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16. Abstract

This project pertains to the design and implementation of a microcomputer database system to interface with the current TxDOT statewide mainframe PMIS system. Persons interested in the statewide PMIS system should direct inquiries to the Pavement Management Section Design Devision, Texas Department of Transportation. This effort, conducted over a five-year period, has produced a now operational DOS/Windows-based system to download data and pavement scores from the TxDOT mainframe system in Austin, Texas. The system's design is based on the DOS-based DataEase relational database system. Collected pavement data and associated scores are downloaded from Austin to Pharr via a 3270 communications link. The import data file is produced by a SAS-JCL job that produces an ASCII file suitable for importing into the district's microcomputer PMIS. Importing at the district level is accomplished by matching the reference marker location fields in the import file to the district level database receiving file's reference marker location fields.

The district-level system is then used to assist district personnel in retrieving, sorting, and presenting information (pavement scores) in a timely manner. The system possesses the capability to adjust/modify the data summarization reports and plots to suit individual situations with short time intervals.

The current design consists of 10 separate database files, one for each county comprising District 21. The files are structured to store location, collected pavement data and associated pavement scores based upon 0.1 mile increments. The current design stores ride, skid, falling weight, and visual data. An additional database file supports the temporary archiving of critical highway segments based upon prespecified critical score values. This file can be sorted in numerous ways in order to rank segments as required and to aid in the formulation of maintenance/rehabilitation strategies within the district.

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INSTALLATION AND TRAINING FOR THE DISTRICT 21 (PHARR) PAVEMENT MANAGEMENT SYSTEM:

by

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Research Report 900-2F
Research Study Number Study 7-900
Research Study Title: Installation and Training for the
District 21 (Pharr) Pavement Management System Database

Sponsored by the
Texas Department of Transportation
District 21, Pharr, Texas

February 1995
TEXAS TRANSPORTATION INSTITUTE
The Texas A&M University System
College Station, Texas 7843-3135

IMPLEMENTATION STATEMENT

This study pertains to the design and implementation of a microcomputer database system to interface with the current TxDOT statewide mainframe PMIS system. Persons interested in the statewide PMIS system should direct inquirires to the Pavement Management Section Design Division, Texas Department of Transportation.

The system described herein utilizes highway segment data currently collected under the Texas Department of Transportation (TxDOT) procedures for visual, falling weight, siometer, and skid data. The purpose of the system is to store (at the district level), summarize, and present highway segment data in a variety of formats useful to Pharr District personnel without altering the content and format of the state PMIS database.

The system defined herein is currently operational within the Pharr District. D21 data, as defined and formatted under the state PMIS system is extracted and imported into the district-level database via 3270 communications protocol using the ARBITER software programs. The system is stored on the Pharr District's PMIS 486 microcomputer system and runs under DOS and or Windows operating systems. Mr. Robert Flores, Pharr District has been trained to maintain the system as currently designed.

DISCLAIMER

The contents of this report reflect the design opinions and specific needs of the Pharr District and the author who are responsible for the material presented herein. The contents do not necessarily reflect the official view or policies of the Texas Department of Transportation (TxDOT). This report does not constitute a standard, define or redefine TxDOT specifications, or regulations.

There is no invention or discovery conceived or first actually reduced to practice in the course of or under this contract, including any art, method, process, machine, manufacture, design or composition of matter, or any new and/or useful improvement thereof, or any variety of plant which is or may be patentable under the patent law of the United States of America or any foreign country. This report is not intended for construction, bidding, or permit purposes.

The measurements used herein (miles) are based upon the standard unit of measure during the duration of this research effort. Since this report deals with a microcomputer-based relational database, the design and development of the TxDOT highway reference marker system (in miles) is an integral part of the concluded effort and cannot be converted to kilometers without a total re-design of the system. Therefore, all distances reported and used in this report are in units of miles.

ACKNOWLEDGMENT

The author wishes to acknowledge the assistance and cooperation of the following individuals. First, a very special debt of gratitude is extended to Mr. Craig Cox, TxDOT, (D-8 Pavements) for his untiring assistance and cooperation in helping with the project. It was through Craig's knowledge and expertise that a significant portion of this system's design and proven success is founded. Without his efforts, this work would not have been possible.

Special appreciation is extended to Mr. Bryan Stampley, TxDOT, (D-8 Pavements) for his strong and forceful guidance throughout the term of this project. Bryan's overall knowledge of pavement management and the workings of TxDOT greatly elevated the success of this effort.

Mr. Robert Flores, Pavement Manager for the Pharr District (TxDOT, D 21), assisted with the design of many of the database procedures contained in the final system. Implementation of the system would not have been possible without his untiring efforts. Mr. Flores worked extremely long hours to master the workings of the system and now possesses the skill levels necessary to work with the programs on a day-to-day basis. In essence, Mr. Flores has made the system a success at the district level.

Mr. John Eaves, formerly of the Texas Transportation Institute deserves special recognition for his unselfish time and devotion in aiding with the administration of the project award within TTI. John was always present to aid or assist when special problems arose.

Last, a special thanks is owed to Ms. Pam Koph of TTI for assistance in arranging and handling travel, ordering supplies, and generally aiding in the administration of this project. Grateful appreciation is also extended to Mr. Tim Jennings (TxDOT, D-19) for his support is setting up the 3270 communications protocol that greatly improved the day-to-day data transmission between the various project sites.

All of the above named individuals have contributed greatly to the success of this effort.

The following registered trademarked commercial software was used in the construction of this research effort.

DataEase. DataEase International, Inc. Trumbull, CT 06611
Microsoft Windows, Version 3.1. Microsoft Corporation, Redmond, WA 98052-6399
Microsoft Excel, Version 5.0. Microsoft Corporation, Redmond, WA 98052-6399

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SUMMARY

This research project described herein pertains to design and implementation of a microcomputer database system to interface with the current TxDOT mainframe PMIS system. This effort was undertaken specifically for The Texas Department of Transportation, District 21, in Pharr, Texas. This effort, conducted over a five year period, has produced a now-operational DOS-Windows based system to download data and pavement scores from the TxDOT mainframe system in Austin, Texas. The system's design is based around the DOS-based DataEase relational database system.

The utility of the system described herein lies in the ability to assist district personnel in retrieving, sorting, and presenting information (pavement scores) in a timely manner. The system possesses the capability to adjust/modify the data summarization reports and plots to suit individual situations with short time intervals.

The current design consists of 10 separate database files, one for each county comprising District 21. The files are structured to store location, collected pavement data and associated pavement scores based upon 0.1 mile increments. The current design stores ride, skid, falling weight, and visual data. An additional database file supports the temporary archiving of critical highway segments based upon pre-specified critical score values. This file can be sorted in numerous ways in order to rank segments as required and to aid in the formulation of maintenance/rehabilitation strategies within the District.

CHAPTER 1
OVERVIEW OF THE DISTRICT-LEVEL PMIS

1.0 INTRODUCTION

According to Federal Requirement, all state departments of transportation are required to implement a Pavement Management System (PMS) by early 1993. The Texas Department of Transportation began work on a preliminary system in the 1970's and subsequently established a Pavement Evaluation System (PES) in 1982. In 1987, a district-level project was undertaken (409-2) under the general direction of Mr. Sam Cox, the District 21 (D 21) Pavement Manager engineer at that time. The purpose of the 409-2 project was to design and implement a microcomputer-based, district-resident pavement management database system with more detail than the state maintained PES system. From 1988 through 1990, the 409-2 project produced a design that was later partially incorporated in the TxDOT PMS system. From 1991-1993, the 409-2 project was replaced with the current Texas Transportation Institute (TTI) designation number "900". This report describes the subsequent modifications and re-design of the 409-2 PMS work into what is currently known within TTI as the Project-900 system. For purposes of identification and clarity, this project will be referred to herein as the District 21 Pavement Management System (D 21 PMS).

The D 21 PMS is a 386/486 microcomputer-based system designed to accept TxDOT standard highway segment data. The system stores, manipulate/sorts, and presents the data in meaningful formats to assist the Pharr District personnel to assess the condition of virtually any pavement segment within the district. The current version of this system does not fully comply with the Federally-mandated details, but parts of the system have been used by TxDOT system designers as part of the projected state-wide PMS system. The state-wide PMS should be on-line and fully operational by mid 1994. In the interim, the D 21 PMS project system will be used by the Pharr District to provide the requisite data analysis for segment data until the state system is fully operational. At that time, it is expected that all or parts of the D 21 PMS will be phased out in favor of the state-wide PMS.

1.1 BACKGROUND

Pavement management systems research and implementation activities have been an on-going function of the Pharr district since the early 70's. The first concentrated effort was under the direction of Mr. Sam Cox (D 21) and Dr. John Epps of the Texas Transportation Institute. Their work evolved into the development of a prototype Maintenance Management System (MMS) which lead to the following:

a. Development of a flexible and rigid pavement rating procedure with sufficient detail for maintenance purposes,

b. Development of a pavement scoring system which closely matched maintenance engineers perceived condition ratings, and

c. Implementation of pavement condition plots to assist in visualization of highway conditions over a given stretch of state-maintained pavement.

The MMS was fully operational by the late 1970's and was used extensively within the Pharr district. The pavement condition plots proved to be invaluable to district engineers for the identification/selection of maintenance and rehabilitation (M&R) projects. For several reasons, the condition rating system was discontinued in late 1978.

In 1985, Project 409 was instituted within the Pharr district under the direction of D-18 PM and the Texas Transportation Institute (TTI). Specifically, this project resurrected the notion of pavement condition data collection and presentation. Project 409 extended the MMS and delineated the following data collection activities.

1. Visual Condition Surveys.

   Visual inspections conducted over 0.5 mile intervals based upon inspection procedures defined in TTI Report 151-2. The surveys relied on the judgment of trained visual raters to define a pavement rating score (PRS).

2. Ride Data Collection.

   Ride data was collected using the May's Ride Meter (MRM) or the Walker Roughness Device (Siometer) based upon 0.2 mile intervals.

3. Deflection analysis.

   Deflection data was collected using a Falling Weight Deflectometer (FWD) based upon 0.5 mile intervals.

4. Skid data analysis.

   Skid data was collected on selected 0.5 mile high-volume segments annually and on 0.5 mile low volume segments every 3rd year.

Associated with the original 409 data collection (items 1-4 above), additional "inventory data items" were also part of the data structure:

a. Pavement width,
b. Surface type and Date of Last Surface (DLS),
c. Average Daily Traffic (ADT),
d. 18 KIP single-axle equivalent loadings (18 KIP),
e. Location of cross roads, and

f. Location of segments was in terms of "milepost" and milepost displacement values.

The original 409 database system included the following files for each of the 10 counties in the Pharr district.

1. A 0.5 mile segment file for visual and FWD data.
2. A 0.2 mile segment file for siometer data.
3. A 0.1 mile "master" file into which the 0.5 mile and 0.2 mile data elements were transferred. Additionally, this file contained pavement history data for up to 5 years of visual PRS and SRS scores, skid, FWD and siometer scores.

Project 409 therefore instituted collection of significant amounts of highway data within the Pharr district. This created the requirement for some form of computerized system (district-resident) to receive and process the information. The later stages of the 409 project were involved with the design and implementation of a microcomputer-based database system to process this data based upon the above mentioned file structure. The initial designs, begun in 1988-89, consisted of utilizing 386-based architecture and the DATAEASE relational database software. By the end of 1990, the entire highway inventory of the Pharr district (District 21) was on-line and receiving the appropriate data. Through use of the DATAEASE query language, numerous summary and exception reports were generated and utilized in various decision making activities.

In 1991, Project 409 was officially terminated and replaced with TTI Project 900. Project 900 represented a direct involvement between the Texas Transportation Institute and the Pharr District. Essentially, the 900 project extended the 409 work for the benefit of the Pharr district. During this time frame (1991-92), newly mandated Federal requirements were imposed on a nation-wide basis relating to computerized pavement management-reporting systems. A state-wide effort was then undertaken by TxDOT through D 19 and D 8 to design and implement a centralized TxDOT Pavement Management System (PMS) consistent with Federal requirements. Elements of the 409 and 900 system have been incorporated into the TxDOT PMS. Implementation of the TxDOT PMS has been slow in materializing and, as of the printing of this report, not totally on-line.

The project described herein relates to the extended and modified work of the original 409 effort. One of the major modifications of the D 21 PMS work is associated with TxDOT's change-over from a "milepost" location system to a "reference marker" location system. During the 1991-92 period, the location system complies with the TxDOT Reference Marker System (RMS). This required that all of the data files be converted to this system.

From August, 1991 to August, 1994, the development and actual implementation work was performed by Dr. Don Smith, Texas A&M Industrial Engineering Department,

Mr. Craig Cox, TxDOT D 8 PM, and Mr. Robert Flores, D 21 Pavement Manager. The remainder of this report describes the important features of this effort.

1.2 OBJECTIVES OF THE RESEARCH

The primary objectives of the D 21 PMS effort are as follows.

1. The extension and modification of the Project 409 effort regarding the day-to-day operation of the microcomputer-based Pavement Management System specifically designed for District 21 (Pharr District).

2. Implement a database designed to store, organize, and produce condition rating tabulations based upon the following TxDOT categories:

    a. Visual inspection every 0.5 miles,
    b. Siometer data collection every 0.1 miles,
    c. Skid data collection every 0.5 miles, and
    d. Falling weight data collection every 0.5 miles.

3. Produce standardized reports, given data collection, relating to:

    a. Location of sorted "critical highway segments" whose pavement evaluation scores for items 2.a, b, c, and d, above, exceed or are below a specified critical score for the condition value being examined;

    b. Condition scores sorted by highway type and reference marker values for each category in section 2, above, for all highway segments within the county along with minimum, maximum, and mean scores for the condition item under consideration;

    c. Condition scores sorted by highway type and reference marker values whose condition score(s) are between two given, user-specified values;

    d. A variety of "ad hoc" reports that are custom to the needs of the district management for special requests on an as-need basis;

    e. The ability to create data sets from item 3 a, b, c, and d, above, that can be subsequently plotted by any of the popular spreadsheet graphics programs; and

4. The maintenance of a 5-year history file capable of storing the summary condition values along with the associated highway segment location data (This file permits the generation of historical data to enable district engineers to visualize pavement degradation over time).

The next chapter describes in detail, the DOS-based design features of the D 21 microcomputer-based Pavement Management System.

CHAPTER 2
OVERVIEW OF THE DATABASE DESIGN

2.0 OVERVIEW

The D 21 PMS database design represents a DOS-based 386/486 microcomputer system utilizing the DATAEASE relational database package along with numerous Microsoft QuickBasic compiled data preparation/reduction programs. Figure 2.1 illustrates the general DOS-based directory scheme for the current TTI 900 database.

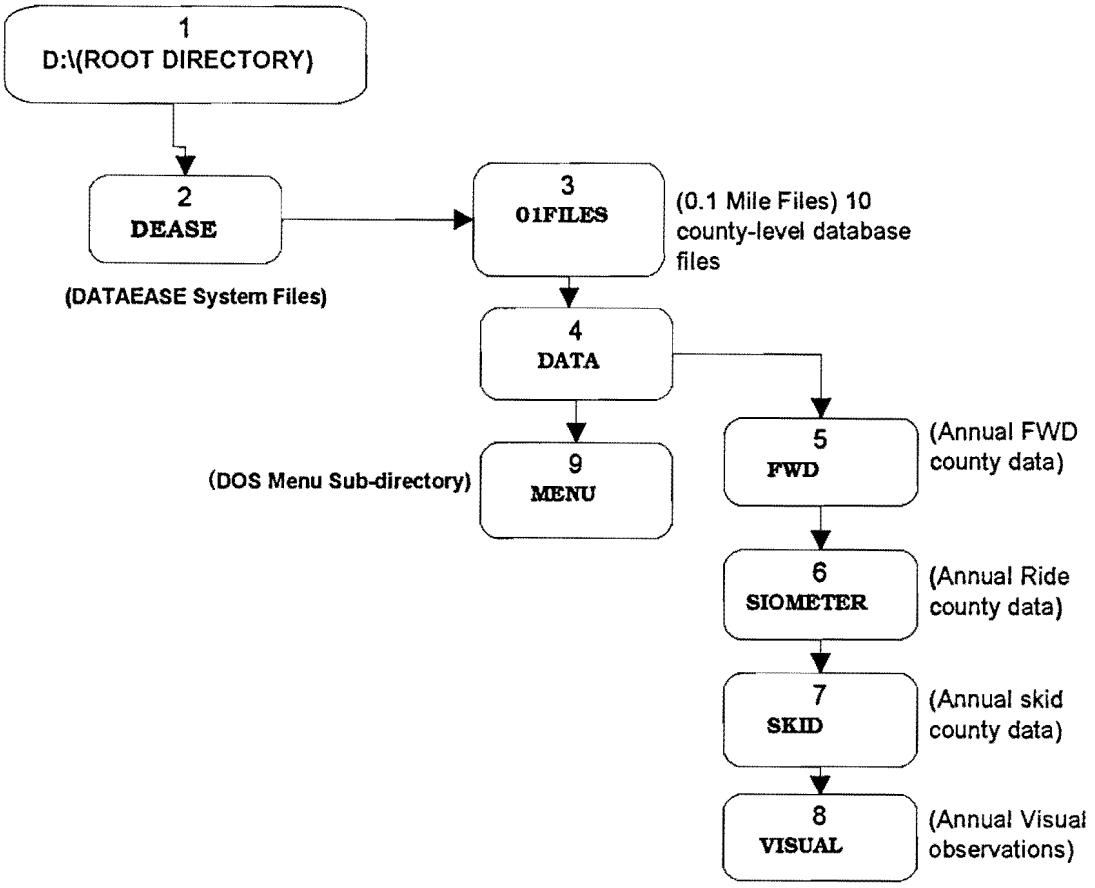


Figure 2.1 D21 P.M.S. DOS Directory Structure

From Figure 2.1, the individual DOS directories that support the system are now defined. (The numbers within each directory/sub-directory icon as shown in Figure 2.1 are used to reference the subsequent discussion). Specific details follow.

1. D:\(ROOT DIRECTORY)

The root directory on the D: drive where the entire D 21 PMS database is stored.

2. DEASE - (D:\DEASE)

The sub-directory that stores the DATAEASE system files and the various ___.EXE Microsoft QuickBASIC programs. Each ___.EXE program will be referenced and discussed in subsequent sections of this report as needed. The current version contains 147 files requiring 4.7Mb of disk space.

3. D:\DEASE\01FILES*.*

This sub-directory holds the DATAEASE database files and the data associated with the 0.1 mile file structure. This directory is comprised of 10 separate 0.1 mile files (one file for each county within the Pharr district). Each of these files holds one record for every tenth-mile highway segment in the respective county. This set of files holds the collected siometer data for a given year. In the near future, these files will be expanded to hold selected highway segment history values (past five years) of PRS, FWD, Skid, and Siometer values. The details of the file structure associated with 0.1 mile file will be presented in a later section of this report.

The current version contains 371 files requiring 21.8 Mb of disk space. These files represent database system files, the 0.1 mile file templates, database procedural language programs (PROCS), 0.1 mile index files, and the associated 0.1 mile data.

4. D:\DEASE\05FILES*.*

This sub-directory contains the DATAEASE database files and the data associated with the 0.5 mile structure for each county in the Pharr District. There are 10 separate files (one file per county) each holding the appropriate number of 0.5 mile segment records for every state-maintained highway in the respective county. The 0.5 mile files holds the collected Visual, FWD, and Skid values.

The current version contains 643 files requiring 11.0 Mb of disk space. These files represent database system files, the 0.5 mile file templates, database procedural language programs (PROCS), 0.5 mile index files, and the associated 0.5 mile data (visual, FWD, and skid values).

5. D:\DEASE\DATA*.*

The DEASE\DATA sub-directory is generally blank. The purpose of the \DATA sub directory is to serve as "root" directory for the FWD, SIOMETER, and SKID sub directories.

6. D:\DEASE\MENU

This directory contains nine (9) DOS-based files associated with the AutoMenu DOS-based system. This series of programs represents a public domain software package that permits generation of text screen menus. A program called AUTOMENU.DAT contains a series of DOS batch file type commands that define the screen menus. When the database system is presented to the user, the main menu is generated from the AUTOMENU.DAT file. The on-screen menu defined by this system represents the interface between the user and the DATAEASE database system.

Specific files for the D 21 start-up menu are

auto.bat,
automenu.com,and
automenu.dat.

The automenu.dat file contains the commands that display the start-up menu to the user. The automenu.dat file produces the current D 21 start-up menu (see Figure 2.2). To activate the D 21 PMIS system from DOS, enter **D 21** <Enter>. The PMIS Entry Menu appears as shown in Figure 2.2.

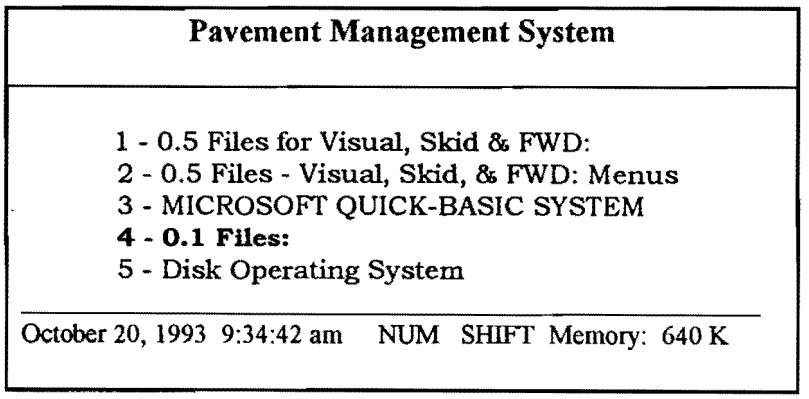


Figure 2.2: D 21 Start-Up Menu

The succeeding chapter will discuss accessing the system from DOS and the various options as shown in Figure 2.2. To enter the DataEase Database, select option 4 - **0.1 Files** < Enter >.

7. DEASE\DATA\FWD

The DEASE\DATA\FWD subdirectory is used to store the falling weight deflectometer raw data as collected in the field. Typically, FWD data is stored on 3.5 inch diskettes. When FWD data collection for a given county is completed, the raw data is returned to the Pharr District Headquarters. The resident pavement management specialist examines the data files and using a text editor and DOS commands, merges the FWD data sets into one file. For larger counties, two or more merged data files are created. Examples of the merged data set follow:

CAMERON.DAT
BROOKS.DAT
:
:
ZAPATA.DAT.

Each file contains FWD raw data for each county. Back-up copies of the data are made and saved in case of need. These *.DAT files are used in the FWD data reduction-data import process that will be described in a subsequent section of this report.

Since the current format (1992) for FWD is involved, the file sizes for raw FWD data can be substantial. FWD raw data files vary from 25Kb for Brooks County to 250Kb for the larger counties (Cameron and Hidalgo).

8. DEASE\DATA\SIOMETER

This directory is used to hold the raw siometer data. Siometer data is collected in the field, stored on floppy disk, returned to the District Headquarters, and merged into a county-level file (similar to the FWD process). The Pharr District personnel usually name the raw siometer data collected for a given county according to the following convention:

RIDE.024:= Raw Ride Data for Brooks County (024)
RIDE.031:= Raw Ride Data for Cameron County (031)
....
....
RIDE.253:= Raw Ride Data for Zapata County (253)

The naming convention uses the county number as the DOS file extent. Typical raw siometer file sizes vary from 10Kb for Brooks County (024) to 64Kb for Hidalgo County (109).

9. DEASE\DATA\SKID

This directory contains the individual raw skid data files as collected from the field. The district's file naming convention for raw skid data uses the following DOS naming convention:

SKxxxxxx.CNM,

where:

SK =	SKid designation - first two characters of the file name,
xxxxxx =	Month-day-year corresponding to the date the raw skid data was collected and,
CNM =	Three letter County Name abbreviation.

Example:

Raw skid data for Willacy county collected on May 10, 1993 might be saved as follows:

SK51093.WIL.

Typical raw skid data files vary from 10Kb for a one-day collection to over 20Kb for a single day's collection in a densely populated county. Skid data reduction requires merging the various daily files from a county into one county file. This is accomplished by first insuring that the county in question has been properly collected. In some years a specific county could be sampled for skid data. In other years, a county would be 100% collected. Regardless of the coverage, the daily raw skid files need to be merged into one file. The following example illustrates the merging of daily skid files.

Given the following raw skid data files,

SK51093.WIL
SK051193.WIL
SK051293.WIL,

one can see that these are the three files containing raw skid data collected on May 10, 11, and 12, 1993 for Willacy County. To prepare this data for subsequent import, the following DOS commands would be issued from the D:\DEASE\DATA\SKID directory:

COPY *.WIL WILLACY.SKD.

The DOS *COPY* command copies all files with extent WIL to the single file WILLACY.SKD. Thus, the merged file, WILLACY.SKD, now represents the entire county.

2.1 HIGHWAY SEGMENT LOCATION

Data collection for this system relies totally on the current TxDOT highway reference marker system. The State of Texas has designed a Pavement Management Information System (PMIS) which contains approximately 180,000 sections of State-maintained highways. These sections are usually 0.5 mile (0.8 Km) in length, although some are longer and some are shorter.

For the Pharr District, all PMIS sections (nominally 0.5 mile sections) were extracted from the TxDOT mainframe system and segmented on a county-by-county basis. These files comprise the 0.5 mile files described herein. By incorporation of QuickBasic .EXE program, the authors used the 0.5 mile file to build a 0.1 mile file.

The system described herein uses the following highway segment location data for each 0.1 mile section in the 10 county district.

1. County Number := 3 digits e.g., 024 for Brooks County
2. Highway Prefix := 2 letters such as

   FM = Farm-to-Market
   IH = Interstate Highway
   US = U.S. Highway
   SH = State Highway
   BU = Business U.S. Highway
   PR = Park Road

3. Highway Number = 4 digits, e.g.," 0430"
4. One character highway suffix
5. One character roadbed designation
6. Three digit Reference Marker value
7. One character Reference Marker suffix
8. Reference Marker Displacement sign ("+" or "-")
9. Reference Marker Displacement value (X.X) in miles

Each highway segment is coded with these nine fields. The 0.5 mile and 0.1 mile files for each county possess unique records for each segment. In this manner, any given segment can be located and referenced for data import.

The following fields uniquely locate a segment of FM 430 in Brooks County (County number 024):

024FM 0430 K508 +0.0.

This character string represents county number 024, FM0430, K roadbed at Reference Marker 508 +0.0 miles.

Details of the Texas Reference Marker System can be found in the following TxDOT publication available from Division 8, Pavement Management:

"*Pavement Management Information System Rater's Manual for Fiscal Year 1994*", TxDOT - D-8Pav., Austin, Texas, Pp.3-16.

The next chapter describes the collection, importing, and reporting of visual data collection based upon 0.1 mile sections.

CHAPTER 3
IMPORTING PMIS DATA AND SCORES FROM TXDOT PMIS

3.0 OVERVIEW

The previous chapter described the steps required to prepare the district level system to receive collected data and scores from the state system. This chapter describes the necessary steps to transfer the state data and scores into holding files for subsequent import-matching into the appropriate county-level database file. An overview of the process described in this chapter is illustrated in Figure 3.1.

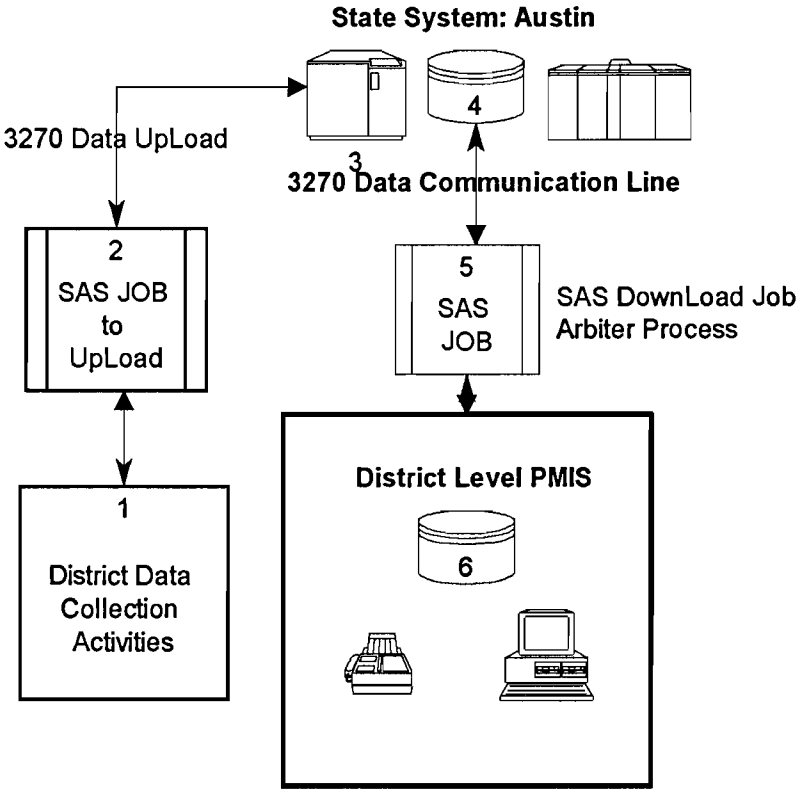


Figure 3.1: Overview of Data Flow

Figure 3.1 provides an overview of the flow of data beginning from the field collection activities and ending with the importing of data and calculated scores.

1. Data collection activities begin in September with visual ratings. Throughout September - May, districts collect visual, ride, skid, and FWD data. As these datasets come into the district from their respective data collection platforms, the raw data is uploaded to the state mainframe system via pre-written 3270-mainframe routines. (See element 2 in Figure 3.1).

2. Once uploaded into the mainframe system, a number of data analysis/data checking routines are executed. Data passing the quality control checks is input to the "CALC" routines where the various pavement scores are determined. The resultant PMIS data is stored on the mainframe (element 4 in Figure 3.1) and is accessible to the districts.

3. Once data and scores are available, the district can access the location data, raw data and associated scores using the 3270 Arbiter communications package. A pre-written SAS routine (element 5 in Figure 3.1) is executed through Arbiter to locate the appropriate county (referenced by county number) and transfers the associated data in ASCII format back down to the district (element 6 of Figure 3.1). The transferred data is temporarily stored in holding files for subsequent import into the district level database system.

To accomplish the data transfer from the state level to the district level, the user is required to run separate SAS jobs (one job per county). Each job essentially builds a separate county-level dataset that is named by the user. The user names the destination file on the district's PC as follows:

C:\D21DATA*countyname*.DAT.

Upon completion of running all 10 counties (specific to District 21), the user should have the following data files in the C:\D21DATA directory:

BROOKS.DAT
CAMERON.DAT
DUVAL.DAT
HIDALGO.DAT
JIMHOGG.DAT
KENEDY.DAT
STARR.DAT
WEBB.DAT
WILLACY.DAT
ZAPATA.DAT.

These files must be present in order to run a matching import into the district-level PMIS!

3.1 PARTIAL IMPORT

Partial data for a given county can be imported. As more data is collected, uploaded to the state system, and the scores calculated, then that data set can be downloaded. As more county data is collected, the download can be repeated and imported in over the existing data on the district's PC.

To amplify this point, consider that from September to December of a given year, visual data is intensely collected within all districts. Very little skid, ride, and FWD data collection takes place until the visual data is finished. As soon as the visual data collection is completed and uploaded, the user may download only the visual data (since this will be the only data in the system). As more data is collected (ride, skid, and FWD), a given county may be re-imported **in over the existing data**, i.e., data over-write. Thus, any subsequent import contains data previously imported plus any new, additional data. In this manner, the district has access to previously collected data and does not have to wait for all data types to be collected and up-loaded.

It is important to note that any subsequent new imports will contain data previously imported plus any new data. The subsequent import into the database files will overwrite existing data records (previously imported) while updating new data records.

3.2 MAINTAINING THE HISTORY FILE ACTIVITIES

The county-level file (for all 10 counties) contains a specific set of data fields towards the end of each highway segment record to hold selected segment scores from prior years. Appendix I, Figure I-4 and fields 58-111 illustrate the format and details associated with history fields. The current design supports six (6) years of history data to be stored within the 0.1 mile county files. History data fields are summarized in Table 3.1 (actual data values are not shown in the table).

Report Yr.>>> Category	92-93	93-94	94-95	95-96	96-97	97-98
VIS IDS	X.XX	X.XX				
COND:	XX	XX				
SCI:	XX	XX				
SSI:	XX	XX				
SKID:	XX	XX				
AVERIDE	XX	XX				
ADT	XXXX	XXXX				
18KP	XXXX	XXXX				
PAVETYPE	X	X				

Table 3.1: History Fields and Data Categories

The data fields that are "saved" (moved to the history fields) once all data collection activities are concluded within a given county are given by the database query **93-94 HIST MOVE** (See Figure 3.2).

DQL: 93-94 HIST MOVE

```
MODIFY RECORDS
VIS DISTRESS 93 := DISTRESS SCORE ;
CONDITION 93-94 := CONDITION SCORE ;
SCI 93 := SCI ;
SSI 93-94 := SSI ;
SKID VALUE 93 := SKID VALUE ;
AVE RIDE 93-94 := AVERAGE RIDE ;
ADT 93-94 := ADT ;
18KIP 93-94 := 18-KIP ;
PAVE TYPE 93-94 := NEW PAVEMENT TYPE.
```

Figure 3.2 : Database Query To Move Field Data to History Fields

This procedure has been specifically written to move the 93-94 data from the state PMIS calculated score fields to the respective history fields. Specifically, the following fields are "copied" to the history fields:

DISTRESS SCORE is copied to VIS DISTRESS 93 field;
CONDITION SCORE is copied to CONDITION 93-94;
SCI score is copied to SCI 93;
SSI score is copied to SSI 93-94;
SKID VALUE is copied to SKID VALUE 93;
AVERAGE RIDE is copied to AVE RIDE 93-94;
ADT is copied to ADT 93-94;
18-KIP is copied to 18KIP 93-94; and
NEW PAVEMENT TYPE is copied to PAVE TYPE 93-94.

3.3 IMPORTANT POINTS REGARDING DATA IMPORT

1. When all data for a given county has been field collected, verified, uploaded to the state's mainframe system and score values calculated, and subsequently downloaded to the district level PMIS, the user runs the appropriate HIST MOVE procedure. This procedure moves the critical PMIS scores for the given year to the history fields. While the HIST MOVE procedure can run anytime during the year, this procedure must be run when all data has been downloaded from the state system.

2. This HIST MOVE procedure is a required operation executed at the end of the data collection year in order to set up for the next year's activities. When the HIST MOVE procedure has been completed and all of the various reports are generated for the year, the next step blanks out all data collection fields except the segment location reference fields and the history fields. The following sequence of operations is required.

   a. Collect and upload the county data. This will be an on-going activity from September to July.
   b. Downloads can be executed any number of times during the year into a specified county.
   c. At the end of each download session, run the HIST MOVE procedure to update the history fields.
   d. Run the various reports and segment plots as needed.
   e When county-wide data collection is finished and uploaded, run the final download.
   f. Run the final HIST MOVE procedure.
   g. Run all of the required reports on the target county as needed.
   h. Back up the entire database to tape and retain.
   i. Run the BLANKing procedure on each county. This sets the county file up for the next year's data collection.
   j. Edit the MOVE HIST procedure to reflect the new year and save under the new year's name. This sets up a new HIST MOVE procedure. Delete the prior year's HIST MOVE procedure!

3.4 MODIFYING THE HISTMOVE PROCEDURE

At the end of a given year when all activities and reports have been generated from the current data and calculated scores, perform the following tasks:

1. Run the current year's HIST MOVE procedure,
2 Run any required reports,
3. Back up the entire database to tape and save in a secure location, and
4. Run the BLANKing procedures on all county 0.1 mile files.

3.5 BLANKING A COUNTY-LEVEL DATABASE FILE

The system maintains ten (10) database procedures that blank each of the 10 county-level database files for end-of-year clearing. Blanking the appropriate data input fields at the end of the current year ensures that none of the prior year's input data remains prior to downloading new data from the state mainframe system. While an import procedure "over-writes" existing data, it is possible for a new year's import to contain missing data. An import session that contains missing data would permit the existing data to remain within one or more active fields. This would bias the data summary for the new year and contribute to inaccurate summary values. Thus, it is imperative to blank the active fields prior to a new import.

To select a blanking procedure, start the database in the usual manner (Figure 3.3) and from the DataEase Main menu select option 4, DQL Advanced Processing.

DATAEASE - MAIN MENU

1. Form Definition and Relationships
2. Record Entry
3. Query By Example - Quick Reports
4. DQL Advanced Processing
5. Menu Definition
6. Database Maintenance
7. System Administration

Figure 3.3: DataEase Main Menu

Figure 3.4 illustrates the DataEase procedure language for blanking Hidalgo County. The remaining nine (9) blanking procedures are identical except for the target file name shown in the second line of the procedure.

BLANK HIDALGO Procedure

```
DEFINE TEMP "COUNTER" NUMBER .
for HIDALGO 0.1
;
COUNTER := COUNTER + 1 .
MESSAGE COUNTER .
modify records
AVERAGE RIDE := blank ;
 SSI := blank ;
 SCI := blank ;
 DISTRESS SCORE := blank ;
 CONDITION SCORE := blank ;
 SKID VALUE := blank ;
 SKID YEAR := blank ;
 SI VALUE := blank ;
 SI COMMENT := blank ;
 SI YEAR := blank ;
 W1 := blank ;
 W2 := blank ;
 W6 := blank ;
 W7 := blank ;
 FWD DATE := blank;
```

Figure 3. 4: Specimen Procedure: BLANK HIDALGO COUNTY

```
VIS LANE := blank ;
VIS COMMENT := blank ;
VIS YEAR := blank ;
PAVEMENT TYPE := blank ;
DISTRESS 1 := blank ;
DISTRESS 2 := blank ;
DISTRESS 3 := blank ;
DISTRESS 4 := blank ;
DISTRESS 5 := blank ;
DISTRESS 6 := blank ;
DISTRESS 7 := blank ;
DISTRESS 8 := blank ;
RAVELING := blank ;
FLUSHING := blank .
```

Figure 3. 4 (cont.): Specimen Procedure: BLANK HIDALGO COUNTY

It is important to emphasize that before any data can be downloaded from the state system, the district-level PMIS receptor system must be cleared of last year's data. However, prior to clearing, one must make certain that all reports have been generated and the current year's database directory has been backed up to tape. The procedure shown in Figure 3.5 must be executed for all 10 counties in order to prepare for current data downloading from the state PMIS system.

3.6 IMPORTING PMIS DATA FROM THE STATE SYSTEM

The importing of highway segment data from the TxDOT mainframe system to the district-level database represents one of the key activities needed to operate the district-level PMIS. It is assumed that all (or most all) of the annual data have been collected at the district level, edited, and uploaded to the TxDOT PMIS mainframe system. However, the system design permits downloading of segment data and associated scores whenever the values are available within the state system. Successive "downloads" into the district-level PMIS simply over-write existing data and may add data to the existing data set.

The following a priori conditions apply.

1. Segment data (Visual, FWD, Siometer, Skid) have been all or partially collected by the district for the current year.

2. The district has successfully uploaded the data to the TxDOT PMIS mainframe system.

3. The TxDOT mainframe PMIS has successfully calculated accurately the resultant pavement scores based upon the collected data and the scoring procedures have been validated by TxDOT.

When these three conditions have been satisfied, the district may initiate a download run to copy selected data fields from the state system into the district-level database system.

3.6.1 Requesting Creation of a Specified County Dataset From the TxDOT PMIS

The TEXDOT mainframe system in Austin maintains the up-loaded data and the associated calculated condition scores. The objective is to retrieve (down-load) parts of the collected data and the calculated scores for storage within the D 21 microcomputer database system. This requires a two-phase process. First, a SAS mainframe job is executed that extracts the specified data from the state-wide database and stores the resultant file on the mainframe under a predefined data set name (DSN), **"D48.PMIS.DIST21.DATA"**.

The second phase is the transfer (download) of the dataset to the district-level PC system. Once downloaded to a PC DOS file, the dataset can be imported into the district-level database for subsequent analysis/evaluation.

3.6.2 Phase I. Building the SAS ASCII File on the Mainframe

The following steps detail the procedures necessary to accomplish a Phase 1 download run.

1. Log into ROSS1, San Antonio region using the established 3270 bind.

2. The appropriate JCL routine to execute a SAS mainframe job for file transfer to the district PC is stored under the N215722 ACID under the name "**DRSTTI**".

3. **F**(etch) **DRSTTI** and **A**(dd) to the active file.

The first part of the SAS JCL that facilitates creating a downloadable dataset to the district's PC database (composed by Craig Cox, D 8PM) is shown in Figure 3.5

SAS PROGRAM TO EFFECT STATE PMIS DOWNLOAD TO DISTRICT LEVEL

```
000001 /*PRIORITY 8
000002 //R4100000 JOB (00000000,N215722),'DRS TTI          ',
000003 //       CLASS=B,MSGLEVEL=(1,1),MSGCLASS=R,TIME=5
000004 //NOJESLOG OUTPUT JESDS=ALL,OUTDISP=(PURGE,WRITE)
000005 /*JOBPARM T=220,L=120
000006 //PMISDUMP  EXEC SAS608,WORK='30000,5000'
000007 //* D21DB  DD  SYSOUT=*
000008 //* D21DB  DD   DSN=D48.PMIS.DIST21.DATA,
000009 //*      UNIT=SYSDA,SPACE=(CYL,(10,5),,,ROUND),
000010 //*      DISP=(NEW,CATLG),
000011 //*      DCB=(RECFM=FB,LRECL=161,BLKSIZE=16100)
000012 //D21DB  DD  DSN=D48.PMIS.DIST21.DATA,DISP=(OLD,KEEP)
000013 //SYSIN    DD *
000014 OPTIONS LS=165 MISSING=' ';
000015  /*                    PMIS DATABASE DUMP
000016    ************************************************************************
000017    *
.........
000034 *
000035   ************************************************************************
000036 */
000037
000038 %LET FY = %STR(1994);        ********>  FISCAL YEAR;
000039 %LET RD = %STR(17);         ********>  RESPONSIBLE DISTRICT;
000040 %LET CN = %STR(145);        ********>  COUNTY NUMBER;
000041 %LET CYC = 1;                ********>  RATING CYCLE;
000042 %LET HWY = %STR(      );    ********>  HIGHWAY;
000043
000044 %LET DBID=P3;
.........
```

Figure 3.5: Opening Part of the SAS JCL to Create the Downloadable Dataset

Observations: (See Figure 3.5)

1. Line 000008 of the JCL contains the pre-defined dataset name (DSN) = **D48.PMIS.DIST21.DATA.** *Do not change this parameter!*

2. Lines 000038 - 000042 (highlighted in Figure 3.6) permit the user to target the following:
   a. A given year of data (Line 000038);
   b. Specify a given District Number i.e., "21" for District 21, (Line 000039);
   c. A specific county number, i.e., "109", (Line 000040); and
   d. A specific highway, (Line 000042).

Using the **Alt-8** key, scroll down to lines 000034 - 000051 of the SAS JCL.

The user edits line 000040 to specify the target county number. Specification of the county number and Responsible District permits building a county dataset for all highway segments within the specified county. If the user edits line 000042 and specifies a certain highway, then the dataset contains only that highway within the specified county for the given district. It is suggested that no entry be made within the parentheses of line 000042. A "no entry" defaults to "all highways" within the specified county.

4. In order to download a given county within District 21 for 1994, the following lines should read (see Figure 3.6).

```
000030  %LET FY = %STR(1994) ;
000039  %LET RD =%STR(21);
000040  %LET CN = %STR(XXX)
000041  %LET CYC = 1 ;
000042  %LET HWY = %STR(    );
```

Figure 3.6: Specific SAS Statement Lines Needed for Downloading

In line 000040, the user will specify the appropriate county number in place of "XXX".

Example:

To download county 109, line 000040 should read:

"%LET CN = %STR(109)".

Leave the other parameters as shown. This will cause the SAS job to produce data and scores for all highways within District 21 in county number 109 and store the results under the data set name "**D48.PMIS.DIST21.DATA**".

It is suggested that the user download one county at a time. One could download the entire district by placing "999" in line 000040. However, this would create a 16-18 Mbyte file which is far too cumbersome to handle. It is suggested that the user work with one county at a time.

5. After a county has been selected, the SAS job must now be executed (submitted). Assuming the user has edited the appropriate county number, press <enter> key to move the cursor to the command line at the top of the screen. To execute the job, from the command line enter the following:

SUBMIT < enter >.

The system will respond acknowledging receipt of the job. Note: It is not abnormal for the mainframe system to require from 10 minutes to up to 60 minutes or so to finish the job. Time to completion is a function of many variables such as high priority jobs in the queue, system downtime, etc. and one should expect moderate delays due to the saturation of the TxDOT mainframe system.

6. After the job has been submitted, the user should save the SAS job by entering

UPDATE * < enter >.

This saves the job so that the next time the JCL is requested, the user can see the last county executed. Therefore, UPDATE the active file after each SUBMIT command.

7. Assuming the UPDATE * command has been issued, the active file is deleted by entering

DEL < return >.

Exit ROSS1 in the normal fashion.

This completes Phase I of the two-phase process. At this point, after a time delay for post-submit execution, the SAS dataset **D48.PMIS.DIST21.DATA** will contain the specified county's data and scores. The next phase describes how the data is *downloaded* from the mainframe to the district's PC database.

3.6.3 Phase II. Downloading the SAS Dataset to the District-Level Database

At this point, the user has the dataset **D48.PMIS.DIST21.DATA** created and stored on the mainframe library. The task is to transfer this dataset down to the district PC for subsequent importing into the PMIS microcomputer database. This task is accomplished by invoking ARBITER.

Before beginning this step make certain that the DOS directory C:\D21DATA or D:\D21DATA exists on the district's PMIS microcomputer. The normal configuration is **C:\D21DATA**. This directory must exist prior to the downloading of the SAS dataset for the specified county. The ARBITER file transfer from the mainframe to the PC is setup to point the downloaded dataset to this specific directory.

The steps necessary to accomplish the file transfer (download) follow.

1. Log onto ARBITER from DOS by typing

ARBITER < return >.

2. Supply the appropriate password and press < enter >.

3. The following ARBITER Services appear (see Figure 3.7).

Arbiter Services
1. Remote Disk
2. Remote File Server
3. External File Interface
4. Interactive Session Relay Terminal
5. Miscellaneous Services

Figure 3.7: Arbiter Services Options

4. Select ARBITER option **3. External File Interface.**

5. ARBITER responds with (Figure 3.8).

File Transfer		
1. SEND	PC file ====>	Host
2. SENDR	Remote Disk ====>	Host
3. SENDRB BATCH	Remote Disk ====>	Host
4. RECV	Host ====>	PC file
5. RECVR	host ====>	Remote Disk
6. RECVRB BATCH	Host ====>	Remote Disk
7. EDIT TRANSFER CHARACTERISTICS		

Figure 3.8: Arbiter Responses

Select option **4, RECV** (host sends a specified file to a PC file).

6. ARBITER responds with the following.

From:

Host DSN	**D48.PMIS.DIST21.DATA**	Member	( )

To:

FilePath	**C:\D21DATA*countyname*.DAT**

Wmode	**Replace**

Note:

1. The Host DSN (DataSetName) must be "**D48.PMIS.DIST21.DATA**". If it is not, edit the Host DSN box as shown above.

2. The FilePath must read: C:\D21DATA*countyname*.DAT where,

countyname = the specific name of the county to be downloaded.

Example:

Assume Brooks County is the downloaded dataset. Then, the correct FilePath must read as follows.

C:\D21DATA\BROOKS.DAT.

Thus, the county name is set to reflect the name of the downloaded county. **This parameter must be changed each time the download is performed to reflect the name of the county being transferred.** The impact is that the **C:\D21DATA** directory holds the individual SAS ASCII datasets for all counties that the user chooses to download.

The following file names (Table 3.2) **must be used** in order to not have to modify any DataEase pre-written import procedures. ***Strictly adhere to the these naming conventions***!

Specified County	Designated DOS File Name
Brooks County:	BROOKS.DAT
Cameron County:	CAMERON.DAT
Duval County:	DUVAL.DAT
Hidalgo County:	HIDALGO.DAT
Jim Hogg County:	JIMHOGG.DAT
Kenedy County:	KENEDY.DAT
Starr County:	STARR.DAT
Webb County:	WEBB.DAT
Willacy County:	WILLACY.DAT
Zapata County:	ZAPATA.DAT

Table 3. 2: DOS FILE NAME ALLOCATIONS FOR D 21 COUNTIES

7. When the user has confirmed that the settings in step 6 are correct, press the <enter> key to begin the file transfer. The transfer can take up to 15 minutes depending upon the size of the specified county. A small county (Brooks, Zapata...) may take only a few minutes. Larger counties (Hidalgo, Cameron, ...) may take much longer. ARBITER will signal the user that the file transfer is complete. Upon completion, exit ARBITER in the normal fashion.

   Upon completion of the seven steps, the user will have transferred the data and scores for the specified county to the appropriate holding files. To begin another county, return to Phase I, step 1 instructions and log back into ROSS1. In the

next chapter, the procedures for transferring the data from the holding files to the actual database file will be presented.

3.7 SUMMARY

This chapter has described the specific steps required to build and transfer county-level (county-by-county) ASCII files containing the appropriate highway segment data and associated scores from the TxDOT mainframe to the district-level microcomputer. The transferred files now reside on the C:\D21DATA directory as "holding files". The next phase is to transfer from each county level holding file to the appropriate database file where analysis and manipulation can occur.

The next chapter defines the steps required to transfer the county-level data from the holding files on the district's PC into the D 21 database for subsequent data analysis.

CHAPTER 4
PMIS DATA IMPORT INTO THE DISTRICT DATABASE

4.0 INTRODUCTION

The previous chapter detailed the procedures for downloading district-wide PMIS data and calculated scores from the TxDOT mainframe system. This chapter is concerned with the procedures required to import each county's data into the microcomputer database system given that all procedures outlined in Chapter Three have been accomplished.

To review, the following data files must be present (as obtained from the procedures defined in Chapter Three) in order to conduct a successful import.

1. The DOS directory D21DATA exists on the appropriate drive (C: or D:) For the purposes of discussion, this report assumes that the C: drive is the active drive. If the D: drive has been selected, then drive references should reflect that drive.

2. The down-loaded county data files (10 of them) exist as,

   C:\BROOKS.DAT
   C:\CAMERON.DAT
   .....
   .....
   C:\ZAPATA.DAT.

Refer to Section 3.1 of the previous chapter if needed. ***For the subsequent discussion, the notation "*.DAT" will generically refer to a downloaded county file as presented above.***

The objective is to transfer (import) each county's file, one county at a time, into the respective county database file. To clarify, the files referenced in item 2, above, refer to the temporary DOS holding files as downloaded from the state system. Within the database system, 10 separate county database files exist with the database format described in Appendix 1. Each of the 10 county database files contain the previously identified 0.1 mile records for all highways in the respective county. Each of these 0.1 mile records contain a unique location key (PMIS Location Key) that identifies that particular segment of highway and is unique and singular to the system.

The user must transfer a record (highway segment) from the downloaded file into the appropriate (and correct) record (highway segment) in the database file. This transfer is based upon the PMIS key field in the *.DAT file (the downloaded file from the state system) **uniquely matching** the existing PMIS key field in the respective county database file. If a given record from the *.DAT file matches the designated county database file

record, all of the data contained in the county holding file is transferred to the associated record in the county database file. If the given *.DAT record does not find a match anywhere in the database file for that county, the *.DAT record is not imported and an error file is generated. The procedure moves to the next *.DAT record and seeks to find a matching record in the respective county database file where the matching process is repeated.

This process is continued until all *.DAT records have been processed by the matching scheme. The DATAEASE software's import procedure automatically provides for matching on a selected field. When concluded, the county database file contains all of data and scores provided by the state system except for any non-matching records. For non-matching records, the analyst must locate the non-matching state provided records and determine why the record did not match. From past experience with the state system, this problem has not occurred because the database records were built from the same records contained in the state PMIS system.

The District's PMIS system contains all of the active 0.1 mile segments within the 10-county district. For a given data collection year, a fraction of the district's inventory is sampled. Some data is collected on 0.5 mile intervals and other data is collected on 0.1 mile intervals. However, not all of the 0.1 mile segments are necessarily sampled. Thus, it is highly likely that the District's PMIS database records will contain missing data for the current year due to the fact that the data was not collected in the first place. Therefore, there will exist missing segments for a given year.

The remainder of this chapter describes the steps required to import and match the downloaded data from the state PMIS system.

4.1 GENERAL OVERVIEW OF THE IMPORT PROCESS

Figure 4.1 depicts the two-step data importing procedure.

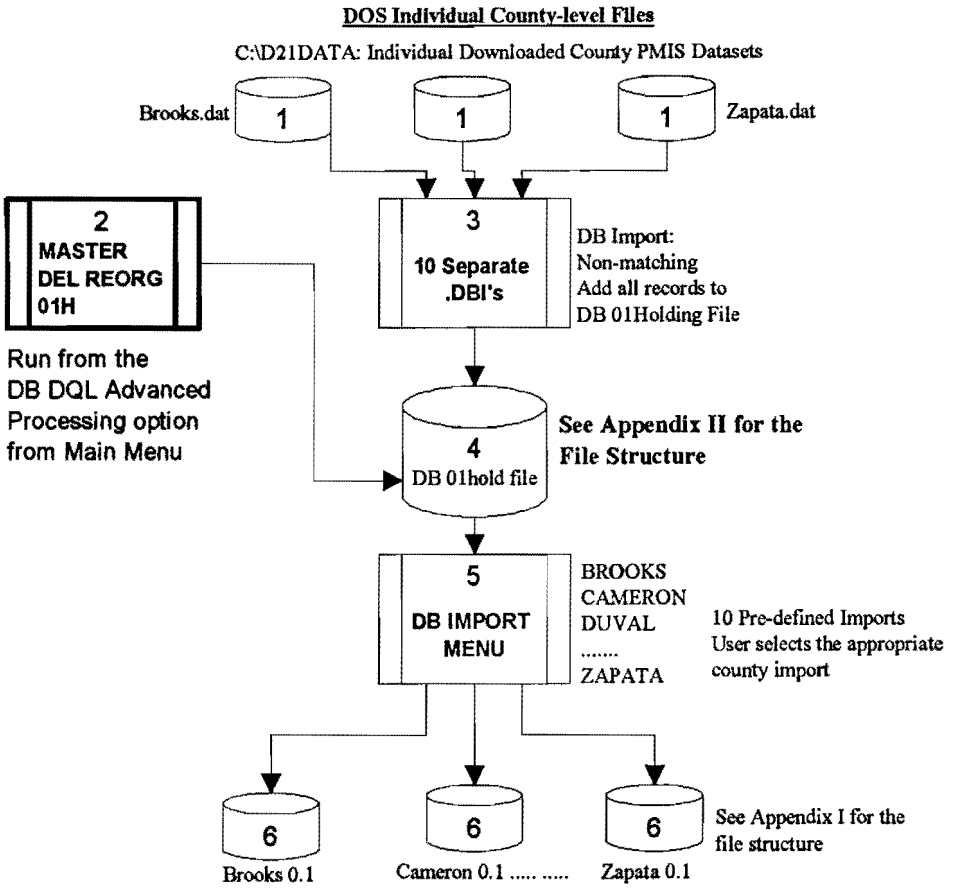


Figure 4.1: Overview of the PMIS Importing Procedure

(The numbers inside each object in Figure 4.1 are referenced and explained below).

1. The data files (objects 1) represent the DOS downloaded ASCII county-level PMIS data and scores as obtained from the state PMIS system. The file format for these files is defined in Appendix II. Before the importing of a given county or counties can be started, the respective county-level down-loaded file (partial or complete) must be present in the C:\D21DATA directory.

2. Refer to objects 2, 3, and 4 in Figure 4.1. To facilitate the importing from the DOS-based ASCII files, a temporary database file has been created and named as **01HOLD**.

   The 01HOLD file is a database file, not an ASCII file. The purpose of this file is to hold a given county-wide ASCII down-load file within the database system. The steps required are shown below.

a. Select a county.

b. Delete and reorganize the current 01HOLD file.

c. Import the selected county's ASCII file into the 01HOLD file using a DO NOT MATCH option in the database import section. A DO NOT MATCH option simply imports the PMIS data into the 01HOLD file without regard to any matching criteria. The procedure simply "copies" the data in the down-loaded ASCII file, record-by-record, into the database file.

d. Given the selected county's data in resident in the 01HOLD file, run the appropriate UPDATE MATCHING import (object 5 in Figure 4.1) that transfers all of the matching records in the 01HOLD file to the specified county's 0.1 mile master database file (Brooks 0.1, Cameron 0.1, ... , Zapata 0.1).

e. Select another county ?

1. Yes, go to step b, above

2. No, finished.

The next section describes the process of PMIS data import into the district-level microcomputer system

4.2 DETAILED STEPS FOR DATA IMPORT

This section provides the user with the step-by-step procedures required to complete data import. As previously stated, it is assumed that the required down-loaded ASCII files for the county or counties in question are up to date and located in the C:\D21DATA directory. Given a selected county, proceed as follows.

4.2.1 Step 1. Menu Selection

From the DataEase Main menu select option 4, DQL Advance Processing (Figure 4.2).

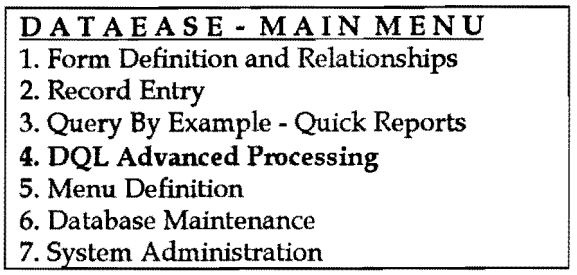


Figure 4.2: DataEase Main Menu

The DQL menu appears as shown in Figure 4.3.

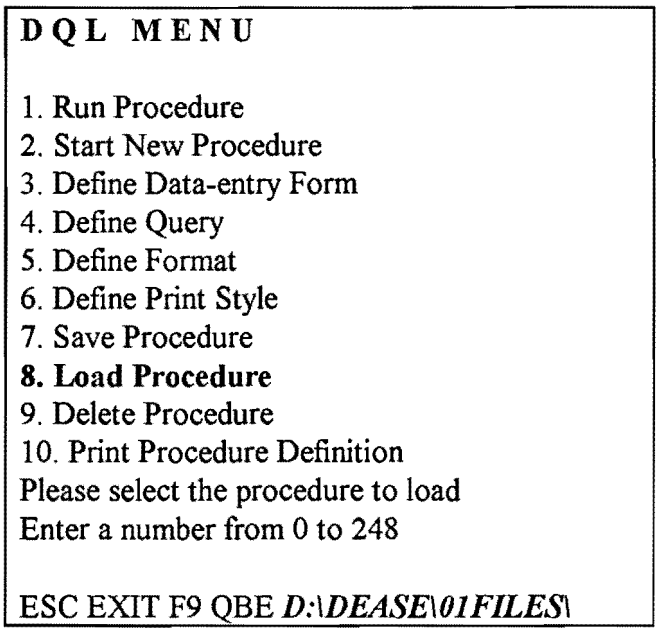


Figure 4.3: DQL Main Menu

Select **option 8, Load Procedure**. A window will appear on the right-hand side of the screen that presents the pre-written database procedures. Using the Pg Dn key scroll through this widow and locate the following procedure:

MASTER DELETE REORG 01H.

Press return to load this procedure. The list of procedures window will disappear and the DQL menu appears as shown in Figure 4.4.

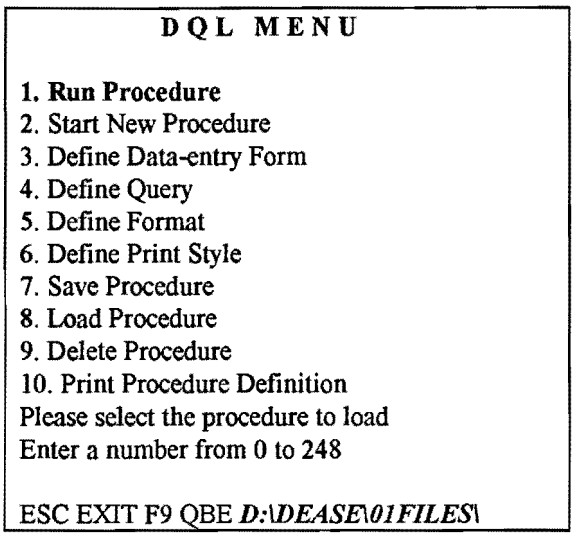


Figure 4.4: DQL Menu

Select option 1, **Run Procedure**. This procedure deletes any existing records that may have been left in the holding file and reorganizes this file to receive the ASCII data from the specified county. At this point the 01HOLD file is prepared for the desired non-matching import procedure.

4.2.2 Step 2. Import Phase

Return to the main menu (repeated pressing of the ESC key) and select option **7, System Administration** (see Figure 4.5).

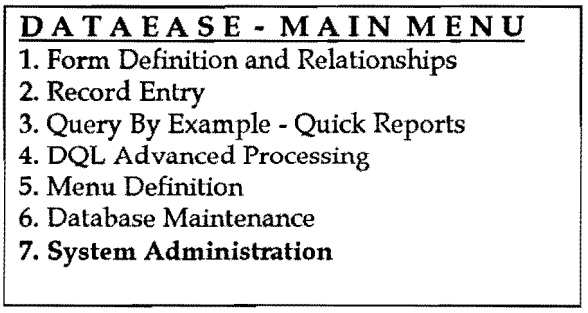


Figure 4.5: DataEase Main Menu

The System Administration menu appears as shown in Figure 4.6.

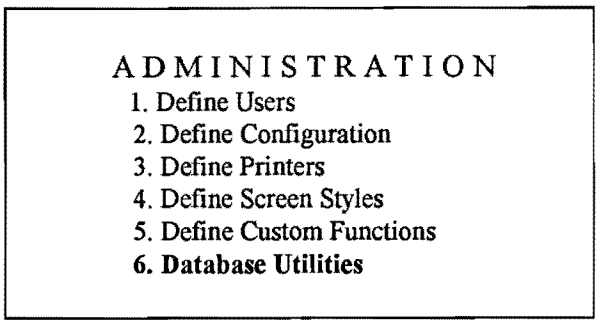


Figure 4.6: Database Administration Menu

Select option 6, Database Utilities. The Database Utilities menu appears as shown in Figure 4.7.

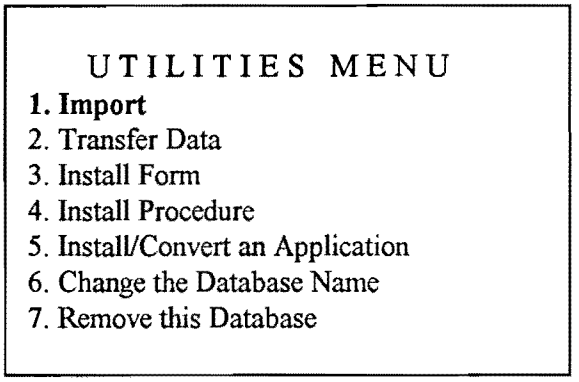


Figure 4.7: Utilities Menu

Select option 1. **Import.** The database import menu appears as shown in Figure 4.8.

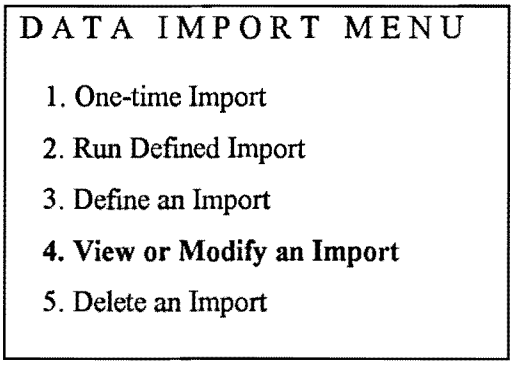


Figure 4.8: Import Menu

Select option 4. View or Modify an Import. A window will appear on the right-hand side of the menu screen showing 19 pre-written import procedures. Pressing the

Page Down key on the key board reveals two more additional imports. The pre-written imports are summarized in Table 4.1.

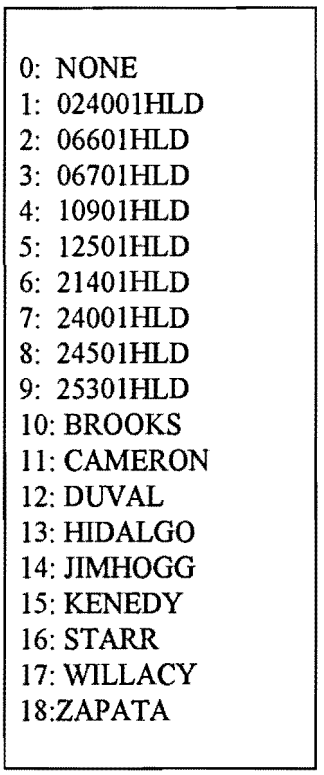


Table 4.1: Listing of Database Imports

Imports 1 through 9 are devoted to importing into the 01HOLD file. Imports 10 through 18 are devoted to importing counties from the 01HOLD file into the respective 0.1 mile master file for the named county. Imports 1-9 are referenced (coded) as follows.

Import 1: *02401hld* refers to

024 = the TxDOT assigned county number (Brooks County in this case),
01hld = 01 Holding File.

Thus, counties are referenced by their county numbers as the first 3 digits in the named import. To import Brooks (county 024) one would select the 02401hld import. To import Starr County, the named import would be **21401hld** (since Starr County is county number 214).

The remaining imports follow a county name convention. The named county imports are import procedures to import and match from the 01hold file into the named county's 0.1 mile master file. The named county import procedures will be covered subsequently.

Note, option 4 of the Import Menu permits one to view the actual import parameters and make any edits/changes deemed necessary. To illustrate, examine the import procedure 02401hld procedure by first highlighting the 02401HLD import and pressing return. The following information concerning this particular import is displayed in Figure 4.9.

Please select the destination Form Name :

01HOLD

Please enter the source data filename :

C:\D21DATA\BROOKS.DAT

What is the data file format ? : **VARIABLE LENGTH**

Field Separator character (If new line, press RETURN): ; (Press Return e)

Record Separator character (If new line, press RETURN): (Press Return e)
For fixed point fields, should the decimal be automatically inserted? :**yes**

The fields in the source file can be organized in two ways:

1. Field Order matches the DataEase form, ALL fields are transferred.

2. Field Names match DataEase Field Names, matching fields are transferred.

For Var. Length files, the first record must consist of source Field Names.

How is the source file organized ?: **BY FIELD ORDER**

Processing can be based on Match between existing and new records.

How should the matching records be processed ? **DO NOT MATCH**

Press F2 to Save, Esc to Exit, or F8 to modify specification

F4CMDHELP ESCEXIT F2SAVE F8MODIFY **6 45 pm**

Figure 4.9: Editing the 01hold File Import Procedure

Explanation (See figure 4.9)

1. The destination file is defined as the temporary 01HOLD database file.
2. The source file is specified as coming from the C:\D21Data\ directory .
3. The file to import is the C:\D21DATA\BROOKS.DAT downloaded PMIS ASCII file.
4. Fields in the source file are separated by the ";" character.
5. Records are separated by the carriage return (hidden) character.
6. Fixed point fields are to have the decimal automatically inserted, if required.
7. The source file is organized by field order. This specifies that the first field in the source file is placed in the first field of the destination file (01HOLD) file, the second field in the source is placed in the second field of the destination, etc.
8. The records in the source file are not matched to any existing records in the destination file because initially, the 01HOLD destination file is empty.

If, for any reason, the downloaded PMIS ASCII files are stored in another directory other than the C:\D21DATA directory, all imports pertaining to movement to the 01HOLD file will have to be edited to reflect the change of location of those files. If this is the case, edit the source data file name in the import procedure and SAVE the import. If the C:|D21DATA does not exist, then the import will fail because the designated source file(s) cannot be located. Pressing the ESC key returns to the main import menu.

To activate an import, from the main menu select option **2. Run Defined Import**. (See Figure 4.10).

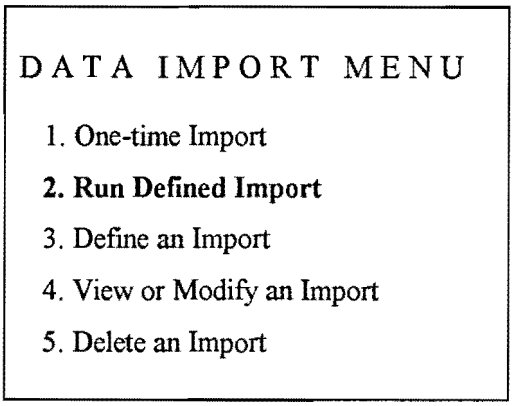


Figure 4.10: Run Defined Import

The following menu appears (Figure 4.11).

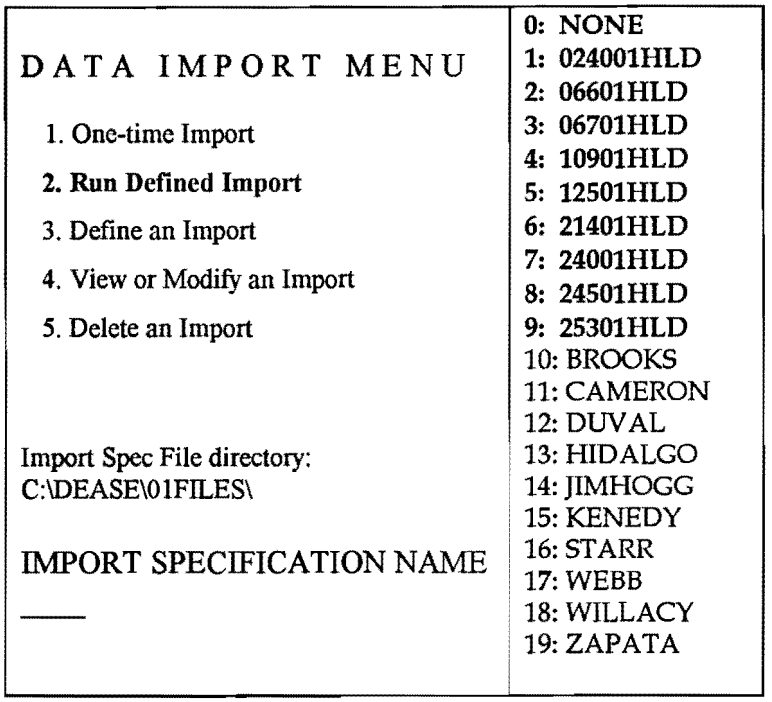


Figure 4.11: Import Choices

The user selects the appropriate county from **imports 1-9** by using the up-down error keys on the keyboard. A blue background will highlight the selected import on the right-hand side of the screen. When the appropriate county numbered import has been selected, the user presses the return key to begin the import. Imports 10-19 will be discussed in the next step.

At the conclusion of the import, the 01HOLD file now contains the downloaded state-provided PMIS data for the selected county. The next step is to import from the 01HOLD file into the appropriate 0.1 mile county database file. **Do not delete any records in the 01HOLD file until the next step is completed!**

4.2.3 Step 3. Matching Import Procedure

This step is involved with the matched-movement of records now residing in the 01HOLD file to the specified county-level 0.1 mile file. To review, the District-level database consists of 10 separate 0.1 mile database files. Each county within in District 21 has it own 0.1 mile database file. The file structure is defined in Appendix 1. The objective in this step is to transfer the data in the 01HOLD file to the matching 0.1 mile file for the same county. However, unlike the previous import where a no-match condition was specified, this step requires that the records in the 01HOLD file match records in the specified county-level file.

The match is based upon the first field in the 01HOLD file and the first field in the specified 0.1 mile database file. The matching field name is **PMIS KEY** in the 01HOLD file and **RMK** (Reference Marker Key) in the county-specific 0.1 mile master file (see Appendix I and II) is a 21 character field. This field exists in both the 01HOLD file and the county-specific 0.1 mile master file and provides a matching record key for both files. The field is constructed by "joining" the following pavement section location parameters:

1. County number,
2. Highway Prefix,
3. Highway Number,
4. Highway Suffix,
5. Roadbed,
6. RM (Reference marker),
7. RM Suffix (Reference Marker suffix),
8. RM Displacement sign (+ or -), and
9. RM Displacement Value.

The convolution of these nine location parameters creates a 21 character text field that represents a unique location key for each 0.1 mile segment. In other words, no two tenth-mile segments will have the same PMIS or RMK key field.

The following process reads each record in the 01HOLD file and matches the current record to an existing record in the county-specific 0.1 mile file based upon equal PMIS and RMK field values in their respective files. In this manner, the data for the collected segment is posted to the correct record in the county-specific 0.1 mile master file.

In designing the system both the PMIS field and the RMK field are indexed fields which permits rapid look-up and matching.

From the Import Main Menu, (Figure 4.12) select option **2. Run Defined Import.**

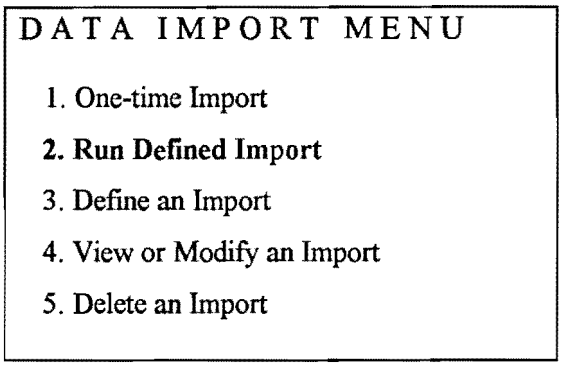


Figure 4.12: Running Defined Import

As in the previous import, a right-hand side window opens displaying all of the pre-written imports. The user is to select one of the imports from import choices 10-19. The choice depends upon the specific county that the user requires (Figure 4.13).

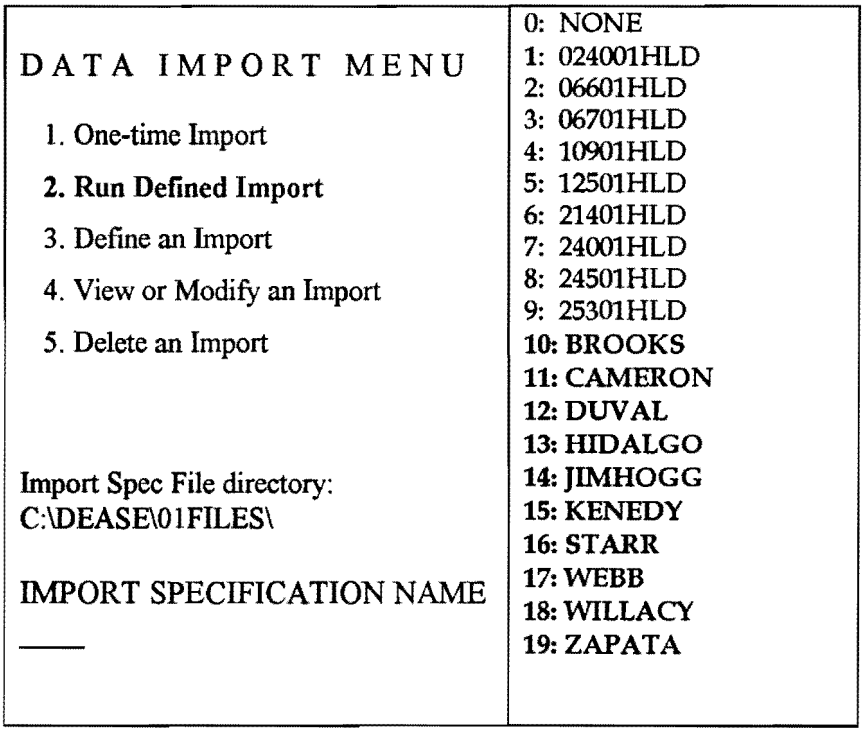


Figure 4.13: Database Import Menu - Import Choices

Use the up-down arrow keys on the keyboard to select the named county **(options 10 through 19)** then press return. The database system manager will control the import

process by matching existing records in the 01HOLD database file to the matching records in the 0.1 mile county specific file (BROOKS, CAMERON,....,ZAPATA).

At the conclusion of the transfer, the system will return to the Data Import Menu. Pressing the ESC key three times will return the user to the Main DataEase System Menu. shown in Figure 4.14.

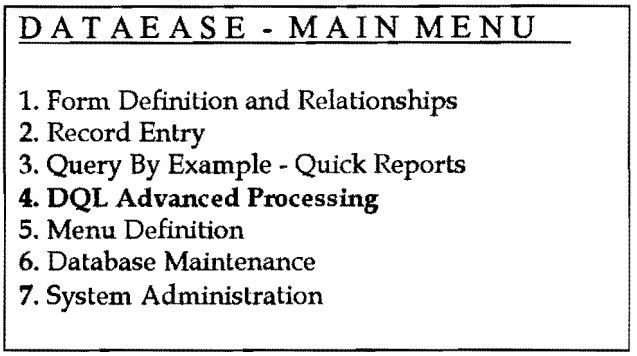


Figure 4.14: Database Main Menu

At this point, the user has concluded the data transfer from the 01HOLD file into the county-specific 0.1 mile master file. Assuming no difficulties, the data contained in the 01HOLD file is no longer needed since the user is finished with the specified county.

If the user desires to work with another county, **return to Step 1** and delete/reorganize the records in the 01HOLD file If the user is finished (for the time being) it is still a good idea to return to Step 1 and set the 01HOLD file up for the next import.

4.4 SUMMARY

This chapter has reviewed the details associated with moving the imported data from the state-level PMIS mainframe system into the district-level PMIS. The resultant import matches the reference marker values in the down-loaded files to the existing reference markers resident in the district-level PMIS. The matching requirement insures that the correct highway segment data from the state-level PMIS is correctly located in the identical 0.1 mile segment in the district-level PMIS.

The next chapter covers the database report and query features that permit producing assorted required and ad hoc reports used in district-level PMIS maintenance and rehabilitation decisions.

CHAPTER 5
GENERATION OF PMIS SUMMARY REPORTS

5.0 INTRODUCTION

The previous chapter described the procedures required to import PMIS data and scores from the TxDOT mainframe system into the District PMIS system. This chapter describes the procedures and gives examples of the variety of summary reports obtainable from the information now resident in the District-level PMIS system.

The TxDOT system (mainframe database) has been designed to receive, hold, calculate, and summarize the data collected at the district level. The TxDOT mainframe system provides the districts with printed reports required by TxDOT administration (standardized reporting) relating to the District's data and scores. However, numerous situations occur at the district level that require summarizing and reporting the data and scores in formats not covered by the TxDOT standard reporting formats. One of the valuable functions served by the district-level PMIS system is to permit the rapid development of data summarization pertaining to customized and ad hoc reports and plots.

The system as reported herein contains a number of custom reports specific to D 21 needs. This chapter will summarize these reports, describe the report generation process, and provide examples of some of the more useful reports. The district-level PMIS system also permits the generation of x-y plots of highway segment data via the data export feature into a spreadsheet program for visual analysis.

The report generation capabilities of the database will be summarized to illustrate the power and flexibility of ad hoc report generation. The trained pavement management analyst can create, format, and execute virtually any combination of data summarization profiles necessary to address specific needs for data reporting outside of the TxDOT system. The remainder of this chapter will summarize and describe these features of the District-level PMIS system.

5.1 OVERVIEW OF THE REPORT GENERATION PROCESS

The District-level PMIS database system permits the user to summarize the data from any of the resident database files into virtually any format desired by the user. This is accomplished by entering the DataEase Report Generation module and composing the appropriate DataEase Query Language statements that will search the designated file for the condition specified in the query language source file. In developing this system for District 21, the authors, over a three-year period, designed numerous standardized reports that summarize ride, skid, FWD, visual, and combinations of these measurements into a collection of reports. The current system maintains over 200 report procedures ("report procs") that are saved within the DataEase system. Each of the "procs" are available to the user through the DataEase Main Menu screen.

Database reports, once composed can be presented to the user in three possible modes: On-screen, line printer (most common), and spooled to a specified ASCII file on disk. The line printer option has been setup to accommodate the Hewlett-Packard LaserJet family of printers. However, other printers can be specified simply by changing the printer definition option. The "spool to disk" option is useful when the user desires to create a plotting file that can be exported to an external plotting program. The authors have successfully used Microsoft's Excel (Version 5) spreadsheet data graphing ability. However, any plotting routine capable of importing a generated ASCII file will suffice.

To produce any one of the pre-written reports or to generate an ad hoc report, enter the report generation section of the DataEase PMIS system, and enter the following commands.

1. Assuming the user is in the C:\ root directory, enter **D21** followed by <Enter>.

2. The D21.bat file presents the preliminary entry screen shown in Figure 5.1.

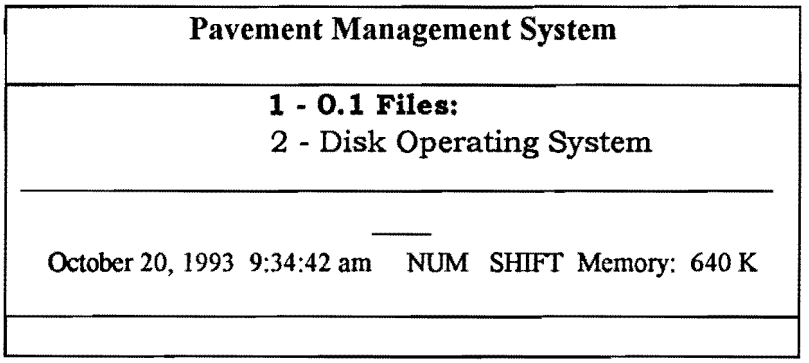


Figure 5.1: D 21 Main PMIS Entry-Level DOS Menu

Enter menu option 1. **0.1 Files** <Enter>.

3. The main DataEase system menu appears as shown in Figure 5.2.

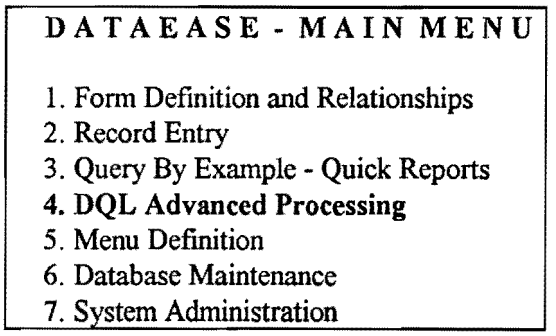


Figure 5.2: Main DataEase Menu

Select option 4. **DQL Advanced Processing**. "DQL" refers to Data Query Language capability of the DataEase database system. Note, Option 2. Record Entry (presented later) permits viewing of a specified record within a specified file in an on-screen mode. The DQL Advanced Processing menu appears (Figure 5.3).

```
D Q L   M E N U                    0: NONE
                                   1: BUILD 0.1 HEADERS
  1. Run Procedure                 2: PRINT SEL RIDE
  2. Start New Procedure           3: MISS SEL SIOM
  3. Define Data-entry Form        4: SEL HW SEG WITH SIO
  4. Define Query                  5: PRINT TOTAL RIDE
  5. Define Format                 6: PRINT CRIT RIDE SEGS
  6. Define Print Style            7: BROOKS 0.1 HEADERS
  7. Save Procedure                8: CAMERON 0.1 HEADERS
  8. Load Procedure                9: DUVAL 0.1 HEADERS
  9. Delete Procedure              10: HIDALGO 0.1 HEADERS
  10. Print Procedure Definition   11: JIMHOGG 0.1 HEADERS
                                   12: KENEDY 0.1 HEADERS
                                   13: STARR 0.1 HEADERS
                                   14: WEBB 0.1 HEADERS
                                   15: WILLACY 0.1 HEADERS
                                   16: ZAPATA 0.1 HEADERS
 Please select the procedure       17: PRINT MISSINSG SIOM
 Enter a number from 0 to 248 :    18: MISSING BROOKS (024)
                                   19: MISSING CAMERON (031)
 0 to 248 UP DOWN RETURN
ESC EXIT F9 QBE    D:\DEASE\01FILES\RIDE 01/08/95 7:26 pm
```

Figure 5.3 DQL Selection Menu

The left-hand portion of the DQL menu shown in Figure 5.3 contains the DQL options (options 1-10) which permit the detailed creation, loading, deletion of forms, and printing procedure definitions. Options 2-7 are concerned with the creation of DQL reports by experienced DQL programmers. Option 8 selects and loads one of the pre-defined DQL procedures needed to print or export data in the prescribed manner. This report will address option 8, Load Procedure, and option 1, Run Procedure. The remaining options are concerned with the creation of new procedures and will not be addressed herein.

The right-hand portion of Figure 5.3 shows the first of several windows containing a partial listing of the DQL pre-written procedures available to the analyst. Figure 5.3 shows only screen 1 of the available procedures. The current version of the PMIS system (as of August 31, 1994) contains 248 procedures. The first nineteen (19) pre-written reports are shown in Figure 5.3. The remaining reports have been organized into a tabular format and are summarized in Tables 5.1-5.4

Most of the pre-written procedures deal with the sorting and presentation (screen and/or printer) of the downloaded PMIS data. Some of the pre-written procedures are reserved for system testing, development of new procedures and "old procedures" not currently needed but inventories in the system for later use if needed.

To execute a specified procedure, the user follows the steps below. If the specified report is to be routed to the line printer, make certain the printer is on-line and loaded with paper.

1. Select Option 8, Load Procedure < Enter >.
2. Highlight the specified procedure using the up-down arrow keys on the keyboard. The page-up and page-down keys will assist in scrolling through the procedure sets.
3. When highlighted, select option 1. - Run Procedure < Enter > from the DQL menu.
4. As soon as the specified report is completed, additional procedures can be selected by repeating steps 1-3, above.
5. To exit the DQL Menu, repeated pressing of the ESC key will return the user to the database main menu or to exit to DOS.

The next sub-section presents a tabulated summary of the remaining DQL procedures.

5.2 SUMMARY OF PMIS DATA QUERY LANGUAGE REPORTS

The following tables summarize the available DQL procedures not shown in Figure 5.3. To view the remaining collection of procedures, the user can use the page-up and page-down keys to scroll through the sets.

The next section will begin the discussion pertaining to each set of relevent DQL reports and illustrate aspects of the database's query language associated with each specific class of procedures.

DATABASE PROCEDURE NO.	DATABASE PROCEDURE NO	DATABASE PROCEDURE NO
20: MISSING DUVAL (067)	40: BROOKS TOTAL RIDE	60: DUVAL RIDE & SKID
21: MISSING HIDALGO (109	41: WILLACY TOTAL SKID	61: HIDALGO RIDE & SKID
22: MISSING JIMHOGG (125	42: CAMERON TOTAL RIDE	62: KENEDY RIDE & SKID
23: MISSING KENEDY (066)	43: DUVAL TOTAL RIDE	63: STARR RIDE & SKID
24: MISSING STARR (214)	44: HIDALGO TOTAL RIDE	64: WEBB RIDE & SKID
25: MISSING WEBB (240)	45: KENEDY TOTAL RIDE	65: WILLACY RIDE & SKID
26: MISSING WILLACY (245	46: STARR TOTAL RIDE	66: ZAPATA RIDE & SKID
27: MISSING ZAPATA (253)	47: WEBB TOTAL RIDE	67: BROOKS SEL CRIT SKID
28: BROOKS CRITICAL SIO	48: WILLACY TOTAL RIDE	68: KENN SEL CRIT SKID
29: BROOKS MISS SEL SIOM	49: ZAPATA TOTAL RIDE	69: HIDA SEL CRIT SKID
30: CAMERON MISS SEL SIO	50: ZAPATA TOTAL SKID	70: CAM SEL CRIT SKID
31: DUVAL MISS SEL SIO	51: WEBB TOTAL SKID	71: DUVAL SEL CRIT SKID
32: HIDALGO MISS SEL SIO	52: STARR TOTAL SKID	72: STARR SEL CRIT SKID
33: KENEDY MISS SEL SIO	53: KENEDY TOTAL SKID	73: WEBB SEL CRIT SKID
34: STARR MISS SEL SIO	54: HIDALGO TOTAL SKID	74: WILLCY SEL CRT SKID
35: WEBB MISS SEL SIO	55: DUVAL TOTAL SKID	75: ZAP SEL CRIT SKID
36: WILLACY MISS SEL SIO	56: CAMERON TOTAL SKID	76: CAMERON SEL HW SKID
37: ZAPATA MISS SEL SIO	57: BROOKS TOTAL SKID	77: BROOKS SEL HW SKID
38: WEBB SEL CRIT SIO	58: BROOKS RIDE & SKID	78: DUVAL SEL HW SKID
39: WEBB SEL SIO	59: CAMERON RIDE & SKID	79: HIDALG SEL HW SKID

Table 5.1: DQL PROCEDURES 20-79

DATABASE PROCEDURE NO.	DATABASE PROCEDURE NO	DATABASE PROCEDURE NO
80: KENEDY SEL HW SKID	100: MASTER DEL/REOG O1H	120: DEL V REC IN BAD F
81: STARR SEL HW SKID	101: PLOT SEL RIDE	121: BAD VISUAL CAMERON
82: WEBB SEL HW SKID	102: PLOT HIDAL SEL RIDE	122: BAD VISUAL DUVAL
83: WILLACY SEL HW SKID	103: PLOT HID RIDE VIS	123: BAD VISUAL HIDALGO
84: ZAPATA SEL HW SKID	104: DEL REC IN BAD HOLD	124: BAD VISUAL JIMHOGG
85: DUMP DOWNLOAD TO DSK	105: REORG BAD HOLD FILE	125: BAD VISUAL KENEDY
86: CUT BROOKS TO DISK	106: MASTER DEL/REO BAD	126: BAD VISUAL STARR
87: MOVE TO HISTORY	107: SORT BAD RIDE FILE	127: BAD VISUAL WEBB
88: GENERAL PLOT EXPORT	108: BAD RIDE BROOKS	128: BAD VISUAL WILLACY
89: CUT CAMERON TO DISK	109: BAD RIDE DUVAL	129: BAD VISUAL ZAPATA
90: CUT KENEDY TO DISK	110: BAD RIDE HIDALGO	130: BAD VISUAL REPORT
91: CUT DUVAL TO DISK	111: BAD RIDE JIMHOGG	131: BAD VIS SORT MAINTSC
92: CUT HIDALGO TO DISK	112: BAD RIDE STARR	132: BAD RIDE SORT M.SEC
93: CUT JIMHOGG TO DISK	113: BAD RIDE KENEDY	133: TEMP
94: CUT STARR TO DISK	114: BAD RIDE WEBB	134: LIST MISS RMARKERS
95: CUT WEBB TO DISK	115: BAD RIDE WILLACY	135: LIST MISS MSEC 024
96: CUT WILLACY TO DISK	116: BAD RIDE ZAPATA	136: MISS MAIN SEC DUVAL
97: CUT ZAPATA TO DISK	117: BAD RIDE REPORT	137: BAD FWD BROOKS
98: DEL RECS IN HOLDING	118: POST 'R' TO BAD RIDE	138: BAD FWD CAMERON
99: REORG 01HOLD FILE	119: BAD VISUAL BROOKS	139: BAD FWD DUVAL

Table 5.2 DQL Procedures 80-139

DATABASE PROCEDURE NO.	DATABASE PROCEDURE NO	DATABASE PROCEDURE NO
140: BAD FWD HIDALGO	160: BLANK FLDS IN TEMP2	180: 01HOLD TO DUVAL
141: BAD FWD JIMHOGG	161: DEL RECS TEMP1 & 2	181: TO HIST 93-94 DUVAL
142: BAD FWD KENEDY	162: MERGE T1 TO T2	182: BLANK HIDALGO
143: BAD FWD STARR	163: MOVE TEMPS TO HOLD	183: 01HOLD TO HIDALGO
144: BAD FWD WEBB	164: SORT BY RMK	184: TO HIST 93-94 HIDALG
145: BAD FWD WILLACY	165: SIMPLE EXPORT	185: BLANK JIMHOGG
146: BAD FWD ZAPATA	BROOKS	186: 01HOLD TO JIM HOGG
147: BAD FWD TOTAL DIST	166: EXPORT ZAPATA	187: TO HIST 93-94 JHOGG
148: BAD FWD BY COUNTY	167: EXPORT 01HOLD OUT	188: BLANK KENEDY
149: BAD FWD BY CN HW	168: TRANS FR 01HOLD CTY	189: 01HOLD TO KENEDY
150: BAD FWD CN HW RM	169: BLANK BROOKS	190: TO HIST 93-94 KENEDY
151: BROOKS TOTAL FWD	170: DEL RECS IN 01HOLD	191: BLANK STARR
152: COPY SEL HW TO HOLD	171: REORG O1HOLD FILE	192: 01HOLD TO STARR
153: COPY TEMP FILE 1	172: MASTER DEL REORG	193: TO HIST 93-94 STARR
154: DEL REC IN HW HOLD	01H	194: BLANK WEBB
155: REORG SPE HW HOLD	173: 01HOLD TO BROOKS	195: 01HOLD TO WEBB
156: DEL RECS IN TEMP F1	174: BLANK CAMERON	196: TO HIST 93-94 WEBB
157: DEL RECS IN TEMP F2	175: TO HIST 93-94 BROOKS	197: BLANK WILLACY
158: REORD TEM FILES	176: TO HIST 93-94 CAMERN	198: 01HOLD TO WILLACY
159: blank flds in Temp1	177: 92-93 HIST MOVE	199: TO HIST 93-94 WILLAC
	178: 01HOLD TO CAMERON	
	179: BLANK DUVAL	

Table 5.3 DQL Procedures 140-199

DATABASE PROCEDURE NO.	DATABASE PROCEDURE NO	DATABASE PROCEDURE NO
200: BLANK ZAPATA	220: SSI<30 ALL SEGS	240: JHOGG SEL CRIT SKID
201: 01HOLD TO ZAPATA	221: SSI 30 TO 80 ALL	241: JHOGG SEL HW SKID
202: TO HIST 93-94 ZAPATA	222: SSI > 80 ALL	242: GENERAL PLOT PROC
203: DEL RECS BAD TEMP FL	223: GROUP SSI<30 ALL	243: DEL SPEC REC IN BAD
204: REORG BAD TEMP FILE	224: GROUP SSI 30-60 ALL	244: REORG THE BAD TEMP
205: SEL HW ALL HIDALGO	225: GROUP COND <50 ALL	245: EXPORT TEST OUT
206: TEST	226: GROUP COND 50-75 ALL	
207: CRIT REC ALL BROOKS	227: CAMERON CRITICAL	
208: MASTER DEL REC TEMP	SIO	
209: CRIT REC ALL	228: DUVAL CRITICAL SIO	
CAMERON	229: HIDALGO CRITICAL SIO	
210: CRIT REC ALL DUVAL	230: JIMHOGG CRITICAL SIO	
211: DEL RECS IN DUMMY	231: KENEDY CRITICAL SIO	
212: REORG DUMMY	232: STARR CRITICAL SIO	
213: CRIT REC ALL HIDALGO	233: WEBB CRITICAL SIO	
214: CRIT REC ALL JIMHOGG	234: WILLACY CRITICAL SIO	
215: CRIT REC ALL KENEDY	235: ZAPATA CRITICAL SIO	
216: CRIT REC ALL STARR	236: JIMHOGG MISS SEL SIO	
217: CRIT REC ALL WEBB	237: JIMHOGG TOTAL RIDE	
218: CRIT REC ALL WILLACY	238: JIMHOGG TOTAL SKID	
219: CRIT REC ALL ZAPATA	239: JIMHOGG RIDE & SKID	

Table 5.4 DQL Procedures 200-245

5.3 MISSING RIDE DATA PROCEDURES

Missing Data Example County: Brooks (024)
Procedure detail: See Appendix E, Section 2.0

The Missing Data reports for each of 10 counties are referenced from menu options 18-27. The Missing "county-name" procedure finds all records in the specified county's 0.1 mile file that is missing its respective RIDE score (SI VALUE). This procedure is normally executed during and just after all data collection has been completed. The missing segment(s) alert the Pavement Manager to errors in the field collection process. If, during a given data collection year, ride is sampled from a county, then there will exist large numbers of missing 0.1 mile sections. Since ride is normally collected on a 100% basis, these reports (one for each county) alert the Pavement Manager to segments that may need to be collected or re-collected.

Table 5.5 illustrates sample partial output from this procedure set using Brooks County as the model. Details concerning this procedure are summarized in Appendix 5, Procedure Set 1.

MISSING SIOMETER DATA FOR BROOKS (024) COUNTY: RUN DATE: 01/10/95 PAGE: 1

RM POINT	.	ROAD BED	0.5 mile REF. MARK	
HIGHWAY PREFIX FM				
HIGHWAY NUMBER 0430				
050 +00.0	000.0	K	MISSING	*
050 +00.1	000.1	K	MISSING	
050 +00.2	000.2	K	MISSING	
050 +00.3	000.3	K	MISSING	
.....			.....	
HIGHWAY NUMBER 0754				
065 +00.0	000.0	K	MISSING	*
.....			.....	
HIGHWAY NUMBER 0755				
062 -00.1	000.0	K	MISSING	*
062 +00.0	000.1	K	MISSING	*
062 +00.1	000.2	K	MISSING	
062 +00.2	000.3	K	MISSING	

Table 5.5: Sample Output for Missing Siometer Data

This report shows the 0.1 mile segments that at the time this report was executed contained missing ride data. This permits district personnel to audit the ride data

collection activities and to validate the completeness of ride data collection over the data collection period.

5.4 SELECTED CRITICAL SIOMETER

Sample Report Name: CRITICAL SEL.SIOMETER BROOKS (024)
Missing Selected Siometer
See Appendix E, section 3.

The Missing Selected Siometer report set (Menu option 29) permits the user to query a specific county-level 0.1 mile file for all highway segments possessing non-blank SI value specified in the data entry menu. This aids the Pavement Manager in immediately identifying all segments within a county with SI scores less than or equal to a user-input "critical score." Based upon the user's critical score value, the resulting segments are identified as specified. Sample partial output from this run is shown in Table 5.6.

MISSING SELECTED SEGMENT SIOMETER DATA FOR BROOKS (024) COUNTY: PAGE: 1

Item No.	REF MARKER LOCATION KEY	REF MARKER	ROADBED			0.5 PMIS SECTION="*"
1	024FM0430 K0508 +00.0	0508 +00.0	000.0	K	0001	*
2	024FM0430 K0508 +00.1	0508 +00.1	000.1	K	0002	
3	024FM0430 K0508 +00.2	0508 +00.2	000.2	K	0003	
4	024FM0430 K0508 +00.3	0508 +00.3	000.3	K	0004	
5	024FM0430 K0508 +00.4	0508 +00.4	000.4	K	0005	
6	024FM0430 K0508 +00.5	0508 +00.5	000.5	K	0006	*
	.....					
	.....					

Table 5. 6: Sample Critical Selected Siometer Output

The report permits the user to evaluate a selected highway within a given county in order to evaluate missing data for the given highway. This report is useful for isolating a particular highway (rather than the entire county) for missing ride data. The report can easily be modified to report on missing Skid, FWD, and visual if needed.

The sample output shown in Table 5.6 is a partial listing of a report executed from the Brooks 0.1 file for FM 0430, K roadbed . This permits evaluation of a specified highway within a given county. Note, menu option 29 is specifically for Brooks County. If users require other counties to be evaluated with this procedure, one loads the procedure (option 8) and edits the "For" file name within the procedure language by selecting option 4, Define Query. Edit the "For" argument to the appropriate county, e.g., Cameron 0.1, Willacy, 0.1, ... ,to suit the individual situation. If the procedure is to be

saved, select option 7, Save Procedure and rename the DQL procedure to conform with the county name.

5.5 CRITICAL SELECTED SIOMETER REPORTS

See Appendix E, section 4 for the DQL detail.

The Critical Selected Siometer reports permit the specification of a given highway within a selected county in order to locate the non-blank SI scores less than or equal to a user specified value. These reports are obtained from menu options as shown in Table 5.1. Sample output is shown in Table 5.7. The target highway, highway number, and roadbed are specified within the data-entry screen associated with this procedure.

This procedure is selected from menu choice 39, Webb Selected Siometer. If the user desires the procedure executed for other counties, the procedure can be edited to change the database file name to match a selected county. Make certain that once edited, the procedure is saved under the appropriate county file name. Table 5.7 illustrates the format of this report using Webb County, IH 35 as the example.

D21 P.M.S. SELECTED HIGHWAY CRITICAL RIDE SUMMARY REPORT FOR
WEBB COUNTY (240): FOR HIGHWAY: IH 0035
CRITICAL SCORE <= 2.0 RUN DATE: 01/11/95 PAGE NUMBER
1

	RM LOCATION	REF	RIDE	YEAR	"*"=0.5
HIGHWAY PREFIX IH					
HIGHWAY NUMBER 0035					
1	A 240IH0035 A0000 +00.5	0000 +00.5	1.7	94	
2	A 240IH0035 A0002 +00.7	0002 +00.7	1.4	94	
3	A 240IH0035 A0003 +00.2	0003 +00.2	0.8	94	
4	A 240IH0035 A0005 +00.0	0005 +00.0	1.9	94	*
5	A 240IH0035 A0005 +00.1	0005 +00.1	1.9	94	
6	A 240IH0035 A0014 +00.0	0014 +00.0	2.0	93	*
...	.....				
95	X 240IH0035 X0026 +00.8	0026 +00.8	1.9	94	
96	X 240IH0035 X0028 +00.1	0028 +00.1	1.9	94	
97	X 240IH0035 X0037 +01.0	0037 +01.0	2.0	94	*

min (current highway)	0.1
max	2.0
mean	1.5

Table 5. 7 Sample Output for Selected Siometer Report

This procedure permits the identification of a specified highway and a critical ride score. The output shown in Table 5.7 illustrates the segments of IH 35 in Webb County

possessing ride values less than or equal to 2.0. The report is useful in evaluating a highway segment in order to locate critical low ride scores.

5.6 TOTAL RIDE REPORTS

See Appendix E, section 5.

The next collection of reports, Menu options 40-49, produce the non-blank ride scores for the specified county, sorted by highway type, highway number, and reference marker location. Table 5.8 illustrates sample partial output for Brooks County.

D21 P.M.S.TOTAL RIDE SUMMARY REPORT FOR
BROOKS COUNTY { 024 }
RUN DATE: 01/10/95 PAGE NUMBER 1

	SFX RBED KEY	RM LOCATION MARKER	REF SCORE	RIDE COLL	YEAR SEC.	0.5 MILE
HIGHWAY PREFIX **FM**						
HIGHWAY NUMBER **0754**						
1	K 024FM0754	K0650 +00.1	0650 +00.1	3.5	93	
2	K 024FM0754	K0650 +00.2	0650 +00.2	3.2	93	
3	K 024FM0754	K0650 +00.3	0650 +00.3	2.5	93	
4	K 024FM0754	K0650 +00.4	0650 +00.4	2.6	93	
5	K 024FM0754	K0650 +00.5	0650 +00.5	2.9	93	*
....	.....					
24	K 024FM0754	K0652 +00.4	0652 +00.4	3.4	93	
25	K 024FM0754	K0652 +00.5	0652 +00.5	0.1	93	
	min (current highway)		0.1			
	max		3.8			
	mean		3.0			
HIGHWAY NUMBER 1418						
26	K 024FM1418	K0648 +00.1	0648 +00.1	1.9	93	
27	K 024FM1418	K0648 +00.2	0648 +00.2	3.6	93	
.....						
83	K 024FM1418	K0652 +01.9	0652 +01.9	3.5	93	
84	K 024FM1418	K0654 +00.0	0654 +00.0	0.1	93	*
	min (current highway)		0.1			
	max		4.4			
	mean		3.1			
Totol Ride for the entire county						
	Summary min for all HW's = type			2.3		
	max		5.0			
	mean		4.4			

Table 5. 8: Total Ride Report for Brooks County

This report, given the selected county, summarizes all of the non-blank ride scored segments by highway type (FM, US, ...) and highway number within highway type. The

report also shows the recorded ride score for the sorted segments. The segments are reported in sorted order by reference marker location. At the end of each highway segment, the minimum, maximum, and mean ride score for the highway segment is reported. At the end of the report, the associated minimum, maximum, and mean ride score for the entire county is reported. These values are reported on all non-blank ride scored segments. Any missing segment scores (blank SI values) are not included.

5.7 TOTAL SKID REPORTS

See Appendix E, section 6.

Total Skid reports, similar to the total ride reports, report the non-blank skid scores for all sorted highway segments within a specified county. Menu options 50-55 produce these reports. However, since skid data was not collected extensively in the 1993-1994 reporting year, very little skid information is in the database for the reporting period. Beginning in the 1994-1995 collection period, more skid data will be collected.

D21 P.M.S.TOTAL SKID SUMMARY REPORT FOR
BROOKS COUNTY (024)

RUN DATE: 01/10/95 PAGE NUMBER 1

	SFX RBED KEY	RM LOCATION MARKER	REF	SKID VALUE	YEAR COLL	0.5 MILE SEC.
HIGHWAY PREFIX FM						
HIGHWAY NUMBER 0430						
1	K	024FM0430 K0508 +00.0	0508 +00.0	not avail	93	*
2	K	024FM0430 K0508 +00.5	0508 +00.5	not avail	93	*
3	K	024FM0430 K0508 +01.0	0508 +01.0	not avail	93	*
4	K	024FM0430 K0508 +01.5	0508 +01.5	not avail	93	*
5	K	024FM0430 K0510 +00.0	0510 +00.0	not avail	93	*
6	K	024FM0430 K0510 +00.5	0510 +00.5	not avail	93	*
7	K	024FM0430 K0510 +01.0	0510 +01.0	not avail	93	*
...		.....	.....	.....		

min (current highway) ***Skid data not avail for 93-94***
max
mean

min ride score for entire county: Skid Data not available for 93-94 year
max ride score " " " :
mean ride score " " " :
end of county summary

Table 5.9: Sample Output for Total Skid Report

Table 5.9 illustrates the format for this report. Even though skid data was not collected, the above table has been included to show the format. Note, this reporting

procedure examines only the 0.5 mile sections because skid (like visual and FWD) are collected over 0.5 mile segments

5.8 TOTAL RIDE AND SKID REPORTS

See Appendix E, section 7.

Total Ride and Skid reports combine the features of the Total Ride and Total Skid reports into one summary report. Note, ride is collected over 0.1 mile intervals and skid is collected over 0.5 mile intervals. The collection of Total Ride and Skid procedures must therefore examine each 0.1 mile record to pick up the ride data. If a 0.1 mile record is also a 0.5 mile collection segment, the associated skid value (if collected) is reported. Menu choices 58-66 select the procedures for a specified county. Table 5.10 illustrates the format of this report set.

D21 P.M.S.TOTAL RIDE & SKID SUMMARY REPORT FOR
BROOKS COUNTY (024)

RUN DATE: 01/10/95 PAGE NUMBER 1

	RM LOCATION KEY			SKID	RIDE	YR	RP	0.5 SEC	
HIGHWAY NUMBER 0754									
35	K 024FM0754 K0650 +00.0	0650 +00.0						000.0	*
36	K 024FM0754 K0650 +00.1	0650 +00.1			3.5	93		000.1	
37	K 024FM0754 K0650 +00.2	0650 +00.2			3.2	93		000.2	
38	K 024FM0754 K0650 +00.3	0650 +00.3			2.5	93		000.3	
39	K 024FM0754 K0650 +00.4	0650 +00.4			2.6	93		000.4	
40	K 024FM0754 K0650 +00.5	0650 +00.5			2.9	93		000.5	*
41	K 024FM0754 K0650 +00.6	0650 +00.6			3.5	93		000.6	
42	K 024FM0754 K0650 +00.7	0650 +00.7			3.4	93		000.7	
43	K 024FM0754 K0650 +00.8	0650 +00.8			2.7	93		000.8	
.....	.....	.....			.....				
58	K 024FM0754 K0652 +00.3	0652 +00.3			3.5	93		002.3	
59	K 024FM0754 K0652 +00.4	0652 +00.4			3.4	93		002.4	
	.....	.....			...	..		.....	

Summary for the Current County

Summary min for all HW's = type	SKID:	RIDE: 2.3
max	Not coll.	5.0
mean	Not coll.	4.4

Table 5.10: Ride and Skid Combined Report Format

Table 5.10 shows the format of the Total Ride and Skid report. The procedure reports all highways in the specified county and sorts the results by highway type and

reference marker. Summary values are shown at the end of each highway type and a total county summary shown at the end of the report.

5.9 SELECTED CRITICAL SKID REPORTS

See Appendix E, section 8.

The Selected Critical Skid report collection (menu options 67-75) permit the analyst to select a given highway within a specified county for the purpose of determining those segments containing skid scores less than or equal to a pre-selected critical skid score. This permits the rapid identification of highway segments with abnormally low skid scores. Since skid data was not collected for the current reporting year, the format of this report (less the actual skid data) is presented in Table 5.11. This report is similar to the Selected Critical Ride Report format and is included for the sake of completeness.

D21 P.M.S. SELECTED HIGHWAY CRITICAL RIDE SUMMARY REPORT FOR
WEBB COUNTY (240): FOR HIGHWAY: IH 0035
CRITICAL SCORE <= XXX RUN DATE: 01/11/95
PAGE NUMBER 1

	RM LOCATION REF	SKID	YEAR "*"=0.5
HIGHWAY PREFIX **IH**			
HIGHWAY NUMBER **0035**			
1	A 240IH0035 A0000 +00.5 0000 +00.5	94	
2	A 240IH0035 A0002 +00.7 0002 +00.7	94	
3	A 240IH0035 A0003 +00.2 0003 +00.2	94	
4	A 240IH0035 A0005 +00.0 0005 +00.0	94	*
5	A 240IH0035 A0005 +00.1 0005 +00.1	94	
6	A 240IH0035 A0014 +00.0 0014 +00.0	94	*
...	.....		
95	X 240IH0035 X0026 +00.8 0026 +00.8	94	
96	X 240IH0035 X0028 +00.1 0028 +00.1	94	
97	X 240IH0035 X0037 +01.0 0037 +01.0	94	*
	min (current highway)		
	max		
	mean		

Table 5.11: Example of Selected Critical Skid Report

5.10 IDENTIFICATION AND ORGANIZATION OF CRITICAL DISTRICT-WIDE HIGHWAY SEGMENT DATA

One of the critical management decisions facing district-level pavement engineers is the rapid determination of maintenance and repair (M&R) projects for a given fiscal year. In order to formulate M&R projects, decision makers must identify and group pavement segments requiring various levels of M&R activity. In order to facilitate the location on a district-wide basis, a set of procedures have been developed to sort through each 0.1 mile county database file seeking critical segments for visual, ride, FWD, and skid. The objective is consolidate all of "bad" 0.1 mile records into one file. Once built, this consolidated file can be sorted in a variety of ways to produce the needed information. Figure 5.4 illustrates this process.

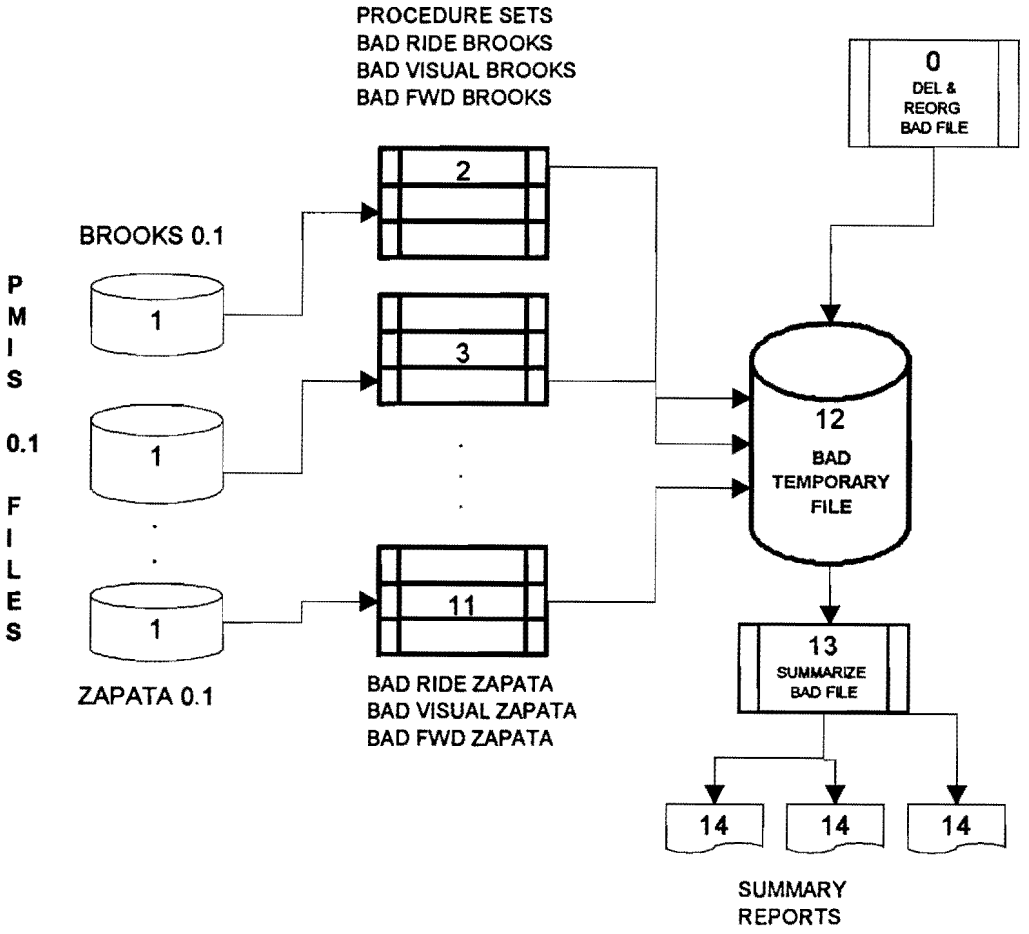


Figure 5. 4: Overview of Creating a Critical Segment Data File

The numbers inside of each object in Figure 5.4 will assist in describing the process of building and referencing the data contained in the BAD TEMPORARY FILE (object 12 in Figure 5.4).

5.10.1 Overview of Building the Critical District-Wide File

From Figure 5.4 the major elements are shown below.

1. The current 0.1 county-level files (Object set 1) e.g., Brooks, Cameron, ... , Zapata. It is assumed that all of these files contain the downloaded and imported PMIS scores and data.

2. Objects 2, 3, ..., 11 represent pre-written DQL procedures. Each county is referenced by three operational procedures:

   a. A BAD RIDE procedure,
   b. A BAD VISUAL procedure,
   c. A BAD FWD procedure, and
   d. A BAD SKID procedure (not yet written).

   Since there are four procedures per county, the system supports 40 separate procedures.

3. Object 12 represents the 0.1 BAD TEMPORARY FILE. This file is a mirror image of the 0.1 File presented in Appendix C. The purpose of this file is to hold the selected data extracted from the various 0.1 county-level files.

4. Object 0 is a procedure that deletes and reorganizes the BAD TEMPORARY file each time the analyst desires to clear and rebuild the file.

5. Object 13 represents a procedure written to summarize the data from the BAD TEMPORARY FILE. Object set 14 represents the various reports the analyst desires.

5.10.2 Building a District-Wide Critical Data Set

Since there are numerous ways to build a BAD TEMPORARY FILE, an example will be presented. In actuality, the D 21 pavement manager builds and re-builds this file numerous times in order to examine a variety of scenarios.

The following example will illustrate building a BAD TEMPORARY FILE using Brooks County data from the 1993-1994 data collection period. To add data from other

counties, the analyst would run the appropriate procedures (object set 2 from Figure 5.4) for the specified counties. If all forty procedures were executed (running all 10 counties) then the BAD TEMPORARY FILE would contain district-wide "BAD" 0.1 segments. The analyst could then compose the appropriate DQL reports as needed for decision making. To build a "bad data set" the following steps are executed.

1. Run the DELete and REORGanize BAD FILE procedure, Menu Option 100 in Table 5.2. The DQL for this procedure follows.

    Procedure Name: MASTER DEL/REO BAD

    RUN PROCEDURE "DEL REC IN BAD HOLD".
    RUN PROCEDURE "REORG BAD HOLD FILE".
    END. (Note, the "periods" are part of the language syntax.)

    The above procedure executes the two procedures (procedure execution from within a procedure) shown above. The two sub-procedures are listed below.

    Procedure Name: DEL REC IN BAD HOLD

    FOR BAD TEMPORARY FILE;
    DELETE RECORDS.

    Procedure Name: REORG BAD HOLD FILE

    REORGANIZE "BAD TEMPORARY FILE".

These two database procedures delete all of the records in the existing BAD TEMPORARY FILE, then reorganize the same file. Upon completion of the two sub-procedures, the BAD TEMPORARY FILE contains no records and is ready to receive a new set of data generated by specifying the critical data parameters associated with the data-entry screens.

2. Determine the target population of 0.1 mile files. Assume the analyst is concerned with critical ride, visual, and FWD scores for Brooks County. Assume the following "critical" values are specified by the analyst:

    a. All segments with ride scores less than or equal to 2.5,
    b. All segments with visual distress less than or equal to 70, and
    c. All FWD greater than 0.9.

    The critical values specified above represent the subjective judgment of the analyst. Different scenarios can be created based upon changing the specified critical values. As such, the resultant database file is totally dependent upon the critical values specified by the user.

3. The database system supports a number of separate procedures that can be used to generate the collection of records specified by the analyst. Table 5.12 summarizes the DQL menu option numbers and the associated procedures.

108: BAD RIDE BROOKS	**137: BAD FWD BROOKS**
109: BAD RIDE DUVAL	138: BAD FWD CAMERON
110: BAD RIDE HIDALGO	139: BAD FWD DUVAL
111: BAD RIDE JIMHOGG	140: BAD FWD HIDALGO
112: BAD RIDE STARR	141: BAD FWD JIMHOGG
113: BAD RIDE KENEDY	142: BAD FWD KENEDY
114: BAD RIDE WEBB	143: BAD FWD STARR
115: BAD RIDE WILLACY	144: BAD FWD WEBB
116: BAD RIDE ZAPATA	145: BAD FWD WILLACY
	146: BAD FWD ZAPATA
119: BAD VISUAL BROOKS	
121: BAD VISUAL CAMERON	
122: BAD VISUAL DUVAL	
123: BAD VISUAL HIDALGO	
124: BAD VISUAL JIMHOGG	
125: BAD VISUAL KENEDY	
126: BAD VISUAL STARR	
127: BAD VISUAL WEBB	
128: BAD VISUAL WILLACY	
129: BAD VISUAL ZAPATA	

Table 5.12: Menu Options for Generating Critical Data

For our example, we will be selecting options 108, 119, and 137, one at a time.

To illustrate the mechanics of the selected DQL procedures, the details of the procedural DQL language and the associated data-entry screen for each procedure will be presented with each step.

4. Generation of the Critical Ride Records.

To build the Critical Ride Records for Brooks County, select option 108 and press the < enter > key. The following data-entry screen appears (Figure 5.5).

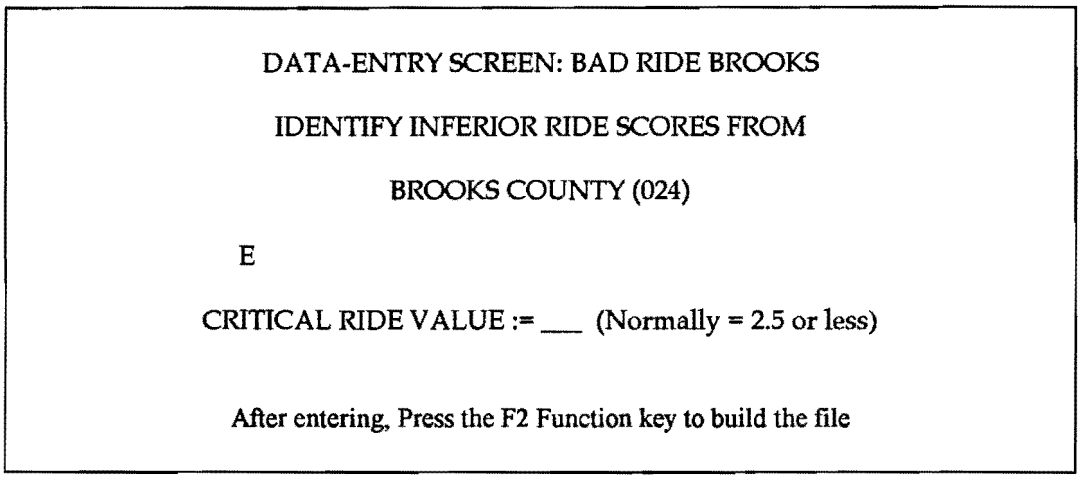


Figure 5.5 Data-Entry Screen for Bad Ride Creation

The user is required to enter a "critical" ride score that is deemed "low." For Ride, a critical score of 2.5 or less is deemed critical. Enter "2.5" and press the F2 key. The automated procedure will scan all records in the Brooks 0.1 file selecting all records possessing non-blank ride scores. When the procedure is complete, press the ESC key to return to the DQL Menu.

Those records with ride scores less than or equal to the critical score are written to the "BAD FILE." The Brooks 0.1 file is not changed. Only those records meeting the criteria are appended to the BAD FILE. The data query language for this procedure is shown in Figure 5.6.

```
                    DQL QUERY: BAD RIDE BROOKS
    --------
DEFINE TEMP "IDENTIFICATION" TEXT .
TEMP IDENTIFICATION := "R" .
DEFINE TEMP "COUNTER" NUMBER .
FOR BROOKS 0.1
WITH SI VALUE NOT = BLANK AND SI VALUE <= DATA-ENTRY CRITICAL RIDE VALUE
COUNTER := COUNTER + 1 .
MESSAGE COUNTER .
ENTER A RECORD IN BAD TEMPORARY FILE
RP LOCATION KEY := BROOKS 0.1 RP LOCATION KEY
RMK := BROOKS 0.1 RMK
HEADER FIELD := BROOKS 0.1 HEADER FIELD
RECORD NO. := BROOKS 0.1 RECORD NO.
TAG := BROOKS 0.1 TAG
COUNTY NUMBER := BROOKS 0.1 COUNTY NUMBER
HIGHWAY PREFIX := BROOKS 0.1 HIGHWAY PREFIX
HIGHWAY NUMBER := BROOKS 0.1 HIGHWAY NUMBER
HIGHWAY SUFFIX := BROOKS 0.1 HIGHWAY SUFFIX
ROADBED := BROOKS 0.1 ROADBED
NEW PAVEMENT TYPE := BROOKS 0.1 NEW PAVEMENT TYPE
 IDENTIFICATION := TEMP IDENTIFICATION
 RM := BROOKS 0.1 RM
RM SUFFIX := BROOKS 0.1 RM SUFFIX
RM DISP. SIGN := BROOKS 0.1 RM DISP. SIGN
RM DISP. := BROOKS 0.1 RM DISP.
REFERENCE POINT := BROOKS 0.1 REFERENCE POINT
MAINTENANCE SECTION := BROOKS 0.1 MAINTENANCE SECTION
HIGHWAY DESIGN TYPE := BROOKS 0.1 HIGHWAY DESIGN TYPE
ADT := BROOKS 0.1 ADT
18-KIP := BROOKS 0.1 18-KIP
SPEED LIMIT := BROOKS 0.1 SPEED LIMIT
DATA COLLECTION SECT := BROOKS 0.1 DATA COLLECTION SECT
AVERAGE RIDE := BROOKS 0.1 AVERAGE RIDE
SSI := BROOKS 0.1 SSI
SCI := BROOKS 0.1 SCI
DISTRESS SCORE := BROOKS 0.1 DISTRESS SCORE
CONDITION SCORE := BROOKS 0.1 CONDITION SCORE
SKID VALUE := BROOKS 0.1 SKID VALUE
SKID YEAR := BROOKS 0.1 SKID YEAR
SI VALUE := BROOKS 0.1 SI VALUE
SI COMMENT := BROOKS 0.1 SI COMMENT
SI YEAR := BROOKS 0.1 SI YEAR
W1 := BROOKS 0.1 W1
W2 := BROOKS 0.1 W2
W6 := BROOKS 0.1 W6
W7 := BROOKS 0.1 W7
FWD DATE := BROOKS 0.1 FWD DATE
VIS LANE := BROOKS 0.1 VIS LANE
VIS COMMENT := BROOKS 0.1 VIS COMMENT
VIS YEAR := BROOKS 0.1 VIS YEAR
PAVEMENT TYPE := BROOKS 0.1 PAVEMENT TYPE
DISTRESS 1 := BROOKS 0.1 DISTRESS 1
DISTRESS 2 := BROOKS 0.1 DISTRESS 2
DISTRESS 3 := BROOKS 0.1 DISTRESS 3
DISTRESS 4 := BROOKS 0.1 DISTRESS 4
DISTRESS 5 := BROOKS 0.1 DISTRESS 5
DISTRESS 6 := BROOKS 0.1 DISTRESS 6
DISTRESS 7 := BROOKS 0.1 DISTRESS 7
DISTRESS 8 := BROOKS 0.1 DISTRESS 8
RAVELING := BROOKS 0.1 RAVELING
FLUSHING := BROOKS 0.1 FLUSHING .
```

Figure 5.6: Query Language for Generating a Bad Ride File

The sort condition is specified in the DQL statement shown below.

WITH SI VALUE NOT BLANK AND SI VALUE < DATA-ENTRY CRITICAL RIDE VALUE

The procedure scans the target file (Brooks 0.1) for all records that are less than or equal to the Data-entry screen field variable "DATA-ENTRY CRITICAL RIDE VALUE." The records that meet the specified criteria are written to the "BAD TEMPORARY FILE" by the DQL statement,

ENTER A RECORD IN BAD TEMPORARY FILE.

The DQL statements immediately below the ENTER A RECORD statement simply copy the current field values in the Brooks 0.1 file to the associated fields in the BAD TEMPORARY FILE. When all records meeting the sort criteria have been found and written to the BAD TEMPORARY FILE, both files are closed. The DQL statement ENTER A RECORD IN implies an append record operation. Append means that each time the BAD TEMPORARY FILE is referenced the selected records are added at the end of the file. In this manner, the target file gets larger with each application of these procedures.

5. Building the Bad Visual File.

To build the Bad Visual File for Brooks County, select Menu option 119 and press < enter >. The data-entry screen for this procedure appears as shown in Figure 5.7.

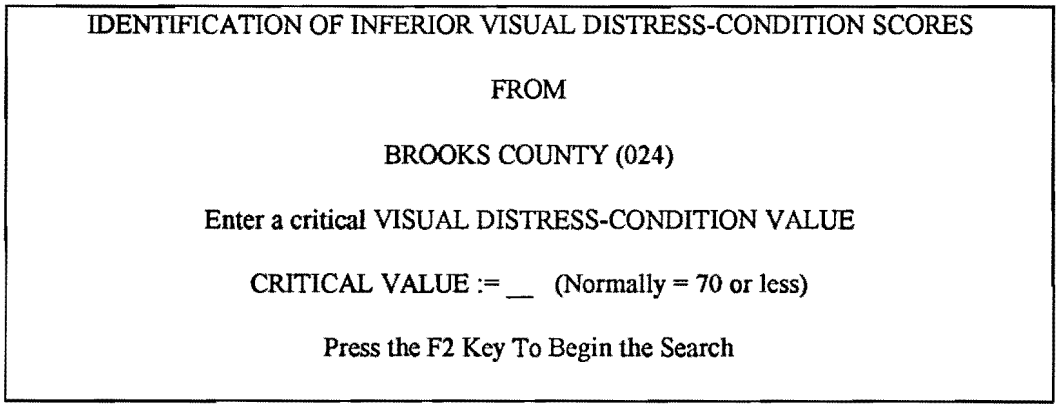


Figure 5.7: Data-Entry for Bad Visual File Creation

This procedure requires the analyst to enter a visual condition score deemed "critical." For this example, we will assume a visual distress score of 70 or less is the required value. The procedure will search the Brooks 0.1 file for all records that possess non-blank visual distress scores less than or equal to 70. The resultant records will be written to the target file BAD TEMPORARY FILE. The procedure language for this action is shown in Figure 5.8.

DQL QUERY: Brooks Bad Visual

```
DEFINE TEMP "IDENTIFICATION" TEXT .
TEMP IDENTIFICATION := "V" .
DEFINE TEMP "COUNTER" NUMBER .
FOR BROOKS 0.1
WITH DISTRESS SCORE NOT = BLANK AND
DISTRESS SCORE <= DATA-ENTRY CRITICAL VALUE ;
COUNTER := COUNTER + 1 .
MESSAGE COUNTER .
ENTER A RECORD IN BAD TEMPORARY FILE
COPY ALL FROM BROOKS 0.1 ;
 IDENTIFICATION := TEMP IDENTIFICATION .
```

Figure 5.8: Query Language for Generating a Bad Visual File

The DQL statement

FOR BROOKS 0.1 WITH DISTRESS SCORE NOT BLANK AND
DISTRESS SCORE < DATA-ENTRY CRITICAL VALUE

establishes the appropriate search criteria as defined by the data-entry field variable DATA-ENTRY CRITICAL VALUE. Use of the DQL commands,

ENTER A RECORD IN BAD TEMPORARY FILE
COPY ALL FROM BROOKS 0.1

greatly shortens the procedure. Since the BAD TEMPORARY FILE is a mirror-image of the Brooks 0.1 file, the COPY ALL command transfers all of the field values in the target file (Brooks 0.1) to the destination file BAD TEMPORARY FILE.

6. Building the Bad Visual File.

To build the Bad FWD File for Brooks County, select Menu option 137 and press < enter >. The data-entry screen for this procedure appears as shown in Figure 5.9.

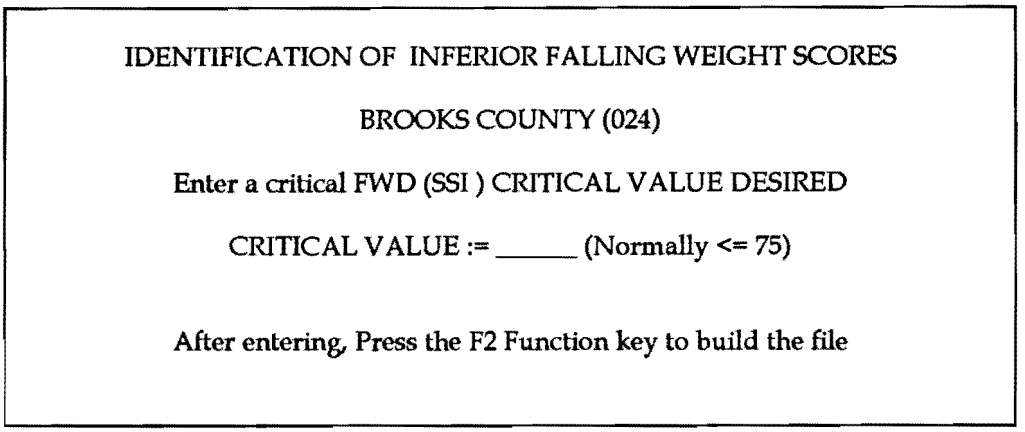


Figure 5.9: Data-Entry for Bad FWD File Creation

The analyst enters the desired structural strength index (SSI) score. In this example the default value of "75" will be used. Press the F2 key to begin the search. The procedure searches the target file Brooks 0.1 for all non-blank SSI records and appends the records meeting the search criteria to the BAD TEMPORARY FILE. The query language for this procedure is shown in Figure 5.10.

```
DEFINE TEMP "IDENTIFICATION" TEXT .
TEMP IDENTIFICATION := "F" .
DEFINE TEMP "COUNTER" NUMBER .
FOR BROOKS 0.1
WITH SSI NOT = BLANK AND
 SSI  <= DATA-ENTRY CRITICAL VALUE ;
COUNTER := COUNTER + 1 .
MESSAGE COUNTER .
ENTER A RECORD IN BAD TEMPORARY FILE
COPY ALL FROM BROOKS 0.1 ;
IDENTIFICATION := TEMP IDENTIFICATION
```

Figure 5.10: Query Language for Generating a Bad FWD File

The search criteria is specified by the DQL statement

FOR BROOKS 0.1 WITH SSI NOT BLANK AND SSI < DATA-ENTRY CRITICAL VALU

The ENTER A RECORD IN command appends the selected records to the BAD TEMPORARY FILE. The COPY ALL FROM command transfers all of the field values in the Brooks 0.1 file to the BAD TEMPORARY FILE.

5.10.3 ADDITIONAL PROCEDURES TO SUMMARIZE CRITICAL DATA

In addition to the procedure set discussed in section 5.10.2, the system supports an additional set of critical data summary procedures. Menu options 213-219 support a one-pass procedure set in that multiple search criteria are established. The procedure set is named CRIT REC ALL *county-name* where *county-name* is the set of counties {Brooks, Cameron, ... , Zapata}. Use of this procedure set will be illustrated by using the Webb County critical record selection procedure (CRIT REC ALL WEBB). The data-entry screen for this procedure is shown in Figure 5.11.

PROCEDURE:
IDENTIFY INFERIOR RIDE, SSI, AND VISUAL SCORES FROM:
WEBB COUNTY
AND
COPY THE SELECTED RECORDS TO THE BAD TEMPORARY FILE

CRITICAL NORMALIZED (0 - 100) RIDE VALUE = ____ Default = <= 75
CRITICAL NORMALIZED (0-100) SSI VALUE = ____ Default = <= 85
CRITICAL NORMALIZED (0-100) VISUAL VALUE = ____ Default = <= 70

After entering, Press the **F2** Function Key to Build the File

Figure 5.11: Critical Records All Data-Entry Menu

This procedure set requires the user to enter three critical score values for critical ride, critical SSI (FWD - normalized), and a critical visual score. The default values established for D 21 are shown in the menu.

The data query language procedure is shown in Figure 5.12 (for the Webb County procedure).

CRIT REC ALL WEBB PROCEDURE

```
DEFINE TEMP "COUNTER" NUMBER .
FOR WEBB 0.1
WITH (SSI NOT = BLANK AND SSI <= DATA-ENTRY CRIT SSI VALUE ) OR
(DISTRESS SCORE NOT = BLANK AND DISTRESS SCORE <= DATA-ENTRY
CRIT VISUAL SCORE ) OR (NORM SI VALUE > 0 AND NORM SI VALUE <=
DATA-ENTRY CRITICAL RIDE VALUE );
MESSAGE COUNTER .
ENTER A RECORD IN BAD TEMPORARY FILE
COPY ALL FROM WEBB 0.1 .
```

Figure 5.12: Data Query Language for Selecting Critical Records

Use of this procedure set will build a BAD FILE data set for any combination of counties desired by the user.

5.10.4 Reporting the Data in the BAD TEMPORARY FILE

At the conclusion of running the BAD RIDE, BAD VISUAL, and BAD FWD procedures, the BAD TEMPORARY FILE contains all records meeting the prescribed search criteria specified in each run. The procedures in the DQL inventory shown in Figure 5.13 assist in summarizing and reporting these critical highway segments.

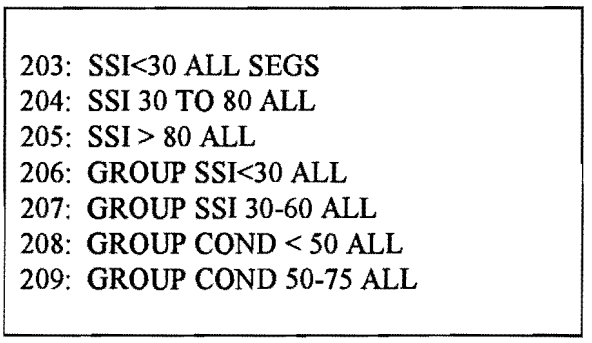


Figure 5.13: Database Procedures to Report Critical Segments

Output samples for the Brooks County data set are shown in tables 5.13-5.15..

5.10.5 SSI Less Than 30 Report

This report is useful in locating potentially severe highway segments contained within the data set. The criterion is based upon locating segments with SSI scores less than 30. Location of these segments within the district point the pavement management engineers to critical segments and permit cost estimation for major reconstruction of those segments. Appendix E10.1 presents the DQL detail. Table 5.15 presents a partial output from this file.

IDENTIFIED NEEDED REHAB SECTIONS: D21 ALL COUNTIES
POTENTIALLY SEVERE SEGMENTS

RUN DATE: 01/14/95 SSI <= 30 PAGE 1

NO.	REF. MARKER LOCATION	M. SEC.	DESGN TYPE	ADT	18-KIP	AVG RIDE	SSI	SCI	DISS. SCORE	COND	NORM RIDE	AVG NORM SI	RAV	FLU
1	024US0281 K0710 +00.5	3	2	14,000	13,686	2.9	6	32.12	43	36	58.0	58. 0	0	0
2	024FM2191 K0664 +00.0	3	2	570	61	3.5	16	53.18	99	99	70.0	64.0	0	0
3	024FM1418 K0652 +00.0	3	2	10	1	3.1	16	41.76	100	100	62.0	62.0	0	0
4	024SH0285 K0516 +01.5	3	2	820	297	3.7	16	30.74	99	99	74.0	68.0	0	1
5	024FM1418 K0652 +01.0	3	2	430	64	3.3	16	37.97	99	99	66.0	58.0	0	0
..	.....	..	..	....	..	..	..	.....	..	..	...	..	..	..

Table 5.13 Critical Records Report Example - Brooks County

The report shown in Table 5.13 provides the user with a summary of the scores for Brooks County. Recall, if a record is present in the BAD FILE then at least one of the field scores has been deemed "critical." Note that the records in this run have been sorted in the order found. No grouping or any other sort criterion has been applied for this procedure. This report's purpose is to locate those records meeting the search criterion.

5.10.6 SSI 30 to 80 Report

The SSI 30 to 80 report locates those segments possessing Structural Strength Index values between 30 to 80. These segments are termed "moderate need" in terms of rehabilitation. Appendix E10.2 presents the DQL detail for this report. Table 5.14 presents a partial summary of this report.

IDENTIFIED NEEDED REHAB SECTIONS: D21 ALL COUNTIES
MODERATE NEED

RUN DATE: 01/14/95 SSI BETWEEN 30 AND 80 PAGE 1

NO.	REF. MARKER LOCATION	M. SEC.	DESGN TYPE	ADT	18-KIP	AVG RIDE	SSI	SCI	DISS. SCORE	COND	NORM RIDE	AVG NORM SI	RAV	FLU
1	024SH0285 K0512 +01.0	3	2	820	297	3.7	33	26.14	100	100	74.0	80.0	0	1
2	024FM2191 K0662 +01.5	3	2	240	32	3.5	33	32.43	100	100	70.0	66.0	0	0
3	024FM2191 K0662 +00.5	3	2	240	32	3.5	33	33.42	98	98	70.0	64.0	0	0
4	024SH0285 K0512 +00.5	3	2	820	297	4.0	33	28.05	100	100	80.0	74.0	0	0
5	024SH0285 K0498 +00.5	3	2	480	163	3.8	38	29.79	100	100	76.0	82.0	0	0
6	024FM0754 K0650 +01.0	3	2	210	149	3.2	38	29.30	100	100	64.0	60.0	0	0
..	.....	..	..											

Table 5.14: Sample Output for the SSI 30 to 80 Report

5.10.7 SSI Greater Than 80 Report

The SSI Greater Than 80 report locates those segments with SSI values greater than 80. Such segments may require light maintenance. Appendix E10.3 presents the DQL detail. The output of this report is similar to Tables 5.13 and 5.14.

5.10.8 Grouped SSI Less Than 30 Report

The Grouped SSI Less Than 30 report presents the same data as in the SSI Less Than 30 report but groups the data by highway prefix, highway number, and reference point. The format of the report output is shown in Table 5.15. Appendix E10.4 presents the query language detail for this report.

D21 PMIS REPORT: ALL SEGMENTS WITH REPORTED SSI <= 30
GROUPED BY COUNTY NO., HW PREFIX, HW NUMBER: CANDIDATE MAJOR REHAB SEGMENTS

RUN DATE:01/15/95 PAGE: 1

ITEM NO REF MARK LOCATION	MAINT SEC	DESGN TYPE	ADT	18 KIP	AVE RIDE	SSI	SCI	DISTRS SCORE	COND. SCORE	NORM RIDE	NORM SI	RAV	FLU
COUNTY NUMBER 024													
HIGHWAY PREFIX FM													
HIGHWAY NUMBER 1418													
1 024FM1418 K0652 +00.0	3	2	10	1	3.1	16	41.76	100	100	62.0	62.	0 0	0
2 024FM1418 K0652 +00.5	3	2	430	64	3.0	28	31.18	99	99	60.0	60.	0 0	0
3 024FM1418 K0652 +01.0	3	2	430	64	3.3	16	37.97	99	99	66.0	58.	0 0	0
MEANS FOR THE CURRENT HIGHWAY						20.0	36.97	99.3	99.5	62.7	60.0		
COUNTY NUMBER 125													
HIGHWAY PREFIX FM													
HIGHWAY NUMBER 0649													
34 125FM0649 K0650 +00.5	4	2	550	634	4.2	22	30.11	100	100	84.0	94.	0 0	0
35 125FM0649 K0654 +00.0	4	2	280	292	3.6	16	36.59	100	100	72.0	94.	0 0	0
36 125FM0649 K0654 +01.0	4	2	280	292	2.9	16	41.61	100	100	58.0	62.	0 0	0
MEANS FOR ENTIRE DISTRICT NON-BLANK SCORES						21.1	37.17	97.2	96.6	70.9	66.5		

Table 5.15: Partial Output of the Grouped SSI Less Than 30 Report

This report presents the critical records from the BAD FILE with SSI scores less than 30 and groups the output by county number, highway prefix, and highway number. The segments within that grouping are sorted by reference marker value. Thus, the analyst can find all of the critical highways within the district and locate those 0.1 mile segments on that highway that require major rehabilitation.

5.10.9 The Grouped SSI 30-60 Report (Moderate Rehabilitation Segments)

This report locates and summarizes those highway segments with SSI scores between 30 to 60. These segments are deemed to be candidates for moderate rehabilitation activities The query language detail is shown in Appendix E10.5. The output of this report is similar to that of Table 5. 15.

5.10.10 The Grouped Visual Condition Less Than 50 Report (Light Rehabilitation Segments)

This report groups the data based upon visual condition scores less than 50. Those segments meeting this criterion are candidates for light rehabilitation. The query language detail for this procedure is shown in Appendix E10.6. The output format for this report is similar to that of Table 5.15.

5.10.11 The Grouped Visual Condition 50-75 Report (Marginal Light Rehabilitation Segments)

This report groups the data based upon visual condition scores between 50 to 75. These segments are candidates for marginal light rehabilitation activities. The query language detail is shown in Appendix E10.7. The output format for this report is the same as that of Table 5.15.

5.11 SUMMARY

This chapter has reviewed the major reports utilized by D 21 for the 1993-1994 project period. These reports assist the analyst in reviewing the collected data, building a critical 0.1 mile file, and summarizing and presenting data from the 0.1 mile county-level files and the critical 0.1 mile file.

The next chapter will present the steps needed to build various export files for plotting highway segment data.

CHAPTER 6
BUILDING EXPORT FILES FOR HIGHWAY SEGMENT PLOTTING

6.0 INTRODUCTION

This chapter presents the steps necessary to create a text file suitable for importing into any general-purpose or special-purpose plotting software package to produce an x-y visual plot. Regardless of the software package used for plotting, the user must select the highway and the specific field values to be plotted. A generic procedure has been created to assist in this process. The procedure (Number 242 from Table 5.4) can be used or modified to produce the plot file.

Pavement managers and their staffs often desire to view highway segment data in order to better visualize the condition of a highway segment. Therefore, the ability to produce a variety of plots provides the analysts with additional information regarding highway conditions and assists in better understanding.

The designers of the D 21 Pavement Management System database determined that use of existing spreadsheet software facilitated the process of producing such plots. The authors have selected Microsoft's Excel Version 5 spreadsheet to facilitate generation of the plots. The process of developing highway segment plots can be accomplished by performing the following steps:

1. Select the highway of interest;
2. Determine what score(s) are needed (SSI, SCI, condition, etc.);
3. Load (and edit if required) the plotting procedure;
4. Specify the file name and location of the text file;
5. Run the procedure thus producing the text file;
6. Edit the text file for subsequent importing into the plotting routine;
7. Exit the database and enter the plotting software (Excel V for example);
8. Import the specified text file into the plotting package;
9. Highlight the appropriate columns in the spreadsheet to plot;
10. Execute the plot routine (Use the Chart Wizard within Excel V combined with any custom editing as required); and
11. Print the chart.

Use of the generalized plotting procedure requires knowledge of the database's query language in order to modify the procedure to cover a variety of options. The generalized procedure cannot cover all foreseen situations for plots. In order to accommodate the day-to-day plotting requirements, the user must be able to edit the procedure to reflect the current need.

The remainder of this chapter will cover the details required to generate highway segment plots based upon the 11 step process presented above.

6.1 SETTING UP TO PLOT A HIGHWAY SEGMENT

The 11-step process will now be presented in order to illustrate the procedure for producing highway segment plots.

Step 1: Select the highway of interest.

Assume the analyst is concerned with the "L" roadbed for US0083 in Hidalgo County.

Step 2: Determine the important highway segment scores that are needed.

It is assumed that the following non-blank field scores are of importance to the user:

1. Structural Strength Index (SSI),
2. Surface Curvature Index (SCI),
3. Visual Distress Score, and
4. Condition score.

Table 6.1 shows the possible database score values that are commonly selected. Note, the actual database field names appear in this table to facilitate building custom procedures for other plotting applications.

Database Field Name	Actual Representation
1. ADT	Average Daily Traffic
2. 18-KIP	18-KIP Equivalent rating
3. AVERAGE RIDE	Average Ride score
4. SSI	Structural Surface Index
5. SCI	Surface Curvature Index
6. DISTRESS SCORE	Highway visual Distress Score
7. CONDITION SCORE	Highway visual condition score
8. SKID VALUE	Skid rating score
9. SI VALUE	Surface Index value

Table 6.1: Common Plotting Choices

6.2 USING THE GENERALIZED BUILD-PLOT PROCEDURE

The succeeding steps are required to access the generalized build-plot procedure and edit the procedure (if necessary) to build the text file.

Step 3: Load (and edit if required) the plotting procedure.

- Enter the D 21 Database system from the C: directory by entering **D21** < Enter >.
- From the DOS Menu select **0.1 Files** < Enter >. The Main Menu appears shown in Figure 6.1

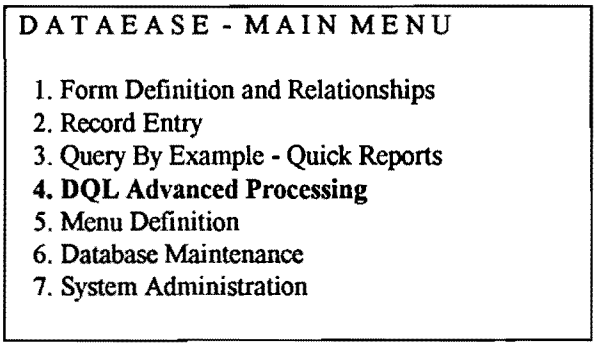


Figure 6.1: DQL Main Menu

- Select Option 4. **DQL Advanced Processing** < Enter > .

The DQL Main Menu appears as shown in Figure 6.2.

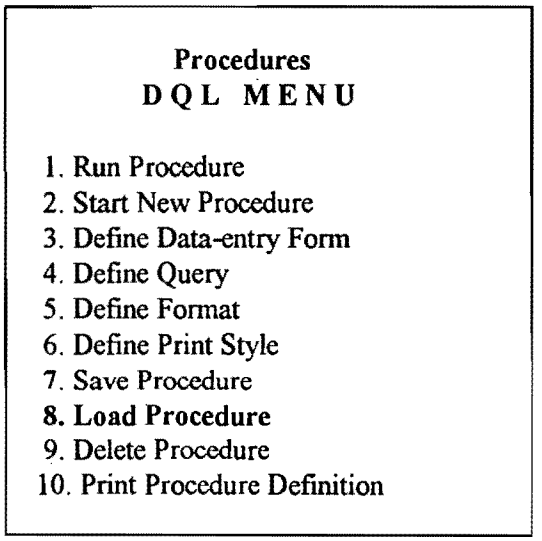


Figure 6.2: Data Query Language Menu

- Select Option 8. **Load Procedure** < Enter >.

A sub-window appears on the right-hand side of the DQL Main menu as shown in Figure 6.3.

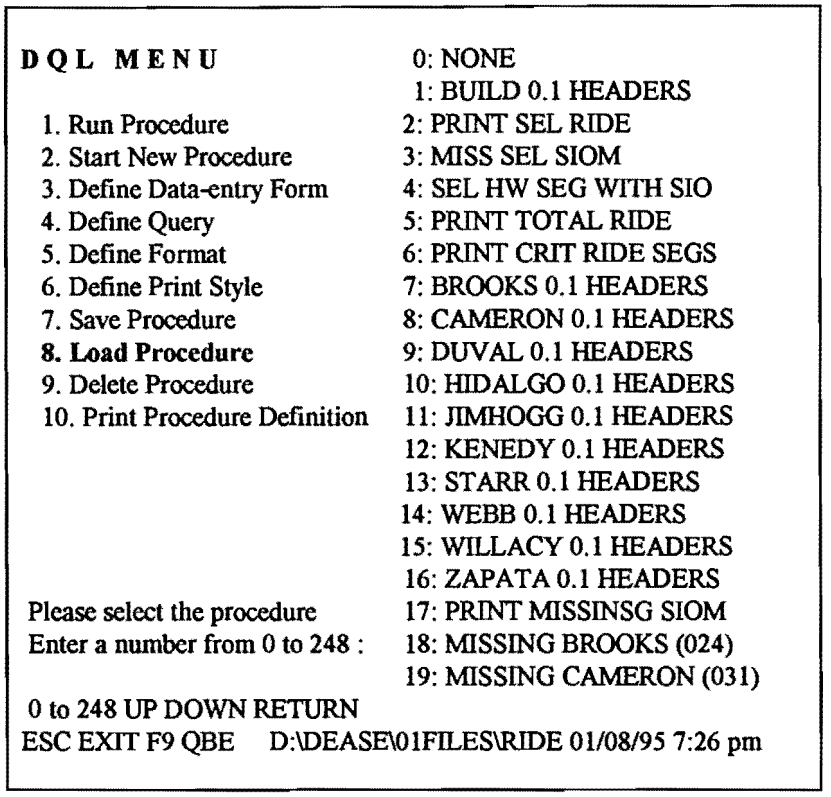


Figure 6.3: DQL Menu with Available Procedures

- Using the Page Down key on the keyboard, scroll through the available procedures until Procedure Number 242, GENERAL PLOT PROC is shown in the window.

- Using the up-down arrow keys, highlight this procedure and press < Enter >. This makes procedure GENERAL PLOT PROC the active procedure.

The procedure language can be viewed and edited if required. By loading an active procedure the DQL menu options change as shown in Figure 6.4.

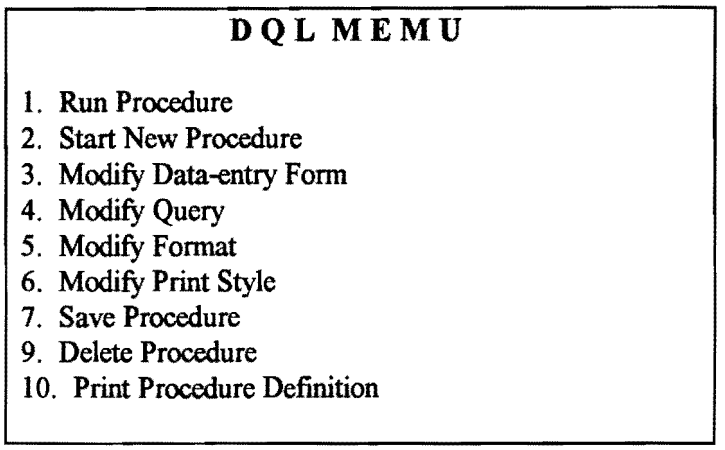


Figure 6.4: DQL Modified Menu

It should be noted that since an active procedure has been selected, the DQL Menu options change. When no procedure has been selected, the menu appears as shown in Figure 6.2. Once a procedure has been selected, options 3, 4, 5, and 6 change. Without a procedure selected options 3, 4, 5, and 6 begin with the command "DEFINE". With a selected procedure (active procedure) these same options present MODIFY to the user. With an active procedure all the user can accomplish is to modify that procedure. In this example, we have selected the GENERAL PLOT PROC as the active procedure. Since this procedure has been pre-defined, the only option is either RUN the procedure or MODIFY aspects of the procedure.

6.3 VIEWING AND EDITING THE GENERAL PLOT PROC

At this point, it is useful to examine the procedure in detail. From the DQL Menu select option **4. Modify Query** and press < Enter >. The DQL procedure appears as shown in Figure 6.5. Associated with this procedure is its data-entry screen. The data-entry screen contains those user-specified values needed to select the specific highway and are available to the procedural language as "data-entry field names".

```
GENERAL PLOT PROC

FOR HIDALGO 0.1 WITH HIGHWAY PREFIX = DATA-ENTRY HIGHWAY PREFIX AND
HIGHWAY NUMBER = DATA-ENTRY HIGHWAY NO. AND ROADBED = DATA-ENTRY
ROADBED AND SSI NOT = BLANK ;
LIST RECORDS
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP. ;
SSI ;
SCI ;
DISTRESS SCORE ;
CONDITION SCORE .
```

Figure 6.5: Procedure Language for Building a Plot File

The associated data-entry screen is shown in Figure 6.6.

```
GENERALIZED PLOTTING PROCEDURE TO
CAPTURE DATA FOR PLOTTING

Enter the desired Highway Prefix, Number, and Roadbed below:

HIGHWAY PREFIX ____
HIGHWAY NO.    ____
ROADBED        _    { K, R, L, A, X }

Select Printer or Screen to follow

PRESS F2 KEY TO BUILD THE FILE.....
```

Figure 6.6 Data-Entry Menu for General PLOT PROC Report

When the procedure runs, the data-entry screen appears and prompts the user to enter the parameters required to define the highway segment. This requires entry of the two-character highway prefix (FM, US, IH, ...). The second entry requires knowledge of the highway number. The TxDOT 4-digit format is required. For example, if the designated highway is US83 the entries for the first two values will be:

Highway Prefix = "US" and
Highway No. = "**0083**".

The final entry requires the designated roadbed code. The roadbed code is a one-character code from the set {K, R, L, A, X}.

Examination of the procedure in Figure 6.5 shows what field variables are to be listed (written) to the designated disk file. The procedure is described below.

FOR HIDALGO 0.1 WITH HIGHWAY PREFIX = DATA-ENTRY HIGHWAY PREFIX AND HIGHWAY NUMBER = DATA-ENTRY HIGHWAY NO. AND ROADBED = DATA-ENTRY ROADBED AND SSI NOT = BLANK ;
LIST RECORDS
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP. ;
SSI ;
SCI ;
DISTRESS SCORE ;
CONDITION SCORE.

The LIST RECORDS statement is a database command statement to write the output file to a specified output device (screen, printer, or a disk file). The FOR command in the procedure defines the specified database file to read. In the above example, the target file is the HIDALGO 0.1 file. The WITH modifies the FOR command and specifies the condition(s) that must be met. In the above example the WITH condition requires

HIGHWAY PREFIX = DATA-ENTRY HIGHWAY PREFIX AND HIGHWAY NUMBER = DATA-ENTRY HIGHWAY NO. AND ROADBED = DATA-ENTRY ROADBED AND SSI NOT = BLANK.

All records with the designated highway prefix, highway number, and roadbed are located in the specified file. Additionally, we require that all selected records must have non-blank SSI scores. If the "SSI NOT = BLANK" is missing then the data set might contain a significant number of partially filled values. In effect, this specific procedure will find all of the 0.5 mile segments since SSI is collected on 0.5 mile intervals. The "non-blank" constraint omits those records that do not have a SSI score posted to them.

If the user desires to plot values that are collected on 0.1 mile intervals (ride) the same constraint applies. Modification (Edit) of this procedure will be illustrated subsequently.

The Edit-Procedure step is initiated if the user desires to make any changes in the procedure. For now, we will omit this operation and continue with the example. At the conclusion of the current example, we will present a section on editing the procedure file.

Step 4. Specification of the Plot File Name and Directory Location.

Returning to the example, press F2 key to return to the DQL modified menu (Figure 6.7). At this point, we want to execute the procedure.

```
D Q L  M E N U
1. Run Procedure
2. Start New Procedure
3. Modify Data-entry Form
4. Modify Query
5. Modify Format
6. Modify Print Style
7. Save Procedure
9. Delete Procedure
10. Print Procedure Definition
```

Figure 6.7: DQL Menu

Step 5: Run the Procedure

From the DQL modified menu, select **option 1. Run Procedure**. The system will preset the following screen (Figure 6.8).

```
GENERAL PLOT PROC

1: Screen 2: Printer 3: Disk

PRINT STYLE SPECIFICATION
  Report Destination:      Disk      Allow Style modification at run-time yes
     If disk Output, Filename:
     D:\D21\DATA\US0083.DAT
```

Figure 6.8: DQL File Output Options

- Specification of Output Routing.

The user can specify where the output is to be routed. The choices are: (1). Screen, (2). Printer, or (3). Disk. For this case we want the output file to go to Disk. Select option 3. DISK and press < Enter >.

- Naming the output file

Since the Disk option was selected, the "IF DISK OUTPUT, FILENAME" prompt appears. The user must specify the DOS path and file name. For the example above, we have selected to write the output file to

D:\D21\DATA\US0083.DAT.

The file is to be written to the D:\D21\DATA subdirectory with the file name:

US0083.DAT.

The file name is determined by the user and can be from one to eight characters with the suggested extension ".DAT". The file location (D:\D21\DATA) is specified by the user. If the system in use does not support a D: drive, change the directory to C:. The selection of the directory to store the file is designated by the user. It is suggested that if a moderate to large number of plots are being generated, the user make a directory on the C: or D: drive that specifically holds plot data files. The user must remember the path and file name when it comes time to import the plot file into the designated plotting software.

When the user is finished specifying the output choices, press the **F2** key to begin running the procedure. The procedure will scan the designated 0.1 file and write the records that meet the sort criteria to the designated DOS directory. Most plot procedure runs take less than 30 seconds to complete. When the run is finished, a blank screen will appear. Press the ESC key to return to the DQL menu.

Step 6: Edit The Plot File

Assuming the procedure correctly produced the file, the user must edit the newly produced text file to prepare it for subsequent import into Excel V spreadsheet. In order to understand why this is necessary, we will examine the file US0083.DAT. This is accomplished by the following steps.

- Press the ESC key until the DATAEASE Main Menu appears (Figure 6.9)

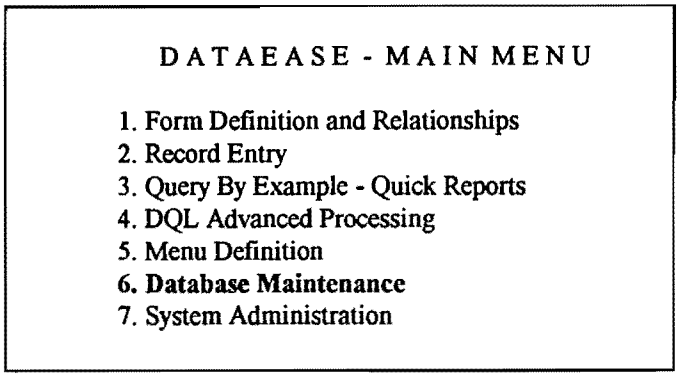


Figure 6.9: DataEase Main Menu

The database system permits "shelling out" to DOS. The purpose for shelling out is to use the DOS text editor EDIT.COM to edit the plot file.

- To shell out to DOS select option **6. Database Maintenance** < Enter >. The following menu appears (Figure 6.10).

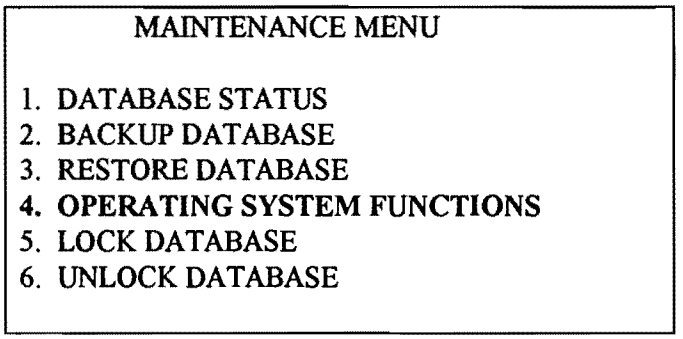


Figure 6.10: Database Maintenance Menu: Shelling to DOS

- Select option **4. OPERATING SYSTEM FUNCTIONS** < Enter >.

The menu shown in Figure 6.11 appears.

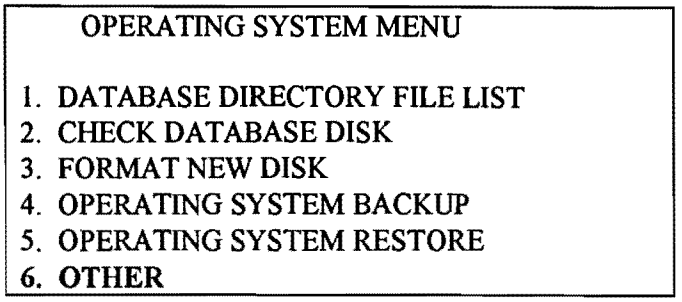


Figure 6.11: Operating System Menu - Shelling to DOS

- Select option 6. Other < Enter >. The menu shown in Figure 6.12 appears.

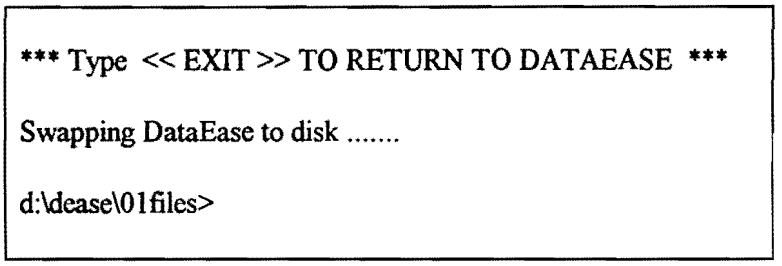


Figure 6.12: Shell-to-DOS Menu

The DOS prompt **d:\dease\01files>** appears. Assuming that DOS is in the PATH statement the user can reference the DOS text editor. We will import the "US0083.DAT" file into this editor and remove some characters from the file. Note: If DEASE is on the C: drive, the prompt will appear as

C:\dease\01files>.

Assuming the DOS prompt is C:\Dease\01Files> the general format to edit the plot file is

EDIT D:\path-name\file-name < Enter >.

- Assuming the plot file is located in the C:\D21\DATA subdirectory, the user will enter

EDIT C:\D21\DATA\US0083.DAT < Enter >.

The DOS text editor will read the specified file and display the contents as shown in Figure 6.13.

```
□&l0O□(10U□&k4S□&l6DRM,SSI,SCI,DISTRESS SCORE,CONDITION SCORE
0840+00.0,73,14.89,100,
0840+00.5,100,4.93,100,100
0840+01.0,100,7.56,100,100
0840+01.5,100,5.09,100,100
0842+00.0,91,5.96,100,100
0842+00.5,45,16.92,100,100
.....
Records omitted.....
.....
0884+01.5,90,2.56,100,100
0886+00.0,90,6.64,100,100
0886+00.5,90,4.97,100,100
0886+01.0,90,4.79,100,100
□E□&k0S□&l6D
```

Figure 6.13: Example Plot Data Text File

During the database built text-file process, output control characters along with the variable field names are written as the first line of the file. The last line of file contains control characters and must be removed.

- Use the DOS Editor's features to highlight and delete the following part of the first line:

  □&l0O□(10U□&k4S□&l6.

  Do not delete the remaining characters of the first record. These characters become "column headers" within the spreadsheet and assist building the chart legend. For this example, the remaining characters are

  DRM,SSI,SCI,DISTRESS SCORE,CONDITION SCORE.

  Note, for this example there are five comma delimited field names in this character string. The first field name (DRM) stands for Distance Reference Marker. The remaining names are self-explanatory.

- Delete the last record (line) in the data set. This will most likely require the user to scroll down until the last line is found. For this example the last record reads as

  □E□&k0S□&l6D.

  Highlight this line and delete it from the text file.

The file should appear as shown in Figure 6.14.

```
DRM,SSI,SCI,DISTRESS SCORE,CONDITION SCORE
0840+00.0,73,14.89,100,
0840+00.5,100,4.93,100,100
0840+01.0,100,7.56,100,100
0840+01.5,100,5.09,100,100
0842+00.0,91,5.96,100,100
0842+00.5,45,16.92,100,100
.....
Records omitted.....
.....
0884+01.5,90,2.56,100,100
0886+00.0,90,6.64,100,100
0886+00.5,90,4.97,100,100
0886+01.0,90,4.79,100,100
```

Figure 6.14: Completed Edited Plot File

- From the DOS Editor, **Save** the file with its original path and file name.
- Exit the DOS editor in the normal fashion.

The plot file is now ready to be imported into Excel V for plotting.

6.4 IMPORTING THE PLOT FILE INTO EXCEL V

At this point we have a text file suitable for import into Excel V. Note, from Figure 6.14, the data is separated by "commas". The "comma" acts as a field delimiter thus separating one data field from another. The spreadsheet program must be "told" that the data is "comma delimited" in order to place each column of data in adjacent columns within the spreadsheet.

Additionally, the first row of the data file (Figure 6.14) contains the database field names. For the example, the field names are

- DRM,
- SSI,
- SCI,
- DISTRESS SCORE, and
- CONDITION SCORE.

These field names will become the column headers in the spreadsheet and will appear along the first row. We desire that these field names appear in the first row as the Chart Wizard feature of Excel will use the column header names as part of the plot legend. We will now continue with the steps required to conduct the import.

Step 7. Exit the Database, Enter Windows, and Select Excel V

- Exit the database by pressing the ESC key until the DataEase main menu appears. Press the ESC key again and the user is prompted to exit the system. Respond with "yes". The system will return to the active operating system (DOS or Windows).

- Enter the Windows environment and activate the Excel icon.

- When Excel is finished loading select the **File/Open** option (Figure 6.15).

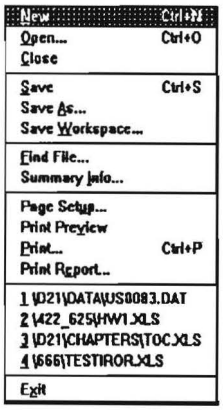


Figure 6.15: Excel File-Open Menu

- When the Select Directory/File window appears, select the appropriate directory where the plot file was saved, highlight the plot file and double-click with the mouse (Figure 6.16).

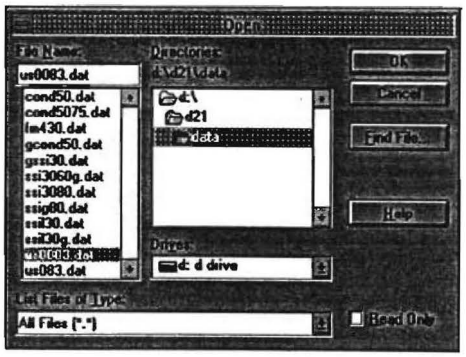


Figure 6.16: Excel Select File Menu

For the example project, the US0083.DAT file is located in the D:\D21\DATA directory. Select the "d21/Data" directory and highlight the US0083.DAT file. Click on the OK button to begin the import process.

- Excel will begin to open the file. However, Excel normally looks for .XLS files and when the system encounters an apparent non-Excel file a warning message appears stating the Excel cannot read the file as a "XLS" file. The prompt asks if the user desires to read the designated file as a "Text File". Click on the OK button which tells Excel to proceed with the file opening.

- Excel will open the TEXT IMPORT WIZARD window and prompt for the following settings (Figure 6.17.)

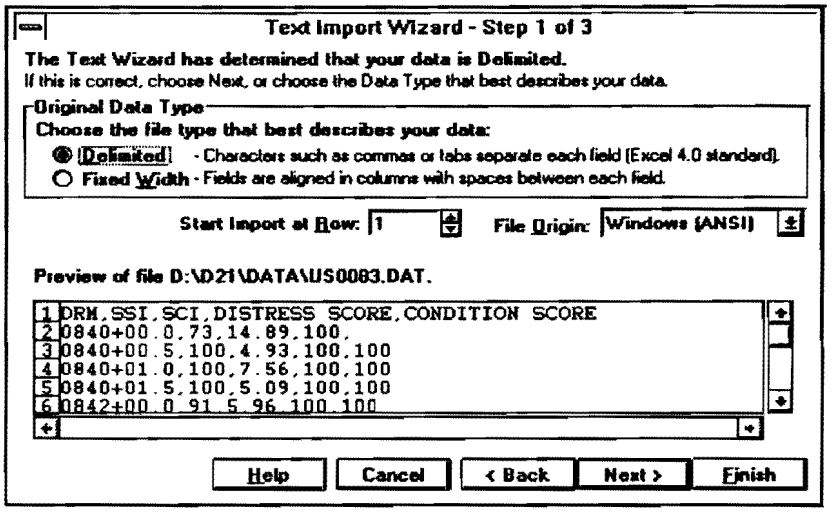


Figure 6.17: Excel Chart Wizard Screen 1 of 3

Note the imported text file appears in the window. However, the data fields appear to be continuous and not delimited. Recall, the database procedure that produced this file consisted of "comma delimited" fields. Additionally, the File Origin must be set to **Windows (ANSI).** Make certain the File Origin option is set to **Windows (ANSI)** and click on the **Next** button. Text Import Wizard screen 2 appears as shown in Figure 6.18.

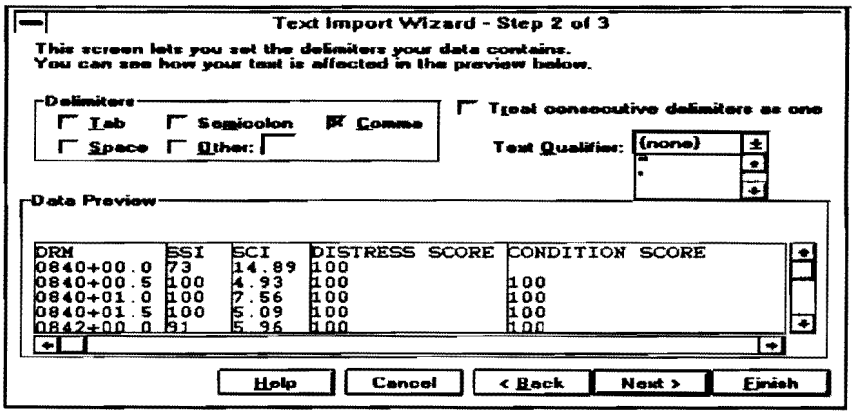


Figure 6.18: Excel Chart Wizard Screen 2

1. Set the Delimiters to COMMA by clicking on the **Comma** box. This establishes that the data is separated by commas.
2. Set the **Text Qualifier** to **(none)** and click on **NEXT**.

Note, the data in the Data Preview area is formatted into columns. The Distance Reference Marker (DRM) column becomes column 1, SSI is column 2, SCI is column 3, etc. The data will now import into the spreadsheet in the appropriate format.

3. Click on FINISHED.

Excel will proceed with the import and place the data in the appropriate cells of the spreadsheet. A portion of the spreadsheet is shown in Figure 6.19.

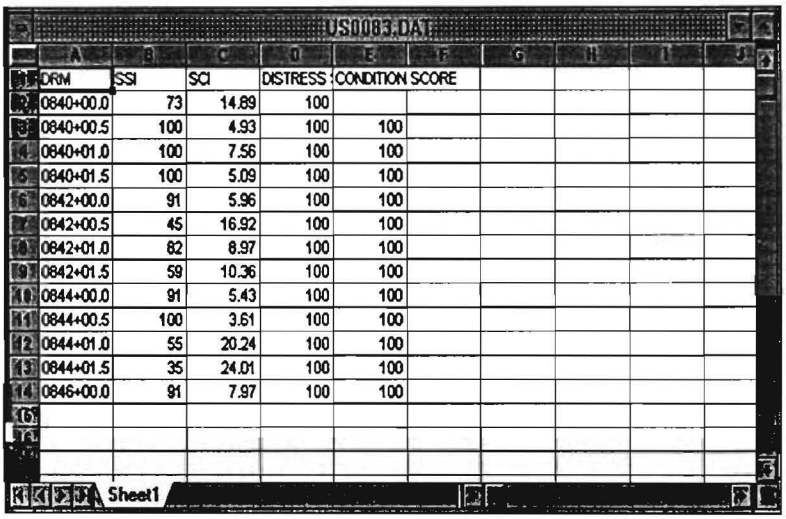


Figure 6.19: Partial Contents of the Excel Spreadsheet with Exported Plot Data

6.5 BUILDING THE BASIC CHART

At this point, the database-produced file for the selected highway segment is resident in sheet one of Excel. The next step is to highlight the spreadsheet cells corresponding to the plotting needs of the analyst. This section provides a step-by-step procedure for defining the basic plot within the Excel environment.

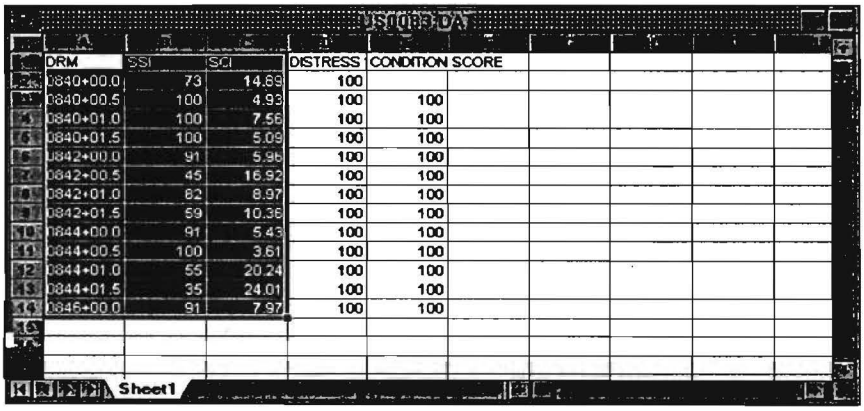
It is to be noted that the original US0083.DAT file was purposely edited down to contain segment information from DRM 0840+00.0 to DRM 0846+00.0. This produced a small file that is used herein for illustrative purposes only. The vast majority of highway segment data will contain substantially more data than the example problem.

From Figure 6.19 note that row 1 of the spreadsheet (columns A-E) contain the field names. These names will be part of the plot legend and must be part of the select plot region.

- Define the Plot Region by Highlighting the Appropriate Range.

In order to plot, the user must define the plot range. Assume we are concerned with plotting SSI and SCI from this data set. Column A represents the Distance Reference Markers and will become the x-axis of the plot. (Column A will always contain DRM data and hence, will default to the x-axis.) Distress and Condition Score will not be plotted in this example. If the user highlighted the entire range, then a 4-line plot would be produced (SSI, SCI, Distress, and Condition Score). Multiple-line plots can become confusing and could require a dual y-axis format due to the range of the scores. Until TxDOT scores all values between 0 and 100, the use of multiple line plots should be minimized.

To select the plot region for this example, with the mouse highlight the region from A1 to C14. Figure 6.20 illustrates the plot range definition.



	DRM	SSI	SCI	DISTRESS	CONDITION SCORE
2	0840+00.0	73	14.89	100	
3	0840+00.5	100	4.93	100	100
4	0840+01.0	100	7.56	100	100
5	0840+01.5	100	5.09	100	100
6	0842+00.0	91	5.96	100	100
7	0842+00.5	45	16.92	100	100
8	0842+01.0	82	8.97	100	100
9	0842+01.5	59	10.36	100	100
10	0844+00.0	91	5.43	100	100
11	0844+00.5	100	3.61	100	100
12	0844+01.0	55	20.24	100	100
13	0844+01.5	35	24.01	100	100
14	0846+00.0	91	7.97	100	100

Sheet1

Figure 6.20: Selected Plot Range Highlighted

The darkened area in Figure 6.20 defines the selected plot range. The succeeding steps will define Column A as the x-axis, columns B and C and the two line charts, and the legend will be the cell values A1, B1, and C1.

- Select the Chart Wizard button to begin the embedding of the plot. Move the mouse to an open area of the spreadsheet and trace a rectangular area of suitable size and double click. The Chart Wizard window will appear as shown in Figure 6.21.

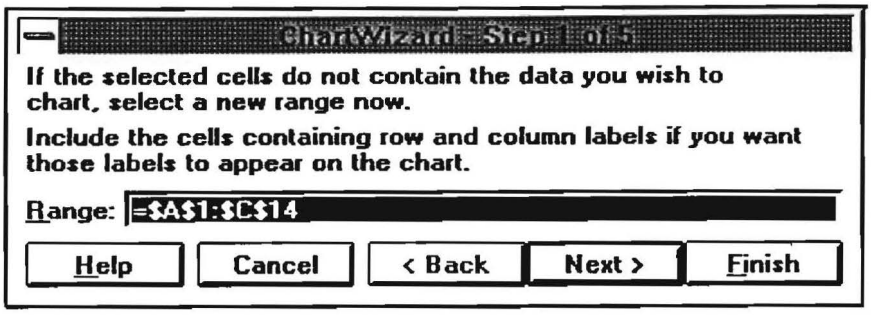


Figure 6.21: Chart Wizard Menu 1 of 5

Note the Range is from A1 to C14. This range corresponds to the highlighted area (plot range) as shown in Figure 6.19. The $ indicates absolute cell values and is automatically selected by Excel. Click on **NEXT** to display Chart Wizard's menu 2 of 5. (See Figure 6.22).

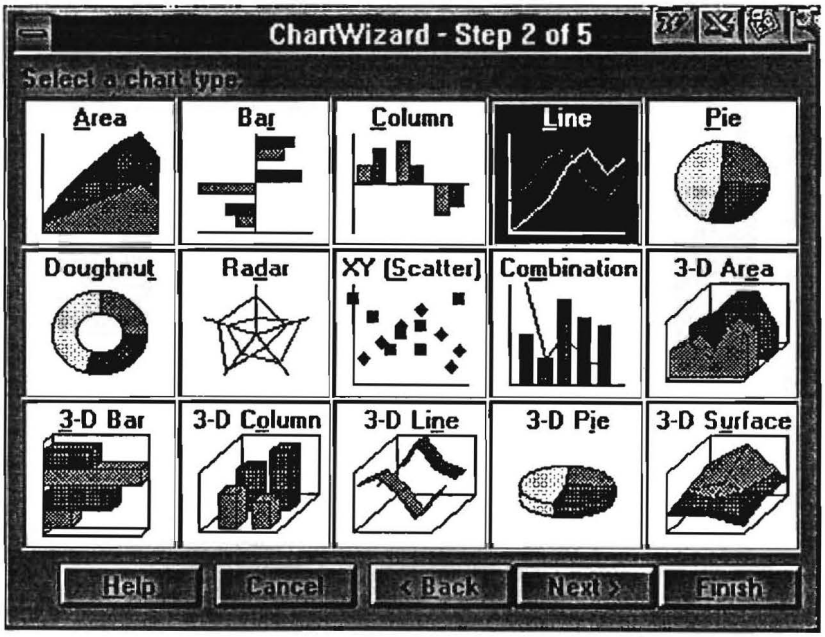


Figure 6.22: Chart Wizard Menu 2 of 5

- Select the **Line** option by moving the mouse pointer into the **Line** box and double clicking.

The second menu illustrates the various plotting formats available. Note, do not select the XY option! The **XY** option requires that the x-axis data be numerical in nature. For highway segment plotting, we require the x-axis data to represent the reference marker values (text). The **Line** option permits the x-axis data to be text or numeric.

- Move the mouse pointer to the Next box and click to show Chart Wizard menu 3 of 5 (Figure 6.23).

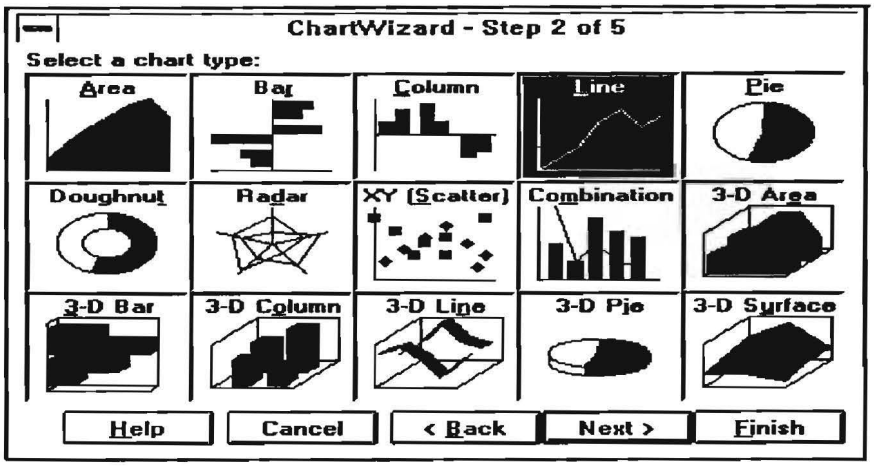


Figure 6.23: Chart Wizard Menu 3 of 5

The third menu provides the options available for the **Line** chart format. The preferred format is shown in box 2.

Move the mouse pointer inside of box 2 and double click. The Chart Wizard's fourth menu appears as shown in Figure 6.24.

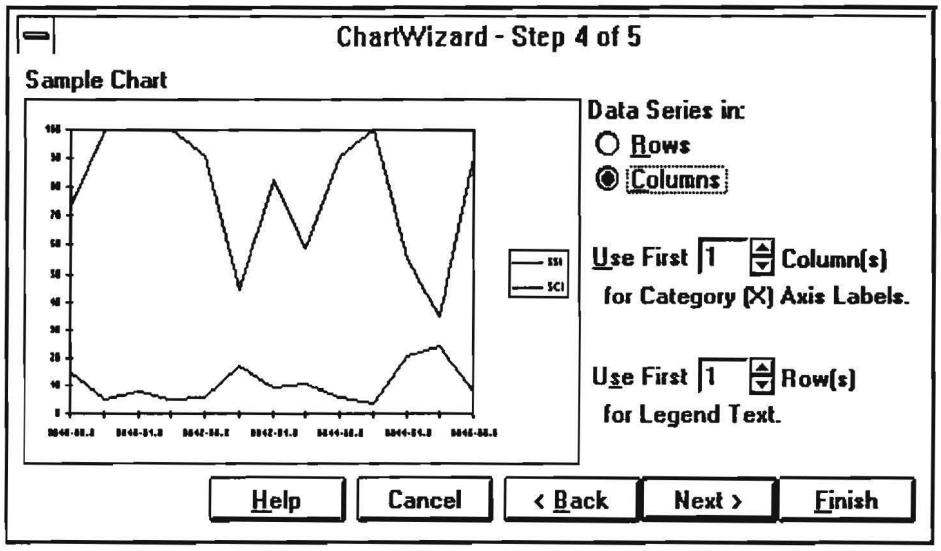


Figure 6.24: Chart Wizard Menu 4 of 5

From Figure 6.24, the user sees the first preview of the plot. The following options need to be selected.

1. Click on the **Columns** option under the **Data Series in** category.

2. Set the **Use First Columns** option equal to 1.
3. Set the **Use First Row(s)** option equal to 1 for the Legend Text.

- Click on the **Next** button to go to the last Chart Wizard menu. Chart Wizard's fifth menu appears as shown in Figure 6.25.

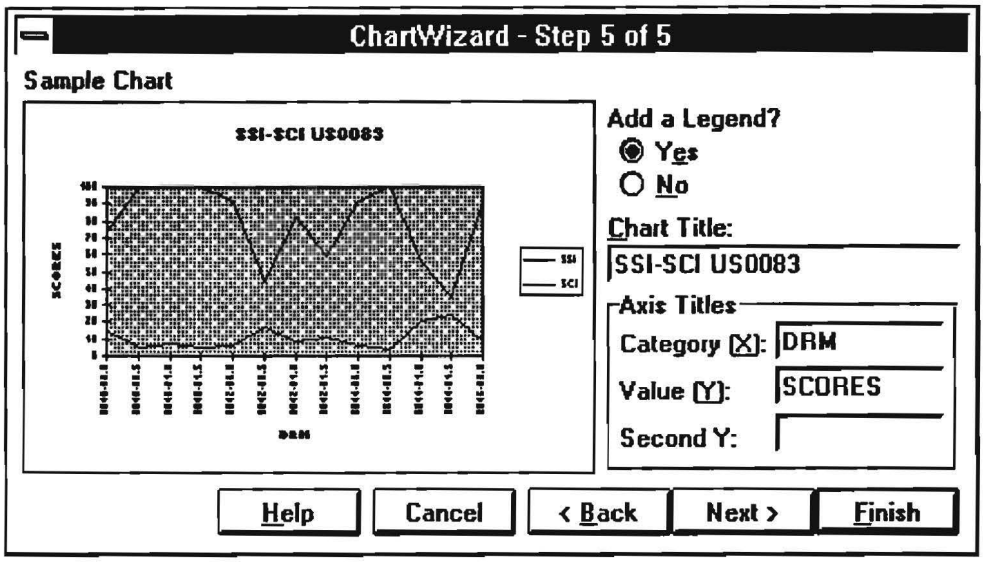


Figure 6.25: Chart Wizard Menu 5 of 5.

The final menu option permits the user to establish a legend, add an appropriate title, and label the x and y axis according to the specific problem. Based upon the example problem (a condensed version of US0083) the following options are selected.

1. Check "Yes" to **Add a Legend**.
2. For **Chart Title**, enter a descriptive title that matches the selected highway. For the example problem we have entered

   "SSI-SCI US0083".

   The user is free to select any appropriate title. It is suggested the title reflect the highway identification (US0083 in this case) and the plotted values (SSI and SCI for this example).

3. Enter descriptive titles for the x and y axis. The x-axis is always comprised of distance reference markers. Therefore, for the Category X title we have entered **DRM** (to stand for Distance Reference Markers).

   For the associated y-axis, we have entered **SCORES** as a sample title.

The left-hand portion of this menu shows the sample plot based upon the previously entered parameters. However, these values and other features of the plot can be modified later to comply with specific needs.

At this point in the sequence, the basic plotting parameters have been established, and we are ready to return to the spreadsheet. The plot will be "pasted" into the spreadsheet and can be customized to suit the analyst.

Move the mouse pointer to the **Finish** button (Figure 6.25) and click to return to the spreadsheet. The resultant action displays the pasted chart in the active spreadsheet as shown in Figure 6.26.

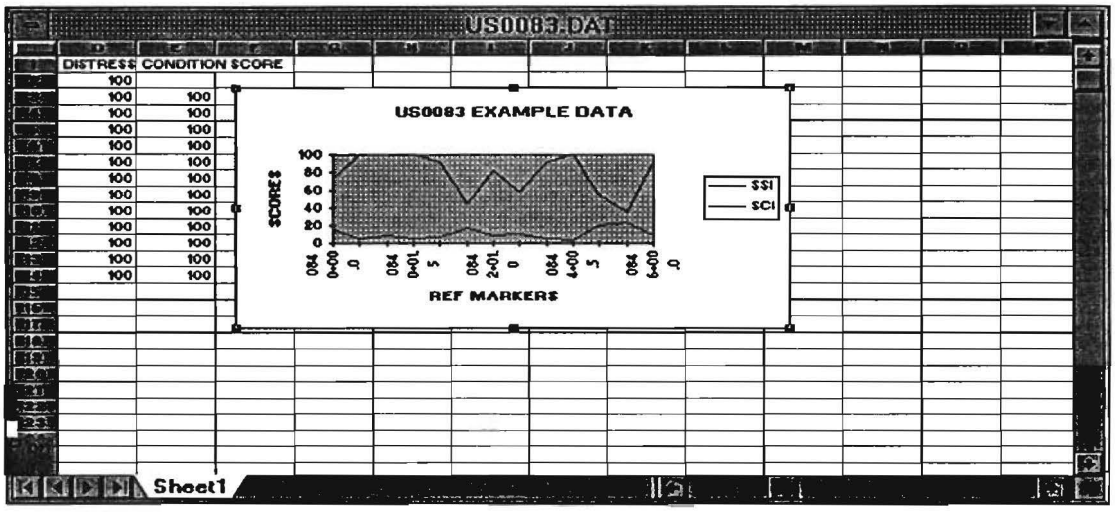


Figure 6.26: Example Plot Pasted into the Active Worksheet

At this point, it is suggested that the current worksheet be saved using the **Save-As** feature of Excel. Select an appropriate file name that can identify the file if needed for later applications.

6.6 CUSTOMIZING THE CHART

From Figure 6.26 we note that the basic chart is now resident on sheet 1 of the spreadsheet. Note the "banding" around the chart. By placing the mouse pointer on the band markers, one can resize the chart for improved visual appearance. By placing the mouse pointer inside the banded region and double clicking the mouse permits the user to conduct additional customizing of the chart prior to printing. This section highlights some of the common customizing features that can be performed.

Depending upon the context of the data (amount, missing data, etc.) the following modification(s) can be applied to the active chart.

1. Changing the font size of the x-axis.
2. Altering the maximum y-value to correspond to a (0 - 100) range.
3. Dealing with missing data or gaps in the data.

Each potential option will now be addressed.

6.6.1 Changing the Font Size of the X-axis

If the data file consists of a large number of observations it is impossible to have every data value posses its own x-value label. This is true for highway segments that are quite long (greater than 10 miles). Excel will automatically scale the x and y axis values and determine the appropriate number of major tick marks to be applied. It may become necessary to edit the x-axis to change the default position and font size to permit assessment of the distance reference marker values.

To modify the x-axis, place the mouse pointer inside the chart and on the x-axis (anywhere on and along the x-axis). Double click the mouse to bring up the Format Axis menu as shown in Figure 6.27.

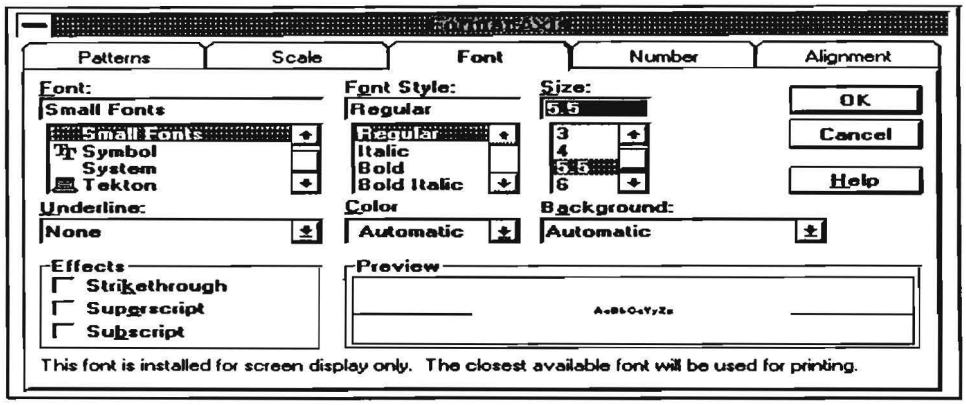


Figure 6.27: Edit Axis Menu

- Under the **Font** option, scroll down through the available fonts and click on **Small Fonts.**
- For **Font Style** select **Regular**.
- For **Size** select a font size between 4, 5.5, or 6. This can be changed later depending upon the appearance of the final plot.
- Move the mouse pointer to tab entitled **Alignment** and click.

The **Alignment** menu appears as shown in Figure 6.28.

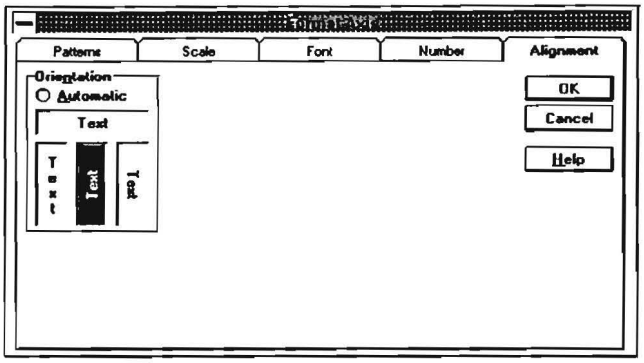


Figure 6.28: The Alignment Menu

Note the x-axis text can be aligned in one of four ways: Horizontal and three vertical options.

- With the mouse pointer select the preferred orientation (normally, select the middle, vertical orientation). Click on the preferred orientation. The main Format Axis menu reappears (Figure 6.27).

- Move the mouse pointer to the OK button and click. This returns the user to the embedded plot (Figure 6.26).

6.6.2 Modification of the Y-axis Values

Depending upon the range of the plotted y-values, the user may wish to check the y-axis plot range. To accomplish this move the mouse pointer to any point on the y axis line and double click. The Format Axis menu for the y-axis appears as shown in Figure 6.29.

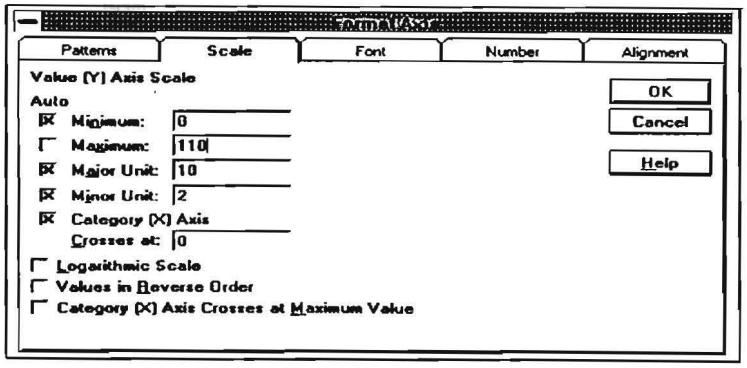


Figure 6.29: Formatting the Y-axis

- Examine the Value (y) Axis Scale values shown in the viewing boxes. Change these values appropriately. Normally, the following values cover most plotting situations.

    1. Minimum Y value = 0.
    2. Maximum Y value = 100.
    3. Major tick-mark unit = 10.
    4. Minor unit = 2.

    Make the appropriate changes in the parameter list.

If changes to the y-axis scale, font, number, or alignment are needed, move the mouse pointer to the respective tab, click, and post the desired changes. Point and click on each sub-menus OK button to return to the embedded chart (Figure 6.27).

6.6.3 Handling Missing Data

There exist plotting situations where the y data values (scores) will be incomplete or missing for the selected highway. If this situation arises, click on the active chart to *band* it.

- From the Excel options along the top of the screen select click on **Tools.** A pull-down menu will appear as shown in figure 6.30.

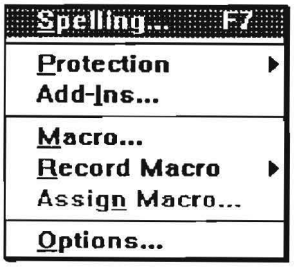


Figure 6.30: Tools Option Menu

- Select **Options.....**

    The Options menu appears as shown in Figure 6.31.

- Using the mouse pointer click on the tab entitled "**Chart**".

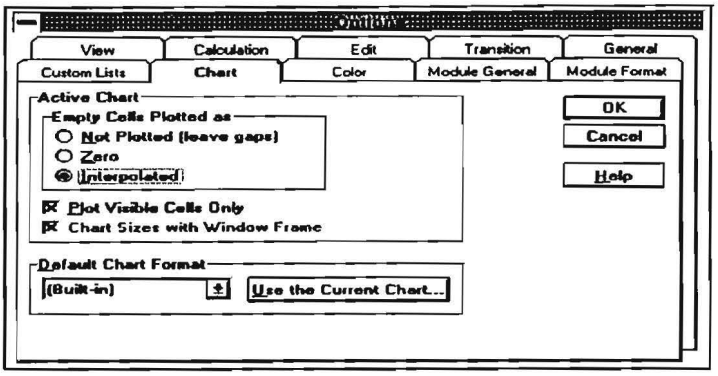


Figure 6.31: Tools - Options Menu for the Active Chart

- Under Active Chart, select the appropriate modification. The possible set-ups are listed below.

    1. Plot empty cells (missing y data) with intentional gaps. If missing data is part of the data set, this option is preferred.

    2. Plot empty cell as zero values (not recommended).

    3. Interpolated. This option provides a "smooth" plot of the y-values. (May or may not be preferred). If the data set contains no missing data, selecting this option "smoothes out" the resultant plot and is more pleasing.

It is suggested the analyst experiment with these options and review the chart. It is a matter of the analyst's personal preference for how the chart is to be presented.

- If any changes are made within this menu option, move the mouse pointer to the OK button to return to the active chart (Figure 6.32).

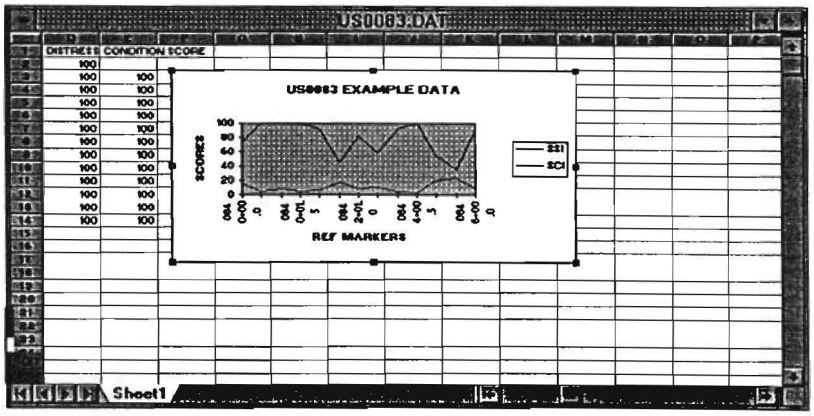


Figure 6.32: The Active Chart for the Example Problem

One final step is required to improve on the appearance of the chart once it is printed. With the mouse pointer move to any point inside of the chart and click.

It is to be emphasized that the analyst will perform a variety of chart modifications depending upon the data and the context in which the chart is to be used. As the user gains more experience with the plotting features of Excel, the production of a variety of plots for different situations becomes easier.

The next section will cover printing the chart.

6.7 PRINTING THE CHART

The next step in the sequence is to print the chart to the active printer. Assuming Excel is setup for the printer of choice (HP LaserJet or HP Color Ink Jet), the following steps are followed to print.

- Click on the **File** option and select **Print Preview** (Figure 6.33).

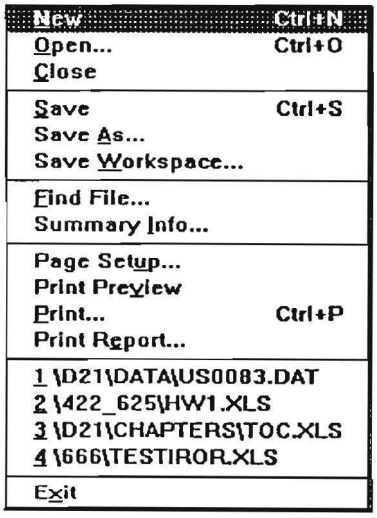


Figure 6.33: Excel File - Print Preview Menu

The following screen appears (Figure 6.34).

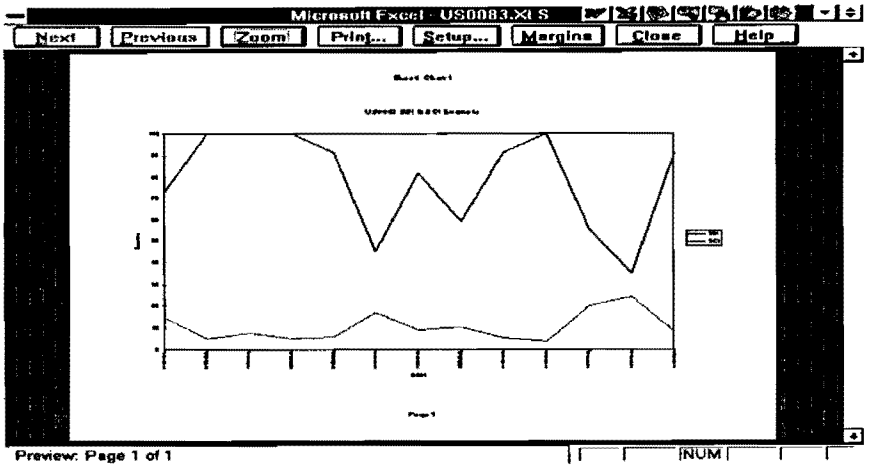


Figure 6.34: Print Preview Main Screen

- Select the Setup option. The Setup option appears as shown in Figure 6.35.

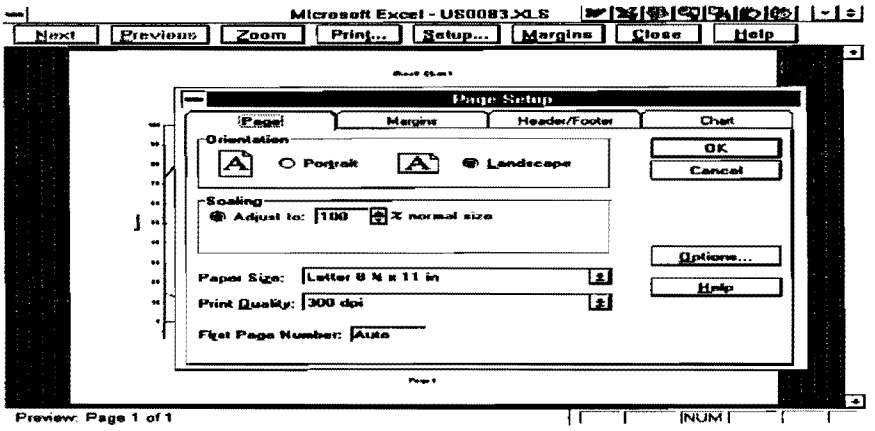


Figure 6.35: Print Setup Menu

The analyst can set features as portrait or landscape orientation. Clicking on the **Margins** option permits adjusting the top-bottom and left-right margins. If these adjustments are completed, the analyst can return to the previous menu (Figure 6.34) by clicking on the **OK** button. The chart is now ready to print.

- **Before printing, make certain the selected printer is on-line and ready.** To print, select the Print option from the Print Preview Main Screen (Figure 6.33). The chart produced from the US0083 data is shown in Figure 6.36.

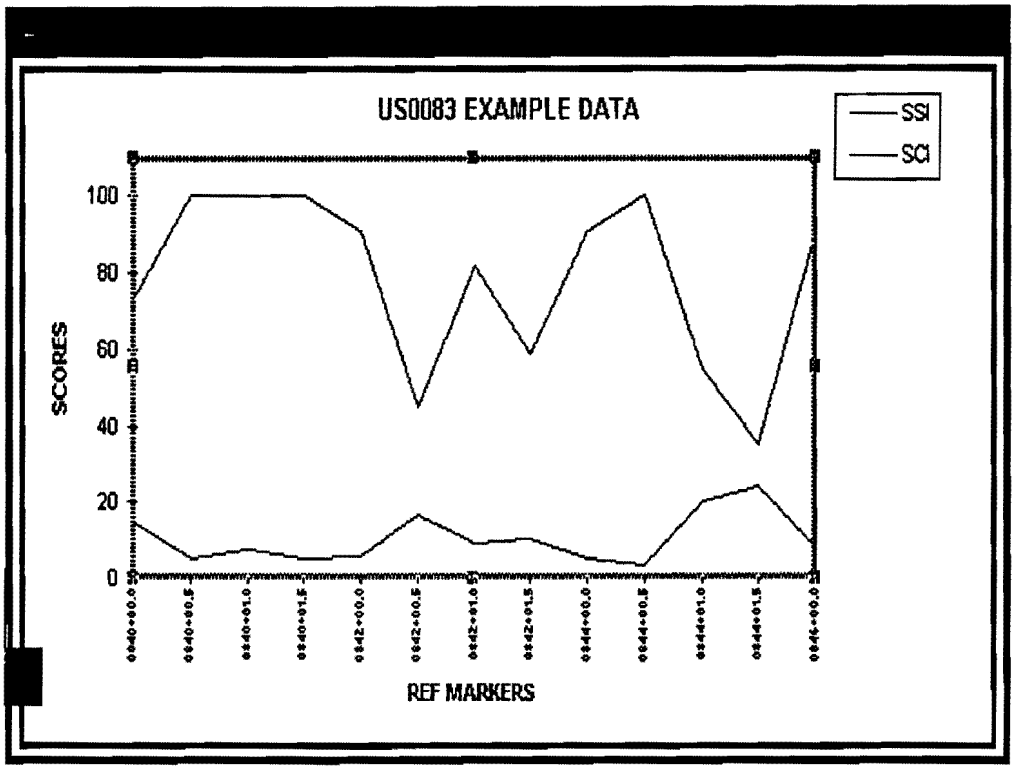


Figure 6.36: Sample Plot for the US0083 Data

6.8 SAVING THE CHART

To save the chart along with the associated worksheet click on the Excel File option and select **Save** or **Save As**. Use the Save option if the file had previously been saved; select the Save As option along with an appropriate file name if the file had not been previously saved.

6.9 SUMMARY

This chapter has covered the steps required to produce highway segment plots from the database system. Highway segment plots permit pavement managers, maintenance supervisors, and other district personnel a visual representation of a given highway.

The next chapter summarizes this research effort and suggests future advancements associated with the utility of a district-level PMIS system.

CHAPTER 7
SUMMARY

7.0 OVERVIEW OF THE RESEARCH PROJECT

This research project has culminated in the design and implementation of a microcomputer database system to interface with the current TxDOT mainframe PMIS system. This effort, conducted over a five year period, has produced an operational system well suited to District 21's need for custom PMIS reports and highway segment plots.

The system's design was based around the DOS-based DataEase relational database system. While still functional, the existing design needs to be ported into a Windows-based system possessing full functionality with the state system and possessing complete integration with existing Windows-based systems.

Much of the utility of the system described herein lies in the ability to assist district personnel in retrieving, sorting, and presenting information in a timely manner with the ability to adjust/modify the forms and plots to suit individual situations. While the state system is indeed powerful, it ties the district to standard reports and formats. If the district desires custom features, the state system is often slow and cumbersome to respond.

As with any database system, the design is never finished. As the state adds or changes features of the existing system, so too must the district-level PMIS. In effect, a database system of this type never stops changing. The current system is readily adaptable to change without loss of continuity or response to needs.

7.1 EXTENSIONS - FUTURE RESEARCH APPLICATIONS

Since a database system represents a dynamic entity, its design is ever changing. Additionally, the needs of the district and the state change and as such, promote the re-design and modification of existing systems. In the view of the author, the following extensions for the future are suggested.

1. The existing design needs to be re-programmed with a Windows compatible database. With the advent of 32-bit operating systems (O/S-2 Warp and Windows-NT) any such effort probably should stay within the Microsoft programming family since the state has heavily invested in Microsoft software. The following concepts are proposed.

    - Reprogram the system with Microsoft's Access Database system.
    - Incorporate the appropriate fields to support metrification of the current reference marker system.

- Install the Windows NT operating system within the various districts to take advantage of full 32-bit architecture. The Windows NT system will permit FTP ability and support a variety of file transfer approaches.

2. Design a scaled-down model of the existing system to support Metropolitan Planning Organizations' (MPO's) needs as related to Federal requirements for pavement management activities.

3. Provide the necessary funding to support the continuation of the system and to permit the required changes that inevitably occur.

4. Undertake the integration of the system in all TxDOT district headquarters.

7.2 CONCLUSIONS

The system described herein constitutes work performed beginning with the TxDOT Project 409 effort and the TxDOT Project 900 work. Work was officially terminated on August 31, 1994.

The system described herein is now fully operational and interfaces with the TxDOT mainframe system under the reference marker system in place up to December 31, 1994. The system permits the generation of a wide variety of standard and custom reports relating to pavement management data and related scores. Additionally, the users possess the capability of producing highway segment plots for visual interpretation.

The system produces data files that clearly show any and all critical segments within the district based upon user-input criteria that define what is "critical". From these files, critical summary reports are produced that identity those segments requiring rehabilitation/maintenance operations.

Appendix A
Database Primary Form Design for the 0.1 Mile File

Specimen County: Zapata

DataEase Form Name: **ZAPATA 0.1**

Key Field: Field No. 18 - PMIS KEY

Note:

The current database design contains 10 separate database files. Each file represents a given county (Brooks, Cameron, ..., Zapata) that currently comprise District 21. The ZAPATA 0.1 file structure is shown to illustrate the file design. The remaining nine (9) counties follow the exact same design format.

A.1 FORM PROPERTIES

Form Name: ZAPATA 0.1

SCREEN DESCRIPTION (Four Screens)

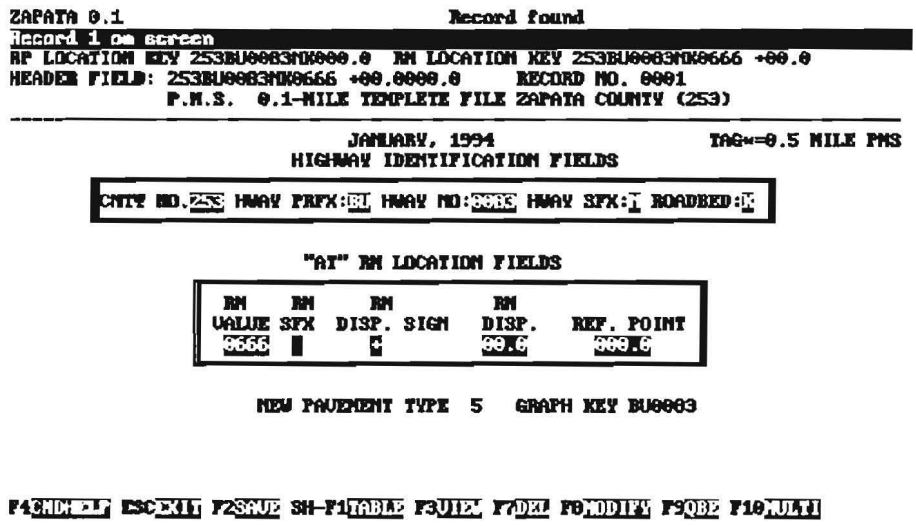


Figure A1.1: Screen No. 1: From The Zapata 0.1 File Example

Figure A1.1 illustrates the first of four screens displays that represent a typical county-level file structure. Screen 1 displays essential highway segment location fields and associated sorting-type fields used in selecting segments, importing-matching data, and organizing data for plotting purposes. Note the RM LOCATION KEY field in the upper right hand corner of the screen. This field is the primary sorting and location key that ties the mainframe PMIS records to the D21 microcomputer database records. The RM LOCATION KEY and the PMIS key fields serve identical purposes.

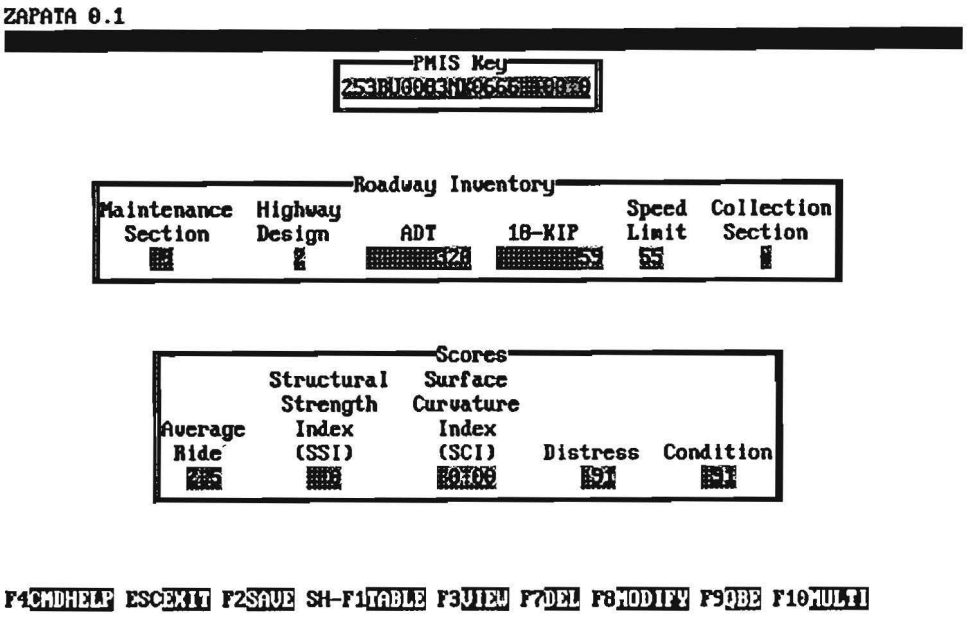


Figure A1.2: Screen 2 of the Zapata 0.1 File Example

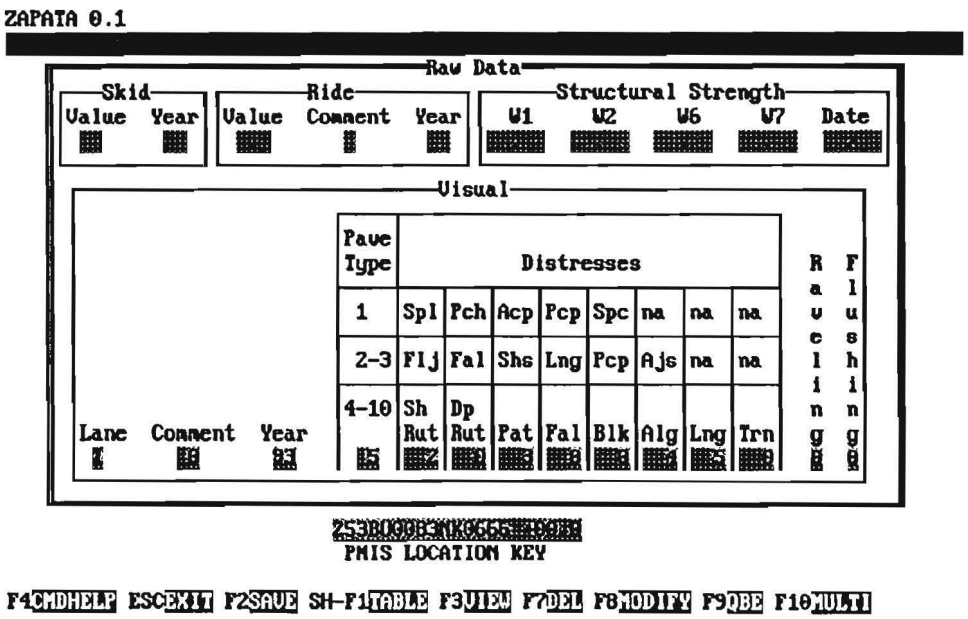


Figure A1.3: Screen 3 of the Zapata 0.1 File example

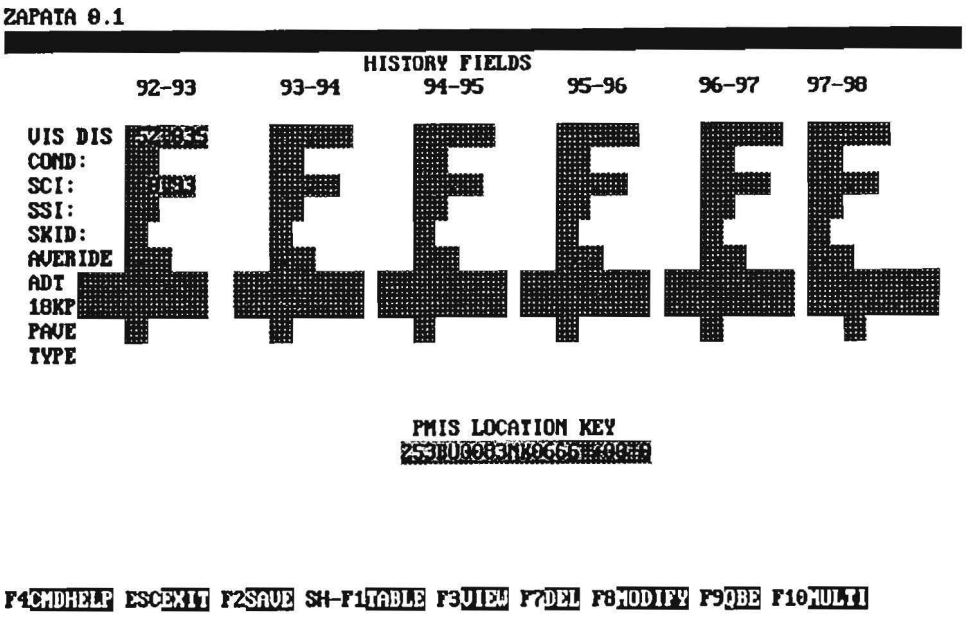


Figure A1.4: Screen 4 From the Zapata 0.1 File Example

A.2 FIELD DESCRIPTIONS

The following data fields comprise the current database design.

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
1	RP LOCATION KEY	Text	16	No	Yes	No	Yes	No	Yes	No	16	16

Calculated Field:
Forrmula: JOINTEXT(COUNTY NUMBER, JOINTEXT(HIGHWAY PREFIX,
JOINTEXT(HIGHWAY NUMBER, JOINTEXT(HIGHWAY SUFFIX,
JOINTEXT(ROADBED,REFERENCE POINT)))))

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
2	RMK	Text	21	NO	YES	YES	YES	NO	YES	NO	21	32

Calculated Field:
Formula: JOINTEXT(COUNTY NUMBER,
JOINTEXT(HIGHWAY PREFIX,
JOINTEXT(HIGHWAY NUMBER,
JOINTEXT(HIGHWAY SUFFIX,
JOINTEXT(ROADBED,
JOINTEXT(RM,
JOINTEXT(RM SUFFIX,
JOINTEXT(RM DISP. SIGN,RM DISP.))))))))

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
3	HEADER FIELD	Text	26	NO	YES	NO	YES	NO	YES	NO	26	53

Calculated Field:
Formula: JOINTEXT(RMK,REFERENCE POINT)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
4	RECORD NO.	Num. String	4	NO	NO	NO	YES	NO	YES	NO	4	79

Formated as : Other Format 0000
Formula: SEQUENCE FROM 0001
Maintains a running sequential record count for each record

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
5	TAG	Text	1	NO	NO	NO	NO	NO	YES	NO	1	83

Notes:
If TAG = "*", denotes a 0.5-mile PMIS data collection segment. If blank, not a PMIS collection segment.

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
6	COUNTY NUMBER	Num. String	3	NO	NO	NO	NO	YES	YES	NO	3	84

Formated as : Other Format 000
Lower Limit: 001: Upper Limit: 254: display Attribute: Highlight 1

Holds the current 3-digit county number (024 = Brooks, 031 = Cameron, ..., etc)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
7	HIGHWAY PREFIX	Choice	2	YES	NO	NO	NO	NO	YES	NO	1	87

Choice 1: PR
Choice 2: FM
Choice 3: SH
Choice 4: US
Choice 5: IH
Choice 6: BP
Choice 7: BF
Choice 8: BS
Choice 9: BU
Choice 10: BI
Choice 11: SL
Choice 12: SS
Choice 13: FS
Choice 14: SA
Choice 15: UA

Field Properties for Highway Prefix - continued

Choice 16: RM
Choice 17: RR
Choice 18: RE
Choice 19: RS
Choice 20: RU
Choice 21: RP
Choice 22: PA
Choice 23: MH
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
8	HIGHWAY NUMBER	Num. String	4	YES	NO	NO	NO	YES	YES	NO	4	88

Formated as : Other Format 0000
Lower Limit: 0001. Upper Limit: 9999
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
9	HIGHWAY SUFFIX	Text	1	NO	NO	NO	YES	NO	YES	NO	1	92

Calculated Field: Formula: " " (Defined as embedded blank character)
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
10	ROADBED	Choice	1	NO	NO	NO	NO	NO	YES	NO	1	93

Choice 1: R
Choice 2: L
Choice 3: A
Choice 4: X
Choice 5: K
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
11	RM	Num. String	4	NO	NO	NO	NO	NO	YES	NO	4	94

Formated as : Other Format 0000
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
12	RM SUFFIX	Text	1	NO	NO	NO	YES	NO	YES	NO	1	98

Formula: " " (Embedded blank character)
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
13	RM DISP. SIGN	Choice	1	NO	NO	NO	NO	NO	YES	NO	1	99

Choice 1: +
Choice 2: -
Field value is limited to either "+" or "-"
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
14	RM DISP.	Num. String	4	NO	NO	NO	NO	NO	YES	NO	3	100

Formated as : Other Format 00.0
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
15	REFERENCE POINT	Num. String	5	NO	NO	NO	NO	NO	NO	NO	4	103

Formated as : Other Format 000.0 Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
16	NEW PAVEMENT TYPE	Number	2	NO	NO	NO	NO	YES	NO	NO	1	107

Number Type : Integer
Lower Limit: 1
Upper Limit: 10

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
17	GRAPH KEY	Text	6	NO	NO	NO	YES	NO	NO	NO	6	108

Calculated Field.
Formula: JOINTEXT(HIGHWAY PREFIX,HIGHWAY NUMBER)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
18	PMIS KEY	Text	21	YES	NO	NO	YES	NO	YES	NO	21	418

Formula: RMK (PMIS KEY = RMK (Reference Marker Key) Retained else numerous DQL procedures would have to be edited.

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
19	MAINTENANCE SECTION	Number	2	NO	NO	NO	NO	NO	NO	NO	1	114

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
20	HIGHWAY DESIGN TYPE NO	Number	1	NO	NO	NO	NO	NO	NO	NO	1	115

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
21	ADT	Number	9	NO	NO	NO	NO	NO	NO	NO	4	116

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
22	18-KIP	Number	9	NO	NO	NO	NO	NO	NO	NO	4	120

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
23	SPEED LIMIT	Number	2	NO	NO	NO	NO	NO	NO	NO	1	124

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
24	DATA COLLECTION SECT	Text	1	NO	NO	NO	NO	NO	NO	NO	1	125

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
25	AVERAGE RIDE	Number	3	NO	NO	NO	NO	NO	NO	NO	4	126

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
26	SSI	Number	3	NO	NO	NO	NO	NO	NO	NO	2	130

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
27	SCI	Number	5	NO	NO	NO	NO	NO	NO	NO	4	132

Number Type : Fixed Point (Surface Curvature Index)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
28	DISTRESS SCORE	Number	3	NO	NO	NO	NO	NO	NO	NO	2	136

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
29	CONDITION SCORE	Number	3	NO	NO	NO	NO	NO	NO	NO	2	138

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
30	SKID VALUE	Number	2	NO	NO	NO	NO	NO	NO	NO	1	140

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
31	SKID YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	141

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
32	SI VALUE	Number	3	NO	NO	NO	NO	NO	NO	NO	4	142

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
33	SI COMMENT	Number	1	NO	NO	NO	NO	NO	NO	NO	1	146

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
34	SI YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	147

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
35	W1	Number	5	NO	NO	NO	NO	NO	NO	NO	4	148

Number Type : Fixed Point

Falling Wt. Geo-phone No. 1 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
36	W2	Number	5	NO	NO	NO	NO	NO	NO	NO	4	152

Number Type : Fixed Point

Falling Wt. Geo-phone No. 2 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
37	W6	Number	5	NO	NO	NO	NO	NO	NO	NO	4	156

Number Type : Fixed Point

Falling Wt. Geo-phone No. 6 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
38	W7	Number	5	NO	NO	NO	NO	NO	NO	NO	4	160

Number Type : Fixed Point

Falling Wt. Geo-phone No. 7 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
39	FWD DATE	Num. String	5	NO	NO	NO	NO	NO	NO	NO	4	164

Formated as : Other Format 00/00

Month/Yr for FWD collection for the current highway segment

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
40	VIS LANE	Number	1	NO	NO	NO	NO	NO	NO	NO	1	168

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
41	VIS COMMENT	Number	2	NO	NO	NO	NO	NO	NO	NO	1	169

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
42	VIS YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	170

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
43	PAVEMENT TYPE	Number	2	NO	NO	NO	NO	NO	NO	NO	1	171

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
44	DISTRESS 1	Number	3	NO	NO	NO	NO	NO	NO	NO	2	172

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
45	DISTRESS 2	Number	3	NO	NO	NO	NO	NO	NO	NO	2	174

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
46	DISTRESS 3	Number	3	NO	NO	NO	NO	NO	NO	NO	2	176

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
47	DISTRESS 4	Number	3	NO	NO	NO	NO	NO	NO	NO	2	178

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
48	DISTRESS 5	Number	3	NO	NO	NO	NO	NO	NO	NO	2	180

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
49	DISTRESS 6	Number	3	NO	NO	NO	NO	NO	NO	NO	2	182

Number Type: Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
50	DISTRESS 7	Number	3	NO	NO	NO	NO	NO	NO	NO	2	184

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
51	DISTRESS 8	Number	3	NO	NO	NO	NO	NO	NO	NO	2	186

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
52	RAVELING	Number	1	NO	NO	NO	NO	NO	NO	NO	1	188

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
53	FLUSHING	Number	1	NO	NO	NO	NO	NO	NO	NO	1	189

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
54	PMIS KEY2	Text	21	NO	NO	NO	NO	NO	NO	NO	21	439

Formula: RMK (Used for screen display convenience only)

BEGIN THE HISTORY FIELDS.

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
55	VIS DISTRESS 92	Number	7	NO	NO	NO	NO	NO	NO	NO	8	190

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
56	VIS DISTRESS 93	Number	7	NO	NO	NO	NO	NO	NO	NO	8	198

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
57	VIS DISTRESS 94	Number	7	NO	NO	NO	NO	NO	NO	NO	8	206

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
58	VIS DISTRESS 95	Number	7	NO	NO	NO	NO	NO	NO	NO	8	214

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
59	VIS DISTRESS 96	Number	7	NO	NO	NO	NO	NO	NO	NO	8	222

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
60	VIS DISTRESS 97	Number	7	NO	NO	NO	NO	NO	NO	NO	8	230

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
61	CONDITION 92-93	Number	3	NO	NO	NO	NO	NO	NO	NO	2	238

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
62	CONDITION 93-94	Number	3	NO	NO	NO	NO	NO	NO	NO	2	240

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
63	CONDITION 94-95	Number	3	NO	NO	NO	NO	NO	NO	NO	2	242

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
64	CONDITION 95-96	Number	3	NO	NO	NO	NO	NO	NO	NO	2	244

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
65	CONDITION 96-97	Number	3	NO	NO	NO	NO	NO	NO	NO	2	246

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
66	CONDITION 97-98	Number	3	NO	NO	NO	NO	NO	NO	NO	2	248

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
67	SCI 92	Number	6	NO	NO	NO	NO	NO	NO	NO	4	250

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
68	SCI 93	Number	6	NO	NO	NO	NO	NO	NO	NO	4	254

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
69	SCI 94	Number	6	NO	NO	NO	NO	NO	NO	NO	4	258

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
70	SCI 95	Number	6	NO	NO	NO	NO	NO	NO	NO	4	262

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
71	SCI 96	Number	6	NO	NO	NO	NO	NO	NO	NO	4	266

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
72	SCI 97	Number	6	NO	NO	NO	NO	NO	NO	NO	4	270

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
73	SSI 92-93	Number	3	NO	NO	NO	NO	NO	NO	NO	2	274

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
74	SSI 93-94	Number	3	NO	NO	NO	NO	NO	NO	NO	2	276

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
75	SSI 94-95	Number	3	NO	NO	NO	NO	NO	NO	NO	2	278

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
76	SSI 95-96	Number	3	NO	NO	NO	NO	NO	NO	NO	2	280

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
77	SSI 96-97	Number	3	NO	NO	NO	NO	NO	NO	NO	2	282

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
78	SSI 97-98	Number	3	NO	NO	NO	NO	NO	NO	NO	2	284

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
79	SKID VALUE 92	Number	2	NO	NO	NO	NO	NO	NO	NO	1	286

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
80	SKID VALUE 93	Number	2	NO	NO	NO	NO	NO	NO	NO	1	287

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
81	SKID VALUE 94	Number	2	NO	NO	NO	NO	NO	NO	NO	1	288

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
82	SKID VALUE 95	Number	2	NO	NO	NO	NO	NO	NO	NO	1	289

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
83	SKID VALUE 96	Number	2	NO	NO	NO	NO	NO	NO	NO	1	290

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
84	SKID VALUE 97	Number	2	NO	NO	NO	NO	NO	NO	NO	1	291

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
85	AVE RIDE 92-93	Number	4	NO	NO	NO	NO	NO	NO	NO	4	292

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
86	AVE RIDE 93-94	Number	4	NO	NO	NO	NO	NO	NO	NO	4	296

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
87	AVE RIDE 94-95	Number	4	NO	NO	NO	NO	NO	NO	NO	4	300

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
88	AVE RIDE 95-96	Number	4	NO	NO	NO	NO	NO	NO	NO	4	304

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
89	AVE RIDE 96-97	Number	4	NO	NO	NO	NO	NO	NO	NO	4	308

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
90	AVE RIDE 97-98	Number	4	NO	NO	NO	NO	NO	NO	NO	4	312

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
91	ADT 92-93	Number	11	NO	NO	NO	NO	NO	NO	NO	8	316

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
92	ADT 93-94	Number	11	NO	NO	NO	NO	NO	NO	NO	8	324

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
93	ADT 94-95	Number	11	NO	NO	NO	NO	NO	NO	NO	8	332

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
94	ADT 95-96	Number	11	NO	NO	NO	NO	NO	NO	NO	8	340

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
95	ADT 96-97	Number	11	NO	NO	NO	NO	NO	NO	NO	8	348

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
96	ADT 92-9352	Number	11	NO	NO	NO	NO	NO	NO	NO	8	356

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
97	18KIP 92-93	Number	11	NO	NO	NO	NO	NO	NO	NO	8	364

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
98	18KIP 93-94	Number	11	NO	NO	NO	NO	NO	NO	NO	8	372

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
99	18KIP 94-95	Number	11	NO	NO	NO	NO	NO	NO	NO	8	380

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
100	18KIP 95-96	Number	11	NO	NO	NO	NO	NO	NO	NO	8	388

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
101	18KIP 96-97	Number	11	NO	NO	NO	NO	NO	NO	NO	8	396

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
102	18KIP 97-98	Number	11	NO	NO	NO	NO	NO	NO	NO	8	404

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
103	PAVE TYPE 92-93	Number	2	NO	NO	NO	NO	NO	NO	NO	1	412

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
104	PAVE TYPE 93-94	Number	2	NO	NO	NO	NO	NO	NO	NO	1	413

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
105	PAVE TYPE 94-95	Number	2	NO	NO	NO	NO	NO	NO	NO	1	414

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
106	PAVE TYPE 95-96	Number	2	NO	NO	NO	NO	NO	NO	NO	1	415

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
107	PAVE TYPE 96-97	Number	2	NO	NO	NO	NO	NO	NO	NO	1	416

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
108	PAVE TYPE 97-98 Number Type : Integer	Number	2	NO	NO	NO	NO	NO	NO	NO	1	417

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
109	PMIS KEY3 Formula: RMK	Text	21	NO	NO	NO	NO	NO	NO	NO	21	460

End of 0.1 county-level Form Structure.

Record Size: 481 Memory: Text = 4247 Fields = 4608 Total = 8855

APPENDIX B
FORM PROPERTIES FOR THE 01HOLD FILE

B1.0 OVERVIEW OF THE 01FILE

The 01HOLD file is used as a temporary target file when down-loading from the TxDOT mainframe system. Upon completion of field data collection, pavement segment evaluation ratings/observations are imported into the State PMIS system. A CALC routine is executed to compute the various PMIS pavement scores (Siometer, Falling Weight, Visual, and Skid). The scores are then stored in the PMIS file system and can be extracted in a variety of ways. For the purpose of this research, segments are requested on a county-by-county basis and imported from the mainframe via ROSS1 and ARBITER down to the D 21 PMIS micro system.

This file is used to temporarily hold the downloaded PMIS scores one county at a time. A DataEase procedure then imports the scores into each county-level file using the PMIS key field as the match. Once the import is completed and validated, the 01HOLD file is cleared and another county is loaded and imported. At the conclusion of this process, all 10 counties will have received the current year's data and scores. At that point, the numerous reports and analysis routines can be executed.

The 01HOLD file is a subset of the master county file design. The PMIS KEY field is the matching field between the 01HOLD and each of the respective county-level files. This establishes a one-to-one match between the temporary 01HOLD and a given county-level file. If a highway segment is in the downloaded data set (i.e., resident in the 01HOLD file), it will match with one and only one record in the specified county-level file.

The county-level data files contain all 0.1 segments currently inventoried. Since a given year's data collection may or may not comprise 100% of all segments (depending upon the type of data collection) only the collected segments will find a match in the county-level file. Therefore it is highly likely that missing data segments will exist at the conclusion of each import pass. This is to be expected due to the data collection sampling procedures used within each district.

It is not the purpose of this file to act as a data input-editing file. The file's sole purpose is to act as a temporary holding file to receive data from the mainframe PMIS system in order to import the same data into one of the selected county-level files. The format of the 01HOLD file is shown below.

Form Name: **01HOLD**

FORM PROPERTIES

Minimum Security Levels:	
to VIEW Records:	Low3
to MODIFY Records:	Medium3
to ENTER Records:	Medium3
to DELETE Records	Medium3
Encrypt Data Records:	no
When Entering Records:	
Default View of This Form:	Form View
Clear Form After Entering Record:	no
Suppress Automatic TAB When a Field Fills:	no
Preserve Old CURRENT DATE, etc. on Modify:	no
Form Name: 01HOLD	

B2.0 SCREEN DESCRIPTION

Figures B.1 and B.2 illustrate the screen images associated with the 01HOLD File.

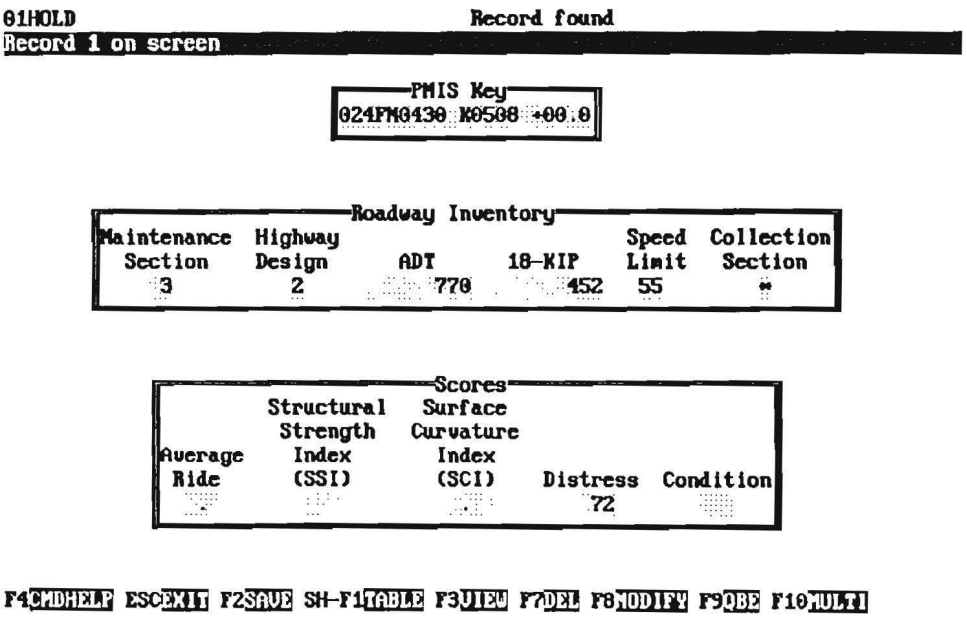


Figure B.1: Screen No. 1 of the 01HOLD File

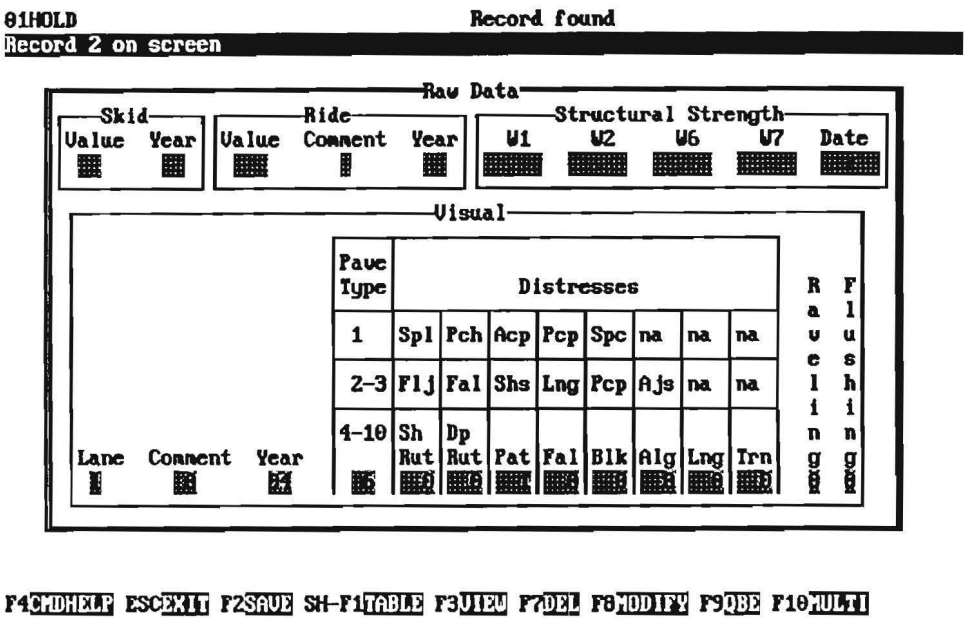


Figure B.2: Screen No.2 of the 01HOLD File

Note:

The following cross-referencing for fields in the **01HOLD** file and the corresponding field in a given county-level file are as follows. Under the field "No." category the first digit(s) is (are) the field number in the 01HOLD file. The number in "( )" is the corresponding field number in the county-level file structure.

Example: Field 1 in the 01HOLD file corresponds to field (18) in any of the county-level files. The 01HOLD file is comprised of 37 fields per record. The detailed field definitions follow.

B3.0 DETAILED FIELD DESCRIPTIONS OF THE 01HOLD FILE

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
1 (18)	PMIS KEY	Text	21	YES	NO	NO	NO	NO	YES	NO	21	418

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
2 (19)	MAINTENANCE SECTION	Number	2	NO	NO	NO	NO	NO	NO	NO	1	114

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
3 (20)	HIGHWAY DESIGN TYPE NO	Number	1	NO	NO	NO	NO	NO	NO	NO	1	115

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
4 (21)	ADT	Number	9	NO	NO	NO	NO	NO	NO	NO	4	116

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
5 (22)	18-KIP	Number	9	NO	NO	NO	NO	NO	NO	NO	4	120

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
6 (23)	SPEED LIMIT	Number	2	NO	NO	NO	NO	NO	NO	NO	1	124

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
7 (24)	DATA COLLECTION SECT	Text	1	NO	NO	NO	NO	NO	NO	NO	1	125

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
8 (25)	AVERAGE RIDE	Number	3	NO	NO	NO	NO	NO	NO	NO	4	126

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
9 (26)	SSI	Number	3	NO	NO	NO	NO	NO	NO	NO	2	130

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
10 (27)	SCI	Number	5	NO	NO	NO	NO	NO	NO	NO	4	132

Number Type : Fixed Point (Surface Curvature Index)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
11 (28)	DISTRESS SCORE	Number	3	NO	NO	NO	NO	NO	NO	NO	2	136

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
12 (29)	CONDITION SCORE	Number	3	NO	NO	NO	NO	NO	NO	NO	2	138

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
13 (30)	SKID VALUE	Number	2	NO	NO	NO	NO	NO	NO	NO	1	140

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
14 (31)	SKID YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	141

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
15 (32)	SI VALUE	Number	3	NO	NO	NO	NO	NO	NO	NO	4	142

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
16 (33)	SI COMMENT	Number	1	NO	NO	NO	NO	NO	NO	NO	1	146

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
17 (34)	SI YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	147

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
18 (35)	W1	Number	5	NO	NO	NO	NO	NO	NO	NO	4	148

Number Type : Fixed Point
Falling Wt. Geo-phone No. 1 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
19 (36)	W2	Number	5	NO	NO	NO	NO	NO	NO	NO	4	152

Number Type : Fixed Point
Falling Wt. Geo-phone No. 2 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
20 (37)	W6	Number	5	NO	NO	NO	NO	NO	NO	NO	4	156

Number Type : Fixed Point
Falling Wt. Geo-phone No. 6 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
21 (38)	W7	Number	5	NO	NO	NO	NO	NO	NO	NO	4	160

Number Type : Fixed Point
Falling Wt. Geo-phone No. 7 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
22 (39)	FWD DATE	Num. String	5	NO	NO	NO	NO	NO	NO	NO	4	164

Formated as : Other Format 00/00
Month/Yr for FWD collection for the current highway segment

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
23 (40)	VIS LANE	Number	1	NO	NO	NO	NO	NO	NO	NO	1	168

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
24 (41)	VIS COMMENT	Number	2	NO	NO	NO	NO	NO	NO	NO	1	169

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
25 (42)	VIS YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	170

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
26	(43) PAVEMENT TYPE	Number	2	NO	NO	NO	NO	NO	NO	NO	1	171

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
27	(44) DISTRESS 1	Number	3	NO	NO	NO	NO	NO	NO	NO	2	172

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
28	(45) DISTRESS 2	Number	3	NO	NO	NO	NO	NO	NO	NO	2	174

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
29	(46) DISTRESS 3	Number	3	NO	NO	NO	NO	NO	NO	NO	2	176

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
30	(47) DISTRESS 4	Number	3	NO	NO	NO	NO	NO	NO	NO	2	178

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
31	(48) DISTRESS 5	Number	3	NO	NO	NO	NO	NO	NO	NO	2	180

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
32	(49) DISTRESS 6	Number	3	NO	NO	NO	NO	NO	NO	NO	2	182

Number Type: Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
33	(50) DISTRESS 7	Number	3	NO	NO	NO	NO	NO	NO	NO	2	184

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
34	(51) DISTRESS 8	Number	3	NO	NO	NO	NO	NO	NO	NO	2	186

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
35	(52) RAVELING	Number	1	NO	NO	NO	NO	NO	NO	NO	1	188

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
36	(53) FLUSHING	Number	1	NO	NO	NO	NO	NO	NO	NO	1	189

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
37	(54) PMIS KEY2	Text	21	NO	NO	NO	NO	NO	NO	NO	21	439

Formula: RMK (Used for screen display convenience only)

Record Size: 104 Memory: Text = 2401 Fields = 37

End of Section.

APPENDIX C
D21 HOLDING FILE DEFINITION FOR CRITICAL HIGHWAY SEGMENTS FROM ALL COUNTIES

C1.0 OVERVIEW OF THE "BAD FILE"

"The Bad File" database file is a working file that holds selected, critical user-specified highway segments accumulated from all 10 counties. This file serves as a holding file for the following categories of critical (Bad) highway segments:

a. Critical siometer (<= 2.5),
b. Critical FWD (<= 80, normalized),
c. Critical Skid (<= 28), and
d. Critical Visual (<= 80, normalized).

This file was created at the request of the District Pavement Manager Engineer in order to locate, and store in one file, all critical highway segments regardless of the county. In effect, this file contains critical highway segments, regardless of the county, in one central file suitable for sorting and reporting in a variety of ways. The sorted information from this file permits rapid identification of critical segments for the entire district and provides an effective mechanism for prioritization of segments for budget workups. The form properties for this database file are shown below.

C2.0 FORM PROPERTIES FOR THE BAD FILE

Form Name: THE BAD FILE

F O R M P R O P E R T I E S

Minimum Security Levels:	
to VIEW Records:	Low3
to MODIFY Records:	Medium3
to ENTER Records:	Medium3
to DELETE Records:	Medium3
Encrypt Data Records:	no
When Entering Records:	
Default View of This Form:	Form View
Clear Form After Entering Record:	no
Suppress Automatic TAB When a Field Fills:	no
Preserve Old CURRENT DATE, etc.	no
Modify:	no

Form Name: THE BAD FILE

C3.0 FIELD DESCRIPTIONS - BAD FILE

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
1	RP LOCATION KEY	Text	16	No	Yes	No	Yes	No	Yes	No	16	16

Calculated Field:
Forrmula: JOINTEXT(COUNTY NUMBER, JOINTEXT(HIGHWAY PREFIX, JOINTEXT(HIGHWAY NUMBER, JOINTEXT(HIGHWAY SUFFIX, JOINTEXT(ROADBED,REFERENCE POINT)))))

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
2	RMK	Text	21	NO	YES	YES	YES	NO	YES	NO	21	32

Calculated Field:
Formula: JOINTEXT(COUNTY NUMBER,
JOINTEXT(HIGHWAY PREFIX,
JOINTEXT(HIGHWAY NUMBER,
JOINTEXT(HIGHWAY SUFFIX,
JOINTEXT(ROADBED,
JOINTEXT(RM,
JOINTEXT(RM SUFFIX,
JOINTEXT(RM DISP. SIGN,RM DISP.))))))))

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
3	HEADER FIELD	Text	26	NO	YES	NO	YES	NO	YES	NO	26	53

Calculated Field:
Formula: JOINTEXT(RMK,REFERENCE POINT)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
4	RECORD NO.	Num. String	4	NO	NO	NO	YES	NO	YES	NO	4	79

Formated as : Other Format 0000
Formula: SEQUENCE FROM 0001
Maintains a running sequential record count for each record

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
5	TAG	Text	1	NO	NO	NO	NO	NO	YES	NO	1	83

Notes:
If TAG = "*", denotes a 0.5-mile PMIS data collection segment. If blank, not a PMIS collection segment.

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
6	COUNTY NUMBER	Num. String	3	NO	NO	NO	NO	YES	YES	NO	3	84

Formated as : Other Format 000
Lower Limit: 001: Upper Limit: 254: display Attribute: Highlight 1

Holds the current 3-digit county number (024 = Brooks, 031 = Cameron, ..., etc)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
7	HIGHWAY PREFIX	Choice	2	YES	NO	NO	NO	NO	YES	NO	1	87

Choice 1: PR
Choice 2: FM
Choice 3: SH
Choice 4: US
Choice 5: IH
Choice 6: BP
Choice 7: BF
Choice 8: BS
Choice 9: BU
Choice 10: BI
Choice 11: SL
Choice 12: SS
Choice 13: FS
Choice 14: SA
Choice 15: UA
Choice 16: RM
Choice 17: RR
Choice 18: RE
Choice 19: RS
Choice 20: RU
Choice 21: RP
Choice 22: PA
Choice 23: MH
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
8	HIGHWAY NUMBER	Num. String	4	YES	NO	NO	NO	YES	YES	NO	4	88

Formated as : Other Format 0000
Lower Limit: 0001. Upper Limit: 9999
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Size	Record Offset
9	HIGHWAY SUFFIX	Text	1	NO	NO	NO	YES	NO	YES	NO	1	92

Calculated Field: Formula: " " (Defined as embedded blank character)
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Size	Record Offset
10	ROADBED	Choice	1	NO	NO	NO	NO	NO	YES	NO	1	93

Choice 1: R
Choice 2: L
Choice 3: A
Choice 4: X
Choice 5: K
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Size	Record Offset
11	RM	Num. String	4	NO	NO	NO	NO	NO	YES	NO	4	94

Formated as : Other Format 0000
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Size	Record Offset
12	RM SUFFIX	Text	1	NO	NO	NO	YES	NO	YES	NO	1	98

Formula: " " (Embedded blank character)
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Size	Record Offset
13	RM DISP. SIGN	Choice	1	NO	NO	NO	NO	NO	YES	NO	1	99

Choice 1: +
Choice 2: -
Field value is limited to either "+" or "-"
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Size	Record Offset
14	RM DISP.	Num. String	4	NO	NO	NO	NO	NO	YES	NO	3	100

Formated as : Other Format 00.0
Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Size	Record Offset
15	REFERENCE POINT	Num. String	5	NO	NO	NO	NO	NO	NO	NO	4	103

Formated as : Other Format 000.0 Display Attribute: Highlight 1

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
16	NEW PAVEMENT TYPE	Number	2	NO	NO	NO	NO	YES	NO	NO	1	107

Number Type : Integer
Lower Limit: 1
Upper Limit: 10

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
17	GRAPH KEY	Text	6	NO	NO	NO	YES	NO	NO	NO	6	108

Calculated Field.
Formula: JOINTEXT(HIGHWAY PREFIX,HIGHWAY NUMBER)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
18	PMIS KEY	Text	21	YES	NO	NO	YES	NO	YES	NO	21	418

Formula: RMK (PMIS KEY = RMK (Reference Marker Key) Retained else numerous DQL procedures would have to be edited.

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
19	MAINTENANCE SECTION	Number	2	NO	NO	NO	NO	NO	NO	NO	1	114

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
20	HIGHWAY DESIGN TYPE NO	Number	1	NO	NO	NO	NO	NO	NO	NO	1	115

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
21	ADT	Number	9	NO	NO	NO	NO	NO	NO	NO	4	116

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
22	18-KIP	Number	9	NO	NO	NO	NO	NO	NO	NO	4	120

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
23	SPEED LIMIT	Number	2	NO	NO	NO	NO	NO	NO	NO	1	124

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
24	DATA COLLECTION SECT	Text	1	NO	NO	NO	NO	NO	NO	NO	1	125

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
25	AVERAGE RIDE	Number	3	NO	NO	NO	NO	NO	NO	NO	4	126

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
26	SSI	Number	3	NO	NO	NO	NO	NO	NO	NO	2	130

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
27	SCI	Number	5	NO	NO	NO	NO	NO	NO	NO	4	132

Number Type : Fixed Point (Surface Curvature Index)

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
28	DISTRESS SCORE	Number	3	NO	NO	NO	NO	NO	NO	NO	2	136

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
29	CONDITION SCORE	Number	3	NO	NO	NO	NO	NO	NO	NO	2	138

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
30	SKID VALUE	Number	2	NO	NO	NO	NO	NO	NO	NO	1	140

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
31	SKID YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	141

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng	Pre-	Hide	Record

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
32	SI VALUE	Number	3	NO	NO	NO	NO	NO	NO	NO	4	142

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
33	SI COMMENT	Number	1	NO	NO	NO	NO	NO	NO	NO	1	146

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
34	SI YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	147

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
35	W1	Number	5	NO	NO	NO	NO	NO	NO	NO	4	148

Number Type : Fixed Point

Falling Wt. Geo-phone No. 1 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
36	W2	Number	5	NO	NO	NO	NO	NO	NO	NO	4	152

Number Type : Fixed Point

Falling Wt. Geo-phone No. 2 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
37	W6	Number	5	NO	NO	NO	NO	NO	NO	NO	4	156

Number Type : Fixed Point

Falling Wt. Geo-phone No. 6 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
38	W7	Number	5	NO	NO	NO	NO	NO	NO	NO	4	160

Number Type : Fixed Point

Falling Wt. Geo-phone No. 7 reading

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
39	FWD DATE	Num. String	5	NO	NO	NO	NO	NO	NO	NO	4	164

Formated as : Other Format 00/00

Month/Yr for FWD collection for the current highway segment

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
40	VIS LANE	Number	1	NO	NO	NO	NO	NO	NO	NO	1	168

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
41	VIS COMMENT	Number	2	NO	NO	NO	NO	NO	NO	NO	1	169

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
42	VIS YEAR	Number	2	NO	NO	NO	NO	NO	NO	NO	1	170

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
43	PAVEMENT TYPE	Number	2	NO	NO	NO	NO	NO	NO	NO	1	171

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
44	DISTRESS 1	Number	3	NO	NO	NO	NO	NO	NO	NO	2	172

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
45	DISTRESS 2	Number	3	NO	NO	NO	NO	NO	NO	NO	2	174

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
46	DISTRESS 3	Number	3	NO	NO	NO	NO	NO	NO	NO	2	176

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
47	DISTRESS 4	Number	3	NO	NO	NO	NO	NO	NO	NO	2	178

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
48	DISTRESS 5	Number	3	NO	NO	NO	NO	NO	NO	NO	2	180

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
49	DISTRESS 6	Number	3	NO	NO	NO	NO	NO	NO	NO	2	182

Number Type: Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
50	DISTRESS 7	Number	3	NO	NO	NO	NO	NO	NO	NO	2	184

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
51	DISTRESS 8	Number	3	NO	NO	NO	NO	NO	NO	NO	2	186

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
52	RAVELING	Number	1	NO	NO	NO	NO	NO	NO	NO	1	188

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
53	FLUSHING	Number	1	NO	NO	NO	NO	NO	NO	NO	1	189

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
54	PMIS KEY2	Text	21	NO	NO	NO	NO	NO	NO	NO	21	439

Formula: RMK (Used for screen display convenience only)

BEGIN THE HISTORY FIELDS.

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
55	VIS DISTRESS 92	Number	7	NO	NO	NO	NO	NO	NO	NO	8	190

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
56	VIS DISTRESS 93	Number	7	NO	NO	NO	NO	NO	NO	NO	8	198

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
57	VIS DISTRESS 94	Number	7	NO	NO	NO	NO	NO	NO	NO	8	206

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
58	VIS DISTRESS 95	Number	7	NO	NO	NO	NO	NO	NO	NO	8	214
	Number Type : Fixed Point											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
59	VIS DISTRESS 96	Number	7	NO	NO	NO	NO	NO	NO	NO	8	222
	Number Type : Fixed Point											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
60	VIS DISTRESS 97	Number	7	NO	NO	NO	NO	NO	NO	NO	8	230
	Number Type : Fixed Point											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
61	CONDITION 92-93	Number	3	NO	NO	NO	NO	NO	NO	NO	2	238
	Number Type : Integer											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
62	CONDITION 93-94	Number	3	NO	NO	NO	NO	NO	NO	NO	2	240
	Number Type : Integer											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
63	CONDITION 94-95	Number	3	NO	NO	NO	NO	NO	NO	NO	2	242
	Number Type : Integer											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
64	CONDITION 95-96	Number	3	NO	NO	NO	NO	NO	NO	NO	2	244
	Number Type : Integer											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
65	CONDITION 96-97	Number	3	NO	NO	NO	NO	NO	NO	NO	2	246
	Number Type : Integer											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
66	CONDITION 97-98	Number	3	NO	NO	NO	NO	NO	NO	NO	2	248
	Number Type : Integer											

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
67	SCI 92	Number	6	NO	NO	NO	NO	NO	NO	NO	4	250

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
68	SCI 93	Number	6	NO	NO	NO	NO	NO	NO	NO	4	254

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
69	SCI 94	Number	6	NO	NO	NO	NO	NO	NO	NO	4	258

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
70	SCI 95	Number	6	NO	NO	NO	NO	NO	NO	NO	4	262

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
71	SCI 96	Number	6	NO	NO	NO	NO	NO	NO	NO	4	266

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
72	SCI 97	Number	6	NO	NO	NO	NO	NO	NO	NO	4	270

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
73	SSI 92-93	Number	3	NO	NO	NO	NO	NO	NO	NO	2	274

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
74	SSI 93-94	Number	3	NO	NO	NO	NO	NO	NO	NO	2	276

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
75	SSI 94-95	Number	3	NO	NO	NO	NO	NO	NO	NO	2	278

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
76	SSI 95-96	Number	3	NO	NO	NO	NO	NO	NO	NO	2	280

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
77	SSI 96-97	Number	3	NO	NO	NO	NO	NO	NO	NO	2	282

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
78	SSI 97-98	Number	3	NO	NO	NO	NO	NO	NO	NO	2	284

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
79	SKID VALUE 92	Number	2	NO	NO	NO	NO	NO	NO	NO	1	286

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
80	SKID VALUE 93	Number	2	NO	NO	NO	NO	NO	NO	NO	1	287

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
81	SKID VALUE 94	Number	2	NO	NO	NO	NO	NO	NO	NO	1	288

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
82	SKID VALUE 95	Number	2	NO	NO	NO	NO	NO	NO	NO	1	289

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
83	SKID VALUE 96	Number	2	NO	NO	NO	NO	NO	NO	NO	1	290

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
84	SKID VALUE 97	Number	2	NO	NO	NO	NO	NO	NO	NO	1	291

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
85	AVE RIDE 92-93	Number	4	NO	NO	NO	NO	NO	NO	NO	4	292

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
86	AVE RIDE 93-94	Number	4	NO	NO	NO	NO	NO	NO	NO	4	296

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
87	AVE RIDE 94-95	Number	4	NO	NO	NO	NO	NO	NO	NO	4	300

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
88	AVE RIDE 95-96	Number	4	NO	NO	NO	NO	NO	NO	NO	4	304

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
89	AVE RIDE 96-97	Number	4	NO	NO	NO	NO	NO	NO	NO	4	308

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
90	AVE RIDE 97-98	Number	4	NO	NO	NO	NO	NO	NO	NO	4	312

Number Type : Fixed Point

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
91	ADT 92-93	Number	11	NO	NO	NO	NO	NO	NO	NO	8	316

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
92	ADT 93-94	Number	11	NO	NO	NO	NO	NO	NO	NO	8	324

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
93	ADT 94-95	Number	11	NO	NO	NO	NO	NO	NO	NO	8	332

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
94	ADT 95-96	Number	11	NO	NO	NO	NO	NO	NO	NO	8	340

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
95	ADT 96-97	Number	11	NO	NO	NO	NO	NO	NO	NO	8	348

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
96	ADT 92-9352	Number	11	NO	NO	NO	NO	NO	NO	NO	8	356

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
97	18KIP 92-93	Number	11	NO	NO	NO	NO	NO	NO	NO	8	364

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
98	18KIP 93-94	Number	11	NO	NO	NO	NO	NO	NO	NO	8	372

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
99	18KIP 94-95	Number	11	NO	NO	NO	NO	NO	NO	NO	8	380

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
100	18KIP 95-96	Number	11	NO	NO	NO	NO	NO	NO	NO	8	388

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
101	18KIP 96-97	Number	11	NO	NO	NO	NO	NO	NO	NO	8	396

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
102	18KIP 97-98	Number	11	NO	NO	NO	NO	NO	NO	NO	8	404

Number Type : Integer

No.	Field Name	Type	Length	Req'd	Index	Unique	Derive	Rng Chk	Pre-vent	Hide Tbl	Record Size	Record Offset
103	PAVE TYPE 92-93	Number	2	NO	NO	NO	NO	NO	NO	NO	1	412
	Number Type : Integer											
104	PAVE TYPE 93-94	Number	2	NO	NO	NO	NO	NO	NO	NO	1	413
	Number Type : Integer											
105	PAVE TYPE 94-95	Number	2	NO	NO	NO	NO	NO	NO	NO	1	414
	Number Type : Integer											
106	PAVE TYPE 95-96	Number	2	NO	NO	NO	NO	NO	NO	NO	1	415
	Number Type : Integer											
107	PAVE TYPE 96-97	Number	2	NO	NO	NO	NO	NO	NO	NO	1	416
	Number Type : Integer											
108	PAVE TYPE 97-98	Number	2	NO	NO	NO	NO	NO	NO	NO	1	417
	Number Type : Integer											
109	PMIS KEY3	Text	21	NO	NO	NO	NO	NO	NO	NO	21	460
	Formula: RMK											

End of 0.1 BAD FILE Form Structure.

Record Size: 481 Memory: Text = 4247 Fields = 4608 Total = 8855

APPENDIX D
DATABASE DQL REPORT INVENTORY

D1.0 DATA QUERY LANGUAGE REPORTS

The following Data Query Language Reports (DQLR) are maintained by the current version of the D 21 PMIS system. These report procedures represent the currently supported DQL reports/exports needed to support the system and reporting functions required by D 21. The following list provides the database report name, the associated DOS file name and the current file size in bytes.

Date: August 31, 1994 - Current Number of procedures 248

No.	PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
1.	BUILD 0.1 HEADERS	D:BUILRAAA.DBR	743
2.	PRINT SEL RIDE	D:PRINRAAA.DBR	2976
	Data-entry Form	D:PRINRAAA.DBF	897
3.	MISS SEL SIOM	D:MISSRAAA.DBR	2208
	Data-entry Form	D:MISSRAAA.DBF	450
4.	SEL HW SEG WITH SIO	D:SELHRAAA.DBR	2207
	Data-entry Form	D:SELHRAAA.DBF	450
5.	PRINT TOTAL RIDE	D:PRINRAAB.DBR	5135
6.	PRINT CRIT RIDE SEGS	D:PRINRAAC.DBR	3472
	Data-entry Form	D:PRINRAAC.DBF	673
7.	BROOKS 0.1 HEADERS	D:BROORAAA.DBR	741
8.	CAMERON 0.1 HEADERS	D:CAMERAAA.DBR	742
9.	DUVAL 0.1 HEADERS	D:DUVARAAA.DBR	740
10.	HIDALGO 0.1 HEADERS	D:HIDARAAA.DBR	742
11.	JIMHOGG 0.1 HEADERS	D:JIMHRAAA.DBR	742
12.	KENEDY 0.1 HEADERS	D:KENERAAA.DBR	741
13.	STARR 0.1 HEADERS	D:STARRAAA.DBR	741
14.	WEBB 0.1 HEADERS	D:WEBBRAAA.DBR	739
15.	WILLACY 0.1 HEADERS	D:WILLRAAA.DBR	742
16.	ZAPATA 0.1 HEADERS	D:ZAPARAAA.DBR	740
17.	PRINT MISSINSG SIOM	D:PRINRAAD.DBR	2015
18.	MISSING BROOKS (024)	D:MISSRAAB.DBR	2187
19.	MISSING CAMERON (031	D:MISSRAAC.DBR	2189
20.	MISSING DUVAL (067)	D:MISSRAAD.DBR	2200
21.	MISSING HIDALGO (109	D:MISSRAAE.DBR	2198
22.	MISSING JIMHOGG (125	D:MISSRAAF.DBR	2190
23.	MISSING KENEDY (066)	D:MISSRAAG.DBR	2200
24.	MISSING STARR (214)	D:MISSRAAH.DBR	2185
25.	MISSING WEBB (240)	D:MISSRAAI.DBR	2194
26.	MISSING WILLACY (245	D:MISSRAAJ.DBR	2190
27.	MISSING ZAPATA (253)	D:MISSRAAK.DBR	2188
28.	BROOKS CRITICAL SIO	D:BROORAAB.DBR	3583

No. PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
Data-entry Form	D:BROORAAB.DBF	757
29. BROOKS MISS SEL SIOM	D:BROORAAC.DBR	2406
Data-entry Form	D:BROORAAC.DBF	798
30. CAMERON MISS SEL SIO	D:CAMERAAD.DBR	2412
Data-entry Form	D:CAMERAAD.DBF	799
31. DUVAL MISS SEL SIO	D:DUVARAAC.DBR	2416
Data-entry Form	D:DUVARAAC.DBF	797
32. HIDALGO MISS SEL SIO	D:HIDARAAC.DBR	2412
Data-entry Form	D:HIDARAAC.DBF	799
33. KENEDY MISS SEL SIO	D:KENERAAC.DBR	2405
Data-entry Form	D:KENERAAC.DBF	798
34. STARR MISS SEL SIO	D:STARRAAC.DBR	2404
Data-entry Form	D:STARRAAC.DBF	797
35. WEBB MISS SEL SIO	BRAAC.DBF	796
36. WILLACY MISS SEL SIO	D:WILLRAAC.DBR	2411
Data-entry Form	D:WILLRAAC.DBF	799
37. ZAPATA MISS SEL SIO	D:ZAPARAAC.DBR	2409
Data-entry Form	D:ZAPARAAC.DBF	798
38. WEBB SEL CRIT SIO	D:WEBBRAAD.DBR	3865
Data-entry Form	D:WEBBRAAD.DBF	925
39. WEBB SEL SIO	D:WEBBRAAE.DBR	3644
Data-entry Form	D:WEBBRAAE.DBF	846
40. BROOKS TOTAL RIDE	D:BROORAAD.DBR	3219
Data-entry Form	D:BROORAAD.DBF	607
41. WILLACY TOTAL SKID	D:WILLRAAE.DBR	3386
Data-entry Form	D:WILLRAAE.DBF	654
42. CAMERON TOTAL RIDE	D:CAMERAAC.DBR	3219
Data-entry Form	D:CAMERAAC.DBF	608
43. DUVAL TOTAL RIDE	D:DUVARAAD.DBR	3214
Data-entry Form	D:DUVARAAD.DBF	606
44. HIDALGO TOTAL RIDE	D:HIDARAAD.DBR	3218
Data-entry Form	D:HIDARAAD.DBF	608
45. KENEDY TOTAL RIDE	D:KENERAAD.DBR	3247
Data-entry Form	D:KENERAAD.DBF	605
46. STARR TOTAL RIDE	D:STARRAAD.DBR	3218
Data-entry Form	D:STARRAAD.DBF	605
47. WEBB TOTAL RIDE	D:WEBBRAAF.DBR	3213
Data-entry Form	D:WEBBRAAF.DBF	604
48. WILLACY TOTAL RIDE	D:WILLRAAD.DBR	3216
Data-entry Form	D:WILLRAAD.DBF	606
49. ZAPATA TOTAL RIDE	D:ZAPARAAD.DBR	3216
Data-entry Form	D:ZAPARAAD.DBF	606
50. ZAPATA TOTAL SKID	D:ZAPARAAE.DBR	3389
Data-entry Form	D:ZAPARAAE.DBF	653

No.	PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
51.	WEBB TOTAL SKID	D:WEBBRAAG.DBR	3384
	Data-entry Form	D:WEBBRAAG.DBF	651
52.	STARR TOTAL SKID	D:STARRAAE.DBR	3386
	Data-entry Form	D:STARRAAE.DBF	652
53.	KENEDY TOTAL SKID	D:KENERAAE.DBR	3388
	Data-entry Form	D:KENERAAE.DBF	653
54.	HIDALGO TOTAL SKID	D:HIDARAAE.DBR	3422
	Data-entry Form	D:HIDARAAE.DBF	651
55.	DUVAL TOTAL SKID	D:DUVARAAE.DBR	3386
	Data-entry Form	D:DUVARAAE.DBF	652
56.	CAMERON TOTAL SKID	D:CAMERAAE.DBR	3390
	Data-entry Form	D:CAMERAAE.DBF	653
57.	BROOKS TOTAL SKID	D:BROORAAE.DBR	3388
	Data-entry Form	D:BROORAAE.DBF	652
58.	BROOKS RIDE & SKID	D:BROORAAF.DBR	3491
	Data-entry Form	D:BROORAAF.DBF	6
59.	CAMERON RIDE & SKID	D:CAMERAAF.DBR	3500
	Data-entry Form	D:CAMERAAF.DBF	657
60.	DUVAL RIDE & SKID	D:DUVARAAF.DBR	3495
	Data-entry Form	D:DUVARAAF.DBF	655
61.	HIDALGO RIDE & SKID	D:HIDARAAF.DBR	3480
	Data-entry Form	D:HIDARAAF.DBF	657
62.	KENEDY RIDE & SKID	D:KENERAAF.DBR	3497
	Data-entry Form	D:KENERAAF.DBF	656
63.	STARR RIDE & SKID	D:STARRAAF.DBR	3497
	Data-entry Form	D:STARRAAF.DBF	655
64.	WEBB RIDE & SKID	D:WEBBRAAH.DBR	3494
	Data-entry Form	D:WEBBRAAH.DBF	656
65.	WILLACY RIDE & SKID	D:WILLRAAF.DBR	3500
	Data-entry Form	D:WILLRAAF.DBF	656
66.	ZAPATA RIDE & SKID	D:ZAPARAAF.DBR	3498
	Data-entry Form	D:ZAPARAAF.DBF	655
67.	BROOKS SEL CRIT SKID	D:BROORAAG.DBR	3987
	Data-entry Form	D:BROORAAG.DBF	927
68.	KENN SEL CRIT SKID	D:KENNRAAA.DBR	3978
	Data-entry Form	D:KENNRAAA.DBF	927
69.	HIDA SEL CRIT SKID	D:HIDARAAG.DBR	3980
	Data-entry Form	D:HIDARAAG.DBF	928
70.	CAM SEL CRIT SKID	D:CAMSRAAA.DBR	3980
	Data-entry Form	D:CAMSRAAA.DBF	928
71.	DUVAL SEL CRIT SKID	D:DUVARAAG.DBR	3976
	Data-entry Form	D:DUVARAAG.DBF	926
72.	STARR SEL CRIT SKID	D:STARRAAG.DBR	3976
	Data-entry Form	D:STARRAAG.DBF	926

No. PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
73. WEBB SEL CRIT SKID	D:WEBBRAAJ.DBR	3974
Data-entry Form	D:WEBBRAAJ.DBF	925
74. WILLCY SEL CRT SKID	D:WILLRAAH.DBR	3981
Data-entry Form	D:WILLRAAH.DBF	928
75. ZAP SEL CRIT SKID	D:ZAPSRAAA.DBR	3978
Data-entry Form	D:ZAPSRAAA.DBF	927
76. CAMERON SEL HW SKID	D:CAMERAAG.DBR	3170
Data-entry Form	D:CAMERAAG.DBF	780
77. BROOKS SEL HW SKID	D:BROORAAH.DBR	3166
Data-entry Form	D:BROORAAH.DBF	779
78. DUVAL SEL HW SKID	D:DUVARAAH.DBR	3173
Data-entry Form	D:DUVARAAH.DBF	778
79. HIDALG SEL HW SKID	D:HIDARAAI.DBR	3169
Data-entry Form	D:HIDARAAI.DBF	780
80. KENEDY SEL HW SKID	D:KENERAAG.DBR	3163
Data-entry Form	D:KENERAAG.DBF	779
81. STARR SEL HW SKID	D:STARRAAH.DBR	3158
Data-entry Form	D:STARRAAH.DBF	778
82. WEBB SEL HW SKID	D:WEBBRAAI.DBR	3158
Data-entry Form	D:WEBBRAAI.DBF	777
83. WILLACY SEL HW SKID	D:WILLRAAG.DBR	3164
Data-entry Form	D:WILLRAAG.DBF	780
84. ZAPATA SEL HW SKID	D:ZAPARAAG.DBR	3161
Data-entry Form	D:ZAPARAAG.DBF	779
85. DUMP DOWNLOAD TO DSK	D:DUMPRAAA.DBR	3449
86. CUT BROOKS TO DISK	D:CUTBRAAA.DBR	3573
87. MOVE TO HISTORY	D:MOVERAAA.DBR	2020
Data-entry Form	D:MOVERAAA.DBF	691
88. GENERAL PLOT EXPORT	D:GENERAAA.DBR	1614
Data-entry Form	D:GENERAAA.DBF	615
89. CUT CAMERON TO DISK	D:CUTCRAAA.DBR	3573
90. CUT KENEDY TO DISK	D:CUTKRAAA.DBR	3573
91. CUT DUVAL TO DISK	D:CUTDRAAA.DBR	3573
92. CUT HIDALGO TO DISK	D:CUTHRAAA.DBR	3573
93. CUT JIMHOGG TO DISK	D:CUTJRAAA.DBR	3573
94. CUT STARR TO DISK	D:CUTSRAAA.DBR	3573
95. CUT WEBB TO DISK	D:CUTWRAAA.DBR	3573
96. CUT WILLACY TO DISK	D:CUTWRAAB.DBR	3573
97. CUT ZAPATA TO DISK	D:CUTZRAAA.DBR	3573
98. DEL RECS IN HOLDING	D:DELRRAAA.DBR	432
99. REORG 01HOLD FILE	D:REORRAAA.DBR	332
100. MASTER DEL/REOG 01H	D:MASTRAAA.DBR	441
101. PLOT SEL RIDE	D:PLOTRAAA.DBR	1054
Data-entry Form	D:PLOTRAAA.DBF	620
102. PLOT HIDAL SEL RIDE	D:PLOTRAAB.DBR	1067
Data-entry Form	D:PLOTRAAB.DBF	620

No. PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
103. PLOT HID RIDE VIS	D:PLOTRAAC.DBR	1227
Data-entry Form	D:PLOTRAAC.DBF	620
104. DEL REC IN BAD HOLD	D:DELRRAAB.DBR	444
105. REORG BAD HOLD FILE	D:REORRAAB.DBR	356
106. MASTER DEL/REO BAD	D:MASTRAAB.DBR	445
107. SORT BAD RIDE FILE	D:SORTRAAA.DBR	1365
108. BAD RIDE BROOKS	D:BADRRAAA.DBR	4713
Data-entry Form	D:BADRRAAA.DBF	493
109. BAD RIDE DUVAL	D:BADRRAAC.DBR	4667
Data-entry Form	D:BADRRAAC.DBF	493
110. BAD RIDE HIDALGO	D:BADRRAAD.DBR	5212
Data-entry Form	D:BADRRAAD.DBF	493
111. BAD RIDE JIMHOGG	D:BADRRAAE.DBR	5244
Data-entry Form	D:BADRRAAE.DBF	493
112. bad ride starr	D:BADRRAAF.DBR	1049
Data-entry Form	D:BADRRAAF.DBF	493
113. BAD RIDE KENEDY	D:BADRRAAG.DBR	1050
Data-entry Form	D:BADRRAAG.DBF	493
114. BAD RIDE WEBB	D:BADRRAAH.DBR	1046
Data-entry Form	D:BADRRAAH.DBF	493
115. BAD RIDE WILLACY	D:BADRRAAI.DBR	1053
Data-entry Form	D:BADRRAAI.DBF	493
116. BAD RIDE ZAPATA	D:BADRRAAJ.DBR	1050
Data-entry Form	D:BADRRAAJ.DBF	493
117. BAD RIDE REPORT	D:BADRRAAK.DBR	2047
118. POST 'R' TO BAD RIDE	D:POSTRAAA.DBR	425
119. BAD VISUAL BROOKS	D:BADVRAAA.DBR	1149
Data-entry Form	D:BADVRAAA.DBF	485
120. DEL V REC IN BAD F	D:DELVRAAA.DBR	434
121. BAD VISUAL CAMERON	D:BADVRAAB.DBR	1141
Data-entry Form	D:BADVRAAB.DBF	485
122. BAD VISUAL DUVAL	D:BADVRAAC.DBR	1129
Data-entry Form	D:BADVRAAC.DBF	485
123. BAD VISUAL HIDALGO	D:BADVRAAD.DBR	1133
Data-entry Form	D:BADVRAAD.DBF	485
124. BAD VISUAL JIMHOGG	D:BADVRAAE.DBR	1130
Data-entry Form	D:BADVRAAE.DBF	485
125. BAD VISUAL KENEDY	D:BADVRAAF.DBR	1129
Data-entry Form	D:BADVRAAF.DBF	485
126. BAD VISUAL STARR	D:BADVRAAG.DBR	1128
Data-entry Form	D:BADVRAAG.DBF	485
127. BAD VISUAL WEBB	D:BADVRAAH.DBR	1124
Data-entry Form	D:BADVRAAH.DBF	485
128. BAD VISUAL WILLACY	D:BADVRAAI.DBR	1131
Data-entry Form	D:BADVRAAI.DBF	485

No. PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
129. BAD VISUAL ZAPATA	D:BADVRAAJ.DBR	1129
Data-entry Form	D:BADVRAAJ.DBF	485
130. BAD VISUAL REPORT	D:BADVRAAK.DBR	2233
131. BAD VIS SORT MAINTSC	D:BADVRAAL.DBR	2508
132. BAD RIDE SORT M.SEC	D:BADRRAAL.DBR	2120
133. TEMP	D:TEMPRAAA.DBR	1482
134. LIST MISS RMARKERS	D:LISTRAAA.DBR	984
135. LIST MISS MSEC 024	D:LISTRAAB.DBR	780
136. MISS MAIN SEC DUVAL	D:MISSRAAL.DBR	995
137. BAD FWD BROOKS	D:BADFRAAA.DBR	1087
Data-entry Form	D:BADFRAAA.DBF	467
138. BAD FWD CAMERON	D:BADFRAAB.DBR	1101
Data-entry Form	D:BADFRAAB.DBF	469
139. BAD FWD DUVAL	D:BADFRAAC.DBR	1098
Data-entry Form	D:BADFRAAC.DBF	469
140. BAD FWD HIDALGO	D:BADFRAAD.DBR	1103
Data-entry Form	D:BADFRAAD.DBF	469
141. BAD FWD JIMHOGG	D:BADFRAAE.DBR	1100
Data-entry Form	D:BADFRAAE.DBF	469
142. BAD FWD KENEDY	D:BADFRAAF.DBR	1099
Data-entry Form	D:BADFRAAF.DBF	469
143. BAD FWD STARR	D:BADFRAAG.DBR	1098
Data-entry Form	D:BADFRAAG.DBF	469
144. BAD FWD WEBB	D:BADFRAAH.DBR	1097
Data-entry Form	D:BADFRAAH.DBF	469
145. BAD FWD WILLACY	D:BADFRAAI.DBR	1104
Data-entry Form	D:BADFRAAI.DBF	469
146. BAD FWD ZAPATA	D:BADFRAAJ.DBR	1103
Data-entry Form	D:BADFRAAJ.DBF	469
147. BAD FWD TOTAL DIST	D:BADFRAAK.DBR	2145
148. BAD FWD BY COUNTY	D:BADFRAAL.DBR	2316
149. BAD FWD BY CN HW	D:BADFRAAM.DBR	2587
150. BAD FWD CN HW RM	D:BADFRAAN.DBR	2577
151. BROOKS TOTAL FWD	D:BROORAAI.DBR	2823
Data-entry Form	D:BROORAAI.DBF	607
152. COPY SEL HW TO HOLD	D:COPYRAAA.DBR	813
153. COPY TEMP FILE 1	D:COPYRAAB.DBR	734
154. DEL REC IN HW HOLD	D:DELRRAAC.DBR	377
155. REORG SPE HW HOLD	D:REORRAAC.DBR	301
156. DEL RECS IN TEMP F1	D:DELRRAAD.DBR	369
157. DEL RECS IN TEMP F2	D:DELRRAAE.DBR	369
158. REORD TEM FILES	D:REORRAAD.DBR	336
159. blank flds ub Temp1	D:BLANRAAA.DBR	1856
160. blank flds in Temp2	D:BLANRAAB.DBR	1855
161. del recs Temp1 & 2	D:DELRRAAF.DBR	640

No. PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
162. merge t1 to t2	D:MERGRAAA.DBR	504
163. move temps to hold	D:MOVERAAB.DBR	511
164. sort by RMK	D:SORTRAAB.DBR	704
165. SIMPLE EXPORT BROOKS	D:SIMPRAAA.DBR	2486
166. export zapata	D:EXPORAAA.DBR	4173
167. EXPORT 01HOLD OUT	D:EXPORAAB.DBR	3461
168. trans fr 01hold cty	D:tranRAAC.DBR	812
169. BLANK BROOKS	D:BLANRAAC.DBR	2060
Data-entry Form	D:BLANRAAC.DBF	737
170. DEL RECS IN 01HOLD	D:DELRRAAG.DBR	420
171. REORG O1HOLD FILE	D:REORRAAE.DBR	331
172. MASTER DEL REORG 01H	D:MASTRAAC.DBR	419
173. 01HOLD TO BROOKS	D:HOLDRAAA.DBR	813
174. BLANK CAMERON	D:BLANRAAD.DBR	2061
Data-entry Form	D:BLANRAAD.DBF	737
175. TO HIST 93-94 BROOKS	D:TOHIRAAA.DBR	2020
Data-entry Form	D:TOHIRAAA.DBF	691
176. TO HIST 93-94 CAMERN	D:TOHIRAAB.DBR	2021
Data-entry Form	D:TOHIRAAB.DBF	692
177. 92-93 HIST MOVE	D:HISTRAAA.DBR	2021
Data-entry Form	D:HISTRAAA.DBF	697
178. 01HOLD TO CAMERON	D:HOLDRAAB.DBR	816
179. BLANK DUVAL	D:BLANRAAE.DBR	2059
Data-entry Form	D:BLANRAAE.DBF	737
180. 01HOLD TO DUVAL	D:HOLDRAAC.DBR	813
Data-entry Form	D:HOLDRAAC.DBF	108
181. TO HIST 93-94 DUVAL	D:TOHIRAAC.DBR	2020
Data-entry Form	D:TOHIRAAC.DBF	690
182. BLANK HIDALGO	D:BLANRAAF.DBR	2061
Data-entry Form	D:BLANRAAF.DBF	737
183. 01HOLD TO HIDALGO	D:HOLDRAAD.DBR	815
184. TO HIST 93-94 HIDALG	D:TOHIRAAD.DBR	2021
Data-entry Form	D:TOHIRAAD.DBF	692
185. BLANK JIMHOGG	D:BLANRAAG.DBR	2061
Data-entry Form	D:BLANRAAG.DBF	737
186. 01HOLD TO JIM HOGG	D:HOLDRAAE.DBR	816
187. TO HIST 93-94 JHOGG	D:TOHIRAAE.DBR	2021
Data-entry Form	D:TOHIRAAE.DBF	685
188. BLANK KENEDY	D:BLANRAAH.DBR	2060
Data-entry Form	D:BLANRAAH.DBF	737
189. 01HOLD TO KENEDY	D:HOLDRAAF.DBR	816
190. TO HIST 93-94 KENEDY	D:TOHIRAAF.DBR	2020
Data-entry Form	D:TOHIRAAF.DBF	683
191. BLANK STARR	D:BLANRAAI.DBR	2059
Data-entry Form	D:BLANRAAI.DBF	737
192. 01HOLD TO STARR	D:HOLDRAAG.DBR	811

No. PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
193. TO HIST 93-94 STARR	D:TOHIRAAG.DBR	2019
Data-entry Form	D:TOHIRAAG.DBF	682
194. BLANK WEBB	D:BLANRAAJ.DBR	2058
Data-entry Form	D:BLANRAAJ.DBF	737
195. 01HOLD TO WEBB	D:HOLDRAAH.DBR	810
196. TO HIST 93-94 WEBB	D:TOHIRAAH.DBR	2018
Data-entry Form	D:TOHIRAAH.DBF	682
197. BLANK WILLACY	D:BLANRAAK.DBR	2061
Data-entry Form	D:BLANRAAK.DBF	737
198. 01HOLD TO WILLACY	D:HOLDRAAI.DBR	817
199. TO HIST 93-94 WILLAC	D:TOHIRAAI.DBR	2021
Data-entry Form	D:TOHIRAAI.DBF	685
200. BLANK ZAPATA	D:BLANRAAL.DBR	2060
Data-entry Form	D:BLANRAAL.DBF	737
201. 01HOLD TO ZAPATA	D:HOLDRAAJ.DBR	813
202. TO HIST 93-94 ZAPATA	D:TOHIRAAJ.DBR	2020
Data-entry Form	D:TOHIRAAJ.DBF	685
203. DEL RECS BAD TEMP FL	D:DELRRAAH.DBR	440
204. REORG BAD TEMP FILE	D:REORRAAF.DBR	299
205. SEL HW ALL HIDALGO	D:SELHRAAB.DBR	3100
Data-entry Form	D:SELHRAAB.DBF	571
206. TEST	D:TESTRAAA.DBR	1409
Data-entry Form	D:TESTRAAA.DBF	787
207. CRIT REC ALL BROOKS	D:CRITRAAA.DBR	1214
Data-entry Form	D:CRITRAAA.DBF	787
208. MASTER DEL REC TEMP	D:MASTRAAD.DBR	372
209. CRIT REC ALL CAMERON	D:CRITRAAB.DBR	1217
Data-entry Form	D:CRITRAAB.DBF	787
210. CRIT REC ALL DUVAL	D:CRITRAAC.DBR	1213
Data-entry Form	D:CRITRAAC.DBF	787
211. DEL RECS IN DUMMY	D:DELRRAAI.DBR	363
212. REORG DUMMY	D:REORRAAG.DBR	277
213. CRIT REC ALL HIDALGO	D:CRITRAAD.DBR	1246
Data-entry Form	D:CRITRAAD.DBF	788
214. CRIT REC ALL JIMHOGG	D:CRITRAAE.DBR	1223
Data-entry Form	D:CRITRAAE.DBF	787
215. CRIT REC ALL KENEDY	D:CRITRAAF.DBR	1219
Data-entry Form	D:CRITRAAF.DBF	787
216. CRIT REC ALL STARR	D:CRITRAAG.DBR	1217
Data-entry Form	D:CRITRAAG.DBF	787
217. CRIT REC ALL WEBB	D:CRITRAAH.DBR	1215
Data-entry Form	D:CRITRAAH.DBF	787
218. CRIT REC ALL WILLACY	D:CRITRAAI.DBR	1221
Data-entry Form	D:CRITRAAI.DBF	787
219. CRIT REC ALL ZAPATA	D:CRITRAAJ.DBR	1219
Data-entry Form	D:CRITRAAJ.DBF	787

No. PROCEDURE NAME	DISK FILE NAME	FILE SIZE Bytes
220. SSI<30 ALL SEGS	D:SSIARAAA.DBR	2840
221. SSI 30 TO 80 ALL	D:SSITRAAA.DBR	2863
222. SSI > 80 ALL	D:SSIARAAB.DBR	2815
223. GROUP SSI<30 ALL	D:GROURAAA.DBR	4899
224. GROUP SSI 30-60 ALL	D:GROURAAF.DBR	4977
225. GROUP COND <50 ALL	D:GROURAAB.DBR	4985
226. GROUP COND 50-75 ALL	D:GROURAAC.DBR	5040
227. CAMERON CRITICAL SIO	D:CAMERAAB.DBR	3585
Data-entry Form	D:CAMERAAB.DBF	758
228. DUVAL CRITICAL SIO	D:DUVARAAB.DBR	3581
Data-entry Form	D:DUVARAAB.DBF	756
229. HIDALGO CRITICAL SIO	D:HIDARAAB.DBR	3585
Data-entry Form	D:HIDARAAB.DBF	758
230. JIMHOGG CRITICAL SIO	D:JIMHRAAB.DBR	3586
Data-entry Form	D:JIMHRAAB.DBF	759
231. KENEDY CRITICAL SIO	D:KENERAAB.DBR	3583
Data-entry Form	D:KENERAAB.DBF	757
232. STARR CRITICAL SIO	D:STARRAAB.DBR	3581
Data-entry Form	D:STARRAAB.DBF	756
233. WEBB CRITICAL SIO	D:WEBBRAAB.DBR	3579
Data-entry Form	D:WEBBRAAB.DBF	755
234. WILLACY CRITICAL SIO	D:WILLRAAB.DBR	3585
Data-entry Form	D:WILLRAAB.DBF	758
235. ZAPATA CRITICAL SIO	D:ZAPARAAB.DBR	3583
Data-entry Form	D:ZAPARAAB.DBF	757
236. JIMHOGG MISS SEL SIO	D:JIMHRAAC.DBR	2413
Data-entry Form	D:JIMHRAAC.DBF	799
237. JIMHOGG TOTAL RIDE	D:JIMHRAAD.DBR	3213
Data-entry Form	D:JIMHRAAD.DBF	607
238. JIMHOGG TOTAL SKID	D:JIMHRAAE.DBR	3392
Data-entry Form	D:JIMHRAAE.DBF	652
239. JIMHOGG RIDE & SKID	D:JIMHRAAF.DBR	3502
Data-entry Form	D:JIMHRAAF.DBF	658
240. JHOGG SEL CRIT SKID	D:JHOGRAAA.DBR	3982
Data-entry Form	D:JHOGRAAA.DBF	929
241. JHOGG SEL HW SKID	D:JHOGRAAB.DBR	3171
Data-entry Form	D:JHOGRAAB.DBF	781
242. GENERAL PLOT PROC	D:GENERAAB.DBR	1247
Data-entry Form	D:GENERAAB.DBF	616
243. DEL SPEC REC IN BAD	D:DELSRAAA.DBR	606
Data-entry Form	D:DELSRAAA.DBF	108
244. REORG THE BAD TEMP	D:REORRAAH.DBR	299
245. EXPORT TEST OUT	D:EXPORAAC.DBR	3281
246. BUILD DATA BRYAN	D:BUILRAAB.DBR	1578
247. SEL HW HIDALGO FWD+	D:SELHRAAC.DBR	3113
Data-entry Form	D:SELHRAAC.DBF	469

APPENDIX E
PMIS DATA QUERY LANGUAGE PRE-DEFINED PROCEDURES

E 1.0 PROCEDURE DEFINITIONS

The following procedure definitions (referenced in Chapter 5) constitute the current collection of active procedures used routinely. The procedure examples shown in this appendix represent one from a set of 10 procedures per set. Since D 21 is comprised of 10 counties, each procedure has been replicated 10 times with the referenced county file name changed within the given procedure set.

E 2.0 PROCEDURE SET 1: MISSING DATA

EXAMPLE COUNTY: BROOKS (024)

```
DEFINE TEMP "COUNTER" NUMBER .
FOR BROOKS 0.1
WITH SI VALUE = BLANK ;
COUNTER := COUNTER + 1 .
MESSAGE COUNTER .
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT DATE ;
HIGHWAY PREFIX IN GROUPS ;
HIGHWAY NUMBER IN GROUPS ;
HIGHWAY SUFFIX ;
RP LOCATION KEY IN ORDER ;
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP.;
REFERENCE POINT ;
ROADBED ;
TAG .
```

End of Procedure

E 3.0 SELECTED CRITICAL SIOMETER

DATA-ENTRY FORM - Example

BROOKS COUNTY (024)
SIOMETER DATA FILE (0.1 MILE)

MISSING DATA FOR A SELECTED HIGHWAY SEGMENT(S)

Permits identification of a Selected Highway and Roadbed for missing siometer data.

Enter the desired Highway Prefix, Number, and Roadbed below:

HIGHWAY PREFIX : ____
HIGHWAY NO. ____
ROADBED ____ { K, R, L, A, X }

Select Printer or Screen to follow
PRESS F2 KEY TO SEARCH . . . . .

DQL QUERY

FOR BROOKS 0.1 ***WITH HIGHWAY PREFIX = DATA-ENTRY HIGHWAY PREFIX AND***
HIGHWAY NUMBER = DATA-ENTRY HIGHWAY NO. AND
ROADBED = DATA-ENTRY ROADBED AND
SI VALUE = BLANK ;
LIST RECORDS
CURRENT ITEM NUMBER ;
HEADER FIELD ;
RECORD NO. ;
CURRENT PAGE NUMBER ;
CURRENT DATE ;
RP LOCATION KEY IN ORDER ;
RMK ;
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP.;
REFERENCE POINT ;
ROADBED ;
TAG .

End of Procedure

To evaluate another county with this procedure, edit the FOR statement and change the county file name. For example, to use this procedure to evaluate a selected road in Cameron County, edit the FOR statement to read:

FOR **CAMERON 0.1** WITH .... .

Do not alter the rest of the procedure. Save the procedure and select option 1, Run Procedure, to produce the specified report.

E 4.0 SELECTED CRITICAL SIOMETER

Procedure: `County-name` MISS SEL SIO
REPORT DEFINITION

Data Input Menu Screen:

D21 PMS CRITICAL RIDE REPORT

This report locates those highway segments (sorted for all highways)
with a critical ride score as user specified below:
FOR
BROOKS COUNTY (024)
Critical Ride Score Specified:___

REPORT QUERY (Critical features of the procedure are shown in bold type)

for **BROOKS 0.1**
with SI VALUE not = BLANK and
SI VALUE <= data-entry Critical Ride Score ;
LIst records
data-entry Critical Ride Score ;
current date ;
CURRENT page number ;
CURRENT item number ;
HIGHWAY PREFIX IN GROUPS;
HIGHWAY NUMBER IN GROUPS;
HIGHWAY SUFFIX ;
ROADBED ;
RP LOCATION KEY IN ORDER ;
RMK ;
SI VALUE : item mean max min ;
SI YEAR ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
AVERAGE RIDE ;
SSI ;
SCI ;
DISTRESS SCORE ;
CONDITION SCORE ;
TAG. *(A "*" in this field = a 0.5-mile PMIS section)*
End

End of Procedure Definition

E 5.0 TOTAL RIDE

PROCEDURE CAMERON TOTAL RIDE

This procedure scans the selected county's 0.1 mile file and reports all segments possessing non-blank ride scores.

DATA-ENTRY FORM

D21 PMS TOTAL RIDE REPORT
This report presents the total ride summary data

FOR
CAMERON COUNTY (031)
Make certain the Laser Printer is On-line
and loaded with paper in the paper tray!

Press the F2 key to begin

DQL QUERY (Example query: Cameron County)

FOR CAMERON 0.1
WITH SI VALUE NOT = BLANK ;

LIST RECORDS
CURRENT DATE ;
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
HIGHWAY PREFIX IN GROUPS;
HIGHWAY NUMBER IN GROUPS;
HIGHWAY SUFFIX ;
ROADBED ;
RP LOCATION KEY IN ORDER ;
RMK ;
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP. IN ORDER ;
SI VALUE : ITEM MEAN MAX MIN ;
SI YEAR ;
TAG .
END

End of query.

E 6.0 TOTAL SKID

PROCEDURE BROOKS TOTAL SKID

DATA-ENTRY FORM (Sample Input Screen for Brooks County)

D21 PMS TOTAL SKID REPORT
1992-93 VERSION

This report presents the total SKID summary data

FOR
BROOKS COUNTY (024)
Make certain the Laser Printer is On-line
and loaded with paper in the paper tray!
Press the F2 key to begin

DQL QUERY

```
FOR BROOKS 0.1
WITH SKID VALUE NOT = BLANK OR
TAG NOT = BLANK ;
LIST RECORDS
CURRENT DATE ;
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
HIGHWAY PREFIX IN GROUPS;
HIGHWAY NUMBER IN GROUPS;
HIGHWAY SUFFIX ;
ROADBED ;
RP LOCATION KEY IN ORDER ;
RMK ;
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP. IN ORDER ;
SKID VALUE : ITEM MEAN MAX MIN ;
SKID YEAR ;
TAG .
END
```

End of Procedure

E 7.0 TOTAL RIDE & SKID

PROCEDURE BROOKS RIDE & SKID

DATA-ENTRY FORM

D21 PMS TOTAL SKID REPORT
1992-93 VERSION
This report presents the total RIDE & SKID summary data
FOR
BROOKS COUNTY (024)
Make certain the Laser Printer is On-line
and loaded with paper in the paper tray!

Press the F2 key to begin

DQL QUERY

```
FOR BROOKS 0.1 ;
LIST RECORDS
CURRENT DATE ;
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
HIGHWAY PREFIX IN GROUPS;
HIGHWAY NUMBER IN GROUPS;
HIGHWAY SUFFIX ;
ROADBED ;
RP LOCATION KEY IN ORDER ;
RMK ;
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP. IN ORDER ;
REFERENCE POINT ;
SI VALUE : ITEM MEAN MAX MIN ;
SI YEAR ;
SKID VALUE :  ITEM MEAN MAX MIN ;
SKID YEAR ;
TAG .
END
```

End of Procedure

E 8.0 SELECTED CRIT SKID

DATA-ENTRY FORM

D21 PMS CRITICAL SKID REPORT
Selected Highway Report

This report locates those highway segments (sorted for all highways) with a critical SKID score as user specified below:

FOR
BROOKS COUNTY (024)
For Highway Prefix _____ Highway Number: _____

Critical SKID Score Specified: _____

Make certain the Laser Printer is On-line
and loaded with paper in the paper tray!
Press the F2 key to begin

DQL QUERY

```
FOR BROOKS 0.1
WITH SKID VALUE  NOT = BLANK AND
SKID VALUE <= DATA-ENTRY CRITICAL SKID SCORE  AND
HIGHWAY PREFIX = DATA-ENTRY HIGHWAY PREFIX AND
HIGHWAY NUMBER = DATA-ENTRY HIGHWAY NUMBER ;
LIST RECORDS
DATA-ENTRY CRITICAL SKID SCORE ;
DATA-ENTRY HIGHWAY PREFIX ;
DATA-ENTRY HIGHWAY NUMBER ;
CURRENT DATE ;
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
HIGHWAY PREFIX IN GROUPS;
HIGHWAY NUMBER IN GROUPS;
HIGHWAY SUFFIX ;
ROADBED ;
RP LOCATION KEY IN ORDER ;
RMK ;
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP. IN ORDER ;
SKID VALUE :  ITEM MEAN MAX MIN ;
SKID YEAR ;
TAG .
```

E 9.0 SELECTED HIGHWAY SKID

PROCEDURE BROOKS SEL HW SKID

DATA-ENTRY FORM

BROOKS COUNTY (024)
SKID DATA FILE (0.1 MILE)

SKID DATA SUMMARY FOR A SELECTED HIGHWAY

Permits identification of a Selected Highway and Roadbed for siometer data.

Enter the desired Highway Prefix, Number, and Roadbed below:

HIGHWAY PREFIX ____
HIGHWAY NO. ____
ROADBED ____ { K, R, L, A, X }

Select Printer or Screen to follow
PRESS F2 KEY TO SEARCH.....

DQL QUERY

FOR BROOKS 0.1 WITH HIGHWAY PREFIX = DATA-ENTRY HIGHWAY PREFIX AND
HIGHWAY NUMBER = DATA-ENTRY HIGHWAY NO. AND ROADBED = DATA-ENTRY ROADBED ;
LIST RECORDS
CURRENT ITEM NUMBER ;
HEADER FIELD ;
RECORD NO. ;
CURRENT PAGE NUMBER ;
CURRENT DATE ;
DATA-ENTRY HIGHWAY PREFIX ;
DATA-ENTRY HIGHWAY NO. ;
DATA-ENTRY ROADBED ;
RP LOCATION KEY IN ORDER ;
RMK ;
RM ;
RM SUFFIX ;
RM DISP. SIGN ;
RM DISP.;
REFERENCE POINT ;
ROADBED ;
SKID VALUE : ITEM MEAN MAX MIN ;
SKID YEAR ;
TAG ._____
End of Procedure

E 10.0 SUMMARY REPORTS FOR THE BAD TEMPORATRY FILE

The following reports summarize the data from building the BAD TEMPORARY FILE. Seven procedures have been written to summarize the data into pre-specified formats.

Notation:

SSI - Structual Surface Index (Falling Weight-type score).
Normalized - Reported score converted to a 0 - 100 range

E 10.1 SSI (NORMALIZED) LESS THAN 30 - ALL SEGMENTS

The following DQL Procedure Language is used to locate and report on all segments possessing non-blank SSI scores less than 30. The purpose for this report is to assist in the identification of those segments requiring major rehabilitation.

```
SSI<30 ALL SEGS
-------------------------
DQL QUERY
  --------
FOR BAD TEMPORARY FILE
WITH SSI NOT = BLANK AND SSI <= 30 ;
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
CURRENT DATE ;
RMK ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
ADT ;
18-KIP ;
AVERAGE RIDE ;
SSI IN ORDER ;
SCI ;
DISTRESS SCORE ;
CONDITION SCORE ;
NORM. RIDE ;
NORM SI VALUE ;
RAVELING ;
FLUSHING .
```

End of Procedure.

E 10.2 SSI 30 TO 80 - ALL SEGMENTS

The purpose of this procedure is to locate and report on all records containing SSI scores between 30 and 80.

SSI 30 TO 80 ALL

FOR BAD TEMPORARY FILE
WITH SSI NOT = BLANK AND SSI BETWEEN 30 TO 80 ;
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
CURRENT DATE ;
RMK ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
ADT ;
18-KIP ;
AVERAGE RIDE ;
SSI IN ORDER ;
SCI ;
DISTRESS SCORE ;
CONDITION SCORE ;
NORM. RIDE ;
NORM SI VALUE ;
RAVELING ;
FLUSHING .

End of procedure.

E 10.3 SSI GREATER THAN 80

This procedure assists in the location of all records with SSI scores greater than 80.

PROCEDURE SSI > 80 ALL

FOR BAD TEMPORARY FILE
WITH SSI NOT = BLANK AND SSI > 80 ;
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
CURRENT DATE ;
RMK ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
ADT ;
18-KIP ;
AVERAGE RIDE ;
SSI IN ORDER ;
SCI ;
DISTRESS SCORE ;
CONDITION SCORE ;
NORM. RIDE ;
NORM SI VALUE ;
RAVELING ;
FLUSHING .

End of procedure.

E 10.4 GROUPED SSI LESS THAN 30 - ALL SEGMENTS

This procedure scans the BAD TEMPORARY FILE (regardless of the county) for all records with SSI scores less that 30. The report is grouped (summarized) by

1. County Number,
2. Highway prefix, and
3. Highway number.

The resulting records are sorted by reference marker value in order within the defined groups.

DQL Procedure Language:

```
GROUP SSI<30 ALL
-------------------------

 DQL QUERY
      ---------
FOR BAD TEMPORARY FILE
WITH SSI NOT = BLANK AND SSI <= 30 ;
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
CURRENT DATE ;
COUNTY NUMBER IN GROUPS ;
HIGHWAY PREFIX IN GROUPS ;
HIGHWAY NUMBER IN GROUPS ;
RMK IN ORDER ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
ADT ;
18-KIP ;
AVERAGE RIDE ;
SSI : ITEM MEAN ;
SCI : ITEM MEAN ;
DISTRESS SCORE : ITEM MEAN ;
CONDITION SCORE : ITEM MEAN ;
NORM. RIDE : ITEM MEAN ;
NORM SI VALUE : ITEM MEAN ;
RAVELING ;
FLUSHING .
```

E 10.5 GROUPED SSI 30 - 60 - ALL SEGMENTS

This procedure scans the BAD TEMPORARY FILE (regardless of the county) for all records with SSI scores between 30 and 60. The report is grouped (summarized) by

1. County Number,
2. Highway prefix, and
3. Highway number.

The resulting records are sorted by reference marker value in order within the defined groups.

DQL Procedure Language:

```
PROCEDURE GROUP SSI 30-60 ALL
-----------------------------

FOR BAD TEMPORARY FILE
WITH SSI NOT = BLANK AND SSI BETWEEN  30 TO 60 ;
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
CURRENT DATE ;
COUNTY NUMBER IN GROUPS ;
HIGHWAY PREFIX IN GROUPS ;
HIGHWAY NUMBER IN GROUPS ;
RMK IN ORDER ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
ADT ;
18-KIP ;
AVERAGE RIDE ;
SSI : ITEM MEAN ;
SCI : ITEM MEAN ;
DISTRESS SCORE : ITEM MEAN ;
CONDITION SCORE : ITEM MEAN ;
NORM. RIDE : ITEM MEAN ;
NORM SI VALUE : ITEM MEAN ;
RAVELING ;
FLUSHING .
```

E 10.6 GROUPED CONDITION LESS THAT 50 - ALL SEGMENTS

This procedure scans the BAD TEMPORARY FILE (regardless of the county) for all records with visual condition scores less than 50. The report is grouped (summarized) by

1. County Number,
2. Highway prefix, and
3. Highway number.

The resulting records are sorted by reference marker value in order within the defined groups.

DQL Procedure Language:

```
PROCEDURE GROUP COND <50 ALL
FOR BAD TEMPORARY FILE
WITH CONDITION SCORE NOT = BLANK AND CONDITION SCORE <= 50 ;
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
CURRENT DATE ;
COUNTY NUMBER IN GROUPS ;
HIGHWAY PREFIX IN GROUPS ;
HIGHWAY NUMBER IN GROUPS ;
RMK IN ORDER ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
ADT ;
18-KIP ;
AVERAGE RIDE ;
SSI : ITEM MEAN ;
SCI : ITEM MEAN ;
DISTRESS SCORE : ITEM MEAN ;
CONDITION SCORE : ITEM MEAN ;
NORM. RIDE : ITEM MEAN ;
NORM SI VALUE : ITEM MEAN ;
RAVELING ;
FLUSHING .
```

E 10.7 GROUPED CONDITION 50 - 75 ALL SEGMENTS

This procedure scans the BAD TEMPORARY FILE (regardless of the county) for all records with visual condition scores between 50 to 75. The report is grouped (summarized) by

1. County Number,
2. Highway prefix, and
3. Highway number.

The resulting records are sorted by reference marker value in order within the defined groups.

DQL Procedure Language:

```
PROCEDURE GROUP COND 50-75 ALL
FOR BAD TEMPORARY FILE
WITH CONDITION SCORE NOT = BLANK AND CONDITION SCORE BETWEEN 50
TO 75 ;
LIST RECORDS
CURRENT PAGE NUMBER ;
CURRENT ITEM NUMBER ;
CURRENT DATE ;
COUNTY NUMBER IN GROUPS ;
HIGHWAY PREFIX IN GROUPS ;
HIGHWAY NUMBER IN GROUPS ;
RMK IN ORDER ;
MAINTENANCE SECTION ;
HIGHWAY DESIGN TYPE ;
ADT ;
18-KIP ;
AVERAGE RIDE ;
SSI : ITEM MEAN ;
SCI : ITEM MEAN ;
DISTRESS SCORE : ITEM MEAN ;
CONDITION SCORE : ITEM MEAN ;
NORM. RIDE : ITEM MEAN ;
NORM SI VALUE : ITEM MEAN ;
RAVELING ;
FLUSHING .
```

APPENDIX F
DATABASE USERS GUIDE

The material contained in this Appendix is for the benefit of new users of the D 21 PMIS. It serves to explain some of the basics the first-time user needs to know to use the database system. Depending upon the degree of familiarity with using computers, the more experienced user may want to skip this section. For first-time users, this appendix should provide basic information to assist in working in the database.

THE CURSOR

When you look at a computer screen, you usually see a blinking white line or rectangle, called the cursor. The cursor tells you where you are on the screen when you are entering data. When you type, the characters are entered on the screen where the cursor is. Also, when you insert or delete characters, they are inserted or deleted at the cursor. You can move the cursor around on the screen with the TAB key, the RETURN key, the Arrow keys, and the special cursor control keys. See the following section, "The Keyboard," for more information.

THE KEYBOARD

This section gives a detailed description of the keys on a computer keyboard. Computer keyboards vary slightly depending on the manufacturer and machine class (AT, PS/2, etc.), so your keyboard may vary slightly from the keyboard discussed in this section. Many keys on your computer keyboard correspond to those on a traditional typewriter. Most of these keys perform the same function on both the typewriter and computer, except for the RETURN key. The RETURN key (or ENTER key on some keyboards) is used to communicate an action, a keystroke, or a set of keystrokes to the system. If you have an IBM AT or PS/2, the keyboard has two keys labeled ENTER and none labeled RETURN. The ENTER key with the carriage return symbol on it is the one you should use when asked to press RETURN.

FUNCTION KEYS

Depending on the type of keyboard you have, it has either 10 or 12 function keys labeled F1 through F10 (or F12). These keys are located either on the left-hand side or across the top of the keyboard. Since some keyboards do not have 12 function keys, only the first ten are used. See the section, "Using the Function Keys," for more information on the function keys.

CURSOR CONTROL KEYS/NUMERIC KEYPAD

On the right of the keyboard is a numeric keypad, which includes plus and minus keys (some keyboards also have multiply and divide keys), and a NUM LOCK key. These keys also have arrows and words on them. When the NUM LOCK key is on, the keys are used to enter numbers. When NUM LOCK is not on, the keys are used to control cursor movement. The arrows move the cursor one character in the indicated direction. HOME, PGUP, PGDN, and END move the cursor multiple lines or pages at once. Some keyboards also have a separate set of Arrow keys and cursor control keys. If your keyboard has dedicated cursor control keys, you can keep NUM LOCK on all the time and use the numeric keyboard strictly for entering numbers.

SPECIAL KEYS

The computer keyboard also includes some special keys not found on a typewriter: DEL (or DELETE), INS (or INSERT), CTRL, ALT, ESC, and ENTER. The DEL and INS keys are used to delete and insert characters, respectively. The CTRL (Control) and ALT keys are used in combination with other keys to perform special functions. The specific ways in which these keys are used is discussed later in the section, "Using the Function Keys." The ESC key is used to cancel or exit an operation. The ENTER key is used to signal that you have finished typing and wish to enter what you have typed. The RETURN key works identically to the ENTER key.

GENERAL INFORMATION

The following sections explain some of the basics you need to know.

- How to use the screen,

- How to make selections from menus,

- How to use the function keys, and

- How to fill in a Record Entry form.

The Screen

This section describes the way to use the computer screen. The left section of the top line of the screen is the Title Area. This area displays the name of the operation in use at any given moment. The right section of the top line of the screen is the Message Area. This area is used to display messages indicating that an operation is in progress or has completed. The middle section of the top line is the Mode/Cursor Position Area. This portion of the screen displays the position of the cursor when you are editing a form or procedure. It also indicates when you are in INSERT mode.

The second line on the screen is the Prompt Line. The Prompt Line is used to display questions to the user or list acceptable responses. The last line on the screen is the

Function Key Line. This line lists the most commonly used function keys. These keys change depending on which operation you are performing. A complete list of the operable function keys is always available on the Pull Down Command menus. See the section, "Getting Help," for more information on the Pull Down Command menus.

In addition to function keys, this line displays

- The drive and directory (complete pathname) of the current database,
- The database name,
- The current system date, and
- The current system time.

The remainder of the screen (lines 3-24) is used as the Work Area. This area displays the form, procedure, query, etc., that you are working on. This area is also used to display full screen menus and Help messages.

Getting Help

You can easily get help at any time. Just press F4 - CMDHELP to display the Pull Down Command Menus. These menus list all the functions that are currently active and the keys used to execute them. If you need more information, just press ALT-F1 HELP. This action displays help messages relating to the function you are performing when you request help. This is known as context-sensitive help. The first help screen displayed is pertinent to your immediate function. Often, more general help is also available. To get more help, press the F1 MORE key.

You can remove the help window by pressing the ALT-F1 HELP key again. If you press any other key, DataEase removes the help window and also accepts the keystroke.

Auto Help

If you are a first time user, or if you are using a function that you have not used before, you can place yourself in Auto help mode. First press ALT-F1 to display the help window, then press SHIFT-F1 AUTO HELP to turn Auto help on. Every time you move to a new question, a new help screen will automatically appear. To turn off Auto help, press SHIFT-F1 AUTO HELP again.

A System Administrator when defining a new user in the database, can specify that help messages for the user should display automatically. When the user has gained some experience with the application, the system administrator can change the help level designation from Automatic to On-demand.

Selecting From Menus

The database system uses four different types of menus: full screen menus, line menus, window menus, and Pull Down Command menus.

Full Screen Menus

To select an option from a full screen menu, you can either type the number next to the choice you want, use the cursor keys to move the highlight bar to the choice you want and press RETURN, or type the first letter (or letters) of the choice you want. If you are typing the letters of a choice, the highlight bar moves to the first choice beginning with that letter. If more than one choice begins with that letter, type more letters until you have specified a unique combination.

Line Menus

To select an option from a line menu, you can type either the number or the first letter(s) of the choice. Line menus do not have highlight bars. If the last choice displayed on a line menu is F1 MORE, this means all the available choices could not be displayed on the single line menu. Press F1 MORE to open a window menu that displays all the available choices. If you know the number that corresponds to the choice you want, you can type the number even if the choice does not show on the line or in the current window.

Window Menus

When a window menu of choices is displayed, the first 20 choices are shown in the window, and the bottom of the window shows the total number of choices available. You can move the highlight bar to the choice you want by pressing F1 MORE, PgDn, PgUp, Up Arrow, or Down Arrow keys or by typing the number of the choice. After you have highlighted a menu choice, press RETURN to select it.

Pull Down Command Menus

To select an option from a Pull Down Command menu, you must first press F4 CMDHELP to display the command menus. Use the Left and Right Arrow keys to access the menu you want, use the Up and Down Arrow keys to highlight an option, and then press RETURN to make your selection.

Exiting a menu.

To exit a menu and return to the previous menu, press ESC EXIT. If you press ESC EXIT when the Main Menu is on the screen, DataEase displays the message:

Exiting DataEase Are you sure?

Answer **yes** to return to the DOS prompt. Answer **no** to continue working.

Using the Function Keys

Most functions are executed by pressing the function key or key combination assigned to the function. For example, to view a record in Record Entry, press F3 VIEW. You do not have to type the word VIEW; the key name is provided for reference only. Some functions require that you press a function key in combination with either the Shift key (SH), the Alt key (ALT), or the Control key (CTRL); for example, SH-F9 PRINT. To execute these functions, press and hold the first key (SH, ALT, or CTRL) while pressing the function key.

Entering Data into Record Entry Forms

Much of the work you do consists of entering data into forms by typing information on the screen. When you enter data, you are given a place to type the information, just as you have a place to write information on a printed form. The areas where you enter information are called fields. Entering data is straightforward and, with a few minutes of training, can be done by anyone. The procedure for entering data is described briefly below.

When the form first displays, the cursor rests in the first field. Enter data by typing it into the field. If you make a mistake when entering data, you can use Backspace, Left and Right Arrow, INS, DEL, and F6 FIELD CLEAR to help correct the mistake.

When the data you are entering completely fills the field, the cursor automatically moves to the next field; if the data does not completely fill the field, you must press RETURN or TAB to move to the next field.

Multiple Choice Fields

Some fields on the form may be multiple choice fields. When the cursor reaches one of these fields, a single line menu of choices for the field is displayed. To select a choice, press the corresponding number. If more than one digit is required to make the selection, the system asks you to type the second digit or a space to complete the selection. When you select one of the choices, the current field is filled and the cursor moves to the next field. Do not press RETURN after making the selection.

If there are more choices than can be accommodated on one line, F1 MORE is listed as the last choice on the menu. Press F1 MORE to display a window menu of choices.

Entering the Record.

After you have filled the form, press F2 SAVE to enter the record.

Checks and Calculations

The database system automatically checks the validity of the information you enter in the fields, making sure that it is the right type of information for the field and that it falls within the specified range. The system may automatically perform calculations and lookup information to update the fields in the form. It also makes sure that you don't enter a duplicate record. All of this assures that your data is entered faster and is more accurate and complete.

Multi-View

To view or enter information in a form related to the current form, press F10 MULTI-VIEW. When you select a relationship to view, the related form is displayed. You can now perform operations (i.e., enter, view, or modify data) as if it were the original form. To return to the original form, press ESC EXIT.

Other Record Entry Functions.

At any time, you can view records sequentially by pressing F3 VIEW. To recall a specific record, specify just enough information to uniquely identify it, and press F3 VIEW. To modify a record, press F8 MODIFY when the record is on the screen. To delete a record, press F7 DELETE when the record is on the screen. To print the record on the screen, press SH-F9 PRINT. To clear the form, press F5 FORM CLEAR. To clear the field in which the cursor rests, press F6 FIELD CLEAR. To exit data-entry mode, press ESC EXIT.

Ad-hoc Reports

The QBE - Quick Reports facility can be used to quickly and easily produce routine reports. You select records and fields from multiple files by simply marking them on the respective forms. You may sort and group records and perform statistical operations on fields.

Calling Other Programs

You can use the DOS Functions option of Database Maintenance to call other programs and issue DOS commands without exiting. Your system may be set up so that your database, word processing, spreadsheet and graphics and communications programs are all accessible from menus.

Exporting Data

The DataEase report facility allows you to export selected data from the database to other programs including word processing, graphics, spreadsheet, and communications programs.

You may produce files in a variety of formats for use with many popular spreadsheet, graphics, and word processing programs. The available Export formats include: DIF (Data Interchange Format, a trademark of Software Arts Inc.), Lotus 1-2-3, Mail-Merge, MultiMate and others. You can also export data to large computer databases in Variable length or Fixed length ASCII formats.

Importing Data

The Data Import facility allows you to import data from other databases, spreadsheet programs, and word processing programs. You may even import data from other DataEase databases. While importing data, you may add new records or update existing records in the database. All or any number of selected fields in a record may be imported.

Database Maintenance

Database Status

You can use the Database Status function to instruct DataEase to provide a complete status of your database, listing information about the forms, reports, and import specifications defined for the database.

Backup and Restore

You can use the Backup facility to create a copy of your database on another storage device (usually floppy disks). The backup procedure is completely controlled by the user. You should make frequent backups of your database. If you need to restore the data, the system knows what to restore by reading the backup disks. However, due to the size of the D21 system, use of a tape backup system is essential.

It is highly suggested that the database main directory and associated sub-directories be backed up to tape one time per week. In fact, multiple tape backups are highly recommended.

Recover Disk Space

Any records deleted from the system are only marked as having been deleted. They continue to occupy disk space. You can recover the space taken up by deleted records by backing up your database and then restoring it.

If hard disk space permits, back the current system to another newly created directory on a hard drive. Recovery of the system from the backup directory to the original location will purge the system of previously deleted records, reports, procedures, and other deleted items.

RECORD ENTRY

The Record Entry function is used to enter data into the forms in a database. Each time you fill in the blank fields on the form and press F2 SAVE to save it, you create a new record in the file. Once the data is in the database, you can view it, modify it, delete it, and produce reports that use it.

When you select the Record Entry option, DataEase displays the Record Entry menu, which is a list of the names of all the forms in your database. Before you can enter any data, you must select the form you want use. The forms are numbered by DataEase in the order in which they were created. The most recently created or modified forms appear at the end of the list.

If the database contains more than 19 forms (the first entry is 0: NONE), press the PgDn key to display the names of more forms. The Up and Down Arrow, PgUp, HOME and END keys are also available to help you move through the list. Once you select a form, it appears on the screen so you can begin entering data into it.

During Record Entry, you enter data into the blank fields on the form. The record entry fields are usually preceded by form text. The form text tells you what data belongs in the field.

Cursor Movement Keys in Record Entry

INS - the INS (Insert) key lets you insert characters into existing text instead of typing over it. In Insert mode, new characters are inserted in front of the character where the cursor rests. While you are in Insert mode, the word INSERT appears in the top center of the screen. To toggle back to overwrite mode, press the INS key again; the INSERT message disappears from the screen. Other cursor movement actions are shown below.

- DEL - the DEL (Delete) key deletes the character the cursor is on.
- Backspace - The Backspace key moves the cursor one space to the left.
- Right and Left Arrow - the Right and Left Arrow keys move the cursor left and right in a field one character at a time.
- RETURN - RETURN moves the cursor to the next field. If a Derivation Formula is specified for the field, the derived value appears when you RETURN out of the field.
- TAB - the TAB key moves the cursor to the next field. SH-TAB moves the cursor to the previous field.

- Up and Down Arrow - the Up and Down Arrow keys move the cursor to a field above or below the field in which the cursor rests.

- HOME - the HOME key moves the cursor to the left uppermost "non-prevent" Data-entry field on the form.

- PgUp - the Page Up key moves the cursor to the first field on the top of the current page. In a multi-page form, PgUp also moves from the top of the current page to the top of the previous page.

- PgDn - the Page Down key moves the cursor to the last field on the form.

RECORD ENTRY PULL DOWN COMMAND MENUS

In Record Entry, there is a set of Pull Down Command menus that you can use for reference or to perform functions during Record Entry. The Command menus list all the function keys and their assignments in Record Entry. Press F4 CMDHELP to display the nine menus available to the user during Record Entry. Use the Right and Left Arrow keys to move from menu to menu, and the Up and Down Arrow keys to highlight menu choices. To make a selection from a menu, just highlight a choice and press RETURN.
Display a Window Menu: F1 MORE

Pressing F1 MORE creates a window menu from any single line menu and displays additional choices which may not have been visible on the single line.

Display Pull Down Command Menus: F4 CMDHELP

F4 CMDHELP displays the nine Pull Down Command menus available to the user during Record Entry. The Command menus list all the Record Entry functions and function key assignments. All Record Entry functions can be performed by making a selection from one of the Command menus or by pressing the appropriate function keys. You don't have to display the menu to perform the function.

RECORD ENTRY FUNCTIONS: FORM VIEW

Exit Record Entry: ESC EXIT

ESC EXIT exits the current function and returns to the previous function. If you are in a Primary form, ESC returns you to the previous menu. If you are in a related form ESC EXIT returns you to the previous related form. Other important keyboard actions are shown below.

- Display Help Message: ALT-F1 MORE HELP
  ALT-F1 displays a system or user-defined help message.
- Save the Record on the Screen: F2 SAVE

F2 SAVE saves the record displayed on the screen to the form's data file.

- Modify a Record: F8 MODIFY
  F8 MODIFY overwrites an existing data file record with the modified version of the record.

- Delete a Record: F7 DELETE
  F7 DELETE deletes the record displayed on the screen from the form's data file.

- Clear the Form: F5 CLEAR FORM
  F5 CLEAR FORM removes data values from all fields on the form.

- Clear the Field: F6 CLEAR FIELD
  F6 CLEAR FIELD removes the data value from the field in which the cursor rests.

- Delete a Long:text Line: SH-F7 DELETE LINE
  SH-F7 DELETE LINE deletes a line in a Long:text field where the cursor rests. If the cursor is not in a Long:text field, SH-F7 deletes the default record.

- Insert a Long:text Line: SH-F8 INSERT LINE
  SH-F8 INS LINE inserts a line in a Long:text field above the line where the cursor rests.

- Undo Record Changes: CTRL-F5 UNDO CHANGES
  CTRL-F5 UNDO CHANGES abandons the changes made to the record on the screen.

- Print a Record: SH-F9 PRINT
  SH-F9 PRINT prints a copy of the record currently on the screen.

- Recalculate Derived Fields: CTRL-F9 RECALCULATE
  CTRL-F9 RECALCULATE recalculates values for all derived fields on the form.

- Turn Off Derivations: ALT-F9 SUSPEND CALC

- ALT-F9 SUSPEND CALC turns off automatic calculation of derived field values. To turn field derivations back on, press ALT-F9 again.

- Enter Unchecked Mode: ALT-F5 ENTER SEARCH CRITERIA
  Removes data values from all fields on the form and enters Unchecked Mode. Unchecked Mode turns off all field derivations and automatic calculations, and

lets you enter values in Prevent Data-entry fields. Unchecked Mode is for search purposes only, records cannot be saved in Unchecked Mode.

- View Next Record: F3 BEGIN SEARCH FOR CRITERIA, F3 NEXT CONSECUTIVE RECORD
  If selection criteria were specified, F3 VIEW finds the first record that matches the specified criteria. If no selection criteria were specified, F3 VIEW displays the next consecutive record in the file.

- View Next Matching Record: ALT-F3 CONTINUE SEARCH FOR CRITERIA

  Displays the next record in the form that matches the specified search criteria. F3 VIEW is used to find the first record that matches the specified criteria and ALT-F3 is then used to find each consecutive matching record.

- Previous Consecutive Record: SH-F3 VIEW BACK

  SH-F3 VIEW BACK displays the previous record in the file. If there is a blank form on the screen, SH-F3 displays the last record in the file.

- Go To Record #: CTRL-F3 VIEW RECORD NUMBER
  CTRL-F3 VIEW RECORD NUMBER prompts for the number of the record you want to view and then displays that record. Records are numbered in the order they are entered.

- Display Records in Table View: SH-F1 TABLE VIEW
  SH-F1 TABLE VIEW displays a Table View of the records in the file. If search criteria have been specified. SH-F1 TABLE VIEW - displays a table of all the records that meet specified criteria.

- Access Related Form: F10 MULTIVIEW
  F10 MULTIVIEW accesses a related form. While in the related form, you can view, add, modify, and delete records just as in a Primary form. Depending on where the cursor is when you press F10 MULTI, you will switch directly to a related form or be asked to select the form to access from a menu of related forms.

- Display Related Form: ALT-F10 MULTIFORM
  ALT-F10 MULTIFORM displays a related form in a window that DataEase places in the middle of the form on the screen. The Table View of the related form displays all the records in the related form that are related to the Primary form record on the screen.

- Perform Dynamic Lookup: CTRL-F10 LOOKUP
  Opens a window into a related form where you can look up a value and bring it back into the original form.
  Exit Related Form: ESC EXIT-exits the related form and returns to the previous form.

- Access Quick Reports: F9 QUICK REPORT

  F9 QUICK REPORT displays the Quick Reports menu. Quick Reports is a Query-By-Example facility that lets you list data from multiple forms, group and obtain statistics on data, and select from a variety of output formats.

- Retrieve Default Field: SH-F6 DEFAULT FIELD
  SH-F6 DEFAULT FIELD enters the appropriate value from the Default Record in the current field. If no Default Record has been defined, the value from the last record saved in the form is entered.

- Retrieve Default Record: SH-F5 DEFAULT FORM
  SH-F5 DEFAULT FORM enters all values saved in the Default Record in the form. If no Default Record has been defined, all fields are filled with values from the last record saved.

- Save the Default Record: SH-F2 SAVE DEFAULT
  SH-F2 SAVE DEFAULT saves the information on the screen as the Default Record.

- Delete Default Record: SH-F7 DELETE DEFAULT
  SH-F7 DELETE DEFAULT deletes the Default Record.

- RECORD ENTRY FUNCTIONS: TABLE VIEW
  In Table View, the function keys are used to perform functions involving the table on the screen.

- Save the Record(s) on Screen: F2 SAVE CHANGES
  F2 SAVE CHANGES saves all the modifications or additions made to the table.

- Undo Changes: CTRL-F5 UNDO RECORD CHANGES
  F5 UNDO RECORD CHANGES abandons all the changes made to the records in the table that have not scrolled off the screen and haven't been saved by pressing F2 SAVE.

- Delete a Record: F7 DELETE RECORD
  F7 DELETE RECORD deletes the record on the line where the cursor rests.

- Clear the Field: F6 CLEAR FIELD
  F6 CLEAR FIELD clears the field in which the cursor rests.

- Display Records in Form View: SH-F1 FORM VIEW
  SH-F1 FORM VIEW is used to toggle from Table View back to Form View.

ENTERING RECORDS

Record Entry forms contain form text and record entry fields. In general, the form text indicates what information you should enter. The record entry fields are the blanks where you enter your data. To enter data, just type values into the blank fields on your screen.

Usually, when you have completely filled a field, the cursor moves automatically to the next field. If your entry has fewer characters than the maximum length of the field, or if the cursor does not automatically move, press RETURN or TAB to move to the next field.

Characteristics that Affect Record Entry

DataEase does not let you enter invalid characters in a field. If you try to enter an invalid character, DataEase beeps, displays the following message.

Character not allowed

and leaves the cursor in the same position, awaiting a valid entry. Specific rules for entering data into each type of field are shown below.

Text Fields

All characters are allowed in Text fields. As you type each character, the cursor moves to the right.

Date, Time, Formatted Numeric String Fields

These fields include punctuation characters in fixed positions that format the field. Formats automatically created by DataEase are shown below.

Field Type	Sample Format
Date	11/30/90
Time	11:28:34
Social Security Number	000-00-0000
Phone Number	(203)-374-8000

Only digits are accepted in these fields. Data is entered from left to right. The cursor automatically skips over punctuation characters.

Unformatted Numeric String Fields

These are the same as Formatted Numeric String fields, except there are no punctuation characters in the field. If you press RETURN or TAB before completely filling the field, the field is padded with leading zeros.

Number Fields

Procedures for the three types of Number fields vary somewhat.

- Integer (whole number) Fields contain only digits with no decimal point. As you type each digit, it is entered in the last position of the field, and existing digits are pushed to the left. Commas are automatically inserted after every third digit.

- Fixed Point and Dollar Fields have a decimal point and a specified number of positions to the right and left of the decimal point. The cursor starts at the decimal point. As you type each digit, it is entered in the last position before the decimal point and existing digits are pushed to the left. Positions to the right of the decimal point are automatically filled with zeros. You can leave them that way by pressing TAB or RETURN to complete the field. To enter a value in these positions, first type the decimal point (period) and then type in the decimal values, which are entered from left to right. Floating Point Fields contain only digits and a decimal point. Data is entered from left to right, and commas are not inserted.

Choice Fields

Choice fields have a predefined set of choices. When the cursor enters the field, these choices are displayed on a menu. Either type the number of the choice to enter the value in the field or start typing the choice value. When DataEase recognizes the characters you enter as a unique Choice value, it enters the complete value in the field.

If all the choices do not fit on the prompt line, it ends with the phrase F1 MORE. If you press F1 MORE, a Window menu displays the first 20 choices, including 0: NONE.

To enter a Choice field value, use the arrow keys to highlight the choice you want to select or enter the number of the choice, and press RETURN. If you want to leave the Choice field without selecting a value, press TAB.

Required Field

A Required field is one that must have a value entered in it. If you press F2 SAVE to save a record with a blank Required field, DataEase beeps and displays the message:

This field must be filled,

and the cursor moves to the first blank required field to await your entry.

Unique Fields

When you press F2 SAVE to save a record that has one or more fields defined as Unique, the combination of all the values in the Unique fields on the screen is checked against the existing records in the file. If it finds another record with the same values for all the Unique fields, DataEase beeps and displays the following message:

Record already exists as N
Do you want to modify that record (y/n)?

Since you cannot save two records with the same Unique values, DataEase assumes you really want to modify the existing record rather than save a new record. Answer y (yes), to modify the matching record or answer n (no), to return to the record on the screen. Unless you change the value of one of the Unique fields you will not be able to save this record as a new record.

Upper Limit/Lower Limit

If the value you enter into a field defined with an Upper Limit or Lower Limit, is within the acceptable range, the cursor moves to the next field. If the value is below the acceptable range, DataEase blanks the field, beeps, and displays the following message:

Field value is too Low
Lowest value allowed: <lower limit>.

If the value is above the acceptable range, DataEase blanks the field, beeps, and displays the following message:

Field value is too High
Highest value allowed: <upper limit>.

As long as the value for the field falls outside the acceptable range, DataEase will not accept it. If the field is also Required, the record cannot be saved.

Derivation Formula

Fields defined with Derivation Formulas instruct DataEase to determine the value for the field. DataEase derives the value of a field when:

- The cursor passes through the field,
- The record is saved, and
- You press CTRL-F9 RECALCULATE to rederive all the fields on the form.

You can override the derived value by entering a value in the field as if it were blank. If you change your mind and want DataEase to derive the value of the field, press F6 FIELD CLR, and press RETURN.

Prevent Data-Entry

You cannot enter data in a field defined as Prevent Data-entry. During Record Entry, the cursor skips over Prevent Data-entry fields. There are times, however, when it is necessary to enter search criteria in a field defined as Prevent Data-entry. To do so, first enter Unchecked mode by pressing ALT-F5 UNCHECKED, and then enter the search criteria. You cannot enter a record in Unchecked Mode; it is for search purposes only.

View Security

You can view data in a field defined with View Security restrictions if your security level is the same as or higher than the minimum defined for the field. If your security level is below the minimum level, the field appears blank even if the record contains a value for the field.

Write Security

You can enter data in a field defined with Write Security restrictions if your security level is the same as or higher than the minimum level defined for the field. If your security level is below the minimum level, DataEase does not let you enter data in the field; the cursor just skips over the field.

ENTERING BATCHES OF RECORDS

When you save a record, the field values may remain on the screen, depending on how the form is defined. To enter another record, you can clear the screen with the F5 FORM CLR key and then fill in the fields for the next record.

Using the Previous Record

If several of the fields contain the same values from record to record, you do not have to clear the screen; it is possible to change only those fields that are different. Simply type over the values that need to be changed. If there are many fields in common from record to record, this method is much faster. To clear a single field of data, place the cursor in the field and press the F6 FIELD CLR key.

Using a Default Record

Another shortcut when entering a batch of records with many fields in common is to create a default record that contains the common field values. Then, whenever you need to

enter the default values, simply press SH-F5 DEFAULT FORM to access the default record. You can also press SH-F6 DEFAULT FIELD to bring in the default value of a single field from the default record.

MULTIVIEW

While in Record Entry, you can use F10 MULTI to enter, view, delete, or modify records in any form that is related to the form on the screen. Once you access a related form, you can treat it as if it were the Primary form (the form selected from the Record Entry menu) and perform any Record Entry functions.

When you press F10 MULTI during Record Entry, one of several things happens.

- If there are no forms related to the current form, nothing happens. You remain on the current record in the current form.
- If there is exactly one form related to the current form, DataEase switches immediately to the related form.
- If there are two or more related forms and the cursor is in a field which is derived with a lookup, then the form from which the lookup takes place is entered and the first matching record is retrieved.
- If there are two or more related forms and the cursor is in a field which is a Match field for only one of those relationships, the form for that relationship is entered, and the first matching record is retrieved.
- In all other cases, a window menu of relationships defined for the current form is displayed. You have to select the desired relationship from the menu. The first matching record, if any, is retrieved. If you select 0: NONE from the menu, DataEase returns to the Primary form.

Once you Multiview to another form, you can press F10 MULTI again to access a form related to the second form. Work back through the chain of relationships by pressing ESC EXIT. When pressing ESC EXIT from the Primary form, you return to the Record menu.

AD-HOC MULTIFORMS

Another way DataEase lets you enter or view records in related files is to display two forms on the screen at the same time. ALT-F10 MULTIFORM displays a related form within a window in the form on the screen.

DYNAMIC LOOKUP

Dynamic Lookup lets you display a related form, look up a value, and bring the value back into the Primary form.

With the cursor in the Match field for the relationship, press CTRL-F10 LOOKUP. DataEase opens a window into the related form and displays a Table View of related form records. You can specify which related form records DataEase will display by entering a partial value and one of the DataEase wildcard characters in the Match field before you perform the lookup. When you press CTRL-F10, DataEase only displays the records in the related form that match the criteria entered in the Match field.

Move the cursor through the table until it highlights the value you are looking for. Press RETURN and the value from that record is entered in the Primary form.

ENTERING RECORDS IN TABLE VIEW

The Table View feature lets you view, enter, modify, or delete a group of records at once. Press SH-F1 TABLE, and DataEase displays a Table View of the records in the form. Each record is displayed as one line in a table, with the Field Names used as column headings.

The default view of a form can be either Form View or Table View (Depending on how a form is defined in Form Definition). Press SH-F1 to change from Form View to Table View or vice-versa at any time during Record Entry.

A status line at the top of the screen tells the status of each record. If there are no records in the file, a blank table is displayed. If you enter a new record, the status line should read

New Record on Line N of M

where N is the number of that record in the file, M is the total number of records in the file and New is the status of the record.

Depending on how the form is defined, some fields may not display in Table View. Each row of the table represents one record in the file and each column of the table represents a field on the form. To enter a record, type in the values in each field. The table automatically shifts to the right as each field is entered. Remember to press TAB or RETURN if the data does not completely fill the field. When you reach the right edge of the table, completely filling the field or pressing RETURN or TAB automatically shifts the table back to the first column. Tests for Required, Unique, Upper Limit, and Lower Limit take place as you enter data in each field.

If the table is full and you want to continue entering records, press END to scroll the records up, creating blank lines at the bottom of the table into which you can enter more records. Each record that is scrolled off the screen is automatically written to disk. The following cursor movement keys are active in Table View.

- TAB - Moves the cursor forward through the table by field.

- SH-TAB - Moves the cursor backward through the table by field. RETURN - Moves the cursor forward through the table by field.
- Left or Right Arrow - Moves the cursor left or right in the table one character at a time.
- Up or Down Arrow - Moves the cursor up and down in the table one record at a time.
- CTRL-Left Arrow - Moves the cursor to the first column in the table. CTRL-Right Arrow - Moves the cursor to the last column in the table. HOME - Moves the cursor to the first row, leftmost column on the screen. END - Scrolls some records off the screen and displays blank lines in which you can enter additional records.

RECORDS

In Record Entry you can view records in several ways:
- from first to last record saved,
- from last to first record saved,
- by specific record number,
- based on values in the record, and
- in groups.

Viewing Records in Order Saved

- To view records in a file in the order that they were entered, press F3 VIEW. Continue to press F3 VIEW to see the records in the order they were saved in the file.

- When you press F3 VIEW with a blank form on the screen, DataEase displays the first record in the file.

- When you press SH-F3 VIEW BACK with a blank form on the screen, DataEase displays the last record in the file.

- When you press SH-F3 VIEW BACK with a record on the screen, DataEase displays the record in the file just before the current record.

In each case, DataEase displays the following message:

Record found
Record N on screen

where N is the record number of the record displayed on the screen.

To see a table of all the records in the file, press SH-F1 TABLE to obtain a Table View of all the records in the file. If your security level is less than the minimum security level to VIEW records specified on the Form Properties screen, you can select the form

from the records menu, but when you press F3 VIEW to view a record, DataEase displays the following message:

Security access denied.

Unchecked Mode

DataEase provides an Unchecked Mode that lets you clear your form of all values including derived values so you can specify search criteria. Unchecked Mode also lets you enter values into Prevent Data-entry fields so you can use them as search criteria. You cannot enter records in Unchecked Mode; it is for search purposes only. Press ALT-F5 UNCHECKED to enter Unchecked Mode.

SEARCHING FOR SPECIFIC RECORDS

You can look for specific records in Record Entry when you know the values of one or more of the fields in the record. Fields frequently used to find a particular record should be indexed, since it significantly improves the speed of the search. To find a particular record perform the following steps:

1. Press ALT-F5 UNCHECKED to clear the screen and turn off field derivations.
2. Enter the values in the fields that match the values of the fields on the record you are searching.
3. Press F3 VIEW. DataEase will search through the file until it finds the first record with values in the fields that match the values specified.

If DataEase finds a matching record it displays the record and the following message:

Record found
Record N on screen

where N is the record number of the matching record displayed on the screen.

The time it takes DataEase to find a record varies depending on the number of records and the number of indexed fields in the form. You can press ESC EXIT at any time to abandon a search.

If the first record found is not the record you are searching for, or if you want to see all matching records, press ALT-F3 CONTINUE VIEW to see each matching record. When there are no more matching records, DataEase beeps and displays the message

No more records.

Searching for a Particular Record Using Table View

To display a table of all records that match the specified search criteria, perform the following steps.

1. Enter Unchecked Mode by pressing ALT-F5 UNCHECKED.
2. Enter the search criteria in the form.
3. Begin the search by pressing SH-F1 TABLE instead of F3 VIEW. Using this method, you get to see all matching records at once instead of having to page through them using ALT-F3.

SEARCHING FOR RECORDS USING WILD CARDS

You can also search for specific records when you are not sure of the values on the record(s). These searches are called wild card searches. Wild cards are special characters that are used to find partial matches. You can search for a record or records by typing the part of the value that you know along with one of the DataEase wild card characters.

Two of the wild card characters are * and ? (asterisk and question mark). The asterisk matches any string of characters of any length. The question mark represents one character in a specific position. The following are examples of wild card matches in a file that contains the three cities: New York, Newark, and Nanuet.

N*	New York, Newark, Nanuet
*K	New York, Newark
*York	New York
new*	New York, Newark
nu	Nanuet
*N	No match
N	New York, Newark, Nanuet
New??k	Newark
New*k	New York, Newark
?ew*	New York, Newark

DataEase does not differentiate between uppercase and lowercase when performing a search.

To display a table of the matching records, enter the search criteria and press SH-F1 TABLE instead of F3 VIEW. The wild card characters cannot be used in a Number or Choice field.

Soundex Search

A Soundex search is a special kind of wildcard search that lets you search for a record based on what a field value "sounds like." The Soundex search finds patterns of

consonants regardless of the vowels in the word. For example, if you perform a Soundex search for the consonant pattern RD, soundex would find the words Red, Read, Ride and Rode.

To perform a Soundex Search, perform the following steps.

1. Clear the form and turn off the field derivations (ALT-F5 UNCHECKED).
2. Move the cursor to the field(s) that you are trying to match and enter the Soundex character ~ (tilde) followed by the word or words that sound like the data in the record you are searching for.
3. Press F3 VIEW. DataEase takes the word(s) following the tilde, ignores the vowels and searches through the file for records with a similar consonant pattern.

When performing a Soundex search, enter as many consonants and as many words as you can. If you enter more than one word in the field, Soundex recognizes the spaces as breaks between words and searches for the words in the order they are entered. If you are not sure where the word will occur in the field, start the search with the * wild card character followed by the ~ Soundex character and then the word(s) to search for.

To display a table of the matching records, enter the search criteria and press SH-F1 TABLE instead of F3 VIEW.

Viewing a Particular Number Record

You can search for a particular number record by pressing CTRL-F3 VIEW RECORD #. DataEase displays the following message:

Enter the Record number to view ?

Type the number of the record and press RETURN. DataEase displays the record. If the record displayed is a deleted record, DataEase beeps and displays the following message:

This is a deleted record.

You can restore the deleted record while it is on the screen by pressing F8 MODIFY.

Viewing Records in Index Order

You can view all the records in a form in alphabetical (A to Z) or numeric (low to high) order if one or more fields have been indexed. Type * in the Indexed field and press F3 VIEW. The first record (in alphabetical or numeric order) appears on the screen. Press ALT-F3 VIEW repeatedly to see all records in indexed order, rather than in the order they were saved.

To display a table of the records in a form in index order, type * in the Indexed field and then press SH-F1 TABLE instead of F3 VIEW.

MODIFYING RECORDS

You can modify any record while it is displayed on the screen, whether you have just entered it or have displayed it as part of a record search. To change the field value or values you wish to modify, type the new values over the existing values or press F6 CLEAR FIELD to clear the field and then enter the new values. Each time you modify a field in a record, DataEase displays the following message on the Status Line:

Record N revised on screen.

Press F8 MODIFY to save the modified version of the record. DataEase saves the record as displayed, overwriting the previous record, and displays the following message:

Record N updated

where N is the record number of the record that has been overwritten.

Security Levels for Modifying Records

If your security level is less than the minimum security levels to DELETE, MODIFY, and ENTER records specified on the Form Properties screen, you cannot enter new information or change the contents of that form. The function descriptions for F7 and F8 on the Function Key line will be blank. If you press F2 SAVE, F7 DELETE, or F8 MODIFY, DataEase displays the following error message:

Security access denied,

and the record remains unchanged.

Modifying Records in Table View

In Table View, you can move through the table and modify values in many records on one screen. When you modify a record in Table View, it changes color from its usual color to blue text on a light gray background and the status line for the records you have modified changes to read

Record X on Line N of M Modified

where X is the record number, N is the number of the record in the table, and M is the total number of records in the form.

Saving Modifications

Modifications are made on a screen by screen basis. If the table of records fits on one screen, make the desired modifications to the file and press F2 SAVE to save all the changes. If the table continues onto more than one screen, any changes made to the records on the screen are automatically entered when you scroll up or down a screen.

Before scrolling or pressing F2 SAVE, you can undo the changes you make to a record by pressing CTRL-F5 UNDO when the cursor is in the modified record. Changes made to the table are automatically saved when the modified records scroll off the screen or when you press F2 SAVE.

Security Levels for Modifying Records in Table View

If your security level is less than the minimum security levels to DELETE, MODIFY, and ENTER records specified on the Form Properties screen, you cannot enter new information or change the contents of that form. The function descriptions for F7 and F8 on the Function Key line will be blank. If you press F2 SAVE, F7 DELETE, or F8 MODIFY, DataEase displays the following error message:

Security access denied,

and the record remains unchanged.

Modifying Records in Multiforms

Modifying a record in the Main form of a Multiform is similar to modifying a record in Form View. Make the desired modifications by typing over the values or clearing the fields and typing the new values. Each time you modify a field in a record, DataEase displays the following message on the Status Line:

Record N revised on screen.

Press F8 MODIFY to save the modified version of the Main form record. DataEase saves the record as displayed, overwriting the previous record, and displays the following message:

Record N updated

where N is the record number of the record that has been overwritten.

DELETING RECORDS

To delete the record on the screen, press F7 DELETE. DataEase displays the following message:

Are you sure you want to delete the record? (y/n)

Answer y (yes) to delete the record. Answer n (no) to cancel the delete. If you answer y (yes), DataEase displays the following message at the top of the screen:

Record deleted
Deleted Record N on Screen

where N is the record number of the deleted record. Although the record remains displayed on the screen, DataEase has marked it deleted.

Security Levels for Deleting Records

If your security level is less than the minimum security level to DELETE records specified on the Form Properties screen, the function description for F7 appears blank, and any attempt to delete a record is unsuccessful. DataEase displays the following error message:

Security access denied,

and the record is not deleted.

Once you have specified what you want to delete, press F8 MODIFY to save all the modifications (or deletions) made to the form. NOTE: Remember that modifications are also saved whenever the records in the table scroll off the screen.

Recovering Deleted Records

Since DataEase does not actually erase deleted records from the disk until you reorganize the form or perform a DataEase Backup and Restore, a nonactive (deleted, but not removed) record can be restored.

- Recovering a Deleted Record in Form View

A deleted record can be restored from Form View if you know its record number. CTRL-F3 VIEW displays records by their record number, even if they have been deleted. Once the record is displayed, press F8 MODIFY to restore the old record to an active status. If you press F2 SAVE, DataEase creates a new record at the end of the file with values that exactly match the deleted record, and the deleted record remains inactive in the sequence.