

TMT

Traffic

Volume

Trends

User Reference Manual Version 1.0

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Office of Highway Policy Information

**United States Department of Transportation
Federal Highway Administration**

Traffic Volume Trends Version 1.0
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1.0 Introduction

The Traffic Volume Trends (TVT) Application is designed to allow either the State or National users the ability to estimate trends in vehicular travel on the highways of urban and rural America. This system allows the user to process road-usage data, edit the data, and use it to evaluate current trends in traffic volume. Data is stored on relational tables using Microsoft Visual Foxpro as the database engine. These tables are populated with data uploaded from ASCII files in Automatic Traffic Recorder or Standard Description Record formats defined in the current edition of the U.S. Department of Transportation Traffic Monitoring Guide (often referred to as the TMG).

The TVT software package loads and validates data, allows editing, performs calculations and estimates on the data and generates reports. Estimation can also be performed on States without data, based on data received from adjacent States.

The latest release of the Traffic Volume Trends application is designed to run on a Pentium processor under the Windows 95, 98 or NT operating systems with a minimum memory requirement of 32 megabytes. Disk requirements are dependent on the volume of data; however, it is recommended that users of this system have at least 1 gigabyte of disk space available.

Notes on fonts used in this document: All references to TVT options, window names and controls are written in *italics*. Text of special importance is written in **boldface** type.

1.1 Acknowledgments

Windows, Windows 95, Windows 98, Windows NT, Visual Foxpro, Windows Explorer and Internet Explorer are all trademarked entities of the Microsoft Corporation.

Pentium is a trademarked entity of Intel Corporation.

Dynazip is a trademarked product of the Dynazip Corporation.

2.0 Installation

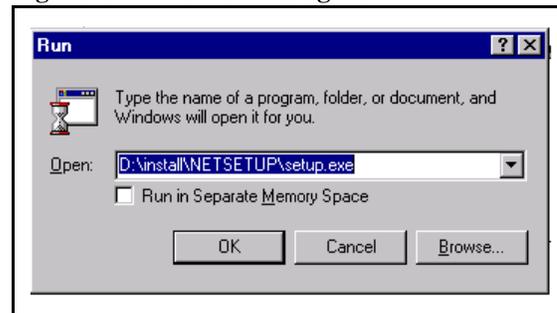
The Traffic Volume Trends System is installed from CD-ROM disk (supplied by the Office of Highway Policy Information).

2.1 Installation from CD ROM

Place the CD-ROM diskette into the drive (usually the D: drive) and then use the mouse to point to the Windows *Start* button on the bottom left corner of the screen. When clicked, a menu displays with various options. Select the option called *Run*. A dialog box appears that will prompt you to enter the name of the installation program. The name of the program is **Setup.exe** and should be in the **D:\NETSETUP** directory*. You may either type the fully-qualified name (drive, path, and program name), or use the *Browse* command button to find the installation program. Note that if you use the *Browse* button to select the program, the *Run* window will re-display with the path and program name entered into the *Open:* text box.

Once the program name is entered, you may begin the installation by clicking on the *OK* command button.

Figure 2.1 - The Run Dialog Box



Installing the Traffic Volume Trends system is similar to installing any other Windows program. It is recommended that you accept the default settings if you are unfamiliar with your machine or installation programs in general. More experienced users may elect to specify a different program path or program group if desired.

* Note that the drive identifier may vary from machine to machine. The drive specified should be the CD-ROM drive on your machine.

Once the program has been installed, shut down and restart Windows. After Windows has been restarted, a new program icon will be added to your *Start* menu. Select the item called *Programs* and then from the secondary menu, *Visual FoxPro Applications*. Select this and you will see another icon titled *TVT*. Clicking on this icon will start the application.

2.2 Creating a Program Shortcut

When TVT is installed, a program group item is added to your *Start* menu but not the actual Windows desktop. The instructions here are included to assist you in creating an icon on the desktop. These icons are commonly referred to as program shortcuts.

First, start Windows Explorer (not to be confused with the Internet Explorer), and select the drive and directory where the TVT program is stored. Unless you specified a different path during installation, the TVT program will reside on the C: drive under directory TVT. Find the icon for TVT.exe. Right click on the icon and a quick menu displays to the right of your cursor. One of the items on this menu will be *Create Shortcut*. Click on this item and a shortcut will be created. Once it is created, a new icon will be added to the directory called Shortcut to TVT.exe. Highlight this item and then drag it to your desktop. Your TVT shortcut is now created and ready to use.

Below is a screen display of Explorer with TVT.exe selected and the quick menu visible. In the diagram on the right is an example of a shortcut before it is moved to the desktop, and below that is the icon on the desktop.

Figure 2.2 - Windows Explorer with TVT.exe icon selected and Quick Menu displayed. Create Shortcut Item is Selected

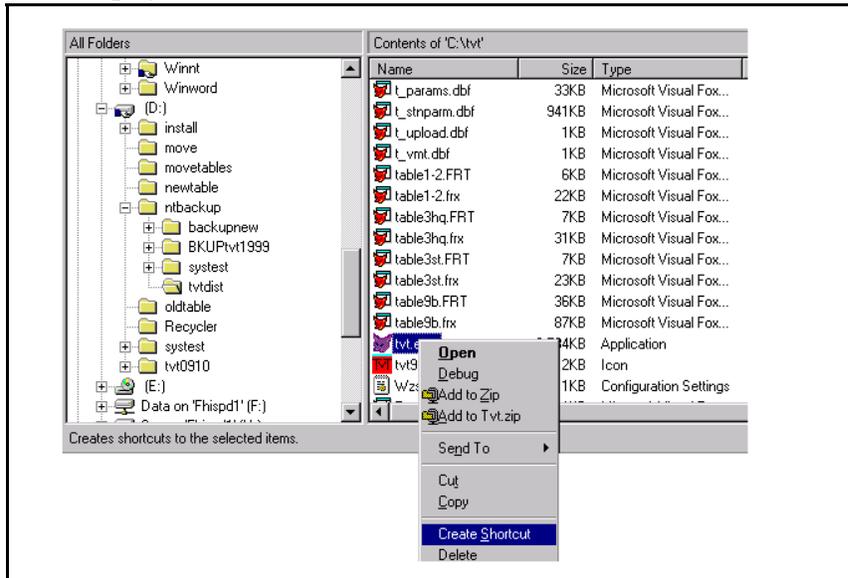


Figure 2.3 - Shortcut as displayed in Explorer

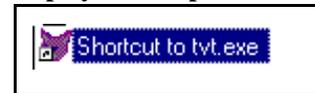


Figure 2.4 - Shortcut as displayed on the Desktop



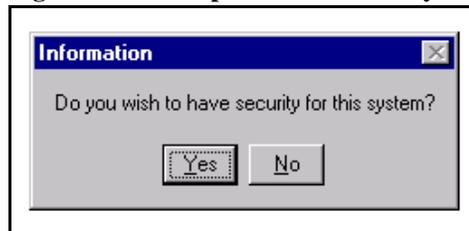
3.0 Running TVT for the First Time

When you first start the Traffic Volume Trends application, you will be prompted to supply additional information that TVT requires to process on your machine. Once you provide this information, you will not be prompted again unless you reinstall. The information requested must be supplied, thus if you cancel TVT before providing it, you will be prompted again the next time you run TVT. Note that even though you are prompted for this information during the initial startup of TVT, you do have the opportunity to change it later.

3.1 Security

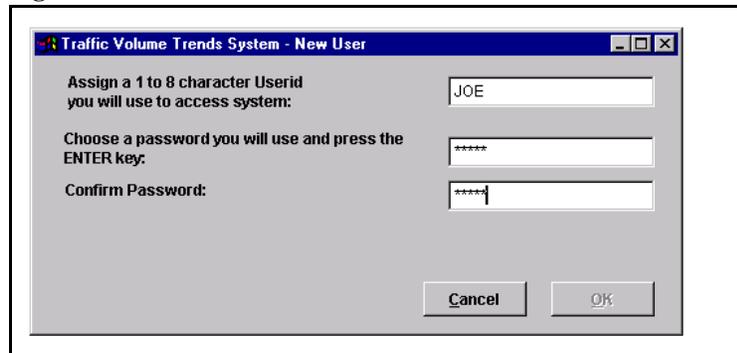
The first thing you will be asked is whether you wish to have security features. If you specify *Yes*, any future user accessing the system will be prompted for a user name and password. In addition, you will be prompted to supply a user name and password for yourself before processing continues. See the illustrations on the following pages for an example of these prompts.

Figure 3.1 - Prompt for User Security



If you click *Yes* on the above prompt, the *New User* window will display, otherwise you will proceed to the next prompt (figures 3.3 and 3.4). Enter a user name (userid) and a password.

Figure 3.2 - The New User Window



Once you have decided upon and entered a password, you must enter it again in the *Confirm Password* text box. The userid and password are **not** case-sensitive. Passwords **must begin with an alphabetic character**.

3.2 User Type

Once you have specified whether or not you wish to have user security, TVT will then ask you what type of user you represent. The *Set User Type* window displays allowing you to choose either *National* or *State*. A National user is typically a U.S. Department of Transportation employee responsible for collecting data for the nation, while a State user is usually a State employee collecting data for his or her State. The basic difference between the two types is the National user is defined to perform tasks applicable to all collected States while a State user is normally defined to one State only.

Figure 3.3 - Set User Type (National)

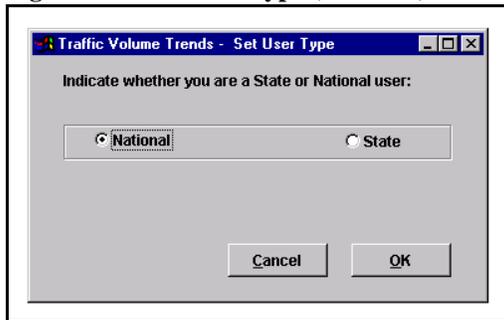
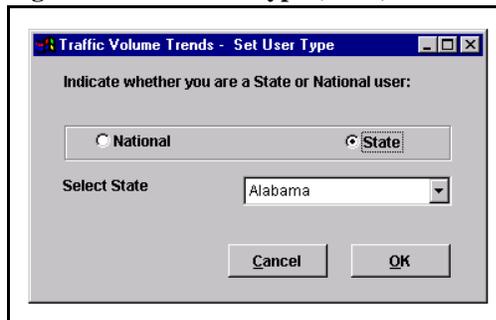


Figure 3.4 - Set User Type (State)

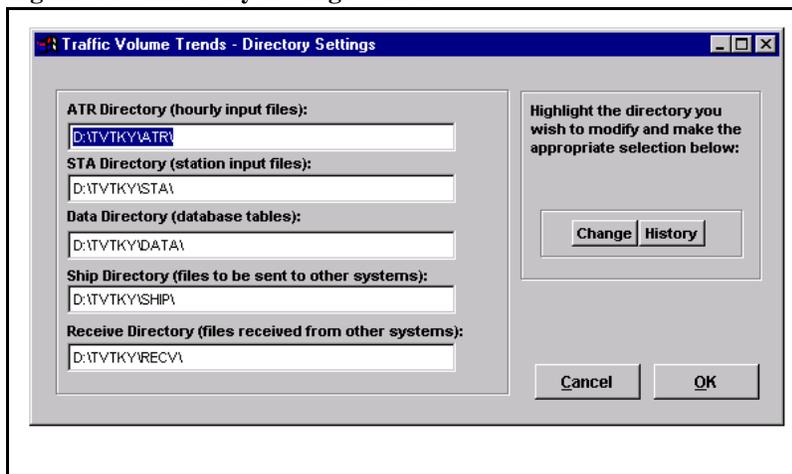


If you indicate that you are a State user, a drop-down combo box will display with a list of State choices. Click on the desired State to select. When you have made a choice (Headquarters or State), click the *OK* command button to proceed.

3.3 Data Directories

The last thing TVT requires is the location of your data directories. By default, TVT creates these directories. They are all subdirectories of the directory where the software is installed. These subdirectories are as follows: ATR (used to store ASCII input hourly files), STA (used to store ASCII input station files), DATA (used to store database files), SHIP, and RECV (for ship and receive operations). If you prefer, you can simply accept these defaults by pressing the *OK* command button. However, TVT allows you to specify your own directories. Be advised that directories specified here become the new default.

Figure 3.5 - Directory Settings Window



4.0 Available Options Under TVT

The Traffic Volume Trends System is a Windows-based application and is menu-driven. All available options are accessible from the menu bar at the top of the screen. The available options are listed below with a brief description. Each item will be discussed in detail later.

4.1 Menu Options

Figure 4.1 - The Main Menu Bar



4.2.1 File

When the *File* item is selected from the main menu bar, a drop down list displays with the following additional options:

- S** *File Transfer*. This provides options to convert ATR 1 Card (1CD) station files into the Station Description Format (STA), export hourly ATR data from DBF format to ASCII, and ship or receive TVT data.
- S** *Load/Validate*. This option is used to load and validate station or hourly ASCII data into the TVT system. Data is then stored in DBF tables.
- S** *End-of-Year*. This is used to calculate the end of year values and normalize TVT multipliers based on input received from the Highway Performance Management System (HPMS). This option is utilized only once per year and usually performed at Federal Highway Administration (FHWA) Headquarters.

4.2.2 Edit

This option is used exactly like *Edit* in any other program that follows the Windows standard. Using this option, one can select all text, cut, copy, paste, undo, redo, find and replace.

4.2.3 View

This option is used to allow you to view or edit the hourly or station DBF tables.

- S** *View/Edit Stations*. This provides the user with the ability to view all station records for a given state, month, and year; replace existing fields; or use system-defined controls to set values. If data has been changed, the user has the option to cancel or save and validate it.
- S** *View/Edit Hourly Data*. This provides the same capabilities described above in the *Edit Stations* option, except that it is used on hourly data tables.

4.2.4 Directory

This option is used to change the default directories used by the TVT application. From here, the user can specify the directories where the data resides. Note that some tables, such as the Vehicle Distance Traveled (VDT) table, are considered system tables. System tables are stored in the same directory as the TVT program and this directory cannot be changed unless you reinstall the program.

4.2.5 Reports

This option is used to generate reports from the TVT database. All reports can be viewed on the screen, written to a file or routed to a printer for print. In addition, some reports can be saved as a file in Lotus format (WK1) for export into a Lotus 1-2-3 spreadsheet application. Note that you must have a copy of Lotus 1-2-3 to utilize this feature.

- S *Discrepancy Report.* This report lists discrepancies encountered during the load, validation, estimate and calculate processes. The report can either be defined to list all errors or only errors for a given State, month, and year.
- S *Number of Stations.* This report lists all stations in the system, or if the user chooses, selectively lists stations by year or by year and month.
- S *Monthly VDT.* This generates the Vehicle Distance Traveled report by month and year.
- S *Annual VDT.* This generates the annual Vehicle Distance Traveled report. The National user has the option of selecting one State, all States, or generating a nationwide summary.
- S *Table 1-2 Reports w/Graphics.* This option allows you to generate Table 1 (Estimated Individual Monthly Motor Vehicle Travel in the United States), Table 2 (Estimated Cumulative Monthly Motor Vehicle Travel in the United States), Table 9B (Estimated Vehicle Distance and Percent Change From Same Period Previous Year), Figure 1 (Moving 12 Month Total on All Highways), and Figure 2 (Travel on U.S. Highways by Month) reports based on a specified year. Figure 1 and 2 reports also provide graphs.
- S *Table 3 Reports.* This option allows you to generate the Table 3 report (Changes on all Rural and Urban Roads by Region and State) for a specific year and month, by region or by State station.

4.2.6 Utilities

This option provides various utilities that allow you to change parameters, select system security, backup critical data, and fine-tune system performance.

- S** *Security.* This option is divided into two screens. On the first screen, you may use this option to enable or disable security. If enabled, TVT will prompt all users for a userid and password before allowing them to access the system. You may also add new users, delete existing ones, or change an existing user's security level. The highest security level is 3 and the lowest is 1. In the current release, the security level is utilized only to control password functions (Only level 3 users can modify or reset another user's password). In future releases, security level features will be further enhanced. On screen two of this option a user can change his or her password, or reset it to exactly match their userid. If the user is security level 3, they have the ability to reset any user's password.
- S** *Modify Parameters.* This option is used to change parameters controlling the TVT system. This includes adjacent States, direction of travel, ATR manufacturers, Functional Class and Route categories, HPMS subdivisions and station percentages. The user simply selects the parameter and replaces the existing value with a new one.
- S** *Pack.* Use this option to permanently remove records marked for deletion on either system or data tables or both.
- S** *Reindex Tables.* This option is used to recreate the compound indexes associated with TVT tables. No selection is required as all indexes are re-created by default.
- S** *Backup TVT Data.* This option is used to make a copy of an existing table. This option can be used to backup hourly or station tables as well as the VDT table.

5.0 Using the System

This section covers in detail the options for ongoing operations available to the TVT user. Each sub-section describes the selection items accessed from the main menu bar and any subordinate options.

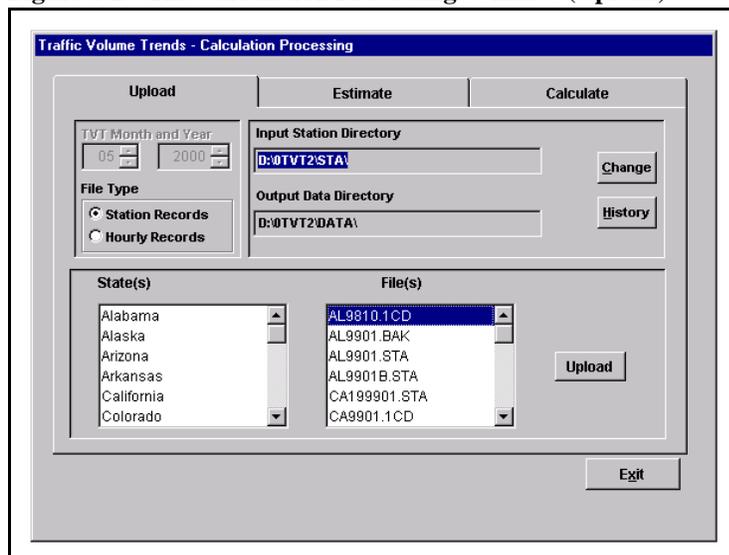
5.1 The File Option

5.1.1 Upload/Validate

The TVT system takes two types of input: station data and hourly data. Station data is used to tell the system where and how the data was collected, while hourly data is the hour by hour collection of actual traffic data. This data is loaded into the system using the *Load/Validate* option. From there it is utilized by TVT to estimate traffic volume trends and calculate a national average.

From the main menu bar, select *File*, then the *Load/Validate* option. The three screen *Calculation Processing* window displays, with the *Upload* screen on top. From this screen you select the type of data (station or hourly), the States to process, and the files associated with the selected States. A user may upload a file with any name or extension as long as the actual data conforms to the formats specified in the Traffic Monitoring Guide. By default, the *Load/Validate* option points to the directories defined when the system is installed (or changed via the *Directory* option). You may elect to specify another directory for the current process by using the *Input* and *Output Directory* text boxes or the *Change/History* command buttons. The system then will then use the directories you've selected.

Figure 5.1 - The Calculation Processing Window (Upload)



Note that any changes you make to the input or output directory paths are used for the current process only. Once you leave the *Load/Validate* window, these paths are reset back to the default directories.

To select a State, click on the desired item in the *State* list box. To select a file, click on the desired item in the *File(s)* list box. For multiple selections, press the CTRL key and then click on any additional choices in the desired list box. Once you have specified the date and selected the State(s) and files to load, click the *Upload* command button to start the load process. If you are processing station records the system will convert the data first to Station Description Format (STA) if it is currently formatted as a 1CD (1-Card) record.

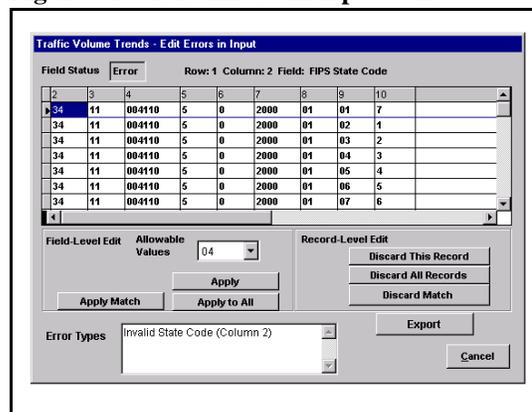
Hourly data can be in the ATR format or the Vehicle Classification Data (CLA) format as defined in the TMG.

The *Exit* command button exits the window.

In the first phase of the upload, each field is validated and any errors are flagged for later edit. Once this process is complete, and if errors are encountered, the *Edit Errors in Input* window displays. You may elect to correct or discard the record. If discarded, the record in error remains on the original ASCII input file but is not passed on to subsequent upload or validation processing. You may also choose to delete all errors instead of correcting them. To discard the current record only, use the *Discard* control. To discard all records, use *Discard All*.

If you choose to correct the errors, use the TAB key or mouse to move to the field has error. You can also click the error shown in the Error Types window. When a field contains an invalid value, the field status box displays the message “ERROR,” and an *Allowable Values* control becomes visible. This control will contain valid values that you may select. When you have the value selected that you want, press the *Apply* command button to make the change. In addition, you may use the *Apply Match* command button to change all values in error that match the current error field’s value or *Apply to All* to change all.

Figure 5.2 - Edit Errors in Input Window



When using the *Apply Match*, the matching fields will be changed to the value specified in the *Allowable Values* control text field. When all the errors have been corrected or discarded, the window will close and processing will resume.

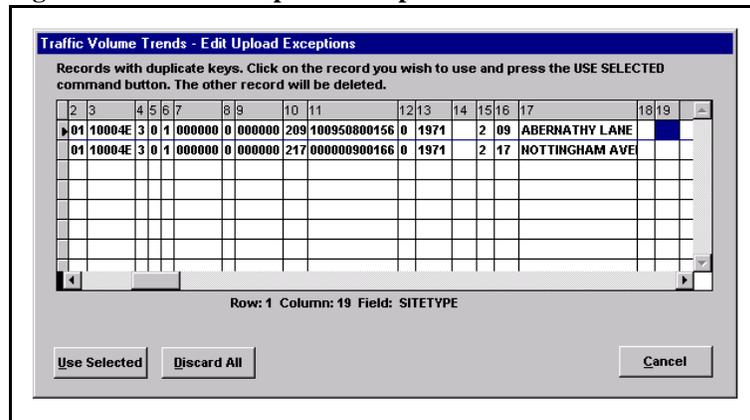
The *Cancel* command button on the bottom right side of the window is used only if you need to halt the upload process. If you click this button, the process will be aborted.

After you have corrected the field errors (or if no errors are encountered), the upload process then checks for duplicate records in the input. This is where two or more input records are exactly the same or the keys used to sort the records are the same. In the first case, where all fields are duplicates, only one record is retained while the others are deleted. This is done automatically by the system. In the second case, where two input records have duplicate keys (but the non-key fields are different), the *Edit Upload Exceptions* window displays. On this form each record with a matching key is listed. To choose a record, select it (by clicking anywhere on the record) and then press the *Use Selected* command button. Once clicked, the other records with duplicate keys are deleted while the one you selected is retained. If more duplicate keys are on the current file, this window will continue to display until all duplicate keys have been handled. Once there are no longer any duplicate keys, the window will close and processing will continue.

You may elect to discard all duplicate keys rather than determining which should be used. If that is your preference, click the *Discard All* command button and all the displayed records with duplicate keys will be deleted. If any additional duplicate keys were encountered, they will then display, otherwise processing will resume.

Again, if you click the *Cancel* command button, the upload process will be aborted.

Figure 5.3 - The Edit Upload Exceptions Window



At this point the last part of the load and validation starts. If the data is hourly input, each individual hour is validated and then written to a monthly file which is input into the estimate process (Screen two of the *Upload/Validation* window). No more windows display.

Station records, however, must be checked against the Master Station table, and if any input records match exactly with a record already on the Master Station table, the input record is discarded. If only the key is duplicate, the *Edit Upload Exceptions* window displays again.

This time you must choose between the new input record or the existing record on the Master Station table. If you choose the former, the new record will be used to replace the existing master record. Otherwise the input record is discarded and the master record is left unchanged.

The controls on this window are similar to those on the previous *Edit Upload Exceptions* window. The *Use New* command button, when clicked, will use the new input record and replace the existing record on the Master Station table. The *Discard New* command button will cause the input record to be discarded and the existing Master Station record to be retained. In addition, there is an *Apply to All Records* check box control. This is used in conjunction with the command buttons. Thus, if you check the *Apply to All Records* control and then press the *Use New* command button, all input records will be used and any matching Master Station record will be replaced. Conversely, if you check the *Apply to All Records* control and press the *Discard New* command button, all new input records will be discarded and the Master Station records will be left unchanged.

Once again, if the *Cancel* command button is pressed, the process is aborted.

Figure 5.4 - Edit Upload Exceptions (Master Station Table)

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
10	14	008013	1	0	3	000000	0	000000	204	000000000000	0	2023	2	04	WILDSTONE RD & A			
10	14	008013	5	0	3	000000	0	000000	204	000000000000	0	1986	2	04	LIMESTONE RD & A			
10	14	008014	3	0	3	000000	0	000000	204	000000000057	0	1950	2	04	DE 2 EAST OF NEW			
10	14	008014	7	0	3	000000	0	000000	204	000000000057	0	1950	2	04	DE 2 EAST OF NEW			
10	14	008015	3	0	2	000000	0	000000	204	000000000000	0	1955	2	04	US 40 EAST OF PLE			

Row: 1 Column: 1 Field: STATECODE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
10	14	008013	1	0	3	000007	0	000000	003	000000000000	0	1986	1900	2	04

LIMESTONE RD & ARUNDEL DR

Use New Discard New Apply to all records Cancel

The last step in the uploading of Station data is the verification step. At this point, the system displays all input records to be added in the *Verify New Master Station Records* window. Note that there is a check box control titled *Associate New Name with Existing Station*. When checked, this flags the selected record as a station that already exists on the Master Station table but with a new station name. A drop down combo box becomes visible with a list of valid stations that exist on the Master Station table that you may use to associate with the new name. Once you are finished, or if you have no names to associate, click the *Process* command button to finish the load validation process. Pressing *Cancel* will abort the process.

Figure 5.5 - Verify New Master Station Records Window

Traffic Volume Trends - Verify New Master Station Records

The following input records are not on the Master Station File and will be added:

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
01	01	000044	1	0	1	00000085	0	00000000	101	101085011200	0	1964	2	06	MP013.1 6.0 MILES	
01	01	000044	5	0	1	00000085	0	00000000	101	101085011200	0	1964	2	06	MP013.1 6.0 MILES	
01	01	000047	1	0	1	00000085	0	00000000	081	000000000000	0	1964	2	06	MP069.2 ON THE CI	
01	01	000047	5	0	1	00000085	0	00000000	081	000000000000	0	1964	2	06	MP069.2 ON THE CI	
01	01	000048	1	0	1	00000065	0	00000000	021	021065208280	0	1964	2	06	MP210.6 2.0 MILES	
01	01	000048	5	0	1	00000065	0	00000000	021	021065208280	0	1964	2	06	MP210.6 2.0 MILES	
01	01	000053	1	0	1	00000059	0	00000000	115	000159169204	0	1964	2	06	MP169.2 2.0 MILES	

State: Alabama

Location on Table:
Row: 1 Column: 1
Field: State Code

Associate New Name with Existing Station

New Station Name: Existing Station:
000044 000001

Apply

Cancel Process

Figure 5.6 - Enlarged View of Associate New Name with Existing Station Check Box

Associate New Name with Existing Station

New Station Name: Existing Station:
06851H 000004

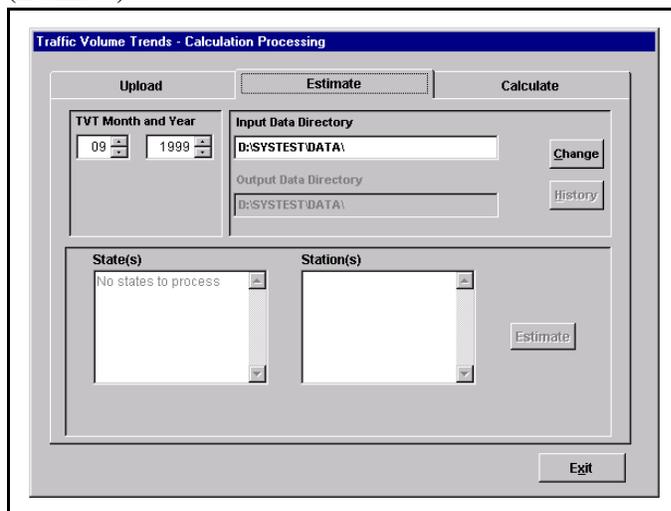
Apply

5.1.2 Estimating Monthly Traffic Volume Trends

To estimate monthly traffic volume trends for a given State or group of States, the second screen of the *Calculation Processing* window is used. To process, you must specify a month and year, and select the State(s) you wish to process. Note that if no files have been uploaded, the *State* list box will be empty. You must upload hourly data for at least one State before you can initiate the estimate process on this screen. This window is similar to the *Upload* screen but with fewer controls. Note that although you may select an input directory, the output directory is fixed and cannot be changed. This is because estimated data is stored in the Vehicle Distance Traveled table (VDT), which is considered a system table and thus resides in the system directory. Also note that there is also a *Station* list box. This control is for information purposes only. It will display all stations within the contents of a currently-selected State.

Once you have specified a date, and have selected at least one State, you may initiate the estimate process.

Figure 5.7 - The Calculation Processing Window (Estimate)



The *Exit* command button, when pressed, exits the window.

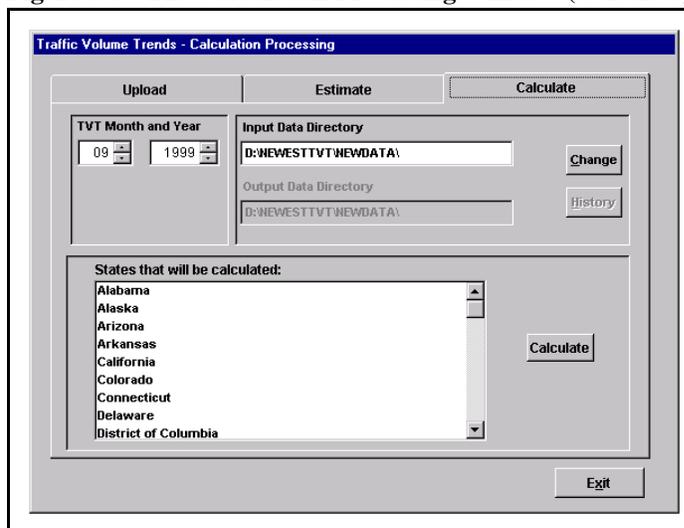
5.1.3 Calculating the National Average

Screen three of the *Calculation Processing* window is the *Calculation* screen. From here you may calculate the average national vehicle miles traveled. To initiate processing from this window, you must have at least one State processed in the upload and estimate processes.

Like the estimate process, calculate does not allow you to specify the output directory. Again, this is because this processes the VDT table which resides in the system directory. Also, you do not select a State, as calculate will only process States that have been uploaded and estimated.

If you wish to change input directories, use the *Change* command button to select a new one. Once you are ready to begin processing, click on the *Calculate* command button.

Figure 5.8 - The Calculation Processing Window (Calculate)



When clicked, the *Exit* command button closes the window.

5.1.4 Convert 1CD

On occasion, you may need to move TVT data files to other systems or send data to other TVT users. This option allows you to convert ASCII station files in 1CD format into the Station Description format (STA).

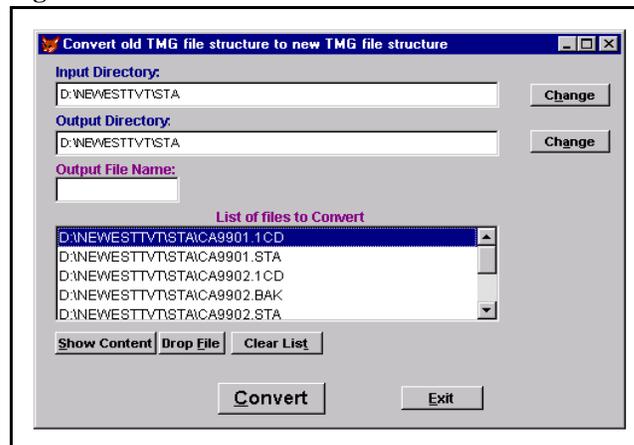
It is accessed by selecting *File* from the menu bar, and then *File Transfer* and then *Convert 1CD* from the drop down menus. When started, the *Convert Old TMG File Structure to New TMG File Structure* window is opened. Any files that are candidates for conversion will display in the list box titled *List of Files to Convert*. To select a file, click on the item and it will be highlighted. To select multiple files, press down the CTRL key and click on any additional items.

The *Input* and *Output* directory text box controls allow you to select your input from another directory, and direct your output to other than the current directory. To change directories, click on the *Change* command button to the right of each field. In the *Output File* text box, enter a one to eight character file name in this field. Do not provide a file extension as TVT will provide one for you. Note that you must choose a file name that is not already in use, otherwise the existing file will be overwritten with the output from this convert.

The *Show Content* command button, when clicked, displays the contents of the currently-selected (highlighted) file. The *Drop File* control drops a file from the *List of Files to Convert* list, and the *Clear Files* control clears this list.

To convert the selected file(s), press the *Convert* command button.

Figure 5.9 - The Convert 1CD Window



5.1.5 Export ATR

This option allows you to select an existing hourly table and convert it back into an ASCII file in ATR format. This is especially useful for States using the TVT system who wish to send validated data in ATR format to Headquarters for loading into that system.

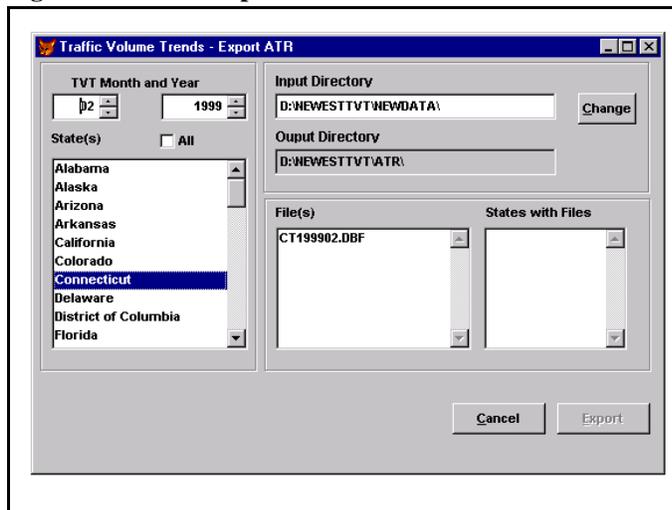
To process, specify the month and year, and then select the States you want to export. If any files exist based on your selection, they will display in the *Files* list box. Click on the files you want to export and press the *Export* command button to begin processing.

To change the input directory, click on the *Change* command button to the right of the *Input Directory* text box. You cannot change the output directory here because all hourly ATR files are stored in the ATR directory. See the *Directory* option in Section 5.3 for help in defining TVT directories.

To select all States for searching, click on the *All* check box above the *State* selection list box. The current input directory will then be searched for files associated with any State.

If you wish to exit the window, press the *Cancel* command button.

Figure 5.10 - The Export ATR Window



5.1.6 End of Year Calculation

The *Calculate End of Year* option is use only once per year and is dependent on the receipt of the HPMSVM2 table from the Highway Performance Monitoring System (HPMS). This table is usually generated in September of each year for data of the previous year. Once received and imported into DBF format (done outside the TVT application), this process may be initiated.

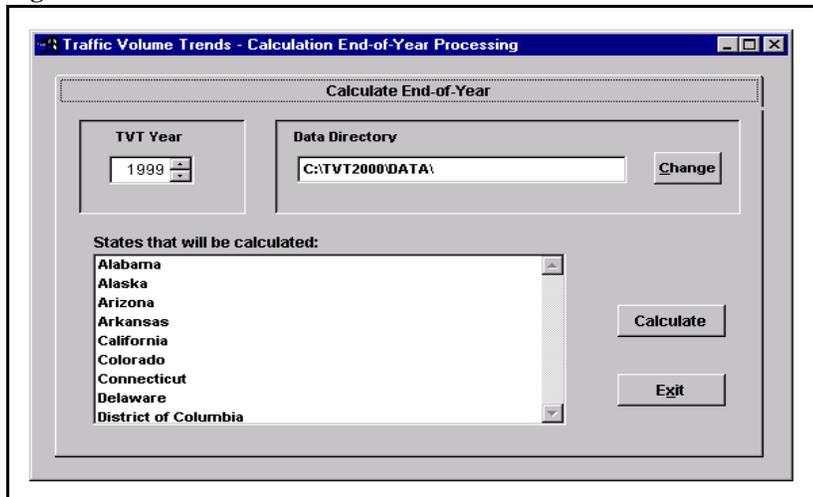
This option is used to normalize the Vehicle Distance Traveled multipliers (used to calculate trends) and to reconcile the TVT data to that generated by HPMS.

Warning: This process, once performed, is irreversible. Assure that the correct files have been received from the HPMS division before commencing processing.

To process, select the year and press the *Calculate* command button. Please note that when processing, the previous year is used. Thus, **if you receive the HPMSVM2 table in September 1999, you will calculate End of Year for 1998**. To change the input directory, use the *Change* command button to the right of the *Data Directory* text box.

To close the window without processing, press the *Exit* command button.

Figure 5.11 - The Calculate End of Year Window



5.2 The View Option

The TVT system provides an editor that allows you to view or edit both hourly and station files. These edit windows are accessed by selecting *View* from the main menu bar and then selecting either the *View/Edit Hourly Data* or *View/Edit Station Data* item. Since both windows are almost identical in appearance and function they will be described together here. Any differences between the two windows will be noted in underlined notation.

5.2.1 Viewing Data

The TVT *View* option allow you to view and/or modify station tables created by the upload process or hourly files created by the same process. Both files are formatted in essentially the same layout as their ASCII counterparts but are in DBF format.

While in the *View* option a number of options are available to you.

You may select any state table that has been previously uploaded. The *State, Month and Year* box displays the current working data. By clicking the drop-down menu on the right corner of the box, the user may view and select data for different state, year, and/or month in the currently-selected directory. Note that instead of the actual file name, you will see the state code, month and year displayed. To make a selection, click on the desired item to highlight it. If your selection is not the table being currently displayed, you will receive messages indicating that the table is being loaded and that the grid is being loaded. If you are viewing hourly data, you will also receive a message indicating that the hours are being converted into readable format. Once completed, the file you selected will be displayed.

To the right of the *State, Month and Year* combo box is the *Current Directory* text box. To change the directory, click the *Change* command button. If no viewable files are available in the current directory, the system will issue a message warning you.

Beneath these two controls is a grid display, showing the actual data on the table. Each row and column is modifiable. Simply move your cursor to the desired field and enter the values you wish to use. You may also use the *Allowable Values* control (below the grid) to select predetermined values. The *Allowable Values* control is usually a combo box with a list of allowable values for a given field. Whenever you move to a new field, this control will change to fit the requirements of that field.

Underneath the grid is a box-bordered area called *Record-Level Edit*. This box provides information about the currently-selected record. The current record number, the total number of records, and any errors in the record are displayed here. Also there is a *Discard* command button. If clicked, the currently selected record will be deleted from the file.

Beneath the *Record-Level Edit* area is another box-bordered area called *Field-Level Edit*. The current row, column and field name are displayed here. To the right of this information is the *Allowable Values* control, which contains valid values for the currently-selected field. When a value is selected in this control and then the *Apply* command button is pressed, the corresponding field in the grid will be changed to match the value of what is in the *Allowable Values* control.

The *Apply* and *Apply to Matching Fields* command buttons all work in conjunction with the *Allowable Field Control*. For example, you are editing the Station ID field, and the current value is 009006E. Using the *Allowable Field* combo box, you find 009006W, which is the new value you wish use. Pressing the *Apply* command button will change the field in the grid to match your specification. Pressing *Apply to Matching Fields* will change all records whose Station ID is 009006E to 009006W.

The *Add New* command button is available only for station data. New station record(s) can be added into the TVT master station database.

In addition, there is the *Exit* command button. When pressed, system will prompt the user for the necessary data saving and validation before returning to the main menu.

Figure 5.12 - The View/Edit Window (Station Data)

Traffic Volume Trends - Edit Station Data

State: KY Month and Year: 03 2004 Current Directory: D:\TVT2\DATA2 Change

State	Month	Year	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
AL	01	1999																2			00
AL	04	2000	4	01														2			04
AZ	05	2000	4	01														2			04
KY	03	2004	4	01														2			04
MD	05	2000	4	01														2			04
WY	04	2000	4	01														2			04
21	000517	7	0	2004	01													2			04
21	000181	1	0	2004	02													2			04
21	000485	5	0	2004	02													2			04

Record-Level Information Errors Only

None

Current Record: 1 Records: 45 Discard Record Add New

Field-Level Edit **Data Entry**

Row: 1 Column: 2 Field: State Code 21

Apply to Matching Fields Apply Exit

5.3 The Directory Option

5.3.1 Defining Default Directories

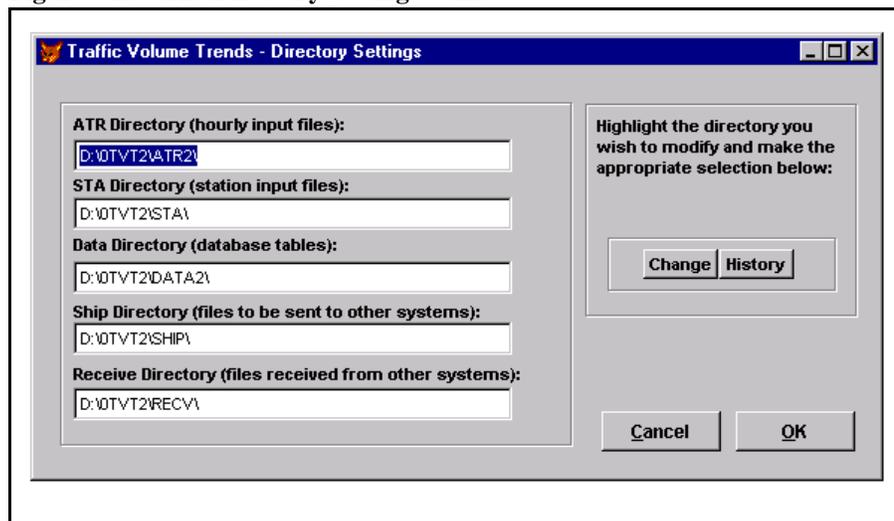
The *Directory* option allows you to specify what default directories will be used to store your data. The directories assigned in this option are used throughout the TVT system. To access this option, click on *Directory* from the main menu bar.

The *Directory Settings* window will display listing the five data directory paths you can modify. These are a) ATR, which is used to store hourly ASCII files in ATR format; b) STA, which is used to store station ASCII files in 1CD or STA format; c) DATA, used to store station and hourly data tables in DBF format; d) SHIP, used as the output directory in the *Ship* option; and e) RECV, used as the temporary working directory by the *Receive* option (for more information on the *Ship/Receive* options see Sections 5.1.6 and 5.1.7 in the preceding chapter).

To change a directory, click on the text box containing the directory you wish to change and then press the *Change* command button, or double click on the text box containing the directory you intend to modify. Double-clicking on the field has the same effect as if you clicked once on the text box and then pressed the *Change* command button. In addition, there is a *History* command button that when clicked will list previous directories you have used for the specified directory type.

To update and store your changes press the *OK* command button. To ignore any changes, press the *Cancel* command button, and any changes you made will be discarded.

Figure 5.13 - The Directory Settings Window



5.4 The Reports Option

The *Reports* option is accessed by selecting *Reports* from the main menu bar. A drop down list displays, showing the different reports available under the TVT system. These include the Vehicle Distance Traveled report for monthly and annual periods, Discrepancy reporting, a station list, Tables 1, 2 and 9B, Figure 1 and 2, and Table 3 reports. These reports may be printed on any printer supported under Windows, saved to a file in ASCII or WK1 (Lotus 1-2-3) formats, or displayed on your screen. In addition, some reports provide graphs that can be exported to spreadsheet software.

5.4.1 Discrepancy Report

This report lists any discrepancies encountered during the TVT upload, validation, estimate or calculation processes. This report can be generated listing all errors or by a specific State, month and year.

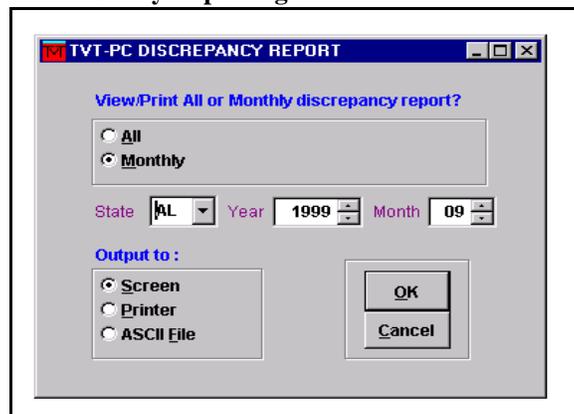
First, you must select either *All* or *Monthly* in the *View/Print All or Monthly Discrepancy Report* option group box. If you select *Monthly*, a *State*, a *Year*, and a *Month* combo box becomes visible. Specify the State, year and month you wish to report on, and then select how you want your output generated.

To do this, use the *Output To:* option group to choose whether you want your output to be displayed on the *Screen*, printed to a *Printer*, or written to an *ASCII File*.

Click the *OK* command button to generate the report. After you are finished, or if you wish to close the form without processing, press the *Cancel* command button.

Note: A description of report viewing capabilities will be included at the end of the *Reports* option section.

Figure 5.14 - The Discrepancy Report Window with Monthly Reporting selected.



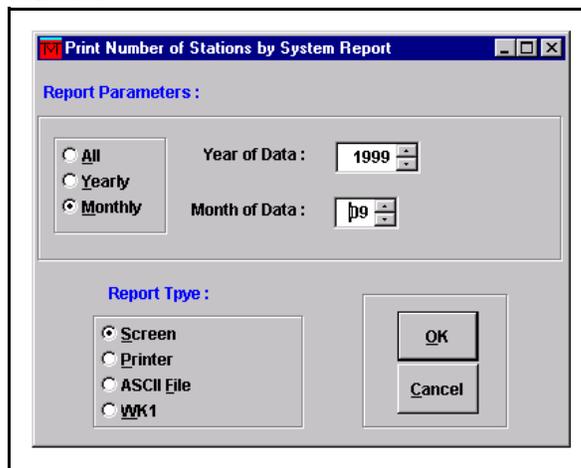
5.4.2 Number of Stations by System Report

This report lists all stations utilized by the TVT system. You have the option of listing all stations, listing stations utilized for a given year, or for a given month and year. On the *Report Parameters* option group, choose either *All*, *Yearly*, or *Monthly*. If *Yearly* is selected, a *Year* combo box is made visible to allow you to select a specific year. If *Monthly* is selected, *Year* and *Month* combo boxes are displayed to allow you to make your choices.

After you have specified the report type, choose the output type of the report. Like the *Discrepancy Report* option, you have the choice of printing, viewing, or writing the file in ASCII format. Additionally, you may also write it as a file in WK1 format (for Lotus 1-2-3 spreadsheet software).

To commence processing, press the *OK* command button. To exit, click on the *Cancel* command button.

Figure 5.15 - The Print Number of Stations by System Report Window with Monthly Reporting Selected



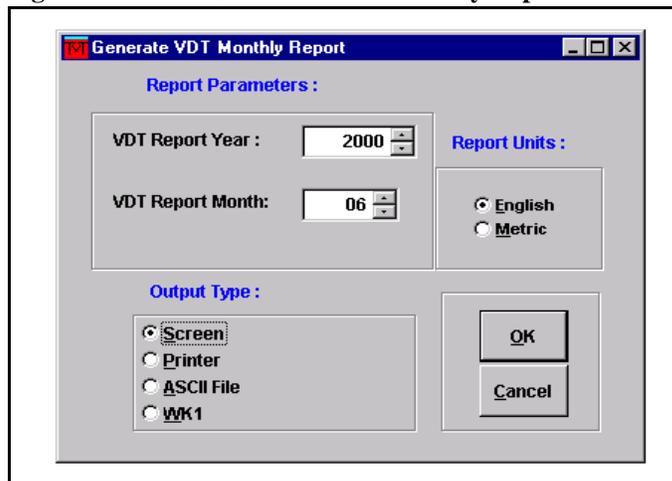
5.4.3 Monthly VDT Report

The *Monthly VDT Report* option generates a report that lists the results from the estimation and calculation processes. It shows the vehicle miles traveled for each State. This report is run every month after all States for a given month are processed. To generate this report, you must specify the month and year you wish to report on. This is achieved by using the *VDT Report Year* and *VDT Report Month* spinner controls.

The *Report Units* option group allows you to select either English or metric units as a standard of measurement. *English* reports in miles while *Metric* uses kilometers.

Once you are ready to generate the report, use the *Report Type* option group to specify the type of output. You may write to the printer, display on the screen, or save as either an ASCII or WK1 file.

Figure 5.16 - The Generate VDT Monthly Report Window



To commence processing, press the *OK* command button. To exit, click on the *Cancel* command button.

5.4.4 Annual VDT Report

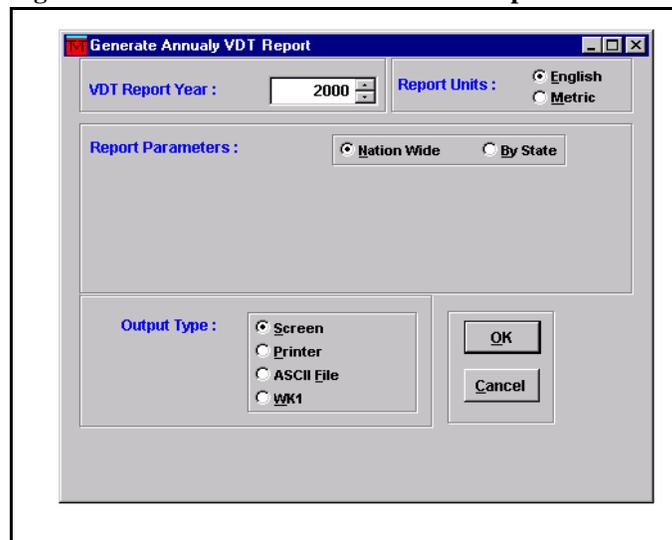
The *Annual VDT Report* option generates a report similar to the monthly VDT report except that it gives an annual summary and provides the ability to summarize by State or nationwide.

The *Report Units* option group allows you to select either English or metric units as a standard of measurement. *English* reports in miles while *Metric* uses kilometers.

Use the *VDT Report Year* spinner to select the process year, and the *Report Parameters* option group to select either *Nationwide* or by *State*.

Once you have selected the process date, use the *Report Type* option group to specify the type of output. Your choices are write to the printer, display on the screen, or save as either and ASCII or WK1 file.

Figure 5.17 - The Generate Annual VDT Report Window



To commence processing, press the *OK* command button. To exit, click on the *Cancel* command button.

5.4.5 Table 1-2 Reports with Graphs

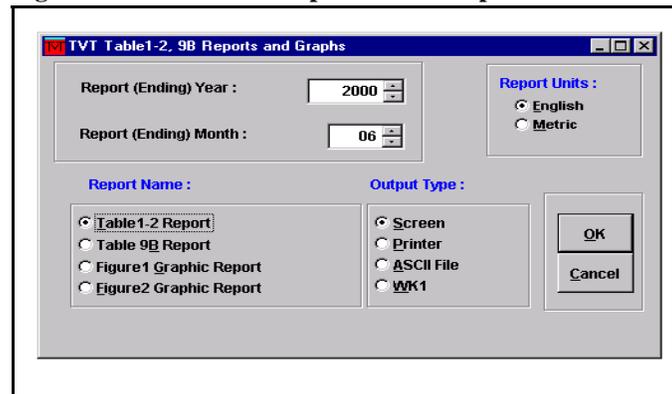
This option is used to generate the Table 1 and Table 2, and Table 9B reports, as well as the Figure 1 and Figure 2 graphic reports.

Specify the year using the *Report (End) Year* spinner and the report with the *Report Name* option group. The Figure 1 report also requires a start year. When this report is selected, a *Start Year* spinner becomes visible to allow you to enter this value.

The *Report Units* option group allows you to select either English or metric units as a standard of measurement. *English* reports in miles while *Metric* uses kilometers.

Note that for Figure 1 and Figure 2 reports you only have two options for output disposition: print or display on the screen.

Figure 5.18 - Table 1-2 Reports with Graphics Window



To commence processing, press the *OK* command button. To exit, click on the *Cancel* command button.

Reports generated under this option:

Table 1. Estimated Individual Monthly Motor Vehicle Travel in the United States.

Table 2. Estimated Cumulative Monthly Motor Vehicle Travel in the United States.

Table 9B. Estimated Vehicle Distance and Percent Change From Same Period Previous Year.

Figure 1. Moving 12 Month Total on All Highways.

Figure 2. Travel on U.S. Highways by Month.

5.4.6 Table 3 Report

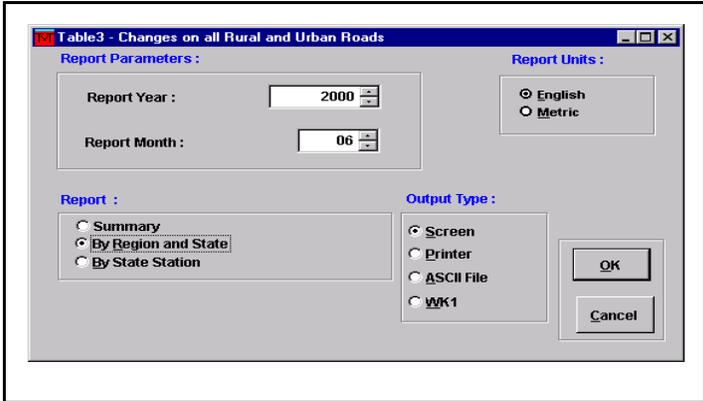
The *Table 3 Report* option generates a report that details the changes made on urban and rural roads. It reports based on the year and month. Use the Summary option to generate the summary pages of the Traffic Volume Trends monthly report.

To specify the date, use the *Report Month* and *Report Year* spinners. Once you have a process date selected, use the *Report:* option group to specify whether the output will be grouped by station, or region and State. If the report is grouped by station, it can be sorted either by station id or by functional classification systems.

The *Report Units* option group allows you to select either English or metric units as a standard of measurement. *English* reports in miles while *Metric* uses kilometers.

This report can either be outputted to the screen, a printer or to either an ASCII or WK1 file.

Figure 5.19 - The Table 3 Report Window



The screenshot shows a dialog box titled "Table3 - Changes on all Rural and Urban Roads". It contains several sections for configuring the report:

- Report Parameters:** Includes "Report Year" (set to 2000) and "Report Month" (set to 06).
- Report Units:** Includes radio buttons for "English" (selected) and "Metric".
- Report:** Includes radio buttons for "Summary", "By Region and State" (selected), and "By State Station".
- Output Type:** Includes radio buttons for "Screen" (selected), "Printer", "ASCII File", and "WK1".
- Buttons for "OK" and "Cancel" are located at the bottom right.

To commence processing, press the *OK* command button. To exit, click on the *Cancel* command button.

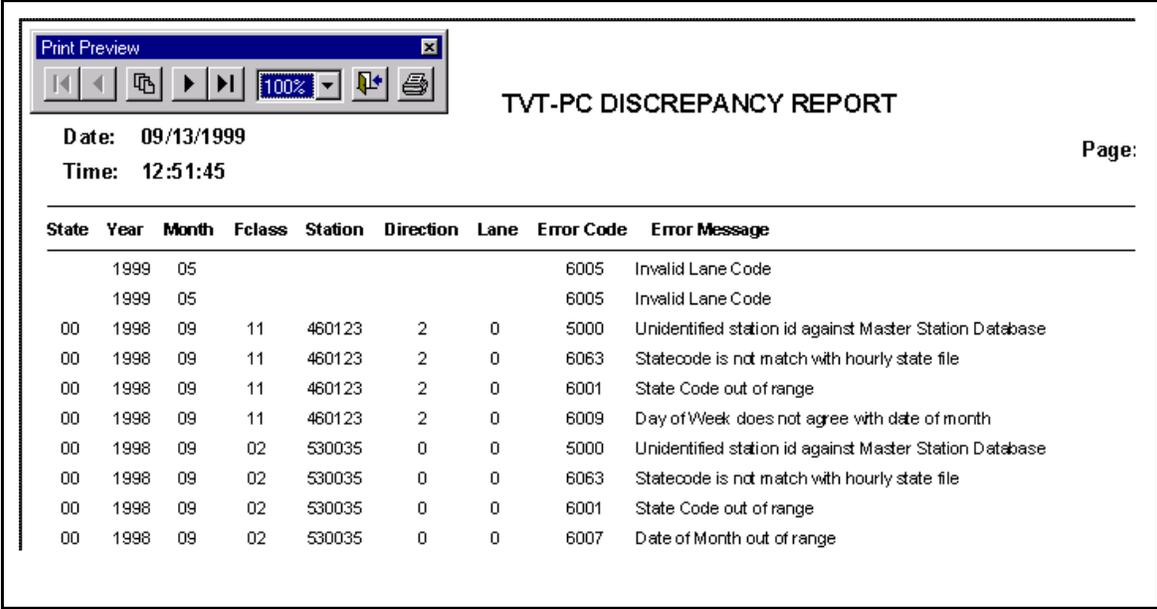
Reports generated under this option:

Summary pages for Traffic Volume Trends monthly report
Changes on all Rural and Urban Roads by Region and State.
Changes on all Rural and Urban Roads by State Station.

5.4.7 A Sample Report Window and its Associated Controls

When creating most TVT reports, you have the ability to view the report on the screen. To accomplish this, select the *Screen* option on the *Report Type* control when generating the report. Below is a sample TVT report and the controls associated with it.

Figure 5.20 - A Report Sample with Floating Toolbar



The screenshot shows a window titled "Print Preview" with a floating toolbar. The toolbar contains eight icons: a left arrow with a vertical line, a left arrow, a magnifying glass, a right arrow, a right arrow with a vertical line, a dropdown menu showing "100%", a double-headed arrow, and a printer icon. The report content is titled "TVT-PC DISCREPANCY REPORT" and includes the following information:

Date: 09/13/1999
Time: 12:51:45
Page:

State	Year	Month	Fclass	Station	Direction	Lane	Error Code	Error Message
	1999	05					6005	Invalid Lane Code
	1999	05					6005	Invalid Lane Code
00	1998	09	11	460123	2	0	5000	Unidentified station id against Master Station Database
00	1998	09	11	460123	2	0	6063	Statecode is not match with hourly state file
00	1998	09	11	460123	2	0	6001	State Code out of range
00	1998	09	11	460123	2	0	6009	Day of Week does not agree with date of month
00	1998	09	02	530035	0	0	5000	Unidentified station id against Master Station Database
00	1998	09	02	530035	0	0	6063	Statecode is not match with hourly state file
00	1998	09	02	530035	0	0	6001	State Code out of range
00	1998	09	02	530035	0	0	6007	Date of Month out of range

While viewing the report you have the ability to vary its size, increment or decrement pages, print or exit. This is accomplished by using the floating toolbar that displays with the report. This toolbar has eight controls: the first five are used for paging, the combo box is used to control viewing size, and the last two are used to close the window and print the report.

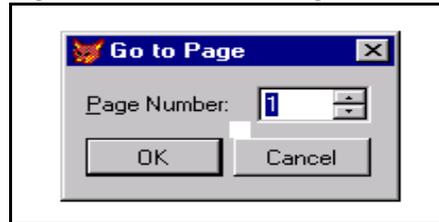
Figure 5.21 - The Floating Toolbar



The two arrow command buttons on the left are used to browse backwards through a report. The button on the far left, depicted as a left arrow pointing to a vertical line, moves you back to the first page of the report. The second arrow (without the vertical line) moves you back one page. If these controls are disabled (light gray) it means you are already at the beginning of the report.

The command button depicting three sheets of paper is used to go to a specific page. When clicked, it opens the *Go To Page* window with a spinner control that will allow you to select a specific page. When you have the page number selected, press the *OK* command button to go to the selected page. Click the *Cancel* button to return to the report without specifying a new page.

Figure 5.22 - The Go to Page Window



To the right of the *Go To* page number control on the floating toolbar are two other buttons depicting arrows, similar to the ones described earlier, but pointing in the opposite direction. Use these controls to skip ahead towards the end of the report. The control showing a right arrow pointing toward a vertical line is used to scroll to the last page of the report, while the one with an arrow only is used to skip forward one page at a time. Again, if these controls are disabled (gray), you are already at the end of the report.

The combo box displaying percentages is used to control the size of the viewing area. Thus 100% is considering the normal report size. The size choices available to you are 10%, 25%, 50%, 100% and ZOOM. Zoom allows you to enlarge a specific portion of the viewing area.

To the left of this control is a command button with an open door depicted upon it. This control closes both the floating toolbar and the report window and returns you to the main menu bar.

Last of all, the button depicting a printer is used to print the report.

5.5 The Utilities Option

5.5.1 Security

The *Security* option allows you to toggle security on or off, add, modify or remove users from your system, change passwords or security levels of individual users. This window consists of two screens: the first screen dealing with userids and security levels, while the second screen is defined to enable password changes. The *Exit* command button will close the *User Security* window.

Figure 5.23 - The User Security Window (User Page)

The screenshot shows a window titled "Traffic Volume Trends - User Security". At the top, it indicates "You are signed on as: JOE". The window is split into two main columns: "User" and "Password".

- User Column:**
 - Select Userid:** A dropdown menu showing "JOE".
 - Type of Modification:** Radio buttons for "Add New User" and "Delete Existing User".
 - Delete Existing User:** A text input field and a note: "Click on the Confirm button to delete or Cancel to undo."
- Password Column:**
 - Add New User:** A text input field.
 - User Type:** Radio buttons for "Headquarters" and "State".
 - State:** A dropdown menu with the instruction "If State user, select State below."
 - Security Level:** A spinner box set to "3" with the note "(1 - lowest, 3 - highest)".

At the bottom left, there is a checked checkbox for "Security is On". At the bottom right, there is an "Exit" button.

5.5.2 The User Screen

On this screen of the window you may add or delete users, change their security level, define them as a State or National user, and on a system-wide level, turn security on or off.

When security is on, each user of the TVT system must enter a one to eight character userid and a one to eight character password. Neither field is case-sensitive, so upper or lower case characters can be used interchangeably. When security is turned off, anyone can access the system.

To view users on your system, use the *Select Userid* combo box. Note that when security is turned off, the userid NONE displays when you open this window. You may still add or delete users, modify their security level or user type with security turned off, however, this information remains unused by the TVT system until you turn security on. There are some restrictions to this window, and they are briefly described here.

You cannot turn security on if you have no users defined to the system, nor can you activate it if none of the users you have defined have a security level of 3. Thus, you must have at least one user defined with a security level of 3 to activate security. Note that 3 is the highest level of security and 1 is the lowest.

In this release, security is used to control who has access to the system and who has the ability to modify passwords and security levels. A user with security level 3 may turn security off or on, add or delete users, modify another user's password, security level or type. Users with a lower security level may only modify their own password and user type. They cannot modify another user's security criteria.

You cannot delete a userid if it is the userid you used to log into the system, nor can you modify its security level. This is to prevent a user from inadvertently turning security on without having an authorized userid to maintain it.

If you have level 3 security, you may add or delete a user by using the *Type of Modification* option group. If you select *Add*, the controls on the right side of the window become active, allowing you to enter a userid, specify the type and State, if applicable. In the bottom right corner is a spinner control that allows you to adjust the security level.

When you add a new user, their password will be set to exactly match the userid. Thus if you define a user called "MARY," the account password will also be MARY. The password screen of this option can be utilized to change the password later on. You may then choose whether the new user is a State or National user. If you select *State* from the *User Type* option group, a combo box control becomes visible displaying valid U.S. States. Select the State that applies by clicking upon it. After you have added the userid and user type, use the *Security Level* spinner control to set the user's security level. Click the *Confirm* command button to add the userid. To cancel the add, click *Cancel*.

Figure 5.24 - Add New User Controls

Add New User

David

User Type

Headquarters State

State
If State user, select State below.

VA

Security Level
(1 - lowest, 3 - highest) 3

Cancel Confirm

Figure 5.25 - Delete User Controls

Delete Existing User

JOE

Click on the Confirm button to delete or Cancel to undo.

Cancel Confirm

If you select *Delete*, the *Delete Existing User* text box becomes active displaying the userid that was selected in the *Select Userid* combo box. When *Delete* is selected, the *Cancel* and *Confirm* command buttons become visible for that selection. Click *Confirm* to delete the userid, *Cancel* to halt deletion.

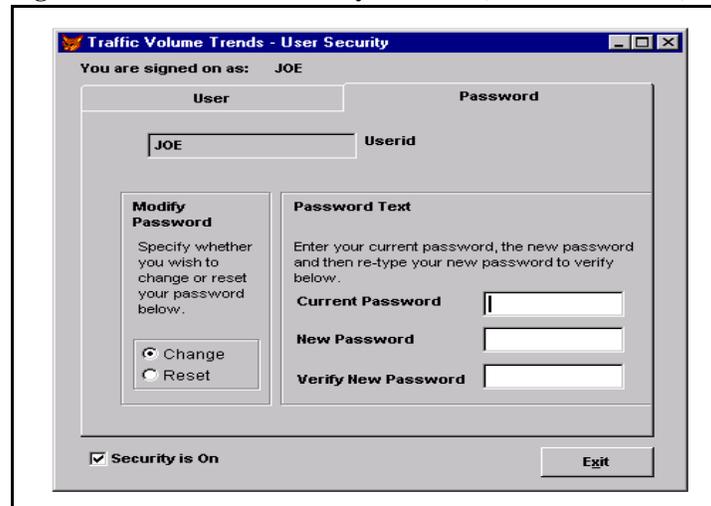
Last is the *Security* check box control. This control is visible only if you have level 3 security. It is displayed on the very bottom of the window. It will not display for users with a security level of 2 or lower.

When security is on, this control will be checked and will be labeled *Security is On*. When security is disabled, the box will be unchecked and will have the label *Security is Off*.

5.5.3 The Password Screen

Screen two of the *Security* option allows you to change or reset your password. A user with a security level of 3 can change or reset passwords for any user in the system.

Figure 5.26 - The User Security Window (Password Screen)



In the top left portion of the window, the userid displays. This field is read only (to change the userid, click the *User* tab return to screen one, and then use the *Select Userid* combo box control to modify). Below the *Userid* text box, is an option group control with two selections, *Change* and *Reset*. By default, *Change* is the option selected when you open the window.

When *Change* is selected, the cursor is positioned in the *Current Password* text box on the right side of the window. Type in your current password and then tab down to the *New Password* text box. Enter a new password of one to eight characters. Again, it is reiterated here that **passwords are not case sensitive**.

Thus, the password “Security” is interpreted as the same word whether it is written in upper or lower case. Once you have typed a new password, you must verify its syntax by typing it again in the *Verify New Password* text box. Once you have entered the password to verify, press the ENTER key. If the password change was successful, you will receive a message from the system to confirm this.

Reset resets a password to match the userid. This is mainly used in a situation where the password is unknown for a given userid, or for assigning passwords to new users in the system. When the *Reset* option group button is clicked, you will get a message asking you if you wish to reset. If you respond with YES, the password is set to match the userid. Thus if the selected userid is JOE, the password for the account will also be set to JOE.

5.5.4 Ship

This option allows you to ship data in DBF format from one location to another (for example, State to FHWA Headquarters). It compresses the selected files and stores them in one file package, using DynaZip utilities. These files can be later uncompressed by using the *Receive* option.

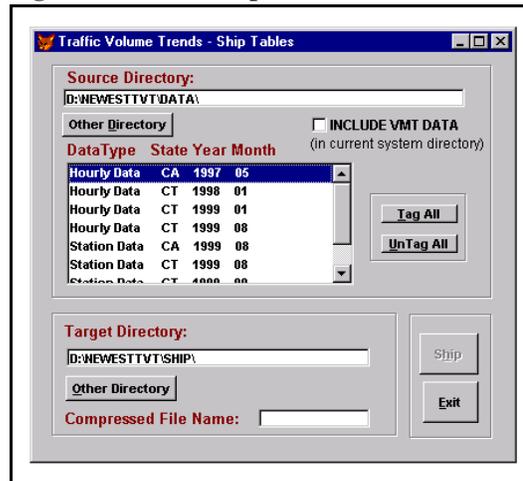
Files are listed by data type in the *Data Type* list box. This list shows the file type (hourly or station), the State postal abbreviation, and the month and year. Select the files you want by clicking on the desired item. To select multiple files, press down the CTRL key and click on the additional files you wish to process. To select all files, click on the *Tag All* command button. To remove the selection from all files, use the *Untag All* command button.

You may also ship the VDT table even though it is in the system directory. To do so, check the *Include VDT* check box. Your input (*Source*) and output (*Target*) directories can be changed by clicking the *Other Directory* command button under each directory's text box.

Last of all, enter a one to eight character output file name where the shipped data will reside. Do not provide an extension as TVT will provide one for you (the extension provided is .zip).

To begin the ship process, press the *Ship* command button. To exit the *Ship* option, click on the *Exit* command button.

Figure 5.27 - The Ship Tables Window



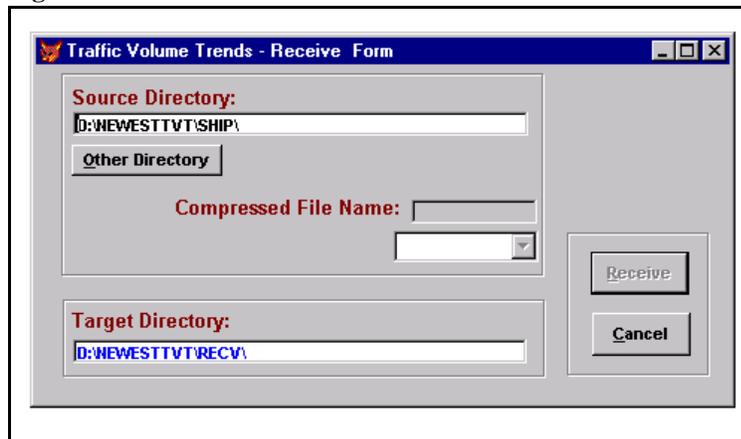
5.5.5 Receive

The *Receive* option is used to decompress files created by the *Ship* option. It requires only that you supply the input (*Source*) directory and the name of the file to decompress. When the shipped files are decompressed, they will be written to the directory specified in the output (*Target*) directory. The output directory is defined as a receive directory and cannot be modified on this screen. See the *Directory* option in Section 5.3 for help in defining TVT directories.

Compressed files in the input directory will be displayed in a drop down combo box underneath the *Compressed File Name* text box. You can select a file listed in the combo box by clicking upon it, and your choice will be displayed in the *Compressed File Name* text box. Once you have provided this information, you are ready to receive the files. Click on the *Receive* command button and the receive process begins. Follow the instructions on the screen to merge received data.

The *Other Directory* command buttons are used to specify another directory.

Figure 5.28 - The Receive Window



Clicking on the *Cancel* command button will exit this window.

5.5.6 Modify Parameters

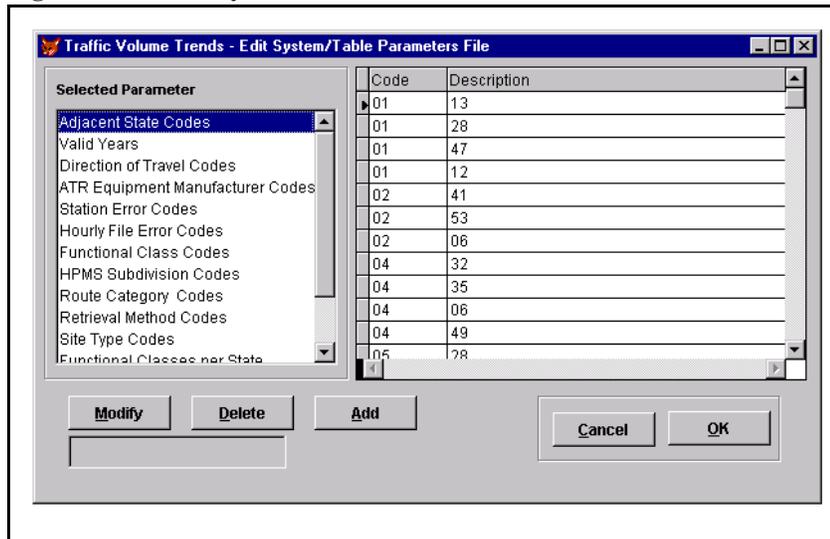
This option is used to modify parameters of the TVT system. It should be used with caution as changes made to parameters on this window can affect your system performance. A description of each parameter is described in Appendix A.5 - Parameter Table Values.

5.5.7 System\Table Parameters

The *System\Table* option is accessed by selecting *Utilities* from the main menu bar, *Modify Parameters* from the drop down menu, and then *System/Table Parameters*.

From this window you have the ability to specify adjacent States, direction of travel codes, ATR manufacturers, retrieval method codes, as well as a number of other parameters.

Figure 5.29 - Edit System Parameters Window



To change a parameter, select (highlight) the desired item from the *Selected Parameter List* on the left side of the window. Then click the applicable command button. To modify a parameter value, use the *Modify* command button. To delete an item, click the *Delete* command button. To add new items, click on the *Add* command button.

When *Modify* is in effect, position your cursor on the *Code and Description* grid (right side of window) and click on the field you wish to change. Either backspace over the existing value or over type. Once you have the desired value in place, you may either click the *OK* command button, which saves the changed values and closes the window, or select another value to change. When all changes have been made, click the *OK* button to save those changes and close the window.

Clicking *Add* will insert a new record at the bottom of the grid. Type in the data, and then either press ENTER or use the down arrow key to add any additional records.

When you click on *Delete*, the item highlighted in the *Code and Description* grid will be deleted. When done, either click *OK* to save the changes (and close the window), or select a new parameter item. When all deletions have been completed, click the *OK* command button to update your changes and close the window. Note that once you click *OK*, deleted records are removed permanently.

When you click on *Add*, the cursor positions itself onto a new line on the *Code and Description* grid allowing you to enter a new value. New lines are added each time you press ENTER or use the down arrow keys. When you are finished adding lines (records), either click *OK* to save (and close the window) or select a new parameter item to take action upon. When you are finished, press *OK* to save your changes and close the window.

As previously stated, the *OK* command button saves all changes made in the current session (since the window was opened) and then closes the window.

The *Cancel* command button discards all changes made in the current session and then closes the window. Thus, if you added a new manufacturer's code and then decided to cancel later on while modifying the direction of travel codes, both the new manufacturer's code and changes made to direction codes will be discarded. Values are only retained permanently when the *OK* button has been pressed.

5.5.8 Display/Edit Station Parameters

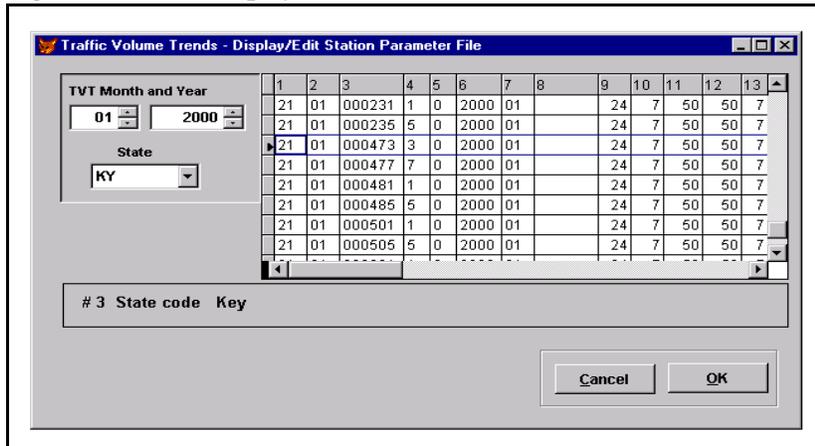
This is the second of the three items listed under the Modify Parameters menu option. It is accessed by selecting *Utilities* from the main menu bar, then *Modify Parameters* from the drop-down menu and then *Display/Edit Station Parameters*. When selected, the *Display/Edit Station Parameter File* window is opened.

This option allows you to modify parameters stored in the Station Parameter file. These parameters control how data is calculated for individual stations. For example, one parameter dictates the minimum ATR collection period, while another is used to determine the maximum number of zero collection hours that can be accepted for hourly records. Again, it should be emphasized that caution must be exercised when modifying these parameters, as changes will affect your processing results. The definitions and uses for these parameters are described in the Traffic Monitoring Guide.

Use the *State* combo box in conjunction with the *Month* and *Year* spinner controls to specify a State and process date.

To change a parameter value, position your cursor on the record and field you wish to change in the grid on the right side of the window. Either backspace and re-type or over-type with the new values in the field you wish to change.

Figure 5.30 - The Display/Edit Station Parameters Window

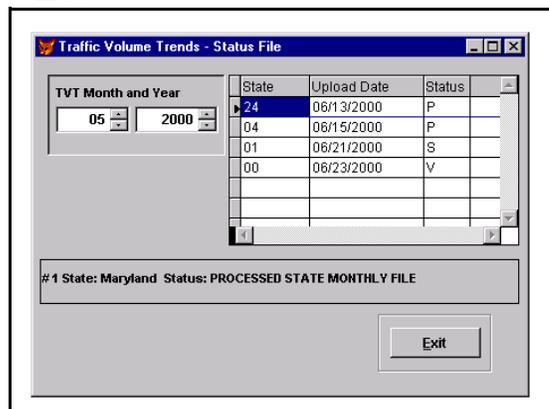


5.5.9 Display Upload Status

This option allows you to browse the Upload Status file. This file contains data showing the status of previous uploads, estimation and calculation processing. To access this option, select *Utilities* from the main menu bar, *Modify Parameters* from the pull down menu, and then *Display Upload Status*. The *Display Upload Status File* window is then opened for use.

Use the spinner controls to specify a month and year, and data for the given time frame will display. To exit, use the *Exit* button.

Figure 5.31 - The Display/Edit Status File Window



5.5.10 Pack

The *Pack* option is used to remove any records marked for deletion in system and data tables. Normally these records are removed during processing, but this option has been made available for contingency purposes. It may be used at any time and will not effect records unless they are meant to be deleted anyway. This option is useful in the event of a system crash, and you want to assure that tables contain only data that is valid. Note that once a pack has been performed, records marked for deletion are removed permanently.

When this window is first opened, two check boxes are displayed. The first, *System Tables*, is used to select TVT system tables for packing. This includes all TVT tables except the VDT, Master Station, and Station Parameter tables.

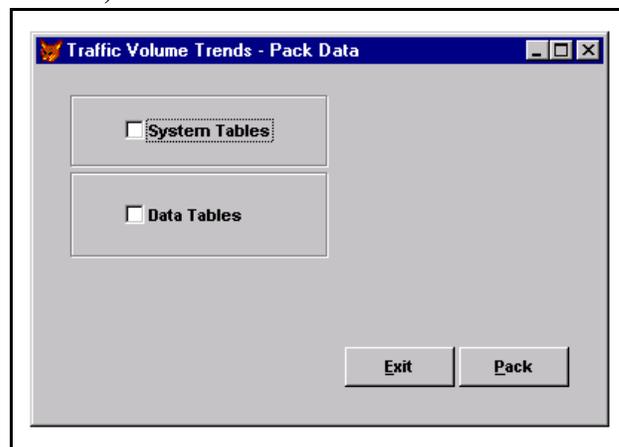
When the *System Tables* control is checked and you select the *Pack* command button, all data marked for deletion on the system tables will be deleted permanently.

The second check box control, *Data Tables*, is used for data tables (Station, Hourly, Station Master and Station Parameter, and VDT tables). When your choices are made, press the *Pack* command button to process.

Note that you may click on both the *System Tables* and *Data Tables* controls concurrently and pack everything at one time.

The *Exit* button closes the window and returns to the main menu.

Figure 5.32 - The Pack Window (with Data Tables Selected)



5.5.11 Reindex

Reindex is used to re-create the indexes associated with the system tables. This option is used in the event that a table's compound index becomes corrupted or out of synchronization, or in the event of a system crash. When executed, this option deletes all existing system table indexes and re-creates them. Unlike the *Pack* option, the Master Station, Station Parm and VDT tables are included in the system table group, thus when you use *Reindex*, the indexes for these tables are deleted and re-created as well.

Note that even though the term 'deleted' is used here, no data is actually deleted when you use the *Reindex* option. Only the indexes that determine a table's record order are removed and re-created.

This window only has two controls: *Cancel* and *Re-index*. *Cancel* closes the window without reindexing, while *Re-index* will begin the reindex process.

Figure 5.33 - The Reindex Window



5.5.12 Backup

The *Backup* option is used to make copies of your tables. This creates an exact copy of a selected file and writes it in the directory specified. Using this option is similar to using Windows Explorer to copy files, except that you do not need to exit the TVT system to make a copy.

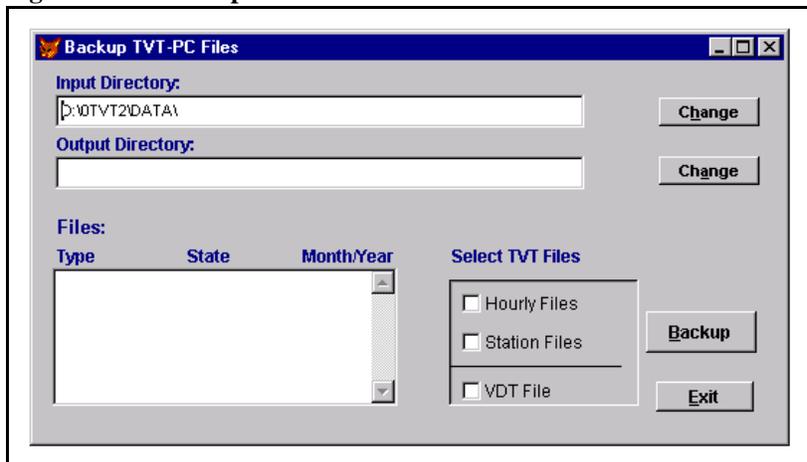
Both the *Input* and *Output* directories can be changed by clicking on the *Change* command button to the right of each *Directory* text box field.

The *Files* list box is empty when you first open the *Backup* window. To have items display on this list, check one of the check box controls to the right of this list. The choices are *Hourly Files*, *Station Files*, and *VDT*. You may select these individually or in a group. Once one of these check boxes is clicked, all files of the selected type will display in the *Files* list box.

Once files are displayed in the *Files* list box, you may select individual items for backup. To select multiple items, press down the CTRL key and select the files. Once you have files selected, and have an output directory specified, you may backup the files by clicking the *Backup* command button.

To close this window, click on the *Exit* command button.

Figure 5.34 - Backup TVT Files Window



A. Appendixes

In the following three appendix sections, the data layouts for ATR, 1CD, and STA input file types are described. All three of these file types are in ASCII format. For a detailed description of each field, please refer to the current edition of the Traffic Monitoring Guide. In the fourth section figures used in this document are listed. The last appendix describes parameter codes used by the TVT application.

A.1 Station Description Format (STA)

Columns	Length	Description
1	1	Record Type: S = Station Record
2-3	2	FIPS State Code
4-9	6	Station ID
10	1	Direction of Travel Code
11	1	Lane of Travel
12-13	2	Year of Data
14-15	2	Functional Classification Code
16	1	Number of Lanes in Direction Indicated
17	1	Sample Type for Traffic Volume
18	1	Number of Lanes Monitored for Traffic Volume
19	1	Method of Traffic Volume Counting
20	1	Sample Type for Vehicle Classification
21	1	Number of Lanes Monitored for Vehicle Classification
22	1	Method of Vehicle Classification
23	1	Algorithm for Vehicle Classification
24-25	2	Classification System for Vehicle Classification
26	1	Sample Type for Truck Weight
27	1	Number of Lanes Monitored for Truck Weight
28	1	Method of Truck Weighing
29	1	Calibration of Weighing System
30	1	Method of Data Retrieval
31	1	Type of Sensor
32	1	Second Type of Sensor
33-34	2	Equipment Make
35-49	15	Equipment Model
50-51	2	Second Equipment Make
52-66	15	Second Equipment Model
67-72	6	Current Directional AADT
73-78	6	Matching Station ID for Previous Data
79-80	2	Year Station Established
81-82	2	Year Station Discontinued
83-85	3	FIPS County Code
86	1	HPMS Sample Type
87-98	12	HPMS Sample Number or Kilometerpoints
99	1	HPMS Subdivision Number
100	1	Posted Route Signing
101-108	8	Posted Signed Route Number
109	1	Concurrent Route Signing
110-117	8	Concurrent Signed Route Number
118-167	50	Station Location

A.2 ATR Station Description Format (1CD)

Columns	Length	Description
1	1	Record Type: 1 = ATR Station
2-3	2	FIPS State Code
4-5	2	Functional Classification Code
6-11	6	Station Identification
12	1	Direction of Travel
13	1	Lane of Travel
14	1	Posted Route Signing
15-20	6	Posted Signed Route Number
21	1	Concurrent Route Signing
22-27	6	Concurrent Signed Route Number
28-30	3	FIPS County Code
31-42	12	HPMS Sample Number or Kilometerpoints
43	1	HPMS Sub-division Number
44-45	2	Year Station Established
46-47	2	Year Station Discontinued
48	1	Method of Data Retrieval
49-50	2	Equipment Make
51-100	50	Location of Station

A.3 Hourly Traffic Volume Record Format (ATR)

Columns	Length	Description
1	1	Record Type: 3 = ATR Hourly record
2-3	2	FIPS State Code
4-5	2	Functional Classification Code
6-11	6	Station Identification
12	1	Direction of Travel
13	1	Lane of Travel
14-15	2	Year of Data
16-17	2	Month of Data
18-19	2	Day of Data (Day of the Month)
20	1	Day of the Week
21-25	5	Traffic Volume Counted 00:01 - 01:00
26-30	5	Traffic Volume Counted 01:01 - 02:00
31-35	5	Traffic Volume Counted 02:01 - 03:00
36-40	5	Traffic Volume Counted 03:01 - 04:00
41-45	5	Traffic Volume Counted 04:01 - 05:00
46-50	5	Traffic Volume Counted 05:01 - 06:00
51-55	5	Traffic Volume Counted 06:01 - 07:00
56-60	5	Traffic Volume Counted 07:01 - 08:00
61-65	5	Traffic Volume Counted 08:01 - 09:00
66-70	5	Traffic Volume Counted 09:01 - 10:00
71-75	5	Traffic Volume Counted 10:01 - 11:00
76-80	5	Traffic Volume Counted 11:01 - 12:00
81-85	5	Traffic Volume Counted 12:01 - 13:00
86-90	5	Traffic Volume Counted 13:01 - 14:00
91-95	5	Traffic Volume Counted 14:01 - 15:00
96-100	5	Traffic Volume Counted 15:01 - 16:00
101-105	5	Traffic Volume Counted 16:01 - 17:00
106-110	5	Traffic Volume Counted 17:01 - 18:00
111-115	5	Traffic Volume Counted 18:01 - 19:00
116-120	5	Traffic Volume Counted 19:01 - 20:00
121-125	5	Traffic Volume Counted 20:01 - 21:00
126-130	5	Traffic Volume Counted 21:01 - 22:00
131-135	5	Traffic Volume Counted 22:01 - 23:00
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A.5 Parameter Table Codes

1. Adjacent state codes

These indicate the states that are defined as adjacent states to the current state being processed. Adjacent states are used to estimate vehicle miles traveled when the current state has no data from the current or previous year.

2. Valid years

Starting and Ending years of system. Do not modify.

3. Direction of Travel Codes

Used to indicate a specific direction of travel. These should be only modified in conjunction to Traffic Monitoring Guide revisions.

4. ATR Manufacturing Codes

This is a unique code associated with the Automated Traffic Recorder manufacturer. These should only be modified in conjunction with Traffic Monitoring Guide revisions.

5. Station/Hourly Error Codes

These are error messages codes associated with the Traffic Volume Trends application to provide the user with information regarding their processing.

6. Functional Class Codes

These indicate the functional class (system) being monitored. These should only be modified in conjunction with Traffic Monitoring Guide revisions.

7. HPMS Subdivision Codes

No longer used.

8. Route Category Codes

Used to indicate the type of highway. These should only be modified in conjunction with Traffic Monitoring Guide revisions.

9. Retrieval Method Codes

Indicates the data transmittal type (telemetry or manual). These should only be modified in conjunction with Traffic Monitoring Guide revisions.

10. Site Type Codes

Used to indicate the location of the Automated Traffic Recorder. These should only be modified in conjunction with Traffic Monitoring Guide revisions.

11. Functional Classes Per State

The minimum and maximum number of valid functional classes. This should only be modified in conjunction with Traffic Monitoring Guide revisions.

12. Valid Month Codes

Used to indicate the month of the year (01 - 12). Do not modify.

13. Station Percent

The default failure percentage for variance in traffic growth. This should only be modified in conjunction with Traffic Monitoring Guide revisions.

A.6 Preparing State Data for FHWA

The Traffic Volume Trends application comes with historical data for each state to allow the state user to generate reports. State users will want to use the application to prepare data for use at FHWA. Traffic Volume Trends is processed on a nationwide level at FHWA, and many states voluntarily submit data on a monthly basis. TVT provides the tools necessary to accomplish this. The *Ship* option provided with TVT allows the state user to easily prepare both station and hourly data for National' use. To do so, the user must first upload and validate the data, as described later in this section. Two types of data can be loaded during the upload and validation process: Station and Hourly data.

Station Data

The State User must first have station data loaded into the master station database. Hourly data is validated based upon what stations reside in this table. Thus, any hourly ATR record containing a station that does not exist on the master station table will be rejected because the station is flagged as invalid.

TVT comes with a populated master station table with data for all 50 states. However, if stations have been added to the State's highway system (or renamed) after TVT has been installed, those stations will not be recognized by the TVT application as valid stations until they have been loaded into the master station table. To do this, the State user starts the *Upload/Validate* process and selects Station records as the type of data being uploaded. Once the process is completed, the necessary system tables are updated.

This monthly station table is what will be shipped to FHWA. Note that whenever stations are added (or renamed), a new monthly station table must be generated and sent to FHWA. Otherwise any hourly data containing the new or renamed stations will be rejected by FHWA TVT application. Monthly station files are written to the output directory specified on the *Upload/Validate* window.

Hourly Data

Normally a state user will send only the hourly ATR data on a monthly basis. Station files are sent on request by FHWA or when a State has added new stations, or has removed or changed existing stations.

To prepare hourly ATR data, the State user first uploads and validates the data. Monthly hourly files are written to the output directory specified in the *Upload/Validate* window.

Uploading and Validating the Data

As described in the TVT User Manual (Section 5.1.1 - Upload/Validate, pages 10 - 14), files are uploaded and validated as one combined process. This operation must be performed before data is shipped to FHWA.

To begin the Upload/Validate process, *File* is selected from the main menu bar, and then *Load/Validate*. When the *Upload/Validate* window displays, the State user specifies the month and year of the data, the type of file (Station or Hourly), the State to process, and then selects the files.

By default, TVT searches the ATR directory for hourly input, and STA for station input. Both these directories are subdirectories of the main TVT directory (this is the directory where TVT was installed). Thus, input ASCII data should reside in their respective directories before processing is initiated. If the ASCII data resides elsewhere, use the *Change* button to the right of the *Input Directory* text box to specify another directory. The upload and validate operation can then be initiated by clicking the *Upload* button. For more a detailed description of this process, refer to Section 5.1.1 of the TVT Users Guide.

Ship Data

Once the upload and validation process is completed for Station and/or Hourly data, the user then prepares the data for shipping. To do so, *File* is selected from the main menu bar, and then *File Transfer*, and the *Ship DBF Files*.

After the *Ship* window displays, the State user will then specify the files to ship. From the file list box, the desired file is selected by clicking upon it. This list box shows the data type (Station or Hourly), the State, year and month. Note that both Station and Hourly files can be shipped at the same time.

The user enters a filename in the *Compressed File Name* text box. This can be any 1-8 character string. Once a name has been specified, the *Ship* button is clicked to begin the ship process. The procedures for using this option are described in the TVT User Manual (Section 5.16 - Ship, page 19).

A.7 VDT Calculations

Calculate/Estimate VDT

This function is used to perform the arithmetic calculations of the multipliers used to determine monthly state traffic volume and to calculate the monthly vehicle distance traveled (VDT) in miles or kilometers for each individual state as a difference between the previous year monthly traffic volume trends.

1. Compare each station weighted-average-day count to the one for the same station for the same month and functional class of previous year, compute the difference by subtracting the current year counts from the previous year counts, and determine the multiplier by dividing the computed difference to the previous counts.
2. Add the current year weighted-average-day counts of all valid stations (i.e., the multiplier of the station is in the limited default tolerance of percentage - 0.3) for each functional class of each state. Add the previous year weighted-average-day counts of all stations corresponding to valid current year stations for each functional class of each state.
3. Calculate the multiplier of each functional class by subtracting the two results above and dividing by the previous year total counts for each functional class of each state.
4. Determine the VDT by multiplying the calculated multiplier and the value of the previous year for each functional class of each state.

For this calculation, the previous year monthly files must be available in the database directory, and the monthly VDT of previous year must available in the VDT data file.

Calculate National Average VDT

This function is used to calculate the monthly national average VDT for each individual state.

1. Determine interim weighted national average multiplier using the data from each reported state by functional class. If the state's data is missing for one or more functional classes, use the average of the functional classes which are reported.
2. If there is no data reported for an entire state, estimate the percent change in travel for each functional class from all surrounding states which have reported data. If there is no data reported in all surrounding states, adding all the current year reported data together, and, for each functional class, sum all the previous year data corresponding to the current

year states that have reported data. Calculate the difference between the two results, and divide by the sum of the previous year to get the national percent change for each reported functional class.

3. Calculate the current VDT for each functional class by using the national percent change and the VDT for the month from the previous year for each reported functional class.

Calculate End-Of-Year VDT

This function performs the necessary calculations of monthly VDT by state using the data from the Highway Performance Monitoring System (HPMS) to replace the estimates used before the data was available. This process should run only once per year when the HPMS data is available.