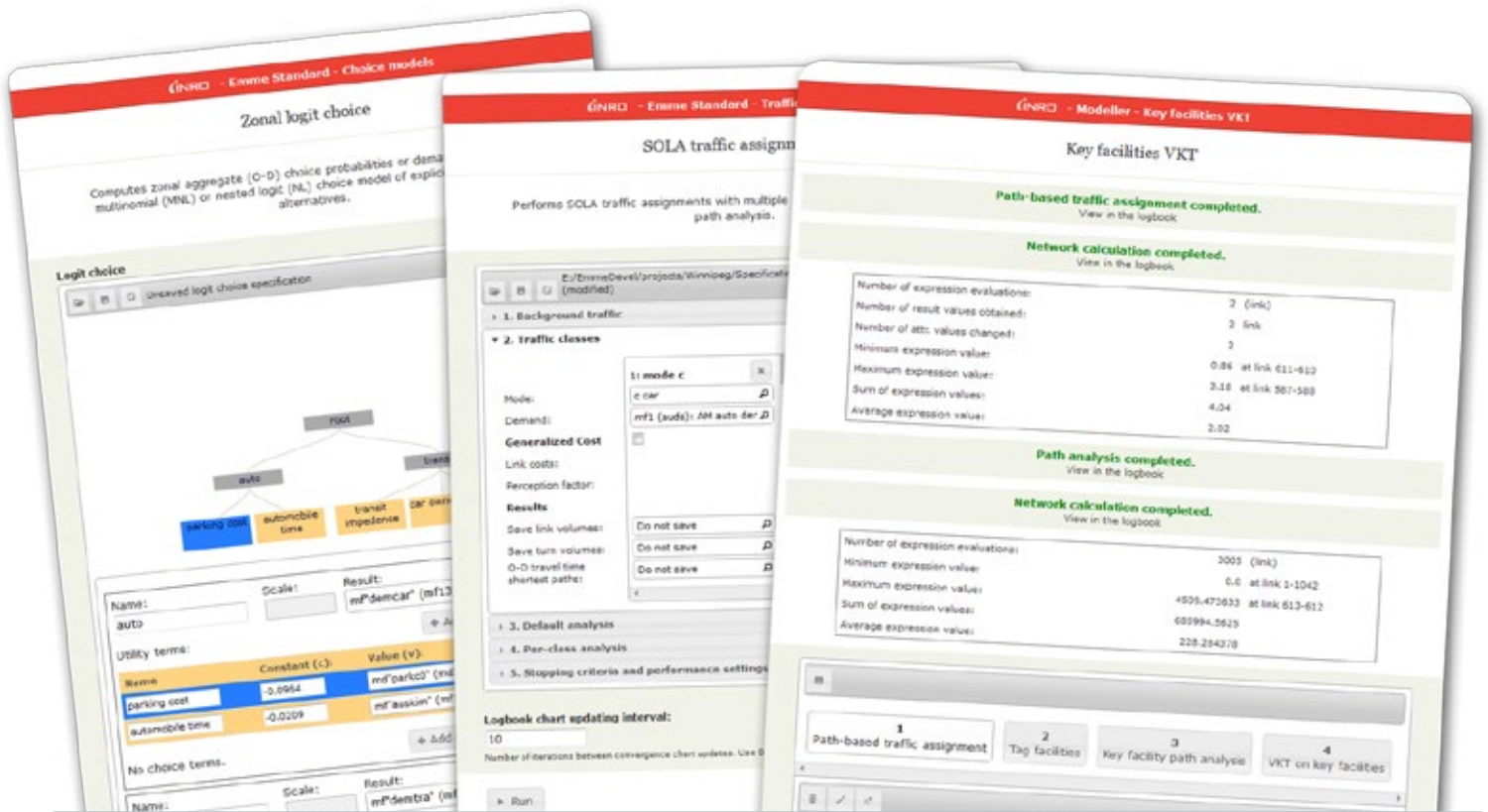
Easily prepare and run models

Work efficiently with transportation forecasting models across the entire modelling lifecycle. A modern component-based application framework provides a Toolbox structure to organize model procedures, utilities, or any other unit of processing into an open, extensible system that promotes understanding, experimentation and design. Each tool provides its own processing logic, a clean and refreshing user interface, and logbook history. The Modeller framework takes care of the rest, providing a seamless transition from interactive use to automation and component reuse, removing much of the tedium of developing models from scratch. Virtually any model or application can be accommodated using 100+ tools provided out-of-the-box in the Emme Standard Toolbox.

You can open more than one tool in Modeller to prepare multiple procedures at once, then determine the order in which they are run. Each tool has a run button with its own progress indicator, and when you switch between tabs tool pages automatically refresh.

Tools are always kept in-sync with the current scenario in Emme Desktop, so you can switch easily between modelling and mapping or reporting.
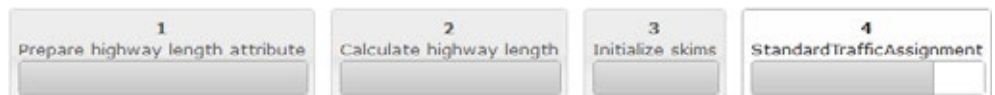
Preparing model procedures has never been easier with universal search and built-in snapshot capabilities to save your work and resume where you left off the next time. You can even create new tools from simple drag-and-drop workflows, without scripting, for repetitive tasks. In Modeller, every tool is a first-class citizen and benefits from the same run control, error handling and logging.

With Modeller, you can expect all of the same powerful and proven modelling components as previous versions of Emme, including results compatibility. And because Emme Modeller provides direct facilities for running Emme macros and the Emme Prompt, you are free to make migration decisions on your own time, without disturbing production runs or other activities.
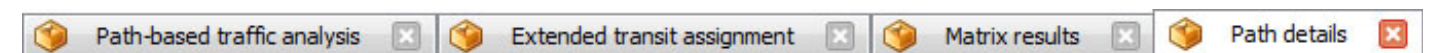
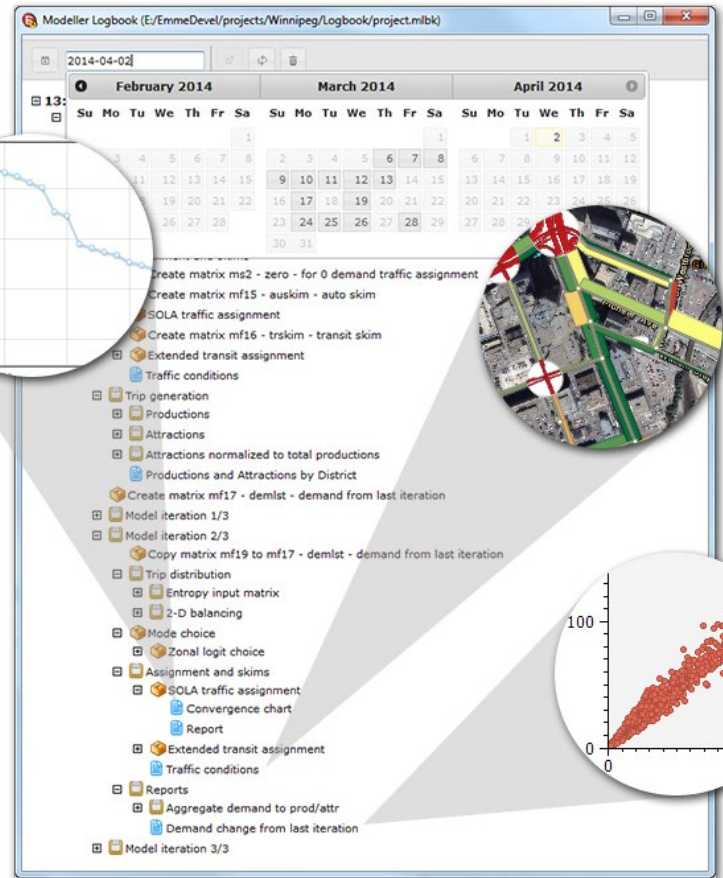# Logbook – Never get lost in a model again

See your models in striking detail. Bring clarity to even the most elaborate model systems. Explore model structure, not just network structure, in stunning hierarchical detail that unfolds while models run. Then review, revise and re-run any step for iterative model development.

RUN, REVIEW, REVISE, RE-RUN. The Logbook always contains a reliable record of execution, and a way to review, revise or re-run any step, even weeks or months after it was run. You can even assemble new workflows using the steps of different model runs.

NEVER GET LOST IN A MODEL AGAIN. For full model applications or more complex procedures involving many tools, the effects are often illuminating, clarifying even conditional logic that may vary from run to run. Because Modeller works the same whether interactive or scripted, the Logbook always matches your model results.

MODEL TRANSPARENCY. Because the Logbook shows what actually happened, even errors, you get a degree of visual debugging without even opening model code. So you can make sure that anyone running your model will understand precisely what occurred, even across the most complex logic. You get professional, maintainable source code. Everyone else gets a transparent run-time visual representation of model structure.

CLEAR COMMUNICATIONS. The Logbook is also useful for model communications and team collaboration, as it provides a visual representation of model flow and structure and reports, along with Emme Desktop maps, charts and tables recorded during execution. And when you are ready, you can delete logbook entries to preserve only the essentials.

API – Seamlessly transition to scripting

Rapidly build and deploy complete applications using any Modeller Tool. Modeller Tools provide the same services whether used interactively or scripted, so there are no new model systems to learn, and no differences in model behavior between scripted and interactive work. Also, model specifications transition easily from interactive, text-based formats to the richer data structures needed for professional model development.

Your models automatically inherit clear step-by-step logging and reports in the Logbook, even automated model runs. You can still visually inspect the details of any model step. This provides invaluable, built-in support for model auditing, troubleshooting and historical/version comparison.

The Emme Modeller API for Python makes it easy to automate any tool, or to combine tools into sophisticated model applications with minimal scripting - often just enough to chain tools together. Or, use the Modeller API to add your own tools to extend the framework and offer new functionality to your teammates or other Emme users. Your new tools will be available via the Modeller API, just like the standard components. You can even create great looking user interfaces for your tools.
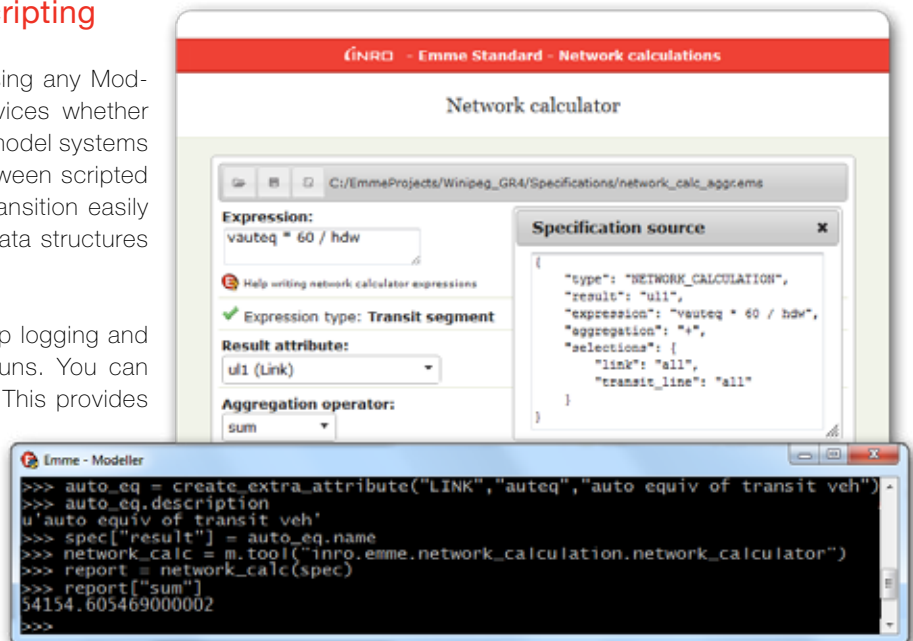
And with the other hundreds of new Emme APIs and services offered, like the new Database API, Network API and Matrix API, you can work directly with your Emme data in Python. The future is completely open.
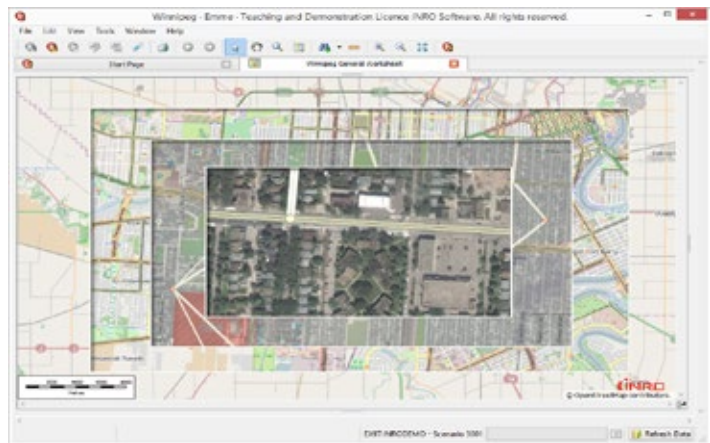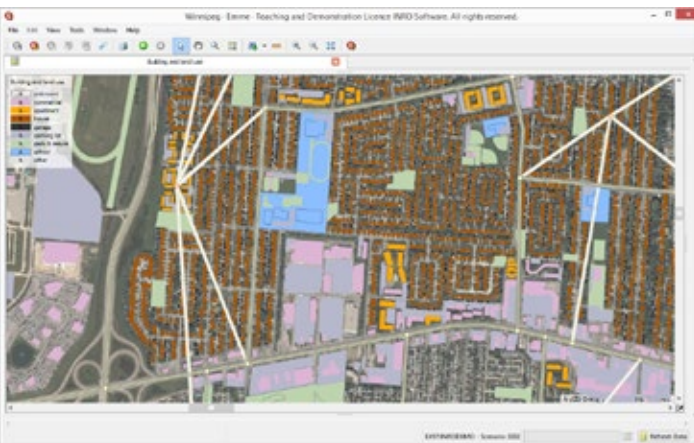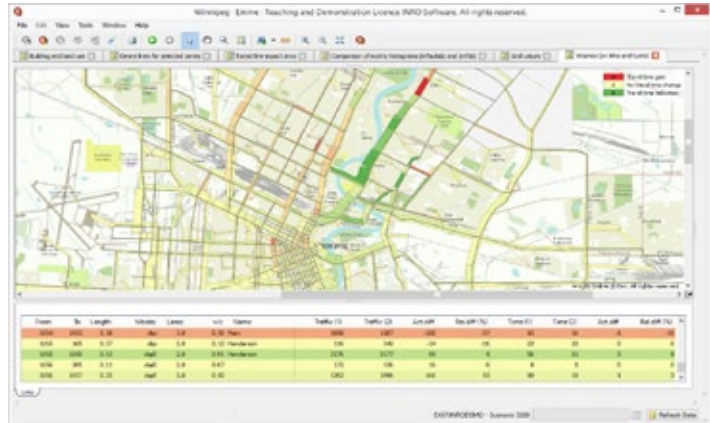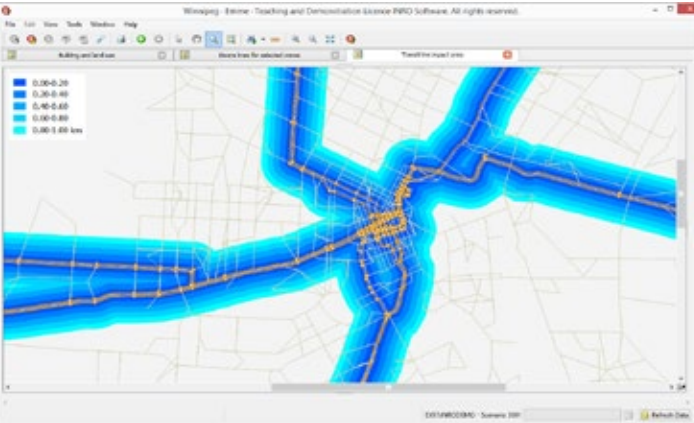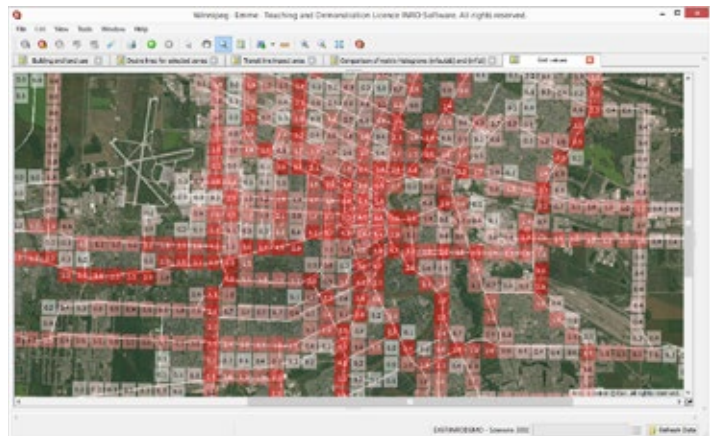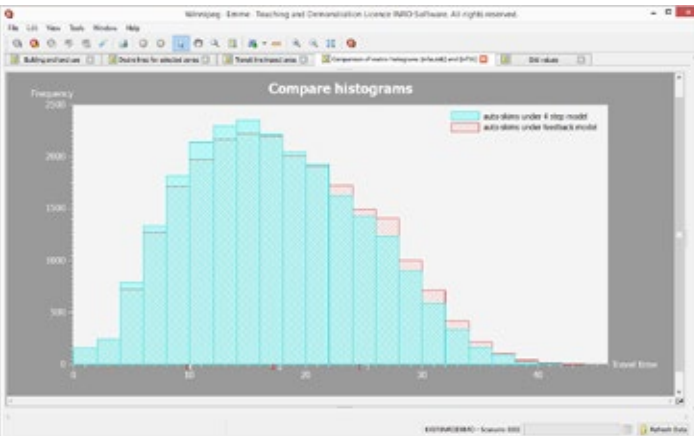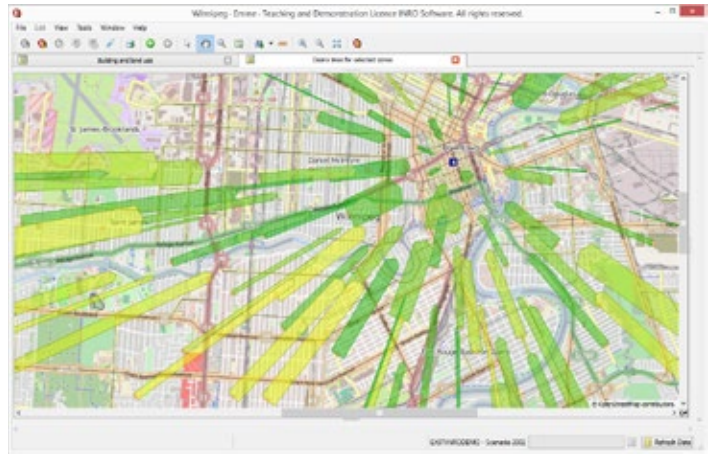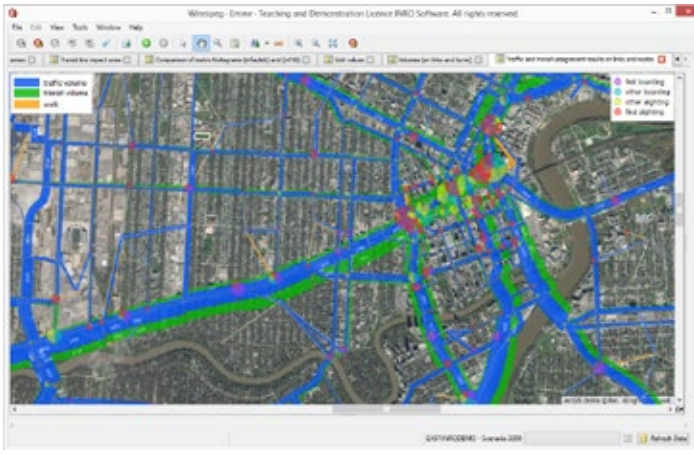
Map, edit, and compare planning scenarios

⒠ Emme Desktop

Emme Desktop provides mapping, editing, and scenario comparison capabilities for Emme models. It helps planners make informed planning decisions using rich maps and reports and transparent access to model data. Emme Desktop provides:

- A wide range of dynamic maps, charts, and reports that automatically update as models run or scenarios are compared.
- An extensible mapping and charting framework that produces great looking visualizations and gives modellers complete transparency on their data.
- An active scenario system for live scenario comparisons, and synchronization with Emme Modeller for modelling and results visualization.
- Point-and-click network editing tools with undo/redo support and session recording.
- Georeferenced display of a wide variety of vector, raster, online, map server and other GIS content, avaialble with the GIS Basemap Add-On.
- Automation via the Emme Desktop Python API

Maps, charts and reports

A COMPREHENSIVE LIBRARY of 100+ maps and charts (worksheets) covering the entire transport planning domain make it easy to get started. Maps are included for network and zonal data, matrix scatterplots and histograms, conditionally formatted reports and tables, special-purpose analyses like grid values for emissions, isochrones / shortest-path displays, and more. Share values, formatting, and filters between maps, charts and reports to create unique and insightful multidimensional views on model data.

TRANSPARENCY. Emme Desktop works on the same Emme Database used for modelling, so there is nothing to get between the modeller and the model data. Transit services, delay functions, attribute values, network topologies, access connectors, etc. are always plain to see and clear to interpret.

Scenario comparisons and expressions

ACTIVE SCENARIOS in the Project Explorer are immediately displayed in open worksheets. As soon as scenarios are opened, closed or re-ordered, maps, charts and reports automatically adjust to display new information. Since worksheets update dynamically from active scenarios it is easy to quickly inspect new or updated model results.

SCENARIO COMPARISONS can be used anywhere because they are built right into expressions. For example, use the network

calculator to quickly compare or compute values between scenarios, use filter expressions to identify network elements that fall within a certain epsilon difference between scenarios, or display symbol size, color or other formatting according to scenario differences.

Network editing and data management

POINT-AND-CLICK EDITING for Emme networks is multi-modal, consistent and supported directly on the same Emme Database used for modelling. Edit nodes, links, link shape, turns, transit lines, transit segments and associated attributes. Split link automatically adjusts corresponding transit itineraries. Route or re-route transit services with help from shortest paths on accessible sub-network. Editing sessions keep a full undo/redo stack of operations.

AN IMPROVED EMME DATABASE supports thousands of extra attributes, up to sixty modes of transport, and up to 30,000 matrices.

SCENARIO MANAGEMENT features help to keep networks manageable. Save editing sessions as macros, and apply changes to other scenarios to keep them in sync. Or use network transaction tools in the Emme Standard Toolbox to record full, partial or difference-only modifications to permit the use of 'reference' or 'master' scenarios. Network comparison worksheets can be used to display or report differences in network topology or attributes.

GIS basemaps

The Web basemap layer provides georeferenced display of basemaps from online map services with worldwide coverage, including ArcGIS Online and OpenStreetMap, in a responsive layer that provides quick view navigation and asynchronous download of tiles. Layer transparency allows for viewing multiple basemaps simultaneously.

ESRI Technology

AUTHORIZED BUSINESS PARTNER

The GIS vector layer supports georeferenced display of shapefiles, PostgreSQL/PostGIS databases, MapInfo TAB, OpenStreetMap formats, AutoCAD DXF and U.S. Census TIGER/Line files. Dataset attributes can be displayed in tables.

The ArcGIS Basemap Add-on, included with Emme where permitted, provides access to georeferenced maps and GIS data exactly as they would appear in ArcMap.

INRO

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