STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION
AVIATION OFFICE

Statewide Airfield Pavement Management Program
Arthur Dunn Airpark
(General Aviation)
Titusville, Florida
(District 5)

February 4, 2008

Prepared for:
Florida Department of Transportation
Aviation Office

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

TABLE OF CONTENTS

SECTION **PAGE NO.**

LIST OF FIGURES

LIST OF TABLES:

APPENDIX

EXECUTIVE SUMMARY

URS Corporation, Inc., MACTEC Engineering and Consulting, Inc. (MACTEC), Planning Technology, Inc. (PTI), and ASC Geosciences, Inc. (ASCG) were awarded with a contract to provide services in support of the Florida Department of Transportation (FDOT) Aviation Office for Phase II of the Statewide Aviation Pavement Management program. As part of this contract, MACTEC conducted pavement condition survey for airside pavements at Arthur Dunn Airpark, evaluated the condition and developed a maintenance and rehabilitation program to improve conditions to prescribed minimum levels.

The total pavement area in 2007 at Arthur Dunn Airpark is 454,981 square feet. The breakdown of pavement area for each pavement use is provided as follows:

Pavement Area by Pavement Use

Use	Area, SqFt	% of Total Area
Runway	152,250	34
Taxiway	124,197	27
Apron	178,534	39
Total	**454,981**	**100**

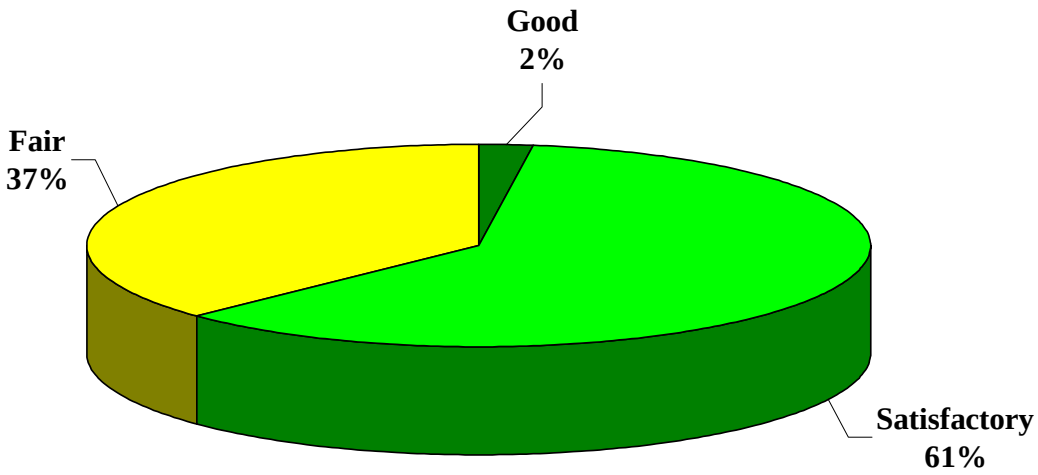
Prepared by BX *Checked by TH*

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

The figure below provides the PCI distribution by rating category for the network. Approximately 63% of the network is in Good and Satisfactory condition while the rest of the network is in Fair condition.

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

Network PCI Distribution by Rating Category



Prepared by BX *Checked by TH*

Condition Summary by Pavement Use

Use	Area-Weighted PCI
Runway	75
Taxiway	70
Apron	74
All	**73**

Prepared by BX *Checked by TH*

The immediate M&R needs include Apron, Taxiway Apron, and Taxiway B. These immediate needs are summarized in the following table.

Immediate Major M&R Needs

Branch	Section	Section Area, SqFt	Major M&R Funded**	PCI Before	Maintenance	PCI After
AP	4105	15,013	$39,049	63	Major M&R < Critical	100
AP	4107	25,181	$72,370	62	Major M&R < Critical	100
TW AP	115	3,022	$13,805	56	Major M&R < Critical	100
TW B	210	3,000	$13,704	56	Major M&R < Critical	100
		Total	**$138,928**	**73***	**← Network Avg. PCI →**	**76***

* 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 pavement sections at Arthur Dunn Airpark, including those sections not shown in this table.
** Cost figures are rounded down. Sum may be different. Costs are adjusted for inflation.

Prepared by BX *Checked by TH*

A forecast of Major M&R needs for a 10-year period was developed using an unlimited budget. The analysis identified ongoing maintenance needs and major M&R during that interval.

10 Year M&R Costs under Unlimited Funding Scenario

Year	Preventive	Major M&R >= Critical	Major M&R < Critical	Total
2008	$20,749	$0	$138,928	$159,677
2009	$46,304	$0	$288,185	$334,489
2010	$51,871	$0	$0	$51,871
2011	$57,578	$0	$12,398	$69,975
2012	$63,020	$0	$9,171	$72,191
2013	$71,753	$0	$0	$71,753
2014	$81,887	$0	$0	$81,887
2015	$34,403	$0	$593,205	$627,608
2016	$41,671	$0	$0	$41,671
2017	$39,603	$0	$92,340	$131,943
Total	**$508,838**	**$0**	**$1,134,226**	**$1,643,064**

Note: Cost figures are rounded down. Sum may be different. Costs are adjusted for inflation.
Prepared by BX *Checked by TH*

The 10 year analysis suggests an annual budget on the order of $165,000 would be expected to provide an improvement in the overall condition, where the area-weighted PCI would increase from 73 in 2007 to 87 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 all Arthur Dunn Airpark pavements in 2017 may remain near 87. The airport manager should realize that what is most important is that the pavement repair work (preventative and major M&R) that has been identified for Arthur Dunn Airpark is conducted at some point in the 10-year plan.

1. 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.

This report describes the procedures used to ensure that the appropriate engineering and scientific standards of care, quality, budget, and schedule requirements are implemented at your airport as a result of your participation in the Statewide Aviation Pavement Management Program.

1.1 Purpose

This Florida Airport Pavement Evaluation 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 airport
- Outline the procedures used to collect, evaluate and report pavement inspection results at your airport
- Present the findings from the inspection and analysis of the needs for maintenance and rehabilitation activities for this airport.

1.2 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.

1.3 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.

1.3.1 *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 provides 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).

1.3.2 *Airport Role*

The airports are the ultimate client for each of the field inspections and reports. Individual airports will be provided final deliverables prepared by the Consultant 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.

1.4 Pavement Types and Pavement Management

1.4.1 *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 two types of pavements;

- Flexible pavement, composed of asphalt concrete (AC) surface, and
- Rigid pavement composed of Portland cement concrete (PCC) surface.

Both 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.

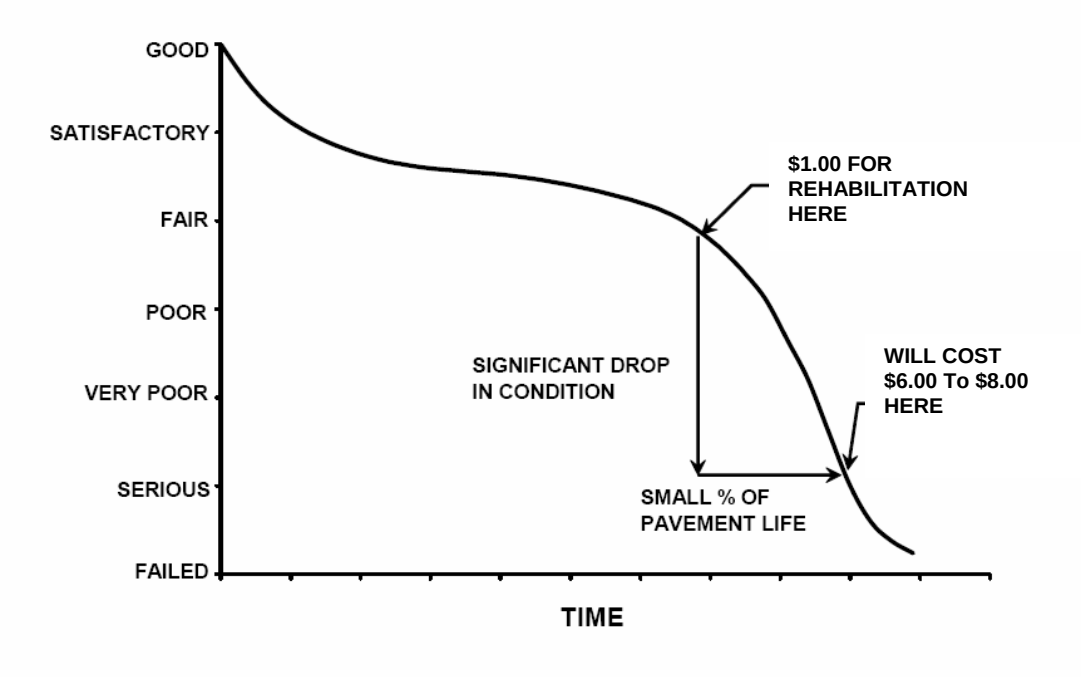
1.4.2 *Pavement Management System Concept*

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 1-1, 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 determined.

Figure 1-1: Pavement Life Cycle



Prepared by BX *Checked by TH*

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 the most feasible alternative 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 airside pavements.

1.4.3 *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 for AC-surfaced pavements and 20 ± 8 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 1-1 below.

Table 1-1: 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

Prepared by BX *Checked by TH*

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 nonrepresentive 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 1-2 shows the PCI scale.

Figure 1-2: PCI Rating Scale

Prepared by BX *Checked by TH*

1.5 Definitions

Aviation Office - The Aviation Office is charged with responsibility for promoting the safe development· of aviation to serve the people of the State of Florida. The Aviation Office worked closely with FDOT District Aviation Specialists, during development of this project. District Aviation Specialists will consult with airport owners in implementation of project recommendations.

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 regional relievers or small hubs
- PR – for primary

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.

Florida DOT (FDOT) - Florida Department of Transportation was represented in this project by the Office of Aviation.

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. The Network Definition for the airport in this report is in Appendix A along with a table of inventory data.

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. NETWORK DEFINITION

Arthur Dunn Airpark (X21) is located approximately 2 miles northwest of Titusville, Florida. Regulated by the Titusville-Cocoa Airport Advisory Board, this airport focuses primarily on recreational flying, sport/experimental aviation, and skydiving. The airport facility includes two runways: Runway 4-22 and Runway 15-33. Runway 4-22 is turf and is served by a stub taxiway. Runway 15-33 is served by a full-length parallel taxiway. Arthur Dunn Airpark is designated as a General Aviation (GA) airport and is located in District 5 of the Florida Department of Transportation.

The pavements within the 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 (runways, taxiways, or aprons) that have distinctly different uses. Branches are then divided into sections 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.

The network definition is used to identify changes in the network since the most recent update in 1998/1999 and also to plan the field inspection activities for 2007 survey. Prior to the field inspection process, the 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 existing 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 of Arthur Dunn Airpark are provided in Table 2-1 and the updated network definition drawing of the airport is given in Appendix A. The field of ***Rank*** in Table 2-1 is defined in the definitions section in section 1.

Table 2-1: Arthur Dunn Airpark Network Definition

Branch Name	Section ID	Rank
APRON	4104	P
	4105	P
	4107	P
	4110	P
T-HANGAR APRON	4205	T
	4210	T
RUNWAY 15-33	6105	P
TAXIWAY A	105	P
	110	P
TAXIWAY AP	115	P
	215	P
TAXIWAY B	205	P
	210	P
TAXIWAY C	305	P
	310	P
	315	P
TAXIWAY D	405	P

Prepared by BX *Checked by TH*

3. PAVEMENT INVENTORY

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

The total pavement area in 2007 at Arthur Dunn Airpark is 454,981 square feet. The breakdown of pavement area for each pavement use is provided in Table 3-1.

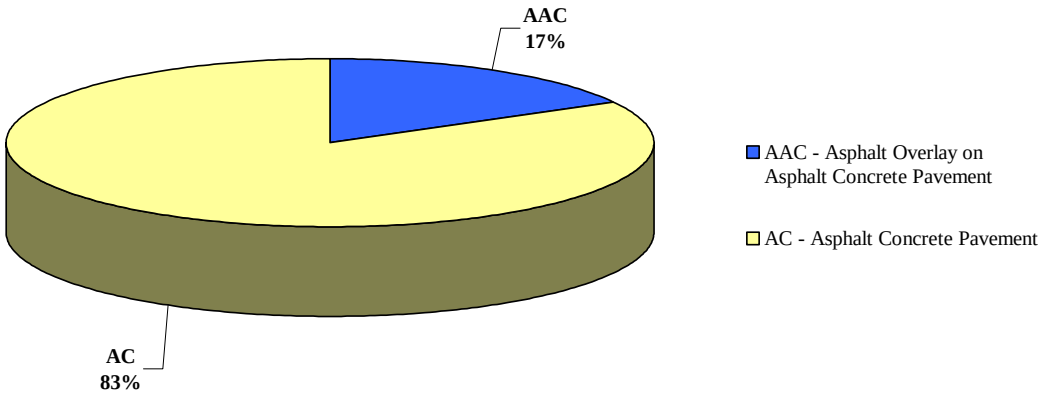
Table 3-1: Pavement Area by Pavement Use

Use	Area, SqFt	% of Total Area
Runway	152,250	34
Taxiway	124,197	27
Apron	178,534	39
Total	**454,981**	**100**

Prepared by BX *Checked by TH*

Figure 3-1 presents the breakdown of the pavement area at Arthur Dunn Airpark by surface type.

Figure 3-1: Pavement Area by Surface Type



Prepared by BX *Checked by TH*

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

4. 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 at Arthur Dunn Airpark were performed in July 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.

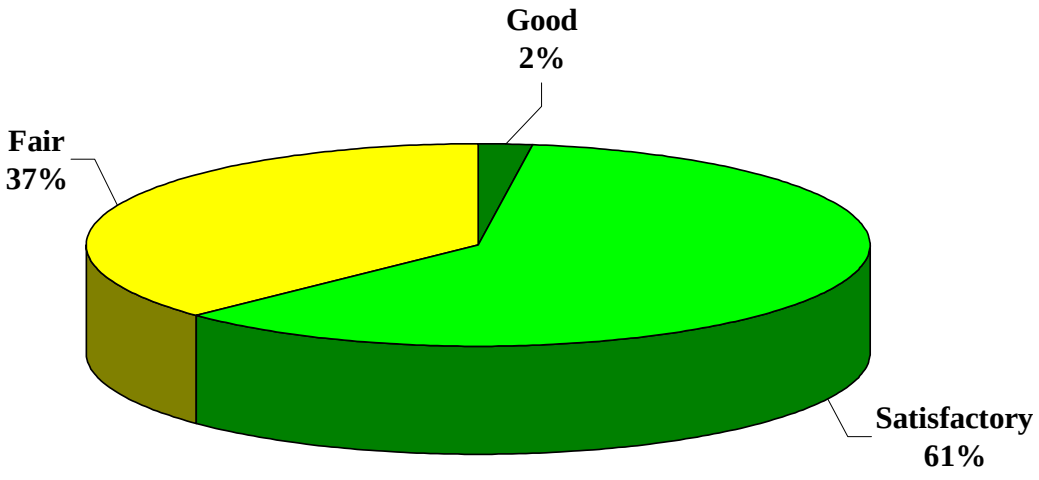
After the completion of data collection, the data were imported into MicroPAVER and PCI values were calculated for the pavement sections.

Appendix B includes detailed distress data generated by MicroPAVER, Appendix C contains a table and a map of PCI results by section inspected in 2007, and Appendix D contains a table of PCI results by branch.

According to the 2007 survey, the overall area-weighted PCI at Arthur Dunn Airpark is 73, representing a Satisfactory overall network condition.

Figure 4-1 provides the PCI distribution by rating category for the network.

Figure 4-1: Network PCI Distribution by Rating Category



Prepared by BX *Checked by TH*

Approximately 63% of the network is in Good and Satisfactory condition while the rest of the network is in Fair condition. Table 4-1 illustrates the area-weighted PCI computed individually for each pavement use.

Table 4-1: Condition by Pavement Use

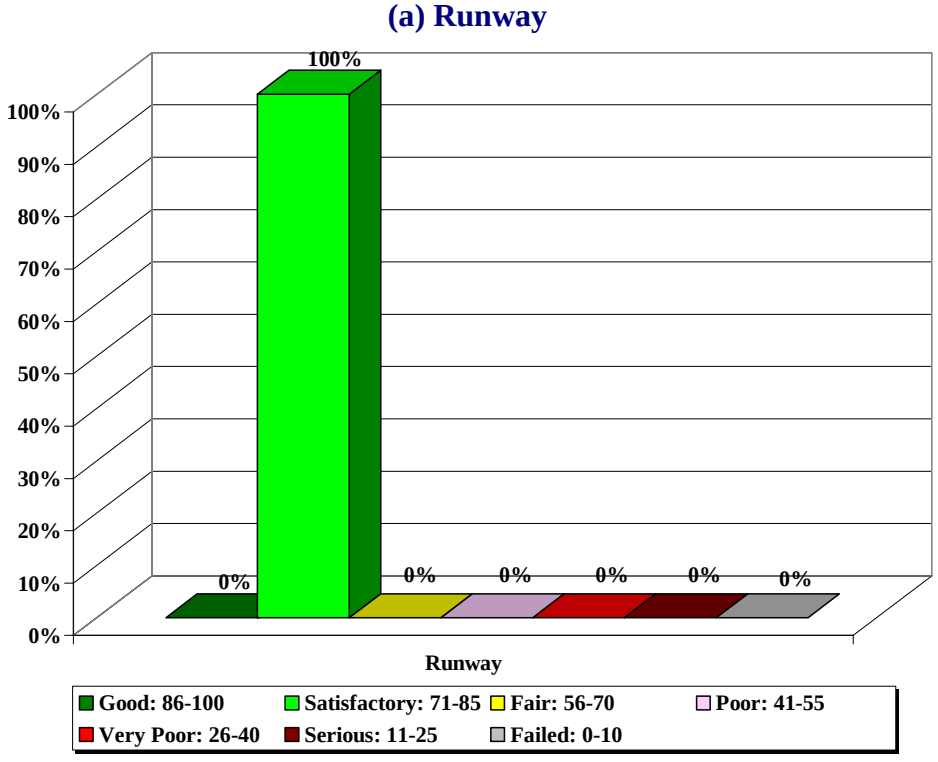
Use	Area-Weighted PCI
Runway	75
Taxiway	70
Apron	74
All	**73**

Prepared by BX *Checked by TH*

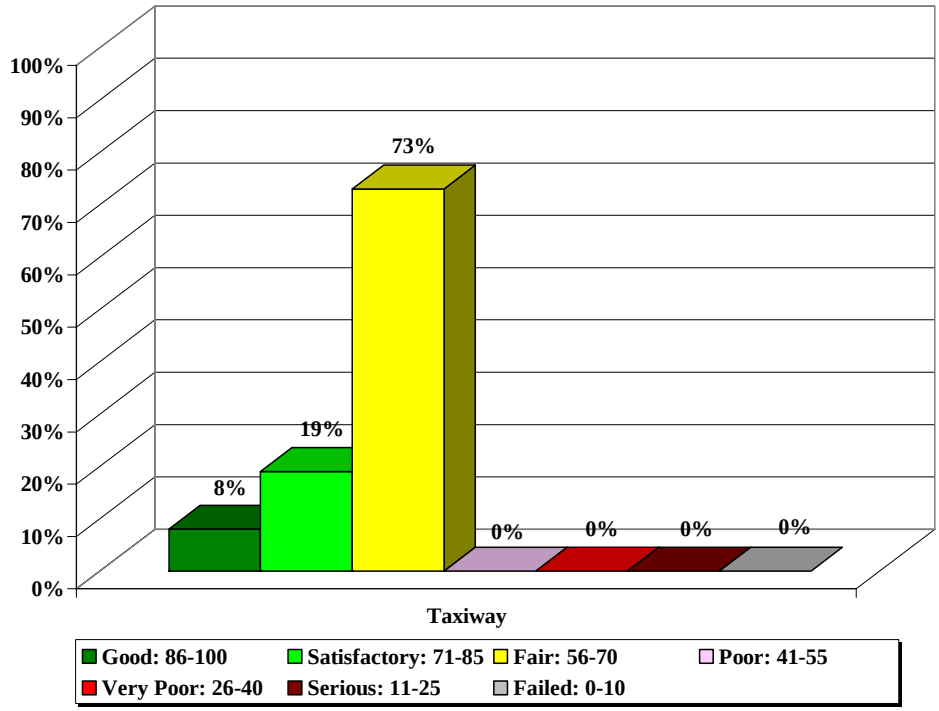
On average, the runway and aprons are in Satisfactory condition, while the taxiways are in Fair condition.

Figure 4-2 presents the breakdown of PCI by range for each pavement use.

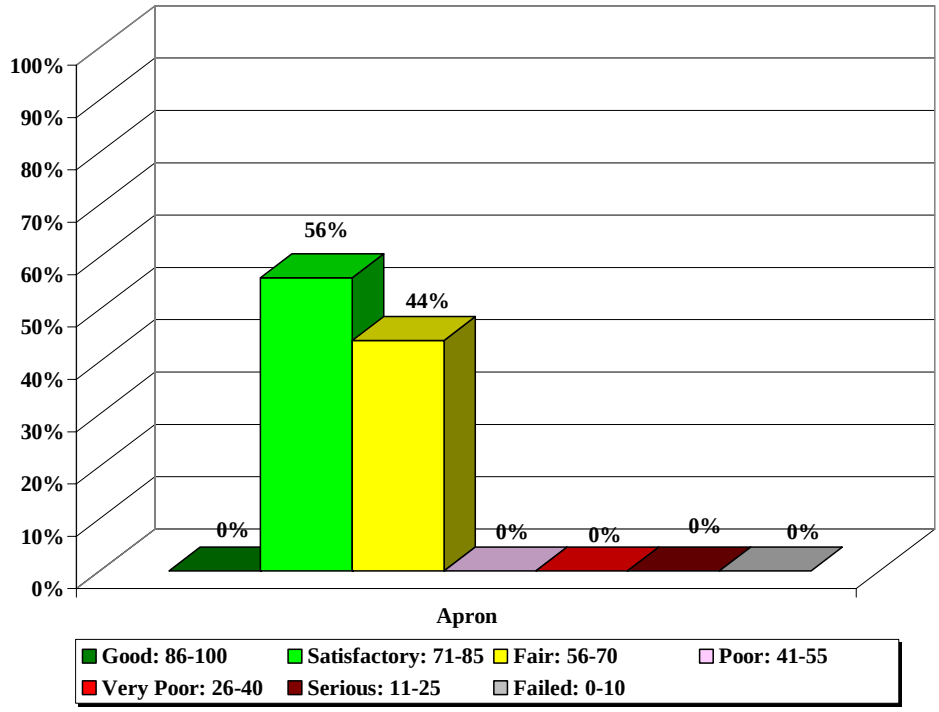
Figure 4-2: Percentage of Pavement Area within Each PCI Range by Pavement Use



(b) Taxiway



(c) Apron

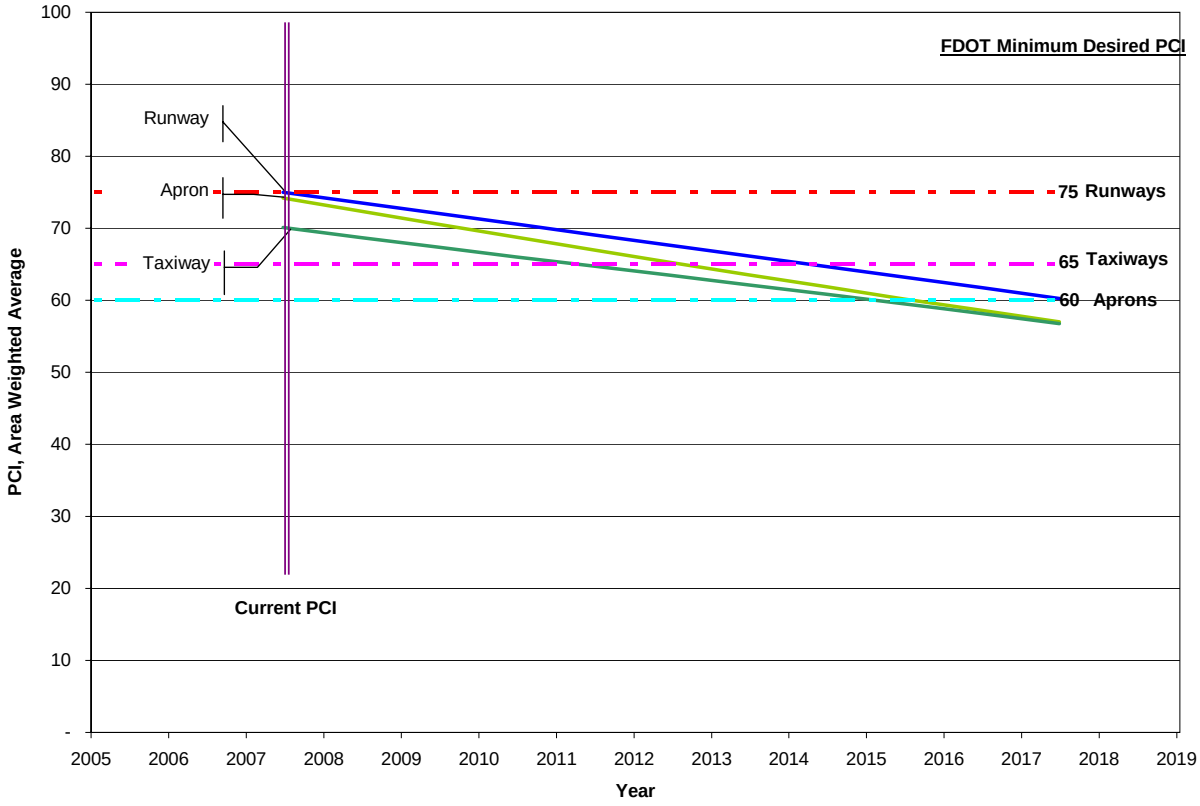


Prepared by BX *Checked by TH*

5. 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). Figure 5-1 illustrates the predicted performance of pavements at Arthur Dunn Airpark based on current 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 General Aviation (GA) airports.

Figure 5-1: Predicted PCI by Pavement Use



Prepared by BX *Checked by TH*

Appendix C presents the tabular summary of the predicted Section PCI for each year from 2008 to 2017.

6. MAINTENANCE POLICIES AND COSTS

6.1 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 6-1 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.

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 critical point 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 airport. Sections above critical PCI levels receive routine maintenances while pavements predicted to deteriorate below their respective critical PCI level during the analysis period will be identified for Major M&R. Table 6-2 gives the critical PCI levels for General Aviation Airports.

Table 6-1: 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

Prepared by BX *Checked by TH*

Table 6-2: Critical PCI for General Aviation Airports

Use	Critical PCI
Runway	65
Taxiway	65
Apron	65

Prepared by BX *Checked by TH*

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 6-3 gives the targeted, or desired, Minimum PCI values for runways, taxiways, and aprons of General Aviation Airports.

Table 6-3: Desired Minimum PCI for General Aviation Airports

Minimum PCI		
Runway	**Taxiway**	**Apron**
75	65	60

Prepared by BX *Checked by TH*

Typical Major M&R activities range from overlays to reconstruction. Based on the critical PCI values in Table 6-2 and our experience with pavement management systems, the PCI trigger 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 trigger 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 6-4 summarizes the M&R activities for General Aviation Airports based on PCI value.

Table 6-4: M&R Activities for General Aviation 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

Prepared by BX *Checked by TH*

6.2 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 6-5 presents the unit costs summary.

Table 6-5: 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

Prepared by BX *Checked by TH*

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 6-6. 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.

Table 6-6: M&R Activities and Unit Costs by Condition for General Aviation Airports

	Activity	PCI Trigger	Cost/SqFt
Maintenance	Crack Sealing and Full-Depth Patching	90	$0.06
		80	$0.24
Rehabilitation	Microsurfacing (AC) or Concrete Pavement Restoration (PCC)	70	$0.69
		60	$3.42
	Mill and Overlay (AC) or Concrete Pavement Restoration (PCC)	50	$6.29
		40	$6.29
	Reconstruction	30	$13.62
		20	$13.62

Prepared by BX *Checked by TH*

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

7. 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 7-1 presents the M&R needs list of immediate needs for Major M&R, i.e. 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.

The 10 year forecast results are shown in Figure 7-1, 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.

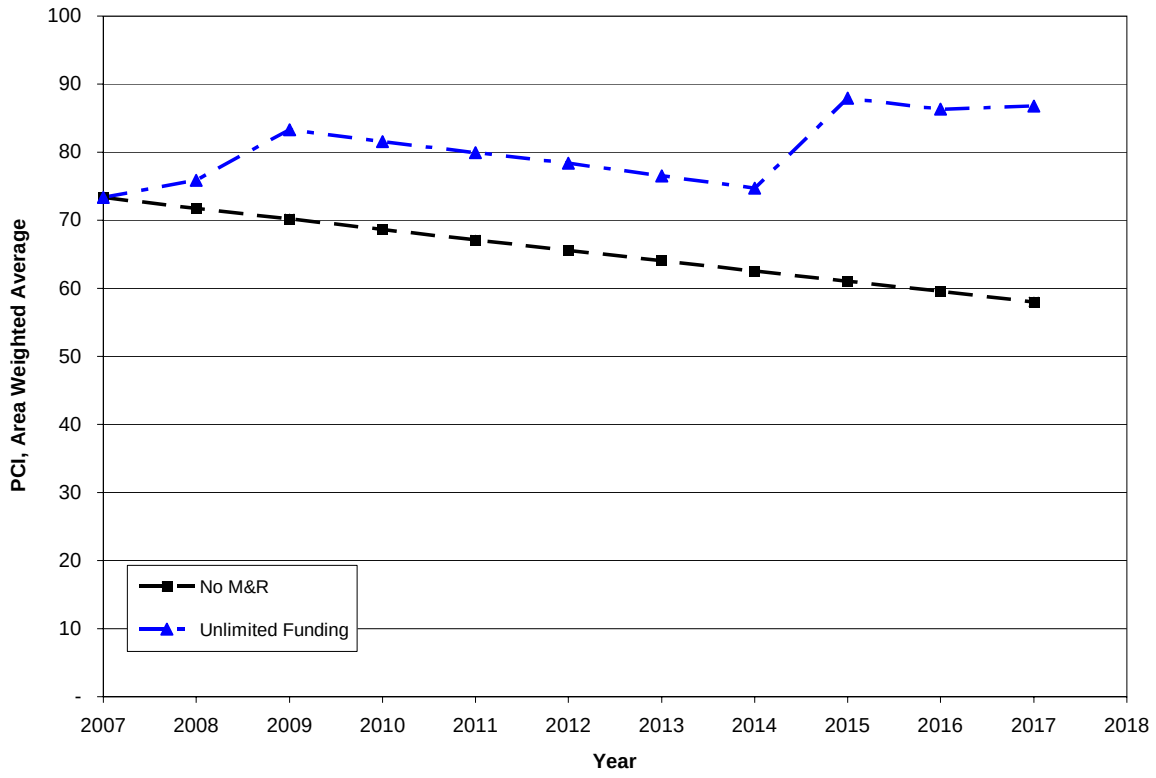
Table 7-1: Summary of Immediate Major M&R Needs

Branch	Section	Section Area, SqFt	Major M&R Funded**	PCI Before	Maintenance	PCI After
AP	4105	15,013	$39,049	63	Major M&R < Critical	100
AP	4107	25,181	$72,370	62	Major M&R < Critical	100
TW AP	115	3,022	$13,805	56	Major M&R < Critical	100
TW B	210	3,000	$13,704	56	Major M&R < Critical	100
		Total	**$138,928**	**73***	**← Network Avg. PCI →**	**76***

* 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 pavement sections at Arthur Dunn Airpark, including those sections not shown in this table.
** Cost figures are rounded down. Sum may be different. Costs are adjusted for inflation.

Prepared by BX *Checked by TH*

Figure 7-1: Budget Scenario Analysis



Prepared by BX *Checked by TH*

The following network level observations can be made from the figure above:

- The PCI will deteriorate from 73 to 58 in ten years if no M&R activities are performed.
- The PCI will remain at or above 75 through the 10-year analysis period under the unlimited budget scenario. A 2017 PCI of 87 with this scenario is 29 PCI points higher than a "No M&R" scenario. The total cost for Major M&R over this 10-year period is about $1.1 million.

8. MAINTENANCE AND REHABILITATION PLAN

The M&R analysis results include activities that likely exceed a typical annual budget level. These activities would need to be evaluated for feasibility and desirability based on the airport'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 8-1 provides the summary results under the critical PCI scenario.

Table 8-1: M&R Costs under Unlimited Funding Scenario

Year	Preventive	Major M&R >= Critical	Major M&R < Critical	Total
2008	$20,749	$0	$138,928	$159,677
2009	$46,304	$0	$288,185	$334,489
2010	$51,871	$0	$0	$51,871
2011	$57,578	$0	$12,398	$69,975
2012	$63,020	$0	$9,171	$72,191
2013	$71,753	$0	$0	$71,753
2014	$81,887	$0	$0	$81,887
2015	$34,403	$0	$593,205	$627,608
2016	$41,671	$0	$0	$41,671
2017	$39,603	$0	$92,340	$131,943
Total	**$508,838**	**$0**	**$1,134,226**	**$1,643,064**

Note: Cost figures are rounded down. Sum may be different. Costs are adjusted for inflation.
Prepared by BX *Checked by TH*

Approximately 12% of the total Major M&R cost is required in the first year (2008). This is a consequence of Apron, Taxiway Apron, and Taxiway B being below Critical PCI.

Runway 15-33 is currently in Satisfactory condition with an average PCI value of 75. This runway has no immediate need for repair, but would need some repair by 2015. The unlimited budget scenario provides the basis for estimating the total repair cost. In reality, it is neither operationally nor fiscally prudent.

Appendix E provides details of M&R plan by year under the unlimited funding scenario and the map of the 10-year M&R plan was provided in Appendix F. 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.

9. VISUAL AIDS

9.1 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.

Selected digital photographs taken during the pavement inspection were provided in an Appendix G to provide visual support to special pavement conditions or distress observed during the inspection of the facility.

10. RECOMMENDATIONS

Pavement condition inspections were performed at Arthur Dunn Airpark and a 10-year M&R plan was developed based on the unlimited funding scenario.

The following recommendations were made based on 2007 condition inspections and M&R analysis results:

- Runway 15-33 is currently in Satisfactory condition with an average PCI value of 75. This runway has no immediate need for repair, but would need some repair by 2015.
- Several areas of the aprons and taxiways (Apron, Taxiway Apron and Taxiway B) were identified that will require immediate funding to improve them above Minimum PCI levels. Further evaluation of these features is necessary in order to develop repair plans and timing for future budgets.

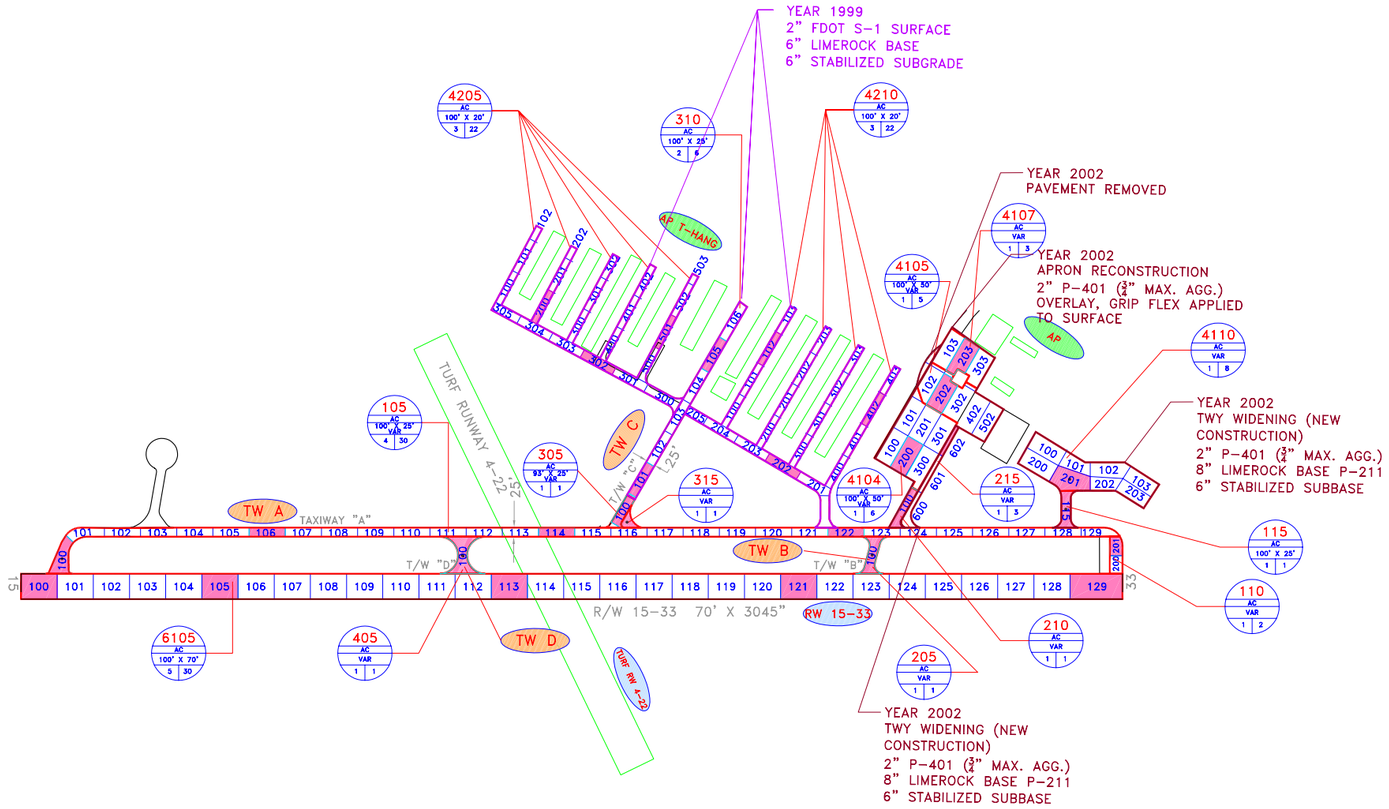
APPENDIX A

NETWORK DEFINITION MAP
AND
PAVEMENT INVENTORY TABLE

FEATURE PAVEMENT HISTORY

FEATURE 6105, 4105, 105, 110, 205, 210 AND 305
1 ¼"–2" BIT. SURFACE – YEAR 1965–70
6" STAB. SAND/SHELL BASE – YEAR 1965–70

FEATURE 405
1 ½"–2" BIT. SURFACE – YEAR 1965–70
6" STAB. SAND/SHELL BASE – YEAR 1965–70



LEGEND

- RW 13-31 — TYPICAL RUNWAY BRANCH ID
- TW A — TYPICAL TAXIWAY BRANCH ID
- AP S — TYPICAL APRON BRANCH ID
- 4105 — SECTION NUMBER
- AC — PAVEMENT TYPE
- 100' X 50' — TYPICAL SAMPLE UNIT INFORMATION
  - FLEXIBLE (AC) PAVEMENT LENGTH & WIDTH
  - RIGID (PCC) PAVEMENT NO. OF SLABS AND SLAB SIZE
- 5 — NUMBER OF SAMPLE UNITS IN SECTION
- 14 — NUMBER OF SAMPLE UNITS TO BE INSPECTED
- 100 — DESIGNATED SAMPLE UNITS. GPS COORDINATES ARE AT THE CENTROID OF THE SAMPLE UNIT.
- 100+ — DOT ON A ODD SHAPED SAMPLE UNIT INIDCATES THE CENTROID LOCATION.
- SOURCE: — SYSTEM INVENTORY DRAWING PREPARED BY URS CORPORATION, JUNE 2005.

PROJECTS YEAR 1998 · PROJECTS YEAR 1999 · PROJECTS YEAR 2000 · PROJECTS YEAR 2001 · PROJECTS YEAR 2002 · PROJECTS YEAR 2003 · PROJECTS YEAR 2004 · PROJECTS YEAR 2005 · PROJECTS YEAR 2006 · PROJECTS YEAR 2007

RUNWAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NOT MATCH PUBLISHED RUNWAY LENGTHS.

NUMBER	DATE	REVISIONS
0	Feb-06	Initial Submittal

DESIGNED: FL | DRAWN: VC | CHECKED: | DATE: 3-2-2006

MACTEC
Engineering and Consulting, Inc.
Tallahassee, Florida
850-656-1293

NETWORK DEFINITION DRAWING

ARTHUR DUNN AIRPARK AIRPORT
TITUSVILLE, BREVARD COUNTY, FLORIDA

FLORIDA DEPARTMENT OF TRANSPORTATION - AVIATION OFFICE

IDENTIFIER: X21 | FDOT DISTRICT: 5

Table A-1: Pavement Inventory

Network Name	Network ID	Branch Name	Branch ID	Section ID	Length, Ft	Width, Ft	Area, SqFt	Rank	Surface	Last Const. Date	Last Insp. Date
ARTHUR DUNN AIRPARK	X21	APRON	AP	4104	130	200	35,650	P	AAC	1/1/2002	7/9/2007
ARTHUR DUNN AIRPARK	X21	APRON	AP	4105	145	100	15,013	P	AAC	1/1/2002	7/9/2007
ARTHUR DUNN AIRPARK	X21	APRON	AP	4107	234	104	25,181	P	AAC	1/1/2002	7/9/2007
ARTHUR DUNN AIRPARK	X21	APRON	AP	4110	385	100	33,190	P	AC	1/1/2002	7/9/2007
ARTHUR DUNN AIRPARK	X21	T-HANGAR APRON	AP T-HANG	4205	1,955	20	39,100	T	AC	1/1/1999	7/9/2007
ARTHUR DUNN AIRPARK	X21	T-HANGAR APRON	AP T-HANG	4210	1,520	20	30,400	T	AC	1/1/1999	7/9/2007
ARTHUR DUNN AIRPARK	X21	RUNWAY 15-33	RW 15-33	6105	3,000	50	152,250	P	AC	1/1/1968	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY A	TW A	105	3,000	25	76,500	P	AC	1/1/1968	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY A	TW A	110	100	35	3,500	P	AC	1/1/1968	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY AP	TW AP	115	100	25	3,022	P	AC	1/1/2002	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY AP	TW AP	215	310	10	4,207	P	AC	1/1/2002	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY B	TW B	205	105	25	4,756	P	AC	1/1/1968	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY B	TW B	210	120	25	3,000	P	AC	1/1/2002	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY C	TW C	305	93	25	4,362	P	AC	1/1/1968	7/9/2007
ARTHUR DUNN AIRPARK	X21	TAXIWAY C	TW C	310	620	25	18,450	P	AC	1/1/1999	7/9/2007

See note at end of table.

Table A-1: Pavement Inventory

Network Name	Network ID	Branch Name	Branch ID	Section ID	Length, Ft	Width, Ft	Area, SqFt	Rank	Surface	Last Const. Date	Last Insp. Date
ARTHUR DUNN AIRPARK	X21	TAXIWAY C	TW C	315	50	50	946	P	AC	1/1/1999	1/1/1999*
ARTHUR DUNN AIRPARK	X21	TAXIWAY D	TW D	405	100	30	5,454	P	AC	1/1/1968	7/9/2007

Note: If new construction, then survey date = last construction date and PCI is set to 100 by MicroPAVER.

* Sections not surveyed due to reasons such as re-sectioning, no escort, not accessible at the time of survey.

APPENDIX B

PCI RE-INSPECTION REPORT

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: AP Name: APRON Use: APRON Area: 109,034.00 SqFt

Section: 4104 of 4 From: - To: - Last Const.: 1/1/2002
Surface: AAC Family: FDOT-GA-AP-AAC Zone: Category: Rank: P
Area: 35,650.00 SqFt Length: 130.00 Ft Width: 200.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 9 Surveyed: 1
Conditions: PCI:85.00 |
Inspection Comments:

Sample Number: 200 Type: R Area: 5,000.00 SqFt
Sample Comments:
52 L 50 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: AP Name: APRON Use: APRON Area: 109,034.00 SqFt

Section: 4105 of 4 From: - To: - Last Const.: 1/1/2002
Surface: AAC Family: FDOT-GA-AP-AAC Zone: Category: Rank: P
Area: 15,013.00 SqFt Length: 145.00 Ft Width: 100.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. 7/9/2007 Total Samples: 7 Surveyed: 1
Date:
Conditions: PCI:65.00 |
Inspection Comments:

Sample Number: 202 Type: R Area: 5,000.00 SqFt
Sample Comments:
52 L 50 L 48 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: AP Name: APRON Use: APRON Area: 109,034.00 SqFt

Section: 4107 of 4 From: - To: - Last Const.: 1/1/2002
Surface: AAC Family: FDOT-GA-AP-AAC Zone: Category: Rank: P
Area: 25,181.00 SqFt Length: 234.00 Ft Width: 104.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 4 Surveyed: 1
Conditions: PCI:64.00 |
Inspection Comments:

Sample Number: 203 Type: R Area: 5,850.00 SqFt
Sample Comments:
52 L 48 L 52 M

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: AP Name: APRON Use: APRON Area: 109,034.00 SqFt

Section: 4110 of 4 From: To: Last Const.: 1/1/2002
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: P
Area: 33,190.00 SqFt Length: 385.00 Ft Width: 100.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 1
Conditions: PCI:77.00 |
Inspection Comments:

Sample Number: 201 Type: R Area: 5,000.00 SqFt
Sample Comments:
52 L 48 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: AP T-HANG Name: T-HANGAR APRON Use: APRON Area: 69,500.00 SqFt

Section: 4205 of 2 From: To: Last Const.: 1/1/1999
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: T
Area: 39,100.00 SqFt Length: 1,955.00 Ft Width: 20.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 3
Conditions: PCI:66.00 |
Inspection Comments:

Sample Number: 200 Type: R Area: 2,000.00 SqFt
Sample Comments:
48 L 56 L 52 L

Sample Number: 302 Type: R Area: 2,000.00 SqFt
Sample Comments:
53 L 52 L 48 L 50 L

Sample Number: 501 Type: R Area: 2,000.00 SqFt
Sample Comments:
50 L 48 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: AP T-HANG Name: T-HANGAR APRON Use: APRON Area: 69,500.00 SqFt

Section: 4210 of 2 From: To: Last Const.: 1/1/1999
Surface: AC Family: FDOT-GA-AP-AC Zone: Category: Rank: T
Area: 30,400.00 SqFt Length: 1,520.00 Ft Width: 20.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 3
Conditions: PCI:82.00 |
Inspection Comments:

Sample Number: 102 Type: R Area: 2,000.00 SqFt
Sample Comments:
52 L 50 L

Sample Number: 202 Type: R Area: 2,000.00 SqFt
Sample Comments:
48 L 52 L

Sample Number: 402 Type: R Area: 2,000.00 SqFt
Sample Comments:
50 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: RW 15-33 Name: RUNWAY 15-33 Use: RUNWAY Area: 152,250.00 SqFt

Section: 6105 of 1 From: - To: - Last Const.: 1/1/1968
Surface: AC Family: FDOT-GA-RW-AC Zone: Category: Rank: P
Area: 152,250.00 SqFt Length: 3,000.00 Ft Width: 50.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 38 Surveyed: 5
Conditions: PCI:75.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 7,000.00 SqFt
Sample Comments:
48 L 52 L 56 L

Sample Number: 105 Type: R Area: 7,000.00 SqFt
Sample Comments:
48 L 52 L 56 L

Sample Number: 113 Type: R Area: 7,000.00 SqFt
Sample Comments:
48 L 52 L 56 L

Sample Number: 121 Type: R Area: 7,000.00 SqFt
Sample Comments:
48 L 52 L 56 L

Sample Number: 129 Type: R Area: 7,000.00 SqFt
Sample Comments:
56 L 48 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW A Name: TAXIWAY A Use: TAXIWAY Area: 80,000.00 SqFt

Section: 105 of 2 From: - To: - Last Const.: 1/1/1968
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 76,500.00 SqFt Length: 3,000.00 Ft Width: 25.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 19 Surveyed: 4
Conditions: PCI:66.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 4,500.00 SqFt
Sample Comments:
48 L 48 M 52 M 52 L

Sample Number: 106 Type: R Area: 2,500.00 SqFt
Sample Comments:
56 L 48 L 52 L

Sample Number: 114 Type: R Area: 2,500.00 SqFt
Sample Comments:
52 L 48 L

Sample Number: 122 Type: R Area: 2,500.00 SqFt
Sample Comments:
52 L 48 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW A Name: TAXIWAY A Use: TAXIWAY Area: 80,000.00 SqFt

Section: 110 of 2 From: - To: - Last Const.: 1/1/1968
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 3,500.00 SqFt Length: 100.00 Ft Width: 35.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 2 Surveyed: 1
Conditions: PCI:70.00 |
Inspection Comments:

Sample Number: 201 Type: R Area: 1,650.00 SqFt
Sample Comments:
48 L 52 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW AP Name: TAXIWAY AP Use: TAXIWAY Area: 7,229.00 SqFt

Section: 115 of 2 From: - To: - Last Const.: 1/1/2002
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 3,022.00 SqFt Length: 100.00 Ft Width: 25.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 1
Conditions: PCI:57.00 |
Inspection Comments:

Sample Number: 115 Type: R Area: 2,500.00 SqFt
Sample Comments:
48 L 48 M 50 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW AP Name: TAXIWAY AP Use: TAXIWAY Area: 7,229.00 SqFt

Section: 215 of 2 From: - To: - Last Const.: 1/1/2002
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 4,207.00 SqFt Length: 310.00 Ft Width: 10.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 1
Conditions: PCI:86.00 |
Inspection Comments:

Sample Number: 602 Type: R Area: 1,000.00 SqFt
Sample Comments:
52 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW B Name: TAXIWAY B Use: TAXIWAY Area: 7,756.00 SqFt

Section: 205 of 2 From: - To: - Last Const.: 1/1/1968
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 4,756.00 SqFt Length: 105.00 Ft Width: 25.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 1
Conditions: PCI:86.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 2,625.00 SqFt
Sample Comments:
48 L 52 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW B Name: TAXIWAY B Use: TAXIWAY Area: 7,756.00 SqFt

Section: 210 of 2 From: - To: - Last Const.: 1/1/2002
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 3,000.00 SqFt Length: 120.00 Ft Width: 25.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 1
Conditions: PCI:57.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 4,200.00 SqFt
Sample Comments:
56 L 50 L 48 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW C Name: TAXIWAY C Use: TAXIWAY Area: 23,758.00 SqFt

Section: 305 of 3 From: - To: - Last Const.: 1/1/1968
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 4,362.00 SqFt Length: 93.00 Ft Width: 25.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 1
Conditions: PCI:68.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 2,500.00 SqFt
Sample Comments:
48 L 45 L 52 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW C Name: TAXIWAY C Use: TAXIWAY Area: 23,758.00 SqFt

Section: 310 of 3 From: - To: - Last Const.: 1/1/1999
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 18,450.00 SqFt Length: 620.00 Ft Width: 25.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 7/9/2007 Total Samples: 5 Surveyed: 2
Conditions: PCI:80.00 |
Inspection Comments:

Sample Number: 101 Type: R Area: 2,500.00 SqFt
Sample Comments:
52 L 50 L 45 L 48 L

Sample Number: 105 Type: R Area: 2,500.00 SqFt
Sample Comments:
50 L 52 L

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW C Name: TAXIWAY C Use: TAXIWAY Area: 23,758.00 SqFt

Section: 315 of 3 From: - To: - Last Const.: 1/1/1999
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 946.00 SqFt Length: 50.00 Ft Width: 50.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

Last Insp. Date: 1/1/1999 Total Samples: 0 Surveyed: 0
Conditions: PCI:100.00 |
Inspection Comments: Construction/Major M&R inspection record.

Sample Number: Type: Area: 0.00
<NO SAMPLE RECORDS>

Re-inspection Report

FDOT
Report Generated Date: 1/30/2008
Site Name:

Network: X21 Name: ARTHUR DUNN AIRPARK

Branch: TW D Name: TAXIWAY D Use: TAXIWAY Area: 5,454.00 SqFt

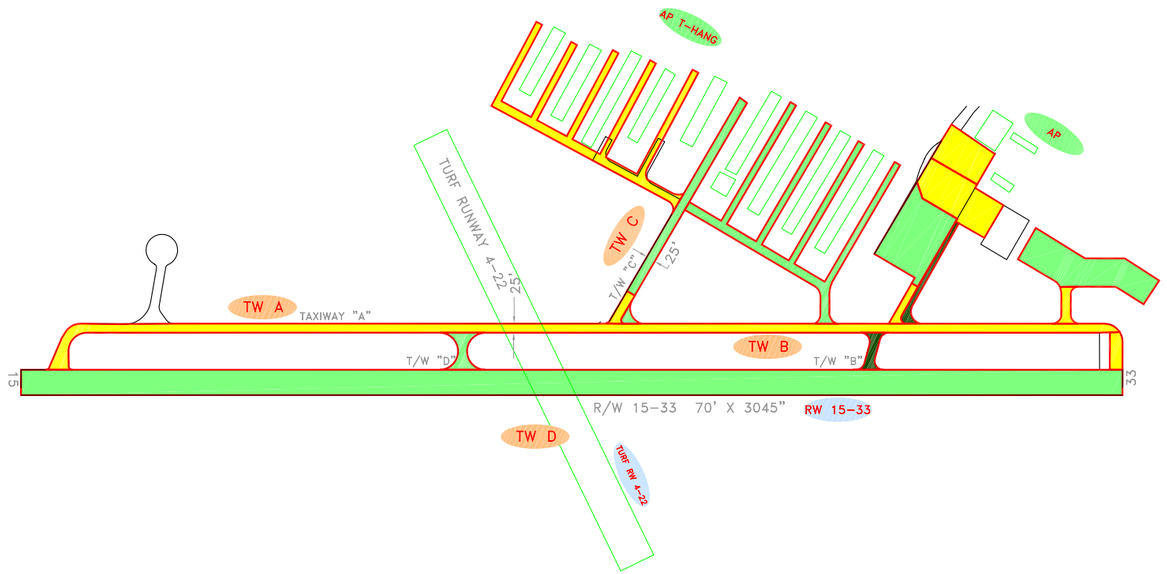
Section: 405 of 1 From: - To: - Last Const.: 1/1/1968
Surface: AC Family: FDOT-GA-TW-AC Zone: Category: Rank: P
Area: 5,454.00 SqFt Length: 100.00 Ft Width: 30.00 Ft
Shoulder: Street Type: Grade: 0.00 Lanes: 0
Section Comments:

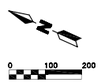
Last Insp. Date: 7/9/2007 Total Samples: 1 Surveyed: 1
Conditions: PCI:83.00 |
Inspection Comments:

Sample Number: 100 Type: R Area: 2,625.00 SqFt
Sample Comments:
52 L 48 L

APPENDIX C

2007 CONDITION MAP AND TABLES





LEGEND

RW 13-31 — TYPICAL RUNWAY BRANCH ID

TW A — TYPICAL TAXIWAY BRANCH ID

AP S — TYPICAL APRON BRANCH ID

- Good
- Satisfactory
- Fair
- Poor
- Very Poor
- Serious
- Failed

RUNWAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NOT MATCH PUBLISHED RUNWAY LENGTHS.

NUMBER	DATE	REVISIONS
1	Jan-30-08	Draft Report
0	Feb-06	Initial Submittal

DESIGNED: FL | DRAWN: VC | CHECKED: | DATE: 3-2-2006

MACTEC
Engineering and Consulting, Inc.
Tallahassee, Florida
850-656-1293

2007 Condition Map

ARTHUR DUNN AIRPARK AIRPORT
TITUSVILLE, BREVARD COUNTY, FLORIDA

FLORIDA DEPARTMENT OF TRANSPORTATION - AVIATION OFFICE

IDENTIFIER: X21

FDOT DISTRICT: 5

Table C-1: Pavement Condition Index

Network Name	Network ID	Branch Name	Branch ID	Section ID	Length, Ft	Width, Ft	Area, SqFt	Rank	Surface	Last Const. Date	Last Insp. Date	2007 PCI
ARTHUR DUNN AIRPARK	X21	APRON	AP	4104	130	200	35,650	P	AAC	1/1/2002	7/9/2007	85
ARTHUR DUNN AIRPARK	X21	APRON	AP	4105	145	100	15,013	P	AAC	1/1/2002	7/9/2007	65
ARTHUR DUNN AIRPARK	X21	APRON	AP	4107	234	104	25,181	P	AAC	1/1/2002	7/9/2007	64
ARTHUR DUNN AIRPARK	X21	APRON	AP	4110	385	100	33,190	P	AC	1/1/2002	7/9/2007	77
ARTHUR DUNN AIRPARK	X21	T-HANGAR APRON	AP T-HANG	4205	1,955	20	39,100	T	AC	1/1/1999	7/9/2007	66
ARTHUR DUNN AIRPARK	X21	T-HANGAR APRON	AP T-HANG	4210	1,520	20	30,400	T	AC	1/1/1999	7/9/2007	82
ARTHUR DUNN AIRPARK	X21	RUNWAY 15-33	RW 15-33	6105	3,000	50	152,250	P	AC	1/1/1968	7/9/2007	75
ARTHUR DUNN AIRPARK	X21	TAXIWAY A	TW A	105	3,000	25	76,500	P	AC	1/1/1968	7/9/2007	66
ARTHUR DUNN AIRPARK	X21	TAXIWAY A	TW A	110	100	35	3,500	P	AC	1/1/1968	7/9/2007	70
ARTHUR DUNN AIRPARK	X21	TAXIWAY AP	TW AP	115	100	25	3,022	P	AC	1/1/2002	7/9/2007	57
ARTHUR DUNN AIRPARK	X21	TAXIWAY AP	TW AP	215	310	10	4,207	P	AC	1/1/2002	7/9/2007	86
ARTHUR DUNN AIRPARK	X21	TAXIWAY B	TW B	205	105	25	4,756	P	AC	1/1/1968	7/9/2007	86
ARTHUR DUNN AIRPARK	X21	TAXIWAY B	TW B	210	120	25	3,000	P	AC	1/1/2002	7/9/2007	57
ARTHUR DUNN AIRPARK	X21	TAXIWAY C	TW C	305	93	25	4,362	P	AC	1/1/1968	7/9/2007	68
ARTHUR DUNN AIRPARK	X21	TAXIWAY C	TW C	310	620	25	18,450	P	AC	1/1/1999	7/9/2007	80

See note at end of table.

Table C-1: Pavement Condition Index

Network Name	Network ID	Branch Name	Branch ID	Section ID	Length, Ft	Width, Ft	Area, SqFt	Rank	Surface	Last Const. Date	Last Insp. Date	2007 PCI
ARTHUR DUNN AIRPARK	X21	TAXIWAY C	TW C	315	50	50	946	P	AC	1/1/1999	1/1/1999*	79
ARTHUR DUNN AIRPARK	X21	TAXIWAY D	TW D	405	100	30	5,454	P	AC	1/1/1968	7/9/2007	83

Note: If new construction, then survey date = last construction date and PCI is set to 100 by MicroPAVER.
* Sections not surveyed due to reasons such as re-sectioning, no escort, not accessible at the time of survey.

Table C-2: Pavement Condition Prediction

Network ID	Branch ID	Section ID	2007 PCI	PCI Forecast									
				2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
X21	AP	4104	85	83	81	79	77	75	74	72	70	68	66
X21	AP	4105	65	63	61	59	57	55	54	52	50	48	46
X21	AP	4107	64	62	60	58	56	54	53	51	49	47	45
X21	AP	4110	77	75	73	72	70	68	66	65	63	62	60
X21	AP T-HANG	4205	66	64	63	61	60	59	57	56	55	53	52
X21	AP T-HANG	4210	82	80	78	76	74	73	71	69	67	66	64
X21	RW 15-33	6105	75	74	72	71	69	68	66	65	63	62	60
X21	TW A	105	66	65	64	63	61	60	59	58	56	55	54
X21	TW A	110	70	69	67	66	65	64	63	62	60	59	58
X21	TW AP	115	57	56	54	53	51	50	48	46	44	42	40
X21	TW AP	215	86	84	82	80	78	76	75	73	72	70	69
X21	TW B	205	86	84	82	80	78	76	75	73	72	70	69
X21	TW B	210	57	56	54	53	51	50	48	46	44	42	40
X21	TW C	305	68	67	66	64	63	62	61	60	59	57	56
X21	TW C	310	80	78	76	75	73	72	71	69	68	67	66
X21	TW C	315	79	78	76	74	73	71	70	69	68	66	65
X21	TW D	405	83	81	79	77	76	74	73	71	70	69	67

Note: If new construction, then survey date = last construction date and PCI is set to 100 by MicroPAVER.

APPENDIX D

AREA-WEIGHTED PCI RESULTS BY BRANCH

Table D-1 Condition Summary by Branch

Network	Branch Name	2007 PCI
ARTHUR DUNN AIRPARK	APRON	75
ARTHUR DUNN AIRPARK	T-HANGAR APRON	73
ARTHUR DUNN AIRPARK	RUNWAY 15-33	75
ARTHUR DUNN AIRPARK	TAXIWAY A	66
ARTHUR DUNN AIRPARK	TAXIWAY AP	74
ARTHUR DUNN AIRPARK	TAXIWAY B	75
ARTHUR DUNN AIRPARK	TAXIWAY C	78
ARTHUR DUNN AIRPARK	TAXIWAY D	83

APPENDIX E

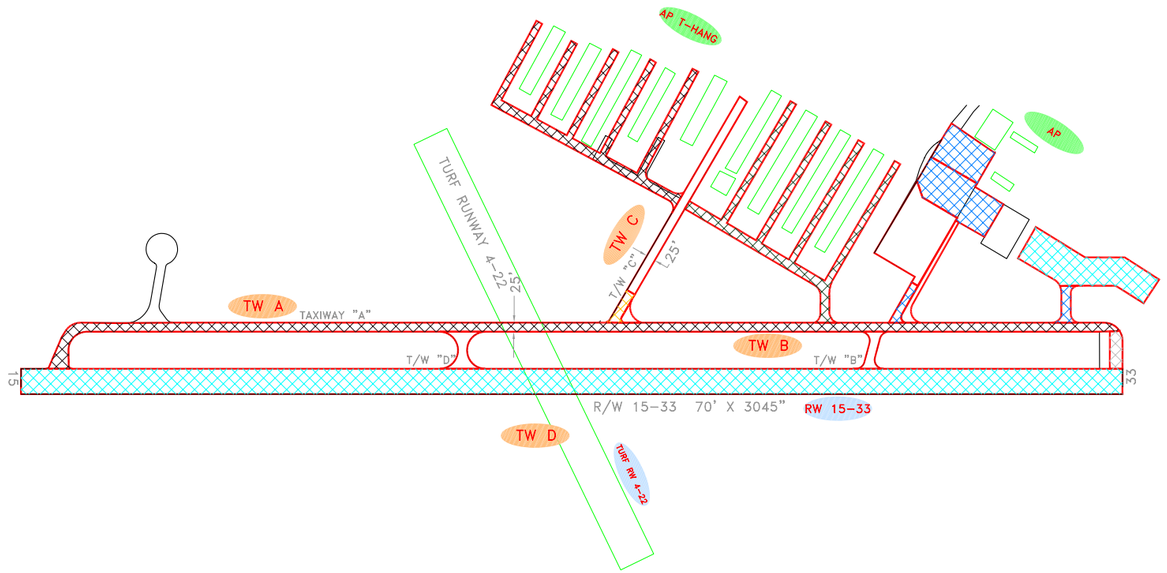
MAJOR M&R PLAN BY YEAR

Table E-1: Major M&R Plan by Year

Network	Branch Use	Branch ID	Section ID	Surface	Area, SqFt	Year	PCI Before Maint.	Activities	PCI After Maint.	Cost
X21	APRON	AP	4105	AAC	15,013	2008	63	Microsurfacing	100	$39,049
X21	APRON	AP	4107	AAC	25,181	2008	62	Microsurfacing	100	$72,370
X21	TAXIWAY	TW AP	115	AC	3,022	2008	56	Microsurfacing	100	$13,805
X21	TAXIWAY	TW B	210	AC	3,000	2008	56	Microsurfacing	100	$13,704
X21	APRON	AP T-HANG	4205	AC	39,100	2009	63	Microsurfacing	100	$104,750
X21	TAXIWAY	TW A	105	AC	76,500	2009	64	Microsurfacing	100	$183,435
X21	TAXIWAY	TW C	305	AC	4,362	2011	63	Microsurfacing	100	$12,398
X21	TAXIWAY	TW A	110	AC	3,500	2012	64	Microsurfacing	100	$9,171
X21	APRON	AP	4110	AC	33,190	2015	63	Microsurfacing	100	$106,172
X21	RUNWAY	RW 15-33	6105	AC	152,250	2015	63	Microsurfacing	100	$487,033
X21	APRON	AP T-HANG	4210	AC	30,400	2017	64	Microsurfacing	100	$92,340

APPENDIX F

10-YEAR M&R MAP



LEGEND

RW 13-31 — TYPICAL RUNWAY BRANCH ID

TW A — TYPICAL TAXIWAY BRANCH ID

AP S — TYPICAL APRON BRANCH ID

Year	Activity
2008	Microsurfacing
2009	
2010	Mill & Overlay
2011	
2012	Reconstruction
2013	
2014	Concrete Pavement Restoration
2015	
2016	
2017	

RUNWAY LENGTHS DEPICTED IN THIS DRAWING ARE FOR PAVEMENT MANAGEMENT PURPOSES ONLY AND MAY NOT MATCH PUBLISHED RUNWAY LENGTHS.

NUMBER	DATE	REVISIONS
1	Jan-30-08	Draft Report
0	Feb-06	Initial Submittal

DESIGNED: FL | DRAWN: VC | CHECKED: | DATE: 3-2-2006

MACTEC
Engineering and Consulting, Inc.
Tallahassee, Florida
850-656-1293

10-Year M&R Map

ARTHUR DUNN AIRPARK AIRPORT
TITUSVILLE, BREVARD COUNTY, FLORIDA

FLORIDA DEPARTMENT OF TRANSPORTATION - AVIATION OFFICE

IDENTIFIER: X21

FDOT DISTRICT: 5

APPENDIX G

PHOTOGRAPHS

RW 15-33 Section 6105 SU 100: Low Severity L/T Cracking (July 9, 2007)

RW 15-33 Section 6105 SU 105: Low Severity Weathering (July 9, 2007)

AP Section 4110 SU 201: Section Overview (July 9, 2007)

TW AP Section 115 SU 115: Low Severity L/T Cracking (July 9, 2007)

TW B Section 210 SU 100: Section Overview (July 9, 2007)

AP Section 4105 SU 202: Low Severity L/T Cracking (July 9, 2007)

AP Section 4107 SU 203: Low Severity L/T Cracking (July 9, 2007)

AP Section 4107 SU 203: Low Severity L/T Cracking (July 9, 2007)

AP Section 4104 SU 200: Section Overview (July 9, 2007)

TW C Section 305 SU 100: Section Overview (July 9, 2007)

TW C Section 305 SU 100: Low Severity L/T Cracking (July 9, 2007)

TW D Section 405 SU 100: Low Severity L/T Cracking (July 9, 2007)