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Abstract

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Implementation involved the training and the use of highway employees as airport inspectors, the development of an historical data base for each airport, cataloging the current condition of each runway pavement, and the development and inclusion of feasible maintenance policies and their estimated costs in a computer package. Finally, a series of condition and projected future condition reports as well as reports concerning the estimated rehabilitation costs were developed from the computer package for each airport.

The project covered a period of approximately 18 months and utilized nearly 50 VDOT employees.

Several recommendations to the VDOAV concerning the future of general aviation airport pavement management are included.

FINAL REPORT

IMPLEMENTATION OF A PAVEMENT MANAGEMENT SYSTEM FOR VIRGINIA'S GENERAL AVIATION AIRPORTS

K. H. McGhee, P. E.
Senior Research Scientist

(Prepared for the Virginia Department of Aviation. The opinions, findings, and conclusions expressed in this report are those of the author and not necessarily those of the Virginia Department of Transportation.)

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ABSTRACT

This report summarizes the activities undertaken to implement a pavement management system at 56 general aviation airports coming under the jurisdiction of the Virginia Department of Aviation (VDOAV). The system, which is called Micro-PAVER, is a proprietary program developed by the U.S. Army Corps of Engineers. It is reported to be used at many airports in the U.S. and abroad and by many local government agencies in the U.S.

Implementation involved the training and the use of highway employees as airport inspectors, the development of an historical data base for each airport, cataloging the current condition of each runway pavement, and the development and inclusion of feasible maintenance policies and their estimated costs in a computer package. Finally, a series of condition and projected future condition reports as well as reports concerning the estimated rehabilitation costs were developed from the computer package for each airport.

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INTRODUCTION

In the mid 1980s, new legislation brought the Virginia Department of Aviation (VDOAV) and the Virginia Department of Transportation (VDOT) into a closer working relationship. As a part of this change, the VDOT Research Council offered their services wherever VDOAV could identify needs. One of those identified needs was in the formal management of pavements at the general aviation airports under the VDOAV'S jurisdiction.

Representatives of the two agencies met in mid-1988 and agreed that the Research Council would develop a proposal and contract documents directed at implementing an agreed-upon pavement management system at approximately 60 general aviation airports in approximately a one-year period.

After some negotiation to establish management guidelines and to review federal directives applicable to the airfields in question, the required documentation was developed and the contract was signed in October 1988. A copy of the working proposal is included as Appendix A.

PURPOSE AND SCOPE

Although it was the purpose of this study to implement a pavement management system for the general aviation airports in the state, it is the purpose of the present report to provide the reader with an understanding of that process. In an effort to accomplish that goal, the report has three parts. These are (1) a general description of the pavement management process and of the Micro-PAVER program, (2) a discussion of the implementation of pavement management at Virginia airports, and (3) a discussion of the products of pavement management and the Micro-PAVER program.

This report does not constitute a research report since no research was done. It is an implementation report, and as such it is the hope of the author that Virginia's general aviation managers will be able to use it as a means of achieving a better understanding of the pavement management process and as an aid to more easily using

the large computer printout (sometimes several hundred pages) provided by the Micro-PAVER system.

BACKGROUND

The Virginia Department of Aviation (VDOAV) under Title 5.1, Chapter 1, Code of The Commonwealth of Virginia, promotes aviation in the Commonwealth, licenses airports, and provides assistance for "the planning, development, construction, and operation of airports."

At the time of the initiation of the present project, there were 64 paved airports open to the public, not including two federally leased airports located in Northern Virginia. VDOAV desired to manage most of those paved airports under Federal Aviation (FAA) Advisory Circular No. 150/5000-6, *Micro-Paver, Pavement Management Systems* (*1*). This pavement management system (PMS) and micro-computer software package was developed by the U.S. Corps of Engineers under contract to the FAA and is intended to provide airport managers and engineers with "a practical decision-making procedure for identifying cost-effective maintenance and repair alternatives."

It is important to note that most of the general aviation airports are the property of localities, of private corporations, and, sometimes, of individuals. The VDOAV, therefore, has only as much authority over these airports as the owners or operators are willing to allow, and even that authority often is allowed as a condition of securing improvement or other funds administered by the VDOAV. A listing of general airport information, including the nature of ownership or management is given in Appendix B.

In view of its many years of experience in managing highway pavements, the VDOT was in a good position to provide the manpower and technical expertise to gather the necessary data and to input that data into an airport pavement management database.

The Research Council was to provide a coordination function, and the data would be collected by the pavement condition rating teams already extant in the districts and already accustomed to working with the research personnel. The approximately even distribution of general aviation airfields around the state made the use of VDOT district teams particularly attractive.

With the above approach in mind, the VDOT and VDOAV agreed to hold a training session at which district and other VDOT pavement management personnel would be familiarized with airport terminology, with pavement management issues that might be unique to runways, aprons, and other airfield pavements, and the necessary safety training. It was anticipated that the training would occur over a three-day period at a centrally located, moderately trafficked airport.

It was further agreed that, upon completion of the training, VDOT would provide a schedule of field ratings and that VDOAV would notify airport sponsors and request their cooperation with the rating teams.

Finally, it was agreed that data from the first round of ratings would be reviewed by the Research Council and furnished to VDOAV with comments but without formal recommendations beyond those issuing from the Micro-PAVER program.

THE PAVEMENT MANAGEMENT PROCESS

The FAA, in advisory circular No. 150/5380-7 dated September 28, 1988, set forth its recommendations for the implementation of an airport pavement management system (*1*).

The FAA noted that agencies experienced in the management of highway pavements historically had managed their pavements through experience rather than through the use of a documented process wherein the greatest needs are met at a minimum cost. They further noted that this approach did not provide for the evaluation of the cost-effectiveness of maintenance actions taken which has "led to an inefficient use of funds." The FAA went on to comment (*1*):

> A pavement management system provides a consistent objective and systematic procedure for setting priorities and schedules, allocating resources, and budgeting for pavement maintenance and rehabilitation. It can also quantify information and provide specific recommendations for actions required to maintain a pavement network at an acceptable level of service while minimizing the cost of maintenance and rehabilitation.

Pavement Management Concepts

A pavement management system provides for the evaluation of a pavement's present condition, the projection of the pavement's condition in the future, the estimation of pavement deterioration rates, and the determination of optimum maintenance and rehabilitation strategies.

Although there are numerous methods of evaluating pavement condition and several parameters one could measure, the PAVER program makes use of pavement distress as the major condition indicator. In that program, a pavement condition index (PCI) is defined over a 0 to 100 scale. Although the methodology for determination of the PCI is beyond the scope of this report, some of its uses will be discussed later.

As has been shown many times, pavements deteriorate in a manner similar to that indicated in Figure 1 (*2*). Note in that Figure that the typical pavement begins in excellent condition and remains at a reasonably high level for some period of time during which there is a gradual decline. However, at some point, typically when about 75 percent of the service life has elapsed with approximately a 40 percent drop in quality (often referred to as a threshold value), a more rapid rate of deterioration sets in. As indicated in Figure 1, failure to apply appropriate maintenance or rehabilitation

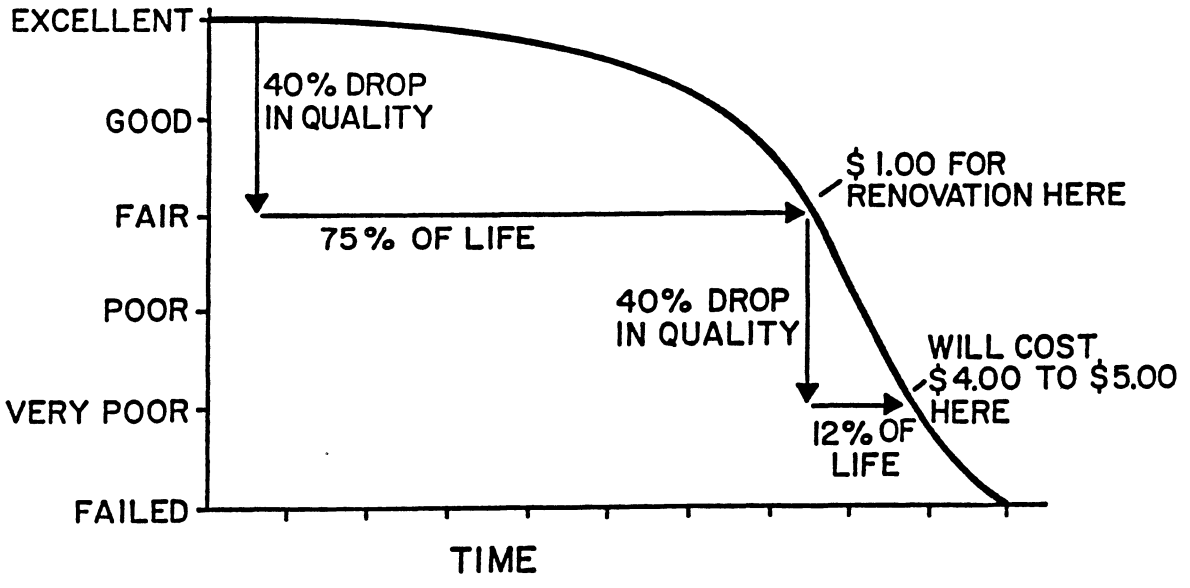


Figure 1. Typical Pavement Condition Life Cycle. Source: APWA Reporter.

actions soon after the rapid deterioration begins can lead to serious financial consequences later. A major thrust of pavement management systems, then, is to project the time at which the threshold will occur so that rehabilitation and the funding for it can be planned.

Pavement Management Elements

The Data Base

Since all pavements do not behave alike or like the "typical pavement," the true deterioration rate can be determined only through the use of historical records composed of condition ratings conducted in the same manner over a number of time periods (often at one- to two-year intervals). The development of these records of pavement condition is one of the major elements of pavement management.

In order to develop realistic pavement deterioration curves and the accompanying projections of future behavior, it is necessary to collect data on the construction history of the pavement to determine the quantities and types of materials comprising the pavement structure. This information is necessary because different pavement materials behave differently.

For the above reasons, pavement management experts nearly all agree that an historical data base is one of the most important elements in a pavement management system. In order for it to be as useful as possible, that data base should include not only pavement structural and condition data, but also information on the maintenance history and on the traffic using the facility currently and in the past. Other major elements identified by the FAA and others are discussed below.

Alternative Strategies

Because different pavement conditions require different maintenance or rehabilitation, a pavement management system, to be fully effective, must contain a series of alternatives. These alternatives should be sensitive to traffic, to the previous maintenance, and to the distress types and mechanisms. In order to be useful to the pavement management system, each strategy must have an associated cost and a life expectancy. Such strategies often comprise a compilation of experiences, especially in the early stages of pavement management. Later, when information feedback systems permit, they normally will be the most cost-effective actions.

Optimization

The matching of the proper alternative with the proper pavement condition and traffic exposure to provide a reasonable or even lowest life-cycle-cost is an optimization procedure. Most pavement management systems utilize the best data and engineering experience together to accomplish this task.

THE PAVER PROGRAM

The PAVER pavement management program was designed by the U.S. Army Corps of Engineers to accommodate the elements mentioned above and to provide users with a series of reports addressing the condition of their pavements, the projected future condition, and the optimum alternatives and their costs for those conditions. The micro-computer version called Micro-PAVER was used in the present project (*2*).

Briefly, Micro-PAVER has the capability of managing pavements on two levels, the network and the project. These were described by the FAA as follows:

- Network level. At the network level, decisions are made regarding the management of an entire pavement network: for example, at the local level, all the pavements at an airport, and at the state level, all the pavements on each of the airports in the state system.
- Project level. At the project level, decisions are made regarding the selection of the most cost-effective maintenance and rehabilitation alternative for a pavement identified as a candidate for work at the network level.

The Micro-PAVER manual provides an excellent discussion of the management details, many of which are beyond the scope of this report.

IMPLEMENTATION ON VIRGINIA AIRPORTS

Personnel and Training

The implementation of a pavement management system at Virginia's airports began in earnest when a Research Council technician, L. E. Wood, Jr., attended a 1-week training course on Micro-PAVER provided by the American Public Works Association. This gave Mr. Wood an excellent overview of the management system, especially in the area of pavement condition evaluation. At about that same time (November 1988), the software package was installed on a Council computer, and the staff began to become familiar with its workings.

Then, April 3 through 5, 1989, a formal 3-day training course attended by 33 VDOT employees, was held in Charlottesville, Virginia. The course was conducted by a consulting firm (Eckrose/Green Associates, Madison, Wisconsin) working under contract to the VDOAV. Appendix C is a listing of the VDOT people who completed the training. Generally, 3 people from each of the 9 highway districts were trained. The training was extremely comprehensive leaving the students in a position to conduct pavement condition ratings on either portland cement concrete or asphalt pavements. Airport safety was a primary consideration and included hands-on experience in communicating with the control tower and on safe access to runways and other airport paved areas. Inspectors were also coached on the proper protocol for dealing with airport operators and managers.

Development of an Historical Data Base

As mentioned earlier, a sound data base of the materials comprising the pavement structure is essential if the pavement management system is to be able to adequately project the pavement's performance. Although not specifically addressed in the contract for the present project, this activity was perceived by the VDOAV as the responsibility of the VDOT. Technicians spent many hours studying project records and plans and in telephone and personal contact with airport operators in order to develop the best possible base without resorting to coring the pavements.

The pavement materials data were then entered into the Micro-PAVER program to properly reflect the layout of the airport; i.e., the proper materials had to be located in the correct paved areas. This, also, was an extremely time-consuming process, but it was essentially completed by mid-1989. In several instances, airport operators were unwilling to provide the necessary data; consequently, those airports were omitted from the system. Ultimately, the data for 56 airports were incorporated into the system.

A final element of historical data desirable for an effective pavement management program and requested in the PAVER program is that concerning previous maintenance activities, their costs, and their life expectancies. As far as the project per-

sonnel could determine, no historical maintenance records were generally available. The decision was therefore made, with VDOAV concurrence, that historical maintenance data would not be a part of the initial data base.

Identification of Maintenance Policies and Unit Costs

Among the more critical issues to be dealt with in the implementation of any pavement management system is the identification of the applicable maintenance procedures or activities to apply to given types of distress. Although this was an integral part of the present effort, the author and staff members, including those from other units of VDOT, had experience only with highway maintenance. However, one Research Council consultant had experience with airport maintenance and was able to provide some input. Maintenance personnel were able to provide some assistance both in establishing the policies and in estimating the unit costs of those policies. Once identified and formatted in a manner consistent with PAVER, the activities and costs were entered into the data base and became a part of the PAVER package for Virginia airports.

The policies and costs are summarized in Appendix D for both asphalt and concrete pavements. The reader will note that this Appendix is in the form of copies of computer screens from the PAVER package. This seemed the most direct and useful way to display the data. The distress code numbers used in this Appendix are consistent with those used in the *PAVER Users Guide* (*2*). While the data given represent the best judgments and cost estimates available at the time the project was completed, the reader should keep in mind the need to constantly update the policies as new technologies develop and the cost estimates as airport specific data becomes available. It is important to recognize that most of the information was derived from highway practices and cost files. The cost data are of particular concern because they are, generally, for much larger quantities than would be encountered in general aviation airports such as those addressed in this project.

Development of Sampling Plans

The next step in the process involved the development of a statistically sound sampling plan for each airport. These plans were used by the inspectors to make sure an adequate representation of each airport was achieved in the pavement condition data. Sampling plans for each airport were developed in the Research Council offices and provided to the trained inspectors prior to their visiting the airports.

Plans were developed using a method set forth by Eckrose and Green (*3*) consistent with Micro-PAVER requirements. This method featured a series of numbers that identified the feature type, i.e., runway, apron, taxiway. (A feature is defined as a pavement section with uniform function, age, composition, and condition.) However, in the present study, only the runways were sampled in accordance with an agreement

with VDOAV. Features were divided into sample units comprised of approximately 5,000 square feet of asphalt pavement or approximately 20 slabs of concrete pavement. Smaller sample units were sometimes dictated by geometrics, age, or construction details.

The distribution and frequency of sampling were in accord with FAA, Micro-PAVER, and Eckrose and Green guidelines to provide representative sampling of airport features at a level of 25 to 35 percent of the units established.

Airport Inspection

Airport inspections were performed by 2- or 3-person teams trained as described earlier and provided with VDOAV-owned two-way radios operating on aviation frequencies and in constant contact with the control tower and incoming aircraft at the airport undergoing inspection. Inspection teams made use of modified 12-passenger vans used in highway pavement condition surveys. These are painted a highly visible orange and are equipped with lighting to meet safety standards for use in highway traffic.

Using calibrated measuring wheels, inspection teams first marked off the selected sampling units from the prepared sampling plan. These plans were occasionally modified to accommodate actual field conditions. After all sample units in a work area were marked, the inspectors walked slowly through each sample unit recording the frequency and the extent of the observed distresses on data sheets provided by Eckrose and Green (*3*), examples of which are reproduced in Appendix E. Some of the previously referenced materials are excellent sources of more detailed information on the distresses included in the surveys and on their causes. Although only one inspector recorded the data, the information represented a consensus of the team. The number of sample units (and therefore data sheets filled out) ranged from as few as 13 on the Lake Anna airport to 112 on the Franklin airport. Statewide, a total of over 1,700 units were inspected.

Although the work generally proceeded smoothly, teams reported difficulty working the inspections between flights at some airports with high traffic. This, however, was handled as well as possible by being in constant communication with the tower. In the areas of communications, safety, and general conduct of the surveys, the inspection teams were most appreciative of the assistance provided by Mr. Michael Swain and Mr. Steven McNeely of the VDOAV, one of whom accompanied each team to one airport (usually the first one inspected by the team).

By late March of 1990, inspections were completed on the last airports to be included in the system. Data from these were provided to the Research Council a few days later and were entered in the data base by mid-April.

The following sections of this report summarize the data base and the pavement management outputs.

PRODUCTS OF THE PAVER PROGRAM

The PAVER package is a very comprehensive and complex pavement management system. The details of its operation are well beyond the scope of this report and are not needed by the airport operator in order to make use of the products. It may be of some interest that the Micro-PAVER version used in this study was comprised of over 50 floppy disks and occupied nearly 10 megabytes of hard disk storage space. The products provided to VDOAV for 56 airports are in the form of floppy disks, which contain the full data base for each airport and bound volumes of computer printout reports from PAVER as mutually agreed upon by VDOT and VDOAV. Other reports in other formats are available to the user who wishes to become more deeply involved in the PAVER system. The report names are those assigned internally by the paver package. Nearly all PAVER reports apply to selected features or to the entire airport, a choice that is made by the operator of the computer. This section will be more intelligible if the reader has available for the airport in which he is interested copies of the computer generated reports to be discussed in each section. Since that may not always be possible, the author has provided some sample printouts from the Suffolk Municipal Airport.

The PCI Report

The PCI report is a section-by-section listing of each feature at the airport. An example is given in Table 1 for a small portion of the Suffolk Municipal Airport. Note that the report includes the necessary identifying numbers as well as the sizes and ages of the features. Finally, the last inspection date and the calculated PCI are given. In the case of the Virginia airports covered by this report, there is only one inspection date since there has been only one formal inspection. In the instances of features not sampled during the present inspection, the date of construction is listed as the last inspection date. This characteristic of the report may be misleading because very old pavements may be indicated as being in perfect condition because of the absence of data to the contrary. For this reason, the reader is cautioned to use this report only to scan for a general indication of feature age and inspection dates. The condition of the airport is much better indicated by other reports that make use only of the sampled units.

TABLE 1

PCI REPORT

Agency Name : SUFFOLK MUNICIPAL AIRPORT
Agency Number : SFQ Report Date: MAR/22/1990
Branch Number : All
Section Number : All
Branch Use : All
Surface Type : All
Pavement Rank : All
Zone : All
Section Category: All Section Area: All
Last Construction Date : All
Last Inspection Date : All
PCI : All

BRANCH NUMBER/USE/ NAME	SECTION NUM/RANK/SURF/AREA (SF)	LAST CONSTRUCT DATE	LAST INSPECTION DATE	PCI
RO725 / Runway Runway Mid 0725	301/ P / AC / 5250.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jan/11/1990 6.6	67
RO725 / Runway Runway Mid 0725	302/ P / AC / 4875.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jan/11/1990 6.6	69
RO725 / Runway Runway Mid 0725	303/ P / AC / 4900.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jan/11/1990 6.6	64
RO725 / Runway Runway Mid 0725	304/ P / AC / 4800.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jan/11/1990 6.6	66
RW/07 / Runway Runway 07	101/ P / AC / 5000.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jun/01/1983 .0	100
RW/07 / Runway Runway 07	102/ P / AC / 5000.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jun/01/1983 .0	100
RW/07 / Runway Runway 07	103/ P / AC / 5000.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jan/11/1990 6.6	62
RW/07 / Runway Runway 07	104/ P / AC / 5000.00 Cat: Zone: 1	Jun/01/1983 Age (Yrs):	Jun/01/1983 .0	100

continues

TABLE 1 (continued)

BRANCH NUMBER/USE/ NAME	SECTION NUM/RANK/SURF/AREA (SF)	LAST CONSTRUCT DATE	LAST INSPECTION DATE	PCI
RW/07 / Runway	105/ P / AC / 5000.00	Jun/01/1983	Jun/01/1983	100
Runway 07	Cat: Zone: 1	Age (Yrs):	.0	
RW/07 / Runway	106/ P / AC / 5000.00	Jun/01/1983	Jan/11/1990	67
Runway 07	Cat: Zone: 1	Age (Yrs):	6.6	
RW/07 / Runway	107/ P / AC / 5000.00	Jun/01/1983	Jun/01/1983	100
Runway 07	Cat: Zone: 1	Age (Yrs):	.0	
RW/07 / Runway	108/ P / AC / 5000.00	Jun/01/1983	Jun/01/1983	100
Runway 07	Cat: Zone: 1	Age (Yrs):	.0	
RW/07 / Runway	109/ P / AC / 5000.00	Jun/01/1983	Jan/11/1990	79
Runway 07	Cat: Zone: 1	Age (Yrs):	6.6	

The PCI Frequency Report

This report (see example in Table 2) provides an excellent, concise summary of the overall condition of pavements at an airport or of selected features of an airport. Frequency distributions (number of sections) are given for 7 ranges of PCI values from "failed" (PCI of 0 to 10) to "excellent" (PCI of 86 to 100). Also given in that tabulation are the percentage of sections, the area, and the percentages of area falling within each PCI range.

PAVER's prediction capabilities are used to provide predicted PCI frequency reports as desired by the user. In the present case, reports for the current year (1990) as well as for 1992, 1995, 2000, and 2005 are provided. Clearly, the predictions for later years will be much more accurate after several PCI determinations have been completed on each feature.

Because it provides useful summary statistics in a compact and easy-to-read format, the frequency distribution report is very helpful to the user of the PMS.

TABLE 2

PCI FREQUENCY REPORT

Agency Name	:	SUFFOLK MUNICIPAL AIRPORT	
Agency Number	:	SFQ	Report Date: Mar/22/1990
Branch Use	:	All	
Pavement Rank	:	All	
Surface Type	:	All	
Zone	:	All	
Section Category	:	All	
Last Construction Date	:	All	
PCI	:	All	

Table of PCI Frequency Report

Year: Apr 1990

Condition	PCI Range	No. of Sections	% of Sections	Total Area	% of Area
Failed	0 - 10	62	35.23	452,000.00	43.30
Very Poor	11 - 25	8	4.55	57,000.00	5.46
Poor	26 - 40	1	.57	7,500.00	.72
Fair	41 - 55	1	.57	7,500.00	.72
Good	56 - 70	15	8.52	74,825.00	7.17
Very Good	71 - 85	88	50.00	440,000.00	42.15
Excellent	86 - 100	1	.57	5,000.00	.48

Total Number of Sections	:	176
Average PCI	:	47
Total Section Area	:	1,043,825.00
Number of Missing Values	:	0

Inspection Schedule Report

The inspection schedule report gives the user a means to plan for future inspections. As may be seen in Table 3, a summary report indicates, for a period of time selected by the user, the number of sections needing to be inspected each year. This schedule is predicated on the rates of deterioration of the pavements and on the quality of data desired.

TABLE 3

INSPECTION SCHEDULE REPORT

Agency Name	:	SUFFOLK MUNICIPAL AIRPORT	
Agency Number	:	SFQ	Report Date: Mar/22/1990
Branch Use	:	All	
Pavement Rank	:	All	
Surface Type	:	All	
Zone	:	All	
Section Category	:	All	
Last Construction Date	:	All	
PCI	:	All	

Table of Inspection Schedule Report

Year to Inspect

Pavement Rank	1990	1991	1992	1993	1994	1995
Primary	153	5	7	10	0	1
Total Sections to Inspect	153	5	7	10	0	1

Total Number of Sections to Inspect : 176
Total Number of Sections Not Needing Inspection : 0
Total Number of Missing Values : 0

A detailed inspection schedule report lists the next inspection date for each sample unit. The criteria used are given in Table 4.

TABLE 4

Inspection Frequency Criteria

Rate of Deterioration (Pts/YR)	Years Between Insp.
> 9	1
6 - 9	2
2 - 5	3
< 5	5

Network Maintenance Report

This may be the most important and useful report produced by PAVER. It provides the user with a summary similar to that shown in Table 5 for each section of pavement. Note that the section's location, dimensions and condition are fully described.

Based on the maintenance policies and the cost estimates discussed earlier, the suggested maintenance activities and the costs of addressing each of the distresses are given. The example given is comprised of 24 portland cement concrete pavement slabs, each with dimensions of 25 ft by 12.5 ft. The major distress appears to be surface scaling of some 1250 ft^2 on 6 slabs. The total estimated cost to repair all distresses for the 24 slabs is approximately $34,000.

Although each section of the airport has its own maintenance report, the system also provides for a network-wide report listing each maintenance activity, the estimated quantities of work, and the estimated costs. Clearly, this type of report is of great value in determining the resources needed to accomplish the necessary work. Also, it might form the basis for contract documents in instances where the work will be let to contract.

TABLE 5

NETWORK MAINTENANCE REPORT

Agency Name:		SUFFOLK MUNICIPAL AIRPORT	
Agency Number	:	SFQ	Report Date: Mar/22/1990
Branch Use	:	All	
Pavement Rank	:	All	
Surface Type	:	PCC	
Zone	:	All	
Section Category	:	All	
Last Construction Date	:	All	
PCI	:	All	
Branch Name	-	RUNWAY 15	
Branch Number	-	RW/15	
Section Number	-	402	
Inspection Date	-	Feb/01/1990	
Slab Length	-	25.00 LF	
Slab Width	-	12.50 LF	
Number of Slabs	-	24	
Section PCI	-	14	

continues

TABLE 5 (continued)

Distress Type	Dis Sev	Dist-Qty Work-Qty	Work Type	Total Cost ($)
62 Corner Break	M	1 Slabs		
		8.00 LF	Clean, Seal - Hot Pour	4
63 Linear Cr	H	3 Slabs		
		56.25 LF	Clean Groove - Seal	84
63 Linear Cr	M	13 Slabs		
		243.75 LF	Clean Groove - Seal	366
65 Jt Seal DMG	L	24 Slabs		
		1200.00 LF	Fill Sealant - Hot Pour	540
70 Scaling	M	4 Slabs		
		1250.00 SF	Patching - PCC Partial Depth	24,300
71 Faulting	L	6 Slab		
		75.00 LF	No Action	0
71 Faulting	M	1 Slabs		
		12.50 LF	No Action	0
72 Shat. Slab	M	2 Slabs		
		625.00 SF	Slab Replacement	8,681
73 Shrinkage Cr		12 Slabs		
		60.00 LF	Surface Seal - Seal, Sealant	27
			Total	34,002

Although the value of the maintenance reports to airport operators and maintenance personnel is clear, the reader is cautioned that the cost figures may not be very realistic, for small facilities or where only small amounts of work are planned. The reason is that the unit costs are based on relatively large quantities of highway work where economies of scale may be realized. Therefore, no mobilization costs are reflected. When developing engineering cost estimates for small quantities of work, the user should either substantially increase the prices or expect a substantial mobilization cost.

Other Reports Available From PAVER

Two major reports available from the PAVER package and not a part of the present effort because of the relative complexity of their required inputs are the "Budget Planning Report" and the "Economic Analysis Report".

The first of these allows the user to produce long-range estimates of budget levels required to keep the pavement network above a preselected PCI level. It requires user input of the desired minimum PCI levels, average repair costs, and the inflation rate for the period of time over which the projections are made.

The second report can be used to help select the most cost-effective pavement repair for given conditions. The user must enter the feasible alternatives, the stream of maintenance activities, and all costs and discount rates to be applied in the analysis. The result is expressed in terms of equivalent uniform annual costs.

THE CONDITION OF VIRGINIA'S GENERAL AVIATION AIRPORTS

Detailed condition data for each of the general aviation airports included in the project are given in the bound report for that airport. No discussion of the results on each of those airports is given, nor was such a discussion intended as a part of the present effort. Although it was not a purpose of this project to perform a formal engineering evaluation of the results achieved from the first round of pavement condition evaluations on general aviation airports, the author and other VDOT participants are experienced in the management of highway pavements. For this reason, a general assessment of the condition of those pavements is offered as background information for VDOAV staff to use as they see fit.

There was a strong consensus among the pavement rating teams, which was shared by the research staff, that the general aviation airports in Virginia have been well managed and are in generally good condition. Although the individual airport reports will show that most have some deficiencies, they also show that few are in poor condition. Where some features are in poor condition, local airport managers often are already addressing the problems.

The pavement management capabilities provided in the present study will make it possible to document the funding required to maintain the general aviation airports in their present good condition.

GENERAL COMMENTS ON THE PAVER PROGRAM

As has been mentioned several times throughout this report, the PAVER program, even its micro-computer version, is an extremely powerful and useful program. Even so, the Research Council staff members who worked with the package on the large project described here found numerous disadvantages. These generally are related to the program's user-unfriendly environment. Some of the items identified by the staff as needing improvement are discussed below.

1. The program often was unable to accept section information for numbered features. Instead, the data would be entered in an un-numbered feature. Once the problem began to occur, the only way to overcome it was to exit the program and start over.

2. In cases in which airport branches have several sections having the same work histories data, entry is extremely awkward as the user has to issue a

separate copy command for each section. Clearly, the program should be revised to provide an automatic copy capability for these instances.

3. Once data were entered in the materials types files the users were unable to edit those files. Efforts to edit these files resulted in a erasure of that data so that to provide usable data the entries had to be repeated.

4. Efforts to generate "family history" reports resulted only in error messages.

5. The package can be very slow in producing and printing reports. For this reason, at a minimum, an "AT" class (80286 based) computer with a 40 MB hard drive is recommended.

6. The Micro-PAVER suppliers were generally inaccessible when the users sought support for the package. Phone calls often were not returned, and some correspondence was not answered.

The reader is reminded that the pavement condition rating method (PCI) integral to PAVER is strongly advocated by the FAA and many other agencies. Its utility and appropriateness are in no way questioned. The point is that VDOAV may be able to secure an analysis package that is more straightforward and easier to use than PAVER.

RECOMMENDATIONS

Based on the experiences gained in the oversight, analysis, and documentation of the present project, the author offers the following recommendations to the Virginia Department of Aviation.

1. VDOAV should be extremely cautious in the use of estimated rehabilitation costs provided by the PAVER program. In many instances, especially on small projects, it will be necessary to add substantial mobilization costs.

2. VDOAV may wish to closely examine pavement management packages other than Micro-PAVER. Although the PCI is a valuable tool and its use should be continued, the computer package is difficult to use, thus making it very time consuming to input data or to secure results.

3. Periodic condition evaluations of general aviation airport pavements should be continued and expanded to include aprons, taxiways, and other peripheral paved areas. As has been found with highway systems, such seemingly incidental areas are so numerous that they may consume a large percentage of the maintenance and rehabilitation budget. Proper documentation of that budget is essential to good pavement management.

4. VDOAV and VDOT should explore the means of securing future airport pavement condition data. If it is deemed desirable to continue with highway

pavement management personnel conducting the surveys, additional resources will be necessary.

CONCLUSION

The project reported herein is an example of a successful cooperative effort between two state agencies. The highways arm of the Department of Transportation, which had the personnel and other resources to accomplish the task, was able to provide what should prove to be a useful service to the Department of Aviation, in which resources of the required type were limited. At a minimum, a good data base of beginning pavement management information has been established along with a computerized management structure.

Although it is the author's opinion that such cooperative activities are in the best interest of the Commonwealth and it's citizens, they are not without their disadvantages. As alluded to earlier, the major disadvantage is in the commitment of resources at the time they are needed to the tasks for which they are needed. Because government agencies at all levels are subject to the mandates of legislative bodies, it is not always possible to focus one's efforts as proposed by earlier plans. As a result of such mandated activities, the author was unable to commit to airport pavement management the time he had originally hoped. Nevertheless, the tireless efforts of dedicated coworkers has led to the completion of the project in a reasonable period of time.

ACKNOWLEDGMENTS

The author gratefully acknowledges the diligent efforts put forth over the past year and a half by a large number of people, mostly employees of the Virginia Department of Transportation. The project could not have been carried through without extra effort on the part of research technician specialist L. E. Wood and the students providing assistance to him. Some of those who contributed greatly were Bill Batts, Joyce Birdsall, Cathy Cragg, Kim Snow, and Keith White.

Although thanks are extended to all the participants in the PCI training session and those individuals who conducted surveys on the airports, the project was possible only through the special efforts and cooperation of the district pavement management coordinators. Those known by the author to have contributed to the successful completion of the project are: W. B. Carder, J. W. Craig, J. O. Jones, K. L. Hardy, C. A. Hicks, L. B. Huseby, J. O. Monroe, J. L. Shelor, L. E. Winslow, and E. E. Wright.

Finally, Steven R. McNeely and John M. Swain, engineers with the Department of Aviation, are to be thanked for their assistance in administering the project and in conducting the condition surveys.

REFERENCES

1. U.S. Department of Transportation, Federal Aviation Administration. 1988. "Pavement Management System," AC: 150/5380-7. Washington, D. C.

2. U.S. Army Corps of Engineers, Construction Engineering Research Laboratory. 1988. "Micro Paver Users Guide, Version 2.0." Champaign, Ill.

3. Eckrose, Roy A. and William H. Green. 1988. "Airport Pavement Inspection by PCI." ECKROSE/GREEN ASSOCIATES. Madison, Wisconsin.

APPENDIX A

A PROPOSAL TO THE VIRGINIA DEPARTMENT OF AVIATION ON AN AIRPORT PAVEMENT MANAGEMENT SYSTEM

A PROPOSAL TO THE VIRGINIA DEPARTMENT OF AVIATION ON AN AIRPORT PAVEMENT MANAGEMENT SYSTEM

by

Phillip L. Melville, P. E.
Research Consultant

PROBLEM STATEMENT

The Department of Aviation (DOA) under Title 5.1, Chapter 1, Code of Virginia promotes aviation in the Commonwealth, licenses airports, and provides assistance "for the planning, development, construction, and operation of airports." There are 64 airports opened to the public not counting the two federal leased airports in northern Virginia. The Federal Aviation Administration (FAA) in its Advisory Circular No. 150/5000-6, "Micro-Paver, Pavement Management Systems," stated that "the primary purpose of an airport pavement is to provide adequate load-carrying capacity and good ride-quality.... There is a need to perform routine maintenance and rehabilitation of existing pavements.... The selection of a specific rehabilitation method involves both engineering and economic considerations."

A software program called MICRO-PAVER was developed by the Corps of Engineers under contract to FAA. It is intended to provide airport managers and engineers "with a practical decision-making procedure for identifying cost-effective maintenance and repair alternatives."

As is the case with any computer program, the quality of the pavement management system will be a direct reflection of the quality of the data collected and entered in the system. In view of its experience in pavement management, VDOT is in a unique position to support this airport program.

The Department of Aviation requested that VDOT undertake the data collection and tabulation to set the stage for a state-wide airport pavement management program. The data collected will be used by the airport owner. Guidance and advice on application will remain under the authority of the DOA and FAA. However, the collection process must as stated in FAA Advisory Circular No. 150/5380-6, "Guidelines and Procedures for Maintenance of Airport Pavements," take into account that "a pavement management system provides a consistent, objective, and systematic procedure for setting priorities and schedules, allocating resources, and budgeting for pavement maintenance and rehabilitation. It also quantifies information and provides specific recommendations for actions required to maintain a pavement network at an acceptable level of service while minimizing the cost of maintenance and rehabilitation."

BACKGROUND

VDOT has been collecting pavement condition data for 13 years and has an ongoing pavement management system. The rationale is the same as for the FAA recommended program. By using the VDOT experience in collecting pavement performance data and the Virginia Transportation Research Council (VTRC) resources to meet airport requirements, DOA can be provided quickly and efficiently with a functioning Micro-Paver program.

Of the 64 public airports in Virginia, not counting the 2 federally leased airports in northern Virginia, 61 need VDOT support to activate the program. Norfolk, Richmond, and Roanoke are believed to have sufficient on-board resources. These 61 airports are fairly evenly scattered among VDOT construction districts (see enclosed map). Existing pavement inspection teams with additional training organized by VTRC will collect the data. Each VDOT construction district will have its airport inspection team. Each district team will survey the airports within its boundaries. However, exception may be made for convenience and efficiency.

METHODOLOGY

The VTRC will organize one training school at a central location subject to DOA approval. It will be located near a low activity General Aviation facility for field training. It is estimated that the school will last three days. On the first day, background and system will be covered; field training will be covered on the second day; and using field data in Micro-Paver will be covered on the third day. Money or human support from DOA, FAA, and trade groups such as the National Association of State Aviation Officials will be requested as needed.

Upon completion of training, VTRC will propose a field schedule for DOA approval. DOA will notify airport sponsors and request their support. Data from the first inspection cycle will be reviewed by VTRC. It will be furnished to DOA with comments but without policy recommendations.

It is suggested that payment for these services be made by IAT invoice on a monthly cost-reimbursement basis, or the VTRC could submit their bills by AS-5 invoice.

The co-principal investigators will be P. L. Melville, consultant, and H. E. Brown and K. H. McGhee, Senior Research Scientists. Correspondence concerning this project should be addressed to H. E. Brown, P. E.

TIME AND COST ESTIMATES

After your programming and funding approval, we will proceed as follows:

Organizing and planning training school	45 days
Training school	3 days
Airport surveys planning	61 days
Airport field surveys	61 days
Data transfer to Micro-Paver	31 days
Review of first statewide survey	30 days

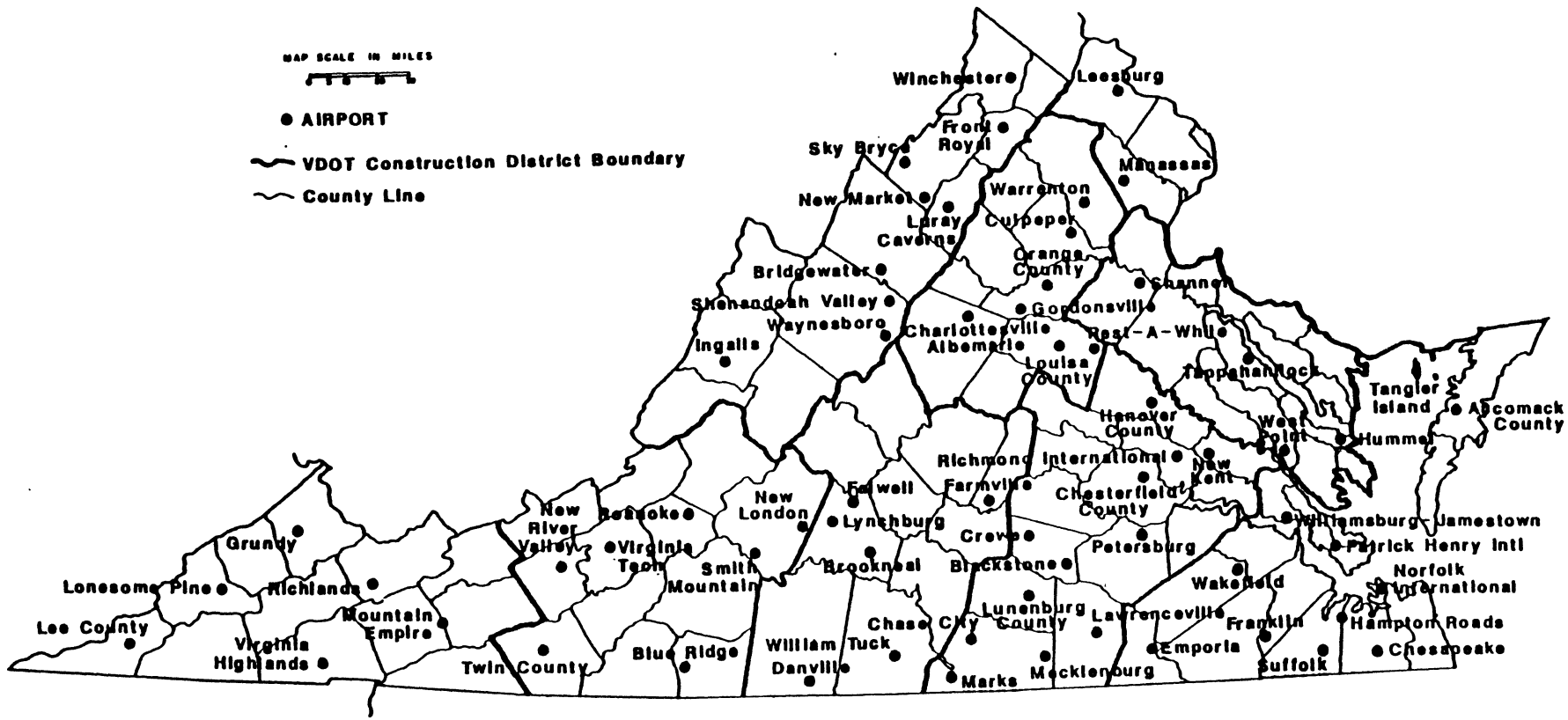
It is estimated that all 61 airports will be surveyed and results forwarded to DOA within 15 months of funding. Cost estimates for this program are as follows:

Salary of principal investigators	$18,000
Salary of support staff	5,000
Travel	5,000
Supplies	2,000
Reimbursable cost of Field Survey Teams	21,600
TOTAL	$51,600

Follow up surveys or analysis will be the subject of separate agreements and findings. No other resources are needed.

DELIVERABLE

VDOT will deliver to DOA the data on each airport (probably on tape or diskette) and hard copy comments.


MAP SCALE IN MILES
0 5 10 15
AIRPORT
VDOT Construction District Boundary
County Line
Winchester
Leesburg
Front Royal
Sky Bryce
Manassas
New Market
Warrenton
Luray Caverns
Culpeper
Orange County
Bridgewater
Shenandoah Valley
Gordonsville
Waynesboro
Charlottesville Albemarle
Rest-A-While
Ingalls
Louisa County
Tappahannock
Tangier Island
Accomack County
Hanover County
West Point
Hummel
Richmond International
New Kent
Farmville
Chesterfield County
New River Valley
Roanoke
New London
Lynchburg
Crewe
Petersburg
Williamsburg-Jamestown
Patrick Henry Intl
Grundy
Virginia Tech
Brookneal
Blackstone
Norfolk International
Lonesome Pine
Richlands
Smith Mountain
Wakefield
Lee County
Mountain Empire
Lunenburg County
Lawrenceville
Franklin
Hampton Roads
Chase City
Virginia Highlands
William Tuck
Emporia
Chesapeake
Twin County
Blue Ridge
Danville
Marks
Mecklenburg
Suffolk

APPENDIX B

GENERAL AVIATION AIRPORTS

INFORMATION

Name	Airport No.	Ownership	Runway Length (ft)	Runway Width (ft)
LEE COUNTY	1	TOWN	2,250	50
LONESOME PINE	2	COMMISSION	4,700	100
GRUNDY MUNICIPAL	3	COMMISSION	2,400	50
RICHLANDS MUNICIPAL*	4	TOWN	3,435	41
MOUNTAIN EMPIRE	5	COMMISSION	4,800	75
TWIN COUNTY	6	COMMISSION	4,200	60
VIRGINIA HIGHLANDS	7	COMMISSION	3,380	75
NEW RIVER VALLEY	8	COMMISSION	6,200	150
VIRGINIA TECH	9	STATE	4,200	100
ROANOKE REGIONAL*	10	COMMISSION	6,800	150
			5,800	150
BRIDGEWATER AIRPARK	11	PRIVATE	2,755	60
INGALLS FIELD	12	COMMISSION	5,600	100
SHENANDOAH VALLEY	13	COMMISSION	6,000	150
WAYNESBORO	14	PRIVATE	2,000	50
FRONT ROYAL	15	COMMISSION	3,000	50
LURAY CAVERNS	16	COMMISSION	3,500	60
NEW MARKET	17	PRIVATE	3,056	60
SKY BRYCE*	18	PRIVATE	2,240	50
WINCHESTER MUNICIPAL	19	CITY	4,500	100
LEESBURG MUNICIPAL	20	TOWN	4,500	75
MANASSAS	21	CITY	5,700	100
			3,700	100
CULPEPER MUNICIPAL	22	COUNTY	4,000	75
GORDONSVILLE MUNICIPAL	23	TOWN	2,300	40
ORANGE COUNTY	24	COUNTY	3,200	75
WARRENTON/FAUQUIER	25	PRIVATE	4,100	60
			2,090	40
CHARLOTTESVILLE/ALB.	26	AUTHORITY	6,000	150
LOUISA COUNTY	27	AUTHORITY	3,800	60
REST-A-WHILE/BUMPASS*	28	PRIVATE	2,560	26
BROOKNEAL/CAMPBELL	29	AUTHORITY	3,800	60
FALWELL/LYNCHBURG	30	PRIVATE	2,900	24
LYNCHBURG MUNICIPAL	31	CITY	5,800	150
			3,987	150
NEW LONDON*	32	PRIVATE	3,164	40
SMITH MOUNTAIN	33	PRIVATE	3,050	50
BLUE RIDGE/MARTINSVILLE	34	AUTHORITY	5,000	75
DANVILLE MUNICIPAL	35	CITY	5,000	150
			4,500	150
			4,060	100

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Name	Airport No.	Ownership	Runway Length (ft)	Runway Width (ft)
CHASE CITY MUNICIPAL	36	TOWN	3,400	50
LAWRENCEVILLE/BRUNSWICK	37	COMMISSION	3,200	50
MARKS MUNICIPAL	38	TOWN	4,500	50
MECKLENBURG/BRUNSWICK	39	COMMISSION	5,000	60
WILLIAM M. TUCK	40	TOWN/COUNTY	4,000	75
BLACKSTONE	41	TOWN	3,025	75
CREWE MUNICIPAL	42	TOWN	3,250	60
FARMVILLE MUNICIPAL	43	TOWN	3,200	60
LUNENBURG COUNTY	44	COMMISSION	3,000	50
CHESTERFIELD COUNTY	45	COUNTY	5,500	100
HANOVER COUNTY	46	COUNTY	4,650	80
NEW KENT	47	COUNTY	3,600	75
RICHMOND INTERNATIONAL*	48	COMMISSION	9,000	150
			6,600	150
			5,300	150
SHANNON	49	PRIVATE	3,000	100
HUMMEL FIELD	50	COUNTY	2,500	45
TAPPAHANNOCK MUN.	51	TOWN	2,785	150
WEST POINT MUNICIPAL	52	TOWN	3,700	75
EMPORIA MUNICIPAL	53	COMMISSION	5,000	80
PETERSBURG MUNICIPAL	54	AUTHORITY	5,000	100
WAKEFIELD MUNICIPAL	55	COMMISSION	4,350	75
CHEASAPEAKE MUNICIPAL	56	AUTHORITY	3,600	60
FRANKLIN MUNICIPAL	57	CITY	5,175	100
			4,100	100
			3,600	100
HAMPTON ROADS	58	PRIVATE	4,000	70
			3,526	70
NORFOLK INTERNATIONAL*	59	AUTHORITY	9,000	150
			4,876	150
SUFFOLK MUNICIPAL	60	CITY	5,000	100
			3,650	150
PATRICK HENRY INT.*	61	COMMISSION	8,000	150
			6,525	150
WILLIAMSBURG-JAMESTOWN	62	PRIVATE	3,200	60
ACCOMACK COUNTY	63	COUNTY	5,000	150
TANGIER ISLAND	64	TOWN	3,600	75

*Not included in implementation project.

APPENDIX C

ATTENDENCE LIST FOR THE AIRPORT

PAVEMENT MANAGEMENT TRAINING SESSION

ATTENDANCE LIST

VDOT EMPLOYEES

AIRPORT PAVEMENT MANAGEMENT TRAINING SESSION

April 3-5, 1989

Charlottesville, Va.

NAME	DISTRICT/DIVISION
Jay Babra	Northern VA
John Beverly	Northern V
J. W. Brewer	Suffolk
J. P. Caldwell, Jr.	Fredericksburg
Wayne Carder	Culpeper
W. D. Cline	Bristol
Jim Craig	Staunton
R. W. Crawford	Northern VA
D. F. Forehand	Suffolk
Bob Gullet	Richmond
Ernest Hampton	Staunton
Ken Hardy	Richmond
C. A. Hicks	Bristol
A. L. Jackson	Richmond
J. O. Jones	Salem
P. L. Melville	Research
H. A. McGhee	Culpeper
K. H. McGhee	Research
Max Miller	Staunton
J. O. Monroe	Lynchburg
S. M. Mullins	Fredericksburg
A. D. Newman	Maintenance
K. E. Noell	Salem
J. L. Shelor	Salem
Edie Southarn	Northern VA
Curtis Spencer	Richmond
M. E. Sturgill	Lynchburg
D. S. Turner	Bristol
K. O. White	Research
R. H. Wilson	Lynchburg
L. E. Winslow	Suffolk
L. E. Wood, Jr.	Research
E. E. Wright	Fredericksburg

APPENDIX D

MAINTENANCE POLICIES AND ESTIMATED COSTS

Policy Number: 1 Policy Description: AIRPORT PAVEMENTS - ASPHALT

Distress	Sev	Work Type & Description	Cost	Unit
41 ALLIGATOR CR	L	SS-SP Surface Seal-Slurry;Skin Patch	.12	sq. ft.
41 ALLIGATOR CR	M	PA-A2 Patching - AC 2in	.60	sq. ft.
41 ALLIGATOR CR	H	PA-FD Patching - AC Full Depth (6in.	1.80	sq. ft.
42 BLEEDING		HO-SA Hot Sand Surface Blotting	.10	sq. ft.
43 BLOCK CR	L	DO-NO No Action	.00	ft.
43 BLOCK CR	M	CS-AS Crack Sealing - Asphalt Seal 1	.50	ft.
43 BLOCK CR	H	CS-CS Crack Sealing - Clean, seal	1.00	ft.
44 CORRUGATION	L	PA-LS Patching - AC Leveling, Slurry	.45	sq. ft.
44 CORRUGATION	M	PA-AL Patching - AC Leveling	.30	sq. ft.
44 CORRUGATION	H	PA-FD Patching - AC Full Depth (6in.	1.80	sq. ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

Policy Number: 1 Policy Description: AIRPORT PAVEMENTS - ASPHALT

Distress	Sev	Work Type & Description	Cost	Unit
45 DEPRESSION	L	PA-AL Patching - AC Leveling	.30	sq. ft.
45 DEPRESSION	M	PA-AL Patching - AC Leveling	.30	sq. ft.
45 DEPRESSION	H	PA-FD Patching - AC Full Depth (6in.	1.80	sq. ft.
46 JET BLAST		DO-NO No Action	.00	ft.
47 JT REF. CR	L	DO-NO No Action	.00	ft.
47 JT REF. CR	M	CS-AS Crack Sealing - Asphalt Seal 1	.50	ft.
47 JT REF. CR	H	CS-CS Crack Sealing - Clean, seal	1.00	ft.
48 L & T CR	L	DO-NO No Action	.00	ft.
48 L & T CR	M	CS-AS Crack Sealing - Asphalt Seal 1	.50	ft.
48 L & T CR	H	CS-CS Crack Sealing - Clean, seal	1.00	ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

778

Policy Number: 1 Policy Description: AIRPORT PAVEMENTS - ASPHALT

Distress	Sev	Work Type & Description	Cost	Unit
49 OIL SPILLAGE		SA-BL Sand Blot Surface	.10	sq. ft.
50 PATCHING	L	PA-SF Patching-Slurry Seal,Fog Coat	.20	sq. ft.
50 PATCHING	M	PA-A2 Patching - AC 2in	.60	sq. ft.
50 PATCHING	H	PA-FD Patching - AC Full Depth (6in.	1.80	sq. ft.
51 POLISHED AG		DO-NO No Action	.00	ft.
52 WEATH/RAVEL	L	SS-SS Surface Seal - Sand; Slurry; F	.15	sq. ft.
52 WEATH/RAVEL	M	SS-SL Surface Seal-Slurry;Sand Seal	.15	sq. ft.
52 WEATH/RAVEL	H	SS-SL Surface Seal-Slurry;Sand Seal	.15	sq. ft.
53 RUTTING	L	PA-AL Patching - AC Leveling	.30	sq. ft.
53 RUTTING	M	PA-AL Patching - AC Leveling	.30	sq. ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

Policy Number: 1 Policy Description: AIRPORT PAVEMENTS - ASPHALT

Distress	Sev	Work Type & Description	Cost	Unit
53 RUTTING	H	PA-FD Patching - AC Full Depth (6in.	1.80	sq. ft.
54 SHOVING	L	PA-LS Patching - AC Leveling, Slurry	.45	sq. ft.
54 SHOVING	M	PA-AL Patching - AC Leveling	.30	sq. ft.
54 SHOVING	H	PA-FD Patching - AC Full Depth (6in.	1.80	sq. ft.
55 SLIPPAGE CR		PA-A2 Patching - AC 2in	.60	sq. ft.
56 SWELLING	L	DO-NO No Action	.00	ft.
56 SWELLING	M	PA-A2 Patching - AC 2in	.60	sq. ft.
56 SWELLING	H	PA-FD Patching - AC Full Depth (6in.	1.80	sq. ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

Policy Number: 2 Policy Description: AIRPORT PAVEMENTS - CONCRETE

Distress	Sev	Work Type & Description	Cost	Unit
61 BLOW-UP	L	PA-PF Patching - PCC Full Depth	16.67	sq. ft.
61 BLOW-UP	M	PA-PF Patching - PCC Full Depth	16.67	sq. ft.
61 BLOW-UP	H	PA-PF Patching - PCC Full Depth	16.67	sq. ft.
62 CORNER BREAK	L	CS-HP Clean,Seal - Hot Pour	.45	ft.
62 CORNER BREAK	M	CS-HP Clean,Seal - Hot Pour	.45	ft.
62 CORNER BREAK	H	PA-PF Patching - PCC Full Depth	16.67	sq. ft.
63 LINEAR CR	L	FS-HP Fill Sealant - Hot Pour	.45	ft.
63 LINEAR CR	M	CG-SL Clean Groove - Seal	1.50	ft.
63 LINEAR CR	H	CG-SL Clean Groove - Seal	1.50	ft.
64 DURABIL. CR	L	DO-NO No Action	.00	ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

Policy Number: 2 Policy Description: AIRPORT PAVEMENTS - CONCRETE

Distress	Sev	Work Type & Description	Cost	Unit
64 DURABIL. CR	M	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
64 DURABIL. CR	H	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
65 JT SEAL DMG	L	FS-HP Fill Sealant - Hot Pour	.45	ft.
65 JT SEAL DMG	M	CG-SL Clean Groove - Seal	1.50	ft.
65 JT SEAL DMG	H	CG-SL Clean Groove - Seal	1.50	ft.
66 SMALL PATCH	L	DO-NO No Action	.00	ft.
66 SMALL PATCH	M	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
66 SMALL PATCH	H	PA-PF Patching - PCC Full Depth	16.67	sq. ft.
67 LARGE PATCH	L	DO-NO No Action	.00	ft.
67 LARGE PATCH	M	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

780

Policy Number: 2 Policy Description: AIRPORT PAVEMENTS - CONCRETE

Distress	Sev	Work Type & Description	Cost	Unit
67 LARGE PATCH	H	PA-PF Patching - PCC Full Depth	16.67	sq. ft.
68 POPOUTS		DO-NO No Action	.00	ft.
69 PUMPING		DO-NO No Action	.00	ft.
70 SCALING	L	DO-NO No Action	.00	ft.
70 SCALING	M	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
70 SCALING	H	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
71 FAULTING	L	DO-NO No Action	.00	ft.
71 FAULTING	M	DO-NO No Action	.00	ft.
71 FAULTING	H	GR-GJ Grinding - Joint Grinding	.39	sq. ft.
72 SHAT. SLAB	L	SL-RP Slab Replacement	13.89	sq. ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

Policy Number: 2 Policy Description: AIRPORT PAVEMENTS - CONCRETE

Distress	Sev	Work Type & Description	Cost	Unit
72 SHAT. SLAB	M	SL-RP Slab Replacement	13.89	sq. ft.
72 SHAT. SLAB	H	SL-RP Slab Replacement	13.89	sq. ft.
73 SHRINKAGE CR		SS-ST Surface Seal - Seal, Sealant	.45	ft.
74 JOINT SPALL	L	DO-NO No Action	.00	ft.
74 JOINT SPALL	M	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
74 JOINT SPALL	H	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
75 CORNER SPALL	L	DO-NO No Action	.00	ft.
75 CORNER SPALL	M	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.
75 CORNER SPALL	H	PA-PP Patching - PCC Partial Depth	19.44	sq. ft.

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F10 returns to the Policy Number/Policy Description form.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 F10Done

Code	Description	Work Unit	Unit Cost	C
BA-10	BASE COURSE - AGGREGATE (10in)	sq. ft.	.63	
BA-A3	Base Course - Aggregate (3 in)	sq. ft.	.19	
BA-A4	Base Course - Aggregate (4 in)	sq. ft.	.25	
BA-A5	Base Course - Aggregate (5 in)	sq. ft.	.38	
BA-A6	Base Course - Aggregate (6 in)	sq. ft.	.38	
BA-A7	Base Course - Aggregate (7 in)	sq. ft.	.42	*
BA-A8	Base Course - Aggregate (8 in)	sq. ft.	.50	
BA-A9	Base Course - Aggregate (9 in)	sq. ft.	.57	*
BA-AG	Base Course - Aggregate	sq. ft.	.00	
BA-B3	Base Course - Bituminous	sq. ft.	.00	*
BA-BI	Base Course - Bituminous	sq. ft.	.00	
BA-ST	Base Course - Stabilized (non-Bi.)	sq. ft.	.00	
BI-BI	Binder - Bituminous	sq. ft.	.00	
BR-SE	Break & Seat	sq. ft.	.00	

Construction Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
CO-PR	Coat - Prime	sq. ft.	.01	
CO-TA	Coat - Tack	sq. ft.	.01	
CR-PC	Complete Reconstruction - PCC	sq. ft.	.00	*
NC-AC	New Construction - AC	sq. ft.	.00	*
NC-PC	New Construction - PCC	sq. ft.	.00	*
SB-50	Subbase Aggregate - (5 in)	sq. ft.	.25	
SB-A4	Subbase Aggregate - (4.5 in)	sq. ft.	.23	
SB-A5	Subbase Aggregate - (5.5 in)	sq. ft.	.28	
SB-A9	Subbase Aggregate - (9 in)	sq. ft.	.45	
SB-AG	Subbase - Aggregate	sq. ft.	.00	
SB-BI	Subbase - Bituminous	sq. ft.	.00	
SB-ST	Subbase - Stabilized (non-Bitum.)	sq. ft.	.00	
SG-CO	Subgrade - Compacted	sq. ft.	.00	
SG-ST	Subgrade - Stabilized	sq. ft.	.00	

Construction Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

782

Code	Description	Work Unit	Unit Cost	C
SU-A1	Surface Course - AC (1.5 in)	sq. ft.	.29	*
SU-A2	Surface Course - AC (2 in)	sq. ft.	.38	*
SU-A5	SURFACE COURSE - AC (5in)	sq. ft.	.95	*
SU-AC	Surface Course - AC	sq. ft.	.00	*
SU-DB	Surface Treatment - Double Bitum.	sq. ft.	.00	*
SU-PC	Surface Course - PCC	sq. ft.	.00	*
SU-PF	Surface Course - Porous Friction	sq. ft.	.00	*

Construction Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
AR-CO	AC Recycling - Cold	sq. ft.	.00	
AR-HO	AC Recycling - Hot	sq. ft.	.00	
CG-SL	Clean Groove - Seal	ft.	1.50	
CR-AC	Complete Reconstruction - AC	sq. ft.	.00	*
CS-AC	Crack Sealing - AC	ft.	.00	
CS-AS	Crack Sealing - Asphalt Seal 1/4 in	ft.	.50	
CS-CS	Crack Sealing - Clean, seal	ft.	1.00	
CS-HP	Clean,Seal - Hot Pour	ft.	.45	
CS-PC	Crack Sealing - PCC	ft.	.00	
DO-NO	No Action	ft.	.00	
FA-TK	Fabric and Tack	sq. ft.	.00	
FS-HP	Fill Sealant - Hot Pour	ft.	.45	
GR-GJ	Grinding - Joint Grinding	sq. ft.	.39	
GR-PC	Grinding - PCC	sq. ft.	.00	

Maintenance Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
GV-AC	Grooving - AC	sq. ft.	.00	
GV-PC	Grooving - PCC	sq. ft.	.00	
HO-SA	Hot Sand Surface Blotting	sq. ft.	.10	
HS-AC	Heater Scarification - AC	sq. ft.	.00	
JS-BI	Joint Sealing - Bituminous	ft.	.00	
JS-SI	Joint Sealing - Silicon	ft.	.00	
MI-AC	Milling - AC	sq. ft.	.00	
MI-PC	Milling - PCC	sq. ft.	.00	
OL-35	OVERLAY - STRUCTURAL (3.5 in)	sq. ft.	.67	*
OL-A1	Overlay - AC Thin (1.5 in)	sq. ft.	.29	*
OL-A2	Overlay - AC Structural (2 in)	sq. ft.	.38	*
OL-A3	Overlay - AC Structural (3 in)	sq. ft.	.57	*
OL-AF	Overlay - AC Fabric	sq. ft.	.00	*
OL-AS	Overlay - AC Structural	sq. ft.	.00	*

Maintenance Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

784

Code		Description
	251	Crushed Stone
	252	Gravel
	253	Sand
280		Others

Treated Materials

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Surface, Treated, and Untreated Materials.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code		Description
310		Crushed Stone
	311	Well-Graded
	312	Poorly Graded (One-Sized)
	313	High Fines Content
320		Gravel
	321	Well-Graded
	322	Poorly Graded
	323	High Fines Content
330		Sand
	331	Well-Graded
	332	Poorly Graded
	333	High Fines Content
340		Fine-Grained Soils
	341	Sandy Silt

Untreated Materials

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Surface, Treated, and Untreated Materials.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code		Description
	164	Self-Expanding Rubber
	165	Sponge Rubber
	166	Closed Cell Plastic
170		Joint and Crack Sealers
	171	Hot-Poured
	172	Cold-Poured
180		Others
190		thissample description
	191	this new one
	192	this one

Surface Materials

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Surface, Treated, and Untreated Materials.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code		Description
210		Cement Treated
	211	Gravel and Crushed Stone
	212	Sand
	213	Silt and Clay
220		Lime-Fly Ash Treated
	221	Gravel and Crushed Stone
	222	Sand
	223	Slag
230		Lime Treated Fine Grained Soil
240		Asphalt-Treated Plant Mix
	241	Crushed Stone
	242	Gravel
	243	Sand
250	.	Asphalt-Treated Road Mix

Treated Materials

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Surface, Treated, and Untreated Materials.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

786

Code		Description
100		Pavement Fabric
	101	Fabric - Petromat
110		Portland Cement Concrete
	111	Plain Concrete
	112	Reinforced Concrete (RCP)
	113	Continuously Reinforced (CRCP)
	114	Prestressed Concrete
	115	Fibrous Concrete
120		Asphalt Concrete
	121	PFC - #8 AGG. & ASPHALT
130		Road Mix Bituminous Surface
140		Sand-Asphalt
	141	Plant Mix Asphalt Concrete
	142	Road Mix Asphalt Concrete

Surface Materials

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Surface, Treated, and Untreated Materials.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code		Description
150		Surface Treatments
	151	Single-Layer Aggregate Seal
	152	Double-Layer Aggregate Seal
	153	3 or more Layer Aggregate Seal
	154	Sand Seal
	155	Slurry Seal
	156	Fog Seal
	157	Prime Coat
	158	Tack Coat
	159	Dust Layering
160		Preformed Joint Fillers
	161	Bituminous Fiber
	162	Cork
	163	Self-Expanding Cork

Surface Materials

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Surface, Treated, and Untreated Materials.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
SS-SS	Surface Seal - Sand; Slurry; Fog	sq. ft.	.15	
SS-ST	Surface Seal - Seal, Sealant	ft.	.45	
SS-SU	Surface Seal - Slurry Seal	sq. ft.	.00	
ST-SB	Surface Treatment - Single Bitum.	sq. ft.	.00	
ST-SS	Surface Treatment - Slurry Seal	sq. ft.	.00	
ST-ST	Surface Treatment - Sand Tar	sq. ft.	.00	
SU-I2	Surface Course - I-2	sq. ft.	.00	*
UN-PC	Undersealing - PCC	ft.	.00	

Maintenance Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4Delete F5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
OL-AT	Overlay - AC Thin	sq. ft.	.00	*
OL-PF	Overlay - PCC Fully Bonded	sq. ft.	.00	*
OL-PP	Overlay - PCC Partially Bonded	sq. ft.	.00	*
OL-PU	Overlay - PCC Unbonded	sq. ft.	.00	*
PA-2A	Patch - AC 2 in	sq. ft.	.00	
PA-A2	Patching - AC 2in	sq. ft.	.60	
PA-AC	Patching - Asphalt Concrete	sq. ft.	.00	
PA-AD	Patching - AC Deep	sq. ft.	.00	
PA-AL	Patching - AC Leveling	sq. ft.	.30	
PA-AS	Patching - AC Shallow	sq. ft.	.00	
PA-AW	Patching - AC Wedge	sq. ft.	.00	
PA-FD	Patching - AC Full Depth (6in.)	sq. ft.	1.80	
PA-FU	Patch - AC Full Depth	sq. ft.	.00	
PA-LS	Patching - AC Leveling, Slurry	sq. ft.	.45	

Maintenance Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
PA-PF	Patching - PCC Full Depth	sq. ft.	16.67	
PA-PP	Patching - PCC Partial Depth	sq. ft.	19.44	
PA-SF	Patching-Slurry Seal,Fog Coat	sq. ft.	.20	
PA-SS	Patching - Skin, Slurry	sq. ft.	.00	
PF-CO	POROUS FRICTION COURSE	sq. ft.	.00	*
SA-BL	Sand Blot Surface	sq. ft.	.10	
SL-RP	Slab Replacement	sq. ft.	13.89	
SR-AC	Surface Reconstruction - AC	sq. ft.	.00	*
SR-PC	Surface Reconstruction - PCC	sq. ft.	.00	*
SS-CT	Surface Seal - Coal Tar	sq. ft.	.00	
SS-FS	Surface Seal - Fog Seal	sq. ft.	.00	
SS-RE	Surface Seal - Rejuvinating	sq. ft.	.00	
SS-SL	Surface Seal-Slurry;Sand Seal	sq. ft.	.15	
SS-SP	Surface Seal-Slurry;Skin Patch	sq. ft.	.12	

Maintenance Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
AR-CO	AC Recycling - Cold	sq. ft.	.00	
AR-HO	AC Recycling - Hot	sq. ft.	.00	
CG-SL	Clean Groove - Seal	ft.	1.50	
CR-AC	Complete Reconstruction - AC	sq. ft.	.00	*
CS-AC	Crack Sealing - AC	ft.	.00	
CS-AS	Crack Sealing - Asphalt Seal 1/4 in	ft.	.50	
CS-CS	Crack Sealing - Clean, seal	ft.	1.00	
CS-HP	Clean,Seal - Hot Pour	ft.	.45	
CS-PC	Crack Sealing - PCC	ft.	.00	
DO-NO	No Action	ft.	.00	
FA-TK	Fabric and Tack	sq. ft.	.00	
FS-HP	Fill Sealant - Hot Pour	ft.	.45	
GR-GJ	Grinding - Joint Grinding	sq. ft.	.39	
GR-PC	Grinding - PCC	sq. ft.	.00	

Maintenance Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
GV-AC	Grooving - AC	sq. ft.	.00	
GV-PC	Grooving - PCC	sq. ft.	.00	
HO-SA	Hot Sand Surface Blotting	sq. ft.	.10	
HS-AC	Heater Scarification - AC	sq. ft.	.00	
JS-BI	Joint Sealing - Bituminous	ft.	.00	
JS-SI	Joint Sealing - Silicon	ft.	.00	
MI-AC	Milling - AC	sq. ft.	.00	
MI-PC	Milling - PCC	sq. ft.	.00	
OL-35	OVERLAY - STRUCTURAL (3.5 in)	sq. ft.	.67	*
OL-A1	Overlay - AC Thin (1.5 in)	sq. ft.	.29	*
OL-A2	Overlay - AC Structural (2 in)	sq. ft.	.38	*
OL-A3	Overlay - AC Structural (3 in)	sq. ft.	.57	*
OL-AF	Overlay - AC Fabric	sq. ft.	.00	*
OL-AS	Overlay - AC Structural	sq. ft.	.00	*

Maintenance Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

790

Code	Description	Work Unit	Unit Cost	C
SU-A1	Surface Course - AC (1.5 in)	sq. ft.	.29	*
SU-A2	Surface Course - AC (2 in)	sq. ft.	.38	*
SU-A5	SURFACE COURSE - AC (5in)	sq. ft.	.95	*
SU-AC	Surface Course - AC	sq. ft.	.00	*
SU-DB	Surface Treatment - Double Bitum.	sq. ft.	.00	*
SU-PC	Surface Course - PCC	sq. ft.	.00	*
SU-PF	Surface Course - Porous Friction	sq. ft.	.00	*

Construction Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
BA-10	BASE COURSE - AGGREGATE (10in)	sq. ft.	.63	
BA-A3	Base Course - Aggregate (3 in)	sq. ft.	.19	
BA-A4	Base Course - Aggregate (4 in)	sq. ft.	.25	
BA-A5	Base Course - Aggregate (5 in)	sq. ft.	.38	
BA-A6	Base Course - Aggregate (6 in)	sq. ft.	.38	
BA-A7	Base Course - Aggregate (7 in)	sq. ft.	.42	*
BA-A8	Base Course - Aggregate (8 in)	sq. ft.	.50	
BA-A9	Base Course - Aggregate (9 in)	sq. ft.	.57	*
BA-AG	Base Course - Aggregate	sq. ft.	.00	
BA-B3	Base Course - Bituminous	sq. ft.	.00	*
BA-BI	Base Course - Bituminous	sq. ft.	.00	
BA-ST	Base Course - Stabilized (non-Bi.)	sq. ft.	.00	
BI-BI	Binder - Bituminous	sq. ft.	.00	
BR-SE	Break & Seat	sq. ft.	.00	

Construction Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

Code	Description	Work Unit	Unit Cost	C
CO-PR	Coat - Prime	sq. ft.	.01	
CO-TA	Coat - Tack	sq. ft.	.01	
CR-PC	Complete Reconstruction - PCC	sq. ft.	.00	*
NC-AC	New Construction - AC	sq. ft.	.00	*
NC-PC	New Construction - PCC	sq. ft.	.00	*
SB-50	Subbase Aggregate - (5 in)	sq. ft.	.25	
SB-A4	Subbase Aggregate - (4.5 in)	sq. ft.	.23	
SB-A5	Subbase Aggregate - (5.5 in)	sq. ft.	.28	
SB-A9	Subbase Aggregate - (9 in)	sq. ft.	.45	
SB-AG	Subbase - Aggregate	sq. ft.	.00	
SB-BI	Subbase - Bituminous	sq. ft.	.00	
SB-ST	Subbase - Stabilized (non-Bitum.)	sq. ft.	.00	
SG-CO	Subgrade - Compacted	sq. ft.	.00	
SG-ST	Subgrade - Stabilized	sq. ft.	.00	

Construction Activities

Position to the desired record using the scrolling keys.
Select an action using the function keys.
F9 toggles between Construction Activities & Maintenance Activities.

F1 Help F2 Keys F3 Add F4DeleteF5 Edit F6 F7 F8 F9 Next F10Done

APPENDIX E

PAVEMENT CONDITION SURVEY DATA SHEETS

FLEXIBLE PAVEMENT
AIRPORT PAVEMENT CONDITION SURVEY SHEET

[illegible]		FEATURE ID	
SAMPLE UNIT NUMBER	NUMBER OF SQUARE FEET	DATE	SURVEYED BY

DISTRESS TYPES	SEVERITY		
	LOW	MEDIUM	HIGH
* 1 ALLIGATOR CRACKING			
2 BLEEDING			
* 3 BLOCK CRACKING			
4 CORRUGATION			
* 5 DEPRESSION			
6 JET BLAST			
7 JT REFLECTION (PCC)			
8 LONG & TRANS CRACKING			
9 OIL SPILLAGE			
10. PATCHING			
11 POLISHED AGGREGATE			
12 RAVELING/WEATHERING			
* 13 RUTTING			
14 SHOVING FROM PCC			
15 SLIPPAGE CRACKING			
16 SWELL			

NOTE: Measure * Distresses Separately When Found In Combination With Other * Distress. Circle Combinations And Connect w/ Line.

ECKROSE/GREEN
ASSOCIATES
6409 ODANA ROAD
MADISON, WISCONSIN 53719
608-274-6409

PAVEMENT SLOPE		SHOULDER SLOPE		SHOULDER CONDITION		INLET CONDITION	
LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	SLOPE	RATING
							FLOW
							STRUCT

796

JOINTED RIGID PAVEMENT
CONDITION SURVEY DATA SHEET FOR SAMPLE UNIT

AIRPORT		DATE
FACILITY	FEATURE	SAMPLE UNIT
SURVEYED BY		SLAB SIZE

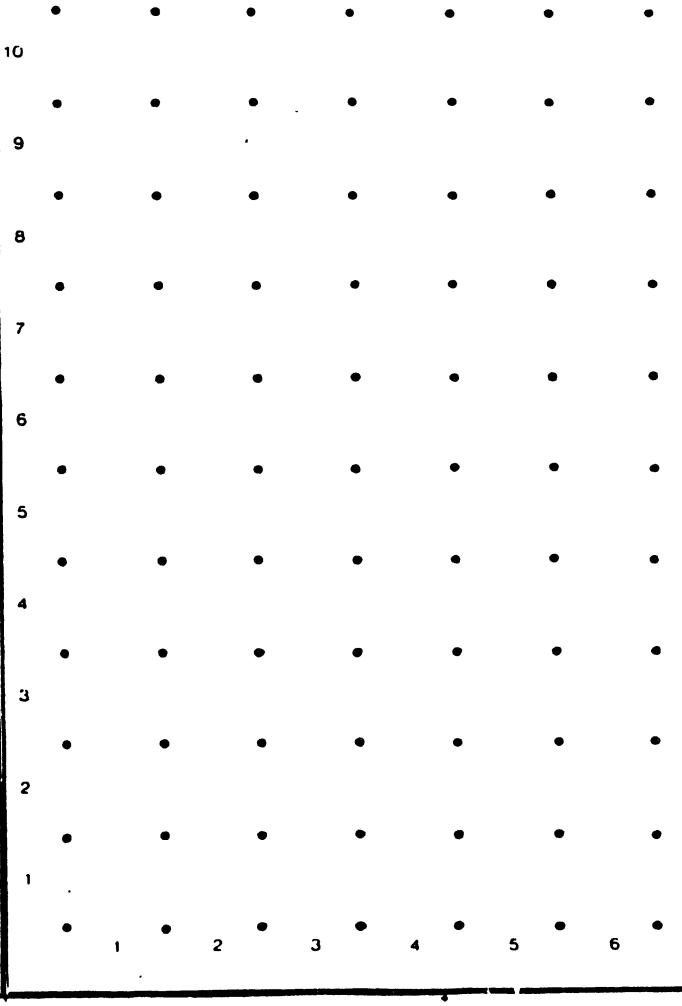
DISTRESS TYPES

1 BLOW-UP
2 CORNER BREAK
3 LONGITUDINAL/ TRANSVERSE/ DIAGONAL CRACK
4 "D" CRACK
5 JOINT SEAL DAMAGE
6 PATCHING, <5 FT²
7 PATCHING/ UTILITY CUT
8 POPOUTS
9 PUMPING
10 SCALING/MAP CRACK/CRAZING
11 SETTLEMENT/ FAULT
12 SHATTERED SLAB
13 SHRINKAGE CRACK
14 SPALLING — JOINTS
15 SPALLING — CORNER

PAVEMENT SLOPE		SHOULDER SLOPE		SHOULDER CONDITION		INLET CONDITION	
LEFT	RIGHT	LEFT	RIGHT	LEFT	RIGHT	SLOPE	RATING
							FLOW
							STRUCT

DIST. TYPE	SEV	NO SLABS

SKETCH



NOTES

ECKROSE / GREEN
ASSOCIATES
6409 ODANA ROAD
MADISON WISCONSIN 53719
608 274 6409