TSIS User's Guide

Version 5.0

Contract No. DTFH61-95-C-00125

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Foreword

This User's Guide describes how to install and begin using the **T**raffic **S**oftware **I**ntegrated **S**ystem (TSIS). ITT Industries, Inc., Systems Division is maintaining TSIS under the direction of the Federal Highway Administration (FHWA) on Contract Number DTFH61-95-C-00125.

For detailed information on how to use the individual components of TSIS, please refer to the User's Guides for those individual components.

Abstract

The FHWA's **T**raffic **S**oftware **I**ntegrated **S**ystem (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.

Contents

1 About TSIS

1.1 Introduction

This guide describes how to install and begin using the **T**raffic **S**oftware **I**ntegrated **S**ystem (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 .

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. 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.

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 5.0

In addition to the new look and feel of the TSIS environment, the TSIS 5.0 package introduces many new features, including a new GUI-based traffic network and simulation input editor known as TRAFED. Also, on-line help is now provided in an HTML format for all TSIS components. This allows us to place the written User's Guides on-line, without having to modify the original documents. The HTML help system uses your Internet browser to provide a powerful, flexible, hypertext-based help utility. Context-sensitive help is still available via the **F1** key.

The following sections describe the new features for each of the pre-configured TSIS components.

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 introduces the following new features:

- **Project View.** The Project view contains a tree control that allows you to efficiently manage your projects. In this view, the set of files that compose the case have a unique root name and are differentiated by their file extension. Expanding a project on the tree displays all the cases associated with that project. Expanding a case on the tree displays the case files whose extensions have been registered with tools in the TSIS suite. At this level, you can apply a tool by double-clicking on the file type (default tool), by highlighting the file type and selecting a tool from the tool bar, or by right-clicking the file type and selecting a tool from the pop-up menu.

- **Output View.** The Output view is used by the tools in the TSIS suite to display processing output and informational messages. This view also includes the browser tab that displays the TShell Welcome panel. As different tools run in TSIS, new tabs are created that show output generated by the tools. You can also save the information to file for future reference.

- **Container/Server.** TShell can now incorporate tools that are OCXs, in addition to executables and dynamic-link libraries. These OCXs can access the TShell interfaces to use TSIS for special purposes, e.g., the TSIS Text Editor is an OCX that displays information in the TShell Output view. You can add your own OCXs by configuring new tools and using them as desired.

- **Text Editor.** TSIS includes a text editor that "understands" the CORSIM TRF file format. When editing a TRF file with this editor, the 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.

- **Scripting.** TShell includes an engine for running Visual Basic Scripts. You can create your own scripts to customize TSIS. We have included two scripts with this release. One is a multi-run script that repeatedly runs CORSIM on a test case with different random number seeds. The other script runs CORSIM on many different test cases. Visual Basic Script language is widely used and enhances the flexibility of the TSIS package.

1.3.2 CORSIM

Version 5.0 of CORSIM offers the following new features:

- **Freeway HOV Operations.** This feature, which was introduced in Version 4.32, has been finalized. Included are new inputs to specify what percentage of HOVs will use the HOV facility (Record Types 33 and 70) and a new input to specify where HOV vehicles begin to react to an off-ramp (Record Type 20). HOV lanes are now allowed on interface links.

- **Control Delay MOE.** This MOE was added for surface-street intersections and can be used to calculate the Level of Service of an intersection or intersection approach using the HCM method.

- **NETSIM Vehicle Type Specific Multipliers for Surface Street Turn Movements.** This is the NETSIM equivalent of the FRESIM feature introduced in version 4.32. It allows users to apply different turn percentages to different vehicle types, such as trucks. NETSIM and FRESIM both use Record Type 24 for this feature.

In addition to these new features, CORSIM 5.0 includes enhancements and fixes to previously identified problems such as:

- Record Type 147 can now be used in FRESIM to specify the distribution of free flow speed based on driver type. It previously could only be used in NETSIM.

- Detectors are now allowed on interface links.

- Any configuration involving stop sign control can be modeled. Previously, some configurations involving stop sign control were not modeled correctly. Logic was also improved to model configurations involving both stop sign and yield sign control.

- The probability of joining spillback, entered on Record Type 141, now also applies to left turning vehicles. It previously applied to through vehicles only.

- The maximum number of FRESIM detectors was increased from 300 to 600. The maximum number of FRESIM detector stations was increased from 70 to 200.

- Many existing features were significantly improved. Errors in FRESIM collision avoidance, destination assignment and leader determination were eliminated. Changes were made to the logic that deals with vehicles crossing interface nodes to improve the car following between networks. Errors in processing truck restriction lanes were corrected. An error in the way vehicle counts on Record Type 53 were converted into entry volumes was corrected.

- FRESIM uses an iterative process to solve a set of equations to assign origin-destination percentages based on inputs from Record Types 25, 26 and 74. Record Type 74 now includes an input for overriding the default value of the criteria for determining that the solution of the gravity model has been reached.

Finally, the following items were changed from version 4.32:

- FRESIM Record Type 24 was modified. The specified link must be a mainline link. In version 4.32 the specified link was an off-ramp link. This was done to make it more compatible with the way it is used in a NETSIM network.

- The change to the NETSIM lane channelization code zero that was introduced in CORSIM 4.32 was removed. A blank or zero channelization works as it did in version 4.2 and earlier.

1.3.3 TRAFVU

Version 5.0 of *TRAFVU* offers the following new features:

- **Roadway Drawing Improvements.** Roadway drawing in version 5.0 is more robust and allows you to more easily control the look of the network, including curvature and intersection connections. In both freeway and surface-street roadways, TRAFVU consistently uses the CORSIM curvature code (i.e., curved links will be curved and straight links will be straight). An additional parameter is supplied that allows you to control the minimum radius of curvature for roadway drawing. We attempt to more closely match the input link length for curved links. In drawing roadways, version 5.0 places the left curbs on the specified nodes and applies specified link distances along the left curb. These consistencies lead to more accurate link lengths and a better depiction of your network. Finally, freeway multi-destination lanes no longer draw overlapping curb lines.

- **Status Bar.** Each network window within TRAFVU now has a status bar. The status bar is used to display the current network time and time period. The status bar also displays the current mouse position in network coordinates. Dragging the arrow cursor over a portion of the network will drag a line whose network distance will be displayed in the status bar. When the mouse is placed over a tool bar button, the status bar displays a brief description for that button.

- **New Tool Bar.** We have modified the TRAFVU tool bar to look more like a standard Windows tool bar and to match the tool bars in the other TSIS components. Additionally, we have modified the behavior of the zoom and pan buttons to match the operation of the same buttons in the TRAFED network editor. Once pressed, these buttons remain depressed and their associated operations remain active until terminated by the user (i.e., you press another button, right click, or press the escape key). Animation will continue when different selections are made instead of stopping every time a different button is selected.

- **Case Reload.** From the File pull-down menu, you can reload the currently active TRAFVU case. This is particularly useful when adjusting the CORSIM input file to achieve the desired network geometry.

- **Attribute Windows.** We modified the link attribute menu window to display the Link ID in its title. This gives you a convenient method for identifying a particular link. We also modified the placement of the menu and associated attribute windows to prevent them from "falling off" the screen. We have also provided the ability to copy the text from the attribute windows and place it on the system clipboard.

- **New Map Adornments.** TRAFVU 5.0 now displays the following CORSIM features:

  - Warning signs (vehicle reaction point positions)

  - Truck lane markings

  - RTOR markings

- **Smaller Signal Heads.** The size of the signal heads displayed in TRAFVU has been reduced to alleviate the problem of the signal heads covering portions of the roadway.

- **Dynamic Scrolling.** Dynamic updating of the network map when using the window scroll bars is now the default behavior. If you have a less capable computer, you can disable this feature via the Options pull-down menu.

- **Keyboard Animation Control.** The space bar now toggles animation between play and pause as opposed to just pausing the animation.

- **Startup Warnings.** When loading a case in TRAFVU version 5.0, only errors and significant startup warnings are displayed when encountered. Basic information and less significant warnings (e.g., missing animation data or link length discrepancies) are not automatically displayed. However, you can access all startup information, warnings, and errors for a case via the **Messages** button in the Case Description window, at any time while the case is loaded.

1.3.4 TRAFED

TRAFED is a new product distributed as part of the TSIS package. It allows you to easily create and edit CORSIM traffic networks. Rather than listing its numerous features here, we have highlighted some of the more interesting features of TRAFED:

- Import an existing TRF file, edit the network, and export the network to TRF file.

- Import a bitmap image of a network (e.g., map or aerial photo) to use as a guide for laying out a network.

- Extend an existing network by connecting links to existing entry or exit nodes, which become internal nodes.

- Split existing links by dropping a node on an existing link to create two links.

- Edit most CORSIM input parameters by simply right clicking on the link or node and editing the data in the appropriate field.

1.4   Purchasing TSIS

The TSIS product is distributed by the following vendors:

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

PC-TRANS

> University of Kansas Transportation Center
>
> 1530 W. 15th Street, Room #2011
>
> Lawrence, KS 66045-7609
>
> tel: (785) 864-5655
>
> fax: (785) 864-3199
>
> pctrans@ukans.edu
>
> http://www.kutc.ku.edu/pctrans

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, 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 5.0 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. 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

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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 4 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.

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.

- 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

For additional information regarding the TSIS package and the CORSIM model, please visit the TSIS web site at: http://www.fhwa-tsis.com. 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 required to install and execute 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

The following are required to install TSIS:

- CD-ROM drive or access to a network installation of TSIS

- A minimum of 25 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 95, Windows 98, Windows NT 4.0, Windows Me, and Windows 2000

- If your computer runs Windows 95, OEM Service Release 2 (OSR2) or later must be installed. To determine which service release is on your computer, right-click on the "My Computer" icon on your desktop and select "Properties". The resulting Windows System Properties dialog displays the version number for your system. Versions 4.0.950 or 4.0.950a indicate that you have an old version of Windows 95, on which TSIS may not work properly. Versions 4.0.950b, 4.0.950c, 4.0.1111, or anything else indicate you have a newer version of Windows 95 and TSIS should operate properly.

- TSIS should install and operate properly on all versions of Windows 98.

- If your computer runs Windows NT 4.0, Service Pack 3 or higher must be installed. The blue screen you see when starting your machine indicates which service pack, if any, is installed. You can download service packs for Windows NT 4.0 from Microsoft's web site.

- Although we have successfully installed and executed TSIS on Windows Me and Windows 2000, we have not performed sufficient testing at this time to officially support these operating systems.

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.

- Microsoft Internet Explorer version 4.01 SP2 or higher must be installed

- We have included the setup program for IE4 on the TSIS 5.0 installation CD in case you need it, or you can download newer versions from Microsoft's web site.

3.2 Installing TSIS 5.0

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 5.0. If you are upgrading an earlier version of TSIS (DOS or Windows) and want to retain that older version, we recommend that you install TSIS 5.0 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 5.0. The TSIS 5.0 installation will warn you and allow you to change the directory if you attempt to install TSIS 5.0 in a directory where a previous version of TSIS is installed.

3.2.2 Installing TSIS

When you insert the TSIS 5.0 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.
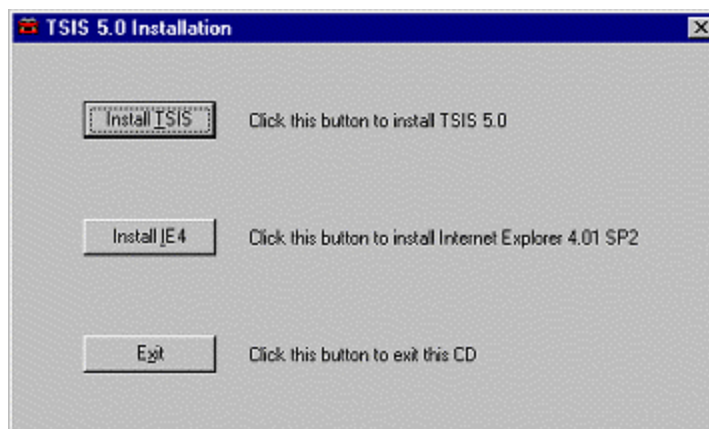
If you do not need to install Internet Explorer, or do not know if you need to, click the **Install TSIS** button. If a newer version of Internet Explorer is required, the setup program will display the following dialog, and you will be able to return to the previous dialog to install Internet Explorer.

Once Internet Explorer is installed, you can return to the TSIS 5.0 Installation dialog to install TSIS. After InstallShield loads the TSIS installation wizard, you will see the following message. While this message is displayed, the setup program is checking for several Microsoft components that are required by TSIS. If your computer has the correct versions of these components, the installation will continue with the main TSIS installation page. These required components are listed and briefly described in Section 3.2.4.
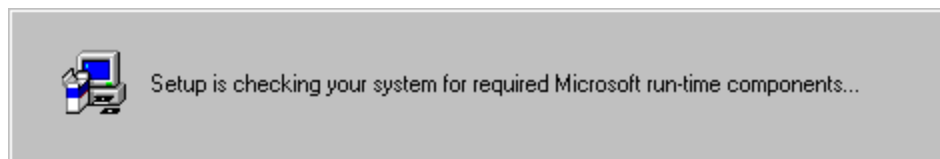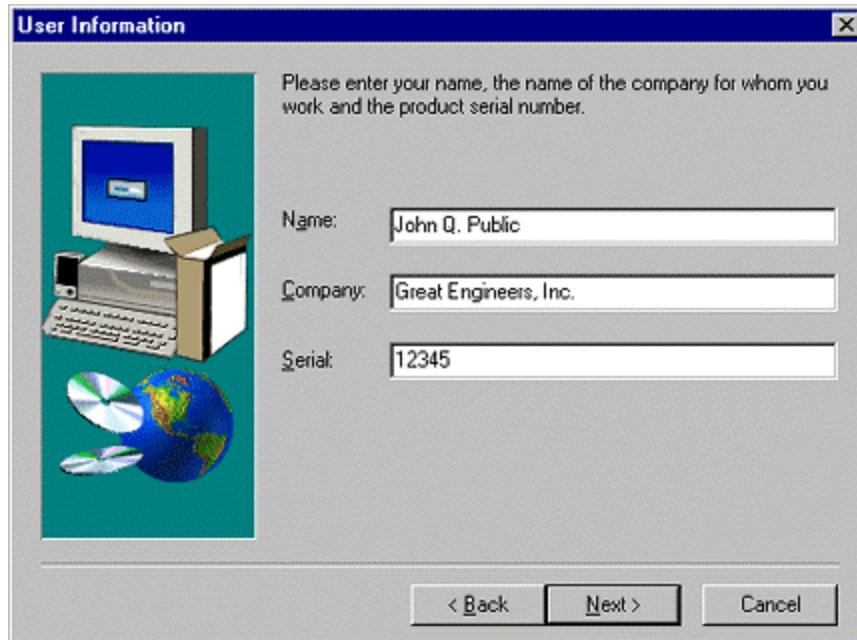
If your system does not have all of the required Microsoft components, the setup program will display the following dialog box that indicates which components are missing or need upgrading. You will then be given a choice to abort the installation or to continue and have the components installed.

The components that are listed in this dialog depends on the operating system and what you have loaded on your computer. If you choose to continue, the setup program will begin installing the required components.

During this process, the setup program may need to reboot your computer. After the required components are installed, the TSIS installation wizard will begin. The first page 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.
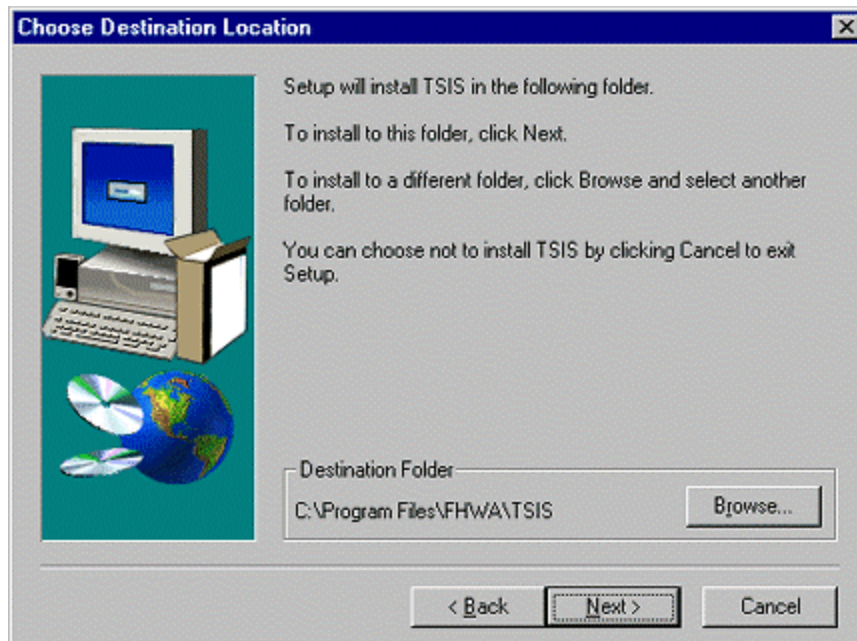
When you press the **Next** button, the setup program will display the data you entered and ask you to confirm it. If the data is not correct, you may return to this dialog and reenter it. Once you confirm the information, the setup program will then display the following dialog that allows you to select 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.
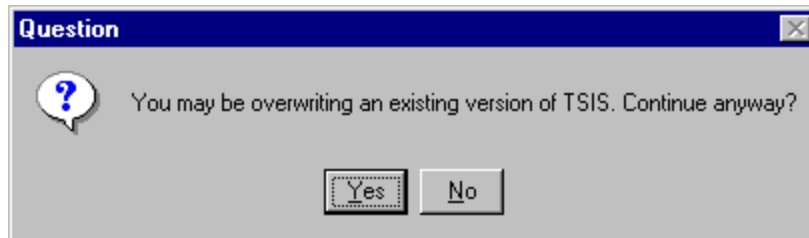
If you select **No** on this dialog, the setup program will return to the destination location dialog. Once the destination folder is selected and accepted, the setup program will ask you to select a setup type from the following dialog.
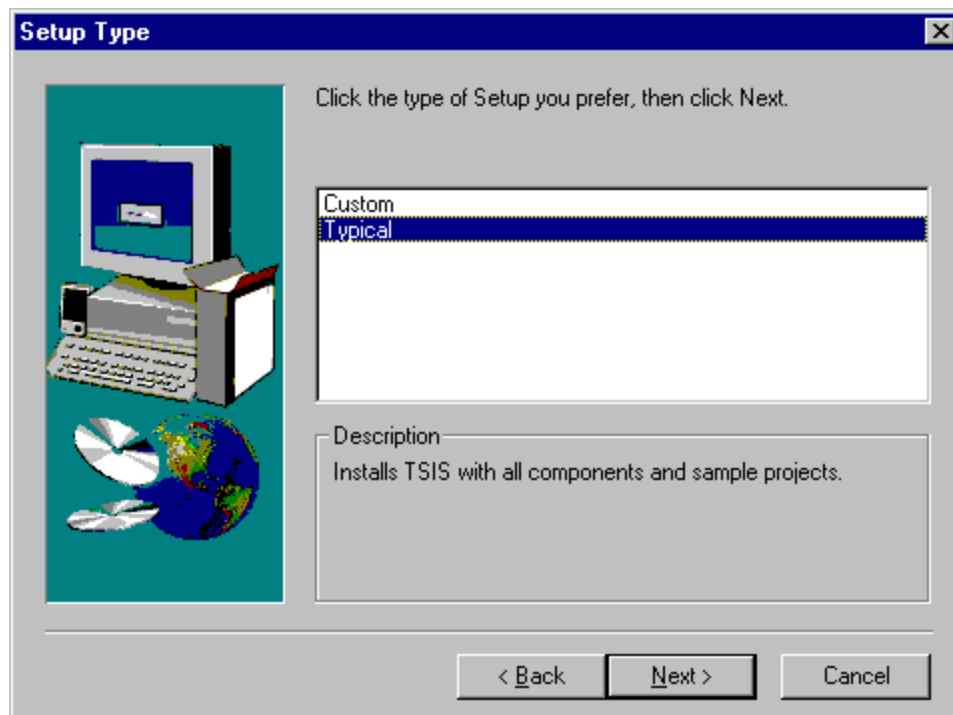
If you choose the "Typical" setup, all TSIS components and sample projects will be installed. If you choose the "Custom" setup, the following dialog will appear when you press the **Next** button. From this dialog, you can specify which components to install and can choose to not install the sample projects.
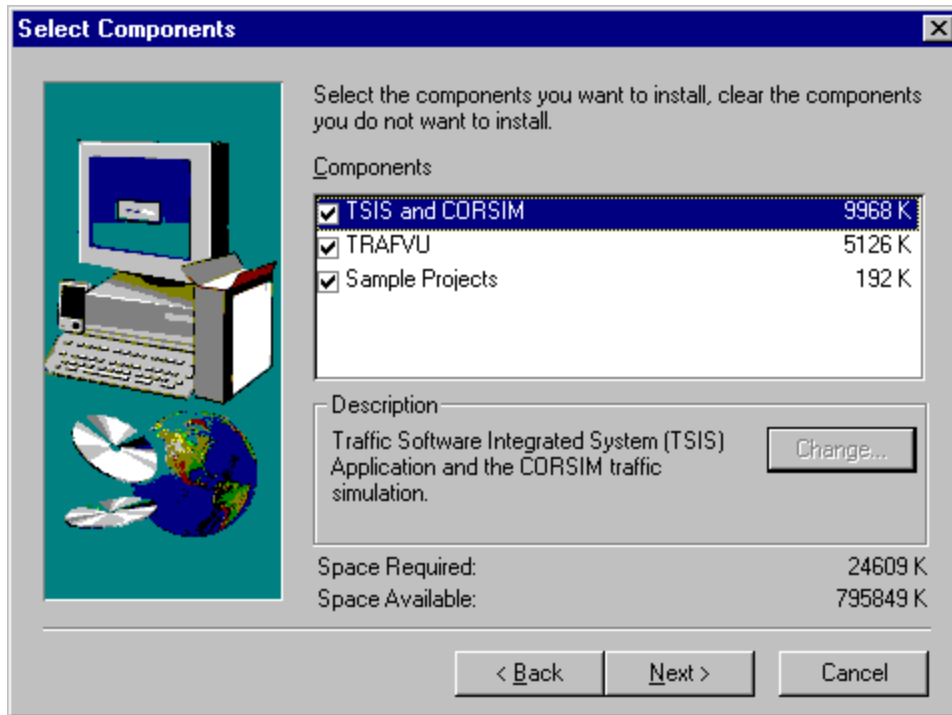
If you choose to install the sample projects, the next dialog in the sequence will ask you to specify a directory in which to install the sample project files. Like the TSIS destination folder dialog, you can accept the default or specify a different folder with the **Browse** button. If the specified 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.
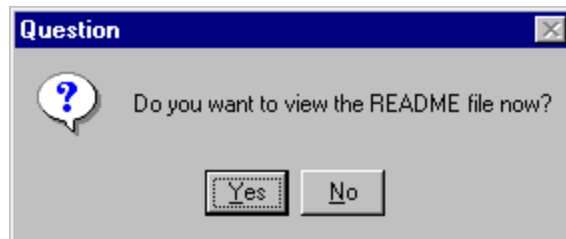
We suggest you read this file for the latest information about the TSIS product. You may also choose to review this file after the installation. The readme file is located in the directory in which you installed TSIS and is viewable using any text editor. Also, you may view the readme file directly from the Welcome browser tab in the TSIS application. When you are finished viewing the readme file, the setup program is finished installing TSIS and dipoles the following dialog. At this point, you complete the installation process by pressing the **Finish** button.
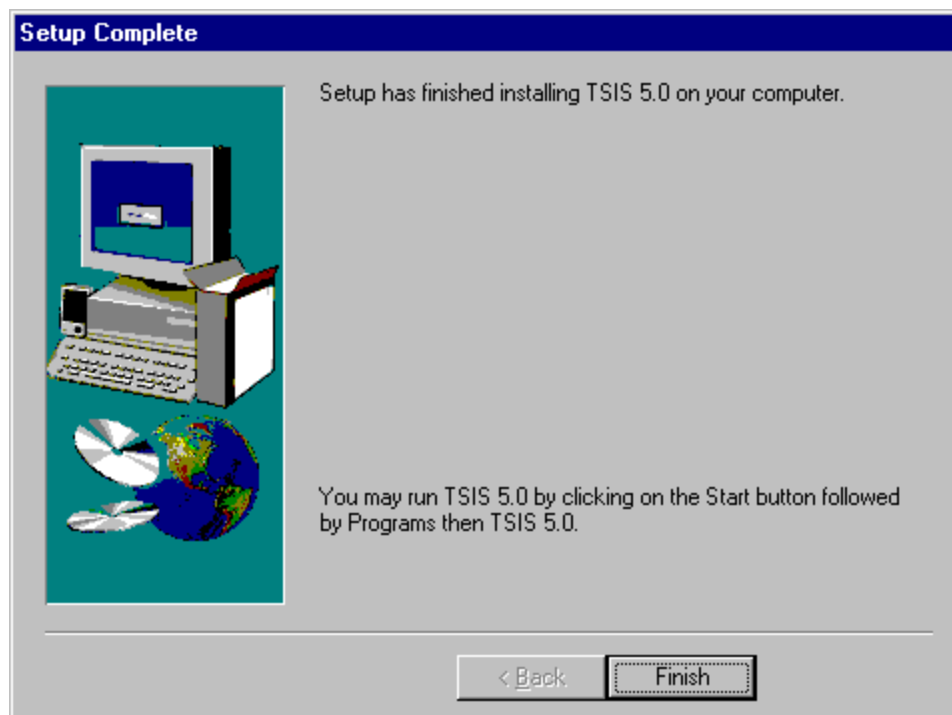
3.2.3 Adding or Restoring TSIS Components

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

On platforms with the Windows NT operating system, you must have administrator privilege to install TSIS 5.0. After installation, any user can run it.

TSIS 5.0 can co-exist with a previous installation of TSIS 4.x, if 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 installation of TSIS 4.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 and installs several Microsoft-supplied components and files to your computer's system directories. The setup program will only install newer versions of these components and files. Furthermore, the setup program will inform you which components need to be upgraded, and will allow you to terminate the installation prior to installing the components. The required Microsoft components include:

- Microsoft Data Access Components (MDAC) - support for the TRF file description database.

- Microsoft DCOM - support for the component architecture used by TSIS.

- Microsoft Common Controls - support for Microsoft standard controls and dialogs used by TSIS.

- Microsoft HTML Help Controls - support for Microsoft compiled HTML help view used by TSIS.

- Microsoft Internet Explorer - support for Internet browser pane used by TSIS.

These components are installed using Microsoft-supplied installation programs, which only install the components if they are newer than the versions that already exist on your system. More information regarding these components can be found at http://www.microsoft.com. 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

- msvcirt.dll

- msvcp60.dll

- msvcrt.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 5.0. Select TSIS 5.0 with the mouse and press the **Add/Remove** button. This will uninstall TSIS 5.0 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 5.0 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 5.0 submenu. From the TSIS 5.0 submenu, you can launch either TSIS 5.0 or TRAFVU.

You may also start TSIS by any of the usual Windows methods, including double-clicking on a TSIS project (TCF) document. You can even launch TSIS from an MS-DOS prompt or the "Run…" command in the Start Menu.

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. Note, multiple runs of the simulation for gathering statistics is still considered part of a single case if 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

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

A 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.

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.

PC-TRANS

A vendor that distributes and supports the TSIS software. For more information, please visit the PC-TRANS web site at: http://kuhub.cc.ukans.edu/~pctrans.

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.

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://www.fhwa-tsis.com, 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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