DEKALB – PEACHTREE AIRPORT

PAVEMENT EVALUATION REPORT

JULY 2002

GEORGIA AVIATION SYSTEM PLAN

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PAVEMENT EVALUATION REPORT

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Introduction

In 2001, the Georgia Department of Transportation (GDOT), Aviation Programs, retained Wilbur Smith Associates, assisted by Applied Pavement Technology, Inc. (APTech), to update the Georgia Aviation System Plan (GASP). APTech's portion of the project involved updating the 1998 State Airport Pavement Management System (APMS) by reevaluating the 94 general aviation airports included in the original APMS plus incorporating eight commercial service airports. The ultimate goal of this project was to provide the airports and the State with the pavement information and analytical tools that can help them identify pavement related needs, optimize the selection of projects and treatments over a multi-year period, and evaluate the long-term impacts of their project priorities.

As part of the GASP Update, an evaluation of the pavement conditions at Dekalb – Peachtree Airport was conducted in 2001. The results of this evaluation are presented within this report and can be used by GDOT, the Federal Aviation Administration (FAA), and Dekalb – Peachtree Airport to monitor the condition of pavements and to identify, prioritize, and schedule pavement maintenance and rehabilitation actions at the airport.

Pavement conditions were assessed using the Pavement Condition Index (PCI) procedure – the industry standard in aviation for visually assessing the condition of pavements. During a PCI inspection, inspectors identify signs of deterioration on the surface of the pavement. The types, severities, and amounts of distress present in a pavement are quantified during the pavement survey. This information is then used to develop a composite index (PCI number) that represents the overall condition of the pavement in numerical terms, ranging from 0 (failed) to 100 (excellent).

The PCI number provides an overall measure of condition and an indication of the level of maintenance or rehabilitation work that will be required to maintain or repair a pavement. This number also provides an objective means of prioritizing and scheduling pavement rehabilitation work. Further, the individual distress information, such as cracking or rutting, provides insight into what is causing the pavement to deteriorate. These factors can then be used to select the appropriate maintenance or rehabilitation action to correct the problem. PCI data also serve as the basis for a computerized APMS – a tool that is used to track pavement condition, identify pavement repair needs, and develop prioritized maintenance and rehabilitation programs with associated schedules and budgets.

The importance of identifying not only the best repair alternative, but also the optimal time of repair, is illustrated in Figure 1. This figure shows that during the first 75 percent of the life of a pavement, approximately 40 percent of the pavement deterioration takes place. After this point, the pavement deteriorates much faster. The financial impact of delaying repairs until the second drop in condition can mean repair expenses 4 to 5 times higher than repairs triggered over the first 75 percent of the pavements life. By evaluating the condition of pavements, and using an

APMS to project future pavement condition, the most economical time to apply pavement maintenance and rehabilitation can be identified.

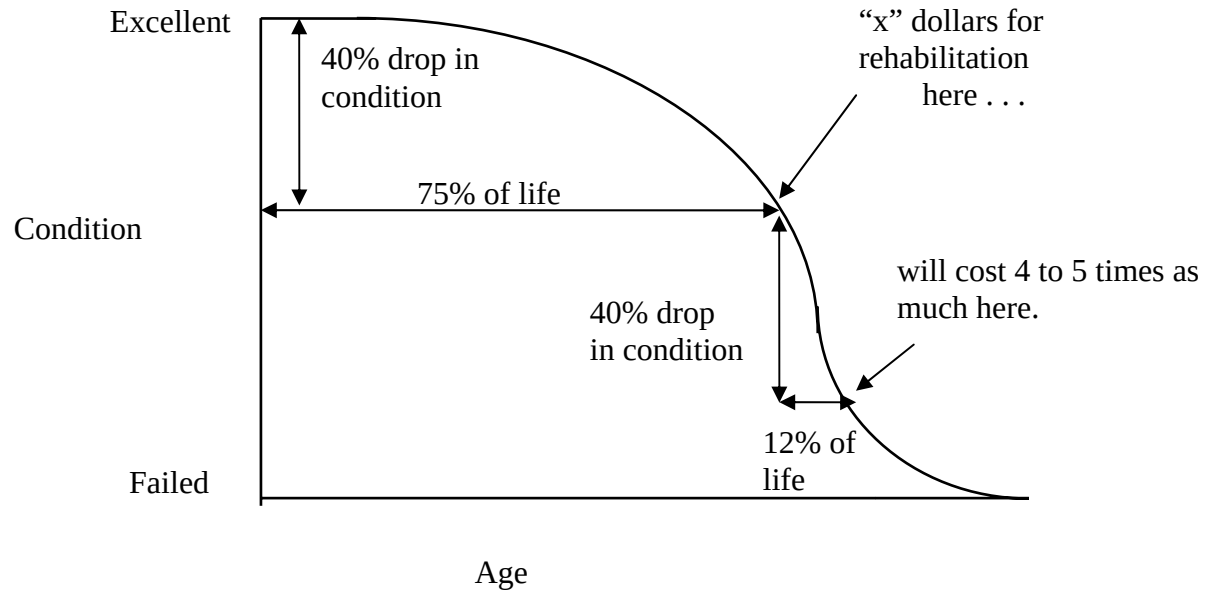


Figure 1. Pavement condition versus cost of repair.

This report contains the results of the 2001 pavement evaluation, as well as a diskette containing the Micro PAVER pavement management software database developed during this project.

Scope of Work

This project included the collection of pavement history information, the development of CAD maps, the evaluation of current pavement condition, and the development of a computerized APMS. The APMS was then used to prepare a 5-year pavement maintenance and rehabilitation program at the state level for the GDOT and the FAA to use as a planning tool.

Individual reports, such as this one, were prepared for each of the project airports to communicate the results of the pavement inspections. A statewide analysis report and an executive summary report were also developed. The statewide analysis report presents the overall results of the study and provides detailed recommendations for future maintenance and rehabilitation actions at the airports. The executive summary presents an overview of the current condition of the State's airports and a summary of the recommended 5-year maintenance and rehabilitation program.

Project Results

Pavement Inventory

Dekalb – Peachtree Airport has over 4,567,933 square feet of pavement. Figure 2 shows the area of the pavement system, broken out by pavement use (runway, taxiway, and apron). This figure also shows the average age of the pavements.

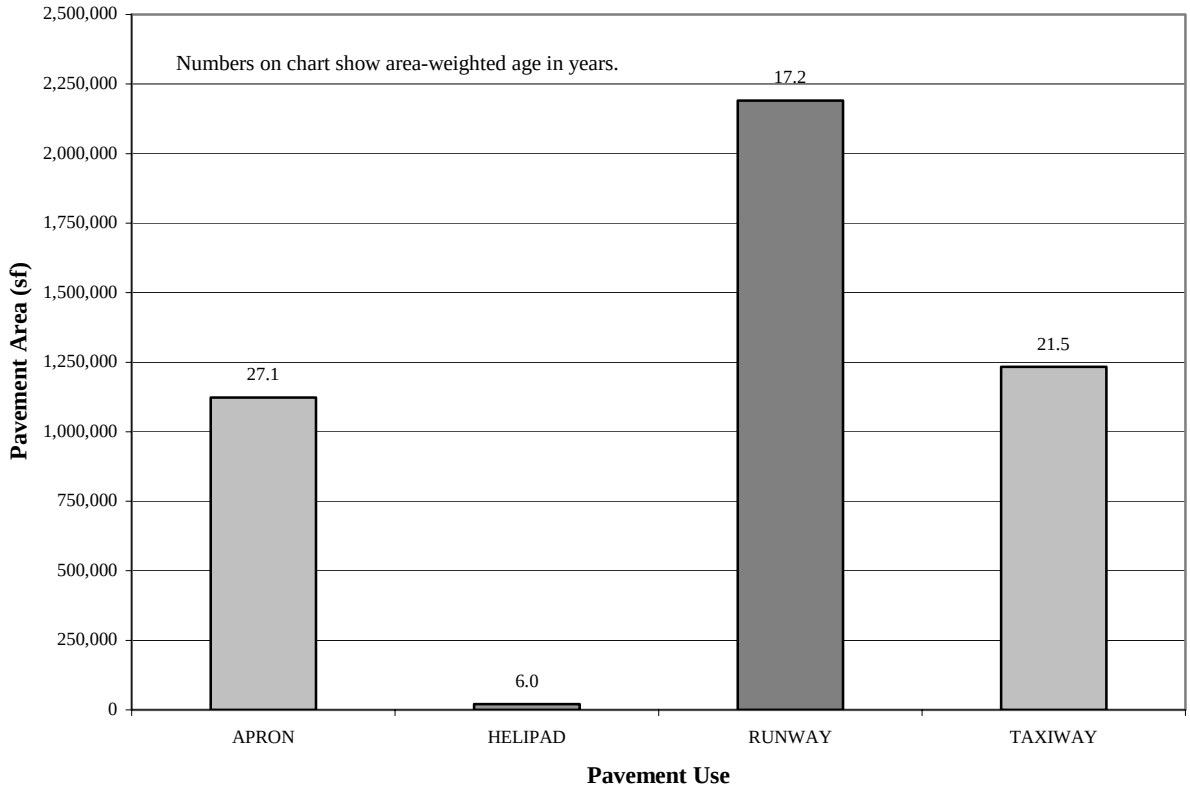


Figure 2. Pavement inventory.

Figure 3 is a network definition map that identifies the pavements at Dekalb – Peachtree Airport evaluated during this project. This map shows how the pavement network was divided into branches, sections, and sample units for pavement management purposes. It also shows the nomenclature used in the Micro PAVER pavement management database to identify the different pavement areas. Finally, the map summarizes the construction history information compiled during the records review and identifies the areas inspected during the visual survey.

Figure 3. Network Definition Map (11 x 17 except for very large airports that need larger map folded into a map sleeve.

A branch is a single entity that serves a distinct function. For example, a runway is considered a branch because it serves a single function (allowing aircraft to take off and land). Taxiways and aprons are also separate branches.

A branch may be further divided into sections. Traditionally, sections are defined as parts of the branch that share common attributes, such as cross-section, last construction date, traffic level, and performance. Using the traditional approach, if a runway was built in 1968 and then extended in 1984, it would be comprised of two separate sections. A modified approach to defining pavement sections has become increasingly popular with state aviation agencies in recent years and has been adopted by GDOT. The basic premise of this approach is that the section is considered the management unit of the APMS, and that it should represent a pavement area where it is realistic to expect that pavement maintenance or rehabilitation would be undertaken. For example, if a runway was built in 1968 and then extended in 1984, in the database this runway would be represented by a single section, even though there are two distinct construction periods. This is because in the future if repair work is scheduled for that runway it is probable that it will be programmed for the entire runway and not just a portion of it.

To estimate the overall condition of each pavement section, each section is subdivided into sample units. Portions of these sample units are then evaluated during pavement inspections and this information is extrapolated to predict the condition of the section as a whole.

PCI Procedure

APTech inspected the pavements at Dekalb – Peachtree Airport using the PCI procedure. This procedure is described in FAA AC 150/5380-6 and ASTM Standard D5340. A network-level sampling rate was used during the inspection, and the sample units inspected are identified on the network definition map shown in Figure 3.

The PCI provides a numerical indication of overall pavement condition, as illustrated in Figure 4. The types and amounts of deterioration are used to calculate the PCI value of the section. The PCI ranges from 0 to 100, with 100 representing a pavement in excellent condition. It should be noted that a PCI value is based on visual signs of pavement deterioration and does not provide a measure of structural capacity.

Typical Pavement Surface	PCI
	100
	60
	5

Figure 4. Visual representation of PCI scale.

In general terms, pavements with a PCI of 60 to 100 that are not exhibiting significant load-related distress will benefit from preventive maintenance actions, such as crack sealing and surface treatments. Pavements with a PCI of 40 to 60 may require major rehabilitation, such as an overlay. Often, when the PCI is less than 40, reconstruction is the only viable alternative due to the substantial damage to the pavement structure. Figure 5 illustrates how the appropriate repair type varies with the PCI of a pavement section.

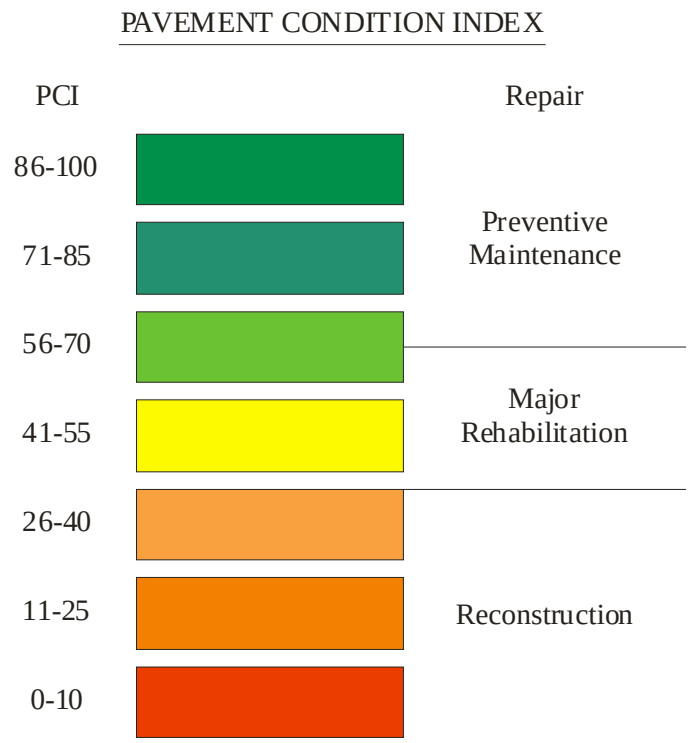


Figure 5. PCI versus repair type.

The types of distress identified during the PCI inspection provide insight into the cause of pavement deterioration. PCI distress types are characterized as load-related (such as alligator cracking on hot-mix asphalt [HMA] pavements or corner breaks on portland cement concrete [PCC] pavements), climate/durability-related (such as weathering [climate-related on HMA pavements) and D-cracking [durability-related on PCC pavements]), and other (distress types that cannot be attributed solely to load or climate/durability). Understanding the cause of distress helps in selecting a rehabilitation alternative that corrects the cause and thus eliminates its recurrence.

Appendix A contains tables for asphalt and concrete pavements indicating the typical types of distresses that may be identified during a PCI survey, the likely cause of each distress type, and feasible maintenance strategies for addressing each distress type.

Inspection Comments

The inspection of Dekalb – Peachtree Airport was completed on October 16th, 2001. Twenty eight sections were defined during the inspection. An extensive crack sealing & repair project was underway at the time of inspection. Prior to the inspection taking place, the details of this project were discussed with the GDOT and Airport Manager. In order to provide a more accurate depiction of pavement conditions, repairs to affected pavements were anticipated and distresses were recorded accordingly. A set of criteria were developed for recording distress information on these pavements. Any longitudinal and transverse (L&T) cracking found would be recorded at low severity and sealed. The pavements were to be milled to remove any minor vertical deformations and resurfaced with a surface treatment. Swelling and raveling and weathering as a result were not recorded. Finally, several areas were to be removed and replaced

where extensive amounts of deterioration existed that could not be fixed by crack sealing. No distresses were recorded in these areas.

Runway 2R-20L

One section was defined in Runway 2R-20L. R2R20LAP-10 is in good condition with significant quantities of longitudinal, transverse, and diagonal (LTD) cracks, shrinkage cracking, map cracking, and patching being found throughout the section. Occasional spalling was also observed.

Runway 2L-20R

Section R2L20RAP-10 is the only section defined in Runway 2L-20R. The section is in good condition with moderate amounts of L&T cracking being observed. In addition, small quantities of block and alligator cracking were found throughout the section. A couple of areas were found that were atypical in condition to the rest of the runway. In these areas, large quantities of patching, rutting, and alligator cracking were found.

Runway 16-34

One section was defined in Runway 16-34. R1634AP-10 is in good condition with large amounts of L&T and block cracking being observed throughout the section. Quantities of swelling and isolated areas of rutting and alligator cracking were also found but will be repaired upon the completion of the crack sealing/surface treatment project.

Runway 9-27

Two sections were defined during the inspection of Runway 9-27. R927AP-10 is in similar condition to Runway 16-34 with larger quantities of block cracking found in the section. R927AP-20 is located where Taxiway A crosses the runway. This area, although similar in condition to the rest of Runway 9-27, was found to be failing. Large amounts of medium and high-severity alligator cracking along with rutting were found throughout the section. These load related distresses were located in the wheel paths of traffic using Taxiway A. This area was not identified for complete repair in the scope of the crack sealing/surface treatment project.

Taxiway A

Three sections exist in Taxiway A. TAAP-10 runs from the approach end of Runway 2R to Runway 9-27. This section is in fair condition with significant quantities of LTD, shrinkage, and map cracking observed throughout the section. In addition to the cracking, joint seal damage at medium and high-severity was found. The holding apron area at the south end of the taxiway was found to be in better condition and inspected as an additional sample unit. TAAP-20 consists of the asphalt pavement between Runway 9-27 and Runway 16-34. It is in poor condition with large amounts of alligator and block cracking being observed. Additionally, significant amounts of rutting and patching were found in the section. TAAP-30 is in similar condition to TAAP-10 with only slightly lower quantities of the same distresses being found throughout the section.

Taxiway B

One section was defined in Taxiway B. TBAP-10 is in fair condition with significant amounts of L&T, block, and alligator cracking being observed throughout the section. Occasional quantities of rutting and patching were also found.

Taxiway C

Three sections are defined in Taxiway C. TCAP-10 is in fair condition with low-severity block cracking covering nearly 100 percent of the section's surface. Both TCAP-20 and TCAP-30 are in poor condition with large quantities of block and alligator cracking found throughout the sections. Additionally, significant quantities of rutting were observed in TCAP-20.

Taxiway D

One section was defined in Taxiway D. TDAP-10 is in poor condition with significant amounts of L&T, block, and alligator cracking being observed. Rutting was also found in moderate quantities throughout the section. The sample units in the intersection with Taxiway E were inspected as additional sample units. Although the distresses found here are similar to those found throughout the section, much higher densities were observed.

Taxiway E

One section, TEAP-10, was defined during the inspection. This section is failed with extensive amounts of alligator cracking and rutting being found throughout the pavement. Additionally, raveling and weathering was found over the entire surface of the section.

Taxiway F

Again, one section was defined in Taxiway F. TFAP-10 is in poor condition with significant amounts of medium-severity alligator cracking, low-severity L&T cracking, rutting being observed.

Taxiway G

One section was defined in Taxiway G. TGAP-10 is in good condition with moderate amounts of block and L&T cracking found throughout the section.

Taxiway H

One section exists in Taxiway H. THAP-10 is in poor condition with extensive amounts of alligator cracking and raveling and weathering being observed. Moderate amounts of L&T cracking were also found. Finally, isolated quantities of rutting were observed in the section.

Taxiway K

Two sections are defined in Taxiway K. TKAP-10 is newer PCC pavement and was found to be free of any distress. TKAP-20 is in good condition with moderate quantities of L&T cracking and raveling and weathering being observed in the section. In addition, isolated quantities of alligator cracking were found. An area at the western end of Taxiway K was found to be failed but was scheduled to be replaced and was not identified during the inspection.

Runway 20R Runup Apron

One section defines the apron adjacent to Taxiway A and E that serves as a runup apron for Runway 20R. A20RUNUPAP-10 is in good condition with significant quantities of low-severity, unsealed, L&T cracking being observed throughout the section. An isolated area of alligator cracking was also found in the section.

Northeast Ramp

One section is defined in the Northeast Ramp. ANERAMPAP-10 is in fair condition with large quantities of L&T cracking and raveling and weathering observed throughout the section. Isolated amounts of medium-severity alligator were also found.

North Ramp

Again, one section is defined in the North Ramp. ANRAMPAP-10 is in good condition with significant amounts of low and medium-severity L&T cracking observed throughout the section. A few areas of alligator cracking were also found.

Northwest Ramp

Two sections are defined in the Northwest Ramp. ANWRAMPAP-10 is in poor condition with significant amounts of alligator, block, and L&T cracking observed throughout the section. Swelling was found in isolated areas associated with the cracking. Finally, raveling and weathering was found in areas throughout the section. ANWRAMPAP-20 is also in poor condition with significant quantities of spalling, faulting, LTD cracking, and patching observed in the section. Additionally, high-severity joint seal damage was found throughout the section.

Perimeter Apron

The Perimeter Apron consists of two sections. APERIMAP-10 is failed with large quantities of alligator and block cracking being found throughout the section. APERIMAP-20 is in excellent condition having been recently rehabilitated. Only small quantities of L&T cracking were found in the section.

Helipad

Two sections are defined in the Helipad. HELIAP-10 is in excellent condition with significant amounts of patching and small amounts of L&T cracking being found throughout the section. HELIAP-20 is also in excellent condition and was found to be free from any distress.

Overall Pavement Condition

The 2001 area-weighted condition of Dekalb – Peachtree Airport is 62, with conditions ranging from 4 to 100 [on a scale of 0 (failed) to 100 (excellent)]. Figures 6 and 7 provide graphs summarizing the overall condition of the pavements at Dekalb – Peachtree Airport. Figure 8 is a map that displays the condition of the pavements evaluated. Table 1 summarizes the results of the pavement evaluation.

Appendix B presents photographs taken during the PCI inspection, and Appendix C contains a detailed inspection report. The detailed inspection report provides information on the quantity of the different types and severities of distresses observed during the visual survey.

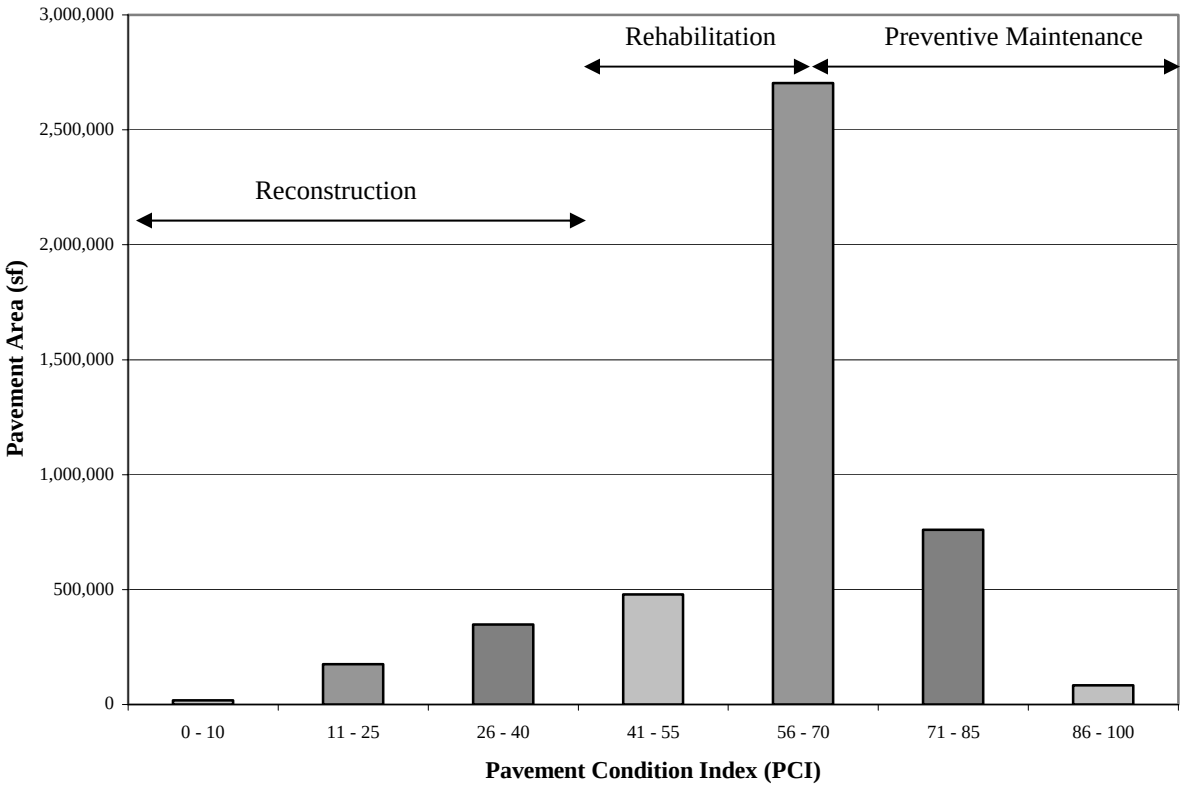


Figure 6. Condition distribution.

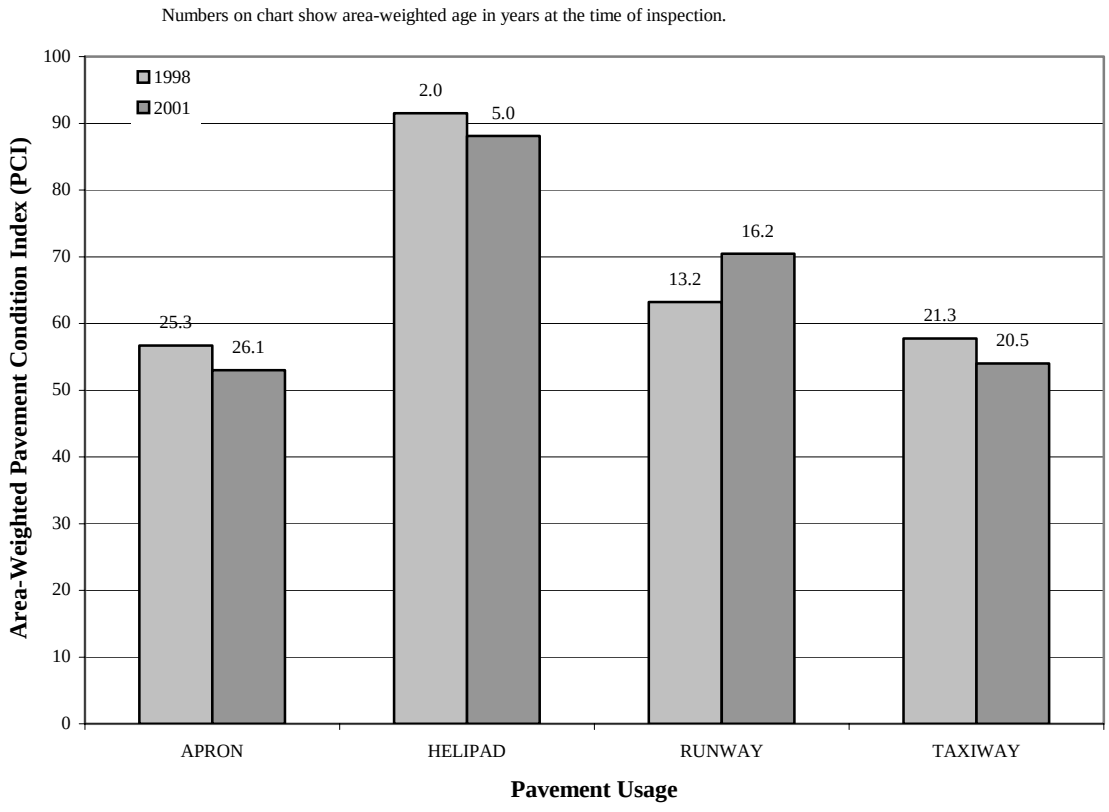
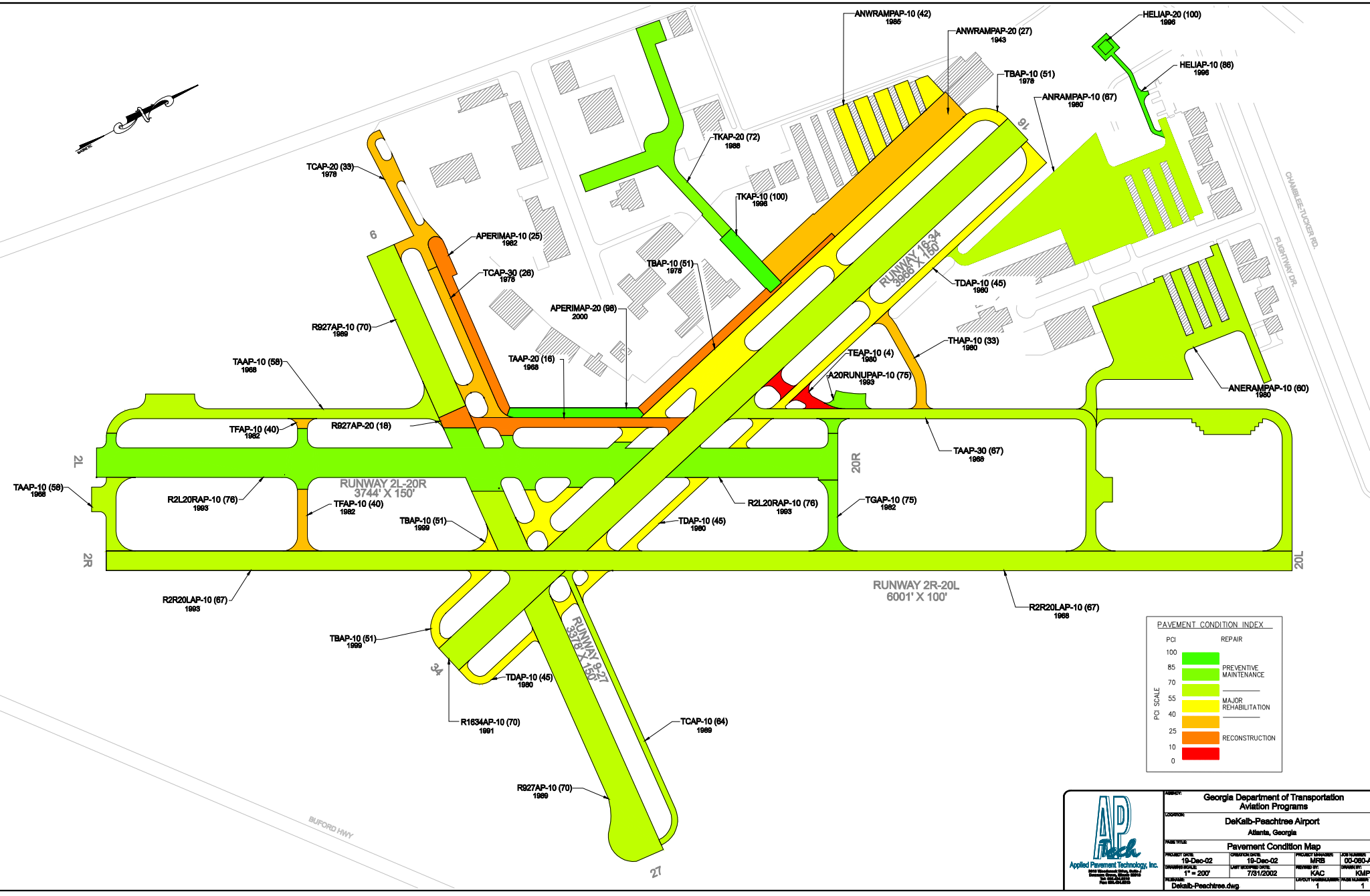


Figure 7. Condition by use.



Applied Pavement Technology, Inc.

AGENCY: Georgia Department of Transportation
Aviation Programs

LOCATION: DeKalb-Peachtree Airport
Atlanta, Georgia

PLATE TITLE: Pavement Condition Map

PROJECT DATE: 19-Dec-02	CREATION DATE: 19-Dec-02	PROJECT MANAGER: MRB	JOB NUMBER: 00-060-A
DRAWING SCALE: 1" = 200'	LAST MODIFIED DATE: 7/31/2002	REVISED BY: KAC	DRAWN BY: KMP
FILE NAME: Dekalb-Peachtree.dwg		LAYOUT NUMBER/NUMBERS: 1	PAGE NUMBER: 1

Figure 8. INSERT PCI MAP
(11 x 17)

Table 1. 2001 pavement inspection results.

DEKALB – PEACHTREE AIRPORT								
BRANCH ID	SECTION ID	SURFACE TYPE [1]	SECTION AREA (sf)	LCD [2]	2001 PCI	% Distress due to:		DISTRESS TYPES [5]
						LOAD [3]	CLIMATE OR DURABILITY [4]	
A20RUNUPAP	10	AC	13,973	1993	75	53	47	L & T CR, ALLIGATOR CR
ANERAMPAP	10	AC	307,181	1980	60	18	82	WEATH/RAVEL, PATCHING, ALLIGATOR CR, L & T CR
ANRAMPAP	10	AC	367,944	1980	67	39	61	L & T CR, PATCHING, ALLIGATOR CR
ANWRAMPAP	10	AC	97,494	1985	42	20	79	SWELLING, ALLIGATOR CR, L & T CR, WEATH/RAVEL, BLOCK CR
ANWRAMPAP	20	PCC	196,350	1943	27	53	7	CORNER BREAK, CORNER SPALL, FAULTING, JOINT SPALL, LARGE PATCH, SHAT. SLAB, SHRINKAGE CR, SMALL PATCH, LINEAR CR, JT SEAL DMG
APERIMAP	10	AC	106,061	1982	25	56	39	SWELLING, PATCHING, DEPRESSION, BLOCK CR, ALLIGATOR CR
APERIMAP	20	AAC	33,992	2000	98	0	100	PATCHING, L & T CR
HELIAP	10	AC	17,879	1996	86	0	100	L & T CR, PATCHING
HELIAP	20	PCC	3,136	1996	100	0	0	N/A
R1634AP	10	AAC	572,400	1991	70	0	99	L & T CR, DEPRESSION, BLOCK CR
R2L20RAP	10	AAC	585,866	1993	76	60	39	ALLIGATOR CR, SWELLING, BLEEDING, BLOCK CR, RUTTING, PATCHING, L & T CR
R2R20LAP	10	PCC	600,100	1968	67	52	4	SHRINKAGE CR, LINEAR CR, JT SEAL DMG, SCALING, SMALL PATCH, LARGE PATCH, CORNER SPALL
R927AP	10	AAC	418,986	1989	70	14	86	ALLIGATOR CR, L & T CR, BLOCK CR
R927AP	20	AAC	13,548	1989	18	72	28	RUTTING, BLOCK CR, L & T CR, PATCHING, ALLIGATOR CR
TAAP	10	PCC	141,156	1968	58	44	26	LINEAR CR, JOINT SPALL, CORNER SPALL, SCALING, SHRINKAGE CR, CORNER BREAK, JT SEAL DMG
TAAP	20	AC	55,325	1968	16	59	41	BLOCK CR, PATCHING, L & T CR, RUTTING, ALLIGATOR CR
TAAP	30	PCC	249,850	1968	67	51	28	SCALING, LINEAR CR, JT SEAL DMG, SHRINKAGE CR
TBAP	10	AAC	219,050	1999	51	57	42	BLOCK CR, L & T CR, PATCHING, RUTTING, SWELLING, ALLIGATOR CR
TCAP	10	AAC	46,347	1989	64	0	100	BLOCK CR, L & T CR
TCAP	20	AC	51,974	1978	33	77	23	ALLIGATOR CR, WEATH/RAVEL, RUTTING, BLOCK CR, L & T CR
TCAP	30	AC	50,079	1978	26	68	32	L & T CR, BLOCK CR, ALLIGATOR CR

Table 1 (continued). 2001 pavement inspection results.

BRANCH ID	SECTION ID	SURFACE TYPE [1]	SECTION AREA (sf)	LCD [2]	2001 PCI	% Distress due to:		DISTRESS TYPES [5]
						LOAD [3]	CLIMATE OR DURABILITY [4]	
TDAP	10	AC	162,755	1980	45	83	14	RUTTING, PATCHING, L & T CR, DEPRESSION, ALLIGATOR CR
TEAP	10	AC	18,484	1980	4	70	30	WEATH/RAVEL, ALLIGATOR CR, L & T CR, RUTTING
TFAP	10	AC	21,744	1982	40	77	21	RUTTING, L & T CR, BLEEDING, BLOCK CR, ALLIGATOR CR
TGAP	10	AC	25,873	1982	75	15	85	ALLIGATOR CR, BLOCK CR, L & T CR
THAP	10	AC	27,876	1980	33	59	41	BLOCK CR, L & T CR, ALLIGATOR CR, WEATH/RAVEL, RUTTING
TKAP	10	PCC	28,800	1996	100	0	0	N/A
TKAP	20	AAC	133,710	1988	72	33	67	L & T CR, WEATH/RAVEL, ALLIGATOR CR, BLOCK CR

NOTES:

[1] See Figure 3 for the location of the branch.

[2] AC = asphalt cement concrete; AAC = asphalt overlay on AC; PCC = portland cement concrete; APC = asphalt overlay on PCC.

[3] LCD = last construction date.

[4] Distress due to load includes those distresses attributed to a structural deficiency in the pavement, such as alligator (fatigue) cracking, rutting, or shattered concrete slabs.

[5] Distress due to climate or durability includes those distresses attributed to either the aging of the pavement and the effects of the environment (such as weathering and raveling or block cracking in asphalt pavements) or to a materials-related problem (such as durability cracking in a concrete pavement).

[6] L & T CR = longitudinal and transverse cracking.

5-Year Pavement Maintenance and Rehabilitation Recommendations

As part of the statewide analysis, a 5-year pavement maintenance and rehabilitation program was developed for Dekalb – Peachtree Airport. The initial steps in generating this program were developing maintenance policies and determining unit cost information for maintenance and rehabilitation actions. A copy of this information is provided in Appendix D. Please note that this information was developed in conjunction with the GDOT and is of a general nature for the entire state.

For purposes of this analysis, pavement repair was categorized as follows:

- major rehabilitation (reconstruction, overlay), and
- localized preventive maintenance (a preventive maintenance action that is applied only to a distressed area, such as crack sealing or patching).

Many budget scenarios were investigated during the statewide analysis, and the results of those may be found in the statewide detailed analysis report. For the purposes of this report, however, only the results of the unlimited budget scenario (where all identified projects are funded) are presented. The analysis results identify those pavement areas that are predicted to need major rehabilitation within the next 5 years, as well as those recommended for preventive maintenance actions.

An unlimited budget was used in the analysis with the goal of maintaining the pavement above its critical PCI value. For runway pavements this value is 65. The rest of the pavements on the airport were assigned a value of 60. In general, preventive maintenance is recommended for pavements with a PCI above the critical value while major rehabilitation is recommended for pavements that have a PCI below the critical value. An inflation rate of 3 percent was used during the analysis.

A summary of the 5-year pavement maintenance and rehabilitation program is presented in Table 2. Detailed information on the recommendations for localized maintenance in Year 1 of the analysis is contained in Appendix E and Appendix F. In Year 1, all distresses observed during the inspection are considered in determining viable localized maintenance projects. Preventive maintenance recommendations that are identified in subsequent years only address crack sealing those cracks in asphalt pavements that were rated as low severity at the time of inspection.

Note that these recommendations are based upon a broad network level analysis and are meant to provide the Airport with an indication of the type of pavement-related work required during the next 5 years. Further engineering investigation will need to be performed to identify exactly which repair action is most appropriate and to more accurately estimate the cost of such work. In addition, the cost estimates provided were based on a statewide policy and each airport should adjust the maintenance policies and unit costs to match its own approach to pavement maintenance and to reflect local costs.

Major rehabilitation projects may be clustered in the first year of the analysis. Obviously, for economic and operational reasons, this work will often need to be distributed over several years. It is important to remember that regardless of the recommendations presented within this report, the Airport is responsible for repairing pavements where existing conditions pose a hazard to safe operations.

Table 2. 5-year program under an unlimited funding analysis scenario.

Branch[1]	Section	Year	Type of Repair[2]	Estimated Cost[3]
R2L20RAP	10	2002	Preventive	$1,775
R927AP	20	2002	Major M&R	$30,619
TAAP	10	2002	Major M&R	$106,181
TAAP	20	2002	Major M&R	$125,035
TAAP	30	2002	Preventive	$17,545
TBAP	10	2002	Major M&R	$164,775
TCAP	20	2002	Major M&R	$93,952
TCAP	30	2002	Major M&R	$113,179
TDAP	10	2002	Major M&R	$122,429
TEAP	10	2002	Major M&R	$41,774
TFAP	10	2002	Major M&R	$19,635
THAP	10	2002	Major M&R	$50,391
ANERAMPAP	10	2002	Major M&R	$231,070
ANRAMPAP	10	2002	Major M&R	$276,777
ANWRAMPAP	10	2002	Major M&R	$73,338
ANWRAMPAP	20	2002	Major M&R	$443,754
APERIMAP	10	2002	Major M&R	$239,699
R2R20LAP	10	2004	Major M&R	$478,902
TAAP	30	2005	Major M&R	$205,371
TCAP	10	2005	Major M&R	$38,096
R1634AP	10	2006	Major M&R	$484,615
R2L20RAP	10	2006	Preventive	$62,859
R927AP	10	2006	Major M&R	$354,729
TGAP	10	2006	Preventive	$3,574
TKAP	20	2006	Preventive	$2,232
A20RUNUPAP	10	2006	Preventive	$1,729

[1]See Figure 3 for the location of the branch.

[2]Major Rehabilitation: overlay, mill and overlay, reconstruction, and so on;
Preventive Maintenance: crack sealing, patching, joint resealing, and so on.

[3]Cost estimates based on broad statewide policy and should be adjusted to reflect local costs.

General Maintenance Recommendations

In addition to the specific maintenance actions presented in Appendix E and Appendix F, it is recommended that the following strategies be considered for prolonging pavement life:

1. Conduct an aggressive campaign against weed growth through timely herbicide applications. Vegetation growing in pavement cracks is very destructive and significantly increases the rate of pavement deterioration.

2. Implement a periodic crack sealing program. Keeping water and debris out of the pavement system through sealing cracks is a proven method for cost-effectively extending the life of the pavement system.

3. Closely monitor heavy equipment movement, such as construction equipment, emergency equipment, and fueling equipment, to make sure that it is only operating on pavement designed to accommodate the heavy loads this type of equipment often applies. Failure to restrict heavy equipment to appropriate areas may result in the premature failure of Airport pavements.

Summary

This report documents the results of the pavement evaluation conducted at Dekalb – Peachtree Airport. During a visual inspection of the pavements in 2001, it was found that the overall condition of the pavement network is a PCI of 62. A 5-year pavement repair program was generated for the Airport, which revealed that approximately $3,784,035 needs to be expended on the pavement system in order to maintain and improve its condition. If this program is followed, over the next 5 years the pavement system will improve from an overall area-weighted PCI value of 62 to approximately a PCI of 90. If money is not expended on pavement maintenance and rehabilitation, it is predicted that the overall area-weighted PCI of the pavement network will drop from 62 to 55.

APPENDIX A

CAUSE OF DISTRESS TABLES

Table A-1. Cause of pavement distress, asphalt-surfaced pavements.

Distress Type	Probable Cause of Distress	Feasible Maintenance Strategies
Alligator Cracking	Fatigue failure of the asphalt concrete surface under repeated traffic loading	If localized, partial- or full-depth asphalt patch. If extensive, major rehabilitation needed.
Bleeding	Excessive amounts of asphalt cement or tars in the mix and/or low air void content	Spread heated sand, roll, and sweep. Another option is to plane excess asphalt. Or, remove and replace.
Block Cracking	Shrinkage of the asphalt concrete and daily temperature cycling; it is not load associated	At low severity levels, crack seal and/or surface treatment. At higher severities, consider overlay.
Corrugation	Traffic action combined with an unstable pavement layer	If localized, mill. If extensive, remove and replace.
Depression	Settlement of the foundation soil or can be "built up" during construction	Patch.
Jet Blast	Bituminous binder has been burned or carbonized	Patch.
Joint Reflection	Movement of the concrete slab beneath the asphalt concrete surface because of thermal and moisture changes	At low and medium severities, crack seal. At higher severities, especially if extensive, consider overlay.
Longitudinal and Transverse Cracking	Cracks may be caused by 1) poorly constructed paving lane joint, 2) shrinkage of the AC surface due to low temperatures or hardening of the asphalt, or 3) reflective crack caused by cracks in an underlying PCC[1] slab	At low and medium severity levels, crack seal. At higher severities, especially if extensive, consider overlay options.
Oil Spillage	Deterioration or softening of the pavement surface caused by the spilling of oil, fuel, or other solvents	Patch.
Patching	N/A	Replace patch if deteriorated.
Polished Aggregate	Repeated traffic applications	Aggregate seal coat is one option. Could also groove or mill. Overlay is another option.
Raveling and Weathering	Asphalt binder may have hardened significantly	Patch if isolated. If low-severity, consider surface treatment if extensive. At medium and high severity levels, consider major rehabilitation if extensive.
Rutting	Usually caused by consolidation or lateral movement of the materials due to traffic loads	Patch medium and high severity levels if localized. If extensive, consider major rehabilitation.
Shoving	Where PCC pavements adjoin flexible pavements, PCC "growth" may shove the asphalt pavement	Mill and patch as needed.
Slippage Cracking	Low strength surface mix or poor bond between the surface and next layer of pavement structure	Partial- or full-depth patch.
Swelling	Usually caused by frost action or by swelling soil	Patch if localized. Major rehabilitation if extensive.

[1]PCC: portland cement concrete

Table A-2. Cause of pavement distress, portland cement concrete pavements.

Distress Type	Probable Cause of Distress	Feasible Maintenance Strategies
Blow-Up	Incompressibles in joints	Partial- or full-depth patch. Slab replacement.
Corner Break	Load repetition combined with loss of support and curling stresses	Seal cracks at low severity. Full-depth patch.
Cracks	Combination of load repetition, curling stresses, and shrinkage stresses	Seal cracks. At high severity, may need full-depth patch or slab replacement.
Durability Cracking	Concrete's inability to withstand environmental factors such as freeze-thaw cycles	Full-depth patch if present on small amount of slab. At higher severity levels, once it has appeared on most of slab, slab replacement.
Joint Seal Damage	Stripping of joint sealant, extrusion of joint sealant, weed growth, hardening of the filler (oxidation, loss of bond to the slab edges, or absence of sealant in joint	Replace joint seal.
Patching (Small and Large)	N/A	Replace patches if deteriorated.
Popouts	Freeze-thaw action in combination with expansive aggregates	Monitor.
Pumping	Poor drainage, poor joint sealant	Seal cracks and joints. Underseal is an option if voids have developed. Establish good drainage.
Scaling	Overfinishing of concrete, deicing salts, improper construction, freeze-thaw cycles, poor aggregate, and alkali-silica reactivity	At low severity levels, do nothing. At medium and high severity levels, partial-depth patches or slab replacement.
Settlement	Upheaval or consolidation	At higher severity levels, leveling patch or grind to restore smooth ride.
Shattered Slab	Load repetition	Replace slab.
Shrinkage	Setting and curing of the concrete	Monitor.
Spalling (Joint and Corner)	Excessive stresses at the joint caused by infiltration of incompressible materials or traffic loads; weak concrete at joint combined with traffic loads	Partial-depth patch.

APPENDIX B

PHOTOGRAPHS

Overview of section R1634AP-10.

Overview of area being replaced in section R1634AP-10.

Block cracking in section R1634AP-10.

Overview of section R2L20RAP-10.

Overview of section R927AP-10.

Block cracking in section R927AP-10.

Overview of section R927AP-20.

Alligator cracking in section R927AP-20.

Overview of section TAAP-10.

LTD cracking in section TAAP-10.

Overview of section TAAP-20.

Alligator cracking in section TAAP-20.

Overview of section TAAP-30.

Overview of section TBAP-10.

Overview of section TBAP-10 at section TCAP-10.

Block cracking in section TBAP-10.

Overview of section TCAP-10.

Overview of section TCAP-20.

Alligator cracking in section TCAP-20.

Overview of section TDAP-10.

Alligator cracking (additional sample unit) in section TDAP-10.

Overview of section TEAP-10.

Alligator cracking in section TEAP-10.

Overview of section TFAP-10.

Overview of section TGAP-10.

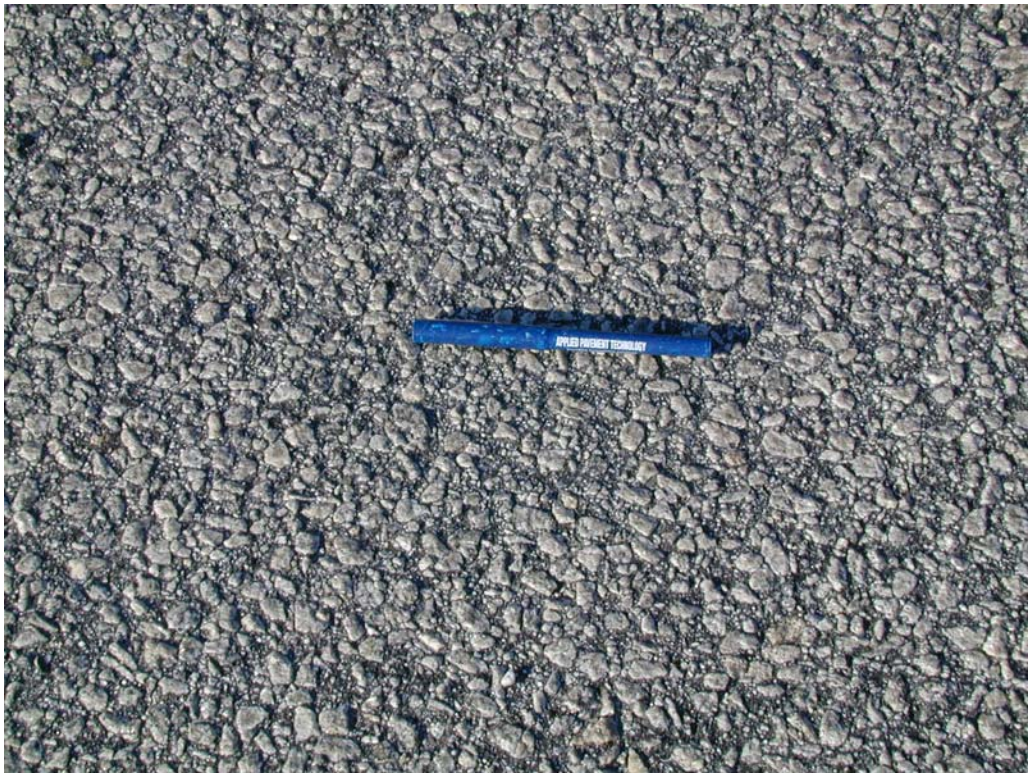
Overview of section THAP-10.

Alligator cracking in section THAP-10.

Overview of section TKAP-10.

Overview of section TKAP-20.

Overview of area being replaced in section TKAP-20.



Raveling and weathering in section TKAP-20.

Overview of section A20RUNUPAP-10.

Overview of section ANWRAMPAP-10.

Overview of section ANWRAMPAP-20.

Scaling in section ANWRAMPAP-20.

Overview of section APERIMAP-10.

Block cracking in section APERIMAP-10.

Overview of section APERIMAP-20.

Overview of section HELIAP-10.

Overview of section HELIAP-20.

APPENDIX C

INSPECTION REPORT

APPENDIX D

MAINTENANCE POLICIES AND UNIT COSTS

Table D-1. GDOT's preventive maintenance policy, asphalt-surfaced pavements.

Distress Type	Severity Level	Maintenance Action
Alligator Cracking	Low	Monitor
	Medium	Patch (major rehabilitation if extensive)
	High	Patch (major rehabilitation if extensive)
Bleeding	N/A	Monitor (major rehabilitation required if skid resistance significantly impacted by the distress)
Block Cracking	Low	Monitor
	Medium	Crack Seal
	High	Crack Seal (major rehabilitation if extensive)
Corrugation	Low	Monitor
	Medium	Patch (major rehabilitation if extensive)
	High	Patch (major rehabilitation if extensive)
Depression	Low	Monitor
	Medium	Patch
	High	Patch
Jet Blast	N/A	Patch
Joint Reflection Cracking	Low	Monitor
	Medium	Crack Seal
	High	Crack Seal (major rehabilitation if extensive)
Longitudinal and Transverse Cracking	Low	Monitor
	Medium	Crack Seal
	High	Crack Seal (major rehabilitation if extensive)
Oil Spillage	N/A	AC Patch
Patching	Low	Monitor
	Medium	Monitor
	High	Patch
Polished Aggregate	N/A	Monitor (major rehabilitation required if skid resistance significantly impacted by the distress)
Raveling and Weathering	Low	Monitor (global preventive maintenance action such as surface treatment if extensive)
	Medium	Patch if localized
	High	Patch if localized
Rutting	Low	Monitor
	Medium	Patch (major rehabilitation if extensive)
	High	Patch (major rehabilitation if extensive)
Shoving	Low	Monitor
	Medium	Patch
	High	Patch
Slippage Cracking	N/A	Patch (major rehabilitation if extensive)
Swelling	Low	Monitor
	Medium	Patch
	High	Patch

Table D-2. GDOT's preventive maintenance policy, portland cement concrete pavements.

Distress Type	Severity Level	Maintenance Action
Blow-Up	Low	Patch
	Medium	Patch
	High	Patch
Corner Break	Low	Crack Seal
	Medium	Crack Seal
	High	Patch
Cracks	Low	Crack Seal
	Medium	Crack Seal
	High	Crack Seal
Durability Cracking	Low	Monitor
	Medium	Patch
	High	Slab Replacement
Joint Seal Damage	Low	Monitor
	Medium	Joint Seal
	High	Joint Seal
Patching	Low	Monitor
	Medium	Patch
	High	Patch
Popouts	N/A	Monitor
Pumping	N/A	Monitor
Scaling	Low	Monitor
	Medium	Slab Replacement
	High	Slab Replacement
Settlement	Low	Monitor
	Medium	Monitor
	High	Grinding
Shattered Slab	Low	Crack Seal
	Medium	Slab Replacement
	High	Slab Replacement
Shrinkage	N/A	Monitor
Spalling (Joint and Corner)	Low	Monitor
	Medium	Patch
	High	Patch

Table D-3. Unit costs for GDOT preventive maintenance actions, non-commercial service airports.

Maintenance Action	Unit Cost ($/sf)
Patching	1.02
Crack Sealing	1.28
Slab Replacement	2.04
Joint Sealing	1.60

Table D-4. GDOT's unit costs based on PCI ranges, non-commercial service airports.

	PCI Range							
Work Type	0 – 29	30 – 39	40 – 49	50 – 59	60 – 69	70 – 79	80 – 89	> 89
Major Rehabilitation: Northern GA	$20.34/sy	$6.77/sy	$6.77/sy	$6.77/sy	$6.77/sy	$4.90/sy	$4.90/sy	$4.90/sy
Major Rehabilitation: Southern GA	$19.52/sy	$5.86/sy	$5.86/sy	$5.86/sy	$5.86/sy	$4.27/sy	$4.27/sy	$4.27/sy

APPENDIX E

YEAR 2002 MAINTENANCE PLAN
ORGANIZED BY SECTION

Table E-1. 2002 maintenance plan organized by section.

Plan Year	Network	Branch	Section	Distress Description	Severity	Work Description	Work Qty.	Work Unit	Unit Cost	Work Cost
2002	ATL-PDK	R2L20RAP	10	L & T CR	M	Crack Sealing	561	LF	$1.28	$717
2002	ATL-PDK	R2L20RAP	10	ALLIGATOR CR	M	Patching	1,038	SF	$1.02	$1,058
2002	ATL-PDK	TAAP	30	LINEAR CR	M	Crack Sealing	731	LF	$1.28	$935
2002	ATL-PDK	TAAP	30	JT SEAL DMG	M	Joint Seal	1,661	LF	$1.60	$2,658
2002	ATL-PDK	TAAP	30	LINEAR CR	L	Crack Sealing	3,573	LF	$1.28	$4,573
2002	ATL-PDK	TAAP	30	JT SEAL DMG	H	Joint Seal	5,862	LF	$1.60	$9,379

APPENDIX F

YEAR 2002 MAINTENANCE PLAN
ORGANIZED BY REPAIR TYPE

Table F-1. 2002 maintenance plan organized by repair type.

Plan Year	Network	Branch	Section	Distress Description	Severity	Work Description	Work Qty.	Work Unit	Unit Cost	Work Cost
2002	ATL-PDK	R2L20RAP	10	L & T CR	M	Crack Sealing	561	LF	$1.28	$717
2002	ATL-PDK	TAAP	30	LINEAR CR	M	Crack Sealing	731	LF	$1.28	$935
2002	ATL-PDK	TAAP	30	LINEAR CR	L	Crack Sealing	3,573	LF	$1.28	$4,573
2002	ATL-PDK	TAAP	30	JT SEAL DMG	M	Joint Seal	1,661	LF	$1.60	$2,658
2002	ATL-PDK	TAAP	30	JT SEAL DMG	H	Joint Seal	5,862	LF	$1.60	$9,379
2002	ATL-PDK	R2L20RAP	10	ALLIGATOR CR	M	Patching	1,038	SF	$1.02	$1,058