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Analyser User Manual

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1. Before You Begin

1.1 Before You Begin

The Paramics Analyser framework supplies the user with a large collection of simulated data derived from the Modeller tool that is stored in binary format. The statistics can be displayed in the context of any network and reported to screen or file. In addition observed data can be created and added to the data in order to create network comparisons between observed and simulated flows.

The Analyser tool is specifically designed to display and report statistics that are relevant to microsimulation users in a format that is both visual and flexible for reporting. The architecture has been developed to enable the engineer to apply their skills and knowledge in the analysis process as well as making it flexible to use in a project analysis role.

Simulation networks, simulated results and observed data are held within an Analyser Workspace, which enables multiple Views to be created that display data in simple or comparison format, either on a common network or on across similar networks.

Tooltips are automatically available in all Paramics tools; these will display the name/function of each icon when the mouse pointer is held over the icon. The Analyser, similar to other Paramics tools is 'network aware'; meaning that by clicking on an element name will direct the network display to that location for viewing.

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1.2 Introduction

Paramics Analyser is a post simulation data analysis package that is specifically designed to operate at the microscopic level, and to integrate with the core Paramics tools.

The Analyser tool is equipped with an Active Help feature and a document reference help that, when selected, displays a window containing context-specific help information, and should therefore be self-explanatory.

The worldwide use of Measures Of Effectiveness (MOEs) and the Levels of Service (LOS) based on the HCM 2000 are integrated as far as possible into the Analyser tool. The user must recognise that the HCM and microsimulation are fundamentally different paradigms and the Analyser attempts to fit into the HCM concept and will not produce identical results, however given the banding approach used in the HCM reporting it is likely that banding will be similar.

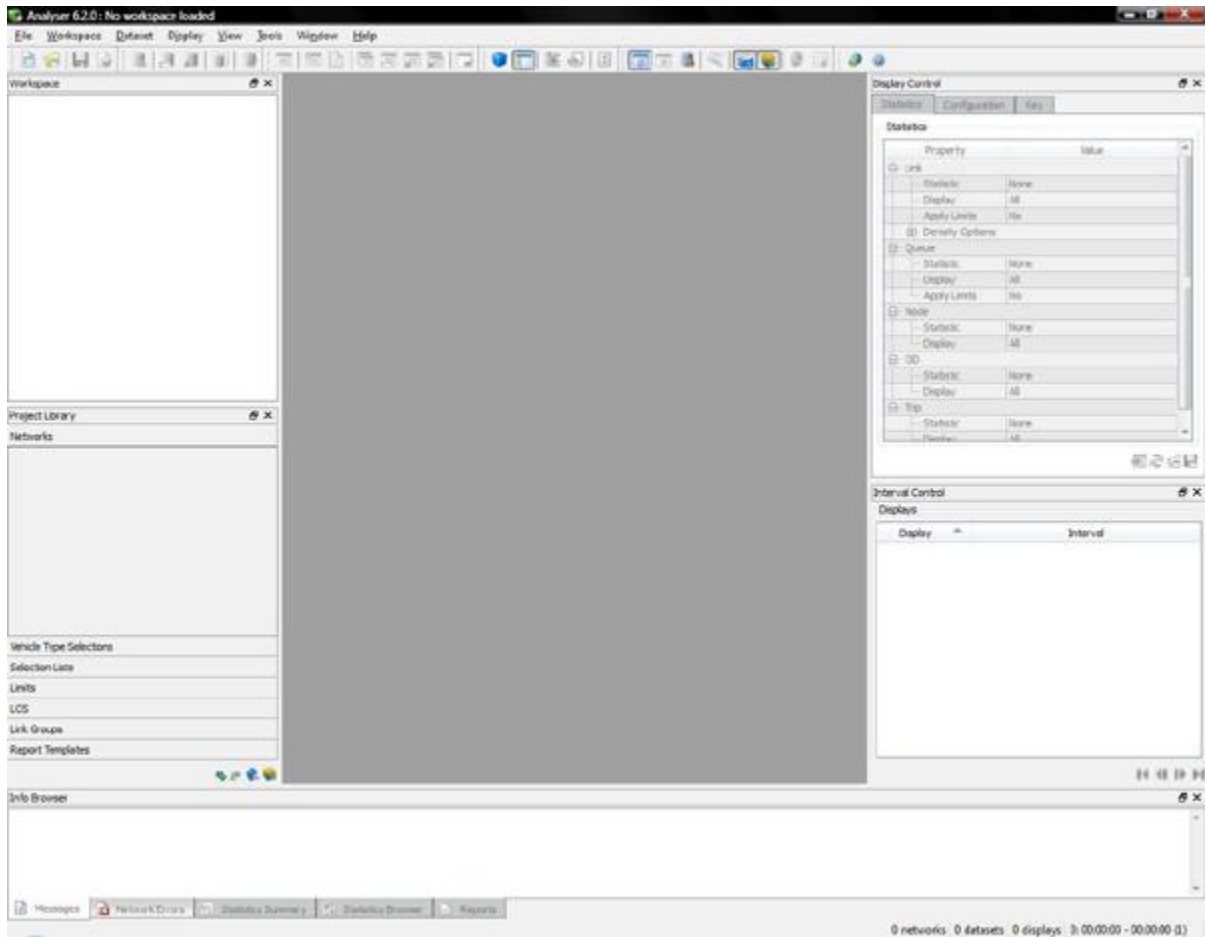
Context menus are menu lists that are specific to particular sections of the Analyser tool. To access the context menu for a window, click the right mouse pointer while the mouse button is positioned over the appropriate section of the window. As an example, right click the mouse button while the mouse is positioned over the Toolbar, the context menu for selecting Dockable Windows and Icon Groups will appear from which the user can select which windows or icons they wish to have displayed.

The Paramics software development is an ongoing process, with additional functionality being created to meet customer needs or to match further developments in ITS or traffic planning processes. If you have any comments on Paramics Analyser or on the contents of this manual, please access Quadstone's Paramics web site at:
<http://www.paramics-online.com>.

2. Layout

2.1 Overview

The section describes the areas of the main Analyser window. All of these can be present in the main window at any time and can be docked or moved outside of the main window.



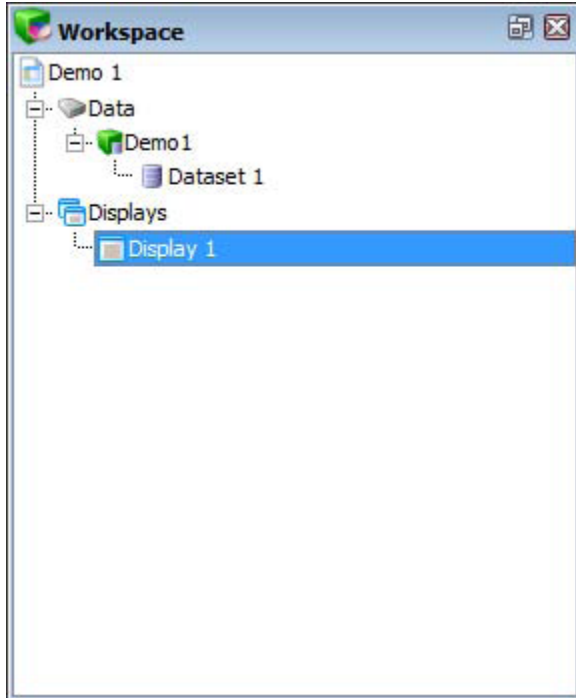
2.2 Workspace

The Analyser workspace is used to contain all the data available to the user and is split into two sections; Data and Display items. The Data items represent the data required to perform statistical analysis, and the Display items specify what data can be shown in a Display window. The two types of data stored in Analyser are Networks and Datasets. The Datasets contain the analysis data (simulated or observed) and these are associated with the network that was used to generate them.

Each workspace must consist of a valid Data and Display branches. The data branch in the workspace must contain a valid Paramics network and dataset/s generated from the Modeller tool. The Display branch defines the viewing environment for the workspace and is empty when initialised.

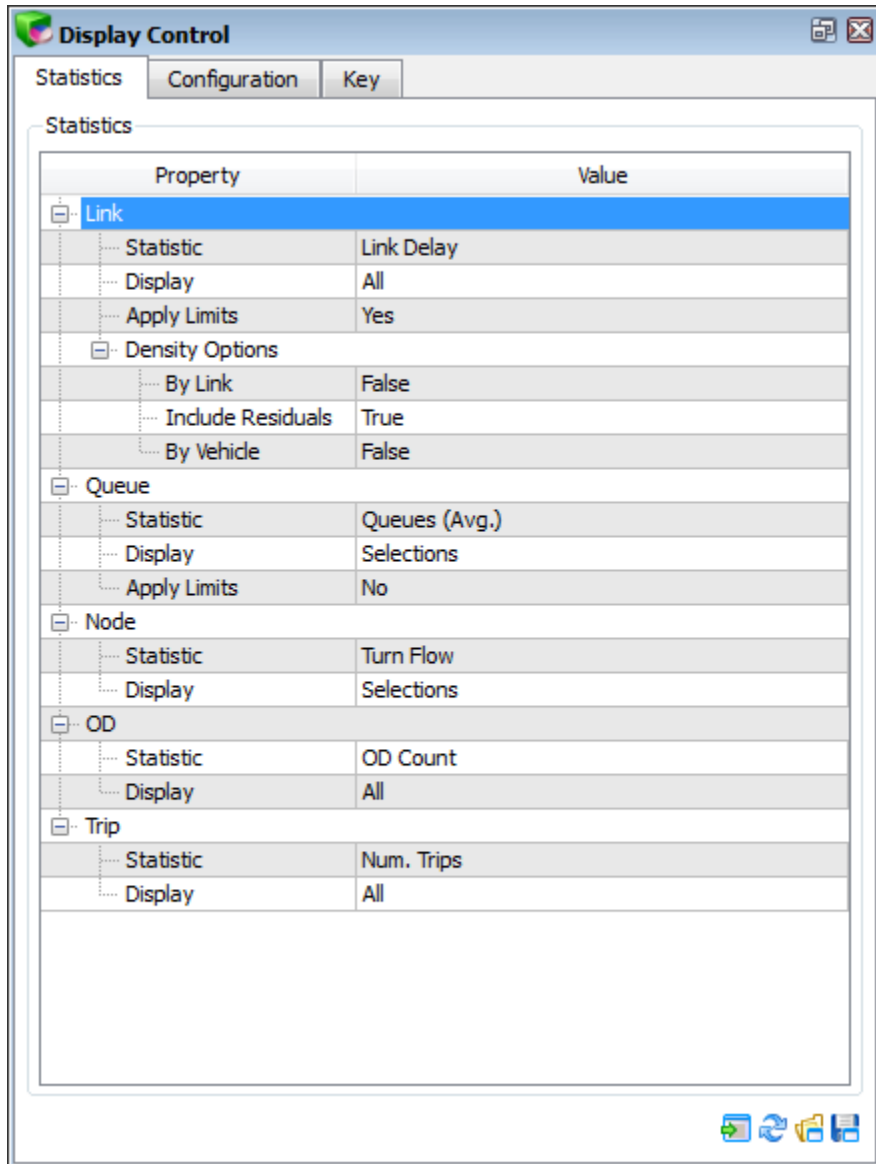
Each of the items in the workspace has context menus associated with them and these can be used to manipulate the items.

Only one workspace can be loaded at any one time.



2.3 Display Window

A Display window shows a network together with any statistics superimposed upon it. Many display windows can be shown at any one time – these can be launched from either the Display item in the workspace or from the Display menu.



2.4 Status Bar

The status bar is located in the bottom right hand side of the Analyser window and displays the following (from left to right):

1. The number of networks currently loaded in the workspace.
2. The number of datasets currently loaded in the workspace.
3. The number of views currently defined in the workspace.
4. The current interval specifies the start and end times of the current interval with the interval duration shown in brackets.

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3. Getting Started

3.1 Overview

In order to become familiar with the Analyser software the Getting Started section guides the user through the basic operation of the tool. This section should be read in conjunction with the reference sections of this manual where appropriate (section 4 onwards).

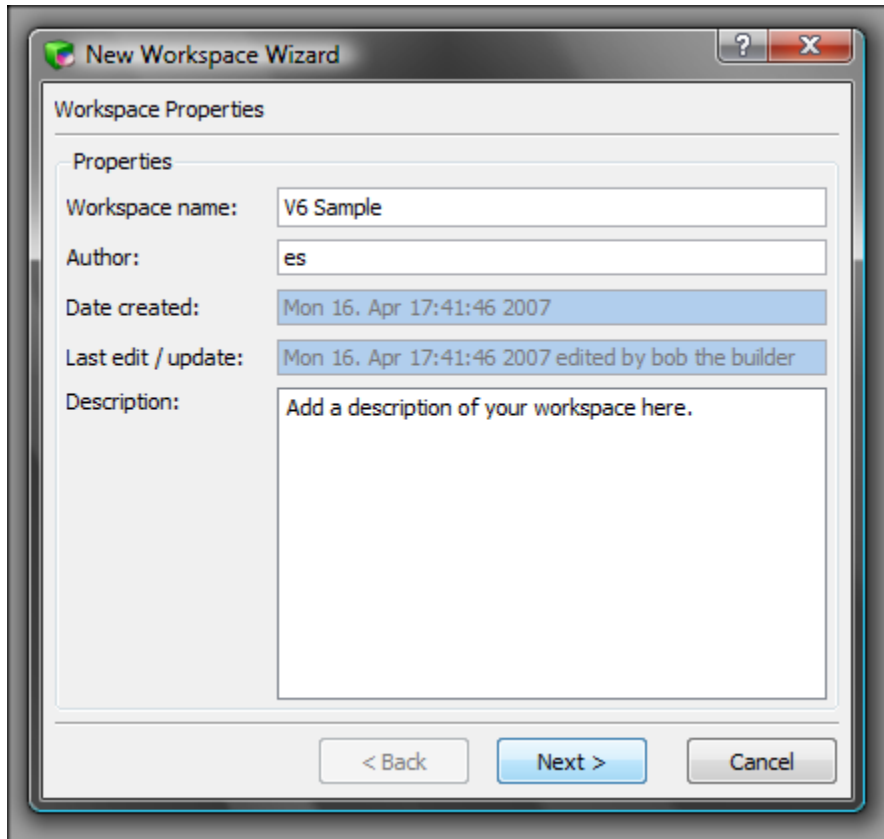
To generate the data required for Analyser the user must run a simulation in Modeller (or Processor) with the Core Network Attributes>> Measurements in the Periodic section set to gather Analyser data. The Analyser data entry must be set to the time interval that the user wishes to aggregate the data for. The files required for Analyser are generated from Modeller in binary format and are stored in the appropriate log/run directory. Observed data can be added as a dataset in order for comparison with simulated results.

A typical workflow for Analyser would be to create an Analyser workspace using the New Workspace Wizard – this adds data to the workspace. Next, a number of Analyser Displays can be created and shown in the main window. These can then be configured using the Display Control. Selecting Create Reports from the Display menu can then generate reports for the current display.

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3.2 Creating A Workspace

When the Analyser is initialised there are no Workspaces loaded and the user must create one in order to analyse data.



Selecting New Workspace from the File dropdown menu or clicking the New Workspace icon in the File toolbar will create a new workspace. This will show the New Workspace Wizard dialogue.

The New Workspace Wizard allows the user to set up a workspace from base data, the first dialogue page enables the properties of the workspace to be defined and a description added. The Workspace Name can be anything that uniquely identifies the Workspace; it also provides the default filename used to save the Workspace to disk. The other Properties fields are not mandatory; however it is good practice to enter a meaningful data.

The second page of the dialogue enables the user to define what base data is included in the workspace initially. The network is selected via a file browser; the data directory by default is a subdirectory showing the simulated or observed datasets for inclusion via the Add Selected icon. Data from different networks can be added by repeating the selection process using the file browsers to select different networks and datasets.

Clicking the Finish button will create the workspace, which will be displayed in the Workspace Tree of the Analyser window.

The File menu also provides a list of Recent Workspaces that allow quick loading of active project Workspaces.

3.3 The Workspace Tree

The Workspace Tree displays the currently loaded workspace in a dockable window, by default in the top right side of the Analyser window. The Workspace Tree displays the workspace and the two branches; Data and Displays.

The Data branch contains the datasets that are loaded into the workspace and the Displays branch contains the environments in which the datasets display the data.

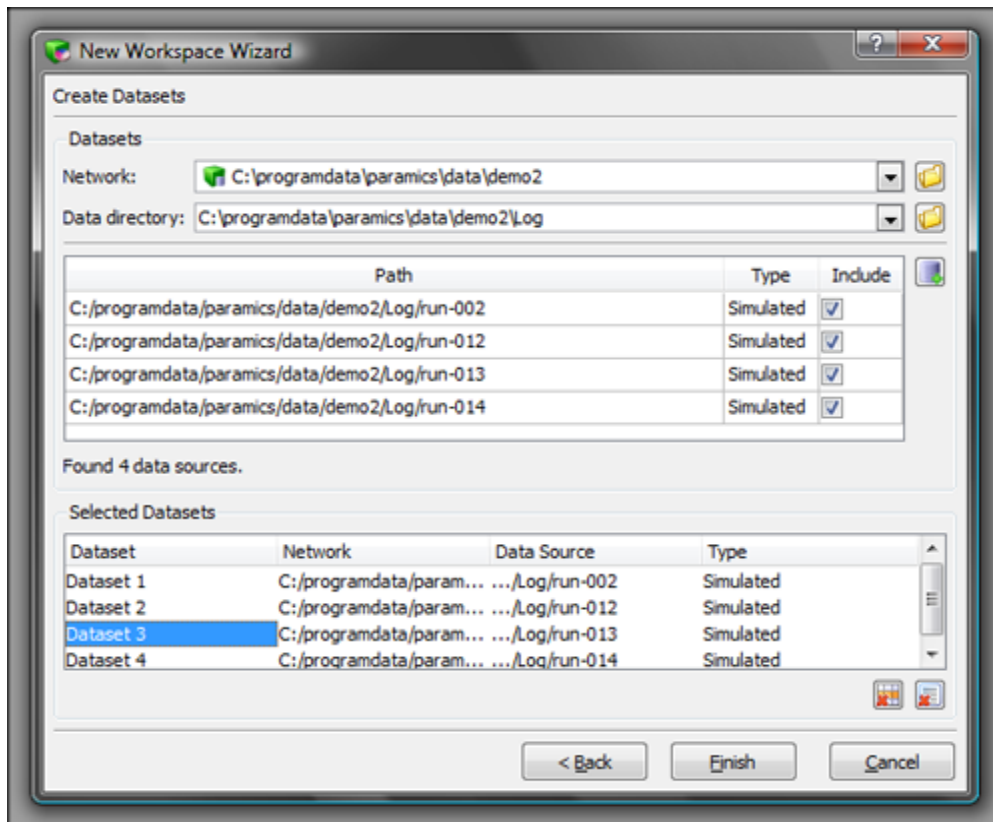
The context menus within the Workspace Tree can be used carry out basic operations of the Workspace, add datasets, create displays, display properties and create reports.

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3.4 Adding Datasets

A Workspace must contain at least one dataset, which consists of a network and associated simulation runs. Datasets can be added and removed from the Workspace in two ways:

- Accessing the Workspace dropdown menu and selecting the 'Add Dataset...' option, this will show the Add Dataset dialogue for the user to select a network from disk or the combo box. Paramics networks are folders and are recognized by a series of mandatory files.
- Using the context menu on the Workspace icon in the Workspace Window and selecting the 'Add Dataset...'



The context menus in the Workspace Tree can be used to remove a dataset from the Workspace. This does not delete the dataset from disk but just removes the network reference from the Workspace.

Using the context menu on the Workspace Name in the Workspace Tree accesses more Workspace specific options such as New, Open, Save and Save As. An asterix (*) displayed after the Workspace name and path in the Title Bar indicates that the Workspace has been modified. Exiting Analyser when the Workspace has not been saved will prompt an automatic warning window to allow the user to Save and Exit, Exit unsaved or to Cancel the Exit.

To save a Workspace select Save Workspace from the main File menu or by selecting Save from the workspace's context menu.

More details on datasets can be found in the Dataset section of this manual.

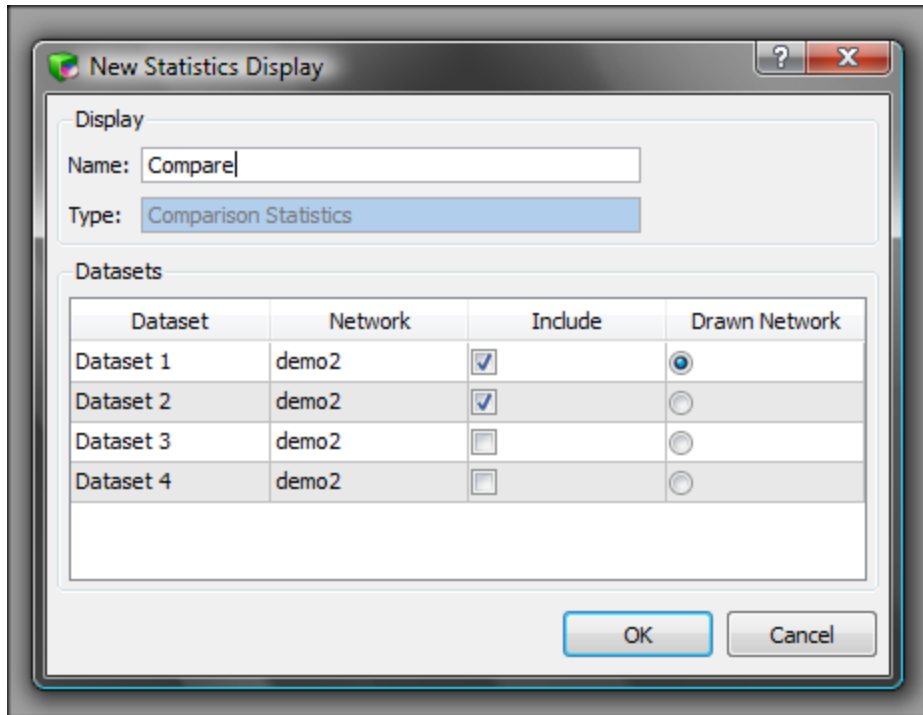
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3.5 Creating A Display

Datasets contain large amounts of information on each simulated run and to filter this data down to manageable sections the Displays are used. Displays can be defined as a selection of dataset entries that are grouped together for the purposes of display and analysis.

A Display is created using the context menu on the Displays item of the Workspace tree or by selecting the Display>>New Display option from the dropdown menu. This will initialise the New Statistics Display dialogue.

Once created a Display is shown in the Workspace Tree and can be opened in a separate window, allowing multiple Displays to be available at any one time. Changing the selected display can be achieved by clicking on the Title Bar of each individual Display; this will make it available for reporting and allow the statistics to be changed.



A display is given a default name, which can be changed by the user when the display is created.

The type of display is automatically selected by the Analyser and depends on the number of datasets selected in the workspace:

- Single Statistics – if one dataset is selected the statistics displayed and reported will be based on the single dataset values
- Comparison Statistics – if two datasets are selected the statistics displayed and reported will be based on the comparison of the two datasets
- Multi Statistics if three or more dataset is selected the statistics displayed and reported will be based on the average of all the datasets

The type of display will determine the statistics available for display and reporting, for example if a single dataset is displayed the statistics will show values for the dataset, if comparison is selected the same statistics are available, however the statistics display will have a choice of comparison modes.

In the Dataset section of the New Statistics Display dialogue all the datasets in the workspace are listed with their associated networks. The include column allows the datasets to be added to the display and the Drawn Network column allows the user to select which network is to be selected for drawing the dataset/s on as a base. At least one dataset is required to be included and a drawn network is required before the OK button is available to allow the completion of the display.

Once all valid selections have been made the OK button will be available to complete the selection and display the selection in the workspace tree in the displays branch. The context menu of the Display in the Workspace Tree or the Show Selected option from the Display dropdown menu is used to display the selected Display in the Analyser window.

More details on the display functions are found in the Display section of this manual.

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3.6 Viewing Statistics

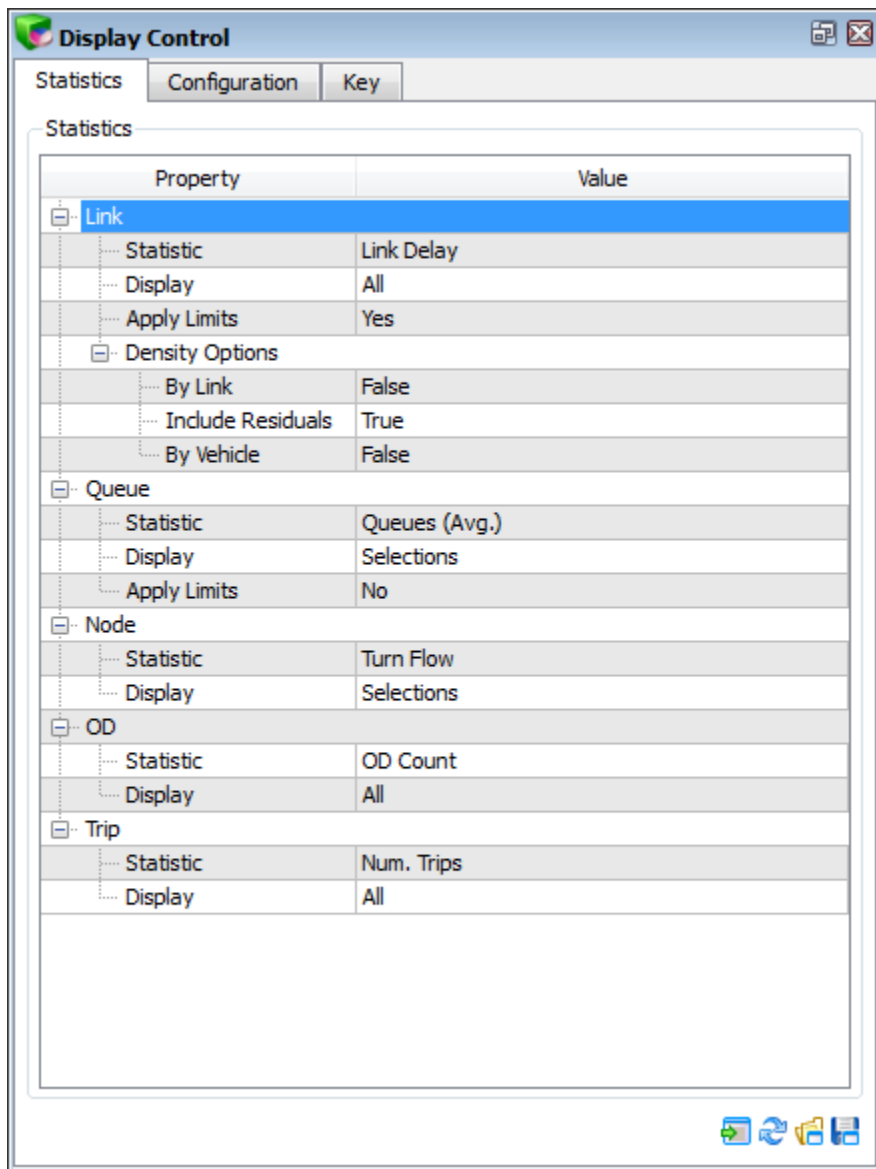
To view statistics and analysis for a dataset or display the display must first be selected and shown in the Analyser window. To do this, select the display in the Workspace Tree and use the context menu and select the Show Selected option or by selecting the Display>>Show Selection option from the dropdown menu.

Displaying the network in the Analyser Display window enables the user to overlay statistics and analysis.

Using the Display Control dockable window the user can select which statistics are overlaid on the network. Statistics are categorised into five different types: Link, Queue, Node, OD and Trip.

More details on the Display Control window can be found in Tools section, in addition statistics are described in more detail in statistics section.

As an example the link count information can be displayed by selecting the Statistics tab in the Display Control dockable window and then selecting the Link Count option from the combo box. To activate the combo box click in the Statistic row of the Value column.



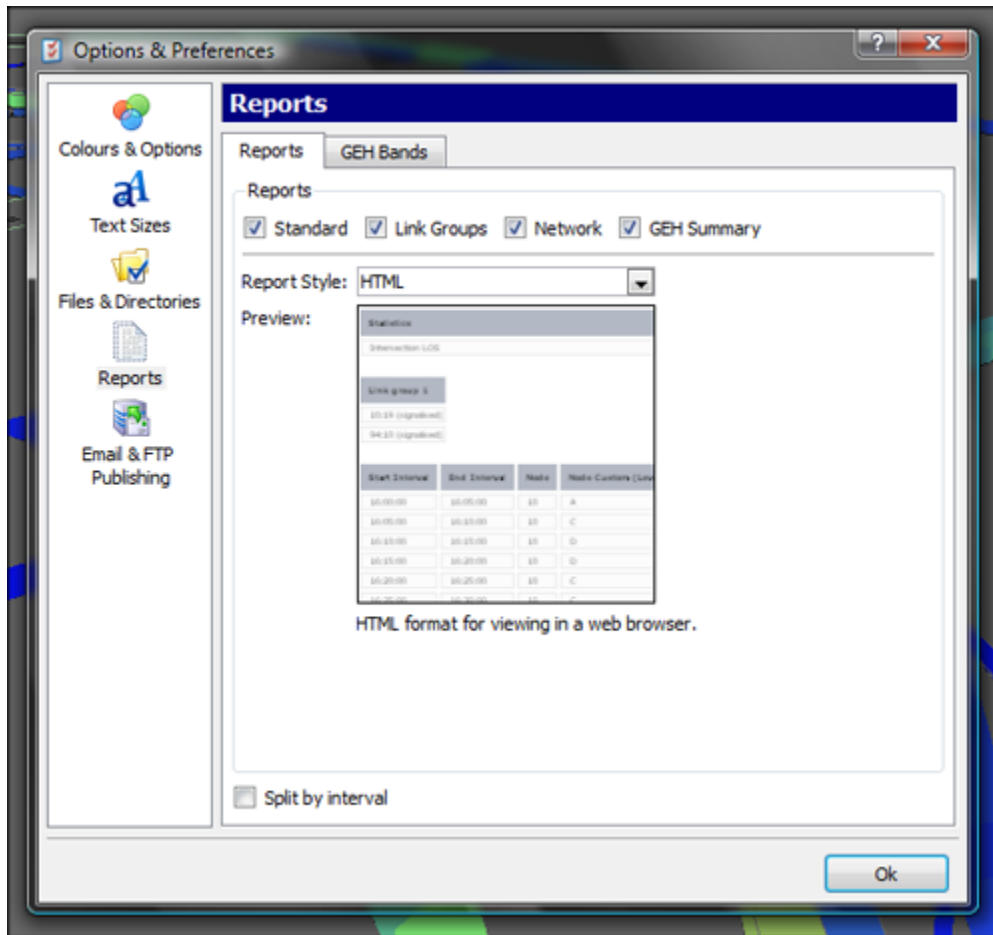
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3.7 Creating Report Templates

As Analyser is capable of storing and reporting a vast amount of data which is more than is practically required by the user a Report Template is required to select what data the user will export to file. A Report Template is a configuration file for the export of selected data from Analyser in the format the users requires; a Report Template itself does not store any information.

To create a Report Template access the Report Templates section of the Project Library and click the 'Add item' icon at the bottom of the library. The context menu also has an 'Add...' option which can be used to show the Report Template dialogue.

The Report Template dialogue will be initialised, which requires a name, so that it can be identified in the Project Library.



In addition a LOS table is required to be created before a template is added, it is recommended that the Preset LOS (HCM 2000) be loaded first time.

Further details on creating a Report Template are covered in the Project Library area of the Tools section. In addition details on how to create Vehicle Type Selections, Selection Lists, Link Groups and LOS are also covered in the Project Library section of this manual.

The format of the report is defined in the Options & Preferences section of this manual and is used to determine the style of the report, the types of statistics to be included and the GEH bands to be included in the report.

The Report Template is defined in two tabs:

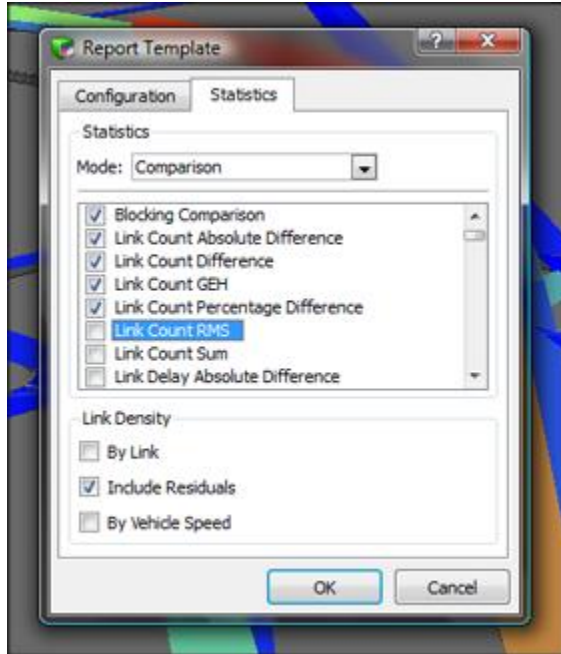
- Configuration – defines the control parameters or filters that are used in producing the report. Such filters include the Vehicle Type Selections, Selection Lists, Link Groups and LOS.
- Statistics – defines which statistics are available for selection from the mode (single/comparison/multi) and allows each statistic to be checked for inclusion in the report.

In addition the density values can be calculated in different ways depending on the network type and methodology in such a way that the density can be gathered by link rather than by lane (average), to include

residual vehicle (vehicle that have not exited the link in the time segment) and calculation of the density as a function of the speed and flow on the link.

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3.8 Creating Reports



Selecting the context menu on a display item in the Workspace and clicking the 'Create Reports...' option or from the dropdown menu will create an output report.

This will show the Create Reports dialogue, which will provide information and option on the data to be reported.

The Create Reports dialogue will display the Dataset that will be included in the report and a Template combo box that will provide the option of selecting different templates for the report. Only report Templates that are consistent with the Display will be available in the Templates combo box.

The format of the reports is detailed in the View>>Options & Preferences Reports section, with the default location set in the View>>Options & Preference Files & Directories section.

Clicking on the individual link (path and filename hyperlink) in the Reports tab of the Information Browser or using the context menu can open the report in a web browser or open the reports folder in Windows File Explorer.

Further details on creating a Report Template are covered in the Project Library area of the Tools section. In addition details on how to create Vehicle Type Selections, Selection Lists, Link Groups and LOS are also covered in the Project Library section of this manual.

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4. File

This section refers to the File dropdown menu option of the dropdown menus.

[\[TOP\]](#)

4.1 New Workspace (Ctrl + N)

This shows the New Workspace wizard that guides the user through the process of creating a new Analyser workspace. The two wizard pages are described below:

- **Workspace Properties** – the user can enter a name for the workspace, the workspace author and a description of the workspace. A workspace name is a mandatory field, however it is good practice to enter a name and description that are meaningful and help identify the workspace.
- **Create Datasets** – This window allows the user to build up a list of datasets that will be added to the Analyser Workspace. The user should use the Network and Data directory combo boxes in order to populate the list of analysis data directories (simulated or observed).

The user can then choose analysis data directories by selecting checkboxes. Pressing the Add icon will add them to the Selected Datasets list. This process can be repeated, building up a list of datasets that will be added to the Analyser workspace

The Network combo contains a list of the networks contained in the Project Library. Buttons are provided to remove or clear datasets from the Selected Datasets list. The user should press Finish to create the specified workspace. Note that the Finish button will only become active when there is at least one item in the Selected Datasets list.

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4.2 Open Workspace (Ctrl + O)

Selecting this option opens the standard file browser and allows the user to select a valid Analyser Workspace file (*.aws). Once the Workspace file is selected the Open button will load the selected Workspace into Paramics Analyser, populating the Workspace Tree

A Workspace will also include any Display windows, held in the Displays branch of the Analyser Workspace.

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4.3 Recent Workspace

This option gives the user a shortcut to load the most recently opened Workspaces, without the need to open a file browser window. The user has an option to remove all of the workspaces from the Recent Workspace list by selecting the 'Clear History' option.

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4.4 Save Workspace (Ctrl + S)

This will save to the current Analyser workspace file, overwriting the currently loaded workspace file. If the current Analyser workspace has not been saved i.e. a new workspace, then the Save As dialogue will be displayed.

[TOP](#)

4.5 Save Workspace As

This option allows the user to save the current workspace to a *.aws file. The Save As... window allows the user to browse to a specific folder and the Save button enables the saving of the workspace to a new workspace name.

[TOP](#)

4.6 Print (Ctrl + P)

This option allows the user to print the current Display window contents to a standard print device. The standard system print dialogue and controls are shown to the user.

[TOP](#)

4.7 Print To File

This option allows the user to print the current Display contents to one of many image file formats. The user can choose raster (jpg, bmp) image formats or scalable vector (DXF, PDF) formats.

[TOP](#)

4.8 Properties

This displays a dialogue showing the workspace properties. This shows the same information as the first page of the New Workspace wizard. It is only active when the Workspace item in the workspace tree is selected.

[TOP](#)

4.9 Exit

This option closes the Paramics Analyser software, prompting the user to save any previously unsaved changes.

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5. Workspace

This section refers to the Workspace dropdown menu option of the dropdown menus.

[\[TOP\]](#)

5.1 Overview

The Workspace menu is designed to allow the user to manage the contents of the Workspace Tree.

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5.2 Add Datasets

This is used to add datasets to the existing Workspace Tree. It allows the user to specify one or more datasets that are to be added to the workspace.

The Add Datasets window allows the user to select a network and gathered Analyser data to be loaded into the workspace as a Dataset. A Dataset consists of a network and a number of Simulation Runs.

The Network combo box enables the selection of any of the networks held in the current Project Library. The network browser allows the user to select any network as a base for the datasets that are to be added to the current workspace. This sets the Data directory that Analyser uses to search for simulated and observed dataset.

Valid datasets will then be displayed in the list below allowing them to be selected by checking the box in the Include column. By clicking the OK icon the selected datasets will be added to the Workspace Tree.

The default opening location of the network browser is set in the Files & Directories section of the View>>Options & Preferences dropdown menu option.

[\[TOP\]](#)

5.3 Expand

Expands the currently selected branch of the workspace tree. Expanding a branch in the workspace can also be achieved by clicking the '+' indicator on the relevant branch. If the branch item is double clicked directly in the workspace it will be toggled (expanded/collapsed).

[\[TOP\]](#)

5.4 Collapse

Collapses the currently selected branch of the workspace tree. Collapsing a branch in the workspace can also be achieved by clicking the '-' indicator on the relevant branch. If the branch item is double clicked directly in the workspace it will be toggled (expanded/collapsed).

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6. Dataset

This section refers to the Dataset dropdown menu option of the dropdown menus.

[TOP](#)

6.1 Overview

The Dataset dropdown menu enables the user to view and manipulate the datasets held within the Analyser Workspace.

Using the context menus in the Workspace window on a dataset item displays a menu of options to manage a dataset. The options are also available from the Dataset dropdown menu.

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6.2 Rename

This allows the user to specify a new name for a dataset. This option is only active if a dataset is currently selected.

[TOP](#)

6.3 Delete

This allows the user to delete the currently selected dataset. This does not remove the dataset data from disk; it is only removed from the workspace tree.

[TOP](#)

6.4 View Raw Data

This option displays the Raw Data Viewer. This window allows the user to look at the data contained within the Analyser binary files that are produced by Modeller. The user can select the type of data displayed and interval of the data file to view.

Raw Data Viewer

Options
 Data Type: Link Interval: 2 16:02:00 - 16:04:00

Raw Data

Link	Vehicle Type	Vehicle Count	Residual Vehicle Count	Average Time	Average Stop Time
1:874z	Car	15	0	2.6	0.0
1:874z	Car	6	1	2.5	0.0
1:874z	Car	5	0	3.0	0.0
1:874z	Car	3	0	2.3	0.0
1:874z	Car	3	0	2.3	0.0
140:891	Car	7	1	11.6	0.0
140:891	Car	3	0	11.7	0.0
140:891	Car	1	0	10.0	0.0
140:891	Car	2	0	13.0	2.5
112y:974	Car	2	0	13.0	0.0
112y:914	Car	9	0	5.4	0.0
112y:914	Car	3	0	5.7	0.0
112y:914	LGV	2	0	5.5	0.0
112y:914	OGV1	1	0	6.0	0.0
627:632	Car	6	0	2.5	0.0
627:632	Car	5	0	2.2	0.0
627:632	Car	2	0	2.2	0.0

OK

[TOP](#)

6.5 Properties

This displays the properties of the currently selected dataset. The Datasets tab shows information describing the currently selected dataset in terms of the dataset name, data location, type and interval information. The Network tab shows information about the associated network.

Selecting Properties allows the user to modify the Workspace Properties in the same way that they are when a new Workspace is created. A Workspace with a network associated with it has the Network tab is enabled; this displays information about the network including the base, core and assignment parameters.

Using the context menu on the Network icon in the Workspace Tree displays a menu of network related actions. This includes the option to remove the network from the Workspace, which can also be achieved via the Workspace Dropdown menu.

[TOP](#)

7. Display

This section refers to the Display dropdown menu option of the dropdown menus.

[TOP](#)

7.1 Overview

The Display dropdown menu provides options for manipulating Analyser Display windows. The Display windows show the network and current statistic selections.

[TOP](#)

7.2 Show Selected

This option displays the currently selected Display item as a Display window. This option is also available by accessing the context menu on an individual Display in the Displays section of the Analyser Workspace or by double clicking on the Display in the workspace.

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7.3 New Display

The New Display option initialises the New Display window, which creates a fresh display.

The 'Type' of Display determines which style of statistics can be shown in a display. A display can be Single, Comparison or Multi depending on the number of

Datasets that are selected for inclusion in the Display via the Include check box available for each dataset.

One Dataset included sets the Type to Single Statistics. In this mode the statistics will be based on the selected dataset only.

Two Datasets included sets the Type to Comparison Statistics. In this mode the statistics will be compared directly against each other. i.e. in direct comparison.

Three or more Datasets included sets the Type to Multi Statistics. In this mode the statistics will be based on the average of all the selected datasets only.

The Drawn Network radio button determines which network will be drawn in the Display window.

This option is also available by accessing the context menu on the Displays item of the Analyser Workspace.

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7.4 Create Reports

The Create Reports option, either selected from the dropdown menu or context menu is used for creating reports based on the data contained within the currently selected Display window.

Output Reports are based on templates, which are created and stored in the Project Library. The specified report template and whatever is selected within the Options and Preferences determine the content of a report.

The Create Reports dialogue will display the Dataset that will be included in the report and a Template combo box that will provide the option of selecting different templates for the report. Only report Templates that are consistent with the Display will be available in the Templates combo box.

The format of the reports is detailed in the View>>Options & Preferences Reports section, with the default location set in the View>>Options & Preference Files & Directories section.

Clicking on the individual link (path and filename hyperlink) in the Reports tab of the Information Browser or using the context menu can open the report in a web browser or open the reports folder in Windows File Explorer.

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7.5 Copy

This option copies the currently selected Display and adds it to the workspace tree.

This option is also available by accessing the context menu on an individual Display in the Displays section of the Analyser Workspace.

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7.6 Rename

This allows the user to specify a new name for the currently selected Display in the Display section of the Workspace window.

This option is also available by accessing the context menu on an individual Display in the Displays section of the Analyser Workspace.

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7.7 Delete

This removes the currently selected Display item from the workspace tree. If the Display item's window is open then this window will be closed.

This option is also available by accessing the context menu on an individual Display in the Displays section of the Analyser Workspace.

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7.8 Delete All

This removes all Displays from the workspace tree and closes any corresponding open windows.

This option is available by accessing the context menu on the Displays item of the Analyser Workspace.

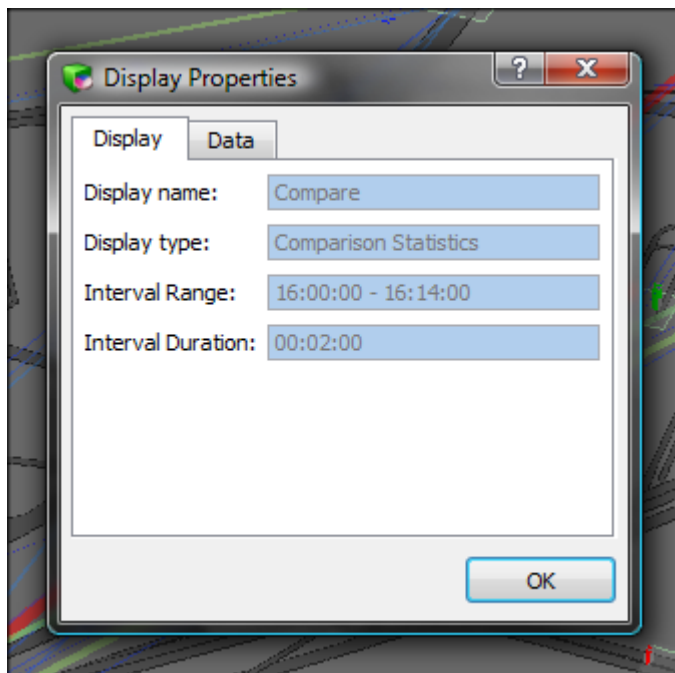
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7.9 Properties

This initialises the Display Properties window. The Display tab shows the name of the display, the type of Display data, the interval range and the interval Duration that is currently showing.

The Data tab shows the datasets that were used to generate the display.

This option is available by accessing the context menu on the Displays item of the Analyser Workspace.



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8. View

This section refers to the View dropdown menu option of the dropdown menus.

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8.1 Toolbars

The View option toggles the specific toolbars available in the Toolbars section of the Analyser:

- File
- Workspace
- Dataset
- Display
- View
- Tools
- Help

Each toolbar is a list of icons that relate directly to the options available from the corresponding dropdown menu.

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8.1.1 Workspace

Toggles the Workspace Tree on and off.

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8.1.2 Layer Selector

This displays the Layer Selector, a dockable common tool. This tool controls the current Display window and mostly consists of network drawing specific flags and some Analyser specific drawing options.

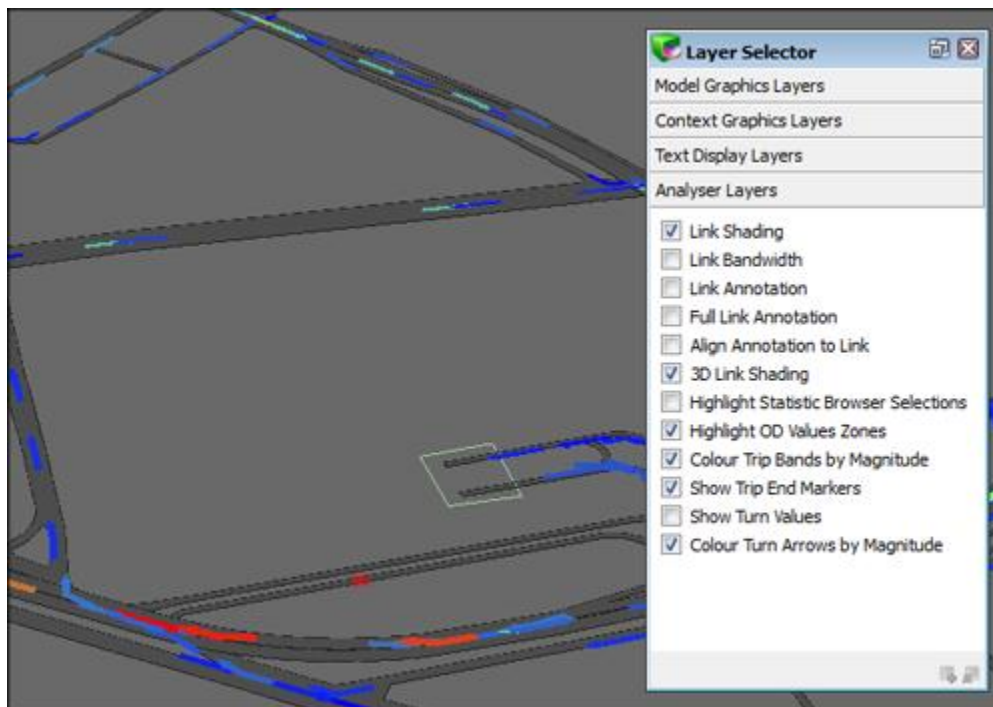
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8.1.2.1 Analyser Graphics Layer

The following graphics layers are specifically available for Analyser;

- **Link Shading** - Links are shaded to reflect the magnitude of the values. The Statistics Browser tab of the Information Browser will display the reported values for each interval if the mouse button is positioned over an individual link

- **Link Bandwidth** - Data values for links are displayed as a bandwidth with the magnitude of the values reflected in the width of the display for each link. In addition bandwidths are coloured in an identical manner to the Link Shading option.
- **Link Annotation** - Displays the link data values as numeric text at the centre point of the link. The View>>Options & Preferences>>Text Sizes window can be used to alter the text size.
- **Full Link Annotation** - Displays the units of the values in addition to the values themselves
- **Align to Link** – Aligns the Link Annotation to the link rather than to the screen alignment.
- **Highlight Statistic Browser Selections** – Highlights the currently selected link/node/zone that is displaying statistics in the Statistics Browser tab of the Information Manager.
- **Highlight OD Values Zones** – Highlights the origin and destination zones when trips are selected in the Analyser Display window.
- **Colour Trip Bands by Magnitude** - Colours the trip bandwidths by the magnitude of the values in the same way as the Link Shading above.
- **Show Trip End Markers** – Shows a 3D marker of origins (green) and destinations (red) trip volumes.
- **Show Turn Values** – Displays the turn values of turning movements.
- **Colour Turn Arrows by Magnitude** - Colours the turn arrows by the magnitude of the values in the same way as the Link Shading above.



8.1.3 View Control

The View Control tool is a dockable window tool that enables quick access to preset Viewpoints, Layer Groups, and Camera Window positions.

The View Control has three tabs:

- Preset Views: saved viewpoints in the network that can be retrieved by double clicking on the entry in the list;
- Layer Groups: a collection of graphics layers setting that can be grouped under a single symbolic name for quick access; and
- Views and Layers can be added, deleted, and updated using the icons at the bottom of the View control tool window. Camera Windows can only be added or deleted from this tool.

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8.1.4 Options & Preferences

This option shows the core options and preferences dialogue. Through this dialogue the user can change colour, drawing, text size values; most of these options are common to all applications. The Analyser specific options are described below.

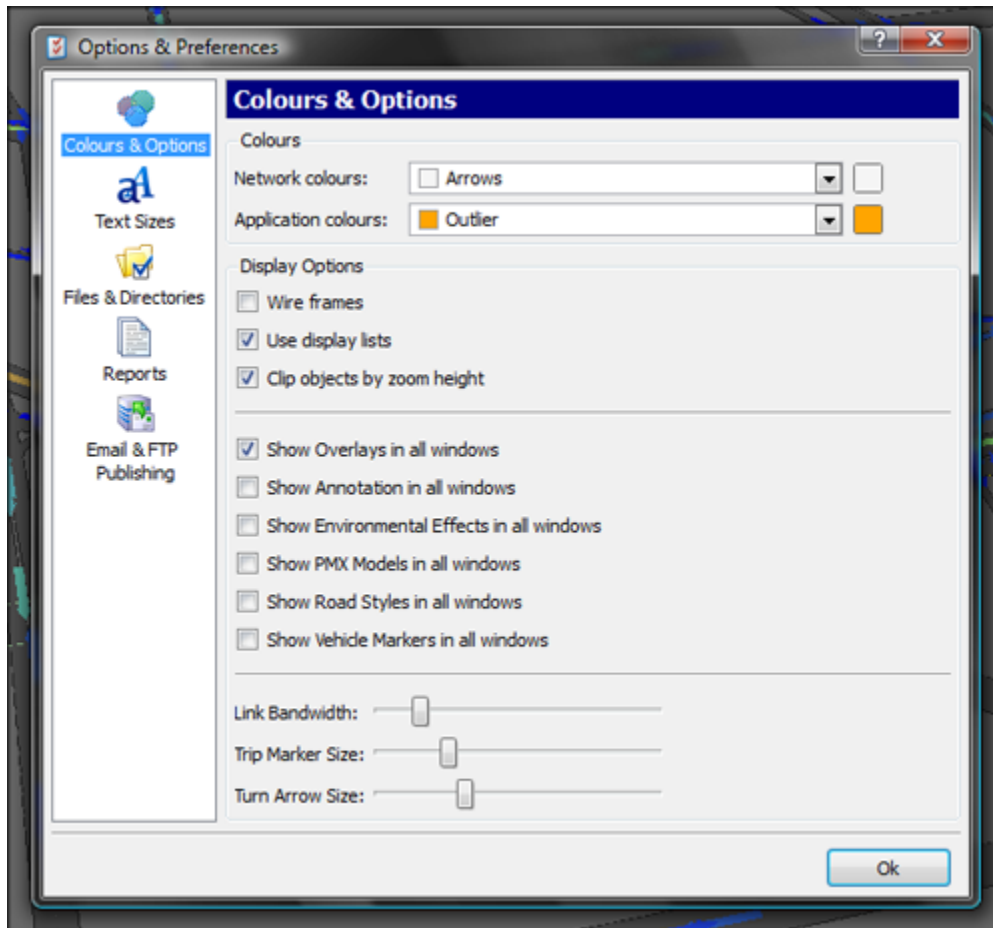
[\[TOP\]](#)

8.1.4.1 Colours & Options

The Colours section is split into two combo lists; Network colours and Application colours.

- Network colours – lists the common network objects and their colours
- Application colours – list the objects that are specific to the Analyser tool and the colours associated with them

The coloured box beside the combo list displays the current colour of the network/application feature. Clicking on this box opens the select colour window that allows the user to choose a preset/basic colour, create and save a custom colour or alter the shade of any available colour.



The Application Colours combo contains colours that are used within the Analyser Display window. The colour can be edited by pressing the button to the right of the combo.

- **Outlier** Used to indicate a statistic value that is outwith the bounds specified by a limit. The outlier colour is used to shade a link when displaying a link statistic (not link custom) and limits are applied.
- **Queue Blocking** This is used when showing the Queue Blocking statistic i.e. a lane on a link that is blocking is coloured using the specified colour.
- **Queue (Primary)** This colour is used to colour lanes when showing one of the queue statistics (not Queue Blocking). It is the colour used when showing single queue statistics and is used as the colour of the first operand when showing a comparison queue statistic.
- **Queue (Secondary)** This colour is used to colour lanes when showing one of the queue statistics (not Queue Blocking). It is only used when showing comparison queue statistics and is used as the colour of the second operand.
- **OD Data** This colour is used when showing OD statistics. It is used for the colour of the bandwidths shown next to links when showing this statistic.
- **Turn Data** This colour is used when showing Node statistics (but not the Intersection LOS statistic). It is used as the colour of the turn arrows and labels.
- **Trip Data** This colour is used when showing Trip statistics.

- **Link Annotation** This is used as the text colour when a link statistic is shown and Link Annotation is selected in the Analyser Layers within the Layer Selector.
- **Node Selection Item** This colour is used to shade selected nodes when building a node selection list library page.
- **Link Selection Item** This colour is used to shade selected links when building a link selection list library page.
- **Trip Selection Item** This colour is used to shade selected trips when building a trip selection list library page.
- **Node Link Group Item** This colour is used to shade a node when creating a link groups library page.
- **Link Link Group Item** This colour is used to shade the links in any link groups that are specified when creating a link groups library page.

The Link Bandwidth slider at the bottom is used for adjusting the size of bandwidths when showing link statistics and when the Link Bandwidth option is selected within the Layer Selector.

Vertical Sync

Turned on, this setting will synchronise the paramics cycle speed to the monitors refresh rate i.e. a monitor of 60hz will limit paramics to 30 x RT.

Leaving this option off will result in paramics running as fast as the PC will allow. If you experience flickering or exuberant mouse controls than we recommend turning this option on.

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8.1.5 Text Sizes

The Text Sizes tab allows the user to set the text size for each text display manually or automatically, relative to the size of the Analyser window.

The 'Auto scale text sizes' is checked by default and as such automatically scales the text sizes to the zoom level of the network display window.

Unchecking the Auto scale text sizes allows the individual text size slider bars to be used to alter the text sizes in the network display window.

This shows a series of sliders for adjusting text sizes in Analyser. The Analyser specific text is described below.

- **Turn Data** This changes the size of the turn arrows and labels when showing Node statistics.
- **Link Annotation** This changes the size of link annotation when showing Link statistics. Note that Link Annotation must be turned on in the Layer Selector.
- **OD Data** This changes the size of the od data labels when showing OD statistics.
- **Trip Data** This changes the size of the trip data labels when showing Trip statistics.

8.1.6 Files and Directories

Allows the user to specify which directories are used as default locations for:

- **Data directory** – the default location for opening networks and workspaces,
- **Libraries directory** – the default location for the Project Library and the style sheets for reporting,
- **Fontmaps directory** – the default location for the Fontmaps used in the Paramics software,
- **Images directory** – the default location for saved screenshots and images,
- **3D Models directory** – the default location of 3D models (pmx),
- **Logs directory** – the default directory for saving the log files underpinning the operation of the Estimator,
- **Reports directory** – the default directory for the output reports,
- **Documents directory** – the default directory for the manuals as accessed by the Help>>Estimator User Manual.

Clicking the folder icon on the right hand side of the folder path display opens up a Browser For Folder window enabling the user to browser to a new folder for the default location or to create a new folder with the Make New Folder button.

8.1.6.1 Reports

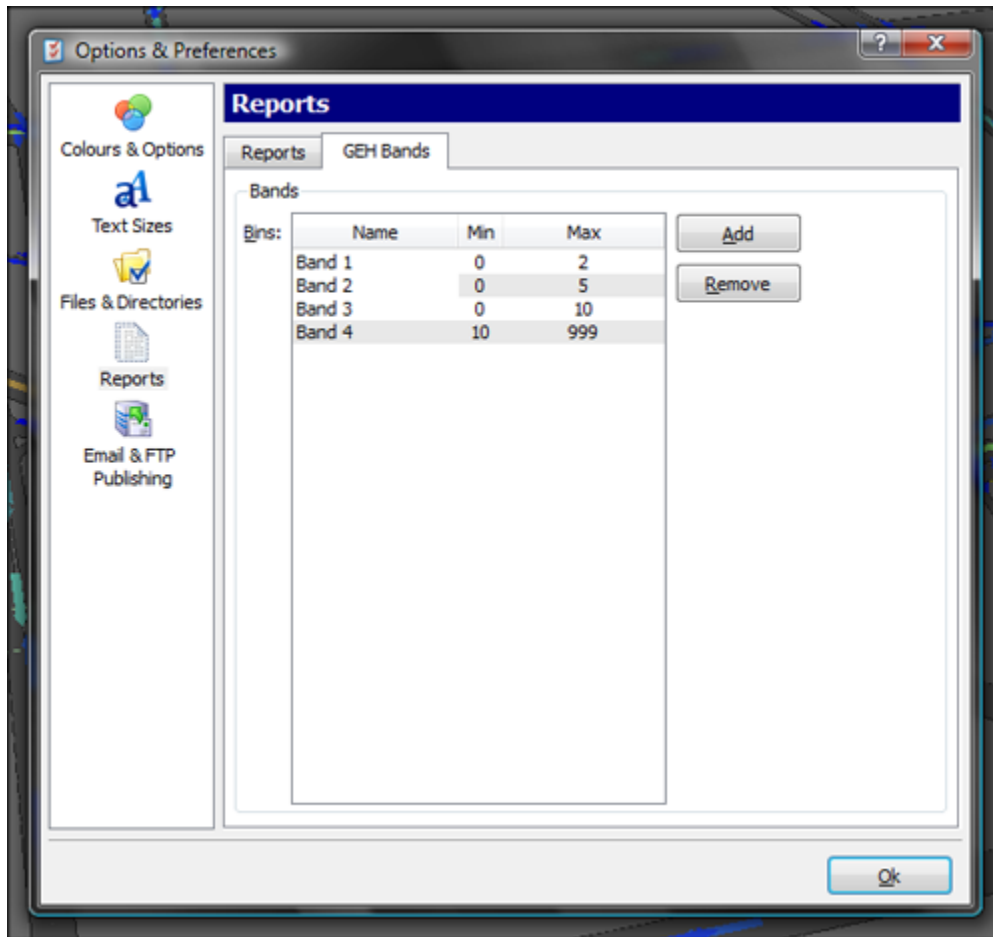
The options selected on this page determine which reports are generated when Create Reports... is selected for a particular Analyser display. It is divided into two tabs, one for Reports and one for specifying GEH bands.

There are four types of report that can be generated and these are described below:

- **Standard** This report type contains all the statistics that are selected in a report template.
- **Link Groups** This report type contains all the link statistics that are selected in a report template. These statistics are reported per link group. A report of this type will only be generated if link groups are specified in the report template.
- **Network** This report type contains the sum and mean of all link statistics that are selected in a report template.
- **GEH Summary** This report type contains the banded values of all GEH statistic types that are selected in a report template. The GEH bands can be specified via the GEH Bands tab.

The reports can be generated as either CSV or HTML by selecting from the Report Style combo box.

If the Split by Interval option is selected, then one report type file will be created for every interval; if unselected, then all the data for a report type will be output to one file.



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8.1.6.2 GEH Bands

The GEH Bands tab is used for specifying a series of bandings that are used for the GEH Summary report file.

The Add and Remove buttons to the right of the table enable the table to be expanded or contracted. Every cell in the table can be edited by double clicking on value or band.

There is a minimum of two bands allowed. The values have minimum of 0 and no specified maximum value.

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8.1.7 Email & FTP Publishing

This section allows the configuration of Analyser publishing facilities, which enables users to be emailed when the reports are available or the reports to be uploaded onto an FTP server.

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8.1.7.1 Email Options

The user has the option to email reports to an email address when complete. Checking the 'Publish Summary reports on completion' and the 'Publish Simulation Run Reports on completion' check boxes enables this option and allows the user to complete the email and security details in the subsequent section. The Test button to the right of the security details allows the user to test this feature.

The 'Recipient list' is the list of email address that Processor Manager will email the selected files to.

To enter multiple email addresses separate email addresses with a semi-colon (;).

The 'From Address' is the address that the email will appear to be from.

The 'SMTP host' is the address of the outgoing mail server, with the 'Username' and 'Password' used for logging onto the SMTP host.

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8.1.7.2 FTP Options

Similar to the Email Options the FTP Options the check box allows a FTP upload when Simulation Runs are completed. Once the 'Publish Summary Reports on completion' and 'Publish Simulation Run Reports on completion' boxes have been checked the user is allowed to specify the FTP and security details. The FTP process can be tested using the Test button to the right of the security details.

Generated reports are then available on the FTP area of the specified host. An index.html file is also uploaded to provide easier access via a web browser.

The 'FTP host' is the address of the FTP server.

The 'Starting dir' is the folder that the reports will be uploaded to; if left blank the reports will be placed in the root folder.

The 'Username' and 'Password' are used for logging onto the FTP host.

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9. Tools

This section refers to the Tools dropdown menu option of the dropdown menus.

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9.1 Display Control

The Display Control tool includes a number of toolbar buttons located at the bottom right of the dialog in the same way as other dockable tools. The options provided in this toolbar allow the user to:

- Apply the current Display Control Settings to all active Displays
- Reset the current Display Control Settings
- Save the current Display Control Settings under a symbolic name
- Recall a set of Display Control Settings

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9.1.1 Statistics

The statistic types are separated out into five statistic classes: Link, Queue, Node, OD and Trip. Each of these statistic classes contains the statistic type to be displayed, and a number of optional items that control how that statistic is displayed. For example, to display Link Count using a selection list, choose Link Count from the Statistic combo, select Selections from the Display item, and choose a selection list from the Configuration tab (assuming a Selection List library page exists). Each item in the Statistics tab is described below.

- **Statistic** This dialogue is common to all statistic class items. This item is used for specifying which statistic is displayed for the statistic class.
- **Display** This dialogue is used for specifying which statistics are shown for links/Queues/Nodes/OD/Trips (All), for link for link groups (by reference to a Link Groups library page), or from a selection list (by reference to a Selections library page).
- **Apply Limits** This option is used in the Link and Queue statistic classes and specifies whether limits are used when displaying a statistic. If set to Yes then the specified library page item in the Configuration tab is used. For example, if limits are applied when displaying link data, and the value of a link statistic lies outwith the corresponding limit bound, then the link will be shaded in the outlier colour specified in the Options & Preferences.
- **Density Options** These are only relevant in the Link statistic class, affecting the Link Density calculation.

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9.1.2 Configuration

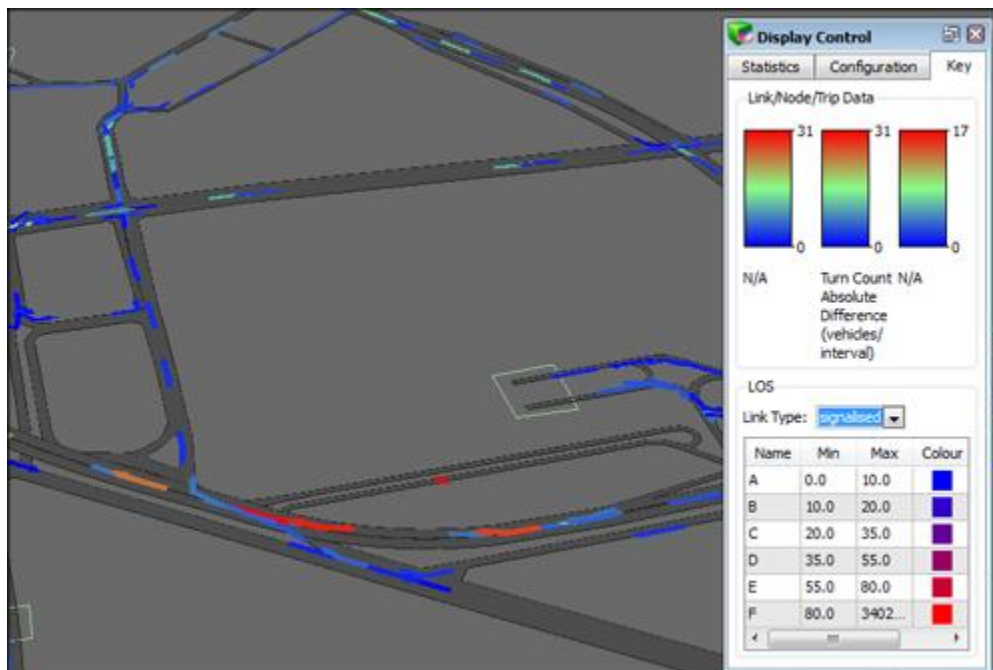
The Configuration tab contains references to library pages and these are referred to by the Statistic tab items e.g. if Selections is chosen for the Display item for the Link statistic class, then the library item that is chosen for Selection Lists in the Configuration tab will be used. Each item is described below.

- Selection Lists This is used when the Display item in the Statistics tab is set to Selections. This combo contains the names of selection list library pages.
- Vehicle Types If set to All then all vehicle types are used when calculating a statistic. If a library page item is selected then the vehicle types specified by the library page are used.
- Limits This contains the names of limits library pages. This is used when the Apply Limits for the Link statistic class is set to Yes.
- LOS This contains the names of LOS library page items. This is used when displaying two statistic types: Link Custom and Intersection LOS.
- Link Groups This contains the names of link group library page items. This can be used to show the average value of a statistic for a group of links. It is also used when calculating the value of the Intersection LOS statistic: rather than using the inbound links to a node, the user can define inbound link groups to a node by specifying these in a link groups library page.

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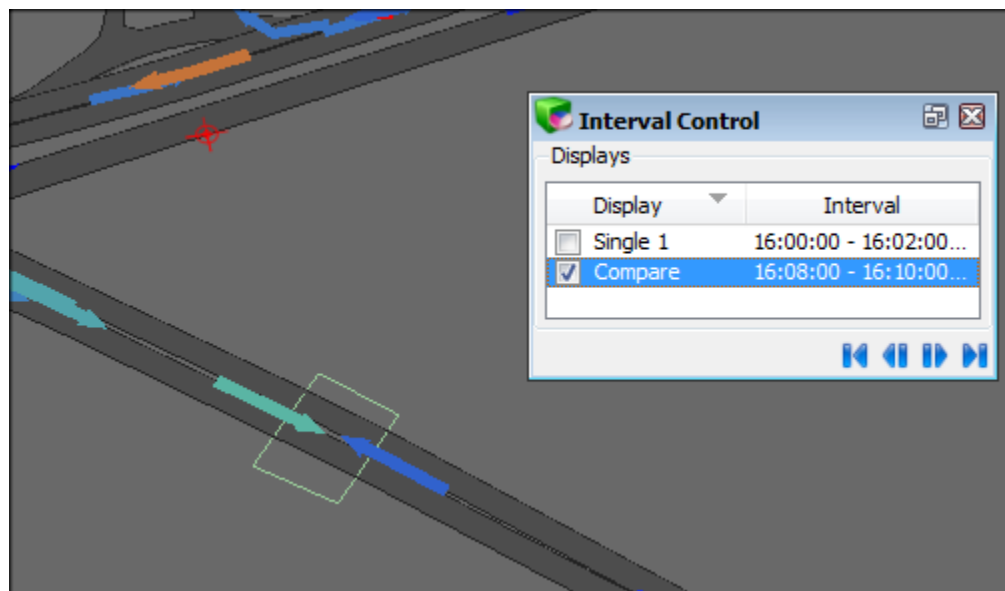
9.1.3 Keys

This tab shows two keys. The link data key shows the colours and min/max values for all link statistics apart from Link Custom. The LOS key shows the tables for whatever LOS library page item is shown in the Configuration tab.



9.2 Interval Control

This allows the user to select a Display window and then increment and decrement the interval it is currently showing data for. If two or more displays are selected then using any of the controls in this tool will be applied to all of the selected Display windows.



9.3 Convert Observed Data

This allows the user to choose link and turn flow observed count data files (in CSV format) and to convert these into binary data files suitable for loading into Analyser.

The observed data converter is in the form of a wizard. The first page allows the user to specify the location of the observed data files for each interval. By double clicking on a cell and pressing the browse button the user can select existing count data files for conversion. Intervals can be added and removed by using the Add/Remove interval tool buttons to the right of the file table. For convenience the entries may be moved to the previous or next interval using the up/down tool buttons.

The start time and interval duration that the observed data files is to be attributed to should be specified on the second page. The Output location for the binary files should then be specified on the third page. A summary page is displayed and when Finish is pressed, the data files are created.

The binary observed files can then be loaded when creating a new workspace or when adding datasets to an existing workspace.

If the source count data files are updated for an observed dataset then Analyser will warn of the change and offer to re-generate the observed data. This operation is only performed when loading a workspace.

Source count data filenames for datasets can be examined from the Source tab of the Dataset Properties dialog.

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9.4 Network Search

The Network Search is a dockable window tool that allows the user to search for full or partial object names/id in the network. This tool replaces the old “nearest node” feature in previous version of the Paramics software.

The user can enter a search string and set a number of filter parameters for example case sensitivity and object type. Once the search is complete a number of matches (if any) will be displayed in the results list. This tool is network aware; double clicking on any entry in the results list will move the main graphics display to that location

The History tab of the Network Search tool records the details of all previous searches and results. Double clicking on an entry in the history list will either re-execute the search or move the main graphics display to the selected result location.

The menu bar at the bottom of the Network Search tool allows access to some common tasks such as save and print

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9.5 Information Browser

The Information Browser is a dockable tool located at the bottom of the Main Window, which typically contains one or more tabs.

- **Messages tab** - shows information generated by the Analyser application.
- **Network Errors tab** displays any errors encountered during the loading of a network when opening an Analyser workspace.
- **Statistics Summary tab** - shows the minimum and maximum values for each statistic in the current Display window, together with the location in the network and the interval the value occurs in. The Statistics Summary is network aware, and so double clicking on an Object will move the crosshair in the Display window to the object and the current interval will be set to the interval the value occurs in.
- **Statistics Browser tab** - shows the values of any statistics near the last clicked mouse position in the current Display window; the values are shown for all intervals. The statistics at some network location can be saved in the bookmarks by pressing the + button. Selecting an item from the bookmarks then shows the statistics for that location. The bookmarks can also be deleted and cleared. Each cell containing a statistic in the Statistics Browser has a context menu associated with it. The items in this context menu are: Print, Save and Detach. Selecting Detach shows the statistic in it's own window.
Using the Save to File... context menu will allow the user to save the Statistic to an ASCII text file.
- **Reports tab** - when reports are generated, this shows one hyperlink per report file. Clicking on one of these hyperlinks launches a browser e.g. Internet Explorer.
- **Network Conflicts** - A Network Conflict Report is automatically created for each comparison Display. The Information Browser is used to list any discrepancies found in the network between the base and the variant

network used in the Display. The entries in the Information Browser are separated by category or severity. This information Browser page is network aware.

A context menu is available to allow printing, saving and copying.

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9.6 Project Library

This contains data that is required in Analyser for creating workspaces and for configuring the statistic Display windows and reports.

The library pages for Analyser are described below:

- **Networks** – Shows the current networks in the library.
- **Vehicle Type Selections** – This allows the user to specify which vehicle types are included in the statistical calculations. The pcus value for each vehicle type can also be specified.
- **Selections Lists** – Collections of network link can be created in Analyser. These specify which statistical values are calculated for an object, either in the Display windows or in reports. For link, nodes, zones and sectors, these objects are selected/deselected by holding the F7 key and pressing the left mouse button. Trips can be selected by holding down the F7 key and pressing the left mouse button to select the origin zone, and then pressing the right mouse button to select the destination zone. When an object is selected, it will be coloured on the network.
- **Limits** – When displaying statistics in a Display window, the Limits specify a range for each statistical type; if a statistic in the Display falls out with it's range then it is coloured in the current outlier colour. In Reports, the Limits determine which statistical values are shown i.e. any outliers are filtered out. In the Limits library page item dialogue, the limits can only be specified for link and queue statistic classes.
- **LOS** – This allows the user to define a set of LOS tables that are used by the Link Custom and Node Custom statistics. Functionality is detailed in the LOS/MOE section.
- **Link Groups** – These are groups of links that are associated with a group name and, optionally, a node. Press the + button to add a group name and then hold the F7 key and the middle mouse button on a link in the network to add it to the Link Selections list. If the link groups are to be used for the Node Custom statistic then the Associated Object should be set to Node, and a node should be chosen from the Node combo box.
- **Report Template** – This is used for specifying which statistics will appear in an Analyser report. It can also be used for configuring the selected statistics. The Statistics tab is used for specifying which statistics will appear in an Analyser report. The Mode is used for selecting whether a Single, Comparison or Multi report will be created. The link density options specify how the link density statistic is calculated. The Configuration tab is used for specifying: Vehicle Types (either All vehicle types or ones from a library page), Selection Lists (either all e.g. links, nodes etc., or from a library page), Link Groups (from a library page) and LOS (from a library page).

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9.6.1 Distance Tool

The Distance Tool is a dockable window tool that allows the user to measure distance in the network.

The Distance Tool uses mouse clicks to create a polyline by adding points or removing points depending on the key presses. F7+Middle mouse is used to add a point to the polyline; F7+Right is used to remove the last point from the polyline.

The total distance measured is shown in the top section of the dialogue. The position of each point in the polyline is shown in the lower half of the dialogue, selecting an entry from this list will highlight that point in the main display.

The menu bar at the bottom of the Distance Tool allows access to some common tasks such as save and print

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9.6.2 Grid & HUD

The Grid & HUD is a dockable window tool that allows the user to configure the display of a information display and grid display in the main graphics display window.

Options in the Grid tab allow the grid step size, scale, and display attributes to be configured. An optional base place display parameter is also provided in this section.

Options in the HUD tab allow information graphics such as the crosshair position and the navigation information in 3D space to be displayed.

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10. Window

This section refers to the Window dropdown menu option of the dropdown menus.

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10.1 Overview

The Window dropdown menu allows the user to format the layout of the displays in the Analyser Window. The available displays are displayed at the foot of the dropdown menu and the currently selected menu has a check beside it.

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10.2 Tile

This arranges any open Display windows in a tiled configuration.

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10.3 Tile Horizontally

This horizontally tiles any open Display windows.

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10.4 Tile Vertically

This vertically tiles any open Display windows.

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10.5 Cascade

This arranges any open Display windows in a cascaded configuration.

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10.6 Close

This closes the current Display window.

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10.7 Close All

This closes all open Display windows.

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11. Help

This section refers to the Help dropdown menu option of the dropdown menus.

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11.1 Overview

The Help dropdown menu enables the user to access the Paramics Support system, which includes the Support Centre.

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11.2 Analyser User Manual

The 'Automatically check for updates' check box uses the internet to search for updates to the software.

The Check Now button manually checks for software and documentation updates when clicked.

For both options the user must be connected to the internet.

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11.3 Active help

Context sensitive guide to Analyser's menus and panels.

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11.4 Support Centre

11.4.1 Contact Us

The Contact Us tab contains details of how the user can access the Paramics online support system. Hyperlinks in the Paramics On The Web section link, via the internet, to the Paramics-Online home page, the Paramics-Online Customer Area and the Paramics-Online user forums.

To access the Paramics-Online Customer Area the user will require their username and password to access the Customer Area. If these are unknown or not available the user should use the Email Support section to request that they be sent as a support query.

The Email Support hyperlink will initialise a pre-addressed email to Paramics Support, which can then be used to contact the Paramics Support team.

If using the Email Support option the user is requested to describe the problem in detail including the simulation time and location of the issue they wish comment on.

Users are requested to note that Paramics Support can only cover technical support of the software and does not cover project support issues unless the user has a specific contract with Paramics Support regarding direct project support.

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11.4.2 License

The License tab contains information on:

- The licensed applications available,
- The version of the software licensed,
- The hexadecimal HASP key ID and,
- The expiry date of the current License.dat file

User should note that all licenses are time limited and are not valid after the expiry date.

The License Updates section allows the user to link directly to the Customer Area in order to automatically update their license file providing the user has an internet connection.

To access the Paramics-Online Customer Area in order download the most up-to-date license file the user will require their Customer Account number. If the Customer Account number is unknown or not available the user should use the Email Support section to request that it be sent as a support query.

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11.4.3 Support Email Info

The Support Email Info tab automatically generates information on the system, licensing and log files that is useful to the support team in helping to diagnose any problems. This information should be copied into the Support Email by selecting the text with the left mouse button and dragging over all the text. The text can then be copied using the context menus before pasting into the Support email.

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11.4.4 Support email Attachments

If the query is network or workspace specific the user should use the Support Email Attachments to generate a Paramics General Archive (.pga) file that can then be attached to any email to the Support team

The check boxes allow the user to select which components be included in the archive file. The Create button enables the user to give the archive a name and to save it to a location so that it can be attached to the Support email.

In the interests of support efficiency it is requested that the user only include run directories and log files if they are relevant to the problem in question. It is good file management to keep log file and run directories to a minimum.

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11.4.5 Options

The 'Automatically check for updates' check box uses the internet to search for updates to the software.

The Check Now button manually checks for software and documentation updates when clicked.

For both options the user must be connected to the internet.

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12. Statistics

12.1 Overview

The Statistics tab is used to display the specified data in the Analyser Display Window.

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12.2 Statistics

12.2.1 Link Density

Selecting the Link density will colour the links according to vehicle density. The units for density are PCUs (Passenger Carrying Unit) per lane per mile or kilometre, depending on the current unit mode. Density is a combination of the average density of traffic throughout the interval and the residual density remaining at the end of the interval.

$$\text{Distance Available} = \frac{\text{link length} * \text{interval duration}}{\text{link freeflow time}}$$

$$= \text{interval duration} * \text{link speed}$$

$$\text{Average Density} = \frac{\text{PCU's}}{(\text{number of lanes} * \text{distance available})}$$

$$\text{Residual Density} = \frac{\text{residual PCUs}}{(\text{number of lanes} * \text{link length})}$$

$$\text{Link Density} = \text{average density} + \text{residual density}$$

PCUs represents the number of PCUs transferred off the end of the link during the interval.

Density calculations have additional options associated with it:

- **Density by Link** – reports/displays Link Density reported by density by link or by average density per lane.
Density by link is reported in PCUs/Km (or PCUs/mile)
Average Density per lane is reported in PCUs/lane/Km (or PCUs/lane/mile)
- **Include Residuals** - Residual vehicles are defined as the vehicles present on the link at the end of the current interval. These vehicles can be included in the density calculations.
Only vehicles that exit links in the current interval are considered for density calculations, however this may not

provide an accurate reflection of the situation if there are short intervals and considerable queuing, blocking or congestion on the links.

The effect of residual vehicles may have substantial bearing on the output. It is recommended that residual vehicles are included for congested networks and excluded for networks involving mainly freeway sections.

The duration of each interval and the length of curial links within the network are other considerations to be made when including or excluding residual vehicles.

- In many methodologies the density is derived from the speed and volume values.

To implement these options access the Density Options in the Display Control>> Statistics>>Link or the Report Template Statistics table in the Link Density section.

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12.2.2 Percent Time Delay

Displays statistics for links according to Percentage Time Delay (PTD). The units for PTD are percent and it is the actual time taken by vehicles to traverse the link minus their freeflow time expressed as a percentage of the freeflow time.

$$\begin{aligned}\text{Minimum Speed} &= \text{The smaller of link speed and the} \\ &\quad \text{vehicle's maximum speed} \\ \text{Freeflow Time} &= \text{link length} / \text{minimum speed} \\ \text{PTD} &= \frac{100.0 * (\text{actual time} - \text{freeflow time})}{\text{freeflow time}}\end{aligned}$$

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12.2.3 Link Delay

Displays statistics for links according to average delay per vehicle. The units for delay are seconds and it is defined as the actual time taken by vehicles to traverse the link minus their free flow time.

$$\begin{aligned}\text{Minimum Speed} &= \text{The smaller of link speed and the} \\ &\quad \text{vehicle's maximum speed} \\ \text{Freeflow Time} &= \frac{\text{link length}}{\text{minimum speed}} \\ \text{Link Delay} &= \text{actual time} - \text{freeflow time}\end{aligned}$$

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12.2.4 Link Speed

Displays statistics for links according to mean speed. It represents the average speed of vehicles traversing the link in the current interval.

$$\text{Link Speed} = \frac{\text{link length}}{\text{actual time}}$$

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12.2.5 Link Stop Times

Displays statistics for links according to the average stop time of vehicles. The units for stop time are seconds. It represents the average time vehicles were stationary while traversing the link in the current interval.

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12.2.6 Link Counts

Displays statistics for links according to the link counts. The units for counts are vehicles and it represents the actual number of vehicles transferring off the end of the link in the current interval.

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12.2.7 Link Flows

Displays statistics for links according to the link flow. The units for flow are PCUs per hour and it represents the flow of vehicles transferring off the end of the link in the current interval.

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12.2.8 Link Custom

Displays statistics for links according to rules specified by the LOS section of the Project Library and defined in the MOE/LOS section. One preset table of MOE/LOS is the Highway Capacity Manual (HCM 2000).

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12.2.9 Turning Counts

Displays the number of vehicles turning at each node in actual vehicles over the current interval, with arrows indicating the direction of the turn. In order to change the text size of the data see the Text Sizes section of the View>>Options & Preferences dropdown menu.

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12.2.10 Turning Flows

Displays the traffic flow turning at each node is displayed numerically as a rate of PCUs per hour, with arrows indicating the direction of the turn. In order to change the text size of the data see the Text Sizes section of the View>>Options & Preferences dropdown menu.

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12.2.11 Turning Counts/Turning Flows (Proportions)

Displays turning count or flow as a percentage of the overall count or flow. This option affects both the display and any saved reports.

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12.2.12 Node Custom

Displays the intersection MOE/LOS for nodes according to the rules specified in the MOE/LOS section

$$LOS = \frac{\sum_{i=1}^L (s_i f_i)}{\sum_{i=1}^L f_i}$$

where L is the number of inbound links to the node, s_i is the value of the statistic for the i th inbound link and f_i is the flow for the i th inbound link.

Only inbound links to the node are considered in Node LOS/MOE calculations. If Link Groups are being used then all inbound Link Groups will be considered in the LOS calculation.

A mixture of Link and Link Groups cannot be used in LOS calculations for nodes, however a Link Group may consist of a single link if required.

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12.2.13 Queues (Max)

Displays the maximum queues that have formed on each of the links during the current interval. Queues are calculated and displayed on a lane-by-lane basis.

The Statistics Browser displays information on the maximum during the interval, for the selected link.

The definition of a traffic queue within Analyser is controlled through the use of limits, which is defined in the Limits Project Library section. Only queues equal to or greater than the minimum threshold (in terms of PCUs) are displayed on screen or saved to any reports

This may be different to the queue definition set in the Modeller; the two definitions are not required to be the same. This provides additional flexibility as the simulation does not need to be re-run if the user wishes to adjust the minimum PCUs required to define a queue.

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12.2.14 Queues (Average)

Displays the average queues per link. The average queue is calculated so that for each simulation time step (by default, every 0.5 seconds), the program records if the vehicle is in a queue and keeps a running count of queued vehicles. This means for example, if statistics are collected for each 5-minute interval then during the 600 simulation time steps (5 minutes * 60 seconds * 2 time steps) the count of vehicle types queued per link is saved. At the end of each 600 time steps the vehicle type count is summed and divided by the number of time steps (in this case 600) to give an average queue per link per vehicle type. The vehicle type is then factored by the appropriate PCU factor to give the average queue in PCUs.

The definition of a traffic queue within Analyser is controlled through the use of limits, which is defined in the Limits Project Library section. Only queues equal to or greater than the minimum threshold (in terms of PCUs) are displayed on screen or saved to any reports.

This may be different to the queue definition set in the Modeller; the two definitions are not required to be the same. This provides additional flexibility as the simulation does not need to be re-run if the user wishes to adjust the minimum PCUs required to define a queue.

The length of the average queue displayed is purely the sum of vehicle type lengths and does not represent the average space between vehicles.

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12.2.15 Blocking

Highlights in red any lanes where any queue exceeded the length of the link during the current interval; known as 'blocking back'. This is regardless of the minimum queue size and is useful for quickly spotting blocked queues on a network without displaying the queues.

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12.2.16 OD Data

Displays the routes taken and traffic counts between the zones during the interval. The Statistics Browser OD section will display the component OD movements and count for the link.

If no selection criteria are is used (All) then all ODs will be considered, alternatively a Selection List may be applied via the configuration tab of the display Control dockable window.

This is used to create 'select link' analyses

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12.2.17 Trip Data

Displays the OD and traffic counts between the zones during the interval. The Statistics Browser Trip section will display the component OD movements.

If no selection criteria are is used (All) then all OD Trips will be displayed, alternatively a Selection List may be applied via the configuration tab of the display Control dockable window.

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12.3 Comparison

12.3.1 Difference (Diff)

Displays the difference between the Base and Variant Datasets. The links are coloured from blue (low) to red (high) according to the magnitude of the difference between Base and Variant for the specified statistic. Differences can be for each link, node or OD pair between the two datasets.

Difference = Base - Variant

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12.3.2 Absolute Difference (Abs Diff)

Displays/reports the Absolute Difference between two datasets; Base and Variant. Links are coloured from blue (low) to red (high) according to the absolute difference of the specified statistic for each link, node or OD pair between the two chosen datasets.

$$\text{Absolute Difference} = \sqrt{(Base - Variant)^2}$$

Note:- Absolute differences are always positive in value.

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12.3.3 Sum (Sum)

Displays the sum of the two Datasets; Base and Variant. Links are coloured from blue (low) to red (high) according to the Sum of the specified statistic for each link, node or OD pair between the two datasets.

Sum = Base + Variant

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12.3.4 Percentage Difference (% Diff)

Toggleing this function colours links from blue (low) to red (high) according to the Percentage Difference of the specified statistic for each link, node or OD pair between the two chosen datasets.

$$\text{Percentage Difference} = \frac{\text{Variant} - \text{Base}}{\text{Base}} \times 100 \quad \text{Base} \neq 0$$

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12.3.5 GEH Statistic (GEH)

The GEH statistic is a modified Chi-squared statistic that incorporates both relative and absolute differences. Guidelines on its use in comparison of flows and calibration can be obtained from the UKs Design Manual for Roads and Bridges (DMRB Vol. 12 Traffic Appraisal in Urban Areas).

$$\sqrt{\frac{(\text{simulated} - \text{observed})^2}{0.5 * (\text{simulated} + \text{observed})}}$$

Note:- An indication of the 'goodness of fit' is given below:

GEH < 5.0 - Flows can be considered a 'good fit'

5 < GEH < 10 - Flows may require further investigation

10 < GEH - Flows cannot be considered a 'good fit'

The GEH statistic is designed for use in comparing simulated and observed hourly traffic volumes only.

The GEH statistic is a comparison and is indifferent to which value is assigned to simulated or observed in the equation.

Therefore the GEH Statistic equation can be written with simulated and observed values interchangeable with Base and Variant.

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13. LOS/MOE

13.1 Overview

Adding a LOS to the Project Library allows the user to add custom MOEs to the Analyser tool or select any predefined LOS or MOEs.

When added to the Project Library the user is asked to provide a name for the LOS/MOE table and on which network from the Project Library that it is to be based upon.

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13.2 Tables Selection

13.2.1 Presets

Allows the user to load predefined MOEs.

Analyser provides a preset LOS that is based on the Highway Capacity Manual (HCM2000); providing a guideline for further HCM analysis.

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13.2.2 Table Mode

This combo box defines whether all links are to be defined by the same parameters by (All) or have different parameters depending on the type of link (Linktype).

- **Linktype** – Applies the default linktype definitions within Paramics. The default table is held in the Linktypes file and can be edited along with the links file to reflect any desired changes. For edits to the links file add the text 'linktype <number>' in the required link entry.
- **All** – Linktypes file is ignored and all links are applied as a single linktype.

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13.2.3 Linktype

The combo box selects the linktype for editing in the Table section. This enables the linktypes to be associated with different displays and parameters. This option is the basis for user defined MOEs. Parameters and displays for each linktype is defined in the Table>>Statistic Section.

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13.3 LOS Table

In the LOS table the user is able to define their own MOEs.

In the table the user can double click on any cell to edit the contents: Name, Min, Max and Colour.

MOE bands can be Added, Deleted and Edited by using the icons to the right of the MOE table. The Up and Down icons can be used to shift the MOE row in the table.

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13.3.1 Statistic

Displays the measurement on which the MOE bands are based. All of the link-based statistics (density, percent time delay, delay, speed, stop times, counts and flows) are available measurements to base the MOEs on.

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13.3.2 Table

The LOS Table displays the current LOS/MOE and the associated threshold values relating to each band. Each LOS/MOE band covers a given range of values and has an associated colour used to colour the links in the Analyser Display window.

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