TShell User's Guide

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Foreword

This User's Guide describes how to access and use TShell, the graphical user interface (GUI) for the Traffic Software Integrated System (TSIS) traffic modeling environment. ITT Industries, Inc., Systems Division developed and is maintaining TShell under the direction of the Federal Highway Administration (FHWA) on Contract Number DTFH61-95-C-00125.

Please refer to the TSIS User's Guide for information on obtaining TSIS and TShell.

Abstract

TShell is the graphical user interface for FHWA's Traffic Software Integrated System (TSIS). This user-friendly interface integrates the TSIS tools, provides a environment where you can easily configure and execute those tools, and enables you to effectively manage your traffic analysis projects.

This guide:

- Introduces users to the capabilities and features of TShell.
- Explains in detail how to use the TShell interface and its components.
- Describes how to use the TShell Project View to manage traffic analysis projects.
- Describes how to configure and maintain tools in the TSIS integrated environment.

Contents

1 About TShell

1.1 Introduction

This guide provides a comprehensive description of how to use TShell, the user interface for the TSIS environment. It is designed to support traffic engineers using TSIS to conduct traffic operations analysis. However, it describes neither the technical aspects of traffic simulations, nor the types of analyses that can be performed using traffic simulations.

In preparing this manual, the authors assumed that you are familiar with the general operation of the Microsoft Windows platforms on which TSIS runs. For general help on using Windows, such as managing the operating system environment and using the file system, please refer to the Microsoft Windows user documentation provided with your computer or available on-line from Microsoft.

1.2 Overview

TSIS is, by design, an integrated set of traffic analysis tools. To provide this integrated environment, TSIS is implemented using a container/component architecture. In this architecture, TShell serves as the container, while the tools are its components. Because of its centralized role in this architecture and because it provides the primary user interface for TSIS, TShell is often referred to as TSIS. In reality, TSIS is a collection that includes all of its constituent tools and TShell. Although TShell makes these tools easier to use, the important work in TSIS is actually performed by the tools.

In this document, we concentrate on describing the user interface concepts of TShell. While it is impossible to discuss TShell without referring to the other tools in TSIS, we will focus on describing the features of TShell that enable you to apply those tools effectively and to maintain the TSIS tool configuration. Furthermore, this document will illustrate how to use TShell to manage your traffic analysis projects.

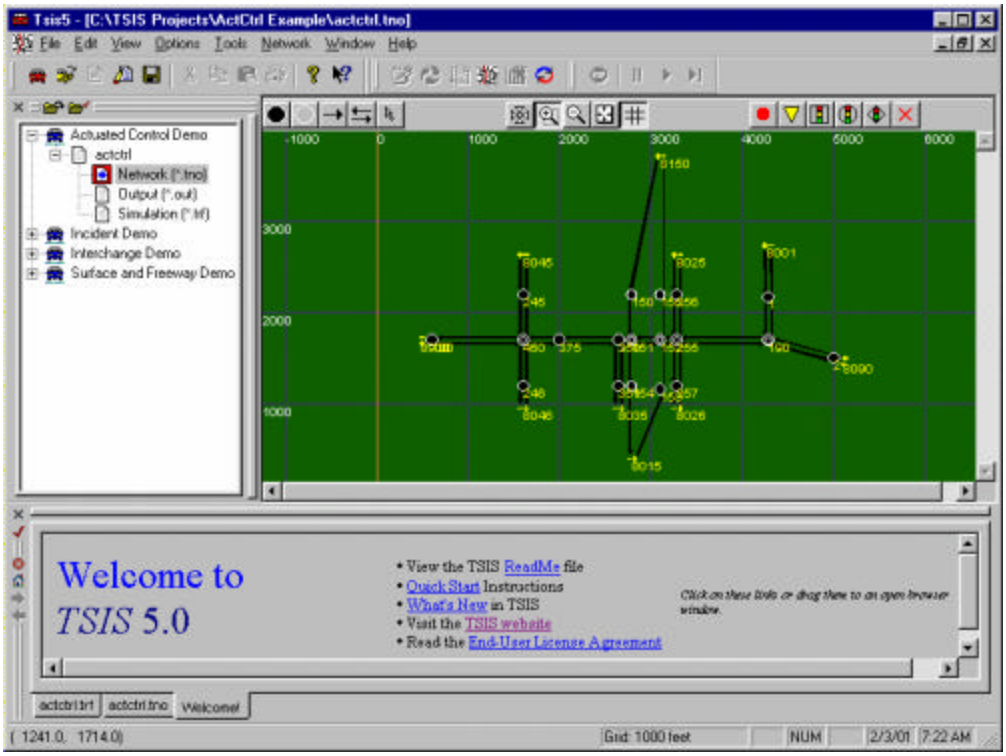
For clarification, we introduce the following terminology. A ***TSIS project*** is a set of simulation cases that reflect a common theme, e.g., signal timing variations for an artery in downtown Washington, D.C. A simulation ***case*** is a single simulation for a specified traffic network as defined by its simulation input file, e.g., one of the signal timing variations. A case includes the simulation input file and all data files generated by the simulation during a run. Note, multiple runs of the simulation for gathering statistics is still considered part of a single case if the input (other than random number seeds) has not changed.

The following section describes the layout and the physical features of the TShell interface. Subsequent sections address the management of projects, the configuration and maintenance of tools, and the setting of preferences for the environment.

2 The TShell User Interface

2.1 The Interface Layout

TShell provides a point-and-click, window-based graphical user interface (GUI) that enables you to apply the TSIS tools to conduct traffic operations analysis. The following figure illustrates the TShell GUI and its constituent elements.



Elements that compose the GUI include:

- Title Bar
- Menu Bar
- Toolbars
- Status Bar

- Project View (displaying the project tree structure)
- Output View (displaying the TSIS Welcome browser tab)
- Workspace Window (displaying a traffic network in TRAFED)

The following sections describe these elements. In those descriptions of the TShell GUI, we assume that you are familiar with the general operation of Windows. For general help on using Windows, such as managing the environment, the file system and printing, please refer to the Microsoft Windows user's guides and on-line help.

2.2 Title Bar

The TShell title bar operates as do the title bars of all Microsoft Windows multiple document interface (MDI) applications. Without any workspace windows open, the TShell title bar displays the TShell/TSIS icon and the name of the application. Buttons at the right of the title bar allow you to minimize, maximize or close TShell.

In general, each workspace window will display its own title bar that indicates the tool it represents and/or the file the tool is operating on. These title bars also contain the buttons to minimize, maximize or close the window. If a workspace window is maximized, its title bar is hidden and the contents of its title bar are displayed in the TShell title bar. When maximized, the window's minimize, maximize, and close buttons are contained in the TShell menu bar at the right.

2.3 Menu Bar

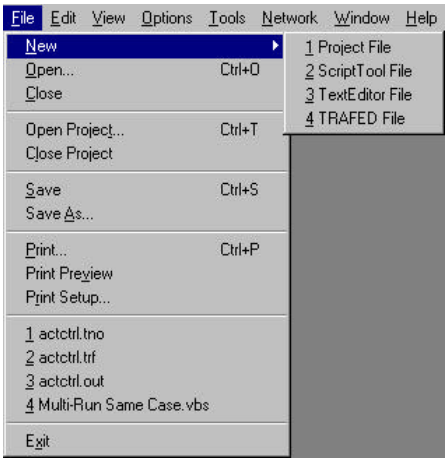
The TShell menu bar operates as do the menu bars of all Microsoft Windows multiple document interface (MDI) applications. Without any workspace windows open, the default menu bar contains pull-down menus that provide access for all TShell operations.

When launched, individual tools may add menus to the menu bar or modify the contents of existing menus. Items in the menus will be enabled or disabled based on which sub-view (Project, Output, Workspace Window) has focus (receives keyboard commands). A sub-view gains focus when you click the mouse in that sub-view. For example, the Edit|Find menu item will operate on the Output View when it has focus and on the TRAFED window when it has focus. Each of these sub-views will process the Edit|Find command in its own way.

The following sections describe each menu (and its included items) for the default TShell menu bar. Please refer the User's Guides for the individual tools for descriptions of the menus they add or how they process menu commands.

2.3.1 File Menu

The File menu allows you to open, close, and save files and projects, access print operations, and exit TShell. It contains the following items:



New: When you select the New item from the File menu, a submenu will appear. The submenu contains a list of items (tools) that you can use to create new files. For example, with the Project File item, you can create a new project (TCF) file. The submenu contains items for all tools that belong to the Editor category.

Open…: This command displays a file open dialog that allows you to select a file to open. The Ctr+O key is an accelerator key for this command.

Close: This command closes the currently active document window.

Open Project…: This command displays a file open dialog that allows you to select a project (TCF) file to open. The Ctr+T key is an accelerator key for this command.

Close Project: This command closes the project associated with the currently highlighted item in the Project View.

Save: This command saves the active document to a file. The Ctrl+S key is an accelerator key for this command.

Save As…: This command displays a file save dialog that allows you to select or specify a file name to which to save the currently active document.

Print…: This command displays a print dialog that allows you to print the contents of the active document window or TShell sub-view that has focus.

Print Preview: This command is used to display the contents of the active document on the screen, as it would appear printed. The functionality of this command depends on the tool associated with the active document.

Print Setup…: This command invokes the Print Setup dialog. From this dialog, you can modify printer settings such as the paper size and orientation.

Recent Files List: This is a list of the last four files that you have opened or saved. Selecting one of the file names from the list, opens that file.

Exit: This command closes all open windows and exits TShell.

2.3.2 Edit Menu

The Edit menu allows you to edit the currently active document or TShell sub-view. It contains the items described below. The functionality of each of these menu items depends on the tool associated with the active document. Please refer to the Help for a specific tool for details regarding its edit commands.

Undo: This command undoes the last edit action for the currently active document or TShell sub-view. The Ctr+Z key is an accelerator key for this command.

Redo: This command redoes the last edit action for the currently active document or TShell sub-view. The Ctr+Y key is an accelerator key for this command.

Cut: This command removes the selected text or object from the active document and puts the selection into the Windows clipboard. The Ctrl+X key is an accelerator key for this command.

Copy: This command copies the selected text or object from the active document or TShell sub-view and puts the selection into the Windows clipboard. The Ctrl+C key is an accelerator key for this command.

Paste: This command inserts the contents from the Windows clipboard into the active document at the location of the caret. If there is a current selection in the document, this command replaces the selection with the contents of clipboard. The Ctrl+V key is an accelerator key for this command.

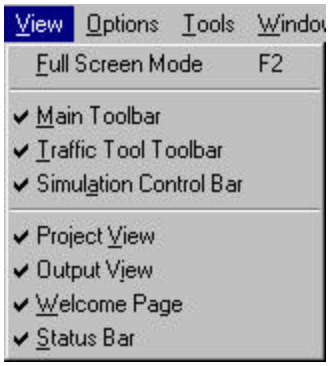
Delete: This command removes the selected text or object from the currently active document or TShell sub-view. If the selection is a file, case, or project from the Project View, the file(s) associated with that item are deleted from the hard drive. The Del key is an accelerator key for this command.

Select All: This command selects all selectable items in the active document or TShell sub-view. The Ctrl+A key is an accelerator key for this command.

Find: This command displays a find dialog that allows you to find specified text or objects in the active document or TShell sub-view. Ctrl+F key is an accelerator key for this command.

2.3.3 View Menu

The View menu allows you to hide or show the different sub-views and toolbars in the TShell interface. A checkmark beside an item indicates the particular sub-view or toolbar is currently visible. Selecting an item on the menu switches (toggles) the visibility state of the item (i.e., a visible item will become hidden and a hidden item will become visible). The View menu contains the following items:



Full Screen Mode: This command toggles the active document view between full screen and normal modes. In full screen mode, the active document is displayed using the entire desktop viewing area (the entire screen). The F2 key is an accelerator key for this command.

Main Toolbar: This command toggles the visibility of the TShell Main toolbar. This toolbar contains buttons that duplicate many of the commands in the File, Edit, and Help menus.

Traffic Tool Toolbar: This command toggles the visibility of the Traffic Tool toolbar. This toolbar contains buttons that activate each of the tools in the current configuration of the TSIS environment.

Simulation Control Bar: This command toggles the visibility of the Simulation Control toolbar. This toolbar contains buttons that provide run control (abort, pause, resume, and step) for the TSIS simulation tools.

Project View: This command toggles the visibility of the TShell Project View.

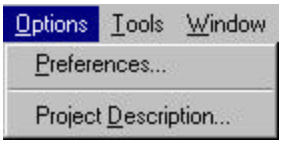
Output View: This command toggles the visibility of the TShell Output View.

Welcome Page: This command toggles the visibility of the Welcome tab within the TShell Output View.

Status Bar: This command toggles the visibility of the TShell status bar.

2.3.4 Options Menu

The Options menu allows you to set user preferences for TShell and provides access to the Project Description dialog. It contains the following items:



Preferences...: This command displays the TSIS Preferences dialog which allows you to set user preferences for the TShell interface.

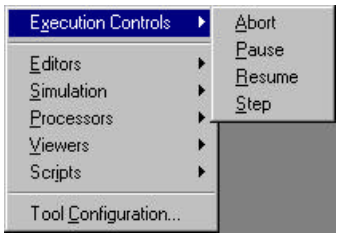
Project Description...: This command displays the Project Description dialog that allows you to view or edit the contents of the project file for the project associated with the currently selected item in the Project View.

2.3.5 Tools Menu

The Tools menu provides you access to executing and configuring the tools contained in the TSIS environment. Within TSIS, tools are divided into four categories: Editors, Simulation, Processors, and Viewers. This menu is divided into submenus that reflect the TSIS tool categories. This menu also provides a submenu that lists all of the Visual Basic scripts that you have defined. These submenus are described in the following sections.

Execution Controls Submenu

The Execution Controls submenu contains commands that allow you to control the execution of a simulation tool. It contains the following commands:



Abort: This command terminates the execution of the currently running simulation tool.

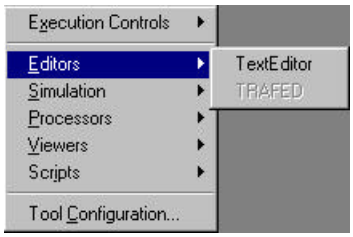
Pause: This command pauses the execution of the currently running simulation tool.

Resume: This command resumes the execution of the currently paused simulation tool.

Step: This command executes one time step for the currently paused simulation tool.

Editors Submenu

The Editors submenu contains a list of all of the currently defined editor tools. Selecting one of these items activates the tool on the active document or on the selected item in the Project View. Submenu items will be disabled (grayed) if the tool is not valid for the document or selected Project View item. This list of tools is dynamic and will reflect any editor tools that you define, in addition to the pre-configured editor tools supplied with TSIS. The following figure illustrates the look of the tool category submenus on the Tools menu.



Simulation Submenu

The Simulation submenu contains a list of all of the currently defined simulation tools. Selecting one of these items activates the tool on the active document or on the selected item in the Project View. Submenu items will be disabled (grayed) if the tool is not valid for the document or selected Project View item. This list of tools is dynamic and will reflect any simulation tools that you define, in addition to the pre-configured simulation tools supplied with TSIS.

Processors Submenu

The Processors submenu contains a list of all of the currently defined processor tools. Selecting one of these items activates the tool on the active document or on the selected item in the Project View. Submenu items will be disabled (grayed) if the tool is not valid for the document or selected Project View item. This list of tools is dynamic and will reflect any processor tools that you define, in addition to the pre-configured processor tools supplied with TSIS.

Viewers Submenu

The Viewers submenu contains a list of all of the currently defined viewer tools. Selecting one of these items activates the tool on the active document or on the selected item in the Project View. Submenu items will be disabled (grayed) if the tool is not valid for the document or selected Project View item. This list of tools is dynamic and will reflect any viewer tools that you define, in addition to the pre-configured viewer tools supplied with TSIS.

Scripts Submenu

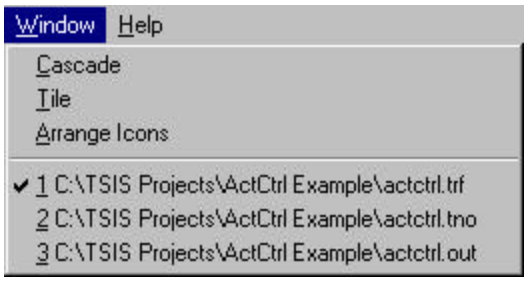
The Scripts submenu contains a list of all of the currently defined Visual Basic script files that reside in the "Scripts" folder under the folder to which TSIS was installed. Selecting one of these items activates the Script Tool on the selected script file. This list of script files is dynamic and will reflect any script files that you define, in addition to the pre-configured scripts supplied with TSIS.

Tool Configuration… Command

This command displays the Tool Configuration dialog that allows you to define, edit, and delete tool configurations. This dialog is described in detail in the Tool Configuration chapter.

2.3.6 Window Menu

The Window menu allows you to control the layout of the documents within the TShell workspace. It contains the following items:



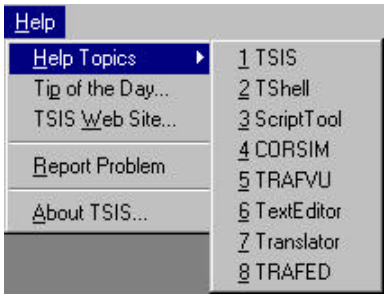
Cascade: This command arranges the open document windows in the TShell workspace in an overlapped fashion, with the title bar of each document visible.

Tile: This command arranges the open document windows in the TShell workspace in a non-overlapped fashion so that each document is completely visible, reducing the size of the windows as necessary.

Arrange Icons: This command arranges the icons for minimized document windows at the bottom of the TShell workspace. If there is an open window at the bottom of the workspace, then some or all of the icons may be hidden behind the open window.

2.3.7 Help Menu

The Help menu allows you to access the on-line help for TSIS, TShell, and any of the TSIS tools that provide on-line help. This menu also provides access to the TSIS web site and to the form used to report problems with the TSIS package. It contains the following items:



Help Topics: When you select the Help Topics item from the Help menu, a submenu will appear. The submenu contains a list of items (tools) that provide on-line help. Selecting one of the tool listed in the submenu displays the on-line help for that tool.

Tip of the Day…: This command displays the Tip of the Day dialog that allows you to view useful tips related to the TSIS package. From this dialog, you can also select whether you want the tips dialog to be displayed on TSIS startup.

TSIS Web Site…: This command launches your default browser to access the TSIS web site.

Report Problem: This command opens the TSIS problem report form in the Text Editor. From the editor, you can fill out the form for submission to your TSIS vendor. You may also customize the form with your personal information and save the customized form for future use.

About TSIS…: This command displays a dialog that provides information about the TSIS package, including version information, copyright information, and user registration information. The dialog also lists the current system resources including available memory and disk space.

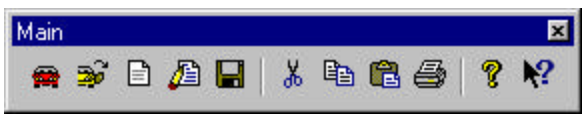
2.4 Toolbars

Toolbars are a set of buttons that, when pressed, invoke many commonly used commands normally issued using the menu system. TShell features three toolbars: (1) a Main toolbar for application specific commands such as opening a file or printing, (2) a Traffic Tool toolbar for executing TSIS traffic tools, and (3) a Simulation Control toolbar, used to control the execution of simulation tools.

TShell toolbars are dockable, meaning that you can position them anywhere within the TShell application window (referred to as floating the toolbar) or attach them to the frame of the TShell application window (referred to as docking the toolbar). To move a toolbar, click and hold in the area between any button and the toolbar outline. You can then drag the toolbar to any location, or dock it to any of the four sides of the TShell window frame. While a toolbar is floating, you may hide the toolbar by clicking the "X" button in the upper right of the toolbar. Each button on a toolbar has a tool tip associated with it. The tool tip is a short description of the button that appears after a short period of time when you place the arrow cursor over the button. A short description of the button is also displayed in the status bar whenever the arrow cursor is over the button.

2.4.1 Main Toolbar

The TShell Main toolbar is shown, in its floating state, in the following figure. This toolbar contains eleven buttons that duplicate the action of several of items on the File, Edit, and Help menus. The action of each of these buttons is described below.



 **New Project File:** This button displays the Project Description dialog that allows you to create a new project (TCF) file.

 **Open Project:** This button displays a file open dialog that allows you to select a project (TCF) file to open.

 **New File:** This button displays the Choose Tool dialog that lists the configured editor tools. Selecting one of these tools opens the tool for creating a new file.

 **Open Selected File:** This button displays the Choose Tool dialog that lists the configured tools that are associated with the file that is currently selected in the TShell Project View. You may then choose one of the tools to open the file. If there is only one tool associated with the file, the Choose Tool dialog is not displayed and the file is opened with that tool.

 **Save:** This button saves the active document to its associated file.

 **Cut:** This button removes the selected text or object from the active document and puts the selection into the Windows clipboard.

 **Copy:** This button copies the selected text or object from the active document or TShell sub-view and puts the selection into the Windows clipboard.

 **Paste:** This button inserts the contents from the Windows clipboard into the active document at the location of the caret. If there is a current selection in the document, this command replaces the selection with the contents of clipboard.

 **Print:** This button command displays a print dialog that allows you to print the contents of the active document window or TShell sub-view that has focus.

 **About:** This button displays a dialog that provides information about the TSIS package, including copyright information and user registration information. The dialog also lists the current system resources including available memory and disk space.

 **Help:** This button displays the on-line help for the TShell application.

2.4.2 Traffic Tool Toolbar

The Traffic Tool toolbar is shown, in its floating state, in the following figure. This toolbar contains a button for each of the configured TSIS tools. The buttons in the figure represent the tools that come pre-configured with the TSIS package. Buttons will be enabled for those tools that are associated with the file type of the active document or selected item in the Project View. Clicking on a tool button with the left mouse button activates the tool, while clicking on the tool button with the right mouse button displays the Configuration dialog for the tool. Clicking a tool button with the right mouse button works even when the tool button is disabled. The specific action of each of these buttons is described below.

 **Script Tool:** This button executes the Script Tool on the file associated with the active document or the currently selected item in the TShell Project View.

 **CORSIM:** This button executes CORSIM on the file associated with the active document or the currently selected item in the TShell Project View.

 **TRAFVU:** This button executes TRAFVU on the file associated with the active document or the currently selected item in the TShell Project View.

 **Text Editor:** This button executes the Text Editor on the file associated with the active document or the currently selected item in the TShell Project View.

 **Translator:** This button executes the Translator on the file associated with the active document or the currently selected item in the TShell Project View.

 **TRAFED:** This button executes TRAFED on the file associated with the active document or the currently selected item in the TShell Project View.

2.4.3 Simulation Control Toolbar

The Simulation Control toolbar is shown, in its floating state, in the following figure. This toolbar contains four buttons that duplicate the actions of the Execution Controls submenu of the Tools menu. These buttons are active only when a simulation tool is running. The action of each of these buttons is described below.

 **Abort Simulation:** This button terminates the execution of the currently running simulation tool.

 **Pause Simulation:** This button pauses the execution of the currently running simulation tool.

 **Resume Simulation:** This button resumes the execution of the currently paused simulation tool.

 **Step Simulation:** This button executes one time step for the currently paused simulation tool.

2.5 Status Bar

The status bar, illustrated in the following figure, forms the bottom edge of the main TShell window. The status bar consists of multiple display panes, each providing information about the active document. The figure illustrates the status bar for a document open in the Text Editor.

Although the contents of the status bar vary depending on the tool associated with the active document, it contains several panes that are consistent between tools. For all tools, the status bar displays a brief description of the command performed by a button or menu item when the mouse cursor is over the button or item. The description appears in the left-most part of the status bar. The contents of the next pane are dependent on the tool associated with the active document. In the example, the Text Editor displays the line and column number for the current position of the caret in the document. Please refer to the documentation for the each of the tools for details on the items each tool displays in the status bar.

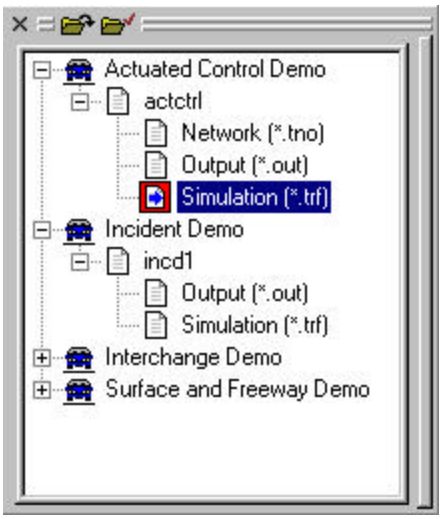
The next three panes indicate the status of the Caps Lock, Num Lock, and Insert keys on the keyboard. If a pane is empty, it indicates the key is not active. Pressing a key toggles the state of its associated indicator in the status bar. The Insert key toggles the state of the overstrike mode in a text editor.

The last two panes of the status bar indicate the current system date and time. The visibility of these two panes can be set via the Status Bar Settings tab in the Preferences Dialog.

Finally, you can show or hide the status bar by enabling or disabling the **View|Status Bar** menu item.

2.6 Project View

The Project View is a dockable control window that displays a hierarchical tree structure of projects, cases, and case files. Using this tree structure, you can efficiently manage your traffic analysis projects. You can also execute tools on the files presented by this view. The Project View is illustrated in the following figure.



Because the Project View is dockable, you can position it anywhere within the TShell application window (referred to as floating the view) or attach it to the frame of the TShell application window (referred to as docking the view). To move the Project View, click and hold in its frame (the gray area). You can then drag the view to any location, or dock it to either the left or right sides of the TShell window frame. The vertical bar on the side of the Project View is used to size the width of the view while it is docked. While the view is floating, you may hide it by clicking the "X" button in the upper right of the view. TShell stores the state, size, location, and current contents of the Project view between sessions so that these items will be restored the next time you use TShell. The Project View contains the following buttons:

Hide Project View: This button hides the Project View. You can restore the Project View using the **View|Project View** menu item.

Open Project: This button displays a file open dialog that allows you to select a project (TCF) file to open. The opened project is added to the tree in the Project View.

Close Project: This button closes (removes from the view) the project associated with the currently highlighted tree item.

2.6.1 Projects

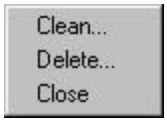
The highest level item in the tree structure represents a ***TSIS project***. A TSIS project is a set of simulation cases that reflect a common theme, e.g., signal timing variations for an artery in downtown Washington, D.C. In general, a project is composed of simulation ***cases***. A simulation case is a single simulation for a specified traffic network as defined by its simulation input file, e.g., one of the signal timing variations. A case includes the simulation input file and all data files generated by the simulation during a run. Note, multiple runs of the

simulation for gathering statistics is still considered part of a single case if the input (other than random number seeds) has not changed. TShell stores all files that pertain to a project in a single directory.

Clicking on the "+" icon in front of a project item in the tree, expands the tree to show the cases that compose the project. Clicking on the "-" icon in front of a project item in the tree, compresses the tree to hide the cases that compose the project. Double clicking the project item will also toggle the expanded state of the project. Additionally, pressing the Enter key while a project item is highlighted toggles the expanded state of the project.

Clicking the project item with the left mouse button highlights the project item in the tree. While the project item in the tree is highlighted, you can delete the project using the Delete key or the **Edit|Delete** menu item. When you delete a project, all of the cases and case files for the project will be deleted from the system's hard drive.

Clicking the project item with the right mouse button displays the following pop-up menu.



Clean…: This command "cleans" the project. When a simulation tool fails to terminate cleanly, e.g., an unexpected execution error occurs, residual files may be left in the project directory. Removing these files may be necessary prior to executing the simulation tool again. Cleaning removes these residual files.

Delete…: This command deletes the project, deleting all of its cases and case files from the system's hard drive.

Close: This command closes (removes from the view) the project.

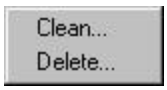
2.6.2 Cases

The second level item in the tree structure represents a ***case***. A ***TSIS project*** is a set of simulation cases that reflect a common theme, e.g., signal timing variations for an artery in downtown Washington, D.C. In general, a project is composed of simulation cases. A simulation case is a single simulation for a specified traffic network as defined by its simulation input file, e.g., one of the signal timing variations. A case includes the simulation input file and all data files generated by the simulation during a run. Note, multiple runs of the simulation for gathering statistics is still considered part of a single case if the input (other than random number seeds) has not changed. All files that pertain to a case have the same root file name, which is the name of the case that appears in the tree structure.

Clicking on the "+" icon in front of a case item in the tree, expands the tree to show the files that compose the case. Clicking on the "-" icon in front of a case item in the tree, compresses the tree to hide the files that compose the case. Double clicking the case item will also toggle the expanded state of the case. Additionally, pressing the Enter key while a case item is highlighted toggles the expanded state of the case.

Clicking the case item with the left mouse button highlights the case item in the tree. While the case item in the tree is highlighted, you can delete the case using the Delete key or the **Edit|Delete** menu item. When you delete a case, all of the files for the case will be deleted from the system's hard drive.

Clicking the case item with the right mouse button displays the following pop-up menu.



Clean…: This command "cleans" the case. When a simulation tool fails to terminate cleanly, e.g., an unexpected execution error occurs, residual files may be left in the case directory. Removing these files may be necessary prior to executing the simulation tool again. Cleaning removes these residual files.

Delete…: This command deletes the case, deleting all of its files from the system's hard drive.

2.6.3 Files

Each simulation case consists of at least one file. The number and types of files that compose a case depend on the tools that are used to define, process, and analyze the case.

Clicking file item with the left mouse button highlights the file item in the tree. While the file item in the tree is highlighted, you can delete the file using the Delete key or the **Edit|Delete** menu item. When you delete a file, it will be deleted from the system's hard drive.

Double clicking the file item with the left mouse button executes the default tool associated with the file. For example, in the default tool configuration the default tool for a TRF input file is the Text Editor. Double clicking on the TRF file item in the tree opens that file in the Text Editor.

Clicking the file item with the right mouse button displays the following pop-up menu.

Open: This command executes the default tool associated with the file.

Open with: When you select the Open with item from the menu, a submenu will appear. The submenu contains a list of items (tools) that are associated with the file. In this list, the default tool is in bold. Selecting an item in this submenu executes the selected tool on the file.

Clean...: This command "cleans" the case associated with the file. When a simulation tool fails to terminate cleanly, e.g., an unexpected execution error occurs, residual files may be left in the case directory. Removing these files may be necessary prior to executing the simulation tool again. Cleaning removes these residual files.

Delete ...: This command deletes the file, removing it from the system's hard drive.

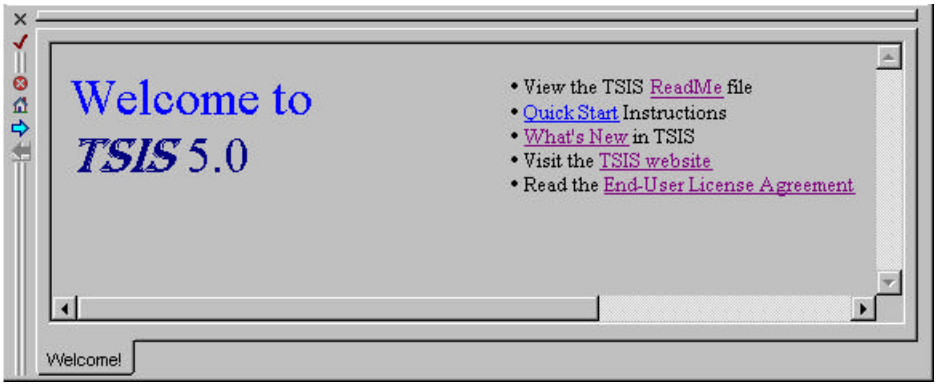
2.7 Output View

The Output View is a dockable control window that displays the output generated by the traffic tools as they operate on files. Because the Output View is dockable, you can position it anywhere within the TShell application window (referred to as floating the view) or attach it to the frame of the TShell application window (referred to as docking the view). To move the Output View, click and hold in its frame (the gray area). You can then drag the view to any location, or dock it to bottom of the TShell window frame. The horizontal bar on the top of the Output View is used to size the height of the view while it is docked. While the view is floating, you may hide it by clicking the "X" button in the upper right of the view. TShell stores the state, size, and location of the Output View between sessions so that these items will be restored the next time you use TShell.

The Output View is a container for multiple tabs. One of these tabs is reserved for the TSIS Welcome page, while the other tabs are associated with the tools.

2.7.1 Welcome Tab

The following figure illustrates the TSIS Welcome Tab. The Welcome Tab contains a copy of the Microsoft Internet Explorer browser. The default page for the browser contains links that allow you to view different files and sites that provide information about the TSIS package.



While the Welcome Tab is active, the frame of the Output View contains the following buttons:

Hide Output View: This button hides the Output View. You can restore the Output View using the **View|Output View** menu item.

Close Tab: This button closes the Welcome Tab. You can restore the Welcome Tab using the **View|Welcome Page** menu item.

Stop Navigation: This button stops the browser from navigating to the specified site or loading the current document.

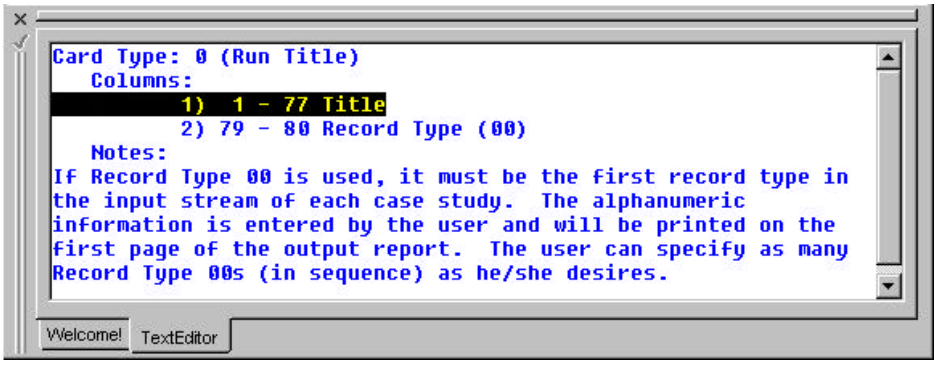
Home: This button causes the browser to navigate to your system-specified home site (page).

Navigate Forward: This button causes the browser to navigate to the next site. It becomes active when you have loaded more than one site.

Navigate Backward: This button causes the browser to navigate to the previous site. It becomes active when you have loaded more than one site.

2.7.2 Tool Tab

The following figure illustrates the style of tab that is associated with most tools in the TSIS suite. Specifically, this figure shows the tab that is associated with the Text Editor. The output information that is contained in the tool tab is dependent on the tool associated with the tab. For details regarding this information, please refer to the user's guide for the specific tool of interest.



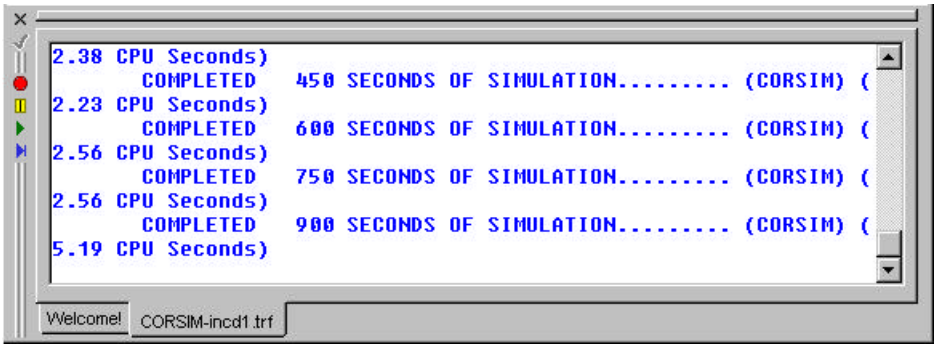
While a tool tab is active, the frame of the Output View contains the following buttons:

Hide Output View: This button hides the Output View. You can restore the Output View using the **View|Output View** menu item.

Close Tab: This button closes the tab.

2.7.3 Simulation Tool Tab

The following figure illustrates the style of tab that is associated with simulation tools in the TSIS suite. Specifically, this figure shows the tab that is associated with CORSIM. The output information that is contained in this tab is dependent on the simulation tool associated with the tab. For details regarding this information, please refer to the user's guide for the specific tool of interest.



While a simulation tool tab is active, the frame of the Output View contains the following buttons:

Hide Output View: This button hides the Output View. You can restore the Output View using the **View|Output View** menu item.

Close Tab: This button closes the tab.

Abort Simulation: This button terminates the execution of the currently running simulation tool.

Pause Simulation: This button pauses the execution of the currently running simulation tool.

Resume Simulation: This button resumes the execution of the currently paused simulation tool.

Step Simulation: This button executes one time step for the currently paused simulation tool.

2.8 Workspace

The TShell workspace is that portion of the TShell frame not in use by the Project and Output views and the TShell menu and toolbars. In this area TShell displays the document windows that are associated with the tools in use. The workspace operates in accordance with the Multiple Document Interface (MDI) standard supported by Microsoft. Within this interface, you can easily navigate between the windows and can also change the relative layout of the windows using the cascade and tile commands from the Window menu.

The Window menu contains a list of all open documents. From this list, you can choose which document window you want to activate, i.e., bring to the top of the display. You can also switch between documents using the Ctrl+Tab keyboard command. When you maximize a document window (by clicking on the maximize button or double clicking on its title bar), that window fills the workspace, covering all other document windows.

For increased viewing area, you can press the F2 key to shift into full screen mode. In full screen mode, the active document window fills the entire screen (except for the space reserved for the TShell menu bar). Pressing the F2 key again restores the TShell workspace to normal mode.

2.9 Help System

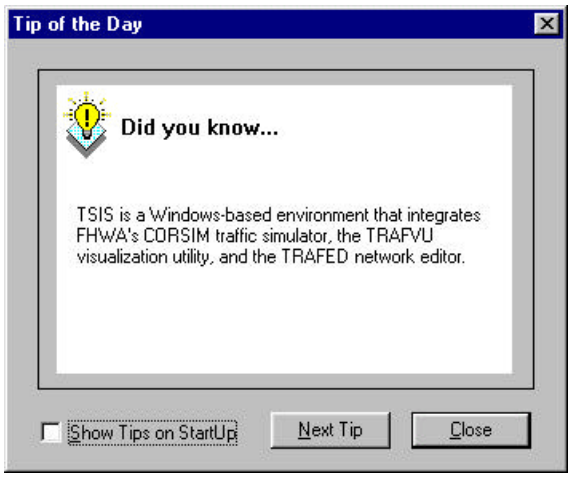
In this section, we cover the aspects of the TShell help system in more detail. The components of the help system are available via the TShell Help menu.

2.9.1 Help Topics

Help topics for TSIS, TShell, and its tools can be accessed via the **Help|Help Topics** menu item. Selecting this item produces a submenu list of all help files available with the TSIS package. The first item on this list is the TSIS User's Guide. That guide provides information regarding the entire TSIS package including installation instructions and vendor information. The second item on the submenu list is the TShell User's Guide (this document). Both of these guides are provided on-line using the Microsoft HTML Help Viewer. The remainder of the items on the submenu list are the user's guides associated with the tools that are currently installed in TSIS. Note, not all tools may provide a help item.

2.9.2 Tip of the Day

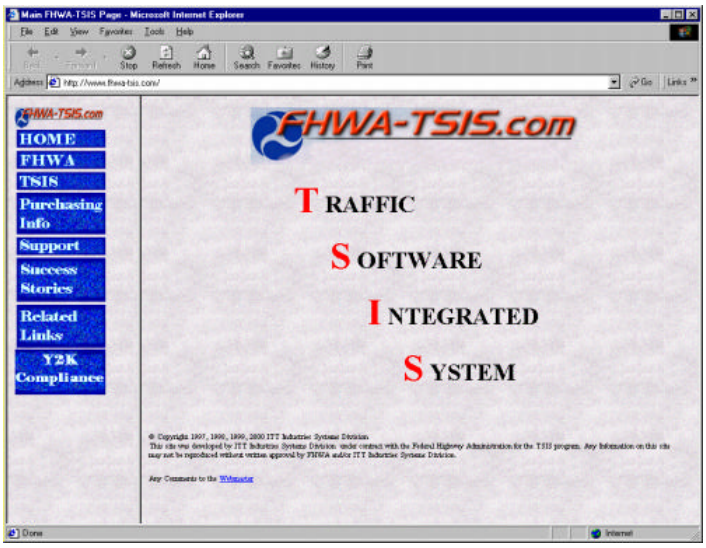
In the delivered configuration, the Tip of the Day dialog appears every time you start TShell. Each time it displays a different helpful note about the TSIS package. You may also access this dialog via the **Help|Tip of the Day** menu item. The Tip of the Day dialog is illustrated in the following figure.



From this dialog you can enable / disable the automatic display of the Tip on startup using the “Show Tips at Startup” checkbox. This dialog also provides a **Next Tip** button that allows you to scan through the TSIS tips.

2.9.3 TSIS Web Site

The **Help|TSIS Web Site** menu item invokes your configured web browser with the TSIS home page. The TSIS home page is illustrated in the following figure. The TSIS web site provides the latest information regarding the TSIS package and provides a forum for users to exchange information regarding the practical application of TSIS.



2.9.4 Report Problem

The **Help|Report Problem** menu item opens the problem report text file in the Text Editor. This file contains a problem report form that you may submit to your vendor to notify FHWA about problems with the TSIS package or to suggest enhancements to the package. The form is shown in the following figure.

```
---------- TSIS ACTION REQUEST FORM ----------
Problem Reference Name:
Date:

-------------------- USER INFORMATION --------------------
Name:
Organization:
Registration Number:
Phone:
Fax:
E-mail:

------------ HARDWARE/SOFTWARE CONFIGURATION ------------
Operating System:
Processor:
Display Resolution:
Display How Many Colors:
Amount of Random Access Memory:
Amount of Disk Storage:

------------------- PROGRAM AND DATA --------------------
TSIS Component Program:
Component Version:
Package Release Version:
Data Set(s):

------------------ PROBLEM DESCRIPTION -------------------
Problem Title:
Problem Type (check all that apply):
__.Malfunction(1)      __.Deficiency(3)     __.Input/Output(5)    __.Suggestion(7)
__.Invalid Results(2)  __.Installation(4)   __.Documentation(6)  __.Query(8)

Severity (check one):
__.Fatal(1)         __.Serious(2)        __.Minor(3)

Problem Description (use as many lines as needed):
```

The problem report text file is named problem.txt and resides in the folder to which TSIS was installed. This file is installed as a read-only file. However, you can make changes to the form and save it to a different file name for submission to your vendor. Alternatively, you can make the file writable and then customize it with your own user information. Once done, you can then make the file read-only to be used as your own personal template for submitting problem reports and suggestions. This eliminates the need to enter your user or computer information every time you create a problem report.

2.9.5 About TSIS

The **Help|About TSIS** menu item displays information about the TSIS package. The information includes a copyright notice, credits, version number, and registration information for your copy of TSIS. This dialog also provides information about system resources, including available memory and disk space.

3 TShell Preferences

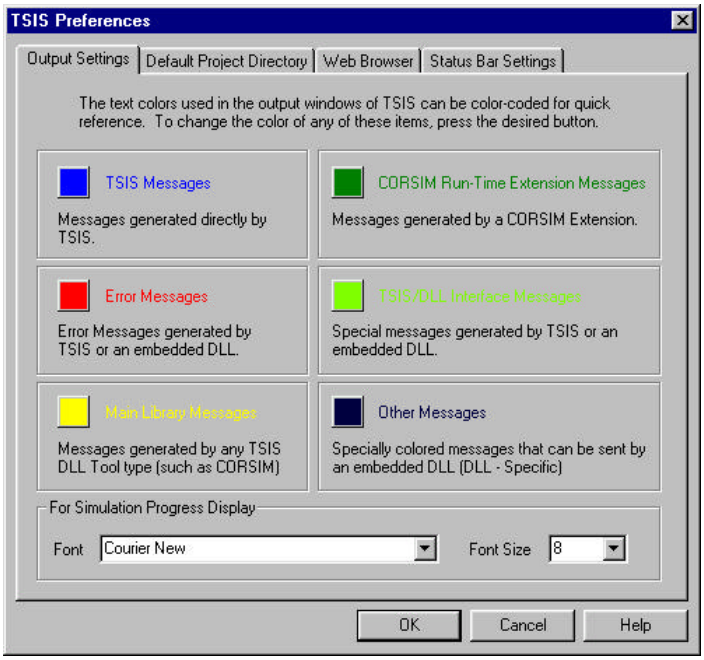
3.1 Preferences Overview

You can customize the many of the elements of the TShell application. To access the Preferences configuration dialog, select the **Options|Preferences** menu command. The TShell application "remembers" your preferences as well as the size and position of its toolbars and the Project and Output views between sessions. It also keeps a list of the projects that you have open in the Project Viewbetween sessions. Window sizing, project, and preference information is stored in the system registry by user. This means that if three different users (as identified by the operating system) log in to the same computer to use TSIS, TShell keeps the information for each user, restoring the layout and preferences for the user that logs in to use TSIS.

The Preference dialog contains several tabs, each of which is described in the following sections.

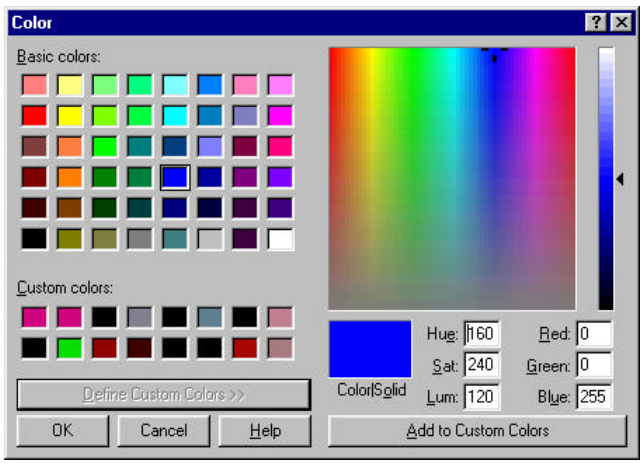
3.2 Output Settings Tab

The Output Settings tab, shown below, contains settings used to control the look of the text displayed in the Output View. From this tab you can set the color for the message types displayed in the Output View as well as the font and font size for the text.



Text Color

The text displayed in the Output View can be color-coded for quick reference. To change the color of any of these message types, press the desired button to bring up Color dialog. Select the desired color and push the **OK** button to return to the Output Settings tab.



The text colors can be set for the following message types:

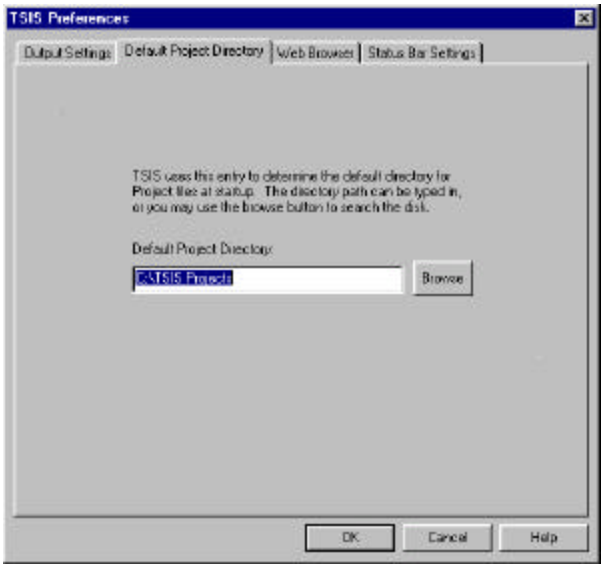
- **TSIS Messages** – Messages generated directly by TShell.
- **Error Messages** – Error Messages generated by TShell or an embedded DLL.
- **Main Library Messages** – Messages generated by any TSIS DLL Tool type (such as CORSIM).
- **CORSIM Run-Time Extension Messages** – Messages generated by a CORSIM run-time extension.
- **TSIS/DLL Interface Messages** – Special messages generated by TShell or an embedded DLL.
- **Other Messages** – Specially colored messages that can be sent by an embedded DLL (DLL – Specific).

Font Type and Size

You can select from the Font drop-down list the type of font used for text in the Output View. This list contains all fonts installed on your system. You may also select the size of the font from the Font Size drop-down list.

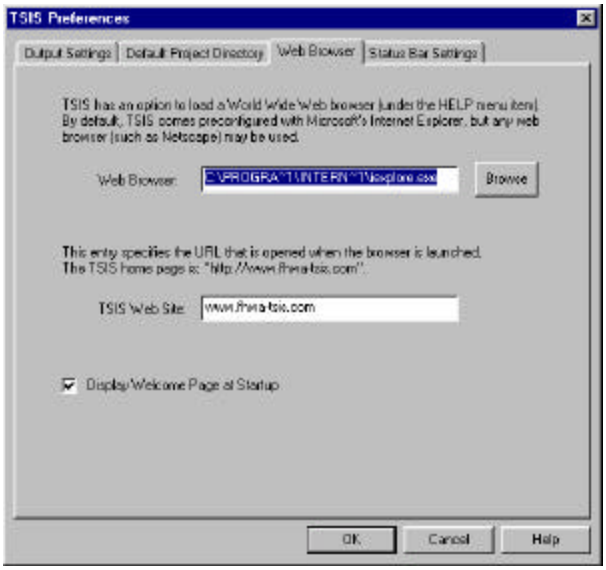
3.3 Default Project Directory Tab

When TSIS was installed on your system, the setup program asked the installer to specify a folder for the sample projects delivered with TSIS. That folder is the default directory for your projects. That is, when you want to open or create a project, TShell looks in this folder by default. You can change the folder that is your default project directory using the Default Project Directory tab, shown in the following figure. You can directly type in the directory path, or you may use the **Browse** button to search for the folder you want to become your default project directory.



3.4 Web Browser Tab

The Web Browser Tab allows you to specify settings for the **Help|TSIS Web Site** menu command.



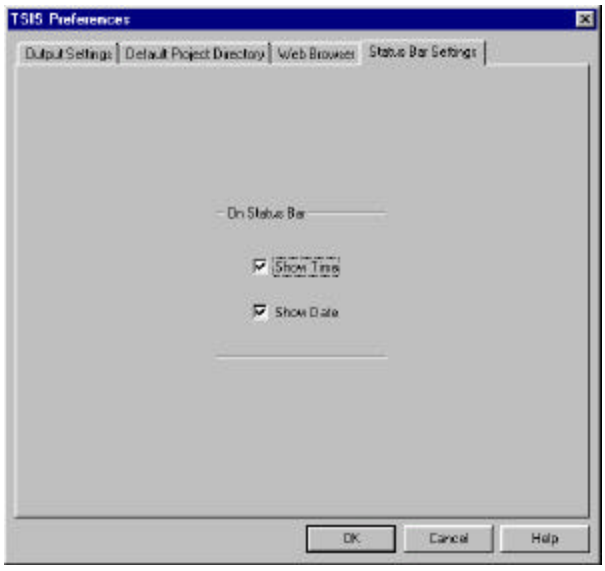
Web Browser: This setting specifies the browser to use for the **Help|TSIS Web Site** menu item. That is, the browser that will be launched to display the TSIS web site. The default setting for this is the Microsoft Internet Explorer.

TSIS Web Site: This entry specifies the URL that is opened when the browser is launched via the **Help|TSIS Web Site** menu item. The TSIS home page is http://www.fhwa-tsis.com.

Display Welcome Page at Startup: The TSIS Welcome Page displays general information about TSIS. This page is shown as one of the tabs in the TShell Output View. You can control whether TShell displays this tab at startup using the "Display Welcome Page at Startup" checkbox.

3.5 Status Bar Settings Tab

You can control whether to display the current system date and time in the TShell status bar from Status Bar Settings tab, shown in the following figure.



Show Time: Checking the Show Time checkbox displays the current system time in the TShell status bar.

Show Date: Checking the Show Date checkbox displays the current system date in the TShell status bar.

4 Creating Projects and Cases

4.1 Projects and Cases Overview

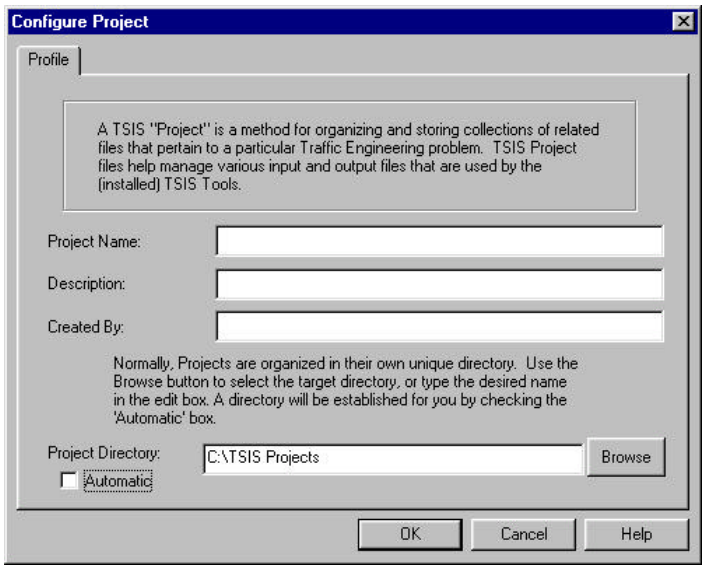
This chapter describes how to create new TSIS projects and cases. It also describes how to create a project when you already have CORSIM simulation input (TRF) files.

A ***TSIS project*** is a set of simulation cases that reflect a common theme, e.g., signal timing variations for an artery in downtown Washington, D.C. A simulation ***case*** is a single simulation for a specified traffic network as defined by its simulation input file, e.g., one of the signal timing variations. A case includes the simulation input file and all data files generated by the simulation during a run. Note, multiple runs of the simulation for gathering statistics is still considered part of a single case if the input (other than random number seeds) has not changed. TShell stores all files that pertain to a project in a single directory.

In essence, a project is a container for organizing and storing collections of related cases that pertain to a particular traffic engineering study. TSIS Projects help manage the various input and output case files that are used by the TSIS tools. A case is simply a collection of the tool input and output files that you associate with a particular scenario of the study. All files that belong to a case have the same root file name. A file can contain the input to or output from a tool.

4.2 Creating a Project

You can create a new project by selecting the **File|New** menu command and selecting TSIS Project on the displayed submenu or by pressing the **New Project** button  on TShell's Main toolbar. This action displays the Configure Project dialog, illustrated in the following figure.



When you create a project using the Configure Project dialog, the information is stored in a TCF file. You can specify both the name of the TCF file and the directory where it resides. All case files that belong to the project will reside in the directory where the TCF file is located. We recommend that you place projects in their own directory for easier management.

Project Name: Use this field to specify the name for the project. This is the name that is displayed in the Project View tree and is the name given to the TCF file that defines the project.

Description: Use this field to describe the project. The description is stored as a text string in the project's TCF file.

Created By: Use this field to provide information about the person or organization that created the project. This information is stored as a text string in the project's TCF file.

Project Directory: Use this field to specify the location of the project's TCF file. You can type in the directory information or you can use the **Browse** button to the right of the field to find an existing folder on your system or network. The default for this field is your current default project directory preference setting.

Automatic: When this item is checked, the Project Directory field is set to your current default project directory preference, and the field is disabled. When you type in the Project Name, it is appended to the directory setting in the Project Directory field. Thus, the new project's TCF file will reside in a sub-directory of your default project directory. The name of the sub-directory will be the name of the project file.

Creating a Project for an Existing TRF File

If you already have existing CORSIM input (TRF) files, but do not have a project for those files, it is easy to create a project for those files. Note, if you do not create a project, you will not be able to view the TRF files in TShell's Project View.

To create a project for existing CORSIM input (TRF) files, open the Configure Project dialog as described above. Then remove the check mark from the Automatic check box. Use the **Browse** button to locate the directory where your TRF files reside. Press the **OK** button on the Open dialog to set the directory you have selected. You can then type in the name of the project and any other information you desire. Finally, close the

Configure Project dialog with the **OK** button to save your project definition. The newly created project will appear in the TShell Project View, and all of the TRF files in the project directory will appear as cases under the project item.

4.3 Creating a Case

A case is defined by the input and output files with which the case is associated. The files that define a case have the same root name where the file extensions differentiate the types of files. For example, a case may consist of the following four files: sample.trf, sample.tno, sample.out, and sample.tsd. These files may have been generated in the following sequence. First, the user defines a network using the TRAFED network editor. On saving the network, TRAFED creates a sample.tno file. The user then applies the TRAFED export feature to create the sample.trf file for input into the CORSIM simulation. When CORSIM is run, it creates the sample.out and sample.tsd files. All four of the files are part of the "sample" case.

Note, not all case files will appear in the project tree. Only those files with extensions that are associated TSIS tools will appear in the tree. Thus, even though the animation data file, sample.tsd, is part of the sample case, it will not appear in the project tree.

To create a new case using the TSIS tools, you can either create a TRF file using the Text Editor, or create a TNO file using TRAFED. The case will appear under the project whose directory you saved the TRF or TNO file.

To create a case using an existing TRF or TNO file, simply copy the file into an existing project directory. The case will then appear under the project item associated with that directory, and will have the same name as the root name of the file.

5 Tool Configuration

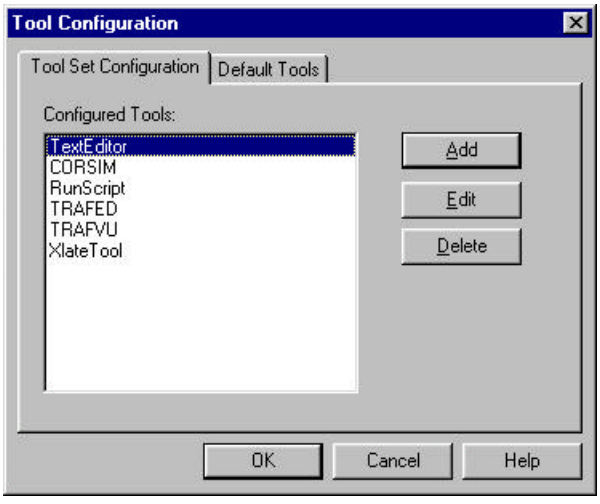
5.1 Tool Configuration Overview

TSIS is an integrated development environment that enables users to conduct traffic operations analysis. Although TSIS has been available since the early 1990s, it was not until 1995 that it became a Windows-based product. With the introduction of TSIS 5.0, the environment has become more integrated and supports an open component architecture that allows you to add and configure your own (or third-party) tools.

The TShell graphical user interface (GUI) provides you with the ability to effectively manage the tools in your TSIS environment. Although TSIS is distributed with a set of pre-configured tools, TShell allows you to easily add and configure your own tools.

5.2 Tool Configuration Dialog

You can add, edit, or delete tools via the TShell Tool Configuration dialog. To display this dialog, select the **Tools|Tool Configuration** menu command. The Tool Configuration dialog is illustrated in the following figure.



The Tool Configuration dialog has three buttons and two tabs as follows:

OK: This button closes the dialog, saving any changes you made to the tool configuration.

Cancel: This button closes the dialog, rejecting all changes you made to the tool configuration.

Help: This button displays the help topic for the Tool Configuration Dialog.

Tool Set Configuration: This tab is used to add, edit, or delete tools.

Default Tools: This tab is used to assign a default tool to files with a specific file extension.

The Tool Set Configuration tab contains a list of currently configured tools and three buttons: **Add**, **Edit**, and **Delete**.

Configured Tools: This control lists the currently configured tools. You can select tools from this list to edit or delete.

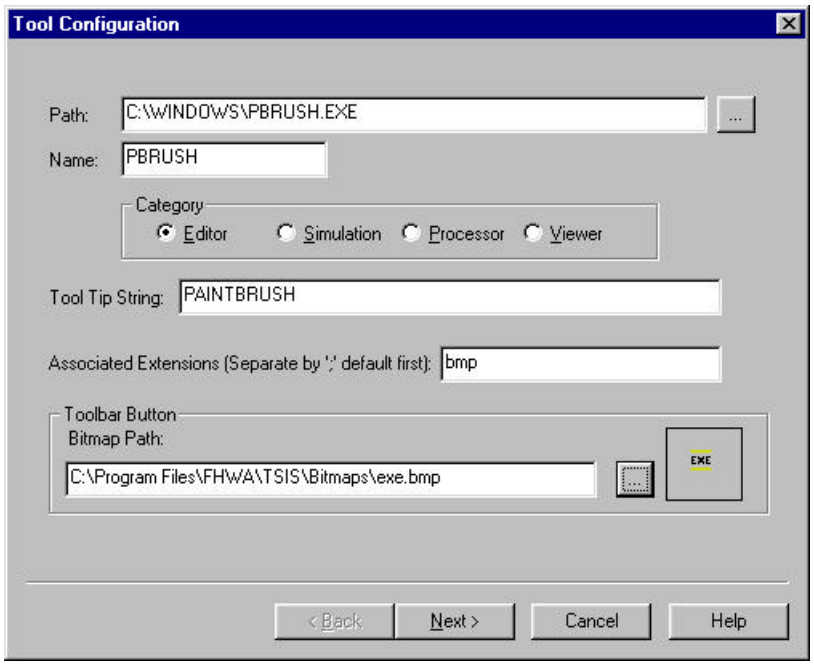
Add: This button starts the tool configuration wizard for adding and configuring a new tool.

Edit: This button displays the Edit Existing Tool Configuration dialog for the tool that is highlighted in the Configured Tools list.

Delete: This button deletes the tool that is highlighted in the Configured Tools list.

5.2.1 Adding a Tool

To illustrate the process of adding a tool, we add the Microsoft Paint application. Starting with the Tool Configuration dialog, press the **Add** button. This will start the tool configuration wizard, shown in the following figure.



The first page of the tool configuration wizard is the same for all types of tools. Subsequent pages will differ depending on the tool's file type and the selected category for the tool. The first page of the wizard contains the following controls.

Path: This is the full path specification for the tool that you wish to add. Use the button to the right of the path specification field to browse the hard drive or network to select the file that defines the tool. TShell recognizes four types of files as tools: applications (EXE files), dynamic link libraries (DLL files), ActiveX controls (OCX files) , and batch programs (BAT files).

Name: This field is used to set the name of the tool. It defaults to the name portion of the tool's path specification. You can provide whatever name you wish, as long as it is unique within the set of existing tools.

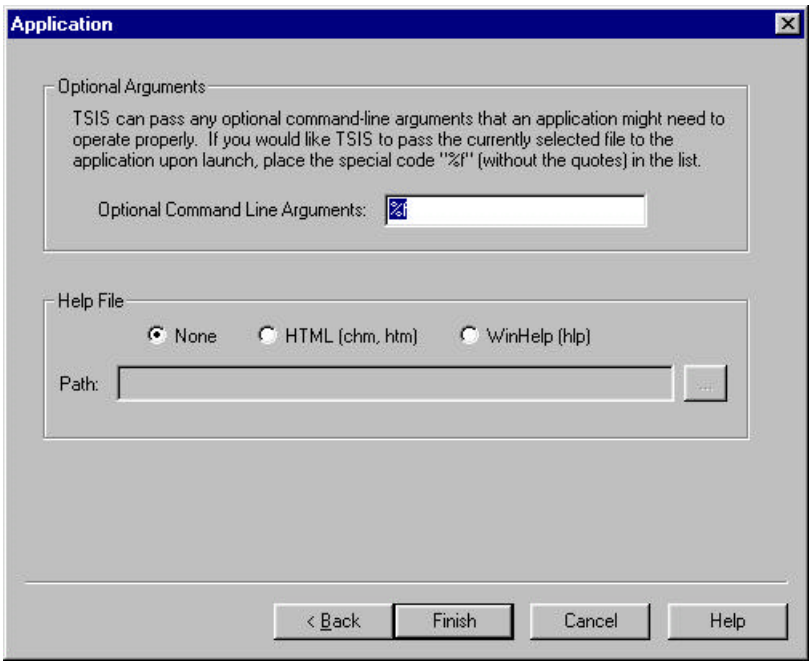
Category: This radio button set is used to identify the type of tool being added. In general, it does not matter which category you choose; it defines which submenu of the Tools menu the tool is listed. However, if the tool can be used to create a file, the Editor category should be selected. This causes the tool to be listed in the submenu of the **File|New** menu item. For Paint, we have selected "Editor" because it can be used to create files.

Tool Tip String: This field is used to set the tool tip that is displayed when the mouse is over the tool button. It defaults to the tool name, but you can specify any string that you want.

Associated Extensions: This field is used to set the file extensions that are associated with this tool. The first extension specified is the default extension. You may enter multiple extensions, separated by semicolons. This information is used to enable and disable the tool button based on the type of file selected in the project tree. If you specify no extension, the tool button will always be enabled. For our example, we have selected "bmp" for Windows bitmap files.

Toolbar Button Bitmap Path: This field is used to specify the full path specification for a bitmap file that will be used as the face for the tool button on the Tools toolbar. You may select any bitmap file, however, we have provided a set of properly sized (16 x 15) bitmap files for your convenience. The button to the right of the field will allow you to browse the hard drive or network to select a bitmap file.

After specifying all of the information on the first page of the wizard, press the **Next** button to continue the new tool configuration process. Because the Paint tool is an EXE file, the next page of the wizard will appear as follows.



Optional Command Line Arguments: This field allows you to specify command line arguments for the application tool you are adding. The specific arguments that can be specified depend on the tool you are adding. These arguments are passed to the tool executable when it is launched by TShell. TShell also provides a special token (%f) that you may specify to pass the name of the selected input file to the tool. In the case of Paint, simply passing a file name causes Paint to open that file when it starts.

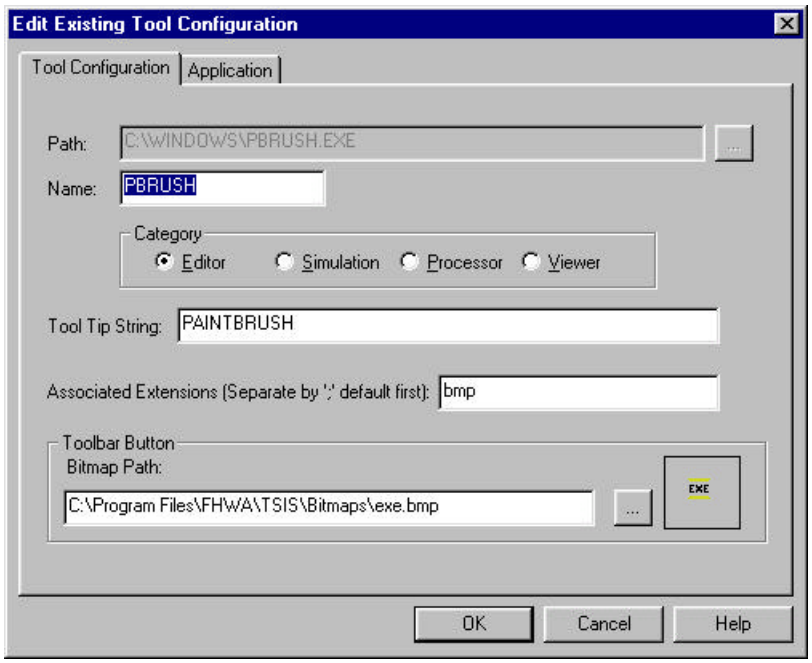
Help File: This control allows you to specify the type and location of a help file to be associated with the tool. If specified, the added tool will appear in the **Help|Help Topics** submenu to provide access to the tool's help file from TShell. TShell supports two types of help, WinHelp, and HTML Help. For our example, we have not loaded a separate help file for the Paint tool.

After specifying all of the information on the second page of the wizard, press the **Finish** button to finalize the new tool configuration. This will return you to the Tool Configuration dialog. Note, the new tool will appear in the list of tools, but won't be added until you press the **OK** button.

5.2.2 Editing an Existing Tool

From the Tool Configuration dialog, you can edit the configuration for an existing tool by highlighting the desired tool and then pressing the **Edit** button. You can also edit a tool's configuration by clicking the right mouse button while the mouse cursor is over the tool's button in the Tools toolbar.

To illustrate this process, we describe editing the Microsoft Paint tool that was described in the section, Adding a Tool. Starting with the Tool Configuration dialog, highlight the PBRUSH tool and press the **Edit** button. This will display the following configuration dialog for the PBRUSH tool.



This dialog has multiple tabs that contain the tool's configuration parameters. The first tab of the configuration dialog is the same for all types of tools. Additional tabs will differ depending on the tool's file type and the selected category for the tool. In edit mode, you are allowed to change all configuration parameters except for the tool's path specification, thus the Path field is disabled (grayed). When you are finished modifying the configuration, press the **OK** button to save your changes and return to the Tool Configuration dialog. Pressing **Cancel** will reject your changes. Note, your changes will also be rejected if you do not press the **OK** button on the Tool Configuration dialog.

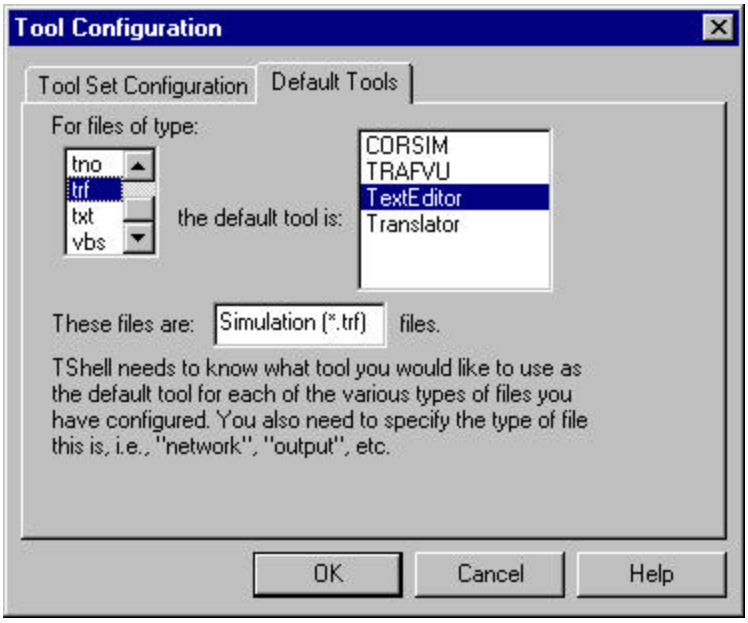
5.2.3 Deleting an Existing Tool

From the Tool Configuration dialog, you can easily delete a tool by highlighting the desired tool and then pressing the **Delete** button. The tool's name will disappear from the Configured Tools list. However, the tool will not actually be deleted until you press the **OK** button on the Tool Configuration dialog.

5.2.4 Specifying Default Tools

The Default Tools tab in the Tool Configuration dialog allows you to specify the primary (or default) tool associated with a file extension. The default tool is the tool that is activated when you double click (or press

the Enter key) on a file item in the Project View tree. The Default Tools tab is illustrated in the following figure:



In this tab, the file type (extension) list contains a single entry for every extension that was specified in the tool configurations (i.e., every extension known to TShell). Although an extension can be associated with multiple tools, only one tool is considered the default tool.

As illustrated in the figure, TRF (CORSIM input) files can be operated on by four tools: CORSIM, TRAFVU, TextEditor, and Translator. The toolbar buttons associated with these tools will be enabled whenever a TRF file is highlighted in the Project View tree. However, the Text Editor tool is defined as the default (highlighted) tool. This means that when a user double clicks on a TRF file in the project tree, that TRF file will be opened by the TextEditor. Using this dialog, you can change the default tool to be any of the tools that support the selected file type.

This dialog also enables you to select the name that appears in the Project View tree for files of the selected type. The figure indicates that TRF files are listed as "Simulation (*.trf)" files in the project tree. You can change the name to be whatever is most meaningful to you.

6 Glossary of Terms

accelerator key

Accelerator keys (also known as shortcut keys) are used as keyboard shortcuts for program commands that are also available on a menu or toolbar.

ATMS

Advanced Traffic Management Systems

case

A single simulation for a specified traffic network as defined by its simulation input file. A case includes the simulation input file and all data files generated by the simulation during a run. Note, multiple runs of the simulation for gathering statistics is still considered part of a single case if the input has not changed.

CORSIM

CORridor SIMulation. This is a microscopic traffic simulation used to generate the vehicle information used by TRAFVU.

DOT

Department of Transportation

dynamic scrolling

With dynamic scrolling, the contents of a window scrolls as the user moves a scroll bar thumb.

FHWA

Federal Highway Administration. Sponsor for the development of the TSIS suite of traffic analysis tools.

graphical user interface

A interface between a user and a software tool, consisting of graphical elements and controls, e.g., windows, dialogs, buttons.

GUI

Graphical User Interface

HTML

Hypertext Markup Language is a system of marking up or tagging a document so that it can be published on the World Wide Web. It is used to display TShell on-line help.

MDI

Multiple Document Interface

Script Tool

The TSIS Script Tool is a combined script editor and tool for executing Visual Basic Scripts. Using the built-in TSIS interfaces, the Script Tool is a powerful mechanism for extending the functionality of the other TSIS components.

TCF

TSIS Configuration File. A file that defines a TSIS project and contains information about the project , e.g., project description and creator.

Text Editor

This editor is a standard text editor that has the additional capability of "understanding" the CORSIM TRF file format. When editing a TRF file with this editor, the TShell output window displays text describing the entry field and record type at the current cursor position. Clicking a specific field description in the output window highlights the corresponding entry field in the displayed TRF file.

thumb

A thumb is the rectangular button in a scroll bar that can be moved to scroll the contents of the window to which the scroll bar is attached.

time step

The smallest unit of time at which the simulation model (CORSIM) reports information. The time step is typically one second. CORSIM reports vehicle positions, signal states, and controller information at each time step.

TNO

Traffic Network Object. A file format used by the TRAFED network editor.

tool

A program or component that is installed into the TSIS environment for use in conducting traffic operations analysis. A tool can be an application (EXE), Dynamic Link Library (DLL), COM object or ActiveX Control (OCX), or a batch program (BAT).

tool tip

A small rectangular pop-up window that displays a brief description of a command bar (toolbar) button's purpose.

TRAFED

TRAF Editor. A graphical input editor used to define traffic networks and other input for simulation. It is part of the TSIS suite of tools.

TRAFVU

TRAF Visualization Utility. A graphics processor used to display traffic networks and animate vehicles and signals on that network. It is part of the TSIS suite of tools.

Translator

A TSIS tool used to translate between the TRF and TNO file formats. It converts TRF files for use by TRAFED. The translator also performs the reverse operation of translating the TRAFED native format (TNO) files into TRF files for use by CORSIM and other tools.

TRF

A file that contains the input data used to define a CORSIM network and to drive the CORSIM simulation for a single simulation case.

TSD

Time step data file. A file that contains the time step-dependent vehicle and signal state information generated by the simulation and used as input to TRAFVU.

TShell

The graphical user interface for the TSIS integrated development environment. It provides a Project view that enables you to manage your TSIS projects. It is also the container for the pre-configured tools and any tools that you add to the suite.

TSIS

Traffic Software Integrated System. TSIS is the integrated development environment that hosts the CORSIM simulation and its support tools.

TSIS Web Site

This web site, http://www.fhwa-tsis.com, contains the latest information about new tools, product updates, known problems, example projects, and usage tips.

Visual Basic Script

VBScript is a lightweight and extremely fast language engine designed specifically for environments like the Internet, intranets, or the World Wide Web.

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