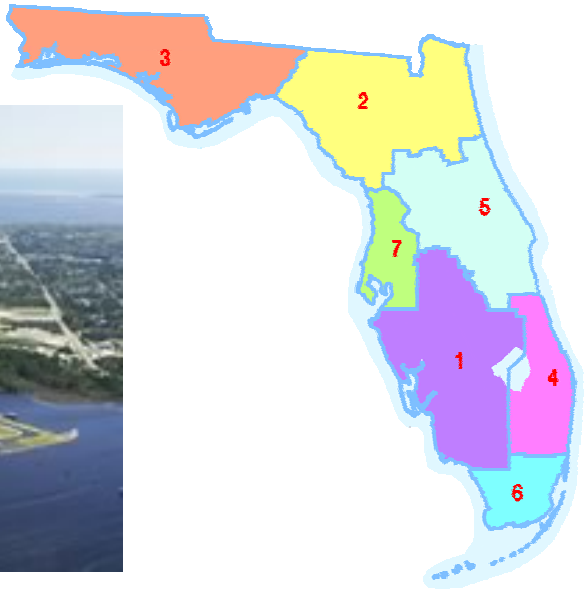
STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
AVIATION OFFICE

Statewide Airfield Pavement Management Program
Executive Summary
Volume 1 of 2

June 27, 2008



Prepared for:
Florida Department of Transportation
Aviation Office

by:

URS Corporation Inc. / MACTEC Engineering & Consulting, Inc. / Planning Technology, Inc. / ASC Geosciences, Inc.

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EXECUTIVE SUMMARY

The Florida Department of Transportation (FDOT) Aviation Office awarded a contract for Phase II of the Statewide Aviation Pavement Management Program to URS Corporation, Inc. with team members MACTEC Engineering and Consulting, Inc. (MACTEC), Planning Technology, Inc. (PTI), and ASC Geosciences, Inc. (ASCG). As part of this contract, MACTEC conducted pavement condition surveys for airside pavements for participating airports, evaluated the conditions, and developed a maintenance and rehabilitation program to improve conditions to prescribed minimum levels. The 85 airports participating in the Statewide Pavement Management Program include 8 Primary (PR), 16 Reliever (RL), and 61 General Aviation (GA) airports.

Pavement Area and Use

The total pavement area in 2006/2007 for the participating airports is approximately 272 million square feet. The breakdown of pavement area for each pavement use by FDOT District is provided as follows:

Table E-1: Pavement Area by Pavement Use – Statewide

Use	Area (Millions of Sq. Ft)							
District	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**Total**
Runway	21	24	10	12	21	8	8	104
Taxiway	17	15	7	14	18	10	4	86
Apron	17	15	8	12	19	8	4	82
Total	**55**	**54**	**25**	**38**	**58**	**26**	**16**	**272**

Figure E-1: Pavement Area by Use – Statewide

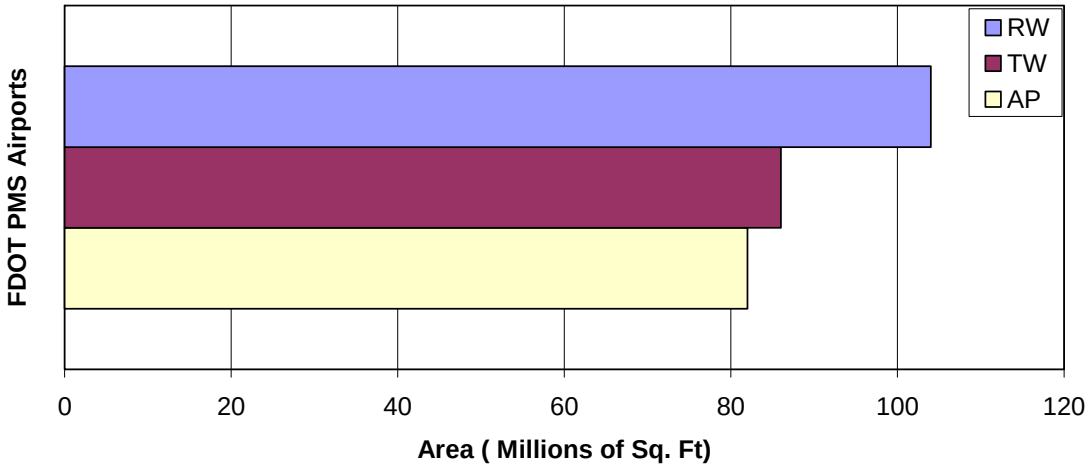

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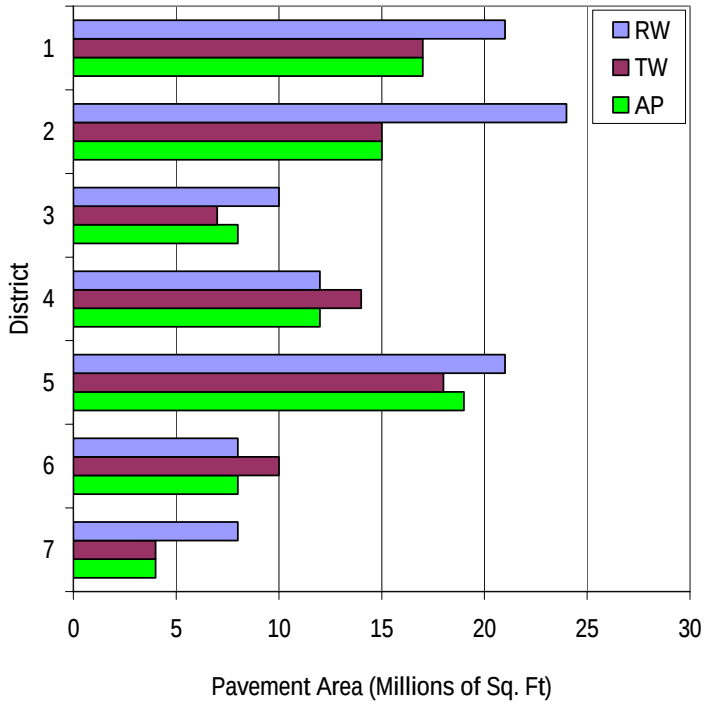
Figure E-2: Pavement Area by Use by District – Statewide



Pavement Condition Index (PCI)

The overall area-weighted Pavement Condition Index (PCI) of the participating airports in 2006/2007 is 73, representing a Satisfactory overall network condition.

Table E-2 provides the distress density by district.

Table E-3 provides the weighted-average PCI by pavement use.

Figure E-3 provides the weighted-average PCI by pavement use by district. Figure E-4 provides the statewide distribution of PCI by pavement use. Figure E-5 provides the statewide area-weighted PCI by surface type.

The condition summary by pavement use table illustrates the area-weighted PCI computed individually for each use. On average, the runways and taxiways are in Satisfactory condition while the aprons are in Fair condition.

Table E-2: Distress Density (%) by District

Surface	Distress	District 1	District 2	District 3	District 4	District 5	District 6	District 7
AC	ALLIGATOR CR	0.529	0.207	0.071	0.543	0.140	0.006	0.646
	BLEEDING	0.017	0.017	0.058	0.018	0.010	0.003	0.002
	BLOCK CR	8.767	16.363	5.555	5.649	12.055	1.699	2.858
	CORRUGATION	0.062	0.068	0.000	0.000	0.005	0.003	0.000
	DEPRESSION	0.211	0.249	0.080	0.189	0.228	0.310	0.297
	JET BLAST	0.022	0.000	0.007	0.000	0.000	0.000	0.000
	JT REF. CR	0.133	0.005	0.002	0.159	0.177	0.007	0.052
	L & T CR	2.430	4.039	3.400	2.761	3.437	1.889	3.236
	OIL SPILLAGE	0.005	0.008	0.005	0.007	0.030	0.025	0.016
	PATCHING	0.467	1.024	0.420	0.341	0.481	0.365	0.892
	POLISHED AG	0.004	0.000	0.000	0.011	0.000	0.000	0.000
	WEATH/RAVEL	40.184	48.825	26.580	42.265	46.515	38.278	50.130
	RUTTING	0.067	0.063	0.033	0.081	0.074	0.030	0.307
	SHOVING	0.008	0.002	0.011	0.000	0.000	0.000	0.000
	SLIPPAGE CR	0.008	0.002	0.000	0.012	0.022	0.007	0.210
	SWELLING	0.375	1.056	0.896	0.927	1.764	0.775	0.905
PCC	BLOW-UP	0.000	0.000	0.014	0.048	0.009	0.306	0.000
	CORNER BREAK	1.834	0.179	1.262	2.215	0.399	1.757	0.944
	LINEAR CR	42.837	5.123	18.366	2.261	7.083	12.324	31.231
	DURABIL. CR	0.048	0.000	0.042	0.000	0.024	2.327	2.543
	JT SEAL DMG	75.681	34.212	87.011	99.369	52.393	95.789	94.842
	SMALL PATCH	4.980	7.632	1.576	2.054	5.975	5.856	27.722
	LARGE PATCH	5.210	2.471	0.708	1.565	0.381	3.553	6.957
	POPOUTS	0.854	0.450	0.773	0.000	0.015	0.000	0.319
	SCALING	27.186	47.665	1.438	6.748	12.489	15.257	86.072
	FAULTING	0.418	0.056	0.679	4.334	0.309	0.000	0.000
	SHAT. SLAB	4.320	1.845	0.750	0.384	3.283	0.832	1.055
	SHRINKAGE CR	3.385	1.201	1.466	2.169	2.486	4.725	7.723
	JOINT SPALL	7.339	2.962	6.989	12.606	11.271	11.049	15.039
	CORNER SPALL	4.247	2.445	6.243	4.274	6.278	1.810	7.518

* Distress density was estimated based on the percentage of the sum of the extrapolated distress quantity at all severity levels for a distress over the entire AC pavement area or PCC slabs within a district. For instance, distress density of alligator cracking for District 1 is 0.529%, meaning 0.529% of District 1's AC pavement area have low, medium, or high severity of alligator cracking. Distress density of blow-up for District 3 is 0.014%, meaning 0.014% of District 3's PCC slabs have blow-up.

Figure E-3: Distress Density (%) - District 1

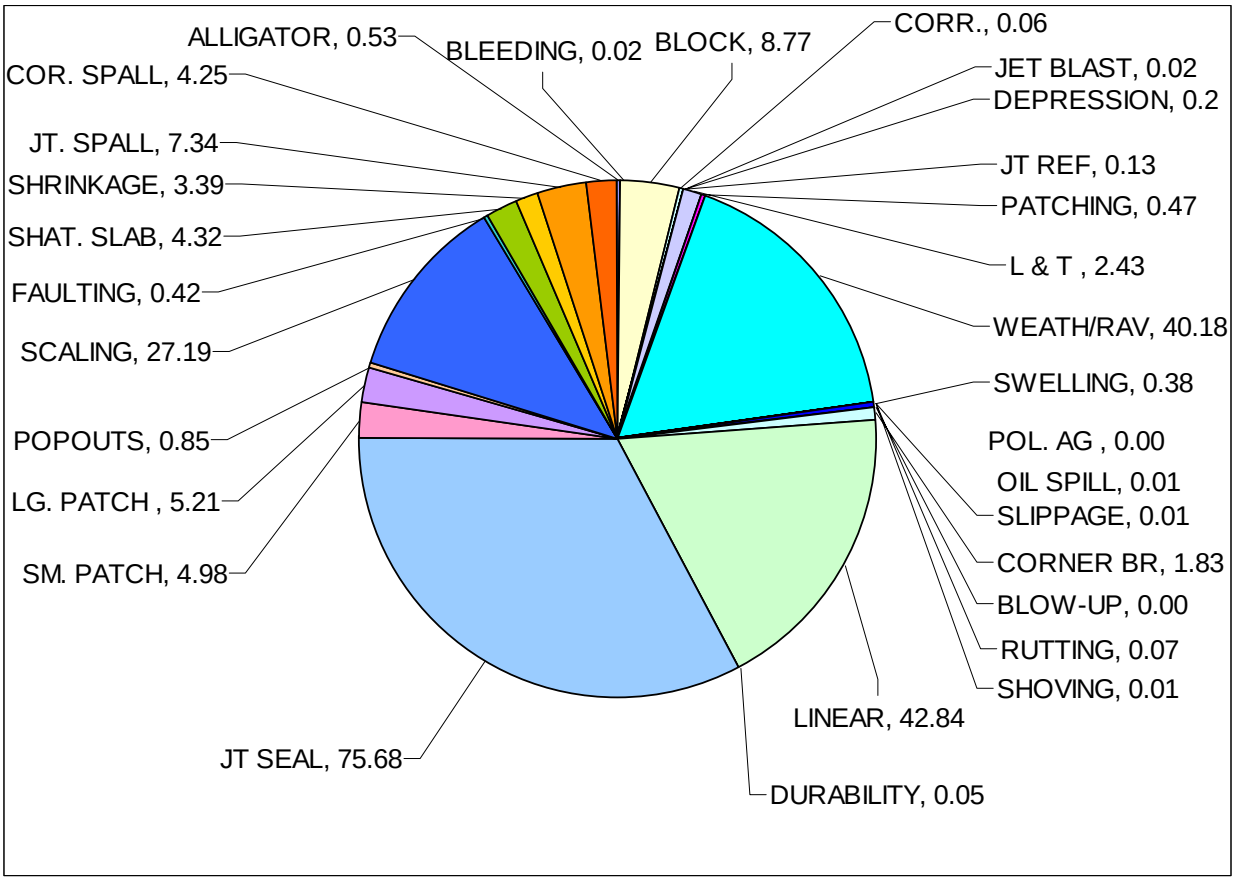


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Figure E-4: Distress Density (%) - District 2

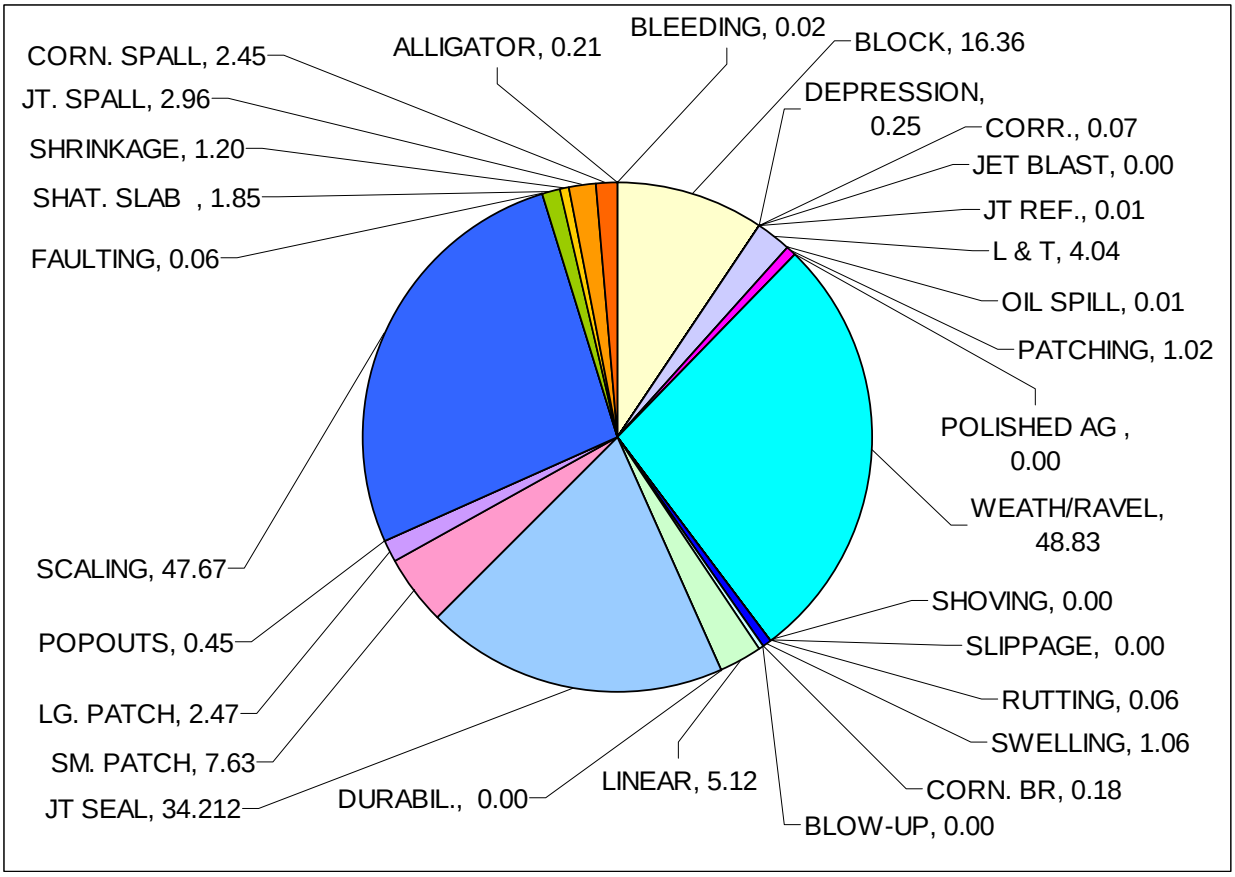

Figure E-5: Distress Density (%) - District 3

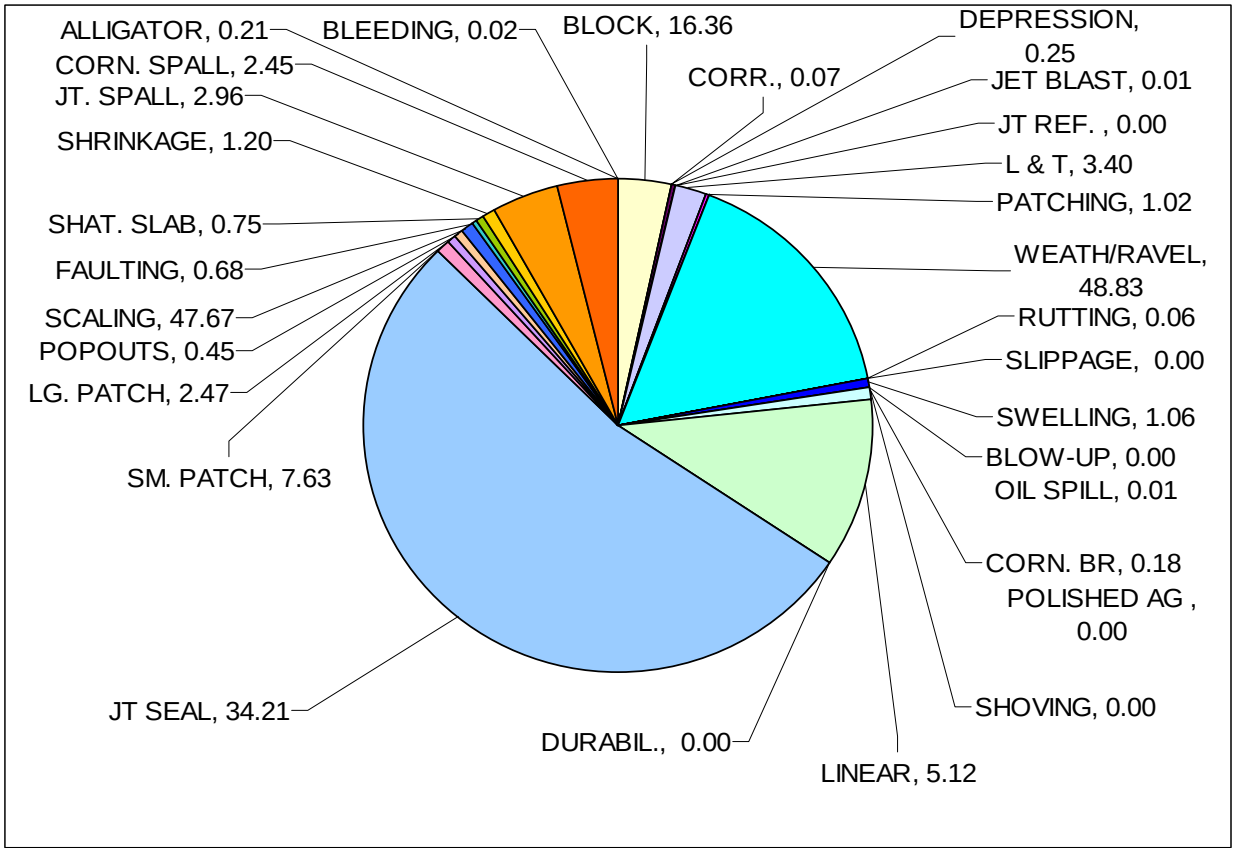

Figure E-6: Distress Density (%) - District 4

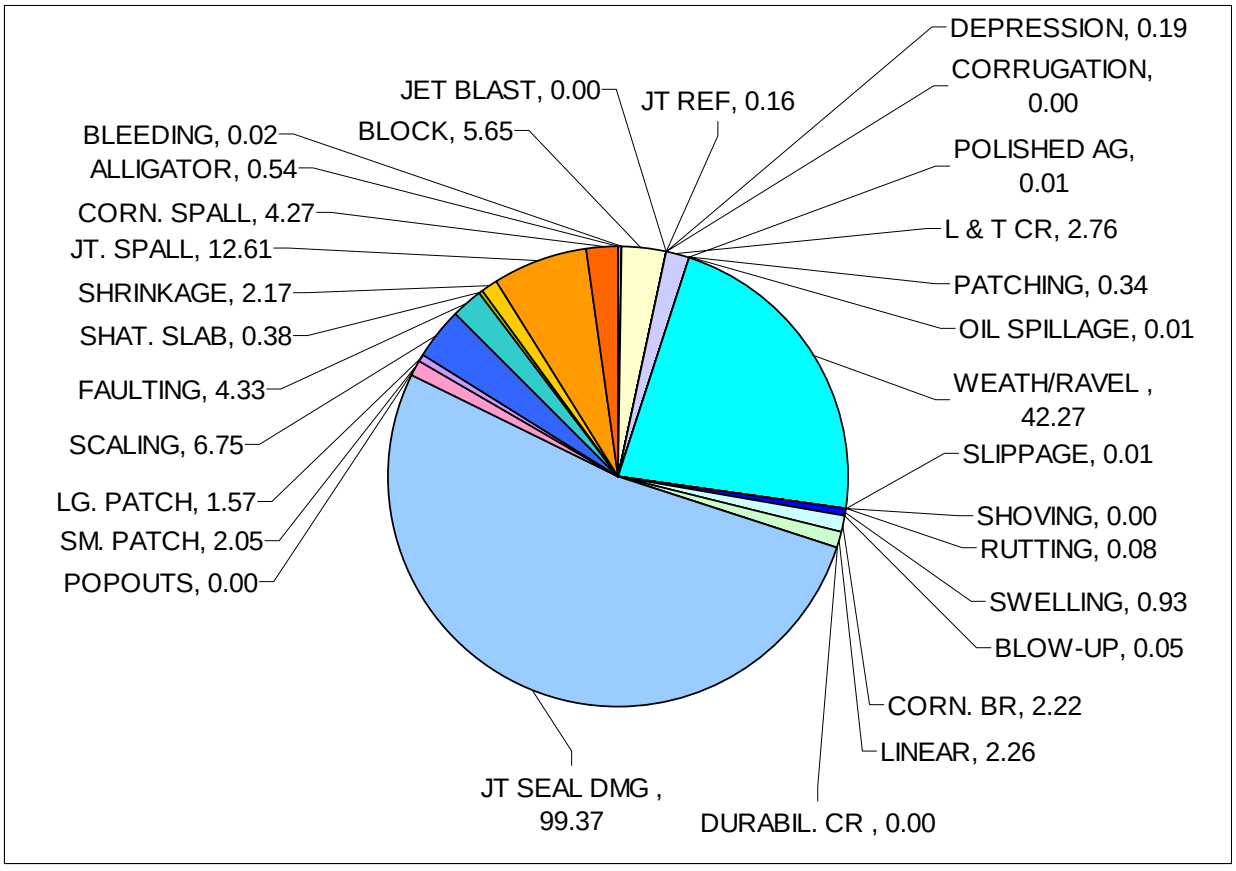

Figure E-7: Distress Density (%) - District 5

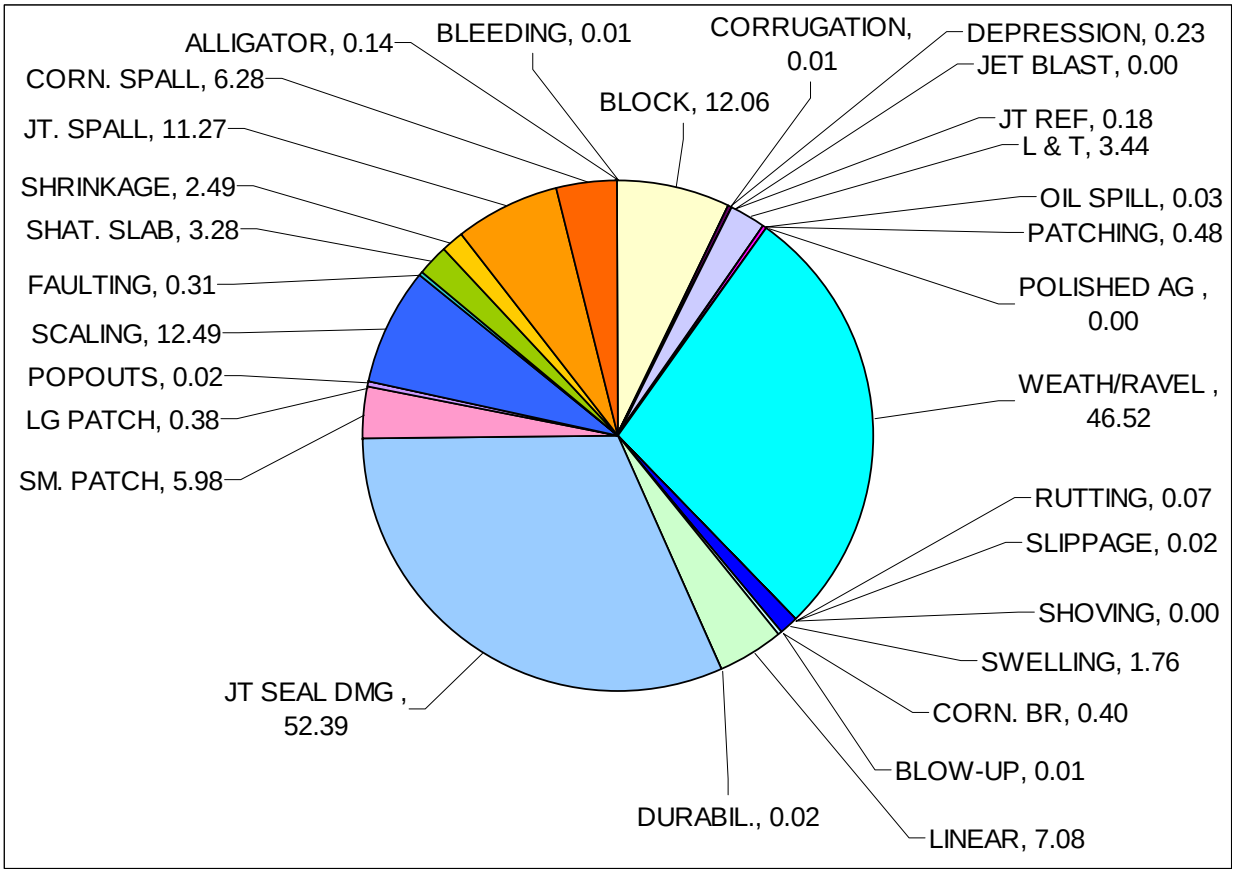

Figure E-8: Distress Density (%) - District 6

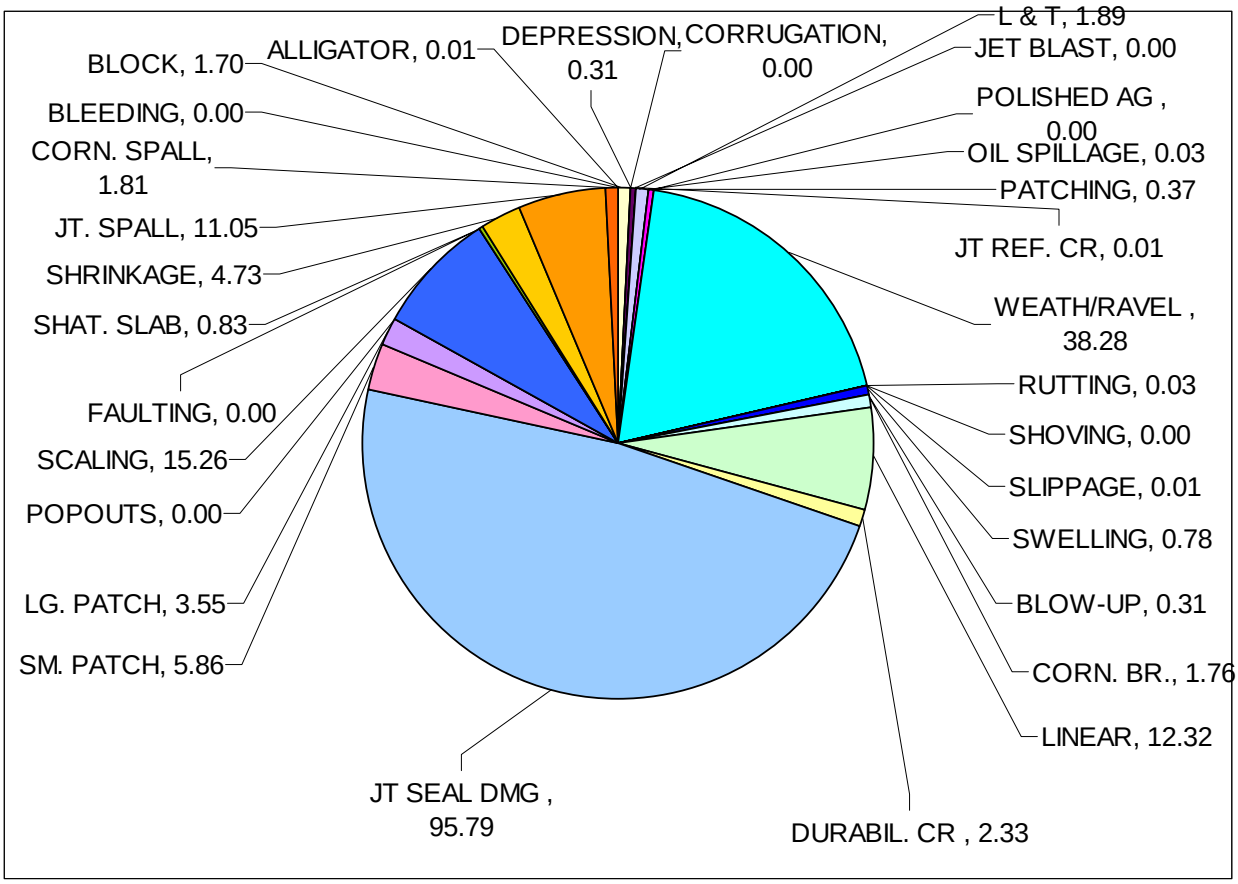

Figure E-9: Distress Density (%) - District 7

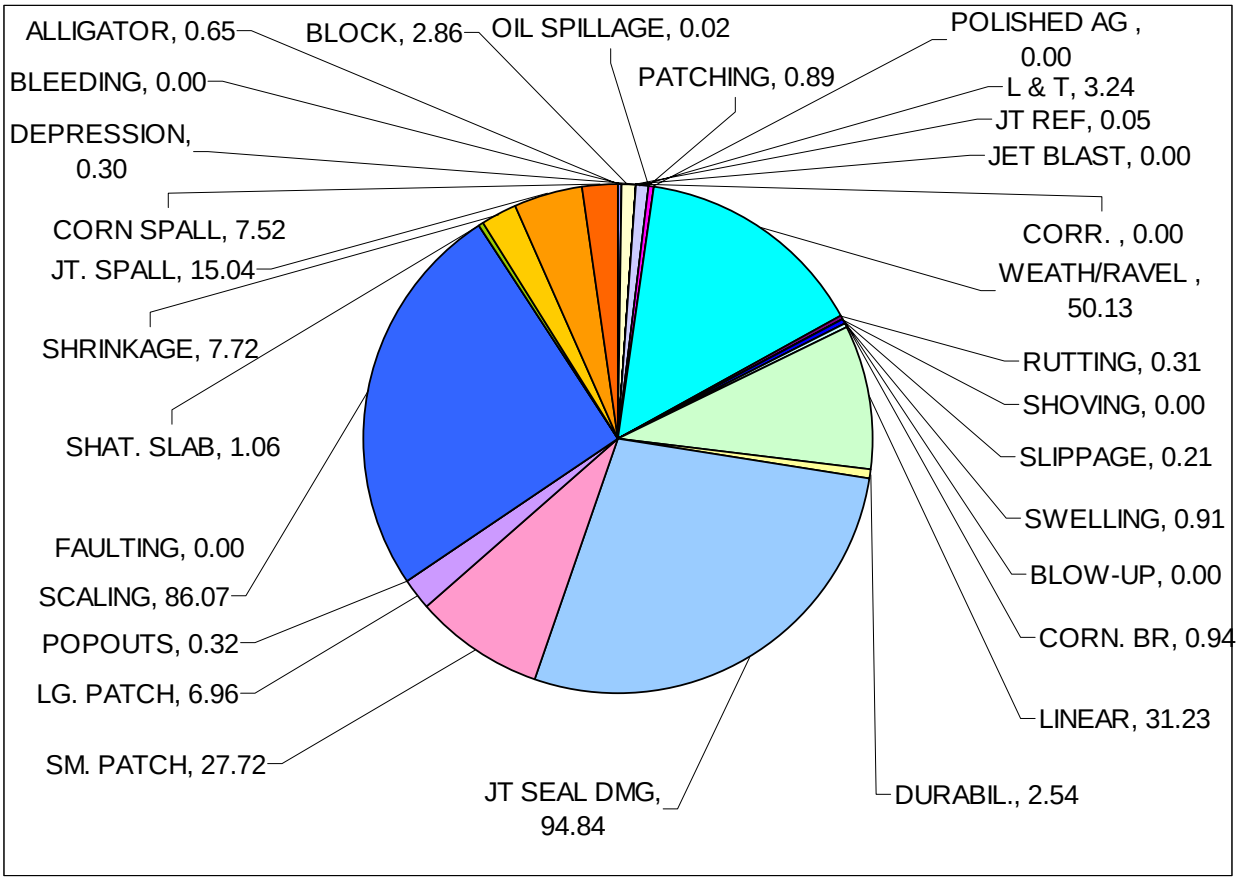

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Table E-3: PCI by Use – Statewide

District	Area-Weighted PCI						District Average	
	RW		TW		AP			
	PCI	Rating	PCI	Rating	PCI	Rating	PCI	Rating
1	75	Satisfactory	78	Satisfactory	72	Satisfactory	75	Satisfactory
2	70	Fair	79	Satisfactory	74	Satisfactory	74	Satisfactory
3	80	Satisfactory	76	Satisfactory	66	Fair	74	Satisfactory
4	73	Satisfactory	75	Satisfactory	71	Satisfactory	73	Satisfactory
5	72	Satisfactory	72	Satisfactory	67	Fair	70	Fair
6	77	Satisfactory	80	Satisfactory	72	Satisfactory	77	Satisfactory
7	67	Fair	62	Fair	68	Fair	66	Fair
Statewide	**73**	**Satisfactory**	**76**	**Satisfactory**	**70**	**Fair**	**73**	**Satisfactory**

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Figure E-10: PCI by Use by District – Statewide

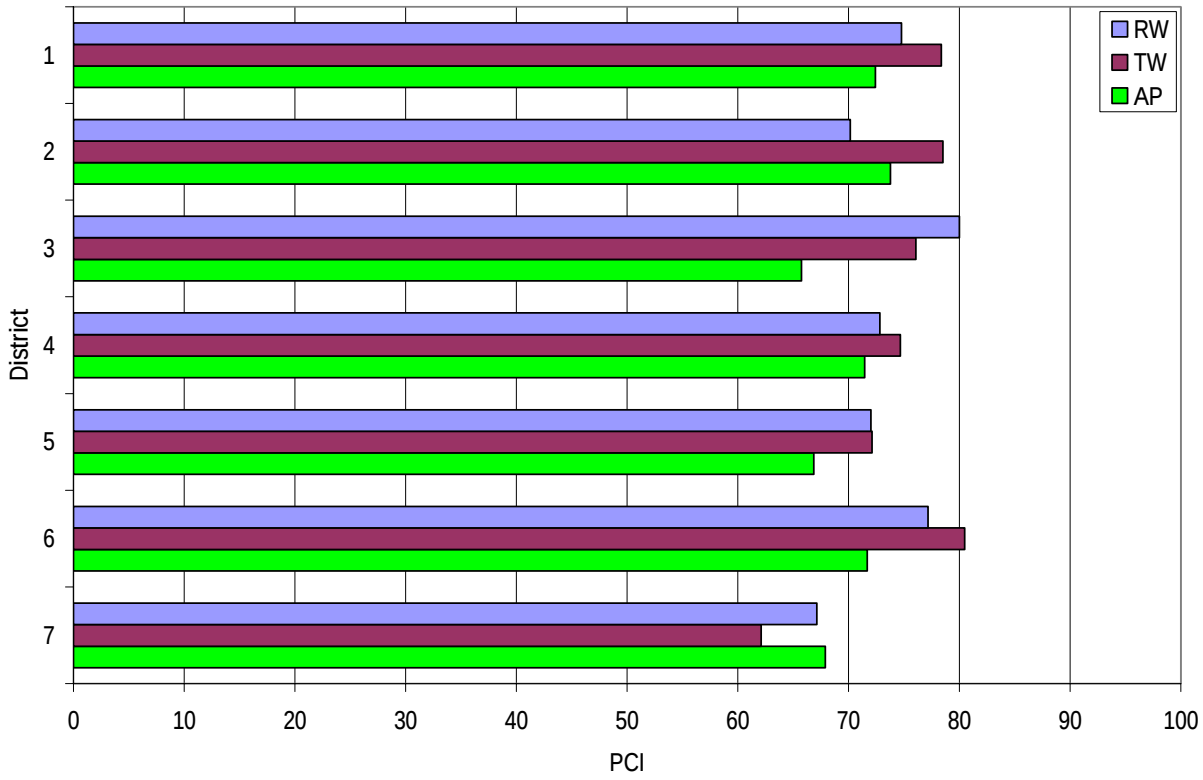

Figure E-11: PCI by Pavement Use – Statewide

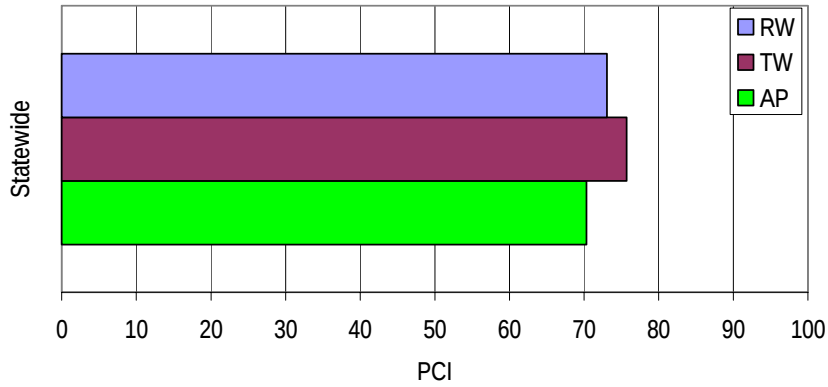

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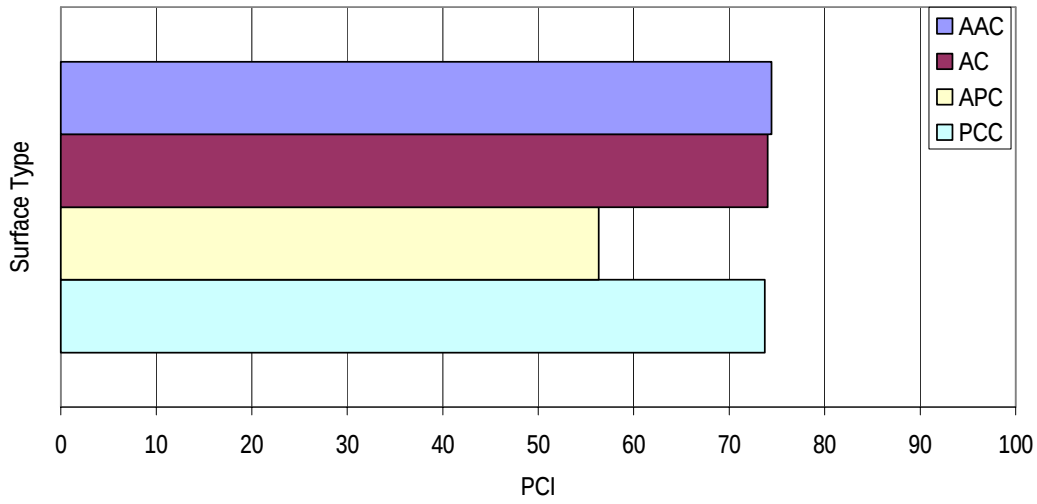
Figure E-12: PCI by Surface Type



AC - asphalt concrete pavement
AAC - asphalt overlay over asphalt concrete pavement
PCC - Rigid pavement or Portland cement concrete surface, and
APC - Composite pavement or asphalt over PCC pavement

Maintenance and Rehabilitation Costs

The participating airports in all districts have immediate (Year 2008) M&R needs. These immediate needs are summarized in the following table.

Table E-4: Immediate Major M&R Cost

District	Avg PCI - Before M&R	Immediate M&R Total **	Avg PCI -1st Year After M&R
1	75	$119,560,000	90
2	74	$128,394,000	88
3	74	$54,930,000	88
4	73	$75,505,000	88
5	70	$191,347,000	90
6	77	$34,242,000	86
7	66	$62,665,000	92
Statewide	**73**	**$666,643,000**	**89**

* This table shows the area-weighted PCI before and after Major M&R and routine maintenance work for the first year of the 10-year plan. It includes all airports participating in the program.
** Cost figures are rounded to nearest $1000. Sum may be different. Costs are adjusted for inflation.

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A forecast of Major M&R cost for a 10-year period was developed using an unlimited budget. The analysis identified ongoing maintenance needs and major M&R during that interval. This is summarized in Table E-5 and Figures E-6 and E-7.

Table E-5: 10 Year M&R Costs under Unlimited Funding Scenario

Year	Preventive	Major M&R (PCI >= Critical)	Major M&R (PCI < Critical)	Total
2008	$8,788,000	$3,026,000	$663,617,000	$675,431,000
2009	$17,671,000	$0	$23,126,000	$40,796,000
2010	$16,705,000	$0	$24,432,000	$41,137,000
2011	$18,509,000	$0	$16,601,000	$35,110,000
2012	$20,598,000	$0	$20,148,000	$40,746,000
2013	$23,009,000	$0	$21,810,000	$44,819,000
2014	$26,966,000	$0	$15,058,000	$42,023,000
2015	$29,974,000	$0	$20,416,000	$50,390,000
2016	$33,631,000	$0	$20,169,000	$53,800,000
2017	$36,687,000	$0	$25,414,000	$62,101,000
Total	**$232,536,000**	**$3,026,000**	**$850,791,000**	**$1,086,353,000**

Note: Cost figures are rounded to nearest $1000. Sum may be different. Costs are adjusted for inflation of 3% per year

The 10 year analysis suggests an annual budget on the order of $109 million would be expected to provide an improvement in the overall condition, where the area-weighted PCI would increase from 73 in 2006/2007 to 81 in 2017.

It is important to note that although preventative and some major M&R activities would have to be conducted over several years, the area-weighted PCI value for participating airports in 2017 may remain near 81. What is most important is that the pavement repair work (preventative and major M&R) that has been identified is conducted at some point in the 10-year plan.

Figure E-13: Immediate M&R Costs by District

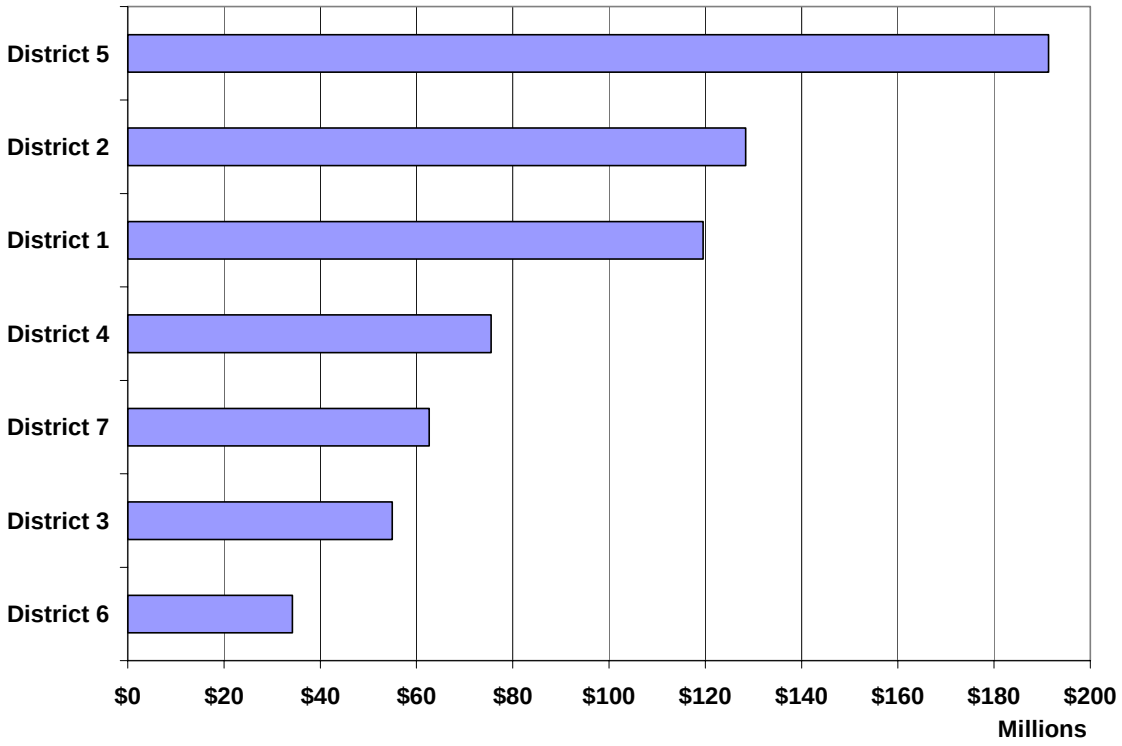
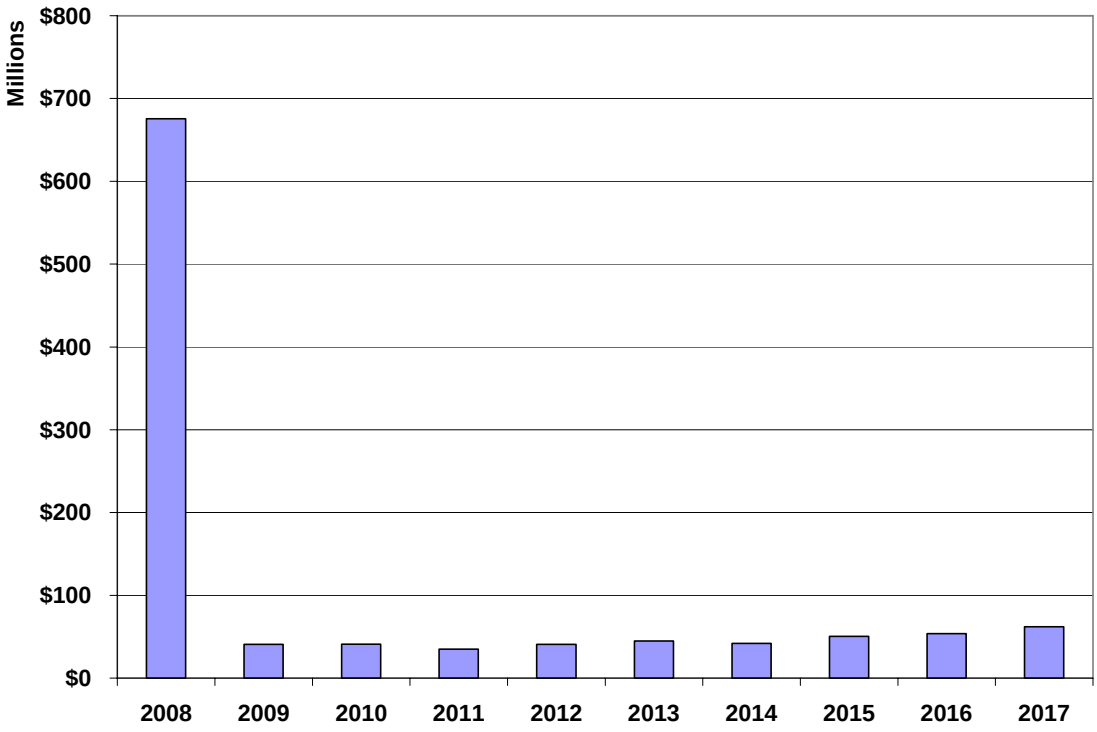


Figure E-14: Estimated Annual Costs (2008-2017)



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1. DEFINITIONS

Base Course - Base Course is a layer of manufactured material, usually crushed rock (aggregate) or stabilized material (asphalt or concrete or Florida Limerock), immediately beneath the surface course of a pavement, which provides support to the surface course.

Branch – (Facility in prior system) - A runway, taxiway or apron is called a Branch. This is an easy reference to a recognizable component of airport pavement. In this report, Branch ID maintains the original AirPAV identification where 100 series through 3000 series facilities are taxiways, 4000 and 5000 series facilities are aprons (the 5000 series represent runup aprons and turnarounds), and 6000 series facilities are runways. It also includes the common designation for the item e.g. RW 18-36.

Category - The Category classifies the airport according to the type and volume of aircraft traffic, as follows:

- GA – for general aviation or community airports
- RL – for relievers or small hubs
- PR – for primary

Condition Map – The map with the conditions of its sections displayed using different colors. Each color represents a PCI category.

Critical PCI – The PCI value considered to be the threshold for M&R decisions. PCI above the Critical generate economical activities expected to preserve and prolong acceptable condition. M&R for PCI values less than Critical make sense only for reasons of safety or to maintain a pavement in operable condition. A pavement section is expected to deteriorate very quickly once it reaches the Critical PCI and the unit cost of repair increases significantly.

Distress Type - A distress type is a defined visible defect in pavement evidenced by cracking, vertical displacement or deterioration of material. In PCI technology, 16 distinct distress types for asphalt surfaced and 15 for Portland cement concrete surfaced pavements have been described and rated according to the impact their presence has on pavement condition.

Localized M&R (Maintenance and Repair) – Localized M&R is a temporizing activity performed on existing pavement to extend its serviceability and/or to improve rideability. Localized M&R can be applied either as a safety (stop-gap) measure or preventive measure. Common localized maintenance methods include crack sealing, joint sealing, and patching.

Global M&R- Global M&R is defined as activities applied to entire pavement sections with the primary objective of slowing the rate of deterioration. These activities are primary for asphalt surfaced pavements, e.g. surface treatments.

MicroPAVER – A commercially available software subsidized by FAA and agencies in the US Department of Defense developed to support engineered management of pavement assets using a condition based approach. This software has the functionality such that if properly implemented, maintained and operated it meets the pavement management system requirements described by FAA in Advisory Circular 150/5380-7A.

Minimum Condition Level - A threshold PCI value established by FDOT to represent the targeted minimum pavement condition that is desirable in the Florida Airport System. These values were established with consideration of pavement function and airport type. For instance, runways have higher minimum condition levels than aprons, and Primary airports have higher minimum condition levels than General Aviation airports.

Major M&R (e.g. Rehabilitation) – Activities performed over the entire area of a pavement section that are intended to restore and/or maintain serviceability. This includes asphalt overlays, milling and replacing asphalt pavement, reconstruction with asphalt, reconstruction with Portland Cement Concrete (PCC) pavements, and PCC overlays.

Network Definition – (Airport Sketch in prior system) – A Network Definition is a CAD drawing which shows the airport pavement outline with Branch and Section boundaries. This sketch is intended to assist the user of the report to quickly associate information from the text to a location on the airport. This drawing also includes the PCI sample units and is used to identify those sample units to be surveyed, i.e. the sampling plan.

Pavement Condition Index (PCI) – The Pavement Condition Index is a number which represents the condition of a pavement segment at an instant in time. It is based on visual identification and measurement of specific distress types commonly found in pavement which has been in service for a period of time. The definitions and procedures for determining the PCI are found in ASTM D 5340-04, "Standard Test Method for Airport Pavement Condition Index Surveys," published by ASTM International.

Pavement Evaluation – A systematic approach undertaken by trained and experienced personnel intended for determination of the condition, serviceability, and best corrective action for pavement. Techniques to standardize pavement evaluation include the Pavement Condition Index procedures.

Pavement Management – Pavement management is a broad function that uses pavement evaluation and pavement performance trends as a basis for planning, programming, financing, and maintaining a pavement system.

Rank – Pavement rank in MicroPAVER determines the priority to be assigned to a pavement section when developing an M&R plan. Pavement sections are ranked as follows according to their use:

- P – for Primary pavements, such as primary runways, primary taxiways, and primary aprons
- S – or Secondary pavements, such as secondary runways, secondary taxiways, and secondary aprons
- T – for Tertiary pavements such as "T' hangars and slightly used aprons

Reconstruction – Reconstruction includes removal of existing pavement, preparation of subgrade, and construction of new pavement with new, or recycled materials. Reconstruction is indicated when distress types evident at the surface indicate failure in the pavement structure or subgrade of a type, and to an extent, not correctable by less extensive construction.

Rehabilitation – Rehabilitation represents construction using existing pavement for a foundation. Rehabilitation most commonly consists of an overlay of existing pavement with a new asphalt or concrete surface. Recently, technology has expanded the options to include recycling of existing pavement, and incorporating engineering fabrics or thin layers of elasticized materials to retard reflection of distress types through the new surface.

Sample Unit – Uniformly sized portions of a Section as defined in ASTM D 5340. Sample units are a means to reduce the total amount of pavement actually surveyed using statistics to select and survey enough area to provide a representative measure of Section PCI. Sample Unit sizes are 5,000 ± 2,000 square feet for AC-surfaced pavements and 20 ± 8 slabs for PCC-surfaced pavements.

Section – (Feature in prior system) - Sections subdivide Branches into portions of similar pavement. Sections are prescribed by pavement structure, age, condition and use. Sections are identified on the airport Network Definition. They are the smallest unit used for determining M&R requirements based on condition.

Section ID – A short form identification for the pavement Section that maintains the original AirPAV identification where 100 series through 3000 series sections are taxiways, 4000 and 5000 series sections are aprons (the 5000 series represent run-up aprons and turnarounds), and 6000 series sections are runways.

Use – In MicroPAVER use is the term for the function of the pavement area. This is either Runway, Taxiway, or Apron for purposes of the FDOT Statewide Aviation Pavement Management System.

2. INTRODUCTION

The State of Florida has more than 100 public airports that are vital to the Florida economy as well as the economy of the United States. These public airports range from small general aviation airports to large international hub airports. These airports serve business travelers, tourism, and cargo operations crucial to the daily life of the people of Florida.

There are millions of square yards of pavement for the runways, taxiways, aprons and other areas that support aircraft operations. The timely and proper maintenance and rehabilitation (M&R) of these pavements allows the airports to operate efficiently, economically and without excessive down time. In order to support the planning, scheduling, and design of the M&R activities, FDOT has implemented pavement management system technology. FDOT has evaluated the use of proprietary software Micro PAVER a industry standard software developed by the U.S. Army Construction Engineering Research Laboratories (CERL). Micro PAVER was used during the current 2006/2007 inspection program. This software package, the Micro PAVER Pavement Management System, optimizes the use of pavement repair funds. The system uses used Microsoft ACCES database, and GIS software developed by ESRI (Arcview), and state-of-the-art engineering techniques to optimize the use of pavement repair funds based on current and predicted pavement conditions, which are determined by using the PCI.

This report describes the procedures used to develop the appropriate engineering and scientific standards of care, quality, budget, and schedule requirements implemented at 85 airports statewide as a result of their participation in the Statewide Aviation Pavement Management Program.

2.1 Purpose

This Executive Summary Report is intended to:

- Describe, briefly, the Florida Department of Transportation (FDOT) Aviation Office Statewide Pavement Management Program and the roles and responsibilities of the program's participants
- Provide background information on pavement management principles, objectives, and benefits to the participating airports
- Outline the procedures used to collect, evaluate and report pavement inspection results at the participating airports
- Summarize the findings from the inspection and analysis of the needs for maintenance and rehabilitation activities for all participating airports.

2.2 FDOT Aviation PMS Program

In 1992, FDOT implemented a Pavement Management System (PMS) program to improve the knowledge of pavement conditions at public airports in the State system, identify maintenance needs at individual airports, automate information management, and establish standards to address future needs.

The FDOT Aviation Office participated in the development of a proprietary software pavement management system and developed and populated a pavement management database that provided valuable information for establishing M&R policies, estimating M&R costs, and developing recommendations for performing routine pavement maintenance. This system was

implemented and condition surveys performed in 1992 and 1993 and again updated in 1998 and 1999. The proprietary system, AIRPAV, is no longer supported.

In 2004, the FDOT Aviation Office undertook a project to update the PMS Program software utilized for the PMS program. The Aviation Office selected a consultant team consisting of URS Corporation, Inc., MACTEC Engineering and Consulting, Inc. (MACTEC), Planning Technology, Inc. (PTI), and ASC Geosciences, Inc. (ASCG) to aid with the implementation of the program update. This project involved a review of the AIRPAV software and other available PMS software. As a result of this review, MicroPAVER was selected as the software for the update project. Condition data from the 1998/1999 surveys were converted to the MicroPAVER system.

The inventory of the pavement systems and drawings of the pavements were updated to reflect maintenance, rehabilitation, and construction activities since 1998/1999 to the extent that information was available. Detailed, specific procedures for the inspection and collection of pavement data were developed for this project. A web-site (www.floridaairportpavement.com) was developed for the input of data under secure procedures. The site also has a public section for dissemination of information to the general public.

2.3 Organization

The FDOT Aviation Office manages the day-to-day details of the Statewide PMS and the updates. The Aviation Office Airport Engineering Manager serves as the Program Manager (PM) monitoring the work of the Consultant. The Aviation Office has review and approval authority for each program task.

2.3.1 *Consultant Role*

The Consultant (MACTEC Engineering and Consulting/URS Corporation/Planning Technology/ASC Geosciences) developed the PMS based upon procedures outlined in FAA Advisory Circular 150/5380-6B Guidelines and Procedures for Maintenance of Airport Pavements (FAA/AC) and ASTM D 5340 Standard Test Method for Airport Pavement Condition Index Surveys (2004).

The Consultant provided technical and administrative assistance to the Aviation Office PM, during the execution of this program, which involves the continuing evaluation of airport pavements and updating of the PMS. A website is available to view and update airport information, including construction activities and pavement condition data. In addition, pavement evaluation reports will be available for viewing and download from the site (www.floridaairportpavement.com).

2.3.2 *Airport Role*

The airports are the ultimate client for each of the field inspections and reports. Individual airports were provided final deliverables prepared by the Consultant on behalf of the FDOT Aviation office that have been reviewed and approved by the FDOT Aviation Office. The airport should review system inventory drawings in their folder in the pavement management website and add maintenance and rehabilitation activities conducted on airside pavements on the website system inventory form.

2.4 Pavement Types and Pavement Management

2.4.1 *Pavement basics*

A pavement is a prepared surface designed to provide a continuous smooth ride at a certain speed and to support an estimated amount of traffic for a certain number of years. Pavements are constructed of a combination of subgrade soils, subbases, bases and surfacing. There are mainly three types of pavements;

- Flexible pavement, including asphalt concrete (AC) pavement and asphalt overlay over asphalt concrete pavement (AAC),
- Rigid pavement or Portland cement concrete (PCC) surface, and
- Composite pavement or asphalt over PCC pavement (APC).

All three pavement types use a combination of layered materials and thicknesses in order to support the traffic loads and protect the underlying subgrade soil. Flexible pavements (AC) dissipate the load from layer to layer until the load magnitude is small enough to be supported by the subgrade soil. In rigid pavements (PCC), the Portland cement concrete supports most of the load, the base or subbase layer is mainly constructed to provide a smooth and continuous platform for the concrete.

Due to the different nature of both pavement types and their materials, flexible and rigid pavements have different distresses and failure mechanisms. Understanding the mechanics and failure modes of both pavement types will assist engineers in making adequate and long lasting repairs or rehabilitation to the pavement structures.

2.4.2 *Pavement Management System Concept*

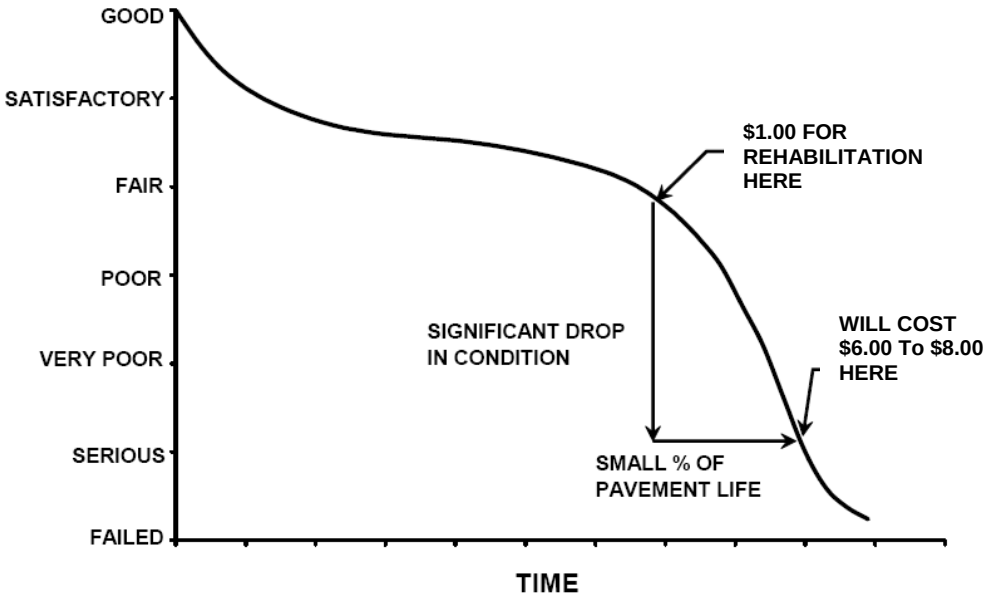
A pavement management system (PMS) is a tool to assist engineers, planners and managing agencies in making decisions when planning pavement M&R. The management of pavements involves scheduling pavement maintenance and rehabilitation before pavements deteriorate to a condition where reconstruction (the most expensive alternative) is the only solution. Figure 2-1, taken from FAA/AC 5380-7A Pavement Management System, illustrates how a pavement generally deteriorates and the relative cost of rehabilitation at various times throughout its life. Note that during the first 75 percent of a pavement's life, it performs relatively well. After that, however, it begins to deteriorate rapidly.

The number of years a pavement stays in "Satisfactory" condition depends on how well it is maintained. The illustration demonstrates the cost of maintaining the pavement above a critical condition before rapid deterioration occurs is much less compared to maintaining pavements after substantial deterioration has occurred.

Pavements deteriorate at an accelerated rate with increasing traffic and limited M&R resources. Planned maintenance and rehabilitation, essentially preventing pavements from reaching deteriorated conditions, helps managers/owners/ agencies stretch and maximize the use of their budgets and prolong the life of the pavements. A PMS provides a tool to schedule and plan maintenance and rehabilitation based on engineering information and existing and predicted conditions of pavements.

There are several components or elements that are essential to a PMS. The first steps in the implementation of a PMS are to know and clearly identify what needs to be managed, the limits of the managing agency's responsibilities and the condition of the existing pavements. Once the cause and the extent of pavement problems are known, the appropriate maintenance and/or rehabilitation can be planned. By using local unit costs and expected yearly budgets, a multi year M&R plan can be developed.

Figure 2-1: Pavement Life Cycle



Pavements deteriorate even if they do not carry any traffic. Pavement distresses may be attributed to climate, environment, materials, construction or traffic. Knowing the cause, extent and predominance of pavement distresses helps determine the most appropriate maintenance or rehabilitation work needed. Planning and applying preventive maintenance prolongs pavement life and minimizes future pavement repair costs. By projecting the rate of deterioration, a life cycle cost analysis can be performed for various alternatives, and the optimal time of application of appropriate feasible alternatives can be determined. Such a decision is critical in order to avoid higher M&R costs at a later date.

A PMS enables the managing agency to identify and maintain the pavement conditions, keeping them at the upper end of the service life-condition curve. At this point, the total annual costs between maintaining a good pavement above a critical condition is much less than rehabilitating a poor pavement that has rapidly deteriorated beyond a critical condition level.

A PMS is a long-term planning tool that will result in an overall improvement of the pavement network condition and will also result in savings by applying the appropriate maintenance and rehabilitation activity at the appropriate time. Accurate estimates and timely M&R decisions and budgeting are of great importance when managing approximately 300 million square feet of Florida aviation pavements.

2.4.3 *Pavement Inspection Methodology for PMS*

Pavement condition assessment is one of the primary decision variables in any airport pavement management system. Pavement condition assessments generally include visual surveys in accordance with ASTM D 5340, *Standard Test Method for Airport Pavement Condition Index Surveys* and structural evaluation. Pavement condition surveys assess the functional condition of the pavement surface. Typically, most problems within a pavement structure will eventually reflect to the pavement surface. The structural condition and relative support of the pavement layers can be assessed utilizing non-destructive deflection testing (NDT) as well as other in-depth engineering evaluation or sampling and testing methods.

Pavement sections are broken down into sample units as established in FAA AC 150/5380-6B and ASTM D 5340. Sample unit sizes are approximately 5000 ± 2000 square feet (3000 to 7000 square feet) for AC-surfaced pavements and 20 ± 8 slabs (12 to 28 slabs) for PCC-surfaced pavements. Before the field inspections, the sampling plan was developed based on previous sampling and modified based on the available knowledge of branches, sections, use patterns, construction types and history. The sampling rate used for FDOT Statewide Pavement Management Program is provided in Table 2-1 below.

Table 2-1: Sampling Rate for FDOT Condition Surveys

AC Pavements			PCC Pavements		
N	N		N	n	
	Runway	Others		Runway	Others
1-4	1	1	1-3	1	1
5-10	2	1	4-6	2	1
11-15	3	2	7-10	3	2
16-30	5	3	11-15	4	2
31-40	7	4	16-20	5	3
41-50	8	5	21-30	7	3
≥51	20% but ≤20	10% but ≤10	31-40	8	4
			41-50	10	5
			≥51	20% but ≤20	10% but ≤10

Where *N = total number of sample units in section*
n = number of sample units to inspect

The sample units to inspect are determined by a systematic random sampling technique. This means that the locations are determined such that they are distributed evenly throughout the section. In the case when non-representative distresses are observed in the field, additional sample units were added.

The distress quantities and severity levels from the sample units are used to compute the PCI value for each section. PCI values range from 0 to 100. MicroPAVER provides a rating scale that relates PCI to pavement condition, with a PCI between 0 and 10 considered 'Failed' pavement and a PCI between 86 and 100 considered 'Good' pavement, with five other conditions for PCI values between 11 and 85. Figure 2-2 shows the PCI scale.

Figure 2-2: PCI Rating Scale

3. NETWORK DEFINITION

Eighty five airports statewide participating in the Statewide Aviation Pavement Management Program were included in the 2006/2007 inspection. These airports are summarized by category and by district in Table 3-1.

Table 3-1: Number of Participating Airports by Category

District	Category			Total
	Primary (PR)	*Reliever (RL)*	*General Aviation (GA)*	
1	2	1	16	19
2	2	4	8	14
3	2	-	9	11
4	1	5	5	11
5	3	5	9	17
6	1	3	2	6
7	1	2	4	7
Total	**12**	**20**	**53**	**85**

The pavements within each participating airport network are defined in MicroPAVER in terms of manageable units that help to organize the data into similar groups. An organizational hierarchy is used to establish these units. The airport pavement network is subdivided into separate branches/facilities (runways, taxiways, or aprons) that have distinctly different uses. Branches are then divided into sections/feature with similar pavement construction and performance that may share other common attributes. Sections are manageable units used to organize the data collection and are treated individually during the rehabilitation planning stage. Sections are further divided into sample units. The sample unit sizes are 5,000 ± 2,000 square feet for AC-surfaced pavements and 20 ± 8 slabs for PCC-surfaced pavements. Sample units are base units for the condition surveys.

For each participating airport the network definition was used to identify changes in the network since the most recent update in 1998/1999 and also to plan the field inspection activities for 2006/2007 surveys. Prior to the field inspection process, each network definition drawing was updated. The purpose of this update is to compare the previous airport configuration and history with the current airport configuration and history and update the drawing showing network branch, section and sample unit designations to match the current configuration. This drawing serves not only as a primary guide for the airfield inspectors but also as an important history record.

The updated network definition fields and network definition drawings for each participating airport are included in Appendix A of the individual airport report.

Tables/Figures Prepared by VVD, Checked by TH

4. PAVEMENT INVENTORY

The detailed pavement inventory was updated to reflect the network definition update and field inspection results.

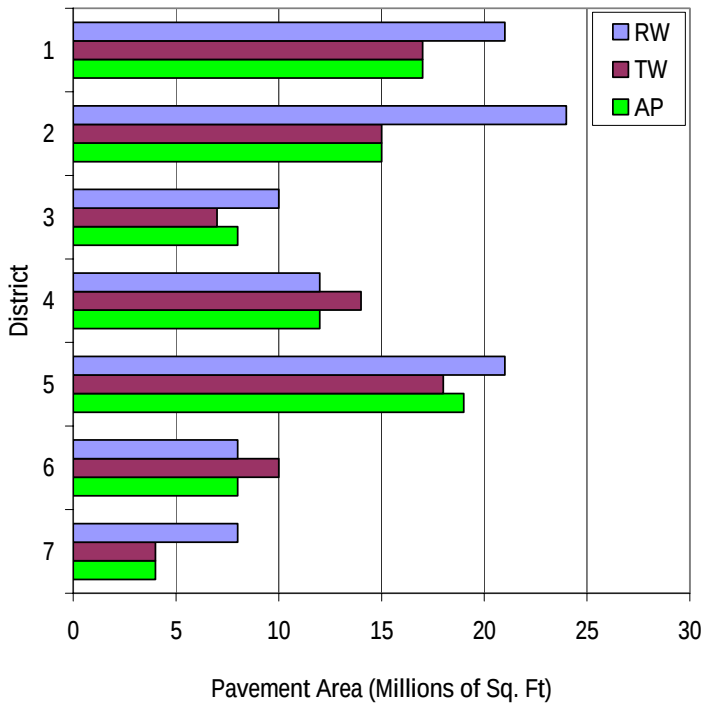
The total pavement area in 2006/2007 for participating airports is approximately 272 million square feet. The breakdown of pavement area for each pavement use by district is provided in Table 4-1.

Table 4-1: Pavement Area by Pavement Use

Use	Area (Millions of Sq. Ft)							
District	1	2	3	4	5	6	7	Total
Runway	21	24	10	12	21	8	8	104
Taxiway	17	15	7	14	18	10	4	86
Apron	17	15	8	12	19	8	4	82
Total	55	54	25	38	58	26	16	272

Figure 4-1 presents the breakdown of the pavement area by pavement use by district.

Figure 4-1: Pavement Area by Use



Details of pavement section information including section dimensions, rank, surface type, last construction date and last inspection date are given in Appendix A of each individual airport report.

Tables/Figures Prepared by VVD, Checked by TH

5. PAVEMENT CONDITION

Pavement conditions were inspected in accordance with the methods outlined in FAA AC 150/5380-6B and ASTM D 5340 "Standard Practice for Airport Pavement Condition Index Surveys." These procedures define distress type, severity and quantity for sampling areas within each section to determine the Pavement Condition Index (PCI).

Pavement condition inspections for the participating airports in state of Florida were performed in 2006/2007. Data were recorded in the field using hand-held PDA (personal digital assistant) technology. The identifying information for each sample unit was pre-loaded into the PDA, and the survey results were entered directly, at the time of inspection. This simplified data handling and management.

During the inspections Global Positioning System (GPS) coordinates were recorded at the centroid of each sample unit. The centroid is usually the geometric center of the area but in cases where sample units are irregular in shape this is the center of mass. These data are presented in tables on updated Network Definition drawings available from the website.

After the completion of data collection, the data were imported into MicroPAVER and PCI values were calculated for the pavement sections.

According to the 2006/2007 survey, the overall area-weighted PCI for the participating airports is 73, representing a Satisfactory overall network condition.

Table 5-1 and Figure 5-1 provide the PCI distribution by rating and surface type category for each district.

Table 5-1: Airport Pavement PCI by Use and Rating Category

District	Area-Weighted PCI						District Average	
	RW		TW		AP			
	PCI	Rating	PCI	Rating	PCI	Rating	PCI	Rating
1	75	Satisfactory	78	Satisfactory	72	Satisfactory	75	Satisfactory
2	70	Fair	79	Satisfactory	74	Satisfactory	74	Satisfactory
3	80	Satisfactory	76	Satisfactory	66	Fair	74	Satisfactory
4	73	Satisfactory	75	Satisfactory	71	Satisfactory	73	Satisfactory
5	72	Satisfactory	72	Satisfactory	67	Fair	70	Fair
6	77	Satisfactory	80	Satisfactory	72	Satisfactory	77	Satisfactory
7	67	Fair	62	Fair	68	Fair	66	Fair
Statewide	**73**	**Satisfactory**	**76**	**Satisfactory**	**70**	**Fair**	**73**	**Satisfactory**

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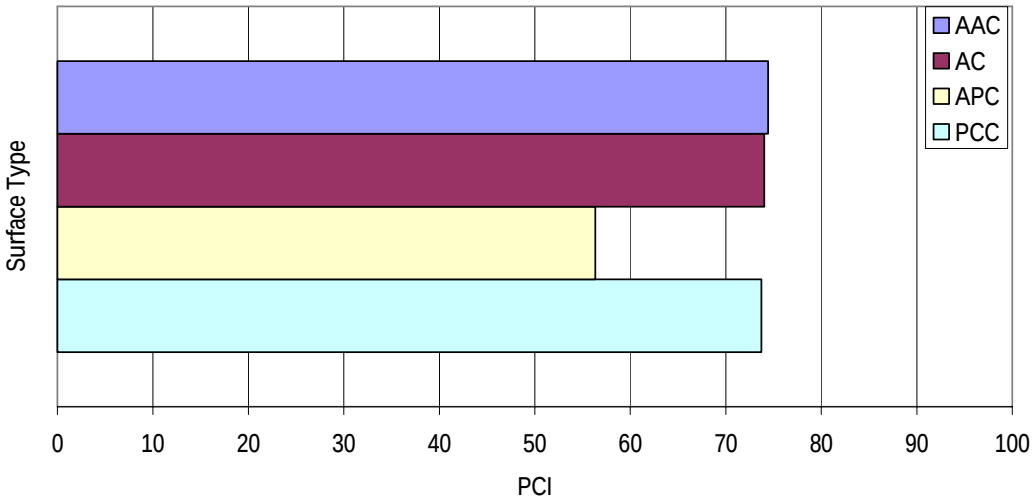
Figure 5-1: PCI by Surface Type



On average, the runways and taxiways are in Satisfactory condition while the aprons are in Fair condition.

Appendix A provides the detailed condition table by district and the condition map by airport.

Tables/Figures Prepared by VVD, Checked by TH

6. PAVEMENT CONDITION PREDICTION

Performance prediction models or deterioration curves for PCI were used to develop a condition forecast. The performance models were developed for combinations of variables such as pavement use (runway, taxiway or apron), surface type (AC or PCC) and airport category (GA, RL, or PR). Figures 6-1 to 6-3 illustrate the predicted performance of pavements at participating airports based on current (measured) condition, age since last construction and the deterioration model appropriate for the type of pavement. The figure presents the forecast for each pavement use and displays the FDOT minimum condition criteria for the airport category.

Figure 6-1: Predicted PCI for GA Airports by Pavement Use – Statewide

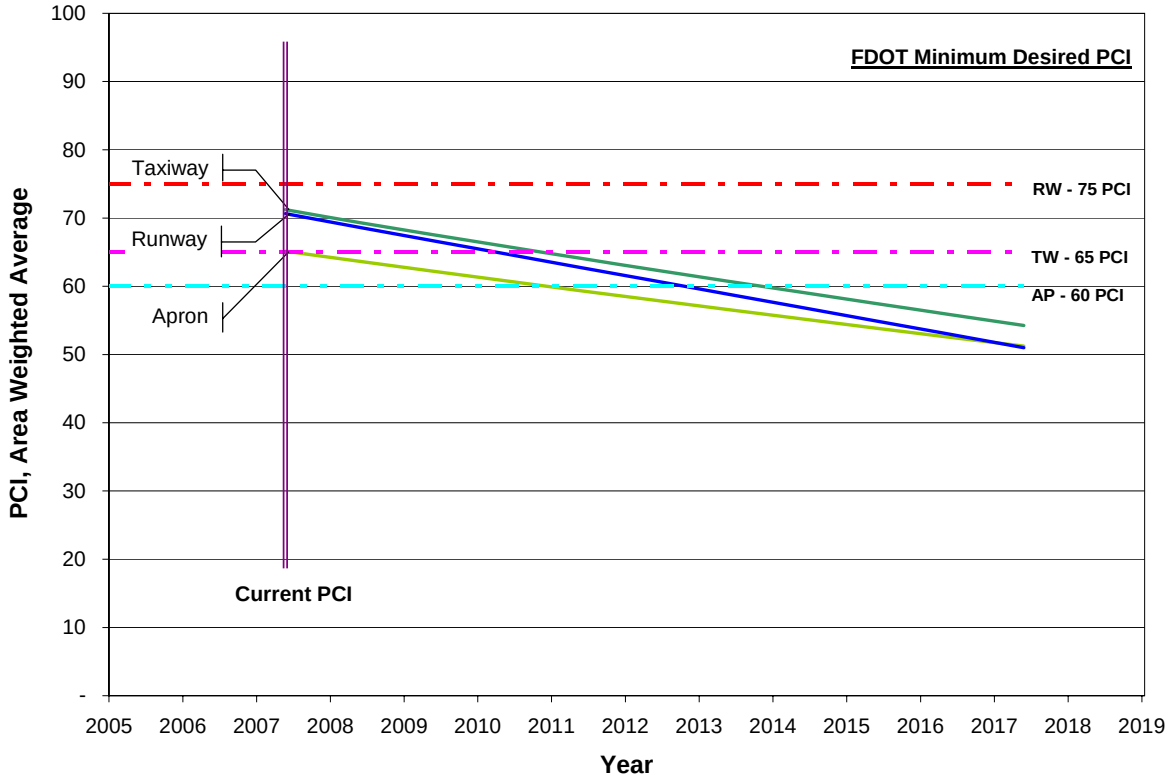


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Figure 6-2: Predicted PCI for RL Airports by Pavement Use – Statewide

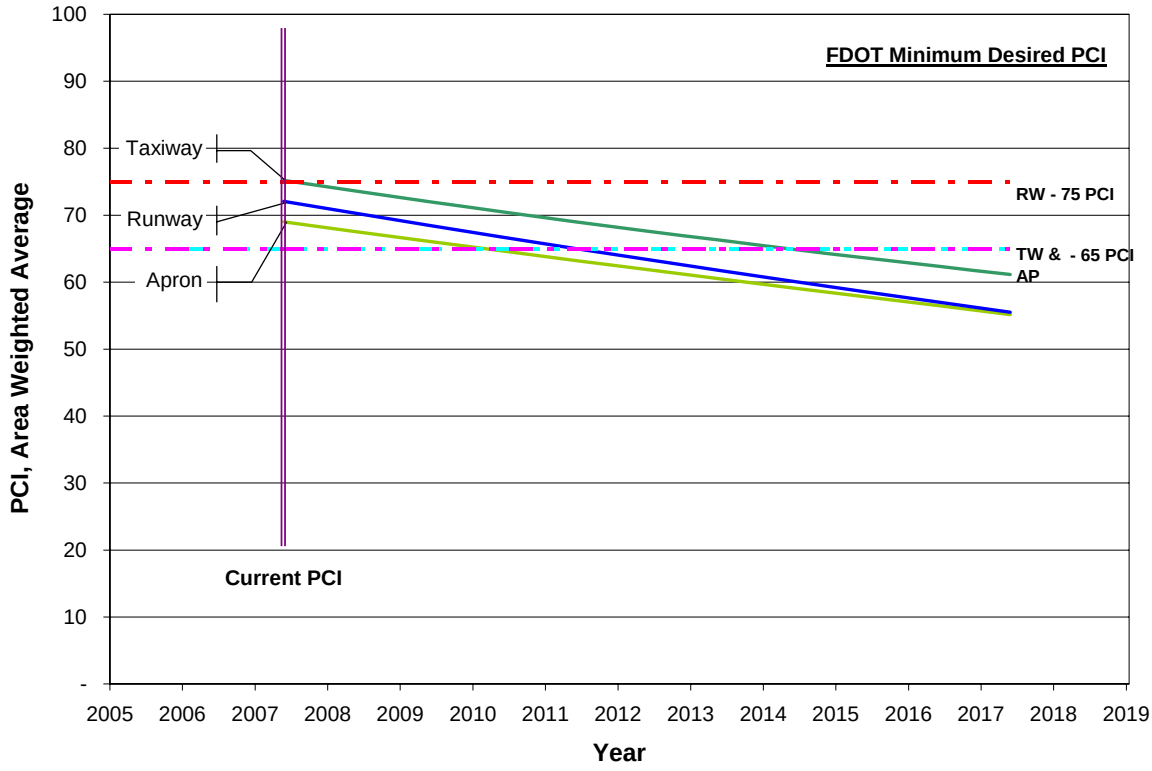
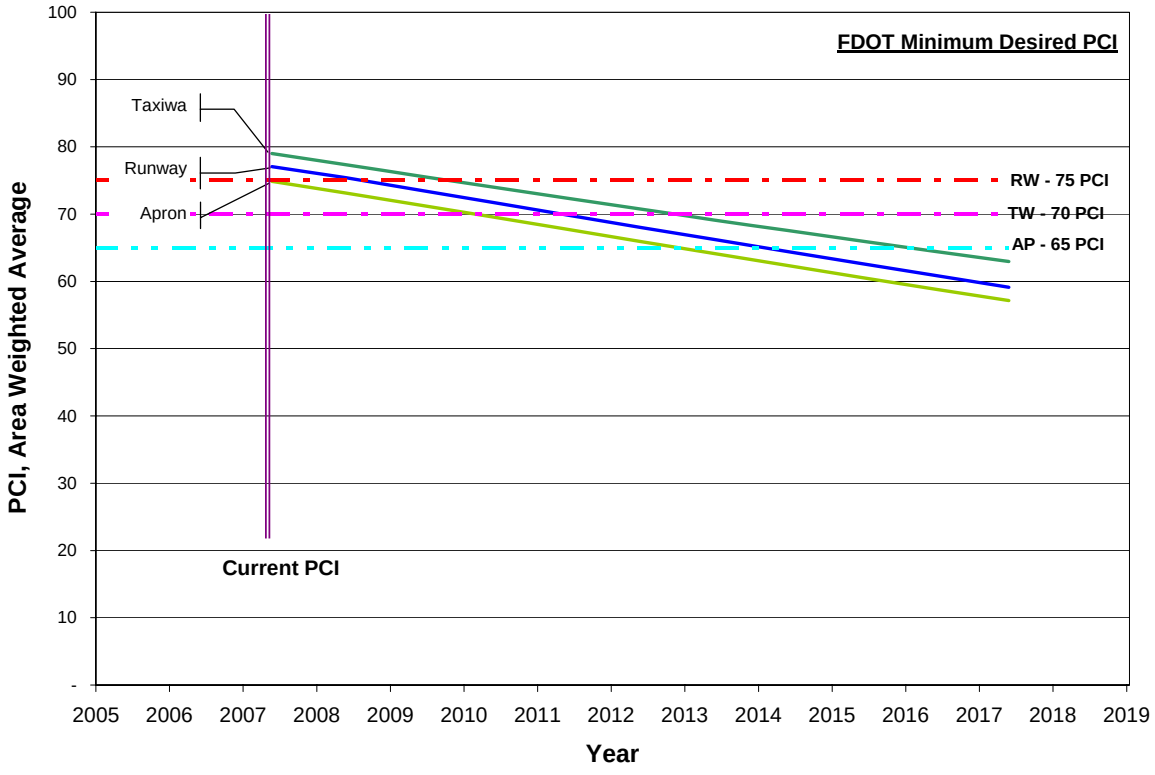


Figure 6-3: Predicted PCI for PR Airports by Pavement Use – Statewide



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7. MAINTENANCE POLICIES AND COSTS

7.1 Policies

Maintenance and rehabilitation (M&R) policies are sets of rules used to develop repair recommendations for distresses encountered during the visual inspections.

Maintenance refers to repair-type activities that are applied to specific distress types on the pavement. These activities are preventative and/or corrective in nature, and are recommended to help achieve the performance goal.

Table 7-1 provides the list of the maintenance activities used in MicroPAVER to treat specific distress types. These repairs are used in an analysis only if there is an inspection within one year prior to the first year of the analysis period. MicroPAVER applies repairs to these distresses and adjusts the PCI based on specific rules.

Table 7-1: Routine Maintenance Activities for Airfield Pavements

Surface	Distress	Severity*	Work Type	Code	Work Unit
AC	Alligator Crack	M, H	Patching - AC Deep	PA-AD	SqFt
	Bleeding	N/A	No Localized M&R	NONE	SqFt
	Block Crack	M, H	Crack Sealing – AC	CS-AC	SqFt
	Corrugation	L, M, H	Patching - AC Deep	PA-AD	SqFt
	Depression	M, H	Patching - AC Deep	PA-AD	SqFt
	Jet Blast	N/A	Patching - AC Deep	PA-AD	SqFt
	Joint Ref. Crack	M, H	Crack Sealing – AC	CS-AC	Ft
	L & T Crack	M, H	Crack Sealing – AC	CS-AC	Ft
	Oil Spillage	N/A	Patching - AC Shallow	PA-AS	SqFt
	Patching	M, H	Patching - AC Deep	PA-AD	SqFt
	Polished Agg.	N/A	No Localized M&R	NONE	SqFt
	Raveling	L	Surface Sealing - Rejuvenating	SS-RE	SqFt
		M	Surface Seal - Coal Tar	SS-CT	SqFt
		H	Microsurfacing	MI-AC	SqFt
	Rutting	M, H	Patching - AC Deep	PA-AD	SqFt
	Shoving	M, H	Grinding (Localized	GR-LL	SqFt
	Slippage Crack	N/A	Patching - AC Shallow	PA-AS	SqFt
	Swelling	M, H	Patching - AC Deep	PA-AD	SqFt
PCC	Blow-Up	L, M, H	Patching - PCC Full Depth	PA-PF	SqFt
	Corner Break	M, H	Patching - PCC Full Depth	PA-PF	SqFt
	Linear Crack	M, H	Crack Sealing – PCC	CS-PC	Ft
	Durability Crack	H	Slab Replacement – PCC	SL-PC	SqFt
		M	Patching - PCC Full Depth	PA-PF	SqFt
	Jt. Seal Damage	M, H	Joint Seal (Localized)	JS-LC	Ft
	Small Patch	M, H	Patching - PCC Partial Depth	PA-PP	SqFt
	Large Patch	M, H	Patching - PCC Full Depth	PA-PF	SqFt
	Popouts	N/A	No Localized M&R	NONE	SqFt
	Pumping	N/A	No Localized M&R	NONE	SqFt
	Scaling	H	Slab Replacement – PCC	SL-PC	SqFt
	Faulting	M, H	Grinding (Localized)	GR-PP	Ft
	Shattered Slab	M, H	Slab Replacement – PCC	SL-PC	SqFt
	Shrinkage Crack	N/A	No Localized M&R	NONE	Ft
	Joint Spall	M, H	Patching - PCC Partial Depth	PA-PP	SqFt
	Corner Spall	M, H	Patching - PCC Partial Depth	PA-PP	SqFt

*L = Low, M = Medium, H = High

Source: FAA AC 150/5380-6A

Tables/Figures Prepared by VVD, Checked by TH

Rehabilitation is warranted when the pavement condition decreases below a critical point such that the deterioration is extensive or rate of deterioration is so great that routine maintenance is no longer cost-efficient. This condition is called "Critical PCI." The Critical PCI levels for different pavement and branch types established in Phase I of Statewide Pavement Management Program were reviewed and updated for development of the M&R plan for the participating airports. Sections above critical PCI levels receive routine maintenance while pavements predicted to deteriorate below their respective critical PCI level during the analysis period will be identified for Major M&R. Based on analysis of the existing conditions and the cost of repairs, the Critical PCI levels for all pavements was determined to be 65.

It should be noted that critical PCI is not the same as Minimum PCI or Minimum Condition. The Minimum PCI is a value set by the user so pavement sections are rehabilitated before they fall below the set minimum. Table 7-2 gives the targeted, or desired, Minimum PCI values for runways, taxiways, and aprons of the three categories of airports.

Table 7-2: Desired Minimum PCI for Airports By Pavement Use

Use	Minimum PCI		
	GA	RL	PR
Runway	75	75	75
Taxiway	65	65	70
Apron	60	65	65

Typical Major M&R activities range from overlays to reconstruction. Based on the critical PCI values of 65 and our experience with pavement management systems, the PCI range when the likely activity would be a mill and resurface was 31 to 55 and reconstruction at a PCI of 30 or lower. One important concept of pavement management systems is that it is cost effective to maintain pavements that are already in good condition rather than wait for them to get worse and require more expensive rehabilitation. With this objective, microsurfacing has been recommended to maintain pavements that have a PCI from 56 and 79. Microsurfacing is a surface treatment suggested for pavements in Fair to Satisfactory condition to extend the pavement life by five to seven years.

Crack sealing and full-depth patching are the M&R activities recommended to repair pavements with PCI values between 80 and 90. MicroPAVER considers these as preventative M&R with their primary objective being to slow the rate of pavement deterioration. While the maximum PCI for mill and overlay has been set to 55, MicroPAVER also assigns mill and overlay to sections with a PCI greater than 55 if they exhibit some structural distress. Table 7-3 summarizes the M&R activities for the three categories of airports based on PCI value.

Table 7-3: M&R Activities for Airports

	Activity	PCI Range
Maintenance	Crack Sealing and Full-Depth Patching	80 and 90
Rehabilitation	Microsurfacing (AC) or Concrete Pavement Restoration (PCC)	56 to 79
	Mill and Overlay (AC) or Concrete Pavement Restoration (PCC)	31 to 55
	Reconstruction	30 and less

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7.2 Unit Costs

FDOT cost databases for airports and highway pavement maintenance and rehabilitation were reviewed in Phase I of Statewide Pavement Mangement Program in order to determine meaningful costs for the program. Table 7-4 presents the unit costs summary.

Table 7-4: Maintenance Unit Costs for FDOT

Code	Name	Cost	Unit
PA-AL	Patching – AC Leveling	$2.00	SqFt
PA-AS	Patching – AC Shallow	$4.00	SqFt
PA-PF	Patching – PCC Full Depth	$50.00	SqFt
PA-PP	Patching – Partial Depth	$35.00	SqFt
SL-PC	Slab Replacement	$15.00	SqFt
CS-PC	Crack Sealing – PCC	$2.00	Ft
UN-PC	Undersealing – PCC	$3.00	Ft
CS-AC	Crack Sealing – AC	$2.00	Ft
GR-PP	Grinding (Localized for PCC)	$20.00	Ft
GR-LL	Grinding (Localized for AC)	$6.00	SqFt
JS-LC	Joint Seal (Localized)	$1.75	Ft
JS-SI	Joint Seal – Silicon	$2.50	Ft
PA-AD	Patching – AC Deep	$7.00	SqFt
OL-AT	Overlay – AC Thin	$1.50	SqFt
SS-CT	Surface Seal – Coal Tar	$0.20	SqFt
SS-RE	Surface Seal – Rejuvenating	$0.15	SqFt
ST-SS	Surface Treatment – Slurry Seal	$0.25	SqFt
ST-ST	Surface Treatment – Sand Tar	$0.25	SqFt
MI-AC	Microsurfacing	$0.90	SqFt

Source: Florida local costs

The improvement in condition due to maintenance actions applied to specific distresses is only performed when an inspection is recent and only in the first year of the M&R analysis. In subsequent years MicroPAVER calculates M&R costs based on expected unit costs for pavements in a range of PCI. That is, for low PCI it is expected that the repair would be significant (e.g. reconstruction) and therefore very costly. Using available unit cost data the Major M&R Cost By Condition table was set up as shown in Table 7-5. The cost assigned to each range of PCI is based on a Transportation Cost Report provided by Office of Planning Policy of FDOT where the unit costs of reconstruction and resurfacing of airfield pavements were included. These costs were then assigned to the appropriate PCI range to arrive at a cost per square foot necessary to restore pavements at that PCI level to new condition, i.e. a PCI of 100.

A 3% inflation rate per year was applied to the unit costs during the M&R analysis.

Table 7-5: M&R Activities and Unit Costs by Condition for Airports

	Activity	PCI Trigger	Cost/SqFt		
			GA	RL	PR
Maintenance	Crack Sealing and Full-Depth Patching	90	$0.06	$0.10	$0.20
		80	$0.24	$0.40	$0.80
Rehabilitation	Microsurfacing (AC) or Concrete Pavement Restoration (PCC)	70	$0.69	$0.90	$1.40
		60	$3.42	$3.68	$4.23
	Mill and Overlay (AC) or Concrete Pavement Restoration (PCC)	50	$6.29	$7.61	$8.55
		40	$6.29	$7.61	$8.55
	Reconstruction	30	$13.62	$18.57	$20.88
		20	$13.62	$18.57	$20.88

Source: Transportation Cost Report provided by Office of Planning Policy of FDOT

8. PAVEMENT REHABILITATION NEEDS ANALYSIS

Maintenance and Rehabilitation (M&R) analyses were performed after the condition data were calculated and MicroPAVER was customized with the maintenance policies and cost settings described in the previous section.

The objective of the M&R analysis is to observe the effect of different fiscal scenarios on the network condition, over a period of ten years. The analysis was conducted using an unlimited budget. An unlimited budget allows all M&R needs to be identified along with the associated cost regardless of priority.

Table 8-1 presents the cost of immediate M&R needs, those that occur in Year 1 of the forecast. The importance of this listing is that it points out the major activities triggered by the current condition of the pavements.

Table 8-1: Summary of Immediate Major M&R Needs

District	Avg PCI - Before M&R	Immediate M&R Total **	Avg PCI -1st Year After M&R
1	75	$119,560,000	90
2	74	$128,394,000	88
3	74	$54,930,000	88
4	73	$75,505,000	88
5	70	$191,347,000	90
6	77	$34,242,000	86
7	66	$62,665,000	92
Statewide	**73**	**$666,643,000**	**89**

* This table shows the area-weighted PCI before and after Major M&R and routine maintenance work for the first year of the 10-year plan. It includes all airports participating in the program.
** Cost figures are rounded to nearest $1000. Sum may be different. Costs are adjusted for inflation.

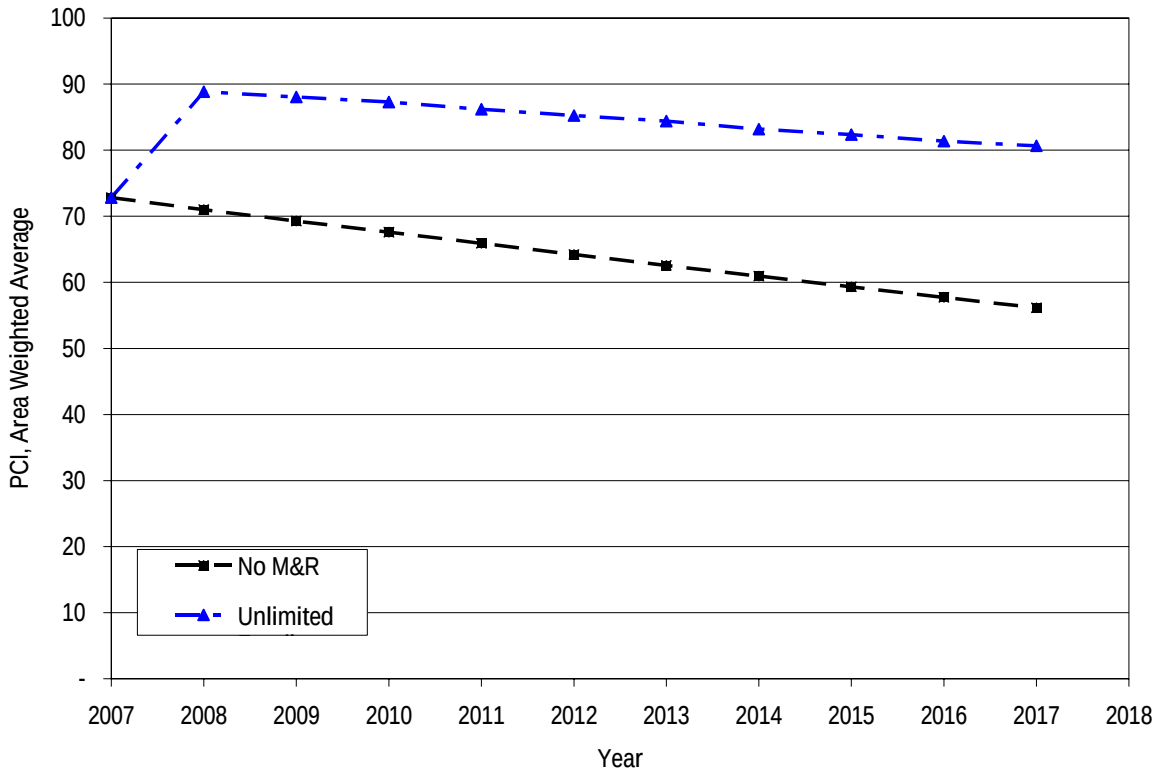
The 10 year forecast results are shown in Figure 8-1, illustrating the effect on pavement condition (PCI) of doing no maintenance versus having unlimited funds and performing all M&R actions based on the policies.

The following network level observations can be made from Figure 8-1:

- The average PCI for airports in state will deteriorate from 73 to 56 in ten years if no M&R activities are performed.
- The PCI will remain at or above 81 through the 10-year analysis period under the unlimited budget scenario. A 2017 PCI of 81 with this scenario is 25 PCI points higher than a "No M&R" scenario. The total cost for Major M&R over this 10-year period is about $854 million.

Tables/Figures Prepared by VVD, Checked by TH

Figure 8-1: Budget Scenario Analysis



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9. MAINTENANCE AND REHABILITATION PLAN

The M&R analysis results provide a list of all M&R needs without regard to budget levels. These activities would need to be evaluated for feasibility and desirability based on the State and District's future plans. In an effort to identify appropriate budget levels the 10 year M&R analysis was evaluated to determine levels needed to address several specific areas: preventive maintenance, major activities for pavements in poor condition (Major M&R for PCI less than Critical), and activities that would be desirable to preserve good pavement conditions where they exist (Major M&R for PCI greater than or equal to Critical).

Table 9-1 provides the summary of these results for the participating airports.

Approximately 79% of the total Major M&R cost is required in the first year (2008). This is a consequence of many large areas of pavement being below Critical PCI.

The unlimited budget scenario provides the basis for estimating the total repair cost. In reality, it is neither operationally nor fiscally prudent.

Appendix B provides M&R summary by district under the unlimited funding scenario. Appendix C provides details of major M&R plan by airport. Appendix D provides maintenance plan for the first year (2008) by airport. It is important to understand that a PMS is a network level tool and the M&R costs provided in this report are only for planning purposes.

Table 9-1: M&R Costs under Unlimited Funding Scenario

Year	Preventive	Major M&R (PCI >= Critical)	Major M&R (PCI < Critical)	Total
2008	$8,788,000	$3,026,000	$663,617,000	$675,431,000
2009	$17,671,000	$0	$23,126,000	$40,796,000
2010	$16,705,000	$0	$24,432,000	$41,137,000
2011	$18,509,000	$0	$16,601,000	$35,110,000
2012	$20,598,000	$0	$20,148,000	$40,746,000
2013	$23,009,000	$0	$21,810,000	$44,819,000
2014	$26,966,000	$0	$15,058,000	$42,023,000
2015	$29,974,000	$0	$20,416,000	$50,390,000
2016	$33,631,000	$0	$20,169,000	$53,800,000
2017	$36,687,000	$0	$25,414,000	$62,101,000
Total	**$232,536,000**	**$3,026,000**	**$850,791,000**	**$1,086,353,000**

Note: Cost figures are rounded to nearest $1000. Sum may be different. Costs are adjusted to inflation

10. VISUAL AIDS

10.1 GIS Linked Shape File

The pavement inventory data and pavement condition were linked to the airport's shape file to graphically show the inventory and condition of the airport via color coding shown on the shape file. The coding provides a visual representation that illustrates the PCIs for each pavement section.

During the inspections Global Positioning System (GPS) coordinates were recorded at the centroid of each sample unit. The centroid is usually the geometric center of the area but in cases where sample units are irregular in shape this is the center of mass. These data are presented in tables on updated Network Definition drawings of each individual airport report.

Selected digital photographs taken during the pavement inspection were provided in Appendix G of each individual airport report. These photographs may provide visual support to special pavement conditions or distress observed during the inspection of the facility. As requested by the Aviation Office, these photographs are not linked to the airport's database.

11. RECOMMENDATIONS

Pavement condition inspections were performed at airports participating in the program and a 10-year M&R plan was developed based on the unlimited funding scenario.

Based on 2006/2007 condition inspections and M&R analysis results, some key M&R repair projects identified for each district for the next 3 years are:

- District 1: Runway 14-32 (Naples Municipal; APF), : Runway 18-36 (Immokalee Regional Airport; IMM), and Runway 9-27 (IMM)
- District 2: Runway 18L-36R (Cecil Field; VQQ), Runway 18R-36L (Cecil Field; VQQ), and Runway 5-23 (Craig Municipal; CRG)
- District 3: Runway 8R-26L (Marianna Municipal Airport; MAI) and Runway 5-23 (Panama City-Bay County International; PFN)
- District 4: Runway 13-31 (Fort Lauderdale International; FLL), Runway 9R-27L (FLL), and Runway 9-27 (St. Lucie County International; FPR)
- District 5: Runway 7L-25R (Daytona Beach International; DAB), Runway 18-36 (Orlando Sanford International; SFB), and Runway 9L-27R (SFB)
- District 6: Runway 18L-36R (Opa Locka; OPF) and Runway 9-27 (Dade Collier Training and Transition; TNT)
- District 7: Runway 4-22 (St. Petersburg Clearwater International; PIE) and Runway 3-21 (Hernando County; BKV)

APPENDIX A

2006/2007 CONDITION TABLES

Appendix A 2006/2007 PCI Condition Table

DISTRICT	AIRPORT	FAA	PCI			
			RW	TW	AP	Overall
1	Airglades Airport	2IS	80	79	63	75
	Naples Municipal Airport	APF	69	65	58	62
	Avon Park Executive Airport	AVO	93	73	69	84
	Bartow Municipal Airport	BOW	81	76	54	73
	Wauchula Municipal Airport	CHN	87	92	74	88
	Page Field Airport	FMY	73	80	80	78
	Winter Haven's Gilbert Airport	GIF	71	76	68	72
	Immokalee Airport	IMM	42	49	92	47
	Lakeland Linder Regional Airport	LAL	77	69	58	70
	Marco Island Airport	MKY	50	2	48	49
	Okeechobee County Airport	OBE	55	68	68	59
	Charlotte County Airport	PGD	98	81	76	87
	Southwest Florida In Airport	RSW	97	96	90	93
	Sebring Regional Airport	SEF	46	80	52	54
	Venice Municipal Airport	VNC	72	59	49	64
	Everglades Airpark	X01	53	90	92	71
	Arcadia Municipal Airport	X06	81	75	84	79
	Lake Wales Municipal Airport	X07	77	85	62	77
	La Belle Municipal Airport	X14	95	91	90	92
2	Suwannee County Airport	24J	99	95	73	90
	Palatka Municipal-Lt. Kay Larkin Field	28J	66	71	51	65
	Perry-Foley Airport	40J	49	98	56	57
	Keystone Airpark	42J	74	81	57	73
	Fernandina Beach Municipal Airport	55J	80	85	73	80
	George T. Lewis Airport	CDK	51	16	25	48
	Craig Municipal Airport	CRG	68	74	51	61
	Cross City Airport	CTY	65	69	61	66
	Gainesville Regional Airport	GNV	87	64	84	78
	Herlong Airport	HEG	70	66	58	65
	Jacksonville International Airport	JAX	96	90	87	90
	Lake City Municipal Airport	LCQ	71	73	75	73
	Cecil Field Airport	VQQ	60	75	75	68
	Williston Municipal	X60	79	59	63	75

Note – NA – Pavement type not applicable for that Airport

Appendix A 2006/2007 PCI Condition Table

DISTRICT	AIRPORT	FAA	PCI			
			RW	TW	AP	Overall
3	Tri-County Airport	1J0	81	84	97	86
	Quincy-Gadsden Airport	2J9	73	82	NA	75
	Peter Prince Field	2R4	83	92	88	88
	DeFuniak Springs Airport	54J	44	95	89	73
	Apalachicola Municipal Airport	AAF	75	69	63	71
	Bob Sikes Airport	CEW	100	81	67	87
	Destin / Fort Walton Beach Airport	DTS	71	75	70	71
	Marianna Municipal Airport	MAI	63	50	26	42
	Panama City-Bay County International Airport	PFN	68	63	76	69
	Pensacola Regional Airport	PNS	94	88	79	88
	Carrabelle-Thompson Airport	X13	93	73	88	91
4	Boca Raton Airport	BCT	61	83	96	68
	North Palm Beach County General Aviation Airport	F45	81	84	84	83
	Fort Lauderdale-Hollywood International Airport	FLL	73	74	73	73
	St. Lucie County International Airport	FPR	58	62	67	63
	North Perry Airport	HWO	81	83	NA	82
	Palm Beach County Park Airport	LNA	74	69	61	67
	Palm Beach County Glades Airport	PHK	74	89	63	76
	Pompano Beach Air Park	PMP	65	71	57	66
	Vero Beach Municipal Airport	VRB	87	82	73	80
	Belle Glade State Municipal Airport	X10	63	52	65	62
	Sebastian Municipal Airport	X26	81	71	89	81

Note – NA – Pavement type not applicable for that Airport

Appendix A 2006/2007 PCI Condition Table

DISTRICT	AIRPORT	FAA	PCI			
			RW	TW	AP	Overall
5	Merritt Island Airport	COI	85	93	76	82
	Daytona Beach Int Airport	DAB	65	71	61	66
	DeLand Municipal Airport	DED	56	62	74	64
	New Smyrna Beach Municipal Airport	EVB	53	66	64	58
	Kissimmee Gateway Airport	ISM	78	74	67	72
	Leesburg International Airport	LEE	79	77	79	78
	Melbourne International Airport	MLB	77	77	69	75
	Ocala International - Jim Taylor Field	OCF	69	67	74	70
	Ormond Beach Municipal Airport	OMN	94	59	60	76
	Orlando Executive Airport	ORL	89	67	64	70
	Orlando Sanford International Airport	SFB	60	83	70	71
	Space Coast Regional Airport	TIX	88	73	52	76
	Arthur Dunn Airpark	X21	75	70	74	73
	Umatilla Municipal Airport	X23	94	NA	95	95
	Dunnellon/Marion County & Park of Commerce Airport	X35	74	46	81	67
	Flagler County Airport	X47	66	65	63	65
	Valkaria Airport	X59	82	31	36	63
6	Key West International Airport	EYW	76	79	75	76
	The Florida Keys Marathon Airport	MTH	60	92	72	73
	Opa Locka Airport	OPF	75	76	58	71
	Kendall-Tamiami Executive Airport	TMB	94	86	85	88
	Dade-Collier Training and Transition	TNT	64	79	57	72
	Homestead General Aviation	X51	81	78	80	79
7	Hernando County	BKV	50	57	73	57
	Crystal River Airport	CGC	88	81	81	84
	Clearwater Airpark	CLW	61	60	68	63
	St. Petersburg-Clearwater International Airport	PIE	71	61	53	65
	Albert Whitted Municipal Airport	SPG	60	68	85	71
	Inverness Airport	X40	93	82	80	88
	Zephyrhills Municipal Airport	ZPH	79	61	62	73

Note – NA – Pavement type not applicable for that Airport

APPENDIX B

M&R SUMMARY BY DISTRICT

Florida Airport System M&R 10 Year Plan Summary

District 1 (in million)

Airport	FAA	2008	2009	2010	2011	2012	Five Year	2013	2014	2015	2016	2017	Ten Year
Airglades Airport	2IS	$1.67	$0.22	$0.05	$0.00	$0.13	$2.06	$0.00	$0.00	$0.10	$0.06	$0.64	$2.86
Naples Municipal Airport	APF	$22.72	$0.49	$0.78	$0.91	$1.56	$26.46	$0.63	$1.28	$0.53	$0.33	$0.00	$29.23
Avon Park Executive Airport	AVO	$1.34	$0.00	$0.04	$0.16	$0.00	$1.54	$0.33	$0.01	$0.00	$0.00	$0.00	$1.88
Bartow Municipal Airport	BOW	$8.92	$0.12	$0.24	$0.61	$0.09	$9.98	$0.19	$0.53	$0.00	$0.04	$0.00	$10.74
Wauchula Municipal Airport	CHN	$0.00	$0.00	$0.00	$0.00	$0.14	$0.14	$0.00	$0.00	$0.00	$0.00	$0.00	$0.14
Page Field Airport	FMY	$2.76	$0.28	$1.30	$0.86	$1.55	$6.74	$0.49	$0.75	$0.99	$2.01	$0.40	$11.37
Winter Haven's Gilbert Airport	GIF	$4.93	$0.42	$0.24	$0.02	$0.00	$5.61	$0.56	$0.17	$0.00	$1.42	$0.19	$7.95
Immokalee Airport	IMM	$18.45	$0.00	$0.00	$0.00	$0.00	$18.45	$0.00	$0.00	$0.00	$0.09	$0.15	$18.70
Lakeland Linder Regional	LAL	$15.04	$0.99	$1.70	$0.32	$1.77	$19.81	$0.96	$0.14	$0.04	$0.00	$0.00	$20.95
Marco Island Airport	MKY	$4.87	$0.00	$0.00	$0.00	$0.00	$4.87	$0.00	$0.00	$0.00	$0.00	$0.00	$4.87
Okeechobee County Airport	OBE	$9.35	$0.00	$0.00	$0.00	$0.00	$9.35	$0.00	$0.22	$0.00	$1.38	$0.36	$11.31
Charlotte County Airport	PGD	$1.99	$1.15	$0.00	$0.00	$0.00	$3.14	$0.00	$0.00	$0.76	$0.19	$0.88	$4.96
Southwest Florida International Airport	RSW	$1.21	$0.00	$0.04	$0.00	$0.00	$1.26	$0.00	$0.00	$0.00	$0.00	$2.16	$3.41
Sebring Regional Airport	SEF	$13.28	$0.00	$1.44	$0.00	$0.14	$14.87	$0.00	$0.09	$0.00	$0.00	$0.00	$14.96
Venice Municipal Airport	VNC	$10.15	$0.25	$0.05	$0.22	$0.00	$10.67	$0.00	$0.00	$0.03	$0.00	$0.00	$10.70
Everglades Airpark	X01	$0.52	$0.07	$0.00	$0.00	$0.00	$0.59	$0.01	$0.05	$0.00	$0.00	$0.00	$0.65
Arcadia Municipal Airport	X06	$0.20	$0.00	$0.00	$0.05	$0.00	$0.25	$0.00	$0.00	$0.00	$0.00	$0.02	$0.27
Lake Wales Municipal Airport	X07	$1.97	$0.00	$0.00	$0.01	$0.00	$1.98	$0.00	$0.00	$0.01	$0.00	$0.00	$1.99
La Belle Municipal Airport	X14	$0.20	$0.00	$0.14	$0.00	$0.00	$0.34	$0.00	$0.00	$0.00	$0.00	$0.00	$0.34
Total		$119.56	$3.99	$6.00	$3.15	$5.39	$138.09	$3.16	$3.22	$2.45	$5.53	$4.80	$157.26

Florida Airport System M&R 10 Year Plan Summary

District 2 (in million)

Airport	FAA	2008	2009	2010	2011	2012	Five Year	2013	2014	2015	2016	2017	Ten Year
Suwannee County Airport	24J	$0.08	$0.00	$0.36	$0.00	$0.00	$0.44	$0.00	$0.00	$0.00	$0.00	$0.00	$0.44
Palatka Municipal-Lt. Kay Larkin Field	28J	$7.10	$0.00	$0.30	$0.01	$0.00	$7.40	$0.02	$0.32	$0.00	$0.00	$0.29	$8.04
Perry-Foley Airport	40J	$15.51	$2.45	$0.00	$0.00	$0.00	$17.96	$0.00	$0.07	$0.00	$0.03	$0.00	$18.06
Keystone Airpark	42J	$2.00	$0.31	$1.07	$0.00	$0.00	$3.38	$0.00	$0.05	$0.62	$0.00	$0.00	$4.05
Fernandina Beach Municipal Airport	55J	$9.17	$0.03	$0.03	$0.02	$0.01	$9.25	$0.01	$0.00	$0.13	$0.00	$0.00	$9.39
George T. Lewis Airport	CDK	$1.88	$0.00	$0.00	$0.00	$0.00	$1.88	$0.00	$0.00	$0.00	$0.00	$0.00	$1.88
Craig Municipal Airport	CRG	$18.27	$0.00	$0.11	$0.03	$0.00	$18.42	$0.27	$0.05	$0.00	$0.00	$0.04	$18.78
Cross City Airport	CTY	$3.02	$0.99	$0.43	$0.11	$0.00	$4.55	$0.49	$0.05	$0.00	$0.00	$0.00	$5.08
Gainesville Regional Airport	GNV	$14.39	$0.00	$0.00	$0.08	$0.07	$14.53	$0.04	$0.02	$0.16	$0.55	$0.74	$16.04
Herlong Airport	HEG	$4.57	$0.01	$1.99	$0.00	$0.00	$6.58	$0.07	$0.03	$0.52	$0.48	$0.57	$8.24
Jacksonville International Airport	JAX	$2.01	$0.26	$0.00	$0.00	$0.27	$2.54	$0.00	$0.24	$0.00	$0.20	$1.76	$4.74
Lake City Municipal Airport	LCQ	$3.30	$0.57	$1.15	$3.62	$0.16	$8.79	$0.01	$0.04	$0.10	$0.19	$0.00	$9.13
Cecil Field Airport	VQQ	$41.63	$1.62	$0.05	$0.07	$1.55	$44.92	$0.06	$0.13	$1.20	$0.51	$1.57	$48.37
Williston Municipal	X60	$5.46	$0.01	$0.00	$0.08	$0.00	$5.54	$0.00	$0.00	$0.00	$0.00	$0.00	$5.54
Total		$128.39	$6.25	$5.49	$4.01	$2.04	$146.19	$0.96	$1.00	$2.71	$1.97	$4.97	$157.79

Florida Airport System M&R 10 Year Plan Summary

District 3 (in million)

Airport	FAA	2008	2009	2010	2011	2012	Five Year	2013	2014	2015	2016	20147	Ten Year
Tri-County Airport	1J0	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.02	$0.00	$0.02
Quincy-Gadsden Airport	2J9	$0.04	$0.01	$0.46	$0.00	$0.00	$0.51	$0.03	$0.00	$0.00	$0.00	$0.00	$0.54
Peter Prince Field	2R4	$0.18	$0.01	$0.22	$0.00	$0.00	$0.41	$0.00	$0.00	$0.90	$0.03	$0.03	$1.37
DeFuniak Springs Airport	54J	$2.89	$0.00	$0.00	$0.00	$0.00	$2.89	$0.00	$0.00	$0.00	$0.00	$0.01	$2.90
Apalachicola Municipal Airport	AAF	$4.53	$0.22	$0.00	$0.00	$0.00	$4.74	$0.70	$0.16	$0.00	$0.00	$0.02	$5.63
Bob Sikes Airport	CEW	$2.15	$0.01	$0.00	$0.00	$0.71	$2.86	$0.11	$0.00	$0.00	$0.79	$0.00	$3.77
Destin / Fort Walton Beach Airport	DTS	$0.82	$0.33	$0.04	$1.08	$0.37	$2.64	$0.40	$0.00	$0.15	$0.13	$0.43	$3.75
Marianna Municipal Airport	MAI	$27.98	$0.00	$1.27	$0.07	$0.00	$29.32	$0.00	$0.00	$0.00	$0.00	$0.00	$29.32
Panama City-Bay County International Airport	PFN	$14.67	$0.19	$2.37	$0.20	$0.73	$18.15	$0.54	$0.14	$0.10	$0.59	$0.00	$19.52
Pensacola Regional Airport	PNS	$1.64	$0.00	$0.11	$0.00	$1.31	$3.05	$0.00	$0.00	$0.00	$0.59	$0.13	$3.77
Carrabelle-Thompson Airport	X13	$0.05	$0.00	$0.00	$0.00	$0.00	$0.05	$0.00	$0.03	$0.00	$0.00	$0.00	$0.08
Total		$54.93	$0.75	$4.46	$1.35	$3.11	$64.61	$1.79	$0.33	$1.15	$2.16	$0.62	$70.65

Florida Airport System M&R 10 Year Plan Summary

District 4 (in million)

Airport	FAA	2008	2009	2010	2011	2012	Five Year	2013	2014	2015	2016	2017	Ten Year
Boca Raton Airport	BCT	$3.67	$0.19	$0.02	$0.00	$0.23	$4.11	$0.00	$0.05	$0.04	$0.00	$0.00	$4.20
North Palm Beach County General Aviation Airport	F45	$0.00	$0.00	$0.00	$0.00	$0.03	$0.03	$0.00	$0.00	$1.02	$1.39	$0.03	$2.47
Fort Lauderdale-Hollywood International Airport	FLL	$33.54	$0.92	$0.43	$1.00	$0.57	$36.46	$3.13	$0.37	$0.55	$0.25	$1.24	$41.99
St. Lucie County International Airport	FPR	$17.15	$0.08	$0.69	$0.16	$0.00	$18.08	$1.29	$0.40	$0.43	$0.00	$0.80	$21.00
North Perry Airport	HWO	$1.02	$0.03	$0.32	$0.79	$0.00	$2.15	$0.35	$0.10	$0.87	$1.06	$0.00	$4.53
Palm Beach County Park Airport	LNA	$5.15	$2.15	$0.25	$0.00	$0.03	$7.57	$0.00	$0.00	$0.37	$0.02	$0.00	$7.96
Palm Beach County Glades Airport	PHK	$0.51	$0.16	$0.00	$0.67	$0.00	$1.34	$0.00	$0.00	$0.14	$0.01	$0.00	$1.50
Pompano Beach Air Park	PMP	$7.45	$1.17	$0.58	$0.57	$0.04	$9.82	$0.00	$0.43	$0.00	$0.00	$0.84	$11.08
Vero Beach Municipal Airport	VRB	$3.36	$0.00	$0.11	$0.41	$0.16	$4.03	$0.99	$0.83	$1.56	$0.00	$1.23	$8.64
Belle Glade State Municipal Airport	X10	$0.86	$0.00	$0.00	$0.00	$0.00	$0.86	$0.00	$0.00	$0.00	$0.00	$0.00	$0.86
Sebastian Municipal Airport	X26	$2.81	$0.00	$0.00	$0.00	$0.00	$2.81	$0.00	$0.00	$0.00	$0.00	$0.00	$2.81
Total		$75.51	$4.70	$2.39	$3.60	$1.06	$87.25	$5.75	$2.17	$4.98	$2.74	$4.14	$107.03

Florida Airport System M&R 10 Year Plan Summary

District 5 (in million)

Airport	FAA	2008	2009	2010	2011	2012	Five Year	2013	2014	2015	2016	2017	Ten Year
Merritt Island Airport	COI	$1.59	$0.00	$0.00	$0.02	$0.00	$1.61	$0.00	$0.00	$0.00	$0.90	$0.00	$2.50
Daytona Beach International Airport	DAB	$45.82	$0.28	$0.74	$0.26	$0.75	$47.86	$0.05	$0.19	$1.77	$0.00	$0.52	$50.39
DeLand Municipal Airport	DED	$8.53	$0.10	$0.03	$0.30	$0.25	$9.20	$0.27	$0.00	$0.29	$0.00	$0.03	$9.79
New Smyrna Beach Municipal Airport	EVB	$16.89	$0.02	$0.00	$0.01	$0.30	$17.22	$0.00	$0.00	$0.00	$0.00	$1.22	$18.44
Kissimmee Gateway Airport	ISM	$13.97	$0.00	$0.00	$0.67	$0.02	$14.66	$0.00	$0.00	$0.03	$0.00	$0.04	$14.74
Leesburg International Airport	LEE	$3.32	$0.13	$0.03	$0.05	$0.14	$3.67	$0.00	$0.00	$0.00	$0.33	$0.00	$4.00
Melbourne International Airport	MLB	$15.13	$0.22	$1.30	$0.69	$0.62	$17.96	$0.52	$3.61	$0.10	$1.13	$0.49	$23.81
Ocala International - Jim Taylor Field	OCF	$5.02	$0.23	$1.20	$0.26	$0.00	$6.71	$0.41	$0.06	$0.00	$0.00	$0.02	$7.20
Ormond Beach Municipal Airport	OMN	$5.31	$0.00	$0.00	$0.02	$0.02	$5.34	$0.11	$0.00	$0.00	$0.00	$0.00	$5.45
Orlando Exe. Airport	ORL	$18.20	$0.00	$1.43	$0.17	$0.97	$20.78	$0.70	$0.00	$1.79	$0.53	$0.94	$24.74
Orlando Sanford International Airport	SFB	$34.49	$0.11	$0.07	$0.19	$0.34	$35.19	$2.47	$0.44	$0.11	$0.30	$0.22	$38.73
Space Coast Regional Airport	TIX	$6.14	$0.00	$0.06	$0.25	$0.01	$6.47	$0.00	$0.21	$1.05	$0.17	$2.21	$10.09
Arthur Dunn Airpark	X21	$0.14	$0.29	$0.00	$0.01	$0.01	$0.45	$0.00	$0.00	$0.59	$0.00	$0.09	$1.13
Umatilla Municipal Airport	X23	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Dunnellon/Marion Airport	X35	$4.63	$0.00	$0.00	$0.00	$0.00	$4.63	$0.33	$0.00	$0.00	$0.00	$0.00	$4.97
Flagler County Airport	X47	$7.21	$0.00	$0.16	$0.00	$1.64	$9.00	$0.07	$0.24	$0.00	$0.00	$0.00	$9.31
Valkaria Airport	X59	$4.95	$0.00	$0.00	$0.00	$0.00	$4.95	$0.00	$0.00	$0.93	$0.75	$0.18	$6.81
Total		$191.35	$1.38	$5.01	$2.89	$5.06	$205.68	$4.92	$4.75	$6.67	$4.10	$5.97	$232.10

Florida Airport System M&R 10 Year Plan Summary

District 6 (in million)

Airport	FAA	2008	2009	2010	2011	2012	Five Year	2013	2014	2015	2016	2017	Ten Year
Key West International Airport	2IS	$0.07	$0.23	$0.00	$0.00	$0.25	$0.56	$0.19	$1.88	$0.00	$0.48	$0.27	$3.36
The Florida Keys Marathon Airport	APF	$4.26	$0.00	$0.00	$0.00	$0.00	$4.26	$0.95	$0.00	$0.00	$0.00	$0.29	$5.49
Opa Locka Airport	AVO	$22.34	$2.62	$0.37	$0.11	$0.73	$26.17	$1.14	$1.07	$0.81	$1.74	$3.42	$34.35
Kendall-Tamiami Executive Airport	BOW	$2.38	$0.00	$0.00	$0.00	$1.02	$3.40	$0.11	$0.16	$0.21	$0.44	$0.03	$4.35
Dade-Collier Training and Transition	CHN	$5.00	$0.00	$0.11	$0.00	$0.00	$5.10	$2.02	$0.23	$0.29	$0.22	$0.01	$7.88
Homestead General Aviation	FMY	$0.20	$0.00	$0.03	$0.00	$0.67	$0.90	$0.44	$0.00	$0.11	$0.77	$0.06	$2.29
Total		$34.24	$2.85	$0.51	$0.11	$2.68	$40.39	$4.84	$3.34	$1.42	$3.64	$4.08	$57.70

Florida Airport System M&R 10 Year Plan Summary

District 7 (in million)

	Airport	2008	2009	2010	2011	2012	Five Year	2013	2014	2015	2016	2017	Ten Year
Hernando County	BKV	$18.43	$0.55	$0.21	$0.05	$0.33	$19.57	$0.07	$0.07	$0.00	$0.00	$0.00	$19.71
Crystal River Airport	CGC	$0.06	$0.00	$0.00	$0.19	$0.08	$0.33	$0.00	$0.08	$0.22	$0.00	$0.03	$0.66
Clearwater Airpark	CLW	$1.68	$0.21	$0.00	$0.10	$0.12	$2.11	$0.00	$0.00	$0.14	$0.00	$0.00	$2.24
St. Petersburg-Clear water International Airport	PIE	$34.04	$0.49	$0.18	$1.05	$0.19	$35.94	$0.29	$0.07	$0.10	$0.01	$0.13	$36.53
Albert Whitted Municipal Airport	SPG	$4.87	$0.43	$0.17	$0.10	$0.00	$5.57	$0.01	$0.03	$0.02	$0.00	$0.33	$5.95
Inverness Airport	X40	$0.00	$0.00	$0.00	$0.00	$0.11	$0.11	$0.03	$0.00	$0.02	$0.02	$0.32	$0.49
Zephyrhills Municipal Airport	ZPH	$3.59	$1.52	$0.01	$0.00	$0.00	$5.12	$0.00	$0.00	$0.54	$0.00	$0.03	$5.70
Total		$62.67	$3.21	$0.57	$1.49	$0.81	$68.74	$0.39	$0.26	$1.03	$0.03	$0.84	$71.29