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4 APPENDIX

1. GENERAL INFORMATION

1.1 Summary

The VTRIS system validates, facilitates editing, summarizes, and generates reports on vehicle travel characteristics. It also maintains the permanent database of the Station description, Vehicle Classification, and Truck Weight measurements in metric units. It allows repetitive data averaging and report generation with different options without additional source data processing.
It allows input of ASCII traffic data as well as import of state-submitted data in internal VTRIS formats. The reports and graphs - final products of VTRIS functionality can be created in both metric and English units.

1.2 Organizational environment

The VTRIS software was developed by Signal Corporation together with the FHWA Office of Highway Policy Information (HPPI). It is distributed among all State agencies and FHWA field offices. The HPPI analytical team representative, Ralph Gillmann, can be reached at (202) 366-5042.

1.3 Hardware and system software environment

VTRIS for MS WINDOWS 95/NT is shipped on one CD and the installation program puts all necessary files into the directory of your choice. Users can also download the installation package from HPPI's Internet Web site. Currently, VTRIS is written as a standalone application. Running VTRIS on the network and sharing data among multiple users may cause the system to crash.

Following are the recommended requirements for running VTRIS with Windows 95/NT:

An IBM-compatible computer with a pentium 133 MHz processor (or higher).

A mouse.

16 MB RAM.

At least 15 megabytes of hard disk space for installation. Actual volume of Vehicle Classification and Truck Weight data should determine the amount of space needed for running the VTRIS application. Large hard disk drives (1 gigabyte and larger) should be considered.

1.4 Development platform

VTRIS software was original written in FoxPro 2.6a for MS Windows and now converted to Visual FoxPro 5.0 for Windows 95/NT. MS Graph software is used to create VTRIS graphs. DynaZIP-32 data compression toolkit were used to incorporate reading and writing of industry standard ZIP files into VTRIS application for receiving and shipping data.

2 SYSTEM DESIGN

2.1 Overview of VTRIS functions

VTRIS implements following functions:

Conversion of the old ASCII Input file structures (Card2, Card4, Card7) into the new TMG formats

Validation of ASCII station, classification and weight data. Editing invalid data and validation of edited data

Load of data into the database of the specified structure

Viewing data in the VTRIS database

Exportation of VTRIS data in a wide variety of different file types

Summarization of data annually, monthly, quarterly, or customary. The system implements two summary methods - Hour of Day and Monthly ADT. It allows to build the summary from classification, weight, or both types of data.

Generation of standard W -Tables (1 through 7) from a Summary with selection of particular stations. The reports can be in metric as well as in English units.

Generation of graphs for the gross vehicle weight Distribution

Saving and retrieving W-Tables

Shipping and retrieving data

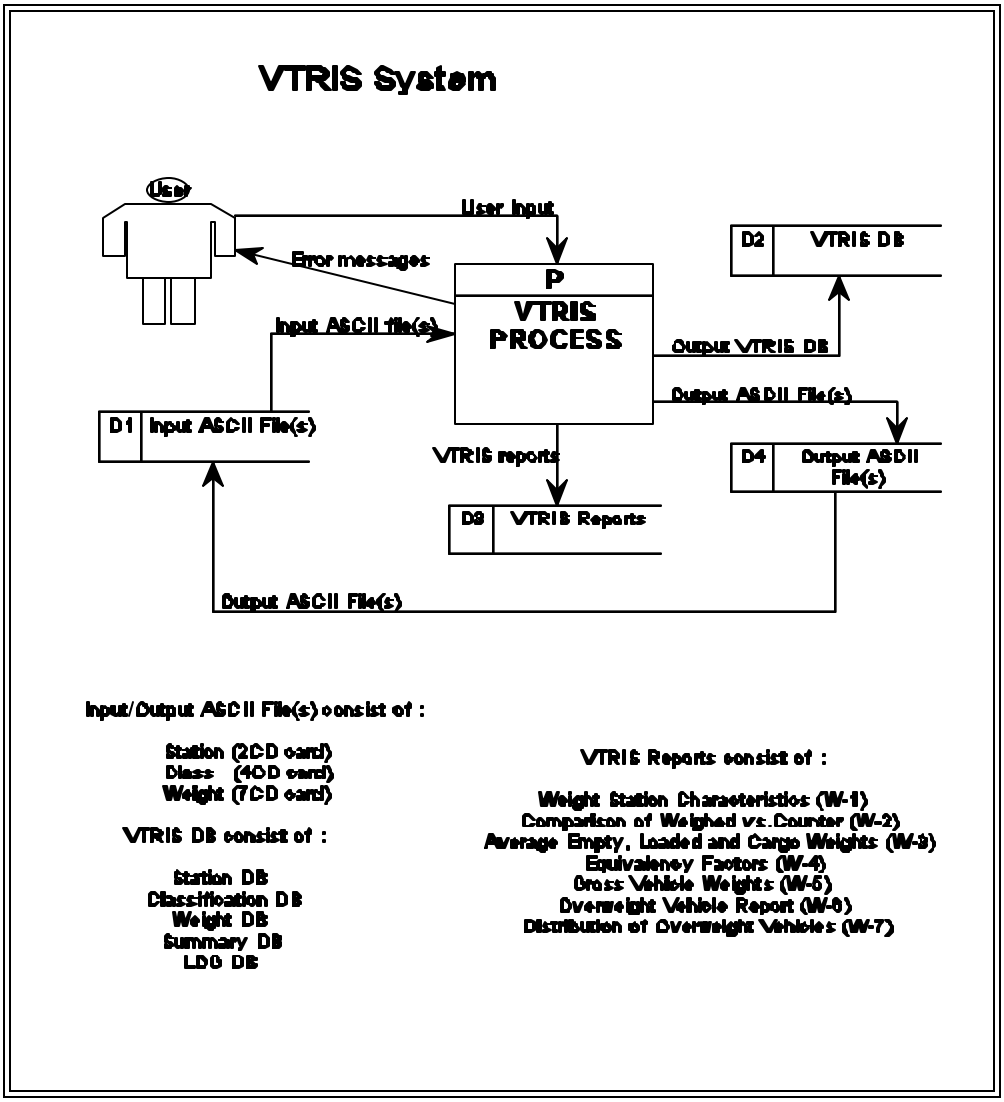
2.2 Design Methodology

The Structured Functional Design methodology was used in the process of the original VTRIS specification . The VTRIS design documents consist of the hierarchy of Data Flow Diagrams with process descriptions, and Entity-Relationship diagrams. The Relational Database Design methodology was used in data design and modeling .

2.3 Logical System Design

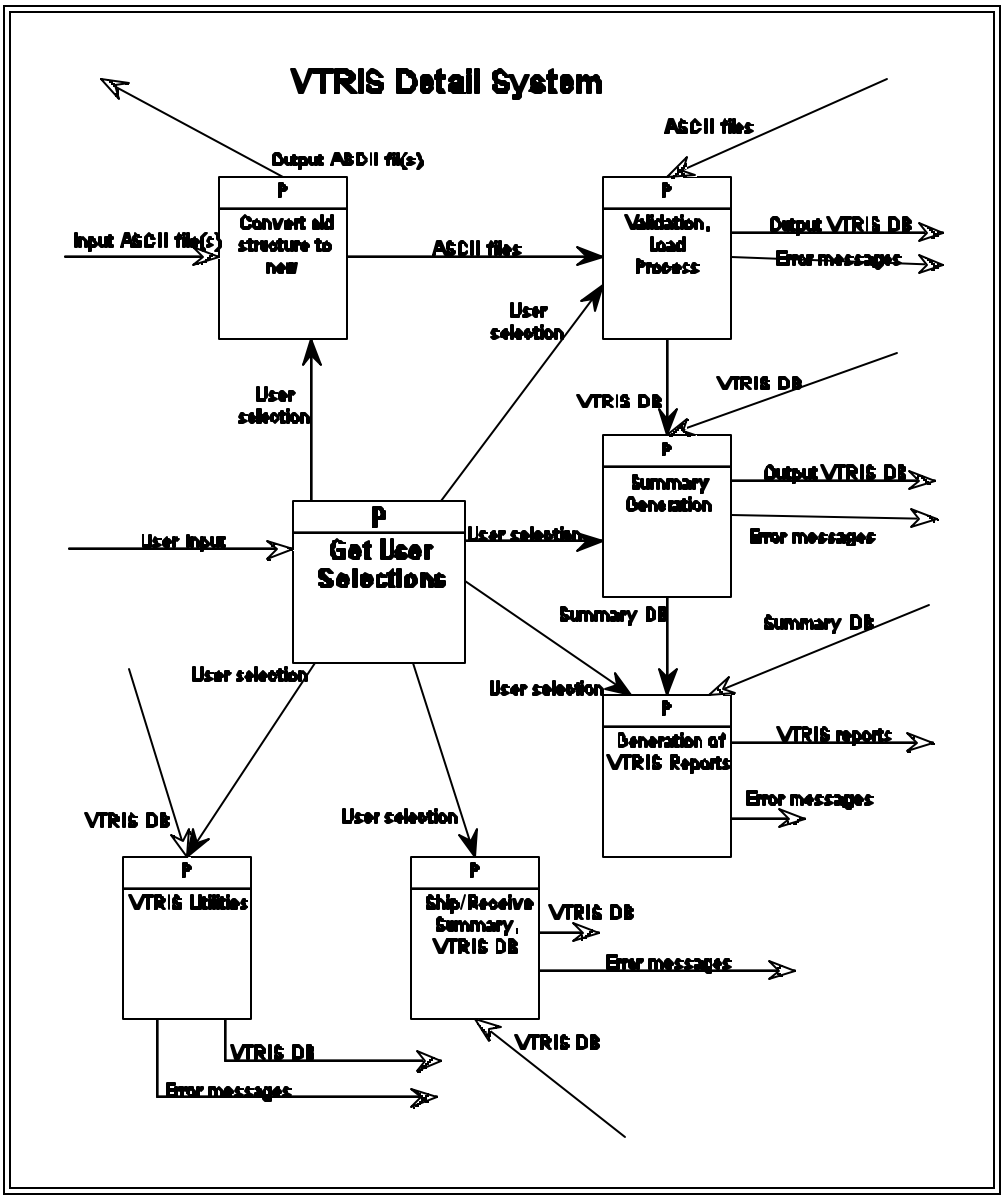
The VTRIS structured specification includes the hierarchy of Data Flow Diagrams. The position within the hierarchy reflects the level of detail. At the very high level VTRIS can be depicted by the following context diagram:

Fig 1



Next level of detail opens main VTRIS data flows form which VTRIS subsystems can be clearly derived.

Fig 2



Process 'Get User Selections' accepts user selections made via VTRIS's GUI and then invokes one of the other processes, passing them the user specified parameters.

Process 'Convert old structure to new' converts ASCII file(s) of the old structure into the new TMG format. This source file(s) will be validated and loaded into the VTRIS database by next Process.

Process 'Validation, Load Process' reads and validates the source file(s). The User can edit the records with errors and then load the correct records into the VTRIS Database. The following pseudocode describes the main processing loop:

```
WHILE not End of  Source File
    READ  Record from Source File
    VALIDATE  Source File Record
    WRITE Record into VTRIS database (VTRIS raw data tables)
ENDWHILE
```

Process 'Summary Generation' generates a summary from the VTRIS Database information. It averages data utilizing the user-selected algorithm and writes summary data into the VTRIS Database.

Process 'Generation of VTRIS Reports' is VTRIS reporting engine that generates W-1 through W-7 reports and graphs from the summaries placed into the VTRIS database by "Summary Generation' Process.

Process 'Ship/Receive Summary, VTRIS DB' allows to export (ship) compressed VTRIS data, and implements VTRIS capability to integrate (receive) it from another VTRIS Database.

Process 'VTRIS Utilities' includes utilities for VTRIS Database maintenance, backups, restores, reindexing, data deletion. It also implements Security and other system maintenance functions. Those functions are pretty much independent form each other and will be defined at the following layers of detail.

The following software subsystems can be singled out within VTRIS:

Conversion - implementing 'Convert old structure to new' and getting appropriate parameters.

Validation and Load - incorporating functionality of the 'Validation, Load Process' and part of 'Get User Selections' responsible for getting Load related parameters form User

Summary - covering functions of the process 'Summary Generation' and appropriate user parameters.

Reports - implementing 'Generation of VTRIS Reports' and obtaining necessary parameters (part of 'Get User Selections').

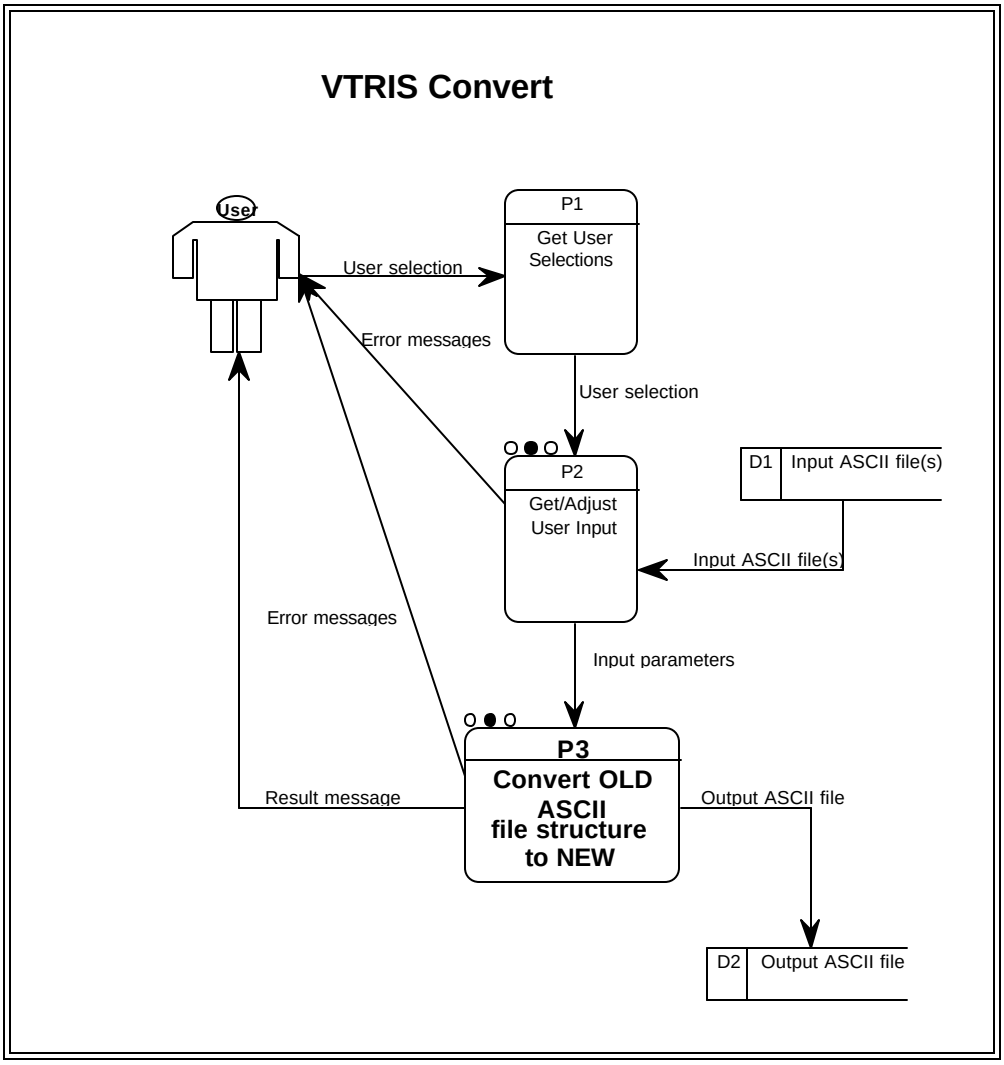
Ship/Receive - consisting of process 'Ship/Receive Summary, VTRIS DB' and getting parameters for them (part of 'Get User Selections').

Utilities - 'VTRIS Utilities' and obtaining appropriate parameters.

2.3.1 Conversion Subsystem

The Data Flow Diagram (DFD) in Fig 3 represents the next level of detail of the Conversion process. It converts the old Card 2, 4 and 7 data into the new formats specified in the TMG, according to the selected criteria.

Fig 3

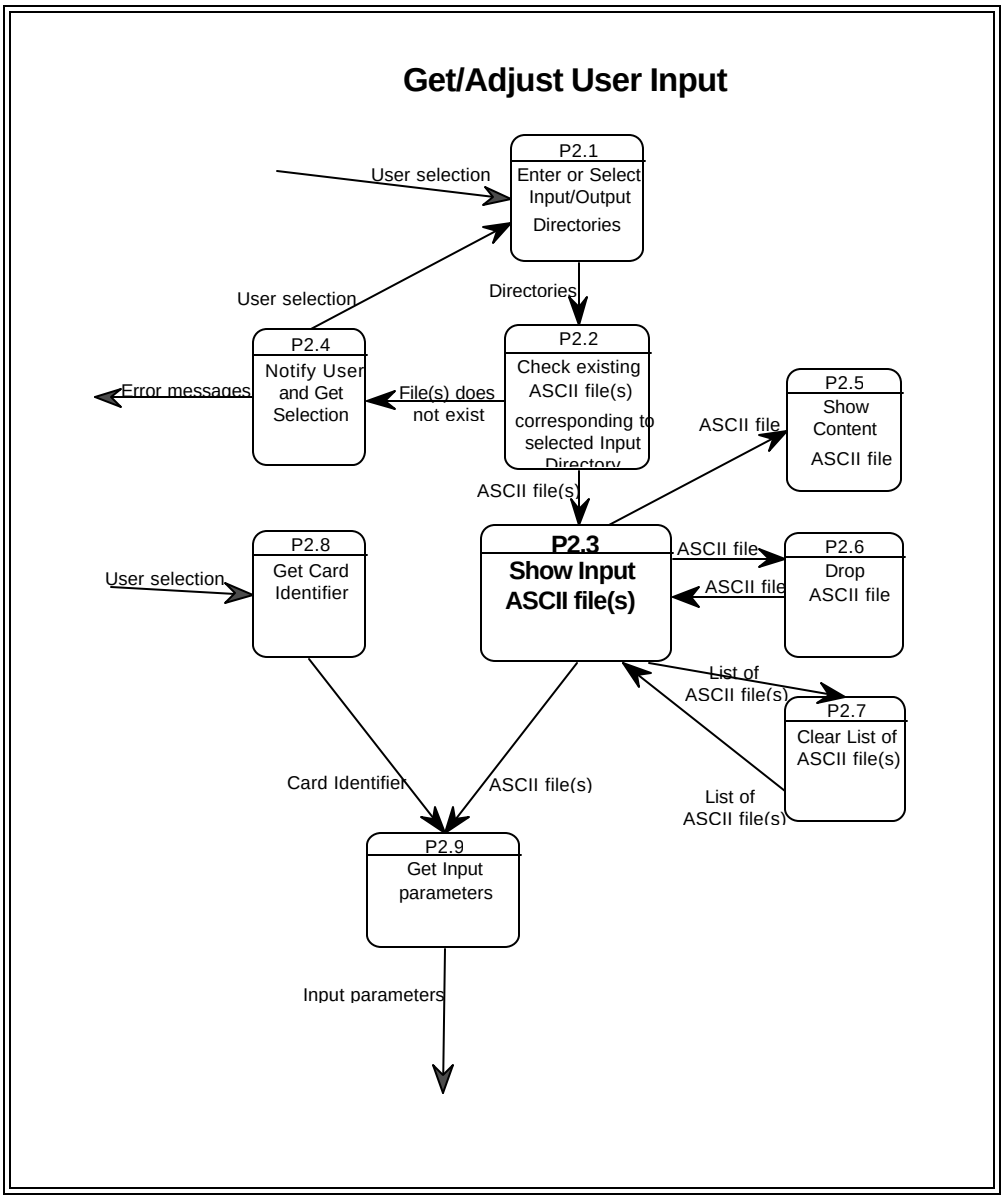


The diagrams in Fig 4 and Fig 5 show more details: Selection of Input ASCII files (P2) and the Conversion itself (P3).

2.3.1.1 (P2) Get/Adjust User Input.

This process selects the ASCII files to convert. It allows the user to enter or select input and output directories. Upon selection of the input directory, an array of ASCII files is created. The interface shows the directory content, allows the user to drop a highlighted file, clear this array, or select file(s) to convert. The Card Identifier should be selected during this process.

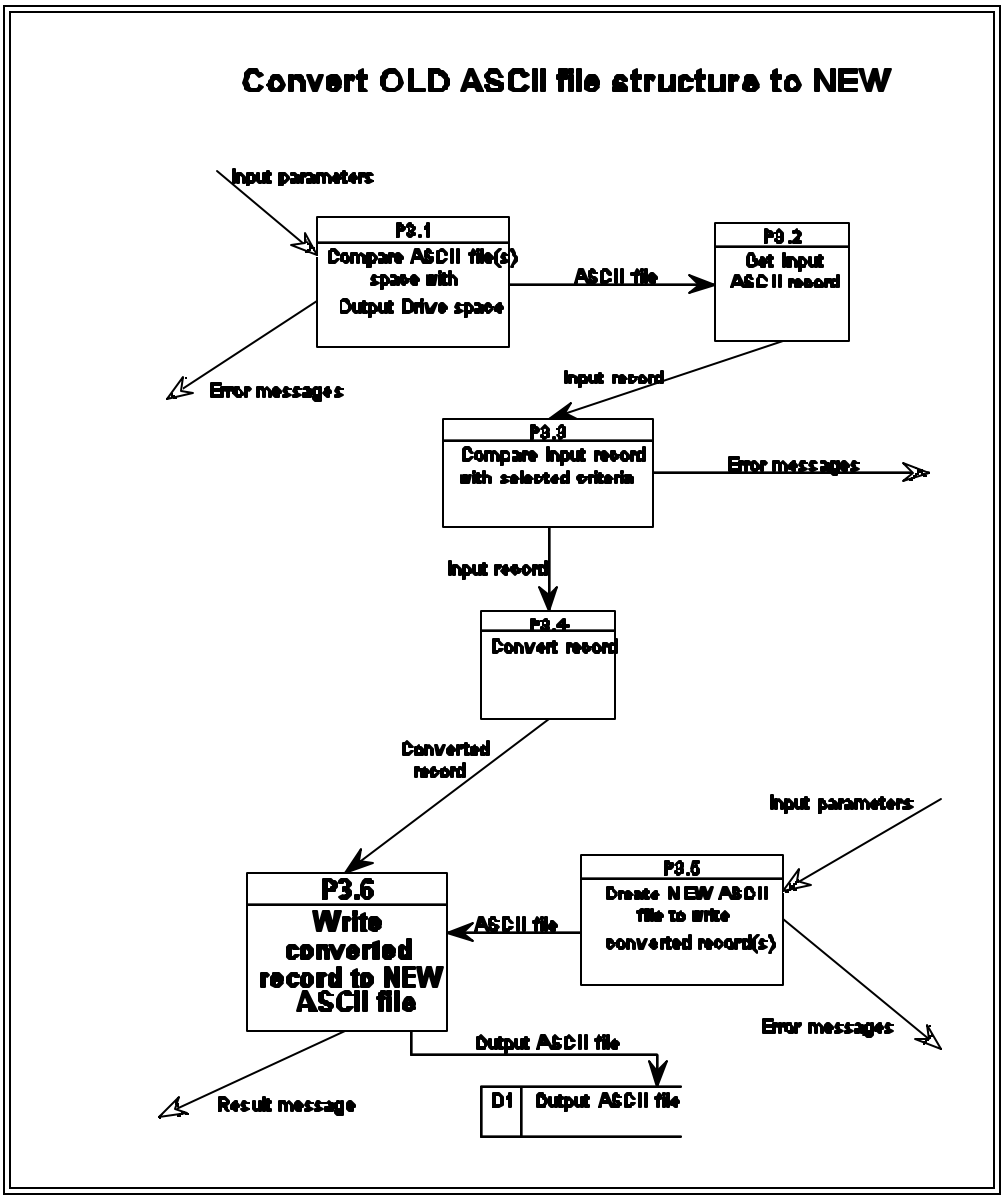
Fig 4



2.3.1.2 (P3) Convert Old ASCII file structure to NEW.

This process checks for the availability of output directory disk space. Depending on the result, it displays the 'Drop some files or specify other drive!' message or proceeds to convert selected file(s). It reads each ASCII files' record and compares it with the selected criteria - identified record type, record's length, etc. All the correct records are converted into the new TMG formats and written into the ASCII output file.

Fig 5



2.3.2 Validation and Load Subsystem

The Load/Validation subsystem is designated to detect all kinds of errors in upcoming data, provide a facility to correct those errors and eventually load valid data into one of the VTRIS tables. The result of the Load/Validation procedure should be valid data placed into the STATION, CLASSIFICATION and WEIGHT tables with the codes for each record reflecting the level of reliability of data (fields). The records with errors are placed into the error tables. Data validity means not only non-violation of coding rules established for STATION, CLASSIFICATION and WEIGHT data, but also includes the support of referential constraint and data integrity within and among the tables.

The data to be loaded into the VTRIS tables may arrive only as plain ASCII files. The newly adopted requirements demand that the ASCII files come named according to the following convention: SSYY.XXX. Where SS - state code, YY - year of data and XXX - 'STA', 'CLA', or 'WGT' for STATION, CLASSIFICATION and WEIGHT data respectively. Since this agreement is not supported at this time, the validation of state FIPS code and year against the file name for a single record will be omitted. Hence, the record type determination problem arises because one file can contain records of all types. To resolve this issue, each record should contain: 'Record type Identifier', 'Key Data' and the other fields specific to its data type.

Each ASCII record will go through the following validation steps:

1. Determination of the record's type according to FHWA formats set for coding of STATION, CLASSIFICATION and WEIGHT data. The data type, record length, and other record parameters are also checked.

2. Validation of single fields within a record to ensure that they hold a valid field value or are within a specific range of values. In addition, cross-validation within a single record between two or more fields is done to ensure that data fields are not contradicting each other.

3. Checks for duplicates and consistency between the records that are being loaded into the same table. This mostly concerns STATION and CLASSIFICATION data since there should not be duplicate records with the same key value. For WEIGHT data it is not a validation issue, but rather a matter of data maintenance since the specified key may identify an unlimited number of records. This corresponds to the fact that the table contains one record per truck measured.

4. Cross-validation between the fields of the new records and the records from the VTRIS table to prevent duplicates and support referential integrity between different VTRIS tables as well as consistency within a single table. The integrity requires that the CLASSIFICATION and WEIGHT data checks against station data to make sure that the key is valid (e.g. Station-Direction-Lane exist).

The following error levels are established:

1. **Junk** - those records that are detected at the earliest stage of validation and result in the record being put into the JUNK file. No further validation is possible for these records until some manual editing is done.

2. **Fatal** - those records that cannot be admitted "as is" even if User would like them to. For those errors, an appropriate correction through the ERROR table Browse/Edit facility is required. Those are typically errors in the key fields and other very significant fields that would violate consistency and referential integrity.

3. **Caution** - those errors that can be fixed or can be flagged by User as acceptable and put into the VTRIS tables "as is". If User accepts and flags them, an appropriate Flag Code will be placed into a VTRIS table along with the record.

4. **Out-of Range** - for those numeric fields whose values are out of a certain valid range. These errors cannot be fixed, since no manual input is allowed for the numeric fields. They can be only flagged "as is" or the whole record must be rejected by User - eliminated or placed into Junk.

Fig 6

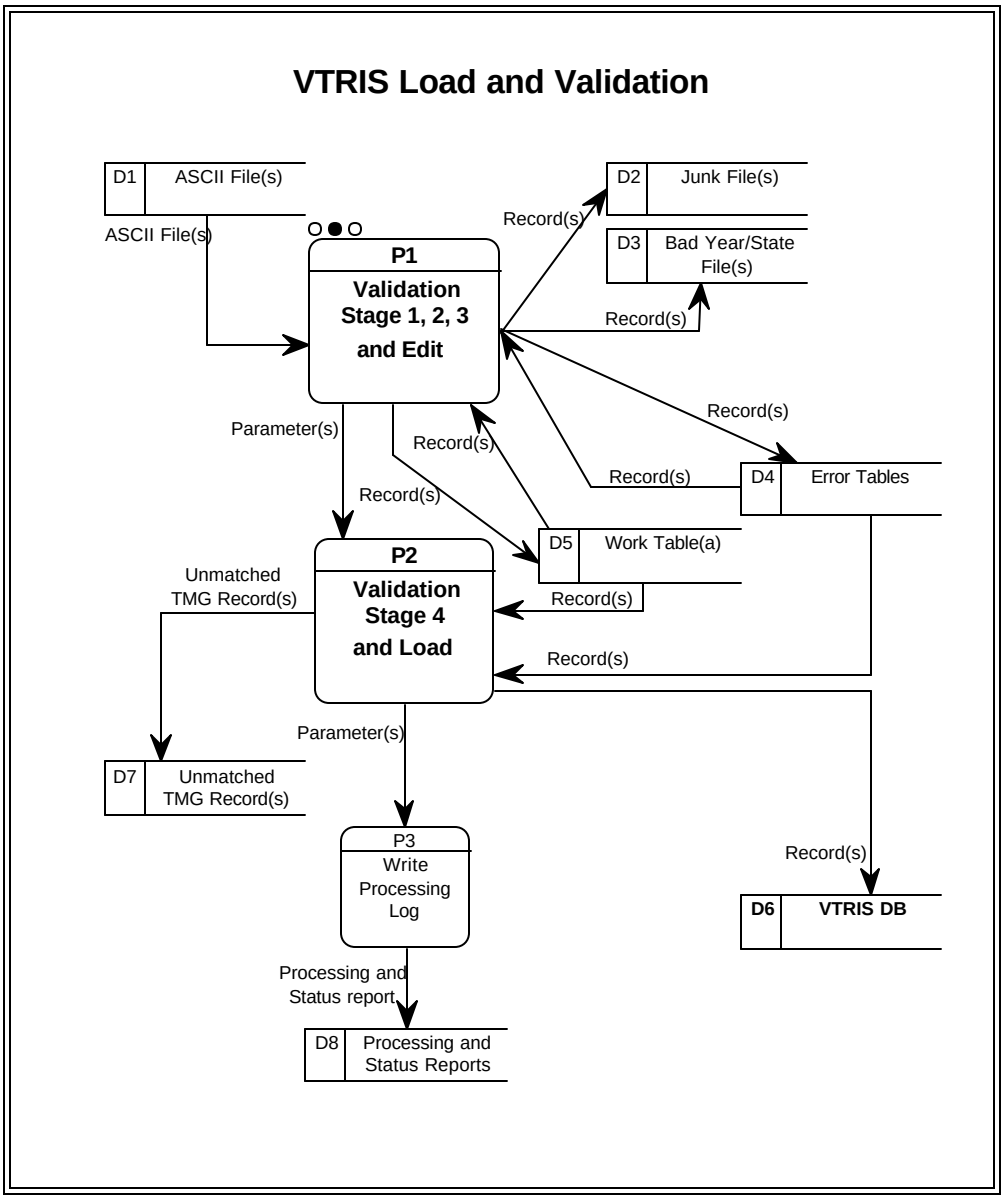
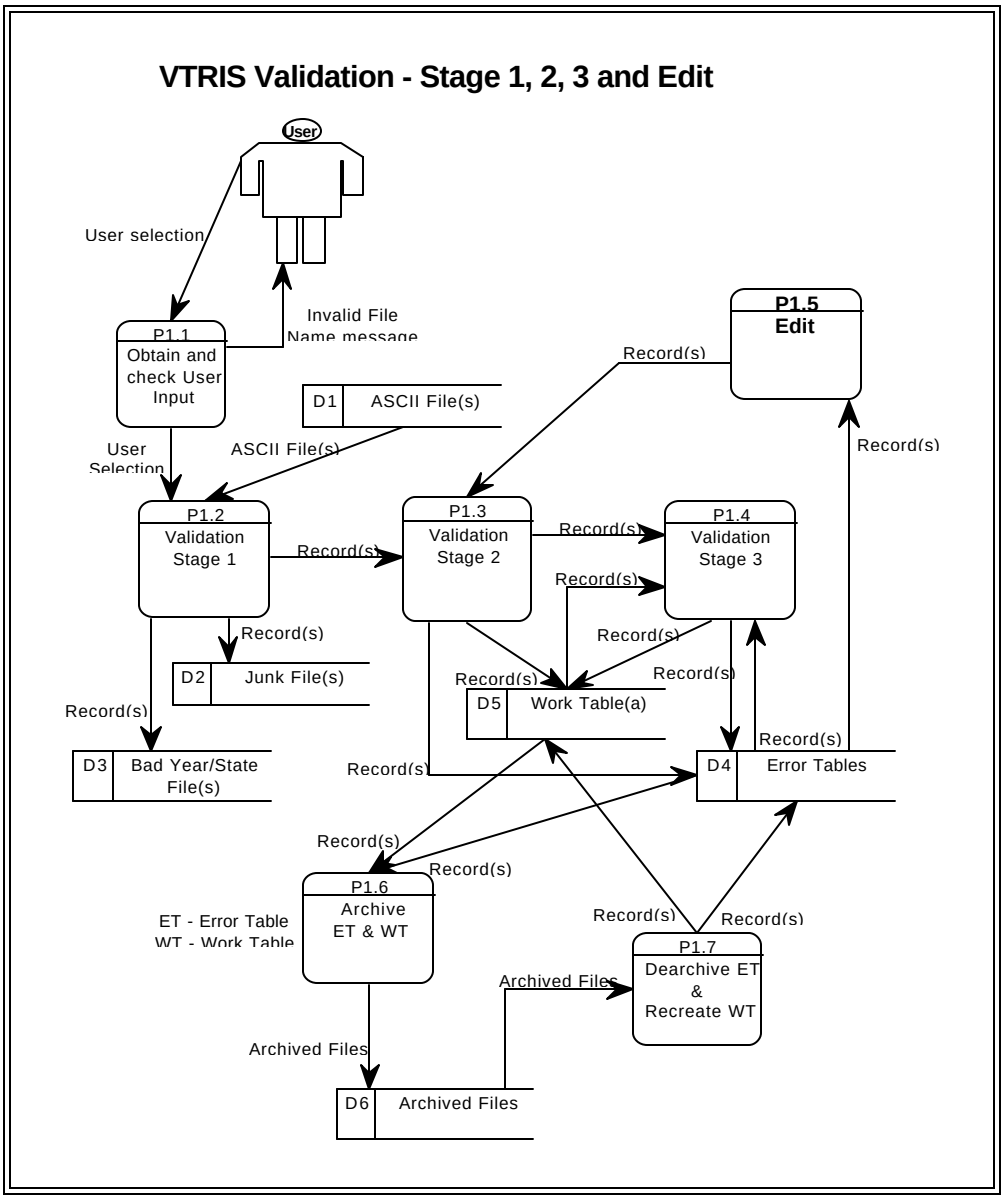


Fig 7


VTRIS Validation - Stage 1, 2, 3 and Edit
User
User selection
Invalid File Name message
P1.1
Obtain and check User Input
D1
ASCII File(s)
User Selection
ASCII File(s)
P1.2
Validation Stage 1
Record(s)
P1.3
Validation Stage 2
Record(s)
P1.4
Validation Stage 3
Record(s)
P1.5
Edit
Record(s)
Record(s)
D2
Junk File(s)
Record(s)
Record(s)
Record(s)
D5
Work Table(a)
Record(s)
Record(s)
D3
Bad Year/State File(s)
Record(s)
D4
Error Tables
Record(s)
Record(s)
Record(s)
P1.6
Archive ET & WT
ET - Error Table
WT - Work Table
Record(s)
Record(s)
P1.7
Dearchive ET & Recreate WT
Archived Files
Archived Files
D6
Archived Files

The **'Obtain and check User Input'** process (P 1.1) allows User to select ASCII files containing STATION, CLASSIFICATION and/or WEIGHT data and start the process of Validation according to TMG established rules.

The **'Validation Stage 1, 2, 3'** process (P 1.2, P 1.3, P 1.4) reads the ASCII file record by record. If the Stage 1 validation fails, it places the record into the ASCII Junk or/and Bad Year/State file(s) with the attached error code(s). Otherwise, it calls Stage 2 validation passing it the record to validate. The Stage 2 validation receives the type of the record and, depending on whether or not it calls the set of small modules to validate each field of the record. It returns OK or a compound error code depending on whether or not any errors were detected. If the record passed Stage 2, the process calls Stage 3 validation for this record. Stage 3 receives type of the record and checks it against the records which are in the Work Table, utilizing error check routines corresponding to the data type. It returns OK or creates a compound error code and also moves all involved records from the Work Table to the Error Table with an appropriate error code. Thus, if the record passes Stage 3 validation, it is placed into the Work Table. Otherwise, the process places it into the Error Table. The work of the process ends when end of the ASCII file is reached.

The **'Archive Error Table and Work Table'** process (P1.6) allows the Error and the Work tables to be moved elsewhere so that User may go on to different loads.

The **'Dearchive Error Table and Recreate Work Table'** process (P1.7) recovers the Error Table with all error codes and flags form the single archive table. It also recreates the Work Table by extracting the records with the Work table codes from the dearchived Error Table, if there are any. The Status is returned. It returns User to the exact same point where he selected to archive Work and Error tables and he can continue.

The **'Write Processing Log'** process (P3) writes the Load results (what files have been loaded into VTRIS and the dates and other pertinent information about the load) into Load Log database.

2.3.3 Summary Subsystem

The Summary Generation process shown in Fig 8 allows the user to create various Summaries and store them in the VTRIS SUMMARY database :

Class Average DB
Class Time Period DB
Weight Time Period DB
Weight Detail DB

Summaries are based on Station description, Classification and/or Weight tables loaded and kept in the VTRIS database.

This process implements the standard methods of Averaging Computations:

Hour of Day

For a given period of time, this method extracts the hourly information for a class and then calculates the average for each hour for that class. Upon averaging each hour, it adds all the 24 averages and then divides the sum by 24 to get the daily average for the class.

Monthly ADT

For a given period of time, this method separates the data by DOW (day of week, i.e Sunday through Saturday), then calculates the average traffic volume for each hour for that DOW. It further divides each hour by the number of days in the period of time specified. Then it sums the 24 hourly averages to get the DOW averages.

During Summary generation the vehicle axle groups are being determined:

Single axle group. (Rules are hard coded in the system)
Tandem axle group (Rules are hard coded in the system)
Triple axle group. (Rules can be changed using utilities/VTRIS Configuration/Class, Weight Summary menu options)
Quad axle group. (Rules can be changed using utilities/VTRIS Configuration/Class, Weight Summary menu options)

There are two methods of Group Code determination:

Vehicle Weight & Size Method

A Single axle group is defined as one or more axles within 1 meter. Thus, if two axles are separated by more than 1 meter, they are in separate axle groups, but if they are 1 meter or less apart, they are in the same axle group and are counted as a single axle.

A Tandem axle group is defined as two or more axles spanning more than 1 meter but no more than 2.44 meters.

A Triple axle group is defined as three or more axles spanning more than 2.44 meters but no more than 3 meters. The spacing rules can be changed.

A Quad axle group is defined as four or more axles spanning more than 3 meters but no more than 3.8 meters.

ASTM (Using Delta)

Delta is 0.6 meter hard coded.

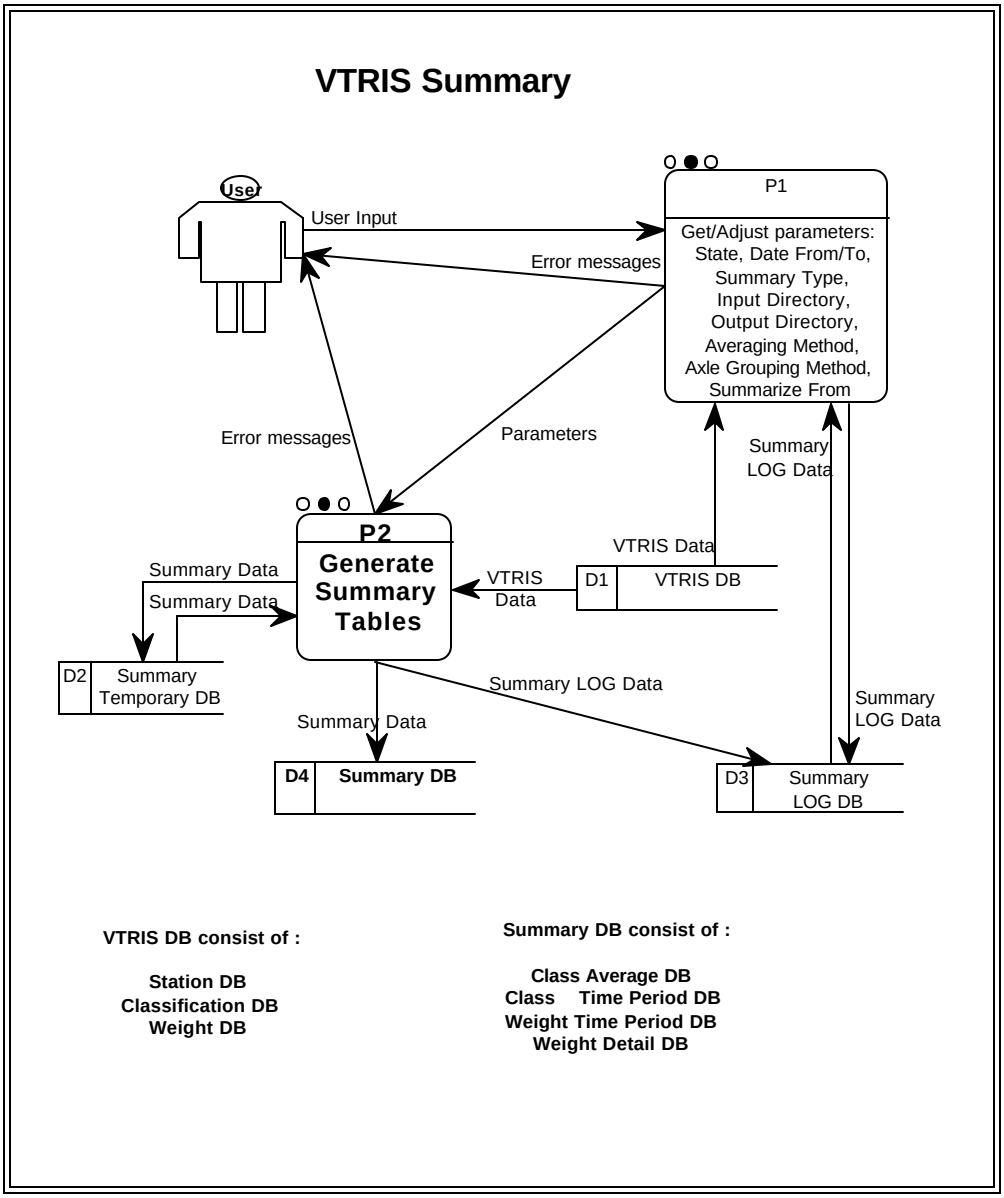
To calculate Single, Tandem, Triple, Quad axles the spacing rules are same. The user has the same options to change triple and quad spacing rules. The difference in the ASTM method is it used delta option.

If axle spacing is significantly greater than the last group's average spacing, start a new group. Current axle space .GT. Group Average + Delta

If axle spacing is significantly less than the last group's average spacing, remove the group's last axle and start a new group with the removed axle and this axle. Current axle space .LT. Group Average - Delta.

The summary generation process can be further broken down into the following:

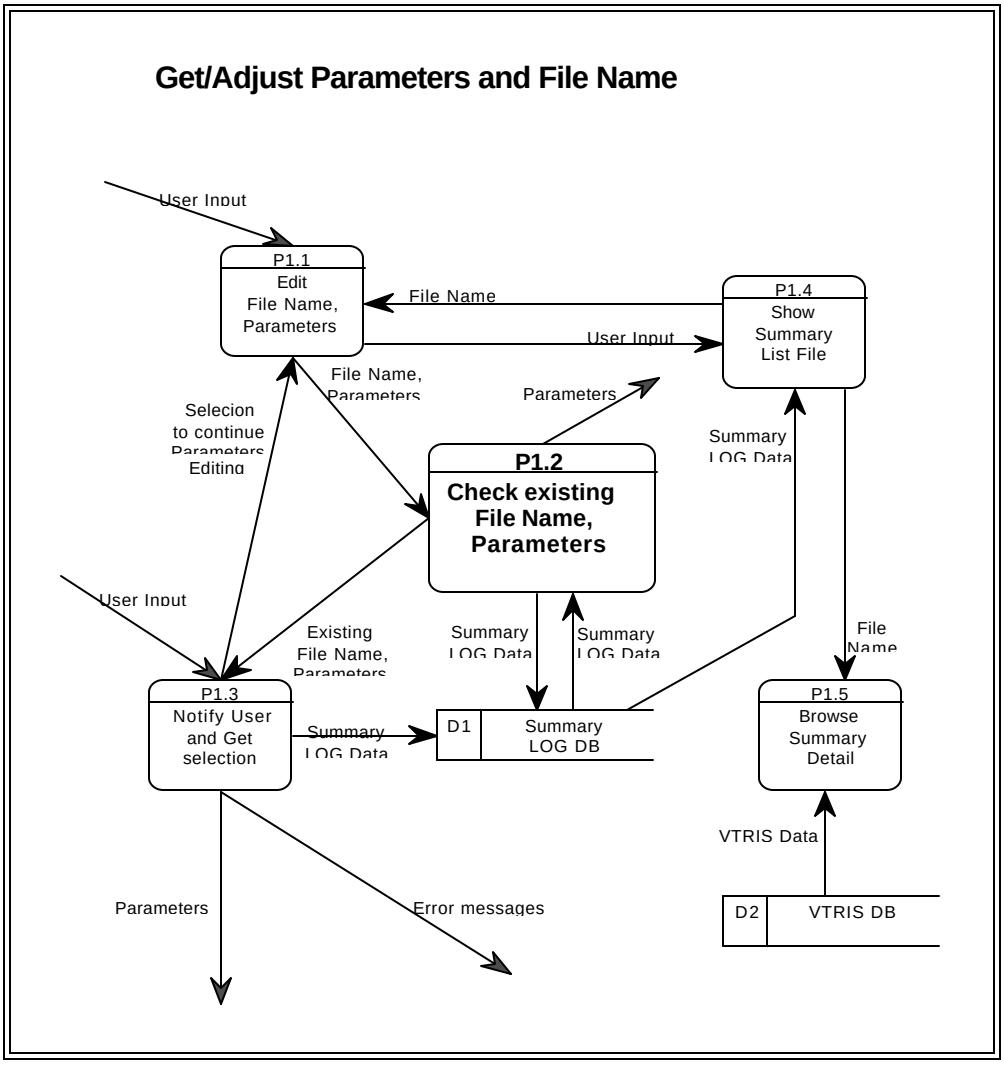
Fig 8



2.3.3.1 Get/Adjust Parameters and File Name

This process allows User to input and edit the following parameters: the State (if User doesn't know the abbreviation of a state he can just press enter on the field and select a state from the list), Date From/To, Day(s) of week, Summary Type (Annually, Quarterly, Monthly or Custom), Input Directory (VTRIS data collection files), Output Directory (where Summary files will be stored), Averaging Method (Hour of Day or Monthly ADT), Axle Grouping Method (Vehicle Size Weight or ASTM) and Summarize from (Both, Classification table or Weigh table). The resulting file will have a name that depends on the selected summary criteria.
Before the selected VTRIS database is summarized, the Process P1.2 checks to see if the summary file with this name already exists. If it does, the new file will have a different extension.
Before he selected VTRIS database will be summarized, the Process P1.2 checks physicals existing files.

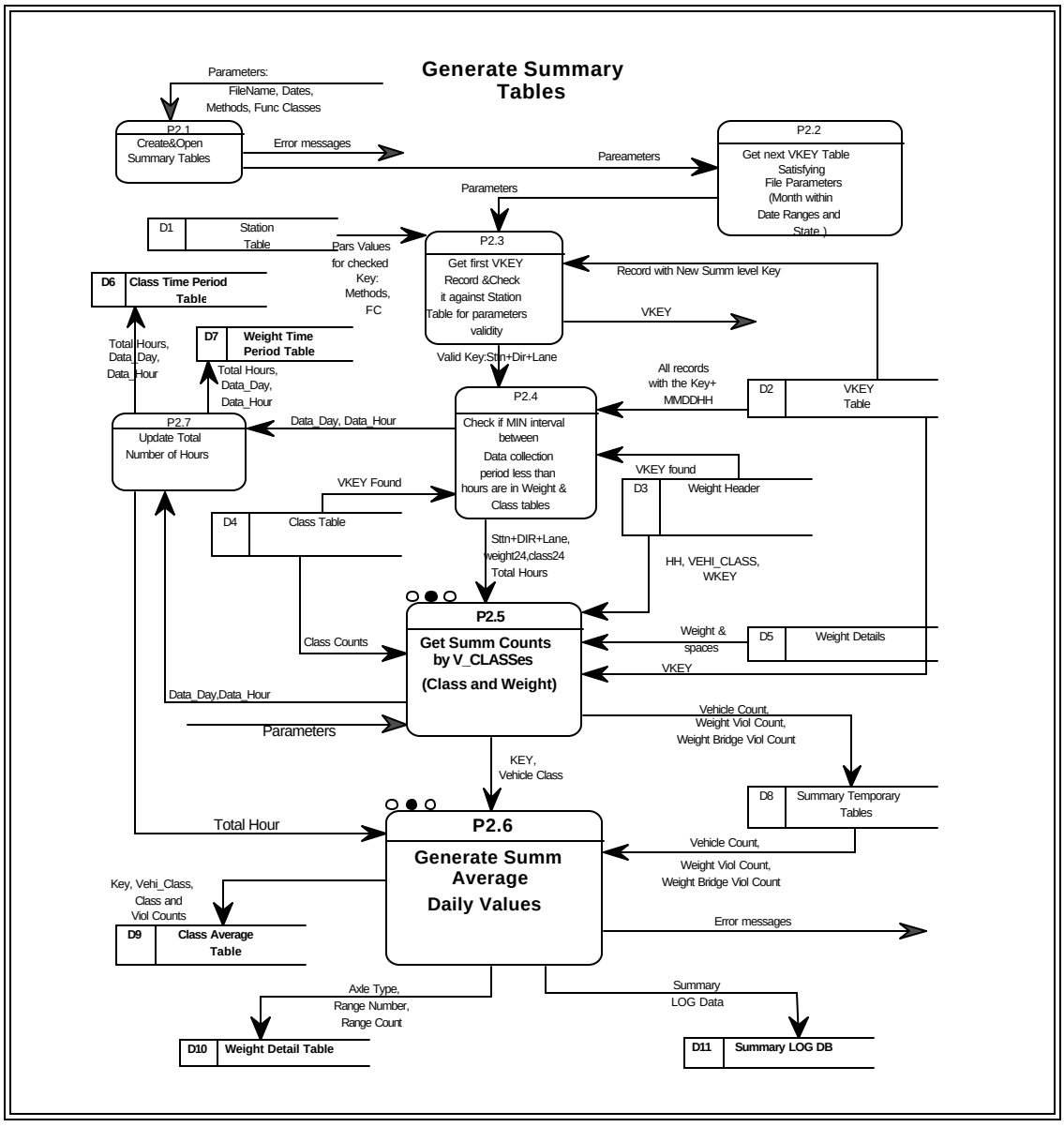
Fig 9



2.3.3.2 Generate Summary Tables

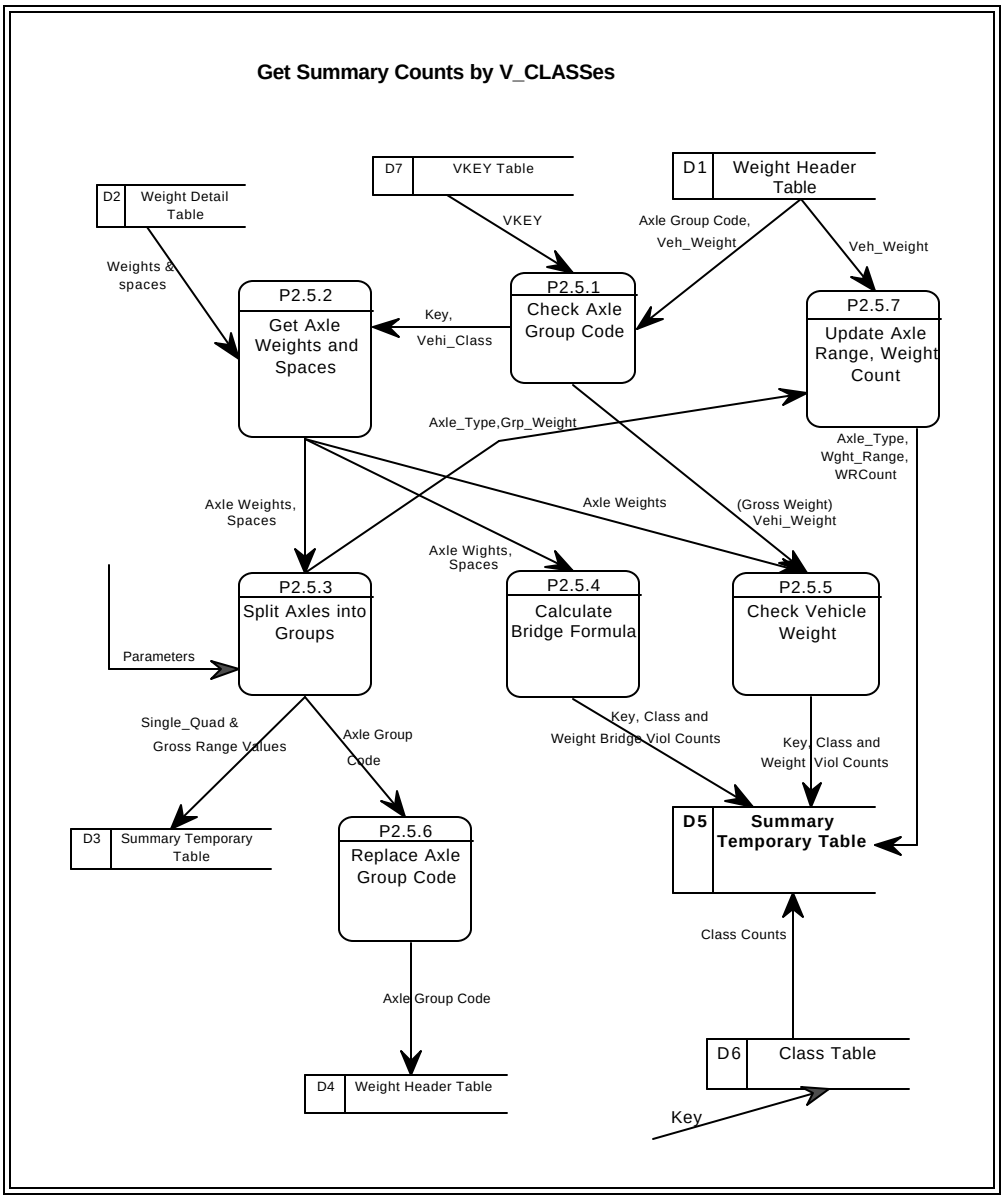
This process generates a summary file. The DFD is very detailed and self-explanatory.

Fig 10



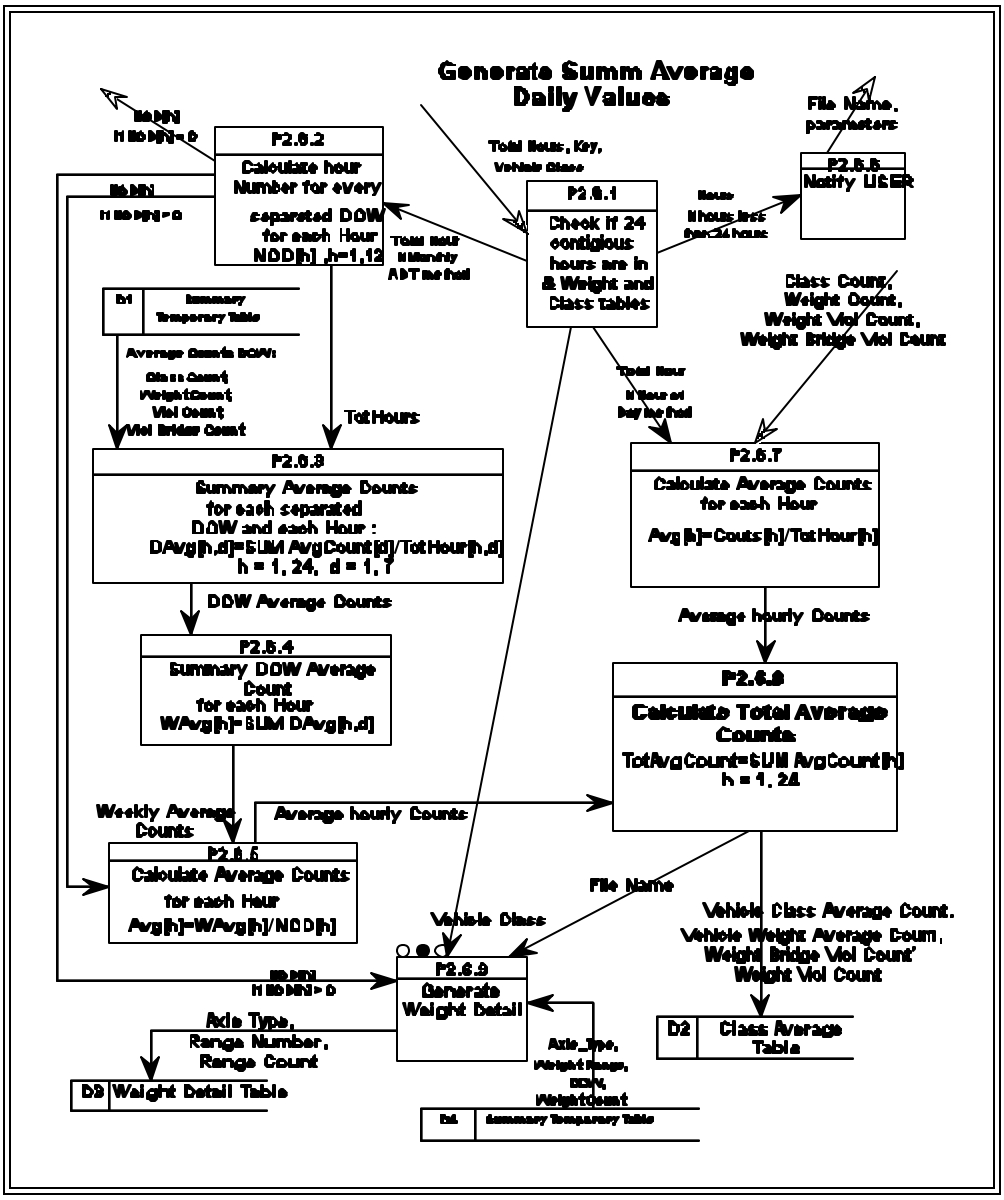
2.3.3.3 Get Summary Counts by V_CLASSes

Fig 11



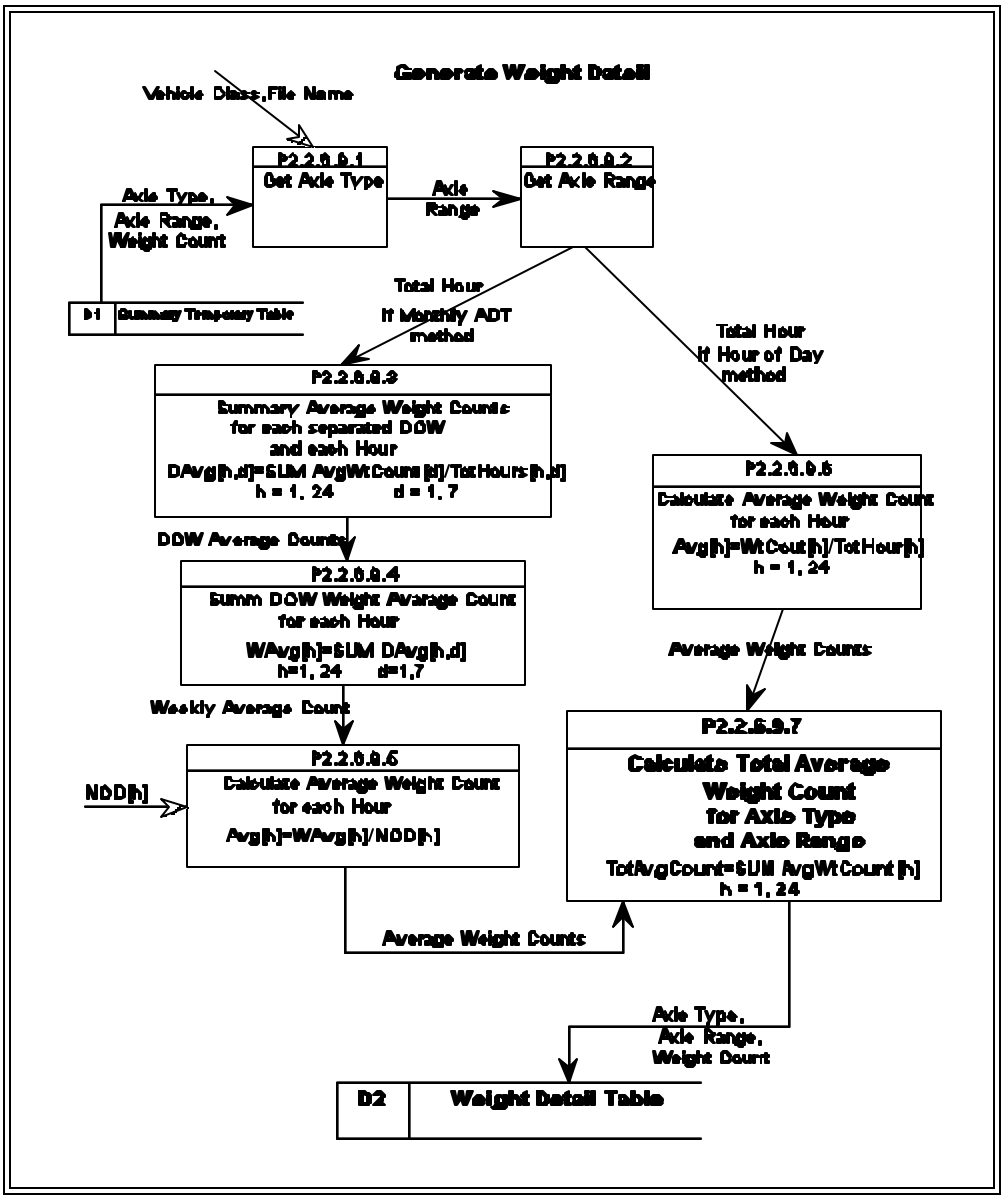
2.3.3.4 Generate Summary Average Daily Values

Fig 12



2.3.3.5 Generate Weight Detail

Fig 13



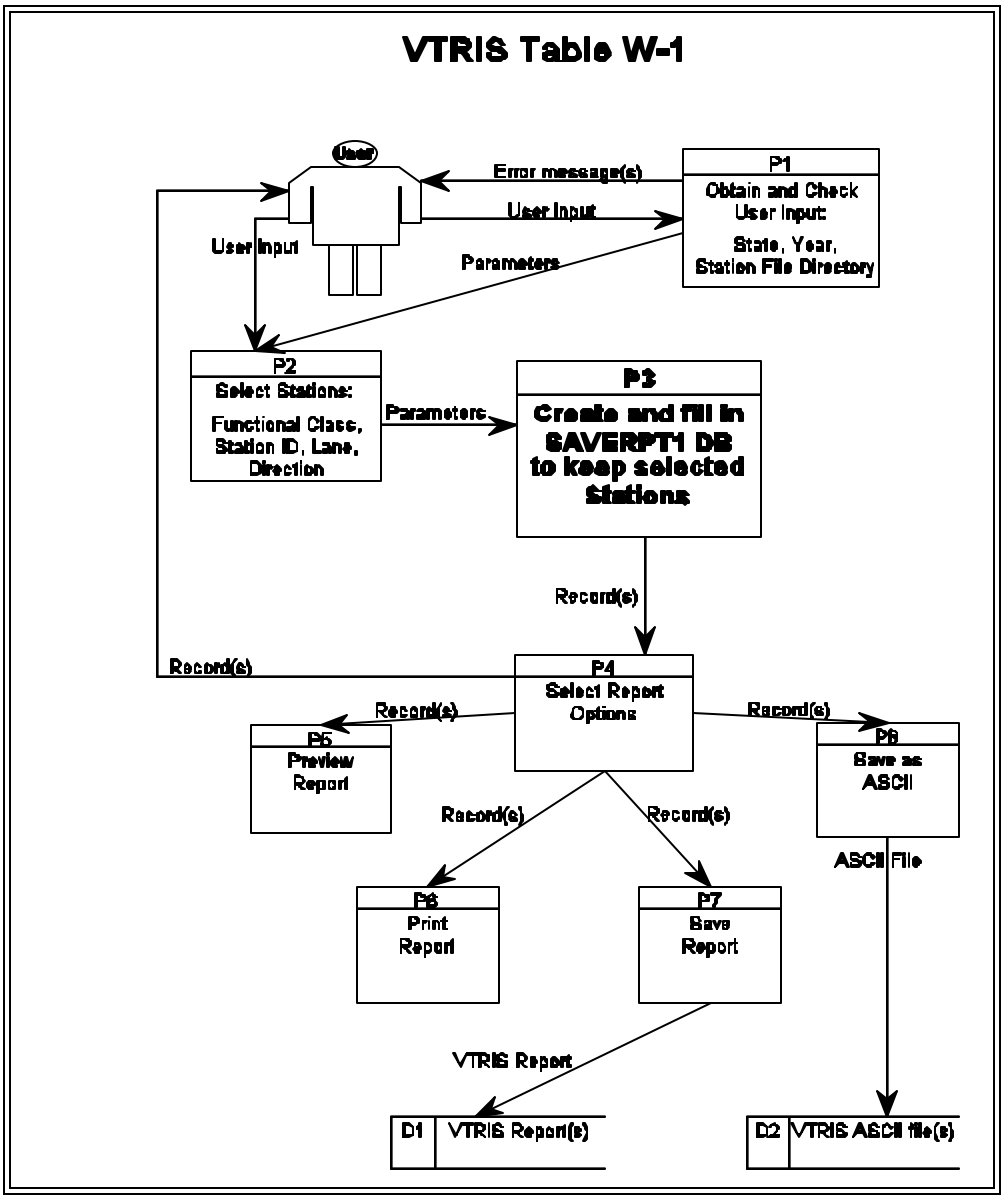
2.3.4 Reports Subsystem

The **VTRIS W-Tables** are designed to provide a standard format for presenting the outcome of the Vehicle Weighing and Classification efforts at truck weigh sites. The data that appears in the W-Tables comes from the Summary files that are generated by the Summary subsystem.
This process has the capability of generating Graphs that come from Summary data or from Raw data.

All W-Tables can be **Viewed** on screen, **Printed,** and with the exception of the graphs, **Save**d to disk like .DBF or ASCII files.

2.3.4.1 VTRIS W-1 Table : Weight Station Characteristics

This table displays the characteristics of each Weight Station based on the information contained in the Station description records. The characteristics include a description of the location of the station along with information about the type of station and the equipment used.
After input data is entered: State, Year and Station File Directory User can limit the Functional Classes and select particular stations to be used for the W-1 Table. This process also creates the VTRIS SAVEPRT1 database and fills in information based on a selection criteria specified by User.
All information are used to View, Print and Save W-1 Table.


VTRIS Table W-1
User
Error message(s)
User Input
User Input
Parameters
P1
Obtain and Check User Input:
State, Year, Station File Directory
P2
Select Stations:
Functional Class, Station ID, Lane, Direction
Parameters
P3
Create and fill in SAVERPT1 DB to keep selected Stations
Record(s)
Record(s)
P4
Select Report Options
Record(s)
Record(s)
P5
Preview Report
P6
Save as ASCII
Record(s)
Record(s)
ASCII File
P8
Print Report
P7
Save Report
VTRIS Report
D1
VTRIS Report(s)
D2
VTRIS ASCII file(s)

W-1 Table

Date 02/02/1999 1

WEIGH STATION CHARACTERISTICS

STATE: MD STATION CODE: 4830 YEAR: 90

FUNCTIONAL CLASS	:Rural Principle Arterial Other
ROUTE INFORMATION	:000000
COUNTY CODE	:023
LOCATION	:BR#11046 US48 @ SAND SPRING RD.
HPMS SAMPLE NO.	:0000000000
HPMS SUBDIV. NO.	:0
YEAR STATION EST.	:88
NUMBER OF LANES	:
WEIGHING EQUIPMENT	:Portable weigh-in-motion system
VEHICLE CLASSIFICATION	:Portable automatic vehicle class
AADT	:-1

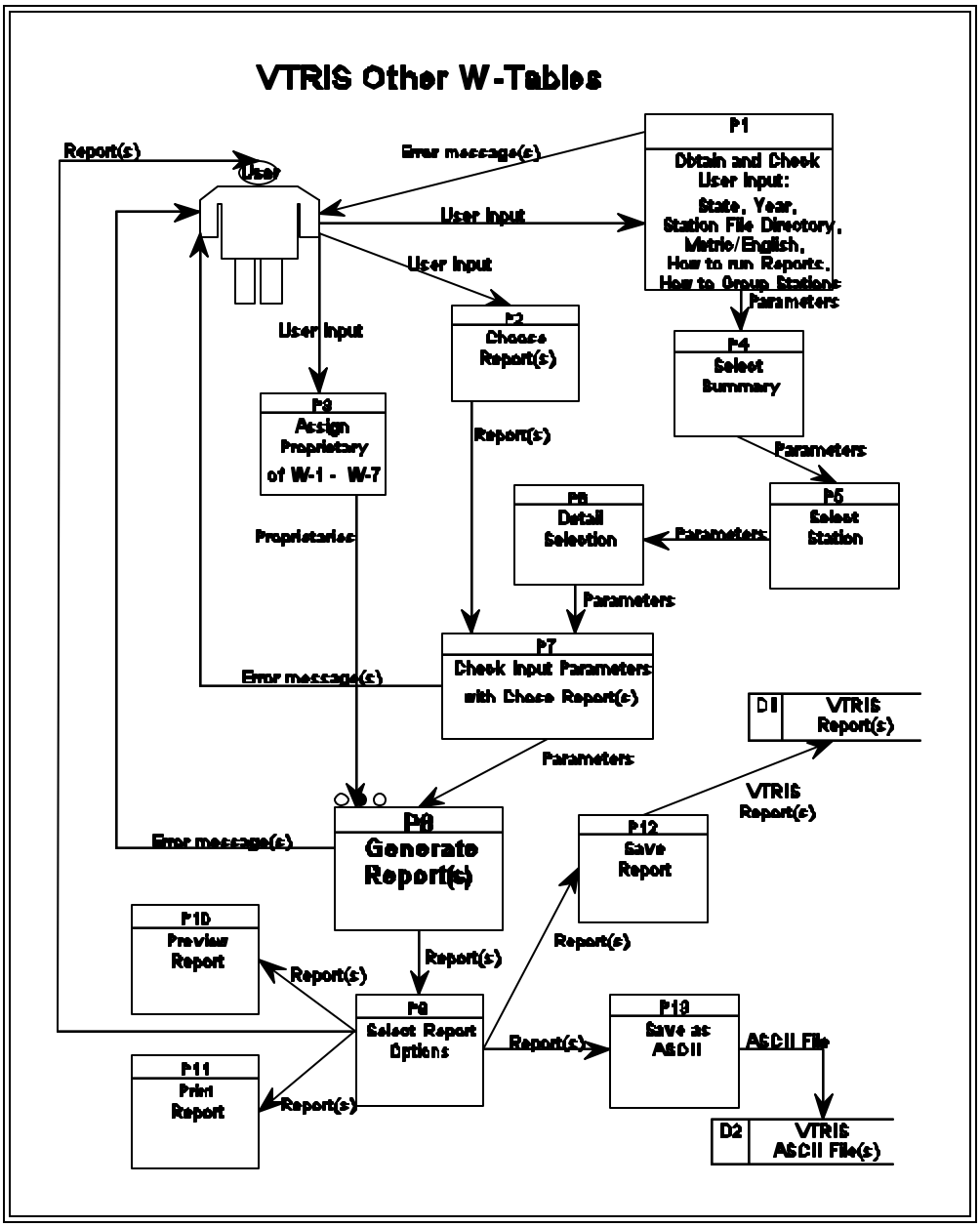
STATE:MD STATION CODE: 4870 YEAR: 90

FUNCTIONAL CLASS	:Rural Principle Arterial Other
ROUTE INFORMATION	:000000
COUNTY CODE	:02
LOCATION	:BR#11046 US48 @ SAND SPRING RD.
HPMS SAMPLE NO.	:0000000000
HPMS SUBDIV. NO.	:0
YEAR STATION EST.	:88
NUMBER OF LANES	:
WEIGHING EQUIPMENT	:Portable weigh-in-motion system
VEHICLE CLASSIFICATION	:Portable automatic vehicle class
AADT	:-1

2.3.4.2 VTRIS Other W-Tables

This process allows User to generate the W-2 through W-7 Reports. Entered or select **Input Data** will be the same for all Reports : State, Year, Station File Directory, Metric/English, How to run Reports and How to Group Stations. After the type of Reports is selected and compared with Input Data by User, the **'Generate Report(s)'** process produces the W-2 through W-7 Reports.
This Reports can be Previewed, Printed (before saving) or Saved like database or ASCII files.

Fig 16



2.3.4.2.1 VTRIS W-2 Table

This table displays a **Summary of the Vehicle Counted and the Vehicle Weighed** for selected stations by Vehicle Classification. The Vehicle Classification data is averaged for each hour and the 24 hourly averages are added for the average daily count.

The W-2 Table breaks the data down by the 13 Vehicle type categories. But this table considers weight information for Vehicle type 5 through 13.

Fig 17

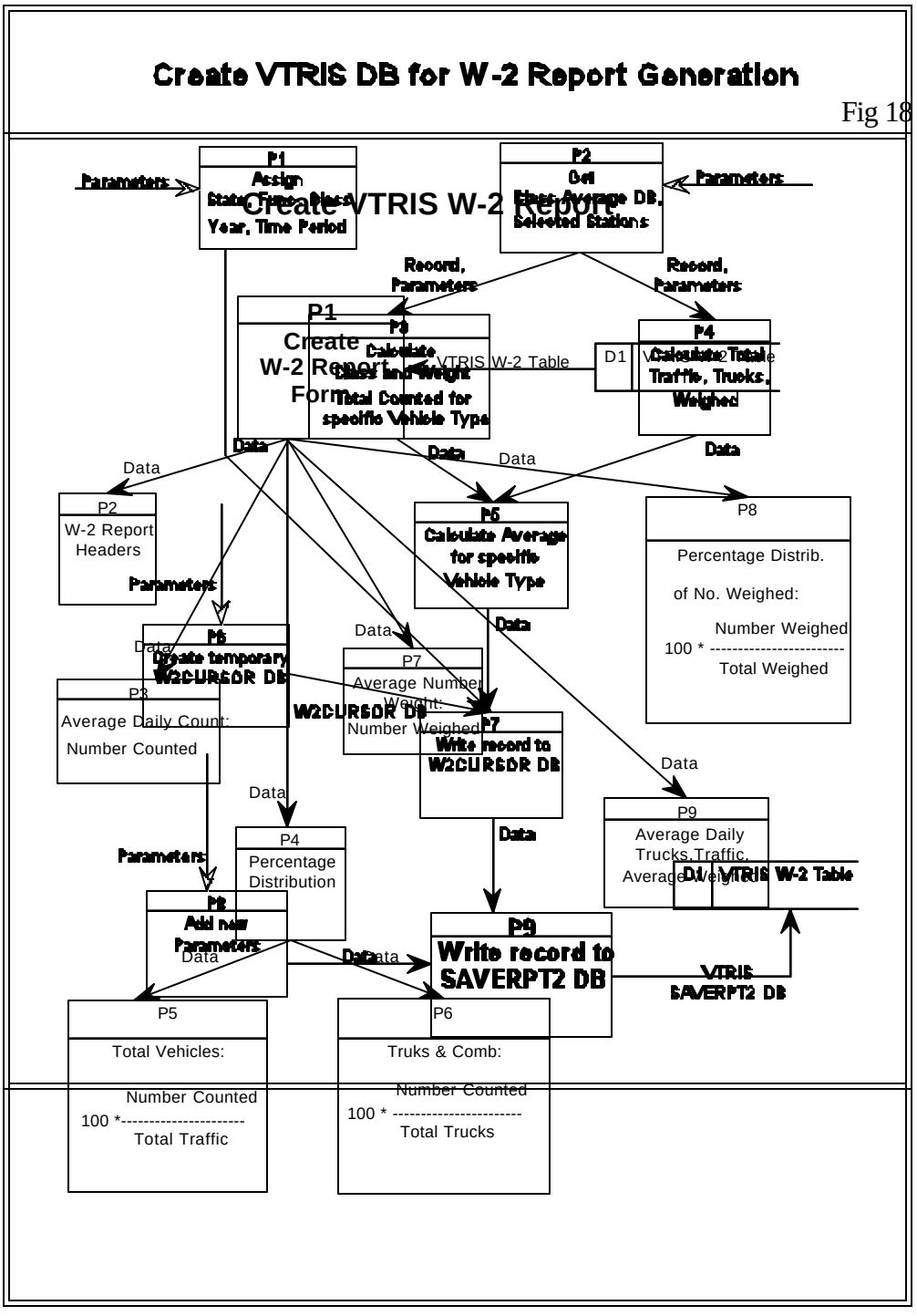


Fig 18

W-2 Table
COMPARISON OF WEIGHED VS. COUNTED
By Direction

AXLE GROUPING METHOD: Vehicle Size & Weight
AVERAGING METHOD: Hour of Day
STATE: MD
PERIOD: 1990

FUNCTIONAL CLASS(02) : 02
STATION CODE(S) 9030 (9030), 9070 (9070)

FHWA VEHICLE CLASS	AVERAGE DAILY COUNT	PERCENTAGE DISTRIBUTION TOTAL VEHICLES	TRUCKS & COMB.	AVERAGE NUMBER WEIGHED	PERCENTAGE DISTRIB. OF NO. WEIGHED
1 Motorcycles	9	0.31			
2 Passenger Cars	2,407	82.77			
Single Unit Trucks:					
3 2-axle,4-tire	352	12.10			
4 Buses	15	0.52			
Single Unit Trucks:					
5 2-axle, 6-tire	56	1.93	44.80	84	64.12
6 3-axle	11	0.38	8.80	15	11.45
7 4-axle, or more	3	0.10	2.40	0	0.00
Single Trailer Trucks:					
9 5-axle, or less	13	0.45	10.40	15	11.45
10 6-axle, or more	5	0.17	4.00	0	0.00
Multi-Trailer Trucks:					
11 5-axle, or less	0	0.00	0.00	0	0.00
12 6-axle	0	0.00	0.00	0	0.00
13 7-axle, or more	1	0.03	0.80	0	0.00

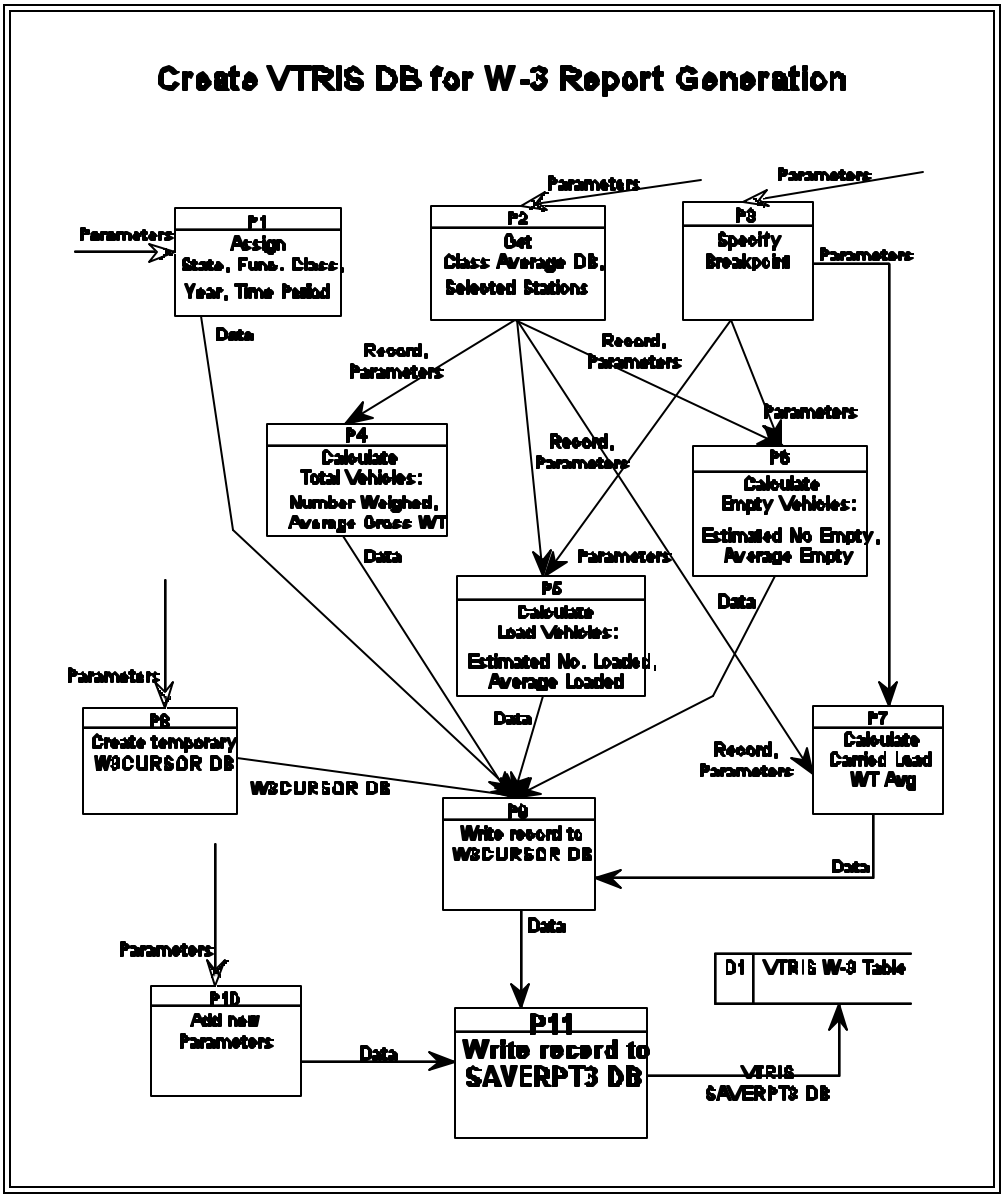
AVERAGE DAILY TRUCKS 125
AVERAGE DAILY TRAFFIC 2,908 **AVERAGE WEIGHED** 131

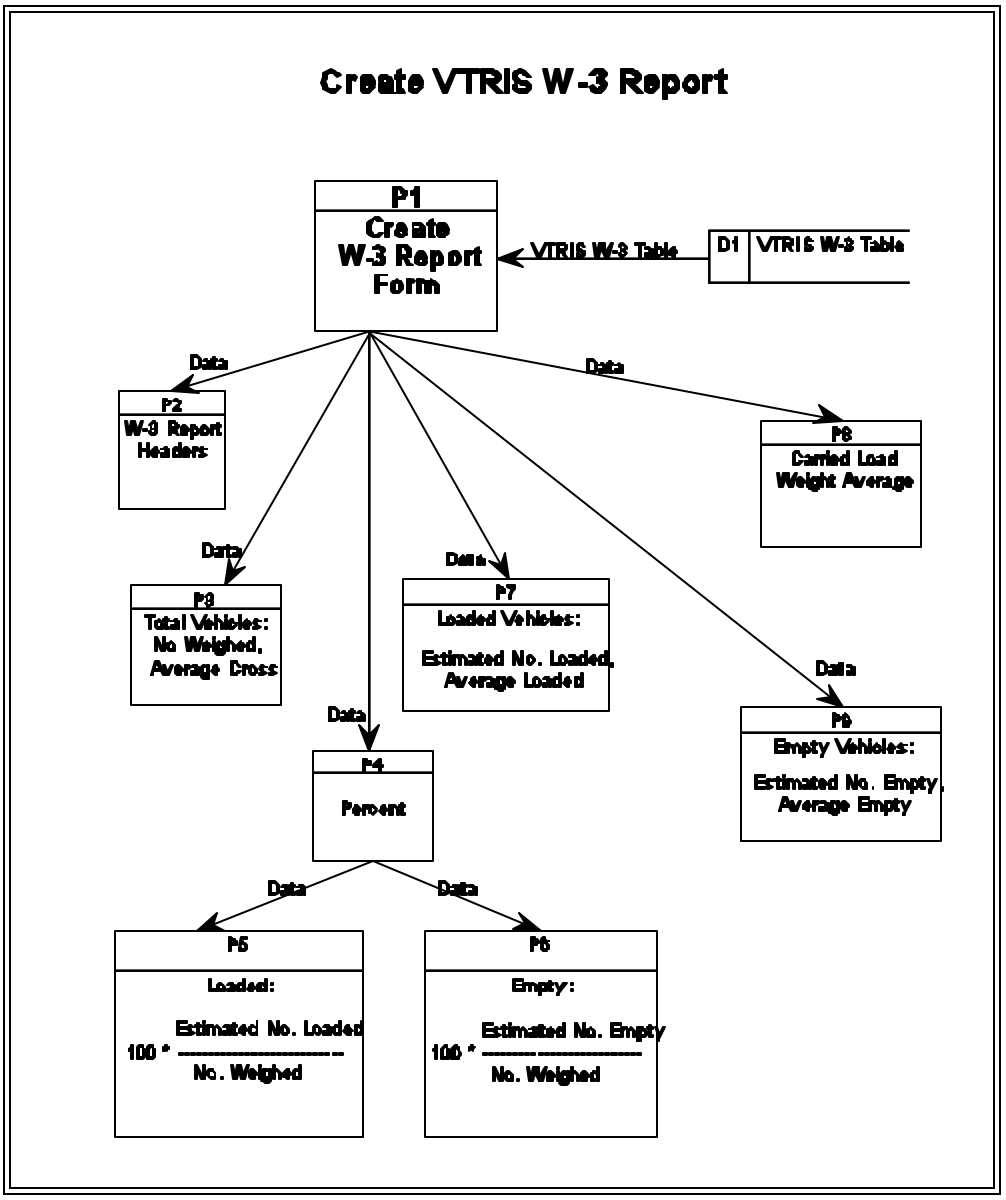
2.3.4.2.2 VTRIS W-3 Table

This table contains information on the **Average Weights of Empty, Loaded and all Trucks and their Estimated Average Carried Load**. This information is broken down by Vehicle Classification 5 through 13 for each Station location.

This process uses weight measurements and the set of breakpoints between empty and loaded trucks to calculate Percent Load, Percent Empty, Average Load Weight and Average Empty Weight.

Fig 20




Create VTRIS W-3 Report
P1
Create W-3 Report Form
VTRIS W-3 Table
D1
VTRIS W-3 Table
Data
P2
W-3 Report Headers
Data
P3
Total Vehicles: No Weighed, Average Gross
Data
P4
Percent
Data
P5
Loaded:
Estimated No. Loaded
100 * ----------
No. Weighed
Data
P6
Empty:
Estimated No. Empty
100 * ----------
No. Weighed
Data
P7
Loaded Vehicles:
Estimated No. Loaded, Average Loaded
Data
P8
Carried Load Weight Average
Data
P9
Empty Vehicles:
Estimated No. Empty, Average Empty

Date:02/12/1999 Page 1

W-3 Table
AVERAGE EMPTY, LOADED, AND CARGO WEIGHTS
By Direction

Averaging Method: Hour of Day Axle Grouping Method: Vehicle Size & Weight
State: MD Period: 1990

FUNCTIONAL CLASS(ES) : 02
STATION CODE(S) 9030 (9030)

	TOTAL VEHICLES			LOADED VEHICLES			EMPTY VEHICLES		
FHWA CLASS	NUMBER WEIGHED	AVERAGE GROSS WT kg	BREAKPOINT EMPTY / LOADEDkg	PERCENT NUMBER LOADED	ESTIMATED AVERAGE LOADED WT kg	CARRIED LOAD WT AVG kg	PERCENT EMPTY	NUMBER EMPTY	ESTIMATED AVERAGE VEHICLE EMPTY WTkg
Single Unit Trucks:									
2-axle,6-tire	84	6,176	4,500	53.57	45	8,555	4,091	46.43	39	3,407
3-axle	15	18,163	7,500	100.00	15	18,163	10,663	0.00	0	0
4-axle,or more	0	0	9,000	0.00	0	0	0	0.00	0	0
All Single Unit	99	7,973		60.61	60	10,928	5,714	39.39	39	3,407
Single Trailer Trucks:									
4-axle, or less	15	15,397	12,500	73.33	11	17,656	5,167	26.67	4	9,171
5-axle	17	26,897	14,000	94.12	16	28,016	14,016	5.88	1	9,335
6-axle, or more	0	34,500	15,500	0.00	0	34,500	19,000	0.00	0	0
All Single Traile	32	21,692		84.38	27	23,962	10,550	15.63	5	9,205
Multi-Trailer Trucks:									
5-axle, or less	0	0	17,000	0.00	0	0	0	0.00	0	0
6-axle	0	0	19,000	0.00	0	0	0	0.00	0	0
7-axle, or more	0	0	21,000	0.00	0	0	0	0.00	0	0
All Multi-Trailer	0	0		0.00	0	0	0	0.00	0	0
All TRUCKS:	131	11,324		66.41	87	14,975	7,216	33.59	44	4,061
ALL COMB. TR:	32	21,692		84.38	27	23,962	10,550	15.63	5	9,205

2.3.4.2.3 VTRIS W-4 Table

This process is most commonly used in Pavement design since it contains information on **Truck Axle loadings and their effect on Flexible and Rigid Pavement based on 18-KIP Equivalent Axle Load**.
This process builds three different sections:

I) **"Equivalency Factors"** provides the Number of Single, Tandem, Tridem and Quad axles weighed which fall into particular weight ranges and gives the resulting 18-KIP Equivalent Axle Loads on the two type of Pavement.

DATE 02/16/1999

Page 1

STATE MD

W-4 TABLE

PERIOD 1990 **EQUIVALENCY FACTORS**

By Direction

FUNCTIONAL CLASS(ES) : 02
AVERAGING METHOD : Hour of Day
AXLE GROUPING METHOD: Vehicle Size & Weight
STATION CODE(S) : 9030 (9030)

DAILY AVERAGES BY VEHICLE CLASS

Equivalent Single Axle Load			3 SU	4	5 SU	6 SU	7 SU	8 STT	9 STT	10 STT	11 MTT	12 MTT	13 MTT
AXLE LOAD IN METRIC TONS (t)	RIGID P= 2.50 D= 228 mm	FLEXIBLE P= 2.50 SN= 127 mm	2-AX 4-TR	BUS	2-AX 6-TR	3-AX	4-AX OR MORE	4-AX OR LESS	5-AX	6-AX OR MORE	5-AX OR LESS	6-AX	7-AX OR MORE
SINGLE AXLES													
UP TO 1.0	0.0003	0.0002	0	0	13	0	0	2	-	0	0	0	0
1.0 TO 2.0	0.0017	0.0017	0	0	61	0	0	3	1	0	0	0	0
2.0 TO 3.0	0.0090	0.0093	0	0	37	-	0	5	2	0	0	0	0
3.0 TO 4.0	0.0317	0.0336	0	0	22	2	0	10	5	-	0	0	0
4.0 TO 5.0	0.0858	0.0919	0	0	16	4	0	6	9	-	0	0	0
5.0 TO 6.0	0.1952	0.2083	0	0	6	4	0	5	2	-	0	0	0
6.0 TO 7.0	0.3922	0.4110	0	0	4	2	0	3	-	0	0	0	0
7.0 TO 8.0	0.7168	0.7299	0	0	3	1	0	2	0	0	0	0	0
8.0 TO 9.0	1.2155	1.1943	0	0	2	1	0	1	0	0	0	0	0
9.0 TO 10.0	1.9378	1.8329	0	0	1	-	0	1	0	0	0	0	0
10.0 TO 11.0	2.9339	2.6759	0	0	2	0	0	0	0	0	0	0	0
11.0 TO 12.0	4.2533	3.7577	0	0	1	0	0	-	0	0	0	0	0
12.0 TO 13.0	5.9476	5.1203	0	0	1	0	0	-	0	0	0	0	0
13.0 TO 14.0	8.0770	6.8157	0	0	-	0	0	0	0	0	0	0	0
14.0 TO 15.0	10.7175	8.9068	0	0	0	0	0	0	0	0	0	0	0
15.0 TO 16.0	13.9651	11.4678	0	0	0	0	0	0	0	0	0	0	0
16.0 TO 17.0	17.9371	14.5851	0	0	0	0	0	0	0	0	0	0	0
17.0 TO 18.0	22.7699	18.3567	0	0	0	0	0	0	0	0	0	0	0
18.0 TO 19.0	28.6168	22.8925	0	0	0	0	0	0	0	0	0	0	0
19.0 TO 20.0	35.6458	28.3146	0	0	0	0	0	0	0	0	0	0	0
ABOVE 20.0	39.4777	31.2634	0	0	0	0	0	0	0	0	0	0	0
AVERAGE SINGLE AXLES WEIGHED			0	0	168	14	0	37	17	0	0	0	0

II) **"Equivalency Factors"** contains information on the Summary ESAL (Equivalent Single Axle Load) Design Factors such as ESAL per Vehicle, Percent Distribution for Flexible and Rigid Pavements and Truck percent.

DATE 02/16/1999

STATE MD

W-4 TABLE
EQUIVALENCY FACTORS
By Direction

PERIOD 1990

FUNCTIONAL CLASS(ES) : 02
AVERAGING METHOD : Hour of Day
AXLE GROUPING METHOD: Vehicle Size & Weight
STATION CODE(S) : see page 1

SUMMARY ESAL DESIGN FACTORS	3 SU 2-AX 4-TR	4 BUS 2-AX 6-TR	5 SU 3-AX	6 SU 4-AX OR	7 SU 4-AX OR	8 STT 5-AX	9 STT 6-AX OR	10 STT 5-AX OR	11 MTT 6-AX OR	12 MTT 7-AX OR	13 MTT
RIGID PAVEMENT P= 2.50 D= 228 mm				MORE	LESS		MORE	LESS			MORE
ESALSs PER VEHICLE	0.0000	0.0000	0.3124	2.3592	0.0000	0.8791	2.3589	2.1852	0.0000	0.0000	0.0000
PERCENT DISTRIBUTION USING AVERAGE DAILY COUNT	0.00	0.00	11.70	14.96	0.00	6.36	63.94	3.01	0.00	0.00	0.00
FLEXIBLE PAVEMENT P= 2.50 SN= 127 mm											
ESALSs PER VEHICLE	0.0000	0.0000	0.2943	1.4391	0.0000	0.7988	1.3738	1.3559	0.0000	0.0000	0.0000
PERCENT DISTRIBUTION USING AVERAGE DAILY COUNT	0.00	0.00	16.94	14.03	0.00	8.89	57.24	2.87	0.00	0.00	0.00
TRAFFIC VOLUME											
AVERAGE VEHICLES WEIGHED	0	0	84	15	0	15	17	-	0	0	0
AVERAGE VEHICLES COUNTED	401	16	78	13	3	15	56	3	0	0	0

III) **“20 Year ESAL Estimates”** displays Flexible and Rigid pavements Growth Rates for percent Truck. For all sections, information is grouped by Truck type 3 through 13 and can be shown for selected station(s), location(s) and/or highway Functional Classification(s).

User defines the **Ranges of Axle Load in 18-KIP** for four types of axles. The default for parameters are:

Fig 25

20 YEAR ESAL ESTIMATES

ADT = 1000

Values in millions

	FLEXIBLE PAVEMENTS GROWTH RATES							RIGID PAVEMENTS GROWTH RATES				
PERCENT TRUCKS	0	2	4	6	8	10	PERCENT TRUCKS	0	2	4	6	8	10
2	0.12	0.14	0.17	0.20	0.24	0.30	2	0.18	0.22	0.27	0.30	0.37	0.46
4	0.23	0.28	0.35	0.40	0.48	0.60	4	0.36	0.44	0.54	0.61	0.75	0.92
6	0.35	0.43	0.52	0.59	0.73	0.90	6	0.54	0.66	0.80	0.91	1.12	1.38
8	0.47	0.57	0.70	0.79	0.97	1.20	8	0.72	0.87	1.07	1.22	1.49	1.84
10	0.58	0.71	0.87	0.99	1.21	1.50	10	0.90	1.09	1.34	1.52	1.86	2.30

Single Axle

Starting: 1.0
Interval: 1.0
Ending : 20.0

Tandem Axle

Starting: 2.0
Interval: 2.0
Ending : 40.0

Tridem Axle

Starting: 3.0
Interval: 3.0
Ending : 60.0

Quad Axle

Starting: 4.0
Interval: 4.0
Ending : 80.0

Those ranges are to be used in calculation of the **Equivalent Single Axle Load (ESAL) coefficients** for Flexible and Rigid surfaces. The following expressions determine special coefficients depending on Axle Load in KIPs (X) and type of Axles (Y)
where Y can be 1 (Single), 2 (Tandem), 3 (Tridem) or 4 (Quad)

For **Flexible Pavement**:

$$Flex(X, Y) = Lg\left(\frac{10^{5.93} * (SN+1)^{9.36} * Y^{4.33}}{(X+Y)^{4.79}}\right) + \frac{Lg\left(\frac{4.1 - P}{4.2 - 1.5}\right)}{0.40 + \frac{0.081*(X+Y)^{3.23}}{(SN+1)^{5.19} * Y^{3.23}}}$$

For **Rigid Pavement**:

$$Conc(X, Y) = Lg\left(\frac{10^{5.85} * (D+1)^{7.35} * Y^{3.28}}{(X+Y)^{4.62}}\right) + \frac{Lg\left(\frac{4.5 - P}{4.5 - 1.5}\right)}{1.0 + \frac{3.63 * (X+Y)^{5.2}}{D^{8.46} * Y^{3.52}}}$$

where SN, P and D are the parameters submitted by User or having their default values:

I) **Serviceability Index (P)** where the default is equal to 2.50

II) **Depth of Rigid Pavement (D)** where the default is equal to 228.0

III) **Structural number of Flexible Pavement (SN)** where the default is equal to 127.0

The main coefficients to be calculated for each Types of Axels (P = 1, 3) and for each Vehicle type 3 through 13 (j = 3, 13) :

Flexible: for i = 1, Np (points of the interval margins for Axle Load values of type P):

$$Flex(18, P)$$

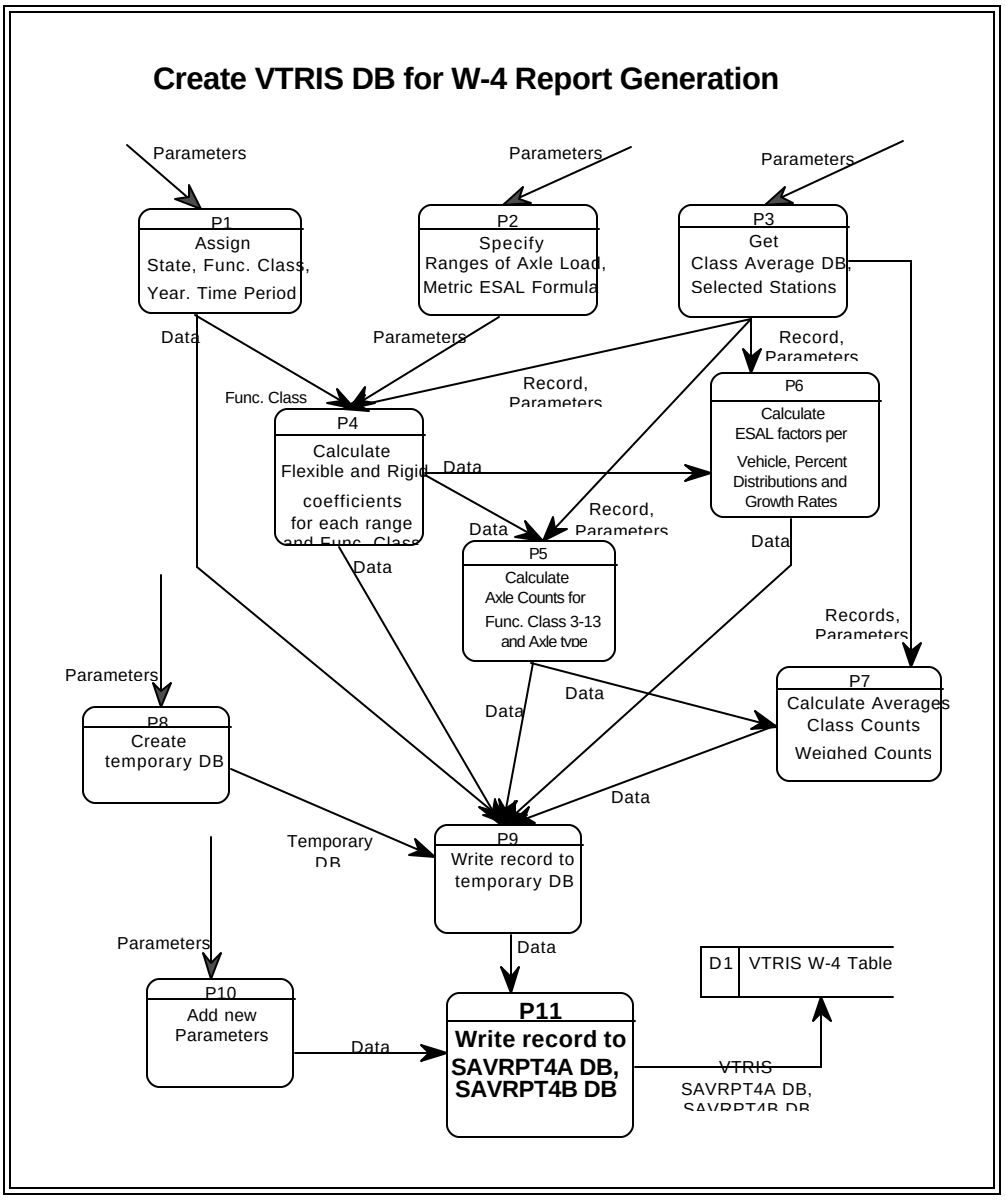
$$Ef[j,i] = \begin{cases} \dfrac{10^{Flex(i,P)}}{10^{Flex(18,P)}} & i = 1 \text{ or } i = Np + 1 \\ \frac{1}{2} * \left(\dfrac{10^{Flex(18,P)}}{10^{Flex(i,P)}} + \dfrac{10^{Flex(18,P)}}{10^{Flex(i-1,P)}} \right) & i <> 1 \\ & i <> Np + 1 \end{cases}$$

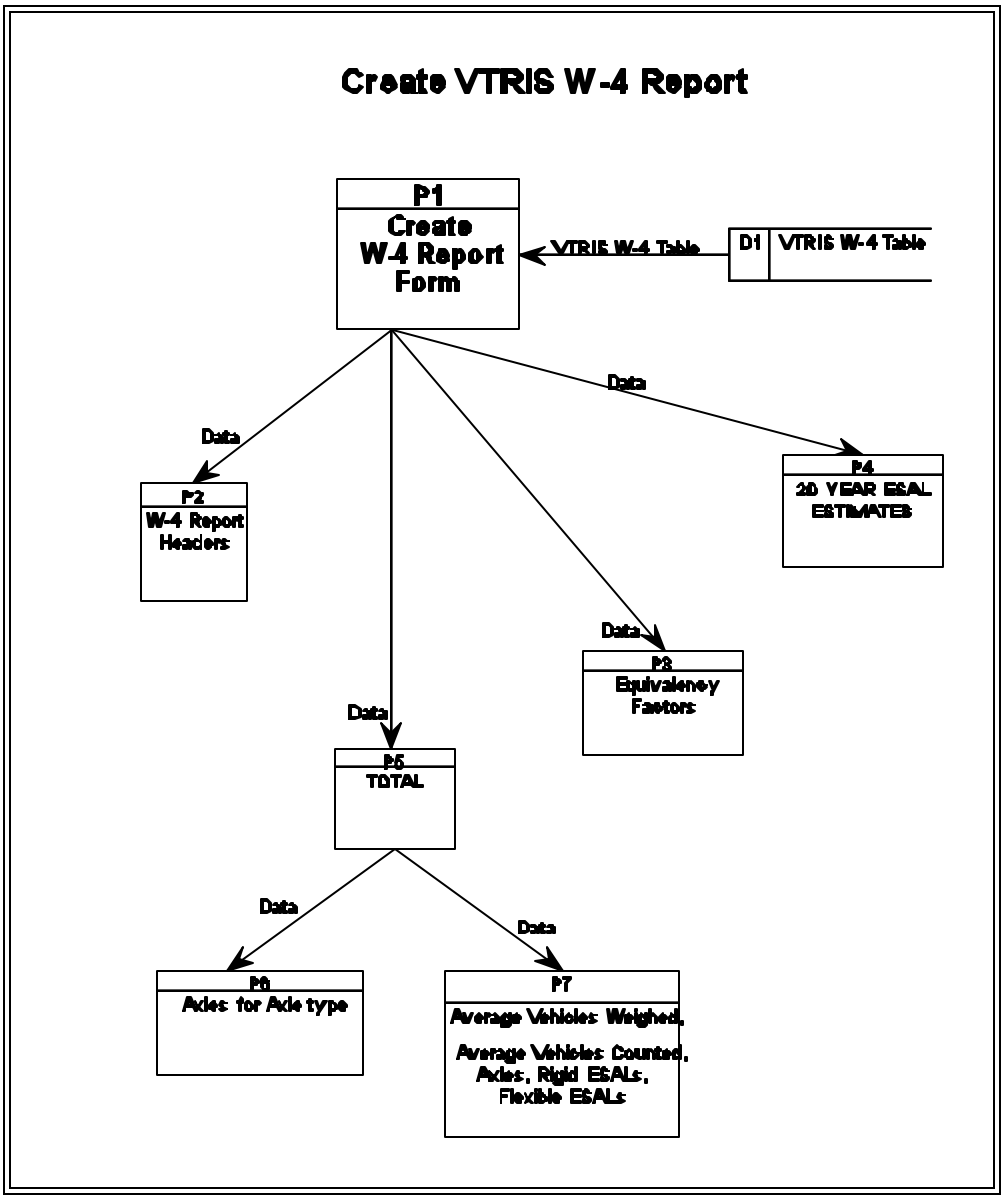
Rigid: for I = 1,NP - points of the intervals margins for Axle Load values of type P:

$$Cn[j,i] = \begin{cases} \dfrac{10^{Conc(18,P)}}{10^{Conc(I,P)}} & i = 1 \text{ or } i = Np + 1 \\ \frac{1}{2} * \left(\dfrac{10^{Conc(18,P)}}{10^{Conc(I,P)}} + \dfrac{10^{Conc(18,P)}}{10^{Conc(I-1,P)}} \right) & i <> 1 \\ & i <> Np + 1 \end{cases}$$

The formulas used in the calculation of the Equivalent Single Axle Loads are those that were developed by the American Association of State Highway and Transportation Officials and used this coefficients.

Fig 26


Create VTRIS DB for W-4 Report Generation
Parameters
Parameters
Parameters
P1
Assign
State, Func. Class,
Year. Time Period
P2
Specify
Ranges of Axle Load,
Metric ESAL Formula
P3
Get
Class Average DB,
Selected Stations
Data
Parameters
Record,
Parameters
Func. Class
Record,
Parameters
P6
Calculate
ESAL factors per
Vehicle, Percent
Distributions and
Growth Rates
P4
Calculate
Flexible and Rigid
coefficients
for each range
Data
Data
Record,
Parameters
Data
Data
P5
Calculate
Axle Counts for
Func. Class 3-13
and Axle type
Records,
Parameters
Parameters
P8
Create
temporary DB
Data
Data
P7
Calculate Averages
Class Counts
Weighed Counts
Data
Temporary
DB
P9
Write record to
temporary DB
Parameters
Data
D1
VTRIS W-4 Table
P10
Add new
Parameters
Data
P11
Write record to
SAVRPT4A DB,
SAVRPT4B DB
VTRIS
SAVRPT4A DB,


Create VTRIS W-4 Report
P1
Create W-4 Report Form
VTRIS W-4 Table
D1
VTRIS W-4 Table
Data
Data
Data
P2
W-4 Report Headers
P4
20 YEAR ESAL ESTIMATES
Data
P3
Equivalency Factors
Data
P5
TOTAL
Data
Data
P6
Axles for Axle type
P7
Average Vehicles Weighed,
Average Vehicles Counted, Axles, Rigid ESALs, Flexible ESALs

2.3.4.2.4 VTRIS W-5 Table

This table shows the **Number of Trucks Weighed in various Gross Weight ranges, Total Average Vehicles Weighed and Total Average Vehicles Counted.**

This process produces values for Truck types 3 through 13 and shows for selected station(s) and/or Functional Classification(s) of highway.

User defines the **Ranges of Gross Weight**. The default for parameters are :

Starting Value: 5

Interval: 2

Fig 28

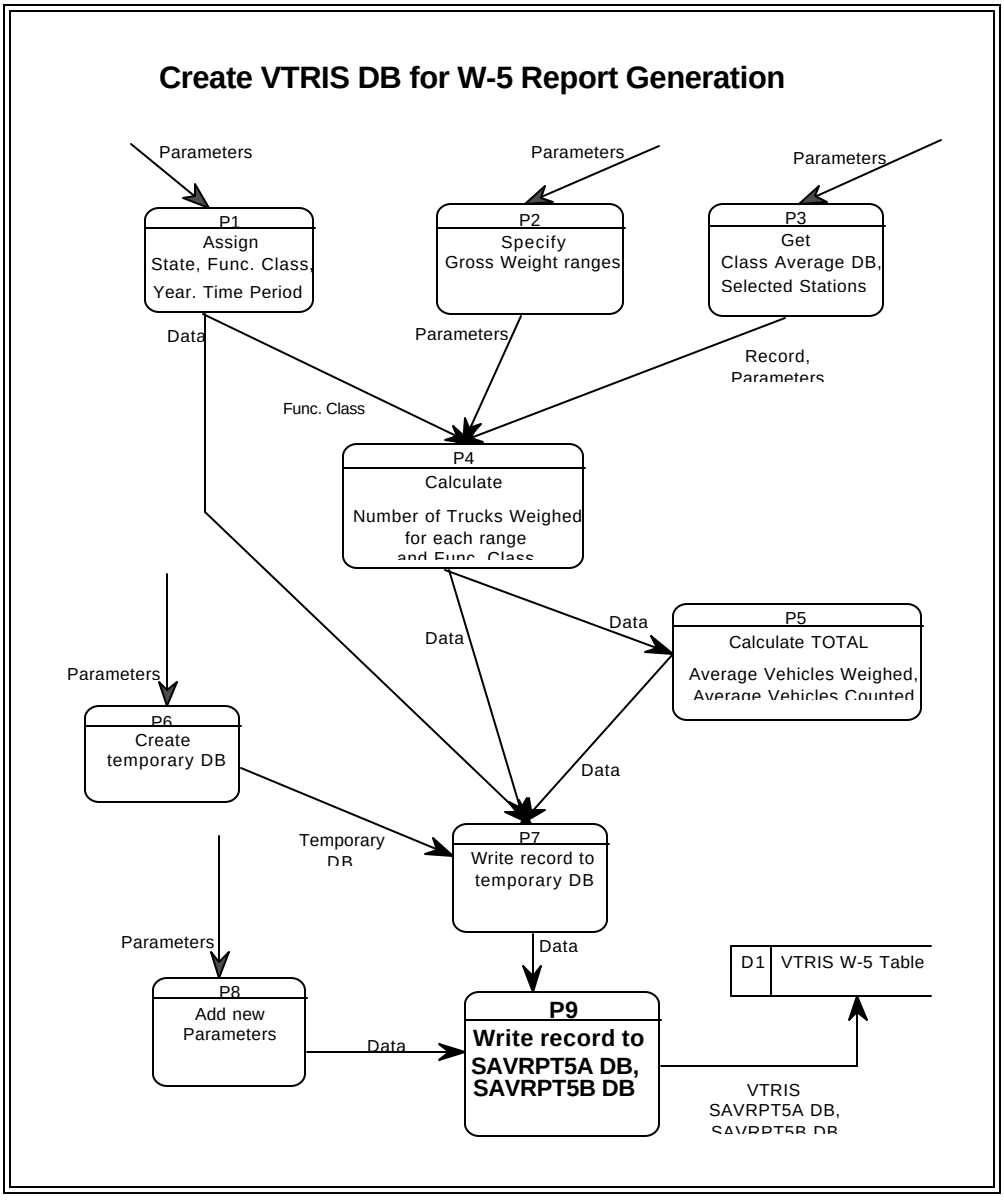
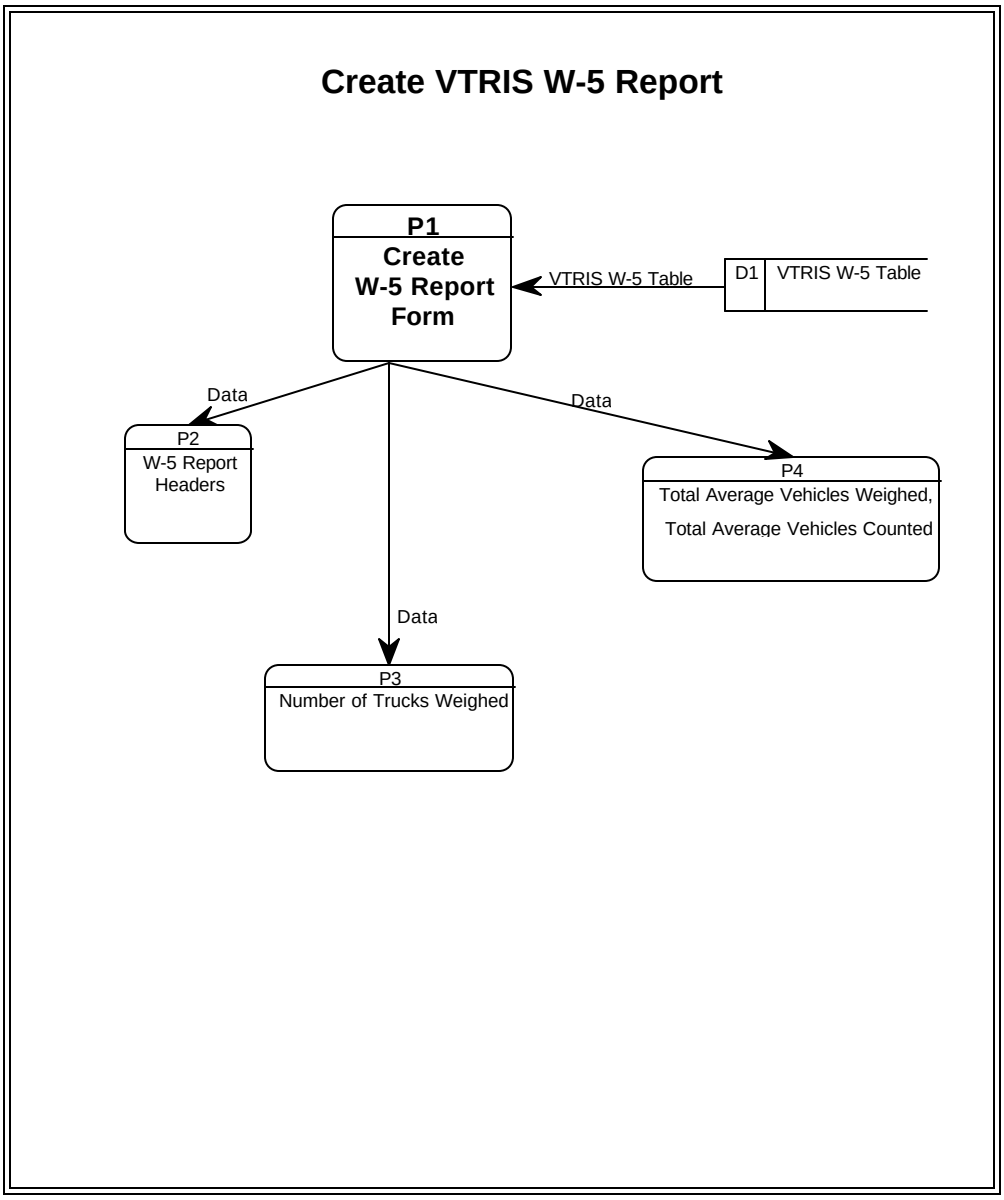


Fig 29


Create VTRIS W-5 Report
P1
Create
W-5 Report
Form
VTRIS W-5 Table
D1
VTRIS W-5 Table
Data
Data
Data
P2
W-5 Report
Headers
P4
Total Average Vehicles Weighed,
Total Average Vehicles Counted
P3
Number of Trucks Weighed

DATE: 02/18/1999

W-5 Table

GROSS VEHICLE WEIGHTS

By Direction

AVERAGING METHOD : Hour of Day
AXLE GROUPING METHOD : Vehicle Size & Weight
STATE : MD
PERIOD : 1990
FUNCTIONAL CLASS(ES): 02
STATION CODE(S) : 9030 (9030)

FHWA VEHICLE CLASSES

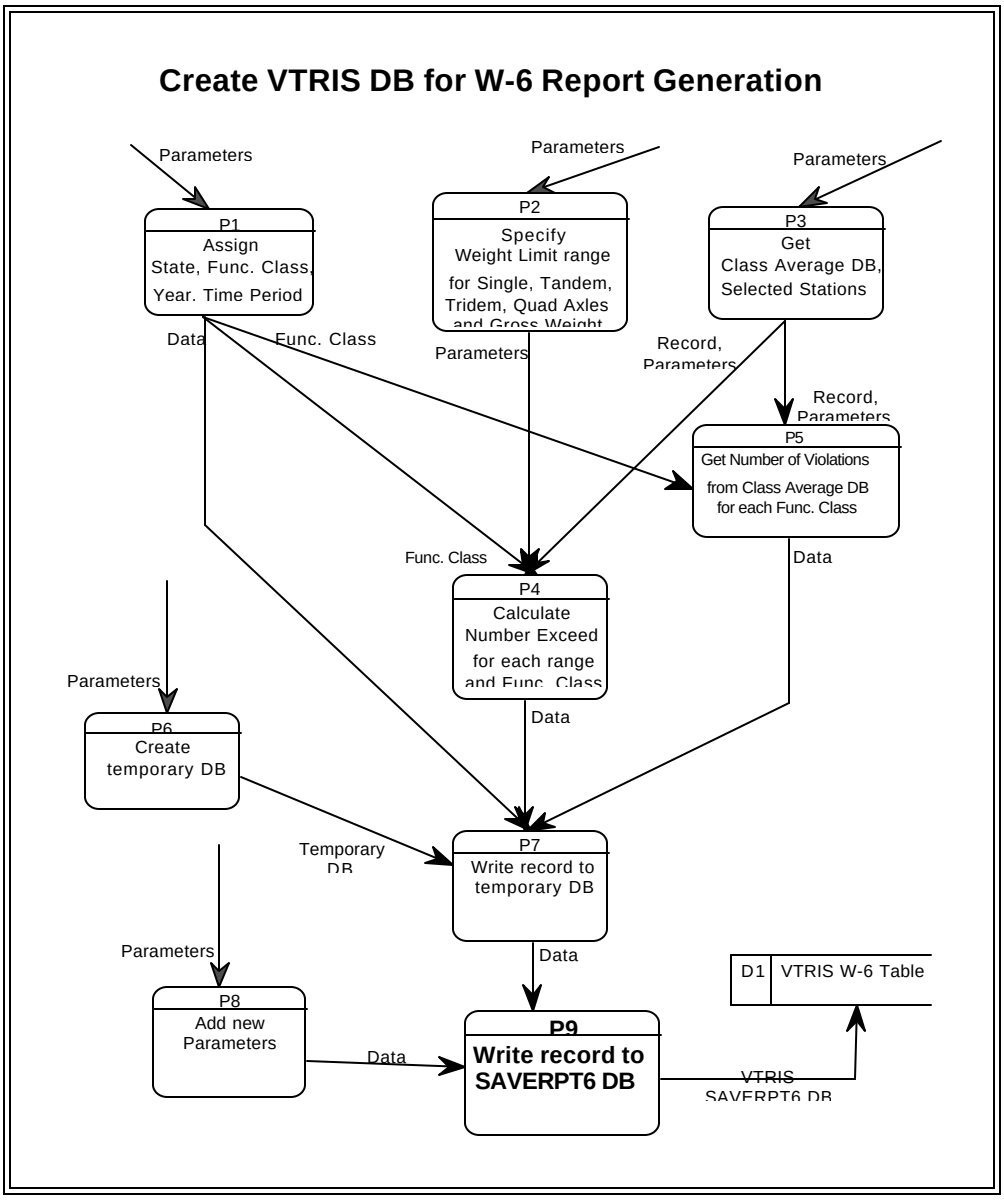
GROSS OPERATING WEIGHT IN METRIC TONS	3 SU 2-AX 4-TR	4 BUS	5 SU 2-AX 6-TR	6 SU 3-AX	7 SU 4-AX OR MORE	8 STT 4-AX OR LESS	9 STT 5-AX	10 STT 6-AX OR MORE	11 MTT 5-AX OR LESS	12 MTT 6-AX	13 MTT 7-AX OR MORE
UNDER 5	0	0	45	0	0	0	0	0	0	0	0
5 TO 7	0	0	14	0	0	1	-	0	0	0	0
7 TO 9	0	0	9	1	0	-	-	0	0	0	0
9 TO 11	0	0	5	1	0	1	0	0	0	0	0
11 TO 13	0	0	5	1	0	1	-	0	0	0	0
13 TO 15	0	0	3	2	0	2	1	0	0	0	0
15 TO 17	0	0	3	2	0	4	1	0	0	0	0
17 TO 19	0	0	1	2	0	1	1	0	0	0	0
19 TO 21	0	0	-	1	0	1	2	0	0	0	0
21 TO 23	0	0	0	2	0	2	1	0	0	0	0
23 TO 25	0	0	0	-	0	-	2	0	0	0	0
25 TO 27	0	0	0	1	0	-	1	0	0	0	0
27 TO 29	0	0	0	-	0	0	1	0	0	0	0
29 TO 31	0	0	0	-	0	0	1	0	0	0	0
31 TO 33	0	0	0	-	0	0	1	0	0	0	0
33 TO 35	0	0	0	1	0	0	2	-	0	0	0
35 TO 37	0	0	0	0	0	0	2	0	0	0	0
37 TO 39	0	0	0	0	0	0	1	0	0	0	0
39 TO 41	0	0	0	0	0	0	1	0	0	0	0
41 TO 43	0	0	0	0	0	0	0	0	0	0	0
43 TO 45	0	0	0	0	0	0	0	0	0	0	0
45 TO 47	0	0	0	0	0	0	0	0	0	0	0
47 TO 49	0	0	0	0	0	0	0	0	0	0	0
49 TO 51	0	0	0	0	0	0	0	0	0	0	0
51 TO 53	0	0	0	0	0	0	0	0	0	0	0
53 TO 55	0	0	0	0	0	0	0	0	0	0	0
55 TO 57	0	0	0	0	0	0	0	0	0	0	0
57 TO 59	0	0	0	0	0	0	0	0	0	0	0
59 TO 61	0	0	0	0	0	0	0	0	0	0	0
61 TO 63	0	0	0	0	0	0	0	0	0	0	0
63 TO 65	0	0	0	0	0	0	0	0	0	0	0
65 TO 67	0	0	0	0	0	0	0	0	0	0	0
67 TO 69	0	0	0	0	0	0	0	0	0	0	0
69 TO 71	0	0	0	0	0	0	0	0	0	0	0
71 TO 73	0	0	0	0	0	0	0	0	0	0	0
73 TO 75	0	0	0	0	0	0	0	0	0	0	0
75 TO 77	0	0	0	0	0	0	0	0	0	0	0
77 TO 79	0	0	0	0	0	0	0	0	0	0	0

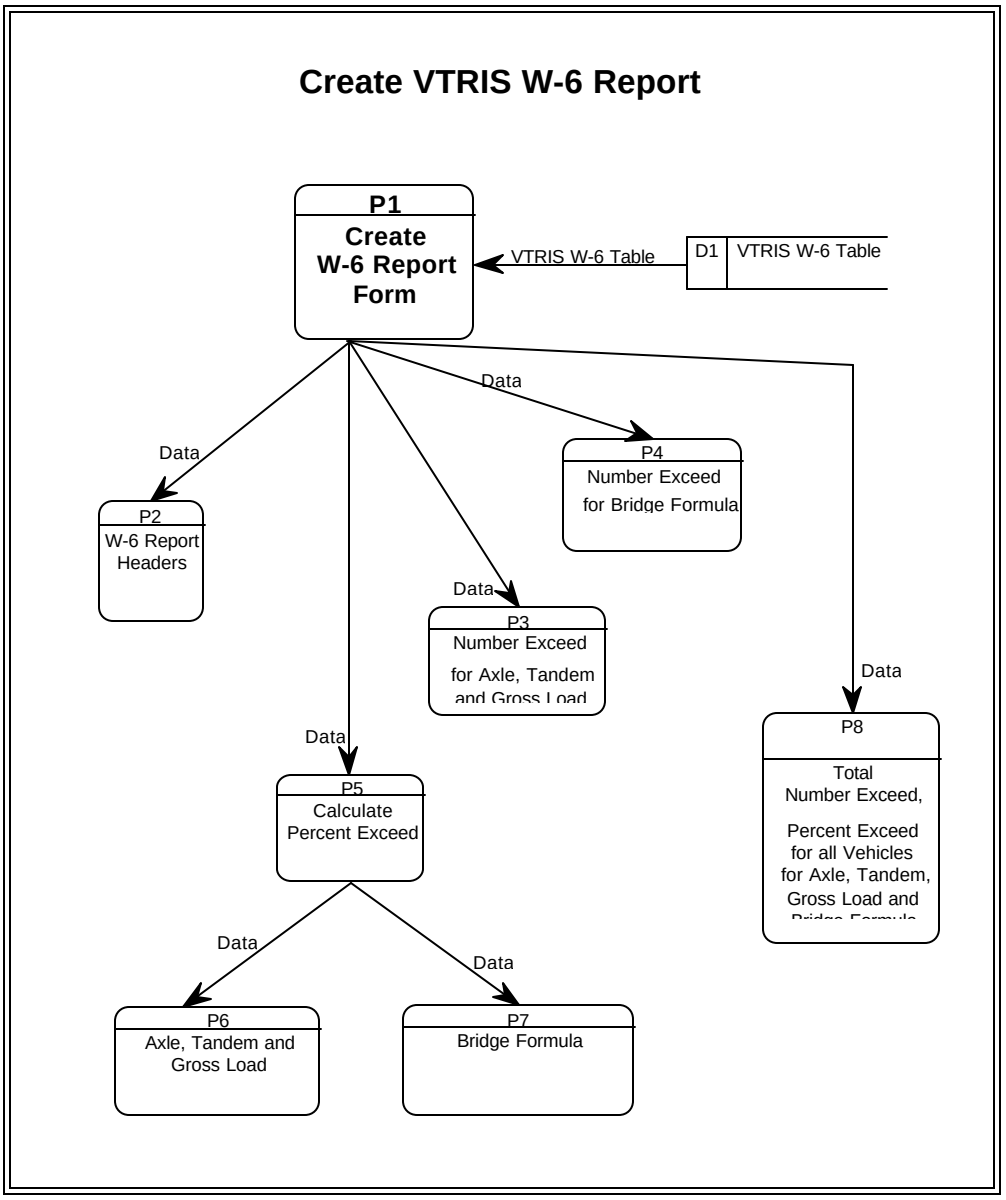
2.3.4.2.5 VTRIS W-6 Table

This table gives the **Number and Percent of Vehicle by type exceeding a User specified Axle, Tandem and Gross Weight Limit (i.e. all Violations of the Bridge Formula)**. A vehicle may have multiple violations of the set criteria. The information can be shown by station(s) and /or Functional Classification(s) of highway and is broken down by Vehicle type 3 trough 13.
The User assigns the **Limit Value Axle Weight range** for Single, Tandem, Tridem and Quad Axles and Gross Weight. The default for parameters are:

Single : 9070
Tandem: 15420
Tridem: 0
Quad: 0
Gross: 36290

The Number Exceed and the Percent Exceed are calculated for each Axle Type and Gross Weight. For the Number Exceed to sum up the number of axles of each type (Single, Tandem, Tridem, Quad and Gross) from the limit value to the maximum number of weight interval.
This table includes the Violations of the Bridge Gross Weight Formula depending only on Vehicle type. The Bridge Gross Weight Formula provides a standard to control the spacing of Truck axles on the Vehicle that uses highway bridge. The Number of Violations of the Bridge Gross Weight Formula calculated previously are in the Summary process.


Create VTRIS DB for W-6 Report Generation
Parameters
P1
Assign
State, Func. Class,
Year. Time Period
Parameters
P2
Specify
Weight Limit range
for Single, Tandem,
Tridem, Quad Axles
and Gross Weight
Parameters
P3
Get
Class Average DB,
Selected Stations
Data
Func. Class
Parameters
Record,
Parameters
Record,
Parameters
P5
Get Number of Violations
from Class Average DB
for each Func. Class
Func. Class
Data
P4
Calculate
Number Exceed
for each range
and Func. Class
Parameters
P6
Create
temporary DB
Data
Temporary
DB
P7
Write record to
temporary DB
Parameters
Data
D1
VTRIS W-6 Table
P8
Add new
Parameters
Data
P9
Write record to
SAVERPT6 DB
VTRIS
SAVERPT6 DB


Create VTRIS W-6 Report
P1
Create W-6 Report Form
VTRIS W-6 Table
D1
VTRIS W-6 Table
Data
Data
Data
Data
Data
Data
Data
P2
W-6 Report Headers
P3
Number Exceed for Axle, Tandem and Gross Load
P4
Number Exceed for Bridge Formula
P5
Calculate Percent Exceed
P6
Axle, Tandem and Gross Load
P7
Bridge Formula
P8
Total Number Exceed, Percent Exceed for all Vehicles for Axle, Tandem, Gross Load and

Date: 02/18/1999 W-6 Table

OVERWEIGHT VEHICLE REPORT Page 1

By Direction

STATE CODE : MD PERIOD : 1990

FUNCTIONAL CLASS(ES) :

02

STATION CODE(S) : 9030 (9030)

FHWA VEHICLE CLASS	Axle Load Limit 9,070 kg		Tandem Load Limit 15,420 kg		Gross Load Limit 36,290 kg		Bridge Formula	
	Number Exceed	Percent Exceed	Number Exceed	Percent Exceed	Number Exceed	Percent Exceed	Number Exceed	Percent Exceed
Single Unit Trucks:								
3 2-axle, tire	0	0.00	0	0.00	0	0.00	0	0.00
4 Buses	0	0.00	0	0.00	0	0.00	0	0.00
Single Unit Trucks:								
5 2-axle, 6-tire	5	2.82	0	0.00	0	0.00	-	0.35
6 3-axle	-	1.69	4	25.19	0	0.00	3	18.53
7 4-axle, or more	0	0.00	0	0.00	0	0.00	0	0.00
Single Trailer Trucks:								
8 4-axle, or less	2	4.21	-	1.12	0	0.00	-	0.96
9 5-axle	0	0.00	8	22.50	4	20.52	5	30.61
10 6-axle, or more	0	0.00	-	29.41	0	0.00	-	100.00
Multi-Trailer Trucks:								
11 5-axle, or less	0	0.00	0	0.00	0	0.00	0	0.00
12 6-axle	0	0.00	0	0.00	0	0.00	0	0.00
13 7-axle, or more	0	0.00	0	0.00	0	0.00	0	0.00
All Vehicles:	7	2.75	11	20.52	4	2.70	9	6.57

2.3.4.2.6 VTRIS W-7 Table

This table gives the **Number and Percent of Average Daily Count for those measurements where Axle Load above a Limit.** The Gross Weight Limits by Vehicle Class (in Kilograms) was assigned by the User. The default is equal to :

VT_Limit[j] = {18140, 24490, 33570, 33570, 36290, 36290, 36290, 36290, 36290 } where j = 5, 13 for each vehicle type respectively.

The information can be shown for each station(s) and/or Functional Classification(s) of highway broken down by Vehicle types 5 through 13.

Fig 34

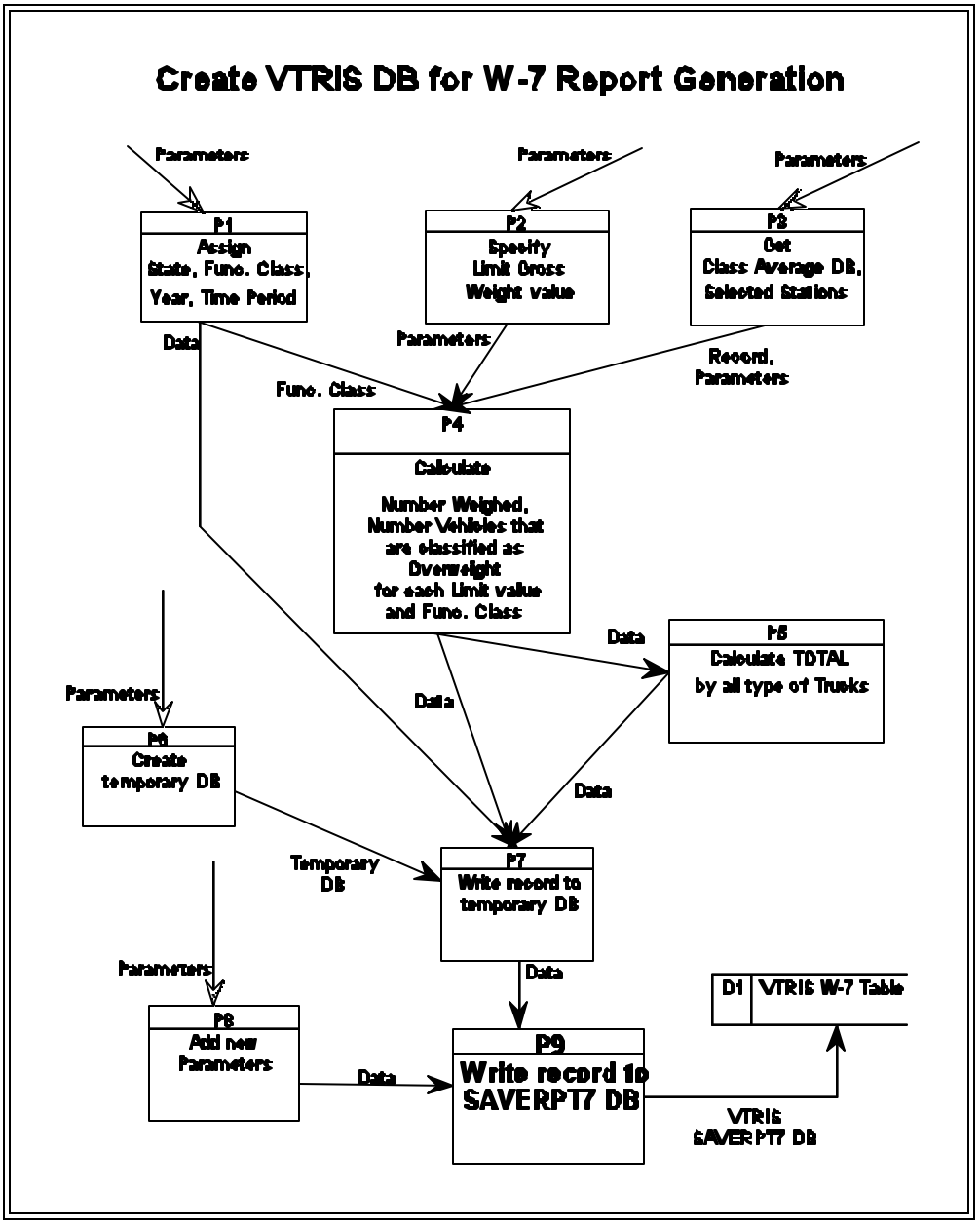
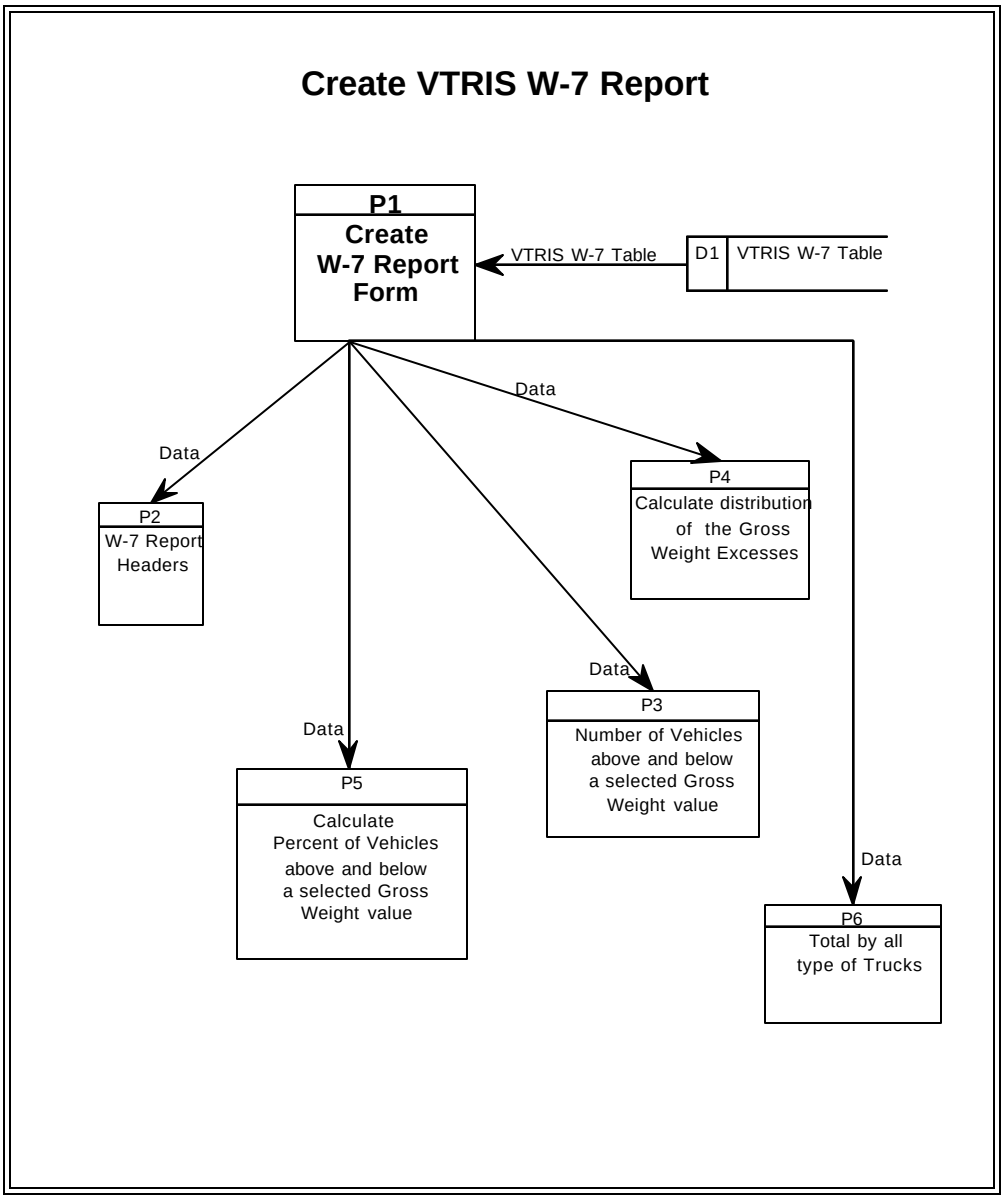


Fig 35


Create VTRIS W-7 Report
P1
Create W-7 Report Form
VTRIS W-7 Table
D1
VTRIS W-7 Table
Data
Data
Data
Data
Data
Data
P2
W-7 Report Headers
P3
Number of Vehicles above and below a selected Gross Weight value
P4
Calculate distribution of the Gross Weight Excesses
P5
Calculate Percent of Vehicles above and below a selected Gross Weight value
P6
Total by all type of Trucks

The Numbers and Percentage shown under the ‘In Excess’ column are the vehicles that are classified as overweight in their respective Axle groupings. Numbers under the ‘Not in Excess’ column plus the ‘In Excess’ column should add to the ‘Number Weighted/Avg. Daily Count’.

W-7 Table
Distribution of Overweight Vehicles

STATE : MD PERIOD :1990
FUNCTIONAL CLASS(ES) : 02
STATION CODE(S) 9030 (9030)

FHWA VEHICLE CLASS	Number Weighed Avg. Daily Count	In Excess	Not in Excess	Excess by percent or More 5	10	20	30	50
Single Unit Trucks:								
5 2-axle, 6-tire	84	0	84	-	-	0	0	0
> 18,140kg	100%	0.00%	100.00%	0.15%	0.01%	0.00%	0.00%	0.00%
6 3-axle	15	3	12	2	2	1	1	0
> 24,490kg	100%	20.00%	80.00%	14.33%	10.40%	7.93%	5.40%	0.00%
7 4-axle, or more	0	0	0	0	0	0	0	0
> 33,570kg	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Single Trailer Trucks:								
8 4-axle, or less	15	0	15	0	0	0	0	0
> 33,570kg	100%	0.00%	100.00%	0.00%	0.00%	0.00%	0.00%	0.00%
9 5-axle	17	4	13	2	-	0	0	0
> 36,290kg	100%	23.53%	76.47%	10.47%	0.47%	0.00%	0.00%	0.00%
10 6-axle, or more	0	0	0	0	0	0	0	0
> 36,290kg	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Multi-Trailer Trucks:								
11 5-axle, or less	0	0	0	0	0	0	0	0
> 36,290kg	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
12 6-axle	0	0	0	0	0	0	0	0
> 36,290kg	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
13 7-axle, or more	0	0	0	0	0	0	0	0
> 36,290kg	100%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
All Trucks:	131	7	124	4	1	1	0	0
	100%	5.34%	94.66%	3.10%	1.26 %	0.91 %	0.00%	0.00 %

2.3.5 Ship/Receive Subsystem

The **Ship** process shown in Fig 37 allows User to ship files on an Annually, Quarterly, Monthly or Custom basis. It collects the **VTRIS DB (loaded in VTRIS) or Summary DB (summarized in VTRIS)** that can be sent to different locations (Target Directory). All databases are compressed and placed on diskettes or another drive.

Fig 37

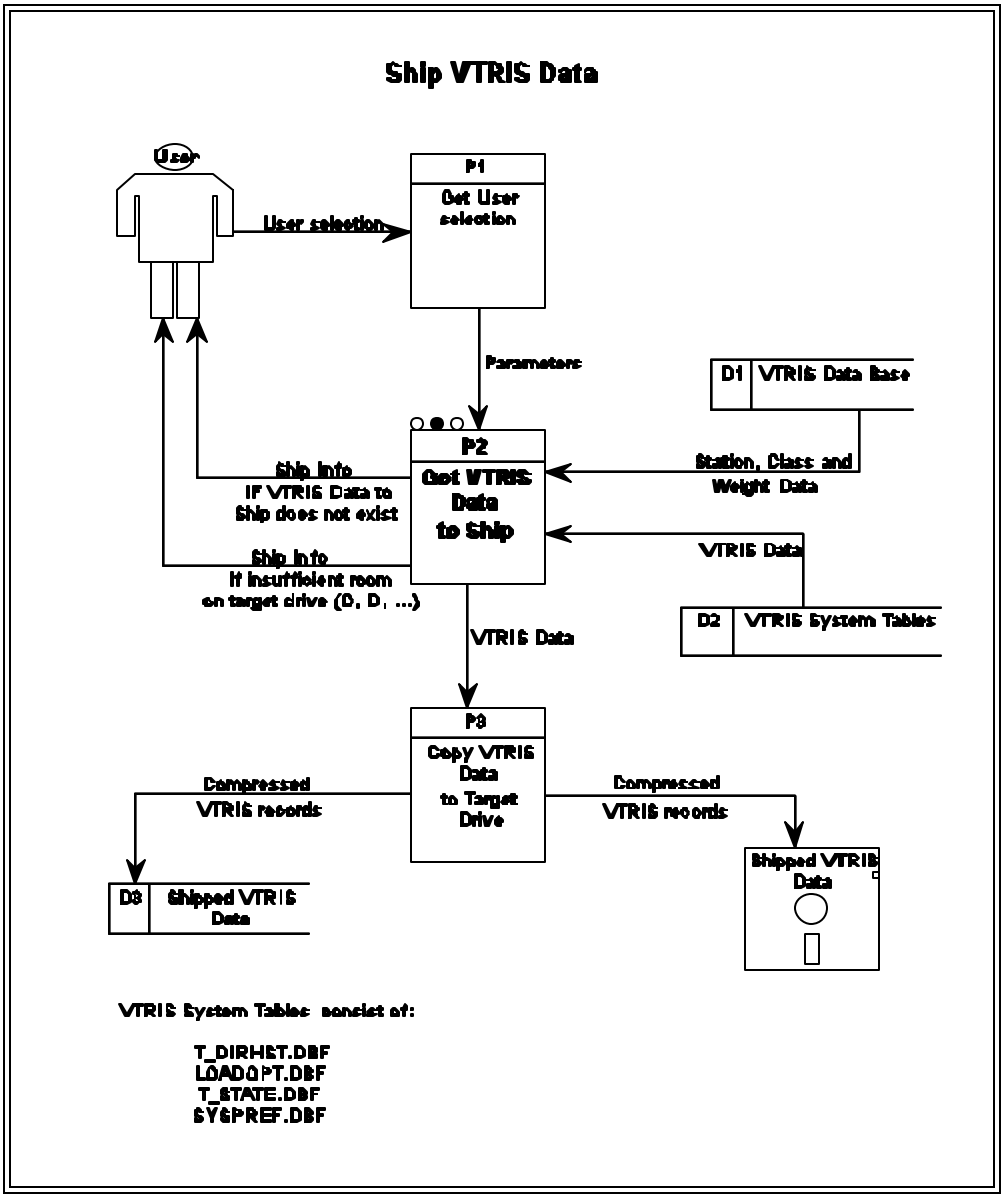


Fig 38

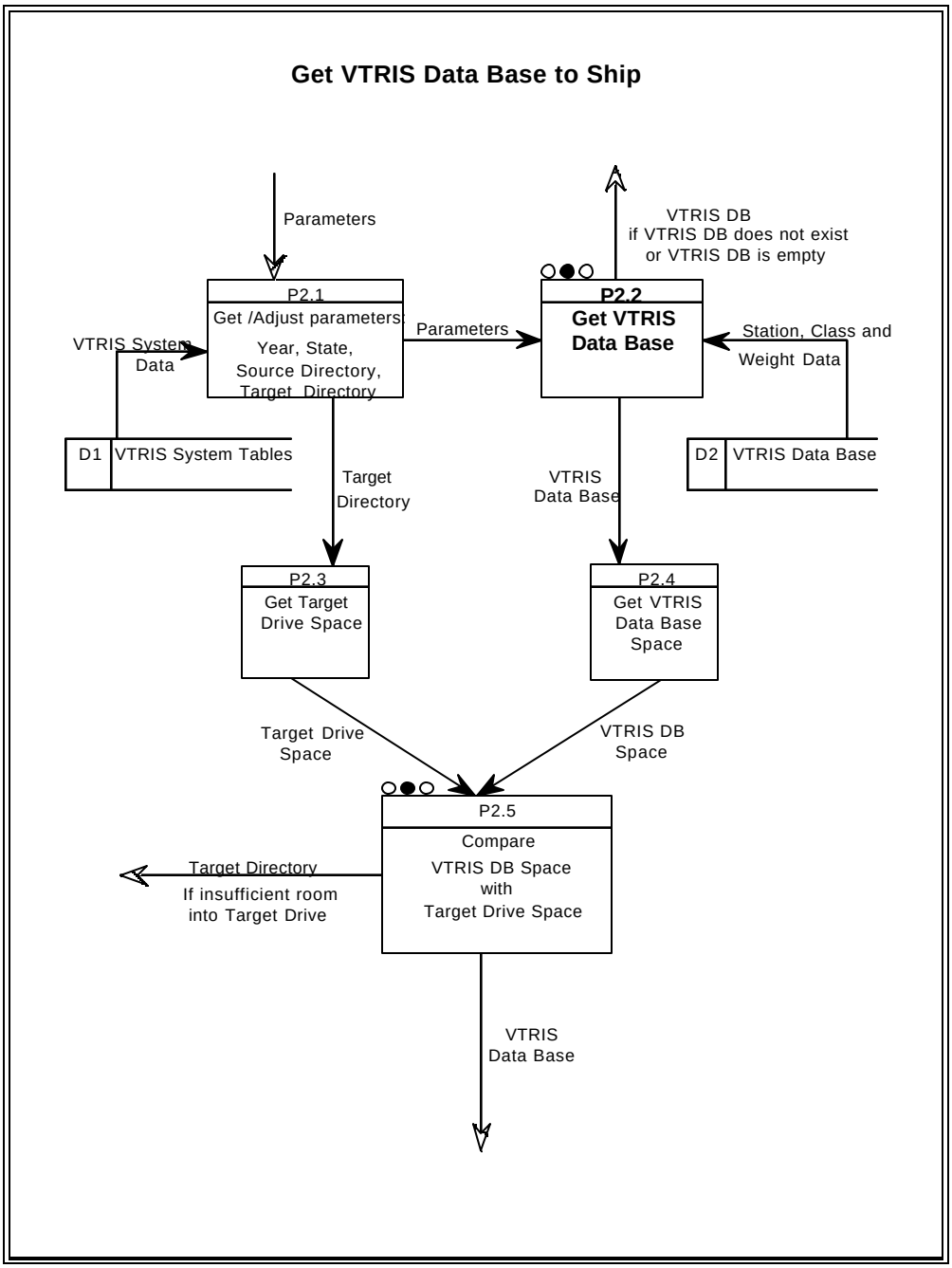

Get VTRIS Data Base to Ship
Parameters
VTRIS DB
if VTRIS DB does not exist
or VTRIS DB is empty
P2.1
Get /Adjust parameters
Year, State,
Source Directory,
Target Directory
P2.2
Get VTRIS
Data Base
VTRIS System
Data
Parameters
Station, Class and
Weight Data
D1
VTRIS System Tables
D2
VTRIS Data Base
Target
Directory
VTRIS
Data Base
P2.3
Get Target
Drive Space
P2.4
Get VTRIS
Data Base
Space
Target Drive
Space
VTRIS DB
Space
P2.5
Compare
VTRIS DB Space
with
Target Drive Space
Target Directory
If insufficient room
into Target Drive
VTRIS
Data Base

Fig 39

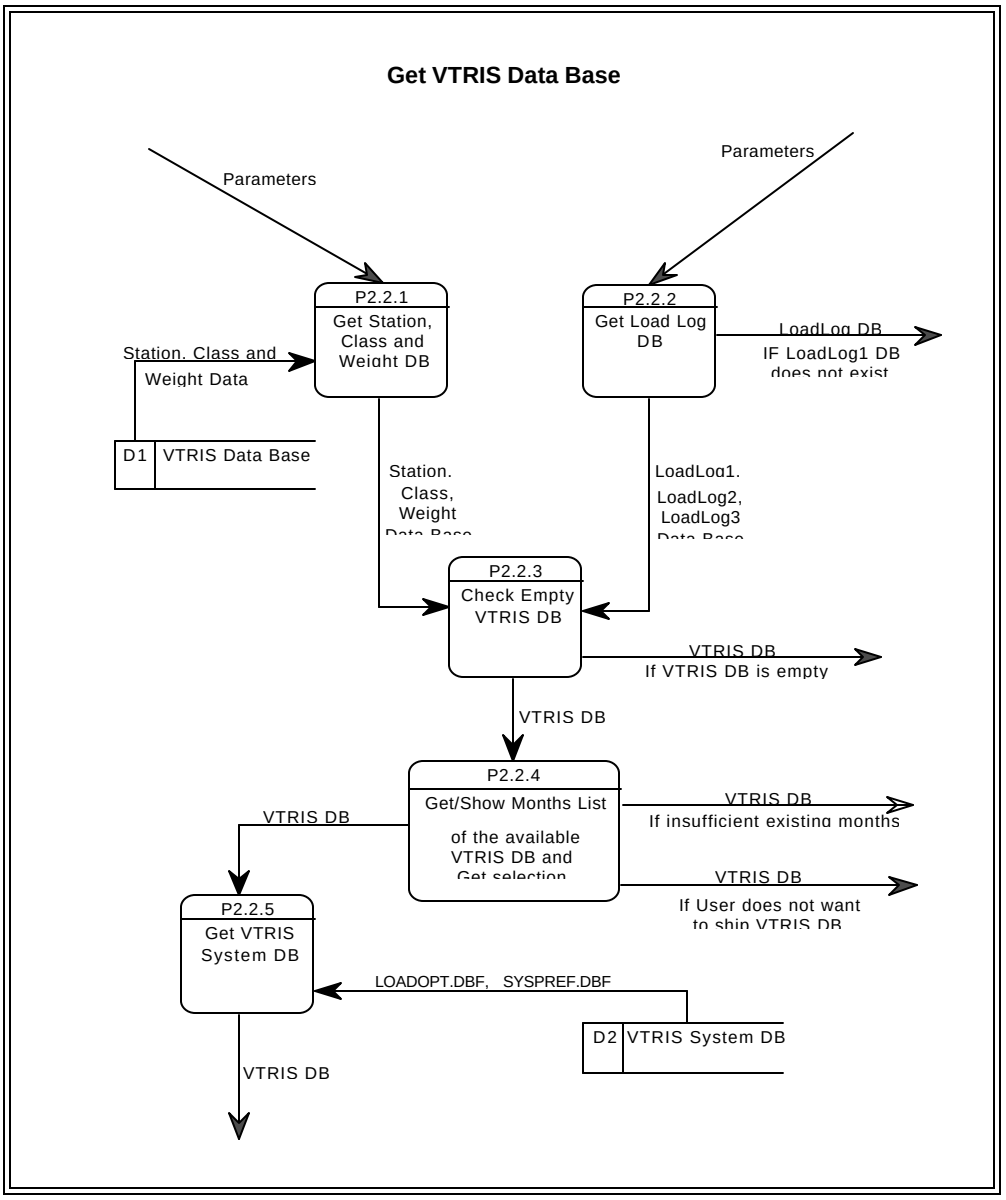
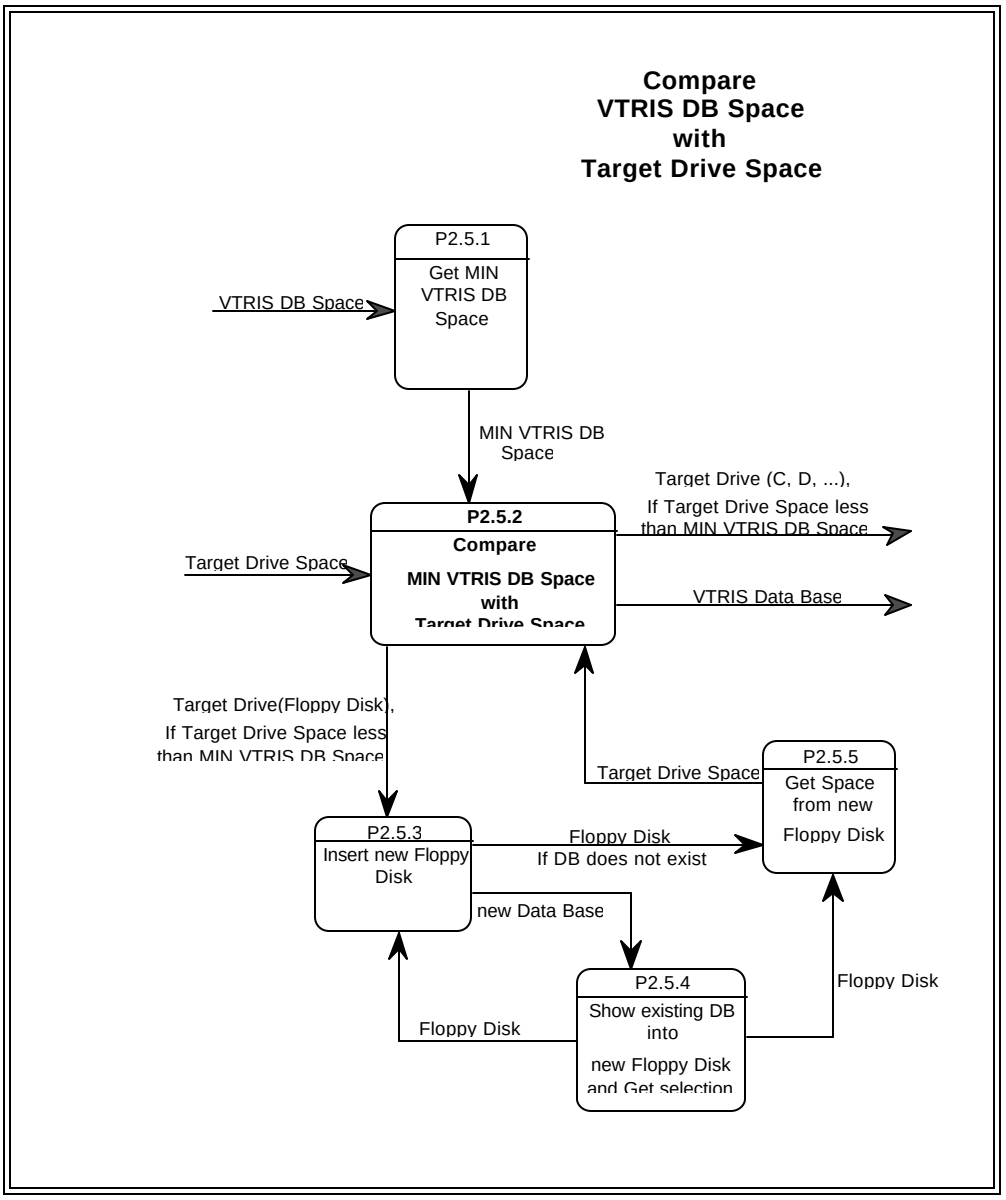

Get VTRIS Data Base
Parameters
Parameters
P2.2.1
Get Station, Class and Weight DB
P2.2.2
Get Load Log DB
LoadLog DB
IF LoadLog1 DB does not exist
Station, Class and Weight Data
D1
VTRIS Data Base
Station, Class, Weight Data Base
LoadLog1, LoadLog2, LoadLog3 Data Base
P2.2.3
Check Empty VTRIS DB
VTRIS DB
If VTRIS DB is empty
VTRIS DB
P2.2.4
Get/Show Months List of the available VTRIS DB and Get selection
VTRIS DB
If insufficient existing months
VTRIS DB
VTRIS DB
If User does not want to ship VTRIS DB
P2.2.5
Get VTRIS System DB
LOADOPT.DBF, SYSPREF.DBF
D2
VTRIS System DB
VTRIS DB

Fig 40



Receive subsystem initiates the process of taking the VTRIS database or Summary database which where shipped before.

Fig 41

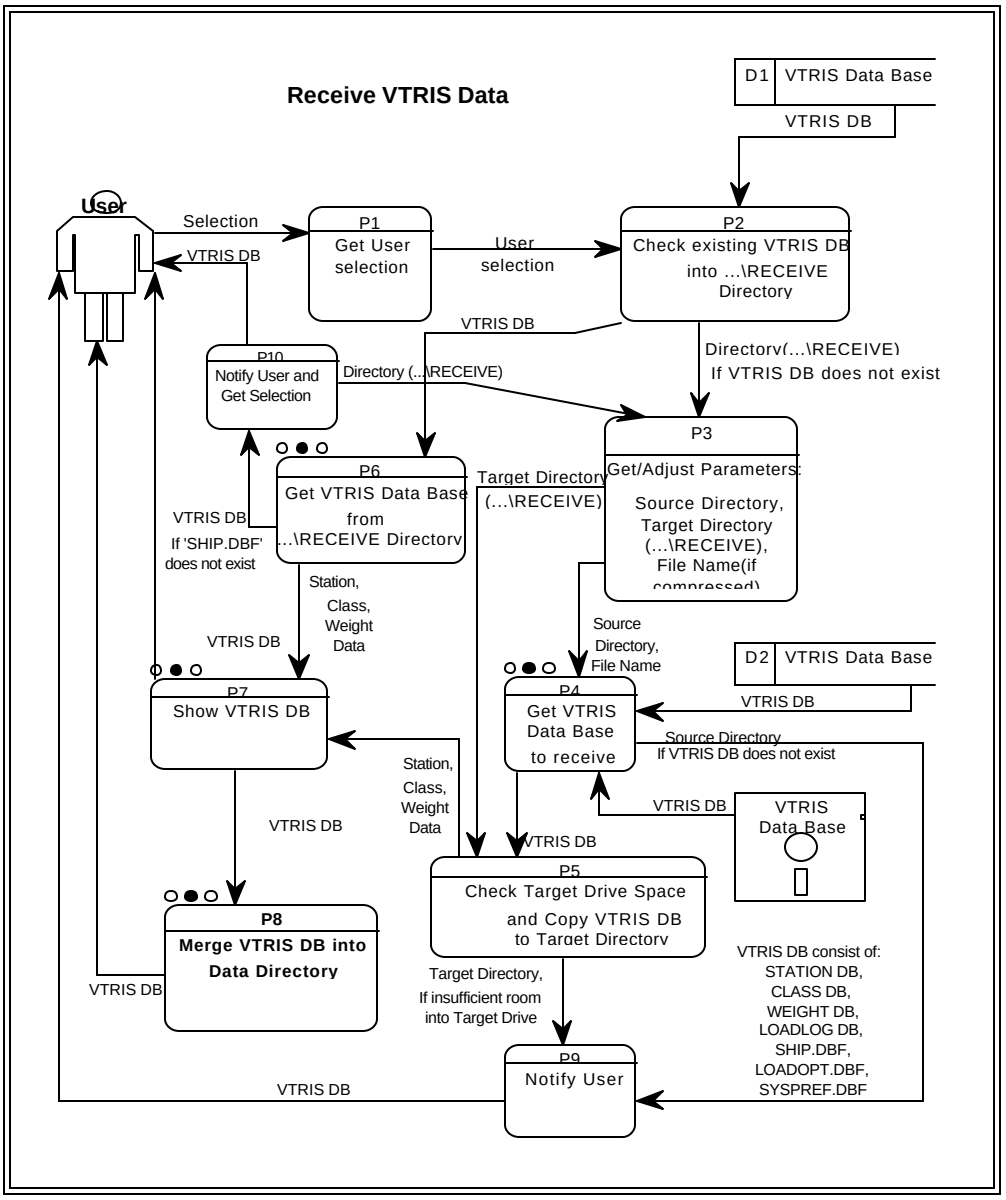

Receive VTRIS Data
D1 VTRIS Data Base
VTRIS DB
User
Selection
VTRIS DB
P1
Get User selection
User selection
P2
Check existing VTRIS DB into ...\RECEIVE Directory
VTRIS DB
Directory(...\RECEIVE)
If VTRIS DB does not exist
P10
Notify User and Get Selection
Directory (...\RECEIVE)
P3
Get/Adjust Parameters:
Source Directory,
Target Directory (...\RECEIVE),
File Name(if compressed)
P6
Get VTRIS Data Base from ...\RECEIVE Directory
Target Directory (...\RECEIVE)
VTRIS DB
If 'SHIP.DBF' does not exist
Station, Class, Weight Data
VTRIS DB
Source Directory, File Name
D2 VTRIS Data Base
VTRIS DB
P7
Show VTRIS DB
P4
Get VTRIS Data Base to receive
Source Directory
If VTRIS DB does not exist
Station, Class, Weight Data
VTRIS DB
VTRIS DB
VTRIS Data Base
VTRIS DB
P5
Check Target Drive Space and Copy VTRIS DB to Target Directory
P8
Merge VTRIS DB into Data Directory
VTRIS DB
Target Directory, If insufficient room into Target Drive
VTRIS DB consist of:
STATION DB,
CLASS DB,
WEIGHT DB,
LOADLOG DB,
SHIP.DBF,
LOADOPT.DBF,
SYSPREF.DBF
P9
Notify User
VTRIS DB

Fig 42

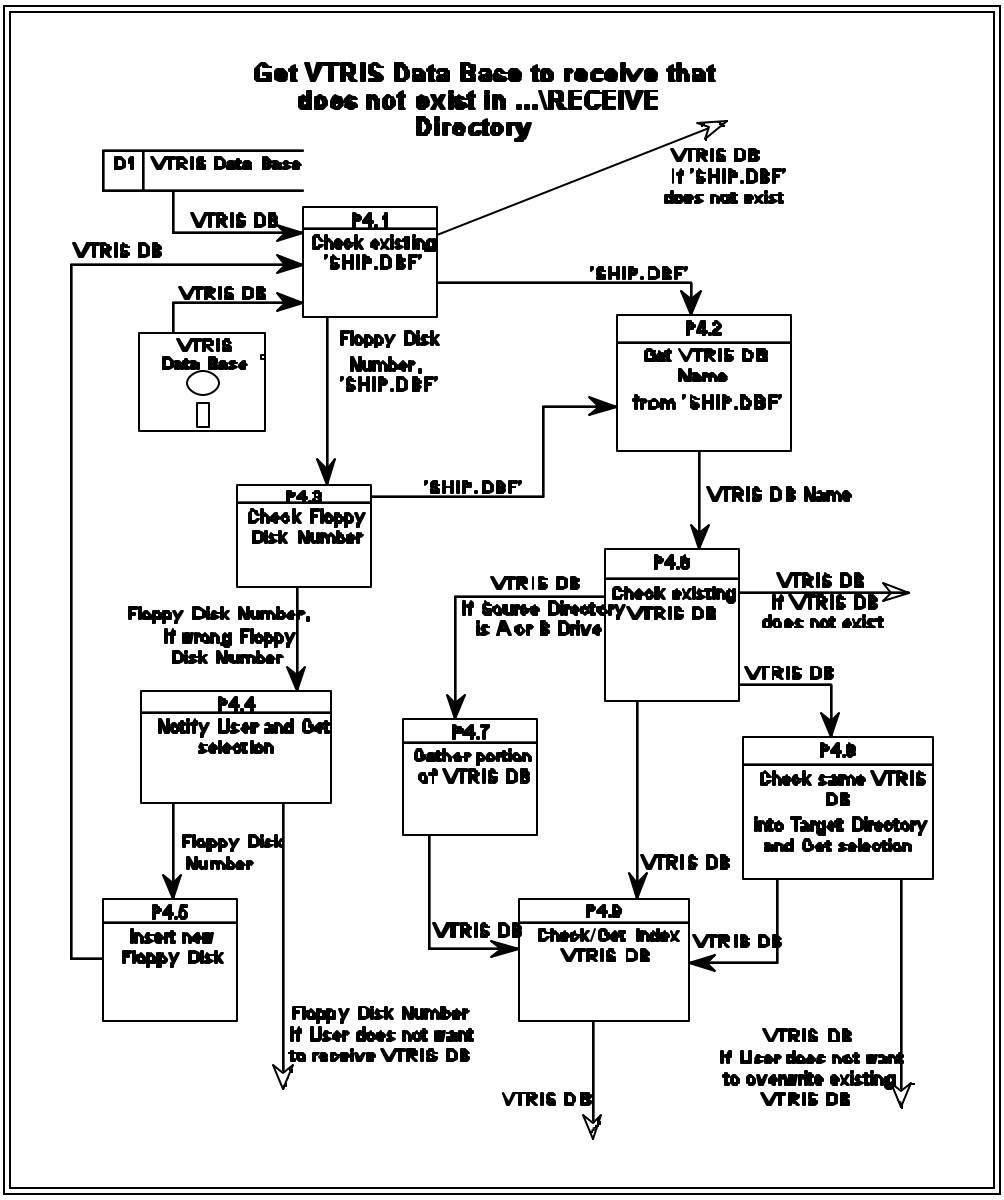

Get VTRIS Data Base to receive that does not exist in ...\RECEIVE Directory
D1 VTRIS Data Base
VTRIS DB
P4.1
Check existing 'SHIP.DBF'
VTRIS DB
If 'SHIP.DBF' does not exist
'SHIP.DBF'
VTRIS Data Base
Floppy Disk Number, 'SHIP.DBF'
P4.2
Get VTRIS DB Name from 'SHIP.DBF'
P4.3
Check Floppy Disk Number
VTRIS DB Name
Floppy Disk Number, If wrong Floppy Disk Number
P4.6
Check existing VTRIS DB
VTRIS DB
If Source Directory is A or B Drive
VTRIS DB
If VTRIS DB does not exist
P4.4
Notify User and Get selection
P4.7
Gather portion of VTRIS DB
P4.8
Check same VTRIS DB into Target Directory and Get selection
Floppy Disk Number
P4.5
Insert new Floppy Disk
P4.9
Check/Get Index VTRIS DB
Floppy Disk Number If User does not want to receive VTRIS DB
VTRIS DB
If User does not want to overwrite existing VTRIS DB

Fig 43

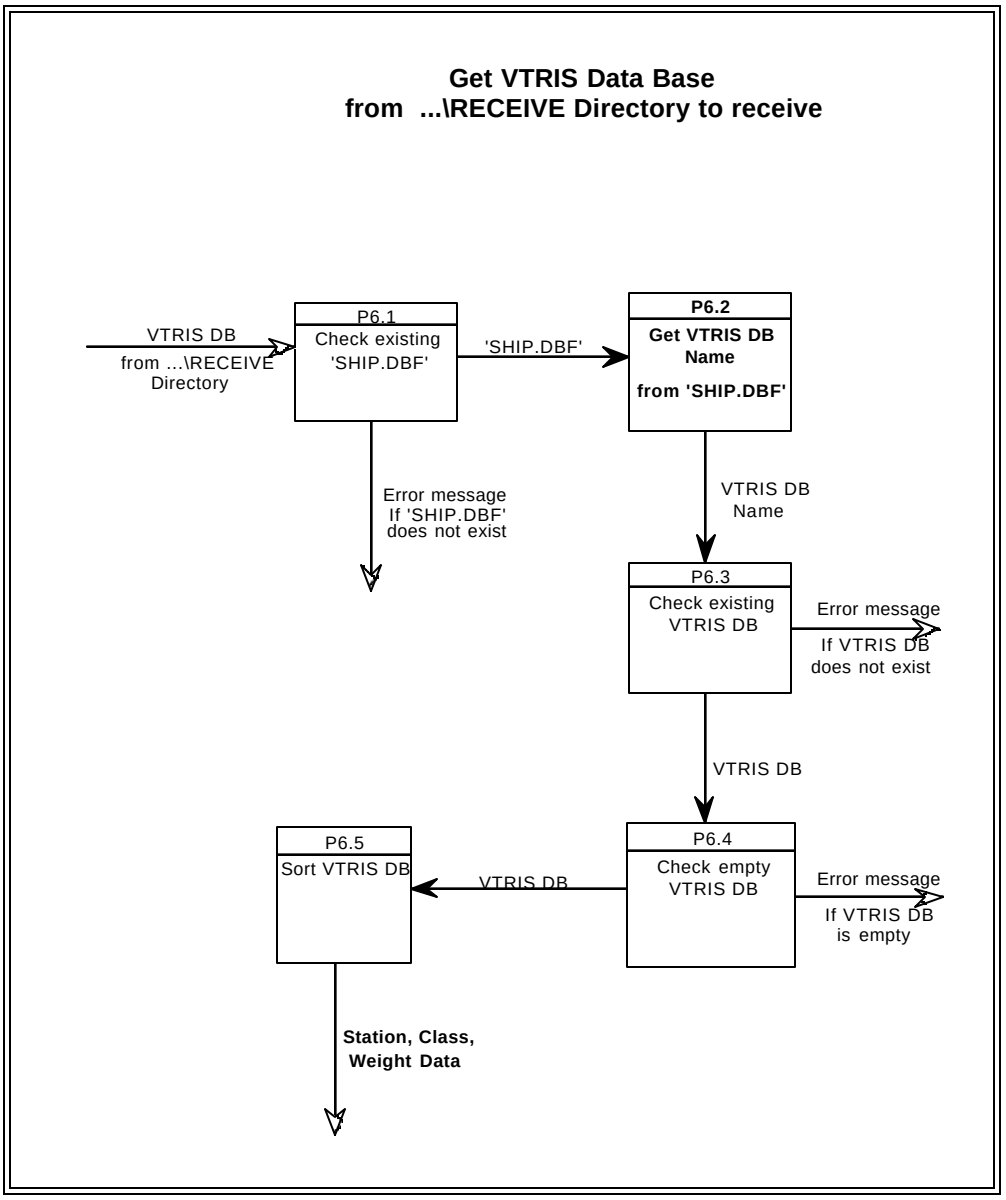

Get VTRIS Data Base
from ...\RECEIVE Directory to receive
VTRIS DB
from ...\RECEIVE
Directory
P6.1
Check existing
'SHIP.DBF'
'SHIP.DBF'
P6.2
Get VTRIS DB
Name
from 'SHIP.DBF'
Error message
If 'SHIP.DBF'
does not exist
VTRIS DB
Name
P6.3
Check existing
VTRIS DB
Error message
If VTRIS DB
does not exist
VTRIS DB
P6.5
Sort VTRIS DB
VTRIS DB
P6.4
Check empty
VTRIS DB
Error message
If VTRIS DB
is empty
Station, Class,
Weight Data

Fig 44

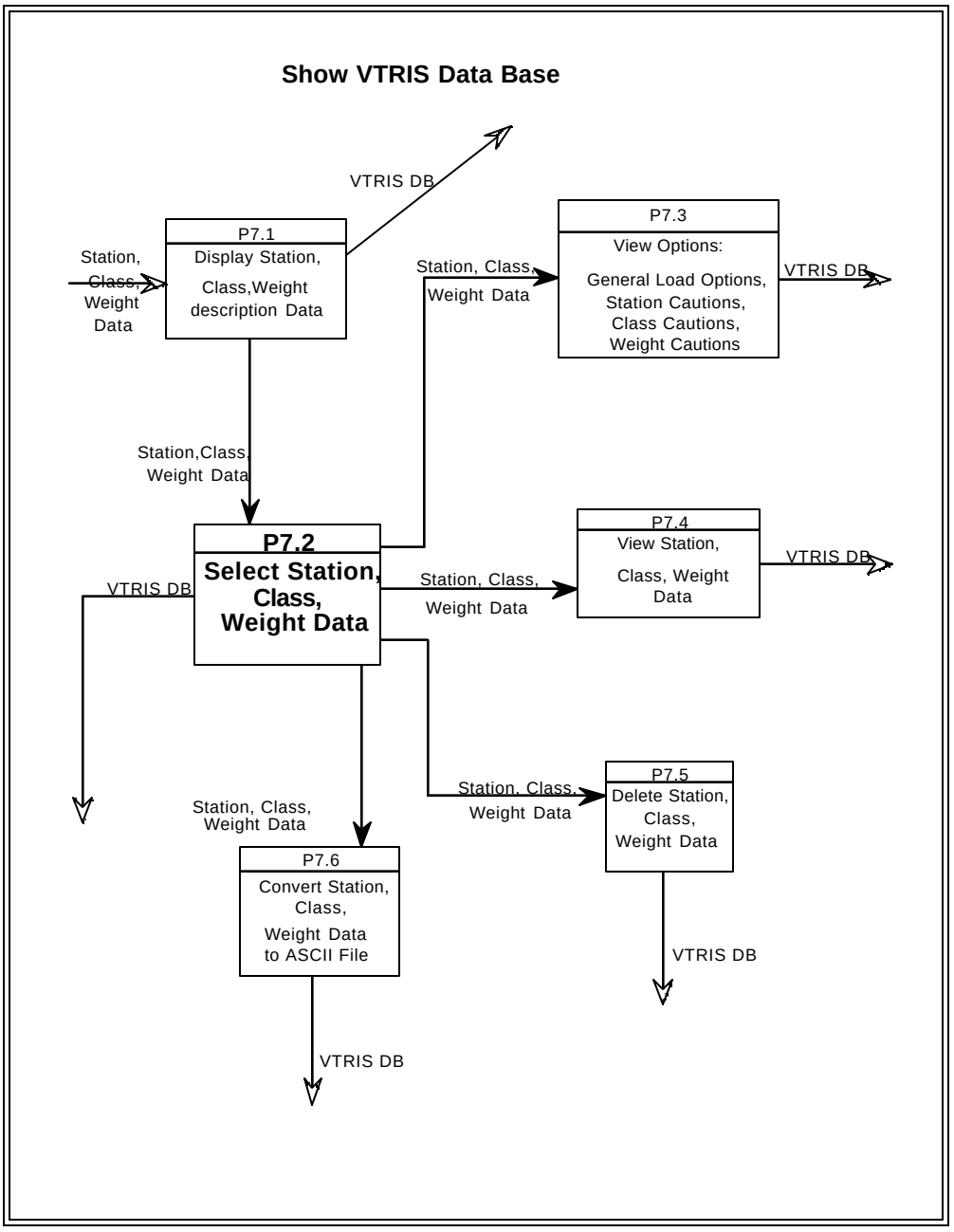
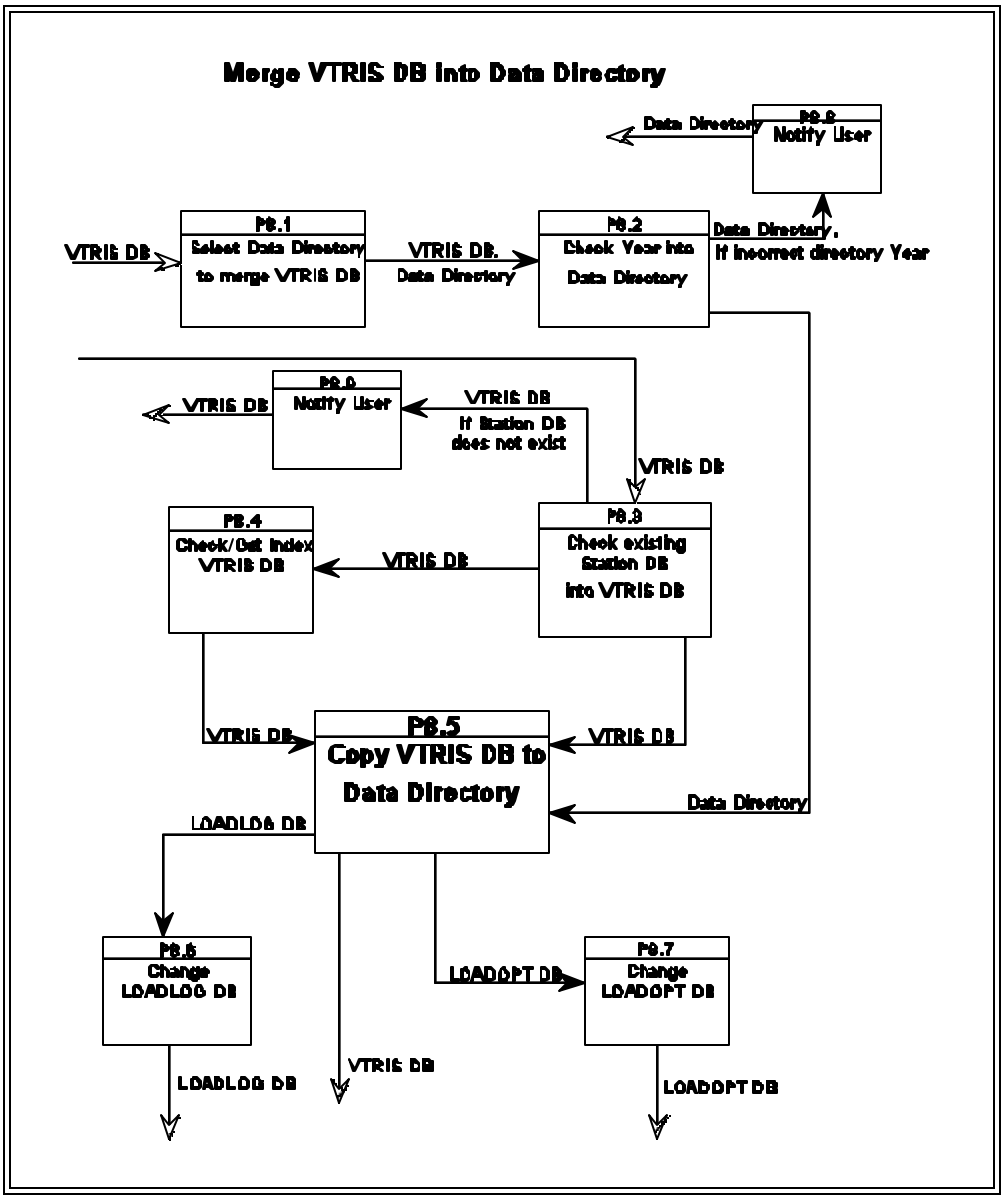

Show VTRIS Data Base
VTRIS DB
P7.1
Display Station,
Class,Weight
description Data
Station,
Class,
Weight
Data
P7.3
View Options:
General Load Options,
Station Cautions,
Class Cautions,
Weight Cautions
Station, Class,
Weight Data
VTRIS DB
Station,Class,
Weight Data
P7.2
Select Station,
Class,
Weight Data
VTRIS DB
Station, Class,
Weight Data
P7.4
View Station,
Class, Weight
Data
VTRIS DB
Station, Class,
Weight Data
P7.5
Delete Station,
Class,
Weight Data
VTRIS DB
Station, Class,
Weight Data
P7.6
Convert Station,
Class,
Weight Data
to ASCII File
VTRIS DB

Fig 45



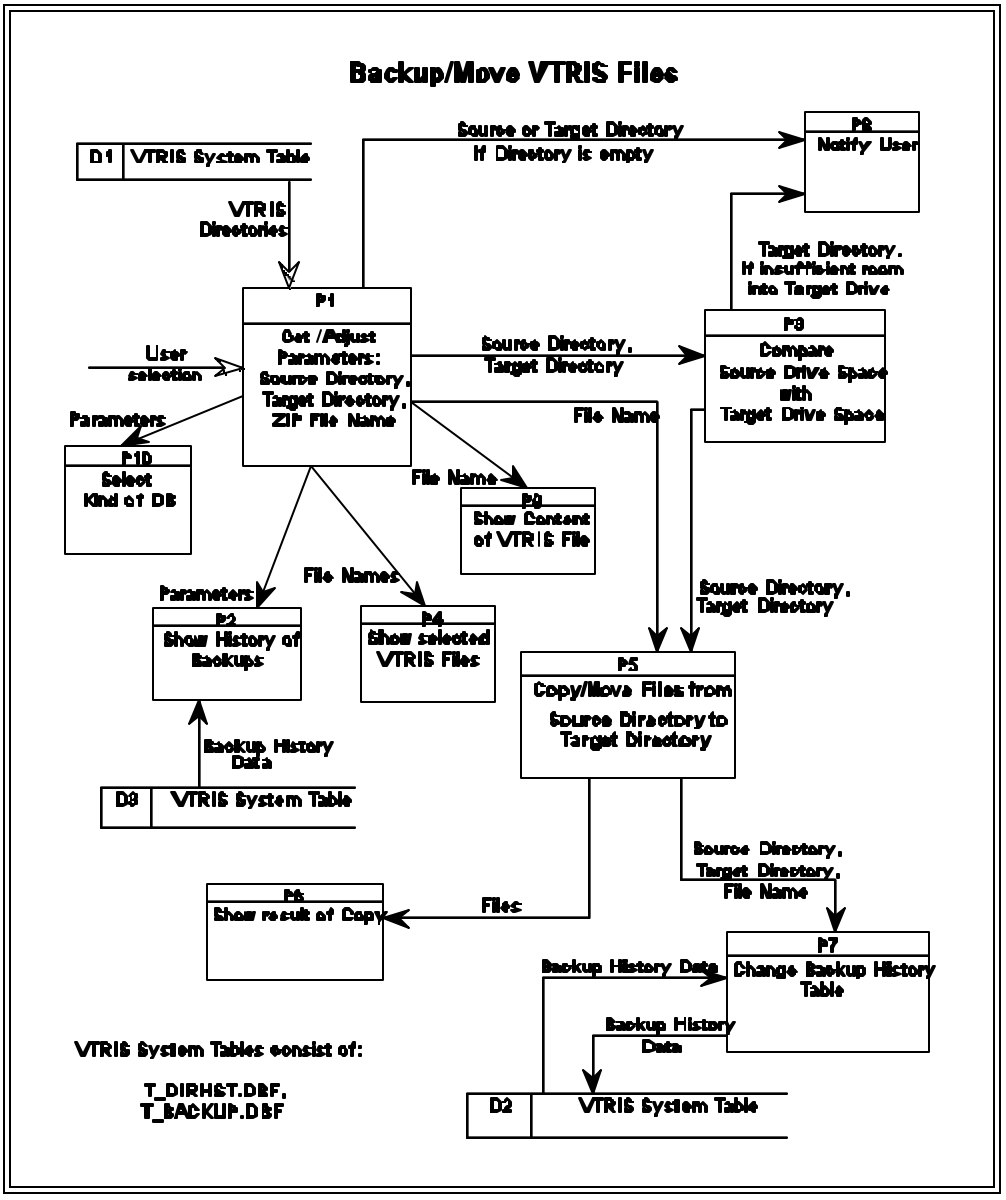
2.3.6 Utilities

Selection of this process displays the collection of utilities by which User can maintain, copy/move, restore or delete VTRIS database, change default values, et cetera.

2.3.6.1 Backup/Move VTRIS Files

This process allows User to create a copy of selected files to be backed up or moved to either the user's hard disk, a floppy or another magnetic storage medium.

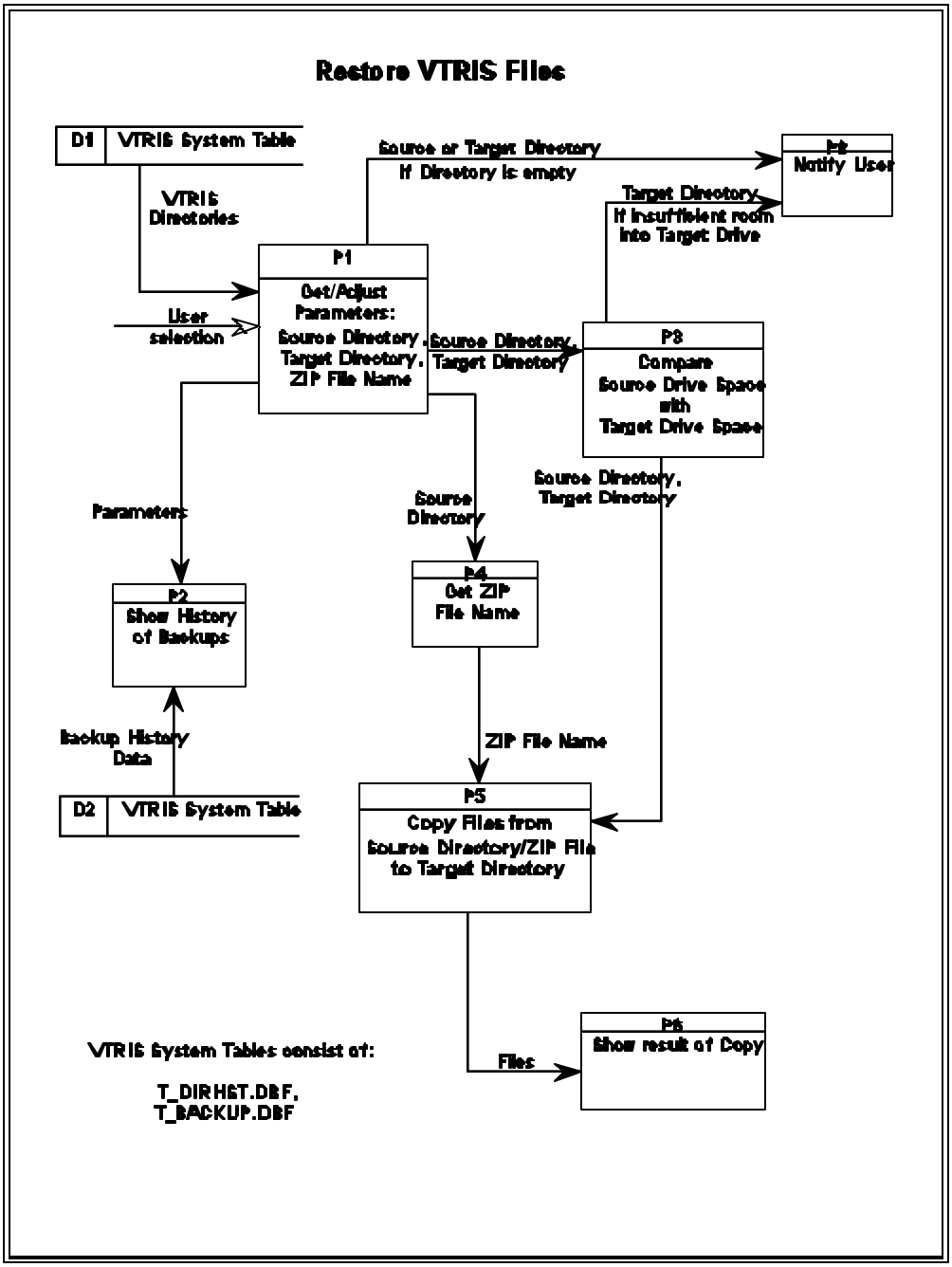
Fig 46



2.3.6.2 Restore VTRIS Files

This process allows the User to restore the files which were previously Backup with the VTRIS Backup utility.

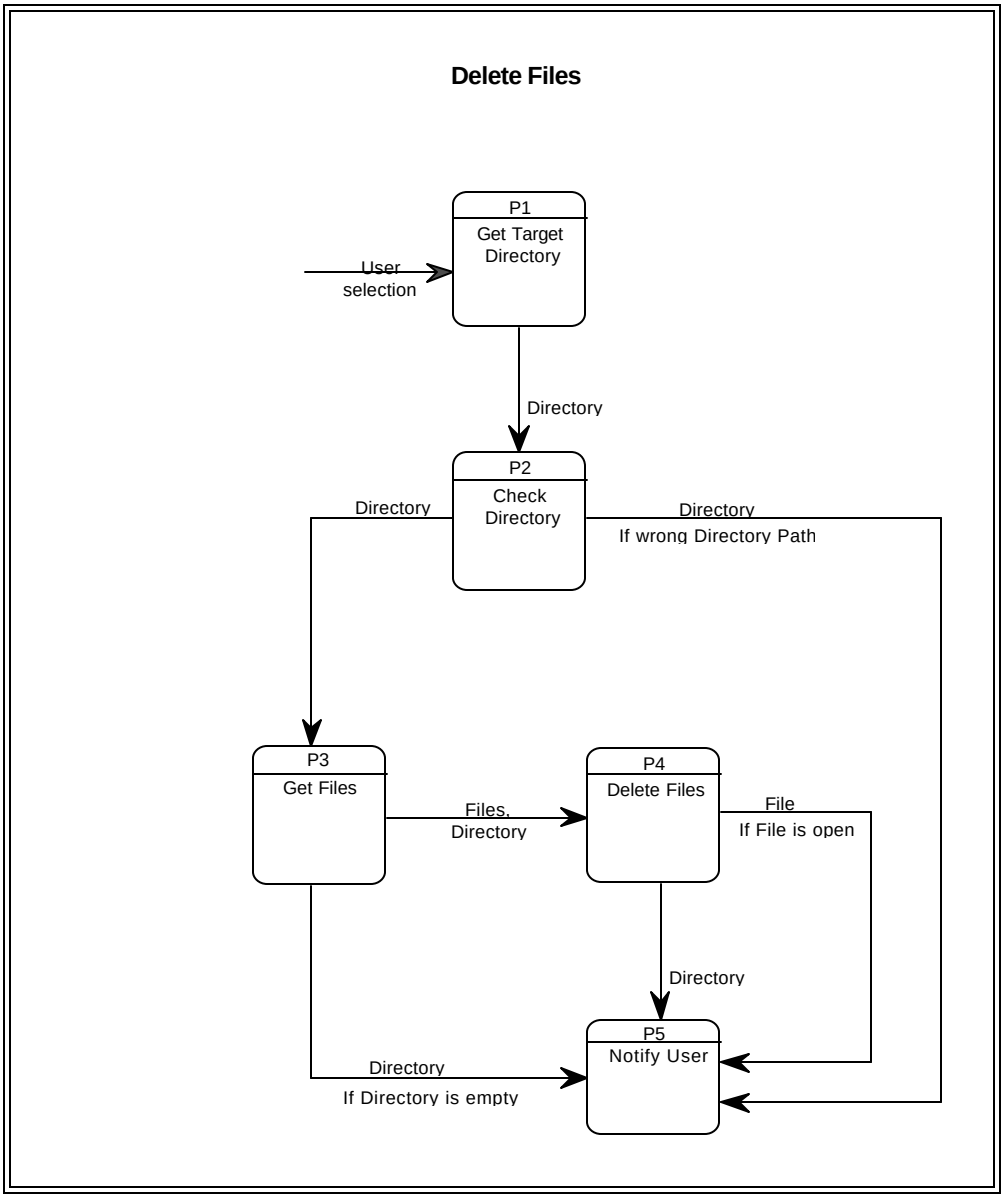
Fig 47



2.3.6.3 Delete Files

This process allows User to delete all files within a selected directory, while leaving the structure intact for possible future restoration.

Fig 48



2.4 VTRIS Data Design

VTRIS data consist of the following groups:

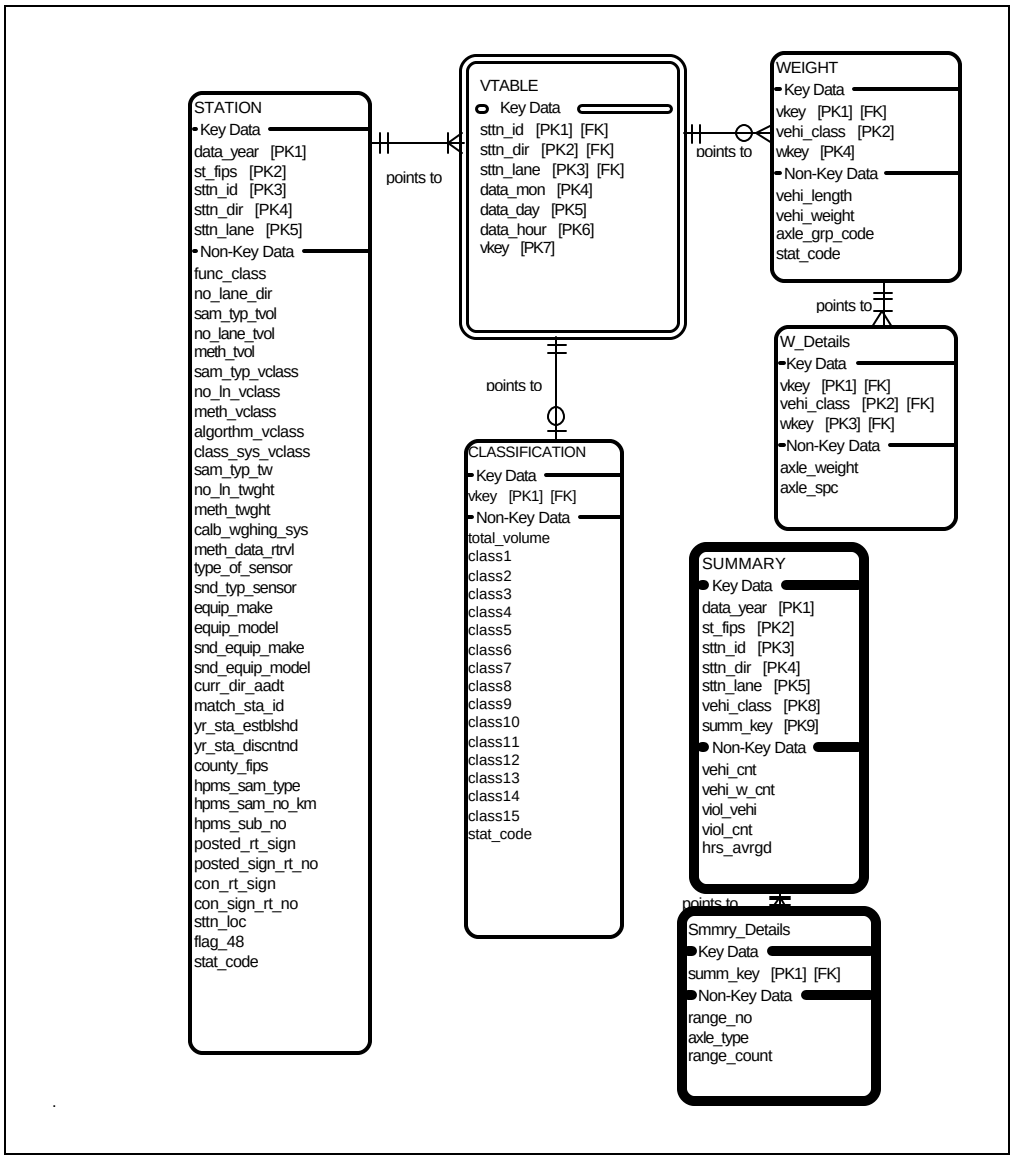
- Station, Classification, and Weight raw data which were validated and loaded into the VTRIS Database (Raw Data Tables).
- Summary data which were built from VTRIS raw data by averaging and placed into the VTRIS Database (Summary Tables)
- Report data which were built from VTRIS summary data and placed into the VTRIS Database (Report Tables)
- Load Log files which keep the information on loads performed during systems life. They are also considered to be the part of the VTRIS Database.
- Summary Log files which keep track of the Summaries created. It also considered to be the part of the VTRIS Database.
- VTRIS system tables. Part of them is shipped along with VTRIS and serves as look up tables. Those data is read only. Other tables are being updated and are intended to keep track of various VTRIS activities.
- VTRIS Temporary tables. These are storage for data which are created for a particular task only and deleted when the task is accomplished. For example, Work and Error Temp Tables being created during the Validation and Load process and discarded after it ends.

VTRIS Database model is represented in a Entity Relationship Diagram (ERD) in Fig 49. This shows relationships between different entities which are normalized up to third form. The relationships reflect real life links between Station, Classification, Weight, and Summary data.

2.4.1 VTRIS Database. Raw data

For the VTRIS raw data, a **single** combination **sttn_id+sttn_dir+sttn_lane** may have measurements **for many data_year+data_month+data_day+data_hour** combinations. It is depicted by one to 0, 1, or many relationship, "has data for time" between STATION and VTABLE entities on the VTRIS Tables ERD. A single entry in VTABLE entity may be only 0 or 1 Classification measurement. This is reflected by 1 to 0 or 1 relationship, "has class hourly record" between VTABLE and CLASSIFICATION entities on the ERD. As to truck weight measurements, there may be 0,1, or many trucks weighed for one hour on a day of a year for a station. So the relationship of truck record is 1 to 0, 1, or many. And, finally, each weighed truck will have more then one axle and that fact is represented by the relationship "has axles" which is one to many.

Fig 49



VTRIS Raw Structures :

STATION

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	DATA_YEAR	Character	2				No
2	ST_FIPS	Character	2				No
3	**STTN_ID**	Character	6				No
4	**STTN_DIR**	Character	1				No
5	**STTN_LANE**	Character	1				No
6	FUNC_CLASS	Character	2				No
7	NO_LN_DIR	Character	1				No
8	SAM_TY_VOL	Character	1				No
9	NO_LN_TVOL	Character	1				No
10	MTHD_TVCNT	Character	1				No
11	SAM_TY_VCL	Character	1				No
12	NO_LN_VCLS	Character	1				No
13	MTHD_VCLSS	Character	1				No
14	ALGO_VCLSS	Character	1				No
15	CLS_SYS_VC	Character	2				No
16	SAM_TY_TRW	Character	1				No
17	NO_LN_TRWH	Character	1				No
18	MTHD_TRWGH	Character	1				No
19	CLB_WG_SYS	Character	1				No
20	MTHD_DTARV	Character	1				No
21	TYPE_SNSOR	Character	1				No
22	SND_TY_SNR	Character	1				No
23	EQUIP_MAKE	Character	2				No
24	EQUIP_MODL	Character	15				No
25	SND_EQ_MAK	Character	2				No
26	SND_EQ_MOD	Character	15				No
27	CRR_DRAADT	Numeric	6				No
28	OLD_STA_ID	Character	6				No
29	YR_STA_BEG	Character	2				No
30	YR_STA_END	Character	2				No
31	CNTY_FIPS	Character	3				No
32	HPMS_SAMTY	Character	1				No
33	HPMS_SAMNK	Character	12				No
34	HPMS_SUBNO	Character	1				No
35	POST_RTSGN	Character	1				No
36	PSGN_RT_NO	Character	8				No
37	CS_RT_SGN	Character	1				No
38	CS_S_RT_NO	Character	8				No
39	STTN_LOC	Character	50				No
40	CLSANDWGT	Character	1				No
41	STTUS_CODE	Character	2				No

VTABLE

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	**STTN_ID**	Character	6				No
2	**STTN_DIR**	Character	1				No
3	**STTN_LANE**	Character	1				No
4	DATA_DAY	Character	2				No
5	DATA_HOUR	Character	2				No
6	**VTRIS_KEY**	Character	3				No
7	CLSWGT	Character	1				No

CLASSIFICATION

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	**VTRIS_KEY**	Character	3				No
2	TOT_VOL	Numeric	7				No
3	CLSS1_HTOT	Numeric	5				No
4	CLSS2_HTOT	Numeric	5				No
5	CLSS3_HTOT	Numeric	5				No
6	CLSS4_HTOT	Numeric	5				No
7	CLSS5_HTOT	Numeric	5				No
8	CLSS6_HTOT	Numeric	5				No
9	CLSS7_HTOT	Numeric	5				No
10	CLSS8_HTOT	Numeric	5				No
11	CLSS9_HTOT	Numeric	5				No
12	CLSSA_HTOT	Numeric	5				No
13	CLSSB_HTOT	Numeric	5				No
14	CLSSC_HTOT	Numeric	5				No
15	CLSSD_HTOT	Numeric	5				No
16	CLSSE_HTOT	Numeric	5				No
17	CLSSF_HTOT	Numeric	5				No
18	STTUS_CODE	Character	2				No

WEIGHT

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	**VTRIS_KEY**	Character	3				No
2	VEHI_CLASS	Character	2				No
3	VEH_LENGTH	Character	3				No
4	VEH_WEIGHT	Character	4				No
5	AXLE_GRPCD	Character	1				No
6	STTUS_CODE	Character	2				No
7	**WEIGHT_KEY**	Character	2				No

WEIGHT DETAIL

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls

1	**VTRIS_KEY**	Character	3	No
2	**WEIGHT_KEY**	Character	2	No
3	AXLE_WEIGH	Character	3	No
4	AXLE_SPACE	Character	3	No

2.4.2 VTRIS Database. Summary data

For the VTRIS Summary data, a **single** combination **sttn_id+sttn_dir+sttn_lane** may have measurements **for many data_year+data_month+data_day+data_hour** combinations. It is depicted by one to 0, 1, or many relationship, "has data for time" between Summary and Summary_Details entities on the VTRIS Tables ERD.

VTRIS Summary Structures :

CLASS AVERAGE FILE

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	**STTN_ID**	Character	6				No
2	**STTN_DIR**	Character	1				No
3	**STTN_LANE**	Character	1				No
4	VEHI_CLASS	Character	2				No
5	**SUMDT_KEY**	Character	3				No
6	VC_AVG_CNT	Numeric	8	2			No
7	VW_AVG_CNT	Numeric	8	2			No
8	VIOL_AWCNT	Numeric	8	2			No
9	VIOL_ABCNT	Numeric	8	2			No
10	FLAG_48	Logical	1				No
11	FUNC_CLASS	Character	2				No

CLASSIFICATION TIME PERIOD FILE

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	**STTN_ID**	Character	6				No
2	**STTN_DIR**	Character	1				No
3	**STTN_LANE**	Character	1				No
4	DTFROM	Date	8				No
5	HRSFROM	Numeric	2				No
6	DTTO	Date	8				No
7	HRSTO	Numeric	2				No
8	TOTAL_HRS	Numeric	4				No

WEIGHT TIME PERIOD FILE

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	**STTN_ID**	Character	6				No
2	**STTN_DIR**	Character	1				No
3	**STTN_LANE**	Character	1				No
4	DTFROM	Date	8				No
5	HRSFROM	Numeric	2				No
6	DTTO	Date	8				No
7	HRSTO	Numeric	2				No
8	TOTAL_HRS	Numeric	4				No

DETAIL WEIGHT FILE

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	**SUMDT_KEY**	Character	3				No
2	AXLE_TYPE	Numeric	1				No
3	RANGE_NO	Numeric	2				No
4	RANGE_CONT	Numeric	8	2			No

2.4.3 VTRIS Database. Reports data

For the VTRIS Reports, data are kept in individual database. Each report has one or two (W-4, W-5) databases.

VTRIS Reports Structures :

VTRIS W-1 Table

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	STATE	Character	2				No
2	STATION_CD	Character	8				No

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
3	STATION_YR	Character	4				No
4	FUNT	Character	2				No

5	FCLASS	Character	67			No
6	ROUTE_INFO	Character	8			No
7	COUNTY	Character	3			No
8	LOCATION	Character	50			No
9	HPMS_SAMP	Character	12			No
10	HPMS_SUB	Character	1			No
11	YEAR_STEST	Character	4			No
12	NUMLANES	Character	1			No
13	WEQUIP	Character	67			No
14	VCLASS	Character	67			No
15	AADT	Numeric	6			No
16	RPTDATE	Date	8			No
17	RPTTIME	Character	8			No
18	RPTTYPE	Character	2			No
19	HEADER1	Character	50			No
20	HEADER2	Character	50			No

VTRIS W-2 Table

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	RPTDATE	Date		8			No
2	RPTTIME	Character		8			No
3	RPTTYPE	Character		2			No
4	STATE	Character		2			No
5	PERIOD	Character		25			No
6	FCLASS	Character		55			No
7	STATION	Memo		10			No
8	HEADER1	Character		50			No
9	HEADER2	Character		50			No
10	UOFMEAS	Character		1			No
11	AVGMETH	Character		1			No
12	SUMMTYPE	Character		1			No
13	ORDERBY	Character		1			No
14	RGROUPMTH	Character		1			No
15	AGROUPMTH	Character		1			No
16	DIRORLANE	Character		1			No
17	A1	Numeric		6			No
18	A2	Numeric		6			No
19	A3	Numeric		6			No
20	A4	Numeric		6			No
21	A5	Numeric		6			No
22	A6	Numeric		6			No
23	A7	Numeric		6			No
24	A8	Numeric		6			No
25	A9	Numeric		6			No
26	A10	Numeric		6			No
27	A11	Numeric		6			No
28	A12	Numeric		6			No
29	A13	Numeric		6			No

30	W5	Numeric	6			No
31	W6	Numeric	6			No
32	W7	Numeric	6			No
33	W8	Numeric	6			No
34	W9	Numeric	6			No
35	W10	Numeric	6			No
36	W11	Numeric	6			No
37	W12	Numeric	6			No
38	W13	Numeric	6			No
39	TWT	Numeric	6			No
40	ATRCK	Numeric	6			No
41	ATRAF	Numeric	6			No
42	OPTNAME	Character	15			No

VTRIS W-3 Table

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	1
RPTDATE	Date	8			No			
2	RPTTIME	Character	8				No	
3	RPTTYPE	Character	2				No	
4	STATE	Character	2				No	
5	PERIOD	Character	25				No	
6	FCLASS	Character	55				No	
7	STATION	Memo	10				No	
8	HEADER1	Character	50				No	
9	HEADER2	Character	50				No	
10	UOFMEAS	Character	1				No	
11	AVGMETH	Character	1				No	
12	SUMMTYPE	Character	1				No	
13	ORDERBY	Character	1				No	
14	RGROUPMTH	Character	1				No	
15	AGROUPMTH	Character	1				No	
16	DIRORLANE	Character	1				No	
17	LBSTOKG	Numeric	10	8			No	
18	GWN5	Numeric	10	2			No	
19	GAV5	Numeric	16	2			No	
20	LWN5	Numeric	10	2			No	
21	LAV5	Numeric	16	2			No	
22	EWN5	Numeric	10	2			No	
23	EAV5	Numeric	16	2			No	
24	CLWAV5	Numeric	16	2			No	
25	GWN6	Numeric	10	2			No	
26	GAV6	Numeric	16	2			No	
27	LWN6	Numeric	10	2			No	
28	LAV6	Numeric	16	2			No	
29	EWN6	Numeric	10	2			No	
30	EAV6	Numeric	16	2			No	
31	CLWAV6	Numeric	16	2			No	
32	GWN7	Numeric	10	2			No	

33	GAV7	Numeric	16	2	No
34	LWN7	Numeric	10	2	No
35	LAV7	Numeric	16	2	No
36	EWN7	Numeric	10	2	No
37	EAV7	Numeric	16	2	No
38	CLWAV7	Numeric	16	2	No
39	GWN8	Numeric	10	2	No
40	GAV8	Numeric	16	2	No
41	LWN8	Numeric	10	2	No
42	LAV8	Numeric	16	2	No
43	EWN8	Numeric	10	2	No
44	EAV8	Numeric	16	2	No
45	CLWAV8	Numeric	16	2	No
46	GWN9	Numeric	10	2	No
47	GAV9	Numeric	16	2	No
48	LWN9	Numeric	10	2	No
49	LAV9	Numeric	16	2	No
50	EWN9	Numeric	10	2	No
51	EAV9	Numeric	16	2	No
52	CLWAV9	Numeric	16	2	No
53	GWN10	Numeric	10	2	No
54	GAV10	Numeric	16	2	No
55	LWN10	Numeric	10	2	No
56	LAV10	Numeric	16	2	No
57	EWN10	Numeric	10	2	No
58	EAV10	Numeric	16	2	No
59	CLWAV10	Numeric	16	2	No
60	GWN11	Numeric	10	2	No
61	GAV11	Numeric	16	2	No
62	LWN11	Numeric	10	2	No
63	LAV11	Numeric	16	2	No
64	EWN11	Numeric	10	2	No
65	EAV11	Numeric	16	2	No
66	CLWAV11	Numeric	16	2	No
67	GWN12	Numeric	10	2	No
68	GAV12	Numeric	16	2	No
69	LWN12	Numeric	10	2	No
70	LAV12	Numeric	16	2	No
71	EWN12	Numeric	10	2	No
72	EAV12	Numeric	16	2	No
73	CLWAV12	Numeric	16	2	No
74	GWN13	Numeric	10	2	No
75	GAV13	Numeric	16	2	No
76	LWN13	Numeric	10	2	No
77	LAV13	Numeric	16	2	No
78	EWN13	Numeric	10	2	No
79	EAV13	Numeric	16	2	No
80	CLWAV13	Numeric	16	2	No
81	NSUT	Numeric	10	2	No

82	SUTGAVG	Numeric	16	2	No
83	NSUTLD	Numeric	10	2	No
84	SUTLAVG	Numeric	16	2	No
85	NSUTEMPT	Numeric	10	2	No
86	SUTCALD	Numeric	16	2	No
87	SUTCAVG	Numeric	16	2	No
88	NSTR	Numeric	10	2	No
89	STRGAVG	Numeric	16	2	No
90	NSTRLD	Numeric	10	2	No
91	STRLAVG	Numeric	16	2	No
92	NSTREMPT	Numeric	10	2	No
93	STRCALD	Numeric	16	2	No
94	STRCAVG	Numeric	16	2	No
95	NMTR	Numeric	10	2	No
96	MTRGAVG	Numeric	16	2	No
97	NMTRLD	Numeric	10	2	No
98	MTRLAVG	Numeric	16	2	No
99	NMTREMPT	Numeric	10	2	No
100	MTRCALD	Numeric	16	2	No
101	MTRCAVG	Numeric	16	2	No
102	NATR	Numeric	10	2	No
103	ATRGAVG	Numeric	16	2	No
104	NATRLD	Numeric	10	2	No
105	ATRLAVG	Numeric	16	2	No
106	NATREMPT	Numeric	10	2	No
107	ATRCALD	Numeric	16	2	No
108	ATRCAVG	Numeric	16	2	No
109	NACR	Numeric	10	2	No
110	ACRGAVG	Numeric	16	2	No
111	NACRLD	Numeric	10	2	No
112	ACRLAVG	Numeric	16	2	No
113	NACREMPT	Numeric	10	2	No
114	ACRCALD	Numeric	16	2	No
115	ACRCAVG	Numeric	16	2	No
116	NCLS5	Numeric	5	1	No
117	NCLS6	Numeric	5	1	No
118	NCLS7	Numeric	5	1	No
119	NCLS8	Numeric	5	1	No
120	NCLS9	Numeric	5	1	No
121	NCLS10	Numeric	5	1	No
122	NCLS11	Numeric	5	1	No
123	NCLS12	Numeric	5	1	No
124	NCLS13	Numeric	5	1	No
125	OPTNAME	Character	15		No

VTRIS W-4 Table

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	
								1
RPTDATE		Date	8		No			
2	RPTTIME	Character	8				No	
3	RPTTYPE	Character	2				No	
4	STATE	Character	2				No	
5	PERIOD	Character	25				No	
6	FCLASS	Character	55				No	
7	STATION	Memo	10				No	
8	HEADER1	Character	50				No	
9	HEADER2	Character	50				No	
10	UOFMEAS	Character	1				No	
11	AVGMETH	Character	1				No	
12	SUMMTYPE	Character	1				No	
13	ORDERBY	Character	1				No	
14	RGROUPMTH	Character	1				No	
15	AGROUPMTH	Character	1				No	
16	DIRORLANE	Character	1				No	
17	OUTERLOOP	Numeric	4				No	
18	WCL1	Numeric	8	2			No	
19	WCL2	Numeric	8	2			No	
20	WCL3	Numeric	8	2			No	
21	WCL4	Numeric	8	2			No	
22	WCL5	Numeric	8	2			No	
23	WCL6	Numeric	8	2			No	
24	WCL7	Numeric	8	2			No	
25	WCL8	Numeric	8	2			No	
26	WCL9	Numeric	8	2			No	
27	WCL10	Numeric	8	2			No	
28	WCL11	Numeric	8	2			No	
29	WCL12	Numeric	8	2			No	
30	WCL13	Numeric	8	2			No	
31	L1	Numeric	8	2			No	
32	L2	Numeric	8	2			No	
33	L3	Numeric	8	2			No	
34	L4	Numeric	8	2			No	
35	L5	Numeric	8	2			No	
36	L6	Numeric	8	2			No	
37	L7	Numeric	8	2			No	
38	L8	Numeric	8	2			No	
39	L9	Numeric	8	2			No	
40	L10	Numeric	8	2			No	
41	L11	Numeric	8	2			No	
42	L12	Numeric	8	2			No	
43	L13	Numeric	8	2			No	
44	ESALRP3	Numeric	7	4			No	
45	ESALRP4	Numeric	7	4			No	
46	ESALRP5	Numeric	7	4			No	
47	ESALRP6	Numeric	7	4			No	
48	ESALRP7	Numeric	7	4			No	

49	ESALRP8	Numeric	7	4	No
50	ESALRP9	Numeric	7	4	No
51	ESALRP10	Numeric	7	4	No
52	ESALRP11	Numeric	7	4	No
53	ESALRP12	Numeric	7	4	No
54	ESALRP13	Numeric	7	4	No
55	SUMRDIST	Numeric	12	4	No
56	WHTCLS	Logical	1		No
57	ESALFP3	Numeric	7	4	No
58	ESALFP4	Numeric	7	4	No
59	ESALFP5	Numeric	7	4	No
60	ESALFP6	Numeric	7	4	No
61	ESALFP7	Numeric	7	4	No
62	ESALFP8	Numeric	7	4	No
63	ESALFP9	Numeric	7	4	No
64	ESALFP10	Numeric	7	4	No
65	ESALFP11	Numeric	7	4	No
66	ESALFP12	Numeric	7	4	No
67	ESALFP13	Numeric	7	4	No
68	SUMFDIST	Numeric	12	4	No
69	PF20	Numeric	6	2	No
70	PF22	Numeric	6	2	No
71	PF24	Numeric	6	2	No
72	PF26	Numeric	6	2	No
73	PF28	Numeric	6	2	No
74	PF210	Numeric	6	2	No
75	PR20	Numeric	6	2	No
76	PR22	Numeric	6	2	No
77	PR24	Numeric	6	2	No
78	PR26	Numeric	6	2	No
79	PR28	Numeric	6	2	No
80	PR210	Numeric	6	2	No
81	PF40	Numeric	6	2	No
82	PF42	Numeric	6	2	No
83	PF44	Numeric	6	2	No
84	PF46	Numeric	6	2	No
85	PF48	Numeric	6	2	No
86	PF410	Numeric	6	2	No
87	PR40	Numeric	6	2	No
88	PR42	Numeric	6	2	No
89	PR44	Numeric	6	2	No
90	PR46	Numeric	6	2	No
91	PR48	Numeric	6	2	No
92	PR410	Numeric	6	2	No
93	PF60	Numeric	6	2	No
94	PF62	Numeric	6	2	No
95	PF64	Numeric	6	2	No
96	PF66	Numeric	6	2	No
97	PF68	Numeric	6	2	No

98	PF610	Numeric	6	2	No
99	PR60	Numeric	6	2	No
100	PR62	Numeric	6	2	No
101	PR64	Numeric	6	2	No
102	PR66	Numeric	6	2	No
103	PR68	Numeric	6	2	No
104	PR610	Numeric	6	2	No
105	PF80	Numeric	6	2	No
106	PF82	Numeric	6	2	No
107	PF84	Numeric	6	2	No
108	PF86	Numeric	6	2	No
109	PF88	Numeric	6	2	No
110	PF810	Numeric	6	2	No
111	PR80	Numeric	6	2	No
112	PR82	Numeric	6	2	No
113	PR84	Numeric	6	2	No
114	PR86	Numeric	6	2	No
115	PR88	Numeric	6	2	No
116	PR810	Numeric	6	2	No
117	PF100	Numeric	6	2	No
118	PF102	Numeric	6	2	No
119	PF104	Numeric	6	2	No
120	PF106	Numeric	6	2	No
121	PF108	Numeric	6	2	No
122	PF1010	Numeric	6	2	No
123	PR100	Numeric	6	2	No
124	PR102	Numeric	6	2	No
125	PR104	Numeric	6	2	No
126	PR106	Numeric	6	2	No
127	PR108	Numeric	6	2	No
128	PR1010	Numeric	6	2	No
129	PF150	Numeric	6	2	No
130	PF152	Numeric	6	2	No
131	PF154	Numeric	6	2	No
132	PF156	Numeric	6	2	No
133	PF158	Numeric	6	2	No
134	PF1510	Numeric	6	2	No
135	PR150	Numeric	6	2	No
136	PR152	Numeric	6	2	No
137	PR154	Numeric	6	2	No
138	PR156	Numeric	6	2	No
139	PR158	Numeric	6	2	No
140	PR1510	Numeric	6	2	No
141	PF200	Numeric	6	2	No
142	PF202	Numeric	6	2	No
143	PF204	Numeric	6	2	No
144	PF206	Numeric	6	2	No
145	PF208	Numeric	6	2	No
146	PF2010	Numeric	6	2	No

147	PR200	Numeric	6	2	No
148	PR202	Numeric	6	2	No
149	PR204	Numeric	6	2	No
150	PR206	Numeric	6	2	No
151	PR208	Numeric	6	2	No
152	PR2010	Numeric	6	2	No
153	PF250	Numeric	6	2	No
154	PF252	Numeric	6	2	No
155	PF254	Numeric	6	2	No
156	PF256	Numeric	6	2	No
157	PF258	Numeric	6	2	No
158	PF2510	Numeric	6	2	No
159	PR250	Numeric	6	2	No
160	PR252	Numeric	6	2	No
161	PR254	Numeric	6	2	No
162	PR256	Numeric	6	2	No
163	PR258	Numeric	6	2	No
164	PR2510	Numeric	6	2	No
165	PF300	Numeric	6	2	No
166	PF302	Numeric	6	2	No
167	PF304	Numeric	6	2	No
168	PF306	Numeric	6	2	No
169	PF308	Numeric	6	2	No
170	PF3010	Numeric	6	2	No
171	PR300	Numeric	6	2	No
172	PR302	Numeric	6	2	No
173	PR304	Numeric	6	2	No
174	PR306	Numeric	6	2	No
175	PR308	Numeric	6	2	No
176	PR3010	Numeric	6	2	No
177	PF350	Numeric	6	2	No
178	PF352	Numeric	6	2	No
179	PF354	Numeric	6	2	No
180	PF356	Numeric	6	2	No
181	PF358	Numeric	6	2	No
182	PF3510	Numeric	6	2	No
183	PR350	Numeric	6	2	No
184	PR352	Numeric	6	2	No
185	PR354	Numeric	6	2	No
186	PR356	Numeric	6	2	No
187	PR358	Numeric	6	2	No
188	PR3510	Numeric	6	2	No
189	PF400	Numeric	6	2	No
190	PF402	Numeric	6	2	No
191	PF404	Numeric	6	2	No
192	PF406	Numeric	6	2	No
193	PF408	Numeric	6	2	No
194	PF4010	Numeric	6	2	No
195	PR400	Numeric	6	2	No

196	PR402	Numeric	6	2	No
197	PR404	Numeric	6	2	No
198	PR406	Numeric	6	2	No
199	PR408	Numeric	6	2	No
200	PR4010	Numeric	6	2	No
201	PF450	Numeric	6	2	No
202	PF452	Numeric	6	2	No
203	PF454	Numeric	6	2	No
204	PF456	Numeric	6	2	No
205	PF458	Numeric	6	2	No
206	PF4510	Numeric	6	2	No
207	PR450	Numeric	6	2	No
208	PR452	Numeric	6	2	No
209	PR454	Numeric	6	2	No
210	PR456	Numeric	6	2	No
211	PR458	Numeric	6	2	No
212	PR4510	Numeric	6	2	No
213	PF500	Numeric	6	2	No
214	PF502	Numeric	6	2	No
215	PF504	Numeric	6	2	No
216	PF506	Numeric	6	2	No
217	PF508	Numeric	6	2	No
218	PF5010	Numeric	6	2	No
219	PR500	Numeric	6	2	No
220	PR502	Numeric	6	2	No
221	PR504	Numeric	6	2	No
222	PR506	Numeric	6	2	No
223	PR508	Numeric	6	2	No
224	PR5010	Numeric	6	2	No
225	TRKPER5	Numeric	6	2	No
226	TRKPER6	Numeric	6	2	No
227	TRKPER7	Numeric	6	2	No
228	TRKPER8	Numeric	6	2	No
229	TRKPER9	Numeric	6	2	No
230	TRKPER10	Numeric	6	2	No
231	TRKPER11	Numeric	6	2	No
232	TRKPER12	Numeric	6	2	No
233	TRKPER13	Numeric	6	2	No
234	FLXPSN	Numeric	10	2	No
235	DRGDP	Numeric	10	2	No
236	SIP	Numeric	10	2	No
237	OPTNAME	Character	15		No

VTRIS W-5 Table(A)

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	
1	RPTDATE	Date	8		No			
2	RPTTIME	Character	8				No	

3	RPTTYPE	Character	2		No
4	STATE	Character	2		No
5	PERIOD	Character	25		No
6	FCLASS	Character	55		No
7	STATION	Memo	10		No
8	HEADER1	Character	50		No
9	HEADER2	Character	50		No
10	UOFMEAS	Character	1		No
11	AVGMETH	Character	1		No
12	ORDERBY	Character	1		No
13	SUMMTYPE	Character	1		No
14	RGROUPMTH	Character	1		No
15	AGROUPMTH	Character	1		No
16	DIRORLANE	Character	1		No
17	KEYNUM	Numeric	8	2	No
18	WCL3	Numeric	8	2	No
19	WCL4	Numeric	8	2	No
20	WCL5	Numeric	8	2	No
21	WCL6	Numeric	8	2	No
22	WCL7	Numeric	8	2	No
23	WCL8	Numeric	8	2	No
24	WCL9	Numeric	8	2	No
25	WCL10	Numeric	8	2	No
26	WCL11	Numeric	8	2	No
27	WCL12	Numeric	8	2	No
28	WCL13	Numeric	8	2	No
29	L3	Numeric	8	2	No
30	L4	Numeric	8	2	No
31	L5	Numeric	8	2	No
32	L6	Numeric	8	2	No
33	L7	Numeric	8	2	No
34	L8	Numeric	8	2	No
35	L9	Numeric	8	2	No
36	L10	Numeric	8	2	No
37	L11	Numeric	8	2	No
38	L12	Numeric	8	2	No
39	L13	Numeric	8	2	No
40	OPTNAME	Character	15		No

VTRIS W-5 Table(B)

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	
1	RPTDATE	Date	8		No			
2	RPTTIME	Character	8				No	
3	KEYNUM	Numeric	4				No	
4	DESC	Character	15				No	
5	CL3	Numeric	8	2			No	
6	CL4	Numeric	8	2			No	

7	CL5	Numeric	8	2	No
8	CL6	Numeric	8	2	No
9	CL7	Numeric	8	2	No
10	CL8	Numeric	8	2	No
11	CL9	Numeric	8	2	No
12	CL10	Numeric	8	2	No
13	CL11	Numeric	8	2	No
14	CL12	Numeric	8	2	No
15	CL13	Numeric	8	2	No
16	OPTNAME	Character	15		No

VTRIS W-6 Table

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	
1	RPTDATE	Date	8		No			
2	RPTTIME	Character	8				No	
3	RPTTYPE	Character	2				No	
4	STATE	Character	2				No	
5	PERIOD	Character	25				No	
6	FCLASS	Character	55				No	
7	STATION	Memo	10				No	
8	HEADER1	Character	50				No	
9	HEADER2	Character	50				No	
10	UOFMEAS	Character	1				No	
11	AVGMETH	Character	1				No	
12	SUMMTYPE	Character	1				No	
13	ORDERBY	Character	1				No	
14	AGROUPMTH	Character	1				No	
15	RGROUPMTH	Character	1				No	
16	DIRORLANE	Character	1				No	
17	N3A	Numeric	10	2			No	
18	N4A	Numeric	10	2			No	
19	N5A	Numeric	10	2			No	
20	N6A	Numeric	10	2			No	
21	N7A	Numeric	10	2			No	
22	N8A	Numeric	10	2			No	
23	N9A	Numeric	10	2			No	
24	N10A	Numeric	10	2			No	
25	N11A	Numeric	10	2			No	
26	N12A	Numeric	10	2			No	
27	N13A	Numeric	10	2			No	
28	N3B	Numeric	10	2			No	
29	N4B	Numeric	10	2			No	
30	N5B	Numeric	10	2			No	
31	N6B	Numeric	10	2			No	
32	N7B	Numeric	10	2			No	
33	N8B	Numeric	10	2			No	
34	N9B	Numeric	10	2			No	

35	N10B	Numeric	10	2	No
36	N11B	Numeric	10	2	No
37	N12B	Numeric	10	2	No
38	N13B	Numeric	10	2	No
39	N3C	Numeric	10	2	No
40	N4C	Numeric	10	2	No
41	N5C	Numeric	10	2	No
42	N6C	Numeric	10	2	No
43	N7C	Numeric	10	2	No
44	N8C	Numeric	10	2	No
45	N9C	Numeric	10	2	No
46	N10C	Numeric	10	2	No
47	N11C	Numeric	10	2	No
48	N12C	Numeric	10	2	No
49	N13C	Numeric	10	2	No
50	N3D	Numeric	10	2	No
51	N4D	Numeric	10	2	No
52	N5D	Numeric	10	2	No
53	N6D	Numeric	10	2	No
54	N7D	Numeric	10	2	No
55	N8D	Numeric	10	2	No
56	N9D	Numeric	10	2	No
57	N10D	Numeric	10	2	No
58	N11D	Numeric	10	2	No
59	N12D	Numeric	10	2	No
60	N13D	Numeric	10	2	No
61	N3E	Numeric	10	2	No
62	N4E	Numeric	10	2	No
63	N5E	Numeric	10	2	No
64	N6E	Numeric	10	2	No
65	N7E	Numeric	10	2	No
66	N8E	Numeric	10	2	No
67	N9E	Numeric	10	2	No
68	N10E	Numeric	10	2	No
69	N11E	Numeric	10	2	No
70	N12E	Numeric	10	2	No
71	N13E	Numeric	10	2	No
72	N3F	Numeric	10	2	No
73	N4F	Numeric	10	2	No
74	N5F	Numeric	10	2	No
75	N6F	Numeric	10	2	No
76	N7F	Numeric	10	2	No
77	N8F	Numeric	10	2	No
78	N9F	Numeric	10	2	No
79	N10F	Numeric	10	2	No
80	N11F	Numeric	10	2	No
81	N12F	Numeric	10	2	No
82	N13F	Numeric	10	2	No

83	V3A	Numeric	10	2	No
84	V4A	Numeric	10	2	No
85	V5A	Numeric	10	2	No
86	V6A	Numeric	10	2	No
87	V7A	Numeric	10	2	No
88	V8A	Numeric	10	2	No
89	V9A	Numeric	10	2	No
90	V10A	Numeric	10	2	No
91	V11A	Numeric	10	2	No
92	V12A	Numeric	10	2	No
93	V13A	Numeric	10	2	No
94	V3B	Numeric	10	2	No
95	V4B	Numeric	10	2	No
96	V5B	Numeric	10	2	No
97	V6B	Numeric	10	2	No
98	V7B	Numeric	10	2	No
99	V8B	Numeric	10	2	No
100	V9B	Numeric	10	2	No
101	V10B	Numeric	10	2	No
102	V11B	Numeric	10	2	No
103	V12B	Numeric	10	2	No
104	V13B	Numeric	10	2	No
105	V3C	Numeric	10	2	No
106	V4C	Numeric	10	2	No
107	V5C	Numeric	10	2	No
108	V6C	Numeric	10	2	No
109	V7C	Numeric	10	2	No
110	V8C	Numeric	10	2	No
111	V9C	Numeric	10	2	No
112	V10C	Numeric	10	2	No
113	V11C	Numeric	10	2	No
114	V12C	Numeric	10	2	No
115	V13C	Numeric	10	2	No
116	V3D	Numeric	10	2	No
117	V4D	Numeric	10	2	No
118	V5D	Numeric	10	2	No
119	V6D	Numeric	10	2	No
120	V7D	Numeric	10	2	No
121	V8D	Numeric	10	2	No
122	V9D	Numeric	10	2	No
123	V10D	Numeric	10	2	No
124	V11D	Numeric	10	2	No
125	V12D	Numeric	10	2	No
126	V13D	Numeric	10	2	No
127	V3E	Numeric	10	2	No
128	V4E	Numeric	10	2	No
129	V5E	Numeric	10	2	No
130	V6E	Numeric	10	2	No
131	V7E	Numeric	10	2	No

132	V8E	Numeric	10	2	No
133	V9E	Numeric	10	2	No
134	V10E	Numeric	10	2	No
135	V11E	Numeric	10	2	No
136	V12E	Numeric	10	2	No
137	V13E	Numeric	10	2	No
138	V3F	Numeric	10	2	No
139	V4F	Numeric	10	2	No
140	V5F	Numeric	10	2	No
141	V6F	Numeric	10	2	No
142	V7F	Numeric	10	2	No
143	V8F	Numeric	10	2	No
144	V9F	Numeric	10	2	No
145	V10F	Numeric	10	2	No
146	V11F	Numeric	10	2	No
147	V12F	Numeric	10	2	No
148	V13F	Numeric	10	2	No
149	LBSTOKG	Numeric	10	8	No
150	WLIMIT1	Numeric	5		No
151	WLIMIT2	Numeric	5		No
152	WLIMIT3	Numeric	5		No
153	WLIMIT4	Numeric	5		No
154	WLIMIT5	Numeric	5		No
155	OPTNAME	Character	15		No

VTRIS W-7 Table

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	
1	RPTDATE	Date	8		No			
2	RPTTIME	Character	8				No	
3	RPTTYPE	Character	2				No	
4	STATE	Character	2				No	
5	PERIOD	Character	25				No	
6	FCLASS	Character	55				No	
7	STATION	Memo	10				No	
8	HEADER1	Character	50				No	
9	HEADER2	Character	50				No	
10	UOFMEAS	Character	1				No	
11	AVGMETH	Character	1				No	
12	SUMMTYPE	Character	1				No	
13	ORDERBY	Character	1				No	
14	RGROUPMTH	Character	1				No	
15	AGROUPMTH	Character	1				No	
16	DIRORLANE	Character	1				No	
17	WLIMIT7_1	Numeric	10	2			No	
18	WLIMIT7_2	Numeric	10	2			No	

19	WLIMIT7_3	Numeric	10	2	No
20	WLIMIT7_4	Numeric	10	2	No
21	WLIMIT7_5	Numeric	10	2	No
22	WLIMIT7_6	Numeric	10	2	No
23	WLIMIT7_7	Numeric	10	2	No
24	WLIMIT7_8	Numeric	10	2	No
25	WLIMIT7_9	Numeric	10	2	No
26	LBSTOKG	Numeric	10	8	No
27	CLASS5NW	Numeric	5		No
28	CLASS6NW	Numeric	5		No
29	CLASS7NW	Numeric	5		No
30	CLASS8NW	Numeric	5		No
31	CLASS9NW	Numeric	5		No
32	CLASS10NW	Numeric	5		No
33	CLASS11NW	Numeric	5		No
34	CLASS12NW	Numeric	5		No
35	CLASS13NW	Numeric	5		No
36	CLASS5_EX	Numeric	5		No
37	CLASS6_EX	Numeric	5		No
38	CLASS7_EX	Numeric	5		No
39	CLASS8_EX	Numeric	5		No
40	CLASS9_EX	Numeric	5		No
41	CLASS10_EX	Numeric	5		No
42	CLASS11_EX	Numeric	5		No
43	CLASS12_EX	Numeric	5		No
44	CLASS13_EX	Numeric	5		No
45	EXC_5_5	Numeric	5	2	No
46	EXC_6_5	Numeric	5	2	No
47	EXC_7_5	Numeric	5	2	No
48	EXC_8_5	Numeric	5	2	No
49	EXC_9_5	Numeric	5	2	No
50	EXC_10_5	Numeric	5	2	No
51	EXC_11_5	Numeric	5	2	No
52	EXC_12_5	Numeric	5	2	No
53	EXC_13_5	Numeric	5	2	No
54	EXC_5_10	Numeric	5	2	No
55	EXC_6_10	Numeric	5	2	No
56	EXC_7_10	Numeric	5	2	No
57	EXC_8_10	Numeric	5	2	No
58	EXC_9_10	Numeric	5	2	No
59	EXC_10_10	Numeric	5	2	No
60	EXC_11_10	Numeric	5	2	No
61	EXC_12_10	Numeric	5	2	No
62	EXC_13_10	Numeric	5	2	No
63	EXC_5_20	Numeric	5	2	No
64	EXC_6_20	Numeric	5	2	No
65	EXC_7_20	Numeric	5	2	No
66	EXC_8_20	Numeric	5	2	No
67	EXC_9_20	Numeric	5	2	No

68	EXC_10_20	Numeric	5	2	No
69	EXC_11_20	Numeric	5	2	No
70	EXC_12_20	Numeric	5	2	No
71	EXC_13_20	Numeric	5	2	No
72	EXC_5_30	Numeric	5	2	No
73	EXC_6_30	Numeric	5	2	No
74	EXC_7_30	Numeric	5	2	No
75	EXC_8_30	Numeric	5	2	No
76	EXC_9_30	Numeric	5	2	No
77	EXC_10_30	Numeric	5	2	No
78	EXC_11_30	Numeric	5	2	No
79	EXC_12_30	Numeric	5	2	No
80	EXC_13_30	Numeric	5	2	No
81	EXC_5_50	Numeric	5	2	No
82	EXC_6_50	Numeric	5	2	No
83	EXC_7_50	Numeric	5	2	No
84	EXC_8_50	Numeric	5	2	No
85	EXC_9_50	Numeric	5	2	No
86	EXC_10_50	Numeric	5	2	No
87	EXC_11_50	Numeric	5	2	No
88	EXC_12_50	Numeric	5	2	No
89	EXC_13_50	Numeric	5	2	No
90	OPTNAME	Character	15		No

2.4.4 VTRIS Database. Load and Summary Logs data

The **Load Log** keeps information on all loads that were performed into the Current Data directory. This information is kept in 3 tables: Load Log1, Load Log 2, Load Log 3.

For the **Load Log 1** data a **single** field **log_no** may have measurements **for many file_no** fields. It is depicted by one to 0, 1, or many relationship, "has data for time" between **Load Log 1** and **Load Log 2** entities on the VTRIS Load Log ERD. For a single entry into **Loag Log 2,** the entity may be 0,1, or many data_type (**Loag Log 3**) - Station, Classification and Weight.

VTRIS Load Log Structures :

Load Log 1

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	
1	LOG_NO	Character	1		Asc	Machine	No	
2	LDATE	Date	8				No	
3	LTIME	Character	5				No	
4	USR_ID	Character	8				No	
5	ST	Character	2				No	
6	LKEY	Numeric	3				No	

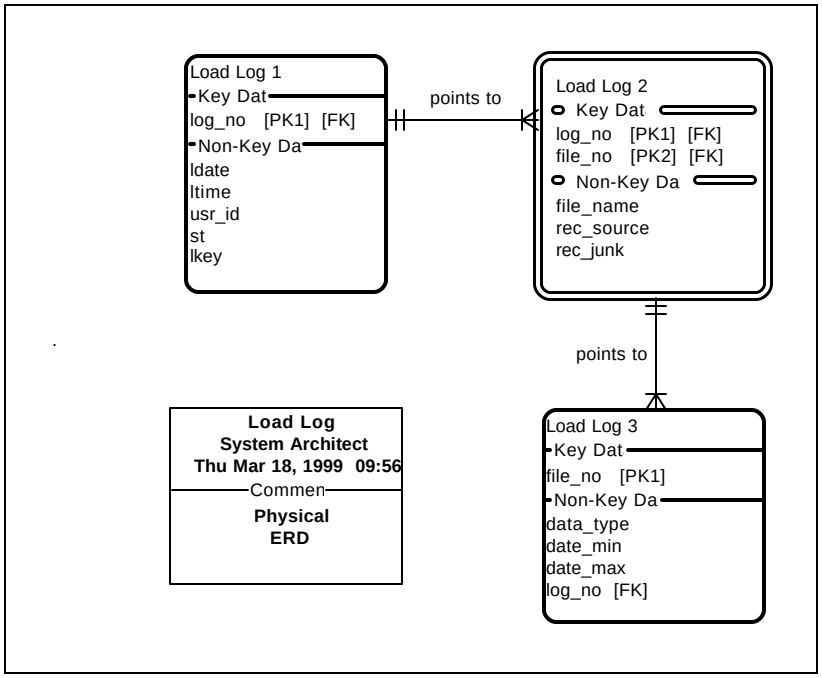
Load Log 2

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	LOG_NO	Character	1		Asc	Machine	No
2	FILE_NAME	Character	60				No
3	FILE_NO	Character	2		Asc	Machine	No
4	REC_SOURCE	Numeric	7				No
5	REC_JUNK	Numeric	7				No

Load Log 3

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls
1	FILE_NO	Character	2		Asc	Machine	No
2	DATA_TYPE	Character	1		Asc	Machine	No
3	DATE_MIN	Date	8				No
4	DATE_MAX	Date	8				No

Fig 50



The **Summary Log** keeps information on all summary files have been created in VTRIS for the particular Year/State combination in the single Database : Summary Log.

VTRIS Summary Log Structures :

Summary Log

Field	Field Name	Type	Width	Dec	Index	Collate	Nulls	
1	PROCESS_ID	Numeric	5		Asc	Machine	No	
2	SUMM_TYPE	Character	1				No	
3	MNTHORQRT	Character	2				No	
4	CDTFRM	Date	8				No	
5	CDTTO	Date	8				No	
6	USERID	Character	8				No	
7	SYSTEMDATE	Date	8				No	
8	SYSTEMTIME	Character	8				No	
9	CALCMTHD	Character	1				No	
10	GRPCMTHD	Character	1				No	
11	SUMMFROM	Character	1				No	
12	STTN_SEL	Character	1				No	
13	FN_CLASS	Character	54				No	
14	TRUCK_WGHT	Character	16				No	
15	VH_CLASS	Character	10				No	
16	FLAG_WREC	Character	1				No	
17	FLAG_CREC	Character	1				No	
18	FLAGCL14	Character	1				No	
19	FLAGCL15	Character	1				No	
20	OTPTFILENA	Character	100				No	
21	NOTES	Memo	4				No	

2.4.5 VTRIS System Tables

Data Tables :

CLASSERR.DBF- Table with error codes of Class data
CLASSERR CDX- Index
CLSDFLT.111- Table with VTRIS defaults
CLSDFLT 222- Index
ERRORFIL. DBF - Table to keep VTRIS error messages
ERRORFIL FPT - Memo file for ERRORFIL table
FOXVTRIS.DBF - File for keeping environmental information.
FOXVTRISFPT - Memo file
HLPVTRIS 111 - VTRIS Help file
HLPVTRIS 333 - Memo file
L_STATUS.DBF - Table with error grouping codes.
L_STATUS.CDX - Index
STANERR.DBF - Table error codes of Station description data

STANERR.CDX- Index
SYSPREF 111 - Table to keep the system setup values
T_BACKUP 111 - Table to keep details of Backups of data from the VTRIS DB
T_BACKUP 333 - Index for T_BACKUP table
T_BKUP.DBF - Table to keep details of the Backup history
T_ALGVCL.DBF- Table containing all codes of the Algorithm of Vehicle Classification data element
T_CLAS. DBF- Table listing Vehicle Classification data elements
T_CLBRWS.DBF - Table containing correct codes of the Calibration of Weight System data element
T_CSVCL.DBF- Table containing correct codes of the Classification System for Vehicle Classification data element
T_DAY. DBF- Table containing correct codes of days of month
T_DIRECT.DBF - Table containing correct codes of the Direction of Travel data element
T_DIRHST.111 - Table to keep the history of VTRIS directory switching
UPGRADE. DBF - Table to define changes in VTRIS during the installation process
T_FCLASS.DBF - Table containing correct codes of the Functional Class data element
T_HOUR. DBF - Table containing correct codes of Hour of the Day data element
T_HPMSST. DBF - Table containing correct codes of the HPMS sample type data element
T_MDRTVL.DBF- Table containing correct codes of the Method of Data Retrieval data element
T_MONTH.DBF - Table containing the names of 12 Months
T_MSKHLP.DBF - Table containing main VTRIS file wildcards to support the VTRIS Utility subsystem
T_MTRVC DBF - Table containing correct codes of the Method of Traffic Volume Count data element
T_MTRWGT.DBF - Table containing correct codes of the Method of Truck Weighing element
T_MVCL.DBF - Table containing correct codes of the Method of Vehicle Classification data element
T_NLANE DBF - Table containing correct codes of the Lane Number data element
T_ROUTE. DBF- Table containing correct codes of the Posted Route Signing data element
T_RULES. DBF - Table containing the rules of data validation
T_RULES FPT - Memo file
T_STATE. DBF - Table listing all States
T_STATE CDX- Index
T_STTN.DBF - Table listing Station description data elements
T_STTRV. DBF - Table containing correct codes of the Sample type for Traffic Volume data element
T_STTRWT.DBF - Table containing correct codes of the Sample type for Truck Weight data element
T_STVCL. DBF - Table containing correct codes of the Sample type for Vehicle Classification data element
T_SUMLOG DBF - Table listing VTRIS Summary log data elements
T_TSENSR.DBF - Table containing correct codes of the Type of Sensor data element
T_USRFTR.DBF - Table to support the VTRIS securilty system
T_USRSEC.DBF - Table to support the VTRIS security system
T_VCLASS.DBF - Table containing correct codes of the Vehicle Class data element

T_WEQUIP.DBF - Table containing correct codes of the Equipment Make data element
T_WGT.DBF - Table listing Truck Weight data elements
USRAUTH. 111 - Table for User access maintenance
USRAUTH 222 - Index
USRVTRIS.111 - Table for User access maintenance
USRVTRIS 222 - Index
WGTERR.DBF - Table with error codes of Weight data
WGTERR. CDX - Index
During VTRIS installation, the files having digits as their extensions are renamed :
111 becomes DBF
222 becomes CDX
333 becomes FPT

2.5 VTRIS System Architecture

VTRIS was originally developed using structured programming methodology and, as the result, code structure is modular with many modules reused by different subsystems. The VTRIS interface was built in compliance with IBM CUA (Common User Access) standard. It implies existence of a system main menu bar with processes being activated upon selection. When a process option is selected, the interface window leading the user to the chosen system function pops up. In FoxPro2.6 and Visual FoxPro 5.0 this approach may be implemented through specification of the main menu bar and utilization of the Foundation Read concept. Most commonly used routines were integrated into a procedure file named PROCFILE.PRG

The following chart depicts the VTRIS structured systems architecture in terms of forms, program modules (PRGs or SPRs), procedures and functions.

```
VTRIS.PRG
¦
¦
¦
+----SET_ENVIRONMENT              (procedure in VTRIS.PRG)
+----CHKERR.PRG            (turns VTRIS error handling on)
+----UPGRADE.PRG
¦    |
¦    +----UPSTSTRU     (procedure in UPGRADE.PRG)
¦    ¦    |
¦    ¦    +----SHIFT_KEY()  (function in UPGRADE.PRG)
¦    ¦
¦    +----NEWDIRS()  (function in UPGRADE.PRG)
¦
+----INSTLN00.PRG
¦    +----USRIDPSW.SPR
¦    +----USERINFO.SPR
¦    +----SCONFG10.SPR
¦    +----CLSWGT.PRG...
¦    +----USRDIRCT.SPR
¦    +----ASGNVAR.PRG
|    +----VTRIS000.PRG
+----USRIDPSW.SPR
+----ASGNVAR.PRG
```

```
+----VTRIS000.PRG
```

This tree depicts high level VTRIS software architecture with the main module VTRIS.PRG calling UPGRADE.PRG to implement certain cahnges specific for each VTRIS release, INSTLN00.PRG to perform initial installation tasks when/if VTRIS is being installed for the first time, USRIDPSW.SPR to get user ID and password, and VTRIS000.PRG which is the main engine of the VTRIS system. The charts below depicts programms call tree in more detail

2.5.1 Load Subsystem Architecture

Main file name : **LOADMAIN**
Total Code Lines Processed = 880

Tree Diagram

LOADMAIN (PRG)
/)))S_States
/)))C_States
/)))W_States
/)))MessageWind
/)))Days_in_Month
/)))laRemember
/)))a2Scan
/)))GetAllTbl
* /)))IncRemember
* * .)))laTemp
/)))Archive1
/)))pOptions
/)))laTables
/)))Load10
/)))ClaOpt
/)))WgtOpt
.)))LoadAsc

2.5.2 Summary Subsystem Architecture

Main file name : **CREATSUM**
Code Lines Processed = 697

Tree Diagram

CREATSUM (form)
/)))ChkSummaryType
/)))SUMM_OK **(**PRG**)**
    /)))AbbrvToDesc
    /)))Plus
    /)))Use_Sttn
    /)))ChkIndxDB
    /)))InputFiles
    * /)))CurMonth
    * /)))Use_Class
    * /)))Use_Wght
    /)))mName
    /)))ChkAldn
    * /)))SummLoop
    * /)))ChkFilep
    * .)))CreateFile
    /)))SumHAM
    /)))SumAAM
    .)))StopIt

2.5.3 Reports Subsystem Architecture

Main file name : **WRPTMAIN**
Total Code Lines Processed= 1949

Tree Diagram

WRPTMAIN (form)
/)))AddRec
/)))AddRec3
/)))AddRec4
/)))AddRec5
/)))Calc6Rep
/)))CalcAvg
/)))CalcAvg3
/)))CalcRep2
/)))CalcRep3
/)))CalcRep4
/)))CalcRep5
/)))CalcRep7
/)))ChgSumDirct
/)))Chk
/)))Chngnts
/)))ChngUnits
/)))ConCrete
/)))Flex
/)))FnlWrt
/)))Format_SumV
/)))Format_W4Cursd

/)))GenerateAll
/)))Get_Details5
/)))Get Details
/)))GetSttnDir
/)))LVar
/)))Normal
/)))ReplRec
/)))ReplRec4
/)))ReplRec5
/)))Replss4
/)))Replss5
/)))RepWCl
/)))SaveData2
/)))SaveData3
/)))SaveData4
/)))SaveData5
/)))SaveData6
/)))SaveData7
/)))SdtRec
/)))ShowOptns
/)))SwitchW1
/)))W2Rec
/)))W3Rec
/)))When_Edit
/)))SaveData
.)))WriteIndv

3 SYSTEM COMPONENTS

3.1 Distribution Package

Distribution package is supplied on one CD for V.5.0 (or three 1.44MB disks for V.2.6) which contain forms, programs, system tables, reports, and other components necessary for VTRIS to be properly installed and operational. All these files are compressed and some of them were split into sections. It also contain Microsoft SETUP.EXE program and certain related files which are used solely to install VTRIS from the disks to the hard drive. These items are not copied to the hard drive during VTRIS installation and are beyond the scope of this manual.

The following files are decompressed and copied to the hard drive form the installation disks while SETUP.EXE runs:

VTRISWIN. EXE - VTRIS application
FOXTOOL .FLL - Visual FoxPro API libraries

Modified		Size	Name
03/15/99	02:29p	286,224	52147786.001
03/15/99	02:29p	210,421	52147786.002
03/15/99	02:29p	316,003	52152042.001
03/15/99	02:29p	303,907	52152042.002
03/15/99	02:29p	278,445	52152042.003
03/15/99	02:29p	341,114	52152042.004
03/15/99	02:29p	310,028	52152042.005
03/15/99	02:29p	343,020	52152042.006
02/26/99	08:46a	2,636	abrtval.bm$
03/02/99	09:11a	172,454	acmsetup.ex_
03/02/99	09:11a	7,079	acmsetup.hl_
02/26/99	08:46a	881	allrec.bm$
02/26/99	08:46a	384	allrec1.bm$
02/26/99	08:46a	349	allrec2.bm$
03/02/99	09:13a	75,818	asycfilt.dl_
03/02/99	09:12a	11,904	autoconv.ex_
02/26/99	08:46a	171	errorfil.db$
02/26/99	08:46a	92	errorfil.fp$
02/26/99	08:46a	290	exclaim.bm$
02/26/99	08:46a	1,000	extract.bm$

02/26/99	08:46a	999	extrbw.bm$
02/26/99	08:46a	906	extrbw1.bm$
02/26/99	08:46a	7,785	foxfont.fo$
03/02/99	09:12a	21,579	foxpro.in_
02/26/99	08:46a	113,537	foxsetup.tt$
02/26/99	08:46a	35,990	foxtools.fl$
02/26/99	08:46a	171	foxvtris.db$
02/26/99	08:46a	92	foxvtris.fp$
02/26/99	08:46a	555	g2light.bm$
02/26/99	08:46a	877	glight.bm$
02/26/99	08:46a	1,797	graph.fr$
02/26/99	08:46a	555	graph.ft$
Modified		**Size**	**Name**
02/26/99	08:46a	645	classerr.cd$
02/26/99	08:46a	1,301	classerr.db$
02/26/99	08:46a	894	clipoff.bm$
02/26/99	08:46a	872	clipon.bm$
03/03/99	07:40a	705	clsdflt.11$
03/02/99	09:13a	10,146	comcat.dl_
02/26/99	08:46a	315,585	comctl32.oc$
02/26/99	08:46a	38,196	complinc.dl$
03/02/99	09:12a	15,600	ctl3dnt.dl_
02/26/99	08:46a	894	disk.bm$
02/26/99	08:46a	57,985	dunzip32.dl$
02/26/99	08:46a	32,726	duzocx32.oc$
02/26/99	08:46a	77,250	dzip32.dl$
02/26/99	08:46a	33,556	dzocx32.oc$
02/26/99	08:46a	10,629	dzprog32.ex$
02/26/99	08:46a	19,381	dzstat32.oc$
03/02/99	09:12a	340,963	graph5.ex_
03/02/99	09:12a	1,598	graph5.re_
03/02/99	09:12a	351,566	graph6.ex_
03/02/99	09:12a	344,974	graph7.ex_
03/02/99	09:12a	23,797	graph8.ex_
03/02/99	09:12a	29,142	gren50.ol_
03/02/99	09:12a	68,834	grintl.dl_
02/26/99	08:46a	506	gy2light.bm$
02/26/99	08:46a	273	h3cm.bm$
02/26/99	08:46a	273	h3d2cm.bm$
03/02/99	09:13a	19,145	hlp95en.dl_
02/26/99	08:46a	1,758	hlpvtris.11$
02/26/99	08:46a	79,968	hlpvtris.33$
03/02/99	09:13a	5,950	hpms6.fr$
03/02/99	09:13a	1,611	hpms6.ft$
03/02/99	09:13a	7,692	hpms7.fr$
03/02/99	09:13a	1,842	hpms7.ft$
02/26/99	08:46a	319	info.bm$
02/26/99	08:46a	254	lines.db$
02/26/99	08:46a	1,591	l_status.cd$

Modified		Size	Name
02/26/99	08:46a	1,435	l_status.db$
02/26/99	08:46a	1,379	magn.bm$
03/02/99	09:12a	141,323	mssetup.dl_
03/02/99	09:12a	154,559	msvcrt20.dl_
02/26/99	08:46a	183,001	msvcrt40.dl$
03/02/99	09:12a	183,001	msvcrt40.dl_
02/26/99	08:46a	354,850	oc30.dl$
03/02/99	09:13a	323,508	oleaut32.dl_
03/02/99	09:12a	15,904	olepro32.dl_
02/26/99	08:46a	320	optional.db$
02/26/99	08:46a	96	output.db$
02/26/99	08:46a	6,473	output.fp$
03/12/99	11:39a	3,204	p1table.fr$
03/12/99	11:39a	1,341	p1table.ft$
02/26/99	08:46a	3,643	p1tableb.fr$
02/26/99	08:46a	1,038	p1tableb.ft$
02/26/99	08:46a	7,722	p2tableb.fr$
02/26/99	08:46a	3,402	p2tableb.ft$
02/26/99	08:46a	6,403	p2tablec.fr$
02/26/99	08:46a	2,774	p2tablec.ft$
02/26/99	08:46a	4,922	p2tablew.fr$
02/26/99	08:46a	2,042	p2tablew.ft$
02/26/99	08:46a	11,707	p3table.fr$
02/26/99	08:46a	6,511	p3table.ft$
02/26/99	08:46a	6,836	p4esal.fr$
02/26/99	08:46a	2,923	p4esal.ft$
02/26/99	08:46a	18,726	p4stable.fr$
02/26/99	08:46a	9,694	p4stable.ft$
02/26/99	08:46a	23,187	p4table.fr$
02/26/99	08:46a	11,033	p4table.ft$
02/26/99	08:46a	6,401	p5table.fr$
02/26/99	08:46a	3,321	p5table.ft$
02/26/99	08:46a	15,097	p6table.fr$
02/26/99	08:46a	7,955	p6table.ft$
02/26/99	08:46a	13,560	p6tablea.fr$
02/26/99	08:46a	7,126	p6tablea.ft$
02/26/99	08:46a	13,660	p6tableb.fr$
02/26/99	08:46a	7,160	p6tableb.ft$
02/26/99	08:46a	12,120	p6tablec.fr$
02/26/99	08:46a	6,252	p6tablec.ft$
02/26/99	08:46a	17,090	p7table.fr$
02/26/99	08:46a	7,331	p7table.ft$
02/26/99	08:46a	825	pinoff.bm$
02/26/99	08:46a	836	pinon.bm$
02/26/99	08:46a	3,053	pq01rpt.fr$
02/26/99	08:46a	1,008	pq01rpt.ft$
02/26/99	08:46a	14,467	pq07rpt.fr$
02/26/99	08:46a	5,097	pq07rpt.ft$

Modified		Size	Name
02/26/99	08:46a	44,551	printers.db$
02/26/99	08:46a	917	prt.bm$
02/26/99	08:46a	2,044	p_codes.cd$
02/26/99	08:46a	44,641	p_codes.db$
02/26/99	08:46a	329	question.bm$
02/26/99	08:46a	419	r2light.bm$
02/26/99	08:46a	320	required.db$
02/26/99	08:46a	952	rlight.bm$
02/26/99	08:46a	1,026	rylight.bm$
02/26/99	08:46a	321	saverpt1.11$
02/26/99	08:46a	511	saverpt1.22$
02/26/99	08:46a	491	saverpt2.11$
02/26/99	08:46a	511	saverpt2.22$
02/26/99	08:46a	92	saverpt2.33$
02/26/99	08:46a	1,178	saverpt3.11$
02/26/99	08:46a	511	saverpt3.22$
02/26/99	08:46a	92	saverpt3.33$
02/26/99	08:46a	1,380	saverpt6.11$
02/26/99	08:46a	511	saverpt6.22$
02/26/99	08:46a	92	saverpt6.33$
02/26/99	08:46a	910	saverpt7.11$
02/26/99	08:46a	511	saverpt7.22$
02/26/99	08:46a	92	saverpt7.33$
02/26/99	08:46a	2,091	savrpt4a.11$
02/26/99	08:46a	548	savrpt4a.22$
02/26/99	08:46a	92	savrpt4a.33$
02/26/99	08:46a	279	savrpt4b.11$
02/26/99	08:46a	548	savrpt4b.22$
02/26/99	08:46a	495	savrpt5a.11$
02/26/99	08:46a	544	savrpt5a.22$
02/26/99	08:46a	92	savrpt5a.33$
02/26/99	08:46a	212	savrpt5b.11$
02/26/99	08:46a	544	savrpt5b.22$
03/02/99	09:12a	5,802	scp.dl_
03/02/99	09:12a	69,217	sdm.dl_
10/29/96	12:00a	74,192	setup.exe
03/15/99	02:29p	22,260	setup.inf
08/21/96	12:00a	149	setup.ini
03/15/99	02:29p	1,150	setup.lst
08/21/96	12:00a	84	setup.tdf
03/15/99	02:29p	14,804	setup32.stf
02/26/99	08:46a	708	stanerr.cd$
02/26/99	08:46a	1,677	stanerr.db$
03/02/99	09:13a	7,136	stdole.tl_
02/26/99	08:46a	289	stop.bm$
02/26/99	08:46a	209	syspref.11$
02/26/99	08:46a	6,689	test90md.cl$
02/26/99	08:46a	526	test90md.st$

Modified		Size	Name
02/26/99	08:46a	105,466	test90md.wg$
02/26/99	08:46a	247	test93sc.2c$
02/26/99	08:46a	1,828	test93sc.4c$
02/26/99	08:46a	2,770	test93sc.7c$
02/26/99	08:46a	289	trach.bm$
02/26/99	08:46a	7,075	tutor.tx$
02/26/99	08:46a	8,508	tutor.wp$
02/26/99	08:46a	405	t_algvcl.db$
02/26/99	08:46a	2,914	t_all.db$
02/26/99	08:46a	132	t_axtype.db$
02/26/99	08:46a	131	t_backup.11$
02/26/99	08:46a	92	t_backup.33$
02/26/99	08:46a	150	t_bkup.db$
02/26/99	08:46a	293	t_cards.db$
02/26/99	08:46a	619	t_clas.db$
02/26/99	08:46a	312	t_clbrws.db$
02/26/99	08:46a	347	t_csvcl.db$
02/26/99	08:46a	293	t_day.db$
02/26/99	08:46a	211	t_direct.db$
02/26/99	08:46a	125	t_dirhst.11$
02/26/99	08:46a	98	t_doweek.db$
02/26/99	08:46a	284	t_fclass.db$
02/26/99	08:46a	217	t_group.db$
02/26/99	08:46a	286	t_hour.db$
02/26/99	08:46a	125	t_hpmsst.db$
02/26/99	08:46a	669	t_maintn.db$
02/26/99	08:46a	118	t_mdrtvl.db$
02/26/99	08:46a	178	t_month.db$
02/26/99	08:46a	332	t_mskhlp.db$
02/26/99	08:46a	161	t_mtrvc.db$
02/26/99	08:46a	209	t_mtrwgt.db$
02/26/99	08:46a	162	t_mvcl.db$
02/26/99	08:46a	247	t_nlane.db$
02/26/99	08:46a	145	t_route.db$
02/26/99	08:46a	635	t_rules.db$
02/26/99	08:46a	1,582	t_rules.fp$
02/26/99	08:46a	628	t_state.cd$
02/26/99	08:46a	1,179	t_state.db$
02/26/99	08:46a	525	t_statin.db$
02/26/99	08:46a	764	t_sttn.db$
02/26/99	08:46a	127	t_sttrv.db$
02/26/99	08:46a	173	t_sttrwt.db$
02/26/99	08:46a	123	t_stvcl.db$
02/26/99	08:46a	432	t_sumlog.db$
02/26/99	08:46a	534	t_tsensr.db$
02/26/99	08:46a	190	t_usrftr.db$
02/26/99	08:46a	120	t_usrsec.db$
02/26/99	08:46a	209	t_utilit.db$

```
02/26/99  08:46a                347 t_vclass.db$
02/26/99  08:46a              1,287 t_wequip.db$
02/26/99  08:46a                311 t_wgt.db$
03/15/99  02:29p                311 upgrade.db$
02/26/99  08:46a                222 usrauth.11$
02/26/99  08:46a                484 usrauth.22$
02/26/99  08:46a                108 usrvtris.11$
02/26/99  08:46a                484 usrvtris.22$
```

Modified		Size	Name

```
02/26/99  08:46a                250 v0d6cm.bm$
03/02/99  09:12a            347,071 vfp500.dl_
03/02/99  09:12a            338,391 vfp501.dl_
03/02/99  09:12a            331,774 vfp502.dl_
03/02/99  09:12a            344,163 vfp503.dl_
03/02/99  09:12a            343,840 vfp504.dl_
03/02/99  09:12a            345,837 vfp505.dl_
03/02/99  09:12a            251,547 vfp506.dl_
03/02/99  09:12a            271,043 vfp5enu.dl_
03/02/99  09:12a             19,596 vfp5env.dl_
03/02/99  09:12a             84,383 vfpole50.dl_
02/26/99  08:46a                399 vtris.bm$
02/26/99  08:46a                304 vtris50.ic$
02/26/99  08:47a                769 wgterr.cd$
02/26/99  08:47a              1,886 wgterr.db$
03/02/99  09:13a             26,212 wizset32.dl_
02/26/99  08:47a                114 workdupl.db$
02/26/99  08:47a                964 ylight.bm$

             240 File(s)      9,548,295 bytes
```

3.2 Installation Process

This process installs VTRIS system. The DFD is very detailed and self-explanatory.

Fig 51

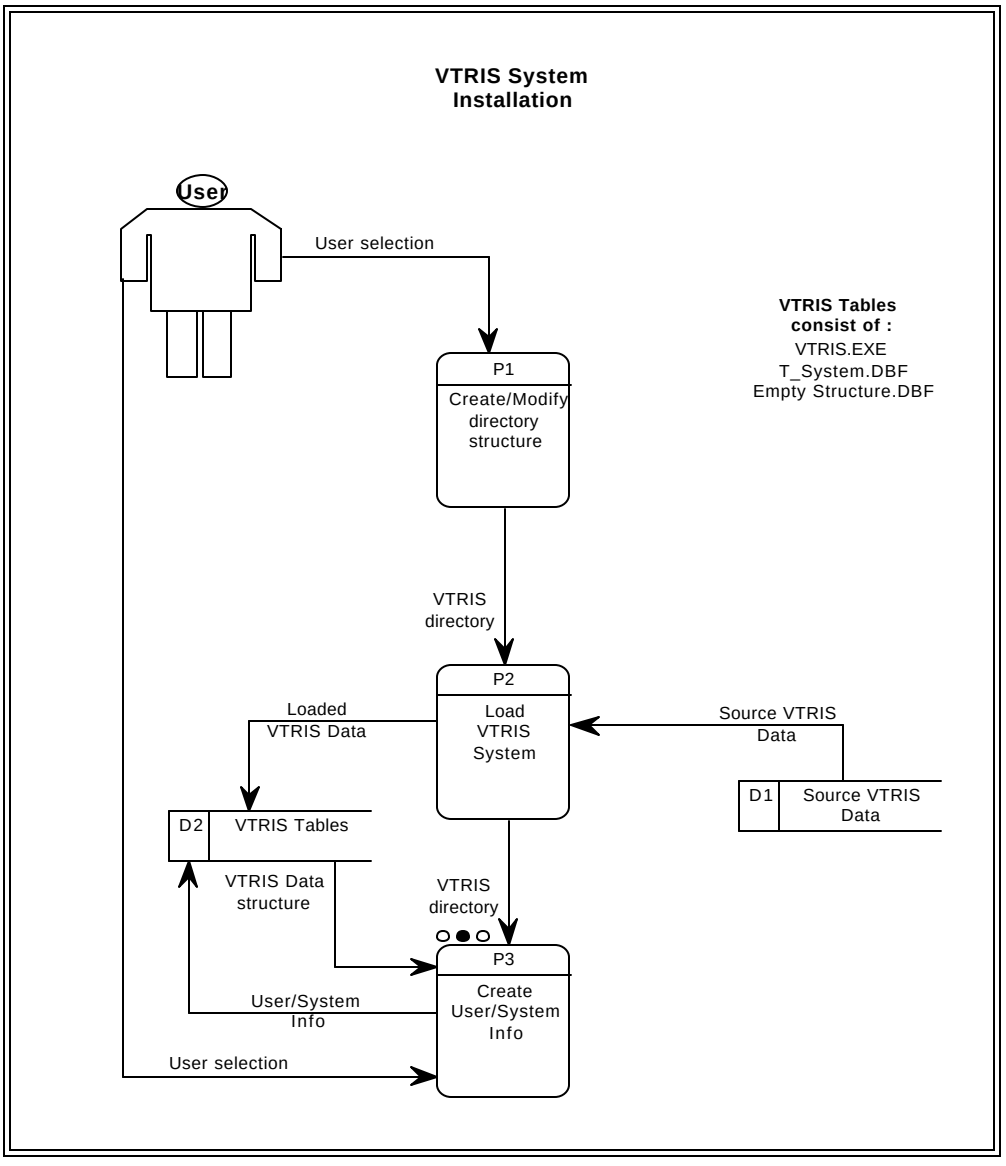
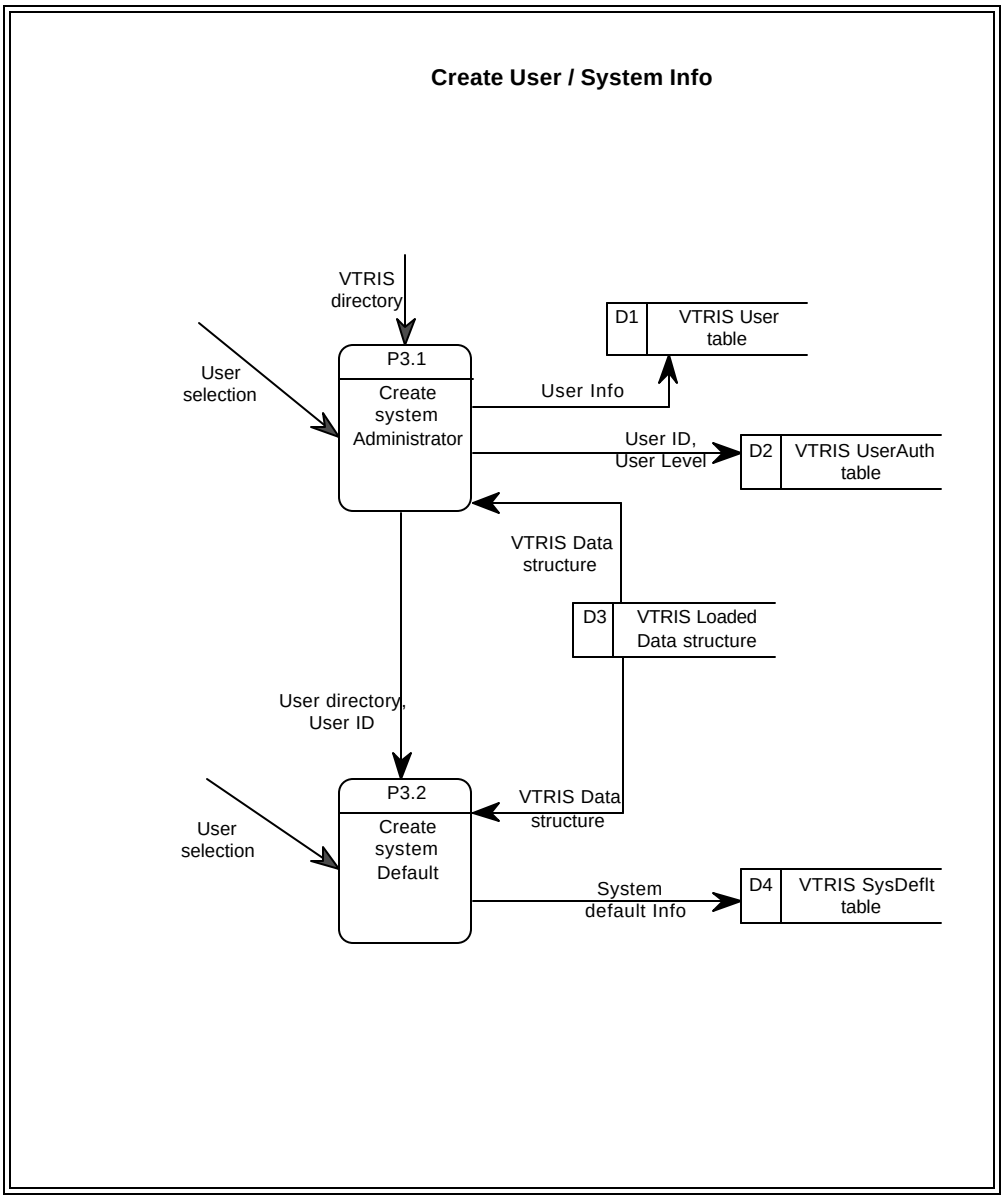


Fig 52


Create User / System Info
VTRIS directory
User selection
P3.1
Create system Administrator
D1
VTRIS User table
User Info
User ID, User Level
D2
VTRIS UserAuth table
VTRIS Data structure
D3
VTRIS Loaded Data structure
User directory, User ID
P3.2
Create system Default
User selection
VTRIS Data structure
System default Info
D4
VTRIS SysDeflt table

3.3 Source Package

The VTRIS application source package is the collections of Visual FoxPro 5.0 forms, programs, databases, and reports. This package is created by storing all the VTRIS source files in the **FHISPD1/DEVELOP:\SOURCE\VTRIS\VTRIS98** directory.

3.3.1 Program Files

Modified		Size	Name
11/01/95	09:01a	10,687	SHOWWGHT.PRG
12/12/97	03:46p	19,349	SHOWSUMM.PRG
11/01/95	09:01a	32,273	SHOWSTTN.PRG
11/14/98	09:12a	3,154	SHOWOPT0.PRG
02/26/98	09:22a	8,371	SHOWLOG.PRG
11/01/95	09:01a	4,865	SHOWDATA.PRG
10/31/97	10:46a	6,090	SHOWBKUP.PRG
11/13/98	05:02p	15,336	RECV_EXP.PRG
10/22/98	09:03a	3,982	BRWSCARD.PRG
11/12/98	03:10p	17,631	PRESELCT.SPR
10/21/98	12:46p	2,050	SETFLAGS.SPR
06/25/98	08:57a	78	MOVERECV.SPR
02/24/98	12:58p	16,637	LOADOPT0.SPR
02/25/98	10:28a	6,407	LOADASC.SPR
07/08/98	01:28p	32,710	LOAD10.SPR
03/31/98	09:52a	85	LECONTB1.SPR
03/26/98	01:11p	85	LECONTB0.SPR
06/25/98	09:10a	1,058	ITEMLIST.SPR
06/09/98	10:07a	78	IMPTFILE.SPR
10/28/98	10:23a	13,339	FLOCATOR.SPR
06/25/98	08:52a	16,871	DLOCATOR.SPR
10/21/98	12:50p	78	SCONFG14.SPR
02/04/98	04:30p	3,242	USERINFO.SPR
10/21/98	12:50p	4,039	SCONFG13.SPR
12/22/98	01:44p	20,124	LOADMAIN.PRG
12/22/98	02:01p	3,679	ITEMLST2.PRG
02/04/98	04:42p	1,646	VTRIS000.PRG
10/21/98	12:49p	3,529	SCONFG11.SPR
10/14/98	02:19p	10,645	VTRIS.PRG
05/15/96	04:39p	1,723	VNEWDIR.PRG
11/14/98	12:08p	5,841	VIEWWGHT.PRG
04/22/98	01:47p	5,057	ARAGMTHD.PRG
11/09/98	02:46p	5,119	VIEWDATA.PRG

```
11/21/94  11:45a                24 VIEWCLAS.PRG
11/25/94  03:10p             3,288 VIEW_WGH.PRG
11/03/98  09:59a               519 LOAD11.SPR
10/21/98  12:49p            15,838 SCONFG10.SPR
10/21/98  11:22a            60,023 LOADEDTW.PRG
04/16/98  08:16a            27,800 MAINSCR.PRG
12/13/95  11:55a             2,930 LOOKFILE.PRG
10/21/98  11:35a                83 LECONTD.SPR
05/05/95  06:29p            30,936 LOADREAL.PRG
05/29/96  04:17p            12,136 LOADLOG2.PRG
05/17/96  02:57p             3,843 LOADLOG1.PRG
10/21/98  09:48a                83 LECONTG.SPR
10/16/98  08:29a             2,777 STTPLOT.SCX
10/16/98  08:29a            39,677 STTPLOT.SCT
03/26/98  03:42p            63,875 LOAD04.PRG
12/18/94  02:14p             3,121 SRCHFILE.PRG
11/01/95  09:00a             6,080 SLCTEXPT.PRG
10/04/94  09:48a             1,768 SLCTDFLT.PRG
12/14/95  01:48p               205 SHUTDN.PRG
10/20/98  03:19p             7,328 DIRLIST.SCT
10/12/94  05:01p             1,538 CLS_DFLT.PRG
11/02/94  04:06p               408 CLASWGHT.PRG
02/06/96  12:29p                38 CLASSES.PRG
12/22/94  11:32a               246 CKH.PRG
08/23/96  09:35a             2,449 CK_SP.PRG
12/26/94  12:34p               362 CHKWEIGH.PRG
11/22/95  11:19a             3,739 CHKLEVEL.PRG
04/03/98  03:26p               682 CHKFLOPP.PRG
06/07/96  08:46a             1,693 CHKERR.PRG
12/23/94  04:10p               776 CHKBRIDG.PRG
04/24/98  08:30a               202 VIEW_EXP.PRG
10/22/98  06:52a            83,809 LOADEDT0.PRG
10/20/98  03:49p            15,710 LOADEDT1.PRG
10/21/98  07:00a             1,918 LEBROW02.PRG
11/14/98  02:34p            14,364 LOADWDTW.PRG
10/21/98  07:00a             1,494 LEBROW01.PRG
10/21/98  11:45a            12,941 DUPSEL0.PRG
11/13/98  12:31p             2,908 BUTBROW0.PRG
04/29/95  02:54p               983 BRWSUSER.PRG
04/21/95  12:20p             1,540 BRWSSECR.PRG
11/01/95  09:05a            12,812 BRWSEXPR.PRG
08/04/97  04:47p             3,958 BRWSBKUP.PRG
03/27/96  12:01p             1,466 BIT.PRG
11/01/95  09:05a            14,367 BACKUP.PRG
03/04/98  03:49p             4,971 ASGNVAR.PRG
11/03/98  03:29p             2,921 ARCHIVE1.PRG
10/21/98  01:20p             4,490 SCONFG12.SPR
10/25/94  02:15p               962 WGT_DFLT.PRG
05/03/95  02:08p               931 WAITER.PRG
```

```
01/09/98  10:40a          6,474 VTRISWIN.PRG
09/02/98  10:53a         11,623 IMPORTDB.PRG
11/10/98  10:24a         22,955 IMP_FILE.PRG
04/22/98  01:46p          3,811 HRAGMTHD.PRG
12/19/94  02:54p            692 GEN_HELP.PRG
04/30/96  11:03a          3,664 FLAG1.PRG
11/22/95  11:35a          5,203 FLAG0.PRG
04/02/97  11:31a          1,923 FILELIST.PRG
09/26/95  01:34p            921 EDITSCR.PRG
08/28/96  01:47p          9,125 EDIT1.PRG
10/31/96  08:35a         10,659 EDIT0.PRG
05/21/98  10:43a          2,654 DZ_ZIP.PRG
11/10/98  10:23a          3,323 REPVIEW.PRG
10/20/98  03:19p          2,123 DIRLIST.SCX
10/21/98  09:45a          2,151 BRWSJNK.SPR
04/30/98  11:03a         17,868 DETLSELT.PRG
03/08/96  01:48p         19,429 DELSTAX.PRG
03/07/96  03:01p          1,863 DELSTA_S.PRG
03/07/96  03:03p         13,137 DELSTA_C.PRG
04/03/96  10:29a         21,250 DELSTA.PRG
02/12/96  12:26p          3,455 DELETEST.PRG
10/24/97  09:47a          3,576 DELETEFL.PRG
12/04/95  12:59p          3,614 DEARCH0.PRG
02/22/96  09:36a          2,687 DBRWS2.PRG
02/22/96  01:58p          6,173 DBRWS.PRG
11/13/98  11:54a         13,789 DATABRWS.PRG
11/13/98  05:05p         18,400 DATA_EXP.PRG
11/06/96  08:36a          2,227 CRTSUMDB.PRG
08/15/97  10:52a         24,402 CREATEDB.PRG
09/07/95  12:54p            345 CONTINFO.PRG
01/25/95  12:12p            404 CONTACT.PRG
03/01/95  04:37p            405 CNVSTRNG.PRG
12/04/98  02:31p         16,379 CLSWGT.PRG
03/11/96  03:03p          3,003 T_TBEDIT.PRG
01/29/99  09:35a         33,047 VTRIS_MN.PRG
10/19/98  11:26a         35,983 SUMMSTA.PRG
09/29/98  12:30p             78 ITEMLST2.SPR
10/19/98  09:04a          7,559 ASCSTA.SPR
04/13/98  11:57a          1,838 SUMMINFO.PRG
04/27/98  03:20p          3,622 SUMMDETL.PRG
11/03/98  03:29p          3,798 ARCHIVE0.PRG
05/03/96  09:05a         29,551 SUMAAM2.PRG
11/01/95  09:00a          6,561 STTN_BRW.PRG
08/06/98  09:18a          4,350 STAVIEW.PRG
11/09/98  02:47p          3,105 VIEWSTTN.PRG
10/21/98  10:55a          2,995 HQ07RPT.SCX
10/21/98  10:55a         32,611 HQ07RPT.SCT
09/04/98  02:24p          4,142 INSTLN00.PRG
10/21/98  10:55a          3,540 HQ01RPT.SCX
```

```
09/04/98  04:11p              13,820 DETLSELT.FXP
08/31/95  03:58p               2,860 SHOW_LOG.PRG
10/22/98  07:37a               1,029 DIRLIST.SPR
03/11/98  02:46p               7,461 USRIDPSW.SPR
03/16/98  09:31a              45,325 USRDIRCT.SPR
04/30/98  10:24a                  78 DETLSELT.SPR
04/23/98  03:56p                  76 SUMMSTA.SPR
04/13/98  12:43p                  78 SUMMINFO.SPR
04/13/98  01:21p                  78 SUMMDETL.SPR
11/02/95  11:54a               1,485 LEBROW01.BAK
10/21/98  10:55a              40,915 HQ01RPT.SCT
12/21/98  02:53p              34,126 MOVERECV.PRG
09/23/98  10:10a               2,120 BUTBROW0.FXP
02/19/99  01:53p              18,056 SUMM_OK.PRG
02/19/99  01:16p              31,542 SUMAAM.PRG
12/22/98  02:00p              39,273 RCVDMOVE.PRG
02/19/99  01:33p              24,288 SUMHAM.PRG
11/13/98  04:02p               3,086 SHOWOPT0.FXP
11/13/98  02:50p              15,045 VTRIS_MN.FXP
11/01/95  09:02a               2,466 SELSTTN.PRG
10/29/97  01:34p               4,413 SELECTDB.PRG
04/21/95  12:51p                 934 SELCWGHT.PRG
11/18/94  12:04p                 913 SELCSTTN.PRG
04/21/95  12:48p                 934 SELCCLAS.PRG
11/01/95  09:02a               3,501 SEL_FILE.PRG
11/01/95  09:02a              34,083 SECR10.PRG
04/27/95  03:02p              11,839 SECR01.PRG
05/22/97  09:41a                 360 RESET.PRG
11/01/98  04:54p                  78 DATAEXPT.SPR
12/07/96  11:37a               2,965 REIND_TB.PRG
12/18/96  11:12a              12,645 REIND_DT.PRG
03/07/96  04:00p                 265 VIEW_DEL.PRG
08/19/96  12:03p              55,108 USRDIRCT.PRG
10/14/98  08:03a              18,900 UPGRADE.PRG
01/02/96  11:55a               1,852 TYPEIN.PRG
01/22/99  01:48p             260,966 PROCFILE.PRG
02/08/99  10:39a              27,505 CNVASCII.PRG
01/14/99  11:24a              36,564 LOAD.PRG
01/27/99  10:18a               3,874 LEDTSTLN.SPR
```

3.3.2 Data Files

Modified		Size	Name
03/12/98	12:56p	232	T_STVCL.DBF
03/12/98	12:56p	366	T_STTRWT.DBF
03/12/98	12:56p	232	T_STTRV.DBF
03/12/98	12:38p	1,818	T_STTN.DBF
10/04/94	01:49p	1,219	T_STATIN.DBF
03/12/98	12:56p	433	T_ROUTE.DBF
03/12/98	12:56p	768	T_NLANE.DBF
03/12/98	12:56p	299	T_MVCL.DBF
03/12/98	12:56p	433	T_MTRWGT.DBF
03/12/98	12:56p	299	T_MTRVC.DBF
12/29/94	03:15p	770	T_MSKHLP.DBF
10/25/94	10:36a	242	T_MONTH.DBF
03/12/98	12:56p	232	T_MDRTVL.DBF
09/28/94	11:07a	1,726	T_MAINTN.DBF
03/12/98	12:56p	232	T_HPMSST.DBF
10/25/94	11:22a	530	T_HOUR.DBF
12/07/93	01:21p	390	T_GROUP.DBF
03/12/98	12:56p	914	T_FCLASS.DBF
07/22/94	02:00p	136	T_DOWEEK.DBF
03/12/98	12:56p	768	T_DIRECT.DBF
10/25/94	11:14a	718	T_DAY.DBF
02/17/99	08:42a	2,442	T_RULES.DBF
11/13/98	09:41a	3,072	T_STATE.CDX
02/17/99	08:41a	6,336	T_RULES.FPT
02/17/99	08:21a	2,501	T_STATE.DBF
03/12/98	12:56p	890	T_CSVCL.DBF
03/12/98	12:56p	701	T_CLBRWS.DBF
05/21/98	01:30p	1,818	T_CLAS.DBF
08/04/97	12:15p	356	T_BKUP.DBF
08/11/98	01:16p	512	T_BACKUP.FPT
08/11/98	01:15p	257	T_BACKUP.DBF
03/12/98	12:56p	969	T_ALGVCL.DBF
07/22/94	04:42p	9,614	T_ALL.DBF
07/22/94	01:20p	366	T_AXTYPE.DBF
10/08/98	11:58a	225	T_DIRHST.DBF
10/22/98	08:21a	528	T_CARDS.DBF
03/12/98	12:56p	3,974	T_WEQUIP.DBF
05/21/98	01:30p	700	T_WGT.DBF
08/12/98	01:26p	1,118	T_VCLASS.DBF
10/04/94	11:45a	334	T_UTILIT.DBF
07/15/94	03:43p	186	T_USRSEC.DBF
07/22/98	08:49a	791	T_USRFTR.DBF
03/12/98	12:56p	1,505	T_TSENSR.DBF

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08/25/98  08:36a                1,001 T_SUMLOG.DBF
```

3.3.3 Form Files

```
     Modified                   Size       Name
01/21/99  01:10p                2,886 DATAEXPT.SCX
01/21/99  01:10p               10,505 DATAEXPT.SCT
01/21/99  01:10p                2,123 LOAD11.SCX
01/21/99  01:10p               29,787 CONVFILE.SCT
01/21/99  01:10p                3,649 CONVFILE.SCX
01/21/99  01:10p                6,061 LOAD11.SCT
01/21/99  01:10p                9,097 ITEMLST2.SCT
01/21/99  01:10p                2,668 ITEMLST2.SCX
01/21/99  01:10p               10,030 RECVEXPT.SCT
01/21/99  01:10p                2,995 RECVEXPT.SCX
01/21/99  01:10p               12,599 RPTPCON.SCT
01/21/99  01:10p                1,687 RPTPCON.SCX
01/21/99  01:10p               40,088 SCONFG10.SCT
01/21/99  01:10p                4,412 SCONFG10.SCX
01/21/99  01:10p               10,967 BRWSJNK.SCT
01/21/99  01:10p                2,123 BRWSJNK.SCX
01/21/99  01:10p               10,689 LECONTD.SCT
11/22/95  11:11a                  512 MOVEFILE.SCT
10/29/97  02:12p               13,006 MOVE_FL.SCX
10/29/97  02:12p                3,387 MOVE_FL.SCT
11/08/95  08:48a                8,530 MOVE.SCX
11/22/95  11:12a                3,742 MOVE.SCT
11/22/95  11:11a                2,561 LOGTYPSL.SCX
11/22/95  11:11a                  512 LOGTYPSL.SCT
03/11/98  04:06p               34,726 LOADOPT1.SCT
05/23/96  05:15p               18,228 LOADLOG2.SCX
05/23/96  05:15p                4,641 LOADLOG2.SCT
05/06/96  09:43a               10,395 LOADLOG1.SCX
05/06/96  09:43a                2,455 LOADLOG1.SCT
11/22/95  11:12a                  582 DUMMY.SCT
11/22/95  11:11a                9,276 DIRSEL.SCX
11/22/95  11:11a                3,115 SHOW_LG2.SCT
03/11/96  03:29p               16,363 SHOW_LG1.SCX
11/22/95  11:12a                9,649 SHIPCOPY.SCX
11/22/95  11:12a                2,343 SHIPCOPY.SCT
03/11/96  03:29p                3,775 SHOW_LG1.SCT
11/22/95  11:11a                4,427 SETPRNTR.SCX
11/22/95  11:12a                3,168 SETPRNTR.SCT
10/29/97  12:17p                8,157 SELECTDB.SCX
10/29/97  12:17p                1,993 SELECTDB.SCT
11/22/95  11:12a                2,561 SEL_STTN.SCX
11/22/95  11:12a                  512 SEL_STTN.SCT
11/08/95  09:06a               22,331 SECR11.SCX
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11/22/95  11:11a                7,273 SECR11.SCT
11/08/95  09:06a                5,546 SCRUSRID.SCX
11/22/95  11:11a                2,561 DEFWGHT.SCX

10/29/97  02:45p               15,990 BACK_UP.SCX
10/29/97  02:45p                4,402 BACK_UP.SCT
10/16/98  03:41p                3,540 ASCSTA.SCX
11/22/95  11:11a                2,561 HLPABOUT.SCX
11/22/95  11:11a                  512 HLPABOUT.SCT
11/12/98  12:19p               53,642 DATAEXPO.SCT
11/22/95  11:11a                2,561 FILESELT.SCX
11/22/95  11:11a                  512 FILESELT.SCT
04/02/97  11:32a                2,073 FILELIST.SCX
05/21/98  10:15a                1,905 DZ32.SCX
05/21/98  10:17a                8,257 DZ32.SCT
09/25/95  03:53p                3,308 DUMMY.SCX
09/26/95  11:10a                9,276 LOADEDIT.SCX
11/22/95  11:12a                3,333 LOADEDIT.SCT
01/21/99  01:10p                2,777 LECONTD.SCX
09/27/95  11:04a                9,276 LECONTRO.SCX
11/22/95  11:12a                2,640 LECONTRO.SCT
03/11/96  03:24p                9,649 LECONTB.SCX
03/11/96  03:24p                3,115 LECONTB.SCT
11/22/95  11:11a                2,561 ITEMLST3.SCX
11/22/95  11:11a                  512 ITEMLST3.SCT
01/21/99  01:10p                8,491 LECONTG.SCT
01/21/99  01:10p                2,450 LECONTG.SCX
03/11/96  03:22p                5,919 ITEMLST1.SCX
03/11/96  03:22p                1,506 ITEMLST1.SCT
11/22/95  11:11a                5,511 SCONTBRW.SCT
11/13/98  10:14a                2,232 SCONFG14.SCX
11/13/98  10:14a                8,129 SCONFG14.SCT
11/13/98  10:13a                3,540 SCONFG13.SCX
11/13/98  10:13a               14,286 SCONFG13.SCT
12/07/98  02:14p               16,714 SCONFG12.SCT
11/13/98  10:12a                7,137 SCONFG11.SCX
11/13/98  10:12a               35,139 SCONFG11.SCT
11/22/95  11:11a                2,561 SCONFG01.SCX
11/22/95  11:11a                  512 SCONFG01.SCT
11/22/95  11:11a                2,561 S_15.SCX
11/22/95  11:11a                  512 S_15.SCT
11/22/95  11:11a                2,561 S_14.SCX
11/22/95  11:11a                  512 S_14.SCT
11/22/95  11:11a                2,561 RSTR.SCX
11/22/95  11:11a                  512 RSTR.SCT
05/07/98  11:39a               11,514 RPTSTA.SCX
05/07/98  11:39a               18,132 RPTSTA.SCT
01/21/99  01:10p               15,349 SETFLAGS.SCT
01/21/99  01:10p                2,668 SETFLAGS.SCX
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01/21/99  01:10p              231,283 SHIP.SCT
01/21/99  01:10p                8,445 SHIP.SCX
10/29/97  02:46p               15,617 RESTORE.SCX
02/19/99  10:54a               59,180 CREATSUM.SCT
02/19/99  10:54a                5,393 CREATSUM.SCX
11/22/95  11:12a                7,038 STAN15.SCX
11/22/95  11:12a                4,480 STAN15.SCT
11/22/95  11:12a               10,768 STAN14.SCX
11/22/95  11:11a                4,699 SCRUSRID.SCT
11/22/95  11:11a               15,244 SCONTBRW.SCX
11/22/95  11:11a                6,592 DIRSEL.SCT
01/21/99  01:10p               24,296 PRESELCT.SCT
01/21/99  01:10p                4,521 PRESELCT.SCX
10/23/97  12:40p               10,395 DELSTA.SCX
12/04/97  10:39a               21,847 DELSTA.SCT
11/01/96  09:33a                8,530 DELETE.SCX
11/01/96  09:33a                1,960 DELETE.SCT
11/22/95  11:11a                  512 DEFWGHT.SCT
11/22/95  11:11a                2,561 DEFSTATN.SCX
11/22/95  11:11a                  512 DEFSTATN.SCT
11/22/95  11:11a                2,561 DEFCLASS.SCX
11/22/95  11:11a                  512 DEFCLASS.SCT
01/21/99  01:10p                7,215 SELCTDAY.SCT
01/27/99  10:23a                2,777 LEDSTLN.SCX
01/02/96  04:09p                8,903 DATASLCT.SCX
01/02/96  04:09p                2,158 DATASLCT.SCT
01/21/99  01:10p                2,123 SELCTDAY.SCX
12/07/98  02:14p                3,976 SCONFG12.SCX
09/05/97  04:17p                8,530 COPY.SCX
09/05/97  04:17p                5,029 COPY.SCT
11/22/95  11:11a               21,585 CLASSIFC.SCX
11/22/95  11:11a               10,944 CLASSIFC.SCT
03/11/96  03:19p               21,958 BRWSRECD.SCX
03/11/96  03:19p                9,987 BRWSRECD.SCT
11/12/98  12:19p                3,213 DATAEXPO.SCX
01/21/99  01:10p                4,987 SELCTINT.SCT
11/08/95  08:29a                6,665 BRWS_USR.SCX
11/22/95  11:12a                4,930 BRWS_USR.SCT
11/22/95  11:11a                2,561 BKUP.SCX
11/22/95  11:11a                  512 BKUP.SCT
11/22/95  11:11a                2,561 BACKUP.SCX
11/22/95  11:11a                  512 BACKUP.SCT
10/16/98  03:41p               28,024 ASCSTA.SCT
11/22/95  11:12a                6,831 USER10.SCT
08/29/97  04:06p               11,141 UNZIP.SCX
08/29/97  04:06p                6,877 UNZIP.SCT
12/05/95  02:33p                3,681 TALKON.SCX
12/05/95  02:33p                  681 TALKON.SCT
08/09/96  03:23p                4,800 SUMNOTE.SCX
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08/09/96  03:23p                1,605 SUMNOTE.SCT
04/23/98  03:56p                3,649 SUMMSTA.SCX
04/23/98  03:56p               13,913 SUMMSTA.SCT
01/21/99  01:10p               96,606 USERDATA.SCT
01/21/99  01:10p                3,104 SUMMLOG.SCX
11/22/95  11:11a                2,561 NOTREADY.SCX
11/22/95  11:11a                  512 NOTREADY.SCT
11/22/95  11:11a                2,561 NEWFNAME.SCX
11/22/95  11:11a                  512 NEWFNAME.SCT
11/22/95  11:11a                2,561 MOVEFILE.SCX
11/22/95  11:12a                5,056 STAN14.SCT
11/22/95  11:12a               14,871 STAN13.SCX
11/22/95  11:12a                7,168 STAN13.SCT
11/22/95  11:12a               14,871 STAN12.SCX
11/22/95  11:12a                7,040 STAN12.SCT
11/22/95  11:12a               14,125 STAN11.SCX
11/22/95  11:12a                6,592 STAN11.SCT
10/29/97  12:20p                8,157 SHOWBKUP.SCX
10/29/97  12:20p                1,894 SHOWBKUP.SCT
11/22/95  11:12a               12,633 SHOW_WGH.SCX
11/22/95  11:12a                3,564 SHOW_WGH.SCT
11/08/95  09:14a               14,871 SHOW_LG2.SCX
01/21/99  01:10p               39,677 STTPLOT.SCT
01/21/99  01:10p                2,777 SHOWBKVT.SCX
01/21/99  01:10p                5,938 SUMM_QM.SCT
01/21/99  01:10p                4,848 SHOW_SUM.SCX
01/21/99  01:10p                1,905 SELCTINT.SCX
01/27/99  10:23a                9,594 LEDSTLN.SCT
01/21/99  01:10p               50,988 SHOW_SUM.SCT
01/21/99  01:10p                2,123 SELECTSM.SCX
01/21/99  01:10p                3,649 LECONTB1.SCX
01/21/99  01:10p               11,170 CLSWGTSM.SCX
02/11/99  11:36a               53,760 DATAEXPORT.SCT
01/21/99  01:10p                1,796 SUMM_QM.SCX
01/21/99  01:10p                5,625 DELEDATE.SCT
01/21/99  01:10p                4,848 BKUPMOVE.SCX
01/21/99  01:10p                8,656 DELTFILE.SCT
01/21/99  01:10p                2,995 SELDIREC.SCX
10/29/97  02:46p                4,410 RESTORE.SCT
11/22/95  11:11a                2,561 REINDEX.SCX
11/22/95  11:11a                  512 REINDEX.SCT
01/21/99  01:10p                2,341 DELTFILE.SCX
01/21/99  01:10p               12,138 INSTPASS.SCT
01/21/99  01:10p               10,577 USRIDPSW.SCT
01/21/99  01:10p                3,431 USRDIRCT.SCX
01/21/99  01:10p               54,099 DETLSELT.SCT
01/21/99  01:10p                4,194 USERSTAT.SCX
04/02/98  02:36p                2,341 USERINFO.SCX
04/02/98  02:36p               14,059 USERINFO.SCT
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11/22/95  11:12a               5,173 USER11.SCX
11/22/95  11:12a               8,646 USER11.SCT
11/22/95  11:12a               5,173 USER10.SCX
02/22/99  09:04a             616,811 WRPTMAIN.SCT
01/21/99  01:10p              20,481 USERSTAT.SCT
01/21/99  01:10p               6,156 USERDATA.SCX
01/21/99  01:10p               9,220 SUMMDETL.SCT
01/21/99  01:10p             203,147 CLSWGTSM.SCT
01/21/99  01:10p               3,649 W1RPT.SCX
01/21/99  01:10p               3,431 MOVERECV.SCX
01/21/99  01:10p               2,450 INSTPASS.SCX
01/21/99  01:10p              52,024 REINDXDT.SCT
02/17/99  11:21a               3,540 DLOCATOR.SCX
01/21/99  01:10p              11,225 IMPTFILE.SCT
01/21/99  01:10p              13,014 DZ_32.SCT
01/21/99  01:10p               2,777 VIEWLOG.SCX
01/21/99  01:10p               3,540 REINDXDT.SCX
01/21/99  01:10p              33,279 DIRVGET.SCT
01/21/99  01:10p               5,502 DETLSELT.SCX
01/21/99  01:10p               5,098 REINDXTB.SCT
01/21/99  01:10p               3,540 VTRISRST.SCX
01/22/99  11:39a              68,820 DATAVIEW.SCT
01/21/99  01:10p               2,559 USRIDPSW.SCX
01/21/99  01:10p              24,289 VIEWLOG.SCT
01/21/99  01:10p               1,796 SUMMNOTE.SCX
01/21/99  01:10p               4,093 SUMMNOTE.SCT
01/21/99  01:10p               5,531 GRAPHDAT.SCT
01/21/99  01:10p               1,796 REINDXTB.SCX
01/21/99  01:10p              29,616 SELDIREC.SCT
01/21/99  01:10p               3,431 DELDATE.SCX
01/21/99  01:10p              30,701 DELDATE.SCT
01/21/99  01:10p               5,365 SELECTSM.SCT
02/22/99  10:19a              59,011 RPSUMOPT.SCT
01/21/99  01:10p               3,649 DELDATA.SCX
01/21/99  01:10p              86,050 BKUPMOVE.SCT
02/22/99  10:19a               5,066 RPSUMOPT.SCX
02/19/99  03:42p               4,194 RPSTAOPT.SCX
01/21/99  01:10p               3,213 SUMMINFO.SCX
01/21/99  01:10p              10,688 SUMMINFO.SCT
01/21/99  01:10p               3,104 SUMMDETL.SCX
01/21/99  01:10p               2,123 DELEDATE.SCX
01/21/99  01:10p               1,905 GRAPHDAT.SCX
01/21/99  01:10p              15,759 LECONTB1.SCT
03/12/99  09:01a               1,578 GETANSW.SCX
01/21/99  01:10p              91,869 LOAD10.SCT
01/21/99  01:10p               5,364 SELECTVT.SCT
01/22/99  11:39a               6,919 DATAVIEW.SCX
01/21/99  01:10p               2,123 SELECTVT.SCX
01/21/99  01:10p               3,431 LECONTB0.SCX
```

```
01/21/99  01:10p              5,457 SHOWBKVT.SCT
01/21/99  01:10p             32,611 HQ07RPT.SCT
02/11/99  10:17a              3,540 HQ01RPT.SCX
01/21/99  01:10p             24,982 SUMMLOG.SCT
01/21/99  01:10p              2,123 DIRLIST.SCX
01/21/99  01:10p              2,777 STTPLOT.SCX
01/21/99  01:10p             15,552 MOVERECV.SCT
01/21/99  01:10p              7,777 ITEMLIST.SCT
01/21/99  01:10p              3,213 IMPTFILE.SCX
01/21/99  01:10p              7,328 DIRLIST.SCT
01/21/99  01:10p             31,125 VTRISRST.SCT
03/12/99  09:01a             43,965 GRTANSW.SCT
01/21/99  01:10p             52,654 GRGVWSUM.SCT
01/21/99  01:10p              5,175 GR_MAIN.SCX
01/21/99  01:10p             77,593 GR_MAIN.SCT
01/21/99  01:10p              7,573 GETRPT.SCX
01/21/99  01:10p             83,340 GETRPT.SCT
01/21/99  01:10p              3,867 GRGVWSUM.SCX
01/21/99  01:10p             14,644 LECONTB0.SCT
02/10/99  02:01p              3,867 FLOCATOR.SCX
02/10/99  02:01p             22,886 FLOCATOR.SCT
01/21/99  01:10p              1,687 DZ_32.SCX
01/21/99  01:10p             49,254 LOADOPT0.SCT
01/21/99  01:10p              5,066 LOADASC.SCX
02/11/99  10:17a             41,128 HQ01RPT.SCT
01/21/99  01:10p              2,995 HQ07RPT.SCX
01/21/99  01:10p             37,340 LOADASC.SCT
01/21/99  01:10p              4,194 LOAD10.scx
02/11/99  11:36a              3,213 DATAEXPORT.SCX
02/19/99  03:42p             70,300 RPSTAOPT.SCT
01/21/99  01:10p             46,699 W1RPT.SCT
02/17/99  11:21a             29,422 DLOCATOR.SCT
01/21/99  01:10p             27,840 DELDATA.SCT
01/21/99  01:10p              2,559 DIRVGET.SCX
02/22/99  09:04a             17,274 WRPTMAIN.SCX
01/21/99  01:10p              2,341 ITEMLIST.SCX
01/21/99  01:10p              2,559 LOADOPT0.SCX
01/21/99  01:10p             22,450 USRDIRCT.SCT
```

3.3.4 Report Files

Modified		Size	Name
11/03/98	10:24a	39,377	P6TABLEB.FRT
11/03/98	10:48a	28,574	P2TABLEC.FRX
11/03/98	10:48a	13,340	P2TABLEC.FRT
11/03/98	10:47a	34,070	P2TABLEB.FRX
11/03/98	10:47a	17,069	P2TABLEB.FRT
08/21/98	08:30a	12,773	P1TABLE.FRX
11/03/98	10:22a	64,298	P6TABLEA.FRX
07/30/98	11:27a	5,903	GRAPH.FRX
07/30/98	11:27a	1,724	GRAPH.FRT
11/03/98	10:06a	85,824	P7TABLE.FRX
02/08/99	03:14p	59,276	4TABLE.FRT
02/18/99	09:48a	24,452	HPMS6.FRX
02/18/99	11:02a	7,829	HPMS7.FRT
02/18/99	11:02a	33,841	HPMS7.FRX
02/18/99	09:48a	5,783	HPMS6.FRT
02/08/99	03:14p	121,319	P4TABLE.FRX
02/11/99	04:21p	15,815	P5TABLE.FRT
02/11/99	04:21p	30,177	P5TABLE.FRX
04/02/97	11:30a	739	FILELIST.FRX
05/19/98	01:37p	76,893	PQ07RPT.FRX
05/19/98	01:37p	26,793	PQ07RPT.FRT
09/03/98	08:37a	7,277	PQ01RPT.FRX
09/03/98	08:37a	2,252	PQ01RPT.FRT
11/03/98	10:06a	41,984	P7TABLE.FRT
11/03/98	10:26a	56,512	P6TABLEC.FRX
11/03/98	10:26a	33,668	P6TABLEC.FRT
11/03/98	10:24a	64,527	P6TABLEB.FRX
08/21/98	08:30a	4,001	P1TABLE.FRT
11/03/98	10:22a	39,179	P6TABLEA.FRT
11/03/98	10:19a	72,084	P6TABLE.FRX
11/03/98	10:19a	44,822	P6TABLE.FRT
11/04/98	10:45a	93,381	P4STABLE.FRX
11/04/98	10:45a	55,976	P4STABLE.FRT
11/04/98	10:46a	31,093	P4ESAL.FRX
11/04/98	10:46a	12,845	P4ESAL.FRT
09/11/98	12:53p	54,680	P3TABLE.FRX
09/11/98	12:53p	36,737	P3TABLE.FRT
11/03/98	10:49a	20,788	P2TABLEW.FRX
04/29/97	04:15p	15,797	P1TABLEB.FRX
04/29/97	04:15p	3,915	P1TABLEB.FRT
11/03/98	10:49a	8,786	P2TABLEW.FRT

3.3.5 Class Files

Modified		Size	Name
05/26/98	08:53a	1,141	ZIPUTIL.VCX
05/26/98	08:53a	536	ZIPUTIL.VCT
11/13/98	08:20a	63,236	VTRIS.VCT
11/13/98	08:20a	9,971	VTRIS.VCX