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16. Abstract

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Since 1974, many research projects have contributed data to the database. This study, besides being the most recent effort, is especially important because it provides the first visual condition survey of the continuously reinforced concrete pavement (CRCP) sections since 1987, and revisits previously surveyed jointed concrete pavement (JCP) sections for the first time since 1984. This year, in addition to continuing the study of the historical test sections, a number of new paving projects were selected with an emphasis on expanding the database to include a representative sample of the new, thicker sections and improved steel designs now being built. A special effort was made to insure that the needs of TxDOT's new Pavement Management Information System (Texas PMIS) would be met now and in the foreseeable future.

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UPDATING AND MAINTAINING THE RIGID PAVEMENT DATABASE

Terry Dossey
B. Frank McCullough

Research Report Number 1342-3F

Research Project 1342

Updating and Maintaining the Rigid Pavement Condition Survey Database

conducted for the

Texas Department of Transportation

in cooperation with the

U.S. Department of Transportation
Federal Highway Administration

by the

CENTER FOR TRANSPORTATION RESEARCH
Bureau of Engineering Research
THE UNIVERSITY OF TEXAS AT AUSTIN

November 1994

IMPLEMENTATION STATEMENT

Findings from this project should be implemented as follows:

1. The updated database can be used immediately by related TxDOT Project 1908 to verify and improve the existing CRCP distress prediction models used in the Texas Pavement Management Information System (PMIS). Coordination between this project and Project 1908 has been maintained in order to insure compatibility between the data collected and the distress types and definitions outlined by PMIS planners.
2. The new jointed pavement database can be used immediately to create performance models for PMIS. This is especially urgent, as no Texas models for jointed pavement distress currently exist.
3. The Rigid Pavement Database, besides being very valuable in design and research studies, will be vital to the Texas PMIS effort for some time to come; it should be maintained and updated periodically.
4. Within two years, the database should be updated with appropriate condition surveys, deflection measurements, etc., to insure that the full value of the 20-year-old database is maintained.

Prepared in cooperation with the Texas Department of Transportation and the U.S. Department of Transportation, Federal Highway Administration.

DISCLAIMERS

The contents of this report reflect the views of the authors, who are responsible for the facts and the accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Highway Administration or the Texas Department of Transportation. This report does not constitute a standard, specification, or regulation.

There was 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 useful improvement thereof, or any variety of plant which is or may be patentable under the patent laws of the United States of America or any foreign country.

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Research Supervisor

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PREFACE

This is the third and final report for Project 1342, "Updating and Maintaining the Rigid Pavement Condition Survey Database." The research project was conducted by the Center for Transportation Research (CTR), The University of Texas at Austin, as part of the Cooperative Research Program sponsored by the Texas Department of Transportation. Specifically, this report summarizes the improvement and updating of the database made possible by the statewide condition survey undertaken between September of 1993 and August of 1994. This study is the latest in a series of projects dating back to 1974 that have developed and expanded a resource that has proven so useful in research, highway planning, and design.

The authors thank the Texas Department of Transportation (TxDOT) for their sponsorship of this project, especially Mr. Andrew Wimsatt of the Highway Design Division, who served as Project Director during the early phases of the project. The authors are also indebted to the CTR staff who participated in the field data collection, specifically Mr. Brent Allison and Mr. Brett Bystrom. Finally, additional credit is due to Ms. Bell Soto and Ms. Anne McFadden for entering the field data into the computer, and to Mr. Steven Easley and Mr. James Speer for assisting in the preparation of this report.

SUMMARY

This report summarizes the present contents of the Rigid Pavement Database after it was updated subsequent to the field surveys of 1993 through 1994. This database, which was initiated in 1974, consists of a 20-year performance record of more than 200 pavement projects across the state of Texas. The data include visual condition surveys, deflection basins taken with the Falling Weight Deflectometer, traffic data, environmental data, and such construction variables as year of construction, thickness, coarse aggregate type, swelling condition, and subbase type.

Since 1974, many research projects have contributed data to the database. This study, besides being the most recent effort, is especially important because it provides the first visual condition survey of the continuously reinforced concrete pavement (CRCP) sections since 1987, and revisits previously surveyed jointed concrete pavement (JCP) sections for the first time since 1984. This year, in addition to continuing the study of the historical test sections, a number of new paving projects were selected with an emphasis on expanding the database to include a representative sample of the new, thicker sections and improved steel designs now being built. A special effort was made to insure that the needs of TxDOT's new Pavement Management Information System (Texas PMIS) would be met now and in the foreseeable future.

CHAPTER 1. BACKGROUND AND SCOPE

This report summarizes the present contents of the Rigid Pavement Database after it was updated subsequent to the field survey of 1993-1994 (Fig 1.1). This database, which was initiated in 1974, consists of a 20-year performance record of more than 200 pavement projects across Texas. The data include visual condition surveys, deflection basins taken with the Falling Weight Deflectometer, traffic data, environmental data, and such construction variables as year of construction, thickness, coarse aggregate type, swelling condition, and subbase type.

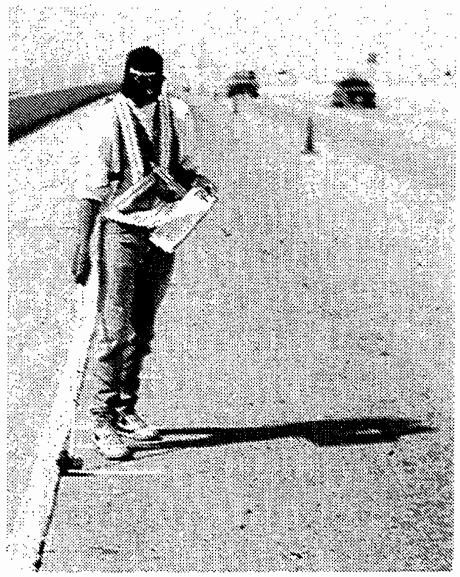


Figure 1.1. Survey crew collecting condition data for the 1993-1994 field survey

1.1 IMPORTANCE OF MAINTAINING A RIGID PAVEMENT DATABASE

The principal reason for maintaining the Rigid Pavement Database is to provide historical pavement performance data that can be used for two primary purposes: (1) to assist in pavement management and administrative decisions, and (2) to improve pavement design procedures.

1.1.1 Importance to Pavement Management

Pavement Management Systems (PMS) always require a "management" database to support their activities (Fig 1.1). Usually, these databases are very large, with the sampling rate very high (sometimes 100 percent for important arteries and Interstate highways) and a sampling frequency that may be every other year or even every year. But, because of their size, only a few performance indicators are recorded, and extrinsic variables relating to design or environment are seldom collected. A good example of this type of database is the TxDOT Pavement Evaluation System (Ref 1).

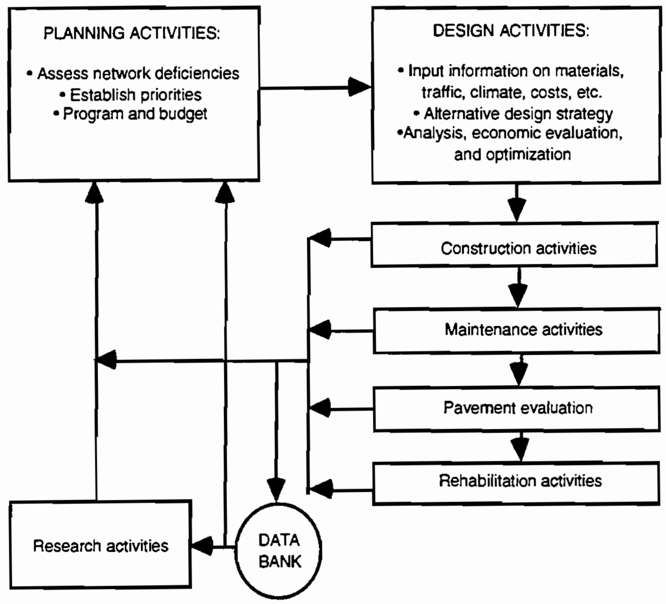


Figure 1.2. Relationship of a database to pavement management systems (Ref 2)

By contrast, the Rigid Pavement Database is a "research" database. As such, it does not attempt to record the condition of every rigid pavement in the state every year; rather, it monitors the development of distress in a small but representative sample of the state's pavements at less frequent intervals. Candidate sections are carefully selected using statistical techniques to insure that inferences and conclusions drawn from the relatively small research database can be safely applied to the overall pavement population. The original work done to select the sections is documented by Chou (Ref 3) for the CRCP sections, and by Ruiz (Ref 4) for the JCP sections.

However, because fewer sections are monitored, it is possible to collect a more detailed condition survey and also to record more "inventory" data relating to the section within a reasonable budget and time frame. Inventory data include background information on each section that may explain differences in performance between pavements over time. Some examples of inventory data include pavement thickness, traffic exposure, environmental factors, and such design elements as coarse aggregate type, reinforcement design, and soil characteristics.

The database provides an excellent source of information to answer very specific administrative and legislative questions. For example, the effect on performance of coarse aggregate types, subbase types, soil type, etc., can be quantified to demonstrate the design and economic impact of decisions.

The research database is important to PMS because such systems require performance prediction models to predict the service life of pavements under a variety of conditions and before and after a variety of rehabilitation options. In this way, with the probable consequences of rehabilitation decisions known, a near optimal, network-level strategy for maintaining the state's pavement inventory can be obtained. An example of this use currently in progress is given in Chapter 2.

The Rigid Pavement Database is the only rigid pavement research database reflecting Texas conditions currently available for PMS model development, and it is still one of the few comprehensive and useful pavement research databases in the nation at the time of this writing.

1.1.2 Importance to Design

The Rigid Pavement Database is also vitally important to Texas pavement designers. Because it records so many factors that may affect pavement performance, many empirical studies have been conducted using the database to investigate the effect of different designs on long-term pavement performance. Also, mechanistic models of pavement behavior often need to be tested and calibrated against "real-world" pavement behavior, for which the 20 years of data in the database serves as an ideal source. A current example of this use of the database is also included in Chapter 2.

1.2 DESCRIPTION OF THE DATABASE

The Rigid Pavement Database consists of two major parts: (1) the Continuously Reinforced Concrete Pavement (CRCP) database, which contains data collected from 1974 to the present on CRCP pavements across the state, and (2) the Jointed Concrete Pavement (JCP) database, which includes historical data from 1982 and 1984 and current data from the 1993-1994 survey conducted under this project. Both databases contain a number of subsidiary files arranged in a hierarchical database structure using the Statistical Analysis System (SAS) computer language (Ref 5); together, they are referred to in this document and elsewhere as the Rigid Pavement Database.

The present configuration of the CRCP database is the result of a redesign in 1987 (Ref 6), which updated the 1974 design to take advantage of modern software tools. The 1994 CRCP database design is identical to the 1987 design. The JCP database was redesigned in 1993 under this project as part of a major effort to coordinate with performance modeling needed for the Texas PMIS (Ref 1). A thorough description of the contents and access to the CRCP database is given in Chapter 3, and a complete reference to the JCP database can be found in an earlier report in this series (Ref 4).

1.3 HISTORY OF THE DATABASE

The CRCP database has evolved significantly since data were first collected for it in 1974. Data were collected in 1974, 1978, 1980, 1982, 1987, and, most recently, in 1994. Prior to each survey effort, a review of the previously collected data and analysis results using the data was made to determine the best data to collect and the best way to collect them.

1.3.1 Evolution of the Survey Locations

Initially, data were collected for every CRCP section in the state, usually by breaking up the survey into 300 m (1000 ft.) sections. In 1984, 600 m (2000 ft) sections were used instead, to correspond with the state PMS system at the time. Finally, in 1987, a decision was made to collect only a representative sample of the CRCP inventory, reverting to the 300 m (1000 ft.) sections, but sampling far fewer sections than in previous years. A sampling scheme was developed that selected one to six sections per paving project, depending on a number of factors (e.g., project length, cut/fill position, and curvature) (Ref 3). The 1993-1994 survey returned to the same sections that were surveyed in 1987.

Figure 1.3 shows how the survey sections have evolved since 1974 for a typical paving project, identified in the database as CFTR section 1001. Between 1974 and 1978, the Dallas-Fort Worth Toll Road was incorporated into the Texas highway system. Thus, IH-30 was extended 85 km (53 miles) by terminating in Fort Worth rather than in Dallas, resulting in the change in mile posts. Distressed areas were overlaid with ACP in the years shown. In 1987, six test sections were selected from the westbound lanes, and a detailed condition and deflection survey was performed. The process was repeated in 1993-1994. Thus, 20 years of performance data are available for these sections.

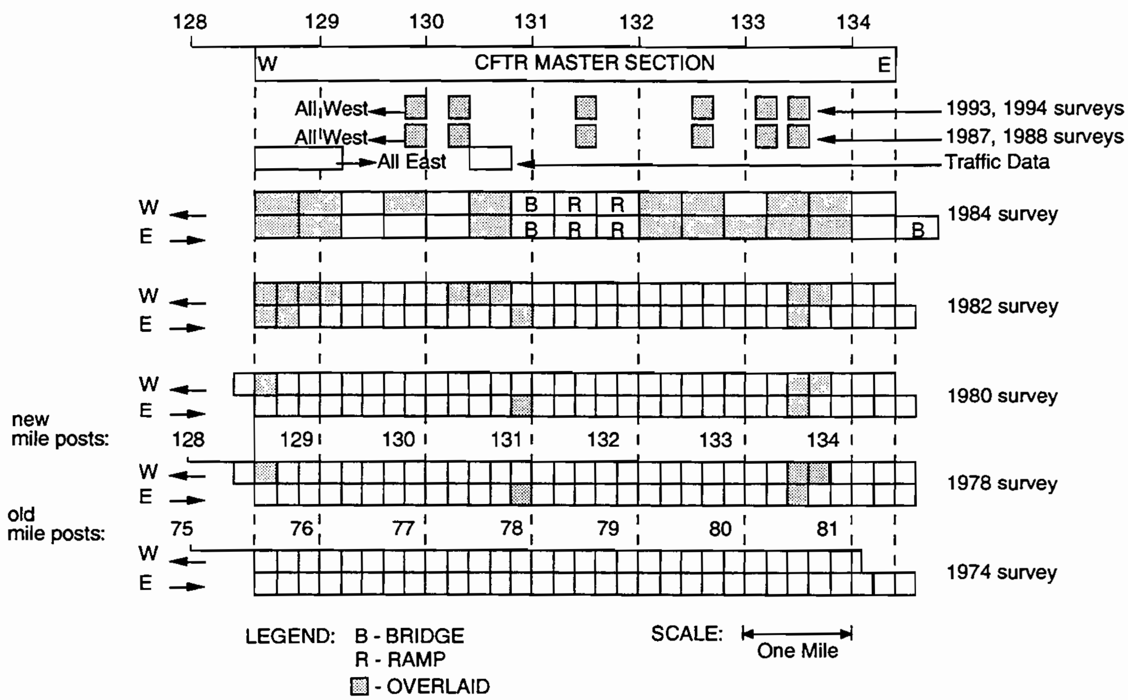


Figure 1.3. Evolution of the CRCP survey locations (1 mile=1.61 km)

The JCP survey locations were all redefined in 1993 under this project, after extensive study and discussion with TxDOT representatives. The locations were selected based on a factorial design developed by Dossey (Ref 6), which was the culmination of a statistical study designed to insure the relatively few JCP sections surveyed would adequately represent the state inventory, including a variety of reinforced and plain jointed pavement designs. An effort was also made to tie in the existing survey data from 1982 and 1984 to the new database, establishing an instant history file for jointed pavements (Ref 4).

1.3.2 Evolution of the Condition Survey Data

Responding to the changing needs of pavement research, and with the benefit of experience, the type of distress data collected has also evolved since 1974. The data collection methodology and the types and definitions of the pavement distresses recorded in each survey year have been documented elsewhere (Ref 4). Table 1.1 summarizes the evolution of the CRCP condition survey data.

Table 1.1. Evolution of the CRCP condition survey data

			Condition Survey Year						
Distress Type	Type	Intensity	74	78	80	82	84	87	94
Cracking	Transverse	Minor	○	○				○	○
		Severe	○	○				○	○
	Longitudinal		○						
	Localized	Minor	○						
		Severe	○						
Spalling		Minor	○	○	○	○			
		Severe	○	○	○	○	○		
Pumping		Minor	○	○	○	○			
		Severe	○	○	○	○			
Punchout		Minor	○	○	○	○		○	○
		Severe	○	○	○	○	○	○	○
Patch	AC		○	○	○	○	○	○	○
	PCC		○	○	○	○	○	○	○
Crack Spacing	Transverse							○	○
Reflected Cracks								○	○
Overlay Bond Failure								○	○

Unlike the long history of CRCP surveys, little precedent existed for data collection on JCP pavements, with only two years of historical data available. So, distress types for jointed pavement were reevaluated during this study, with the primary consideration being to collect the distress types needed for the Texas PMIS and related study 1908. Also, an effort was made wherever possible to maintain compatibility with the previous JCP surveys performed in 1982 and 1984, so that a long-term history of JCP performance would be available immediately. Table 1.2 shows the performance variables for JCP that were collected in the survey.

1.4 ORGANIZATION OF THE REPORT

Chapter 1 serves as an introduction to the Rigid Pavement Database. It outlines the importance of maintaining the database, briefly describes the contents and organization of the database, and gives a thumbnail sketch of how the database has evolved since its inception in 1974. Appropriate references are supplied to the reader who needs more detailed information on the historical evolution of the database. Chapter 2 presents the philosophy of the database. The usefulness of the database in pavement management and design is clearly shown by two recent examples of its use: (1) development of performance models for the TxDOT Pavement Management Information System (PMIS), and (2) calibration of CRCP mechanistic design models in the CRCP8 design program.

Chapter 3 lists the database contents, along with specific instructions for accessing the data. In addition to a summary of data collected in previous years under previous projects, the chapter focuses on the CRCP and JCP performance data collected under the current project from 1993 to 1994. This chapter is intended as a short but useful summary of a large and complex database; additional references are given for the reader who needs more detailed or technical information.

Chapter 4 contains some demographic analysis of the database, including age distributions of the survey sections at the time of data collection. It shows the current experimental design for CRCP and JCP data, with some commentary on the difficulties in filling the design factorials. Finally, several analysis examples are given to show how the database is actually used for statistical analysis. Chapter 5 explains why the effort of updating the Rigid Pavement Database should be continued, and gives some recommendations as to how that should be done in future surveys.

Table 1.2. List of distress types for overlaid and non-overlaid JCP (Ref 4)

Non-overlaid JCP pavements	Overlaid JCP pavements
Cracking	
Corner breaks Durability "D" cracking Longitudinal cracking Transverse cracking	Alligator cracking Block cracking Longitudinal cracks Transverse cracks Corner breaks
Joint deficiencies	
Spalling of longitudinal and transverse joints/cracks Faulting of transverse joints/cracks	Faulted joints
Miscellaneous distresses	
AC and PCC patches Punchouts	Rutting AC patches Punchouts

CHAPTER 2. DATABASE PHILOSOPHY

From its inception, the Rigid Pavement Database has been designed and maintained to support the widest possible range of tasks relating to pavement design and management. It is no longer intended to be a complete inventory of the state's rigid pavement system; that task is now relegated to the TxDOT-maintained Pavement Evaluation System (PES) (Ref. 1). Accordingly, the number of survey sections collected was downgraded from 100 percent of the rigid sections in the state to just 328 projects (431 survey sections) in 1987. That level of collection is continued in this most recent survey. Because fewer sections are visited, it is possible to collect much more detailed data for each section within the time and budget constraints imposed upon the study. This style of "research database" is ideally suited to provide the comprehensive data needed to develop design and performance models, where it is not initially known what factors are significant in determining the performance of a pavement or development of a particular form of distress. As such, it acts as a complement to the less-detailed, higher-sample-size PES databases used to manage the state's total pavement inventory.

Some of the recent (and current) applications of the Rigid Pavement Database are given in this chapter as illustrations of the vital role the database plays in many areas of pavement design and management.

2.1 RELATIONSHIP TO THE TEXAS PMIS

In December 1991, Congress passed the Intermodal Surface Transportation Efficiency Act of 1991, providing $155 billion in funding for highways, highway safety, and mass transportation for the period of 1992-1997. One of the requirements of the Act is that each state receiving federal aid "develop, establish, and implement" a highway pavement management system. Failure to do so by fiscal year 1996 would result in a 10 percent penalty of apportioned highway funds.

This requirement constitutes an enormous challenge for Texas. Currently, the state maintains 123,000 km (76,509 centerline miles) of highway pavements, which includes 2,135 km (1,326 miles) of continuously reinforced concrete pavement (CRCP) and 1,397 km (868 miles) of jointed concrete pavement (JCP). Managing these assets in accordance with the new federal guidelines requires the development of a pavement management system (PMS) that can assist Texas pavement planners in choosing the most cost-effective strategies for pavement rehabilitation. Not only must the system recommend an optimal treatment for a pavement section; it must also recommend when to apply the treatment and predict the extended pavement life afforded by the treatment. Since funding is always limited, the program must also prioritize the sections by need and predict the results of delayed rehabilitation (Ref 7).

Texas has responded to this challenge by developing the Pavement Management Information System (PMIS). The PMIS is "an automated system for storing, retrieving, analyzing, and reporting information to help with pavement-related decision-making processes" (Ref 1). PMIS contains most of the automated components of TxDOT's pavement management system, and is used at the network level to assist planners in making decisions that affect the entire state pavement inventory. Figure 2.1 shows how PMIS fits into the state's overall pavement management system.

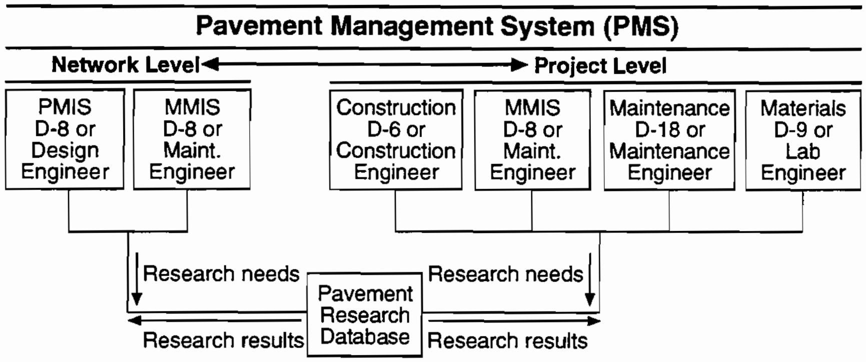


Figure 2.1. Overall structure of the TxDOT Pavement Management System (Ref 1)

PMIS includes a pavement modeling system that predicts the response of the pavement network to various inputs, including traffic, materials, design thicknesses, and climatic variables. In order to develop these models, TxDOT funded separate studies for asphalt and portland cement concrete (PCC) pavements. The PCC study (Project 1908: Texas Pavement Management Information System) made extensive use of the historical data in the Rigid Pavement Database. The primary objective of this study is to develop models relating distress to pavement age (and other factors) for the distress types identified in Table 2.1.

Table 2.1. PMIS distress types for concrete pavement (Ref 1)

Pavement Type	Distress	How Rated
Continuously Reinforced Concrete Pavement (CRCP)	Spalled cracks	Total number
	Punchouts	Total number
	Asphalt patches	Total number
	Concrete patches	Total number
	Average crack spacing	Feet
Jointed Concrete Pavement (JCP)	Failed joints or cracks	Total number
	Failures	Total number
	Shattered slabs	Total number
	Slabs with longitudinal cracks	Total number
	Concrete patches	Total number
	Apparent joint spacing	Feet

For more information about PMIS distress ratings, see the 1992 PMIS Rater's Manual (available from D-8PM).

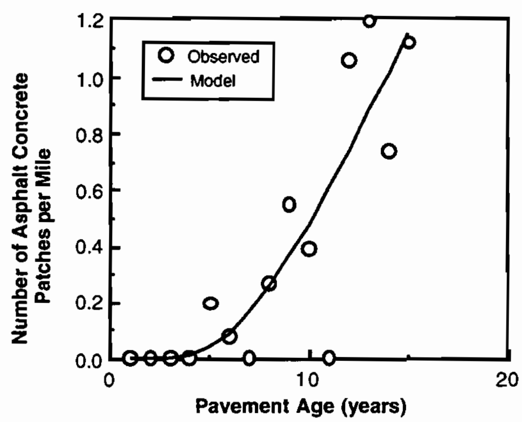
Using the database, Project 1908 researchers first analyzed 20 years of historical distress data to determine which construction, environmental, and traffic factors had a significant effect on CRCP. Table 2.2 shows the results (Ref 7).

Table 2.2. Significant factors influencing CRCP distress

DISTRESS TYPE	SIGNIFICANT FACTORS
Minor Punchouts	AGE, SOIL, SOIL*CAT, TEMP*CAT, RAIN*SOIL
Severe Punchouts	CAT*AGE, AGE*TEMP, AGE, SOIL, TEMP*RAIN
PCC Patches	AGE, AGE*CAT, AGE*SBT, AGE*RAIN, AGE*HT
AC Patches	AGE*TEMP, AGE*RAIN, AGE, AGE*HT
Cracks per 100 feet	TEMP*CAT, CTRAF*RAIN, AGE, RAIN, RAIN*AGE
Spalled Cracks	AGE*CAT, AGE*RAIN, AGE, AGE*SBT

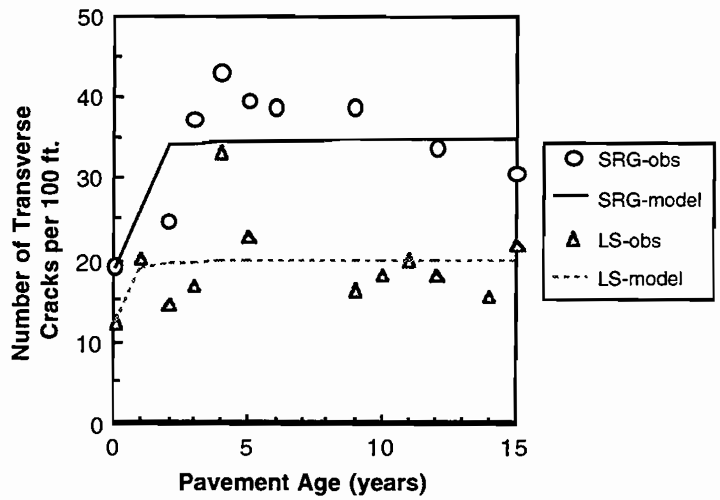
*Factors connected with an asterisk are their two-way interactions

Next, models relating each distress to age were developed using the database. These preliminary models were developed by averaging all the database sections collected at similar ages and finding the best fit sigmoidal curve through the points. As an example, the curves for asphalt patching and crack spacing are given as Figures 2.2 and 2.3.



$$\textbf{Number of ACC Patches per Mile} = 9.72\, e^{-\left(\frac{36.15}{AGE}\right)^{0.86}}$$

Figure 2.2. Prediction curve for asphalt patching (1 mile=1.61 km)



$$\text{Number of Transverse Cracks per 100ft. (SRG)} = 34.90\ e^{-\left(\frac{0.061}{AGE}\right)^{1.0}}$$

$$\text{Number of Transverse Cracks per 100ft. (LS)} = 19.79\ e^{-\left(\frac{0.051}{AGE}\right)^{1.06}}$$

Figure 2.3. Crack spacing performance curves for limestone and siliceous river gravel aggregate pavements (1 foot=0.304 m)

Additional work is now being undertaken by Project 1908 researchers to modify the CRCP performance curves to reflect environmental and traffic effects.

For jointed concrete pavements, Project 1342 staff joined in a cooperative effort with Project 1908 staff to insure that the 1993-1994 field data collection included all the distress types needed by the PMIS (Table 2.1). This cooperation produced new data collection forms and a factorial design that will meet the needs of the Texas PMIS now and for the foreseeable future. The JCP experiment design and the results of the subsequent data collection effort are summarized in Chapter 3 and completely documented in a previous report of this study (Ref 4). At the time of this writing, Project 1908 staff are using the 1993-94 JCP data to develop distress curves for jointed pavements.

2.2 RELATIONSHIP TO DESIGN PRACTICE

2.2.1 Distress in CRCP

Punchouts represent the primary distress manifestation in CRC pavements. A punchout occurs when closely spaced transverse cracks are joined by longitudinal cracking. Longitudinal cracking is primarily caused by repeated wheel load applications, which fatigue the pavement and ultimately end its serviceable life. So, in essence, an evolution of distress takes place in CRCP.

First, volumetric changes caused by drying shrinkage and thermal expansion and contraction produce stresses in the pavement that are relieved by the formation of early age transverse cracking. The spacing of these cracks is influenced by a variety of factors: Recent studies have shown that some of the primary factors controlling crack spacing include thermal coefficient of the coarse aggregate, placement time (especially during the summer months), quality control during construction, and curing techniques that retain moisture and thus slow drying shrinkage and moderate peak heat buildup (Ref 8). Most of the early age cracking occurs in the first 24 to 48 hours, and almost all the cracks will have formed within the first year after placement.

The next stage in CRCP distress occurs as wheel load applications produce longitudinal cracking in the pavement. If the initial transverse cracks are closely spaced, there is a high probability that the transverse cracks will be joined by the longitudinal cracks. This distress is termed a minor punchout. As the process proceeds, multiple cracks are joined producing small blocks of concrete that are completely separated from the rest of the pavement, sometimes with a complete loss of load transfer or even popping out from the road surface. This stage of distress is termed a severe punchout.

At some point, these distresses will be repaired by patching with either asphalt or portland cement patches. Since the difference between a severe punchout and a patch is strictly a maintenance decision, it is often useful to define "failures" as the sum of the existing severe punchouts and patches on a pavement, often expressed in terms of "failures per mile." When the number of failures per mile reaches some arbitrarily high number, usually between 10 and 15, a decision is usually made to overlay or reconstruct the pavement to restore ride quality and structural integrity.

2.2.2 Design Considerations

Designers must be able to predict the useful life of a pavement constructed from a given design. Several widely used techniques exist for designing pavement: a primary method often followed is given in the AASHTO Guide (Ref. 9). For a desired pavement life (in terms of cumulative traffic exposure), the AASHTO Guide recommends a design thickness and steel reinforcement; however, the failure criteria used by the Guide are based strictly on loss of ride quality and does not directly address failures or material fatigue.

Recently, models have been developed that attempt to predict the development of failures for a given design with cumulative traffic exposure. Besides accounting for pavement thickness and reinforcement design, these analytical models also take into account such additional factors as coarse aggregate type, concrete properties, swelling condition, and the environment.

2.2.3 CRCP8 Analysis Program

As an example of an analysis program developed using the database, CRCP8 uses a mechanistic process to predict early age crack spacing and width, steel stresses, and, ultimately, the rate of failure development with repeated load applications over the lifetime of the pavement. This work is based on a mechanistic analysis of CRC pavement, including the stochastic (non-uniform) nature of the materials used in its construction (Ref 10).

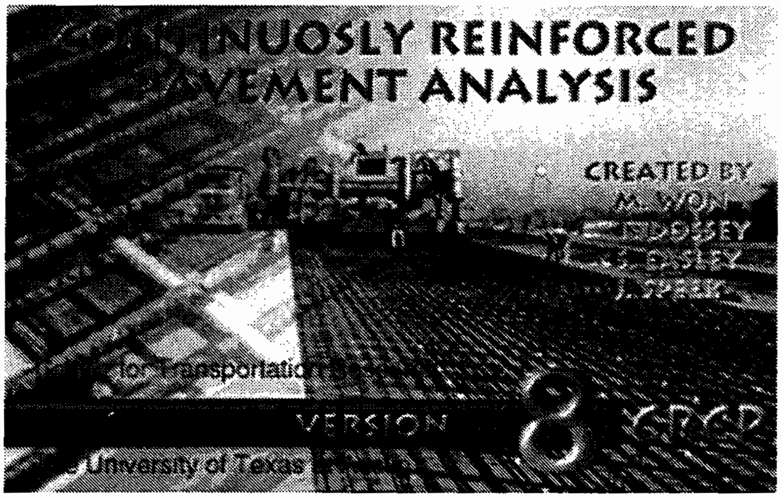


Figure 2.4. The CRCP8 program for the IBM personal computer

Figure 2.4 shows the output screen of CRCP8 for a typical analysis problem. The designer has input parameters for a 25 cm (10 inch) CRC pavement, using limestone coarse aggregate. The steel design specifies number 6 bar (1.9 cm dia.) at a 0.6 percent reinforcement. The pavement will be subjected to a 8 to 14° C (15 to 25° F) temperature drop during the first 28 days after construction. The program has predicted a 1 m (3 ft.) mean crack spacing with a standard deviation of 0.5 m (1.6 ft.). The graph at the bottom right of the figure shows the development of failures with traffic exposure based on a 95 percent design reliability; for instance, the program is predicting a failure rate of 15 FPM after 15 million ESALs of traffic loading.

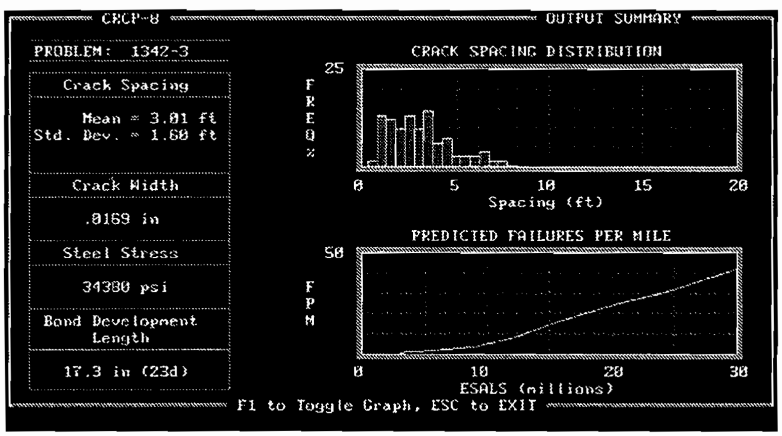


Figure 2.5. Output from the CRCP8 program

2.2.4 Calibration of CRCP8 Using the Rigid Pavement Database

A recent study (Ref 11) attempted to improve the CRCP8 analysis program by focusing on (1) the importance of the heat of hydration on the early-age behavior of CRCP; (2) the effect of construction season and time of placement during the day on the early-age cracking; (3) detrimental characteristics of the early age cracks in terms of their shapes and widths; (4) the effect of coarse aggregate type on cracking; (5) factors affecting crack width; (6) determination of setting temperature used as a reference temperature in the calculation of the temperature-induced stresses; and (7) the correlation between the shrinkage of concrete pavement in the field and that of lab-cured cylinders. Based on these observations and findings, recommendations are provided as to how the early age observations may be simulated in the CRCP program. Recommendations for future design and construction are also presented.

The Rigid Pavement Database was used in this study to determine which factors influence long-term distress in CRC pavements. The three major factors identified were (1) early age crack spacing, (2) coarse aggregate type, and (3) swelling condition in the subgrade. Using the database, models were developed to predict number of failures per mile as a function of traffic exposure. Figure 2.6 shows how the rate of failure is affected by coarse aggregate and soil types.

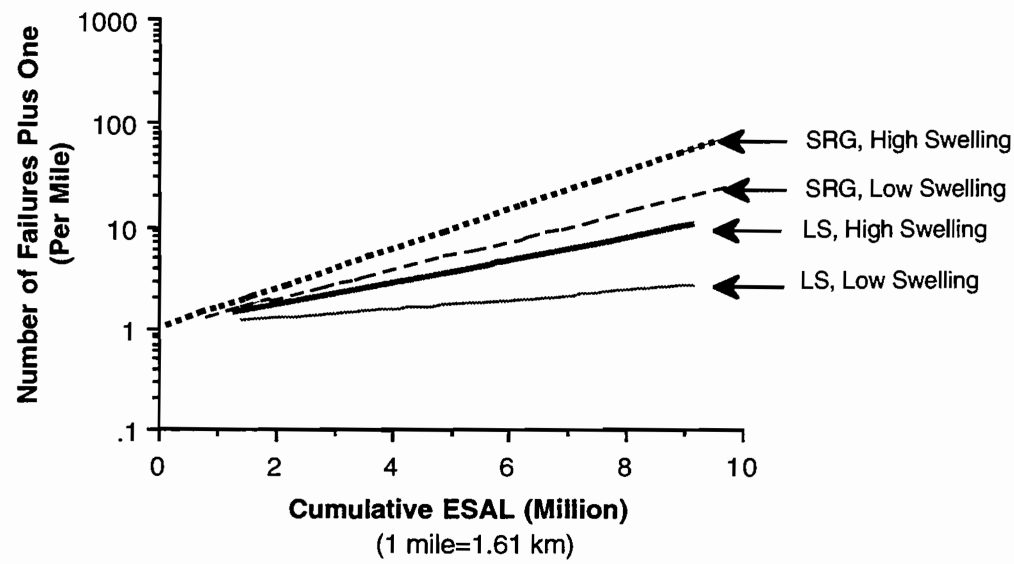


Figure 2.6. Mean failure curves for different coarse aggregate types and swelling conditions

Failure curves for various reliabilities were also developed. Figure 2.7 shows an example for limestone aggregate and swelling subgrade.

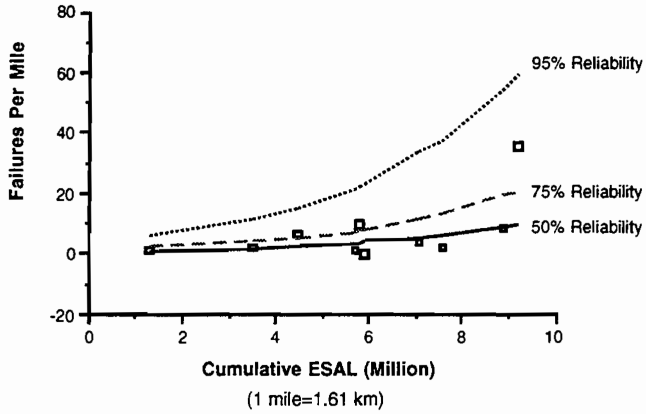


Figure 2.7. Failure curves with various reliabilities (LS, high swelling)

Now that the effects of coarse aggregate and swelling soil have been incorporated, the CRCP8 analysis program can accurately simulate the early age behavior of continuously reinforced concrete pavements for various design reliabilities. It can be used to predict crack spacing, crack width, steel stresses, frictional forces, and displacements based on volume changes caused by temperature differentials and drying shrinkage, as well as additional input data relating to pavement design, environmental factors, and loading.

As a final step, a design program CRCPAV has been prepared which uses the same models as CRCP8, the analysis program. Unlike CRCP8, which predicts the performance of a given CRCP design, CRCPAV solves for the optimum steel reinforcement design needed to achieve a desired crack spacing, crack opening, steel stress, and long-term rate of failure development.

2.2.5 JRCP6 Analysis Program

A similar analysis program has been developed for jointed pavements. Using the same type of inputs as CRCP8, the JRCP6 program predicts the occurrence of early age cracks, steel stress, and joint opening. Ruiz' work with the jointed pavement section of the Rigid Pavement Database has made it possible to calibrate the JRCP6 models to predict the occurrence of various JCP failures with traffic exposure and time. At the time of this writing, this work is still underway.

2.3 SUMMARY

While many other studies have used the database since its inception in 1974, this chapter described two of the most recent uses of the database for pavement management and design. Because it contains more than 20 years of historical data, and because it includes diverse information relating to environmental, construction, and traffic exposure, the database is a unique and valuable resource for modeling the performance of Texas pavements.

CHAPTER 3. DATABASE CONTENTS AND ACCESS

3.1 CRCP CONDITION SURVEY DATA

As stated previously, the Rigid Pavement Database consists of two primary sections: (1) the Continuously Reinforced Concrete Pavement (CRCP) database, and the Jointed Concrete Pavement (JCP) database. Both are organized in a similar manner, but the information contained in each varies to reflect the different distress types and design considerations associated with each type of pavement. Table 3.1 shows the complete contents and variable name list for the CRCP database.

In terms of organization, the CRCP database was updated by the following steps: (1) All new pavement projects added to the database this year were added to the master file; (2) condition survey data brought in from the field on data collection forms were typed into a computer file, and a 10-key pad was used to generate a check sum for the data so that errors were identified and corrected; (3) crack spacing data were typed into a separate computer file, using a procedure similar to that used for the condition survey data; (4) updated traffic information was added to the existing traffic data file; and (5) a set of existing programs was used to read, check, and merge the various files into the CRCP database, according to the procedure diagrammed in Figure 3.1.

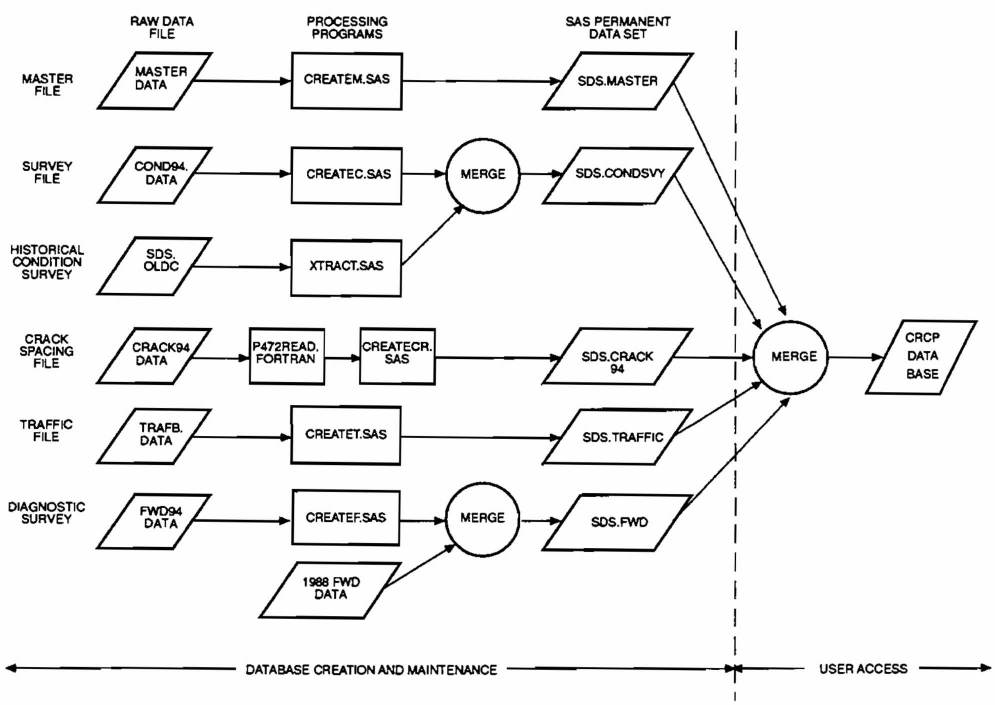


Figure 3.1. CRCP database creation sequence

*Table 3.1. CRCP database contents**

Item	Description	Files*	Item	Description	Files*
CFTR	Section ID Number	M,S,C,D	LEN	Length surveyed (ft)	S
SECT	Subsection surveyed	S,C,D	FROM	Survey section start (text)	S
DIR	Direction surveyed	S,C,D	TO	Survey section end (text)	S
COUNTY	County name	M	ACP	Number of asphalt patches	S
HWY	Highway designation	M	PCCP	Portland cement patches	S
CTRL	TXDOT control number	M	NCRK	Number of cracks in section	S
SEC	TXDOT section number	M	BF	Bonding failures	S
JOB	TXDOT construction job number	M	MPO	Minor punch outs	S
NJOB	TXDOT subsequent job numbers	M	SPO	Severe punch outs	S
CDATE	Construction date	M	NF	Number of failures	S
OV1-OV4	Date of first four overlays	M	CRK	Individual crack spacing	C
MP1	Beginning milepost	M	YR	Year of observation	S,T
MP2	Ending milepost	M	N	Number of points averaged	T
L	Section length (entire section, miles)	M	ADT	Average daily traffic	T
D	CRC pavement thickness (in.)	M	PTRUCK	Percent Trucks	T
CAT	Coarse aggregate type: 1=SRG,	M	ESAL2	Yearly ESAL, both directions	T
	2=LS, 3=1&2,4=SLAG,		ATHWL	Avg. 10 heaviest wheel loads	T
	5=1&4 or 2&4		PTAND	Percent Tandem Axles	T
SBT	Subbase type: 1=Asphalt treated,	M	CD	Coefficient of drainage	M
	2=Cement treated, 3=Lime treated,		CONF	Geophone configuration (see text)	D
	4=Crushed stone		SS	Subsection (see text)	D
SOIL	Y for swelling soil, N if not	M	TDEV	Temperature device (see text)	D
TEMP	Yearly temperature range (°F)	M	STATION	Station within sub-section	D
RAIN	Average annual rainfall	M	STEMP	Surface temp (F)	D
ADT	Average daily traffic (estimated)	M	HEIGHT	FWD drop height	D
G	ADT growth rate (estimated)	M	LBS	Load intensity (lbs)	D
LANE	Number of lanes (each direction)	M	DF1-DF7	Deflection at each geophone	D
ST	Surface type (AC, C&G, etc.)	M		*Items designated:	
MAIN	Y if main lane, N if shoulder or access rd.	M		M are in SDS.MASTER,	
DATE	Date surveyed	S		S in SDS.CONDSURV,	
LANES	Number of lanes	S		C in SDS.CRACK87,	
RATER	Rater code	S		T in SDS.TRAFFIC,	
CFP	Cut/Fill Position	S		D in SDS.FWD	
CURVE	Curve (Y or N)	S			
OVR	Overlaid (Y or N)	S,D			

*AC overlay distresses were not collected until the 1994 survey. Overlay thicknesses and PMIS lane designator will be added to the database in the future.

A complete listing of the CRCP condition survey data collected during the 1993-1994 survey appears in Appendix A. A description of the entire CRCP database design process can be found elsewhere (Ref 6).

3.2 JOINTED PAVEMENT CONDITION SURVEY DATA

The jointed pavement database is organized much like the CRCP database. However, many of the variables are different, owing to the different design and performance considerations for jointed pavements. For instance, in terms of design variables, the presence or absence of steel reinforcement and dowels has been included, as well as the joint spacings. In terms of distress manifestation, additional fields were reserved for distress types common to jointed pavements (e.g., faulting and corner breaks). This project also included, as requested by TxDOT PMIS planners, distresses found in overlaid JCP pavements (e.g., rutting and alligator cracking). Tables 3.2-3.6 list all variables in the JCP database (Ref 4).

Master File: As illustrated in Table 3.2, this file contains all the identification and design information. The main fields include the CFTR and construction project number, completion date, location, structural, and environmental information.

Condition Survey File: This file includes all the information collected from the field for every test section surveyed. The CFTR number permits the connection of the information contained in the condition survey file with the master file and the other files composing the database. Table 3.3 lists the name and provides a brief description of the items stored in this file. Location, geometric details, and distresses surveyed in the field form the main body of this file.

Crack Spacing File: Information on crack spacing was included in a separate file. The cumulative distance from the first point of each test section to every crack for the first 60.96 m (200 feet) was collected in the field. Table 3.4 illustrates the contents of this file.

Traffic Data File: This file contains the cumulative AADT history for every test section (dating from initial project construction). Additional items include the CFTR number for indexing with other files, and such traffic factors as truck percentage, directional distribution, average ten heaviest wheel loads (ATHWL), and estimated 80-kN (18-kip) ESALs, as shown in Table 3.5.

Table 3.2. JCP master file contents

Item	Description
CFTR	Section id number
SECT	Subsection surveyed
DIR	Direction surveyed
COUNTY	County name
HWY	Highway designation
CTRL	TxDOT control number
SEC	TxDOT section number
JOB	TxDOT construction job number
PVT	Pavement type: 1 = plain, 2 = reinforced
CDATE	Project completion date (years)
MP1	Beginning milepost for the construction project (Interstate highways)
MP2	Ending milepost for the construction project (Interstate highways)
RM1	Beginning reference marker for the construction project (Texas highways)
RM2	Ending reference marker for the construction project (Texas highways)
LEN	Project length (miles)
D	Pavement thickness (in.)
DOW	Presence of load transfer devices (dowels)
CAT	Coarse aggregate type: 1 = limestone, 2 = SRG, 3=1&2, 4 = other
SBT	Subbase type: 1=ac treated, 2=pc treated, 3=lime treated, 4=crshd. stone
SHLD	Shoulder type
SOIL	Y for swelling soil, N if not
COLD	Average lowest temperature (°F)
HOT	Average highest temperature (°F)
RAIN	Average annual rainfall (in.)
CD	Coefficient of drainage

Table 3.3. JCP condition survey file contents

Item	Description
CFTR	Section ID number
SECT	Subsection surveyed
DIR	Direction surveyed
DATE	Date surveyed
LANES	Number of lanes (each direction)
RATER	Rater code
RBD	Roadbed type: c = cut, f = fill, t = transition, g = at grade
CURVE	Horizontal curve (y or n)
OVER	Overlay (y or n)
MP1	Beginning milepost for the subsection surveyed (Interstate highways)
MP2	Ending milepost for the subsection surveyed (Interstate highways)
RM1	Beginning reference marker for the subsection surveyed (Texas highways)
RM2	Ending reference marker for the subsection surveyed (Texas highways)
LEN	Length surveyed (ft)
MPO	Minor punchouts
SPO	Severe punchouts
DCRK	Number of durability "D" cracking
CBRKS	Number of corner breaks
SPALL	Number of spalled longitudinal and transverse joints/cracks
FAULT	Number of faulted of transverse joints/cracks
ACP1	Number of asphalt patches (.09-4.64 m^2/1-50 sq. ft.)
ACP51	Number of asphalt patches (4.74-13.9 m^2/51-150 sq. ft.)
ACP150	Number of asphalt patches (>13.9 m^2/150 sq. ft.)
PCC1	Number of portland cement concrete patches (.09-4.64 m^2/1-50 sq. ft.)
PCC51	Number of portland cement concrete patches (4.74-13.9 m^2/51-150 sq. ft.)
PCC150	Number of portland cement concrete patches (>13.9 m^2/150 sq. ft.)
LCRK	Number of slabs with longitudinal cracks
TCRK	Number of transverse cracks for first 60.9 m (200 ft.)
ACRK	Alligator cracking (% of rated lanes total surface area)
BCRK	Block cracking (% of rated lanes total surface area)
SRUT	Shallow rutting (% of total wheel path area)
DRUT	Deep rutting (% of total wheel path area)

Table 3.4. JCP crack spacing file

Item	Description
CFTR	Section ID number
SECT	Subsection surveyed
DIR	Direction surveyed
CRK	Individual crack spacing

Table 3.5. JCP traffic file contents

Item	Description
CFTR	Section ID number
SECT	Subsection
DIR	Direction
AADT	Annual average daily traffic
PTRUCK	Percent trucks
DIST	Directional distribution
ATHWL	Avg. 10 heaviest wheel loads
PTAND	Percent tandem axles
ESAL	80 kN (18-kip) equivalent single axle loads (estimated)

Maintenance and Rehabilitation Data File: As shown in Table 3.6, this file contains the complete M&R history of the pavement, including overlay thickness and such miscellaneous activities as seal coats, shoulder improvement, slurry seals, and the widening of existing concrete. It is important to note that M&R activities are current only up to 1992.

Table 3.6. JCP maintenance and rehabilitation file contents

Item	Description
CFTR	Section ID number
SECT	Subsection
DIR	Direction
OV1-OV3	Date of first three overlays
OVT1-OVT3	Thickness of first three overlays (in.)
MISC	Description and date of miscellaneous activities
COMM	Comments

The JCP database was created by this study to fulfill a need expressed by TxDOT planners and Project 1908 staff. Although it does incorporate some historical data taken in 1982 and 1984, the design of the database is new, both in organization and content. The JCP database was created by the following steps: (1) inventory data for all projects (obtained from TxDOT files and prior Project 1908 findings) were key-entered into a Master file; (2) condition survey data brought in from the field on data collection forms were typed into a computer file, and a check sum was used to correct transcription errors in the same way as the CRCP data; (3) crack spacing data were typed into a separate computer file, using a procedure similar to that used for the CRCP crack spacing data; (4) traffic information was retrieved from TxDOT files and used to create a traffic data file; and (5) a set of new programs was written to read, check, and merge the various files into the JCP database, according to the procedure diagrammed in Figure 3.2. A complete description of the origin, organization, and contents of the JCP database may be found elsewhere (Ref 4).

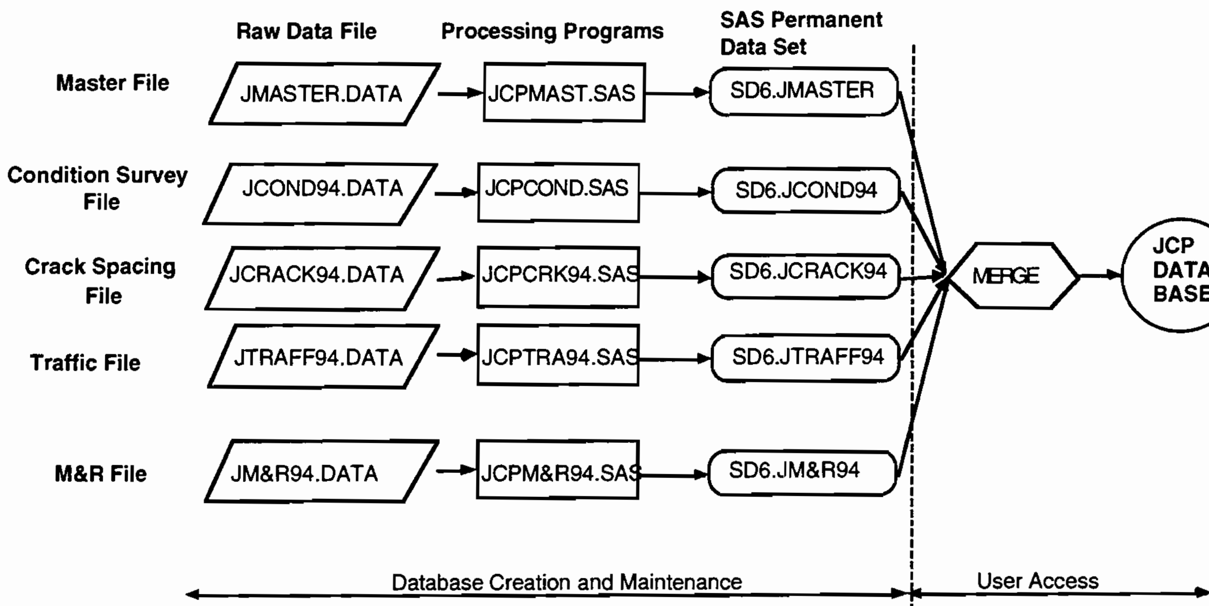


Figure 3.2. Creation sequence for the JCP database

3.3 COMPUTERIZED ACCESS

Both the CRCP and JCP databases are stored in UT's IBM 3081 mainframe computer. The Statistical Analysis System (SAS) computer language was chosen in the 1987 study (Ref 6) for the following reasons: (1) ease of use, (2) longevity, (3) statistical and reporting capabilities, and (4) acceptance across a number of hardware platforms. This last consideration is especially important because it means that the database can be used on the TxDOT mainframe or on any IBM compatible personal computer. With the update of mainframe SAS to version 6, the SAS language is identical on mainframe and PC computers.

However, it does mean that in order to use the database it is necessary to learn SAS. Fortunately, most people find it reasonably easy to learn a working subset of SAS within a week or two, provided they are already familiar with other programming languages. It is also possible to learn the minimum SAS needed to extract the data, and then transfer the desired variables to any PC spreadsheet program such as Lotus or Excel. Many users have used the database in exactly this way. The full-screen version of SAS on the IBM PC has an online HELP facility that makes it especially easy to learn. Instruction in the SAS language is outside the scope of this report (Ref 6), but a few quick and easy examples using SAS are given in Chapter 4.

Finally, if one desires to use SAS on The University of Texas mainframe computer, access can be gained to the database by logging in and then typing the following two lines:

```
CP LINK FTAO152 191 195 RR P472
ACCESS 195 Q
```

All the database files (the names are given in Figs 3.1 and 3.2) now appear on the user's "Q" disk. Variables in the files are named as in the tables.

CHAPTER 4. DATABASE DEMOGRAPHICS AND ANALYSIS EXAMPLES

This chapter deals with applications of the Rigid Pavement Database. The first section lists vital statistics pertaining to the content of the database that define the inference space of any model or calibration developed using the database. The second section gives several specific examples of how to access the database using the SAS language.

4.1 DEMOGRAPHICS OF THE DATABASE

Whether the Rigid Pavement Database is to be used for design or management applications, it is vital to understand the underlying "demographics" of the database. Used here, demographics means the distribution of the survey data with respect to certain key characteristics, such as pavement age at the time of the survey, pavement thickness, and coarse aggregate type. Models developed using the database are valid only within the inference space of the database. For example, prior to 1987, very few CRCP sections thicker than 20 cm (8 inches) had been surveyed; any model derived from these data must be used with caution if applied to thicker pavements.

Owing to the importance of this concept, the demographics of the database are summarized here for all the major variables.

4.1.1 Demographics of the CRCP Database

This section gives the demographics for the CRCP portion of the database. It should be pointed out that some of the demographics given here refer to just the 1993-1994 condition survey, while others refer to the entire contents of the CRCP database, including all data collected since 1974; the figures and tables will be clearly labeled as to which population they represent. The reason for this is that many studies (Ref 7) require pavement condition information at specific pavement ages. A pavement built in 1970 would have been 4 years old when surveyed in 1974, 8 years old in 1978, and so on until the 1994 survey at 24 years of age, when the pavement is likely to have been overlaid and in the last part of its service life. Thus, a single pavement section may provide up to seven observations from the database over time.

Figure 4.1 shows the distribution of the CRCP projects by TxDOT District. Districts where condition survey data were taken are shaded, with the number of sections in parentheses after the District number. Obviously, not all Districts have CRC pavements, and some Districts have many more centerline miles of CRCP than others. The overall design factorial of the database (Ref 3) was intended to insure a representative sample across the state.

Figure 4.2 shows the number of survey sections per CRCP project. These sections follow the 1987 experiment design, which selected from one to six sections per project based on length, cut/fill position, and several other factors (Ref 3). Of course, the 1993-1994 survey varied slightly from the original design, owing to new projects added, difficulties in locating the 1987 pavement sections, and inability to survey some sections because of dangerous conditions. It is expected that the next survey will use the1987 design, with only slight changes required (i.e., adding new projects and possibly deleting some of the older overlaid sections).

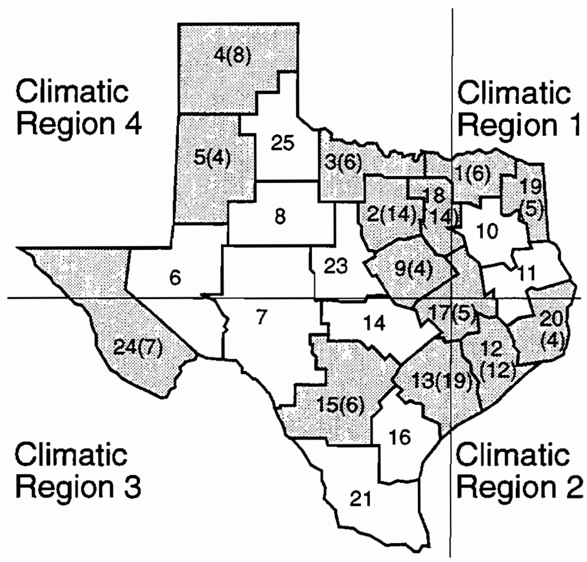


Figure 4.1. CRCP projects by district (number of projects in parentheses)

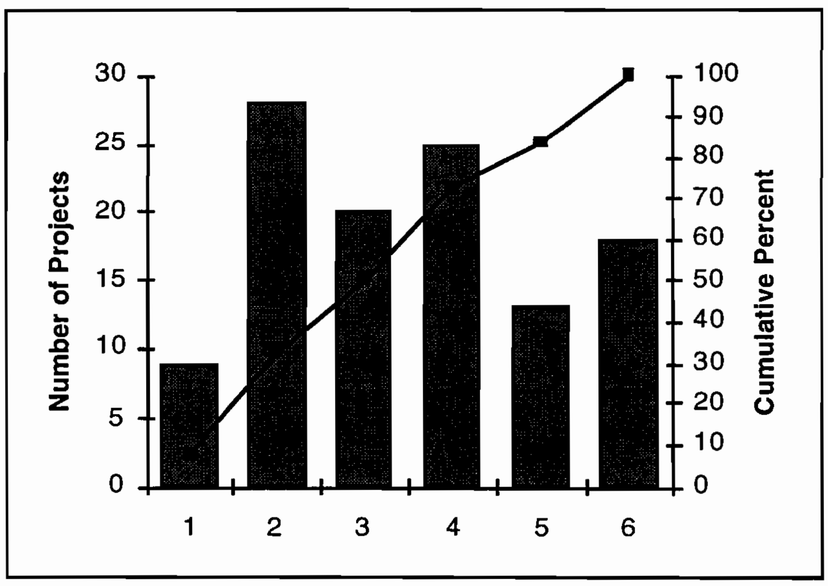


Figure 4.2. Number of CRCP test sections per construction project

Figure 4.3 shows the 1993-1994 survey section distribution by functional classification (highway type). Over 70 percent of the data was collected from Interstate highways, since that is where most CRC pavements are placed. Beltways, US, and state highways taken together comprise less than 30 percent of the CRCP database population.

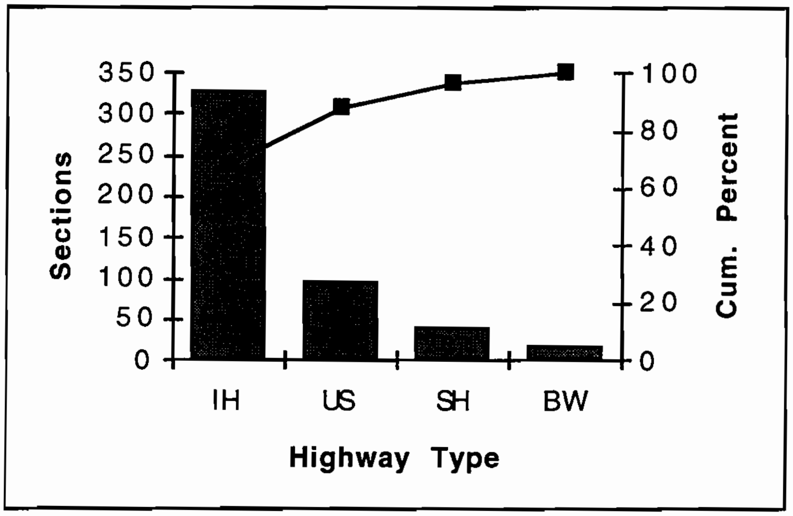


Figure 4.3. CRCP highway functional classification distribution

Figure 4.4 shows the distribution of lane number for CRC pavements. The designations "1-2", "2-3", and "3-4" in the legend indicate that the roadway has an unequal number of lanes in each direction. For example, "2-3" lanes would mean a highway with two lanes in one direction and three in the other. From the chart it can be seen that almost 60 percent of the sections surveyed in 1993-1994 were four-lane highways (two lanes each direction).

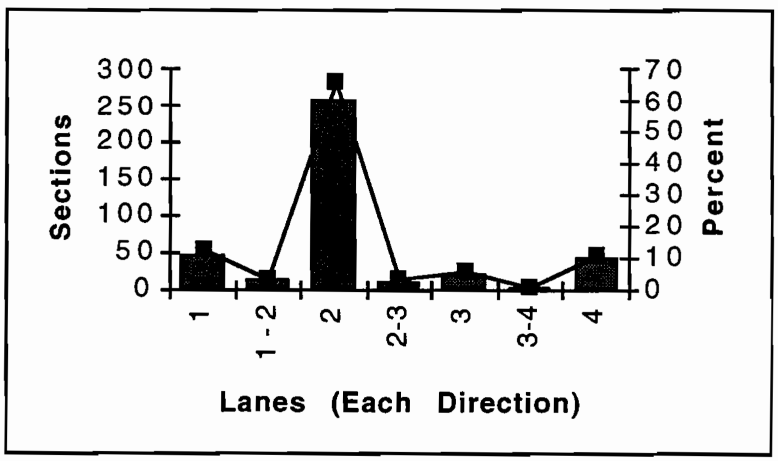


Figure 4.4 Distribution of CRCP test section lanes per direction

Figure 4.5 shows the distribution for roadbed type (cut/fill position). Because the 1987 database factorial design (Ref 3) identified roadbed type as an important predictor of pavement performance, the field crew was instructed to select and survey sections from all four types. The sections marked "transition" are taken from sections of the roadway where a transition from cut to fill occurs.

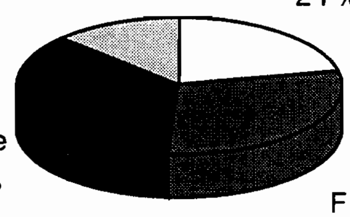


Figure 4.5. CRCP roadbed type distribution

Figures 4.6 and 4.7 illustrate important characteristics of the database relating to pavement age. Figure 4.6 shows the age distribution of the sections collected during the 1993-1994 field survey. Note that despite an effort to include as many newly constructed CRC pavements as possible in the survey, less than 20 percent of the sections surveyed are 10 years old or less. Over half of the sections surveyed were already more than 20 years old in 1994. Study on these older sections is still warranted, because the non-overlaid portion of these pavements offer the opportunity to study factors that improve long-term performance, while the overlaid sections offer much needed data for the study of overlay performance on rigid pavements. The TxDOT PMIS effort is currently using this database to develop performance models for composite (overlaid) pavements (Ref 1).

The data are also valuable for improving overlay design. At the request of TxDOT Design Division, a recent case study was undertaken to determine performance of an old, overlaid PCC pavement that was to be milled off and re-overlaid. This study used historical data from the database, along with additional data, to determine the effect of the overlay on dynamic loading, roughness, fatigue, and rate of failure development (Ref 13).

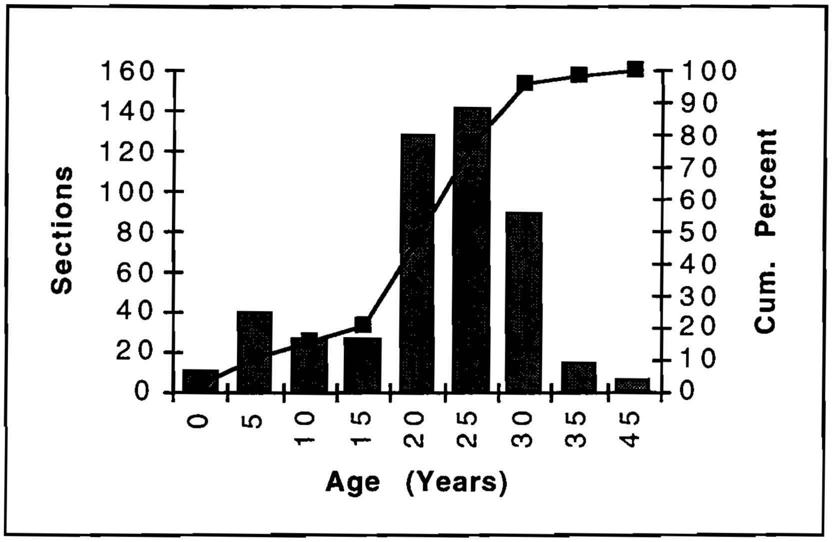


Figure 4.6. Age distribution of CRCP test sections surveyed (1993-1994 survey)

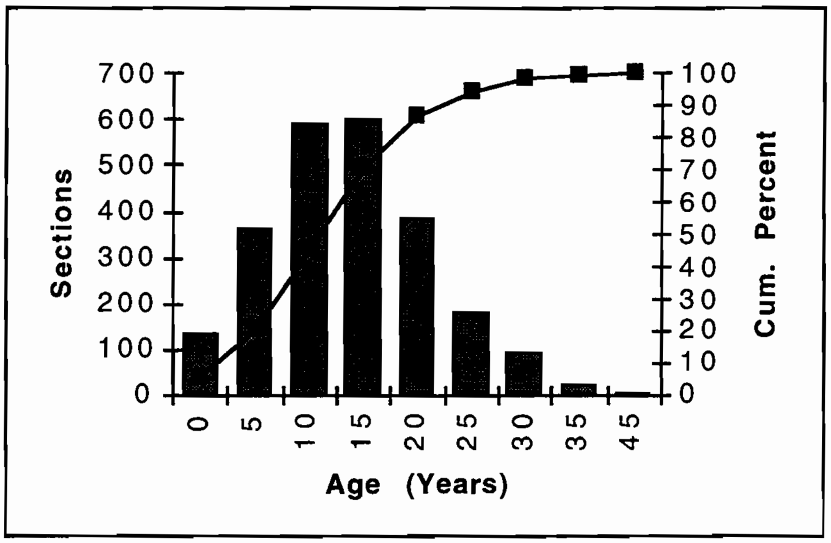


Figure 4.7. Age distribution of CRCP test sections surveyed (entire database)

In contrast to Figure 4.6, Figure 4.7 shows the pavement age distribution for the entire database over all the survey years. As explained in the introduction to this section, a pavement built in 1970 would contribute seven observations to this population, assuming it was successfully surveyed in all subsequent survey years. Accordingly, the database in fact contains a large amount of data for CRC pavements of all ages, as the figure clearly indicates. TxDOT Project 1908 is currently using the data in this fashion to develop distress vs. age curves for the Texas PMIS (Ref 7), as mentioned in Chapter 2.

Table 4.1 shows that a balance between sampled overlaid and non-overlaid sections is being maintained in the database.

Table 4.1. CRCP overlaid vs. non-overlaid test sections

Status	Frequency	Percent
NON-OVERLAID	253	51.5
OVERLAID	238	48.5

Finally, Table 4.2 shows the coarse aggregate type (CAT) distribution, while Figure 4.8 shows the thickness distribution of the test sections surveyed. Based on the CAT distribution, about one-half of the test sections were built with limestone, and almost half were built with siliceous river gravel aggregates. The thicknesses of the test sections ranged from 20 to 33 cm (8 to 13 inches), with most pavements having a thickness of 20 cm (8 inches). The effect of thickness on performance is well-known, and the effect of coarse aggregate on performance is currently being studied (Ref 8).

Table 4.2. CRCP coarse aggregate type distribution

Coarse Aggregate	1994 Survey Sect.	Percent
LIMESTONE	263	55
SILICEOUS	211	44
OTHER	7	1

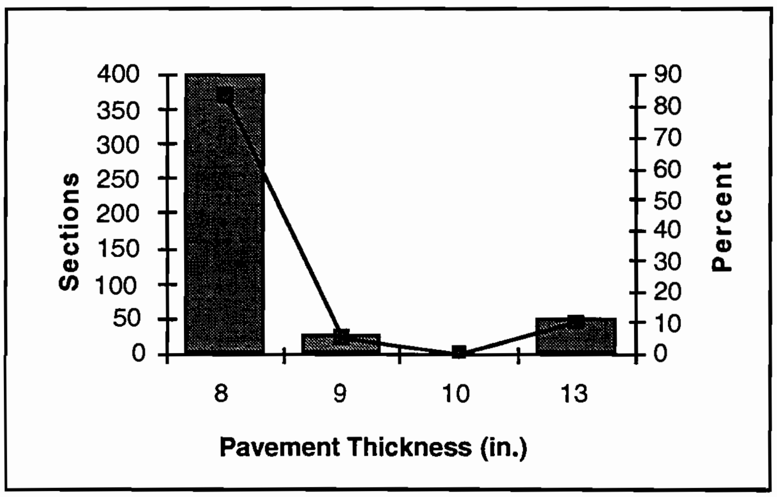


Figure 4.8. CRCP slab thickness distribution (1 inch=2.54 cm)

4.1.2 Demographics of the JCP Database

This section discusses the condition survey results in terms of the demographics for the JCP test sections collected. The demographics reported here are taken from a recent CTR report (Ref 4), as a convenience to the reader and for the sake of completeness in this report. As illustrated in Table 4.3, a total of 68 JCP and JRC pavement projects were surveyed in approximately equal proportion. The number of test sections for each pavement type is also similar, resulting in a total of 145.

Table 4.3. JCP pavement distribution by type

Pavement Type	Projects	Cumulative %	Test Sections	Cumulative %
JCP	32	47	73	50
JRCP	36	100	72	100

Figure 4.9 shows the distribution of projects over a total of 14 districts. It is clearly observed that the majority of surveys were performed in the districts of Houston, Dallas, and Beaumont, with 18, 15, and 11 construction projects, respectively. The location of the test sections according to climatic regions is shown in Figure 4.10.

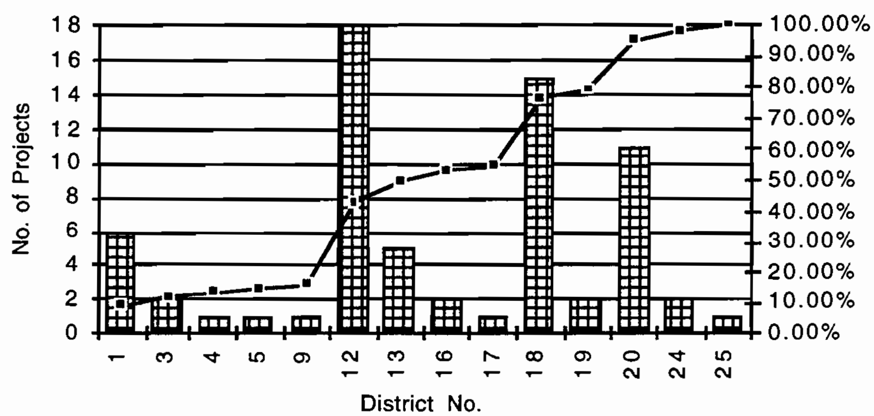


Figure 4.8. JCP project distribution by district

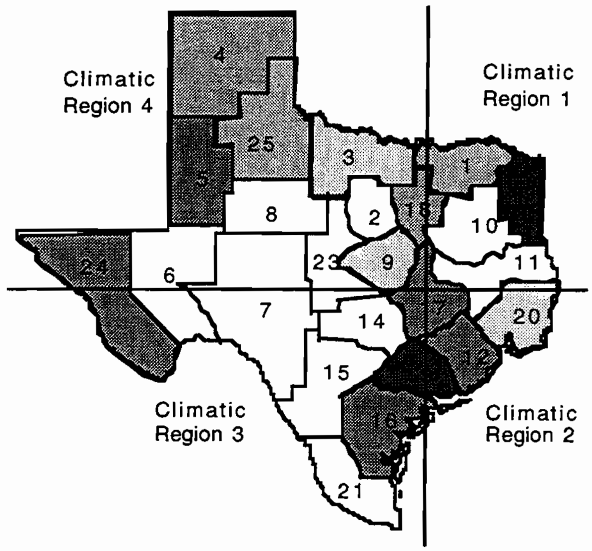


Figure 4.10. Location of JCP projects surveyed

The number of test sections per construction project is summarized in Figure 4.11. This chart shows that more than 80 percent of the projects contain at least two sections, and that a maximum of four test sections were collected per project.

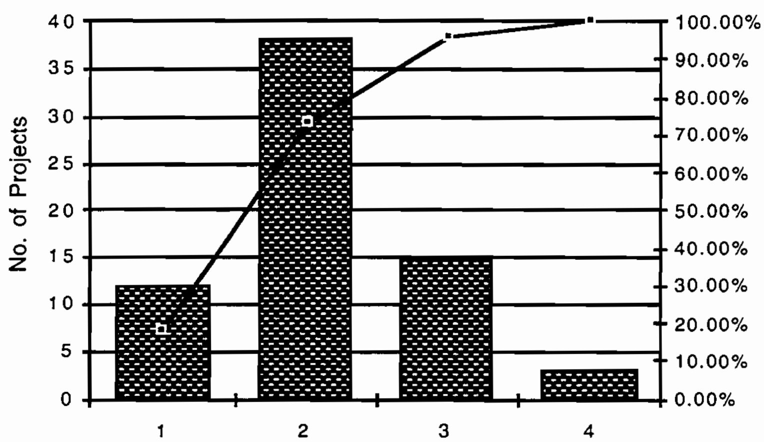


Figure 4.11. Number of JCP test sections per construction project

Figure 4.12 summarizes the highway functional classification distribution of test sections surveyed. It can be observed that the condition survey was mostly performed on test sections for Interstate, U.S., and state highways, since jointed pavement is primarily used on heavy-traffic pavements.

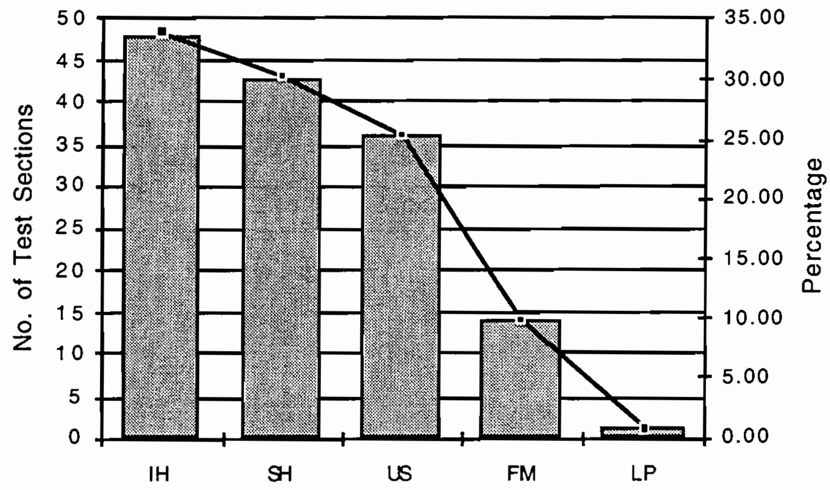


Figure 4.12. JCP highway functional classification distribution

Figure 4.13 shows the distribution of number of lanes per direction for the test sections surveyed. The majority of the test sections were obtained from highways with two lanes per direction, which is consistent with the functional classification distribution shown in the previous figure.

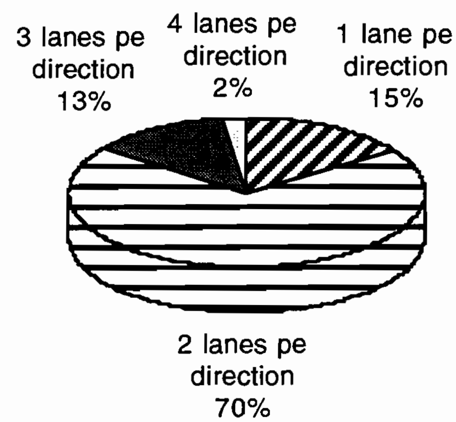


Figure 4.13. Distribution of JCP test section lanes per direction

Figure 4.14 shows the roadbed type distribution in terms of cut, fill, transition, and at-grade sections. This chart reflects the predominantly flat terrain of highways in Texas (i.e., the condition of almost half of the test sections was at-grade).

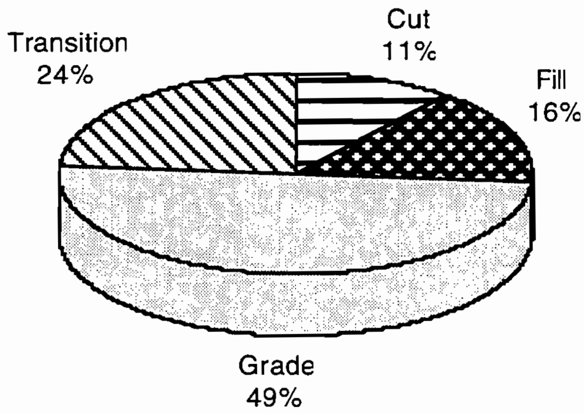


Figure 4.14. JCP roadbed type distribution

Figure 4.15 shows the age distribution of the test sections. Two main conclusions can be derived from this chart: The projects surveyed are on average 25-27 years old, and approximately 17 percent of the projects are less than 15 years old. This indicates that since the midpoint value for the factorial is 15 years, the JCP database is currently unbalanced in terms of age.

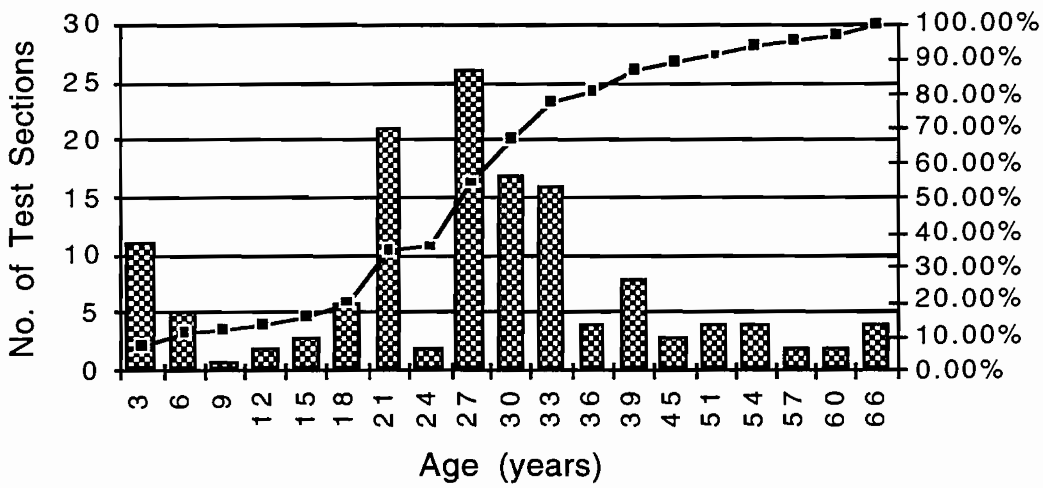


Figure 4.15. JCP age distribution of test sections surveyed

The number of overlaid vs. non-overlaid test sections is presented in Table 4.4. Despite the age of the pavement projects, 55 percent of the sections were still non-overlaid at the time of the survey.

Table 4.4. Overlaid vs. non-overlaid JCP test sections

Status	Frequency	Percent
NON-OVERLAID	81	55.9
OVERLAID	64	44.1

Finally, Table 4.5 shows the coarse aggregate type (CAT) distribution, while Figure 4.16 shows the thickness distribution of the test sections surveyed. Based on the CAT distribution, one-third of the test sections were built with limestone, and almost two-thirds were built with siliceous river gravel aggregates. The thicknesses of test sections ranged from 15.2 to 33 cm (6 to 13 inches), with a significant number of pavements having thicknesses of 25.4 cm (10 inches).

Table 4.5. JCP coarse aggregate type distribution

CAT	Frequency	Percent
LIMESTONE	48	33.8
SILICEOUS	88	62.0
OTHER	6	4.2

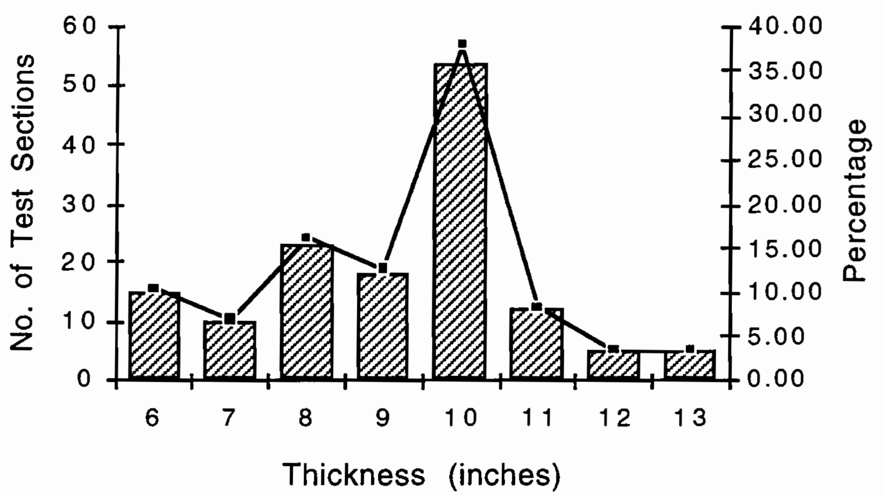


Figure 4.16. JCP slab thickness distribution (1 inch=2.54 cm)

4.2 EXAMPLE ANALYSES

The following examples demonstrate some typical database access and analysis techniques. All programs are written in the SAS language and all were run on The University of Texas' IBM mainframe computer. In most cases, the programs will also run on the PC version of SAS without any changes. The three examples that follow each access the CRCP database. Accessing the JCP database is identical, except that the file names differ as shown in Figures 3.1 and 3.2.

4.2.1 Histogram Generation

All of the histograms (frequency charts) presented in this chapter were produced using simple SAS programs. For example, here is the SAS program that produced the distribution graph for cut / fill position, shown in Figure 4.5. Comments (marked "/*") explain each line of the program.

```
DATA ONLY94;            /* Create a new dataset called ONLY94 */
SET SDS.CONDSURV;       /* Access the condition survey database */
IF YR=94;               /* Keep only the 1994 data */
PROC FREQ;              /* Call program to produce frequency distribution */
TABLES CFP;             /* Produce frequency table for cut / fill position */
```

As shown in the program, accessing a variable from the database requires knowing its name; for the first example, YR (year of the survey) and CFP (cut / fill position) are found in Table 3.1, as well as the SAS database in which they are found (SDS.CONDSURV).

4.2.2 Report Generation

This program produces the computer listing in Appendix A, which is a listing of just the 1994 condition survey data sorted by ID number (CFTR), section number (SECT), and lane direction (DIR).

```
DATA ONLY94;            /* Create a new dataset called ONLY94 */
IF YR=94;               /* Keep only the data for 1994 */
PROC SORT;              /* Call the SAS sorting procedure */
BY CFTR SECT DIR;       /* Sort by id, section number, and travel direction */
TITLE 'The 1993 - 1994 Condition Survey Data'; /* Put a title on each output page */
PROC PRINT;             /* Print the listing neatly, with headers */
PROC CONTENTS;          /* Also print internal file info at the end of the Appendix */
```

4.2.3 Extracting Data for Use in an Excel Spreadsheet

Often it's convenient to use the database information in some other computer language or application. This is an especially common procedure when PC SAS is used, say, for creating a graphic to "paste" into a word processing document (like this report). In this example, a chart is desired showing the frequency distribution of pavement thickness for the 1993-1994 survey sections. Since pavement thickness is stored in the MASTER file, a merge is needed to assemble the necessary variables.

```
DATA THICK;               /* Create a new dataset called THICK */
MERGE                     /*  Merge data from the master and survey files */
SDS.MASTER (IN=OK)
SDS.CONDSURV (IN=OK2);
BY CFTR;                  /* Merge records with same CFTR number */
IF YR=94;                 /* Keep only the data for 1994  */
IF OK AND OK2;            /* Keep only if a match is found in both files */
KEEP CFTR SECT D;         /* Keep only section id and thickness variables */
PROC FREQ;                /* Call the SAS frequency procedure */
TABLES D / OUT=F;         /* Make freq. table for thickness and save in dataset F */
DATA _NULL_;              /* Make a new dataset but don't save it  */
FILE OUT;                 /* Define output file name for the computer */
PUT D COUNT PERCENT;          /* Write thickness, count, and percent to file OUT */;
```

After this program is run, an unformatted file is created that can then be read by any other program or microcomputer application. The results of reading this output into EXCEL and using "Chart Wizard" can be seen in Figure 4.8.

4.2.4 Summary

The three examples given above are intended only as an introduction to using SAS with the database. All of the information needed by the experienced SAS user to access the database is given in Figures 3.1 and 3.2, and in Tables 3.1 through 3.6. The inexperienced user is directed to the basic SAS reference manual (Ref 5).

CHAPTER 5. CONCLUSIONS AND RECOMMENDATIONS

5.1 SUMMARY

The Rigid Pavement Database consists of two parts: the Continuously Reinforced Concrete Pavement (CRCP) database, and the Jointed Concrete Pavement (JCP) database. Updated condition survey data for each were collected between September 1993 and August 1994. Data from the 1993-1994 survey were merged with historical data where available, and stored as a SAS database that can be easily accessed on mainframe or IBM-compatible microcomputers.

5.1.1. CRCP Database

The 1993-1994 CRCP condition survey was, in part, a return to more than 400 survey sections delineated in the 1987 CRCP experiment design. Many of these sections have been monitored since 1974; together, they comprise one of the most detailed, comprehensive, and valuable historical databases for rigid pavement in the nation. Over its 20-year history, the Rigid Pavement Database has been used in many research studies, primarily to assist in the development of performance models for pavement management and design. Two current studies making use of the database, TxDOT projects 1908 and 1244, were outlined in Chapter 2.

More than half of the CRCP sections surveyed in this study are currently more than 20 years old; many are overlaid. The great majority are 20.3 cm (8 inches) thick. Although it is important to continue to monitor some of these sections (the Texas PMIS needs performance data on overlaid rigid pavements), an effort was made during this survey to include a number of newer, thicker pavements that incorporate new designs, new materials, and new construction techniques.

Fortunately, a substantial amount of early age performance data from these newer sections were made available by TxDOT Project 1244, which is an ongoing study to determine the effect of coarse aggregate on long-term PCC performance. Data from these sections have been incorporated into the database, and they will continue to be monitored in future surveys. Some of these pavements are up to 33 cm (13 inches) thick, and incorporate double-matted steel designs and aggregate blends. It is vital that these new designs be monitored over time to determine their effectiveness.

5.1.2. JCP Database

Unlike the CRCP database, the JCP database is relatively new. A complete experimental design for collecting JCP performance data was begun in related TxDOT Project 187.7, and completed and executed in this study. Based on factors likely to affect JCP performance (e.g., thickness, joint spacing, presence of load transfer devices, aggregate type, environmental region, and age), two sampling factorials were set up (one for jointed plain and one for jointed reinforced pavement) and a total of 68 projects were visited, with data collected from 145 test sections across the state.

In order to create a performance history for JCP sections, which has proven so useful in the CRCP database, an effort was made to identify sections within the sampling factorial that were surveyed by the Center for Transportation Research in 1982 and 1984. By revisiting these sections, a 12-year historical record was obtained for many of the sections in the database.

Like the CRCP database, many of the JCP sections are more than 20 years old. However, this reflects the age distribution of existing jointed pavements in the state. A good balance was obtained between overlaid and non-overlaid pavements, as needed by design studies and the Texas PMIS. Most (35 percent) of the jointed pavements surveyed were 25 cm (10 inches) thick, but the remainder were evenly distributed between 15 to 34 cm (6 and 13 inches), giving a good inference space for modeling.

A special effort was made to coordinate with the Texas PMIS, which consisted primarily of selecting and defining JCP distresses that are compatible with the PMIS performance models.

5.1.3 Database Organization

The Rigid Pavement Database is stored in The University of Texas' IBM mainframe computer. The data are also available for IBM personal computers and compatibles. The database is organized in a hierarchical file structure, using the SAS language for access. By using the information given in Chapter 3, users familiar with SAS can extract historical information from the database, for reporting or analysis in SAS or other mainframe or microcomputer programming languages and applications. Three simple examples in Chapter 4 demonstrate some typical database applications for novice users.

5.2 RECOMMENDATIONS

Based on the analysis presented in this report and previous reports under this project, the following recommendations are suggested:

(1) The updated CRCP database can be used immediately by TxDOT and Project 1908 researchers to verify and improve the existing CRCP performance models needed for the Texas PMIS under development.

(2) The new JCP database can be used to create JCP performance models for PMIS, for which no data were previously available.

(3) Both the JCP and CRCP databases can provide data needed to develop performance models for overlaid pavement, which are needed by PMIS and for overlay design.

(4) The Rigid Pavement Database, besides being very valuable in design and research studies, will continue to be vital to the TxDOT PMIS effort for some time.

(5) The database should be used to monitor the effectiveness of the new, thicker PCC designs, such as the 32 cm (13 in.) double-matted steel pavements recently constructed in the Houston District using limestone, river gravel, and blended aggregate.

(6) The database should be maintained using the SAS language for the foreseeable future, since this powerful and versatile software operates on both mainframe and PC platforms, and will be reliably maintained indefinitely.

(7) Within two years, the database should be updated with appropriate condition surveys, deflection measurements, etc., to insure that the full value of the 20-year-old database is maintained.

(8) Data collection for CRCP and jointed pavements should continue according to the factorial design currently being used. An effort should be made for the JCP, and particularly the CRCP database, to identify and collect data from newly constructed pavements, especially those incorporating new designs.

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Appendix A

The 1993-1994 Condition Survey

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
1	1001	1	W	041894	2	0	C	T	Y	1000	5	MP 133.8	MP 133.6	0	0	1	0	0	.	.	.	.	.
2	1001	2	W	041894	2	0	T	C	Y	1000	5	133.5	133.3	0	0	7	0	0	.	.	.	.	.
3	1001	3	W	041894	2	0	G	T	Y	1000	5	132.7	132.5	0	0	1	0	0	.	.	.	.	.
4	1001	4	W	041894	2	0	C	T	Y	1000	5	MP 131.6	MP 131.4	0	0	1	0	0	.	.	.	.	.
5	1001	5	W	041894	2	0	F	C	Y	1000	5	130.4	130.2	0	0	2	0	0	.	.	.	.	.
6	1001	6	W	041894	2	0	F	T	Y	1000	5	NEAR 130	129.8	0	0	0	0	0	.	.	.	.	.
7	1003	1	W	071394	2	0	G	T	X	1000	5	142.2	142.0	0	.	0	.	.	0	0	0	0	.
8	1003	2	W	071394	2	0	C	T	X	1000	5	141.2	141.0	0	.	0	.	.	0	0	0	0	.
9	1003	3	W	071394	2	0	F	T	X	1000	5	140.1	139.9	1	.	3	.	.	1	0	0	1	.
10	1003	4	W	071394	2	0	F	T	X	1000	5	139.8	139.6	2	.	4	.	.	2	0	0	2	.
11	1003	5	W	071394	2	0	T	T	X	1000	5	139.4	139.2	0	.	2	.	.	0	0	0	0	.
12	1003	6	W	071394	2	0	C	T	X	1000	5	138.4	138.2	0	.	2	.	.	0	0	0	0	.
13	1005	1	W	071394	2	0	F	T	X	1000	5	153.0	152.8	0	.	0	.	.	0	0	0	0	.
14	1005	2	W	071394	2	0	F	T	X	1000	5	152.0	151.8	0	.	0	.	.	0	0	0	0	.
15	1005	3	W	071394	2	0	T	T	X	1000	5	151.7	151.5	0	.	0	.	.	0	0	0	0	.
16	1005	4	W	071394	2	0	F	T	X	1000	5	151.3	151.1	0	.	0	.	.	0	0	0	0	.
17	1005	5	W	071394	2	0	G	T	X	1000	5	151.0	150.8	0	.	0	.	.	0	0	0	0	.
18	1005	6	E	071394	2	0	C	T	X	1000	5	149.0	149.2	1	.	0	.	.	0	0	0	0	.
19	1008	1	S	061693	4	0	F	T	Y	1000	5	500' N OF RM216	500' S OF RM216	0	0	1	0	0	.	.	.	.	.
20	1008	2	S	061693	4	0	F	T	Y	1000	5	0.4 MI S OF RM218	1000' S	0	0	18	0	0	.	.	.	.	.
21	1008	3	S	061693	4	0	C	T	Y	1000	5	300' N OF RM220	700' S OF RM220	0	0	16	0	0	.	.	.	.	.
22	1008	4	N	061693	4	0	C	T	Y	1000	5	1.4 MI N OF RM222	1000' N	3	0	0	0	0	.	.	.	.	.
23	1008	5	N	061693	4	0	T	T	Y	1000	5	1.6 MI N OF RM222	1000' N	0	0	0	0	0	.	.	.	.	.
24	1008	6	N	061693	4	0	F	T	Y	1000	5	1.0 MI N OF RM220	10000' NORTH	0	0	0	0	0	.	.	.	.	.
25	1013	1	N	071394	2	0	C	T	N	1000	5	195.3	195.1	0	0	425	.	.	0	0	.	.	.
26	1013	2	N	071394	2	0	T	T	N	1000	5	RM 194.5	RM 194.3	0	0	500	.	.	0	0	.	.	.
27	1013	3	N	071394	2	0	C	T	N	1000	5	194.3	194.1	1	0	478	.	.	0	0	.	.	.
28	1013	4	N	071394	2	0	G	T	N	1000	5	193.4	193.2	0	0	286	.	.	0	0	.	.	.
29	1013	5	N	071394	2	0	F	T	N	1000	5	RM 188.9	RM 189.1	0	0	392	.	.	0	0	.	.	.
30	1013	6	N	071394	2	0	F	T	N	1000	5	191.8	191.6	0	0	413	.	.	0	0	.	.	.
31	1015	1	E	070694	2	0	F	T	N	1000	5	RM 640.5	640.7	0	0	245	.	.	0	0	.	.	.
32	1015	2	E	070694	2	0	C	C	N	1000	5	641.6	641.8	0	0	200	.	.	0	0	.	.	.
33	1015	3	W	070694	2	0	C	T	N	1000	5	642.2	642	0	0	217	.	.	0	0	.	.	.
34	1015	4	W	070694	2	0	T	T	N	1000	5	640.7	640.5	0	0	191	.	.	0	0	.	.	.
35	1015	5	W	070694	2	0	F	T	N	1000	5	640.1	639.9	0	0	193	.	.	0	0	.	.	.
36	2002	1	E	120793	2	0	F	T	N	1000	5	1000' EAST OF MP 415	2000' E OF MP 415	0	0	186	.	.	0	0	.	.	.
37	2002	2	E	120793	2	0	C	T	N	1000	5	416 + 800	416 + 1800	0	0	174	.	.	0	0	.	.	.
38	2002	3	E	120793	2	0	C	T	N	1000	5	417 - 2500'	414 - 1500'	0	0	188	.	.	0	0	.	.	.
39	2002	4	E	120793	2	0	T	T	N	1000	5	MP 417 +2000	MP 417 +3000	0	0	185	.	.	0	0	.	.	.
40	2002	5	E	120793	2	0	F	T	N	1000	5	MP 418 -1000'	MP 418	0	0	206	.	.	0	0	.	.	.
41	2002	6	W	120793	2	0	C	T	N	1000	5	PARKER COUNTY LINE	COUNTY LINE -1000'	0	0	132	.	.	0	0	.	.	.
42	2028	1	N	120993	2	0	T	C	N	1000	5	MP 37 -3000'	MP 37 -2000'	0	1	169	.	.	0	0	.	.	.
43	2028	1	S	120993	2	0	G	C	N	1000	5	2000' S OF MP 37	3000' S OF MP 37	0	10	156	.	.	0	0	.	.	.
44	2028	2	N	120993	2	0	C	T	Y	1000	5	MP 36-800'	MP 36+200'	0	0	0	0	0	.	.	.	.	.
45	2028	2	S	120993	2	0	G	T	Y	1000	5	200' N OF MP 36	800' S OF MP 36	0	0	1	0	0	.	.	.	.	.
46	2028	3	S	120993	2	0	F	T	Y	1000	5	1000' S OF MP 36	2000' S OF MP 36	1	0	1	0	0	.	.	.	.	.
47	2031	1	E	120893	2	0	G	T	Y	1000	5	200 E OF MP 20	1200 E OF MP 20	0	0	0	0	0	.	.	.	.	.
48	2031	1	W	120893	2	0	C	T	Y	1000	5	1200' E OF MP 20	200' E OF MP 20	0	0	0	0	0	.	.	.	.	.
49	2031	2	E	120893	2	0	F	T	Y	1000	5	2000' W OF MP 20	1000' W OF MP 20	0	0	0	0	0	.	.	.	.	.
50	2031	2	W	120893	2	0	F	T	Y	1000	5	1000' W OF MP 20	2000' W OF MP 20	0	0	0	0	0	.	.	.	.	.
51	2031	3	W	120893	2	0	F	T	Y	1000	5	1500' W OF MP 18	2500' W OF MP 18	1	0	0	0	0	.	.	.	.	.
52	2031	4	W	120893	2	0			Y	1000	5	2500' W OF MP 18	3500' W OF MP 18	0	0	0	0	0	.	.	.	.	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
53	2032	1	E	120793	2	0	C	T	Y	1000	5	1000' W OF MP 4	MP 4	0	0	0	0	0	.	.	.	.	.
54	2032	1	W	120793	2	0	C	T	Y	1000	5	MP 4	1000' W OF MP 4	2	0	7	0	0	.	.	.	.	.
55	2032	3	E	120793	2	0	T	T	N	1000	5	1000' WEST OF EXIT 7A	EXIT 7A	0	3	113	.	.	0	0	.	.	.
56	2041	1	N	120993	3	0	F	T	N	1000	5	1500' S OF 464	500' S OF 464	6	0	184	.	.	0	0	.	.	.
57	2041	1	S	120993	3	0	F	T	N	1000	5	500' S OF 464	1500' S OF 464	0	0	193	.	.	0	0	.	.	.
58	2041	2	N	120993	3	0	F	C	N	1000	5	2500' N OF 464	3500' N OF 464	1	0	137	.	.	0	1	.	.	.
59	2044	1	N	120993	3	0	F	C	N	1000	5	MP 460.5	MP 460.3	9	0	192	.	.	0	0	.	.	.
60	2044	1	S	120993	3	0	F	C	N	1000	5	460.3	460.5	1	0	199	.	.	0	0	.	.	.
61	2044	2	N	120993	3	0	F	T	N	1000	5	MP 461.5	MP 461.3	10	0	171	.	.	0	0	.	.	.
62	2044	2	S	120993	3	0	C	T	N	1000	5	MP 461.3	MP 461.5	12	1	215	.	.	0	0	.	.	.
63	2044	3	S	120993	3	0	T	C	N	1000	5	1220' N OF 462	200' N OF 462	2	0	270	.	.	0	0	.	.	.
64	2044	4	S	120993	3	0	G	T	N	1000	5	462 + 500 SOUTH	462 + 1500 SOUTH	2	2	231	.	.	0	0	.	.	.
65	2044	5	S	120993	3	0	T	T	N	1000	5	2000' N OF 464	1000' N OF 464	0	0	191	.	.	0	0	.	.	.
66	2046	1	N	120893	3	0	G	T	Y	1000	5	302.6	302.4	0	0	0	0	0	.	.	.	.	.
67	2046	1	S	120893	3	0	T	T	Y	1000	5	302.4	302.6	2	0	6	0	0	.	.	.	.	.
68	2046	2	N	120893	3	0	G	T	Y	1000	5	302.7	302.5	0	0	0	0	0	.	.	.	.	.
69	2049	1	N	120893	2	0	T	T	N	1000	5	265	264.8	0	0	188	.	.	0	0	.	.	.
70	2049	1	S	120893	2	0	C	T	N	1000	5	MP 264.8	MP 265	0	3	195	.	.	0	0	.	.	.
71	2049	2	S	120893	2	0	F	T	N	1000	5	266.3	266.5	0	1	180	.	.	0	0	.	.	.
72	2049	3	S	120893	3	0	G	T	N	1000	5	MP 267.6	MP 267.8	0	0	190	.	.	0	0	.	.	.
73	2049	4	S	120893	2	0			N	1000	5	268-700'	268+300'	0	0	185	.	.	0	0	.	.	.
74	2050	1	N	120893	2	0	G	T	N	1000	5	272+1200	272+200	0	0	185	.	.	0	0	.	.	.
75	2050	1	S	120893	2	0	G	T	N	1000	5	MP 272+200	MP 272+1200	0	0	165	.	.	0	0	.	.	.
76	2050	2	S	120893	2	0	G	T	N	1000	5	273+1000(S)	273+2000(S)	0	1	165	.	.	0	0	.	.	.
77	2051	1	E	120793	2	0	F	T	N	1000	5	389+2200	389+3200	0	0	200	.	.	0	0	.	.	.
78	2051	1	W	120793	2	0			N	800	4	MP 390 - 2200'	MP 390 - 3200'	0	0	153	.	.	0	0	.	.	.
79	2051	2	E	120793	2	0	T	T	N	1000	5	1200' W OF MP 389	200' W OF MP 389	0	3	181	.	.	0	0	.	.	.
80	2059	1	E	201207	9	3	C	T	N	1000	5	368 - 1300 W	369 - 300 W	0	0	199	.	.	0	0	.	.	.
81	2059	1	W	120793	2	0	G	T	N	1000	5	300' W OF MP 368 (368-300	1300' W OF 368 (368-1300'	0	0	195	.	.	0	0	.	.	.
82	2059	2	E	120793	2	0	T	T	N	1000	5	1300' W OF 365	300' W OF 365	0	0	195	.	.	0	0	.	.	.
83	2059	2	W	120793	2	0	C	T	Y	1000	5	300' W OF 365 (365-300)	1300' W OF 365 (365-1300'	0	0	37	0	1	.	.	.	.	.
84	2060	1	E	120693	4	0	F	T	N	1000	5	MP 445-900'	MP 445+100'	0	0	158	.	.	0	0	.	.	.
85	2060	1	W	120693	4	0	F	T	N	1000	5	445+100	445-900	0	0	138	.	.	0	0	.	.	.
86	2060	2	W	120693	4	0	F	T	N	1000	5	445-2000'	445-3000'	0	0	165	.	.	0	0	.	.	.
87	2075	1	N	120993	3	0	G	T	N	1000	5	900 S OF MP 44	100 N OF MP 44	0	0	136	.	.	0	0	.	.	.
88	2075	1	S	120993	3	0	G	T	N	1000	5	100 N OF 44	900 S OF 44	0	0	155	.	.	0	0	.	.	.
89	2075	2	S	120993	3	0	F	T	N	1000	5	700' S OF MP 43	1700' S OF MP 43	0	0	147	.	.	0	0	.	.	.
90	2075	3	S	120993	3	0	C	C	N	1000	5	700' S OF 41	1700' S OF MP 41	0	0	149	.	.	0	0	.	.	.
91	2075	4	S	120993	3	0	C	T	N	1000	5	2500 S OF MP 41	3500 S OF MP 41	0	0	144	.	.	0	0	.	.	.
92	2098	1	E	120893	3	0	C	T	N	1000	5	MP 12.4	MP 12.6	0	9	196	.	.	0	0	.	.	.
93	2098	1	W	120893	3	0	C	T	N	1000	5	MP 12.6	MP 12.4	0	0	216	.	.	0	0	.	.	.
94	2098	2	E	120893	3	0	T	T	N	1000	5	1000 W OF MP 11	MP 11	0	2	158	.	.	0	0	.	.	.
95	2098	2	W	120893	3	0	G	T	N	1000	5	MP 11	1000 W OF MP 11	0	0	155	.	.	0	0	.	.	.
96	3001	1	N	070194	2	0			N	1000	5	4.15	4.35	0	1	247	.	.	0	0	.	.	.
97	3001	1	S	070194	2	0			N	1000	5	4.35	4.15	0	1	171	.	.	0	0	.	.	.
98	3001	2	N	062994	2	0	T	C	X	1000	5	MP 5	5.2	2	.	224	.	.	0	0	0	44	.
99	3001	2	S	062994	2	0	T	C	X	1000	5	MP 5.2	5.0	0	.	132	.	.	0	0	0	47	.
100	3004	1	N	062994	2	0	F	T	X	1000	5	11.7	11.9	0	.	233	.	.	0	0	0	43	.
101	3004	2	S	062994	2	0	F	C	X	1000	5	MP 13.5	13.3	0	.	230	.	.	0	0	0	45	.
102	3004	3	S	070194	2	0	G	T	N	1000	5	12 + 400'	600'S.OF MP 12	0	0	230	.	.	0	0	.	.	.
103	3004	4	S	070194	2	0	C	T	N	1000	5	11.4	11.2	0	0	152	.	.	0	0	.	.	.
104	3004	5	N	062594	2	0	T	T	X	1000	5	11.3	11.5	0	.	5	.	.	0	0	0	5	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
105	3010	1	S	063094	2	0			N	1000	5	315	315.2	0	0	186	.	.	0	0	.	.	.
106	3010	2	S	063094	2	0	F	T	N	1000	5	315.8	RM 316.0	0	0	189	.	.	0	0	.	.	.
107	3010	3	S	063094	2	0	C	T	N	1000	5	316.9	317.1	0	0	175	.	.	0	0	.	.	.
108	3010	4	S	063094	2	0	F	C	N	1000	5	322.3	322.5	1	3	221	.	.	0	0	.	.	.
109	3010	5	N	063094	2	0	F	T	N	1000	5	316.2	316	0	0	216	.	.	0	0	.	.	.
110	3010	6	N	063094	2	0	C	T	N	1000	5	317.2	317	2	2	160	.	.	0	0	.	.	.
111	3011	1	N	063094	2	0	F	T	N	1000	5	311.9	311.7	1	0	26	.	.	0	0	.	.	.
112	3011	2	N	063094	2	0	F	T	N	1000	5	311.5	311.3	1	0	179	.	.	0	0	.	.	.
113	3011	3	N	063094	2	0	C	T	N	1000	5	311.3	311.1	2	1	210	.	.	0	2	.	.	.
114	3011	4	S	063094	2	0	G	T	N	1000	5	311.9	312.1	0	0	210	.	.	0	0	.	.	.
115	3018	1	S	062994	2	0	F	T	X	1000	5	RM 390.4	390.6	0	.	18	.	.	0	0	0	4	.
116	3018	2	S	062994	2	0	C	T	X	1000	5	392.1	392.3	0	.	4	.	.	0	0	0	2	.
117	3018	3	S	062994	2	0	C		N	1000	5	395.4	395.6	0	0	174	.	.	0	0	.	.	.
118	3018	4	S	062994	2	0	G	T	N	1000	5	395.6	395.8	0	0	171	.	.	0	0	.	.	.
119	3018	5	N	062994	2	0	C	C	N	1000	5	222.4	222.2	0	0	196	.	.	0	0	.	.	.
120	3018	6	N	062994	2	0	F	T	N	1000	5	219.6	219.4	0	0	195	.	.	0	0	.	.	.
121	3022	1	N	063094	2	0	F	T	N	1000	5	302	301.8	0	0	179	.	.	0	0	.	.	.
122	3022	2	N	063094	2	0	F	T	N	1000	5	303.6	303.4	0	0	201	.	.	0	0	.	.	.
123	3022	3	N	063094	2	0	T	T	N	1000	5	RM 303.85	303.65	0	0	193	.	.	0	0	.	.	.
124	3022	4	N	063094	2	0	G	T	N	1000	5	302.6	302.4	0	0	220	.	.	0	0	.	.	.
125	3022	5	N	063094	2	0	F	T	N	1000	5	307.5	307.3	0	0	186	.	.	0	0	.	.	.
126	4002	1	W	051894	2	0	F	T	Y	1000	5	71.7	71.5	2	0	4	0	0	.	.	.	.	.
127	4002	2	W	051894	2	0	G	T	Y	1000	5	71.35	71.15	0	0	0	0	0	.	.	.	.	.
128	4002	2	2	051894	2	0	G	T	Y	1000	5	71.35	71.15	0	0	0	0	0	.	.	.	.	.
129	4005	1	E	051894	2	0	G	T	Y	1000	5	92	92.2	0	0	160	0	0	.	.	.	.	.
130	4005	1	W	051894	2	0	G	T	Y	1000	5	92.2	92	0	0	22	0	0	.	.	.	.	.
131	4005	2	E	051894	2	0	G	T	Y	1000	5	MP 89	89.2	0	0	171	0	0	.	.	.	.	.
132	4005	2	W	051894	2	0	G	T	Y	1000	5	89.2	89	0	0	64	0	0	.	.	.	.	.
133	4005	3	W	051894	2	0	G	T	Y	1000	5	86.2	86	1	0	72	0	0	.	.	.	.	.
134	4009	1	W	051794	3	0	T	T	Y	1000	5	66.8	66.6	1	0	2	0	0	.	.	.	.	.
135	4009	2	W	051794	3	0	G	C	Y	1000	5	MP 66.5	MP 66.3	1	0	0	0	0	.	.	.	.	.
136	4009	3	W	051794	3	0	F	C	Y	1000	5	66-700'(W)	66-1700'(W)	0	0	3	0	0	.	.	.	.	.
137	4009	4	W	051794	3	0	G	T	Y	1000	5	65.2	65	0	0	6	0	0	.	.	.	.	.
138	4009	5	W	051794	2	0	C	C	Y	1000	5	62.7	62.5	0	0	0	0	0	.	.	.	.	.
139	4010	1	W	051894	2	0	G	T	Y	1000	5	82.2	82	0	0	8	0	0	.	.	.	.	.
140	4010	2	W	051894	2	0	G	T	Y	1000	5	79.2	79	0	0	0	0	0	.	.	.	.	.
141	4010	3	W	051894	2	0	F	T	Y	1000	5	78.9	78.7	0	0	0	0	0	.	.	.	.	.
142	4011	1	E	051794	2	0	G	T	Y	1000	5	60	60.2	2	0	6	0	0	.	.	.	.	.
143	4011	1	W	051794	2	0	G	T	Y	1000	5	61.2	60	0	0	0	0	0	.	.	.	.	.
144	4011	2	E	051794	2	0	F	T	Y	1000	5	60.5	60.7	0	0	0	0	0	.	.	.	.	.
145	4011	2	W	051794	2	0	F	T	Y	1000	5	MP 60.7	MP 60.5	0	0	7	0	0	.	.	.	.	.
146	4011	3	W	051794	2	0	G	T	Y	1000	5	56.2	56	0	0	0	0	0	.	.	.	.	.
147	4022	1	E	051894	2	0	G	T	N	1000	5	MP 115	115.2	0	0	389	.	.	0	0	.	.	.
148	4022	1	W	051894	2	0	G	T	N	1000	5	115.2	115	0	0	383	.	.	0	0	.	.	.
149	4022	2	W	051894	2	0	F	C	N	1000	5	MP 114.7	114.5	0	0	398	.	.	0	0	.	.	.
150	4023	1	W	051894	2	0	C	C	Y	1000	5	124.7	124.5	0	0	16	0	0	.	.	.	.	.
151	4023	2	W	051894	2	0	C	C	Y	1000	5	124.5	124.3	0	0	30	0	0	.	.	.	.	.
152	4023	3	W	051894	2	0	G	T	Y	1000	5	123.4	123.2	15	0	31	0	0	.	.	.	.	.
153	4025	1	W	061194	2	0	T	T	Y	1000	5	129.8	129.6	0	0	0	0	0	.	.	.	.	.
154	4025	2	W	061094	2	0	C	C	Y	1000	5	129.4	129.2	0	0	0	0	0	.	.	.	.	.
155	4025	3	W	061094	2	0	G	T	Y	1000	5	128.1	127.9	0	0	0	0	0	.	.	.	.	.
156	4025	4	W	060194	2	0	F	T	Y	1000	5	127.35	127.15	0	0	0	0	0	.	.	.	.	.
157	5005	1	N	051694	2	0	G	T	N	1000	5	43-1000 TO S	43	0	0	361	.	.	0	0	.	.	.
158	5005	1	S	051694	2	0	G	T	N	1000	5	MP 43	MP 43-1000'(S)	0	0	366	.	.	0	0	.	.	.
159	5005	2	N	051694	2	0	G	T	N	1000	5	43-2500 FT (S)	43-1500 FT (S)	0	0	374	.	.	0	0	.	.	.
160	5005	2	S	051694	2	0	G	T	N	1000	5	43-1500'(S)	43-2500'(S)	0	0	362	.	.	0	0	.	.	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
161	5005	2	W	051694	2	0	G	T	N	1000	5	43-2500'(S)	43-1500'(S)	0	0	374	.	.	0	0	.	.	.
162	5007	1	S	051694	2	0	T	C	N	1000	5	38.5	38.3	0	0	159	.	.	0	0	.	.	.
163	5007	2	S	051694	2	0	C	T	N	1000	5	38+300 FT (N)	38-700 FT (S)	0	0	162	.	.	0	0	.	.	.
164	5007	3	S	051694	2	0	G	C	N	1000	5	MP 39	38.8	0	0	196	.	.	0	0	.	.	.
165	5008	1	N	051694	2	0			N	1000	5	MP 57-1000 TO S	MP 57	0	0	436	.	.	0	0	.	.	.
166	5008	1	N	051694	2	0			N	1000	5	57-1000'(S)	57	0	0	436	.	.	0	0	.	.	.
167	5008	1	S	051694	2	0			N	1000	5	MP 57	MP 57-1000'	0	0	326	.	.	0	0	.	.	.
168	5008	2	N	051694	2	0	G	C	N	1000	5	MP 54.8	MP 55	0	0	440	.	.	0	0	.	.	.
169	5008	2	N	051694	2	0	G	C	N	1000	5	54.8	55	0	0	440	.	.	0	0	.	.	.
170	5008	2	S	051694	2	0	G	C	N	1000	5	MP 55	54.8	0	0	294	.	.	0	0	.	.	.
171	5008	2	S	051694	2	0	G	C	N	1000	5	55	54.8	0	0	294	.	.	0	0	.	.	.
172	5009	1	N	051994	2	0	G	T	N	1000	5	60.2	60	0	0	360	.	.	0	0	.	.	.
173	5009	1	S	051994	2	0	G	T	N	1000	5	60	60.2	0	0	365	.	.	0	0	.	.	.
174	5009	2	S	051994	2	0	G	T	N	1000	5	59.2	59	0	0	313	.	.	0	0	.	.	.
175	9001	1	N	041593	4	0	G	T	Y	1000	5	MP 313+0.8 MI	1000' N	0	0	6	0	0	.	.	.	.	.
176	9001	1	N	040593	4	0	G	T	Y	1000	5	MP 313+0.8 MI	1000' N	0	0	6	0	0	.	.	.	.	.
177	9001	2	N	041593	4	0	G	C	Y	1000	5	MP 314-200'	1000' N	0	0	3	0	0	.	.	.	.	.
178	9001	3	N	041593	4	0	C	T	Y	1000	5	MP 314+0.6 MI	1000' N	0	0	1	0	0	.	.	.	.	.
179	9001	4	N	041593	4	0	G	C	Y	1000	5	MP 315+0.1 MI	1000' N	0	0	1	0	0	.	.	.	.	.
180	9001	5	S	041493	4	0	C	C	Y	1000	5	MP 315-0.1 MI	1000' S	0	0	0	0	0	.	.	.	.	.
181	9002	1	N	041593	4	0	G	T	Y	1000	5	MP 316+0.2 MI	1000' N	0	0	2	0	0	.	.	.	.	.
182	9002	2	N	041593	4	0	G	T	Y	1000	5	MP 317-0.1 MI	1000' N	1	0	0	0	0	.	.	.	.	.
183	9002	3	N	041593	4	0	T	C	Y	1000	5	MP 318+0.1 MI	1000' N	0	0	1	0	0	.	.	.	.	.
184	9002	4	S	041493	4	0	C	T	Y	1000	5	MP 319-0.3 MI	1000' S	0	0	5	0	0	.	.	.	.	.
185	9002	5	S	041493	4	0	F	C	Y	1000	5	MP 318-0.3 MI	1000' S	1	0	4	0	0	.	.	.	.	.
186	9002	6	S	041493	4	0	G	T	Y	1000	5	MP 318-0.8 MI	1000' S	0	0	6	0	4	.	.	.	.	.
187	9004	1	S	041593	4	0	C	T	Y	1000	5	MP 333+0.3 MI	1000' S	0	0	28	0	0	.	.	.	.	.
188	9004	2	S	041593	4	0	T	T	Y	1000	5	MP 333+0.1 MI	1000' S	0	0	19	0	0	.	.	.	.	.
189	9004	3	N	041593	4	0	F	T	Y	1000	5	MP 331+0.7 MI	1000' N	0	0	4	0	0	.	.	.	.	.
190	9004	4	N	041593	4	0	G	T	Y	1000	5	MP 332+0.4 MI	1000' N	0	0	25	0	1	.	.	.	.	.
191	9102	1	W	040793	2	0	G	T	Y	1000	5	RM 586	1000' W	0	0	0	0	0	.	.	.	.	.
192	9102	2	E	040793	2	0	G	T	Y	1000	5	RM 584	1000' E	0	0	0	0	0	.	.	.	.	.
193	9102	3	W	040793	2	0	G	T	Y	1000	5	RM 582	1000' W	0	0	0	0	0	.	.	.	.	.
194	12500	1	E	......	2	0			N	200	1	0	250 FT	0	0	42	.	.	0	0	.	.	.
195	12500	1	E	......	2	0	F	T	N	200	1	0	250 FT	0	0	42	.	.	0	0	.	.	.
196	12500	2	E	......	2	0	F	T	N	200	1	250	500 FT	0	0	34	.	.	0	0	.	.	.
197	12500	3	E	......	2	0	F	T	N	200	1	500	750 FT	0	0	40	.	.	0	0	.	.	.
198	12500	4	E	......	2	0	F	T	N	200	1	750	1000 FT	0	0	45	.	.	0	0	.	.	.
199	12500	5	E	......	2	0	F	T	N	200	1	1000	1250 FT	0	0	43	.	.	0	0	.	.	.
200	12500	6	E	......	2	0	F	T	N	200	1	1250	1500 FT	0	0	25	.	.	0	0	.	.	.
201	12500	7	E	......	2	0	F	T	N	200	1	1500	1750 FT	0	0	42	.	.	0	0	.	.	.
202	12500	8	E	......	2	0	F	T	N	200	1	1750	2000 FT	0	0	39	.	.	0	0	.	.	.
203	12500	9	E	......	2	0	F	T	N	200	1	2000	2250 FT	0	0	33	.	.	0	0	.	.	.
204	12501	1	E	......	2	0	G	T	N	200	1	2250	2500 FT	0	0	61	.	.	0	0	.	.	.
205	12501	2	E	......	2	0	G	T	N	200	1	STA 68+70	STA 66+40	0	0	66	.	.	0	0	.	.	.
206	12501	3	E	......	2	0	G	T	N	200	1	STA 66+40	STA 64+10	0	0	40	.	.	0	0	.	.	.
207	12501	4	E	......	2	0	G	T	N	200	1	STA 64+10	STA 61+80	0	0	45	.	.	0	0	.	.	.
208	12502	1	E	......	2	0	G	T	N	200	1	STA 61+80	STA 58+50	0	0	34	.	.	0	0	.	.	.
209	12502	2	E	......	2	0	G	T	N	200	1	STA 57+00	STA 54+70	0	0	30	.	.	0	0	.	.	.
210	12502	3	E	......	2	0	G	T	N	200	1	STA 54+70	STA 52+40	0	0	38	.	.	0	0	.	.	.
211	12502	4	E	......	2	0	G	T	N	200	1	STA 52+40	STA 50+10	0	0	34	.	.	0	0	.	.	.
212	12503	1	S	......	2	0	F	T	N	200	1	STA 50+10	STA 47+80	0	0	30	.	.	0	0	.	.	.
213	12503	2	S	......	2	0	F	T	N	200	1	STA 437+70	STA 440+00	0	0	33	.	.	0	0	.	.	.
214	12503	3	S	......	2	0	F	T	N	200	1	STA 440+00	STA 442+30	0	0	21	.	.	0	0	.	.	.
215	12503	4	S	......	2	0	F	T	N	200	1	STA 442+30	STA 444+60	0	0	32	.	.	0	0	.	.	.
216	12504	1	S	......	2	0	F	T	N	200	1	STA 448+90	STA 451+20	0	0	20	.	.	0	0	.	.	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	NM	FROM	TO	ACP	PCP	NCRK	BF	NF	MPO	SPO	X101	X111	FAIL
217	12504	2	S	......	2	0	F	T	N	200	1	STA 451+20	STA 453+50	0	0	18	.	.	0	0	.	.	.
218	12504	3	S	......	2	0	F	T	N	200	1	STA 453+50	STA 455+80	0	0	19	.	.	0	0	.	.	.
219	12504	4	S	......	2	0	F	T	N	200	1	STA 455+80	STA 457+60	0	0	29	.	.	0	0	.	.	.
220	12505	1	E	......	2	0	G	T	N	200	1	SOP+0	SOP+250	0	0	0	.	.	0	0	.	.	.
221	12505	2	E	......	2	0	G	T	N	200	1	SOP+250	SOP+500	0	0	20	.	.	0	0	.	.	.
222	12505	3	E	......	2	0	G	T	N	200	1	SOP+500	SOP+750	0	0	24	.	.	0	0	.	.	.
223	12505	4	E	......	2	0	G	T	N	200	1	SOP+750	SOP+1000	0	0	29	.	.	0	0	.	.	.
224	12506	1	E	......	2	0	G	T	N	200	1	SOP+0	SOP+250	0	0	25	.	.	0	0	.	.	.
225	12506	2	E	......	2	0	G	T	N	200	1	SOP+250	SOP+500	0	0	21	.	.	0	0	.	.	.
226	12506	3	E	......	2	0	G	T	N	200	1	SOP+500	SOP+750	0	0	33	.	.	0	0	.	.	.
227	12506	4	E	......	.	.	G	T	N	200	1	SOP+750	SOP+1000	0	0	31	.	.	0	0	.	.	.
228	12507	1	N	......	2	0	G	C	N	200	1	STA 1212+25	STA 1214+55	0	0	44	.	.	0	0	.	.	.
229	12507	2	N	......	2	0	G	C	N	200	1	STA 1214+55	STA 1216+85	0	0	50	.	.	0	0	.	.	.
230	12507	3	N	......	2	0	G	C	N	200	1	STA 1216+85	STA 1219+55	0	0	41	.	.	0	0	.	.	.
231	12507	4	N	......	2	0	G	C	N	200	1	STA 1219+55	STA 1221+45	0	0	49	.	.	0	0	.	.	.
232	12508	1	N	......	2	0	G	C	N	200	1	STA 1200+75	STA 1203+05	0	0	41	.	.	0	0	.	.	.
233	12508	2	N	......	2	0	G	C	N	200	1	STA 1203+05	STA 1205+35	0	0	39	.	.	0	0	.	.	.
234	12508	3	N	......	2	0	G	C	N	200	1	STA 1205+35	STA 1207+65	0	0	40	.	.	0	0	.	.	.
235	12508	4	N	......	2	0	G	C	N	200	1	STA 1207+65	STA 1212+25	0	0	39	.	.	0	0	.	.	.
236	12901	1	E	020594	3	0	G	T	N	800	4	0.3 MI E OF HARDY TOLL RD	0.5 MI E OF HARDY TOLL RD	0	15	168	.	.	0	0	.	.	.
237	12901	2	E	020594	3	0	G	T	N	1000	5	0.5 MI E OF HARDY TOLL RO	0.7 MI E OF HARDY TOLL RO	0	40	208	.	.	0	0	.	.	.
238	12901	3	W	020594	3	0	G	T	N	1000	5	0.3 MI W OF ALDINE WESTFI	0.5 MI W OF ALDINE	0	20	229	.	.	0	0	.	.	.
239	12901	4	W	020594	3	0	G	T	N	1000	5	0.5 MI W OF ALDINE WEST.	0.7 MI W OF ALDINE WEST.	0	49	192	.	.	3	0	.	.	.
240	12902	1	W	020594	3	0	G	T	N	1000	5	1.4 MI E OF IH-45	1.6 MI E OF IH-45	0	1	205	.	.	0	0	.	.	.
241	12902	2	W	020594	3	0	G	T	N	1000	5	0.2 MI W OF HARDY TOLL RO	0.4 MI W OF HARDY TOLL RO	0	0	188	.	.	1	0	.	.	.
242	12906	1	N	020594	3	0	G	T	N	1000	5	0.1 MI N OF HAZEL HORST (	0.3 MI N OF HAZEL HORST	0	0	146	.	.	0	0	.	.	.
243	12907	1	N	020594	3	0	G	T	N	1000	5	0.3 MI S OF HAZEL HORST	0.1 MI S OF HAZEL HORST	0	0	122	.	.	0	0	.	.	.
244	13001	1	W	020793	2	0	G	T	Y	1000	5	MP 699.4	1000' W	0	0	4	0	0	.	.	.	.	.
245	13001	1	W	021793	2	0	G	T	Y	400	2			0	0	2	0	2	.	.	.	.	.
246	13001	2	W	021793	2	0	C		Y	1000	5	MP 697.7	MP 697.5	0	0	0	0	0	.	.	.	.	.
247	13002	3	W	021893	2	0	G	T	Y	1000	5	MP 695+263'	1000' W	0	0	4	0	0	.	.	.	.	.
248	13002	4	W	021893	2	0	G	T	Y	1000	5	MP 693+300'	1000' W	0	0	12	0	1	.	.	.	.	.
249	13002	5	W	021893	2	0	C	T	Y	1000	5	MP 692+993'	1000' W	1	0	16	0	3	.	.	.	.	.
250	13007	1	E	021793	2	0	C	T	Y	1000	5	MP 685	1000' E	0	0	0	0	0	.	.	.	.	.
251	13007	2	E	021793	2	0	C	T	Y	1000	5	MP 686	1000' E	0	0	2	0	0	.	.	.	.	.
252	13007	3	E	021793	2	0	T	T	Y	1000	5	MP 686+0.7 MI	1000' E	0	0	1	0	0	.	.	.	.	.
253	13007	4	E	021793	2	0	F	T	Y	1000	5	MP 688+0.25 MI	1000' E	0	0	1	0	0	.	.	.	.	.
254	13007	5	E	021793	2	0	F	T	Y	1000	5	MP 688+0.85	1000' E	0	0	0	0	0	.	.	.	.	.
255	13009	1	N	040193	4	0	T	C	N	1000	5	RM 586+1.15 MI	1000' N	0	9	323	.	.	8	0	.	.	.
256	13009	2	S	033193	4	0	T	C	Y	1000	5	RM 586+0.95 MI	1000' S	2	0	12	0	0	.	.	.	.	.
257	13013	2	W	022593	2	0	C	T	Y	1000	5	MP 667+1000'	1000' W @ MP 667	0	0	0	0	0	.	.	.	.	.
258	13013	3	W	022593	2	0	F	T	Y	1000	5	MP 666.55	1000' W	0	0	0	0	0	.	.	.	.	.
259	13013	4	W	022593	2	0	F	T	Y	1000	5	MP 666.75	1000' W	0	0	1	0	0	.	.	.	.	.
260	13013	5	W	022593	2	0			Y	1000	5	MP 663.45	1000' W	0	0	1	0	0	.	.	.	.	.
261	13013	5	W	022593	2	0			Y	1000	5	MP 663.45	1000' WEST	0	0	1	0	0	.	.	.	.	.
262	13015	1	W	022493	2	0	C	T	N	1000	5	MP 661.0	1000' W	0	1	222	.	.	0	0	.	.	.
263	13015	2	W	022493	2	0	F	C	N	1000	5	MP 659+0.75	1000' W	2	4	205	.	.	0	0	.	.	.
264	13015	3	W	022493	2	0	C	T	N	1000	5	MP 659+0.15	1000' W	0	0	227	.	.	0	0	.	.	.
265	13015	4	E	022593	2	0	F	T	N	1000	5	MP 659.6	1000' EAST	0	0	195	.	.	0	0	.	.	.
266	13015	5	W	022493	2	0	F	T	N	1000	5	1330' E OF MP 661	330' E OF MP 661	0	1	211	.	.	2	0	.	.	.
267	13019	1	N	033193	4	0	G	T	Y	1000	5	RM 620.6	1000' N	0	0	15	0	0	.	.	.	.	.
268	13019	2	N	033193	4	0	G	C	Y	1000	5	RM 618	1000' N	0	0	0	0	0	.	.	.	.	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
269	13019	4	N	033193	4	0	G	T	Y	1000	5	RM 620+1.25 MI	1000' N	0	0	14	0	0	.	.	.	.	.
270	13020	1	W	092493	2	0	F	T	N	1000	5	644.85	1000'	0	6	151	.	.	0	0	.	.	.
271	13020	2	W	092493	2	0	C		N	1000	5	644.26	1000' (363' FROM MP 644)	1	0	118	.	.	0	0	.	.	.
272	13020	3	E	092493	2	0	T	T	N	1000	5	643.84	1000' (171' FROM MP 644)	0	0	152	.	.	0	0	.	.	.
273	13021	1	W	021893	2	0	G	T	N	1000	5	MP 652	1000' W	0	1	121	.	.	0	0	.	.	.
274	13021	1	W	021893	2	0			N	1000	5			0	1	121	.	.	0	0	.	.	.
275	13021	2	W	021893	2	0	T	C	N	1000	5	MP 652.45	1000' W	0	0	134	.	.	0	0	.	.	.
276	13021	3	E	021893	2	0	F	T	N	1000	5	MP 650+0.3 MI	1000' E	0	0	139	.	.	0	0	.	.	.
277	13021	4	E	021893	2	0	C	T	N	1000	5	MP 651+0.1 MI	1000' E	0	2	126	.	.	0	0	.	.	.
278	13021	4	E	021893	2	0			N	1000	5			0	2	126	.	.	0	0	.	.	.
279	13021	5	W	021893	2	0	C	T	Y	1000	5	MP 648.35	1000' W	0	0	0	0	0	.	.	.	.	.
280	13021	5	W	021893	2	0	C	T	Y	1000	5	MP 648.35	1000'W	0	0	0	0	0	.	.	.	.	.
281	13023	1	N	092493	2	0	G	T	Y	1000	5	584.45 (RM586-1.55 MI)	(1000') 584.3	2	0	10	0	0	.	.	.	.	.
282	13023	2	N	092493	2	0	F	C	Y	1000	5	584.15	1000' N --- 583.9	0	0	0	0	0	.	.	.	.	.
283	13023	3	N	023093	4	0	G	T	Y	1000	5	RM 583.75	1000' N	0	0	1	0	0	.	.	.	.	.
284	13023	4	N	033093	4	0	G	T	Y	1000	5	RM 582	1000' N	0	0	0	0	0	.	.	.	.	.
285	13024	1	W	033093	4	0	G	C	N	1000	5	RM 578.7	1000' N	0	4	425	.	.	6	2	.	.	.
286	13024	2	N	033093	4	0	G	C	N	1000	5	RM 578	1000' N	0	1	418	.	.	25	0	.	.	.
287	13028	1	N	033093	4	0	G	T	N	1000	5	RM 572	1000' N	0	0	245	.	.	0	0	.	.	.
288	13028	3		033093	4	0	F	C	N	1000	5	RM 570.6	1000' S	0	5	378	.	.	0	0	.	.	.
289	13028	4	S	033093	4	0	G	T	N	1000	5	RM 572	1000' S	0	0	272	.	.	0	0	.	.	.
290	13029	1	N	033193	4	0	F	C	Y	1000	5	RM 602.15	RM 602.0	0	0	0	0	0	.	.	.	.	.
291	13029	2	N	033193	4	0	G	T	Y	1000	5	RM 600	1000' N	0	0	28	0	2	.	.	.	.	.
292	13029	3	S	033193	4	0	G	T	Y	1000	5	RM 600	1000' S	0	0	2	0	0	.	.	.	.	.
293	13030	1	S	033193	4	0	F	C	Y	1000	5	RM 602.8	1000' S	0	0	0	0	0	.	.	.	.	.
294	13030	2	S	033193	4	0	G	T	Y	1000	5	RM 603.4	1000' S	0	0	0	0	0	.	.	.	.	.
295	13031	1	N	033193	4	0	G	T	Y	1000	5	RM 606.8	1000'	0	0	17	0	0	.	.	.	.	.
296	13031	2	N	092493	2	0	F	T	Y	1000	5	606.15	606	0	0	3	0	0	.	.	.	.	.
297	13032	1	N	033193	4	0	G	C	Y	1000	5	RM 610+1.5 MI	1000' N	0	0	0	0	0	.	.	.	.	.
298	13032	2	N	023193	4	0	G	C	Y	1000	5	RM 608+1.6 MI	1000' N	0	0	0	0	0	.	.	.	.	.
299	13032	3	N	033193	4	0	G	C	Y	1000	5	RM608.5	1000' N	0	0	0	0	0	.	.	.	.	.
300	13032	4	S	033193	4	0	F	T	Y	1000	5	RM 608+0.6 MI	1000' S	0	0	5	0	1	.	.	.	.	.
301	13101	1	N	031393	5	0	G	C	N	1000	5	RM 558+0.5	1000' N	0	0	0	.	.	0	0	.	.	.
302	13103	1	S	030393	2	0	G	T	Y	1000	5	RM 528+1.4 MI	1000' S	0	0	24	0	0	.	.	.	.	.
303	13103	2	N	030393	2	0	G	T	Y	1000	5	1000' S OF RM 530	RM 530	2	0	107	0	0	.	.	.	.	.
304	13104	2	S	030493	2	0	G	T	Y	1000	5	RM 550	1000' S	0	0	42	0	0	.	.	.	.	.
305	15015	4	E	022593	2	0	F	T	N	1000	5	MP 659.6	1000' E	0	0	195	.	.	0	0	.	.	.
306	15032	1	N	101593	3	0	F	C	Y	1000	5	143	143+1000'	5	0	0	0	0	.	.	.	.	.
307	15032	2	N	101593	3	0	G	C	Y	1000	5	143.8	143.8+1000'	0	0	0	0	0	.	.	.	.	.
308	15033	1	N	101593	3	0	F	C	Y	1000	5	MP 142	142+900'	0	0	13	0	0	.	.	.	.	.
309	15036	1	N	101593	3	0	F	C	Y	1000	5	MP 145	MP 145+1000'	0	0	8	0	0	.	.	.	.	.
310	15036	2	N	101593	3	0	F	T	Y	1000	5	147.6	+ 1000'	0	0	6	0	0	.	.	.	.	.
311	15036	3	N	101593	3	0	F	C	Y	1000	5	147.4	147.4+1000'	0	0	4	0	0	.	.	.	.	.
312	15901	1	N	101593	.	0	T	T	N	800	4	MP 168-800'	MP 168	0	0	112	.	.	0	0	.	.	.
313	15902	1	N	101593	3	0	T	T	Y	1000	5	MP 166	166+1000'	0	0	19	0	0	.	.	.	.	.
314	15902	2	N	101593	3	0	T	T	Y	1000	5	EXIT 165	EXIT 165+1000'	0	0	0	0	0	.	.	.	.	.
315	17002	1	N	062393	4	0	G	T	Y	1000	5	MP 124	1000' N	0	0	180	0	0	.	.	.	.	.
316	17002	2	S	062393	4	0	G	T	Y	1000	5	MP 132-0.1 MI	1000' S	0	0	192	0	0	.	.	.	.	.
317	17002	3	S	062393	4	0	F	T	Y	1000	5	MP 130+0.6 MI FOUND OLD P	1000' S	0	0	238	0	0	.	.	.	.	.
318	17002	4	S	062393	4	0	T	T	Y	1000	5	MP 130+165' FOUND OLD PAI	1000' S	0	0	156	0	0	.	.	.	.	.
319	17002	5	S	062393	4	0	F	T	Y	1000	5	MP 130-0.5 MI FOUND OLD P	1000' S	0	0	121	0	0	.	.	.	.	.
320	17002	6	S	062393	4	0	C	T	Y	1000	5	MP 129-0.5 MI FOUND OLD P		0	0	138	0	0	.	.	.	.	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
321	17002	7	S	062393	4	0	C	T	Y	1000	5	MP 128-0.7 MI OLD PAINT F	1000' S	0	0	113	0	0	.	.	.	.	.
322	17003	1	N	062393	4	0	G	T	Y	1000	5	MP 152+0.8 MI	1000' N (300' S OF MP 153	0	0	0	0	0	.	.	.	.	.
323	17003	2	N	062393	4	0	C	T	Y	1000	5	MP 153+0.5 MI	1000' N	0	0	0	0	0	.	.	.	.	.
324	17003	3	N	062393	4	0	F	T	Y	1000	5	MP 153+0.9 MI (684' S OF	1000' N	0	0	0	0	0	.	.	.	.	.
325	17003	4	N	062393	4	0	C	T	Y	1000	5	MP 157+0.2 MI	1000' N	0	0	0	0	0	.	.	.	.	.
326	17003	5	N	062393	4	0	T	T	Y	1000	5	MP 157+0.5 MI	1000' N	0	0	0	0	0	.	.	.	.	.
327	17003	6	N	062393	4	0	F	T	Y	1000	5	MP 158+50'	1000' N	0	0	0	0	0	.	.	.	.	.
328	17004	1	S	020494	2	0	G	T	Y	1000	5	MP 150-0.2	MP 149.6	0	1	1	0	0	.	.	.	.	.
329	17004	2	S	020494	2	0	C	T	Y	1000	5	MP 150	MP 149.8	0	0	0	0	0	.	.	.	.	.
330	17004	3	S	020494	2	0	T	T	Y	1000	5	MP 149.7	MP 149.5	0	0	0	0	0	.	.	.	.	.
331	17004	4	S	020494	2	0	C	T	Y	1000	5	MP 149.2	MP 149	0	10	0	0	0	.	.	.	.	.
332	17004	5	S	020494	2	0	F	C	Y	1000	5	MP 148.9	MP 148.7	0	0	1	0	0	.	.	.	.	.
333	17004	6	S	020494	2	0	F	T	Y	1000	5	MP 147.5	MP 147.3	0	0	0	0	0	.	.	.	.	.
334	17007	1	S	062393	4	0	G	T	N	1000	5	MP 173-200'	1000' S	0	0	317	.	.	0	0	.	.	.
335	17007	2	S	062393	4	0	C	T	N	1000	5	MP 172+1000'	MP 172	0	0	317	.	.	0	0	.	.	.
336	17007	3	S	062393	4	0	F	T	N	1000	5	MP 172-0.1 MI	1000' S	0	0	330	.	.	0	0	.	.	.
337	17011	1	S	062493	4	0	T	C	N	1000	5	RM 676+1.7 MI ; MOVED DUE	1000'	3	1	187	.	.	3	6	.	.	.
338	17011	2	S	062493	4	0	G	T	N	1000	5	RM 586+0.6 MI	1000' S	4	2	145	.	.	3	2	.	.	.
339	17011	3	S	062493	4	0	T	T	N	1000	5	RM 588+0.6 MI	1000' S	5	1	275	.	.	2	0	.	.	.
340	17011	4	S	062493	4	0	C	T	N	1000	5	RM 588+0.9 MI	1000' S	0	1	213	.	.	1	0	.	.	.
341	17011	5	S	062493	4	0			N	1000	5	RM 592+0.6 MI	1000' S	0	0	311	.	.	0	0	.	.	.
342	17011	6	N	062493	4	0	F	T	N	1000	5	RM 594-1.2 MI	1000' N	1	0	186	.	.	0	0	.	.	.
343	18054	1	E	120693	3	0	C	T	Y	1000	5	MP 50-500'	MP 50+500'	0	0	0	0	0	.	.	.	.	.
344	18054	1	W	120693	3	0	T	T	Y	1000	5	MP 50+500'	MP 50-500'	0	0	11	0	0	.	.	.	.	.
345	18054	2	W	120693	3	0	F	T	Y	1000	5	49.2	49.2+1000'	0	0	5	0	0	.	.	.	.	.
346	18062	1	E	120693	3	0	C	C	Y	1000	5	200' E LAMAR BLVD	350' E OF MP 46	0	0	151	0	0	.	.	.	.	.
347	18062	1	W	120693	3	0	C	C	Y	1000	5	MP 46 + 350'	MP 46 - 650'	0	0	138	0	0	.	.	.	.	.
348	18066	1	N	120693	3	0	C	T	N	1000	5	MP 422	MP 422 + 1000'	0	0	152	.	.	0	1	.	.	.
349	18066	1	S	120693	3	0	F	T	N	1000	5	MP 422+1000'	MP 422	0	0	192	.	.	0	0	.	.	.
350	18066	2	S	120693	3	0	C	T	N	1000	5	EXIT 421B-1100'	EXIT 421B-100'	0	0	186	.	.	1	0	.	.	.
351	18071	1	N	100793	2	0	T	T	N	800	4	MP 70.5	MP 70.7	0	1	181	.	.	0	0	.	.	.
352	18071	1	S	100793	2	0	G	C	N	1000	5	MP 70.7	MP 70.5	0	0	241	.	.	0	0	.	.	.
353	18071	2	N	100793	2	0	C	T	N	1000	5	MP 69.6	MP 69.8	0	0	122	.	.	0	0	.	.	.
354	18071	2	S	100793	2	0	C	T	N	1000	5	MP 69.8	MP 69.6	0	0	128	.	.	0	0	.	.	.
355	18071	3	N	100793	2	0	T	T	N	1000	5	MP 70.3	MP 70.5	0	0	125	.	.	0	0	.	.	.
356	18071	4	N	100793	2	0	T	T	N	1000	5	MP 70.8	MP 71.0	0	0	250	.	.	0	0	.	.	.
357	18072	1	E	100693	4	0	F	T	N	1000	5	MP 26.5+1000'	MP 26.5	0	0	185	.	.	0	0	.	.	.
358	18072	1	W	100693	4	0	F	T	N	1000	5	MP 25.5	+ 1000'	0	0	212	.	.	0	0	.	.	.
359	18072	2	E	100693	4	0	G	T	N	1000	5	MP 25.6	MP 25.6-1000'	0	0	241	.	.	0	0	.	.	.
360	18072	3	E	100693	4	0	C	T	Y	1000	5	MP 25-300'	MP 25-1300'	0	0	204	0	0	.	.	.	.	.
361	18072	4	E	100693	4	0	F	T	N	1000	5	MP 24.6	MP 24.4	0	0	215	.	.	0	0	.	.	.
362	18073	1	E	100693	4	0	T	C	N	1000	5	500' N OF PRESTON BRIDGE	1500' W OF PRESTON BRIDGE	0	0	153	.	.	0	0	.	.	.
363	18073	1	W	100693	4	0	T	C	N	1000	5	500' W OF PRESTON	1500' N OF PRESTON	0	0	145	.	.	0	0	.	.	.
364	18073	2	W	100693	4	0	T	T	N	1000	5	800' W OF TOLLWAY	1800' OF TOLLWAY	0	0	150	.	.	0	0	.	.	.
365	18073	3	W	100693	4	0	C	T	N	1000	5	MP 24.2	MP 24.2+1000'	0	0	215	.	.	0	0	.	.	.
366	18079	1	E	100793	4	0	F	T	N	1000	5	300' W OF MP 14	1000' E	0	0	282	.	.	0	0	.	.	.
367	18079	1	W	100793	4	0	F	C	N	1000	5	300' W OF JUPITER RD	1000' W	0	0	215	.	.	0	0	.	.	.
368	18079	2	E	100693	3	0	C	T	N	1000	5	MP 31.1	MP 31.3	0	0	102	.	.	0	0	.	.	.
369	18079	2	W	100693	3	0	C	T	N	1000	5	MP 31+300'	MP 31+1300'	0	0	57	.	.	0	0	.	.	.
370	18079	3	E	100693	3	0	T	T	N	800	4	MP 31.7-1000'	MP 31.7	0	0	136	.	.	0	0	.	.	.
371	18079	3	W	100693	3	0	G	T	N	1000	5	MP 31.7	31.7+1000'	0	0	139	.	.	0	0	.	.	.
372	18079	4	E	100793	4	0	F	C	N	1000	5	200' E OF CITY LIMITS(SIG	1000' E	0	0	262	.	.	0	0	.	.	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
373	18080	1	N	100793	2	0	T	T	N	1000	5	MP 81.5	MP 81.5+1000'	0	0	167	.	.	0	0	.	.	.
374	18080	1	S	100793	2	0	C	T	N	1000	5	MP 81.5	MP 81.3	0	0	228	.	.	0	0	.	.	.
375	18080	2	S	100793	2	0	G	T	N	1000	5	MP 81.2	MP 81.2+1000'	0	0	228	.	.	0	0	.	.	.
376	18080	3	S	100793	2	0	F	T	N	1000	5	MP 74-1000'	MP 74	0	0	257	.	.	0	0	.	.	.
377	18080	4	S	100793	2	0	C	T	N	1000	5	MP 73.4	MP 73.4-1000'	0	0	241	.	.	0	0	.	.	.
378	18080	5	S	100793	2	0	F	T	N	1000	5	MP 71+1000' N	MP 71	0	0	243	.	.	0	0	.	.	.
379	18086	1	N	100793	2	0	F	T	N	1000	5	MP 84+400'	MP 84.3+1400'	0	0	239	.	.	0	0	.	.	.
380	18086	1	S	100793	2	0	F	T	N	1000	5	MP 84+1400'	MP 84+400'	1	1	226	.	.	0	0	.	.	.
381	18086	2	N	100793	2	0	F	C	N	1000	5	MP 85+400'	MP 85+1400'	2	0	184	.	.	0	0	.	.	.
382	18088	1	N	100693	4	0	F	T	Y	1000	5	MP 4+500'	MP 4-500'	0	0	5	0	0	.	.	.	.	.
383	18088	1	S	100693	4	0	T	T	Y	1000	5	MP 4+500'	MP 4-500'	0	0	2	0	0	.	.	.	.	.
384	18088	2	S	100693	4	0	C	T	Y	1000	5	MP 7+400'	MP 7-600'	0	0	0	0	0	.	.	.	.	.
385	18088	3	S	100693	4	0	C	C	Y	1000	5	MP 3+500'	MP 3+1500'	0	0	0	0	0	.	.	.	.	.
386	18093	1	S	100693	3	0	F	C	N	1000	5	3000' N OF MP 283	2000' N OF MP 283	0	0	172	.	.	0	0	.	.	.
387	18106	1	E	093093	4	0	T	T	N	1000	5	MP 467-1200'	1000' EAST	0	0	152	.	.	0	0	.	.	.
388	18106	1	W	093093	4	0	T	C	N	1000	5	200' W OF 467	1000' W	0	0	161	.	.	1	0	.	.	.
389	18106	2	E	093093	4	0	C	T	N	1000	5	MP 466	1000' EAST	0	0	177	.	.	0	0	.	.	.
390	18106	2	W	093093	4	0	G	T	N	1000	5	1000' E OF 466	466	0	0	135	.	.	0	0	.	.	.
391	18106	3	W	093093	4	0	F	T	N	1000	5	MP 465+1700'	1000' WEST	0	0	203	.	.	0	0	.	.	.
392	18107	1	E	120693	3	0	C	T	Y	1000	5	GRAND PRAIRIE EXIT (EB)	GRAND PRAIRIE EXIT + 1000	0	0	117	0	0	.	.	.	.	.
393	18107	1	W	120693	3	0	F	T	N	1000	5	MP 458 + 1500'	MP 458 + 2500'	0	0	155	.	.	0	0	.	.	.
394	18107	2	E	120693	3	0	C	T	Y	1000	5	MP 457	MP 457 + 1000'	0	0	1	0	0	.	.	.	.	.
395	18107	2	W	120693	3	0	C	T	Y	1000	5	457-1000'	MP 457	0	0	2	0	1	.	.	.	.	.
396	18107	3	W	120693	3	0	F	T	N	1000	5	.5 MILE TARRANT CO. - 100	.5 MILE TARRANT CO.	0	0	135	.	.	0	0	.	.	.
397	19001	1	W	092993	2	0	C	C	Y	1000	5	MP 634-0.2 MI	1000' W	0	0	15	0	0	.	.	.	.	.
398	19001	2	W	092993	2	0	C	T	Y	1000	5	MP 634-0.8 MI	1000' W	0	0	33	0	1	.	.	.	.	.
399	19001	3	W	092993	2	0	C	T	Y	1000	5	631.9	631.7	3	0	9	0	1	.	.	.	.	.
400	19001	4	W	092993	2	0	F	T	Y	1000	5	631.2	631	1	0	8	0	0	.	.	.	.	.
401	19001	5	W	092993	2	0	T	T	Y	1000	5	630.8	630.6	0	0	41	0	2	.	.	.	.	.
402	19001	6	W	092993	2	0	F	T	Y	1000	5	630.6	630.4	0	0	19	0	2	.	.	.	.	.
403	19006	1	W	092993	2	0	F	T	Y	1000	5	MP 621-0.5 MI	100' WEST	0	0	53	0	7	.	.	.	.	.
404	19006	2	W	092993	2	0	T	T	Y	1000	5	MP 620	1000' W	0	0	25	0	0	.	.	.	.	.
405	19006	3	W	092993	2	0	G	T	Y	1000	5	619.7	619.5	0	0	11	0	0	.	.	.	.	.
406	19006	4	W	092993	2	0	F	T	Y	1000	5	619.5	619.3	0	0	26	0	1	.	.	.	.	.
407	19006	5	W	092993	2	0	F	T	Y	1000	5	619.1	618.9	0	0	17	0	0	.	.	.	.	.
408	19006	6	W	092993	2	0	C	T	Y	1000	5	618.8	618.6	2	0	10	0	1	.	.	.	.	.
409	19010	1	W	081693	4	0	C	T	Y	1000	5	MP 211+0.1 MI	1000' W	0	0	3	0	1	.	.	.	.	.
410	19010	2	W	081693	4	0	T		Y	1000	5	MP 210.9	1000' W	0	0	0	0	0	.	.	.	.	.
411	19010	3	W	081793	4	0	G	C	Y	1000	5	MP 210+0.5 MI	1000' W	1	0	0	0	1	.	.	.	.	.
412	19010	4	W	081793	4	0	F	T	Y	1000	5	MP 208+0.9 MI	1000' W	0	0	0	0	0	.	.	.	.	.
413	19010	5	W	081893	4	0	C	T	Y	1000	5	MP 208+0.5 MI	1000' W	0	0	0	0	0	.	.	.	.	.
414	19010	6	W	081893	4	0	F	T	Y	1000	5	MP 207+0.3 MI	1000' W	0	0	0	0	0	.	.	.	.	.
415	19019	1	W	042293	4	0	G	T	Y	1000	5	MP 197+0.7 MI	1000' W	0	0	159	0	0	.	.	.	.	.
416	19019	2	W	042293	4	0	F	T	Y	1000	5	MP 197+0.3 MI	1000' W	5	0	213	0	2	.	.	.	.	.
417	19019	3	W	042293	4	0			Y	1000	5	MP 197	1000' W	2	0	131	0	0	.	.	.	.	.
418	19019	4	W	042293	4	0	T	T	Y	1000	5	MP 196+0.6 MI	1000' W	3	0	171	0	1	.	.	.	.	.
419	19019	5	W	042293	4	0	C	T	Y	1000	5	MP 195+0.7 MI	1000' W	7	0	570	0	2	.	.	.	.	.
420	19019	6	W	042293	4	0	F	C	Y	1000	5	MP 195	1000' W	2	0	285	0	2	.	.	.	.	.
421	20003	1	W	022594	2	0	G	T	N	1000	5	3/10 W OF 32ND ST	5/10 W OF 32ND ST	0	0	430	.	.	0	0	.	.	.
422	20003	2	W	022594	2	0	F	T	N	1000	5	1.8 MI W OF 32ND ST	2 MI W OF 32ND ST	0	1	319	.	.	0	0	.	.	.
423	20003	4	W	022594	2	0	G	T	N	1000	5	.8 MI W OF 32ND ST	1 MI W OF 32ND ST	0	0	408	.	.	0	0	.	.	.
424	20003	5	E	022594	2	0	G	T	N	1000	5	0.5 MI E OF US 96	1.5 MI E OF US 96	0	0	362	.	.	0	0	.	.	.

OBS	CFTR	SECT	DIR	DATE	LANES	RATER	CFP	CURVE	OVR	LEN	N	FROM	TO	ACP	PCCP	NCRK	BF	NF	MPO	SPO	X10	X11	FAIL
425	20003	6	W	022594	2	0	G	T	N	1000	5			1	1	321	.	.	0	0	.	.	.
426	20009	1	W	022594	2	0	G	T	Y	1000	5	MP 838	MP 838+1000 W	0	0	1	0	0	.	.	.	.	.
427	20009	2	W	022594	2	0	G	T	Y	1000	5	0.7 MI W OF MP 838	0.9 MI W OF MP 838	0	0	0	0	0	.	.	.	.	.
428	20009	3	W	022594	2	0	F	T	Y	600	3	0.2 MI W OF MP 837	0.3 MI W OF MP 837	0	0	1	0	0	.	.	.	.	.
429	20009	4	W	022594	2	0	G	T	Y	1000	5	MP 835	MP 834.8	0	0	6	0	0	.	.	.	.	.
430	20009	5	W	022594	2	0	G	T	Y	1000	5	MP 833.9	MP 833.7	0	0	0	0	0	.	.	.	.	.
431	20011	1	S	022594	2	0	G	T	N	1000	5	0.9 MI S OF 347	1.1 MI S OF 347	1	0	257	.	.	0	0	.	.	.
432	20011	2	S	022594	2	0	G	T	N	1000	5	1.1 MI S OF 347 JUNE	1.3 MI S OF 347	4	1	277	.	.	0	0	.	.	.
433	20011	3	S	022594	2	0	G	T	N	1000	5	1.4 MI S OF 347	1.6 MI S OF 347	13	1	288	.	.	1	0	.	.	.
434	20011	4	S	022594	2	0	G	T	N	1000	5	2 MI S OF 347 JUNE	2.2 S OF 347 JUNE	0	2	259	.	.	0	1	.	.	.
435	20023	1	W	022594	2	0	F	C	N	1000	5	0.7 W OF 380	0.9 W OF 380	0	0	433	.	.	0	0	.	.	.
436	20023	2	W	022594	2	0	G	T	N	1000	5	1.8 MI W OF 380	2.0 MI W OF 380	3	1	426	.	.	0	0	.	.	.
437	20023	3	E	022594	2	0	F	C	N	1000	5	0.2 MI E OF AVE A	0.4 MI E OF AVE A	0	2	436	.	.	0	0	.	.	.
438	20023	4	E	022494	2	0	G	C	N	1000	5	0.7 MI E OF AVE A	0.9 MI E OF AVE A	0	0	436	.	.	0	0	.	.	.
439	24006	1	W	060594	4	0	C	C	N	1000	5	MP 18.6	MP 18.4	0	0	150	.	.	0	0	.	.	.
440	24006	2	W	060594	4	0	G	C	N	1000	5	MP 19.1	MP 18.9	0	0	118	.	.	0	0	.	.	.
441	24007	1	W	060594	4	0	C	C	N	1000	5	17.7	17.5	0	0	252	.	.	0	0	.	.	.
442	24007	2	W	060594	3	0	F	C	N	1000	5	15.85	15.65	0	1	204	.	.	0	0	.	.	.
443	24007	3	W	060594	4	0	C	T	N	1000	5	16.6	16.4	0	0	229	.	.	0	0	.	.	.
444	24007	4	W	060594	3	0	T	C	N	1000	5	14.8	14.6	0	0	176	.	.	0	0	.	.	.
445	24009	1	E	060594	2	0	G	T	X	1000	5	MP 177.25	MP 177.45	0	.	0	.	.	0	0	0	0	.
446	24009	2	E	060594	2	0	C	T	X	1000	5	MP 178.5	MP 178.7	0	.	0	.	.	0	0	0	0	.
447	24009	3	W	060594	2	0	F	T	X	1000	5	MP 178-50FT	MP 178-1050FT	0	.	0	.	.	0	0	0	0	.
448	24010	1	W	060594	2	0	C	T	X	1000	5	185-90'	185-1090'	0	.	0	.	.	0	0	0	0	.
449	24010	2	W	060594	2	0	C	T	X	1000	5	MP 183.7	MP 183.5	0	.	0	.	.	0	0	0	0	.
450	24010	3	W	060594	2	0			X	1000	5	MP 182.6	MP 182.4	0	.	0	.	.	0	0	0	0	.
451	24010	4	W	060594	2	0	T	T	X	1000	5	MP 181.0	MP 180.8	0	.	0	.	.	0	0	0	0	.
452	24010	5	E	060594	2	0	T	T	X	1000	5	MP 186.2	MP 186.4	0	.	7	.	.	0	0	0	2	.
453	24010	6	W	060594	2	0	F	C	X	1000	5	MP 180.8	MP 180.6	0	.	0	.	.	0	0	0	0	.
454	24014	1	E	060594	2	0	G	T	X	1000	5	MP 154+120	MP 154+1120	0	.	0	.	.	0	0	0	0	.
455	24014	2	E	060594	2	0	G	T	X	1000	5	MP 156-1000	MP 156	0	.	0	.	.	0	0	0	0	.
456	24014	3	E	060594	2	0	C	C	X	1000	5	MP 164-220	MP 164+780FT	0	.	0	.	.	0	0	0	0	.
457	24014	4	E	060594	2	0	C	C	X	1000	5	MP 165	MP 165.2	0	.	0	.	.	0	0	0	0	.
458	24022	1	E	060594	2	0	C	C	X	1000	5	MP 138.2	MP 138.4	0	.	0	.	.	0	0	0	0	.
459	24022	2	W	060594	2	0	F	T	X	1000	5	MP 139.7	MP 139.5	0	.	0	.	.	0	0	0	0	.
460	24022	3	W	060594	2	0	G	C	X	1000	5	MP 138	MP 137.8	0	.	0	.	.	0	0	0	0	.
461	24091	1	W	060594	2	0	F	T	N	1000	5	MP 97.7	97.5	0	0	156	.	.	0	0	.	.	.
462	24091	2	W	060594	2	0	G	T	N	1000	5	MP 93-200'	MP 93-1200'	0	0	157	.	.	0	0	.	.	.

CONTENTS PROCEDURE

Data Set Name:	SD6.COND94	Observations:	462
Member Type:	DATA	Variables:	23
Engine:	V608	Indexes:	0
Created:	14:25 Thursday, December 1, 1994	Observation Length:	188
Last Modified:	14:25 Thursday, December 1, 1994	Deleted Observations:	0
Protection:		Compressed:	NO
Data Set Type:		Sorted:	YES
Label:			

-----Engine/Host Dependent Information-----

Data Set Page Size: 10240
Number of Data Set Pages: 9
File Format: 607
First Data Page: 1
Max Obs per Page: 54
Obs in First Data Page: 37
Userid : FTAO152
File : COND94 SD6

-----Alphabetic List of Variables and Attributes-----

#	Variable	Type	Len	Pos	Label
14	ACP	Num	8	108	ASPHALT PATCHES
17	BF	Num	8	132	BONDING FAILURE? (OVERLAY ONLY)
7	CFP	Char	1	39	CUT/FILL POSITION
1	CFTR	Num	8	0	CFTR ID NUMBER
8	CURVE	Char	1	40	
4	DATE	Char	6	17	DATE SURVEYED
3	DIR	Char	1	16	
23	FAIL	Num	8	180	
12	FROM	Char	25	58	
5	LANES	Num	8	23	NUMBER OF LANES
10	LEN	Num	8	42	SECTION LENGTH (FT)
19	MPO	Num	8	148	MINOR PUNCH OUTS (NON-OVERLAID ONLY)
11	N	Num	8	50	
16	NCRK	Num	8	124	NUMBER OF CRACKS
18	NF	Num	8	140	NUMBER OF BOND FAILURES (OVERLAY ONLY)
9	OVR	Char	1	41	OVERLAID?
15	PCCP	Num	8	116	CEMENT PATCHES
6	RATER	Num	8	31	RATER NO.
2	SECT	Num	8	8	SURVEY SECTION NUMBER
20	SPO	Num	8	156	SEVERE PUNCH OUTS (NON-OVERLAID ONLY)
13	TO	Char	25	83	
21	X10	Num	8	164	
22	X11	Num	8	172	

-----Sort Information-----

Sortedby: CFTR SECT DIR
Validated: YES
Character Set: EBCDIC
Sort Option: NODUPREC