TSIS User's Guide

Version 6.0

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Microsoft and Windows are registered trademarks of Microsoft Corporation.
This User's Guide describes how to install and begin using the Traffic Software Integrated System (TSIS). The McTrans Center is maintaining TSIS.

For detailed information on how to use the individual components of TSIS, please refer to the User's Guides for those individual components.
The FHWA's Traffic Software Integrated System (TSIS) is an integrated development environment that enables users to conduct traffic operations analysis. Built using a component architecture, TSIS is a toolbox that contains tools that allow the user to define and manage traffic analysis projects, define traffic networks and create inputs for traffic simulation analysis, execute traffic simulation models, and interpret the results of those models.

Although TSIS comes pre-configured with a set of tools, the component architecture is open and users can add their own tools to the TSIS environment.

The guide:

- Introduces users to the concept of the TSIS integrated development environment
- Highlights the new features and capabilities in this version of TSIS
- Describes how to start using TSIS

Each tool, included in this version of TSIS, has its own user's guide. The reader is directed to those user's guides for details concerning the operation and use of the tools.
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1 About TSIS

1.1 Introduction

This guide describes how to install and begin using the Traffic Software Integrated System (TSIS). This guide is intended 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 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. TSIS 6.0 continues to use that open architecture.

The TSIS environment's graphical user interface (GUI) provides you with the ability to effectively manage your traffic analysis projects and traffic analysis tools. This intuitive, user-friendly interface integrates those traffic analysis tools in one environment so that you may easily access and apply them. On-line help for each tool is also integrated into the TSIS interface.

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. Multiple runs of the simulation for gathering statistics is still considered part of a single case provided the input (other than random number seeds) has not changed.

This version of TSIS includes several pre-configured tools including a GUI-base network and simulation input editor (TRAFED), the CORSIM traffic simulation, and the TRAFVU animation and simulation analysis tool. These and the other pre-configured components are described in more detail in the section titled, TSIS Package.
As a final note, even though TSIS and CORSIM have been used somewhat interchangeably in the past, in reality, CORSIM is just one of the tools in the TSIS toolbox. In future versions of TSIS, we envision that other simulation models will be incorporated into the development environment.

1.3 What's New in TSIS 6.0

The components in the TSIS 6.0 package offer several new features and fixes that are described in the following sections (for a more up-to-date list, please read the “Whats New.htm” located on your CD-ROM or the TSIS installation directory).

1.3.1 TShell

TShell is the TSIS environment's GUI that integrates the TSIS tools and allows you to effectively manage your traffic analysis projects. It offers the following new features:

- **Project View Sorting.** The Project view now provides the capability of sorting the project tree either by the names of the items on the tree or by the modified dates of the files associated with the tree items.

- **Project View Properties.** You can now specify properties for the Project view. These properties include the tree sort parameter and order, whether files that you delete via the tree are sent to the recycle bin, and whether TShell displays confirmation dialogs for tree operations. The Project view also displays item-specific properties for each of the different types of tree items: projects, cases, and files.

- **Output View Properties.** The Output view properties include background color and text font, size, and color. These properties are now accessible via the Output view pop-up menu as well as from the TShell menu bar.

1.3.2 CORSIM

Version 6.0 of CORSIM offers the following new features:

- **CORSIM Interface.** CORSIM now provides its own interface and driver software, separate from TShell. The CORSIM Driver component, CORSIMDriver.dll, provides a user interface for running CORSIM and includes a built-in, multi-run capability. The CORSIMDriver.dll runs the CORSIMServer.exe, which executes the CORSIM simulation DLL. This architecture allows multiple simulations to be running at one time by simply starting a new CORSIM run on a different testcase. Note that with this new architecture, existing Run Time Extensions (RTE) will need slight modifications to work correctly with the new components.

- **Output Processor.** In addition to the user interface, the CORSIM driver provides access to a new output data processor. The output processor enables you to accumulate user-selected statistics and summary data during multiple runs of CORSIM. It writes the collected data to an Excel workbook, a comma-separated file, and/or a tab separated file.

- **Increased Network Size.** CORSIM internal nodes can now be numbered between 1 and 6999, increasing the upper limit from 1000. Accordingly, the number of allowed internal nodes and links has increased. No changes were made to the interface node numbering or the entry/exit node numbering. Source/Sink nodes can now use any internal node number instead of requiring a number between 2000 to 2999. In implementing these improvements, no changes to the TRF file format were required. Therefore, your TRF files that ran with the previous version of CORSIM will continue to run with the new version of CORSIM.

To facilitate the increased network size, CORSIM now dynamically allocates memory for many of its internal data arrays. The benefits of this change are that small networks will use a smaller amount of memory and network size is no longer limited by fixed array sizes (size is limited by the number of nodes supported and the amount of memory your system provides). Version 5.0 of CORSIM always used approximately 50 megabytes of memory, regardless of network size. Now CORSIM uses approximately
25 megabytes for small networks of a few links and nodes or upwards of 600 megabytes for a 7,000-node network with 100,000 vehicles. The following network limits were changed:

- Global maximum internal node number from 1000 to 6999.
- Global number of links from 2,000 to dynamic.
- Max number of NETSIM nodes (including interface and entry/exit) from 500 to 9,000.
- Max number of NETSIM links from 1,000 to dynamic.
- Max number of NETSIM vehicles from 20,000 to dynamic.
- Max number of NETSIM detectors from 700 to 7,000.
- Max number of actuated signals from 100 to 1,000.
- Max number of pedestrian phases from 100 to 1,000.
- Max number of FRESIM nodes (including interface and entry/exit) from 500 to 9,000.
- Max number of FRESIM links from 1000 to dynamic.
- Max number of FRESIM segments from 20 to dynamic.
- Max number of FRESIM vehicles from 20,000 to dynamic.
- Max number of FRESIM detectors from 600 to 6,000.
- Max number of FRESIM connectors from 100 to 5,000.
- Max number of FRESIM detector stations from 200 to 2,000.
- Max number of FRESIM data stations from 200 to 2,000.
- Max number of FRESIM ramp meters from 150 to 4,000.
- Max global bus routes from 100 to 500.
- Max FRESIM bus routes from 100 to 500.
- Max number of FRESIM buses from 200 to 2,000.
- Max number of NETSIM buses from 256 to 2,000.

**Miscellaneous Changes and Fixes.**

- Modified the NETSIM limitation requiring link lengths of less than or equal to 4000 feet. The new limit is 9999 feet.
- Associated temporary filenames (LU?) with the input case name (casename.LU?). This allows CORSIM to run simultaneously on multiple testcases in the same directory.
- Added a new flag on RT 2 (entry 3, column 16) to force CORSIM to use the maximum initialization time.
- The logic for determining if a vehicle would join spillback was changed. Previously there was no way to prevent a vehicle from becoming the first vehicle in spillback. Record Type 141 now defines the probability that a vehicle will BECOME the first, second, third or fourth or later vehicle in spillback instead of JOINING the first, second, third or fourth or later vehicle in spillback.
- There was an error in the way CORSIM calculated the new position on a receiving link for vehicles that perform a left or right turn. The error caused those vehicles to be placed on the new link at a location that was a vehicle length too far downstream. The error was especially noticeable for long vehicles, such as trucks and buses.
- Bus offset time was not used when a route originated in FRESIM. It was only used if the route originated in NETSIM. Both NETSIM and FRESIM now use offset.
Control delay was aggregated over all turn movements in the simulation output table. There is now a new table in the NETSIM movement specific output section that includes control delay by turn movement.

Corrected a problem counting bus trips that terminate in NETSIM. The number of trips was always reported as zero.

Improved error checking for Record Type 25.

An error in sending link travel time MOES to TRAFVU was corrected.

The calculation of the average speed used in determining when anticipatory lane changes should begin was limited to vehicles that were located within the length of the acceleration lane instead of using all vehicles on the entire link.

Anticipatory lane change inputs are now echoed to the output file.

An error in processing Record Type 53 inputs in subsequent time periods was corrected.

Corrected several errors in determining leaders and followers on complicated geometries, including clover leaves.

Corrected an error related to a vehicle in an interchange that fails to make its required turn and gets reassigned.

Allowed exit interface links to be specified as destinations on Record Type 74.

Fixed several problems with bus movements. Previously, buses would leave bus stations without trying to find a gap in the traffic stream and would sometimes move onto other vehicles. They now use lane change logic to determine if there is an acceptable gap in the traffic stream.

Corrected an error in determining the lane alignment on a receiving link when there's a left turn pocket on the subject link. The error affected car following from subject link to receiving link.

Corrected a numerical accuracy error that caused spurious fatal errors when OD fractions didn't add up to exactly 100%.

Corrected a problem that occurred when a lane that was closed in a previous time period becomes open in a subsequent time period.

Corrected a problem that allowed vehicles to accelerate at 12 ft/sec/sec when discharging from a link, even when the performance table limited the acceleration to a smaller value.

Corrected an error that caused NETSIM vehicles to stop immediately when cooperating with a lane changer.

Corrected errors that caused some NETSIM vehicles to jump all the way to the stop bar when they became first in queue, regardless of how far they had to jump.

Corrected an error reading the percentage of HOV violators in subsequent time periods in FRESIM.

Corrected errors in multiple threshold ramp metering.

Corrected errors in HOV operations that caused unnecessary warning messages.

### 1.3.3 TRAFVU

Version 6.0 of TRAFVU offers the following new features:

- **Bitmap Background.** We have modified TRAFVU to display the bitmap background used by TRAFED. When exporting the TRAFED network to a CORSIM input (TRF) file, TRAFED writes the bitmap information to the TRF file. TRAFVU then uses that information to display the proper bitmap in the correct location on the network map. From the Display menu and a corresponding toolbar button, you can toggle the display of the background bitmap.
• **Link Names.** We have added the display of link names to the map in TRAFVU. TRAFVU displays link names next to links that have entries on record type 10 in the TRF file. From the Display menu and a corresponding toolbar button, you can toggle the display of the link names. Using the Preferences dialog, you can control the color, size, and placement of the link names on the network map.

• **User Preferences.** TRAFVU now maintains application and window settings for a user between TRAFVU sessions. Each user can have different preference settings. Application-level preferences include: dynamic scrolling, tool tip display, and APC window settings (including size and placement). Window-level preferences include: object display button settings, vehicle color and detail properties, background color, link name settings, and window component (toolbar, legend, status bar) display preferences.

• **Warning Sign Display.** You can now control the display of warning and HOV signs using the Warning Sign item on the Display menu or the corresponding toolbar button.

• **Entry Links.** You can now right click on an entry link to display its attributes, e.g., entry volume.

• **Zoom Capture and Set.** We have modified the Zoom Capture and Set dialog to enable you to specify the file to which window coordinates are saved or from which they are retrieved. This allows you to save multiple sets of coordinates for a single or multiple cases.

• **INV File.** TRAFVU no longer generates an INV file when it loads a case. This allows you to load cases (TRF files) from write-protected directories/drives and from CD-ROM.

### 1.3.4 TRAFED

Version 6.0 of TRAFED offers the following new features:

• Improved range checking.

• Improved default setting.

• TRAFED now reads the TNO file using XML enabling more flexibility regarding its content and order.

• You can now scroll past the edge of the existing network using the scroll buttons.

• A new distance-measuring tool has been added to the toolbar.

• The bitmap may be turned on and off with a button on the toolbar.

• You can now sort the TRF file during export so that most of its records are sorted by their first two fields.

• Link splitting has been improved and no longer resets the signal controllers.

• Numerous bugs have been fixed including: Fixed-time Controller Offset has been fixed to be time period dependent.

• Turning volumes present in the TRF file are now preserved during translation to TNO file format. Previously, the volumes were changed to percentages based on CORSIM’s use of the values.

### 1.3.5 TSIS Script Tool

Version 6.0 of the TSIS Script Tool offers the following new features:

• **New Script Interfaces.** The Script Tool provides improved interfaces for better interaction with TShell and for running CORSIM. The Script Tool User's Guide includes a new, detailed Reference Manual for the functions defined by these new interfaces.

• **New Sample Scripts.** TSIS 6.0 includes seven sample Visual Basic scripts that use the new Script Tool interfaces and that demonstrate the new capabilities of the CORSIM component.
1.4 Purchasing TSIS

The TSIS product is distributed by the following vendor:

**McTrans Center**
PO Box 116585
Gainesville, FL 32611-6585
tel: (352) 392-0378
fax: (352) 392-3224
mctrans@ce.ufl.edu
http://mctrans.ce.ufl.edu

1.5 Reporting Problems

If you encounter problems with the TSIS package, you can get assistance from your vendor. If you would like to submit a problem report (PR) you can fill out the form that is available from the TShell Help menu and mail/e-mail it to your vendor. To access the PR form from TSIS, select the Help menu, and then select the Report Problem item. This will open a problem report form in the TSIS text editor. If TSIS is not accessible or if you prefer, you can edit the problem.txt file that is available in the directory into which you installed TSIS.

You may also want to edit problem.txt to create a personal template for submitting problem reports. This eliminates the need to enter your personal or computer information every time you create a problem report.

Finally, we welcome suggestions on how to improve TSIS. You may submit your suggestions using the problem report form.
2 TSIS Package

2.1 Components

TSIS 6.0 comes pre-configured with the following 7 tools:

TShell
TShell is 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. See the TShell User's Guide for additional details.

CORSIM
The CORSIM simulation consists of an integrated set of two microscopic simulation models (NETSIM and FRESIM) that represent the entire traffic environment as a function of time. NETSIM represents surface-street traffic and FRESIM represents freeway traffic. Microscopic simulations model the movements of individual vehicles, which include the influences of driver behavior. Thus, the effects of very detailed strategies, such as relocating bus stations or changing parking restrictions, can be studied with such models. CORSIM provides its own interface in TSIS 6.0 that enables you to control the simulation and the accumulation of traffic measures of effectiveness. See the CORSIM User's Guide for additional details.

TRAFED
TRAFED is a graphical user interface-based editor that allows you to easily create and edit traffic networks and simulation input for the CORSIM model. See the TRAFED User's Guide for additional details.

TRAFVU
TRAFVU (TRAF Visualization Utility) is a state-of-the-art graphics post-processor for FHWA’s CORSIM microscopic traffic simulation system. TRAFVU displays traffic networks, animates simulated traffic flow operations, animates and displays simulation output measures of effectiveness, and displays user-specified input parameters for simulated network objects. See the TRAFVU User's Guide for additional details.

TSIS 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. This makes manual editing of the text file much easier than with previous text editors. See the TSIS Text Editor User's Guide for additional details.

**TSIS 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. We have also included two scripts with this release. One is a multi-run script that repeatedly runs CORSIM on a test case, applying different random number seeds to each run. The other script runs CORSIM on many different test cases. See the Script Tool User's Guide for additional details.

**TSIS Translator**

The TSIS Translator converts TRF files for use by TRAFED. This translator also performs the reverse operation of translating the TRAFED native format (TNO) files into TRF files for use by CORSIM and other tools. See the Translator User's Guide for additional details.

### 2.2 Examples

Included with the TSIS package are 5 example projects that demonstrate different features of the CORSIM model. These examples also help in understanding and using the TShell interface.

**Actuated Control Demo**

This project demonstrates the operation of actuated control in the CORSIM model.

**CORSIM City Demo**

This project demonstrates the capabilities of the TSIS package in creating and simulating a wide variety of different roadway configurations and interchanges.

**Incident Demo**

This project demonstrates the effects of a freeway incident (accident) on a freeway and its surrounding arterials as modeled by CORSIM.

**Interchange Demo**

This project demonstrates the operation of the CORSIM surface-street interchange feature.

**Surface and Freeway Demo**

This combined surface-street and freeway project demonstrates many features of the CORSIM model, including intersection controller and bus operations.

### 2.3 Documentation

In addition to this guide, there are several other guides provided with this package. These user's guides are provided both on-line as part of the TSIS help system and as Adobe® PDF files on the installation CD (see the Documentation folder on the TSIS installation CD). You may view and print PDF files with the Adobe Acrobat Reader, available for free on the Adobe web site at: [www.adobe.com/acrobat](http://www.adobe.com/acrobat).
• TShell User's Guide
• CORSIM User's Guide
• CORSIM Reference Manual
• TRAFED User's Guide
• TRAFVU User's Guide
• Text Editor User's Guide
• Script Tool User's Guide
• Translator User's Guide
• File Description Document

For additional information regarding the TSIS package and the CORSIM model, please visit the TSIS web site at: http://mctrans.ce.ufl.edu/featured/tsis. This site contains the latest information about new tools, product updates, known problems, example projects, and usage tips.

Please contact your vendor for information about training workshops.
3 Getting Started

3.1 System Requirements

This section lists the minimum and recommended hardware requirements for installing and executing TSIS on a personal computer. Microscopic simulation is, by its nature, extremely processor intensive. Furthermore, a large network or lengthy simulation may generate hundreds of megabytes of vehicle and signal animation data. Thus, fast processors and large disk drives will be required when simulating large traffic networks.

3.1.1 Hardware

Most Intel processor-based computer systems that are available today are sufficient for hosting TSIS. However, some legacy systems may not be suitable for TSIS. Thus, we recommend the following:

- Intel-based Pentium or higher processor operating at 200 MHz or faster
- A minimum of 64 MB RAM with 128 MB or more recommended
- A minimum of 50 MB of disk space with 2 GB or more recommended

Keep in mind that increased traffic network size and simulation time requires increased memory usage and disk space. Thus, to simulate a large network, a large amount of memory and disk space may be required for efficient operation and shorter run times.

The following are required to install TSIS:

- CD-ROM drive or access to a network installation of TSIS
- A minimum of 34 MB of disk space for the fully-installed TSIS package (not including the space required for the installation of Microsoft Internet Explorer, if needed)

3.1.2 Operating Systems

TSIS was designed to operate with the following Microsoft Windows operating systems:

- Windows 2000 (all versions), Windows XP (all versions), and Windows 2003 Server.

3.1.3 Internet Browser

The HTML help system used by TSIS and the integrated browser in TShell require the installation of Microsoft Internet Explorer. You do not have to use Internet Explorer as your default browser. You can use Netscape or any other browser you like, but Internet Explorer must be installed on your computer so that TSIS help system will function. Any version of Internet Explorer installed as part of the supported Operating Systems is supported by TSIS 6.0.
3.1.4 Visual Basic Script Engine

For executing Visual Basic scripts, the Script Tool uses the Microsoft Visual Basic script engine (VBScript) version 5.5 or higher. This Microsoft product is generally installed on a platform running a Microsoft operating system and Internet Explorer. If the script engine is not installed on your computer, the Script Tool will not be able to execute Visual Basic scripts. Installing TSIS does not install the Visual Basic script engine. However, you can download and install the latest version of the Visual Basic script engine from Microsoft at http://msdn.microsoft.com/scripting.

3.2 Installing TSIS 6.0

This section describes the procedure for installing the TSIS package and system support files.

3.2.1 Upgrading a Previous Version of TSIS

You do not need to uninstall previous versions of TSIS before installing TSIS 6.0. If you are upgrading an earlier version of TSIS (DOS or Windows) and want to retain that older version, you must install TSIS 6.0 to a directory other than where your older version was installed. This will allow you to continue to use the older version as well as TSIS 6.0. The TSIS 6.0 installation will warn you and allow you to change the directory if you attempt to install TSIS 6.0 in a directory where a previous version of TSIS is installed.

3.2.2 Installing TSIS

When you insert the TSIS installation CD into your CD-ROM drive, it should automatically launch the TSIS setup program. If the setup program does not automatically start, you can start it by using your file explorer to find the TSISInstall.exe program on the root folder of the CD. Just double click on TSISInstall.exe to begin the installation. You may also install TSIS using the Add/Remove Programs interface in the Windows Control Panel. Once started, the setup program displays the following dialog.

![TSIS Installation Dialog](image)

After InstallShield loads the TSIS installation wizard, you will see the following dialog.
If there is an open TSIS application, the setup program will not be able to successfully install TSIS. This dialog asks you to close all open TSIS applications prior to continuing with the setup. Once you have terminated all open TSIS applications, you can press the Yes button to continue with the setup.

After you continue the installation, the setup displays the following message. While this message is displayed, the setup program is checking for the required Microsoft Data Access (MDAC) version required by TSIS. If your computer has the correct version of MDAC, the installation will continue with the main TSIS installation page.

If your system does not have the required MDAC version, the setup program will display the following dialog box, which indicates that your system needs to be upgraded. You will then be given a choice to abort the installation or to continue and have the MDAC component installed.

If you choose "No", the setup program will stop TSIS installation and displays the "TSIS Installation" dialog box. At this point, you can either install MDAC by clicking on the MDAC button or download the latest version from Microsoft site (http://www.microsoft.com/data). Once the MDAC installation has completed, the TSIS installation wizard will begin.

If you choose "Yes", the setup program will continue TSIS installation without installing the required MDAC version and will display the TSIS installation wizard. Please note that you may install MDAC anytime after the TSIS installation has completed.

The first page of TSIS installation wizard is a welcome page, and the second page displays a copy of the TSIS End-User License Agreement. The third page of the wizard, shown in the following figure, asks for your user information. The serial number is issued by your vendor. This number is displayed in the TSIS About dialog and although any number will work, the number issued by your vendor will help them provide you assistance.
When you press the Next button, the setup program will display the data you entered and ask you to confirm it. If the data is not correct, you may return to this dialog and reenter it. Once you confirm the information, the setup program will then display the following dialog that allows you to select the folder in which to install TSIS.

If the default destination folder is acceptable, you can press the Next button. If not, press the Browse button to specify the destination folder of your choice. If the destination folder already contains a previously installed version of TSIS, you will get the following dialog.
If you select No on this dialog, the setup program will return to the destination location dialog. Once the destination folder is selected and accepted, the setup program will ask you to select a setup type from the following dialog.

If you choose the "Typical" setup, all TSIS components and sample projects will be installed. If you choose the "Custom" setup, the following dialog will appear when you press the Next button. From this dialog, you can specify which components to install and can choose to not install the sample projects.
If you choose to install the sample projects, the next dialog in the sequence will ask you to specify a directory in which to install the sample project files. Like the TSIS destination folder dialog, you can accept the default or specify a different folder with the **Browse** button. If the specified folder does not exist, the setup program will ask you if you want to create the folder. Also, if a folder of the selected name already exists, the setup program will ask you if you want to overwrite existing project files with the sample project files (of the same name). Once the sample project folder is selected, the setup program begins the process of copying the TSIS files to your hard drive and installing the TSIS program. During this process, the setup program displays several animated screens and messages that indicate the progress of the installation. Once the installation is complete, the following dialog asks if you want to view the readme.txt file.

![Question dialog](image)

Do you want to view the README file now?

[ ] Yes  [ ] No

We suggest you read this file for the latest information about the TSIS product. You may also choose to review this file after the installation. The readme file is located in the directory in which you installed TSIS and is viewable using any text editor. Also, you may view the readme file directly from the Welcome browser tab in the TSIS application. When you are finished viewing the readme file, the setup program is finished installing TSIS and displays the following dialog. At this point, you complete the installation process by pressing the **Finish** button and rebooting your system for the change to take effect.

![TSIS 6 Setup](image)

**InstallShield Wizard Complete**

Setup has finished installing TSIS 6 on your computer.

You may run TSIS 6 by clicking on the Start button followed by Programs then TSIS 6.
3.2.3 Adding or Restoring TSIS Components

If you did not initially install the entire TSIS package, or if some of the original files have been changed, then you might like to run the installation again to install the missing components or restore altered files. To add or replace a TSIS component, follow the installation procedure described above and select “Custom” when prompted for the installation type. Follow the instructions on the screen to select which components to install.

3.2.4 Installation Notes

You must have administrator privilege to install TSIS 6.0. After installation, any user can run it.

TSIS 6.0 can co-exist with any previous installation of TSIS 4.x or TSIS 5.x provided it is installed into a different folder. The setup program allows you to choose the installation folder, so just make sure it is different from your installations of TSIS 4.x and TSIS 5.x. Additionally, the setup program will warn you if you attempt to overwrite a previous version of TSIS.

For TSIS to operate properly, the setup program checks for MDAC, a Microsoft-supplied component, on your computer's system. MDAC is required by TSIS to support for the TRF file description database.

MDAC is installed using Microsoft-supplied installation program, which only install the component if there is a newer than the version that already exist on your system. More information regarding this component can be found at http://www.microsoft.com/data. In addition, the setup program will install a few run-time library files without informing you. The run-time library files that are installed (without user intervention) include:

- mfc42.dll
- msvcrt.dll
- msvcp60.dll
- msvcr7.dll
- riched20.dll
- shlwapi.dll

These files provide the run-time support for Microsoft C and C++ language elements and for Microsoft Foundation Classes (MFC) upon which TSIS is built. These files are installed to your computer's system file directory only if they do not exist or are newer than the files that already exist on your system.

3.2.5 Removing TSIS

TSIS can be removed from your system using the Add/Remove Programs interface from the Windows Control Panel. On the Install/Uninstall tab, scroll the list of programs until you see TSIS 6.0. Select TSIS 6.0 with the mouse and press the Add/Remove button. This will uninstall TSIS 6.0 from your system. Note, the uninstall process will not remove any files that have changed since installation, or any files that you have added. Thus, not all of the folders that the TSIS setup program added may be removed automatically. Once the uninstall process finishes, it will indicate to you what it could not remove. After uninstalling TSIS, you can manually delete the folders using the file explorer.

3.3 Starting TSIS

The TSIS setup program will add a TSIS 6.0 entry in your Start Menu Programs section. To start TSIS, click on the Start button. Then select the Programs submenu and then select the TSIS 6.0 submenu. From the TSIS 6.0 submenu, you can launch either TSIS 6.0 or TRAFVU.
You may also start TSIS by any of the standard Windows methods, including double clicking on a TSIS project (TCF) document, CORSIM input (TRF) file, or TRAFED network object (TNO) file. You can even launch TSIS from an MS-DOS prompt or the “Run…” command in the Start Menu.

Note that the TSIS installation process does not associate any file types (e.g., TCF, TRF, or TNO) with the TSIS application. Therefore, if you want to start TSIS by clicking on a file, you will need to make the association by registering the file type via your system's file explorer. Please refer to your operating system help for guidance in registering file types. When specifying the application used to open a file type, add a "%1" after the application path and name so that spaces in the file path and name will be properly passed to the application. Be sure to include the quotation marks around the %1 parameter.

TSIS stores user-specified preferences by user. As part of the startup process, TSIS restores those preferences to the state they had when you last used TSIS. It restores window size and position, tool definitions, and tool bar states and positions.

For more information on getting started refer to the Quick Start Instructions, available via the Welcome tab in the TShell Output View.
4 Glossary of Terms

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. Multiple runs of the simulation for gathering statistics is still considered part of a single case provided the input has not changed.

Common Controls
A Microsoft component that supports the use of common graphical interface controls, e.g., a list box, within programs that run under the Windows operating systems.

Component
An independent software application that can be easily integrated into other software applications or into a container program.

Component Architecture
A software architecture in which a framework, called a container, supports the use and interaction of independent software components (tools).

Container
A computer program composed of a framework that supports the use and interaction of independent software components.

CORSIM
CORridor SIMulation. A microscopic traffic simulation tool supported by the TSIS environment.

DCOM
Distributed Component Object Model
Glossary of Terms

**Destination folder**
A user-specified folder (directory) to which the setup program will install the TSIS software or sample projects.

**DOT**
Department of Transportation

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

**FRESIM**
FREeway SIMulation. The part of the CORSIM simulation that models freeway operations.

**Graphical User Interface**
An interface between a user and a software tool, consisting of graphical elements and controls, e.g., windows, dialogs, buttons.

**GUI**
Graphical User Interface

**HOV**
High Occupancy Vehicle. This term is generally used to describe roadway lanes (facilities) that are reserved for vehicles that contain more than one occupant.

**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 TSIS on-line help.

**McTrans**
A vendor that distributes and supports the TSIS software. For more information, please visit the McTrans web site at: [http://mctrans.ce.ufl.edu](http://mctrans.ce.ufl.edu).

**MDAC**
Microsoft Data Access Components. The Microsoft Data Access Components architecture provides a universal framework for exposing both traditional SQL-based database sources and non-SQL data stores such as documents or multidimensional sources. In TSIS, MDAC supports the use of the TRF database.

**MFC**
Microsoft Foundation Classes. The C++ class library that Microsoft provides with its C++ compiler to assist programmers in creating Windows-based applications. MFC hides the fundamental Windows API in class...
hierarchies so that programmers can write a Windows-based application without needing to know the details of the native Windows API. TSIS and its components are built using MFC.

**MOE**
Measure of Effectiveness. One of several statistics, generated by the simulation, that indicates the state of traffic flow within the network.

**MS-DOS**
Microsoft Disk Operating System. A Microsoft operating system that predates the Windows operating systems.

**NETSIM**
NETwork SIMulation. The part of the CORSIM simulation that models surface-street operations.

**OCX**
ActiveX control file. A component format used by the TSIS container.

**PDF**
Portable Document Format. A universal, portable document format developed by Adobe. TSIS user guide's are distributed using this format.

**PR**
Problem Report

**Project**
A set of simulation cases that reflect a common theme, e.g., signal timing variations for an artery in downtown Washington, D.C. See the definition for case.

**RAM**
Random Access Memory

**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.

**System Files**
Microsoft support files, required by TSIS, that the TSIS setup program installs to the system directory of your computer. Because these files are used by a wide variety of Microsoft and other third-party software products, they are often already installed on your system. TSIS will only install the files if they do not exist or if the existing files are older than those needed by TSIS.
Glossary of Terms

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.

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).

TRAFED
TRAFED is a graphical user interface-based editor that allows you to easily create and edit traffic networks and simulation input for the CORSIM model.

TRAFVU
TRAFVU (TRAF Visualization Utility) is a user-friendly graphics post-processor that displays traffic networks, animates simulated traffic flow operations, animates and displays simulation output measures of effectiveness, and displays user-specified input parameters for simulated network objects.

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.

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://mctrans.ce.ufl.edu/featured/tsis](http://mctrans.ce.ufl.edu/featured/tsis), contains the latest information about new tools, product updates, known problems, example projects, and usage tips.

**VBS**
Visual Basic Script. A file with a VBS extension that contains a Visual Basic script.

**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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