Using Enif to Extend the Possibilities Offered in EMME/2

● About Enif

● Ease of use

● Generic configurations
  – Network
  – Matrices
  – Functions
  – Assignment results
  – Scenario comparison
  – Other plots
  – Lists

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About Enif

● Enif: complement to EMME2
  – EMME/2: for modelling transportation networks
  – Enif: query and analysis tool

● Access to same data but easier to customize plots and lists
  – Look of plots and lists no longer restricted by developer’s decisions
  – Almost unlimited number of possibilities

● Homogeneous access to all elements of the data banks (network and matrix data)

● Answers to several suggestions made by EMME/2 users
  – Windowing more user-friendly
  – Easy control of pen width, number of decimals, text fonts
  – Easy (global) specification of left-hand traffic
  – More “natural” syntax for selection
  – Several types of elements on the same plot (e.g.: transit lines and turns)
  – Easier printing capabilities
  – Possibility of exporting resulting plots in different formats
  – ...
Ease of use

- On-line help
  - Tips
  - On-line documentation

- “History” of previous expressions

- Easy to configure the software itself:
  - appearance of Enif windows
  - fonts and colors used
  - use of right-hand or left-hand traffic
  - predefined views
  - printing settings
  - localization: specify translation files
  - registered configurations (plots and lists)

- Predefined configurations

Generic configurations

- Application independent (can be used with any EMME/2 data bank)

- Distributed with Enif
  - Novice user: can explore data bank in browsing mode
  - Advanced user: can use these configurations as a starting point for new ones

- More than 80 plot configurations and 20 list configurations
  - Structure similar to EMME/2 module groups
  - Usage described within the configuration (Plot description)

- Provide more comprehensive output choices than those currently available in EMME/2
  - Node pie charts
  - Network histogram
  - Matrix scattergram
  - Transit line load profile
  - Grid value on base network (functionalities of GRTOOL)
  - Polygons at nodes (functionalities of POLYZONE)
  - Diagram and network information on the same plot
  - ...
**Generic configurations: Network**

- **Bare network**
  - Easy windowing
  - Easy control of the display (pen and color)
  - "Query" capabilities on the plot (tips)

- **Base network**
  - **Functionality of module 2.13**
    - **Base network with node boxes**
      - Display nodes for a subset of nodes (possible in EMME/2, but only in option 6)
      - Node numbers and/or node value(s)
      - Link selection determines active nodes (isActive)
    - **Base network with annotation(s)**
      - Display annotations and other annotation files
    - **Node value(s) on base network**
      - Display several node attributes using different shapes, including pie charts
      - Node tips display the node identifier and value(s)
    - **Link value(s) on base network**
      - Numeric link values (no need to compute and store the result beforehand)
      - Easy multilayers
      - Link tips display the link identifier and modes
    - **Link text on base network**
      - Control of the text position
      - Possibility of displaying link values even if link is too short
    - **Node and link attributes on base network**
      - Combines all of the above
      - Predefined choices correspond to module 2.13 options

- **Auto network**
  - **Street representation**
    - Red contours indicate prohibited side of traffic for one-way streets
  - **Intersections on base network**
    - Default: display turning movements for all intersections nodes
    - Interactive selection of individual intersections: double-click (Full view)

- **Transit network**
  - **Functionality of module 2.23 (and more)**
    - **Transit line itinerary (line by line)**
      - Line selection: "up" and "down" arrows display one transit line after another
      - Print legend and caption show the line selection
      - Full view adjusted automatically
      - Link selection determines active nodes (isActive)
    - **Transit line itineraries (several lines)**
    - **Transit lines on base network**
      - Predefined expressions correspond to the option 2 sub-menu
      - Multilayers possible
    - **Transit segment value(s) at nodes**
      - Segment values accumulated at nodes
Network histograms (all network elements: mode, node, link, turn, vehicle, line, segment)

- **<Network element> histogram**
  - **Weight:** one or several values
    - **single value:** stylus vector is stretched to cover the X-range
    - **multilayer:** one stylus index per layer
  - **Bar tips** display the value of the expression for each bar

- **Statistics**
- **Title and Descriptions**

Network scattergrams (all network elements)

- **<Network element> scattergram**
- **Regression**
- **Title, Descriptions and Symbols**

Network tools

- **Shortest path between two nodes**
  - Computed according to any specified link expression: predefined choices available
  - **Node tips** display the node identifier and, for the leaf node, the path cost

- **Shortest path forest**
  - Interactive root selection: double-click (or Ctrl+double-click)
  - **Node tips**
  - Automatic update of the stylus index

- **Isochrones**
  - **Node tips**
  - Predefined choices for the stylus index: different travel time intervals

- **Grid value on base network**
  - **Predefined choices for the link value**
  - **Automatic scaling for coloring cells**
  - **Grid cell tips** display the grid value

- **Polygons at nodes**
  - **Access to external file (including shape files)**
  - **To convey more information:** zonal information

- **Asymmetric link attributes**
  - **Graphic representation of macro validnet**
  - **Predefined link selector to check length against Euclidean distance**
  - **Link tips** (value of reverse link shown in parentheses)
Generic configurations: Matrices

- Matrix value
  Functionalities of module 3.13
- Desire lines for selected node(s)
  By origin or by destination (depending on active mapper)
  Interaction (communication) between plots and lists
  ➔ A plot can influence a list:
    e.g., highlighting a row in a list when clicking on an element in a plot
  ➔ A list can influence a plot:
    e.g., modifying a plot by selecting an element in a list
- Matrix value(s) by single origin or destination
- Matrices by origin and/or destination (chimneys)

- Matrix histogram
  Same design as for network histograms
- Matrix scattergram
  New functionality
  Same design as for network scattergrams
- Comparison of matrix histograms

Generic configurations: Functions

Functionalities of module 4.13

- One configuration for each type of function
  - Volume-delay functions
  - Transit time functions
  - Turn penalty functions
  - Auto demand functions
  - Transit demand functions
  - User functions
  - Generic functions
    New functionality
Generic configurations: Assignment results

- **Auto volumes**
  Functionalities of module 6.12 (options 1, 2 and 3), no turning movements on intersections
  Predefined link expressions
  **Link tips** display the link identifier, auto volumes and additional auto volumes

- **Link and turn auto volumes**
  Same functionalities but with turning movements on intersections
  Predefined link and turn expressions (⇒ turn attribute follows link attribute)

- **Auto speed and time**
  Functionalities of module 6.12 (options 4 and 5)
  By default: numeric values, no bars
  **Link tips** display the link identifier, auto speed and auto times

- **Auto volumes on intersections**

- **Grid values**
  Predefined link expressions using assignment results (e.g. to compute emissions for various types of pollutants)

- **Transit volumes on links**
  Functionalities of module 6.22, option 1
  + possibility of multilayers
  Full view gives the smallest window that contains the links selected in the “Segment link value” mapper

- **Transit and auxiliary transit volumes**
  Functionalities of module 6.22, option 3

- **Individual transit line volumes**
  One mapper to display partial transit volumes
  Another mapper to display total transit volumes

- **Boardings and alightings at nodes (pie charts)**
  Functionalities of module 6.22, option 4
  **Node tips** display the node identifier and value(s)

- **Boardings and alightings at stops (subset of lines)**

- **Transit segment attributes on links and nodes**

- **Transit line profile (with capacity)**
  Bars represent segment volumes; part of the volume that exceeds capacity is displayed in red
  Line selector: “up” and “down” arrows display one transit line after another (ranges adjusted automatically)
  **Diagram tips** display number of boardings, alightings, through passengers and on-board passengers

- **Transit line profile and position on base network**
  Can display both diagrams and network information on the same plot

- **Auto and transit assignment results**
  Several types of results on the same plot
  - on links
  - on links and nodes
Generic configurations: Scenario comparison

- Compare auto volumes and times
  
  Functionalities of module 6.13  
  Associated list: Auto volumes and times comparison

- Compare node values
  
  New functionality

- Individual element comparisons (scattergrams)
  
  No need to compute the difference before generating the scattergram  
  Scattergram tips display the element identifier and the corresponding X,Y values
  
  - Mode attributes
  - Node attributes
  - Link attributes
  - Turn attributes
  - Vehicle attributes
  - Line attributes
  - Segment attributes

Generic configurations: Other plots

- Legend

- Shape files
  
  Access to external files (.shp, .dbf)
  ▷ To enhance graphic output
  ▷ To access external attributes

- Annotations
  
  Access to external ASCII files (.annotx, .ann)

- Image
  
  Access to external bitmapped files (.jpeg, .png, .bmp, etc.)

- Coordinate grid

- Constant histogram

- Constant scattergram

- Example of coordinate transformation
  
  Easy network transformation (rotation, translation, scaling)
Generic lists

- Network
  - Modes
  - Nodes
    Can send and receive external markings
  - Links
  - Vehicles
  - Transit line summary
  - Transit line itineraries
  - Transit lines on base network (by node)
  - Transit lines on base network (by link)
  - Turning movements at intersections

- Matrices
  - Full matrix
    Can display several values for each cell

Generic lists (continued)

- Assignment results
  - Auto volumes and times (on links)
    Functionalities of module 6.11, option 1
    Can send and receive external markings
  - Auto volumes and times (on intersections)
    Functionalities of module 6.11, option 2
    Can send and receive external markings
  - Transit line summary
    Functionalities of module 6.21, option 1
  - Assignment results by transit line
    Functionalities of module 6.21, option 2
  - Transit results on base network
    Functionalities of module 6.21, option 3
  - Transit volumes at nodes
    Functionalities of module 6.21, option 4
  - Auto volume comparison
    Associated plot: Compare auto volumes and times

- Element pickers
  Send marking signal on double-click
  - Node picker
  - Zone picker
  - Intersection picker