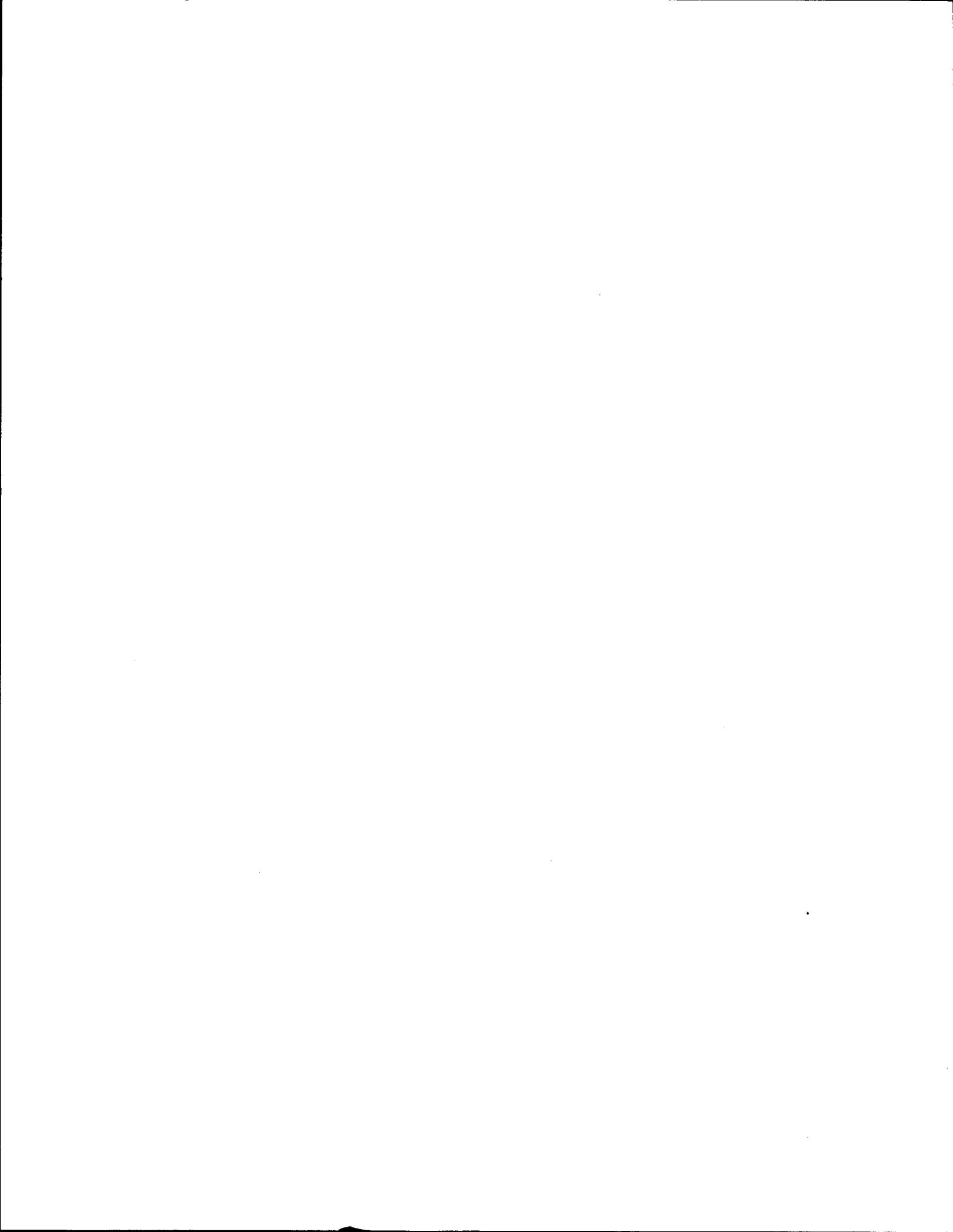


1. Report No. FHWA/TX-99/1722-2		2. Government Accession No.		3. Recipient's Catalog No.	
4. Title and Subtitle DEVELOP MAINTENANCE STRATEGY SELECTION PROCEDURES FOR PAVEMENTS INCORPORATING SEMI-RIGID OR CHEMICALLY STABILIZED LAYERS				5. Report Date December 1998	
				6. Performing Organization Code	
7. Author(s) Thomas J. Freeman and Dallas N. Little				8. Performing Organization Report No. Report 1722-2	
9. Performing Organization Name and Address Texas Transportation Institute The Texas A&M University System College Station, Texas 77843-3135				10. Work Unit No. (TRAIS)	
				11. Contract or Grant No. Project No. 0-1722	
12. Sponsoring Agency Name and Address Texas Department of Transportation Research and Technology Transfer Office P. O. Box 5080 Austin, Texas 78763-5080				13. Type of Report and Period Covered Research: September 1996 - August 1998	
				14. Sponsoring Agency Code	
15. Supplementary Notes Research performed in cooperation with the Texas Department of Transportation and the Department of Transportation, Federal Highway Administration. Research Study Title:					
16. Abstract  <p>TxDOT does not currently have a formal maintenance strategy selection procedure for pavements which have semi-rigid or chemically stabilized layers. The approach used was to interview experienced TxDOT personnel in each district and to determine the appropriate maintenance treatments and timing in that district for a variety of expected situations and conditions.</p> <p>The result of this research was a set of treatment assignments for each district and for airports, for a matrix of expected conditions including distress type, severity, and quantity; traffic level or importance; rate of development; and purpose of the treatment. A computer program and user's manual were developed to assist in treatment selection.</p>					
17. Key Words Maintenance			18. Distribution Statement No restrictions. This document is available to the public through NTIS: National Technical Information Service 5285 Port Royal Road Springfield, Virginia 22161		
19. Security Classif.(of this report) Unclassified		20. Security Classif.(of this page) Unclassified		21. No. of Pages 125	22. Price



**DEVELOP MAINTENANCE STRATEGY SELECTION PROCEDURES FOR  
PAVEMENTS INCORPORATING SEMI-RIGID OR  
CHEMICALLY STABILIZED LAYERS**

by

Thomas J. Freeman  
Engineering Research Associate  
Texas Transportation Institute

and

Dallas N. Little  
Senior Research Fellow  
Texas Transportation Institute

Report 1722-2

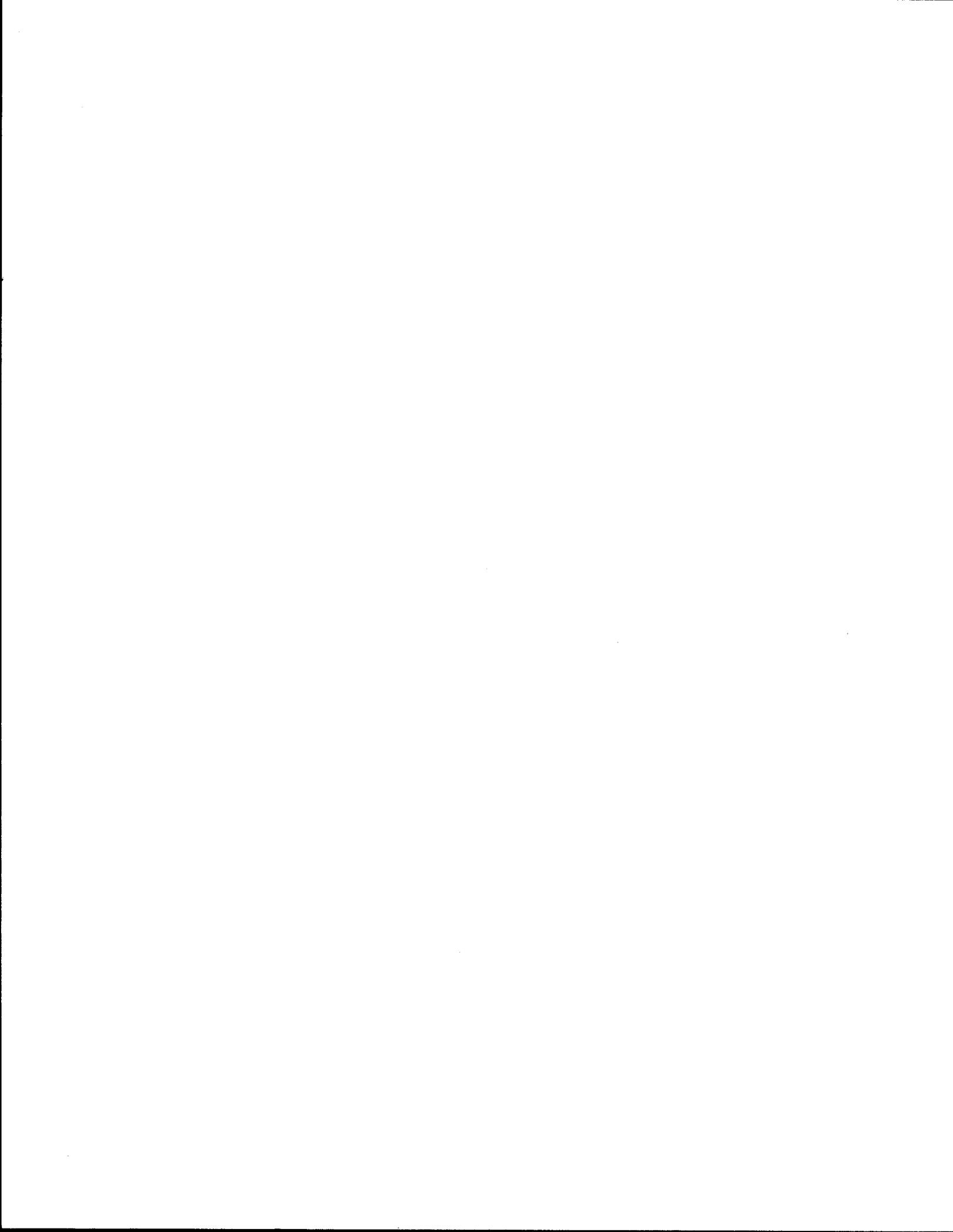
Project Number 0-1722

Research Project Title: Develop Maintenance Strategy Selection Procedures  
for Pavements Incorporating Semi-rigid or Chemically Stabilized Layers

Sponsored by the  
Texas Department of Transportation  
In Cooperation with  
U.S. Department of Transportation  
Federal Highway Administration

December 1998

TEXAS TRANSPORTATION INSTITUTE  
The Texas A&M University System  
College Station, Texas 77843-3135



## **DISCLAIMER**

The contents of this report reflect the views of the authors who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the official views or policies of the Texas Department of Transportation (TxDOT) or the Federal Highway Administration. This report does not constitute a standard, specification, or regulation. Additionally, this report is not intended for construction, bidding, or permit purposes. Dr. Dallas N. Little and Thomas J. Freeman were the Principal Investigators for the project.

## **ACKNOWLEDGMENT**

Special thanks are given to Robert Flores of TxDOT's Pharr District for his assistance in the development of this strategy selection process. We also extend a thanks to the representatives of the Texas Department of Transportation for their assistance in conducting the research and development of this report. Thanks to the support from FHWA.

# TABLE OF CONTENTS

List of Figures .....	viii
List of Tables .....	ix
CHAPTER 1. BACKGROUND AND OBJECTIVES .....	1
BACKGROUND AND OBJECTIVES .....	1
LITERATURE SEARCH .....	2
OVERVIEW .....	2
Performance .....	4
Prevention of Shrinkage Cracks .....	5
Special Treatments .....	7
Maintenance .....	9
STABILIZED PAVEMENTS QUESTIONNAIRE .....	21
CHAPTER 2. TEXAS EXPERIENCE .....	23
CHAPTER 3. IDENTIFY FACTORS FOR MAINTENANCE STRATEGY	
SELECTION PROCESS .....	27
INTRODUCTION .....	27
MAINTENANCE STRATEGY SELECTION CRITERIA .....	27
COMPLETING THE QUESTIONNAIRES .....	29
CHAPTER 4. DEVELOP AUTOMATED FORMAT FOR MAINTENANCE	
STRATEGY SELECTION .....	33
Cautions .....	41
CHAPTER 5. PREPARE FIELD GUIDES .....	43
REFERENCES .....	45
APPENDIX A- RESULTS OF QUESTIONNAIRES BY DISTRICT .....	A1
APPENDIX B- RESULTS OF SURVEY BY DISTRICT .....	B1

## LIST OF FIGURES

Figure		Page
1	Examples of Transverse Cracking (TxDOT, 1998) .....	34
2	Example of Cupped and Tented Cracks .....	35
3	Examples of Longitudinal Cracking (TxDOT, 1998) .....	36
4	Examples of Rutting (TxDOT, 1998) .....	38
5	Examples of Alligator Cracking (TxDOT, 1998) .....	39
6	Examples of Failures (TxDOT, 1998) .....	41

**LIST OF TABLES**

Table	Page
1 Summary of Other Maintenance Strategies from the Literature .....	18
2 Maintenance Strategy Selection. ....	32



# CHAPTER 1. BACKGROUND AND OBJECTIVES

## BACKGROUND AND OBJECTIVES

As the Texas Department of Transportation (TxDOT) changes to meet new challenges and as experienced people retire or otherwise leave state service, new maintenance people and area engineers are hired to fill those positions. Since training in the areas of pavement performance and the impact of maintenance treatments is usually a hands-on, learn-by-doing effort, there exists a need to provide these people with some guidance as to when maintenance treatments should be applied. Also, since most formal education programs do not discuss when, why, or even how to apply maintenance treatments, inexperienced personnel are unprepared to deal with these problems. This research addresses this need for the specific situation of asphalt pavements with a chemically stabilized layers. In addition to providing guidance to inexperienced personnel, this research will help to standardize the approach to maintaining pavements within a district, and since one district has access to the guidelines from all other districts, new or different approaches used by other districts can be discovered.

The key question to be answered by this research is “what is the proper maintenance strategy and under what conditions should it be performed?” Pavements with stabilized layers perform differently, in terms of distress, and must be maintained differently. For example, a typical, properly performing pavement with stabilized layers will have transverse cracks with a crack spacing (distance from one crack to another) of 2 m - 7 m caused by shrinkage of the underlying stabilized layer. These cracks develop more quickly and are often wider than cracks found on non-stabilized pavements. An inexperienced person might see this cracking as an impending failure of the pavement when, in fact, the pavement will typically remain in this condition and perform quite well for a long time.

The results of this research provide the decision maker with the results of the best decision making process from experienced people in their district. The field guides detail the decision making process based on the type, severity, and extent of distress, and on the level of importance of the pavement. The data will then be used to determine the appropriate maintenance technique. Often, the decision maker is trying to “buy time” until a more extensive rehabilitation can be performed. Knowing that a less expensive treatment will provide adequate service until the road or airport

runway is reconstructed will be of tremendous help to those making the decisions.

In support of this approach, the following research was conducted.

## **LITERATURE SEARCH**

Researchers conducted an exhaustive literature review which resulted in numerous articles associated with performance and maintenance of pavements with stabilized bases and subbases. However, these articles dealt primarily with strength properties, occasionally with crack spacing or other distress characteristics, and almost never on methods of maintaining these pavements. Because so little data existed on performance and maintenance techniques, our original approach of discussing the life of various maintenance treatments was abandoned in favor of identifying the best maintenance treatment for a given situation.

Pertinent aspects of the literature are synthesized in the following paragraphs.

## **OVERVIEW**

Chemically-stabilized materials have been used extensively in the U.S. and other countries primarily as base and subbase in flexible pavements. More recently, those materials have been used as sub-bases to concrete pavings (George, 1990). Pavement materials are usually stabilized to upgrade the quality of marginal aggregates. Stabilized layers usually consist of soil or aggregates stabilized with either Portland cement, lime, fly ash, or fly ash with an additive to improve reactivity.

Generally, stabilization results in improved stability and strength of pavement materials. Pavements with chemically stabilized layers are usually overlaid with asphaltic materials to provide a wearing surface. The surface type and thickness depends on traffic volume, availability of materials, cost, climatic conditions, and local practice (George, 1990). The mix design determines the proper proportion of stabilizing agent and water in the mixture to ensure that the layers will have adequate strength and stiffness to support traffic loads and to provide stability.

The mechanisms that result from chemical stabilization with cement lime or fly ash are the same or a combination of the following (Bhuiyan et al., 1995):

- Cation exchange, where sodium, magnesium, and other cations are replaced by the calcium cations from the available calcium hydroxide;

- Flocculation and agglomeration, where flocculation of the clay particles increases the effective grain size and reduces plasticity, thus increasing the strength of the matrix;
- Pozzolanic reaction, where the high pH environment created by the available calcium hydroxide solubilizes silicates and aluminates at the clay surface, which in turn react with calcium ions to form cementitious products primarily composed of calcium silicate hydrates or calcium aluminate hydrates, or both;
- Carbonate cementation, where calcium oxide reacts with carbon dioxide from the atmosphere to form calcium carbonate precipitates, which cement the soil particles;
- Cementitious hydration reaction where calcium silicates and/or calcium aluminates, which are chemically combined in the production of portland cement clinker or in the coal burning (fly ash) process, hydrate too rapidly (within a few hours) for calcium silicate and/or calcium aluminate hydrates.

The presence of stabilized layers in a pavement greatly reduces the vertical subgrade pressure but at the same time attracts tensile stresses at the bottom of the stabilized layer(s).

Project 1722 offers a decision plan to select the appropriate maintenance alternative for distressed chemically-treated bases and subbases. It is beyond the scope of this report to address the fundamental properties of cement, lime, and lime-fly ash stabilized pavement layers. However, it is meaningful for the reader or user of this document to have a more basic understanding of the causes for distress, especially volume change induced cracking distress with these chemically treated layers, and particularly in portland cement stabilized layers. One of the most authoritative references on the properties and performance of cement treated pavements is *Cement-Treated Pavements* by R.I.T. Williams, published by Elsevier Applied Science, 1986. This book presents several sections that are of particular interest, especially if the reader is interested in the reasons for distress and attempts to solve the problems from the outset or in the design stage. Of particular interest in Williams' book are the sections entitled: Nature of Cement-Treated Materials (pp. 178 - 200), The Structural Properties of Cement-Treated Materials (pp. 206 - 243), Factors Influencing Cracking (pp. 339 - 374), Methods of Dealing with Cracking (pp. 395 - 422), and the In-Service Behavior of Cement-Treated Pavements (pp. 432 - 463).

## **Performance**

Pavement performance is the history of the pavement condition over time or with increased number of axle load applications. Both design and construction have a very direct influence on pavement performance. Maintenance strategies of pavements are significantly affected by the nature and performance of the pavements. Load-induced fatigue cracking and shrinkage cracking owing to volume and/or thermal changes are the primary distresses that affect pavements with chemically stabilized layers (George, 1990). Shrinkage cracks appear at the surface of stabilized layers during the early life of the pavement, as early as a few days to a few years after construction. Fatigue cracks, on the other hand, are typically initiated at the bottom of the pavement. In either case, the crack initiated at the top or bottom face, depending on the load, propagates through the depth of the pavement matter over time depending on the traffic and structural conditions of the pavement.

Reflective cracking may occur after a length of time depending on the pavement structure, the type and thickness of the surfacing, the volume of traffic, and weather conditions. The period is commonly between two and five years, but with thin surfacing and large movements at crack joints, reflective cracks may occur within months or even weeks (Norling, 1973). These cracks provide easy inlets for incompressible solid particles and water which affect not only the surface course but also the structural capacity of the pavement. Shrinkage cracking is considered a natural characteristic of soil-cement. Such cracks are not the result of structural failure and, from an engineering standpoint, have not created a significant problem except in some very localized instances (Costigan and Thompson, 1986). Research and experience show, however, that shrinkage cracks accelerate pavement deterioration. Costigan and Thompson (1986) assert that critical pavement response affecting performance occurs at transverse shrinkage cracks. Shrinkage cracking is one of the unsatisfactory aspects of the overall behavior of soil-cement bases. At the time of occurrence, it has relatively little or no effect on riding quality of highway pavement. However, "secondary deterioration" effects, such as deflection and the resultant weakening of the subgrade, can be highly detrimental to the performance and useful life of the pavement structure. Shrinkage cracking has been studied by George (1973), who attributes the cracks to internally developed shrinkage-induced stresses. Undoubtedly, load-induced (fatigue) cracking constitutes the predominant pavement distress manifestation followed by shrinkage cracking. Kota et al. (1995) noted that shrinkage cracks with

widths greater than 2.5 mm significantly affect pavement performance. Using the ILLI-SLAB finite element program, the computed load transfer efficiency was as low as 35 percent for large crack widths. The presence of wide shrinkage cracks increases the critical flexural tensile stress for design by as much as two times (Kota et al., 1995). A correction factor of two was therefore recommended for design by Kota et al. Lower levels of stabilizer or those that are less rigidly stabilized may perform better than those with higher stabilizer content. Shrinkage cracks, when combined with free water at the crack interface and high traffic loading, erosion of the fine material adjacent to the cracks occurs, resulting in pumping of fines to the surface.

### **Prevention of Shrinkage Cracks**

It should be kept in mind that cracks occur in the bituminous surface of all types of flexible and stabilized pavements. The amount of cracking varies with the properties of the bituminous surface and base, age, climatic conditions, and traffic. Low temperature cracking of bituminous surfaces on flexible pavements is caused primarily by temperature changes at low temperatures that induce tensile stresses in the surface and/or base. Reflective cracking is not unique to pavements with stabilized layers only.

Laboratory research shows that the following practical factors affect the amount of base shrinkage:

1. Initial shrinkage is caused mainly by loss of water due to drying of the base.
2. The soil type is an important variable. Low-clay-content granular materials shrink less than fine-grained soils.
3. A mixture compacted above optimum moisture will shrink more than the same mixture compacted at optimum moisture content.
4. Changes in stabilizer content, density, and temperature have only a minor effect on the amount of shrinkage compared to the effect of initial compaction moisture content.
5. The spacing and width of the cracks depend on the tensile strength of the stabilized material, shrinkage properties (soil type), and friction between the base and subgrade or subbase.

Experience has shown that certain bituminous surfaces can be used to retard reflective cracking (Costigan and Thompson, 1986).

### ***Bituminous Surface Treatment***

Fewer shrinkage cracks reflect through a bituminous surface treatment than through a hot mix surface. Those that do reflect through are narrow and difficult to see because of the texture of the surface treatment. Double or triple surface treatments out-perform single surface treatments. One popular method is to place two layers the year of construction and a third layer the following year. It must be recognized that surface treatments are only suitable in the light-to-moderate traffic range and that in northern areas, they may be damaged by snowplows.

### ***Hot-Mix Asphaltic Concrete***

As traffic increases, thicker asphalt concrete surfaces are commonly used. Reflective cracking is affected by the thickness of the bituminous surface and whether one- or two-layer construction is used. Two layer construction has been found to be beneficial if the binder course function is a crack-arresting layer. A minimum thickness of three inches has been specified by many agencies.

### ***Delayed Surface Placement***

It has been suggested that delaying placement of the asphalt concrete surface is helpful. Delaying placement of the bituminous surface provides time for much of the total shrinkage of the base to occur before the surface is placed. This should result in less shrinkage of the base after the surface is placed and less reflective cracking through either asphalt concrete surfaces or surface treatments.

### ***Higher Penetration Asphalt***

When a softer or higher penetration asphalt is used, the asphalt concrete surface is less brittle, and the cracks tend to heal under traffic during warm weather. The highest penetration asphalt commensurate with adequate stability for traffic and climatic conditions should be used. Canada's Sainte Anne Test Road (Nowling, 1973) showed that the viscosity of the asphalt is also a significant

variable affecting reflective cracking. A surface incorporating both properties of high viscosity and soft grade asphalt showed the greatest resistance to cracking.

### ***Delayed Multiple Layers***

Delayed layers is another version of asphalt concrete surface construction. About 99 percent of the subdivision residential streets in the rapidly growing urban area of Dekalb County, Georgia, are soil-cement. A one-week waiting period is required between placement of a 1-inch Binder course and a 1-inch Surface course. A minimum of reflective cracking occurred. The Alberta Highway Department (Nowling, 1973) has built about 1,200 miles soil-cement. A 2-inch Road mix using 4 percent MC 250 asphalt was placed the year of construction; one to three years later, a 2- or 4-inch asphalt concrete surface (6 to 6 ½ percent, 250 minimum penetration asphalt) was applied. This was followed in one to three years with a seal coat consisting of 0.25 gal per square yard of cationic emulsion and 30 lb of ½-inch maximum chips. On a project north of Edmonton (Nowling, 1973), the soil-cement base and asphalt surfaces extend through the shoulder, and the seal coat covers the traffic lanes only. Reflective cracks are evident in the shoulder at about a 20- to 25-foot spacing. They are much less evident in the traffic lanes having the seal coat.

### **Special Treatments**

The various versions of conventional surfaces discussed have generally provided surfaces that have not had excessive reflective cracking. With a properly designed asphalt mix and an adequate stabilized base design, the cracks that occurred have not caused engineering problems, in most situations. In some areas, additional means for further reducing reflective cracks may be justified. They do not provide permanently crack-free surfaces on stabilized bases or any type of base course. When the cracks do appear over a period of time, they should be narrower than the cracks that would normally occur.

### ***Bituminous Surface Treatment Between Stabilized Base and AC Surface***

The use of double bitumen surface treatment or single bitumen surface treatment followed in 30 days or more by an asphalt concrete surface delays occurrence of reflective cracks. Projects have

been built with success in Georgia, Iowa, Tennessee, and Michigan (Nowling, 1973).

### ***Upside-Down Design***

The upside-down design has been used extensively in New Mexico, Arizona, and British Columbia. New Mexico, where the upside-down design originated, has many miles of cement treated base in service. This design adds an untreated granular layer between the CTB and the bituminous surface to minimize and delay reflective cracking. The typical design, from the bottom up, consists of 0 to 6 inches of granular subbase, depending on the subgrade soil; 6 inches of CTB with 3 to 5 percent cement; 4 to 6 inches of untreated granular material; a 3 1/2- to 4-inches asphalt concrete surface; and a 1/2- to 5/8-inch plant-mix seal coat placed at the time of construction or a few years later. Inspection of 13 projects, most of them four to six years old on Interstate 3, indicates that reflective cracks in upside-down CTB pavements in the New Mexico environment do not appear for three to five years; when they do appear, they are narrow and spaced further apart than normal. The untreated layer in the upside-down design must be designed so that it does not collect water.

### ***Asphalt-Ground Rubber Treatments***

Gallaway and Lagrone (1971) have suggested that a strain-relieving interlayer utilizing ground-vulcanized-rubber aggregate, mineral filler, and anionic asphalt emulsion can be used as a crack arrester between a base course and bituminous surface.

### ***Pre-cracking***

Experimental studies conducted in Japan (Yamanochi, 1973) and a complimentary study in Switzerland (Fetz, 1982) suggested opening the young soil-cement base to traffic, which induces many micro-cracks that enhance the performance of the base layer. Yamanochi (1973) recommended inducing microcracks under normal traffic. Early trafficking helps to promote numerous fine cracks as opposed to fewer wide cracks. In addition, the young soil-cement can become denser on trafficking within a day or two of its placing. Fetz (1982) speculates that a cement-treated layer with fine cracks induced in it will exhibit relatively low modulus and, in turn, develop lower wheel load stresses and thermal/shrinkage stresses.

## **Maintenance**

Maintenance consists of a set of preventive activities directed toward limiting the rate of deterioration of a structure or corrective activities directed toward keeping the structure in a serviceable state (Haas et al., 1994). For pavements, this includes such preventive work as chip seals and such corrective work as patching. The alternatives considered by an agency for rehabilitation and for maintenance, both preventive and corrective, usually represent current practice. The process used to select feasible rehabilitation alternatives from a set of available alternatives can range from simple engineering judgment to a decision tree of expert systems. From a performance standpoint, periodic resealing of the asphalt surface is more effective in sealing fine cracks than sealing the individual cracks. Sealing individual cracks has an aesthetic problem. Wider cracks require sealing, depending on local climatic conditions. The cracks are usually cleaned thoroughly, and all spalled pieces of the surface are removed. Liquid asphalt or asphalt emulsion slurry are used to fill the cracks. Rubber modified emulsion have been proven to be very effective. An application of sand over the bitumen prevents pickup by traffic.

Several highway agencies have had some experience with the maintenance of pavements with chemically stabilized layers. Some of the scantily documented experiences are discussed below.

### ***Australia***

An extensive study of the performance of cement treated pavements was carried out on a series of specially constructed test tracks in Australia (1986 and 1987), using the Accelerated Loading Facility (ALF) (Atkinson, 1990). This study provided a clearer understanding of the causes and mechanisms of the distress in various new cement treated pavement configurations in Australia. The study was also directed at evaluating a range of measures which attempt to prevent or reduce the incidence of reflective cracking through an applied surfacing.

The test pavements were constructed by contract, using a closely controlled pug mill and paving operation. A series of trials were performed by ALF on the test pavements after which excavations were made through the pavement layers to identify distress and to determine any failure modes which may be present.

The excavations through the test pavements revealed that extensive debonding was occurring

between the layers of cement-treated material. This debonding caused the layers to act as individual layers rather than a thick bonded unit, resulting in high tensile stresses at the bottom when under load. The stresses induced exceeded the tensile strength of the cement-treated material, and vertical cracks were formed, starting at the debonded interface and propagating vertically upwards to the surface. This process repeated through the pavement layers until all layers were debonded and vertically cracked. Block cracking appeared at the surface as a result of this process. In addition, when debonding and vertical cracking combined with free water at the crack interface and high traffic loading, erosion of the fine material adjacent to the cracks occurred, resulting in pumping of fines to the surface. Transverse cracking with regular crack spacings of 5-7 m were observed as a result of drying and thermal shrinkage.

Several construction practices have since been adopted to ensure that a more satisfactory bond is achieved between subsequent layers, thereby reducing the potential for cracking and subsequent pumping of fines from layers. Some these measures include:

- Cement slurry between the layers,
- Cement powder between the layers,
- Bitumen membrane between the layers, and
- Constructing multiple layers in one day using Type C cement (slower setting) and lightly scarifying the surface of each layer before placing the next layer.

A 5.6 km section of cement-treated pavement in the vicinity of the ALF trial was selected for a crack control trial. This pavement was a three-layer cement-treated base with a total depth of 330 mm, made up of three 110 mm layers with a two seal coat (16 mm and 10 mm aggregate and 85-100 penetration grade bitumen). The material used in the construction was a crushed rock which was stabilized with 3 percent by weight of cement. Construction techniques and the contractor were the same as for the ALF trial. This pavement had been opened to traffic, and the northbound lanes carried a traffic volume of 7,500 vehicle per day, with 8 percent commercial vehicles. The climate is a sub-tropical with an annual rainfall of 1000-1200 mm and an annual temperature range of 10-30°C.

Regular transverse cracking and some longitudinal cracking on both lanes had occurred, and fine material pumped through these cracks during wet weather.

Different crack control treatments were applied to the cracked pavement to evaluate their effectiveness. The products selected for inclusion in the trial were grouped into various categories as:

- Interlayer treatment with 45 mm asphalt overlay
- Sprayed polymer modified binder interlayers
- Adhesive backed strips
- Geogrid interlayers
- Geofabric interlayers
- Polymer modified asphalt
- Polymer modified binder reseals

Most crack control systems require covering with or incorporating into asphalt. A thin asphalt surfacing (45 mm) was adopted, as the surfacing is only required to provide a satisfactory traffic surface rather than provide a structural layer. In addition to the sections where crack control products had been applied, two control sections of asphalt, without pretreatment, were placed to enable a comparison of the performance of the crack control systems against untreated sections.

After two years service, performance was based on the number of reflected cracks and the presence of pumping of fines through the applied surfacing. The following conclusions were drawn on the different crack control systems:

- Only two of the systems have proved to eliminate, or at least significantly reduce, the incidence of reflective cracking through the surfacing. These are polymer modified binder interlayers full width with asphalt overlay (45 mm) and polymer modified binder reseals.

Three of the systems have effectively prevented pumping of fines through the applied surfacing. These are:

- Polymer modified binder interlayers full width with asphalt overlay (45 mm),
- Geofabric full width with asphalt overlay, and
- Polymer modified binder reseals.

Based on these findings, several cement-treated pavements showing extensive cracking, have been treated with either a polymer modified binder interlayer full width or geofabric under an asphalt

overlay.

### *South Africa*

Biesenbach et al. (1989) wrote a paper on a practical experience in the rehabilitation of a road with cement-treated base course in South Africa. This road is National Route 7, sections 7 and 8 between Garies and Okiep in the North-West Cape. Pavement profile is 19 mm chips with two applications of slurry surfacing, a 200 mm crushed granite (two layers) stabilized with about 4.5 percent cement aiming at a UCS of 5.2 to 8.6 MPa base, a 150 mm of sandy decomposed granite subbase, a 250 mm sandy decomposed granite subgrade, and a well-graded decomposed granite subgrade with a low PI and a design CBR of 5.

The average annual rainfall is about 143 mm, and the traffic volume is low with about 50 to 100 heavy vehicles per day in one direction. The number of ESALs in 1987 was about 0.8 million. Cracking followed the well-known pattern which includes transverse and longitudinal shrinkage cracks, with traffic associated or secondary cracks. The severity levels and extent of the cracks varied considerably. As expected, the cracking was more severe over high fills and frequently also on the lower side of super-elevations. Serious pumping was not observed due to low rainfall and traffic. Rutting was generally not regarded as a serious problem.

Overlays were not considered because the low traffic volume could not justify the high cost. A reseal using conventional binders was also not considered because of poor performance history. Cracks reappeared after a year when two subsections were resealed in 1982 using bitumen emulsion and 7 mm chips. Resealing with bitumen-rubber was therefore considered. However, certain sections had developed severe block cracking, pumping, and rutting, and mere reseal would not be adequate to rehabilitate these sections economically. It was decided that over such badly distressed areas, the top 100 mm of the cement-treated base should be milled and recycled. The decision on where to mill was based on visual examination.

A self propelled milling machine was used to mill the top 100 mm of the CTB. Over short extremely distressed areas, the entire depth of the CTB was milled. The grading of the milled CTB had to conform to the limits shown below.

The milled CTB had to conform to specified limits throughout the contract.

After spreading the milled CTB out to a flat mat, it was treated with 60 percent stable grade anionic emulsion to provide 1 percent net bitumen by mass of dry aggregate. The emulsion was applied by adding it to the compaction water. The surface of the emulsion-treated base ETB was sprayed with a diluted emulsion to prevent possible raveling under traffic.

Prior to surfacing, cracks in the CTB wider than 3 mm were sealed with bitumen-rubber, suitably heated and poured from a can.

A source of Gabbro was used for producing the chips. The nominal size of the chips was 16 mm and had to meet a grading specification. The aggregates were precoated with creosote (sacrosote) at nominal rate of 0.6 percent by mass. An 80/100 penetration grade bitumen was specified. The rubber was obtained from processing and recycling tires, free from fabric, steel cords, and other contaminants. The Bitumen-Rubber blend conformed to the following specifications:

Percentage of rubber by mass of total blend	18-27 percent
Blending/reaction temperature	170-210 <sup>0</sup> C
Reaction or digesting time	0.5-4 hrs
Viscosity (centipoise)	1500 min
Softening point (Ring and Ball)	55 <sup>0</sup> C min
Resilience (%)	10 min
Flow (mm)	70 max

A diluted anionic stable grade emulsion (30 percent bitumen) tack coat was applied at a rate of 0.55 liters/m<sup>2</sup>.

Based on observations made from experimental sections, the bitumen-rubber was sprayed at a rate of 2.8 liters/m<sup>2</sup>. The 16 mm chips were spread at a rate of 83-92 m<sup>2</sup>/m<sup>3</sup>.

Although the rehabilitated road was still in an early stage by the time this report was written, the authors concluded that the bitumen-rubber was performing well as a crack sealant. After about two years in service, an inspection of the unmilled sections revealed only a few faint signs of pumping, with hair cracks not even visible. The amount of milling could have been reduced if no cracks reappeared at all. The visual assessment used in conjunction with engineering judgement proved to be a successful approach instead of time consuming and expensive crack activity meter. There were complaints by transport companies regarding the rough texture of the surface resulting in increased

in tire wear. Smaller, nominal-sized chips (say 13 mm) would have improved the texture, but the associated disadvantage of limiting the applied bitumen-rubber could have defeated the main purpose of sealing the cracks.

### *Spain*

A special type of slurry seal, with modified bitumen emulsion and reinforced fibers has been applied in Spain to seal cracks (1998). This is a fibers-reinforced microsurfacing and was applied as a surface membrane (SAM). However, there were no data to support the success of this treatment. There are other forms of seals like chip seal, fog seal, cape seal, slurry seal, rejuvenating seal, and sand seal, and the performance of any option depends on the extent of cracks, climate, and traffic loads.

The microsurfacing consisted of the following materials.

#### Aggregates:

The aggregates have to be clean and of variable sizes. The gradation has to fit in a specified envelope. The aggregates will also have to be hard and resistant to polishing.

#### Fibers:

They are plastic type and must meet the following specifications:

- Break elongation exceeding 40 percent;
- Melting point over 250<sup>0</sup> C;
- Water absorption below 1 percent; and
- Tensile strength higher than 5000 kg/cm.

#### Emulsion:

The emulsion used was a cationic emulsion of bitumen modified by elastometric products of the SBR types. The residual binder must exhibit low thermal susceptibility (penetration index larger than 1.5, high plasticity interval temperature, and a ring and ball softening point which exceeds 75 percent ), average resiliency measured by the Elastic Recovery Test (above 80

percent), and high toughness (in excess of 20 kg cm).

#### Design:

The optimum content of both the polymer in the emulsion and the fiber in the microsurfacing were determined using a procedure called the Flexibility Test. The flexibility test employs a flexurometer to measure the cracking resistance of the microsurfacing at different polymer and fiber contents.

#### Application:

The mixing and spreading equipment used is similar to the one used for standard slurries. However, other devices are needed for the addition of fibers. The fibers can be added either dry or wet. If the latter process is used, tire rollers are recommended to help the outflow of the breaking water.

The microsurfacing was applied on the National Highway IV, which links Madrid to Andalusia, in Southern Spain. The traffic volume was 110,000 vehicles/day with 18 percent heavy traffic.

The pavement profile consists of a 20 cm (8") soil-cement sub-base, a 25 cm (10") dry rolled concrete base, and a 15 cm (6") asphalt concrete surface course applied in two layers. The highway was widened from two to three lanes in each direction. Joints, 8 cm deep, were sawed at every 15 m in the rolled concrete base course. A 0.85 m wide geogrid was applied over the lengthwise and crosswise joints between the bituminous base course and the wearing course.

The geogrid did not stop cracks from reflecting in the wearing course, and a number of transverse cracks appeared after three years of service. The transverse cracks (sawed cracks inclusive), spaced about 7.5 m, as well as other intermediate transverse and longitudinal cracks reflected through the wearing course.

#### Decision Making

The situation called for immediate attention due to the heavy traffic that uses the highway and

the progressive deterioration of the pavement. The main objective of any action was to stop and prevent/or delay the reflection of cracks in the surface course. Two actions were readily defined. A rehabilitation option, which employs procedures at the lowest possible cost that would increase serviceability and extend the pavement life for another two to three years, or a reconstruction.

A rehabilitation option was adopted and two rehabilitation techniques were selected; both were based on SAM membrane. The first approach consisted of a microsurfacing treatment of modified emulsion with previously lacquered aggregates; the second approach consisted of applying a microsurfacing, reinforced with fibers. The second was adopted; ambient temperature was the main factor in making this decision.

### Application

Microsurfacing was applied in two layers. The temperature during application of the first layer ranged from 2 to 14<sup>o</sup> C, and the curing time was slow. The amount applied averaged 6.6 kg/m<sup>2</sup> after a prime coat of about 300 kg/m<sup>2</sup> of 50 percent emulsion. The first layer was composed of the following:

- Silica sand 0-6 mm 100
- Modified cation emulsion (63percent)15
- Water 10
- Fiber 0.3
- Cement and additives 1

The application of the second layer was carried out at ambient temperatures ranging 8 to 22<sup>o</sup> C. The curing times were short, and the average amount applied was 7.5 kg/m<sup>2</sup>. The layer was composed of the following:

- Silica sand 0-5 mm 66
- Porphyric fine gravel 34
- Modified cation emulsion (63percent)17
- Water 9
- Fiber 0.6
- Cement and additives 1

The authors (TxDOT, 1998) did not have enough data to support the success of this application. Only the first layer had been applied at the time this paper was published. However, the number of cracks were reduced, and the performance of this application was good after a harsh winter condition. The untreated sections were significantly deteriorated due to the combined action of the heavy traffic and rains during the winter.

The authors asserted that modification of asphalt emulsion and inclusion of fibers gave the microsurfacing an improvement in thermal susceptibility, resiliency, and flexibility which are needed to prevent and/or retard reflective cracks.

The literature regarding successful maintenance activities on chemically-stabilized bases is fairly broad and can be characterized as relatively site or location specific. Table 1 summarizes some of the pertinent literature regarding maintenance of pavements containing cement-stabilized bases under the categories of general maintenance, major maintenance, assessing condition of cement-treated pavement, and rehabilitation guidance.

**Table 1. Summary of Other Maintenance Strategies from the Literature.**

Category	Source	Pertinent Findings
General Maintenance	Lilley (1970)	Failure in early life of cement-stabilized pavements must be dealt with during maintenance.
	PCA (1949)	Although restraint cracking forms early and reflects through the bitumenous overlay, it may not be necessary to seal cracks until they begin to ravel. This view is still held widely today in many countries.
	PCA (1979)	Not necessary to seal and fill cracks as far as performance is concerned. Sealing is unattractive and often detracts from appearance of the road and the user assessment of the roadway. However, cracks wider than 3 mm may require filling if weather conditions dictate. Cracks should be thoroughly cleaned prior to filling and then filled with proper bitumen and sanded to prevent traffic pick-up. Proper materials and equipment must be matched with the crack size and level of distress.
	PIARC (1983)	The PIARC 1983 presents guidelines on maintenance and discusses the approaches used in Europe. The report emphasizes the importance of sealing cracks to prevent water penetration into pavement sublayers. However, the report documents the controversy on the effectiveness of sealing as well as the problems caused by unsealed shrinkage cracking.
Major Maintenance	Williams (1986)	<p><b>Rigid Concept:</b> Normally, cement-treated bases and some lime-fly ash-treated bases and subbases are designed to have ultimate compressive strengths of greater than 2,000 psi and resilient moduli of over 1,000,000 psi. Although it is assumed that these pavements will exhibit a slab action under load between the transverse shrinkage cracks, work by Kota et al. (1995) demonstrates that care must be taken to ensure that these pavements are structurally designed to ensure that load-induced stresses are not great enough to fatigue crack the pavement in a manner that dramatically diminishes load-carrying capacity. Therefore, if the rigid concept is adhered to, maintenance techniques must complement design strategies to ensure that the slab action is retained.</p> <p><b>Flexible Concept:</b> An equally popular view is that the treated layer should ultimately exhibit flexible behavior. This may occur if an initially well cemented layer cracks under traffic into segments that are small enough not to exhibit large slab action but act as large "aggregate pieces." This can be assisted in the design stage by ensuring, for example, that the strength of the stabilized layer never exceeds a certain value (800 psi) (Ingles and Metcalf, 1972). This concept can also be achieved by purposefully cracking the pavement in a "crack and seat" type operation of rehabilitation. Little (1998) and Trebig, Goddawallah and Little (1998) have proposed that lime-fly ash treated bases and lime-cement-fly ash treated layers can be designed with strength and stiffness thresholds and to take advantage of the longer term and slower pozzolanic reactions to reduce the frequency and severity of shrinkage cracks. Little (1998) also favors the use of low levels of pozzolanic stabilizers in reclaiming operations to ensure strength without excessive cracking. This approach could be effectively meshed into a maintenance-rehabilitation strategy.</p>

**Table 1. Summary of Other Maintenance Strategies from the Literature (continued).**

Category	Source	Pertinent Findings
Assessing Condition of Cement-Treated Pavement	Williams (1986)	<p><i>Severe deformation in the wheel-paths but without cracking:</i> Suggests lack of stability which can be verified by removing the bituminous material and, if verified, replace with high stability hot mix.</p> <p><i>Crazing and horizontal cracking found:</i> Remove hot mix and inspect the cement-treated layer for origin of cracking. Verify by coring at particular site. Major rehabilitation is often unavoidable. Reclamation efforts should consider the selection of chemical stabilizers that will promote long-term pozzolanic stabilization without making the layer overly rigid. Establishment of a flexible reclaimed layer may be preferable.</p> <p><i>Presence of transverse cracks or of longitudinal cracks:</i> These cracks are not necessarily a major concern. If the cracks are not severe, it may be acceptable to seal only. If the cracks are causing deterioration, it may be necessary to remove by sawing strips of about 18-inches on each side and replace with well designed and compacted material, perhaps high stability hot mix.</p> <p><i>Attention to interface between the bituminous surfacing and the stabilized base:</i> The material should be removed and inspected. If the cement layer has weakened or deteriorated, it must be replaced to restore a strong bond between the bituminous surface and the existing, stabilized base.</p>
	Corney (1977)	Areas of abnormally high surface deflection usually require partial reconstruction in which part of the whole of the cemented base is removed and replaced with bituminous roadbase materials. This is generally more economical than a very thick overlay.
	Naraus (1973)	Methods of rectifying pumping deterioration resulting from moving blocks may include using rippers or gird rollers to break down the material in situ to approximately its original size for grading and treat with cement and recompact. Little (1998) suggests low levels of cement or lime-fly ash for reclamation to produce a moisture resistant and stable, yet semi-flexible, base where traffic considerations allow. Other alternatives are black base replacement and thick overlays.
	Skinner and Martin (1955)	Used lean concrete 2 to 8-inches thick to produce a stress relieving interlayer between existing PCC slab and overlay. The lean concrete was saw jointed and air entrained to reduce freeze-thaw sensitivity.
Rehabilitation Guidance	Grant and Curtayne (1982)	Discuss the advantages of rehabilitation over new construction. Deflection testing can be used with mechanistic approaches to provide a superior pavement. The authors emphasize the need to assess the entire pavement using non-destructive deflection testing and identifying areas of immediate need which can be addressed as local maintenance/rehabilitation usually related to restoring proper drainage.

**Table 1. Summary of Other Maintenance Strategies from the Literature (continued).**

Category	Source	Pertinent Findings
	Freeme et al. (1982)	Used Heavy Weight Deflectometer (HWD), profileometer, nuclear density gages, moisture contents, and construction records together with analytical mechanistic techniques to establish maintenance and rehabilitation strategies for cement-treated pavements in a very effective manner.
	Ministry of Transport, France (1979)	<p><i>Evaluation Process:</i></p> <ol style="list-style-type: none"> <li>1. General bearing capacity obtained by Lacroix deflectometer during the most unfavorable period of the year.</li> <li>2. Visual examination of damage made either by inspector walking along the pavement so as to cover 10 km per day or by a high-efficiency photographic vehicle covering 150 km=m at night. A "degradation catalogue" allows a common language to be used.</li> <li>3. Take cores at points dictated by deflection survey.</li> <li>4. Obtain details of the history of the pavement in terms of maintenance provided.</li> <li>5. In zones having a thick bituminous layer or incorporating hydraulically bound materials, vibration tests and radius of curvature measurements are also undertaken.</li> </ol> <p>The Ministry of Transport offers some interesting suggestions on cataloguing pavement distress in pavements containing cement stabilized layers. Williamson (1986) discusses this approach on pp. 669 and 670 of his book.</p>

## **STABILIZED PAVEMENTS QUESTIONNAIRE**

Questionnaires were developed to capture the experience of outside agencies and sent to other states, industry representatives, other countries, etc. Due to an initially poor number of responses, a number of the state maintenance engineers were phoned and asked to submit their responses. The small number and character of the responses led us to conclude that most agencies did not have formal procedures to deal with the maintenance of pavements with chemically stabilized layers. Instead, the problem appeared to be viewed as a part of the larger roadway maintenance problem.



## CHAPTER 2. TEXAS EXPERIENCE

Questionnaires for TxDOT agencies were developed and submitted. The questionnaires were sent to the Design Division and to each of the district engineers to have the DEs forward one questionnaire to the district pavement management engineer, and a different questionnaire to the maintenance engineer, and two maintenance foremen. A follow-up call to districts where we had not received at least one response was conducted and was very successful. We received data from 17 districts.

### *TxDOT Survey*

The TxDOT questionnaire was divided into 10 questions. The research team submitted the questions to the 17 participating districts and traveled to each district to assist in preparation of the questionnaire and to obtain as much detailed information as possible.

The results of the TxDOT survey are presented in Appendix A, and the results are summarized concisely question-by-question in the following paragraphs.

#### Question 1: What additives do you use for stabilizing subgrades and bases?

Seventy-one percent of the districts used lime for subgrade stabilization; 35 percent used portland cement; 12 percent used lime-fly ash, and none used asphalt. For base course stabilization, 53 percent used lime; 59 percent used portland cement, 18 percent used lime-fly ash, and 35 percent used asphalt.

#### Question 2: What thickness do you typically stabilize?

The great majority of the districts who use lime for subgrade stabilization only stabilized to a depth of 6-inches and none reported stabilized to depth greater than 10-inches.

This points to the fact that lime is widely used in Texas but primarily as a working platform and not as a structural layer. Studies in Colorado (CTL/Thompson, 1998) demonstrate that stabilization with lime to depths of about 12-inches results in much greater structural contribution than the 6-inch layers.

Portland cement subgrade stabilization typically occurs to a depth of between 6 and 10 inches.

Base course stabilization typically occurs to depth between 8 and 14 inches for lime, portland cement, and lime-fly ash stabilized bases. Asphalt stabilized bases are typically thinner as they normally work in concert with the asphalt surface to provide a composite structural layer. Although not directly addressed in this study, it is important to understand that under-designed (too thin) chemically stabilized pavement layers are susceptible to fatigue cracking induced failure which, if it progresses far enough, can result in full deterioration of the stabilized layer. The structural contribution of the stabilized layer (adequacy of thickness and material properties - strength and stiffness) should be considered in making reclamation/recycling considerations.

Question 3: What percent stabilizer do you typically use?

Question 4: How do you choose the percentage?

The survey revealed that a typical range of 3 to 6 percent lime is normally used for subgrade stabilization. Of the districts using lime for subgrade soil stabilization, about 50 percent normally use 4 percent or less lime for durable stabilization with the development of significant pozzolanic strength (McAllister and Petry, 1995). Under-stabilization with hydrated lime can result in less than optimal long-term structural performance.

The relatively low percentages of lime and portland cement coupled with the fact that 32 percent of the lime stabilizer content is selected based on engineering judgement is reason to believe that structural performance and durability of these pavements could be significantly improved by following a good, well-established mixture design procedure.

Question 5: What are typical back-calculated moduli for these stabilized layers?

Relatively little data were provided for stabilized subgrades. However, based on the responses, lime-stabilized subgrades could be conservatively assigned a design modulus of 30 ksi with the cement stabilized layer about 60 ksi. This typically represents a four to eight fold improvement over the untreated subgrades.

Limited data on lime-stabilized bases, cement-stabilized bases, and lime-fly ash-stabilized

bases as well as asphalt-stabilized bases provide considerable stiffness (and thus structural enhancement) when compared to unstabilized bases.

Question 7: What types of problems have you encountered with your stabilization efforts?

A wide range of problems were identified. Seventy percent of the districts reported sulfate induced swell. The great majority of reported distress and related problems was due to excessive crashing (53 percent), fatigue cracking (29 percent), and loss of stabilization (35 percent).

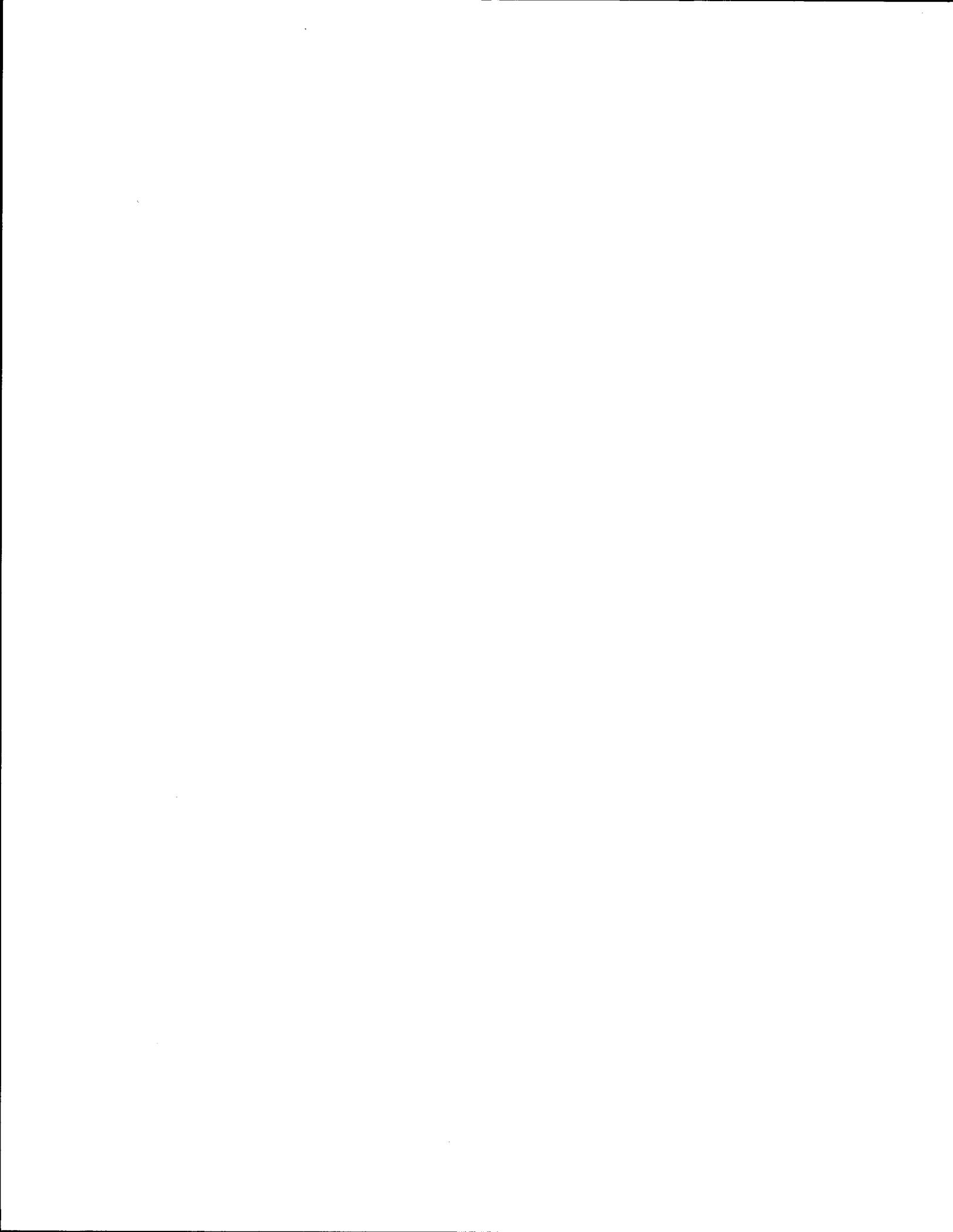
Question 8: How have those pavements performed in terms of cracking roughness?

Question 9: What procedures or treatments do you use to maintain those stabilized pavements, and in what condition is the pavement when the procedure is applied?

These responses revealed generally varied but favorable performances from stabilized subgrade and bases. The biggest objection is excessive crashing and not roughness or loss of load-carrying capability. Question 9 revealed a wide variety of treatments ranging from crack sealing to overlay for each type of stabilization and for stabilizer of subgrades and bases. A detailed description of the maintenance action is presented in Appendix B.

Question 10: How do you determine which type of maintenance treatment to apply?

Question 10 establishes that maintenance decisions are based on engineering judgement 82 percent of the time, pavement management programs 41 percent of the time, decisions trees 29 percent of the time, and policy manuals 12 percent of the time.



## **CHAPTER 3. IDENTIFY FACTORS FOR MAINTENANCE STRATEGY SELECTION PROCESS**

### **INTRODUCTION**

The results of the questionnaires, both from TxDOT (Appendix A) and other sources, were used to develop the treatment strategy selection matrix. A variety of assignment procedures were tested and modified before developing the final assignment procedure. The factors used to develop the matrix were: Predominant Distress Type, Extent, and Severity; Fast or Slow (development of distress); Traffic Level or Importance; Action if Only Localized, Short Term Repair, and Long Term Treatment. Each will be described below.

### **MAINTENANCE STRATEGY SELECTION CRITERIA**

Questionnaires and engineering judgement were used to determine which factors were most important in determining the maintenance treatment to use. The condition of the pavement, expressed as the type, severity, and extent of distress, and traffic level were the two primary factors.

The most common distress types identified in the responses and the literature were selected and included as primary criteria. These distress types were: transverse cracking, longitudinal cracking, rutting, alligator cracking, swell/roughness, and failures. It is possible that other distresses could have been included, but these appear to cover almost all of the typical problems. The definition of the distresses and severities were taken from the PMIS Rater's Manual (Ref XXX) since district personnel were most likely to be familiar with these definitions, regular training classes in data collection using this method are available, and because new or inexperienced personnel would be most likely to have seen or used these definitions.

In addition to the type, the extent or spacing of the cracks was found to be important. One transverse crack every 50' might be maintained much differently than on a pavement where the cracks were spaced only 10' apart.

The severity of the distress was also used as a primary criteria. Crack sealing is very effective for cracks less than ½ ", but less effective on very wide or very narrow cracks. Another example is for rutting where the ruts can be ½" to 1" or greater than 1".

Traffic was included in the primary matrix at three user-defined levels. A criteria of low, medium, or high traffic volume or importance was used instead of identifying specific traffic volumes of, for example, < 1000, 1000 to 20000, and > 20000. Several urban districts have low volume FM routes that have a higher AADT than the high volume of a more rural district. Greater flexibility was achieved by letting each district define low, medium, and high. The qualifier of level of "importance" was added to traffic the criteria since traffic volume alone may not account for the differences in decision making.

The final criteria in the decision matrix was for the treatment purpose. The three categories of Localized, Short-Term Repair, and Long-Term Treatment are meant to divide the matrix into three categories based on the intent of the treatment. If the purpose of the treatment is to fix the problem and restore the road, the Long Term criteria would be chosen. However, in many instances, the purpose of a treatment is to last, or hold the road condition, until a more substantial treatment or rehabilitation can be performed. This is reflected in the Short Term criteria. The third category is for the situation where the distress is only in a localized area. In this instance not all treatments are applicable. For example, although microsurfacing is often used to fill ruts, it would be impractical to use microsurfacing if the rutting was only a small amount of widely scattered areas.

From these criteria, the strategy selection process was developed. Several iterations were produced, filled out in-house, and modified prior to visiting the first district. However, one change was made after visiting the first two districts. Originally, the criteria was further spilt into two categories of whether or not there was any load-associated damage. The purpose of this question was to separate pavements that may have been worn out and beginning to deteriorate structurally. However, many of the districts responded that they would perform they same treatment and would just patch any small areas. This additional criteria was dropped and responses from earlier districts were converted. Table 2 is the final form for the maintenance strategy selection questionnaire.

Some of the early iterations included the type of stabilizer used and an estimate of the life of the treatment. The type of stabilizer criteria was dropped because the results of the questionnaires

(Appendix A), indicated that the type of stabilizer seemed to be less important than the traffic volume in predicting the performance or the treatment to be applied. The life of various alternatives was eliminated due to a lack of specific performance data and was replaced by the concept of asking which treatment would be used for a long-term treatment, short-term repair, and if the distress was only in a localized area.

## **COMPLETING THE QUESTIONNAIRES**

The matrix of questions was assembled, reviewed, and a face-to-face interview arranged at each district, except for El Paso, Laredo, and Odessa which were conducted by phone and fax. The interview was set up to be with the District Pavement Engineer, or the contact they designated, with assistance from as many maintenance personnel as needed. Typically, two people were involved in completing the questionnaire. Each questionnaire was sent back to the districts via E-mail for review. The results of these questionnaires are included in Appendix B.

Since districts are managed differently and have different capabilities with respect to maintenance techniques and treatments, the answer to “what is maintenance” was left to the individual districts. In some districts, maintenance forces can reconstruct two miles of pavement and still be considered maintenance. In other districts, anything more substantial than a seal coat was administered by the Construction Division or some other division. Because of this, the matrix can also be used to assist in deciding when it is too late to apply preventive maintenance. For example, if the proper long-term treatment is rehabilitation, routine crack sealing should not be performed.

Each block in the questionnaire, based on the predominant distress type, was described and completed prior to beginning the next block. Within a block, each line was discussed and completed. For example, under Transverse Cracking, the discussion was:

“What do you do for a long term treatment on a pavement that has transverse cracking with a crack spacing of >40' if the cracks are mostly tight and it is on a low volume or low importance road?”

“What do you do if you are just trying to hold it together until a more major treatment can be applied?”

“What if it the distress is only in a 200' long area?”

Often, it was easier to complete the block by starting at the most severe condition (considerable cracking, deteriorated, high volume or high importance) and working back to the less severe. The questionnaire was completed by reviewing the remaining blocks. In many occasions, the same treatment was used in multiple blocks.

After completing all of the questionnaires, the data was entered into a spreadsheet and is included as Appendix B.

**Table 2. Maintenance Strategy Selection**

Predominant Crack Distress	Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low Medium High			
		Open, < 1/2"	Low Medium High			
		>1/2" or deteriorated	Low Medium High			
		Cupped or Tented	Low Medium High			
	15' - 40'	Mostly tight	Low Medium High			
		Open, < 1/2"	Low Medium High			
		>1/2" or deteriorated	Low Medium High			
		Cupped or Tented	Low Medium High			
	<15'	Mostly Tight	Low Medium High			
		Open, < 1/2"	Low Medium High			
		>1/2" or deteriorated	Low Medium High			
		Cupped or Tented	Low Medium High			

Predominant Crack Distress	Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Longitudinal Cracking	>Lane Width	Mostly tight	Low Medium High			
		Open, < 1/2"	Low Medium High			
		>1/2" or deteriorated	Low Medium High			
	1 per lane	Mostly tight	Low Medium High			
		Open, < 1/2"	Low Medium High			
		>1/2" or deteriorated	Low Medium High			
	>1 per lane	Mostly Tight	Low Medium High			
		Open, < 1/2"	Low Medium High			
		>1/2" or deteriorated	Low Medium High			

**Table 1. Maintenance Strategy Selection (continued)**

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	0.5" to 1" (Shallow)	Low	F S			
			Medium	F S			
			High	F S			
	> 1" (Deep)		Low	F S			
			Medium	F S			
			High	F S			
	Both Wheelpaths	0.5" to 1" (Shallow)	Low	F S			
			Medium	F S			
			High	F S			
> 1" (Deep)			Low	F S			
			Medium	F S			
			High	F S			

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low Medium High			
		Major	Low Medium High			
	Both Wheelpaths	Minor	Low Medium High			
		Major	Low Medium High			

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/ Roughness	Some Roughness	Low Medium High			
	Rough	Low Medium High			

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low Medium High			
	Many	Low Medium High			

## CHAPTER 4. DEVELOP AUTOMATED FORMAT FOR MAINTENANCE STRATEGY SELECTION

A simple computer program was developed using the computer software C++<sup>R</sup> to display the specific treatment information identified by the experts in each district. While it would have been easier and far more elegant to develop the program for a Windows 95, 98, or NT with a Graphical User Interface (GUI) that would allow the user to pick assignments using the mouse, this may not have been compatible with older systems at some Area offices. Therefore, a DOS program was written. If the program receives wide support, a Windows version could be developed cheaply and easily.

The purpose of the computer program is to guide the user through a decision matrix by describing certain features about the roadway to be maintained. The features were listed in an earlier chapter but will be repeated here along with a complete description and discussion of the meaning and characteristics of each entry. This will serve as the user's manual and as the basis for the field guides.

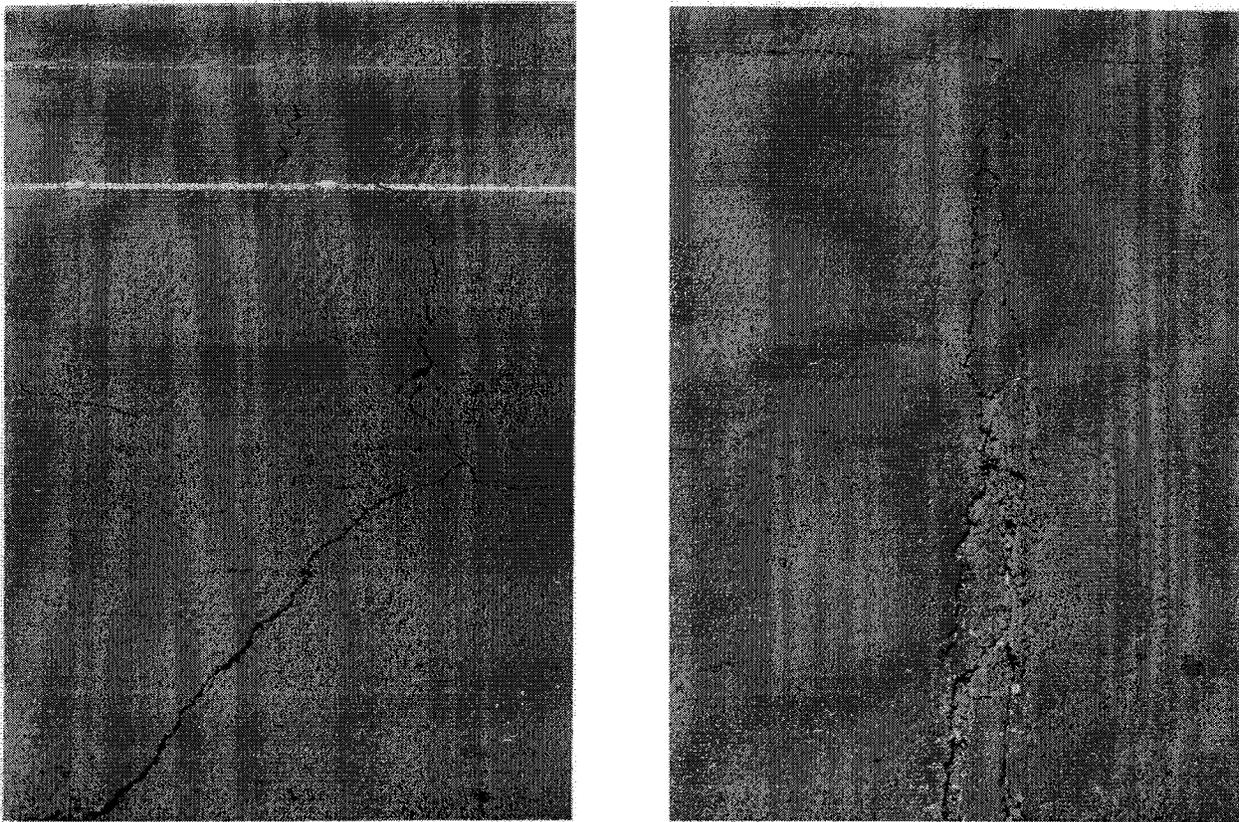
The PMIS manual was used for the description and severity of each distress (TxDOT 1998). The PMIS description and pictures of each distress are included below. In each district, the following description of each element was used. For the purpose of this discussion, we will proceed across a line in the selection process and describe each element. When moving to a new line or block, only the new items will be discussed.

Predominant Distress - For this pavement, determine which distress is the primary reason for maintenance of this pavement. The procedure can be rerun with a different distress to assess the impact on the treatment assignment. Normally, the more comprehensive treatment would be selected. For example, if crack sealing was the result of one run and seal coat was the result of using a different distress, seal coat would be selected.

*Case 1, the predominant distress is Transverse Cracking.*

Transverse Cracking - "Transverse cracking consists of cracks or breaks which travel at right angles to the pavement centerline (Figure 1). Joint cracks and reflective cracks may also be rated as transverse cracking.

Transverse cracks are usually caused by differential movement beneath the pavement surface. They may also be caused by surface shrinkage due to extreme temperature variations” (TxDOT 1998).



**Figure 1. Examples of Transverse Cracking (TxDOT 1998).**

What is the approximate spacing between transverse cracks?

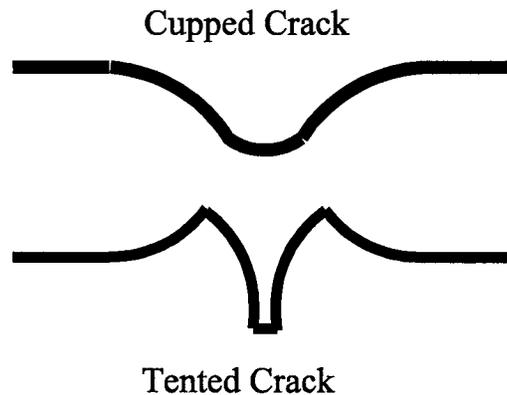
Crack Spacing - > 40' For a given pavement with only transverse cracking, assume that the crack spacing is >40'. One way to visualize this 40' spacing is that it is about one crack every centerline paint stripe.

Crack Spacing - 15'-40' In this case, assume the crack spacing is generally about 30'.

Crack Spacing - < 15' Assume that cracks are now spaced every 10' - 15'.

What is the typical severity of the cracks? Remember, small areas can be patched.

<u>Severity</u> -	Mostly Tight	These cracks are tight or hairline, about 1/16" to 1/8" wide. They are difficult to see unless after a rain or when stopped along the road and looking towards the sun.
<u>Severity</u> -	Open, < 1/2"	These cracks are easy to see, even while driving. They are wider than the tight cracks described above but are not spalled. These are easy to crack seal.
<u>Severity</u> -	> 1/2" or Deteriorated	These cracks are wide enough to be felt while driving and are easily visible. Small areas may be deteriorated, especially in the wheel paths.
<u>Severity</u> -	Cupped or Tented	These cracks are a difficult type of crack to repair. They are very rough and are usually caused by infiltration (tent) or pumping (cup) of the material. These cracks are somewhat rare in Texas, but if encountered can be difficult to address (Figure 2).



**Figure 2. Example of Cupped and Tented Cracks.**

What is the traffic level or importance of the road?

<u>Traffic Level - Or Importance</u>	Low	Think of a typical low volume FM road that doesn't carry much traffic.
--------------------------------------	-----	--

Traffic Level - Or Importance    Medium    A US highway, state route, or a high volume FM road are examples that can be used.

Traffic Level - Or Importance    High    Typically, an interstate or high volume US highway in the district is used as the example.

Based on the categories discussed above and the purpose of the maintenance, what treatment strategy would be used?

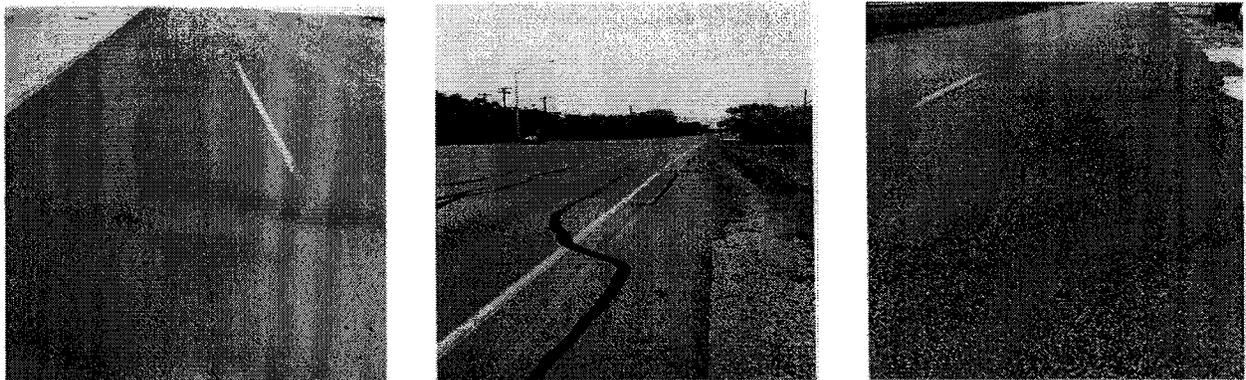
Strategy    Action if Only Localized    What do you do if the transverse cracking is only in one small area of about 200' long?

Strategy    Short Term Repair    1 - 2 Years    What do you do if you are just trying to hold the pavement for a year or two until a major or more appropriate treatment can be scheduled?

Strategy    Long Term Treatment    3+ Years    What is the appropriate Long Term treatment for this road?

*Case 2, the predominant distress is Longitudinal Cracking.*

Longitudinal Cracking -    “Longitudinal cracking consists of cracks or breaks which run approximately parallel to the pavement centerline (Figure 3). Edge cracks, joints or slab cracks, and reflective cracking on composite pavement (i.e., overlaid concrete pavement) may all be rated as longitudinal cracking. Differential movement beneath the surface is the primary cause of longitudinal cracking (TxDOT 1998)”.



**Figure 3. Examples of Longitudinal Cracking (TxDOT 1998).**

What is the approximate number of longitudinal cracks?

Crack Spacing - > Lane Width Assume that there is only one crack for both lanes.

Crack Spacing - 1 Per Lane In this case, there is one crack in each lane.

Crack Spacing - > 1 per Lane For this case, there is more than one crack per lane. Usually, this case has some faulting or dishing out of the outer crack in the outside lane.

What is the typical severity of the cracks? Remember, small areas can be patched.

Severity - Mostly Tight These cracks are tight or hairline, about 1/16" to 1/8" wide. They are difficult to see unless after a rain or when stopped along the road and looking towards the sun.

Severity - Open, < 1/2" These cracks are easy to see, even while driving. They are wider than the tight cracks described above, but are not spalled. These are easy to crack seal.

Severity - > 1/2" or Deteriorated These cracks are wide enough to be felt while driving and are easily visible. Small areas may be deteriorated and there may be faulting or spalling of the cracks.

Traffic Level or Importance, and Strategy selection are the same as for Transverse Cracking.

*Case 3, the predominant distress is Rutting.*

Rutting - "A rut is a longitudinal surface depression in a wheelpath (Figure 4). Rutting in the rated lane may be observed in one or both wheelpaths. Rutting is caused by consolidation or lateral movement of the pavement materials due to traffic loads. Significant amounts of rutting indicate that one or more of the pavement layers is inadequate. Rutting is indicative of a structural problem and may lead to the onset of serious structural failures (TxDOT 1998)".

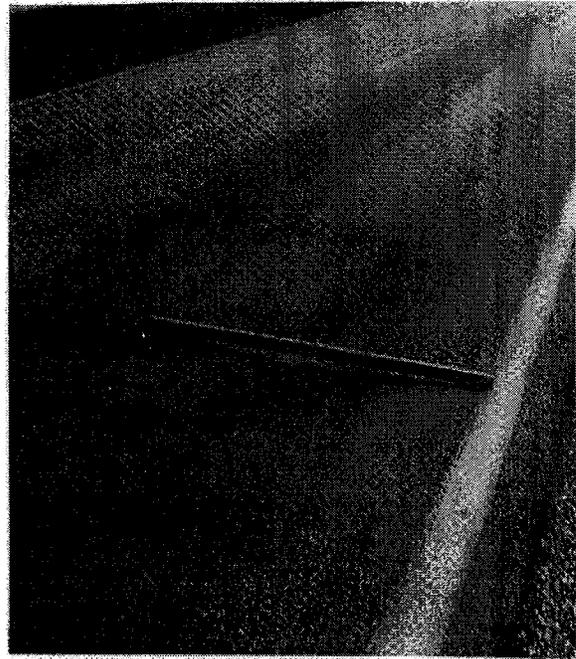
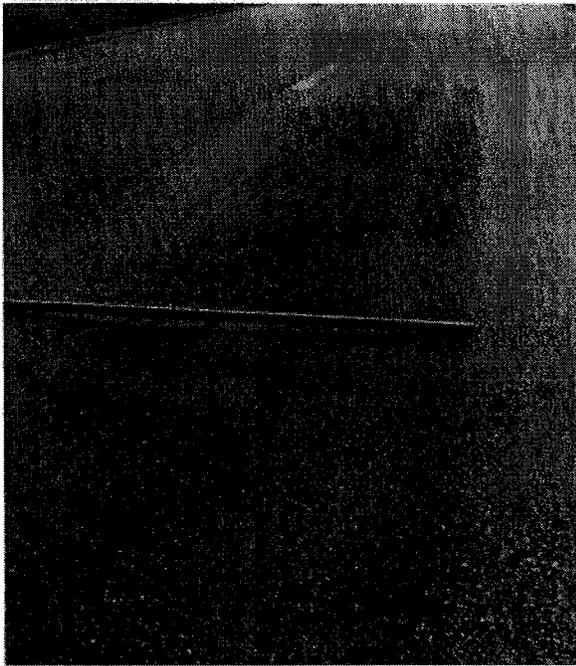
What is the extent of the rutting?

# Lanes - 1 Wheelpath Assume that the rutting is only in one wheelpath.

# Lanes - Both Wheelpaths What do you do if both wheelpaths are rutted?

What is the typical depth of the rutting?

- |                   |          |  |
|-------------------|----------|--|
| <u>Severity</u> - | ½" to 1" | The rutting is defined as shallow and may be difficult to see.   |
| <u>Severity</u> - | > 1"     | The rutting is deep, will hold considerable water, and is easy to see, even while driving. If the rut is greater than 2", use the criteria for failures. |



**Figure 4. Examples of Rutting (TxDOT 1998).**

Traffic Level or Importance, and Strategy selection are the same as for Transverse Cracking.

*Case 4, the predominant distress is Alligator Cracking.*

Alligator Cracking - "Alligator cracking consists of interconnecting cracks which form small, irregularly-shaped blocks which resemble the patterns found on an alligator's skin (Figure 5). Blocks formed by alligator cracks are less than 1 foot by 1 foot (0.3 meter by 0.3 meter). Larger blocks should be rated as block cracking.

Alligator cracks are formed whenever the pavement surface is repeatedly flexed under traffic loads. As a result, alligator cracking may indicate improper design or weak structural layers. Alligator cracking may also be caused by heavily-loaded vehicles (TxDOT 1998)".

What is the extent of the alligator cracking?

# Lanes - 1 Wheelpath Assume that the alligator cracking is only in one wheelpath.

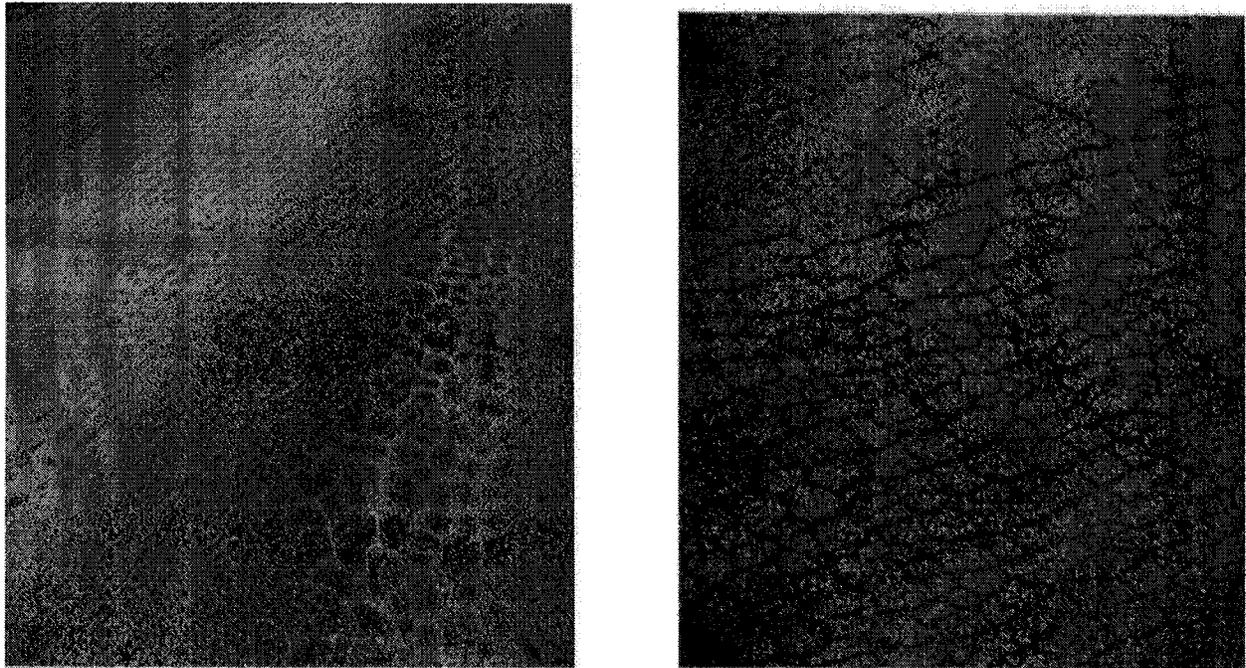
# Lanes - Both Wheelpaths What do you do if both wheelpaths have alligator cracking?

What is the severity of the alligator cracking?

Severity - Minor Not too extensive, cracking not too severe.

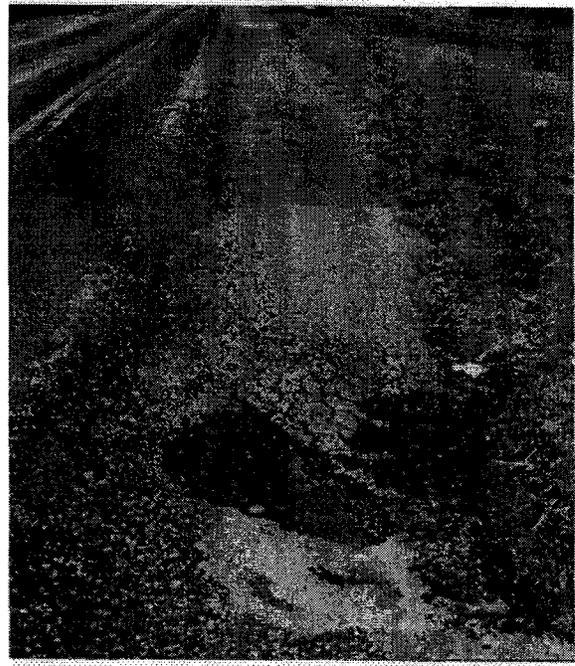
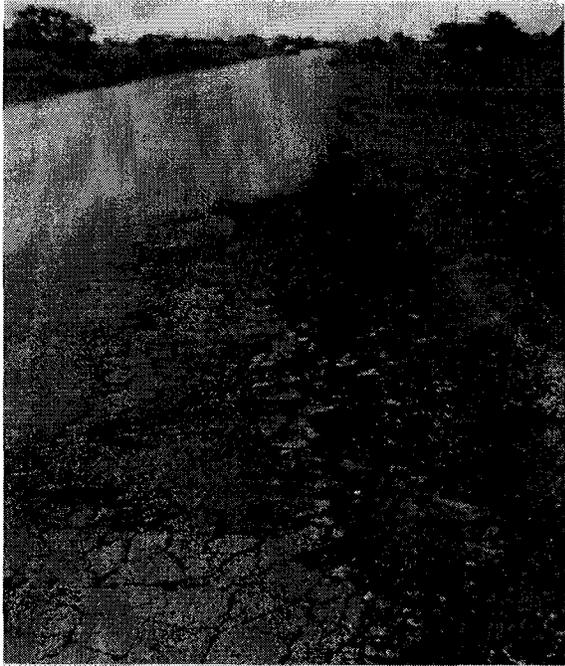
Severity - Major Alligator cracking is extensive, nearly continuous throughout the section, and the cracking is severe but not yet a failure.

Traffic Level or Importance, and Strategy selection are the same as for Transverse Cracking.



**Figure 5. Examples of Alligator Cracking (TxDOT 1998).**

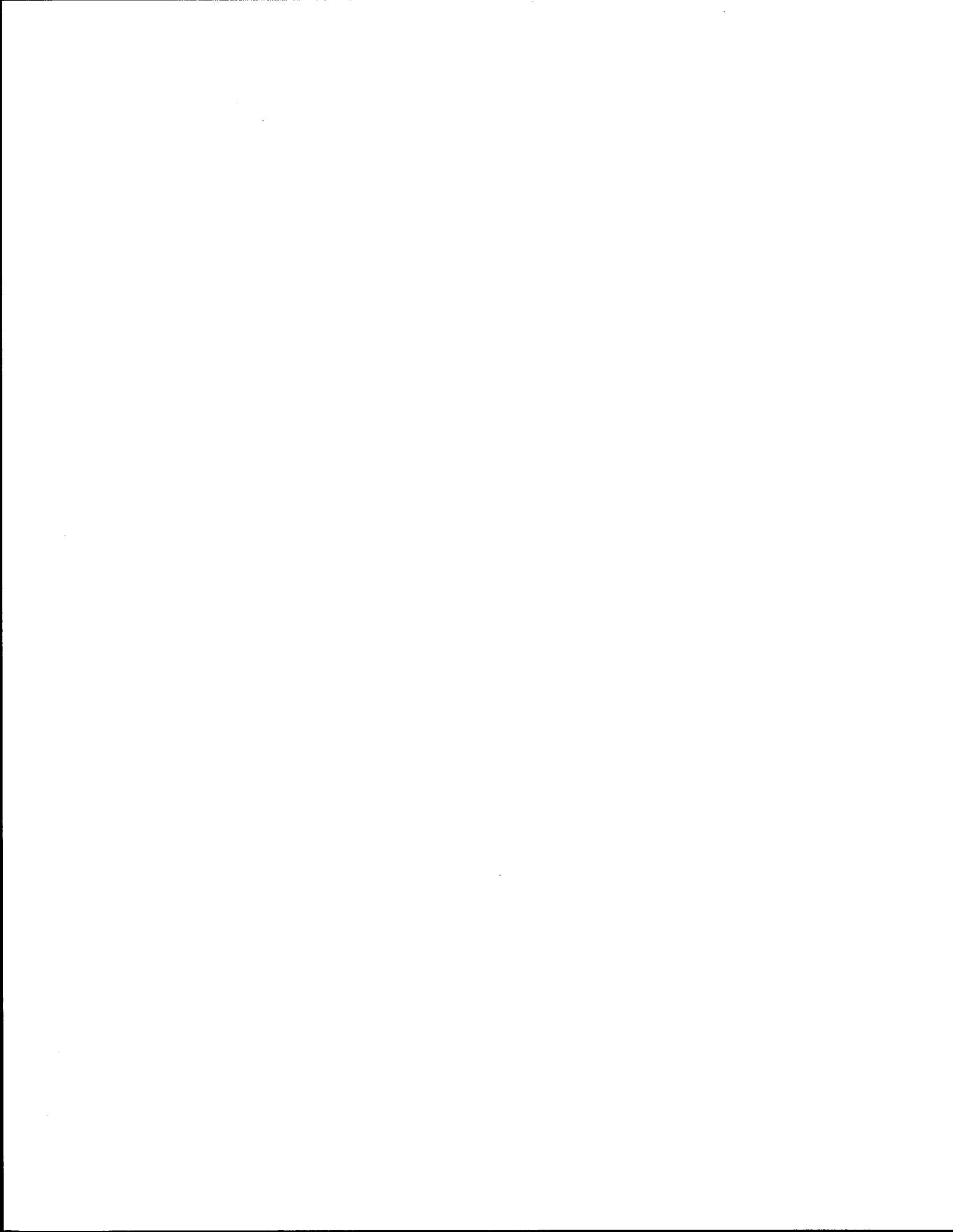




**Figure 6. Examples of Failures (TxDOT 1998).**

### **Cautions**

Except for the initial performance period, most pavements do not exhibit only a single type of distress. For example, rutting is often accompanied or followed by alligator cracking while transverse cracking is accompanied by longitudinal cracking. However, to have a simple, usable matrix, the strategy selection process had to be based on a single dominant distress. If the pavement has substantial amounts of multiple distresses, the procedure should be analyzed for each one and the most corrective treatment chosen.



## **CHAPTER 5. PREPARE FIELD GUIDES**

Two pocket field guides have been prepared, based on providing the appropriate input to the computer program and to the appropriate district attachment. The roadway version is taken directly from the preceding chapter and will guide the user through the decision criteria to the treatment selection identified by their district.

A separate guide has been prepared for airports because of the uniqueness of their situation and because the work is performed differently on the two pavements. The nature of airport traffic requires a much smoother pavement than can be tolerated on many roadways.



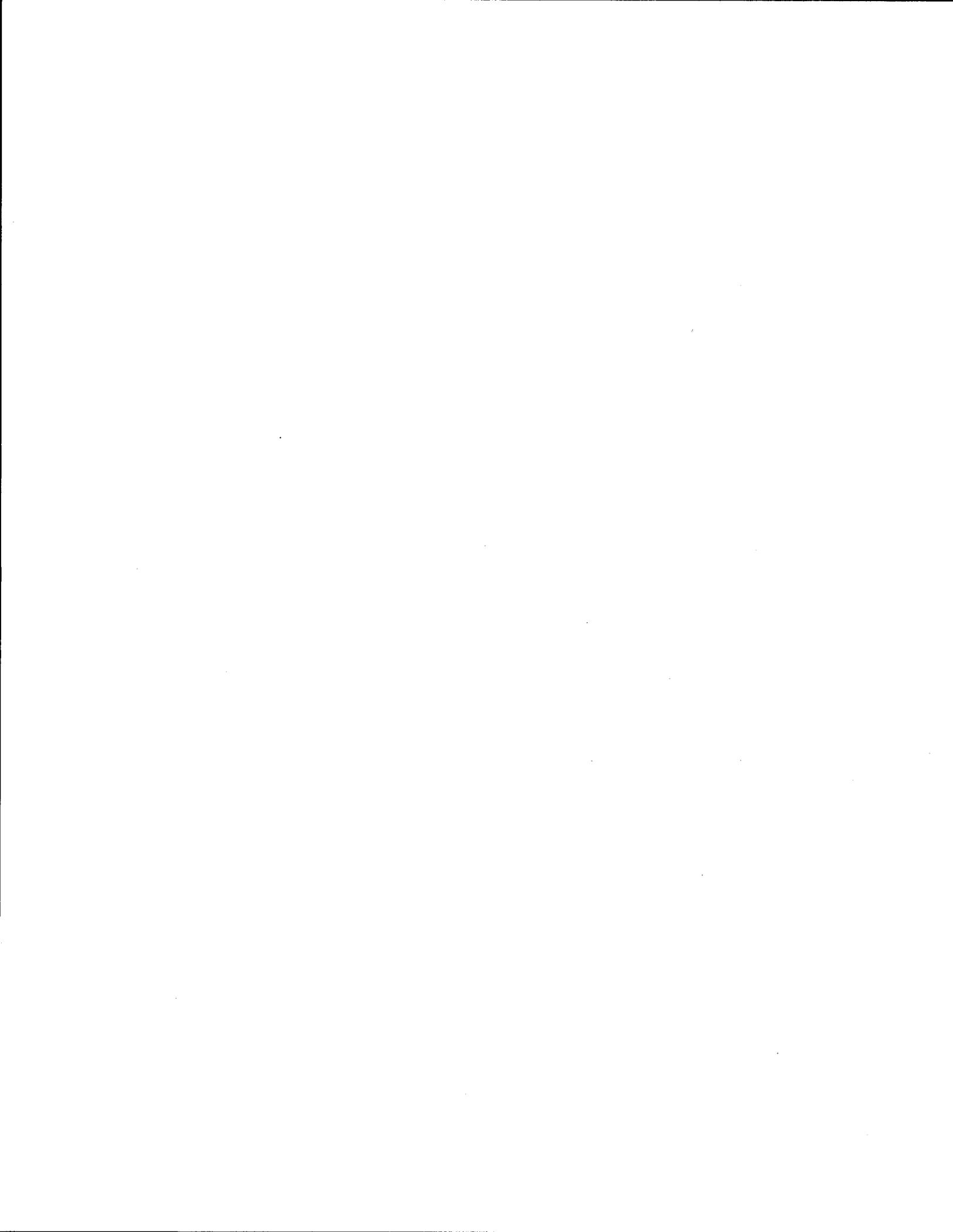
## REFERENCES

1. Alberola R., and J. Gordillo. "*Treatment of Cracks in Semi-Rigid Pavement: Cold Microsurfacing with Modified Bitumen Emulsion and Fibers: Spanish Experience,*" Proceedings of the 2<sup>nd</sup> International Rilem Conference, Liege, Belgium, 1993.
2. Atkinson D. J. "*Evaluation of Rehabilitation Measures for Cracked Cement Treated Pavements,*" Proceedings, 6th Conference, Road Engineering Association of Asia and Australia, 1990.
3. Biesenbach W. J., J. L. Barrable, and D. Shear. "*Practical Experience in the Rehabilitation of a Road with Cement-Treated Basecourse,*" Proceedings, 5th Conference on Asphalt Pavements for Southern Africa, June 1989.
4. Bhuiyan, J. U., D. N. Little, and R. E. Graves. "*Evaluation of Calcareous Base Course Materials Stabilized with Low Percentage of Lime in South Texas*". Transportation Research Record 1486, National Research Council, Washington D.C., 1995.
5. Costigan, R. R., and M. R. Thompson. "*Response and Performance of Alternate Launch and Recovery Surfaces that Contain Layers of Stabilized Material,*" Transportation Research Record 1095, National Research Council, Washington D.C., 1986.
6. Fetz L. B. "*Soil-Cement: Mix Design, Structural Design and Research in Progress in Switzerland,*" Presented at the 61st Annual Meeting of the Transportation Research Board, Washington D.C., 1982.
7. George, K. P. "*Characterization and Structural Design of Cement-Treated Base*". Transportation Research Record 1288, National Research Council, Washington D.C., 1990.
8. George, K. P. "*Mechanism of Shrinkage Cracking of Soil-Cement Bases,*" Transportation Research Record 442, National Research Council, Washington D.C., 1973.
9. Haas R., W. R. Hudson, and J. Zanieswski. "*Modern Pavement Management,*"

- Krieger Publishing Company, Malabar, Florida, 1994.
10. Kota, P. B. V. S., T. Scullion, and D. N. Little. "*Investigation of Performance of Heavily Stabilized Bases in Houston District*," Presented at the 74th Annual Meeting of the Transportation Research Board, Washington D.C., January 1995.
  11. Norling, L. T. "*Minimizing Reflective Cracks in Soil-Cement Pavements: A Status Report of Laboratory Studies and Field Practices*". Transportation Research Record 442, National Research Council, Washington D.C., 1973.
  12. "Pavement Management Information System Rater's Manual for Fiscal Year 1999," Texas Department of Transportation, June, 1998.
  13. Ste. Anne Test Road: "Construction and Summary and Performance After Two Years Service," Manitoba Highway and Shell Canada Limited.
  14. Yamanouchi T. "*Some Studies on the Cracking of Soil-Cement in Japan*," Transportation Research Record 442, National Research Council, Washington D.C., 1973.

Appendix A

Results of Survey  
by District



1. What additives do you use for stabilizing bases and subgrades?

Dist	Subgrade				Base			
	Lime	Cement	Lime-Fly Ash	Asphalt	Lime	Cement	Lime-Fly Ash	Asphalt
Ama	X					X	X	X
Atl	X		X		X		X	
Beau	X							X
Bro	X				X	X		
Bry	X	X						
Corp	X	X			X	X		
ElPa	X	X			X	X		X
FtW	X	X			X	X		
Hou	X	X			X	X		X
Lar	X				X	X		X
Lub			X*				X*	
Luf	X				X	X		
Ode		X				X		X
Par								
Tyl								
San								
Yoa	X				X	X		

Beau - Synthetic fibers

\* Lub - Fly ash (no lime) for both base and subgrade

2. What thickness do you typically stabilize?

Dist	Subgrade				Base			
	Lime	Cement	Lime-Fly Ash	Asphalt	Lime	Cement	Lime-Fly Ash	Asphalt
Ama	6					6-10	6-10	4-6
Atl	8		8-16		10		10	
Beau	6							8
Bro	6-10	6-10			10	10		
Bry								
Corp	8	8			8-16	8-16		
ElPa	6	6						6
FtW	8	8			8-12	8-12		
Hou	6	6			14	12		Var
Lar	8	8			8-14	8		12
Lub			8*				8*	
Luf	6-10				6-10	10		
Ode	6					6		6
Par								
Tyl								
San								
Yoa	6				14	14		

Lub - \* Fly ash (no lime) only

3. What percent stabilizer do you typically use?								
Dist	Subgrade				Base			
	Lime	Cement	Lime- Fly Ash	Asphalt	Lime	Cement	Lime- Fly Ash	Asphalt
Ama	3-4					2	1 and 4	4.5
Atl	4-5		3-6		3-4.5		1-2/3-6	
Beau	6							4
Bro	4-8	4-8			4	4		
Bry								
Corp	4	4-6			1.5-2	4-5		
ElPa	3	4						6
FtW	5-6	5-6			3-5	3-5		
Hou	6	Var				5		5
Lar	3	2			1	2		4
Lub			7 or 10*					
Luf	6				6	5		
Ode		3-6				3-6		Var
Par								
Tyl								
San								
Yoa	5				1.5-2			

Lub - \* Fly ash (no lime) only

4. How do you choose the percentage?			
Dist	Engineering Judgement	Mix Design	Standard Design
Ama		X	
Atl	X		
Beau	X		X
Bro	X <sub>C</sub>		X <sub>L</sub>
Bry			
Corp	X	X	
ELPa		X	
FtW	X	X	
Hou	X		X
Lar			
Lub			
Luf			X
Ode			X
Par			
Tyl			
San			
Yoa			

5. What are typical back-calculated moduli (KSI) for these stabilized layers?								
Dist	Subgrade				Base			
	Lime	Cement	Lime- Fly Ash	Asphalt	Lime	Cement	Lime- Fly Ash	Asphalt
Ama	20					800	300	300
Atl	X							
Beau	X							
Bro	X							
Bry								
Corp	30-50	50-70			70-100	1200- 1800		
ElPa	X							
FtW								
Hou	30				60	1000- 2000		300
Lar	X				X			
Lub			60-120*				60-120*	
Luf	X				X	X		
Ode		60				100		450
Par								
Tyl								
San								
Yoa	800				1500			

X - Not enough data

FtW - Tom Scullion should have these values

Lub - \* Fly ash (no lime) only

6. What typical strength values do you get?

Dist	Subgrade				Base			
	Lime	Cement	Lime-Fly Ash	Asphalt	Lime	Cement	Lime-Fly Ash	Asphalt
Ama	Q <sub>u</sub> =60					100-300	80	50
Atl	Q <sub>u</sub> =145							
Beau	X							
Bro	X							
Bry								
Corp	X							
ElPa	X							
FtW								
Hou	M <sub>r</sub> =30k				M <sub>r</sub> =50-700k	1000-2000		300-500
Lar								
Lub	X							
Luf	X				X	X		
Ode		X				X		X
Par								
Tyl								
San								
Yoa	X							

X - No data

FtW - Tom Scullion should have these values

Lub - \* Fly ash (no lime) only

Lar - Class 1 or Class 2

7. What types of problems have you encountered with your stabilization efforts?

Dist	Sulfate Swell	Organics	Drainage	Excessive Cracking	Cupping or tenting	Faulting	Loss of Stabilization	Fatigue Cracking
Ama				X	X			
Atl				X				X
Beau			X				X	X
Bro	X			X			X	
Bry				X		X	X	X
Corp			X				X	X
EIPa	X							
FtW	X			X	X		X	
Hou				X			X	
Lar	*	*	*	*	*	*	*	*
Lub								
Luf				X				
Ode								
Par				X				X
Tyl								
San								
Yoa				X				

Lar - \* No Problems

Amar - Higher cement means more cracking

Atl - Stopped using L-FA. Low rates worked well; higher rates worked poorly.

Lub - Difficult for AC surface treatments to stick to fly ash treated base. Fly ash stabilized base takes longer to harden. Fly ash base can form a crystalline skin surface.

Luf - Excessive cracking if too high a percentage of cement used, otherwise no problems.

Ode - Not enough data or historical information is available yet.

Tyl - Cracking from over stabilization

SA - Asphalt emulsion led to pushing, shoving, and rutting due to high asphalt content.

Yoa - Excessive cracking may be due to over-stabilization

8. How have those pavements performed in terms of cracking and roughness?

Dist	Low Traffic				Medium Traffic				High Traffic			
	Lime	Cement	LFA	AC	Lime	Cement	LFA	AC	Lime	Cement	LFA	AC
Ama							GS	GS	GS	PM	GS	GS
Atl	GS		MF		GS		RP		GS		RP	
Beau	MF			MF	MF			MF	MF			MF
Bro	S	G			S	G			S	G		
Bry	GS	GS			GS	GS			GS	GS		
Corp	MG	MG			MF	MG			MP	MF		
EIPa												
FtW	SG	SG			SG	SG			SG	SG		
Hou	SC	SC			MF	MF			MP	MP		
Lar	SG				MG				MG			MG
Lub												
Luf	G	G			G	G						
Ode		S				S				S		
Par	GS	GS			GS	GS		GS	GM	GM		GM
Tyl	GF-S	GF-S	GF-S		GF-S	GF-S	GF-S		GF-S	GF-S	GF-S	
San		GM		GM		GM		GM		GM		GM
Yoa	MF				MF				MF			

S - Smooth, not noticeable

M - Moderate tire noise

R - Rough, cupping

G - Good, cracks are tight, few  
(50' spacing)

F - Many cracks  
(20' Spacing)

P - Many open cracks  
(<20' Spacing)

EIP - Most treatments under concrete pavements

Lub - Fly ash, all Smooth and Good

San - RAP all GM

9. What procedures or treatments do you use to maintain those stabilized pavements and in what condition is the pavement when the procedure is applied?

Dist	Low Traffic			Medium Traffic			High Traffic		
	Good	Fair	Poor	Good	Fair	Poor	Good	Fair	Poor
Ama	CS	SC	SC		SC	R	CS	R	R
Atl		SC	SC+CS		SC+OL	CS+OL	SC	SC+TOL	CS+TOL
Beau		S	OL		S	OL		OL	OL
Bro	CS	SC	SC+OL	CS	SC	SC+OL	CS	SC	SC+OL
Bry	CS	SC	R	CS	SC	R	CS	SC	R
Corp	SC	SC	SC	OL/SC	OL/SC	R/SC	SC/OL	SC/OL	R/Rec
EIPa	SC	SC	CS	SC	SC	CS	SC	SC	CS
FtW									
Hou		CS	CS+OL		CS	CS+OL		CS	CS+OL
Lar	CS	CS		SC	SC		OL	SC	
Lub									
Luf	CS	CS	CS+Lev						
Ode	SC,OL			SC,OL					
Par	SC	SC,CS	CS+SC	SC	CS+SC	CS+M +SC	M	CS+M	CS+SC+ OL
Tyl		SC	CS		SC	CS		SC	CS
San	CS,SC ,OL	SC	R	CS,SC ,OL	SC	R		SC	CS
Yoa		CS	CS		CS,SC	CS,SC			

CS - Crack Seal

SC - Seal Cracks

R - Rehab

Rec - Reconstruct

OL - Overlay

TOL - Thick Overlay M-Micro

Lev - Level Up

Lub - Within the last three years, we have had no problems with cracking of fly ash treated base, nor have we performed any maintenance.

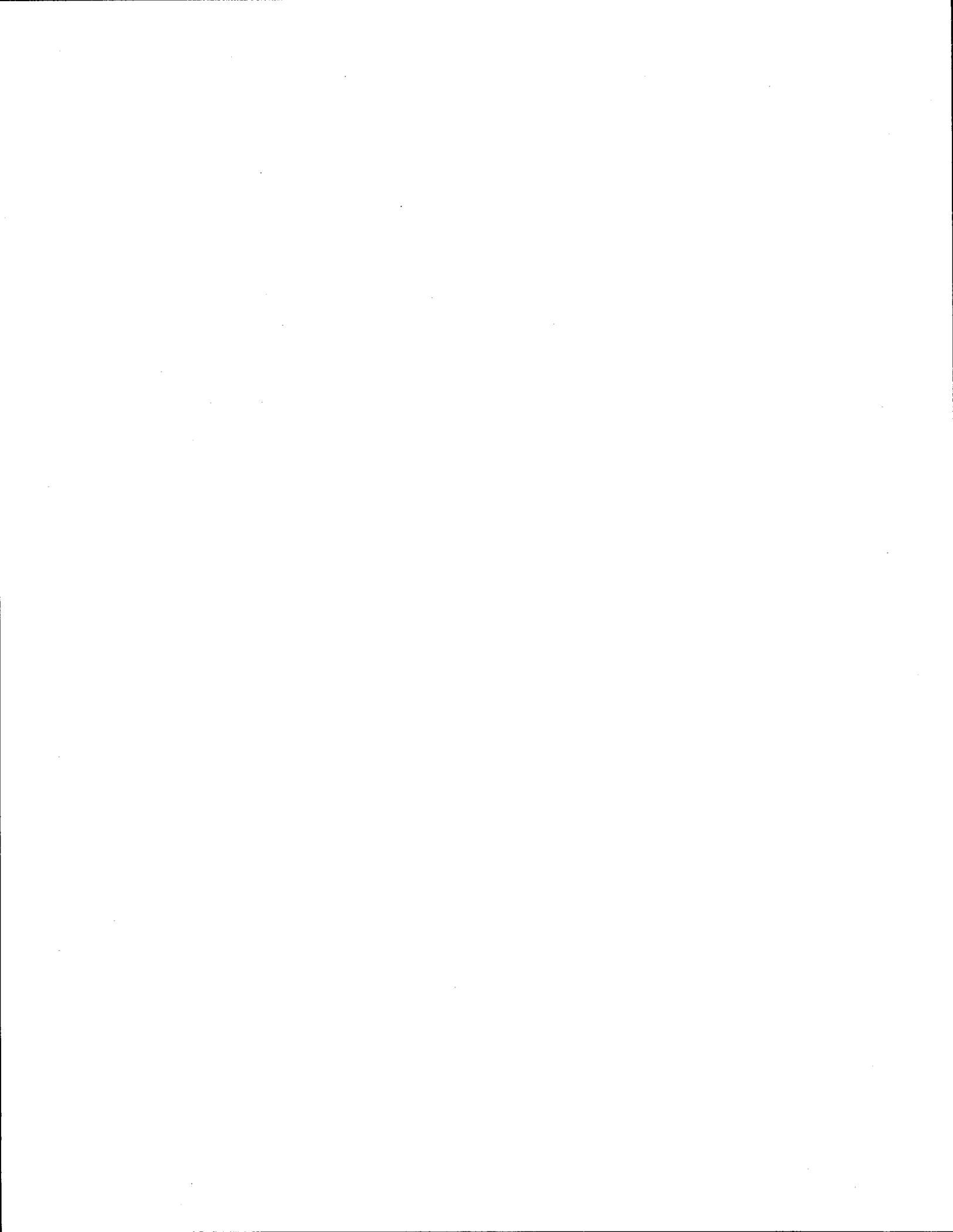
10. How do you determine which type of maintenance treatment to apply?				
Dist	Engineering Judgement	Pavement Management Program	Decision Tree	Policy, Manuals
Ama	X	X		
Atl	X		x	
Beau	X			X
Bro	X			
Bry	X	X	X	X
Corp	X	X		
ElPa	X			
FtW	X	X	X	
Hou	X			
Lar		X		
Lub	X	X	X	
Luf	X			
Ode	X	X		
Par	X			
Tyl			X	
San				
Yoa	X			

Lar - Money available

San - Maintenance supervisor decides

# Appendix B

## Results of Questionnaires by District



# Abilene

Predominant Crack Distress	Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor
			High	Crack seal	Crack seal	Crack seal
	Open, < 1/2"		Low	Crack seal	Seal coat	Crack seal and seal coat
			Medium	Crack seal	Seal coat	Crack seal and rubberized seal coat
			High	Crack seal	Crack seal and seal coat	Crack seal and rubberized seal coat
	>1/2" or deteriorated		Low	Crack seal and strip seal	Seal coat	Rehabilitate
			Medium	Patch and crack seal	Crack seal and hot mix	Rehabilitate
			High	Patch and crack seal	Crack seal and hot mix	Rehabilitate
	Cupped or Tented		Low	Crack seal	Monitor	Monitor
			Medium	Patch and crack seal	Joint repair	Joint repair
			High	Patch and crack seal	Joint repair	Joint repair
15' - 40'	Mostly tight	Low	Crack seal	Seal coat	Seal coat	
		Medium	Crack seal	Seal coat	Seal coat	
		High	Crack seal	Seal coat	Seal coat	
	Open, < 1/2"		Low	Crack seal	Seal coat	Seal coat
			Medium	Crack seal	Seal coat	Hot mix overlay
			High	Crack seal	Hot mix overlay	Rehabilitate
	>1/2" or deteriorated		Low	Patch and crack seal	Seal coat	Rehabilitate
			Medium	Patch and crack seal	Rehabilitate	Rehabilitate
			High	Patch and crack seal	Rehabilitate	Rehabilitate
	Cupped or Tented		Low	Patch and crack seal	Monitor	Monitor
			Medium	Patch and crack seal	Joint repair	Joint repair
			High	Patch and crack seal	Joint repair	Rehabilitate
<15'	Mostly Tight	Low	Crack seal	Seal coat	Seal coat	
		Medium	Crack seal	Seal coat	Seal coat	
		High	Crack seal	Seal coat	Hot mix overlay	
	Open, < 1/2"		Low	Crack seal	Seal coat	Hot mix overlay
			Medium	Crack seal	Hot mix overlay	Rehabilitate
			High	Crack seal	Rehabilitate	Rehabilitate
	>1/2" or deteriorated		Low	Patch and crack seal	Rehabilitate	Rehabilitate
			Medium	Patch and crack seal	Rehabilitate	Reconstruction
			High	Patch and crack seal	Reconstruction	Reconstruction
	Cupped or Tented		Low	Patch and crack seal	Joint repair	Joint repair
			Medium	Patch and crack seal	Rehabilitate	Rehabilitate
			High	Patch and crack seal	Rehabilitate	Rehabilitate

Predominant Crack Distress	Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Plant mix seal or hot mix overlay
	Open, < 1/2"		Low	Crack seal	Crack seal	Seal coat
			Medium	Crack seal	Crack seal	Crack seal and rubberized seal coat
			High	Crack seal	Crack seal and hot mix overlay	Crack seal and hot mix overlay
	>1/2" or deteriorated		Low	Crack seal	Patch and crack seal	Patch and hot mix overlay
			Medium	Patch and crack seal	Patch and hot mix overlay	Rehabilitate
			High	Patch and crack seal	Patch and hot mix overlay	Rehabilitate
	1 per lane	Mostly tight	Low	Crack seal	Seal coat	Seal coat
			Medium	Crack seal	Seal coat	Seal coat
			High	Crack seal	Seal coat	Seal coat
Open, < 1/2"		Low	Crack seal	Seal coat	Seal coat	Seal coat
		Medium	Crack seal	Seal coat	Hot mix overlay	Hot mix overlay
		High	Crack seal	Hot mix	Hot mix overlay	Hot mix overlay
>1/2" or deteriorated	Low	Crack seal	Rehabilitate	Rehabilitate	Rehabilitate	
	Medium	Patch and crack seal	Rehabilitate	Rehabilitate	Rehabilitate	
	High	Patch and crack seal	Rehabilitate	Rehabilitate	Reconstruct	
>1 per lane	Mostly Tight	Low	Seal coat	Seal coat	Seal coat	
		Medium	Seal coat	Seal coat	Seal coat	
		High	Seal coat	Seal coat	Hot mix overlay	
	Open, < 1/2"	Low	Seal coat	Seal coat	Seal coat	Seal coat
		Medium	Seal coat	Seal coat	Hot mix overlay	Hot mix overlay
		High	Seal coat	Rehabilitate	Rehabilitate	Rehabilitate
>1/2" or deteriorated	Low	Reconstruct	Reconstruct	Rehabilitate	Rehabilitate	
	Medium	Reconstruct	Reconstruct	Rehabilitate	Reconstruct	
	High	Reconstruct	Reconstruct	Reconstruct	Reconstruct	

## Abilene (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	Low	F	Fill rut	Monitor	Monitor	Monitor	
			S	Monitor		Monitor		
		0.5" to 1" (Shallow)	Medium	F	Fill rut	Monitor	Monitor	Fill rut
			S	Monitor	Monitor		Fill rut	
		High	F	Fill rut	Fill rut	Fill rut	Fill rut	
			S	Fill rut		Fill rut		
	> 1" (Deep)	Low	F	Fill rut	Monitor	Monitor	Fill rut	
			S	Monitor		Monitor	Fill rut	
		Medium	F	Patch	Fill rut	Fill rut	Patch	
			S	Fill rut		Fill rut	Patch	
		High	F	Patch	Fill rut	Patch	Mill and hot mix overlay	
			S	Fill rut		Patch	Mill and hot mix overlay	
Both Wheelpaths	Low	F	Fill rut	Monitor	Monitor	Monitor		
		S	Monitor		Monitor			
	0.5" to 1" (Shallow)	Medium	F	Fill rut	Monitor	Fill rut	Fill rut	
		S	Monitor	Monitor		Fill rut		
	High	F	Fill rut	Fill rut	Patch	Patch		
		S	Fill rut		Patch	Patch		
> 1" (Deep)	Low	F	Fill rut	Monitor	Fill rut	Fill rut		
		S	Monitor		Fill rut	Fill rut		
	Medium	F	Patch	Patch	Patch	Mill and hot mix overlay		
		S	Patch		Patch	Mill and hot mix overlay		
	High	F	Patch	Patch	Mill and hot mix overlay	Mill and hot mix overlay		
		S	Patch		Mill and hot mix overlay	Mill and hot mix overlay		

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Crack seal	Patch
			Medium	Patch	Patch	Patch
			High	Patch	Patch	Patch
		Major	Low	Patch	Patch	Deep patch
			Medium	Patch	Patch	Deep patch
			High	Patch	Deep patch	Deep patch
	Both Wheelpaths	Minor	Low	Monitor	Patch	Patch
			Medium	Patch	Patch	Deep patch
			High	Deep patch	Deep patch	Deep patch
		Major	Low	Patch	Patch	Deep patch
			Medium	Patch	Deep patch	Rehabilitate
			High	Deep patch	Rehabilitate	Rehabilitate

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Swell/ Roughness	Some Roughness	Low	Monitor	Monitor	Hot mix overlay	
		Medium	Monitor	Hot mix overlay	Mill and hot mix overlay	
		High	Level up	Mill and hot mix overlay	Rehabilitate	
	Rough	Low	Monitor	Level up	Hot mix overlay	Hot mix overlay
		Medium	Level up	Level up	Mill and hot mix overlay	Rehabilitate
		High	Level up	Level up	Rehabilitate	Rehabilitate

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Failures	Few	Low	Patch	Patch	Patch	
		Medium	Patch	Patch	Hot mix overlay	
		High	Patch	Mill and hot mix overlay	Rehabilitate	
	Many	Low	Patch	Patch	Patch	Hot mix overlay
		Medium	Patch	Mill and hot mix overlay	Rehabilitate	
		High	Patch	Rehabilitate	Rehabilitate	

David Seago

## Amarillo

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40"	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	
	Mostly tight	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor and crack seal if nearby	Crack seal	Crack seal	
		High	Monitor and crack seal if nearby	Crack seal	Crack seal	
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
Cupped or Tented	Low	Crack seal or monitor	Crack seal or monitor	Crack seal or monitor	Crack seal or monitor	
	Medium	Crack seal	Crack seal	Crack seal	Crack seal	
	High	Crack seal	Crack seal	Crack seal	Crack seal	
15' - 40'	Mostly tight	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor or fog seal	Monitor or fog seal	
		High	Monitor	Monitor or fog seal	Monitor or fog seal	
	Open, < 1/2"	Low	Monitor and crack seal if nearby	Crack seal	Crack seal and seal coat	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Monitor and crack seal if nearby	Crack seal	Crack seal and seal coat	
		Medium	Crack seal	Crack seal	Plan major rehabilitation	
		High	Crack seal	Crack seal	Plan major rehabilitation	
	Cupped or Tented	Low	Crack seal	Crack seal and patch bad areas	Crack seal and patch bad areas, plan seal coat	
		Medium	Crack seal and monitor	Dig out and replace	Plan major rehabilitation	
		High	Crack seal and monitor	Dig out and replace	Plan major rehabilitation	
<15'	Mostly Tight	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor or fog seal	Monitor or fog seal	
		High	Monitor	Monitor or fog seal	Monitor or fog seal	
	Open, < 1/2"	Low	Monitor and crack seal if nearby	Crack seal	Crack seal and seal coat	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Blade patch	Crack seal	Overlay	
		Medium	Crack seal	Crack seal	Overlay	
		High	Crack seal	Crack seal	Plan major rehabilitation	
	Cupped or Tented	Low	Blade patch	Crack seal, patch bad areas, and seal coat	Crack seal, patch bad areas, and seal coat	
		Medium	Blade patch or crack seal	Dig out and replace or crack seal, patch bad areas, and seal coat	Plan major rehabilitation or crack seal, patch bad areas, and seal coat	
		High	Crack seal and monitor	Dig out and replace	Plan major rehabilitation	

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	
	Mostly tight	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor and crack seal if working nearby	Crack seal	Crack seal	
		High	Monitor and crack seal if working nearby	Crack seal	Crack seal	
	Open, < 1/2"	Low	Monitor and crack seal if working nearby	Crack seal	Crack seal	
		Medium	Remove, restabilize, and replace	Crack seal	Crack seal	
		High	Remove, restabilize, and replace	Crack seal and level up	Crack seal and level up	
	>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor	Monitor
		High	Monitor	Monitor	Monitor	Monitor
1 per lane	Mostly tight	Low	Monitor and crack seal if working nearby	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
Open, < 1/2"	Low	Monitor and crack seal and blade patch worst areas if working nearby	Crack seal and blade patch worst areas	Seal coat		
	Medium	Crack seal and blade patch worst areas	Crack seal and blade patch worst areas	Overlay		
	High	Crack seal and blade patch worst areas	Crack seal and blade patch worst areas	Overlay		
>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	Monitor	
	Medium	Monitor	Monitor	Monitor	Monitor	
	High	Monitor	Monitor	Monitor	Monitor	
>1 per lane	Mostly Tight	Low	Remove, restabilize, and replace	Crack seal	Seal coat	
		Medium	Remove, restabilize, and replace	Crack seal	Mill and overlay	
		High	Remove, restabilize, and replace	Crack seal	Mill and overlay	
Open, < 1/2"	Low	Remove, restabilize, and replace	Crack seal and blade patch worst areas	Plan major rehabilitation		
	Medium	Remove, restabilize, and replace	Crack seal and blade patch worst areas	Plan major rehabilitation		
	High	Remove, restabilize, and replace	Crack seal and blade patch worst areas	Plan major rehabilitation		
>1/2" or deteriorated	Low	Remove, restabilize, and replace	Crack seal and blade patch worst areas	Plan major rehabilitation		
	Medium	Remove, restabilize, and replace	Crack seal and blade patch worst areas	Plan major rehabilitation		
	High	Remove, restabilize, and replace	Crack seal and blade patch worst areas	Plan major rehabilitation		

## Amarillo (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F	Monitor	Monitor	Monitor	Monitor
			S	Monitor or strip seal	Strip seal	Strip seal	
		0.5" to 1" (Shallow)	Medium	F	Remove, restabilize, and replace	Monitor	Monitor
				S	Blade patch or level up	Monitor	Overlay
		High	F	Remove, restabilize, and replace	Monitor	Monitor	
			S	Blade patch or level up	Monitor	Overlay	
	> 1" (Deep)	Low	F	Remove, restabilize, and replace	Blade patch	Blade patch and plan rehabilitation	
			S	Remove, restabilize, and replace	Monitor	Microsurface	
		Medium	F	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	
			S	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	
		High	F	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	
			S	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Monitor	Monitor	Monitor	
			S	Monitor or strip seal	Strip seal	Strip seal	
		Medium	F	Remove, restabilize, and replace	Monitor	Monitor	
			S	Blade patch or level up	Monitor	Overlay	
		High	F	Remove, restabilize, and replace	Monitor	Monitor	
			S	Blade patch or level up	Monitor	Overlay	
	> 1" (Deep)	Low	F	Remove, restabilize, and replace	Blade patch	Blade patch and plan rehabilitation	
			S	Remove, restabilize, and replace	Monitor	Microsurface	
		Medium	F	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	
			S	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	
		High	F	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	
			S	Mill and level up	Mill and level up	Mill, level up, and plan rehabilitation	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Monitor	Monitor and plan rehabilitation
			Medium	Monitor	Monitor	Monitor and plan rehabilitation
			High	Monitor	Monitor	Monitor and plan rehabilitation
		Major	Low	Dig out and replace	Plan major rehabilitation	Plan major rehabilitation
			Medium	Dig out and replace	Plan major rehabilitation	Plan major rehabilitation
			High	Dig out and replace	Plan major rehabilitation	Plan major rehabilitation
	Both Wheelpaths	Minor	Low	Monitor	Seal coat	Seal coat
			Medium	Monitor	Plan major rehabilitation	Plan major rehabilitation
			High	Monitor	Plan major rehabilitation	Plan major rehabilitation
		Major	Low	Remove, restabilize, and replace	Plan major rehabilitation	Plan major rehabilitation
			Medium	Remove, restabilize, and replace	Plan major rehabilitation	Plan major rehabilitation
			High	Remove, restabilize, and replace	Plan major rehabilitation	Plan major rehabilitation

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Monitor
		Medium	Maybe patch and overlay	Maybe level up	Overlay
		High	Maybe patch and overlay	Maybe level up	Overlay
	Rough	Low	Blade level	Monitor	Plan rehabilitation
		Medium	Level up	Level up	Plan rehabilitation
		High	Level up	Level up	Plan rehabilitation

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Dig out and replace	Remove, restabilize, and replace	Dig out and replace
		Medium	Dig out and replace	Remove, restabilize, and replace	Overlay
		High	Dig out and replace	Remove, restabilize, and replace	Overlay
	Many	Low	Remove, restabilize, and replace	Plan rehabilitation	Plan rehabilitation
		Medium	Remove, restabilize, and replace	Plan rehabilitation	Plan rehabilitation
		High	Remove, restabilize, and replace	Plan rehabilitation	Plan rehabilitation

Ron Johnston

## Atlanta

Predominant Crack		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Distress	Spacing Severity					
Transverse Cracking	>40'	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Fog seal	Fog seal	
		High	Monitor	Fog seal	Fog seal	
	Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
	Cupped or Tented	Low	Monitor until density increases			
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
15' - 40'	Mostly tight	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Fog seal	Fog seal	
		High	Monitor	Fog seal	Fog seal	
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Spot seal bad areas as needed and observe	Spot seal bad areas as needed and observe	Spot seal bad areas as needed and observe	Spot seal bad areas as needed and observe
		High	Crack seal	Crack seal	Crack seal	Crack seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
	Cupped or Tented	Low	Spot seal or Monitor	Spot seal or Monitor	Spot seal or Monitor	Level up and seal coat
		Medium	Crack seal and spot seal bad areas	Crack seal and spot seal bad areas	Crack seal and spot seal bad areas	Level up and seal coat
		High	Mill and inlay	Mill and inlay	Mill and inlay	Crack seal and seal coat or thin overlay
<15'	Mostly Tight	Low	Monitor	Monitor	Monitor until cracks are wider	
		Medium	Monitor	Monitor	Seal coat or spot seal wider ones	
		High	Monitor	Monitor	Seal coat	
	Open, < 1/2"	Low	Patch and spot seal	Patch and spot seal	Patch and spot seal	Patch, crack seal, and seal coat
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal or spot seal	Crack seal or spot seal	Crack seal or spot seal	Reconstruct
	>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	Reconstruct
		Medium	Monitor	Patch and spot seal	Patch and spot seal	Reconstruct
		High	Spot seal or base repair	Spot seal	Spot seal	Reconstruct
	Cupped or Tented	Low	Monitor	Monitor	Monitor	Crack seal, level up, and seal coat
		Medium	Spot seal	Spot seal	Crack seal and spot seal bad areas	Crack seal, level up, and seal coat
		High	Mill <2" and inlay	Mill <2" and inlay	Mill and inlay	Crack seal, seal coat, and thick overlay

Predominant Crack Spacing		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Distress	(Across) Severity					
Longitudinal Cracking	>Lane Width	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Monitor	
		High	Monitor	Monitor	Strip seal	
	Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal and strip seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal and strip seal
	1 per lane	Mostly tight	Low	Monitor	Monitor	Seal coat
			Medium	Monitor	Monitor	Seal coat
			High	Monitor	Monitor	Seal coat
Open, < 1/2"		Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal and seal coat
>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal	
	Medium	Crack seal	Crack seal	Crack seal	Crack seal	
	High	Crack seal	Crack seal	Crack seal	Crack seal or strip seal, and seal coat and overlay	
>1 per lane	Mostly Tight	Low	Monitor or spot seal	Monitor	Seal coat	
		Medium	Spot seal	Spot seal	Seal coat	
		High	Spot seal	Seal coat	Seal coat	
	Open, < 1/2"	Low	Crack seal or strip seal	Crack seal or strip seal	Crack seal or strip seal	Crack seal or strip seal
		Medium	Crack seal	Crack seal	Crack seal	Reconstruct
		High	Crack seal	Crack seal	Crack seal	Reconstruct
>1/2" or deteriorated	Low	Crack seal or strip seal	Crack seal or strip seal	Crack seal or strip seal	Crack seal or strip seal	
	Medium	Crack seal	Crack seal	Crack seal	Reconstruct	
	High	Crack seal	Crack seal	Crack seal	Reconstruct	

## Atlanta (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F	F	Blade patch	Level up	Level up and seal coat
				S	Blade patch	Level up	Level up and seal coat
		Medium	F	F	Blade patch	Level up	Level up and seal coat
				S	Blade patch	Level up	Level up and seal coat
		High	F	F	Blade patch or inlay	Microsurface and plan rehabilitation or observe closely	Microsurface and plan rehabilitation or observe closely
				S	Blade patch or inlay	Microsurface and plan rehabilitation or observe closely	Microsurface and plan rehabilitation or observe closely
	> 1" (Deep)	Low	F	F	Spot level up	Spot level up	Spot level and seal coat
				S	Spot level up	Spot level up	Spot level and seal coat
		Medium	F	F	Spot level up	Spot level up	Reconstruct
				S	Spot level up	Spot level up	Strip seal if cracked and microsurface
		High	F	F	Spot inlay as needed	Spot inlay as needed	Reconstruct
				S	Spot inlay as needed	Spot inlay as needed	Strip seal if cracked and microsurface
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	F	Blade patch	Level up	Level up and seal coat
				S	Blade patch	Level up	Level up and seal coat
		Medium	F	F	Blade patch	Level up	Level up and seal coat
	S			Blade patch	Level up	Level up and seal coat	
	> 1" (Deep)	High	F	F	Blade patch or inlay	Microsurface and plan rehabilitation or observe closely	Microsurface and plan rehabilitation or observe closely
				S	Blade patch or inlay	Microsurface and plan rehabilitation or observe closely	Microsurface and plan rehabilitation or observe closely
Low		F	F	Spot level up	Spot level up	Spot level and seal coat	
	S		Spot level up	Spot level up	Spot level and seal coat		
Medium	F	F	Spot level up	Spot level up	Reconstruct		
		S	Spot level up	Spot level up	Strip seal if cracked and microsurface		
High	F	F	Spot inlay as needed	Spot inlay as needed	Reconstruct		
		S	Spot inlay as needed	Spot inlay as needed	Strip seal if cracked and microsurface		

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Spot seal	Fog seal	Fog seal
			Medium	Spot seal	Fog seal	Fog seal
			High	Spot seal	Fog seal	Fog seal
		Major	Low	Spot seal	Spot or strip seal	Spot or strip seal
			Medium	Spot seal	Spot or strip seal	Spot or strip seal
			High	Spot seal	Spot seal and base repair	Spot seal and base repair
Both Wheelpaths	Minor	Low	Spot seal	Spot or strip seal	Spot or strip seal	
		Medium	Spot seal	Spot or strip seal	Spot or strip seal	
		High	Spot seal	Spot or strip seal	Spot or strip seal	
	Major	Low	Spot seal	Plan rehabilitation	Base repair and seal coat	
		Medium	Spot seal	Strip seal	Strip seal	
		High	Spot seal	Spot seal and base repair	Reconstruct	

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Blade patch and seal coat
		Medium	Blade patch	Blade patch	Blade patch and seal coat
		High	Blade patch	Blade patch	Blade patch and seal coat
	Rough	Low	Spot level	Spot level	Spot level
		Medium	Either spot level or mill and fill	Either spot level or mill and fill	Either spot level or mill and fill
		High	Mill and fill to establish profile	Mill and fill to establish profile	Mill and fill to establish profile and overlay

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Spot base repair	Spot base repair	Spot base repair
		Medium	Spot base repair	Spot base repair	Spot base repair
		High	Spot base repair	Spot base repair	Spot base repair
	Many	Low	Spot base repair	Spot base repair	Reconstruct
		Medium	Spot base repair	Spot base repair	Reconstruct
		High	Spot base repair	Spot base repair	Reconstruct

Gaylon Childress  
Eddie Coffee  
Tommy Ellison

# Austin

Predominant Crack Distress			Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Spacing	Severity						
Transverse Cracking	Mostly tight	Low	Monitor	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Crack seal	Crack seal	
		High	Monitor	Crack seal	Crack seal	Crack seal	
	>40'	Open, < 1/2"	Low	Monitor	Monitor	Crack seal	Crack seal
			Medium	Monitor	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal	Cold mix patch
	>1/2" or deteriorated	Cupped or Tented	Low	Cold mix patch	Cold mix patch	Cold mix patch	Cold mix patch
			Medium	Cold mix patch	Cold mix patch	Cold mix patch	Cold mix patch
			High	Cold mix patch	Cold mix patch	Cold mix patch	Saw out, patch, and call Forensic team
	15' - 40'	Mostly tight	Low	Cold mix patch and crack seal			
			Medium	Cold mix patch and crack seal	Hot mix patch	Hot mix patch	Hot mix patch
			High	Cold mix patch and crack seal	Hot mix patch	Hot mix patch	Saw out, patch, and call Forensic team
Open, < 1/2"		Cupped or Tented	Low	Crack seal	Crack seal	Crack seal	Cold mix patch
			Medium	Crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal
			High	Crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal
>1/2" or deteriorated		Cupped or Tented	Low	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch
			Medium	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch
			High	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Hot mix patch and maybe seal coat
<15'		Mostly Tight	Low	Cold mix patch	Cold mix patch	Cold mix patch	Cold mix patch
			Medium	Cold mix patch	Cold mix patch	Cold mix patch	Cold mix patch and maybe call Forensic team
			High	Cold mix patch	Cold mix patch	Cold mix patch	Maybe seal coat
	Open, < 1/2"	Cupped or Tented	Low	Crack seal	Crack seal	Crack seal	Seal coat
			Medium	Crack seal	Crack seal	Crack seal	Seal coat
			High	Crack seal	Cold mix patch	Cold mix patch	Cold mix patch and seal coat
	>1/2" or deteriorated	Cupped or Tented	Low	Cold mix patch	Seal coat	Seal coat	Seal coat
			Medium	Cold mix patch and seal coat	Seal coat	Seal coat	Seal coat or reconstruct
			High	Localized reconstruction	Localized reconstruction	Localized reconstruction	Reconstruct
	>1/2" or deteriorated	Cupped or Tented	Low	Localized reconstruction	Seal coat	Seal coat	Seal coat
			Medium	Localized reconstruction	Seal coat	Seal coat	Seal coat or reconstruct
			High	Localized reconstruction	Reconstruct	Reconstruct	Reconstruct
Cupped or Tented	Cupped or Tented	Low	Localized reconstruction	Seal coat	Seal coat	Seal coat	
		Medium	Localized reconstruction	Seal coat	Seal coat	Cold mix patch and seal coat	
		High	Localized reconstruction	Cold mix patch and seal coat	Cold mix patch and seal coat	Cold mix patch and seal coat	

Predominant Crack Distress			Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Spacing (Across)	Severity						
Longitudinal Cracking	Mostly tight	Low	Monitor	Crack seal	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	Crack seal	
	>Lane Width	Open, < 1/2"	Low	Monitor	Crack seal	Crack seal	Crack seal
			Medium	Monitor	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal	Crack seal
	>1/2" or deteriorated	Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal
			High	Crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal
	1 per lane	Mostly tight	Low	Monitor	Crack seal	Crack seal	Crack seal
			Medium	Monitor	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal	Crack seal
Open, < 1/2"		Mostly Tight	Low	Monitor	Crack seal	Crack seal	Crack seal
			Medium	Monitor	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal	Crack seal
>1/2" or deteriorated		Mostly Tight	Low	Crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal
			Medium	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal
			High	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Strip seal
>1 per lane		Mostly Tight	Low	Crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and seal coat
			Medium	Crack seal	Cold mix patch and crack seal	Cold mix patch and crack seal	Cold mix patch and seal coat
			High	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and seal coat
Open, < 1/2"	Mostly Tight	Low	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and seal coat	
		Medium	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and seal coat	
		High	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and strip seal	Cold mix patch and seal coat or reconstruct	
>1/2" or deteriorated	Mostly Tight	Low	Cold mix patch and strip seal	Cold mix patch and seal coat	Cold mix patch and seal coat	Cold mix patch and seal coat	
		Medium	Cold mix patch and strip seal	Level up and seal coat	Level up and seal coat	Rehabilitation	
		High	Level up	Level up and seal coat	Level up and seal coat	Rehabilitation	

### Austin (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	0.5" to 1" (Shallow)	Low	F S	Fill rut Monitor	Fill rut Monitor	Fill rut Cold mix patch
			Medium	F S	Fill rut Monitor	Fill rut Mill and fill rut	Cold mix patch Cold mix patch
			High	F S	Fill rut Monitor	Fill rut Mill and fill rut	Cold mix patch and full depth repair Cold mix patch and full depth repair
		> 1" (Deep)	Low	F S	Fill rut Monitor	Fill rut Fill rut	Fill rut Cold mix patch
			Medium	F S	Cold mix patch Fill rut	Cold mix patch Mill and fill rut	Cold mix patch and full depth repair Cold mix patch and full depth repair
			High	F S	Cold mix patch Cold mix patch	Full depth repair Mill and fill rut	Full depth repair Full depth repair
	Both Wheelpaths	0.5" to 1" (Shallow)	Low	F S	Fill rut Monitor	Fill rut Monitor	Fill rut Cold mix patch
			Medium	F S	Fill rut Monitor	Fill rut Mill and fill rut	Cold mix patch Cold mix patch
			High	F S	Full depth repair Full depth repair	Fill rut Mill and fill rut	Cold mix patch and full depth repair Cold mix patch and full depth repair
		> 1" (Deep)	Low	F S	Monitor Fill rut	Fill rut Fill rut	Fill rut Cold mix patch
			Medium	F S	Cold mix patch Cold mix patch	Cold mix patch Mill and fill rut	Cold mix patch and full depth repair Cold mix patch and full depth repair
			High	F S	Full depth repair Full depth repair	Full depth repair Mill and fill rut	Full depth repair Full depth repair

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Cold mix patch	Cold mix patch and strip seal
			Medium	Crack seal	Cold mix patch	Cold mix patch and strip seal
			High	Crack seal	Cold mix patch	Cold mix patch and strip seal
		Major	Low	Cold mix patch	Cut out and repair	Reconstruct
			Medium	Cold mix patch	Cut out and repair	Reconstruct
			High	Cold mix patch	Cut out and repair	Reconstruct
	Both Wheelpaths	Minor	Low	Crack seal	Cold mix patch	Seal coat
			Medium	Crack seal	Cold mix patch	Cold mix patch and seal coat
			High	Crack seal	Cold mix patch	Reconstruct
		Major	Low	Cold mix patch	Cold mix patch and strip seal	Cold mix patch and seal coat
			Medium	Cold mix patch	Cold mix patch and seal coat	Cold mix patch and seal coat or Reconstruct
			High	Cold mix patch	Cold mix patch and seal coat	Reconstruct

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Level up	Level up
		Medium	Monitor	Level up	Thin overlay
		High	Level up	Level up	Thin overlay
	Rough	Low	Monitor	Level up	Level up
		Medium	Level up	Level and thin overlay	Rehabilitate
		High	Level up	Level and thin overlay	Rehabilitate

Predominant Distress	Few or Many	Traffic Level or Importance	Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Monitor	Patch with cold mix or hot mix	Resurface
		Medium	Patch with cold mix or hot mix	Patch with cold mix or hot mix	Resurface
		High	Patch with cold mix or hot mix	Patch with cold mix or hot mix	Resurface
	Many	Low	Patch with cold mix or hot mix	Patch with cold mix or hot mix	Resurface
		Medium	Patch with cold mix or hot mix	Resurface	Resurface
		High	Patch with cold mix or hot mix	Resurface	Resurface
Wes Burford					

# Beaumont

Predominant Crack Distress	Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Monitor	Monitor	Monitor or seal coat
			Medium	Monitor	Monitor	Monitor or seal coat
			High	Monitor	Crack seal or seal coat	Seal coat or overlay
		Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal or seal coat
			Medium	Crack seal	Crack seal	Crack seal or seal coat
			High	Crack seal	Crack seal	Crack seal or seal coat
		>1/2" or deteriorated	Low	Overlay or crack seal	Crack seal and overlay or seal coat	Seal coat
			Medium	Overlay or crack seal	Crack seal and overlay or seal coat	Seal coat
			High	Overlay or crack seal	Crack seal and overlay or seal coat	Seal coat
		Cupped or Tented	Low	Mill	Mill or mill and overlay	Mill or mill and overlay
			Medium	Mill	Mill and overlay	Mill or mill and overlay
			High	Mill	Mill and overlay	Mill or mill and overlay
	15' - 40'	Mostly tight	Low	Seal coat or overlay	Seal coat	Seal coat or overlay
			Medium	Seal coat or overlay	Seal coat	Seal coat or overlay
			High	Seal coat or overlay	Seal coat	Seal coat or overlay
		Open, < 1/2"	Low	Overlay or crack seal	Seal coat	Seal coat or overlay
			Medium	Overlay or crack seal	Seal coat	Seal coat or overlay
			High	Overlay or crack seal	Seal coat	Seal coat or overlay
		>1/2" or deteriorated	Low	Seal coat and overlay	Seal coat and overlay	Seal coat or overlay
			Medium	Seal coat and overlay	Seal coat and overlay	Seal coat or overlay
			High	Seal coat and overlay	Seal coat and overlay	Seal coat or overlay
		Cupped or Tented	Low	Mill	Mill and overlay	Mill and overlay
			Medium	Mill	Mill and overlay	Mill and overlay
			High	Mill	Mill and overlay	Mill and overlay
<15'	Mostly Tight	Low	Overlay or crack seal	Seal coat	Seal coat	
		Medium	Overlay or crack seal	Seal coat	Seal coat	
		High	Overlay or seal coat	Seal coat	Seal coat	
	Open, < 1/2"	Low	Overlay or seal coat	Seal coat and overlay	Seal coat or overlay	
		Medium	Overlay	Seal coat and overlay	Seal coat or overlay	
		High	Overlay	Seal coat and overlay	Seal coat or overlay	
	>1/2" or deteriorated	Low	Overlay	Seal coat and overlay	Seal coat and overlay	
		Medium	Overlay	Seal coat and overlay	Seal coat and overlay	
		High	Overlay	Seal coat and overlay	Seal coat and overlay	
	Cupped or Tented	Low	Mill and overlay	Mill and overlay	Mill and overlay	
		Medium	Mill and overlay	Mill and overlay	Mill and overlay	
		High	Mill and overlay	Mill and overlay	Mill and overlay	

Predominant Crack Distress	Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Crack seal or seal coat	
			Medium	Monitor	Monitor	Crack seal or seal coat	
			High	Monitor	Monitor	Crack seal or seal coat	
		Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal or seal coat	
			Medium	Crack seal	Crack seal	Crack seal or seal coat	
			High	Crack seal	Crack seal	Crack seal or seal coat	
		>1/2" or deteriorated	Low	Crack seal	Crack seal or seal coat	Crack seal or seal coat and overlay	
			Medium	Crack seal	Crack seal or seal coat	Crack seal or seal coat and overlay	
			High	Crack seal	Crack seal or seal coat	Crack seal or seal coat and overlay	
		1 per lane	Mostly tight	Low	Crack seal	Crack seal or seal coat	Crack seal or seal coat
				Medium	Crack seal	Crack seal or seal coat	Crack seal or seal coat
				High	Crack seal	Crack seal or seal coat	Crack seal or seal coat
	Open, < 1/2"		Low	Crack seal	Crack seal or seal coat	Crack seal or seal coat	
			Medium	Crack seal	Crack seal or seal coat	Crack seal or seal coat	
			High	Crack seal	Crack seal or seal coat	Crack seal or seal coat	
	>1 per lane	Mostly Tight	Low	Seal coat and overlay	Crack seal or seal coat and overlay		
			Medium	Seal coat and overlay	Crack seal or seal coat and overlay		
			High	Seal coat and overlay	Crack seal or seal coat and overlay		
		Open, < 1/2"	Low	Overlay	Seal coat or overlay	Seal coat or overlay	
			Medium	Overlay	Seal coat or overlay	Seal coat or overlay	
			High	Overlay	Seal coat or overlay	Seal coat or overlay	
	>1/2" or deteriorated	Low	Overlay	Overlay	Seal coat and overlay		
		Medium	Overlay	Overlay	Seal coat and overlay		
		High	Overlay	Overlay	Seal coat and overlay		

## Beaumont (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F	Overlay	Overlay	Overlay	Seal coat and overlay
			S	Overlay	Overlay	Overlay	Seal coat and overlay
		0.5" to 1" (Shallow)	F	Overlay	Overlay	Overlay	Seal coat and overlay
			S	Overlay	Overlay	Overlay	Seal coat and overlay
		High	F	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			S	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
	> 1" (Deep)	Low	F	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
		S	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay	
		Medium	F	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
		S	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay	
		High	F	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
		S	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay	
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			S	Overlay	Seal coat and overlay	Seal coat and overlay	
		Medium	F	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			S	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
		High	F	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			S	Overlay	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
	> 1" (Deep)	Low	F	Overlay	Overlay	Seal coat and overlay	Seal coat and overlay
		S	Overlay	Overlay	Seal coat and overlay	Seal coat and overlay	
		Medium	F	Overlay	Overlay	Seal coat and overlay	Seal coat and overlay
		S	Overlay	Overlay	Seal coat and overlay	Seal coat and overlay	
		High	F	Mill and overlay	Overlay	Seal coat and overlay	Seal coat and overlay
		S	Mill and overlay	Overlay	Seal coat and overlay	Seal coat and overlay	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Seal coat	Seal coat	Seal coat
			Medium	Seal coat	Seal coat	Seal coat
			High	Seal coat	Seal coat	Seal coat
		Major	Low	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			Medium	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			High	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
Both Wheelpaths	Minor	Low	Seal coat	Seal coat	Seal coat	
		Medium	Seal coat	Seal coat	Seal coat	
		High	Seal coat	Seal coat	Seal coat	
		Major	Low	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			Medium	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay
			High	Seal coat and overlay	Seal coat and overlay	Seal coat and overlay

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor or overlay	Seal coat
		Medium	Monitor	Monitor or overlay	Seal coat
		High	Monitor	Monitor or overlay	Seal coat
	Rough	Low	Mill and overlay or seal coat	Mill and overlay or seal coat	Mill and overlay or seal coat
		Medium	Mill and overlay or seal coat	Mill and overlay or seal coat	Mill, seal coat, and overlay
		High	Mill and overlay or seal coat	Mill and overlay or seal coat	Mill, seal coat, and overlay

Predominant Distress	Few or Many	Traffic Level or Importance	Only Localized	Short Term Repair 1-2 Years	Long Term Treatment Seal coat
Failures	Few	Low	Patch	Overlay	Seal coat and overlay
		Medium	Patch	Overlay	Seal coat and overlay
		High	Patch	Overlay	Seal coat and overlay
	Many	Low	Patch	Overlay	Reconstruct
		Medium	Patch	Overlay	Reconstruct
		High	Patch	Overlay	Reconstruct

Consensus of  
Susan Chu  
Jimmie Poplin  
Harry Rees  
Walter Pierson  
Anonymous

# Brownwood

Predominant Crack Distress		Predominant Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40'	Mostly tight	Low	Low	Crack seal	Crack seal	Crack seal	
			Medium	Medium	Crack seal	Crack seal	Crack seal	
			High	High	Crack seal	Crack seal	Crack seal	
		Open, < 1/2"	Low	Low	Crack seal	Crack seal	Crack seal	Crack seal
			Medium	Medium	Crack seal	Crack seal	Rout cracks and seal	
			High	High	Crack seal	Crack seal	Rout cracks and seal	
		>1/2" or deteriorated	Low	Low	Patch	Patch	Patch	Patch
			Medium	Medium	Patch	Patch	Patch	Patch
			High	High	Patch	Patch	Patch	Patch
		Cupped or Tented	Low	Low	Patch	Patch	Patch	Patch
			Medium	Medium	Patch	Patch	Patch	Patch
			High	High	Patch	Patch	Patch	Patch
	15' - 40'	Mostly tight	Low	Low	Crack seal	Crack seal	Crack seal	
			Medium	Medium	Crack seal	Crack seal	Crack seal	
			High	High	Crack seal	Crack seal	Crack seal	
		Open, < 1/2"	Low	Low	Crack seal	Crack seal	Crack seal	Crack seal
			Medium	Medium	Crack seal	Crack seal	Rout cracks and seal	
			High	High	Crack seal	Crack seal	Rout cracks and seal	
		>1/2" or deteriorated	Low	Low	Patch	Patch	Patch	Patch
			Medium	Medium	Patch	Patch	Patch	Patch
			High	High	Patch	Patch	Patch	Patch
		Cupped or Tented	Low	Low	Patch	Patch	Patch	Patch
			Medium	Medium	Patch	Patch	Patch	Patch
			High	High	Patch	Patch	Patch	Patch
<15'	Mostly Tight	Low	Low	Seal coat	Seal coat	Seal coat		
		Medium	Medium	Seal coat	Seal coat	Seal coat		
		High	High	Seal coat	Seal coat	Seal coat		
	Open, < 1/2"	Low	Low	Crack seal	Seal coat	Seal coat		
		Medium	Medium	Crack seal	Crack seal and seal coat	Crack seal and seal coat		
		High	High	Crack seal	Crack seal and seal coat	Reconstruct		
	>1/2" or deteriorated	Low	Low	Patch	Patch and seal coat	Reconstruct		
		Medium	Medium	Patch	Reconstruct	Reconstruct		
		High	High	Patch	Reconstruct	Reconstruct		
	Cupped or Tented	Low	Low	Patch	Reconstruct	Reconstruct		
		Medium	Medium	Patch	Reconstruct	Reconstruct		
		High	High	Patch	Reconstruct	Reconstruct		

Predominant Crack Distress		Predominant Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Low	Crack seal	Crack seal	Crack seal	
			Medium	Medium	Crack seal	Crack seal	Crack seal	
			High	High	Crack seal	Crack seal	Crack seal	
		Open, < 1/2"	Low	Low	Crack seal	Crack seal	Crack seal and overlay	
			Medium	Medium	Crack seal	Crack seal	Rout cracks and overlay	
			High	High	Crack seal	Crack seal	Rout cracks and overlay	
		>1/2" or deteriorated	Low	Low	Patch	Patch	Patch and overlay	
			Medium	Medium	Patch	Patch	Patch and overlay	
			High	High	Patch	Patch	Patch and overlay	
		1 per lane	Mostly tight	Low	Low	Crack seal	Crack seal	Crack seal
				Medium	Medium	Crack seal	Crack seal	Crack seal
				High	High	Crack seal	Crack seal	Crack seal
	Open, < 1/2"		Low	Low	Crack seal	Crack seal	Crack seal and overlay	
			Medium	Medium	Crack seal	Crack seal	Rout cracks and overlay	
			High	High	Crack seal	Crack seal	Rout cracks and overlay	
	>1/2" or deteriorated		Low	Low	Patch	Patch	Patch and overlay	
			Medium	Medium	Patch	Patch	Patch and overlay	
			High	High	Patch	Patch	Patch and overlay	
	>1 per lane		Mostly Tight	Low	Low	Crack seal	Seal coat	Seal coat and overlay
				Medium	Medium	Crack seal	Seal coat	Seal coat and overlay
				High	High	Crack seal	Seal coat	Seal coat and overlay
		Open, < 1/2"	Low	Low	Crack seal	Rout cracks and seal	Rout cracks and overlay	
			Medium	Medium	Crack seal	Rout cracks and seal	Rout cracks and overlay	
			High	High	Crack seal	Rout cracks and seal	Rout cracks and overlay	
>1/2" or deteriorated		Low	Low	Patch	Patch and seal coat	Reconstruct		
		Medium	Medium	Patch	Patch and seal coat	Reconstruct		
		High	High	Patch	Patch and seal coat	Reconstruct		

## Brownwood (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	Low	F	Fill rut	Fill rut	Fill rut	Microsurface	
			S	Monitor				Fill rut
		0.5" to 1" (Shallow)	Medium	F	Fill rut	Fill rut	Fill rut	Microsurface
				S	Monitor			
			High	F	Fill rut	Fill rut	Fill rut	Microsurface
				S	Fill rut			
	> 1" (Deep)	Low	F	Fill rut	Fill rut	Fill rut	Reconstruct	
			S	Monitor				Fill rut
		Medium	F	Patch	Fill rut	Fill rut	Reconstruct	
			S	Fill rut				Fill rut
		High	F	Patch	Fill rut	Fill rut	Reconstruct	
			S	Fill rut				Fill rut
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Fill rut	Microsurface	Microsurface	Overlay	
			S	Monitor				Microsurface
		High	F	Fill rut	Microsurface	Overlay		
	> 1" (Deep)	Low	F	Fill rut	Overlay	Overlay	Reconstruct	
			S	Monitor				Overlay
		Medium	F	Patch	Overlay	Reconstruct		
	High	F	Patch	Overlay	Reconstruct			

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years			
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Seal coat	Patch and seal coat			
			Medium	Patch			Seal coat	Patch and seal coat	
			High	Patch			Seal coat	Patch and seal coat	
		Major	Low	Patch	Patch and seal coat	Patch and seal coat	Patch and overlay		
			Medium	Patch				Patch and seal coat	Patch and overlay
			High	Patch				Patch and seal coat	Patch and overlay
	Both Wheelpaths	Minor	Low	Monitor	Patch and seal coat	Patch and seal coat	Patch and overlay		
			Medium	Patch				Patch and seal coat	Patch and overlay
			High	Patch				Patch and seal coat	Patch and overlay
		Major	Low	Patch	Patch and overlay	Patch and overlay	Reconstruct		
			Medium	Patch				Patch and overlay	Reconstruct
			High	Patch				Patch and overlay	Reconstruct

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years			
Swell/Roughness	Some Roughness	Low	Monitor	Level up	Level up			
		Medium	Monitor			Level up	Level up	
		High	Level up			Level up	Level up	
	Rough	Low	Monitor	Level up	Level up	Reconstruct		
		Medium	Level up				Level up	Reconstruct
		High	Level up				Level up	Reconstruct

Predominant Distress	Few or Many	Traffic Level or Importance	Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years			
Failures	Few	Low	Patch	Patch	Patch and overlay			
		Medium	Patch			Patch	Patch and overlay	
		High	Patch			Patch	Patch and overlay	
	Many	Low	Patch	Patch	Patch	Reconstruct		
		Medium	Patch				Patch	Reconstruct
		High	Patch				Patch	Reconstruct

# Bryan

Predominant Crack Distress		Predominant Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Low	Nothing	Crack Seal	Nothing
			Medium	Medium	Crack Seal	Crack Seal	Nothing
			High	High	Crack Seal	Crack Seal	Nothing
		Open, < 1/2"	Low	Low	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			Medium	Medium	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			High	High	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
		>1/2" or deteriorated	Low	Low	Crack Seal	Patch bad areas, crack seal rest	Spot Reconstruct
			Medium	Medium	Crack Seal	Patch bad areas, crack seal rest	Spot Reconstruct
			High	High	Crack Seal	Patch bad areas, crack seal rest	Spot Reconstruct
		Cupped or Tented	Low	Low	Minor level up	Minor level up and call District or Forensic Team	Minor level up and call District or Forensic Team
			Medium	Medium	Minor level up	Minor level up and call District or Forensic Team	Minor level up and call District or Forensic Team
			High	High	Minor level up	Minor level up and call District or Forensic Team	Minor level up and call District or Forensic Team
	15' - 40'	Mostly tight	Low	Low	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			Medium	Medium	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			High	High	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
		Open, < 1/2"	Low	Low	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			Medium	Medium	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			High	High	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
		>1/2" or deteriorated	Low	Low	Patch and Crack Seal	Patch bad areas, crack seal rest	Spot Reconstruct
			Medium	Medium	Patch and Crack Seal	Patch bad areas, crack seal rest	Spot Reconstruct
			High	High	Patch and Crack Seal	Patch bad areas, crack seal rest	Spot Reconstruct
		Cupped or Tented	Low	Low	Patch	Minor level up and call District or Forensic Team	Minor level up and call District or Forensic Team
			Medium	Medium	Patch	Minor level up and call District or Forensic Team	Minor level up and call District or Forensic Team
			High	High	Patch	Minor level up and call District or Forensic Team	Minor level up and call District or Forensic Team
<15'	Mostly Tight	Low	Low	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule	
		Medium	Medium	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule	
		High	High	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule	
	Open, < 1/2"	Low	Low	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule	
		Medium	Medium	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule	
		High	High	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule	
	>1/2" or deteriorated	Low	Low	Base repair	Base repair	Reconstruct	
		Medium	Medium	Base repair	Base repair	Reconstruct	
		High	High	Base repair	Base repair	Reconstruct	
	Cupped or Tented	Low	Low	Patch	Patch	Reconstruct	
		Medium	Medium	Patch	Patch	Reconstruct	
		High	High	Patch	Patch	Reconstruct	

Predominant Crack Distress		Predominant Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Low	Nothing	Crack Seal	Crack Seal	
			Medium	Medium	Crack Seal	Crack Seal	Crack Seal	
			High	High	Crack Seal	Crack Seal	Crack Seal	
		Open, < 1/2"	Low	Low	Crack Seal	Crack Seal	Crack Seal	
			Medium	Medium	Crack Seal	Crack Seal	Crack Seal	
			High	High	Crack Seal	Crack Seal	Crack Seal	
		>1/2" or deteriorated	Low	Low	Crack Seal	Crack Seal	Crack Seal	Spot Reconstruct
			Medium	Medium	Crack Seal	Crack Seal	Crack Seal	Spot Reconstruct
			High	High	Crack Seal	Crack Seal	Crack Seal	Spot Reconstruct
		1 per lane	Mostly tight	Low	Low	Crack Seal	Crack Seal	Crack Seal
				Medium	Medium	Crack Seal	Crack Seal	Crack Seal
				High	High	Crack Seal	Crack Seal	Crack Seal
	Open, < 1/2"		Low	Low	Crack Seal	Crack Seal	Crack Seal	Crack Seal
			Medium	Medium	Crack Seal	Crack Seal	Crack Seal	Crack Seal
			High	High	Crack Seal	Crack Seal	Crack Seal	Crack Seal
	>1 per lane	Mostly Tight	Low	Low	Crack Seal	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			Medium	Medium	Crack Seal	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			High	High	Crack Seal	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
		Open, < 1/2"	Low	Low	Crack Seal	Crack Seal	Crack Seal	Crack seal, seal coat on normal schedule
			Medium	Medium	Crack Seal	Crack Seal	Crack Seal	Either Crack seal, seal coat or reconstruct
			High	High	Crack Seal	Crack Seal	Crack Seal	Reconstruct
	>1/2" or deteriorated	Low	Low	Crack Seal	Crack Seal	Crack Seal	Reconstruct	
		Medium	Medium	Crack Seal	Crack Seal	Crack Seal	Reconstruct	
		High	High	Crack Seal	Crack Seal	Crack Seal	Reconstruct	

## Bryan (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	Low	F	Fill Rut	Level up	Level up and seal coat normal schedule
			Medium	S	Nothing	Level up	Level up and seal coat normal schedule
		0.5" to 1" (Shallow)	Low	F	Fill Rut	Level up	Level up and seal coat normal schedule
			Medium	S	Nothing	Level up	Level up and seal coat normal schedule
		High	F	Fill Rut	Mill and replace	Mill and replace	
			S	Nothing	Mill and replace	Mill and replace	
	> 1" (Deep)	Low	F	Fill Rut	Level up	Level up and seal coat normal schedule	
		Medium	S	Nothing	Level up	Level up and seal coat normal schedule	
		Medium	F	Patch	Level up	Level up and seal coat normal schedule	
			S	Fill Rut	Level up	Level up and seal coat normal schedule	
		High	F	Patch	Mill and replace	Mill and replace	
			S	Fill Rut	Mill and replace	Mill and replace	
Both Wheelpaths	0.5" to 1" (Shallow)	Low	Low	F	Fill Rut	Level up	Level up and seal coat normal schedule
			Medium	S	Nothing	Level up	Level up and seal coat normal schedule
		High	F	Fill Rut	Mill and replace	Mill and replace	
			S	Fill Rut	Mill and replace	Mill and replace	
		> 1" (Deep)	Low	F	Fill Rut	Level up	Level up and seal coat normal schedule
			Medium	S	Nothing	Level up	Level up and seal coat normal schedule
	Medium		F	Patch	Mill and replace	Mill and replace	
			S	Patch	Mill and replace	Level up and seal coat normal schedule	
	High		F	Patch	Mill and replace	Mill and replace	
			S	Patch	Mill and replace	Mill and replace	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Spot seal	Spot seal	Spot seal
			Medium	Spot seal	Spot seal	Spot seal
			High	Spot seal	Spot seal	Spot seal
		Major	Low	Spot reconstruct	Spot reconstruct	Spot reconstruct
			Medium	Spot reconstruct	Spot reconstruct	Spot reconstruct
			High	Spot reconstruct	Spot reconstruct	Spot reconstruct
Both Wheelpaths	Minor	Low	Spot seal	Full lane seal coat	Full lane seal coat	
		Medium	Spot seal	Full lane seal coat	Full lane seal coat	
		High	Spot seal	Full lane seal coat	Full lane seal coat	
	Major	Low	Spot reconstruct	Spot reconstruct lane	Spot reconstruct lane	
		Medium	Spot reconstruct	Spot reconstruct lane	Spot reconstruct lane	
		High	Spot reconstruct	Spot reconstruct lane	Spot reconstruct lane	

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Nothing	Nothing	Nothing
		Medium	Nothing	Nothing	Nothing
		High	Spot level up	Spot level up	Spot level up
	Rough	Low	Level up	Level up	Level up
		Medium	Level up	Level up	Level up
		High	Spot level up	Mill and replace	Mill and replace

Predominant Distress	Few or Many	Traffic Level or Importance	Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Spot repair	Spot repair	Spot repair
		Medium	Spot repair	Spot repair	Spot repair
		High	Spot repair	Spot repair	Spot repair
	Many	Low	Reconstruct	Reconstruct	Reconstruct
		Medium	Reconstruct	Reconstruct	Reconstruct
		High	Reconstruct	Reconstruct	Reconstruct

Darlene Goehl

# Childress

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40'	Low	Monitor	Monitor	Monitor	
		Mostly tight	Medium	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	
	>1/2" or deteriorated	Low	Patch bad areas	Patch bad areas	Patch bad areas	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
	Cupped or Tented	Low	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
		Medium	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
		High	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
15' - 40'	Mostly tight	Low	Monitor	Monitor	Monitor	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
	Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
	Cupped or Tented	Low	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
		Medium	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
		High	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
<15'	Mostly Tight	Low	Blade patch	Blade patch	Blade patch	
		Medium	Blade patch	Blade patch	Blade patch	
		High	Seal coat	Seal coat	Seal coat	
	Open, < 1/2"	Low	Seal coat or strip seal	Seal coat or strip seal	Seal coat or strip seal	
		Medium	Blade patch	Blade patch	Blade patch	
		High	Patch bad areas	Patch bad areas	Patch bad areas	
	>1/2" or deteriorated	Low	Blade patch	Blade patch	Blade patch	
		Medium	Mill and blade patch	Mill and blade patch	Mill and blade patch	
		High	Mill and blade patch	Mill and blade patch	Reconstruct	
	Cupped or Tented	Low	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
		Medium	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	
		High	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	Minor patching and call District or Forensic Team	

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	
		Medium	Monitor	Monitor		
		High	Monitor	Crack seal		
		Open, < 1/2"	Low	Strip seal	Strip seal	Strip seal
			Medium	Strip seal	Strip seal	Strip seal
			High	Crack seal	Crack seal	
		>1/2" or deteriorated	Low	Strip seal	Strip seal	Strip seal
			Medium	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal
	1 per lane	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	
			High	Monitor	Crack seal	
		Open, < 1/2"	Low	Strip seal	Strip seal	Strip seal
			Medium	Strip seal	Strip seal	Strip seal
			High	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Blade patch	Blade patch	Blade patch	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
>1 per lane	Mostly Tight	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor		
		High	Seal coat	Seal coat		
	Open, < 1/2"	Low	Strip seal	Strip seal	Strip seal	
		Medium	Strip seal	Strip seal	Seal coat	
		High	Seal coat	Seal coat	Crack seal and seal coat later	
>1/2" or deteriorated	Low	Blade patch	Blade patch	Blade patch		
	Medium	Blade patch	Blade patch	Reconstruct		
	High	Blade patch	Reconstruct	Reconstruct		

## Childress (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F	Monitor	Monitor	Monitor	Monitor
			S	Monitor	Monitor	Monitor	
		0.5" to 1" (Shallow)	Medium	F	Monitor	Monitor	Monitor
			S	Monitor	Monitor	Monitor	
		High	F	Blade patch	Microsurface	Overlay	
			S	Blade patch	Microsurface	Overlay	
	> 1" (Deep)	Low	F	Monitor	Monitor	Rework surface and base	
			S	Blade patch	Blade patch	Rework surface and base	
		Medium	F	Blade patch	Blade patch	Blade patch	
			S	Blade patch	Blade patch	Blade patch	
		High	F	Blade patch	Blade patch	Blade patch	
			S	Blade patch	Blade patch	Blade patch	
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Monitor	Monitor	Monitor	
			S	Monitor	Monitor	Monitor	
		Medium	F	Monitor	Monitor	Monitor	
			S	Monitor	Monitor	Monitor	
		High	F	Blade patch	Microsurface	Overlay	
			S	Blade patch	Microsurface	Overlay	
	> 1" (Deep)	Low	F	Blade patch or strip seal	Blade patch or strip seal	Rework surface and base	
			S	Monitor	Monitor	Rework surface and base	
		Medium	F	Blade patch	Blade patch	Blade patch	
			S	Blade patch	Blade patch	Blade patch	
		High	F	Blade patch	Mill and overlay	Mill and overlay	
			S	Blade patch	Mill and overlay	Mill and overlay	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Monitor	Strip seal
			Medium	Monitor	Monitor	Strip seal
			High	Monitor	Monitor	Strip seal
		Major	Low	Strip seal	Strip seal	Blade patch
			Medium	Strip seal	Strip seal	Blade patch
			High	Blade patch	Blade patch	Mill surface and base, replace
	Both Wheelpaths	Minor	Low	Strip seal	Strip seal	Strip seal
			Medium	Strip seal	Strip seal	Blade patch
			High	Blade patch	Blade patch	Blade patch
		Major	Low	Seal coat	Seal coat	Rework surface and base
			Medium	Blade patch	Blade patch	Rework surface and base
			High	Blade patch	Blade patch	Reconstruct

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor
		High	Mill	Mill	Mill
	Rough	Low	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor
		High	Mill	Mill	Mill (no replace)

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Blade patch	Blade patch	Blade patch
		Medium	Blade patch	Blade patch	Overlay
		High	Blade patch	Blade patch	Overlay
	Many	Low	Blade patch	Blade patch	Blade patch
		Medium	Blade patch	Blade patch	Reconstruct
		High	Blade patch	Blade patch	Reconstruct

# Corpus Christi

Predominant Crack Distress	Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40'	Mostly tight	Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Monitor	Monitor	
			High	Monitor	Monitor	Monitor	
	Open, < 1/2"			Low	Monitor	Monitor	Monitor
				Medium	Monitor	Crack seal	Crack seal
				High	Monitor	Crack seal	Crack seal
	>1/2" or deteriorated			Low	Patch and crack seal	Patch and crack seal	Patch and crack seal
				Medium	Patch, crack seal, and level up	Patch, crack seal, and level up	Patch, crack seal, and level up
				High	Patch, crack seal, and level up	Patch, crack seal, and level up	Patch, crack seal, and level up
	Cupped or Tented			Low	Blade level tops of cracks and patch	Call District Office	Call District Office
				Medium	Mill, crack seal, and blade level	Call District Office	Call District Office
				High	Mill, crack seal, and blade level	Call District Office	Call District Office
15' - 40'	Mostly tight		Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Monitor	Monitor	
			High	Monitor	Monitor	Monitor	
	Open, < 1/2"			Low	Monitor	Crack seal	Crack seal
				Medium	Patch and crack seal	Patch and crack seal	Patch and crack seal
				High	Patch and crack seal	Patch and crack seal	Patch and crack seal
	>1/2" or deteriorated			Low	Monitor	Crack seal	Crack seal
				Medium	Patch, crack seal, and level up	Patch and crack seal	Patch and crack seal
				High	Patch, crack seal, and level up	Patch and crack seal	Patch and crack seal
	Cupped or Tented			Low	Blade level tops of cracks and patch	Call District Office	Call District Office
				Medium	Mill, crack seal, and blade level	Call District Office	Call District Office
				High	Mill, crack seal, and blade level	Call District Office	Call District Office
<15'	Mostly Tight		Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Monitor	Monitor	
			High	Monitor	Monitor	Monitor	
	Open, < 1/2"			Low	Monitor	Crack seal	Crack seal
				Medium	Patch and crack seal	Patch and crack seal	Patch and crack seal
				High	Patch and crack seal	Patch and crack seal	Patch and crack seal
	>1/2" or deteriorated			Low	Monitor	Crack seal	Crack seal
				Medium	Patch, crack seal, and level up	Patch and crack seal	Patch and crack seal
				High	Patch, crack seal, and level up	Patch and crack seal	Patch and crack seal
	Cupped or Tented			Low	Blade level tops of cracks and patch	Call District Office	Call District Office
				Medium	Mill, crack seal, and blade level	Call District Office	Call District Office
				High	Mill, crack seal, and blade level	Call District Office	Call District Office

Predominant Crack Distress	Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Fog seal or monitor	Fog seal or monitor	
			Medium	Monitor	Fog seal or monitor	Fog seal or monitor	
			High	Monitor	Fog seal or monitor	Fog seal or monitor	
		Open, < 1/2"	Low	Monitor	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor or crack seal	Crack seal	Crack seal
			High	Monitor	Monitor	Crack seal	Crack seal
	>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Crack seal	Crack seal	
		High	Monitor	Monitor	Crack seal	Crack seal	
	1 per lane	Mostly tight	Low	Monitor	Monitor	Fog seal or monitor	Seal coat
			Medium	Monitor	Monitor	Fog seal or monitor	Seal coat (rural) or overlay (urban)
			High	Monitor	Monitor	Fog seal or monitor	Seal coat (rural) or overlay (urban)
Open, < 1/2"		Low	Monitor	Monitor	Crack seal	Crack seal	
		Medium	Monitor	Monitor	Crack seal and strip seal	Crack seal and strip seal	
		High	Monitor	Monitor	Crack seal and strip seal	Crack seal and strip seal	
>1/2" or deteriorated	Low	Monitor	Monitor	Call District Office	Call District Office		
	Medium	Monitor	Monitor	Call District Office	Call District Office		
	High	Monitor	Monitor	Call District Office	Call District Office		
>1 per lane	Mostly Tight	Low	Monitor	Monitor	Fog seal or monitor	Seal coat	
		Medium	Monitor	Monitor	Fog seal or monitor	Seal coat (rural) or overlay (urban)	
		High	Monitor	Monitor	Fog seal or monitor	Seal coat (rural) or overlay (urban)	
	Open, < 1/2"	Low	Monitor	Monitor	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	Crack seal	
>1/2" or deteriorated	Low	Crack seal and blade patch	Crack seal and blade patch	Call District Office	Call District Office		
	Medium	Crack seal and blade patch	Crack seal and blade patch	Call District Office	Call District Office		
	High	Crack seal and blade patch	Crack seal and blade patch	Call District Office	Call District Office		

## Corpus Christi (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	Low	Low	F	Monitor	Fill ruts and or strip seal	Fill ruts and or strip seal	
			Medium	S	Monitor	Fill ruts and or strip seal	Fill ruts and or strip seal	
		0.5" to 1" (Shallow)	Medium	F	Blade level or hot mix level up			
			High	S	Blade level or hot mix level up			
		> 1" (Deep)	Low	F	Blade level or hot mix level up	Fill ruts and or strip seal	Fill ruts and level up	Fill ruts and level up
			Medium	S	Blade patch	Fill ruts and or strip seal	Fill ruts and level up	Fill ruts and level up
	Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Monitor	Fill ruts and or strip seal	Fill ruts and or strip seal	Fill ruts and or strip seal
			Medium	S	Monitor	Fill ruts and or strip seal	Fill ruts and or strip seal	Fill ruts and or strip seal
		High	F	Blade level or hot mix level up				
			S	Blade level or hot mix level up				
		> 1" (Deep)	Low	F	Blade level or hot mix level up	Fill ruts and or strip seal	Fill ruts and level up	Fill ruts and level up
			Medium	S	Blade patch	Fill ruts and or strip seal	Fill ruts and level up	Fill ruts and level up

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Plan rehabilitation or restoration	Plan rehabilitation or restoration	
			High	Monitor	Plan rehabilitation or restoration	Plan rehabilitation or restoration	
	Both Wheelpaths	Major	Low	Monitor	Monitor	Monitor	Monitor
			Medium	Full depth base repair and level up or hot mix patch	Plan rehabilitation or restoration	Plan rehabilitation or restoration	
			High	Full depth base repair and level up or hot mix patch	Plan rehabilitation or restoration	Plan rehabilitation or restoration	

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Swell/Roughness	Some Roughness	Low	Monitor	Blade level up	Blade level up	
		Medium	Monitor	Mill and level up	Mill and level up	
		High	Monitor	Mill and level up	Mill and level up	
	Rough	Low	Monitor	Blade level up	Blade level up	Blade level up
		Medium	Monitor	Mill and level up	Mill and level up	Mill and level up
		High	Monitor	Mill and level up	Mill and level up	Mill and level up

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Failures	Few	Low	Full depth base repair and level up or hot mix patch	Full depth base repair and level up or hot mix patch	Full depth base repair and level up or hot mix patch	
		Medium	Full depth base repair and level up or hot mix patch	Full depth base repair and level up or hot mix patch	Full depth base repair and level up or hot mix patch	
		High	Full depth base repair and level up or hot mix patch	Full depth base repair and level up or hot mix patch	Full depth base repair and level up or hot mix patch	
	Many	Low	Full depth base repair and level up or hot mix patch	Plan rehabilitation or restoration	Plan rehabilitation or restoration	Plan rehabilitation or restoration
		Medium	Full depth base repair and level up or hot mix patch	Plan rehabilitation or restoration	Plan rehabilitation or restoration	Plan rehabilitation or restoration
		High	Full depth base repair and level up or hot mix patch	Plan rehabilitation or restoration	Plan rehabilitation or restoration	Plan rehabilitation or restoration

John Hernandez

# Dallas

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40'	Low	Crack seal	Seal coat	Seal coat	
		Medium	Crack seal	Either crack seal or seal coat	Either crack seal or seal coat	
		High	Crack seal	Crack seal	Crack seal	
	Mostly tight	Low	Crack seal	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal and plant mix seal	Crack seal and plant mix seal	
		High	Patch and crack seal	Crack seal and plant mix seal	Crack seal and plant mix seal	
	Open, < 1/2"	Low	Blade patch	Reconstruct	Reconstruct	
		Medium	Mill and overlay	Mill and overlay	Mill and overlay	
		High	Mill and overlay	Mill and overlay	Mill and overlay	
	>1/2" or deteriorated	Low	Level up	Level up	Level up	
		Medium	Mill and inlay	Mill and inlay	Mill and inlay	
		High	Mill and inlay	Mill and inlay	Mill and inlay	
	Cupped or Tented	Low	Crack seal	Seal coat	Seal coat	
		Medium	Crack seal	Either crack seal or seal coat	Either crack seal or seal coat	
		High	Crack seal	Crack seal	Crack seal	
	15' - 40'	Mostly tight	Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal and plant mix seal	Crack seal and plant mix seal
			High	Crack seal	Crack seal and plant mix seal	Crack seal and plant mix seal
Open, < 1/2"		Low	Blade patch	Reconstruct	Reconstruct	
		Medium	Mill and overlay	Mill and overlay	Mill and overlay	
		High	Mill and overlay	Mill and overlay	Mill and overlay	
>1/2" or deteriorated		Low	Level up	Level up	Level up	
		Medium	Mill and inlay	Mill and inlay	Mill and inlay	
		High	Mill and inlay	Mill and inlay	Mill and inlay	
Cupped or Tented		Low	Crack seal	Seal coat	Seal coat	
		Medium	Crack seal	Either crack seal or seal coat	Either crack seal or seal coat	
		High	Crack seal	Crack seal	Crack seal	
<15'		Mostly Tight	Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal and plant mix seal	Crack seal and plant mix seal
			High	Crack seal	Crack seal and plant mix seal	Crack seal and plant mix seal
		Open, < 1/2"	Low	Blade patch	Reconstruct	Reconstruct
			Medium	Mill and overlay	Mill and overlay	Mill and overlay
			High	Mill and overlay	Mill and overlay	Mill and overlay
	>1/2" or deteriorated	Low	Level up	Level up	Level up	
		Medium	Mill and inlay	Mill and inlay	Mill and inlay	
		High	Mill and inlay	Mill and inlay	Mill and inlay	
	Cupped or Tented	Low	Crack seal	Seal coat	Seal coat	
		Medium	Crack seal	Either crack seal or seal coat	Either crack seal or seal coat	
		High	Crack seal	Crack seal	Crack seal	

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Low	Observe and wait for normal seal coat cycle	Observe and wait for normal seal coat cycle	Observe and wait for normal seal coat cycle	
		Medium	Observe and wait for normal seal coat cycle	Observe and wait for normal seal coat cycle	Observe and wait for normal seal coat cycle	
		High	Observe and wait for normal seal coat cycle	Observe and wait for normal seal coat cycle	Observe and wait for normal seal coat cycle	
	Mostly tight	Low	Crack seal	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	
	Open, < 1/2"	Low	Cut out and replace	Cut out and replace	Cut out and replace	
		Medium	Cut out and replace	Cut out and replace	Cut out and replace	
		High	Cut out and replace	Cut out and replace	Cut out and replace	
	>1/2" or deteriorated	Low	Monitor	Observe and wait for normal seal coat cycle	Observe and wait for normal seal coat cycle	
		Medium	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay	
		High	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay	
	1 per lane	Mostly tight	Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Check for widening. If yes, rebuild edges, otherwise reconstruct
			High	Crack seal	Crack seal	Check for widening. If yes, rebuild edges, otherwise reconstruct
		Open, < 1/2"	Low	Blade patch	Reconstruct	Reconstruct
			Medium	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay
			High	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay
		>1/2" or deteriorated	Low	Monitor	Seal coat	Seal coat
			Medium	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay
			High	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay	Monitor until cracks are wider, then mill, underseal, and overlay
		Mostly Tight	Low	Blade patch	Reconstruct	Reconstruct
			Medium	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay
			High	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay
>1 per lane	Open, < 1/2"	Low	Blade patch	Reconstruct	Reconstruct	
		Medium	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay	
		High	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay	
>1/2" or deteriorated	Low	Blade patch	Reconstruct	Reconstruct		
	Medium	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay		
	High	Mill, underseal, and overlay	Mill, underseal, and overlay	Mill, underseal, and overlay		

## Dallas (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	Low	F	Monitor	Monitor	Monitor
				S	Monitor	Monitor	Monitor
		0.5" to 1" (Shallow)	Medium	F	Mill and replace rutted area	Mill and replace rutted area	Mill and replace rutted area
				S	Mill and replace rutted area	Mill and replace rutted area	Mill and replace rutted area
		High	High	F	Mill and replace rutted area	Mill and replace rutted area	Mill and replace rutted area
				S	Mill and replace rutted area	Mill and replace rutted area	Mill and replace rutted area
	> 1" (Deep)	Low	Low	F	Blade patch	Blade patch	Blade patch
				S	Blade patch	Blade patch	Blade patch
		Medium	Medium	F	Mill rut and replace	Mill rut and replace	Mill rut and replace
				S	Mill rut and replace	Mill rut and replace	Mill rut and replace
		High	High	F	Mill rut and replace	Mill rut and replace	Mill rut and replace
				S	Mill rut and replace	Mill rut and replace	Mill rut and replace
Both Wheelpaths	0.5" to 1" (Shallow)	Low	Low	F	Monitor	Monitor until wider	Monitor until wider
				S	Monitor	Monitor until wider	Monitor until wider
		Medium	Medium	F	Mill and replace	Mill and replace	Mill and replace
				S	Mill and replace	Mill and replace	Mill and replace
		High	High	F	Mill and replace	Mill and replace	Mill and replace
				S	Mill and replace	Mill and replace	Mill and replace
	> 1" (Deep)	Low	Low	F	Rut fill with drag box or laydown machine	Rut fill with drag box or laydown machine	Blade patch and overlay
				S	Rut fill with drag box or laydown machine	Rut fill with drag box or laydown machine	Blade patch and overlay
		Medium	Medium	F	Mill and replace	Mill and replace	Mill and replace
				S	Mill and replace	Mill and replace	Mill and replace
		High	High	F	Mill and replace	Mill and replace	Mill and replace
				S	Mill and replace	Mill and replace	Mill and replace

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Blade and replace	Seal coat and overlay	Seal coat and overlay
			Medium	Mill and replace	Mill and replace	Mill and replace
			High	Mill and replace	Mill and replace	Mill and replace
		Major	Low	Blade and replace	Blade and replace	Blade and replace
			Medium	Mill and replace	Mill and replace	Mill and replace
			High	Mill and replace	Mill and replace	Mill and replace
Both Wheelpaths	Minor	Low	Blade and replace	Seal coat and overlay	Seal coat and overlay	
		Medium	Mill and replace	Mill and replace	Mill and replace	
		High	Mill and replace	Mill and replace	Mill and replace	
	Major	Low	Blade and replace	Blade and replace	Blade and replace	
		Medium	Mill and replace	Mill and replace	Mill and replace	
		High	Mill and replace	Mill and replace	Mill and replace	

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/ Roughness	Some Roughness	Low	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor
		High	Monitor	Monitor	Monitor
	Rough	Low	Patch and level up	Patch and level up	Patch and level up
		Medium	Patch and level up	Patch and level up	Patch and level up
		High	Patch and level up	Patch and level up	Patch and level up

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Cut out areas and replace	Cut out areas and replace	Cut out areas and replace
		Medium	Cut out areas and replace	Cut out areas and replace	Cut out areas and replace or reconstruct
		High	Cut out areas and replace	Cut out areas and replace	Cut out areas and replace
	Many	Low	Cut out areas and replace	Cut out areas and replace	Cut out areas and replace
		Medium	Cut out areas and replace	Reconstruct	Reconstruct
		High	Cut out areas and replace	Reconstruct	Reconstruct

Joe Thompson  
Gary Charlton

# El Paso

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years			
Transverse Cracking	>40'	Mostly tight	Low Medium High	Monitor Monitor Crack seal	Crack seal Crack seal Seal coat	Crack seal Crack seal Seal coat		
		Open, < 1/2"	Low Medium High	Monitor Crack seal Crack seal	Crack seal Seal coat Seal coat	Crack seal Seal coat Seal coat		
			>1/2" or deteriorated	Low Medium High	Crack seal Crack seal Strip seal	Crack seal Crack seal Strip seal	Crack seal Crack seal Strip seal	
				Cupped or Tented	Low Medium High	Crack seal Strip seal Strip seal	Crack seal Strip seal Strip seal	Crack seal Strip seal Strip seal
		15' - 40'			Mostly tight	Low Medium High	Monitor Monitor Crack seal	Crack seal Crack seal Crack seal
			Open, < 1/2"		Low Medium High	Monitor Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal
				>1/2" or deteriorated	Low Medium High	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal
					Cupped or Tented	Low Medium High	Crack seal Strip seal Strip seal	Crack seal Strip seal Strip seal
			<15'			Mostly Tight	Low Medium High	Monitor Monitor Crack seal
	Open, < 1/2"			Low Medium High		Monitor Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal
				>1/2" or deteriorated	Low Medium High	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal
					Cupped or Tented	Low Medium High	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years				
Longitudinal Cracking	>Lane Width	Mostly tight	Low Medium High	Monitor Monitor Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal			
		Open, < 1/2"	Low Medium High	Monitor Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal			
			>1/2" or deteriorated	Low Medium High	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal		
				1 per lane	Mostly tight	Low Medium High	Monitor Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal
		Open, < 1/2"			Low Medium High	Monitor Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal	
			>1/2" or deteriorated		Low Medium High	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal	
					>1 per lane	Mostly Tight	Low Medium High	Monitor Crack seal Crack seal	Crack seal Crack seal Crack seal
		Open, < 1/2"				Low Medium High	Monitor Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal
			>1/2" or deteriorated			Low Medium High	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal	Crack seal Crack seal Crack seal

## El Paso (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	Low	F	Strip seal	Strip seal	Strip seal	Strip seal	
			S	Strip seal	Strip seal	Strip seal		
		0.5" to 1" (Shallow)	Medium	F	Microsurface	Microsurface	Microsurface	Microsurface
			S	Microsurface	Microsurface	Microsurface		
		High	F	Microsurface	Microsurface	Microsurface	Microsurface	
			S	Microsurface	Microsurface	Microsurface		
	> 1" (Deep)	Low	F	Fill ruts	Microsurface	Mill and overlay		
		S	Fill ruts	Microsurface	Mill and overlay			
		Medium	F	Microsurface	Microsurface	Mill and overlay		
			S	Microsurface	Microsurface	Mill and overlay		
		High	F	Microsurface	Microsurface	Mill and overlay		
			S	Microsurface	Microsurface	Mill and overlay		
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Strip seal	Strip seal	Strip seal	Strip seal	
			S	Strip seal	Strip seal	Strip seal		
		Medium	F	Microsurface	Microsurface	Mill and overlay		
			S	Microsurface	Microsurface	Mill and overlay		
		High	F	Microsurface	Microsurface	Mill and overlay		
			S	Microsurface	Microsurface	Mill and overlay		
	> 1" (Deep)	Low	F	Microsurface	Microsurface	Mill and seal coat		
		S	Microsurface	Microsurface	Mill and seal coat			
		Medium	F	Microsurface	Microsurface	Mill and overlay		
			S	Microsurface	Microsurface	Mill and overlay		
		High	F	Microsurface	Microsurface	Mill and overlay		
			S	Microsurface	Microsurface	Mill and overlay		

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Strip seal	Strip seal	Seal coat
			Medium	Strip seal	Seal coat	Rubberized seal coat
			High	Strip seal	Seal coat	Rubberized seal coat
		Major	Low	Strip seal	Seal coat	Rubberized seal coat
			Medium	Strip seal	Seal coat	Rubberized seal coat
			High	Strip seal	Seal coat	Rubberized seal coat
	Both Wheelpaths	Minor	Low	Strip seal	Seal coat	Seal coat
			Medium	Strip seal	Seal coat	Rubberized seal coat
			High	Strip seal	Seal coat	Rubberized seal coat
		Major	Low	Strip seal	Seal coat	Rubberized seal coat
			Medium	Strip seal	Seal coat	Rubberized seal coat
			High	Strip seal	Seal coat	Rubberized seal coat

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Mill	Monitor	Mill and overlay
		Medium	Mill	Mill and seal coat	Mill and overlay
		High	Mill	Mill and seal coat	Mill and overlay
	Rough	Low	Mill	Mill and seal coat	Mill and overlay
		Medium	Mill	Mill and seal coat	Mill and overlay
		High	Mill	Mill and seal coat	Mill and overlay

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Patch	Seal coat	Patch and overlay
		Medium	Patch	Seal coat	Patch and overlay
		High	Patch	Seal coat	Patch and overlay
	Many	Low	Patch	Seal coat	Overlay
		Medium	Patch	Seal coat	Reconstruct
		High	Patch	Seal coat	Reconstruct

J. V. Herrera  
Roberto Tejada

# Fort Worth

Predominant Crack Distress	Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Monitor or crack seal	Monitor or crack seal	Crack seal wide cracks or Monitor
			Medium	Monitor or crack seal	Monitor or crack seal	Crack seal wide cracks or Monitor
			High	Monitor or crack seal	Monitor or crack seal	Crack seal wide cracks or Monitor
	Open, < 1/2"		Low	Monitor or crack seal	Monitor or crack seal	Monitor or crack seal
			Medium	Monitor or crack seal	Monitor or crack seal	Monitor or crack seal
			High	Monitor or crack seal	Monitor or crack seal	Monitor or crack seal
	>1/2" or deteriorated		Low	Crack fill (type F)	Crack fill (type F)	Crack fill (type F)
			Medium	Crack fill (type F)	Crack fill (type F)	Crack fill (type F)
			High	Crack fill (type F)	Crack fill (type F)	Crack fill (type F) and overlay
	Cupped or Tented		Low	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and seal coat. Call District office
			Medium	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office
			High	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office
15' - 40'	Mostly tight	Low	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and seal coat. Call District office	
		Medium	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office	
		High	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office	
	Open, < 1/2"		Low	Blade patch	Crack seal	Plan seal coat
			Medium	Blade patch	Crack seal	Seal coat or microsurface
			High	Blade patch	Crack seal	Microsurface
	>1/2" or deteriorated		Low	Crack seal	Crack seal	Crack seal and plan seal coat
			Medium	Crack seal	Crack seal	Crack seal and plan seal coat or microsurface
			High	Crack seal	Crack seal	Crack seal and overlay or microsurface
	Cupped or Tented		Low	Crack fill (type F).	Crack fill (type F). Call District office	Crack fill (type F) and plan seal coat
			Medium	Crack fill (type F) and level up.	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay
			High	Crack fill (type F) and level up.	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay
<15'	Mostly Tight	Low	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and seal coat. Call District office	
		Medium	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office	
		High	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office	
	Open, < 1/2"		Low	Crack seal	Crack seal	Crack seal and plan seal coat
			Medium	Crack seal	Crack seal	Crack seal and plan seal coat or microsurface
			High	Crack seal	Crack seal	Crack seal and overlay or microsurface
	>1/2" or deteriorated		Low	Crack fill (type F).	Crack fill (type F). Call District office	Crack fill (type F) and plan seal coat
			Medium	Crack fill (type F) and level up.	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay
			High	Crack fill (type F) and level up.	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay
	Cupped or Tented		Low	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and seal coat. Call District office
			Medium	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office
			High	Crack fill (type F) and level up. Call District office	Crack fill (type F) and level up. Call District office	Crack fill (type F), level up, and overlay. Call District office

Predominant Crack Distress	Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Crack seal or Monitor	Crack seal or Monitor
			High	Monitor	Crack seal or Monitor	Crack seal or Monitor
		Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal
	1 per lane	>1/2" or deteriorated	Low	Crack fill (type F).	Crack fill (type F).	Crack fill (type F).
			Medium	Crack fill (type F).	Crack fill (type F).	Crack fill (type F).
			High	Crack fill (type F).	Crack fill (type F).	Crack fill (type F).
		Mostly tight	Low	Crack seal or Monitor	Crack seal or Monitor	Strip seal
			Medium	Crack seal	Crack seal	Strip seal
			High	Crack seal	Crack seal	Crack seal
>1 per lane	Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal and strip seal	
		Medium	Crack seal	Crack seal	Crack seal and strip seal	
		High	Crack seal	Crack seal	Blade overlay or patch	
	>1/2" or deteriorated	Low	Crack fill (type F).	Crack fill (type F).	Call District office	
		Medium	Crack fill (type F).	Crack fill (type F).	Call District office	
		High	Crack fill (type F).	Crack fill (type F).	Call District office	
>1 per lane	Mostly Tight	Low	Crack seal	Crack seal	Call District office	
		Medium	Crack seal	Crack seal	Call District office	
		High	Crack seal	Crack seal	Call District office	
	Open, < 1/2"	Low	Crack fill (type F).	Crack fill (type F).	Call District office	
		Medium	Crack fill (type F).	Crack fill (type F).	Call District office	
		High	Crack fill (type F).	Crack fill (type F).	Call District office	
>1/2" or deteriorated	Low	Crack fill (type F).	Crack fill (type F).	Call District office		
	Medium	Crack fill (type F).	Crack fill (type F).	Call District office		
	High	Crack fill (type F).	Crack fill (type F).	Call District office		



# Houston

Predominant Crack Distress		Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Low	Monitor	Monitor	Monitor
			Medium	Medium	Monitor	Monitor	Monitor
			High	High	Monitor	Monitor	Monitor
	Open, < 1/2"		Low	Low	Monitor	Crack seal	Crack seal and overlay
			Medium	Medium	Monitor	Crack seal	Crack seal and overlay
			High	High	Monitor	Crack seal	Crack seal and overlay
	>1/2" or deteriorated		Low	Low	Patch	Patch	Patch or crack seal, and overlay
			Medium	Medium	Patch	Patch	Patch or crack seal, and overlay
			High	High	Patch	Patch	Patch or crack seal, and overlay
	Cupped or Tented		Low	Low	Patch	Patch or monitor	Patch and overlay
			Medium	Medium	Patch	Patch or monitor	Patch and overlay
			High	High	Patch	Patch or monitor	Patch and overlay
15' - 40'	Mostly tight	Low	Low	Monitor	Monitor	Monitor	
		Medium	Medium	Monitor	Monitor	Monitor	
		High	High	Monitor	Monitor	Monitor	
	Open, < 1/2"		Low	Low	Monitor	Crack seal	Crack seal and overlay
			Medium	Medium	Monitor	Crack seal	Crack seal and overlay
			High	High	Monitor	Crack seal	Crack seal and overlay
	>1/2" or deteriorated		Low	Low	Monitor	Patch	Patch and overlay
			Medium	Medium	Monitor	Patch	Patch and overlay
			High	High	Monitor	Patch	Patch and overlay
	Cupped or Tented		Low	Low	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
			Medium	Medium	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
			High	High	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
<15'	Mostly Tight	Low	Low	Monitor	Monitor	Monitor	
		Medium	Medium	Monitor	Monitor	Monitor	
		High	High	Monitor	Monitor	Monitor	
	Open, < 1/2"		Low	Low	Crack seal	Crack seal	Crack seal and overlay
			Medium	Medium	Crack seal	Crack seal	Crack seal and overlay
			High	High	Crack seal	Crack seal	Crack seal and overlay
	>1/2" or deteriorated		Low	Low	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
			Medium	Medium	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
			High	High	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
	Cupped or Tented		Low	Low	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
			Medium	Medium	Patch	Patch	Patch and overlay, or reconstruct if in bad shape
			High	High	Patch	Patch	Patch and overlay, or reconstruct if in bad shape

Predominant Crack Distress		Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Low	Monitor	Monitor	Monitor	
			Medium	Medium	Monitor	Monitor	Monitor	
			High	High	Monitor	Monitor	Monitor	
		Open, < 1/2"		Low	Low	Monitor	Crack seal	Crack seal and overlay
				Medium	Medium	Monitor	Crack seal	Crack seal and overlay
				High	High	Monitor	Crack seal	Crack seal and overlay
		>1/2" or deteriorated		Low	Low	Crack seal	Crack seal	Patch and overlay
				Medium	Medium	Crack seal	Crack seal	Patch and overlay
				High	High	Crack seal	Crack seal	Patch and overlay
		1 per lane	Mostly tight	Low	Low	Monitor	Monitor	Monitor
				Medium	Medium	Monitor	Monitor	Monitor
				High	High	Monitor	Monitor	Monitor
Open, < 1/2"	Low		Low	Monitor	Crack seal	Crack seal and overlay		
	Medium		Medium	Monitor	Crack seal	Crack seal and overlay		
	High		High	Monitor	Crack seal	Crack seal and overlay		
>1/2" or deteriorated	Low	Low	Crack seal	Crack seal	Patch and overlay			
	Medium	Medium	Crack seal	Crack seal	Patch and overlay			
	High	High	Crack seal	Crack seal	Patch and overlay			
>1 per lane	Mostly Tight	Low	Low	Monitor	Monitor	Monitor		
		Medium	Medium	Monitor	Monitor	Monitor		
		High	High	Monitor	Monitor	Monitor		
	Open, < 1/2"	Low	Low	Crack seal	Crack seal	Crack seal and overlay		
		Medium	Medium	Crack seal	Crack seal	Crack seal and overlay		
		High	High	Crack seal	Crack seal	Crack seal and overlay		
>1/2" or deteriorated	Low	Low	Patch	Patch	Patch and overlay			
	Medium	Medium	Patch	Patch	Reconstruct			
	High	High	Patch	Patch	Reconstruct			

## Houston (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	Low	F	Monitor	Monitor	Overlay
			Medium	S	Monitor	Monitor	Overlay
		0.5" to 1" (Shallow)	Medium	F	Monitor	Fill ruts	Overlay
			High	S	Monitor	Fill ruts	Overlay
		> 1" (Deep)	Low	F	Patch	Fill ruts	Overlay
			Medium	S	Patch	Fill ruts	Overlay
	Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Monitor	Monitor	Overlay
			Medium	S	Monitor	Monitor	Overlay
		> 1" (Deep)	Low	F	Patch	Fill ruts	Overlay
			Medium	S	Patch	Fill ruts	Overlay
			Low	F	Patch	Fill ruts	Overlay
			Medium	S	Patch	Fill ruts	Overlay

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Thin patch	Thin patch	Patch or mill and overlay if continuous
			Medium	Thin patch	Thin patch	Patch or mill and overlay if continuous
			High	Thin patch	Thin patch	Patch or mill and overlay if continuous
		Major	Low	Full depth patch	Full depth patch	Full depth patch or overlay. Reconstruct if continuous.
			Medium	Full depth patch	Full depth patch	Full depth patch or overlay. Reconstruct if continuous.
			High	Full depth patch	Full depth patch	Full depth patch or overlay. Reconstruct if continuous.
	Both Wheelpaths	Minor	Low	Thin patch	Thin patch	Patch or mill and overlay if continuous
			Medium	Thin patch	Thin patch	Patch or mill and overlay if continuous
			High	Thin patch	Thin patch	Patch or mill and overlay if continuous
		Major	Low	Full depth patch	Full depth patch	Full depth patch or overlay. Reconstruct if continuous.
			Medium	Full depth patch	Full depth patch	Full depth patch or overlay. Reconstruct if continuous.
			High	Full depth patch	Full depth patch	Full depth patch or overlay. Reconstruct if continuous.

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Overlay	
		Medium	Monitor	Monitor	Overlay	
		High	Monitor	Monitor	Overlay	
	Rough	Low	Level up	Level up	Level up	Thick overlay or Bomag
		Medium	Level up	Level up	Level up	Thick overlay or Bomag
		High	Level up	Level up	Level up	Thick overlay or Bomag

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Patch	Patch	Patch and overlay. If less than 2 years old, patch only
		Medium	Patch	Patch	Patch and overlay. If less than 2 years old, patch only
		High	Patch	Patch	Patch and overlay. If less than 2 years old, patch only
	Many	Low	Patch	Patch	Patch and overlay. If less than 2 years old, patch only
		Medium	Patch	Patch	Patch and overlay. If less than 2 years old, patch only
		High	Patch	Patch	Patch and overlay. If less than 2 years old, patch only

Pat Henry

# Laredo

Predominant Crack Distress		Traffic Level or Importance		Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40'	Mostly tight	Low	Crack seal	Seal coat	Seal coat	
			Medium	Crack seal	Seal coat	Seal coat	
			High	Crack seal	Seal coat	Seal coat	
	Open, < 1/2"	Low	Low	Crack seal	Seal coat	Seal coat	
			Medium	Crack seal	Seal coat	Seal coat	
			High	Crack seal	Seal coat	Overlay	
	>1/2" or deteriorated	Low	Low	Patch	Seal coat	Seal coat	
			Medium	Patch	Seal coat	Seal coat	
			High	Patch	Overlay	Overlay	
	Cupped or Tented	Low	Low	Mill and crack seal	Seal coat	Seal coat	
			Medium	Mill and crack seal	Seal coat	Seal coat	
			High	Mill and crack seal	Overlay	Overlay	
	15' - 40'	Mostly tight	Low	Low	Crack seal	Seal coat	Seal coat
				Medium	Crack seal	Seal coat	Seal coat
				High	Crack seal	Overlay	Overlay
		Open, < 1/2"	Low	Low	Crack seal	Seal coat	Seal coat
				Medium	Crack seal	Seal coat	Seal coat
				High	Crack seal	Overlay	Overlay
		>1/2" or deteriorated	Low	Low	Patch	Seal coat	Seal coat
				Medium	Patch	Seal coat	Seal coat
			High	Patch	Overlay	Overlay	
Cupped or Tented		Low	Low	Mill and crack seal	Seal coat	Seal coat	
			Medium	Mill and crack seal	Seal coat	Overlay	
			High	Mill and crack seal	Overlay	Overlay	
<15'	Mostly Tight	Low	Low	Crack seal	Seal coat	Seal coat	
			Medium	Crack seal	Seal coat	Overlay	
			High	Crack seal	Seal coat	Overlay	
	Open, < 1/2"	Low	Low	Crack seal	Seal coat	Overlay	
			Medium	Crack seal	Seal coat	Rehabilitate	
			High	Crack seal	Overlay	Rehabilitate	
	>1/2" or deteriorated	Low	Low	Patch	Seal coat	Rehabilitate	
			Medium	Patch	Seal coat	Reconstruct	
			High	Patch	Overlay	Reconstruct	
	Cupped or Tented	Low	Low	Mill and crack seal	Seal coat	Seal coat	
			Medium	Mill and crack seal	Overlay	Overlay	
			High	Mill and crack seal	Overlay	Overlay	

Predominant Crack Distress		Traffic Level or Importance		Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years		
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Crack seal	Seal coat	Seal coat		
				Medium	Crack seal	Seal coat	Seal coat	
				High	Crack seal	Seal coat	Seal coat	
		Open, < 1/2"	Low	Low	Crack seal	Seal coat	Seal coat	
				Medium	Crack seal	Seal coat	Seal coat	
				High	Crack seal	Seal coat	Overlay	
		>1/2" or deteriorated	Low	Low	Patch	Seal coat	Seal coat	
				Medium	Patch	Seal coat	Seal coat	
				High	Patch	Overlay	Overlay	
		1 per lane	Mostly tight	Low	Low	Crack seal	Seal coat	Seal coat
					Medium	Crack seal	Seal coat	Seal coat
					High	Crack seal	Seal coat	Overlay
	Open, < 1/2"		Low	Low	Crack seal	Seal coat	Seal coat	
				Medium	Crack seal	Seal coat	Seal coat	
				High	Crack seal	Overlay	Overlay	
	>1 per lane	>1/2" or deteriorated	Low	Low	Patch	Seal coat	Seal coat	
				Medium	Patch	Seal coat	Overlay	
				High	Patch	Overlay	Overlay	
		Mostly Tight	Low	Low	Crack seal	Seal coat	Seal coat	
				Medium	Crack seal	Overlay	Overlay	
			High	Crack seal	Overlay	Rehabilitate		
Open, < 1/2"	Low	Low	Crack seal	Seal coat	Overlay			
		Medium	Crack seal	Overlay	Rehabilitate			
		High	Crack seal	Overlay	Rehabilitate			
>1/2" or deteriorated	Low	Low	Patch	Seal coat	Overlay			
		Medium	Patch	Seal coat	Rehabilitate			
		High	Patch	Overlay	Reconstruct			

## Laredo (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	0.5" to 1" (Shallow)	Low	F S	Monitor Monitor	Monitor Monitor	Monitor Monitor	
			Medium	F S	Monitor Monitor	Monitor Monitor	Monitor Monitor	
			High	F S	Monitor Monitor	Monitor Monitor	Microsurface Monitor	
		> 1" (Deep)	Low	F S	Monitor Monitor	Monitor Monitor	Microsurface Microsurface	
			Medium	F S	Monitor Monitor	Microsurface Monitor	Overlay Microsurface	
			High	F S	Monitor Monitor	Microsurface Microsurface	Overlay Overlay	
	Both Wheelpaths	0.5" to 1" (Shallow)	Low	F S	Monitor Monitor	Monitor Monitor	Monitor Monitor	Monitor Monitor
			Medium	F S	Monitor Monitor	Monitor Monitor	Monitor Monitor	Monitor Monitor
			High	F S	Monitor Monitor	Monitor Monitor	Microsurface Monitor	Microsurface Monitor
		> 1" (Deep)	Low	F S	Monitor Monitor	Monitor Monitor	Microsurface Microsurface	Microsurface Microsurface
			Medium	F S	Monitor Monitor	Microsurface Monitor	Overlay Microsurface	Overlay Microsurface
			High	F S	Monitor Monitor	Microsurface Microsurface	Overlay Microsurface	Overlay Overlay

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Crack seal	Seal coat	Seal coat
			Medium	Crack seal	Seal coat	Seal coat
			High	Crack seal	Seal coat	Seal coat
		Major	Low	Patch	Seal coat	Seal coat
			Medium	Patch	Seal coat	Overlay
			High	Patch	Seal coat	Overlay
	Both Wheelpaths	Minor	Low	Crack seal	Seal coat	Seal coat
			Medium	Crack seal	Seal coat	Seal coat
			High	Crack seal	Seal coat	Seal coat
		Major	Low	Patch	Seal coat	Seal coat
			Medium	Patch	Seal coat	Overlay
			High	Patch	Seal coat	Overlay

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Overlay	
		High	Monitor	Overlay	Rehabilitate	
	Rough	Low	Monitor	Monitor	Overlay	Rehabilitate
		Medium	Monitor	Monitor	Overlay	Reconstruct
		High	Monitor	Monitor	Overlay	Reconstruct

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Patch	Seal coat	Seal coat
		Medium	Patch	Seal coat	Seal coat
		High	Patch	Seal coat	Overlay
	Many	Low	Patch	Seal coat	Rehabilitate
		Medium	Patch	Rehabilitate	Rehabilitate
		High	Patch	Reconstruct	Reconstruct

Roy Garcia

## Lubbock

Predominant Crack Distress		Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Spacing						
Transverse Cracking	>40'	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor
		Open, < 1/2"	Low	Crack seal if working nearby	Plan crack seal	Crack seal and plan seal coat
			Medium	Crack seal	Crack seal	
			High	Crack seal	Crack seal	
		>1/2" or deteriorated	Low	Plan crack seal	Crack fill and crack seal or patch	Crack fill and crack seal or patch
			Medium	Crack fill and crack seal or patch	Crack fill and crack seal or patch	
			High	Crack fill and crack seal or patch	Crack fill and crack seal or patch	
		Cupped or Tented	Low	Spot level	If cupped, strip seal. If tented, blade tops of cracks and patch	If cupped, strip seal. If tented, blade tops of cracks and patch
			Medium	Spot level	If cupped, strip seal. If tented, blade tops of cracks and patch	If cupped, strip seal. If tented, blade tops of cracks and patch
			High	Spot level	Mill cracks and level up	Mill cracks and level up
15' - 40'	Mostly tight	Low	Monitor	Monitor	Plan seal coat	
			Medium	Monitor	Monitor or fog seal	
			High	Monitor	Monitor or fog seal	
		Open, < 1/2"	Low	Monitor and crack seal if working nearby	Monitor, crack seal if it deteriorates	Plan crack seal and seal coat
			Medium	Monitor and crack seal if working nearby	Monitor, crack seal if it deteriorates	
			High	Crack seal	Crack seal	
		>1/2" or deteriorated	Low	Tack and blade patch or crack seal	Crack fill and crack seal, patch bad areas.	Plan rehabilitation
			Medium	Tack and blade patch or crack seal	Crack fill and crack seal, patch bad areas.	
			High	Tack and blade patch or crack seal	Crack fill and crack seal, patch bad areas.	
		Cupped or Tented	Low	Blade patch	Plan rehabilitation	Plan rehabilitation
			Medium	Blade patch or mill and maybe overlay	If cupped, mill. If tented, mill tops of cracks	Mill and overlay or plan rehabilitation
			High	Mill and maybe overlay	If cupped, mill. If tented, mill tops of cracks	Mill and overlay or plan rehabilitation
<15'	Mostly Tight	Low	Monitor	Monitor	Plan seal coat	
			Medium	Monitor	Monitor or fog seal	
			High	Monitor	Monitor or fog seal	
		Open, < 1/2"	Low	Monitor and crack seal if working nearby	Monitor, crack seal if it deteriorates	Plan crack seal and seal coat
			Medium	Monitor and crack seal if working nearby	Monitor, crack seal if it deteriorates	
			High	Crack seal	Crack seal	
		>1/2" or deteriorated	Low	Tack and blade patch or crack seal	Crack fill and crack seal, patch bad areas.	Plan rehabilitation
			Medium	Tack and blade patch	Crack fill and crack seal, patch bad areas.	
			High	Tack and blade patch	Crack fill and crack seal, patch bad areas.	
		Cupped or Tented	Low	Blade patch	Plan rehabilitation	Plan rehabilitation
			Medium	Blade patch or mill and maybe overlay	If cupped, mill. If tented, mill tops of cracks	Mill and overlay or plan rehabilitation
			High	Mill and maybe overlay	If cupped, mill. If tented, mill tops of cracks	Mill and overlay or plan rehabilitation

Predominant Crack Spacing		Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
(Across)						
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	
			High	Monitor	Monitor	
		Open, < 1/2"	Low	Monitor and crack seal if working nearby	Monitor and crack seal if working nearby	Plan crack seal
			Medium	Monitor and crack seal if working nearby	Monitor and crack seal if working nearby	
			High	Monitor and crack seal if working nearby	Monitor and crack seal if working nearby	
		>1/2" or deteriorated	Low	Monitor and crack fill and crack seal if working nearby	Plan crack fill and crack seal	Crack fill and crack seal
			Medium	Crack fill and crack seal, level up if needed	Crack fill and crack seal, level up if needed	
			High	Crack fill and crack seal, level up if needed	Crack fill and crack seal, level up if needed	
	1 per lane	Mostly tight	Low	Monitor	Monitor	Monitor
				Medium	Monitor	Monitor or fog seal
				High	Strip seal	Strip seal
		Open, < 1/2"	Low	Monitor and crack seal if working nearby	Plan crack seal	Crack seal
			Medium	Monitor and crack seal if working nearby	Plan crack seal	
			High	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal	
		Medium	Crack fill and crack seal, level up if needed	Crack fill and crack seal, level up if needed		
		High	Crack fill and crack seal, level up if needed	Crack fill and crack seal, level up if needed		
>1 per lane	Mostly Tight	Low	Monitor	Monitor or fog seal	Plan seal coat	
			Medium	Monitor	Monitor or fog seal	
			High	Monitor	Plan seal coat	
		Open, < 1/2"	Low		Crack seal	Plan major rehabilitation
			Medium		Crack seal	
			High		Crack seal	
	>1/2" or deteriorated	Low	Crack seal and blade patch	Crack seal and blade patch	Plan major rehabilitation	
		Medium	Crack seal and blade patch	Crack seal and blade patch		
		High	Crack seal and blade patch	Crack seal and blade patch		

## Lubbock (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F		Monitor or level up	Monitor or level up	Level up
			S		Monitor or level up	Monitor or level up	Level up
		Medium	F		Monitor or level up	Monitor or level up	Level up
			S		Monitor or level up	Monitor or level up	Level up
		High	F		Level up	Level up	Mill and level up
			S		Level up	Level up	Mill and level up
	> 1" (Deep)	Low	F		Remove and replace	Remove and replace	Remove and replace
			S		Remove and replace	Remove and replace	Remove and replace
		Medium	F		Dig out and replace	Dig out and replace	Dig out and replace
			S		Dig out and replace	Dig out and replace	Dig out and replace
		High	F		Dig out and replace	Dig out and replace	Dig out and replace
			S		Dig out and replace	Dig out and replace	Dig out and replace
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F		Monitor or blade level	Strip seal or blade level	Plan rehabilitation
			S		Monitor or blade level	Strip seal or blade level	Plan rehabilitation
		Medium	F		Monitor or level up	Strip seal or blade level	Mill and overlay or plan rehabilitation
			S		Monitor or level up	Strip seal or blade level	Mill and overlay or plan rehabilitation
		High	F		Monitor or level up	Mill	Mill and overlay or plan rehabilitation
			S		Monitor or level up	Mill	Mill and overlay or plan rehabilitation
	> 1" (Deep)	Low	F		Remove, restabilize, and replace or Bomag	Level up and plan rehabilitation	Plan rehabilitation
			S		Remove, restabilize, and replace or Bomag	Level up and plan rehabilitation	Plan rehabilitation
		Medium	F		Remove, restabilize, and replace or Bomag	Mill and level up	Plan rehabilitation
			S		Remove, restabilize, and replace or Bomag	Mill and level up	Plan rehabilitation
		High	F		Mill and level up	Mill and level up	Plan rehabilitation
			S		Mill and level up	Plan rehabilitation	Plan rehabilitation

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Strip seal	Strip seal	Strip seal
			Medium	Strip seal	Strip seal	Strip seal or plan rehabilitation
			High	Strip seal	Strip seal	Plan rehabilitation
		Major	Low	Dig out and replace	Plan rehabilitation	Plan rehabilitation
			Medium	Remove full depth and replace	Plan rehabilitation	Plan rehabilitation
			High	Remove full depth and replace	Plan rehabilitation	Plan rehabilitation
	Both Wheelpaths	Minor	Low	Spot seal	Plan seal coat	Seal coat
			Medium	Spot seal	Plan seal coat	Seal coat
			High	Strip seal or lane width seal	Strip seal or seal coat	Plan rehabilitation
		Major	Low	Dig out and replace	Plan rehabilitation	Plan rehabilitation
			Medium	Remove full depth and replace	Plan rehabilitation	Plan rehabilitation
			High	Remove full depth and replace	Plan rehabilitation	Plan rehabilitation

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Level up	Call District Office	Call District Office
		Medium	Level up	Call District Office	Call District Office
		High	Level up	Call District Office	Call District Office
	Rough	Low	Level up	Call District Office	Call District Office
		Medium	Level up	Call District Office	Call District Office
		High	Level up	Call District Office	Call District Office

Predominant Distress	Few or Many	Traffic Level or Importance	Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Patch	Patch	Patch or remove and replace
		Medium	Patch	Patch	Patch or remove and replace
		High	Patch	Remove and replace	Remove and replace
	Many	Low	Remove, restabilize, and replace or Bomag	Plan rehabilitation	Plan rehabilitation
		Medium	Remove full depth and replace	Plan rehabilitation	Plan rehabilitation
		High	Remove full depth and replace	Plan rehabilitation	Plan rehabilitation

Ted Moore  
George Dozier

# Lufkin

Predominant Crack Distress		Crack Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Low	Monitor unless in the area, then seal coat	Monitor unless in the area, then seal coat	Monitor unless in the area, then seal coat
			Medium	Medium	Crack seal	Crack seal	Crack seal
			High	High	Crack seal	Crack seal	Crack seal
		Open, < 1/2"	Low	Low	Crack seal	Crack seal	Crack seal and seal coat
			Medium	Medium	Crack seal	Crack seal	Crack seal and seal coat
			High	High	Crack seal	Crack seal	Crack seal and seal coat
		>1/2" or deteriorated	Low	Low	Crack seal	Crack seal	Crack seal and seal coat
			Medium	Medium	Crack seal	Crack seal	Crack seal and seal coat
			High	High	Crack seal	Crack seal	Crack seal and seal coat
	Cupped or Tented	Low	Low	Crack seal	Crack seal	Crack seal and seal coat	
		Medium	Medium	Crack seal	Crack seal	Crack seal and seal coat	
		High	High	Crack seal	Crack seal	Crack seal and seal coat	
	15' - 40'	Mostly tight	Low	Low	Crack seal	Crack seal	Crack seal and seal coat
			Medium	Medium	Crack seal	Crack seal	Crack seal and seal coat
			High	High	Crack seal	Crack seal	Crack seal and seal coat
		Open, < 1/2"	Low	Low	Crack seal	Crack seal	Crack seal
			Medium	Medium	Crack seal	Crack seal	Crack seal
			High	High	Crack seal	Crack seal	Crack seal
		>1/2" or deteriorated	Low	Low	Mix in place or remove and replace	Call District Office	Call District Office
			Medium	Medium	Mix in place or remove and replace	Call District Office	Call District Office
			High	High	Mix in place or remove and replace	Call District Office	Call District Office
		Cupped or Tented	Low	Low	Blade level up if working nearby	Blade level up	Blade level up and spot seal
			Medium	Medium	Blade level up if working nearby	Blade level up	Call District Office
			High	High	Level up	Crack seal	Crack seal
<15'	Mostly Tight	Low	Low	Crack seal	Crack seal	Crack seal and seal coat	
		Medium	Medium	Crack seal	Crack seal	Crack seal and seal coat	
		High	High	Crack seal	Crack seal	Crack seal and seal coat	
	Open, < 1/2"	Low	Low	Crack seal	Crack seal	Crack seal	
		Medium	Medium	Crack seal	Crack seal	Crack seal	
		High	High	Crack seal	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Low	Mix in place or remove and replace	Call District Office	Call District Office	
		Medium	Medium	Mix in place or remove and replace	Call District Office	Call District Office	
		High	High	Mix in place or remove and replace	Call District Office	Call District Office	
	Cupped or Tented	Low	Low	Blade level up if working nearby	Blade level up	Blade level up and spot seal	
		Medium	Medium	Blade level up if working nearby	Blade level up	Call District Office	
		High	High	Level up	Crack seal	Crack seal	

Predominant Crack Distress		Crack Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Low	Monitor	Monitor until scheduled seal coat	Monitor until scheduled seal coat	
			Medium	Medium	Crack seal	Crack seal	Crack seal	
			High	High	Crack seal	Crack seal	Crack seal	
		Open, < 1/2"	Low	Low	Monitor until nearby, then spot seal	Monitor until scheduled seal coat	Monitor until scheduled seal coat	
			Medium	Medium	Crack seal	Crack seal and seal coat	Crack seal	
			High	High	Crack seal	Crack seal and seal coat	Crack seal	
		>1/2" or deteriorated	Low	Low	Call District Office	Call District Office	Call District Office	
			Medium	Medium	Call District Office	Call District Office	Call District Office	
			High	High	Call District Office	Call District Office	Call District Office	
		1 per lane	Mostly tight	Low	Low	Monitor	Monitor until scheduled seal coat	Monitor until scheduled seal coat
				Medium	Medium	Crack seal	Crack seal	Crack seal
				High	High	Crack seal	Crack seal	Crack seal
	Open, < 1/2"		Low	Low	Monitor until nearby, then spot seal	Monitor until scheduled seal coat	Monitor until scheduled seal coat	
			Medium	Medium	Crack seal	Crack seal and seal coat	Crack seal	
			High	High	Crack seal	Crack seal and seal coat	Crack seal	
	>1/2" or deteriorated		Low	Low	Call District Office	Call District Office	Call District Office	
			Medium	Medium	Call District Office	Call District Office	Call District Office	
			High	High	Call District Office	Call District Office	Call District Office	
	>1 per lane		Mostly Tight	Low	Low	Monitor	Monitor until scheduled seal coat	Monitor until scheduled seal coat
				Medium	Medium	Crack seal	Crack seal	Crack seal
				High	High	Crack seal	Crack seal	Crack seal
		Open, < 1/2"	Low	Low	Monitor until nearby, then spot seal	Monitor until scheduled seal coat	Seal coat	
			Medium	Medium	Crack seal	Crack seal and seal coat	Crack seal and seal coat	
			High	High	Crack seal	Crack seal and seal coat	Crack seal and seal coat	
>1/2" or deteriorated	Low	Low	Call District Office	Call District Office	Call District Office			
	Medium	Medium	Call District Office	Call District Office	Call District Office			
	High	High	Call District Office	Call District Office	Call District Office			

## Lufkin (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	Low	F	Level up	Level up	Level up
				S	Level up	Level up	Level up
		0.5" to 1" (Shallow)	Medium	F	Level up	Level up	Level up
				S	Level up	Level up	Level up
		High	High	F	Level up	Level up	Level up
				S	Level up	Level up	Level up
	> 1" (Deep)	Low	Low	F	Level up or repair	Level up or repair	Level up and repair
				S	Level up or repair	Level up or repair	Level up and repair
		Medium	Medium	F	Level up or repair	Level up or repair	Mill and replace
				S	Level up or repair	Level up or repair	Mill and replace
		High	High	F	Level up or repair	Level up or repair	Mill and replace
				S	Level up or repair	Level up or repair	Mill and replace
Both Wheelpaths	0.5" to 1" (Shallow)	Low	Low	F	Level up	Level up	Level up
				S	Level up	Level up	Level up
	Medium	Medium	F	Level up	Level up	Level up	
			S	Level up	Level up	Level up	
	High	High	F	Level up	Level up	Level up	
			S	Level up	Level up	Level up	
> 1" (Deep)	Low	Low	F	Level up or repair	Level up or repair	Level up and repair	
			S	Level up or repair	Level up or repair	Level up and repair	
	Medium	Medium	F	Level up or repair	Level up or repair	Mill and replace	
			S	Level up or repair	Level up or repair	Mill and replace	
High	High	F	Level up or repair	Level up or repair	Mill and replace		
		S	Level up or repair	Level up or repair	Mill and replace		

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Spot seal	Spot seal	Spot seal
			Medium	Spot seal	Spot seal	Spot seal
			High	Spot seal	Spot seal	Spot seal
		Major	Low	Dig out and replace	Plan rehabilitation	Plan rehabilitation
			Medium	Dig out and replace	Plan rehabilitation	Plan rehabilitation
			High	Dig out and replace	Plan rehabilitation	Plan rehabilitation
	Both Wheelpaths	Minor	Low	Spot seal	Spot seal	Spot seal
			Medium	Spot seal	Spot seal	Spot seal
			High	Spot seal	Spot seal	Spot seal
		Major	Low	Dig out and replace	Plan rehabilitation	Plan rehabilitation
			Medium	Dig out and replace	Plan rehabilitation	Plan rehabilitation
			High	Dig out and replace	Plan rehabilitation	Plan rehabilitation

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/ Roughness	Some Roughness	Low	Level up	Level up	Level up
		Medium	Level up	Level up	Level up
		High	Level up	Level up	Level up
	Rough	Low	Mill or level up	Mill or level up	Mill or level up
		Medium	Mill or level up	Mill or level up	Mill or level up
		High	Mill or level up	Mill or level up	Mill or level up

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Dig out and replace	Dig out and replace	Dig out and replace
		Medium	Dig out and replace	Dig out and replace	Dig out and replace
		High	Dig out and replace	Dig out and replace	Dig out and replace
	Many	Low	Dig out and replace	Plan rehabilitation	Plan rehabilitation
		Medium	Dig out and replace	Plan rehabilitation	Plan rehabilitation
		High	Dig out and replace	Plan rehabilitation	Plan rehabilitation

Ron Evers  
Robert Neel

No data received



## Paris

Predominant Crack Distress		Traffic Level or Importance		Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor	Monitor
		High	Monitor	Monitor	Monitor	Monitor
	>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	Plan seal coat
		Medium	Monitor	Crack seal	Crack seal	Crack seal
		High	Monitor	Crack seal	Crack seal	Crack seal
	Cupped or Tented	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor	Either monitor or blade tops of cracks and crack seal
		High	Monitor	Monitor	Blade tops of cracks and crack seal	Blade tops of cracks and crack seal
15' - 40'	Mostly tight	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor	Monitor
		High	Monitor	Monitor	Monitor	Monitor
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor	Monitor
		High	Monitor	Monitor	Monitor	Monitor
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
	Cupped or Tented	Low	Blade tops of cracks and skin patch	Blade tops of cracks and skin patch	Mill and seal coat	Mill and seal coat
		Medium	Blade tops of cracks and skin patch	Blade tops of cracks and skin patch	Mill tops of cracks, seal coat and slurry	Mill tops of cracks, seal coat and slurry
		High	Blade tops of cracks and skin patch	Blade tops of cracks and skin patch	Plan rehabilitation (mill, fabric, and overlay)	Plan rehabilitation (mill, fabric, and overlay)
<15'	Mostly Tight	Low	Monitor	Monitor	Monitor	Fog seal
		Medium	Monitor	Monitor	Monitor	Fog seal
		High	Monitor	Monitor	Monitor	Fog seal
	Open, < 1/2"	Low	Fog seal and sand, broom into cracks	Fog seal and sand, broom into cracks	Crack seal	Crack seal
		Medium	Skin patch	Skin patch	Crack seal	Crack seal
		High	Skin patch	Skin patch	Crack seal	Crack seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
	Cupped or Tented	Low	Blade tops of cracks and skin patch	Blade tops of cracks and skin patch	Mill and seal coat	Mill and seal coat
		Medium	Blade tops of cracks and skin patch	Blade tops of cracks and skin patch	Mill tops of cracks, seal coat and slurry	Mill tops of cracks, seal coat and slurry
		High	Blade tops of cracks and skin patch	Blade tops of cracks and skin patch	Plan rehabilitation (mill, fabric, and overlay)	Plan rehabilitation (mill, fabric, and overlay)

Predominant Crack Distress		Traffic Level or Importance		Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Monitor	Monitor	
			High	Monitor	Monitor	Monitor	
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	Monitor	
	>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Either monitor or crack seal	Either monitor or crack seal	
		High	Monitor	Monitor	Crack seal	Crack seal	
	1 per lane	Mostly tight	Low	Monitor	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor	Monitor
Open, < 1/2"		Low	Monitor	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	Monitor	
>1/2" or deteriorated		Low	Monitor	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Either monitor or crack seal	Either monitor or crack seal	
		High	Monitor	Monitor	Crack seal	Crack seal	
>1 per lane		Mostly Tight	Low	Monitor	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor	Monitor
	Open, < 1/2"	Low	Fog seal	Fog seal	Fog seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal	Crack seal	
		High	Crack seal	Crack seal	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Skin patch	
		Medium	Skin patch	Skin patch	Skin patch	Skin patch	
		High	Skin patch	Skin patch	Skin patch	Skin patch	

## Paris (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F		Spot level in curves and on hills	Monitor	Monitor
			S		Spot level in curves and on hills	Monitor	Monitor
		0.5" to 1" (Shallow)	F		Blade patch	Spot level up	Spot level up
			S		Blade patch	Spot level up	Spot level up
		High	F		Blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
			S		Blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
	> 1" (Deep)	Low	F		Spot level in curves and on hills	Spot level up	Plan rehabilitation or spot seal
			S		Spot level in curves and on hills	Spot level up	Plan rehabilitation or spot seal
		Medium	F		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
			S		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
		High	F		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
			S		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F		Spot level in curves and on hills	Monitor	Monitor
			S		Spot level in curves and on hills	Monitor	Monitor
		Medium	F		Blade patch	Spot level up	Spot level up
			S		Blade patch	Spot level up	Spot level up
		High	F		Blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
			S		Blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
	> 1" (Deep)	Low	F		Spot level in curves and on hills	Spot level up	Plan rehabilitation or spot seal
			S		Spot level in curves and on hills	Spot level up	Plan rehabilitation or spot seal
		Medium	F		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
			S		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
		High	F		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch
			S		Blade patch	Microsurface ruts	Microsurface ruts, follow with seal coat next year or hot mix cold laid blade patch

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Seal coat	Monitor	Monitor
			Medium	Seal coat	Seal coat	Seal coat
			High	Seal coat	Seal coat	Seal coat
		Major	Low	Blade patch and seal coat	Plan rehabilitation	Plan rehabilitation
			Medium	Blade patch and seal coat	Plan rehabilitation	Plan rehabilitation
			High	Blade patch and seal coat	Plan rehabilitation	Plan rehabilitation
Both Wheelpaths		Minor	Low	Seal coat	Monitor	Monitor
			Medium	Seal coat	Seal coat	Seal coat
			High	Seal coat	Seal coat	Seal coat
		Major	Low	Blade patch and seal coat	Plan rehabilitation	Plan rehabilitation
			Medium	Blade patch and seal coat	Plan rehabilitation	Plan rehabilitation
			High	Blade patch and seal coat	Plan rehabilitation	Plan rehabilitation

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor, but plan rehabilitation	Monitor, but plan rehabilitation
		Medium	Monitor	Monitor, but plan rehabilitation	Monitor, but plan rehabilitation
		High	Monitor	Monitor, but plan rehabilitation	Monitor, but plan rehabilitation
	Rough	Low	Spot level	Spot level. If abrupt bump, cut out and replace.	Spot level. If abrupt bump, cut out and replace.
		Medium	Spot level	Spot level. If abrupt bump, cut out and replace.	Spot level. If abrupt bump, cut out and replace.
		High	Spot level	Spot level. If abrupt bump, cut out and replace.	Spot level. If abrupt bump, cut out and replace.

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Patch with pothole crew	Patch with pothole crew	Patch with pothole crew
		Medium	Remove, restabilize, and replace	Remove, restabilize, and replace	Remove, restabilize, and replace
		High	Remove, restabilize, and replace	Remove, restabilize, and replace	Remove, restabilize, and replace
	Many	Low	Patch with pothole crew	Patch with pothole crew	Patch with pothole crew
		Medium	Remove, restabilize, and replace	Remove, restabilize, and replace	Remove, restabilize, and replace
		High	Remove, restabilize, and replace	Remove, restabilize, and replace	Remove, restabilize, and replace

J.B. Hutchinson

Pharr

Predominant Crack Distress	Spacing	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor
	Open, < 1/2"		Low	Monitor	Crack seal	Crack seal
			Medium	Monitor	Crack seal	Crack seal
			High	Monitor	Crack seal	Crack seal
	>1/2" or deteriorated		Low	Monitor	Crack fill and crack seal	Crack fill and crack seal
			Medium	Monitor	Crack fill and crack seal	Crack fill and crack seal
			High	Monitor	Crack fill and crack seal	Crack fill and crack seal
	Cupped or Tented		Low	Blade shave tops of cracks and maintenance seal	Mill and maintenance seal	Mill and maintenance seal
			Medium	Either blade shave tops of cracks and maintenance seal or maintenance seal	Mill and maintenance seal	Mill and maintenance seal
			High	Mill and maintenance seal	Mill and maintenance seal	Mill and maintenance seal
15' - 40'	Mostly tight		Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor
	Open, < 1/2"		Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal
	>1/2" or deteriorated		Low	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal
			Medium	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal
			High	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal, seal coat if nothing planned for more than 2 years
	Cupped or Tented		Low	Blade shave tops of cracks and maintenance seal	Mill and maintenance seal	Mill and maintenance seal
			Medium	Either blade shave tops of cracks and maintenance seal or maintenance seal	Mill and maintenance seal	Mill and maintenance seal
			High	Mill and maintenance seal	Mill and maintenance seal	Mill and maintenance seal
<15'	Mostly Tight		Low	Monitor	Fog seal	Fog seal
			Medium	Monitor	Fog seal	Fog seal
			High	Monitor	Fog seal	Fog seal
	Open, < 1/2"		Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal
	>1/2" or deteriorated		Low	Bomag, restabilize and resurface	Crack fill, crack seal, and seal coat	Bomag, restabilize and resurface or reconstruct, or District Project Selection
			Medium	Bomag, restabilize and resurface	Crack fill, crack seal, and seal coat	Bomag, restabilize and resurface or reconstruct, or District Project Selection
			High	Bomag, restabilize and resurface	Crack fill, crack seal, and seal coat	Bomag, restabilize and resurface or reconstruct, or District Project Selection
	Cupped or Tented		Low	Blade shave tops of cracks and maintenance seal	Call District Office	Call District Office
			Medium	Either blade shave tops of cracks and maintenance seal or maintenance seal	Call District Office	Call District Office
			High	Mill and maintenance seal	Call District Office	Call District Office

Predominant Crack Distress	Spacing (Across)	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Monitor	Monitor	
			High	Monitor	Monitor	Monitor	
	Open, < 1/2"		Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Crack seal	Crack seal	
			High	Monitor	Crack seal	Crack seal	
	>1/2" or deteriorated		Low	Maybe level up	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up	
			Medium	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up	
			High	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up	
	1 per lane	Mostly tight		Low	Monitor	Monitor	Monitor
				Medium	Monitor	Monitor	Monitor
				High	Monitor	Monitor	Monitor
Open, < 1/2"			Low	Monitor or crack seal	Crack seal	Crack seal	
			Medium	Monitor or crack seal	Crack seal	Crack seal	
			High	Monitor or crack seal	Crack seal	Crack seal	
>1/2" or deteriorated		Low	Crack fill and crack seal	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up		
		Medium	Crack fill and crack seal	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up		
		High	Crack fill and crack seal	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up		
>1 per lane	Mostly Tight		Low	Monitor	Monitor	Monitor or strip seal	
			Medium	Monitor	Monitor	Monitor or strip seal	
			High	Monitor	Monitor	Monitor or strip seal	
	Open, < 1/2"		Low	Crack seal	Crack seal	Crack seal	
			Medium	Crack seal	Crack seal	Crack seal	
			High	Crack seal	Crack seal	Crack seal	
>1/2" or deteriorated		Low	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up	Crack fill, crack seal, level up, and seal coat		
		Medium	Crack fill, crack seal, and level up	Crack fill, crack seal, and level up	Either crack fill, crack seal, and level up or remove, restabilize, and replace or reconstruct		
		High	Crack fill, crack seal, and level up	Remove, restabilize, and replace, or reconstruction, or District Project Selection	Remove, restabilize, and replace, or reconstruction, or District Project Selection		

Pharr (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	Low	F	Blade level	Blade level	Level up and strip seal
				S	Blade level	Blade level	Level up and strip seal
		0.5" to 1" (Shallow)	Medium	F	Blade level	Mill and monitor	Mill, seal, and monitor
				S	Blade level	Blade level	Blade level
		High	High	F	Blade level	Mill and monitor	Mill, seal, and monitor
				S	Blade level	Blade level	Blade level
	> 1" (Deep)	Low	Low	F	Blade level	Blade level	Blade level
				S	Blade level	Blade level	Blade level
		Medium	Medium	F	Blade level	Mill and replace	District Project Selection
				S	Blade level	Mill and replace or blade level	District Project Selection
		High	High	F	Blade level	Mill and replace	District Project Selection
				S	Blade level	Mill and replace or blade level	District Project Selection
Both Wheelpaths	Low	Low	F	Blade level	Blade level	Level up and strip seal	
			S	Blade level	Blade level	Level up and strip seal	
	0.5" to 1" (Shallow)	Medium	F	Blade level	Mill and monitor	Mill, seal, and monitor	
			S	Blade level	Blade level	Blade level	
	High	High	F	Blade level	Mill and monitor	Mill, seal, and monitor	
			S	Blade level	Blade level	Blade level	
> 1" (Deep)	Medium	F	Blade level	Mill and replace	District Project Selection		
		S	Blade level	Mill and replace or blade level	District Project Selection		
High	High	F	Blade level	Mill and replace	District Project Selection		
		S	Blade level	Mill and replace or blade level	District Project Selection		

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Strip seal	Spot squeegee and seal coat	Spot squeegee and seal coat
			Medium	Strip seal	Spot squeegee and seal coat	Spot squeegee and seal coat
			High	Strip seal	Spot squeegee and seal coat	Spot squeegee and seal coat
	Major	Major	Low	Spot squeegee and seal coat	Spot squeegee and seal coat	Spot squeegee and seal coat
			Medium	Mill and replace	District Project Selection or Mill and replace	Mill and replace
			High	Mill and replace	District Project Selection or Mill and replace	Mill and replace
Both Wheelpaths	Minor	Minor	Low	Strip seal	Spot squeegee and seal coat	Spot squeegee and seal coat
			Medium	Strip seal	Spot squeegee and seal coat	Spot squeegee and seal coat
			High	Strip seal	Spot squeegee and seal coat	Spot squeegee and seal coat
	Major	Major	Low	Spot squeegee and seal coat	Spot squeegee and seal coat	Spot squeegee and seal coat
			Medium	Mill and replace	District Project Selection or Mill and replace	District Project Selection or Mill and replace
			High	Mill and replace	District Project Selection or Mill and replace	District Project Selection or Mill and replace

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Swell/Roughness	Some Roughness	Some Roughness	Low	Monitor or level up	Monitor	Monitor
			Medium	Blade level up	Blade level up	Blade level up
			High	Blade level up	Blade level up	Blade level up
	Rough	Rough	Low	Blade level up	Blade level up	Blade level up
			Medium	Blade level up	Call District Office or Forensic Team	Call District Office or Forensic Team
			High	Blade level up	Call District Office or Forensic Team	Call District Office or Forensic Team

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Failures	Few	Few	Low	Remove and replace	Remove and replace	Remove and replace
			Medium	Spot Bomag, restabilize, and replace	Spot Bomag, restabilize, and replace	Spot Bomag, restabilize, and replace
			High	Spot Bomag, restabilize, and replace	Spot Bomag, restabilize, and replace	Spot Bomag, restabilize, and replace
	Many	Many	Low	Bomag, restabilize, and replace	Bomag, restabilize, and replace	Bomag, restabilize, and replace
			Medium	Bomag, restabilize, and replace	Bomag, restabilize, and replace	District Project Selection or Mill and replace
			High	Bomag, restabilize, and replace	Bomag, restabilize, and replace	District Project Selection or Mill and replace

Chano Falcon  
 John Solis  
 Emilio Vela  
 Carlos Ruiz

# San Angelo

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Low	Monitor	Monitor	Monitor
		Mostly tight	Medium	Monitor	Monitor or fog seal
		High	Monitor	Monitor or fog seal	Fog seal and monitor
	Open, < 1/2"	Low	Strip seal	Fog seal	Fog seal
		Medium	Strip seal	Fog seal or seal coat	Seal coat
		High	Strip seal	Seal coat	Seal coat
	>1/2" or deteriorated	Low	Patch	Seal coat	Seal coat
		Medium	Patch	Crack seal	Seal coat
		High	Patch	Seal coat	Bandaid fabric strip and overlay
	Cupped or Tented	Low	Cut out and patch	Patch	Patch
		Medium	Patch	Patch	Patch
		High	Patch	Patch	Bandaid fabric strip and overlay
15' - 40'	Mostly tight	Low	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor or fog seal
		High	Monitor	Monitor or fog seal	Monitor or fog seal
	Open, < 1/2"	Low	Strip seal	Strip seal	Patch
		Medium	Strip seal	Patch	Patch
		High	Patch	Patch	Patch
	>1/2" or deteriorated	Low	Patch	Patch and seal coat	Program for rehabilitation
		Medium	Patch	Patch and seal coat	Program for rehabilitation
		High	Patch	Patch and seal coat	Program for rehabilitation
	Cupped or Tented	Low	Patch and crack seal	Patch and seal coat	Program for rehabilitation
		Medium	Patch and crack seal	Patch and seal coat	Program for rehabilitation
		High	Patch and crack seal	Patch and seal coat	Program for rehabilitation
<15'	Mostly Tight	Low	Patch	Seal coat	Seal coat and monitor
		Medium	Patch	Seal coat	Seal coat and monitor
		High	Patch	Seal coat	Seal coat and monitor
	Open, < 1/2"	Low	Patch	Geotextile or microsurface	Rehabilitation
		Medium	Patch	Geotextile or microsurface	Rehabilitation
		High	Patch	Geotextile or microsurface	Rehabilitation
	>1/2" or deteriorated	Low	Patch	Geotextile or microsurface	Rehabilitation
		Medium	Patch	Geotextile or microsurface	Rehabilitation
		High	Patch	Geotextile or microsurface	Rehabilitation
	Cupped or Tented	Low	Patch	Seal coat to hold together, but should try to fix before 2 - 3 years	Reconstruct
		Medium	Patch	Seal coat to hold together, but should try to fix before 2 - 3 years	Reconstruct
		High	Patch	Seal coat to hold together, but should try to fix before 2 - 3 years	Reconstruct

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Low	Monitor	Monitor	Monitor	
		Mostly tight	Medium	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	
	Open, < 1/2"	Low	Strip seal	Strip seal	Strip seal	
		Medium	Strip seal	Strip seal	Strip seal	
		High	Crack seal	Crack seal	Seal coat	
	>1/2" or deteriorated	Low	Strip seal	Seal coat	Geotextile and overlay	
		Medium	Seal coat	Crack seal	Geotextile and overlay	
		High	Patch	Geotextile and overlay	Rehabilitation	
	1 per lane	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor
Open, < 1/2"		Low	Strip seal	Strip seal	Strip seal	
		Medium	Seal coat	Seal coat	Seal coat	
		High	Patch	Geotextile and overlay	Rehabilitation	
>1/2" or deteriorated	Low	Patch and crack seal	Seal coat	Microsurface		
	Medium	Patch and crack seal	Microsurface	Geotextile and overlay		
	High	Patch	Geotextile and overlay	Rehabilitation		
>1 per lane	Mostly Tight	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Monitor	
		High	Monitor	Monitor	Monitor	
	Open, < 1/2"	Low	Patch	Seal coat	Seal coat	
		Medium	Patch	Seal coat	Seal coat	
		High	Patch	Geotextile and overlay	Rehabilitation	
>1/2" or deteriorated	Low	Patch	Microsurface	Rehabilitation		
	Medium	Patch	Microsurface	Rehabilitation		
	High	Patch	Geotextile and overlay	Rehabilitation		

## San Angelo (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	0.5" to 1" (Shallow)	Low	F S	Fill rut Monitor	Mill Monitor	Seal coat - Grade 3 CMHB overlay	
			Medium	F S	Fill rut Monitor	Mill Monitor	CMHB overlay CMHB overlay	
			High	F S	Mill Mill	Mill Monitor	Rehabilitate If intersection, use PCC, otherwise rehabilitate	
	> 1" (Deep)		Low	F S	Patch Fill rut	Microsurface Microsurface	Microsurface Microsurface	
			Medium	F S	Patch Patch	Microsurface Microsurface	CMHB overlay CMHB overlay	
			High	F S	Patch Patch	Microsurface Microsurface	CMHB overlay CMHB overlay	
	Both Wheelpaths	0.5" to 1" (Shallow)		Low	F S	Fill rut Monitor	Patch Monitor	Seal coat - Grade 3 CMHB overlay
				Medium	F S	Fill rut Monitor	Patch Monitor	CMHB overlay CMHB overlay
				High	F S	Mill Mill	Patch Monitor	Rehabilitate If intersection, use PCC, otherwise rehabilitate
> 1" (Deep)			Low	F S	Patch Patch	Rehabilitate Rehabilitate	Rehabilitate Rehabilitate	
			Medium	F S	Patch Patch	Rehabilitate Rehabilitate	Rehabilitate Rehabilitate	
			High	F S	Patch Patch	Rehabilitate Rehabilitate	Rehabilitate Rehabilitate	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Strip seal	Seal coat
			Medium	Strip seal	Strip seal	Seal coat
			High	Strip seal	Strip seal	Seal coat
	Both Wheelpaths	Major	Low	Patch	Seal coat	Seal coat
			Medium	Patch	Seal coat	Geotextile and overlay
			High	Patch	Seal coat	Mill and overlay
Both Wheelpaths	Minor		Low	Monitor	Strip seal	Seal coat
			Medium	Strip seal	Strip seal	Seal coat
			High	Strip seal	Strip seal	Seal coat
	Major		Low	Patch	Seal coat	Seal coat
			Medium	Patch	Seal coat	Geotextile and overlay
			High	Patch	Seal coat	Mill and overlay

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Rehabilitate	
		Medium	Monitor	Monitor	Rehabilitate	
		High	Monitor	Monitor	Rehabilitate	
	Rough		Low	Mill and overlay	Monitor	Rehabilitate
			Medium	Mill and overlay	Monitor	Rehabilitate
			High	Mill and overlay	Monitor	Rehabilitate

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Patch	Patch	Mill and overlay, if ravelling use a seal coat
		Medium	Patch	Patch	Mill and overlay, if ravelling use a seal coat
		High	Patch	Patch	Mill and overlay, if ravelling use a seal coat
	Many	Low	Patch	Patch	Mill and overlay, if ravelling use a seal coat
		Medium	Patch	Patch	Mill and overlay, if ravelling use a seal coat
		High	Patch	Patch	Mill and overlay, if ravelling use a seal coat

Rudy Herrman

# San Antonio

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40' Mostly tight	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor until sealing nearby, then crack seal	Monitor until sealing nearby, then crack seal	
		High	Monitor	Monitor until sealing nearby, then crack seal	Monitor until sealing nearby, then crack seal	
	Open, < 1/2"	Low	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
		Medium	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
		High	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
	>1/2" or deteriorated	Low	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
		Medium	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
		High	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
	Cupped or Tented	Low	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
		Medium	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
		High	Monitor until sealing nearby, then crack seal	Crack seal	Crack seal	
	15' - 40'	Mostly tight	Low	Monitor	Monitor	Monitor
			Medium	Monitor	Monitor	Monitor
			High	Monitor	Monitor	Monitor
		Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal
			High	Crack seal	Crack seal	Crack seal
		>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal and monitor
			High	Crack seal	Crack seal	Crack seal and monitor
		Cupped or Tented	Low	Crack seal, maybe blade patch	Crack seal	Crack seal, maybe blade patch
			Medium	Crack seal	Crack seal	Mill and seal coat or mill and crack seal
			High	Crack seal	Crack seal	Mill and seal coat or mill and crack seal
<15'	Mostly Tight	Low	Spot seal or monitor	Plan seal coat	Seal coat	
		Medium	Either spot seal or monitor	Either plan seal coat or monitor	Either seal coat or monitor	
		High	Monitor	Monitor	Monitor	
	Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal and plan seal coat	
		Medium	Crack seal	Crack seal	Crack seal and overlay or rubber seal	
		High	Crack seal	Crack seal	Crack seal and seal coat, plan overlay	
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Plan major rehabilitation	
		Medium	Crack seal	Crack seal	Plan major rehabilitation	
		High	Crack seal	Crack seal	Plan major rehabilitation	
	Cupped or Tented	Low	Blade patch	Spot seal	Bomag and reconstruct	
		Medium	Mill and replace	Mill and replace	Mill and replace	
		High	Mill and replace	Mill and replace	Mill and replace	

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years		
Longitudinal Cracking	>Lane Width	Low	Monitor	Monitor	Monitor		
		Medium	Crack seal or monitor	Crack seal or monitor	Crack seal or monitor		
		High	Crack seal or monitor	Crack seal	Crack seal		
	Open, < 1/2"	Low	Monitor	Monitor	Monitor		
		Medium	Crack seal or monitor	Crack seal or monitor	Crack seal or monitor		
		High	Crack seal or monitor	Crack seal	Crack seal		
	>1/2" or deteriorated	Low	Monitor	Monitor	Monitor		
		Medium	Crack seal or monitor	Crack seal or monitor	Crack seal or monitor		
		High	Crack seal or monitor	Crack seal	Crack seal		
	1 per lane	Mostly tight	Low	Monitor	Monitor	Monitor	
			Medium	Monitor	Monitor	Monitor	
			High	Monitor	Monitor	Monitor	
		Open, < 1/2"	Low	Monitor	Monitor	Monitor	
			Medium	Crack seal or monitor	Crack seal or monitor	Crack seal or monitor	
			High	Crack seal or monitor	Crack seal	Crack seal	
		>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	
			Medium	Crack seal or monitor	Crack seal or monitor	Crack seal or monitor	
			High	Crack seal or monitor	Crack seal	Crack seal	
		>1 per lane	Mostly Tight	Low	Monitor	Monitor	Monitor
				Medium	Monitor	Monitor	Monitor
				High	Monitor	Monitor	Monitor
	Open, < 1/2"		Low	Crack seal	Crack seal	Crack seal	
			Medium	Crack seal	Crack seal	Crack seal	
			High	Crack seal	Crack seal	Crack seal	
>1/2" or deteriorated	Low		Crack seal	Spot or strip seal	Seal coat		
	Medium		Crack seal	Mill and replace worst areas	Plan rehabilitation or mill, seal coat, and overlay		
	High		Crack seal	Mill and replace worst areas	Plan rehabilitation or mill, seal coat, and overlay		

## San Antonio (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	Low	F	Monitor	Monitor	Monitor	Monitor	
			S	Monitor	Monitor	Monitor		
		0.5" to 1" (Shallow)	Medium	F	Monitor	Monitor	Monitor	Mill or level up
			S	Monitor	Monitor	Monitor	Mill or level up	
		High	F	Monitor	Mill or level up	Mill or level up	Mill or level up	
			S	Monitor	Mill or level up	Mill or level up	Mill or level up	
	> 1" (Deep)	Low	F	Blade patch	Monitor	Monitor	Monitor or plan level up and seal coat	
			S	Blade patch	Monitor	Monitor	Monitor or plan level up and seal coat	
		Medium	F	Blade patch	Mill	Monitor or plan level up and seal coat	Mill	
			S	Blade patch	Mill	Monitor or plan level up and seal coat	Mill	
		High	F	Blade patch or strip seal	Mill	Mill or level up and overlay	Mill or level up and overlay	
			S	Blade patch or strip seal	Mill	Mill or level up and overlay	Mill or level up and overlay	
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Monitor	Monitor	Monitor or plan level up and seal coat		
			S	Monitor	Monitor	Monitor or plan level up and seal coat		
		Medium	F	Monitor	Monitor	Monitor or plan level up and seal coat	Monitor or plan level up and seal coat	
			S	Monitor	Monitor	Monitor or plan level up and seal coat	Monitor or plan level up and seal coat	
		High	F	Mill	Mill	Mill	Mill	
			S	Mill	Mill	Mill	Mill	
	> 1" (Deep)	Low	F	Monitor	Monitor	Monitor or plan level up and seal coat		
			S	Monitor	Monitor	Monitor or plan level up and seal coat		
		Medium	F	Mill, seal coat, and overlay or mill	Mill	Mill, seal coat, and overlay or mill	Mill, seal coat, and overlay or mill	
			S	Mill, seal coat, and overlay or mill	Mill	Mill, seal coat, and overlay or mill	Mill, seal coat, and overlay or mill	
		High	F	Mill, seal coat, and overlay or mill	Mill	Mill, seal coat, and overlay or mill	Mill, seal coat, and overlay or mill	
			S	Mill, seal coat, and overlay or mill	Mill	Mill, seal coat, and overlay or mill	Mill, seal coat, and overlay or mill	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Spot base repair	Seal coat and hope	Seal coat and hope
			Medium	Spot base repair	Plan rehabilitation	Plan rehabilitation
			High	Spot base repair	Plan rehabilitation	Plan rehabilitation
		Major	Low	Spot base repair	Seal coat and hope	Spot base repair and seal coat
			Medium	Spot base repair	Plan rehabilitation	Plan rehabilitation
			High	Spot base repair	Plan rehabilitation	Plan rehabilitation
	Both Wheelpaths	Minor	Low	Spot base repair	Seal coat and hope	Seal coat and hope
			Medium	Spot base repair	Plan rehabilitation	Plan rehabilitation
			High	Spot base repair	Plan rehabilitation	Plan rehabilitation
		Major	Low	Spot base repair	Seal coat and hope	Spot base repair and seal coat
			Medium	Spot base repair	Plan rehabilitation	Plan rehabilitation
			High	Spot base repair	Plan rehabilitation	Plan rehabilitation

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Monitor
		Medium	Monitor	Monitor	Monitor
		High	Blade patch or monitor	Blade patch or monitor	Blade patch or monitor
	Rough	Low	Blade level up	Blade level up	Blade level up
		Medium	Blade level up	Blade level up	Blade level up
		High	Blade level up	Blade level up	Blade level up or blade level and overlay

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Spot base repair or fill holes	Spot base repair or fill holes	Fill holes and plan rehabilitation
		Medium	Spot base repair or fill holes	Spot base repair or fill holes	Fill holes and plan rehabilitation
		High	Spot base repair or fill holes	Spot base repair or fill holes	Fill holes and plan rehabilitation
	Many	Low	Spot base repair or fill holes	Spot base repair or fill holes	Fill holes and plan rehabilitation
		Medium	Spot base repair or fill holes	Spot base repair or fill holes	Fill holes and plan rehabilitation
		High	Spot base repair or fill holes	Spot base repair or fill holes	Fill holes and plan rehabilitation

Patrick Downey  
Watkins Romer

# Tyler

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40' Mostly tight	Low	Strip seal	Plan seal coat	Plan seal coat
		Medium	Strip seal	Plan seal coat	Plan seal coat
		High	Strip seal	Plan seal coat, except Interstate	Plan seal coat, except Interstate
	Open, < 1/2"	Low	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat
		Medium	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat
		High	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat, except Interstate
	>1/2" or deteriorated	Low	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas
		Medium	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas
		High	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas
	Cupped or Tented	Low	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped
		Medium	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped
		High	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped
15' - 40'	Mostly tight	Low	Strip seal	Plan seal coat	Plan seal coat
		Medium	Strip seal	Plan seal coat	Plan seal coat
		High	Strip seal	Plan seal coat, except Interstate	Plan seal coat, except Interstate
	Open, < 1/2"	Low	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat
		Medium	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat
		High	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat, except Interstate
	>1/2" or deteriorated	Low	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas
		Medium	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas
		High	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas	Fill cracks with patch material if wide, patch bad areas
	Cupped or Tented	Low	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped
		Medium	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped
		High	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped	If tented, mill (or just shave) tops of cracks, patch if cupped
<15'	Mostly Tight	Low	Strip seal	Plan seal coat	Plan seal coat
		Medium	Strip seal	Plan seal coat	Plan seal coat
		High	Strip seal	Plan seal coat, except Interstate	Plan seal coat, except Interstate
	Open, < 1/2"	Low	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat
		Medium	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat
		High	Crack seal	Crack seal, plan seal coat	Crack seal, plan seal coat, except Interstate
	>1/2" or deteriorated	Low	Blade patch	Blade patch	Blade patch
		Medium	Blade patch or mill and inlay	Blade patch or mill and inlay	Blade patch or mill and inlay
		High	Mill and inlay	Mill and inlay	Mill and inlay
	Cupped or Tented	Low	Blade patch	Blade patch	Blade patch
		Medium	Blade patch or mill and inlay	Blade patch or mill and inlay	Blade patch or mill and inlay
		High	Mill and inlay	Mill and inlay	Mill and inlay



Tyler (continued)

Predominant Distress	# Lanes	Traffic Level Severity or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator	1 Wheelpath	Low	Spot reconstruct	Seal coat (grade 3), may follow with grade 4 if cracks reflect through	Seal coat (grade 3), may follow with grade 4 if cracks reflect through
Cracking	Minor	Medium	Spot reconstruct	Seal coat (grade 3), may follow with grade 4 if cracks reflect through	Seal coat (grade 3), may follow with grade 4 if cracks reflect through
		High	Spot reconstruct	Mill and inlay	Mill and inlay
	Major	Low	Spot reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct
		High	Spot reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct
Both Wheelpaths	Minor	Low	Spot reconstruct	Seal coat (grade 3), may follow with grade 4 if cracks reflect through	Seal coat (grade 3), may follow with grade 4 if cracks reflect through
		Medium	Spot reconstruct	Seal coat (grade 3), may follow with grade 4 if cracks reflect through	Seal coat (grade 3), may follow with grade 4 if cracks reflect through
	Major	Low	Spot reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct
		High	Spot reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct	Check integrity of base layers. If OK, mill and inlay, if not reconstruct. If seal coat pavement, Bomag and reconstruct

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/ Roughness	Some Roughness	Low	Level up	Level up	Level up
		Medium	Level up	Level up	Level up
High		Level up	Level up	Level up	
Rough	Low	Level up	Level up	Mill and inlay, if seal coat Bomag	Mill and inlay, if seal coat Bomag
	Medium	Level up	Level up	Mill and inlay, if seal coat Bomag	Mill and inlay, if seal coat Bomag
	High	Level up	Level up	Mill and inlay, if seal coat Bomag	Mill and inlay, if seal coat Bomag

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Spot patch	Spot patch	Spot patch
		Medium	Spot patch	Spot patch	Spot patch
		High	Spot patch	Spot patch	Spot patch
Many	Low	Dig out and blade patch	Dig out and blade patch	Mill and inlay, if seal coat Bomag	Mill and inlay, if seal coat Bomag
	Medium	Dig out and blade patch	Dig out and blade patch	Mill and inlay, if seal coat Bomag	Mill and inlay, if seal coat Bomag
	High	Dig out and blade patch	Dig out and blade patch	Mill and inlay, or patch, or overlay, or reconstruct	Mill and inlay, or patch, or overlay, or reconstruct

Dennis Cooley

## Waco

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Transverse Cracking	>40'	Low	Monitor	Monitor	Crack seal or seal coat
		Medium	Crack seal	Crack seal or seal coat	Seal coat and overlay
		High	Crack seal	Seal coat and overlay	Seal coat and overlay
	Mostly tight	Low	Crack seal or monitor	Monitor	Seal coat
		Medium	Crack seal	Crack seal	Seal coat
		High	Crack seal	Seal coat and overlay	Seal coat and overlay
	Open, < 1/2"	Low	Crack seal or monitor	Seal coat	Seal coat or seal coat and overlay
		Medium	Crack seal	Seal coat and overlay	Seal coat and overlay
		High	Patch and crack seal	Seal coat and overlay	Seal coat and overlay
	>1/2" or deteriorated	Low	Monitor	Monitor	Patch and seal coat
		Medium	Patch and crack seal	Patch and seal coat	Patch, seal coat, and overlay
		High	Patch and crack seal	Patch, seal coat, and overlay or patch and cape seal	Patch, seal coat, and overlay
15' - 40'	Mostly tight	Low	Monitor	Monitor	Seal coat
		Medium	Monitor	Crack seal	Crack seal or seal coat and overlay
		High	Patch and crack seal	Seal coat and overlay	Crack seal or seal coat and overlay
	Open, < 1/2"	Low	Monitor	Seal coat	Seal coat and overlay
		Medium	Crack seal	Crack seal or seal coat	Seal coat and overlay
		High	Patch and crack seal	Seal coat and overlay	Seal coat and overlay
	>1/2" or deteriorated	Low	Patch and crack seal	Patch and crack seal	Patch, seal coat, and overlay
		Medium	Patch and crack seal	Patch and crack seal	Patch, seal coat, and overlay
		High	Patch and crack seal	Seal coat and overlay	Patch, seal coat, and overlay
	Cupped or Tented	Low	Patch and crack seal	Patch and seal coat	Patch, seal coat, and overlay
		Medium	Patch and crack seal	Patch and seal coat	Patch, seal coat, and overlay
		High	Patch and crack seal	Seal coat and overlay	Patch, seal coat, and overlay
<15'	Mostly Tight	Low	Seal coat	Seal coat	Seal coat and overlay
		Medium	Seal coat	Seal coat	Seal coat and overlay
		High	Patch and seal coat	Seal coat and overlay	Seal coat and overlay
	Open, < 1/2"	Low	Patch and seal coat	Patch, seal coat and overlay	Patch, seal coat, and overlay
		Medium	Patch and seal coat	Patch, seal coat, and overlay	Reconstruct
		High	Patch and crack seal	Patch, seal coat, and overlay	Reconstruct
	>1/2" or deteriorated	Low	Patch and seal coat	Patch, seal coat and overlay	Reconstruct
		Medium	Reconstruct	Reconstruct	Reconstruct
		High	Reconstruct	Reconstruct	Reconstruct
	Cupped or Tented	Low	Patch and crack seal	Patch, seal coat, and overlay	Reconstruct
		Medium	Patch and crack seal	Patch, seal coat, and overlay	Reconstruct
		High	Patch and crack seal	Patch, seal coat, and overlay	Reconstruct

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Seal coat
			Medium	Monitor	Crack seal or strip seal	Seal coat and overlay
			High	Crack seal or seal coat	Crack seal or seal coat	Seal coat and overlay
		Open, < 1/2"	Low	Monitor	Patch and seal coat or crack seal	Seal coat and overlay
			Medium	Crack seal	Crack seal or seal coat	Seal coat and overlay
			High	Crack seal	Seal coat	Seal coat and overlay
		>1/2" or deteriorated	Low	Crack seal or seal coat	Crack seal or seal coat	Crack seal or seal coat and overlay
			Medium	Crack seal	Crack seal or seal coat	Seal coat and overlay
			High	Patch and crack seal	Crack seal or seal coat	Seal coat and overlay
	1 per lane	Mostly tight	Low	Crack seal	Strip seal	Crack seal or seal coat
			Medium	Crack seal or seal coat	Crack seal or seal coat	Seal coat or overlay
			High	Crack seal or seal coat	Seal coat and overlay or cape seal	Seal coat and overlay
		Open, < 1/2"	Low	Crack seal or seal coat	Crack seal or seal coat	Seal coat
			Medium	Crack seal or seal coat	Crack seal or seal coat	Seal coat and overlay
			High	Crack seal or seal coat	Seal coat and overlay or cape seal	Seal coat and overlay
		>1/2" or deteriorated	Low	Patch and seal coat	Patch and seal coat	Patch, seal coat, and overlay
			Medium	Patch and seal coat	Patch and seal coat or patch, seal coat, and overlay	Patch, seal coat, and overlay
			High	Patch and seal coat	Patch, seal coat, and overlay	Mill and overlay
>1 per lane	Mostly Tight	Low	Seal coat	Seal coat	Seal coat and overlay	
		Medium	Seal coat	Seal coat and overlay	Seal coat and thick overlay	
		High	Seal coat	Seal coat and overlay	Seal coat and thick overlay	
	Open, < 1/2"	Low	Patch and seal coat	Patch and seal coat	Rehabilitate	
		Medium	Patch and seal coat	Seal coat and overlay	Rehabilitate	
		High	Seal coat and overlay	Seal coat and overlay	Rehabilitate	
>1/2" or deteriorated	Low	Patch, seal coat, and overlay	Rehabilitate	Reconstruct		
	Medium	Reconstruct	Reconstruct	Reconstruct		
	High	Reconstruct	Reconstruct	Reconstruct		

## Waco (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Rutting	1 Wheelpath	0.5" to 1" (Shallow)	Low	F	Fill rut	Fill rut	Fill rut and seal coat	
				S	Monitor	Monitor	Fill rut and seal coat	
			Medium	F	Fill rut	Fill rut	Fill rut and overlay	
				S	Monitor	Fill rut	Fill rut and overlay	
				High	F	Fill rut	Fill rut and seal coat	Fill rut and overlay
					S	Fill rut	Fill rut and seal coat	Fill rut and overlay
				Low	F	Fill rut	Fill rut and seal coat	Fill rut and seal coat
					S	Monitor	Fill rut	Fill rut
				Medium	F	Mill and fill rut	Fill rut and seal coat	Mill and overlay
				S	Mill and fill rut	Fill rut and seal coat	Mill and overlay	
			High	F	Mill and fill rut	Fill rut and overlay	Mill and overlay	
				S	Mill and fill rut	Fill rut and overlay	Mill and overlay	
Both Wheelpaths	0.5" to 1" (Shallow)		Low	F	Fill rut	Fill rut and seal coat	Fill rut and seal coat or mill and seal coat	
				S	Monitor	Seal coat	Fill rut and seal coat or mill and seal coat	
			Medium	F	Fill rut	Fill rut and overlay	Mill and overlay	
				S	Fill rut	Fill rut and seal coat	Mill and overlay	
				High	F	Fill rut	Mill and overlay	Mill and overlay
					S	Fill rut	Fill rut and overlay	Mill and overlay
				Low	F	Fill rut	Mill and seal coat or overlay	Rehabilitate
					S	Fill rut	Mill and seal coat	Rehabilitate
				Medium	F	Patch	Mill and overlay	Rehabilitate or reconstruct
				S	Patch	Mill and overlay	Rehabilitate	
			High	F	Patch	Rehabilitate	Reconstruct	
				S	Patch	Rehabilitate	Reconstruct	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor	Patch	Patch
			Medium	Skin patch or strip seal	Patch and strip seal	Patch and seal coat
			High	Skin patch	Patch, seal coat, and overlay	Patch, seal coat, and overlay
	Major		Low	Skin patch	Patch and seal coat	Patch, seal coat, and overlay
			Medium	Skin patch	Deep patch and strip seal	Deep patch and overlay
			High	Deep patch	Deep patch and overlay	Deep patch and overlay
Both Wheelpaths	Minor		Low	Monitor	Patch	Patch
			Medium	Skin patch	Patch and strip seal	Patch and seal coat
			High	Patch	Patch, seal coat, and overlay	Patch, seal coat, and overlay
	Major		Low	Patch	Patch and seal coat	Patch, seal coat, and overlay
			Medium	Patch	Deep patch and strip seal	Deep patch and overlay
			High	Deep patch	Deep patch and overlay	Deep patch and overlay

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Swell/Roughness	Some Roughness	Low	Monitor	Level up	Level up and seal coat	
		Medium	Monitor	Level up and seal coat	Level up, seal coat, and overlay	
		High	Level up	Level up and overlay	Level up, seal coat, and overlay	
	Rough		Low	Monitor	Level up and seal coat	Level up and seal coat
			Medium	Level up	Level up and overlay	Level up, seal coat, and overlay
			High	Level up	Level up and overlay	Level up, seal coat, and overlay

Predominant Distress	Few or Many	Traffic Level or Importance	Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Failures	Few	Low	Patch	Patch	Patch and seal coat	
		Medium	Patch	Patch and seal coat	Patch and overlay	
		High	Patch	Mill and overlay	Mill and overlay	
	Many		Low	Patch	Mill and overlay	Rehabilitate
			Medium	Patch	Mill and overlay	Reconstruct
			High	Patch	Rehabilitate	Reconstruct
Billy Pigg						

## Wichita Falls

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40'	Low	Monitor	Monitor	Monitor	
		Medium	Monitor	Monitor	Crack seal and strip seal	
		High	Monitor	Monitor	Crack seal and strip seal	
	Open, < 1/2"	Low	Monitor and crack seal if nearby	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal
	>1/2" or deteriorated	Low	Monitor and crack fill and crack seal if nearby	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal
		Medium	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal
		High	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal
	Cupped or Tented	Low	Monitor or blade tops of cracks and level up if working nearby	Blade tops of cracks and level up	Blade tops of cracks and level up	Blade tops of cracks and level up
		Medium	Transverse mill, crack fill and crack seal	Transverse mill, crack fill and crack seal	Transverse mill, crack fill and crack seal	Transverse mill, crack fill and crack seal
		High	Transverse mill, crack fill and crack seal	Transverse mill, crack fill and crack seal	Transverse mill, crack fill and crack seal	Transverse mill, crack fill and crack seal
15' - 40'	Mostly tight	Low	Monitor	Monitor or special crews seal coat	State funds seal coat	
		Medium	Strip seal or crack seal if working nearby	Plan seal coat	Plan seal coat	
		High	Strip seal or crack seal if working nearby	Plan seal coat	Plan seal coat	
	Open, < 1/2"	Low	Monitor and crack seal if nearby	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal and plan rehabilitation	
		High	Crack seal	Crack seal	Crack seal and plan rehabilitation	
	>1/2" or deteriorated	Low	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal
		Medium	Crack fill and crack seal	Crack fill and crack seal	Crack fill and level up or core and plan major rehabilitation	
		High	Crack fill and crack seal	Crack fill and crack seal	Core and plan major rehabilitation	
	Cupped or Tented	Low	Blade level up	Blade level if plan is to seal coat, blade tops of cracks if plan is to rebuild or resurface	Plan rehabilitation	
		Medium	Blade level up	Mill, crack seal, and seal coat	Mill surface, crack seal, and overlay	
		High	Blade level up	Mill, crack seal, and seal coat	Mill surface, crack seal, and overlay	
<15'	Mostly Tight	Low	Monitor	Monitor or special crews seal coat	State funds seal coat	
		Medium	Strip seal or crack seal if working nearby	Plan seal coat	Plan seal coat	
		High	Strip seal or crack seal if working nearby	Plan seal coat	Plan seal coat	
	Open, < 1/2"	Low	Monitor and crack seal if nearby	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal and plan rehabilitation	
		High	Crack seal	Crack seal	Crack seal and plan rehabilitation	
	>1/2" or deteriorated	Low	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal	Crack fill and crack seal
		Medium	Crack fill and crack seal	Crack fill and crack seal	Crack fill and level up or core and plan major rehabilitation	
		High	Crack fill and crack seal	Crack fill and crack seal	Core and plan major rehabilitation	
	Cupped or Tented	Low	Blade level up	Blade level if plan is to seal coat, blade tops of cracks if plan is to rebuild or resurface	Plan rehabilitation	
		Medium	Blade level up	Mill, crack seal, and seal coat	Mill surface, crack seal, and overlay	
		High	Blade level up	Mill, crack seal, and seal coat	Mill surface, crack seal, and overlay	

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years		
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Monitor	Monitor	Monitor	
			Medium	Monitor and crack seal if working nearby	Crack seal	Crack seal	
			High	Monitor and crack seal if working nearby	Crack seal	Crack seal	
		Open, < 1/2"	Low	Monitor and crack seal if working nearby	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal	
			High	Crack seal	Crack seal	Crack seal	
		>1/2" or deteriorated	Low	Monitor and crack seal and level up if working nearby	Crack seal and level up	Crack seal and level up	
			Medium	Crack seal and level up	Crack seal and level up	Crack seal, level up, and plan rehabilitation	
			High	Crack seal and level up	Crack seal and level up	Crack seal, level up, and plan rehabilitation	
		1 per lane	Mostly tight	Low	Monitor	Monitor	Monitor
				Medium	Monitor and crack seal if working nearby	Crack seal	Crack seal
				High	Monitor and crack seal if working nearby	Crack seal	Crack seal
	Open, < 1/2"		Low	Monitor and crack seal if working nearby	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal	
			High	Crack seal	Crack seal	Crack seal	
	>1 per lane	>1/2" or deteriorated	Low	Monitor and crack seal and level up if working nearby	Crack seal and level up	Crack seal and level up	
			Medium	Crack seal and level up	Crack seal and level up	Crack seal, level up, and plan rehabilitation	
			High	Crack seal and level up	Crack seal and level up	Crack seal, level up, and plan rehabilitation	
		Mostly Tight	Low	Monitor	Monitor	Monitor	
			Medium	Monitor and crack seal if working nearby	Monitor and crack seal if working nearby	Monitor and crack seal if working nearby	
			High	Monitor and crack seal if working nearby	Monitor and crack seal if working nearby	Monitor and crack seal if working nearby	
	Open, < 1/2"	Low	Monitor and crack seal if working nearby	Crack seal	Crack seal	Crack seal	
		Medium	Crack seal	Crack seal	Crack seal		
		High	Crack seal	Crack seal	Crack seal		
>1/2" or deteriorated	Low	Blade level up	Blade level up	Plan rehabilitation			
	Medium	Mill and replace	Crack seal and level up	Core and plan rehabilitation			
	High	Mill and replace	Crack seal and level up	Core and plan rehabilitation			

## Wichita Falls (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F		Monitor	Monitor	Monitor and blade patch bad areas
			S		Monitor	Monitor	Monitor and blade patch bad areas
		Medium	F		Blade tops and blade level up	Mill and maybe seal coat	Core and monitor or remove, restabilize, and replace
			S		Blade tops and blade level up	Mill and seal coat	Core and monitor or remove, restabilize, and replace
		High	F		Blade tops and blade level up	Mill and maybe seal coat	Core and monitor or remove, restabilize, and replace
			S		Blade tops and blade level up	Mill and seal coat	Core and monitor or remove, restabilize, and replace
	> 1" (Deep)	Low	F		Dig out and replace	Remove, restabilize, and replace	Remove, restabilize, and replace
			S		Blade level up	Remove, restabilize, and replace	Remove, restabilize, and replace
		Medium	F		Mill and level up	Mill and level up	Core, mill, and overlay
			S		Blade level up	Mill and level up	Core, mill, and overlay
		High	F		Mill and level up	Mill and level up	Core, mill, and overlay
			S		Blade level up	Mill and level up	Core, mill, and overlay
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F		Blade patch bad areas	Blade patch bad areas	Plan overlay, blade patch bad areas
			S		Blade patch bad areas	Blade patch bad areas	Plan overlay, blade patch bad areas
		Medium	F		Blade tops and blade level up	Mill and maybe seal coat	Core and monitor or remove, restabilize, and replace
			S		Blade tops and blade level up	Mill and seal coat	Core and monitor or remove, restabilize, and replace
		High	F		Blade tops and blade level up	Mill and maybe seal coat	Core and monitor or remove, restabilize, and replace
			S		Blade tops and blade level up	Mill and seal coat	Core and monitor or remove, restabilize, and replace
	> 1" (Deep)	Low	F		Dig out and replace	Remove, restabilize, and replace	Remove, restabilize, and replace
			S		Blade level up	Remove, restabilize, and replace	Remove, restabilize, and replace
		Medium	F		Mill and level up	Mill and level up	Core, mill, and overlay
			S		Blade level up	Mill and level up	Core, mill, and overlay
		High	F		Mill and level up	Mill and level up	Core, mill, and overlay
			S		Blade level up	Mill and level up	Core, mill, and overlay

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Monitor or fog seal if working nearby	Fog seal	Seal coat
			Medium	Strip seal	Strip seal	Strip seal and plan rehabilitation
			High	Strip seal	Strip seal	Strip seal and plan rehabilitation
		Major	Low	Strip seal	Strip seal	Strip seal and plan rehabilitation
			Medium	Strip seal	Strip seal	Strip seal and plan rehabilitation
			High	Strip seal	Strip seal	Strip seal and plan rehabilitation
	Both Wheelpaths	Minor	Low	Monitor or fog seal if working nearby	Fog seal	Seal coat
			Medium	Strip seal	Strip seal	Strip seal and plan rehabilitation
			High	Strip seal	Strip seal	Strip seal and plan rehabilitation
		Major	Low	Strip seal	Strip seal	Strip seal and plan rehabilitation
			Medium	Strip seal	Strip seal	Strip seal and plan rehabilitation
			High	Strip seal	Strip seal	Strip seal and plan rehabilitation

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor or blade level up	Monitor or blade level up	Monitor or blade level up
		Medium	Level up	Level up	Maybe level up and plan rehabilitation
		High	Level up	Level up	Level up and plan rehabilitation
	Rough	Low	Maybe blade level up	Maybe blade level up	Maybe blade level up
		Medium	Level up	Level up	Level up and overlay
		High	Level up	Level up	Level up and overlay
Failures	Few	Low	Dig out and replace	Dig out and replace	Dig out and replace
		Medium	Dig out and replace	Dig out and replace	Dig out, replace, and overlay
		High	Dig out and replace	Dig out and replace	Dig out, replace, and overlay
	Many	Low	Dig out and replace	Dig out and replace	Plan rehabilitation
		Medium	Dig out and replace	Dig out and replace	Plan rehabilitation
		High	Dig out and replace	Dig out and replace	Plan rehabilitation

Brady Woolsey  
Tim Hertel

# Yoakum

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40'	Low	Monitor	Monitor	Seal coat on normal schedule	
		Medium	Monitor	Monitor	Seal coat on normal schedule	
		High	Monitor	Monitor	Seal coat on normal schedule	
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Seal coat on normal schedule
		Medium	Monitor	Crack seal	Crack seal	Crack seal and seal coat on normal schedule
		High	Monitor	Crack seal	Crack seal	Crack seal and seal coat on normal schedule
	>1/2" or deteriorated	Low	Monitor	Monitor	Monitor	Seal coat on normal schedule
		Medium	Fill cracks	Fill cracks	Fill cracks	Seal coat on normal schedule
		High	Fill cracks	Fill cracks	Fill cracks	Fill cracks
	Cupped or Tented	Low	Monitor	Monitor	Monitor	Seal coat on normal schedule
		Medium	Blade mill and maybe spot seal	Blade mill and maybe spot seal	Blade mill and maybe spot seal	Mill and maybe spot seal
		High	Blade mill and maybe spot seal	Blade mill and maybe spot seal	Blade mill and maybe spot seal	Mill and maybe spot seal
15' - 40'	Mostly tight	Low	Monitor	Monitor	Seal coat on normal schedule	
		Medium	Monitor	Monitor	Seal coat on normal schedule	
		High	Monitor	Monitor	Seal coat on normal schedule	
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Seal coat on normal schedule
		Medium	Spot seal	Crack seal	Crack seal	Crack seal and seal coat on normal schedule
		High	Spot seal	Crack seal	Crack seal	Crack seal and seal coat on normal schedule
	>1/2" or deteriorated	Low	Fill cracks	Monitor	Monitor	Seal coat on normal schedule
		Medium	Fill cracks	Fill cracks	Fill cracks	Crack fill (cold mix) abd rubberized seal coat
		High	Fill cracks	Fill cracks	Fill cracks	Crack fill (cold mix) abd rubberized seal coat
	Cupped or Tented	Low	Monitor	Monitor	Monitor	Seal coat on normal schedule
		Medium	Blade mill and spot seal	Mill cracks and rubber seal coat	Mill cracks and rubber seal coat	Mill cracks and overlay
		High	Blade mill and spot seal	Mill cracks and rubber seal coat	Mill cracks and rubber seal coat	Mill cracks and overlay
<15'	Mostly Tight	Low	Monitor	Monitor	Monitor	
		Medium	Monitor and spot seal if worsens	Monitor	Monitor	Seal coat on normal schedule
		High	Spot seal or monitor	Monitor	Monitor	Seal coat on normal schedule
	Open, < 1/2"	Low	Spot seal	Monitor	Monitor	Seal coat on normal schedule if seal planned in less than 1-2 years otherwise seal with state forces
		Medium	Crack seal	Crack seal	Crack seal	Crack seal and seal coat on normal schedule if seal planned in less than 1-2years, otherwise seal with state forces
		High	Crack seal	Crack seal	Crack seal	Crack seal and seal coat on normal schedule if seal planned in less than 1-2years, otherwise seal with state forces
	> 1/2" or deteriorated	Low	Spot seal	Seal coat	Seal coat	Seal coat
		Medium	Crack fill (cold mix) and rubber seal coat	Crack fill (cold mix) and rubber seal coat	Crack fill (cold mix) and rubber seal coat	Crack fill (cold mix) abd rubberized seal coat
		High	Crack fill (cold mix) and rubber seal coat	Crack fill (cold mix) and rubber seal coat	Crack fill (cold mix) and rubber seal coat	Crack fill (cold mix) abd rubberized seal coat
	Cupped or Tented	Low	Crack seal	Blade mill and seal coat	Blade mill and seal coat	Mill cracks and seal coat
		Medium	Blade mill and spot seal	Mill cracks and rubber seal coat	Mill cracks and rubber seal coat	Mill cracks and overlay
		High	Blade mill and spot seal	Mill cracks and rubber seal coat	Mill cracks and rubber seal coat	Mill cracks and overlay

Predominant Crack Distress (Across)		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Low	Monitor	Monitor	Seal coat on normal schedule	
		Medium	Monitor	Monitor	Seal coat on normal schedule	
		High	Monitor	Monitor	Seal coat on normal schedule	
	Open, < 1/2"	Low	Monitor	Monitor	Monitor	Seal coat on normal schedule
		Medium	Strip seal	Strip seal	Strip seal	Strip seal
		High	Strip seal	Strip seal	Strip seal	Strip seal
	>1/2" or deteriorated	Low	Crack fill and level up	Crack fill and level up	Crack fill and level up	Crack fill and level up
		Medium	Crack fill and level up	Crack fill and level up	Crack fill and level up	Crack fill and level up
		High	Crack fill and level up	Crack fill and level up	Crack fill and level up	Crack fill and level up
	1 per lane	Mostly tight	Low	Monitor	Monitor	Seal coat on normal schedule
			Medium	Monitor	Monitor	Seal coat on normal schedule
			High	Monitor	Monitor	Seal coat on normal schedule
Open, < 1/2"		Low	Monitor	Strip seal	Strip seal	Strip seal
		Medium	Spot seal	Crack seal	Crack seal	Crack seal
		High	Spot seal	Crack seal	Crack seal	Crack seal
>1/2" or deteriorated	Low	Crack fill and level up	Crack fill and level up	Crack fill and level up	Crack fill and level up	
	Medium	Crack fill and level up	Crack fill and level up	Crack fill and level up	Crack fill and level up	
	High	Crack fill and level up	Crack fill and level up	Crack fill and level up	Crack fill and level up	
>1 per lane	Mostly Tight	Low	Monitor	Monitor	Seal coat on normal schedule	
		Medium	Monitor	Seal coat on normal schedule	Seal coat on normal schedule	
		High	Monitor	Seal coat on normal schedule	Seal coat on normal schedule	
	Open, < 1/2"	Low	Spot seal	Reconstruct	Reconstruct	Reconstruct
		Medium	Spot repair	Reconstruct	Reconstruct	Reconstruct
		High	Spot repair	Reconstruct	Reconstruct	Reconstruct
>1/2" or deteriorated	Low	Spot seal	Reconstruct	Reconstruct	Reconstruct	
	Medium	Spot repair	Reconstruct	Reconstruct	Reconstruct	
	High	Spot repair	Reconstruct	Reconstruct	Reconstruct	

## Yoakum (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F		Blade level up	Blade level up	Blade level up
			S		Blade level up	Blade level up	Monitor
		0.5" to 1" (Shallow)	F		Blade level up	Blade level up	Blade level up
			S		Blade level up	Blade level up	Blade level up
		High	F		Blade level up	Blade level up	Blade level up
			S		Blade level up	Blade level up	Blade level up
	> 1" (Deep)	Low	F		Blade level up	Blade level up	Blade level up
			S		Blade level up	Blade level up	Blade level up
		Medium	F		Blade level up	Blade level up	Bomag and replace
			S		Blade level up	Blade level up	Blade level up
		High	F		Blade level up	Blade level up	Bomag and replace
			S		Blade level up	Blade level up	Blade level up
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F		Blade level up	Blade level up	Blade level up
			S		Blade level up	Blade level up	Blade level up
		Medium	F		Blade level up	Blade level up	Blade level up
			S		Blade level up	Blade level up	Blade level up
		High	F		Blade level up	Blade level up	Blade level up
			S		Blade level up	Blade level up	Blade level up
	> 1" (Deep)	Low	F		Blade level up	Blade level up	Bomag and replace
			S		Blade level up	Blade level up	Blade level up
		Medium	F		Blade level up	Blade level up	Blade level up and overlay
			S		Blade level up	Blade level up	Blade level up and overlay
		High	F		Blade level up	Blade level up	Blade level up and overlay
			S		Blade level up	Blade level up	Blade level up and overlay

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Strip seal	Strip seal	Strip seal
			Medium	Strip seal	Strip seal	Strip seal
			High	Strip seal	Strip seal	Strip seal
		Major	Low	Strip seal	Strip seal	Strip seal
			Medium	Remove and replace	Bomag and replace	Bomag and replace
			High	Remove and replace	Bomag and replace	Bomag and replace
	Both Wheelpaths	Minor	Low	Strip seal	Strip seal	Strip seal
			Medium	Strip seal	Strip seal	Strip seal
			High	Strip seal	Strip seal	Strip seal
		Major	Low	Strip seal	Strip seal	Strip seal
			Medium	Remove and replace	Bomag and replace	Bomag and replace
			High	Remove and replace	Bomag and replace	Bomag and replace

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Monitor
		Medium	Blade patch	Blade level up	Blade level up and overlay
		High	Blade patch	Blade level up	Blade level up and overlay
	Rough	Low	Blade patch	Blade patch	Blade patch
		Medium	Blade patch	Blade level up	Blade level up and overlay
		High	Blade patch	Blade level up	Blade level up and overlay

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Remove and replace	Spot repair	Spot repair
		Medium	Remove and replace	Spot repair	Spot repair
		High	Remove and replace	Spot repair	Spot repair
	Many	Low	Remove and replace	Bomag and replace	Bomag and replace
		Medium	Remove and replace	Reconstruct	Reconstruct
		High	Remove and replace	Reconstruct	Reconstruct

Carl O'Neill  
Gerald Freytag

## Airports

Predominant Crack Distress		Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Transverse Cracking	>40' Mostly tight	Low	Monitor	Monitor	Crack seal	
		Medium	Monitor	Monitor	Crack seal	
		High	Monitor	Monitor	Crack seal or Slurry seal	
	Open, < 1/2"	Low	Monitor	Crack seal	Crack seal	Crack seal
		Medium	Crack seal	Crack seal	Crack seal	Crack seal
		High	Crack seal	Crack seal	Crack seal	Crack seal or seal coat or slurry seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal	Crack seal	Crack seal
		Medium	Crack seal or crack fill	Crack seal or crack fill	Crack seal or crack fill	Crack fill
		High	Crack seal or crack fill	Crack seal or crack fill	Crack seal or crack fill	Crack fill or seal coat
	Cupped or Tented	Low	Crack seal	Crack fill	Crack fill	Crack fill
		Medium	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill and seal coat
		High	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill and seal coat
15' - 40'	Mostly tight	Low	Monitor	Fog seal	Fog seal	
		Medium	Crack seal	Fog seal	Fog seal or slurry seal	
		High	Crack seal	Fog seal or slurry seal	Fog seal or slurry seal	
	Open, < 1/2"	Low	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
		Medium	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
		High	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal or crack fill and seal coat	Crack seal or crack fill and seal coat	Crack seal or crack fill and seal coat
		Medium	Crack seal or crack fill	Crack seal or crack fill and seal coat	Crack seal or crack fill and seal coat	Crack seal or crack fill and seal coat
		High	Crack seal or crack fill	Crack seal or crack fill and seal coat or cape seal	Crack seal or crack fill and seal coat or cape seal	Crack seal or crack fill and seal coat or cape seal
	Cupped or Tented	Low	Crack seal	Crack fill	Crack fill	Mill and seal coat
		Medium	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Mill and overlay
		High	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Blade tops of cracks or crack fill	Mill and overlay or reconstruct
<15'	Mostly Tight	Low	Monitor	Seal coat	Seal coat	
		Medium	Crack seal	Seal coat or slurry seal	Seal coat or slurry seal	
		High	Crack seal	Seal coat or slurry seal	Seal coat or slurry seal or cape seal	
	Open, < 1/2"	Low	Crack seal	Seal coat or slurry seal	Seal coat or slurry seal	Seal coat
		Medium	Crack seal	Seal coat or slurry seal	Seal coat or slurry seal	Seal coat or slurry seal
		High	Crack seal	Seal coat or slurry seal	Seal coat or slurry seal	Seal coat or slurry seal or cape seal
	>1/2" or deteriorated	Low	Crack seal	Crack seal or crack fill and seal coat	Crack seal or crack fill and seal coat	Mill and seal coat
		Medium	Crack seal or crack fill	Crack seal or crack fill and seal coat	Crack seal or crack fill and seal coat	Mill and overlay
		High	Crack seal or crack fill	Crack seal or crack fill and seal coat or cape seal	Crack seal or crack fill and seal coat or cape seal	Mill and overlay or reconstruct
	Cupped or Tented	Low	Crack seal	Mill and seal coat	Mill and seal coat	Mill and seal coat
		Medium	Blade tops of cracks or crack fill	Mill and overlay	Mill and overlay	Mill and overlay
		High	Blade tops of cracks or crack fill	Mill and overlay or reconstruct	Mill and overlay or reconstruct	Mill and overlay or reconstruct

Predominant Crack Spacing Distress (Across)		Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years	
Longitudinal Cracking	>Lane Width	Mostly tight	Low	Crack seal	Crack seal	Crack seal	
			Medium	Crack seal	Crack seal	Crack seal	
			High	Crack seal	Crack seal	Crack seal	
	Open, < 1/2"		Low	Crack seal	Crack seal	Crack seal	Crack seal
			Medium	Crack seal	Crack seal	Crack seal	
			High	Crack seal	Crack seal	Crack seal	
	>1/2" or deteriorated		Low	Crack seal	Crack fill	Crack fill	Crack fill
			Medium	Crack fill	Crack fill	Crack fill	
			High	Crack fill	Crack fill	Crack fill	
	1 per lane	Mostly tight	Low	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
			Medium	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
			High	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
Open, < 1/2"			Low	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
			Medium	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
			High	Crack seal	Crack seal	Crack seal	Seal coat or slurry seal
>1/2" or deteriorated			Low	Crack seal	Crack fill	Crack fill	Seal coat or cape seal
			Medium	Crack fill	Crack fill	Crack fill	Seal coat or cape seal
			High	Crack fill	Crack fill	Crack fill	Seal coat or cape seal
>1 per lane		Mostly Tight	Low	Crack seal	Seal coat	Seal coat	Seal coat or slurry seal
			Medium	Crack seal	Seal coat	Seal coat	Seal coat or slurry seal
			High	Crack seal	Seal coat	Seal coat	Seal coat or slurry seal
	Open, < 1/2"		Low	Crack seal	Seal coat	Seal coat	Seal coat or slurry seal
			Medium	Crack seal	Seal coat	Seal coat	Seal coat or slurry seal
			High	Crack seal	Seal coat	Seal coat	Seal coat or slurry seal
	>1/2" or deteriorated		Low	Crack seal	Seal coat or reconstruct	Seal coat or reconstruct	Seal coat or reconstruct
			Medium	Crack seal	Seal coat or reconstruct	Seal coat or reconstruct	Seal coat or reconstruct
			High	Crack seal	BoMag and overlay	BoMag and overlay	Seal coat or reconstruct

## Airports (continued)

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Fast or Slow	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Rutting	1 Wheelpath	Low	F	Monitor	Monitor	Monitor	Monitor
				Monitor	Monitor	Monitor	
		Medium	F	Monitor	Monitor	Monitor	
				Monitor	Monitor	Monitor	
		High	F	Skin patch	Skin patch	Skin patch or microsurfacing	
				Skin patch	Skin patch	Skin patch or microsurfacing	
	> 1" (Deep)	Low	F	Skin patch	Skin patch	Skin patch	
				Skin patch	Skin patch	Skin patch	
		Medium	F	Skin patch	Skin patch	Skin patch or microsurfacing	
				Skin patch	Skin patch	Skin patch or microsurfacing	
		High	F	Dig out and patch	Dig out and patch	Microsurfacing or dig out and patch	
				Skin patch	Skin patch	Microsurfacing or dig out and patch	
Both Wheelpaths	0.5" to 1" (Shallow)	Low	F	Monitor	Monitor	Monitor	Monitor
				Monitor	Monitor	Monitor	
		Medium	F	Monitor	Monitor	Skin patch	
				Monitor	Monitor	Skin patch	
		High	F	Skin patch	Skin patch	Skin patch or microsurfacing	
				Skin patch	Skin patch	Skin patch or microsurfacing	
	> 1" (Deep)	Low	F	Skin patch	Skin patch	Skin patch	
				Skin patch	Skin patch	Skin patch	
		Medium	F	Skin patch	Skin patch	Skin patch or microsurfacing	
				Skin patch	Skin patch	Skin patch or microsurfacing	
		High	F	Dig out and patch	Dig out and patch	Microsurfacing or dig out and patch	
				Skin patch	Skin patch	Microsurfacing or dig out and patch	

Predominant Distress	# Lanes	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Alligator Cracking	1 Wheelpath	Minor	Low	Crack seal if sealing nearby	Crack seal if sealing nearby	Dig out and patch
			Medium	Crack seal if sealing nearby	Crack seal if sealing nearby	Dig out and patch
			High	Crack seal if sealing nearby	Dig out and patch	Dig out and patch
		Major	Low	Crack seal if sealing nearby	Crack seal if sealing nearby	Dig out and patch
			Medium	Dig out and patch	Dig out and patch	Dig out and patch
			High	Dig out and patch	Dig out and patch	Dig out and patch
	Both Wheelpaths	Minor	Low	Crack seal if sealing nearby	Crack seal if sealing nearby	Dig out and patch
			Medium	Dig out and patch	Dig out and patch	Dig out and patch
			High	Dig out and patch	Dig out and patch	Dig out and patch
		Major	Low	Dig out and patch	Dig out and patch	Dig out and patch
			Medium	Dig out and patch	Dig out and patch	Dig out, patch, and overlay
			High	Dig out and patch	Dig out and patch	Dig out, patch, and overlay

Predominant Distress	Severity	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Swell/Roughness	Some Roughness	Low	Monitor	Monitor	Monitor
		Medium	Monitor	Blade tops and patch	Blade tops and patch
		High	Blade tops and patch	Blade tops and patch	Blade tops and patch
	Rough	Low	Monitor	Monitor	Monitor
		Medium	Blade tops and patch	Blade tops and patch	Blade tops and patch
		High	Blade tops and patch	Blade tops and patch	Blade tops and patch

Predominant Distress	Few or Many	Traffic Level or Importance	Action if Only Localized	Short Term Repair 1-2 Years	Long Term Treatment 3+ Years
Failures	Few	Low	Dig out and patch	Dig out and patch	Dig out and patch
		Medium	Dig out and patch	Dig out and patch	Dig out and patch
		High	Dig out and patch	Dig out and patch	Dig out, patch, and overlay
	Many	Low	Dig out and patch	Dig out and patch	Dig out and patch
		Medium	Dig out and patch	Dig out, patch, and overlay	Dig out, patch, and overlay
		High	Dig out and patch	Dig out, patch, and overlay	Dig out, patch, and overlay

Tom Freeman