DANIEL FIELD

PAVEMENT EVALUATION REPORT

JULY 2002

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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 Daniel Field 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 Daniel Field 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.

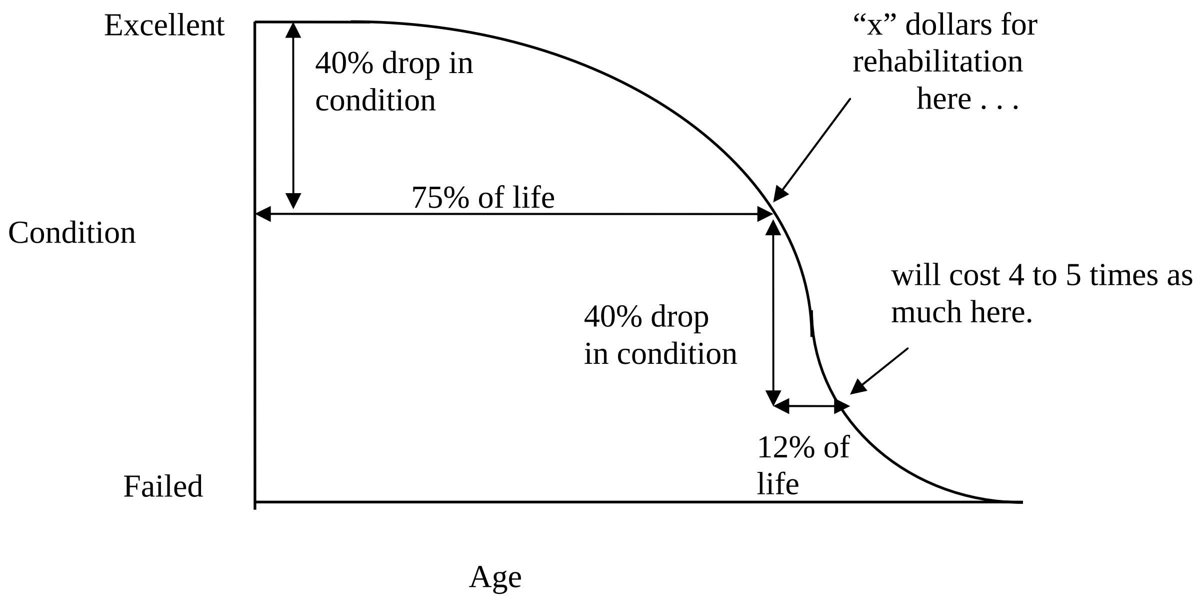


Figure 1. Pavement condition versus cost of repair.

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

Daniel Field has over 1,997,832 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.

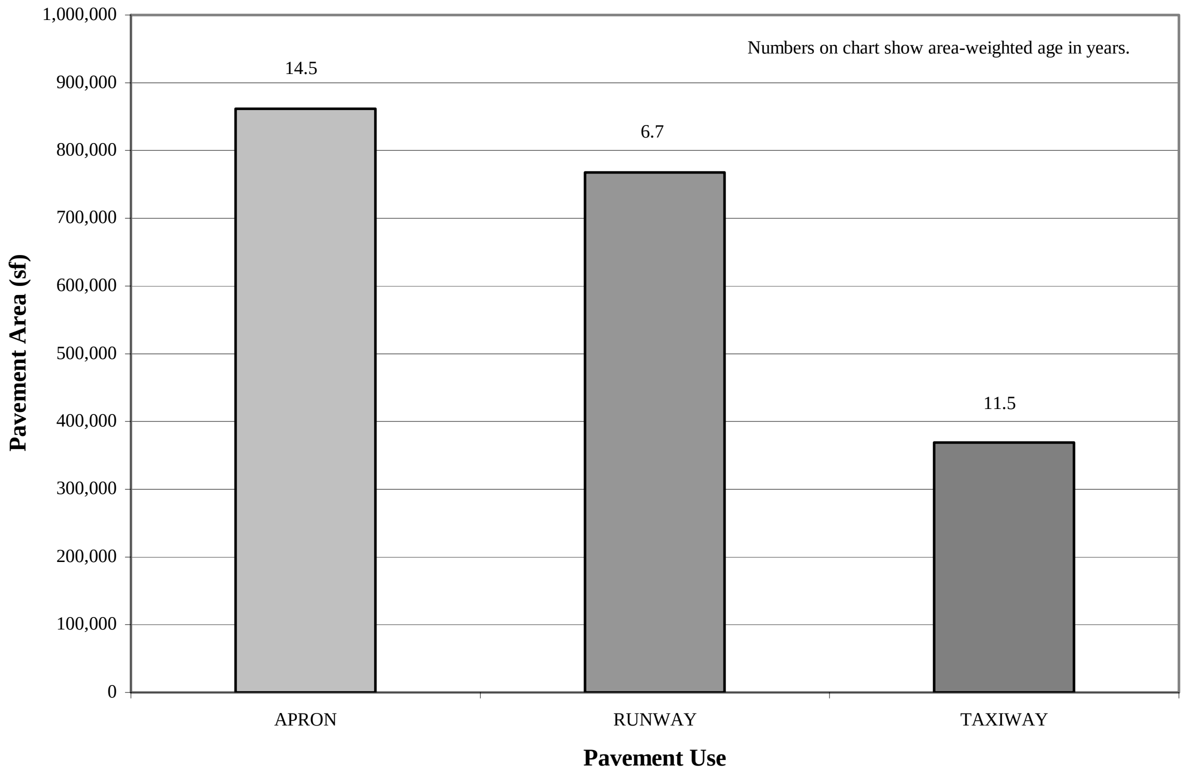


Figure 2. Pavement inventory.

Figure 3 is a network definition map that identifies the pavements at Daniel Field 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 Daniel Field 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.

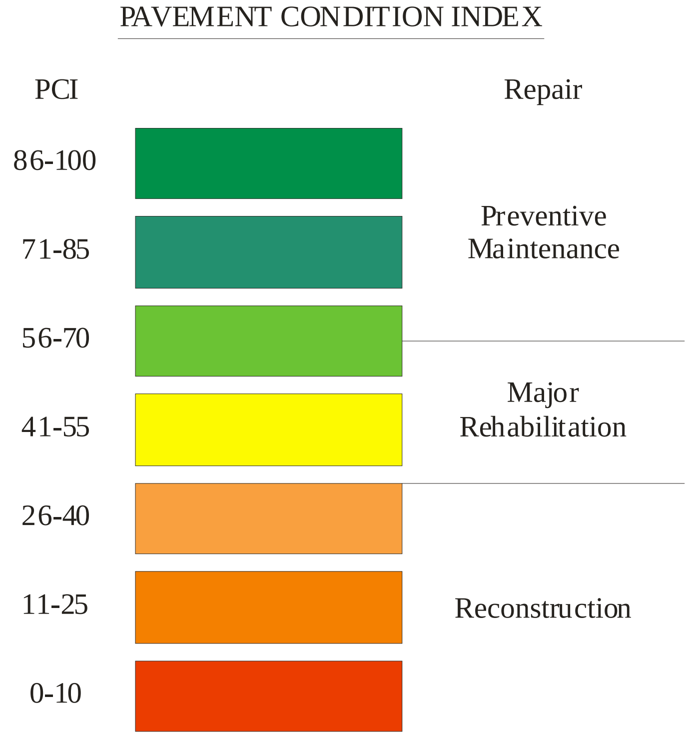


Figure 5. PCI versus repair type.

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 at Daniel Field was completed on November 18, 2001. Fourteen sections were defined during the inspection.

Runway 5-23

Runway 5-23 was defined by two sections. R523AG-10 is in good condition with significant amounts of longitudinal and transverse (L&T) cracking found throughout the section, the majority of which were sealed. Low-severity patching was also found. R523AG-20 is located at the intersection of R523AG-10 and R1129AG-10. Extensive amounts of low and medium-severity raveling and weathering and L&T cracking were observed in this section.

Runway 11-29

Runway 11-29 is defined by one section running the full length of the runway. During the inspection in 1998, R1129AG-10 was functioning as 150 feet wide runway. The recent overlay in 2000 on the runway was done only on the center 100 feet of the runway. The rest of the older pavement is now serving as a shoulder. The runway is in excellent condition with small quantities of low-severity, unsealed, L&T cracking found throughout.

Taxiway A

Taxiway A is defined by one section and is in good condition. Extensive amounts of low and medium-severity L&T cracking were observed throughout the taxiway.

Taxiway D

Taxiway D is in excellent condition with low-severity L&T cracking and raveling and weathering observed throughout. The majority of L&T cracking was unsealed.

Taxiway E

Taxiway E is in fair condition with significant amounts of low-severity block cracking and patching. Low, medium and high-severity raveling and weathering were also found throughout.

Terminal Apron

The Terminal Apron was divided into six sections for this inspection.

ATERMAG-10 was last overlaid in 2000. This section is presently in excellent condition with isolated areas with low-severity L&T cracking. Only one sample unit was noted with extensive amounts of low-severity block cracking. Hence this sample unit was surveyed as an additional sample unit.

ATERMAG-20 was last overlaid in 2000 and presently is in excellent condition. No distress was observed in this section.

ATERMAG-30 was is in good condition with extensive amounts of low and medium-severity L&T cracking and raveling and weathering found.

ATERMAG-40 is similar to ATERMAG-30 and is in good condition. The only distress found in this section was low and medium-severity L&T cracking.

ATERMAG-50 is in good condition with extensive amounts of low-severity block cracking, L&T cracking and raveling and weathering. Some isolated areas of low-severity patching and depression were also observed in the section.

ATERMAG-60 is older pavement and is in fair condition. Extensive amounts of low, medium and high-severity patching were observed throughout the section. Other distresses found included low-severity block cracking, depression and L&T cracking.

Tower Apron

Two sections are defined in the apron located in front of the control tower.

ATOWERAG-10 is in good condition with moderate amounts of low-severity L&T cracking and swelling observed throughout the section.

ATOWERAG-20 is also in good condition. Extensive amounts of medium-severity block cracking and low and medium-severity L&T cracking were found throughout the section. Other distresses present in this section included low-severity depression, patching and raveling and weathering.

T-Hangars

One section defines the t-hangar area on the airport. THANGAG-10 is in very good condition with extensive amounts of low-severity raveling and weathering observed throughout the section.

Overall Pavement Condition

The 2001 area-weighted condition of Daniel Field is 82, with conditions ranging from 48 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 Daniel Field. 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.

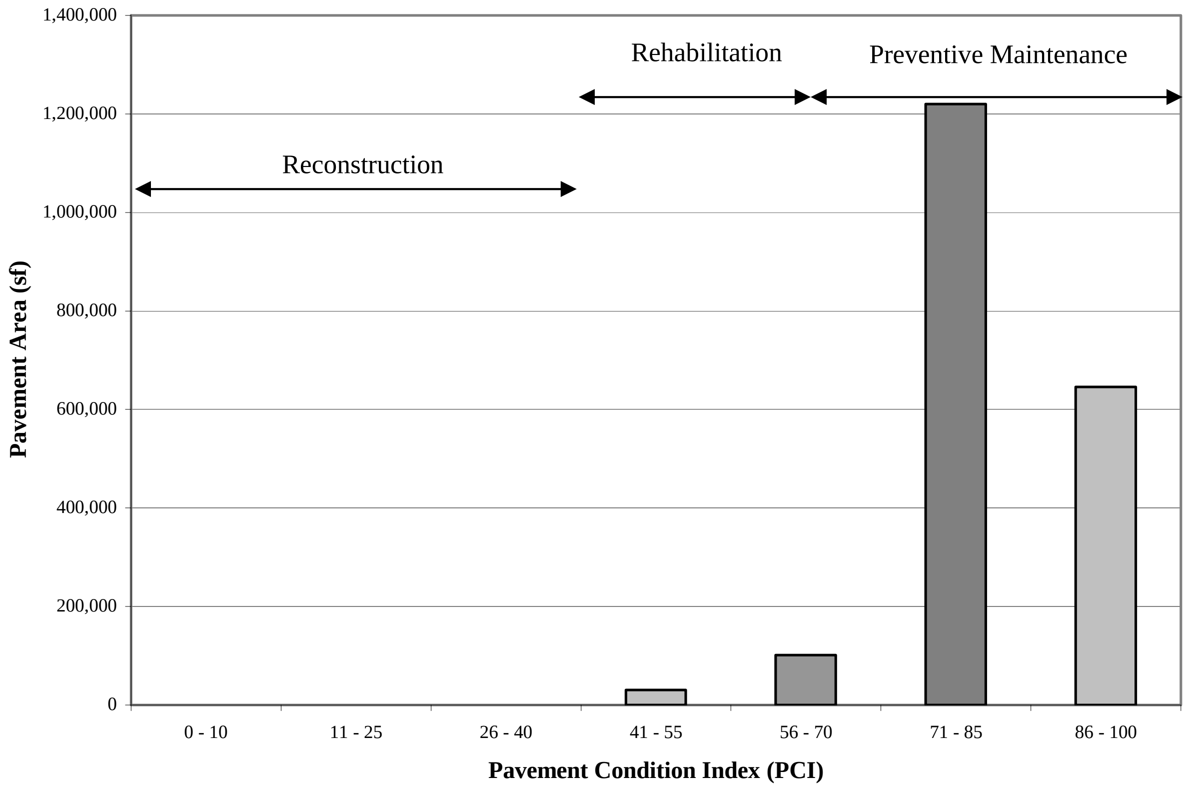


Figure 6. Condition distribution.

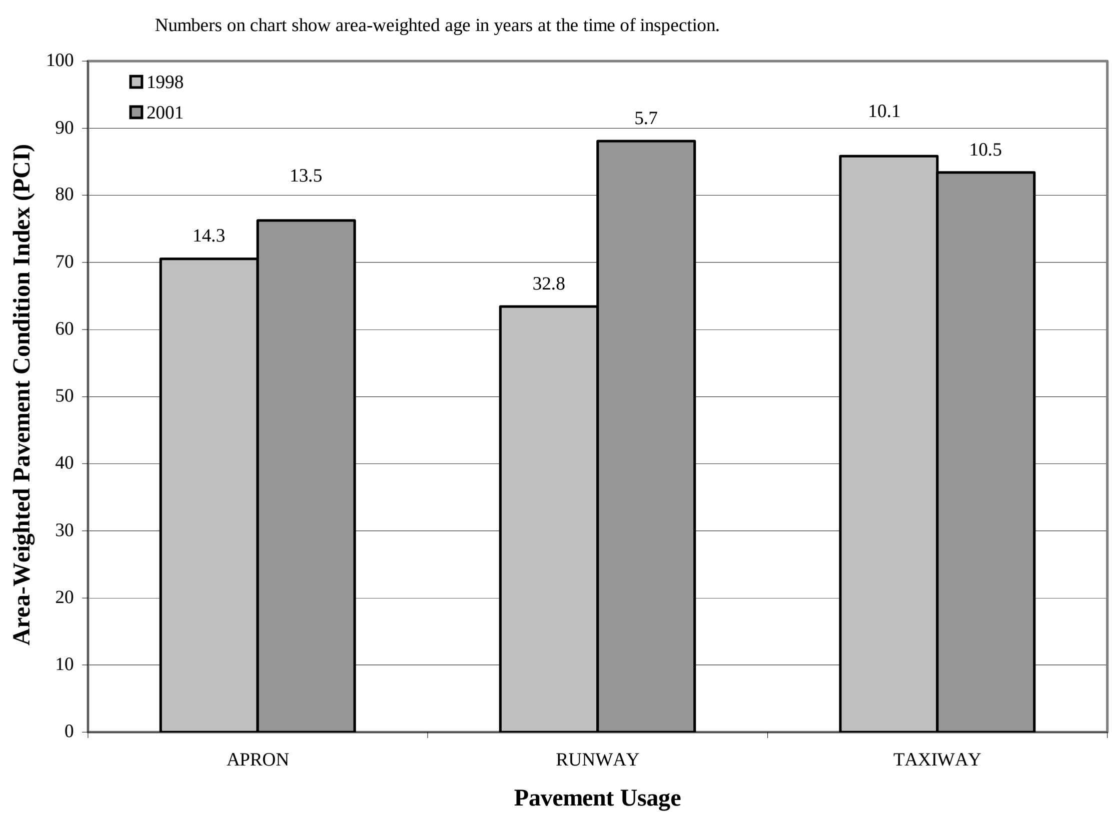
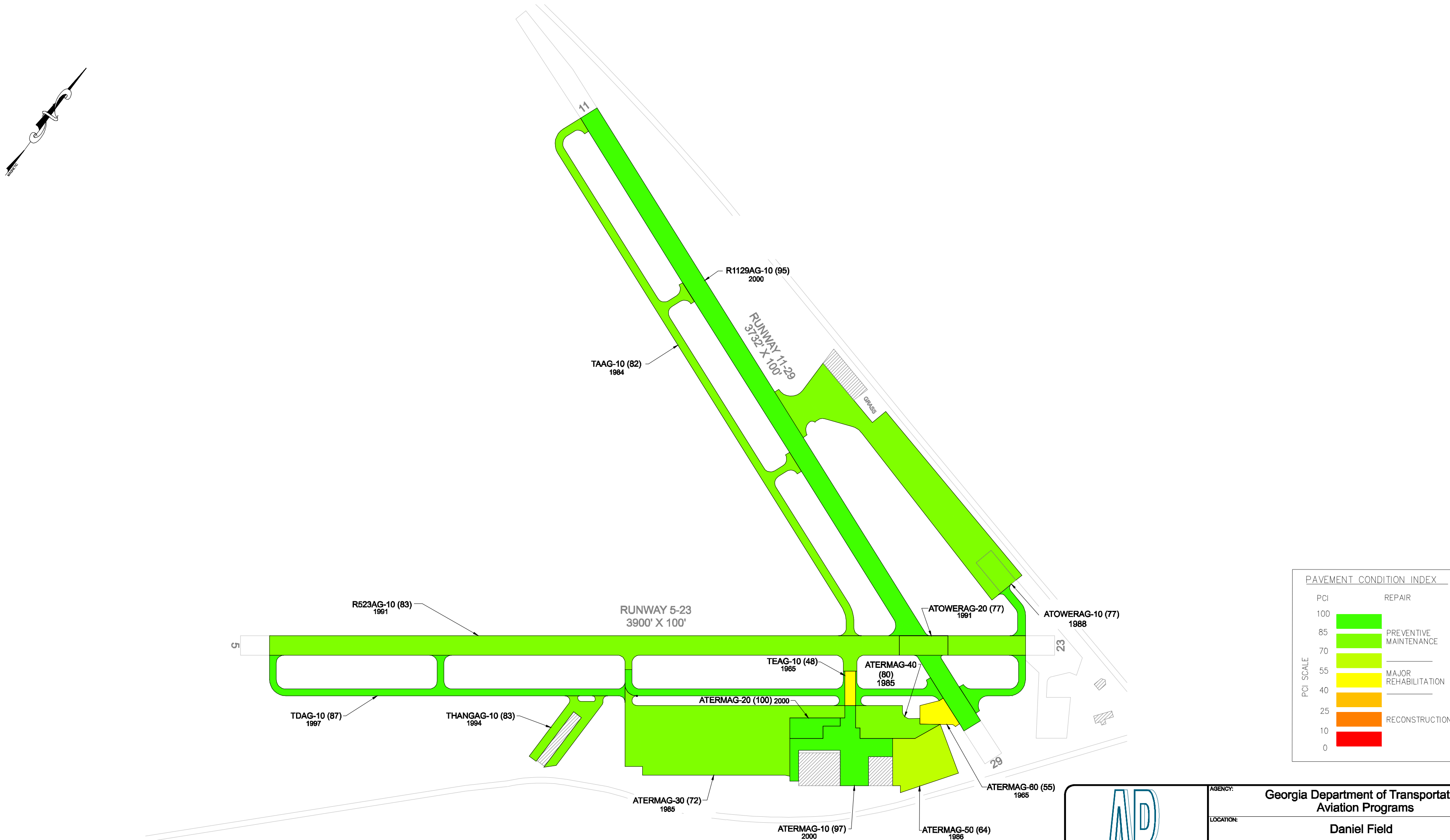


Figure 7. Condition by use.



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PAGE TITLE: Pavement Condition Index Map			
PROJECT DATE: 19-Dec-02	CREATION DATE: 19-Dec-02	PROJECT MANAGER: MRB	JOB NUMBER: 00-060-AM1
DRAWING SCALE: 1" = 500'	LAST MODIFIED DATE: 8/1/2002	REVISED BY: AMR	DRAWN BY: KMP
FILENAME: Daniel Field.dwg		LAYOUT NAME/NUMBER: 1	PAGE NUMBER: 1

Figure 8. INSERT PCI MAP
(11 x 17)

Table 1. 2001 pavement inspection results.

DANIEL FIELD								
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]	
ATERMAG	10	AAC	85,700	2000	97	0	100	BLOCK CR, L & T CR
ATERMAG	20	AAC	22,520	2000	100	0	0	N/A
ATERMAG	30	AC	320,530	1985	72	0	100	L & T CR, WEATH/RAVEL
ATERMAG	40	AAC	52,919	1985	80	0	100	L & T CR
ATERMAG	50	AC	76,550	1986	64	0	100	WEATH/RAVEL, PATCHING, L & T CR, DEPRESSION, BLOCK CR
ATERMAG	60	AAC	19,613	1965	55	0	99	DEPRESSION, BLOCK CR, L & T CR, WEATH/RAVEL, PATCHING
ATOWERAG	10	AAC	20,000	1988	77	0	84	L & T CR, SWELLING
ATOWERAG	20	AAC	263,680	1988	77	0	99	DEPRESSION, WEATH/RAVEL, BLOCK CR, PATCHING, L & T CR
R1129AG	10	AAC	367,227	2000	95	0	100	L & T CR
R523AG	10	AAC	375,193	1991	83	0	100	PATCHING, L & T CR
R523AG	20	AAC	25,000	1991	63	0	100	WEATH/RAVEL, L & T CR
TAAG	10	AC	146,935	1984	82	0	100	L & T CR
TDAG	10	AC	170,240	1997	87	0	98	WEATH/RAVEL, DEPRESSION, L & T CR
TEAG	10	AC	10,800	1965	48	0	100	WEATH/RAVEL, PATCHING, BLOCK CR
THANGAG	10	AAC	40,925	1994	83	0	100	WEATH/RAVEL

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 Daniel Field. 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]
R523AG	20	2002	Major M&R	$30,114
TAAG	10	2002	Preventive	$2,851
TDAG	10	2002	Preventive	$1,347
TEAG	10	2002	Major M&R	$8,124
ATERMAG	30	2002	Preventive	$10,442
ATERMAG	60	2002	Major M&R	$14,753
ATOWERAG	20	2002	Preventive	$7,892
R1129AG	10	2006	Preventive	$9,771
R523AG	10	2006	Preventive	$31,042
TAAG	10	2006	Preventive	$2,756
TDAG	10	2006	Preventive	$3,724
ATERMAG	10	2006	Preventive	$4,034
ATERMAG	30	2006	Preventive	$10,665
ATERMAG	40	2006	Preventive	$755
ATERMAG	50	2006	Preventive	$14,803
ATOWERAG	10	2006	Preventive	$2,171
ATOWERAG	20	2006	Preventive	$4,152
THANGAG	10	2006	Major M&R	$34,649

[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 Daniel Field. During a visual inspection of the pavements in 2001, it was found that the overall condition of the pavement network is a PCI of 82. A 5- year pavement repair program was generated for the Airport, which revealed that approximately $194,045 needs to be expended on the pavement system in order to preserve its condition.

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 R523AG-10.

L&T cracking in section R523AG-10.

Weathering in section R523AG-10.

Overview of section R1129AG-10.

L&T cracking in section R1129AG-10.

Overview of section TAAG-10.

Overview of section TDAG-10.

Overview of section TEAG-10.

Block cracking in section TEAG-10.

Weathering in section TEAG-10.

Overview of section ATERMAG-10.

Block cracking in section ATERMAG-10.

Overview of section ATERMAG-20.

L&T Cracking in section ATERMAG-20.

Weathering in section ATERMAG-20.

Overview of section ATERMAG-40.

Overview of section ATERMAG-50.

Block cracking in section ATERMAG-50.

Overview of section ATERMAG-60.

Block cracking in section ATERMAG-60.

Patching in section ATERMAG-60.

Weathering in section ATERMAG-60.

Overview of section ATOWERAG-10.

Swelling in section ATOWERAG-10.

Overview of section ATOWERAG-20.

Block cracking in section ATOWERAG-20.

Overview of section THANGAG-10.

Weathering in section THANGAG-10.

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	AUG-DNL	ATERMAG	30	L & T CR	M	Crack Sealing	7,680	LF	$1.28	$9,831
2002	AUG-DNL	ATERMAG	30	WEATH/RAVEL	M	Patching	599	SF	$1.02	$611
2002	AUG-DNL	ATOWERAG	20	BLOCK CR	M	Crack Sealing	1,190	LF	$1.28	$1,524
2002	AUG-DNL	ATOWERAG	20	L & T CR	M	Crack Sealing	4,975	LF	$1.28	$6,368
2002	AUG-DNL	TAAG	10	L & T CR	M	Crack Sealing	2,227	LF	$1.28	$2,851
2002	AUG-DNL	TDAG	10	L & T CR	M	Crack Sealing	1,052	LF	$1.28	$1,347

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	AUG-DNL	ATERMAG	30	L & T CR	M	Crack Sealing	7,680	LF	$1.28	$9,831
2002	AUG-DNL	ATOWERAG	20	BLOCK CR	M	Crack Sealing	1,190	LF	$1.28	$1,524
2002	AUG-DNL	ATOWERAG	20	L & T CR	M	Crack Sealing	4,975	LF	$1.28	$6,368
2002	AUG-DNL	TAAG	10	L & T CR	M	Crack Sealing	2,227	LF	$1.28	$2,851
2002	AUG-DNL	TDAG	10	L & T CR	M	Crack Sealing	1,052	LF	$1.28	$1,347
2002	AUG-DNL	ATERMAG	30	WEATH/RAVEL	M	Patching	599	SF	$1.02	$611